



**Revision 1**

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# **HYDROGEOLOGIC INVESTIGATION REPORT**

**FLEETWIDE ASSESSMENT  
ZION STATION  
ZION, ILLINOIS**

**Prepared For:  
Exelon Generation Company, LLC**

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**Prepared by:  
Conestoga-Rovers  
& Associates**

651 Colby Drive  
Waterloo, Ontario  
Canada N2V 1C2

Office: (519) 884-0510  
Fax: (519) 884-0525

web: <http://www.CRAworld.com>

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## EXECUTIVE SUMMARY

This Hydrogeologic Investigation Report (HIR) documents the results of Conestoga-Rovers & Associates' (CRA's) May to July 2006 hydrogeologic investigation pertaining to the Zion Station (Station). CRA prepared this HIR for Exelon as part of its Fleetwide Program to determine whether groundwater at and in the vicinity of its nuclear power generating facilities has been adversely impacted by any releases of radionuclides.

CRA collected and analyzed information on any historical releases, the structures, components, and areas of the Station that have the potential to release tritium or other radioactive liquids to the environment and past hydrogeologic investigations at the Station. CRA used this information, combined with its understanding of groundwater flow at the Station to identify the Areas for Further Evaluation (AFE) for the Station.

Fifteen new monitoring wells were installed, including 11 permanent and 4 temporary monitoring wells. CRA also collected two rounds of water levels from the newly installed wells and the surface water staff gauge. All groundwater and surface water samples were analyzed for tritium, strontium-89/90, and gamma-emitting radionuclides. Field activities were completed between May and July 2006.

The results of the hydrogeologic investigation are:

- Gamma-emitting radionuclides associated with licensed plant operations were not detected at concentrations greater than their respective Lower Limits of Detection (LLDs) in any of the groundwater or surface water samples obtained and analyzed during the course of this investigation;
- Strontium-89/90 was not detected at a concentration greater than the LLD of 2.0 picoCuries per liter (pCi/L) in any of the groundwater or surface water samples obtained and analyzed during the course of this investigation;
- Tritium was not detected within any area in or adjacent to the Station at levels above the United States Environmental Protection Agency drinking water standard of 20,000 pCi/L in any of the groundwater or surface water samples obtained and analyzed during the course of this investigation;
- Low levels of tritium were detected at concentrations greater than the LLD of 200 pCi/L, which is considered background;
- Tritium was detected in groundwater samples collected from monitoring well MW-ZN-01S. These concentrations ranged from less than LLD (most recently) to  $586 \pm 141$  pCi/L (lower interval) and  $220 \pm 123$  pCi/L to  $261 \pm 124$  pCi/L (upper

interval). The detected concentrations are significantly less than applicable drinking water standard. The source of tritium in this location is likely attributable to historical releases in this area. However, the most recent sample results are within the range of background concentrations;

- Based on the results of this investigation, tritium is not migrating off the Station property at detectable concentrations;
- Based on the results of this investigation, there is no current risk from exposure to radionuclides associated with licensed plant operations through any of the identified potential exposure pathways; and
- Based on the results of this investigation, there are no known active releases into the groundwater at the Station.

Based upon the information collected to date, CRA recommends that Exelon conduct periodic monitoring of selected sample locations.

## 1.0 INTRODUCTION

Conestoga-Rovers & Associates (CRA) has prepared this Hydrogeologic Investigation Report (HIR) for Exelon Generation Company, LLC (Exelon) as part of its fleetwide program to determine whether groundwater at and near its nuclear power generating facilities has been adversely impacted by any releases of radionuclides. This report documents the results of CRA's May 2006 Hydrogeologic Investigation Work Plan (Work Plan), as well as several other investigative tasks recommended by CRA during the course of the investigation. These investigations pertain to Exelon's Zion Station (Station) in Zion, Illinois (see Figure 1.1). The Station is defined as all property, structures, systems, and components owned and operated by Exelon LLC and located at 101 Shiloh Boulevard, Zion, Lake County, Illinois. The approximate property boundaries are depicted on Figure 1.2.

Pursuant to the Work Plan, CRA assessed groundwater quality at the Station in locations designated as areas for further evaluation (AFEs). The process by which CRA identified AFEs is discussed in Section 3.0 of this report.

The objectives of the Work Plan were to:

- characterize the geologic and hydrogeologic conditions at the Station including subsurface soil types, the presence or absence of confining layers, and the direction and rate of groundwater flow;
- characterize the groundwater/surface water interaction at the Station, including a determination of the surface water flow regime;
- evaluate groundwater quality at the Station including the vertical and horizontal extent, quantity, concentrations, and potential sources of tritium and other radionuclides in the groundwater, if any;
- define the probable sources of any radionuclides released at the Station;
- evaluate potential human, ecological, or environmental receptors of any radionuclides that might have been released to the groundwater; and
- evaluate whether interim response activities are warranted.

## 2.0 STATION DESCRIPTION

The following section presents a general summary of the Station location and definition, overview of Station operations, surrounding land use, and an overview of both regional and Station-specific topography, surface water features, geology, hydrogeology, and groundwater flow conditions. This section also presents an overview of groundwater use in the area.

### 2.1 STATION LOCATION

The Station is a former nuclear power generating facility that, in the early spring of 1998, converted both units' generators to synchronous condensers that provide voltage stability to the northeast Illinois power grid. The Station encompasses approximately 250 acres (Exelon, 2004). Figure 1.2 presents a Station Boundaries and Features plan.

The Station is located on the eastern edge of Zion between 23rd and 29th Streets, from the Chicago and Northwestern Railroad tracks to Lake Michigan.

The Station is being maintained and monitored under the "SAFSTOR" (safe storage of components of the nuclear power plant) phase of decommissioning, as is discussed below.

### 2.2 OVERVIEW OF COOLING WATER OPERATIONS

#### Former Operations

In the mid-1950s, Commonwealth Edison Company (ComEd) purchased about 250 acres on the eastern edge of Zion. The Station operated as a dual unit pressurized water reactor plant. A construction permit was issued in December 1968. An operating license was issued October 19, 1973 for Unit 1 and November 14, 1973 for Unit 2. Commercial operations commenced in December 1973 for Unit 1 and September 1974 for Unit 2.

Unit 1 operations ended on February 21, 1997 and Unit 2 operations ended on September 19, 1996. All fuel was removed from the reactor and placed in the spent fuel pool on April 27, 1997 for Unit 1 and on February 25, 1998 for Unit 2. Commercial operation of the plant ended on January 14, 1998 when the Unicom Corporation and ComEd Boards of Directors authorized the permanent cessation of operations at the Station. Exelon submitted the certification of fuel transfer on March 9, 1998. In addition

to maintaining the synchronous condensers, the Station's employees also monitor the safe storage of spent fuel.

Discharges from the Station are subject to the requirements of Nuclear Regulatory Commission (NRC) Operating Licenses DPR-39 and DPR-48. Discharges from the Station are also subject to regulation under the Illinois Environmental Protection Agency (EPA) National Pollutant Discharge Elimination System (NPDES) Permit IL0002763. The NPDES permit provides limits on parameters such as pH, total suspended solids, and oil and grease.

#### Cooling Water Operations 1973-1997

The Station is comprised of two nearly identical pressurized water reactors with supporting facilities. Both primary reactor coolant systems were designed by Westinghouse Corporation and each is comprised of a reactor vessel and four heat transfer loops. Each loop contains a reactor coolant pump, steam generator, and associated piping and valves. In addition, each system includes a pressurizer, a pressurizer relief tank, interconnecting piping, and the instrumentation necessary for operational control.

Each Containment Building is cylindrical with a shallow dome roof and has a flat slab foundation. The entire structure is internally lined with a welded steel plate and completely encloses the primary coolant system, steam generators, reactor coolant loops, and portions of the auxiliary and engineered safety feature systems.

Heat produced in the reactor was converted to electrical energy by the power conversion system between 1973 and 1997. A turbine generator converted the thermal energy of steam produced in the steam generators into mechanical shaft power and then into electrical energy.

The exhaust steam from the turbine was condensed and deaerated in the main condenser. The waste heat in the main condenser was removed by the circulating water system. Circulating water was withdrawn from Lake Michigan, approximately 450 feet east of the condensate storage tank, via an intake pipe connected to the circulating water pumps. After circulating through the plant condensers, the cooling water was routed back to the lake via discharge lines (ComEd, 1999).

Primary coolant was treated to remove impurities and recirculated through the primary water (PW) system. Primary coolant was stored in two above ground storage tanks (ASTs) located on the east side of the Turbine Building.



Secondary cooling water (condensate cooling water) was treated to remove impurities and recirculated through the condensate (CD/SC) system. Secondary cooling water is stored in ASTs located on the east side of the Turbine Building.

Circulating water is drawn from Lake Michigan by way of an intake pipe that extends approximately a half mile into the Lake. Circulating water is returned to Lake Michigan by way of two discharge pipes that extend approximately a quarter mile into the lake.

Liquid wastes have been discharged under the NRC permit through the blowdown line, which is piped to the circulating water discharge pipe located east of the Turbine Building.

#### Voltage Stabilization and SAFSTOR

The Station is being decommissioned under the NRC regulatory process. The Station is currently in the "SAFSTOR" phase of the decommissioning process where the Station is maintained in a condition that allows it to be safely stored and subsequently decontaminated to levels that permit its release for unrestricted use.

### **2.3            SURROUNDING LAND USE**

The Station is located on the shore of Lake Michigan, in the eastern portion of the City of Zion, and adjacent to the Illinois Beach State Park.

The Illinois Beach State Park is located along the Lake Michigan shoreline and is divided into a northern unit and a southern unit, with the Station situated between the two units. The Illinois Beach State Park encompasses 4,160 acres and received approximately 2.75 million visitors in 1998. The Park is considered a natural resource (ATSDR, 2000).

The land located to the west of the Station is generally undeveloped with a limited number of industrial/commercial facilities present along Deborah Avenue. Residential areas and the City of Zion downtown are located west of the Chicago & Northwestern Railroad, which is west of the Station. Lake Michigan borders the Station to the east.

## **2.4        STATION SETTING**

The following sections present a summary of the topography, surface water features, geology, hydrogeology, and groundwater flow conditions in the region surrounding the Station. The information was primarily gathered from Sections 2.1 and 2.3 of the Zion Defueled Safety Analysis Report (DSAR) last revision dated October 2004 (Exelon, 2004). The main references the DSAR relies upon are listed in Section 10.0 of this HIR. CRA checked and verified all DSAR references that apply to this HIR.

### **2.4.1        TOPOGRAPHY AND SURFACE WATER FEATURES**

Lake County consists of moraines, outwash plains, lake plains, kames, stream terraces, flood plains, beaches, and bogs. The county is in the Wheaton Morainal country of the Great Lakes section of the Central Lowland province. Relief in Lake County was caused by differences in the thickness of deposits left by the most recent glacier. The land surface gradually slopes to the south or southeast. The highest point in the county, 957 feet above mean sea level (AMSL), is located on Gander Mountain in the northwest corner of the county. The lowest point is at the Lake Michigan shore near Waukegan. Several moraines run through the county. From east to west, they are the Lake Border Morainic System, the Tinley Moraine, the Valparaiso Morainic System, and the Fox Lake Moraine. In general, Lake County has a poorly defined drainage pattern. Many drainage ways terminate in depressions and marshes. The land area falls into four major watersheds and 26 drainage basins. The Chicago River, Des Plaines River, Fox River, and Lake Michigan watersheds are all shared with neighboring counties in Illinois and Wisconsin (NRCS, 2005).

The Lake Michigan shoreline between North Chicago, Illinois and Kenosha, Wisconsin comprises the Zion beach-ridge plain. The Zion beach-ridge plain consists of linear, generally coast-parallel mounds of sand and gravel that have been built up by wave action to extend the coast outward into Lake Michigan. The Zion beach-ridge plain has a maximum width of approximately 1 mile near the City of Zion (Chrzastowski and Frankie, 2000). The older dunes become root-bound by vegetation resulting in long lines of sandy ridges separated by linear marshes.

The main portion of the Station is located on a sand ridge that runs parallel to the Lake Michigan shoreline as shown on Figure 1.2. The area in the immediate vicinity of the Station has been leveled and is paved. The ground elevation at the main complex is 591 feet AMSL. The average lake level is 577 feet AMSL. The eastern portion of the

Station is a beach gently sloping to the Lake Michigan shoreline. The area to the west of the Station is a low-lying wet area.

Lake Michigan has a surface area of 22,300 square miles, with a mean depth of 276 feet and a volume of 1,170 cubic miles. Lake Michigan has a natural outlet through the Straits of Mackinac on the north end of the lake and a second outlet through the Illinois Waterway near Chicago (USEPA, 1995).

The average surface elevation of Lake Michigan is 577 feet AMSL. The surface elevation of Lake Michigan varies daily and annually, and is affected by hydrologic and atmospheric conditions and flow through the two outlets. Water levels in Lake Michigan typically vary about 1 foot in elevation between annual low and high measurements. Generally, the lowest levels occur in winter when much of the precipitation is locked up in ice and snow on land, and dry winter air masses pass over the lakes enhancing evaporation. Levels are highest in summer after the spring thaw when runoff increases (USEPA, 1995).

The low-lying wet area on the western portion of the Station is in the watershed of the Dead River, which flows through the marshy swales located to the west of the longitudinal sand dunes that follow the Lake Michigan shoreline. The Dead River passes through the Illinois Beach State Park as shown on Figure 1.1. The Dead River flows into Lake Michigan at a point approximately 2.3 miles south of the Station. The Dead River was so named because the mouth is periodically blocked by shifting sandbars on the Lake Michigan shoreline.

Storm water runoff from the switchyard is captured by the perimeter ditch, which is a drainage channel that follows the Station's outer fence. The perimeter ditch connects to Lake Michigan to the north and south of the Protected Area (PA). Figure 2.1 presents a depiction of the perimeter ditch and the stormwater drainage ditches that control surface water at the Station. On the western portion of the Station property some of these drainage systems intercept the shallow groundwater. This is not the case on the eastern portion of the Station property where the stormwater drainage system is located above the water table as it drops towards Lake Michigan.

## **2.4.2**      **GEOLOGY**

This section presents an overview of Station geology based upon the 1967 Foundation Investigation (Dames and Moore, 1967) and other geologic publications. The Station is underlain by overburden deposits and a regionally extensive sequence of consolidated

sedimentary deposits. The major stratigraphic features can be divided into Paleozoic aged bedrock and Quaternary Period overburden deposits. Figure 2.2 presents a stratigraphic cross-section representative of bedrock units in Lake County, Illinois. Figure 2.3 presents a cross-section of the overburden deposits associated with the Zion beach-ridge plain.

Rocks of the Cambrian through Silurian Periods are marine in origin and were deposited in a sea that covered all of Illinois (Willman, 1971). The rocks consist of sandstones, shales, and carbonates for a combined thickness of approximately 2,500 feet. Southerly long shore currents have eroded the Root River delta and transported the sediments along the western shore of Lake Michigan to form the Zion beach-ridge plain (Chrzastowski and Frankie, 2000).

### **2.4.3 HYDROGEOLOGY**

Groundwater in the region occurs in shallow glacial, alluvial, and lacustrine deposits. The shallow water-bearing zone is isolated from the underlying regional bedrock aquifers by a significant thickness of glacial or lacustrine silts and clays.

Bedrock units form three major aquifer systems in northeastern Illinois. The uppermost bedrock aquifer consists of the Silurian dolomites. The underlying Maquoketa Group shales hydraulically separate the Silurian aquifer from deeper units.

The deeper aquifer systems include the Cambrian-Ordovician aquifer group, which includes the St. Peter and Ironton-Galesville sandstones. The underlying Eau Claire Formation hydraulically separates the Cambrian-Ordovician aquifer group from the deeper Mt. Simon Aquifer (Visocky et al., 1985).

The sandstones of the Mt. Simon Formation are not typically used for potable water because of undesirable characteristics including high concentrations of total dissolved solids and natural radioactivity. Crystalline basement rock underlies the Mt. Simon Formation (Visocky et al., 1985).

Lake Michigan acts as a major regional discharge zone for groundwater. The groundwater flow in both unconsolidated deposits and bedrock units in the region is generally toward the lake; however, localized pumping induces variations in flow directions in the bedrock aquifers.

## 2.5 AREA GROUNDWATER USE

A water well inventory compiled as part of this investigation indicates a number of wells located (or formerly located) near the Station. The locations of wells in the vicinity of the Station are provided on Figure 2.4. A water well report was prepared using Illinois water well databases and associated well logs, and is provided in Appendix A. The well records for locations nearest to the Station (map identifiers 5, 6, and 10) are mis-located (Map Id. 5<sup>1</sup>), not a water well (Map Id. 6<sup>2</sup>), or no longer exist (Map Ids. 6 and 10<sup>3</sup>). With the exception of Map Ids. 6 and 10, the wells identified in the water well report have not been field verified and it is expected that many of the wells listed have been abandoned.

The City of Zion provides municipal water to the City residents and the surrounding area. The City purchases water from the Lake County Public Water District (LCPWD). The LCPWD obtains its water from Lake Michigan by means of an intake pipe located approximately 1.1 mile north of the Station and extending 3,000 feet into the Lake. The City of Zion municipal code requires all improved properties to be connected to the City's water supply. It is "unlawful for any person to construct, permit or maintain a private well or water supply system within the City which uses groundwater as a potable water supply" (City of Zion, 2004). The only exception is for existing wells constructed prior to March 2, 2004 at properties located more than 100 feet from the municipal supply system, which must: 1) enter into an agreement with the City, and 2) demonstrate that the well water is unlikely to contain any contaminant at concentrations exceeding the United States Environmental Protection Agency (USEPA) drinking water standards (City of Zion, 2004).

The Station is connected to the Zion municipal water supply and does not use groundwater in its operations. The Illinois Beach State Park is serviced by municipal water.

- 
- <sup>1</sup> Map ID 5 is a private water well at Lot #1, Beach Homeland subdivision, Beach Park, Illinois. The latitude and longitude listed in the ISWS database is inconsistent with the address listed in the well log (Beach Park is located between Zion and Waukegan).
  - <sup>2</sup> Map ID 6 is an engineering test hole installed by Norm Hester of the ISGS on November 1, 1972. The total depth was 15 feet. This boring was installed as part of a study documented in Fraser and Hester (1974).
  - <sup>3</sup> Map ID 10 is a water well installed by F H Ferguson at 'Zion Estates' at an unknown date. The total depth of the well was 138 feet. The location specified in the well record (42.446046N, 87.800889W) indicates that this well was located on the eastern edge of what is now the Zion Station. 'Zion Estates' may have been part of the Hosah Beach subdivision (see Bannon-Nilles 2003) which was purchased by ComEd in about 1967. This well is not currently present at the Zion Station.

### 3.0 AREAS FOR FURTHER EVALUATION

CRA considered all Station operations in assessing groundwater quality at the Station. During this process, CRA identified areas at the Station that warranted further evaluation or "AFEs". This section discusses the process by which AFEs were selected.

CRA's identification of AFEs involved the following components:

- Station inspection on March 22 to 23, 2006;
- interviews with Station personnel;
- evaluation of Station systems;
- investigation of confirmed and unconfirmed releases of radionuclides; and
- review of previous Station investigations.

CRA analyzed the information collected from these components combined with information obtained from CRA's study of hydrogeologic conditions at the Station to identify those areas where groundwater potentially could be impacted from operations at the Station.

CRA then designed an investigation to determine whether any confirmed or potential releases or any other release of radionuclides adversely affected groundwater. This entailed evaluating whether existing Station groundwater monitoring systems were sufficient to assess the groundwater quality at the AFEs. If the systems were not sufficient to adequately investigate groundwater quality associated with any AFE, additional monitoring wells were installed by CRA.

The following sections describe the above considerations and the identification of AFEs. The results of CRA's investigation are discussed in Section 5.0.

#### 3.1 SYSTEMS EVALUATIONS

Exelon launched an initiative to systematically assess the structures, systems and components that store, use, or convey potentially radioactively contaminated liquids. Maps depicting each of these systems were developed and provided to CRA for review. The locations of these systems are presented on Figure 3.1. The Station identified a total of 17 systems that contain or could contain potentially radioactively contaminated liquids. The following presents a list of these systems.

| <i>System Identification</i> | <i>Description</i>                |
|------------------------------|-----------------------------------|
| AD                           | Auxiliary Drains                  |
| AX                           | Auxiliary Steam                   |
| BD                           | Blowdown System                   |
| CF                           | Cavity Fill                       |
| CW                           | Circulating Water                 |
| VC                           | Chemical and Volume Control       |
| CC                           | Component Cooling                 |
| CD/SC                        | Condensate and Condensate Storage |
| MS                           | Main Steam                        |
| PW                           | Primary Water                     |
| RR                           | Resin Removal                     |
| SI                           | Safety Injection                  |
| SW                           | Service Water                     |
| SF                           | Spent Fuel                        |
| TD                           | Turbine Building Drains           |
| WD                           | Waste Disposal                    |
| WT                           | Waste Water                       |

After these systems were identified, Exelon developed a list of the various structures, components and areas of the systems (e.g., piping, tanks, and process equipment) that handle or could potentially handle any radioactively contaminated liquids. The structures, components, and areas may include:

- aboveground storage tanks;
- condensate vents;
- areas where confirmed or potential historical releases, spills, or accidental discharges may have occurred;
- pipes;
- pools;
- sumps;
- surface water bodies (i.e., basins, pits, ponds, or lagoons);
- trenches;
- underground storage tanks; and
- vaults.

The Station then individually evaluated the various system components to determine the potential for any release of radioactively contaminated liquid to enter the environment. Each structure or identified component was evaluated against the following seven primary criteria:

- location of the component (i.e., basement or second floor of building);
- component construction material (i.e., stainless steel or steel tanks);
- construction methodologies (i.e., welded or mechanical pipe joints);
- concentration of radioactively contaminated liquid stored or conveyed;
- amount of radioactively contaminated liquid stored or conveyed;
- existing controls (i.e., containment and detection); and
- maintenance history.

System components, which were located inside a building or that otherwise had some form of secondary containment, such that a release of radioactively contaminated liquid would not be discharged directly to the environment, were eliminated from further evaluation. System components that are not located within buildings or did not have some other form of secondary containment were retained for further qualitative evaluation of the risk of a release of radioactively contaminated liquid to the environment and the potential magnitude of any release.

Exelon's risk evaluation took into consideration factors such as:

- the potential concentration of radionuclides;
- the volume of liquid stored or managed;
- the probabilities of the systems actually containing radioactively contaminated liquid; and
- the potential for a release of radioactively contaminated liquid from the system component.

These factors were then used to rank the systems and system components according to the risk for a potential release of a radioactively contaminated liquid to the environment. The evaluation process resulted in the identification of structures, components, and areas to be considered for further evaluation.



## 3.2 HISTORICAL RELEASES

CRA also reviewed information concerning confirmed or potential historical releases of radionuclides at the Station, including reports and documents previously prepared by Exelon and compiled for CRA's review. CRA evaluated this information in identifying the AFEs. Any historical releases identified during the course of this assessment that may have a current impact on Station conditions are further discussed in Section 3.4.

## 3.3 STATION INVESTIGATIONS

CRA considered previous Station investigations in the process of selecting the AFEs for the Station. This section presents a summary of the pre-operational radiological environmental monitoring program (pre-operational REMP), past station investigations, and the radiological environmental monitoring program (REMP).

### 3.3.1 PRE-OPERATIONAL RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

A pre-operational REMP was conducted to establish background radioactivity levels prior to operation of the Station. The environmental media sampled and analyzed during the pre-operational REMP were surface water, well water, air particulates, milk, locally grown vegetables, and aquatic plants and animals (ComEd, 1971). The results of the monitoring were detailed in the report entitled, 1971 Zion Station Final Safety Analysis Report, December 1971.

The pre-operational REMP report noted that surface water was sampled at five public water intakes. Generally, the gross beta radioactivity of Lake Michigan was less than 10 picoCuries per liter (pCi/L) with typical concentrations between 3 pCi/L to 6 pCi/L. Gross alpha radioactivity was typically less than 3 pCi/L (ComEd, 1971).

Tritium levels in Lake Michigan water were studied in the vicinity of Zion Station throughout 1970. The concentration of tritium in the surface water samples from the Lake at Zion ranged from approximately  $311 \pm 20$  pCi/L to  $374 \pm 34$  pCi/L and averaged 340 pCi/L. There was no statistical difference in average tritium concentrations among the stations (eight stations from Kenosha to Waukegan) (ComEd, 1971).

### 1973 Aerial Radiological Measuring System

An Aerial Radiological Measuring System (ARMS) survey was conducted at the Station prior to the startup of the reactors in 1973. The ARMS survey was conducted using small aircraft flying at an altitude between 300 and 500 feet. Ground-based measurements were obtained from two locations as part of the study. Tritium measurements were not included in the ARMS survey (ComEd, 1999).

The ARMS survey showed that cosmic ray exposure rate was substantially less than the northern Illinois background radiation level (ComEd, 1999).

Soil samples contained small concentrations of uranium-238 and thorium-232. Cesium-137 activity in soil samples ranged from 0.276 to 0.40 picoCuries per gram (pCi/g) (ComEd, 1999).

### **3.3.2 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM**

The REMP at the Station was initiated in 1973. The REMP includes the collection of multi-media samples including air, surface water, groundwater, fish, sediment, and vegetation. The samples are analyzed for beta and gamma-emitting radionuclides, tritium, iodine-131, and/or strontium as established in the procedures developed for the REMP. The samples are collected at established locations, identified as stations, so that trends in the data can be monitored.

An annual report is prepared providing a description of the activities performed and the results of the analysis of the samples collected from the various media. The latest report generated was prepared by Station personnel and is entitled Final Monthly Progress Report to Exelon Nuclear, Radiological Environmental Monitoring Program - 2005. This report concluded that the operation of the Station had no adverse radiological impact on the environment. The annual report is submitted to the NRC.

Prior to the cessation of power generation in 1998, surface water samples were collected at the following six locations along Lake Michigan:

- Kenosha, Wisconsin (intake located 10 miles north of the Station);
- Lake County Public Water District (intake located 1.1 miles north of the Station);
- Waukegan, Illinois (intake located 6 miles south of the Station);
- North Chicago, Illinois (intake located 10 miles south of the Station);

- Great Lakes NTS (intake located 13 miles south of the Station); and
- Lake Forest, Illinois (intake located 16.5 miles south of the Station).

After 1998, surface water samples were collected at the following four locations along Lake Michigan:

- Kenosha, Wisconsin (intake located 10 miles north of the Station);
- Lake County Public Water District (intake located 1.1 miles north of the Station);
- Waukegan, Illinois (intake located 6 miles south of the Station); and
- Lake Forest, Illinois (intake located 16.5 miles south of the Station).

Lake Michigan surface water data are collected as part of the REMP. Tritium concentrations in surface water samples from Lake Michigan ranged from non-detect to 660 pCi/L.

### **3.3.3 DEFUELED SAFETY ANALYSIS REPORT**

In October 2004, Exelon updated the Defueled Safety Analysis Report (DSAR). The DSAR discusses the overall adequacy of the Station for safety, storing, and handling of fuel and radioactive waste, and to monitor potential radiological effluent release paths. It provides information on Station and local characteristics such as geography, demography, meteorology, geology, and hydrogeology.

The DSAR states that intermittent liquid effluents from the Station will not affect groundwater supplies in the adjacent area in excess of concentrations in 10 CFR 20 due to local drainage patterns, release rates, and specific features of the sources of water supplies.

The DSAR also states that the Station's radioactive liquid waste generated is collected, treated and either recycled or discharged. Discharged liquid wastes are monitored to assure compliance with 10 CFR 20. Radioactivity levels should not exceed permissible concentrations at the cooling water outlet in Lake Michigan. The two closest municipal water intakes are the LCPWD (approximately 1 mile north) and the Waukegan Waterworks (approximately 6 miles south). The February 2005 REMP report indicates that there have been no tritium concentrations detected in surface water samples at concentrations exceeding the lower limit of detection (LLD) of 200 pCi/L.

### 3.3.4 WISCONSIN DEPARTMENT OF HEALTH AND FAMILY SERVICES MONITORING

The Wisconsin Public Health Statutes 254.41 mandates the Department of Health and Family Services (DHFS) to conduct environmental radiation monitoring around the nuclear power facilities that impact Wisconsin. The Station is included in this monitoring due to its proximity to the Wisconsin border. In the 2004 Zion Environmental Radioactivity Survey, the Wisconsin DHFS concluded:

- air particulate analysis shows no evidence of influence by the Station on air quality;
- the average yearly exposure of ambient gamma radiation is at background levels and is comparable to other areas within Wisconsin;
- the surface water samples showed no unusual concentrations of gross beta, gross gamma, tritium, and strontium;
- the gamma isotopic analysis for surface water indicated radioisotopes below their respective minimum detectable concentration;
- the gamma isotopic analysis on vegetation detected only a small amount of the naturally occurring elements potassium-40 and beryllium-7;
- the gamma isotopic analysis for soil detected potassium-40 and cesium-137. These were also detected in previous years and are naturally occurring (potassium-40) or attributable to fallout from previous atmospheric nuclear tests (cesium-137); and
- doses of radiation as a result of gaseous and liquid effluent are less than the limits allowed for an average individual as stated in Federal Regulations.

### 3.4 IDENTIFIED AREAS FOR FURTHER EVALUATION

CRA used the information presented in the above sections along with its understanding of the hydrogeology at the Station to identify AFEs, which were a primary consideration in the development of the scope of work in the Work Plan. The establishment of AFEs is a standard planning practice in hydrogeologic investigations to focus the investigation activities at areas where there is the greatest potential for impact to groundwater.

Specifically, AFEs were identified based on these six considerations:

- systems evaluations;
- risk evaluations;
- review of confirmed and/or potential releases;

- review of documents;
- review of the hydrogeologic conditions; and
- Station inspection completed on March 22 and 23, 2006.

Prior to CRA completing its analysis and determination of AFEs, Station personnel completed an exhaustive review of all historic and current management of systems that may contain potentially radioactively contaminated liquids.

CRA reviewed the systems identified by the Station, which have the potential for the release of radioactively contaminated liquids to the environment, and groundwater flow at the Station. This evaluation allowed CRA to become familiar with Station operations and potential systems that may impact groundwater. CRA then evaluated information concerning historic releases as provided by the Station. This information, along with a review of the results from historic site investigations, was used to refine CRA's understanding of areas likely to have the highest possibility of impacting groundwater. Where at risk systems or identified historical releases were located in close proximity or were located in areas which could not be evaluated separately, the systems and historical releases were combined into a single AFE. At times, during the Station investigation, separate AFEs were combined into one or were otherwise altered based on additional information and consideration. This HIR details the AFEs investigated.

Finally, CRA used its understanding of known hydrogeologic conditions (prior to this investigation) to identify AFEs. Groundwater flow was an important factor in deciding whether to combine systems or historical releases into a single AFE or create separate AFEs. For example, groundwater beneath several systems that contain radioactively contaminated liquids that flows toward a common discharge point were likely combined into a single AFE. The AFEs were created based on known groundwater flow conditions prior to the work completed during this investigation.

Based upon its review of information concerning confirmed or potential historical releases, historic investigations, and the systems at the Station that have the potential for release of radioactively contaminated liquids to the environment combined with its understanding of groundwater flow at the Station, CRA has identified four AFEs (see Figure 3.1).

AFE-Zion-1: Main Complex Area

This area was identified to evaluate the main area of the facility, which includes the two containment structures, the Fuel Building that contains spent fuel, the Auxiliary Building, and the Turbine Building.

AFE-Zion-2: Unit 1 (Southern) Aboveground Storage Tank (AST) Area

This area was identified to evaluate the quality of groundwater in the area around the Unit 1 systems including the primary water storage tank, the secondary condensate tank, oil separator, discharge tunnel, and discharge outfall. This AFE was established based on information regarding the storage, handling, and historical releases in this area.

AFE-Zion-3: Unit 2 (Northern) AST Area

This area was identified to evaluate the quality of groundwater in the area around the Unit 2 systems including the primary water storage tank, secondary condensate tank, oil separator, discharge tunnel, and discharge outfall. This AFE was established based on information regarding the storage, handling, and historical releases in this area.

AFE-Zion-4: Wastewater Treatment Plant Area

This area comprises the Wastewater Treatment Plant in the northeast corner of the Station. Groundwater monitoring was initiated in this area of the Station to evaluate the wastewater treatment and associated systems.

## 4.0 FIELD METHODS

The field investigations completed for this HIR were completed in May to July 2006. CRA supervised the installation of monitoring wells and a staff gauge, and collected samples from the newly-installed monitoring wells and the surface water location. The field investigations were completed in accordance with the methodologies presented in the Work Plan (CRA, 2006).

The scope of work presented in the Work Plan included the installation and sampling of nine permanent monitoring wells and the collection of a surface water sample. Based on the concentrations of tritium detected in monitoring well MW-ZN-01S, additional investigative activities were recommended by CRA, and implemented in June and July 2006. The additional investigative tasks included a second round of sampling at MW-ZN-01S and the installation and sampling of two permanent and four temporary monitoring wells. The additional investigative activities provided plume delineation and additional hydraulic information cross-gradient and down-gradient of MW-ZN-01S. The groundwater sampling events undertaken as part of the investigation are:

- May 24-26, 2006 sampling of MW-ZN-01S through MW-ZN-09S;
- June 28, 2006 sampling of MW-ZN-01S (second round);
- July 17, 2006 sampling of TW-ZN-100 through TW-ZN-103; and
- July 28, 2006 sampling of MW-ZN-10S and MW-ZN-11S.

### 4.1 STAFF GAUGE INSTALLATION

Figure 4.1 presents the location of the staff gauge installed as part of this investigation. CRA installed staff gauge SG-ZN-01, which is a notch in a bridge within the Intake Crib. The Intake Crib is hydraulically connected to Lake Michigan via the intake tunnel that extends approximately 1/2 mile into Lake Michigan.

### 4.2 GROUNDWATER MONITORING WELL INSTALLATION

Prior to completing any ground penetration activities, CRA completed subsurface utility clearance procedures to minimize the potential of injury to workers and/or damage to subsurface utility structures. The subsurface clearance procedures consisted of completing an electronic survey within a minimum of 10-foot radius of the proposed location utilizing electromagnetic and ground penetrating radar technology.

Additionally, a vacuum soft dig was used to verify utilities were not present at the proposed location to a depth to 10 feet bgs.

Fifteen new monitoring wells were installed for the fleetwide hydrogeologic investigation, including 11 permanent and 4 temporary monitoring wells. Monitoring well construction logs are provided in Appendix B. Figure 4.1 presents the location of the 15 new monitoring wells. These locations were selected based on a review of all data provided, the hydrogeology at the Station, and current understanding of identified AFEs, and modified based on conditions encountered during the investigation. Table 4.1 summarizes the well installation details.

Specific installation protocols for the permanent monitoring wells are described below:

- the borehole was advanced to the target depth using 4.25-inch inside diameter hollow-stem augers (HSA);
- a nominal 2-inch diameter (No. 10 slot) PVC screen, 10 or 20 feet in length, attached to a sufficient length of 2-inch diameter schedule 40 PVC riser pipe to extend to the surface, was placed into the borehole through the augers;
- a filter sand pack consisting of silica sand was installed to a minimum height of 2 feet above the top of the screen as the augers were removed;
- a minimum 2-foot thick seal consisting of 3/8-inch diameter bentonite pellets or chips was placed on top of the sand pack and hydrated using potable water;
- the remaining borehole annulus was sealed to within 3 feet of the surface using pure bentonite chips (the soft-dig portion of the borehole was backfilled with a mixture of soil and bentonite); and
- the remaining portion of the annulus was filled with concrete and a 6-inch diameter protective above-grade casing. The well head was fitted with a water-tight lockable cap.

Specific installation protocols for the temporary monitoring wells are described below:

- the borehole was advanced to the target depth using a 2-inch direct push technology (DPT) drill rig;
- a nominal 1-inch diameter (No. 10 slot) PVC screen, 15 or 20 feet in length, attached to a sufficient length of 1-inch diameter schedule 40 PVC riser pipe to extend to the surface, was placed into the borehole through the DPT casing;
- a filter sand pack consisting of silica sand was installed to a minimum height of 2 feet above the top of the screen as the augers were removed;



- a minimum 2-foot thick seal consisting of bentonite powder was placed on top of the sand pack; and
- the remaining borehole annulus was sealed at the surface using bentonite powder or chips.

The shallow soil borings completed in unconsolidated materials that were to be used for monitoring well installation were installed using either DPT or 4.25-inch inside diameter HSA drilling techniques. The borehole depths ranged from 19 to 45 feet bgs. During the subsurface utility clearance activities described above, the borehole was periodically examined and the soil types documented. A description was added to each monitoring well construction log. The overburden soils were classified using the Unified Soil Classification System (USCS).

#### 4.3 GROUNDWATER MONITORING WELL DEVELOPMENT

To establish good hydraulic communication with the aquifer and reduce the volume of sediment in the permanent monitoring wells, well development was conducted in accordance with the procedure outlined below:

- monitoring wells were surged using a pre-cleaned bailer for a period of at least 5 minutes;
- a minimum of one well volume of water was purged using a submersible pump;
- the monitoring well was surged for 5 minutes again;
- water was purged from the monitoring well using an electric submersible pump;
- groundwater was collected at regular intervals and the pH, temperature, and conductivity were measured using field instruments. These instruments were calibrated daily according to the manufacturer's specifications. Additionally, observations such as color, odor, and turbidity of the purged water were recorded; and
- development continued until the turbidity and silt content of the monitoring wells were significantly reduced and three consistent readings of pH, temperature, and conductivity were recorded, or a minimum of ten well volumes was purged.

A summary of the monitoring well development parameter measurements is presented in Table 4.2.

#### 4.4 SURVEY

The 15 monitoring wells and surface water gauge were surveyed to establish reference elevations relative to mean sea level. The top of each well casing was surveyed to the nearest 0.01 foot relative to the National Geodetic Vertical Datum (NGVD), and the survey point was marked on the well casing. The survey included the ground elevation at each well to the nearest 0.10 foot relative to the NGVD, and the horizontal well location to the nearest 1.0 foot. A reference point was also marked on the concrete at the surface water elevation measuring location.

The Lake Michigan shoreline was surveyed at the Station using a handheld Global Positioning System (GPS) with an estimated accuracy of  $\pm 12$  feet. The GPS survey was conducted on June 30, 2006.

#### 4.5 GROUNDWATER AND SURFACE WATER ELEVATION MEASUREMENTS

On May 23, 2006 and July 27, 2006, CRA collected water level measurements from the monitoring wells and the staff gauge at the Station in accordance with the Work Plan. Based on the measured depth to water from the reference point and the surveyed elevation of the reference point, the groundwater or surface water elevation was calculated. A summary of groundwater and surface water elevations is provided in Table 4.3.

Prior to the water level measurements, the wells and staff gauges were identified and located. Once the wells were identified, CRA completed a thorough inspection of each well and noted any deficiencies. Water level measurements were collected using an electronic depth-to-water probe accurate to  $\pm 0.01$  foot. The measurements were made from the designated location on the inner riser or steel casing of each monitoring well and reference point on the staff gauge. The water level measurements were obtained using the following procedures:

- the proper elevation of the meter was checked by inserting the tip into water and noting if the contact was registering correctly;
- the tip was dried, and then slowly lowered into the well or surface water body until contact with the water was indicated;
- the tip was slowly raised until the light and/or buzzer just began to activate. This indicated the static water level;

- the reading at the reference point was noted to the nearest hundredth of a foot;
- the reading was then re-checked; and
- the water level was then recorded, and the water level meter decontaminated prior to use at the next location.

Surface water measurements for Lake Michigan were obtained from the National Oceanic and Atmospheric Administration (NOAA) gauging stations at Milwaukee, Wisconsin (Station 9087057), and Calumet Harbor, Illinois (Station 9087044) for the date and time when the water levels in monitoring wells were measured (NOAA, 2006).

| <i>Station</i>                   | <i>Time Period</i>       | <i>Median Lake Elevation</i> |
|----------------------------------|--------------------------|------------------------------|
| 9087057 Milwaukee                | May 23, 2006 8:00-13:00  | 577.99                       |
| 9087044 Calumet Harbor           | May 23, 2006 8:00-13:00  | 577.94                       |
| May 23, 2006 8:00-13:00 Average  |                          | 577.97                       |
| 9087057 Milwaukee                | July 27, 2006 9:15-11:10 | 577.91                       |
| 9087044 Calumet Harbor           | July 27, 2006 9:15-11:10 | 577.96                       |
| July 27, 2006 9:15-11:10 Average |                          | 577.93                       |

#### 4.6 GROUNDWATER AND SURFACE WATER SAMPLE COLLECTION

CRA conducted one round of groundwater sampling during the hydrogeologic investigation, with additional samples collected from monitoring well MW-ZN-01S. A total of 15 monitoring wells were sampled between May 24, 2006 and July 28, 2006. Eleven new permanent monitoring wells were installed. The sampling was scheduled to allow for 2 weeks to elapse between well development and groundwater sample collection. Four temporary monitoring wells were installed and sampled in July 2006.

At the monitoring well locations, CRA conducted the sampling using peristaltic pumps and dedicated polyethylene tubing to employ low flow purging techniques, as described in Puls and Barcelona (1996).

For permanent monitoring wells with 20-foot screen lengths (MW-ZN-01S through MW-ZN-08S, MW-ZN-10S and MW-ZN-11S), separate samples were collected from the lower portion and the upper portion of the screened interval. The lower sampling interval targets potential releases from deep structural features such as the basement of the Auxiliary Building. The upper sampling interval targets potential surface and near surface releases such as spills from the primary cooling water ASTs.

The groundwater in the monitoring wells was sampled by the following low-flow procedures:

- the wells were located and the well identification numbers were verified;
- a water level measurement was taken;
- the well was sounded by carefully lowering the water level tape to the bottom of the well (so as to minimize penetration and disturbance of the well bottom sediment), and comparing the sounded depth to the installed depth to assess the presence of any excess sediment or drill cuttings;
- the pump or tubing was lowered slowly into the well and fixed into place such that the intake was located at the mid-point of the well screen, or a minimum of 2 feet above the well bottom/sediment level;
- the purging was conducted using a pumping rate between 100 to 500 milliliters per minute. Initial purging began using the lower end of this range. The groundwater level was monitored to ensure that a drawdown of less than 0.3 foot occurred. If this criterion was met, the pumping rate was increased dependent on the behavior of the well. During purging, the pumping rate and groundwater level were measured and recorded approximately every 10 minutes;
- the field parameters [pH, temperature, conductivity, oxidation-reduction potential (ORP), dissolved oxygen (DO), and turbidity] were monitored during the purging to evaluate the stabilization of the purged groundwater. Stabilization was considered to be achieved when three consecutive readings for each parameter, taken at 5-minute intervals, were within the following limits:
 

|              |  |
|--------------|--|
| pH           | ± 0.1 pH units of the average value of the three readings,   |
| Temperature  | ± 3 percent of the average value of the three readings,  |
| Conductivity | ± 0.005 milliSiemen per centimeter (mS/cm) of the average value of the three readings for conductivity <1 mS/cm and ± 0.01 mS/cm of the average value of the three readings for conductivity >1 mS/cm, |
| ORP          | ± 10 millivolts (mV) of the average value of the three readings,   |
| DO           | ± 10 percent of the average value of the three readings, and   |
| Turbidity    | ± 10 percent of the average value of the three readings, or a final value of less than 5 nephelometric turbidity units (NTUs);   |
- once purging was complete, the groundwater samples were collected directly from the pump/tubing directly into the sample containers; and

- in the event that the groundwater recharge to the monitoring well was insufficient to conduct the low-flow procedure, the well was pumped dry and allowed to sufficiently recharge prior to sampling.

All groundwater samples were labeled with a unique sample number, the date and time, the parameters to be analyzed, the job number, and the sampler's initials. The samples were then screened by the Station for shipment to Teledyne Brown Engineering Inc. (Teledyne Brown).

A sample key is presented in Table 4.4; field measurements for the hydrogeologic investigation are presented in Table 4.5.

CRA containerized the water purged from the monitoring wells during the sampling, as well as the water purged from all of the wells during the hydrogeologic investigation. The water was placed into 55-gallon drums, which will be processed by the Station in accordance with its NPDES permit.

One surface water sample was collected on May 26, 2006 from Lake Michigan at station SW-ZN-1, adjacent to the Station. The surface water sampling location is presented on Figure 4.1.

The surface water sample was collected by directly filling the sample container from the composite sampler at the determined location until completely filled. A sample key is presented in Table 4.4.

#### **4.7      DATA QUALITY OBJECTIVES**

CRA has validated the analytical data to establish the accuracy and completeness of the data reported. Teledyne Brown provided the analytical services. The Quality Assurance Program for the laboratory is described in Appendix C. Analytical data for groundwater and surface water samples collected in accordance with the Work Plan are presented in Appendix D. Data validation reports are presented in Appendix E. The data validation included the following information and evaluations:

- sample preservation;
- sample holding times;
- laboratory method blanks;
- laboratory control samples;

- laboratory duplicates;
- verification of laboratory qualifiers; and
- field quality control (field blanks and duplicates).

Following the completion of field activities, CRA compiled and reviewed the geologic, hydrogeologic, and analytical data.

The data were reviewed using the following techniques:

- data tables and databox figures;
- hydrogeologic cross-sections; and
- hydraulic analyses.

#### **4.8        SAMPLE IDENTIFICATION**

Systematic sample identification codes were used to uniquely identify all samples. The identification code format used in the field was: WG - Zion - MW-8L - 052406 - MS - 001. A summary of sample identification numbers is presented in Table 4.4.

|        |   |                               |
|--------|---|-------------------------------|
| WG     | - | Sample matrix -groundwater    |
| WS     | - | Sample matrix - surface water |
| Zion   | - | Station code                  |
| ZN     | - | Station code                  |
| MW-8L  | - | Well location                 |
| 052406 | - | Date                          |
| MS     | - | Sampler initial               |
| 001    | - | Sample number                 |

#### **4.9        CHAIN-OF-CUSTODY RECORD**

The samples were delivered to Station personnel under chain-of-custody protocol. Subsequently, the Station shipped the samples under chain-of-custody protocol to Teledyne Brown for analyses.

#### 4.10 QUALITY CONTROL SAMPLES

Quality control samples were collected to evaluate the sampling and analysis process.

##### Field Duplicates

Field duplicates were collected to verify the accuracy of the analytical laboratory by providing two samples collected at the same location and then comparing the analytical results for consistency. Field duplicate samples were collected at a frequency of one duplicate for every ten samples collected. A total of three duplicate samples were collected. The locations of duplicate samples were selected in the field during the performance of sample collection activities. The duplicate samples were collected simultaneously with the actual sample and were analyzed for the same parameters as the actual samples.

##### Split Samples

Split samples from permanent monitoring wells and surface water were collected for the NRC for tritium simultaneously with the actual sample at every sample location. Split samples were delivered to the Station personnel and (if requested) made available to the NRC. Split samples from the temporary monitoring wells were collected directly by the NRC and the Illinois Emergency Management Agency (IEMA).

#### 4.11 ANALYSES

Groundwater and surface water samples were analyzed for tritium and gamma-emitting radionuclides as listed in NUREG-1301, and strontium-89/90 as listed 40 CFR 141.25.

## 5.0 RESULTS SUMMARY

This section provides a summary of Station-specific geology and hydrogeology, along with a discussion of hydraulic gradients, groundwater elevations, and flow directions in the vicinity of the Station. This section also presents and evaluates the analytical results obtained from activities performed in accordance with the Work Plan.

### 5.1 STATION GEOLOGY

Geologic cross-sections in both a south-north and east-west profile have been developed. Figure 5.1 displays the cross-section locations across the Station and the cross-sections are provided on Figures 5.2 and 5.3. These cross-section locations were chosen because of their close proximity to the AFEs and structures potentially influencing groundwater flow patterns.

The Station is underlain by overburden deposits and a regionally extensive sequence of consolidated sedimentary deposits as discussed in Section 2.4.3. In descending order, the following overburden stratigraphic units have been identified and characterized during the various Station investigations:

- Upper Sand Unit: Dense to very dense granular soils which range in gradation from very fine sand to fine to coarse sand, and which contains some gravel and occasional cobbles and boulders. Depth ranges from the ground surface to an elevation of approximately 555 feet AMSL.
- Silt-Clay Unit: Hard silt, silty clay, clayey silt, and sandy silt, which contain some sand and gravel and occasional cobbles and boulders. Depth ranges from approximately 525 feet to 555 feet AMSL.
- Lower Sand Unit: Dense to very dense sands and silty sands which contain some gravel, occasional cobbles and boulders, and layers of hard silty clay, clayey silt, and sandy silt. Depth ranges from approximately 480 feet to 525 feet AMSL (ComEd, 1969).

The Upper Sand Unit includes the surficial deposits of the Zion beach-ridge plain and consists of sand and gravel of the Lake Michigan Formation. The Lake Michigan Formation describes Holocene shallow-water, near-shore beach sediments predominantly consisting of medium-grained sand with local lenses of sandy gravel, and containing beds of silt.



The Silt-Clay Unit is consistent with quiet water lacustrine deposits and may be associated with post-glacial Lake Michigan (Nipissing Phase).

The Lower Sand Unit is consistent with recurring sequences of beach and quiet water lacustrine deposits and may be associated with the extreme Lake level fluctuations. As Lake levels rose, beach deposits moved westward with the shoreline and were followed by quiet water silt and clay deposits (a transgressive sequence). As Lake levels fell, the beach moved eastward with the shoreline (a regressive sequence).

The overburden sediments are underlain by Silurian carbonate bedrock of the Niagaran Series, which was encountered at depths ranging from 102 to 116 feet bgs (ComEd, 1969). In northeastern Illinois the Niagaran Series includes the Racine, Sugar Run, and Joliet Formations (Willman et al., 1975). Below the Silurian carbonates lie Pre-Cambrian through Ordovician sedimentary rocks, including shales, carbonates, and sandstone. Crystalline basement rock is located at a depth of approximately 2,500 feet. The sedimentary bedrock strata are generally horizontal with a gentle dip to the east (Visocky et al., 1985).

Some of the Station structures are constructed to depths of approximately 60 feet bgs. Excavations were completed from grade, through the Upper Sand Unit and into the topmost portion of the Silt-Clay Unit. Excavated sands were stockpiled during the construction and used as backfill (Exelon, 2004), and are considered to be hydraulically similar to the Upper Sand Unit.

The fifteen new monitoring wells (MW-ZN-01S, MW-ZN-02S, MW-ZN-03S, MW-ZN-04S, MW-ZN-05S, MW-ZN-06S, MW-ZN-07S, MW-ZN-08S, MW-ZN-09S, MW-ZN-10S, MW-ZN-11S, TW-ZN-100, TW-ZN-101, TW-ZN-102, and TW-ZN-103) were installed within the Upper Sand Unit or fill, which consists of a primarily fine-grained sand that overlies the Silt-Clay Unit. The monitoring well logs wells are presented in Appendix B.

Cross-Section A-A' (Figure 5.2) is a north-south profile through the east side of the Station. It begins at monitoring well MW-ZN-08S and terminates at MW-ZN-05S. This cross-section transects AFE-Zion-2, AFE-Zion-3, and AFE-Zion-4. This cross-section also shows the relationship between the groundwater and the geology, excavated areas, and reactor containment and building foundations.

Cross-Section B-B' (Figure 5.3) is a west-east profile that runs from monitoring well MW-ZN-07 through the Station to Lake Michigan and intersects AFE-Zion-1 and

AFE-Zion-3. This cross-section shows the relationship between the groundwater and geology, and building foundations.

## **5.2        STATION HYDROGEOLOGY**

This section presents the Station hydrogeology, including groundwater flow direction, man-made influences on groundwater flow, vertical hydraulic gradients, and lateral groundwater flow and velocity.

### **5.2.1      GROUNDWATER FLOW DIRECTIONS**

The shallow groundwater flows to the east toward Lake Michigan. The building foundations restrict the groundwater flow, which causes the groundwater to flow around the Station. As mentioned previously, the shallow water table intercepts the stormwater drainage ditches in the west area of the Station property, but does appear to affect the flow of groundwater to the east and toward Lake Michigan. Groundwater flow directions for May 2006 are provided on Figure 5.4, flow directions for July 2006 are provided on Figure 5.5. Both figures present groundwater flow in the shallow groundwater system. The sheet pile wall limits the flow of groundwater towards Lake Michigan. Groundwater between the sheet pile wall and the Turbine Building flows to the north or south around the wall. Although groundwater flow circumscribes the sheet pile wall, a small component of leakage through the wall is expected.

The sheet pile wall is constructed of MZ-27 steel sheet piling. MZ-27 sheet piling is comprised of z-shaped sheet steel sections which are 18-inches wide with a 12-inch offset. The sections are 45 feet long, 3/8-inch thick, and weigh 27 pounds per square foot of wall.

### **5.2.2      MAN-MADE INFLUENCES ON GROUNDWATER FLOW**

The building foundations of the main complex extend through the Upper Sand Unit and into the top of the underlying silts and clays. Deep structures include the Reactor Containment Buildings, the Fuel Storage Building, the Auxiliary Building, the Turbine Building, and the crib area. The deep building foundations act as hydraulic barriers for shallow groundwater as is discussed below.

During the construction of the Station, a sheet pile wall was installed along the Lake Michigan shoreline to prevent lake water from entering the excavation. The sheet pile wall was modified over the course of the construction and currently extends to a depth of approximately 45 feet bgs. The top of the sheet pile wall is lined with boulders and forms a breakwall, which is shown on Figure 5.3.

Shallow groundwater will flow into the stormwater drainage ditches located on the west portion of the Station property. However, the groundwater in this area is upgradient of the PA and areas within the Station that potentially contain tritiated water. As such the groundwater discharge to these stormwater systems is not expected to be impacted by tritium.

### **5.2.3 VERTICAL HYDRAULIC GRADIENTS**

The Upper Sand Unit is a high permeability unit that is directly connected to Lake Michigan, which is a regional discharge feature, and which generally allows unrestricted lateral groundwater flow. Vertical groundwater flow is limited by the underlying Silt-Clay Unit, which has a low permeability and is approximately 30 feet thick. To the extent that vertical flow can occur, the vertical gradient is expected to be upward based on the artesian pressure observed in the Lower Sand Unit during the 1967 Foundation Investigation (Dames and Moore, 1967).

### **5.2.4 LATERAL GROUNDWATER FLOW AND VELOCITY**

Fifteen monitoring wells were installed at the Station as part of the 2006 hydrogeologic investigation. Shallow groundwater is present at a depth less than 12 feet bgs in the Upper Sand Unit. The shallow water-bearing zone is isolated from the underlying regional bedrock aquifers by the underlying Silt-Clay Unit. The Silt-Clay Unit is approximately 30 feet thick and extends approximately 15 feet below the deepest structural feature at the Station.

Shallow groundwater flows is generally towards Lake Michigan. A potentiometric surface contour map is provided on Figure 5.4 (May 2006) and Figure 5.5 (July 2006). The hydraulic gradient ranges from 0.001 feet per foot near the switchyard (west of the Station) to 0.008 feet per foot near the eastern portion of the Station. The hydraulic conductivity of the surficial sands is expected to be approximately 12 feet per day based on the median measurement from a study conducted along the Illinois-Indiana border of the shallow aquifer along Lake Michigan (USGS, 1996). The velocity of the shallow

groundwater may be roughly approximated using the Station-specific hydraulic gradient with the literature value for hydraulic conductivity and a typical value for porosity. Using the hydraulic gradient range of 0.001 to 0.008 feet per foot with a hydraulic conductivity of 12 feet per day and an assumed porosity of 0.32 yields a velocity range of 14 to 110 feet per year (USEPA, 1996).

### **5.3 GROUNDWATER QUALITY**

CRA personnel collected groundwater samples from fifteen wells. The samples were analyzed for tritium and additional radionuclides. Teledyne Brown provided the analytical services. The Quality Assurance Program for the laboratory is described in Appendix C. The analytical data reports are provided in Appendix D.

The analytical data presented herein have been subjected to CRA's data validation process. CRA has used the data with appropriate qualifiers where necessary.

The data reported in the figures and tables do not include the results of recounts that the laboratory completed, except if those results ultimately replaced an initial report. The tables and figures, therefore, include only the first analysis reported by the laboratory. Where multiple samples were collected over time, then the most recent result has been used in the discussion, below.

Two samples were collected from two different elevations in each permanent monitoring well except for monitoring well MW-ZN-09S. The samples were collected at 16 feet above the well bottom for the upper sample and 3 feet above the well bottom for the lower sample. At monitoring well MW-ZN-09S there was not a sufficient depth of water for both samples to be collected and a single sample at MW-ZN-09S was collected at 3 feet above the well bottom, which is the equivalent of an upper sample in the other monitoring wells.

#### **5.3.1 SUMMARY OF BETA-EMITTING RADIONUCLIDES ANALYTICAL RESULTS**

A summary of the tritium results for the groundwater samples collected during this investigation is provided in Table 5.1 and shown on Figure 5.6.

Groundwater samples were collected from the upper and lower portions of the screen in each monitoring well with a 20-foot screen (MW-ZN-01S through MW-ZN-11S with the

exception of MW-ZN-09S). Groundwater samples were also collected from Temporary Wells (TW-ZN-100 through TW-ZN-103). All tritium concentrations were below the USEPA drinking water standard of 20,000 pCi/L. Tritium was not detected greater than the LLD of 200 pCi/L in samples collected from 14 of the 15 monitoring wells. Concentrations of tritium exceeding the LLD of 200 pCi/L were only detected in groundwater samples collected from monitoring well MW-ZN-01S. The concentrations of tritium detected in the initial round of sampling were  $586 \pm 141$  pCi/L in the lower portion of the screen and  $261 \pm 124$  pCi/L in the upper portion of the screen. MW-ZN-01S was re-sampled on June 28, 2006 and the concentrations of tritium were less than the LLD of 200 pCi/L in the lower portion of the screen and 220 pCi/L in the upper portion of the screen.

Strontium-89/90 was not detected at concentrations exceeding the LLD of 2.0 pCi/L. A summary of the strontium-89/90 results for the groundwater samples collected as part of the investigation that is the subject of this HIR is provided in Table 5.2 and shown on Figure 5.7.

### 5.3.2 SUMMARY OF GAMMA-EMITTING RADIONUCLIDES ANALYTICAL RESULTS

Gamma-emitting target radionuclides were not detected at concentration greater than their respective LLD. A summary of the gamma-emitting radionuclides results for the groundwater samples collected as part of the investigation that is the subject of this HIR is provided in Table 5.2 and presented graphically on Figure 5.7.

Other non-targeted radionuclides are included in the tables but excluded from discussion in this report. These radionuclides were either a) naturally occurring and thus not produced by the Station, or b) could be definitively evaluated as being naturally occurring due to the lack of presence of other radionuclides, which would otherwise indicate the potential of production from the Station.

### 5.3.3 SUMMARY OF FIELD MEASUREMENTS

Table 4.5 presents a summary of monitoring well purging parameters collected during the well purging and sampling activities. These field measurements included pH, dissolved oxygen, conductivity, turbidity, and temperature. The field parameters were typical of a shallow sand aquifer. The pH values ranged from 5.51 standard units to

10.42 standard units. The conductivity was indicative of a shallow water table system subject to surface water recharge.

Of note were the elevated turbidity readings above 900 NTU collected from the lower portion of the screen at MW-ZN-04S; however, the elevated turbidity readings are indicative of the very loose and fine-grained organic material at this well's lower screen interval, as shown on the MW-ZN-04S stratigraphic log. Overall, the readings were within the expected ranges for naturally occurring groundwater.

## **5.4 SURFACE WATER QUALITY**

One surface water sample was collected from Lake Michigan at the location shown on Figure 4.1. This sample was analyzed for tritium, gamma-emitting radionuclides, and strontium-89/90. Teledyne Brown provided the analytical services. The Quality Assurance Program for the laboratory is described in Appendix C. The analytical data reports are provided in Appendix D.

### **5.4.1 SUMMARY OF BETA-EMITTING RADIONUCLIDE ANALYTICAL RESULTS**

Tritium was not detected at concentrations exceeding the LLD of 200 pCi/L. A summary of the tritium result for the surface water sample collected in this investigation is provided in Table 5.1 and shown on Figure 5.6.

Strontium-89/90 was not detected at concentration exceeding the LLD of 2.0 pCi/L. The strontium-89/90 result for the surface water sample collected in this investigation is provided in Table 5.2 and shown on Figure 5.7.

### **5.4.2 SUMMARY OF GAMMA-EMITTING RADIONUCLIDES ANALYTICAL RESULTS**

Gamma-emitting target radionuclides were not detected at concentration exceeding their respective LLD. A summary of the gamma-emitting radionuclides results for the surface water sample collected in this investigation is provided in Table 5.2 and shown on Figure 5.7.

Other non-targeted radionuclides are included in the tables but excluded from discussion in this report. These radionuclides were either a) naturally occurring and

thus not produced by the Station, or b) could be definitively evaluated as being naturally occurring due to the lack of presence of other radionuclides which would otherwise indicate the potential of production from the Station.

## 6.0 RADIONUCLIDES OF CONCERN AND SOURCE AREAS

This section discusses radionuclides evaluated in this investigation, potential sources of the radionuclides detected, and their distribution.

### 6.1 GAMMA-EMITTING RADIONUCLIDES

Gamma-emitting target radionuclides were not detected at concentration exceeding their respective LLD. Other non-targeted radionuclides were also included in the tables but excluded from discussion in this report. These radionuclides were either a) naturally occurring and thus not produced by the Station, or b) could be definitively evaluated as being naturally occurring due to the lack of presence of other radionuclides which would otherwise indicate the potential of production from the Station.

### 6.2 BETA-EMITTING RADIONUCLIDES

Strontium-89/90 was not detected in any of the samples collected at concentrations that were greater than the LLD of 2.0 pCi/L. Tritium was detected in one of the sixteen total sample locations. Concentrations of tritium ranged between less than the LLD of 200 pCi/L to  $586 \pm 141$  pCi/L.

Since only tritium was detected above the radionuclides' LLDs, the following sections focus on tritium; specifically, providing general characteristics of tritium, potential sources, distribution in groundwater, and a conceptual model for migration.

### 6.3 TRITIUM

This section discusses the general characteristics of tritium, the distribution of tritium in groundwater and surface water, and the conceptual model of tritium release and migration.

#### 6.3.1 GENERAL CHARACTERISTICS

Tritium (chemical symbol H-3) is a radioactive isotope of hydrogen. The most common forms of tritium are tritium gas and tritium oxide, which is also called "tritiated water." The chemical properties of tritium are essentially those of ordinary hydrogen. Tritiated



water behaves the same as ordinary water in both the environment and the body. Tritium can be taken into the body by drinking water, breathing air, eating food, or absorption through skin. Once tritium enters the body, it disperses quickly and is uniformly distributed throughout the body. Tritium is excreted primarily through urine within a month or so after ingestion. Organically bound tritium (tritium that is incorporated in organic compounds) can remain in the body for a longer period.

Tritium is produced naturally in the upper atmosphere when cosmic rays strike air molecules. Tritium is also produced during nuclear weapons explosions, as a by-product in reactors producing electricity, and in special production reactors, where the isotopes lithium-7 and/or boron-10 are bombarded to produce tritium.

Although tritium can be a gas, its most common form is in water because, like non-radioactive hydrogen, radioactive tritium reacts with oxygen to form water. Tritium replaces one of the stable hydrogen atoms in the water molecule and is called tritiated water. Like normal water, tritiated water is colorless and odorless. Tritiated water behaves chemically and physically like non-tritiated water in the subsurface, and therefore tritiated water will travel at the same velocity as the average groundwater velocity.

Tritium has a half-life of approximately 12.3 years. It decays spontaneously to helium-3 ( $^3\text{He}$ ). This radioactive decay releases a beta particle (low-energy electron). The radioactivity of tritium is the source of the risk of exposure.

Tritium is one of the least dangerous radionuclides because it emits very weak radiation and leaves the body relatively quickly. Since tritium is almost always found as water, it goes directly into soft tissues and organs. The associated dose to these tissues is generally uniform and is dependent on the water content of the specific tissue.

### **6.3.2 DISTRIBUTION IN STATION GROUNDWATER**

This section provides an overview of the lateral and vertical distribution of tritium detected in groundwater at the Station. Tritium was detected in groundwater at concentrations exceeding the LLD of 200 pCi/L.

Tritium concentrations in groundwater are presented on Figure 5.6. Tritium was only detected in groundwater samples from monitoring well MW-ZN-01S in May 2006 from both the upper sampling interval ( $261 \pm 124$  pCi/L, 22 feet bgs) and the lower sampling interval ( $586 \pm 141$  pCi/L, 35 feet bgs). Tritium was only detected in groundwater

samples from monitoring well MW-ZN-01S in June 2006 in the upper sampling interval ( $220 \pm 123$  pCi/L, 22 feet bgs). Tritium was not detected above the LLD of 200 pCi/L in June 2006 at the MW-ZN-01S lower sampling interval.

### **6.3.3 CONCEPTUAL MODEL OF TRITIUM RELEASE AND MIGRATION**

This Section presents CRA's conceptual model of groundwater and tritium migration at the Station.

A conceptual model of groundwater and tritium migration is provided herein. This model is then used to discuss the recent detections of tritium observed during the hydrogeologic investigations presented in this HIR.

Groundwater flows within the Upper Sand Unit at the Station in response to the regional discharge point located to the east of the Station (Lake Michigan). Groundwater moving within the Upper Sand Unit is separated from the regional bedrock aquifer zones by the underlying low-permeability Silt-Clay Unit.

Groundwater in the Upper Sand Unit generally flows to the east and discharges to Lake Michigan. Groundwater flowing in Upper Sand Unit is affected by the building foundations which, in some cases, extend into the underlying glacial silts and clays. The sheet pile wall also limits the flow of groundwater towards Lake Michigan. There is no indication from the HIR investigation that tritium-impacted groundwater is migrating off the Station property.

### **6.3.4 ATTENUATION OF TRITIUM WITHIN THE SHALLOW GROUNDWATER SYSTEM**

Tritium in the groundwater system would be affected by the infiltration from precipitation recharge. This could result in the upper water table zone of the sand aquifer having lower concentrations of tritium than deeper portions (these upper and lower zones are only separated by 10 feet).

The permeable nature of the Upper Sand Unit also supports attenuation of the tritium through lateral groundwater movement. The dispersion of the tritium as it flows through the Upper Sand Unit along with its natural decay rate will allow for reduction in concentrations over time and with distance from a release into the groundwater.

Tritium was not detected at concentrations exceeding the LLD of 200 pCi/L in the four temporary wells located downgradient of MW-ZN-01S and in surface water sample collected from Lake Michigan, which is the ultimate receptor of groundwater discharge from the Station. There is no indication from the HIR investigation that tritium-impacted groundwater is migrating off the Station property.

## 7.0 EXPOSURE PATHWAY ASSESSMENT

This section addresses the groundwater impacts from tritium and other radionuclides at the Station and potential risks to human health and the environment.

Based upon historical knowledge and data related to the Station operations, and based upon radionuclide analyses of groundwater samples, the primary constituent of concern (COC) is tritium. The discussions that follow are restricted to the exposure pathways related to tritium.

Teledyne Brown reports all samples to their statistically derived minimum detectable concentration (MDC) of approximately 150 to 170 pCi/L, which is associated with 95 percent confidence interval on their hardcopy reports. However, the laboratory uses a 99 percent confidence range ( $\pm 3$ -sigma) for determining whether to report the sample activity concentration as detected or not. This 3-sigma confidence range typically equates to 150 ( $\pm 135.75$ ) pCi/L.

Exelon has specified a LLD of 200 pCi/L for the Fleetwide assessment. Exelon has also required the laboratory to report related peaks identified at the 95 percent confidence level (2-sigma).

This HIR, therefore, screens and assesses data using Exelon's LLD of 200 pCi/L. As is outlined below, this concentration is also a reasonable approximation of the background concentration of tritium in groundwater at the Station.

### 7.1 HEALTH EFFECTS OF TRITIUM

Tritium is a radionuclide that decays by emitting a low-energy beta particle that cannot penetrate deeply into tissue or travel far in air. A person's exposure to tritium is primarily through the ingestion of water (drinking water) or through ingestion of water-bearing food products. Inhalation of tritium requires the water to be in a vapor form (i.e., through evaporation or vaporization due to heating). Inhalation is a minor exposure route when compared to direct ingestion or drinking of tritiated water. Absorption of tritium through skin is possible, but tritium exposure is more limited here versus direct ingestion or drinking of tritiated water.

## 7.2 BACKGROUND CONCENTRATIONS OF TRITIUM

The purpose of the following paragraphs is to establish a background concentration through review of various media.

### 7.2.1 GROUNDWATER

Tritium is created in the environment from naturally occurring processes both cosmic and subterranean, as well as from anthropogenic (i.e., man-made) sources. In the upper atmosphere, "cosmogenic" tritium is produced from the bombardment of stable nuclides and combines with oxygen to form tritiated water, which will then enter the hydrologic cycle. Below ground, "lithogenic" tritium is produced by the bombardment of natural lithium isotopes  ${}^6\text{Li}$  (92.5% abundance) and  ${}^7\text{Li}$  (7.5% abundance) present in crystalline rocks by neutrons produced by the radioactive decay of uranium and thorium. Lithogenic production of tritium is usually negligible compared to other sources due to the limited abundance of lithium in rock. The lithogenic tritium is introduced directly to groundwater.

A major anthropogenic source of tritium comes from the former atmospheric testing of thermonuclear weapons. Levels of tritium in precipitation increased during the 1950s and early 1960s, coinciding with the release of significant amounts of tritium to the atmosphere during nuclear weapons testing prior to the signing of the Limited Test Ban Treaty in 1963, which prohibited atmospheric nuclear tests.

### 7.2.2 PRECIPITATION DATA

Precipitation samples are routinely collected at stations around the world for the analysis of tritium and other radionuclides. Two publicly available databases that provided tritium concentrations in precipitation are Global Network of Isotopes in Precipitation (GNIP) and USEPA's RadNet database. GNIP provides tritium precipitation concentration data for samples collected world wide from 1960 to 2006. RadNet provides tritium precipitation concentration data for samples collected at Stations through the U.S. from 1960 up to and including 2006.

Based on GNIP data for sample stations located in the U.S. Midwest including Chicago, St. Louis and Madison, Wisconsin, as well as Ottawa, Ontario, and data from the University of Chicago, tritium concentrations peaked around 1963. This peak, which approached 10,000 pCi/L for some stations, coincided with the atmospheric testing of

thermonuclear weapons. Tritium concentrations showed a sharp decline up until 1975 followed by a gradual decline since that time. Tritium concentrations in Midwest precipitation have typically been below 100 pCi/L since around 1980.

The RadNet database for several stations in the U.S. Midwest (Chicago, Columbus, Indianapolis, Lansing, Madison, Minneapolis, Painesville, Toledo, and Welsch) did not show the same trend, which can be attributed to pre-1995 data handling procedures. The pre-1995 data were rounded to the nearest 100 pCi/L, which dampened out variances in the data. The post-1995 RadNet data, where rounding was not applied, exhibit much more scatter, and similar to the GNIP data, the vast majority of the data were less than 100 pCi/L.

CRA constructed a non-parametric upper tolerance limit with a confidence of 95 percent and coverage of 95 percent based on RadNet data for USEPA Region 5 from 2004 to 2005. The resulting upper tolerance limit is 133 pCi/L, which indicates that CRA is 95 percent confident that 95 percent of the ambient precipitation concentration results are below 133 pCi/L. The statistical confidence, however, must be compared with the limitations of the underlying RadNet data, which does not include the minimum detectable concentration for a majority of the measurements. Some of the RadNet values below 200 pCi/L may be approximated. Nevertheless, these results show a background contribution for precipitation of up to 133 pCi/L.

### **7.2.3 SURFACE WATER DATA**

Tritium concentrations are routinely measured in large surface water bodies, including Lake Michigan and the Mississippi River. Surface water data from the RadNet database for Illinois sampling stations include East Moline (Mississippi River), Moline (Mississippi River), Marseilles (Illinois River), Morris (Illinois River), Oregon (Rock River), and Zion (Lake Michigan). As is the case for the RadNet precipitation data, the pre-September 1995 Illinois surface water data was rounded to the nearest 100 pCi/L, creating a dampening of variances in the data. The post-1995 Illinois surface water data, similar to the post-1995 Midwest precipitation data, were less than 100 pCi/L, with the exception of the Moline (Mississippi River) station. Tritium surface water concentrations at this location varied between 100 and 800 pCi/L, which may reflect local natural or anthropogenic inputs.

The RadNet surface water data typically has a reported 'Combined Standard Uncertainty' of 35 to 50 pCi/L. According to USEPA, this corresponds to a  $\pm 70$  to 100 pCi/L 95 percent confidence bound on each given measurement. Therefore,

the typical background data provided may be subject to measurement uncertainty of approximately  $\pm 70$  to 100 pCi/L.

#### **7.2.4 DRINKING WATER DATA**

Tritium concentrations in drinking water from the RadNet database for three Illinois sampling stations (Chicago, Morris, and East Chicago) exhibit similar trends as the precipitation and surface water data. As with the precipitation and surface water data, the pre-1995 data have dampened out variances due to rounding the data to the nearest 100 pCi/L. The post-1995 results show tritium concentrations in samples of drinking water were less than 100 pCi/L.

#### **7.2.5 EXPECTED TRITIUM BACKGROUND FOR THE STATION**

As reported in the GNIP and RadNet databases, tritium concentrations in U.S. Midwest precipitation have typically been less than 100 pCi/L since 1980. Tritium concentrations reported in the RadNet database for Illinois surface water and groundwater, at least since 1995, have typically been less than 100 pCi/L. Based on USEPA Region 5's 2004 to 2005 RadNet precipitation data, 95 percent of the ambient concentrations of tritiated water in Illinois are expected to be less than 133 pCi/L, based on a 95 percent confidence limit. Tritium concentrations in surface water and drinking water at the Station are expected to be comparable or less based on historical data and trends.

Concentrations in groundwater similar to surface water and drinking water are expected to be less than precipitation values. The lower groundwater concentrations are related to the age of the groundwater as compared to the half-life of tritium. Deep aquifers in proximity to crystalline basement rock, however, can potentially show elevated concentrations of tritium due to lithogenic sources.

The Pre-Operational REMP report noted that lake water was sampled at five public water intakes. Generally, the gross beta radioactivity of Lake Michigan was less than 10 pCi/L. Typical values from throughout the Lake were between 3 to 6 pCi/L. Gross alpha radioactivity was typically less than 3 pCi/L (ComEd, 1971).

Tritium levels in Lake Michigan water were studied in the vicinity of Zion throughout 1970 (prior to the construction of the Station). The concentration of tritium in Lake Michigan near Zion ranged from approximately  $311 \pm 20$  pCi/L to  $374 \pm 34$  pCi/L and averaged 340 pCi/L. There was no statistical difference in average tritium levels among

the sample locations (eight sample locations from Kenosha to Waukegan) (ComEd, 1971).

As was noted in Section 7.0, the reporting limits for the tritium results are to an LLD of 200 pCi/L. This concentration also represents a reasonable representation of background groundwater quality, given the data for precipitation, surface water, and drinking water.

Based on the evaluation presented above, the background concentration for tritium at the Station is reasonably represented by the LLD of 200 pCi/L.

### **7.3 IDENTIFICATION OF POTENTIAL EXPOSURE PATHWAYS AND POTENTIAL RECEPTORS**

There are two potential exposure pathways for tritium originating in or adjacent to the Station:

- potential groundwater migration off the Station property to private and public groundwater users; and
- potential groundwater migration off the Station property to Lake Michigan.

The following section provides an overview of each of these two potential exposure pathways for tritium in groundwater.

#### **7.3.1 POTENTIAL GROUNDWATER MIGRATION TO DRINKING WATER USERS OFF THE STATION PROPERTY**

Based upon the groundwater and surface water data presented in this HIR, groundwater flow is to the east towards Lake Michigan. The horizontal extent of the elevated concentrations of tritium in the direction of groundwater flow has been established, and is limited to the area around MW-ZN-01S. Tritium was not detected in the four temporary well installed near the shoreline above the LLD of 200 pCi/L. The tritium concentrations in groundwater samples collected from MW-ZN-01S ranged from less than LLD (most recently) to  $586 \pm 141$  pCi/L (lower interval),  $220 \pm 123$  pCi/L to  $261 \pm 124$  pCi/L (upper interval), which are significantly less than the USEPA drinking water standard of 20,000 pCi/L. No tritium was detected above the LLD (200 pCi/L) in the other fourteen monitoring wells across the Station. In addition, there are no potable water supply wells downgradient of the Station or of monitoring well MW-ZN-01S.



The direction of groundwater flow is east towards Lake Michigan. Tritium was not detected at concentrations greater than the LLD (200 pCi/L) in the four temporary wells located downgradient of MW-ZN-01S. There is no potentially complete exposure pathway, and therefore there is no current risk of exposure associated with groundwater ingestion off the Station property.

### **7.3.2 POTENTIAL GROUNDWATER MIGRATION TO SURFACE WATER USERS**

Based upon the groundwater and surface water data presented in this HIR, groundwater flow is to the east towards Lake Michigan. The horizontal extent of the elevated concentrations of tritium is limited to the area around MW-ZN-01S. The tritium concentrations detected in groundwater samples collected from MW-ZN-01S ranged from less than LLD (200 pCi/L) (most recently) to  $586 \pm 141$  pCi/L (lower interval) and  $220 \pm 123$  pCi/L to  $261 \pm 124$  pCi/L (upper interval), which are significantly less than the USEPA drinking water standard of 20,000 pCi/L. No tritium was detected above the LLD (200 pCi/L) in the other 14 monitoring wells across the Station. In addition, no tritium was detected above the LLD (200 pCi/L) in the downgradient monitoring wells (MW-ZN-11S and TW-ZN-100 through TW-ZN-103) and the surface water sample collected from Lake Michigan at station SW-ZN-01, adjacent to the Station.

The Lake County Public Works Department obtains its water for the City of Zion from Lake Michigan by means of an intake pipe located approximately 1 mile to the north of the Station and extending 3,000 feet into the Lake. Since tritium was not detected at concentrations greater than LLD (200 pCi/L) in the four temporary wells and MW-ZN-11S (which are downgradient of MW-ZN-01S) or the Lake Michigan surface water sample, there is an incomplete exposure pathway. Therefore, there is no current risk of exposure associated with ingestion and recreational use off the Station property.

### **7.4 SUMMARY OF POTENTIAL TRITIUM EXPOSURE PATHWAYS**

There are two potential groundwater exposure pathways for tritium originating at the Station:

- groundwater migration off the Station Property to private and public groundwater users (drinking water exposure); and
- groundwater migration off the Station Property to Lake Michigan (drinking water exposure and recreational exposure).

Based upon the groundwater and surface water data provided and referenced in this investigation, none of the potential receptors are at risk of exposure to concentrations of tritium in excess of USEPA drinking water standard (20,000 pCi/L).

## 7.5 OTHER RADIONUCLIDES

Target radionuclides were not detected at concentrations greater than their respective LLDs in the groundwater and surface water samples collected. Other non-targeted radionuclides were also included in the tables but excluded from discussion in this report. These radionuclides were either a) naturally occurring and thus not produced by the Station, or b) could be definitively evaluated as being naturally occurring due to the lack of presence of other radionuclides which would otherwise indicate the potential of production from the Station.

## 8.0 CONCLUSIONS

Based on all of the studies completed to date at the Zion Station, CRA concludes:

### Groundwater Flow

- The water table is in the Upper Sand Unit. The depth to water ranged from 5 to 14 feet bgs.
- The shallow groundwater at the Station generally flows to the east towards Lake Michigan.
- Groundwater flow at the Station is affected by the construction (basements/foundations) of the Reactor, Turbine, and Auxiliary Buildings, which were constructed into the Silt-Clay Unit. These buildings are barriers to lateral flow.
- A sheet pile wall was initially installed to limit the infiltration of Lake Michigan water into the construction excavation for the main Station buildings. The wall currently influences groundwater flow on the east side of the Station by diverting the groundwater around the wall.

### Groundwater Quality

- None of the detected tritium concentrations in the groundwater exceeded the USEPA drinking water standard of 20,000 pCi/L.
- Tritium was not detected at concentrations greater than the LLD (200 pCi/L) in 14 of the 15 monitoring wells collected as part of this investigation.
- Tritium was detected in groundwater samples collected from monitoring well MW-ZN-01S. These concentrations ranged from less than LLD (most recently) to  $586 \pm 141$  pCi/L (lower interval) and  $220 \pm 123$  pCi/L to  $261 \pm 124$  pCi/L (upper interval).
- Gamma-emitting radionuclides associated with licensed plant operations were not detected at concentrations greater than their respective LLDs in any of the sample collected as part of this investigation.
- Strontium-89/90 was not detected at concentrations greater than the LLD of 2.0 pCi/L in any sample collected as part of this investigation.
- Tritium is not migrating off the Station property.

Surface Water Quality

- Tritium was not detected in the surface water sample at a concentration greater than the USEPA drinking water standard of 20,000 pCi/L.
- Tritium was not detected in the surface water sample at a concentration greater than the LLD of 200 pCi/L.
- Gamma-emitting radionuclides associated with licensed plant operations were not detected at concentrations greater than their LLDs in the sample collected as part of this investigation.
- Strontium-89/90 was not detected at concentrations greater than the LLD of 2.0 pCi/L in the sample collected as part of this investigation.

AFE-Zion-1: Main Complex Area, AFE-Zion-3: Unit 2 (Northern) AST Area, and AFE-Zion-4: Wastewater Treatment Plant Area

- Gamma-emitting radionuclides associated with licensed plant operations were not detected at concentrations greater than their respective LLDs in any of the groundwater samples collected from the monitoring wells in the vicinity of AFEs Zion-1, 3, and 4.
- Strontium-89/90 was not detected at concentrations greater than the LLD of 2.0 pCi/L in any of the groundwater samples collected from the monitoring wells in the vicinity of AFEs-Zion-1, 3, and 4.
- Tritium was detected in groundwater samples collected from monitoring well MW-ZN-01S. These concentrations ranged from less than LLD (most recently) to  $586 \pm 141$  pCi/L (lower interval) and  $220 \pm 123$  pCi/L to  $261 \pm 124$  pCi/L (upper interval). The tritium is localized to the area in the vicinity of monitoring well MW-ZN-01S. No tritium was detected in the four temporary wells and MW-ZN-11S, located downgradient of monitoring well MW-ZN-01S. This well is located in close proximity to AFEs Zion 1, 3, and 4. The source of tritium in this location is likely attributable to historical releases in this area. However, the most recent sample results are within the range of background concentrations.

AFE-Zion-2: Unit 1 (Southern) Aboveground Storage Tank (AST) Area

- Gamma-emitting radionuclides associated with licensed plant operations were not detected at concentrations greater than their respective LLDs in any of the groundwater samples collected from the monitoring wells in the vicinity of AFE-Zion-2.

- Strontium-89/90 was not detected at concentrations greater than the LLD of 2.0 pCi/L in any of the groundwater samples collected from the monitoring wells in the vicinity of AFE-Zion-2.
- Tritium was not detected at concentrations greater than the LLD of 200 pCi/L in any of the groundwater samples collected from the monitoring wells near AFE-Zion-2.
- There have been no impacts to groundwater from AFE-Zion-2.

#### Potential Receptors

Based on the results of this investigation<sup>4</sup>, there is no current risk from exposure to radionuclides associated with licensed plant operations through any of the identified potential exposure pathways.

#### General Conclusions

- Based on the results of this investigation, tritium is not migrating off the Station property at detectable concentrations; and
- Based on the results of this investigation, there are no known active releases into the groundwater at the Station.

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<sup>4</sup> Using the LLDs specified in this HIR.

## 9.0 RECOMMENDATIONS

The following presents CRA's recommendations for proposed activities to be completed at the Station.

### 9.1 DATA GAPS

Based on the results of this hydrogeologic investigation, there are no data gaps remaining to support CRA's conclusions regarding the characterization of the groundwater regime and potential impacts from radionuclides at the Station.

### 9.2 GROUNDWATER MONITORING

Based upon the information collected to date, CRA recommends that Exelon conduct periodic monitoring of selected sample locations.

#### Temporary Well Abandonment

Four temporary wells were installed on the beach between the sheet pile wall and the normal high water mark. These temporary wells are not expected to survive the winter due to storms and ice buildup and should be properly abandoned before the onset of cold weather.

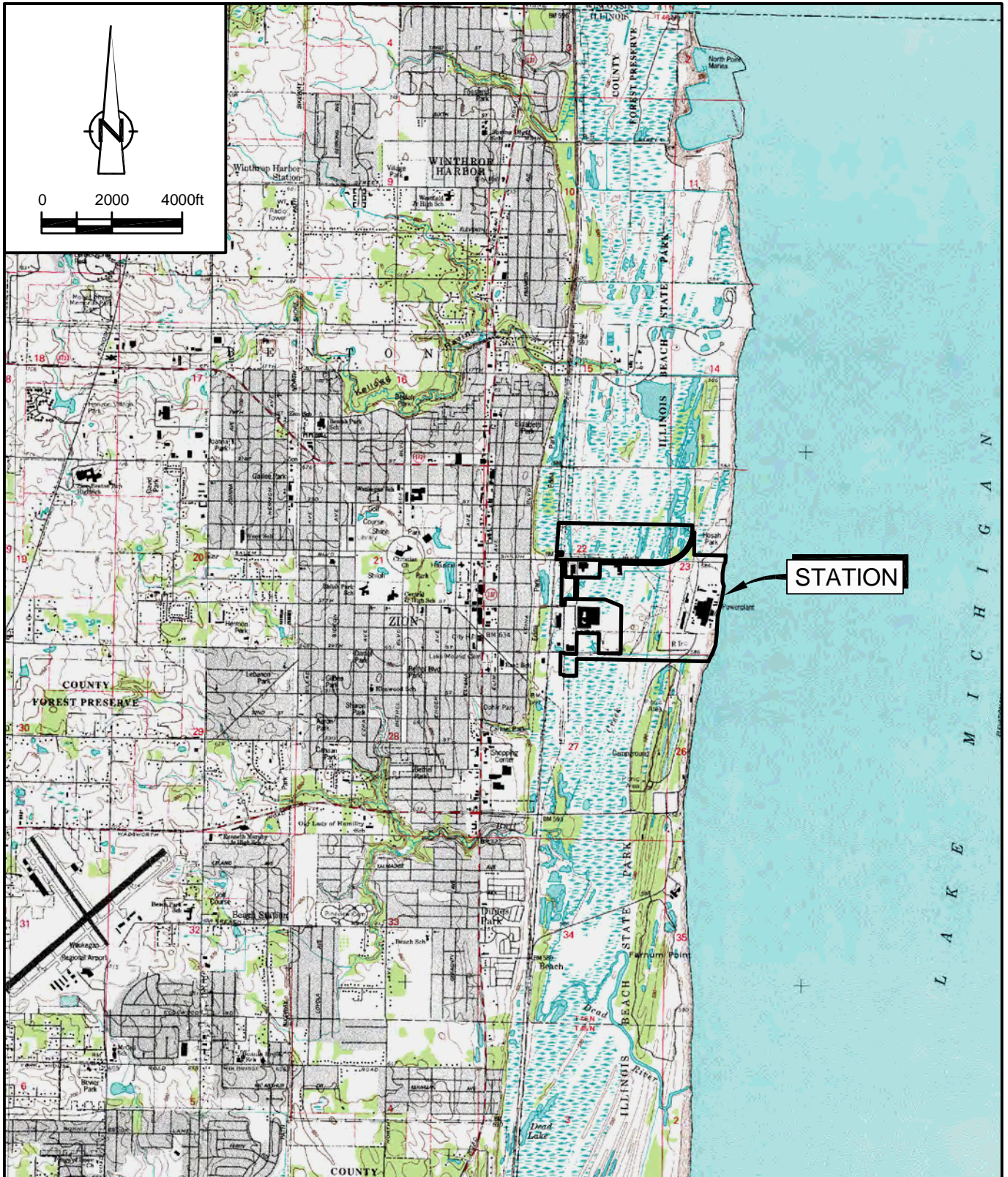
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SOURCE: USGS QUADRANGLE MAP;  
ZION, ILLINOIS (1993)

figure 1.1

STATION LOCATION MAP  
ZION STATION

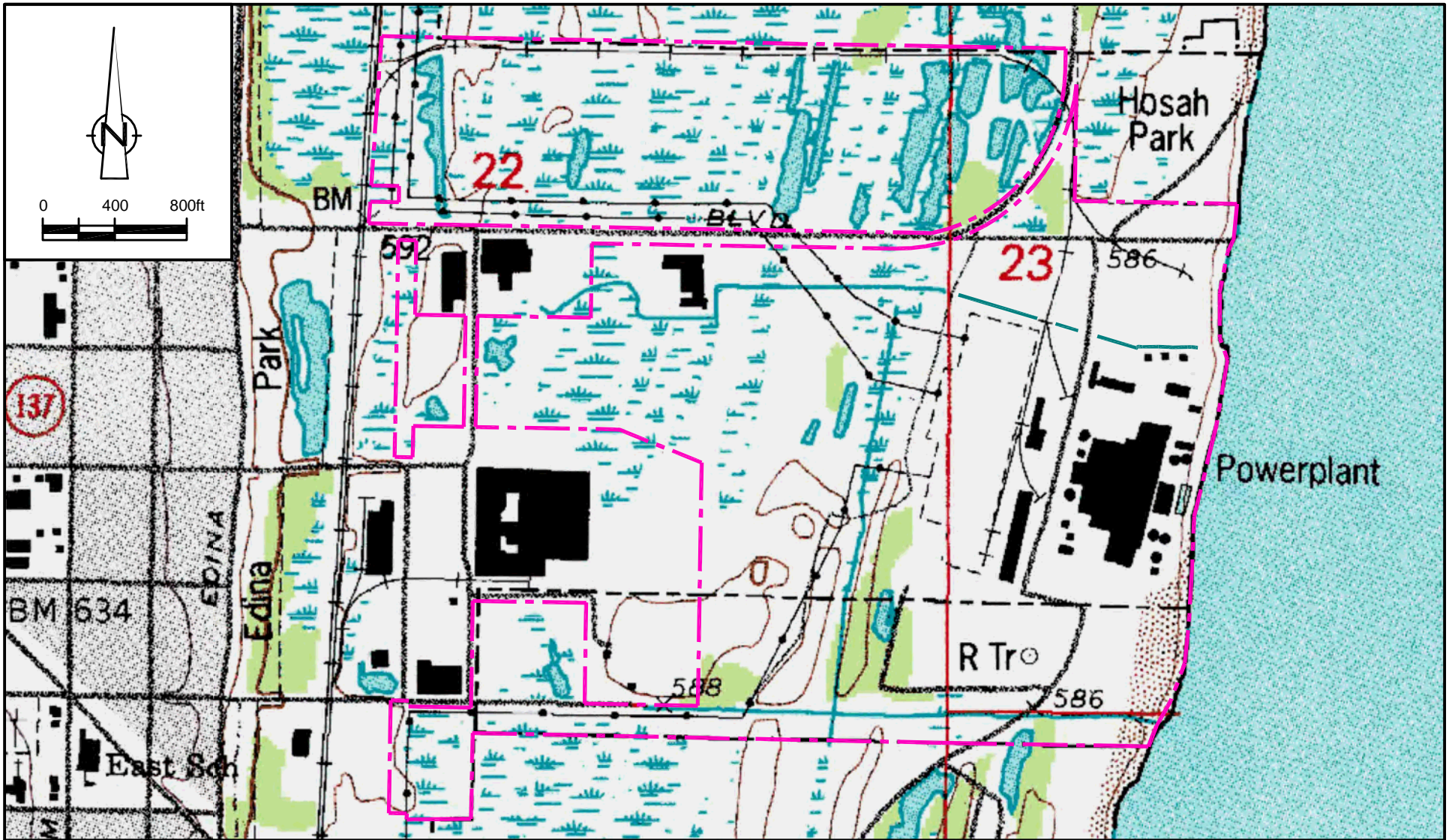
EXELON GENERATION COMPANY, LLC  
*Zion, Illinois*



# FIGURE 1.2 STATION BOUNDARIES AND FEATURES

(Withheld)





SOURCES: MAP: USGS QUADRANGLE MAP;  
 ZION, ILLINOIS (1993)  
 WELL LOCATIONS: BANKS INFORMATION SOLUTIONS, INC.  
 WATER WELL REPORT, JUNE 7, 2006

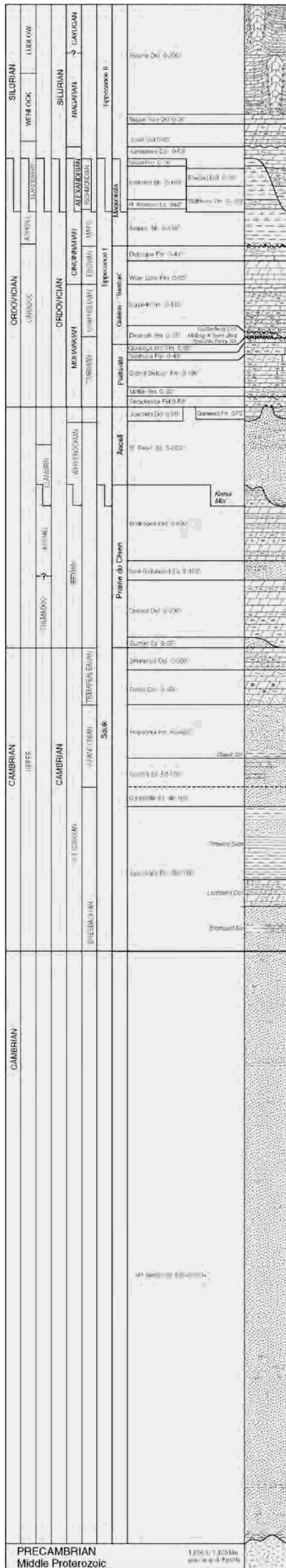


**LEGEND**

- - - PROPERTY LINE
- DITCH

figure 2.1

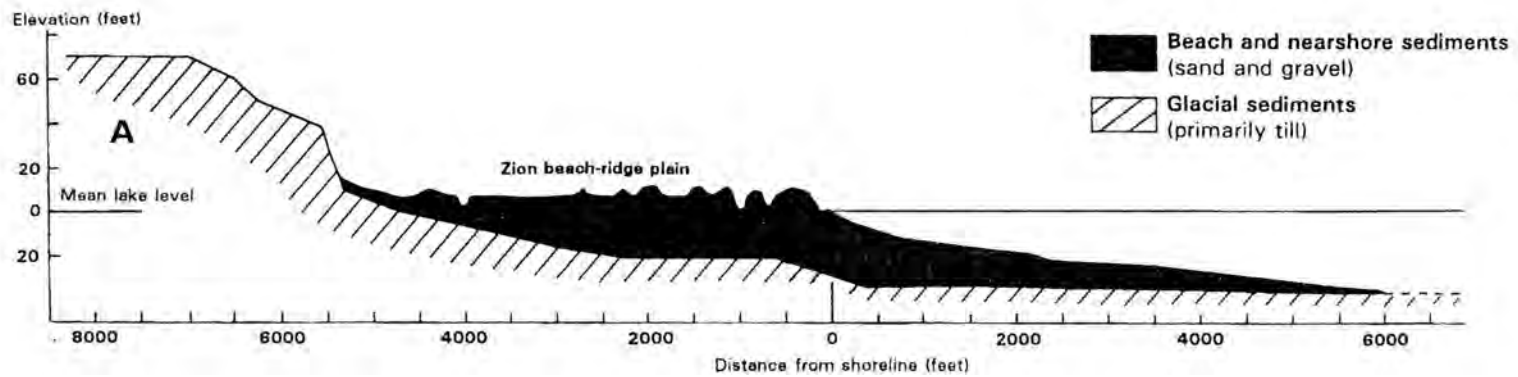
STATION SURFACE WATER FEATURES  
 ZION STATION  
 EXELON GENERATION COMPANY, LLC  
 Zion, Illinois



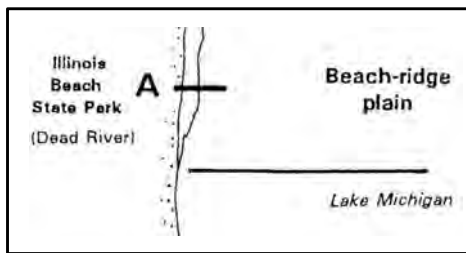
SOURCE: ILLINOIS STATE GEOLOGICAL SURVEY,  
INTRODUCTION TO 3-D VISUALIZATION OF  
BEDROCK IN LAKE COUNTY, ILLINOIS

figure 2.2  
REGIONAL STRATIGRAPHIC CROSS-SECTION  
ZION STATION  
EXELON GENERATION COMPANY, LLC  
Zion, Illinois





SOURCE: GUIDE TO THE GEOLOGY OF ILLINOIS BEACH STATE PARK AND THE ZION BEACH-RIDGE PLAIN, LAKE COUNTY, ILLINOIS STATE GEOLOGICAL SURVEY, 2000.



CROSS-SECTION LOCATION

figure 2.3

CROSS-SECTION OF THE ZION BEACH-RIDGE PLAIN  
 ZION STATION  
 EXELON GENERATION COMPANY, LLC  
*Zion, Illinois*

# FIGURE 2.4 PRIVATE/PUBLIC WATER SUPPLY WELL LOCATIONS

(Withheld)

# FIGURE 3.1 AREAS FOR FURTHER EVALUATION

(Withheld)

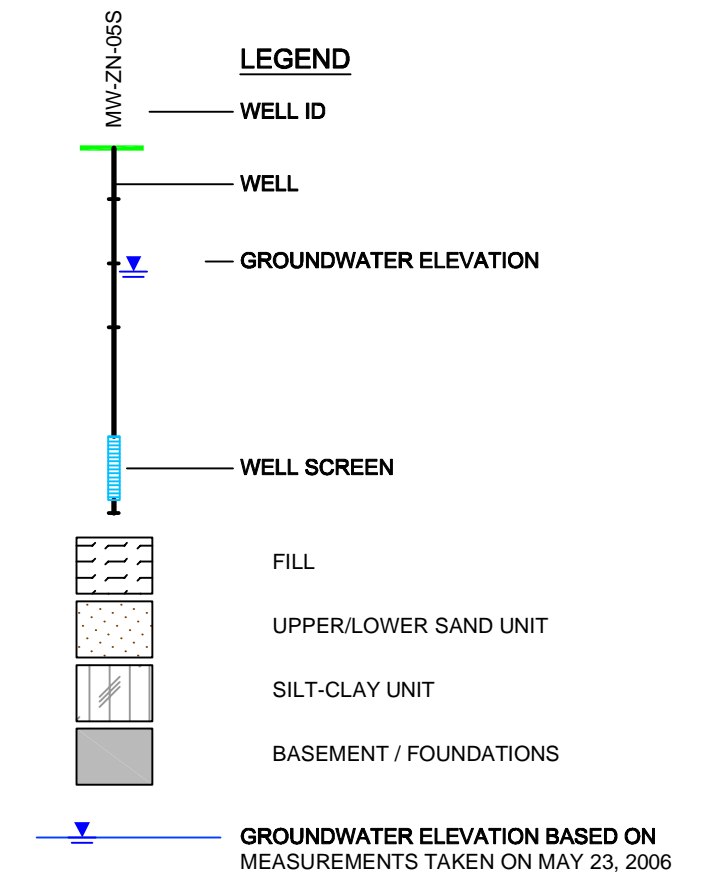
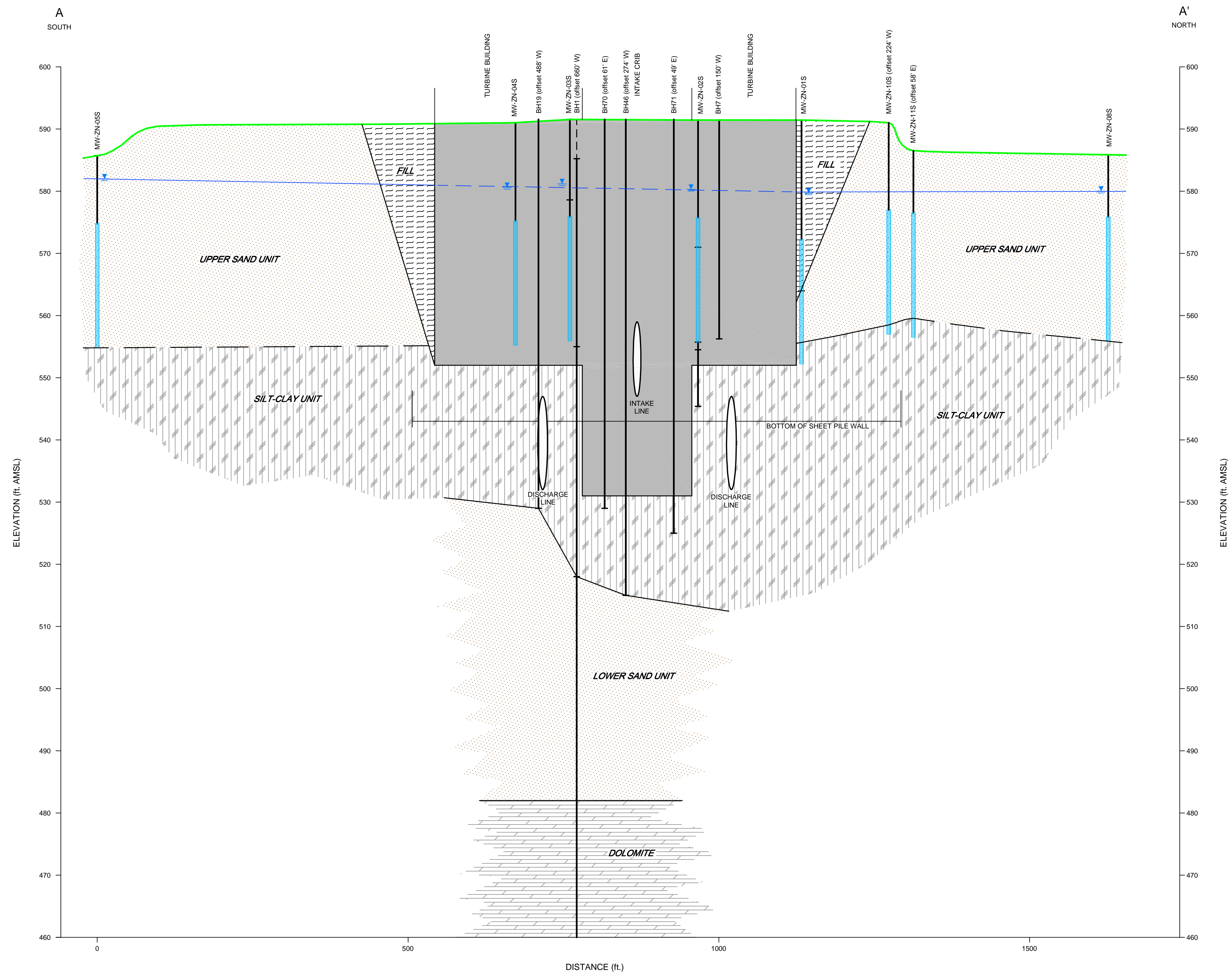


**FIGURE 4.1 GROUNDWATER AND  
SURFACE WATER MONITORING  
LOCATIONS**

(Withheld)

# FIGURE 5.1 STATION GEOLOGIC CROSS-SECTION LOCATION MAP

(Withheld)



**SCALE VERIFICATION**

THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.

**EXELON GENERATION COMPANY, LLC**

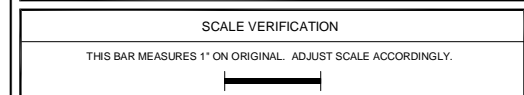
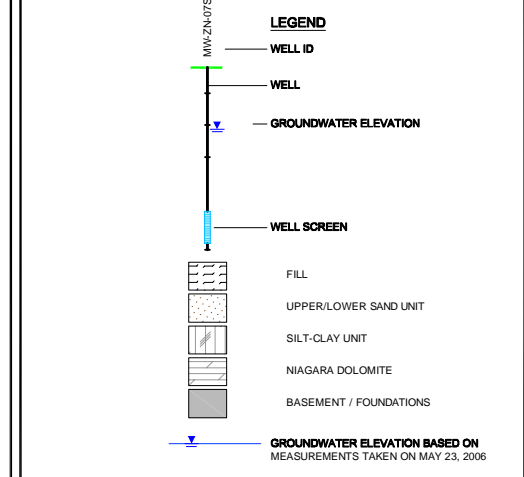
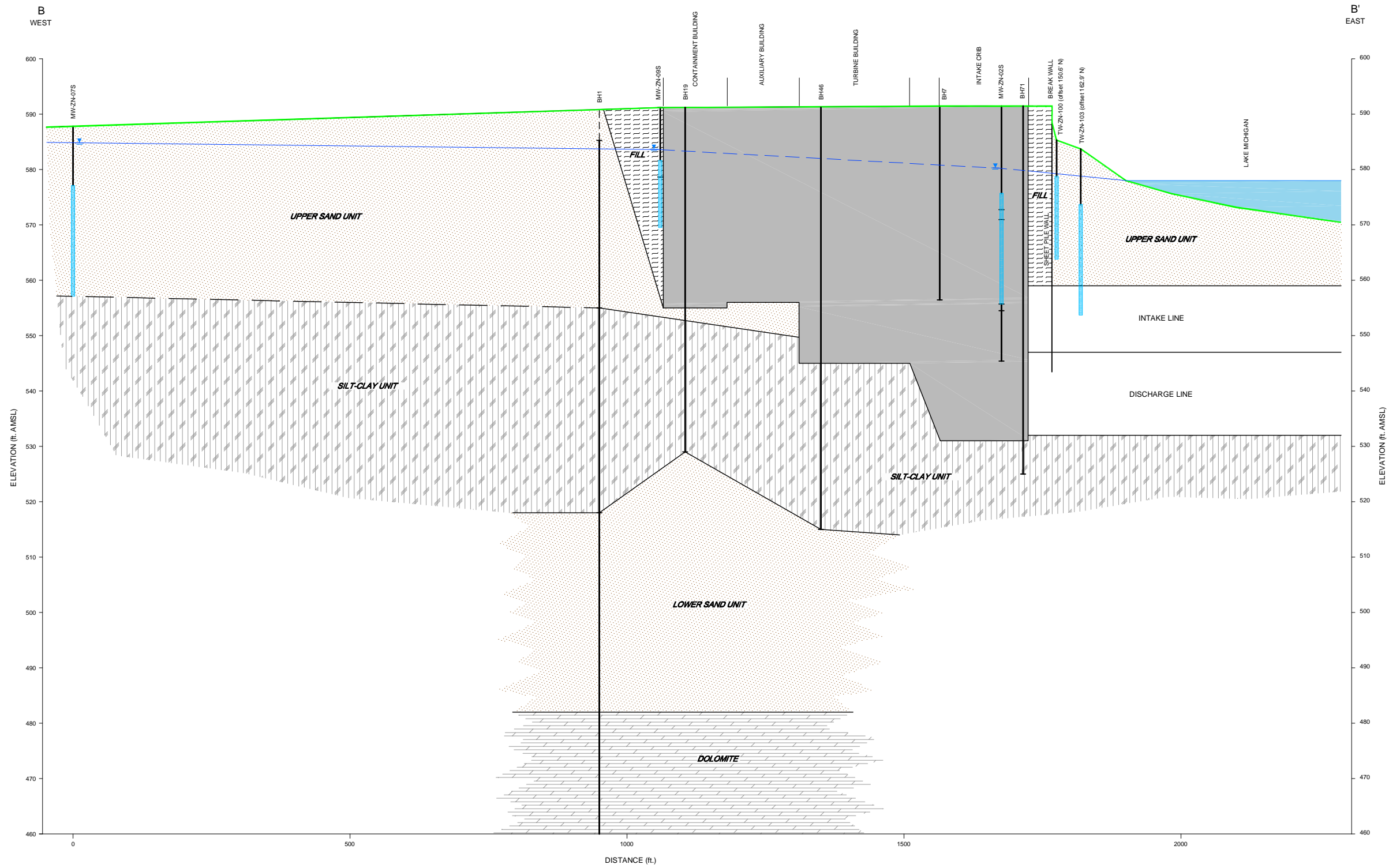
**FLEETWIDE ASSESSMENT**

**GEOLOGIC CROSS SECTION A-A'**  
ZION STATION  
ZION, ILLINOIS



Source Reference:

|                                |                                      |  |
|--------------------------------|--------------------------------------|--|
| Project Manager:<br>S. QUIGLEY | Reviewed By:<br>J. RABY              | Date:<br>AUGUST 2006                   |
| Scale:<br>AS SHOWN             | Project N <sup>o</sup> :<br>45136-30 | Report N <sup>o</sup> :<br>022         |
|                                |                                      | Drawing N <sup>o</sup> :<br>figure 5.2 |



**EXELON GENERATION COMPANY, LLC**

**FLEETWIDE ASSESSMENT**

**GEOLOGIC CROSS SECTION B-B'**

**ZION STATION**

**ZION, ILLINOIS**



Source Reference:

|                               |                         |                           |
|-------------------------------|-------------------------|---------------------------|
| Project Manager:<br>S. OUGLEY | Reviewed By:<br>J. RABY | Date:<br>AUGUST 2006      |
| Scale:<br>AS SHOWN            | Project No:<br>45136-30 | Report No:<br>022         |
|                               |                         | Drawing No:<br>figure 5.3 |

FIGURE 5.4 POTENTIOMETRIC  
SURFACE CONTOURS . MAY 2006 .  
SHALLOW GROUNDWATER ZONE

(Withheld)

FIGURE 5.5 POTENTIOMETRIC  
SURFACE CONTOURS . JULY 2006 .  
SHALLOW GROUNDWATER ZONE

(Withheld)

FIGURE 5.6 TRITIUM  
CONCENTRATIONS .  
GROUNDWATER AND SURFACE  
WATER

(Withheld)

FIGURE 5.7 RADIONUCLIDE  
CONCENTRATIONS .  
GROUNDWATER AND SURFACE  
WATER

(Withheld)



TABLE 4.1

**SUMMARY OF MONITORING WELL INSTALLATION DETAILS  
FLEETWIDE ASSESSMENT  
ZION STATION  
ZION, ILLINOIS**

| Well Location | X-coord.<br>(Site-Specific Coordinates) | Y-coord.    | Surface Elevation<br>(NGVD) | Reference Elevation<br>(NGVD) | Installation Date | Boring Total Depth<br>(ft bgs) | Screened Interval |        |                  |        | Well Diameter<br>(inches) | Well Construction |
|---------------|---|-------------|-----------------------------|-------------------------------|-------------------|--------------------------------|-------------------|--------|------------------|--------|---------------------------|-------------------|
|               |   |             |                             |                               |                   |                                | Top<br>(ft bgs)   | Bottom | Top<br>(ft NGVD) | Bottom |                           |                   |
| MW-ZN-01S     | 1424319.58                              | 15418801.80 | 591.43                      | 594.10                        | 5/1/2006          | 39                             | 19                | 39     | 572.43           | 552.43 | 2                         | 2-inch PVC Screen |
| MW-ZN-02S     | 1424278.62                              | 15418640.44 | 591.21                      | 593.78                        | 5/2/2006          | 45                             | 15                | 35     | 576.21           | 556.21 | 2                         | 2-inch PVC Screen |
| MW-ZN-03S     | 1424216.30                              | 15418443.87 | 591.54                      | 594.02                        | 5/2/2006          | 35.3                           | 15.3              | 35.3   | 576.24           | 556.24 | 2                         | 2-inch PVC Screen |
| MW-ZN-04S     | 1424212.26                              | 15418356.60 | 591.01                      | 593.82                        | 5/3/2006          | 35                             | 15                | 35     | 576.01           | 556.01 | 2                         | 2-inch PVC Screen |
| MW-ZN-05S     | 1423805.72                              | 15417820.38 | 585.72                      | 588.64                        | 5/4/2006          | 30                             | 10                | 30     | 575.72           | 555.72 | 2                         | 2-inch PVC Screen |
| MW-ZN-06S     | 1422629.16                              | 15418474.29 | 589.78                      | 592.66                        | 5/5/2006          | 30                             | 10                | 30     | 579.78           | 559.78 | 2                         | 2-inch PVC Screen |
| MW-ZN-07S     | 1422858.29                              | 15419254.58 | 587.08                      | 589.82                        | 5/6/2006          | 30                             | 10                | 30     | 577.08           | 557.08 | 2                         | 2-inch PVC Screen |
| MW-ZN-08S     | 1424335.21                              | 15419294.95 | 585.85                      | 588.73                        | 5/5/2006          | 30                             | 10                | 30     | 575.85           | 555.85 | 2                         | 2-inch PVC Screen |
| MW-ZN-09S     | 1423689.57                              | 15418596.56 | 591.18                      | 593.84                        | 5/5/2006          | 19                             | 9                 | 19     | 582.18           | 572.18 | 2                         | 2-inch PVC Screen |
| MW-ZN-10S     | 1424100.31                              | 15418949.08 | 591.00                      | 593.70                        | 7/13/2006         | 34                             | 14                | 34     | 577.00           | 557.00 | 2                         | 2-inch PVC Screen |
| MW-ZN-11S     | 1424383.37                              | 15418979.86 | 586.50                      | 589.50                        | 7/14/2006         | 30                             | 10                | 30     | 576.50           | 556.50 | 2                         | 2-inch PVC Screen |
| TW-ZN-100     | 1424390.02                              | 15418713.68 | 585.30                      | 590.00                        | 7/7/2006          | 22                             | 6.5               | 21.5   | 578.80           | 563.80 | 1                         | 1-inch PVC Screen |
| TW-ZN-101     | 1424414.23                              | 15418779.65 | 584.30                      | 588.70                        | 7/7/2006          | 19                             | 4                 | 19     | 580.30           | 565.30 | 1                         | 1-inch PVC Screen |
| TW-ZN-102     | 1424432.51                              | 15418865.75 | 584.30                      | 588.60                        | 7/7/2006          | 21                             | 6                 | 21     | 578.30           | 563.30 | 1                         | 1-inch PVC Screen |
| TW-ZN-103     | 1424431.73                              | 15418705.47 | 583.70                      | 587.50                        | 7/7/2006          | 30                             | 10                | 30     | 573.70           | 553.70 | 1                         | 1-inch PVC Screen |

Notes:

NGVD - National Geodetic Vertical datum

ft bgs - feet below ground surface

PVC - polyvinyl chloride

**TABLE 4.2**

**SUMMARY OF MONITORING WELL DEVELOPMENT PARAMATERS  
FLEETWIDE ASSESSMENT  
ZION STATION  
ZION, ILLINOIS**

| <b>Sample Location</b> | <b>Date</b> | <b>Well Volume (gallons)</b> | <b>Gallons Purged</b> | <b>Water Level</b> | <b>pH (Std. Units)</b> | <b>Conductivity (µS/cm) <sup>1</sup></b> | <b>Temperature (°C)</b> | <b>Turbidity (ntu) <sup>2</sup></b> | <b>Observations</b>  | <b>Pump Type</b> |
|------------------------|-------------|------------------------------|-----------------------|--------------------|------------------------|--|-------------------------|-------------------------------------|----------------------|------------------|
| MW-ZN-01S              | 5/3/2006    | 5.0                          | 5                     | 13.3               | NA                     | NA                                       | NA                      | NA                                  | brown, turbid, silty | Peristaltic      |
|                        |             |                              | 10                    |                    | 7.46                   | 757                                      | 17.0                    | > 1000                              | brown, turbid, silty |                  |
|                        |             |                              | 15                    |                    | NA                     | NA                                       | NA                      | NA                                  | brown, turbid, silty |                  |
|                        |             |                              | 20                    |                    | 7.38                   | 699                                      | 17.0                    | > 1000                              | brown, turbid, silty |                  |
|                        |             |                              | 25                    |                    | 7.20                   | 662                                      | 15.7                    | > 1000                              | brown, turbid, silty |                  |
|                        |             |                              | 30                    |                    | 7.31                   | 640                                      | 16.1                    | > 1000                              | brown, turbid, silty |                  |
|                        |             |                              | 35                    |                    | 7.33                   | 633                                      | 17.1                    | > 1000                              | brown, turbid, silty |                  |
|                        |             |                              | 40                    |                    |                        | 622                                      | 16.5                    | > 1000                              | brown, turbid, silty |                  |
|                        |             |                              | 45                    |                    | 7.48                   | 607                                      | 19.2                    | > 1000                              | brown, turbid, silty |                  |
|                        |             |                              | 50                    |                    | 7.43                   | 599                                      | 16.6                    | > 1000                              | brown, turbid, silty |                  |
|                        |             |                              | 55                    |                    | 7.41                   | 591                                      | 16.5                    | 340                                 | brown, turbid, silty |                  |
|                        |             |                              | 60                    |                    | 7.41                   | 593                                      | 16.3                    | 164                                 | brown, turbid, silty |                  |
|                        |             |                              | 65                    |                    | 7.43                   | 593                                      | 16.3                    | 164                                 | brown, turbid, silty |                  |
|                        |             |                              | 70                    |                    | 7.44                   | 580                                      | 17.4                    | 99.6                                | brown, turbid, silty |                  |
|                        |             |                              | 75                    |                    | 7.45                   | 589                                      | 15.9                    | 95.3                                | brown, turbid, silty |                  |
| 80                     | 7.43        | 586                          | 16.1                  | 82                 | brown, turbid, silty   |  |                         |                                     |                      |                  |
| MW-ZN-02S              | 5/4/2006    | 3.5                          | 4                     | 13.6               | 7.97                   | 653                                      | 12.5                    | > 1000                              | silty, gray          | Peristaltic      |
|                        |             |                              | 8                     |                    | 7.80                   | 614                                      | 14.6                    | > 1000                              | silty, gray          |                  |
|                        |             |                              | 12                    |                    | 7.74                   | 605                                      | 14.5                    | > 1000                              | silty, gray          |                  |
|                        |             |                              | 18                    |                    | 7.83                   | 595                                      | 14                      | > 1000                              | silty, gray          |                  |
|                        |             |                              | 22                    |                    | 7.63                   | 582                                      | 13.3                    | > 1000                              | silty, gray          |                  |
|                        |             |                              | 26                    |                    | 7.64                   | 577                                      | 13                      | > 1000                              | silty, gray          |                  |
|                        |             |                              | 30                    |                    | 7.62                   | 199.5                                    | 12.6                    | > 1000                              | silty, gray          |                  |
|                        |             |                              | 34                    |                    | 7.58                   | 95.6                                     | 13.3                    | > 1000                              | silty, gray          |                  |
|                        |             |                              | 40                    |                    | 7.57                   | 196.3                                    | 12.6                    | > 1000                              | silty, gray          |                  |
|                        |             |                              | 44                    |                    | 7.61                   | 195.1                                    | 12.9                    | 896                                 | getting less cloudy  |                  |
| 48                     | 7.60        | 96.3                         | 12.8                  | 702                | getting less cloudy    |  |                         |                                     |                      |                  |

**TABLE 4.2**  
**SUMMARY OF MONITORING WELL DEVELOPMENT PARAMATERS**  
**FLEETWIDE ASSESSMENT**  
**ZION STATION**  
**ZION, ILLINOIS**

| <b>Sample Location</b> | <b>Date</b> | <b>Well Volume (gallons)</b> | <b>Gallons Purged</b> | <b>Water Level</b> | <b>pH (Std. Units)</b> | <b>Conductivity (µS/cm) <sup>1</sup></b> | <b>Temperature (°C)</b> | <b>Turbidity (ntu) <sup>2</sup></b> | <b>Observations</b>    | <b>Pump Type</b> |
|------------------------|-------------|------------------------------|-----------------------|--------------------|------------------------|--|-------------------------|-------------------------------------|------------------------|------------------|
| MW-ZN-03S              | 5/5/2006    | 3.72                         | 4                     | 13.12              | 7.44                   | 666                                      | 11.3                    | > 1000                              | cloudy, brown          | Peristaltic      |
|                        |             |                              | 8                     |                    | 7.41                   | 628                                      | 11.3                    | > 1000                              | cloudy, brown          |                  |
|                        |             |                              | 12                    |                    | 7.46                   | 608                                      | 10.9                    | > 1000                              | cloudy, brown          |                  |
|                        |             |                              | 16                    |                    | 7.43                   | 604                                      | 10.5                    | > 1000                              | cloudy, brown          |                  |
|                        |             |                              | 20                    |                    | 7.47                   | 200                                      | 10.7                    | > 1000                              | cloudy, brown          |                  |
|                        |             |                              | 24                    |                    | 7.43                   | 192.2                                    | 10.4                    | > 1000                              | cloudy, brown          |                  |
|                        |             |                              | 28                    |                    | 7.43                   | 188.8                                    | 10.7                    | > 1000                              | cloudy, brown          |                  |
|                        |             |                              | 32                    |                    | 7.40                   | 188.0                                    | 10.9                    | 834                                 | cloudy, brown          |                  |
|                        |             |                              | 36                    |                    | 7.42                   | 186.1                                    | 10.6                    | 838                                 | cloudy, brown          |                  |
|                        |             |                              | 40                    |                    | 7.40                   | 181.3                                    | 10.5                    | > 1000                              | cloudy, brown          |                  |
|                        |             |                              | 44                    |                    | 7.40                   | 181.7                                    | 10.9                    | > 1000                              | cloudy, brown          |                  |
|                        |             |                              | 48                    |                    | 7.40                   | 178.9                                    | 10.4                    | > 1000                              | cloudy, brown          |                  |
|                        |             |                              | 52                    |                    | 7.41                   | 177.0                                    | 10.4                    | 1000                                | cloudy, brown          |                  |
|                        |             |                              | MW-ZN-04S             |                    | 5/5/2006               |  | 8                       | 14.27                               | 7.24                   |                  |
| 12                     | 7.50        | 185.5                        |                       | 12.6               |                        |  | > 1000                  |                                     | cloudy, brown          |                  |
| 16                     | 7.51        | 553                          |                       | 12.8               |                        |  | > 1000                  |                                     | cloudy, brown          |                  |
| 20                     | 7.50        | 179.0                        |                       | 12.8               |                        |  | > 1000                  |                                     | cloudy, brown          |                  |
| 24                     | 7.49        | 177.6                        |                       | 12.8               |                        |  | 689                     |                                     | cloudy, brown          |                  |
| 28                     | 7.50        | 176.5                        |                       | 12.8               |                        |  | 508                     |                                     | cloudy, brown          |                  |
| 32                     | 7.48        | 175.2                        |                       | 12.8               |                        |  | 312                     |                                     | slightly cloudy, brown |                  |
| 36                     | 7.48        | 176.0                        |                       | 12.6               |                        |  | 267                     |                                     | slightly cloudy, brown |                  |
| 40                     | 7.47        | 173.4                        |                       | 12.6               |                        |  | 180                     |                                     | slightly cloudy, brown |                  |
| 44                     | 7.47        | 173.4                        |                       | 12.6               |                        |  | 114                     |                                     | slightly cloudy, brown |                  |
| 48                     | 7.46        | 172.2                        |                       | 12.6               |                        |  | 85.1                    |                                     | slightly cloudy, brown |                  |
| 52                     | 7.46        | 171.7                        |                       | 12.6               |                        |  | 52.8                    |                                     | slightly cloudy, brown |                  |

**TABLE 4.2**  
**SUMMARY OF MONITORING WELL DEVELOPMENT PARAMATERS**  
**FLEETWIDE ASSESSMENT**  
**ZION STATION**  
**ZION, ILLINOIS**

| <i>Sample Location</i> | <i>Date</i> | <i>Well Volume (gallons)</i> | <i>Gallons Purged</i> | <i>Water Level</i> | <i>pH</i>           | <i>Conductivity</i>         | <i>Temperature</i> | <i>Turbidity</i>          | <i>Observations</i>    | <i>Pump Type</i> |
|------------------------|-------------|------------------------------|-----------------------|--------------------|---------------------|-----------------------------|--------------------|---------------------------|------------------------|------------------|
|                        |             |                              |                       |                    | <i>(Std. Units)</i> | <i>(µS/cm) <sup>1</sup></i> | <i>(°C)</i>        | <i>(ntu) <sup>2</sup></i> |                        |                  |
| MW-ZN-05S              | 5/8/2006    | 4.1                          | 5                     | 25.63              | 7.28                | 140.0                       | 12.4               | > 1000                    | cloudy, brown          | Peristaltic      |
|                        |             |                              | 10                    |                    | 7.21                | 141.5                       | 12.6               | 879                       | cloudy, brown          |                  |
|                        |             |                              | 15                    |                    | 7.22                | 142.3                       | 12.8               | > 1000                    | cloudy, brown          |                  |
|                        |             |                              | 20                    |                    | 7.25                | 140.7                       | 12.5               | 588.0                     | cloudy, brown          |                  |
|                        |             |                              | 25                    |                    | 7.25                | 142.2                       | 12.5               | 228.00                    | slightly cloudy, brown |                  |
|                        |             |                              | 30                    |                    | 7.25                | 144.3                       | 12.3               | 482.00                    | slightly cloudy, brown |                  |
|                        |             |                              | 35                    |                    | 7.22                | 147.1                       | 12.5               | 60.00                     | clear                  |                  |
|                        |             |                              | 40                    |                    | 7.24                | 145.2                       | 12.6               | 32.6                      | clear                  |                  |
|                        |             |                              | 45                    |                    | 7.23                | 144.5                       | 12.7               | 19.7                      | clear                  |                  |
|                        |             |                              | 50                    |                    | 7.23                | 144.6                       | 12.7               | 16                        | clear                  |                  |
|                        |             |                              | 55                    |                    | 7.25                | 144.0                       | 12.7               | 16.2                      | clear                  |                  |
|                        |             |                              | 60                    |                    | 7.25                | 144.0                       | 12.6               | 10.2                      | clear                  |                  |
|                        |             |                              | MW-ZN-06S             |                    | 5/8/2006            | 3.52                        | 3.5                | 3.52                      | 7.12                   |                  |
| 7.0                    | 7.09        | 133.7                        |                       | 10.3               |                     |                             | > 1000             |                           | silty, gray            |                  |
| 10.5                   | 7.08        | 137.6                        |                       | 11.0               |                     |                             | > 1000             |                           | silty, gray            |                  |
| 14.0                   | 7.05        | 137.6                        |                       | 10.3               |                     |                             | > 1000             |                           | silty, gray            |                  |
| 17.5                   | 7.04        | 139.0                        |                       | 10.7               |                     |                             | > 1000             |                           | silty, gray            |                  |
| 21.0                   | 7.35        | 122.5                        |                       | 10.8               |                     |                             | 1000               |                           | silty, gray            |                  |
| 24.5                   | 7.24        | 124.7                        |                       | 10.5               |                     |                             | 232                |                           | clearer                |                  |
| 28.0                   | 7.13        | 126.8                        |                       | 10.0               |                     |                             | > 1000             |                           | clear                  |                  |
| 31.5                   | 7.07        | 128.3                        |                       | 10.3               |                     |                             | 520                |                           | clear                  |                  |
| 35.0                   | 7.08        | 128.5                        |                       | 10.2               |                     |                             | 148                |                           | silty                  |                  |
| 38.5                   | 7.03        | 128.8                        |                       | 10.0               |                     |                             | > 1000             |                           | silty                  |                  |
| 41.0                   | 6.99        | 132.0                        |                       | 10.5               |                     |                             | 458                |                           | clear                  |                  |
| 44.5                   | 7.10        | 129.1                        |                       | 10.4               |                     |                             | 143                |                           | clear                  |                  |
| 48                     | 7.01        | 131.4                        | 10.5                  | 137.8              | clear               |                             |                    |                           |                        |                  |

**TABLE 4.2**  
**SUMMARY OF MONITORING WELL DEVELOPMENT PARAMATERS**  
**FLEETWIDE ASSESSMENT**  
**ZION STATION**  
**ZION, ILLINOIS**

| <b>Sample Location</b> | <b>Date</b> | <b>Well Volume (gallons)</b> | <b>Gallons Purged</b> | <b>Water Level</b> | <b>pH (Std. Units)</b> | <b>Conductivity (µS/cm) <sup>1</sup></b> | <b>Temperature (°C)</b> | <b>Turbidity (ntu) <sup>2</sup></b> | <b>Observations</b>   | <b>Pump Type</b> |
|------------------------|-------------|------------------------------|-----------------------|--------------------|------------------------|--|-------------------------|-------------------------------------|-----------------------|------------------|
| MW-ZN-07S              | 5/8/2006    | 4.3                          | 4.3                   | 5.20               | 7.15                   | 139.5                                    | 10.5                    | > 1000                              | silty, gray           | Peristaltic      |
|                        |             |                              | 8.6                   |                    | 7.11                   | 141.3                                    | 10.7                    | > 1000                              | silty, gray           |                  |
|                        |             |                              | 12.9                  |                    | 7.11                   | 137.6                                    | 10.8                    | > 1000                              | silty, gray           |                  |
|                        |             |                              | 16.2                  |                    | 7.13                   | 136.1                                    | 10.6                    | > 1000                              | silty, gray           |                  |
|                        |             |                              | 20.5                  |                    | 7.13                   | 139.0                                    | 10.7                    | > 1000                              | silty, gray           |                  |
|                        |             |                              | 24.8                  |                    | 7.05                   | 138.6                                    | 10.3                    | > 1000                              | silty, gray           |                  |
|                        |             |                              | 29.1                  |                    | 7.05                   | 137.6                                    | 10.5                    | 872                                 | silty, gray           |                  |
|                        |             |                              | 33.4                  |                    | 7.07                   | 138.2                                    | 10.3                    | 569                                 | silty, gray           |                  |
|                        |             |                              | 37.7                  |                    | 7.07                   | 113.7                                    | 10.7                    | > 1000                              | silty, gray           |                  |
|                        |             |                              | 42.0                  |                    | 7.06                   | 140.1                                    | 10.4                    | 520                                 | silty, gray           |                  |
|                        |             |                              | 45.3                  |                    | 7.06                   | 138.5                                    | 10.8                    | 213                                 | silty, gray           |                  |
|                        |             |                              | 49.6                  |                    | 7.04                   | 139.3                                    | 10.4                    | 89.7                                | silty, gray           |                  |
|                        |             |                              | MW-ZN-08S             |                    | 5/8/2006               | 3.86                                     | 3.9                     | 8.17                                | 7.45                  |                  |
| 9.8                    | 7.47        | 136.8                        |                       | 12.8               |                        |  | 1000                    |                                     | NA                    |                  |
| 11.7                   | 7.40        | 138.5                        |                       | 12.9               |                        |  | 628                     |                                     | NA                    |                  |
| 15.6                   | 7.42        | 139.4                        |                       | 13.3               |                        |  | > 1000                  |                                     | NA                    |                  |
| 19.5                   | 7.42        | 138.4                        |                       | 12.6               |                        |  | 898                     |                                     | NA                    |                  |
| 23.4                   | 7.41        | 138.1                        |                       | 12.6               |                        |  | 898                     |                                     | NA                    |                  |
| 27.3                   | 7.41        | 141.5                        |                       | 13.3               |                        |  | 898                     |                                     | NA                    |                  |
| 31.2                   | 7.42        | 138.1                        |                       | 13.0               |                        |  | 387                     |                                     | NA                    |                  |
| 35.1                   | 7.33        | 138.1                        |                       | 12.6               |                        |  | 198                     |                                     | NA                    |                  |
| 39.0                   | 7.41        | 138.4                        |                       | 13.0               |                        |  | 101                     |                                     | NA                    |                  |
| 42.9                   | 7.39        | 139.3                        |                       | 12.4               |                        |  | 75.2                    |                                     | NA                    |                  |
| 46.8                   | 7.42        | 138.7                        | 12.6                  | 50.9               | NA                     |  |                         |                                     |                       |                  |
| MW-ZN-09S              | 5/8/2006    | 1.58                         | 2                     | 9.89               | 8.97                   | 158.7                                    | 11.9                    | > 1000                              | cloudy, gray          | Peristaltic      |
|                        |             |                              | 4                     |                    | 9.13                   | 159.7                                    | 11.7                    | > 1000                              | septic odor           |                  |
|                        |             |                              | 6                     |                    | 9.18                   | 158.6                                    | 11.7                    | > 1000                              | septic odor           |                  |
|                        |             |                              | 8                     |                    | 9.15                   | 156.3                                    | 11.7                    | 484                                 | septic odor           |                  |
|                        |             |                              | 10                    |                    | 9.13                   | 155.3                                    | 11.7                    | 245                                 | slightly cloudy, gray |                  |
|                        |             |                              | 12                    |                    | 9.00                   | 152.1                                    | 11.8                    | > 1000                              | slightly cloudy, gray |                  |
|                        |             |                              | 14                    |                    | 9.10                   | 151.1                                    | 11.8                    | 277                                 | slightly cloudy, gray |                  |
|                        |             |                              | 16                    |                    | 9.07                   | 150.2                                    | 11.8                    | 44.7                                | slightly cloudy, gray |                  |
|                        |             |                              | 18                    |                    | 9.09                   | 148.6                                    | 11.8                    | 13.10                               | clear, septic odor    |                  |
|                        |             |                              | 20                    |                    | 9.09                   | 147.7                                    | 11.7                    | 9.93                                | clear, septic odor    |                  |
|                        |             |                              | 22                    |                    | 9.04                   | 147.2                                    | 11.7                    | 8.67                                | clear, septic odor    |                  |

**TABLE 4.2**  
**SUMMARY OF MONITORING WELL DEVELOPMENT PARAMATERS**  
**FLEETWIDE ASSESSMENT**  
**ZION STATION**  
**ZION, ILLINOIS**

| <i>Sample Location</i> | <i>Date</i> | <i>Well Volume (gallons)</i> | <i>Gallons Purged</i> | <i>Water Level</i> | <i>pH (Std. Units)</i> | <i>Conductivity (µS/cm)<sup>1</sup></i> | <i>Temperature (°C)</i> | <i>Turbidity (ntu)<sup>2</sup></i> | <i>Observations</i> | <i>Pump Type</i> |
|------------------------|-------------|------------------------------|-----------------------|--------------------|------------------------|---|-------------------------|------------------------------------|---------------------|------------------|
| MW-ZN-10S              | 7/14/2006   | 4                            | 90*                   | 13.58              | 6.89                   | 913.0                                   | 16.7                    | 151.00                             | cloudy              | Peristaltic      |
|                        |             |                              | 94                    |                    | 7.18                   | 776.0                                   | 15.0                    | 132.00                             | cloudy              |                  |
|                        |             |                              | 98                    |                    | 7.26                   | 738.0                                   | 14.0                    | 281.00                             | cloudy              |                  |
|                        |             |                              | 102                   |                    | 7.34                   | 748.0                                   | 13.8                    | 112                                | clear               |                  |
|                        |             |                              | 106                   |                    | 7.37                   | 738.0                                   | 13.8                    | 75.5                               | clear               |                  |
| MW-ZN-11S              | 7/14/2006   | 3                            | 3                     | 10.5               | 7.47                   | 863.0                                   | 17.3                    | >1000                              | cloudy, brown       | Peristaltic      |
|                        |             |                              | 6                     |                    | 7.31                   | 842.0                                   | 16.8                    | >1000                              | cloudy, brown       |                  |
|                        |             |                              | 9                     |                    | 7.35                   | 839.0                                   | 16.1                    | >1000                              | cloudy, brown       |                  |
|                        |             |                              | 12                    |                    | 7.36                   | 832.0                                   | 16.2                    | 243                                | clear               |                  |
|                        |             |                              | 15                    |                    | 7.31                   | 828.0                                   | 16.0                    | 162                                | clear               |                  |
|                        |             |                              | 18                    |                    | 7.31                   | 806.0                                   | 16.0                    | 88.80                              | clear               |                  |
|                        |             |                              | 24                    |                    | 7.28                   | 654.0                                   | 16.7                    | >1000                              | clear               |                  |
|                        |             |                              | 27                    |                    | 7.28                   | 827.0                                   | 15.9                    | 258.00                             | clear               |                  |
|                        |             |                              | 30                    |                    | 7.33                   | 503.0                                   | 16.7                    | 83.7                               | clear               |                  |
|                        |             |                              | 33                    |                    | 7.33                   | 791.0                                   | 16.4                    | 52                                 | clear               |                  |
|                        |             |                              | 36                    |                    | 7.27                   | 802                                     | 16.2                    | 105                                | clear               |                  |
|                        |             |                              | 45                    |                    | 7.27                   | 799                                     | 15.6                    | 50                                 | clear               |                  |
|                        |             |                              | 51                    |                    | 7.36                   | 792                                     | 15.6                    | 23.6                               | clear               |                  |
| 56                     | 7.27        | 798                          | 15.7                  | 22                 | clear                  |   |                         |                                    |                     |                  |

Notes:

<sup>1</sup> µS/cm - microSiemens per centimeter

<sup>2</sup> ntu - nephelometric turbidity units

\* purged 90 gallons from well before taking readings

TABLE 4.3

**SUMMARY OF GROUNDWATER AND SURFACE WATER ELEVATIONS  
FLEETWIDE ASSESSMENT  
ZION STATION  
ZION, ILLINOIS**

| <i>Sample<br/>Location</i> | <i>Reference<br/>Elevation<br/>(NGVD)</i> | <i>May 23, 2006</i>                                |   |
|----------------------------|---|--|---|
|                            |   | <i>Depth to Water<br/>(ft Below<br/>Reference)</i> | <i>Groundwater<br/>Elevation<br/>(NGVD)</i> |
| MW-ZN-01S                  | 594.10                                    | 14.41  | 579.69                                      |
| MW-ZN-02S                  | 593.78                                    | 13.48  | 580.30                                      |
| MW-ZN-03S                  | 594.02                                    | 12.84  | 581.18                                      |
| MW-ZN-04S                  | 593.82                                    | 13.23  | 580.59                                      |
| MW-ZN-05S                  | 588.64                                    | 6.67   | 581.97                                      |
| MW-ZN-06S                  | 592.66                                    | 7.71   | 584.95                                      |
| MW-ZN-07S                  | 589.82                                    | 5.02   | 584.80                                      |
| MW-ZN-08S                  | 588.73                                    | 8.73   | 580.00                                      |
| MW-ZN-09S                  | 593.84                                    | 9.99   | 583.85                                      |
| Lake Michigan (average)    | 577.97                                    | --   | --  |
| <i>Sample<br/>Location</i> | <i>Reference<br/>Elevation<br/>(NGVD)</i> | <i>July 27, 2006</i>                               |   |
|                            |   | <i>Depth to Water<br/>(ft Below<br/>Reference)</i> | <i>Groundwater<br/>Elevation<br/>(NGVD)</i> |
| MW-ZN-01S                  | 594.10                                    | 14.80  | 579.30                                      |
| MW-ZN-02S                  | 593.78                                    | 13.78  | 580.00                                      |
| MW-ZN-03S                  | 594.02                                    | 13.37  | 580.65                                      |
| MW-ZN-04S                  | 593.82                                    | 13.23  | 580.59                                      |
| MW-ZN-05S                  | 588.64                                    | 8.01   | 580.63                                      |
| MW-ZN-06S                  | 592.66                                    | 9.47   | 583.19                                      |
| MW-ZN-07S                  | 589.82                                    | 6.47   | 583.35                                      |
| MW-ZN-08S                  | 588.73                                    | 9.30   | 579.43                                      |
| MW-ZN-09S                  | 593.84                                    | 11.13  | 582.71                                      |
| MW-ZN-10S                  | 593.67                                    | 13.72  | 579.95                                      |
| MW-ZN-11S                  | 589.47                                    | 10.65  | 578.82                                      |
| TW-ZN-100                  | 590.01                                    | 10.62  | 579.39                                      |
| TW-ZN-101                  | 588.68                                    | 10.27  | 578.41                                      |
| TW-ZN-102                  | 588.58                                    | 10.33  | 578.25                                      |
| TW-ZN-103                  | 587.49                                    | 9.03   | 578.46                                      |
| Lake Michigan (average)    | 577.93                                    | --   | --  |

Notes:

NGVD - National Geodetic Vertical datum

TABLE 4.4

**SAMPLE KEY  
FLEETWIDE ASSESSMENT  
ZION STATION  
ZION, ILLINOIS**

| <i>Sample Location</i> <sup>(1)</sup> | <i>Sample Identification</i>  | <i>QC Sample</i> | <i>Date</i> | <i>Matrix</i> | <i>Analyses</i>                |
|---------------------------------------|-------------------------------|------------------|-------------|---------------|--------------------------------|
| MW-ZN-08S(L)                          | WG-Zion-MW-8L-052406-MS-001   |                  | 5/24/06     | Groundwater   | Tritium / Target Radionuclides |
| MW-ZN-04S(U)                          | WG-Zion-MW-4U-052406-MB-002   |                  | 5/24/06     | Groundwater   | Tritium / Target Radionuclides |
| MW-ZN-08S(U)                          | WG-Zion-MW-8U-052406-MS-003   |                  | 5/24/06     | Groundwater   | Tritium / Target Radionuclides |
| MW-ZN-04S(L)                          | WG-Zion-MW-4L-052406-MB-004   |                  | 5/24/06     | Groundwater   | Tritium / Target Radionuclides |
| MW-ZN-07S(U)                          | WG-Zion-MW-7U-052406-MS-005   |                  | 5/24/06     | Groundwater   | Tritium / Target Radionuclides |
| MW-ZN-07S(L)                          | WG-Zion-MW-7L-052506-MS-007   |                  | 5/25/06     | Groundwater   | Tritium / Target Radionuclides |
| MW-ZN-06S(L)                          | WG-Zion-MW-6L-052506-MS-009   |                  | 5/25/06     | Groundwater   | Tritium / Target Radionuclides |
| MW-ZN-03S(U)                          | WG-ZN-MW-ZN-03U-052506-DS-01  |                  | 5/25/06     | Groundwater   | Tritium / Target Radionuclides |
| MW-ZN-03S(U)                          | WG-ZN-MW-ZN-03U-052506-DS-02  | Duplicate (01)   | 5/25/06     | Groundwater   | Tritium / Target Radionuclides |
| MW-ZN-03S(L)                          | WG-ZN-MW-ZN-03L-052506-DS-03  |                  | 5/25/06     | Groundwater   | Tritium / Target Radionuclides |
| MW-ZN-02S(U)                          | WG-ZN-MW-ZN-02U-052606-DS-04  |                  | 5/26/06     | Groundwater   | Tritium / Target Radionuclides |
| MW-ZN-01S(U)                          | WG-ZN-MW-ZN-01U-052606-DS-05  |                  | 5/26/06     | Groundwater   | Tritium / Target Radionuclides |
| MW-ZN-02S(L)                          | WG-ZN-MW-ZN-02L-052606-DS-06  |                  | 5/26/06     | Groundwater   | Tritium / Target Radionuclides |
| MW-ZN-01S(L)                          | WG-ZN-MW-ZN-01L-052606-DS-07  |                  | 5/26/06     | Groundwater   | Tritium / Target Radionuclides |
| MW-ZN-09S                             | WG-ZN-MW-ZN-09-052606-DS-08   |                  | 5/26/06     | Groundwater   | Tritium / Target Radionuclides |
| MW-ZN-09S                             | WG-ZN-MW-ZN-09-052606-DS-09   | Duplicate (08)   | 5/26/06     | Groundwater   | Tritium / Target Radionuclides |
| MW-ZN-06S(U)                          | WG-Zion-MW-6U-052606-MS-011   |                  | 5/26/06     | Groundwater   | Tritium / Target Radionuclides |
| MW-ZN-05S(L)                          | WG-Zion-MW-5L-052606-MS-013   |                  | 5/26/06     | Groundwater   | Tritium / Target Radionuclides |
| SW-ZN-1                               | WS-Zion-Lake-052606-MS-015    |                  | 5/26/06     | Surface Water | Tritium / Target Radionuclides |
| MW-ZN-05S(U)                          | WG-Zion-MW-5U-052606-MS-017   |                  | 5/26/06     | Groundwater   | Tritium / Target Radionuclides |
| MW-ZN-10S(L)                          | WG-ZN-MW-ZN-10L-072806-MS-005 |                  | 7/28/2006   | Groundwater   | Tritium / Target Radionuclides |
| MW-ZN-10S(U)                          | WG-ZN-MW-ZN-10U-072806-MS-003 |                  | 7/28/2006   | Groundwater   | Tritium / Target Radionuclides |
| MW-ZN-10S(U)                          | WG-ZN-MW-ZN-10U-072806-MS-004 |                  | 7/28/2006   | Groundwater   | Tritium / Target Radionuclides |
| MW-ZN-11S(L)                          | WG-ZN-MW-ZN-11L-072806-TL-002 |                  | 7/28/2006   | Groundwater   | Tritium / Target Radionuclides |
| MW-ZN-11S(U)                          | WG-ZN-MW-ZN-11U-072806-TL-001 |                  | 7/28/2006   | Groundwater   | Tritium / Target Radionuclides |
| TW-ZN-100                             | GW-071706-JL-TW-ZN-100        |                  | 7/17/2006   | Groundwater   | Tritium / Target Radionuclides |



TABLE 4.4

**SAMPLE KEY  
FLEETWIDE ASSESSMENT  
ZION STATION  
ZION, ILLINOIS**

| <i>Sample Location</i> <sup>(1)</sup> | <i>Sample Identification</i> | <i>QC Sample</i> | <i>Date</i> | <i>Matrix</i> | <i>Analyses</i>                |
|---------------------------------------|------------------------------|------------------|-------------|---------------|--------------------------------|
| TW-ZN-101                             | GW-071706-JL-TW-ZN-101       |                  | 7/17/2006   | Groundwater   | Tritium / Target Radionuclides |
| TW-ZN-102                             | GW-071706-JL-TW-ZN-102       |                  | 7/17/2006   | Groundwater   | Tritium / Target Radionuclides |
| TW-ZN-103                             | GW-071706-JL-TW-ZN-103       |                  | 7/17/2006   | Groundwater   | Tritium / Target Radionuclides |

Notes:

QC - Quality Control

Target Radionuclides: Sr-89/90, Mn-54, Co-58, Fe-59, Co-60, Zn-65, Nb-95, Zr-95, Cs-134, Cs-137, Ba-140, and La-140

Duplicate (08) - Duplicate of sample number in parenthesis

**TABLE 4.5**  
**SUMMARY OF MONITORING WELL PURGING PARAMETERS**  
**FLEETWIDE ASSESSMENT**  
**ZION STATION**  
**ZION, ILLINOIS**

| <i>Sample Location</i> <sup>1</sup> | <i>Date</i> | <i>Minutes Purged</i> | <i>Water Level</i> | <i>Flow Rate (mL/min)</i> | <i>pH (Std. Units)</i> | <i>Conductivity (µS/cm)</i> <sup>2</sup> | <i>Temperature (°C)</i> | <i>Turbidity (ntu)</i> <sup>3</sup> | <i>DO (mg/L)</i> | <i>ORP</i> | <i>Pump Type</i> |
|-------------------------------------|-------------|-----------------------|--------------------|---------------------------|------------------------|--|-------------------------|-------------------------------------|------------------|------------|------------------|
| MW-ZN-01S(U)                        | 5/26/2006   | 5                     | 14.67              | 200                       | 6.33                   | 822                                      | 15.01                   | NM                                  | 0.71             | 333.10     | Peristaltic      |
|                                     |             | 10                    | 14.67              | 200                       | 6.62                   | 812                                      | 14.45                   | 5.38                                | 0.54             | 114.3      |                  |
|                                     |             | 15                    | 14.67              | 200                       | 7.03                   | 810                                      | 14.42                   | 5.36                                | 0.46             | -11.2      |                  |
|                                     |             | 20                    | 14.67              | 200                       | 7.08                   | 822                                      | 14.81                   | 5.13                                | 0.55             | -100.0     |                  |
|                                     |             | 25                    | 14.67              | 200                       | 7.07                   | 821                                      | 14.85                   | 5.44                                | 0.53             | -101.6     |                  |
|                                     |             | 30                    | 14.67              | 200                       | 7.12                   | 814                                      | 14.78                   | 5.36                                | 0.51             | -104.4     |                  |
| MW-ZN-01S(U)                        | 6/28/2006   | 5                     | 14.57              | 305                       | 7.53                   | 877                                      | 15.61                   | 4.51                                | 0.71             | NM         | Peristaltic      |
|                                     |             | 10                    | 14.57              | 305                       | 7.54                   | 889                                      | 15.56                   | 4.25                                | 0.60             | NM         |                  |
|                                     |             | 15                    | 14.57              | 305                       | 7.56                   | 896                                      | 15.58                   | 3.80                                | 0.50             | NM         |                  |
|                                     |             | 20                    | 14.57              | 305                       | 7.58                   | 901                                      | 15.65                   | 3.81                                | 0.47             | NM         |                  |
|                                     |             | 25                    | 14.57              | 305                       | 7.60                   | 905                                      | 15.59                   | 4.23                                | 0.44             | NM         |                  |
|                                     |             | 30                    | 14.58              | 305                       | 7.59                   | 908                                      | 15.55                   | 4.45                                | 0.41             | NM         |                  |
|                                     |             | 35                    | 14.57              | 305                       | 7.59                   | 910                                      | 15.55                   | 4.65                                | 0.36             | NM         |                  |
|                                     |             | 40                    | 14.58              | 305                       | 7.60                   | 910                                      | 15.65                   | 11.45                               | 0.39             | NM         |                  |
|                                     |             | 45                    | 14.58              | 305                       | 7.60                   | 910                                      | 15.54                   | 11.67                               | 0.38             | NM         |                  |
|                                     |             | 50                    | 14.58              | 305                       | 7.61                   | 912                                      | 15.66                   | 11.83                               | 0.39             | NM         |                  |
|                                     |             | 55                    | 14.59              | 305                       | 7.63                   | 911                                      | 15.67                   | 12.03                               | 0.39             | NM         |                  |
| MW-ZN-01S(L)                        | 5/26/2006   | 5                     | 14.65              | 310                       | 6.92                   | 847                                      | 14.71                   | 3.01                                | 0.46             | -81.0      | Peristaltic      |
|                                     |             | 10                    | 14.65              | 310                       | 6.98                   | 843                                      | 14.64                   | 1.67                                | 0.42             | -85.1      |                  |
|                                     |             | 15                    | 14.65              | 310                       | 7.00                   | 841                                      | 14.62                   | 0.36                                | 0.43             | -88.1      |                  |
| MW-ZN-01S(L)                        | 6/28/2006   | 5                     | 14.57              | 310                       | 7.46                   | 1550                                     | 15.94                   | 48.0                                | 0.59             | NM         | Peristaltic      |
|                                     |             | 10                    | 14.58              | 310                       | 7.45                   | 1490                                     | 15.90                   | 32.1                                | 0.49             | NM         |                  |
|                                     |             | 15                    | 14.57              | 310                       | 7.48                   | 1239                                     | 15.67                   | 16.1                                | 0.41             | NM         |                  |
|                                     |             | 20                    | 14.58              | 310                       | 7.53                   | 1152                                     | 15.57                   | 9.90                                | 0.39             | NM         |                  |
|                                     |             | 25                    | 14.57              | 310                       | 7.54                   | 1096                                     | 15.76                   | 8.00                                | 0.35             | NM         |                  |
|                                     |             | 30                    | 14.56              | 310                       | 7.54                   | 1065                                     | 15.81                   | 5.61                                | 0.33             | NM         |                  |
|                                     |             | 35                    | 14.56              | 310                       | 7.54                   | 1036                                     | 15.64                   | 4.63                                | 0.33             | NM         |                  |
|                                     |             | 40                    | 14.57              | 310                       | 7.54                   | 1032                                     | 15.7                    | 4.52                                | 0.31             | NM         |                  |
|                                     |             | 45                    | 14.56              | 310                       | 7.54                   | 1030                                     | 15.75                   | 2.31                                | 0.31             | NM         |                  |
|                                     |             | 50                    | 14.56              | 310                       | 7.55                   | 1028                                     | 15.76                   | 1.78                                | 0.30             | NM         |                  |
|                                     |             | 55                    | 14.56              | 310                       | 7.54                   | 1028                                     | 15.89                   | 1.71                                | 0.30             | NM         |                  |

TABLE 4.5

**SUMMARY OF MONITORING WELL PURGING PARAMETERS  
FLEETWIDE ASSESSMENT  
ZION STATION  
ZION, ILLINOIS**

| <i>Sample Location</i> <sup>1</sup> | <i>Date</i> | <i>Minutes Purged</i> | <i>Water Level</i> | <i>Flow Rate (mL/min)</i> | <i>pH (Std. Units)</i> | <i>Conductivity (µS/cm)</i> <sup>2</sup> | <i>Temperature (°C)</i> | <i>Turbidity (ntu)</i> <sup>3</sup> | <i>DO (mg/L)</i> | <i>ORP</i> | <i>Pump Type</i> |
|-------------------------------------|-------------|-----------------------|--------------------|---------------------------|------------------------|--|-------------------------|-------------------------------------|------------------|------------|------------------|
| MW-ZN-02S(U)                        | 5/26/2006   | 5                     | 13.89              | 250                       | 7.36                   | 585                                      | 10.43                   | NM                                  | 7.3              | 264.5      | Peristaltic      |
|                                     |             | 10                    | 13.89              | 250                       | 7.40                   | 582                                      | 10.55                   | NM                                  | 5.6              | 223.4      |                  |
|                                     |             | 15                    | 13.89              | 250                       | 7.10                   | 583                                      | 10.87                   | NM                                  | 0.54             | 240.9      |                  |
|                                     |             | 20                    | 13.89              | 250                       | 6.68                   | 585                                      | 10.96                   | 5.43                                | 0.45             | 369.8      |                  |
|                                     |             | 25                    | 13.89              | 250                       | 6.39                   | 587                                      | 10.99                   | NM                                  | 0.43             | 437.8      |                  |
|                                     |             | 30                    | 13.89              | 250                       | 6.21                   | 585                                      | 10.92                   | NM                                  | 0.42             | 477.7      |                  |
|                                     |             | 35                    | 13.89              | 250                       | 6.36                   | 583                                      | 10.93                   | NM                                  | 0.39             | 491.1      |                  |
|                                     |             | 40                    | 13.89              | 250                       | 5.89                   | 585                                      | 11.12                   | 5.52                                | 0.4              | 537.1      |                  |
|                                     |             | 45                    | 13.89              | 250                       | 5.82                   | 585                                      | 11.11                   | 5.28                                | 0.4              | 541.3      |                  |
|                                     |             | 50                    | 13.89              | 250                       | 5.72                   | 585                                      | 11.05                   | 6.03                                | 0.39             | 545.4      |                  |
| MW-ZN-02S(L)                        | 5/26/2006   | 5                     | 13.61              | 220                       | 6.57                   | 596                                      | 11.24                   | NM                                  | 0.78             | 400.1      | Peristaltic      |
|                                     |             | 10                    | 13.61              | 220                       | 6.51                   | 598                                      | 11.42                   | NM                                  | 0.74             | 402.2      |                  |
|                                     |             | 15                    | 13.61              | 220                       | 6.27                   | 600                                      | 11.51                   | NM                                  | 0.71             | 427.1      |                  |
|                                     |             | 20                    | 13.61              | 220                       | 5.95                   | 601                                      | 11.60                   | 4.99                                | 0.67             | 461.7      |                  |
|                                     |             | 25                    | 13.61              | 220                       | 5.84                   | 601                                      | 11.63                   | 7.73                                | 0.65             | 484.5      |                  |
|                                     |             | 30                    | 13.61              | 220                       | 6.47                   | 597                                      | 11.39                   | 0.00                                | 0.59             | 467.5      |                  |
|                                     |             | 35                    | 13.61              | 220                       | 6.69                   | 594                                      | 11.23                   | 2.19                                | 0.57             | 439.7      |                  |
|                                     |             | 40                    | 13.61              | 220                       | 6.69                   | 599                                      | 11.33                   | 0.00                                | 0.57             | 412.6      |                  |
|                                     |             | 45                    | 13.61              | 220                       | 6.67                   | 599                                      | 11.32                   | 0.00                                | 0.56             | 413.0      |                  |

TABLE 4.5

**SUMMARY OF MONITORING WELL PURGING PARAMETERS  
FLEETWIDE ASSESSMENT  
ZION STATION  
ZION, ILLINOIS**

| <i>Sample Location</i> <sup>1</sup> | <i>Date</i> | <i>Minutes Purged</i> | <i>Water Level</i> | <i>Flow Rate (mL/min)</i> | <i>pH (Std. Units)</i> | <i>Conductivity (µS/cm)</i> <sup>2</sup> | <i>Temperature (°C)</i> | <i>Turbidity (ntu)</i> <sup>3</sup> | <i>DO (mg/L)</i> | <i>ORP</i> | <i>Pump Type</i> |
|-------------------------------------|-------------|-----------------------|--------------------|---------------------------|------------------------|--|-------------------------|-------------------------------------|------------------|------------|------------------|
| MW-ZN-03S(U)                        | 5/25/2006   | 5                     | 13.55              | 280                       | 6.94                   | 740                                      | 10.56                   | 28.1                                | 5.91             | 222.9      | Peristaltic      |
|                                     |             | 10                    | 13.55              | 280                       | 6.34                   | 749                                      | 10.37                   | 0.20                                | 1.99             | 400.6      |                  |
|                                     |             | 15                    | 13.55              | 280                       | 6.10                   | 745                                      | 10.50                   | 0.26                                | 2.18             | 467.4      |                  |
|                                     |             | 20                    | 13.55              | 280                       | 5.96                   | 741                                      | 10.39                   | 0.0                                 | 1.99             | 506.1      |                  |
|                                     |             | 25                    | 13.55              | 280                       | 5.83                   | 738                                      | 10.45                   | 0.78                                | 1.85             | 579.3      |                  |
|                                     |             | 30                    | 13.55              | 280                       | 5.79                   | 738                                      | 10.47                   | 1.24                                | 1.87             | 527.4      |                  |
|                                     |             | 35                    | 13.55              | 280                       | 5.74                   | 738                                      | 10.55                   | 1.51                                | 1.86             | 536.0      |                  |
|                                     |             | 40                    | 13.55              | 280                       | 5.72                   | 740                                      | 10.61                   | 1.93                                | 1.81             | 540.2      |                  |
|                                     |             | 45                    | 13.55              | 290                       | 5.46                   | 744                                      | 10.57                   | 1.50                                | 0.55             | 571.4      |                  |
|                                     |             | 50                    | 13.55              | 290                       | 5.58                   | 741                                      | 10.48                   | 1.17                                | 0.48             | 569.4      |                  |
|                                     |             | 55                    | 13.55              | 290                       | 5.51                   | 738                                      | 10.48                   | 1.62                                | 0.48             | 571.7      |                  |
| MW-ZN-03S(L)                        | 5/25/2006   | 5                     | 13.45              | 370                       | 5.77                   | 733                                      | 10.72                   | 349                                 | 0.37             | 613.7      | Peristaltic      |
|                                     |             | 10                    | 13.45              | 370                       | 5.75                   | 737                                      | 10.72                   | 321                                 | 0.37             | 617.7      |                  |
|                                     |             | 15                    | 13.45              | 370                       | 5.93                   | 730                                      | 10.55                   | 250                                 | 0.36             | 610.2      |                  |
|                                     |             | 20                    | 13.45              | 370                       | 5.67                   | 750                                      | 10.63                   | 50.6                                | 0.37             | 630.7      |                  |
|                                     |             | 25                    | 13.45              | 370                       | 5.89                   | 759                                      | 10.71                   | 26.7                                | 0.35             | 621.6      |                  |
|                                     |             | 30                    | 13.45              | 370                       | 5.79                   | 762                                      | 10.56                   | 11.1                                | 0.33             | 632.8      |                  |
|                                     |             | 35                    | 13.45              | 370                       | 5.82                   | 766                                      | 10.75                   | 7.42                                | 0.33             | 631.2      |                  |
|                                     |             | 40                    | 13.45              | 370                       | 5.73                   | 769                                      | 10.64                   | 7.99                                | 0.33             | 636.8      |                  |
|                                     |             | 45                    | 13.45              | 370                       | 5.79                   | 764                                      | 10.60                   | 7.88                                | 0.32             | 635.9      |                  |
|                                     |             | 50                    | 13.45              | 370                       | 5.80                   | 766                                      | 10.55                   | 8.07                                | 0.31             | 636.0      |                  |
| MW-ZN-04S(U)                        | 5/24/2006   | 5                     | NM                 | NM                        | 6.60                   | 812                                      | 12.9                    | 40.60                               | NM               | NM         | Peristaltic      |
|                                     |             | 10                    | NM                 | NM                        | 7.04                   | 689                                      | 13.0                    | 29.60                               | NM               | NM         |                  |
|                                     |             | 15                    | NM                 | NM                        | 7.15                   | 670                                      | 12.9                    | 23.60                               | NM               | NM         |                  |
|                                     |             | 20                    | NM                 | NM                        | 7.20                   | 643                                      | 13.1                    | 21.30                               | NM               | NM         |                  |
|                                     |             | 25                    | NM                 | NM                        | 7.26                   | 642                                      | 13.0                    | 21.5                                | NM               | NM         |                  |
|                                     |             | 30                    | NM                 | NM                        | 7.27                   | 640                                      | 12.8                    | 19.3                                | NM               | NM         |                  |

TABLE 4.5

SUMMARY OF MONITORING WELL PURGING PARAMETERS  
 FLEETWIDE ASSESSMENT  
 ZION STATION  
 ZION, ILLINOIS

| Sample Location <sup>1</sup> | Date      | Minutes Purged | Water Level | Flow Rate (mL/min) | pH (Std. Units) | Conductivity (µS/cm) <sup>2</sup> | Temperature (°C) | Turbidity (ntu) <sup>3</sup> | DO (mg/L) | ORP  | Pump Type   |
|------------------------------|-----------|----------------|-------------|--------------------|-----------------|-----------------------------------|------------------|------------------------------|-----------|------|-------------|
| MW-ZN-04S(L)                 | 5/24/2006 | 5              | NM          | NM                 | 7.14            | 769                               | 14.5             | > 1000                       | NM        | NM   |             |
|                              |           | 10             | NM          | NM                 | 7.11            | 774                               | 14.2             | > 1000                       | NM        | NM   |             |
|                              |           | 15             | NM          | NM                 | 7.10            | 789                               | 13.6             | > 1000                       | NM        | NM   |             |
|                              |           | 20             | NM          | NM                 | 7.13            | 785                               | 13.8             | > 1000                       | NM        | NM   |             |
|                              |           | 25             | NM          | NM                 | 7.16            | 781                               | 13.8             | > 1000                       | NM        | NM   |             |
|                              |           | 30             | NM          | NM                 | 7.17            | 787                               | 13.4             | > 1000                       | NM        | NM   |             |
|                              |           | 35             | NM          | NM                 | 7.14            | 774                               | 13.0             | 979                          | NM        | NM   |             |
|                              |           | 40             | NM          | NM                 | 7.13            | 780                               | 12.8             | 980                          | NM        | NM   |             |
| MW-ZN-05S(L)                 | 5/26/2006 | 5              | NM          | 175                | 9.08            | 902                               | 12.99            | 900                          | 4.21      | 41.2 | Peristaltic |
|                              |           | 10             | NM          | 175                | 9.38            | 902                               | 13.07            | 750                          | 1.36      | 39.1 |             |
|                              |           | 15             | NM          | 175                | 9.75            | 903                               | 13.15            | 650                          | 1.01      | 35.0 |             |
|                              |           | 20             | NM          | 175                | 9.97            | 902                               | 13.09            | 500                          | 0.84      | 31.9 |             |
|                              |           | 25             | NM          | 175                | 10.11           | 899                               | 13.23            | 400                          | 0.75      | 28.3 |             |
|                              |           | 30             | NM          | 175                | 10.22           | 899                               | 13.47            | 350                          | 0.72      | 26.3 |             |
|                              |           | 35             | NM          | 175                | 10.35           | 899                               | 13.67            | 280                          | 0.66      | 22.2 |             |
|                              |           | 40             | NM          | 175                | 10.39           | 898                               | 13.68            | 240                          | 0.70      | 19.1 |             |
|                              |           | 45             | NM          | 175                | 10.37           | 897                               | 13.83            | 190                          | 0.62      | 16.9 |             |
|                              |           | 50             | NM          | 175                | 10.35           | 896                               | 13.77            | 170                          | 0.61      | 15.2 |             |
|                              |           | 55             | NM          | 175                | 10.34           | 894                               | 13.54            | 140                          | 0.58      | 13.3 |             |
|                              |           | 60             | NM          | 175                | 10.34           | 893                               | 13.36            | 130                          | 0.56      | 11.2 |             |
|                              |           | 65             | NM          | 175                | 10.31           | 893                               | 13.78            | 110                          | 0.54      | 10.6 |             |
|                              |           | 70             | NM          | 175                | 10.33           | 894                               | 13.91            | 90                           | 0.53      | 3.0  |             |
|                              |           | 75             | NM          | 175                | 10.33           | 892                               | 13.66            | 75                           | 0.53      | 3.4  |             |
|                              |           | 80             | NM          | 175                | 10.26           | 893                               | 13.82            | 70                           | 0.51      | 4.5  |             |
|                              |           | 85             | NM          | 175                | 10.27           | 892                               | 13.53            | 60                           | 0.50      | 0.1  |             |
|                              |           | 90             | NM          | 175                | 10.16           | 890                               | 13.92            | 55                           | 0.74      | 1.7  |             |
| 95                           | NM        | 175            | 10.15       | 893                | 14.03           | 55                                | 0.62             | 1.6                          |           |      |             |
| 100                          | NM        | 175            | 10.15       | 893                | 14.13           | 45                                | 0.56             | 2.6                          |           |      |             |
| 105                          | NM        | 175            | 10.18       | 893                | 14.13           | 40                                | 0.54             | 3.1                          |           |      |             |
| 110                          | NM        | 175            | 10.20       | 893                | 14.15           | 36                                | 0.53             | 4.4                          |           |      |             |
| 115                          | NM        | 175            | 10.23       | 895                | 14.11           | 36                                | 0.53             | 6.3                          |           |      |             |

TABLE 4.5

SUMMARY OF MONITORING WELL PURGING PARAMETERS  
 FLEETWIDE ASSESSMENT  
 ZION STATION  
 ZION, ILLINOIS

| Sample Location <sup>1</sup> | Date      | Minutes Purged | Water Level | Flow Rate (mL/min) | pH (Std. Units) | Conductivity (µS/cm) <sup>2</sup> | Temperature (°C) | Turbidity (ntu) <sup>3</sup> | DO (mg/L) | ORP   | Pump Type   |
|------------------------------|-----------|----------------|-------------|--------------------|-----------------|-----------------------------------|------------------|------------------------------|-----------|-------|-------------|
| MW-ZN-05S(U)                 | 5/26/2006 | 15             | NM          | 175                | 9.40            | 924                               | 12.71            | 32                           | 1.34      | 81.6  | Peristaltic |
|                              |           | 20             | NM          | 175                | 9.49            | 906                               | 12.83            | 140                          | 1.0       | 67.5  |             |
|                              |           | 25             | NM          | 175                | 9.53            | 901                               | 13.23            | 250                          | 0.85      | 52.6  |             |
|                              |           | 30             | NM          | 175                | 9.58            | 897                               | 13.44            | 230                          | 0.76      | 42.9  |             |
|                              |           | 35             | NM          | 175                | 9.63            | 896                               | 13.58            | 190                          | 0.70      | 28.7  |             |
|                              |           | 40             | NM          | 175                | 9.66            | 901                               | 13.45            | 170                          | 0.68      | 23.6  |             |
|                              |           | 45             | NM          | 175                | 9.69            | 901                               | 13.61            | 130                          | 0.63      | 17.1  |             |
|                              |           | 50             | NM          | 175                | 9.72            | 901                               | 13.49            | 120                          | 0.62      | 9.4   |             |
|                              |           | 55             | NM          | 175                | 9.75            | 900                               | 13.78            | 85                           | 0.56      | 8.0   |             |
|                              |           | 60             | NM          | 175                | 9.86            | 900                               | 13.29            | 65                           | 0.53      | 1.8   |             |
|                              |           | 65             | NM          | 175                | 9.84            | 901                               | 13.22            | 60                           | NA        | NA    |             |
|                              |           | 70             | NM          | 175                | 9.90            | 899                               | 13.09            | 55                           | 0.81      | 3.0   |             |
|                              |           | 75             | NM          | 175                | 9.95            | 898                               | 13.24            | 55                           | 0.60      | 1.2   |             |
|                              |           | 80             | NM          | 175                | 10.00           | 897                               | 13.16            | 45                           | 0.56      | -4.3  |             |
|                              |           | 85             | NM          | 175                | 10.06           | 896                               | 13.13            | 45                           | 0.52      | -6.8  |             |
|                              |           | 90             | NM          | 175                | 10.04           | 896                               | 13.15            | 39                           | 0.51      | -10.8 |             |
| 95                           | NM        | 175            | 10.23       | 897                | 13.22           | 40                                | 0.50             | -12.7                        |           |       |             |
| 100                          | NM        | 175            | 10.37       | 899                | 13.18           | 30                                | 0.51             | -12.6                        |           |       |             |
| 105                          | NM        | 175            | 10.42       | 894                | 13.33           | 30                                | 0.49             | -14.9                        |           |       |             |
| MW-ZN-06S(L)                 | 5/25/2006 | 5              | NM          | 175                | 7.11            | 1073                              | 12.51            | 180                          | 2.20      | 99.6  | Peristaltic |
|                              |           | 10             | NM          | 175                | 6.95            | 955                               | 12.04            | 130                          | 1.42      | 105.3 |             |
|                              |           | 15             | NM          | 175                | 6.61            | 876                               | 11.82            | 90                           | 1.25      | 114.8 |             |
|                              |           | 20             | NM          | 175                | 6.46            | 864                               | 11.75            | 13                           | 1.03      | 105.8 |             |
|                              |           | 25             | NM          | 175                | 6.44            | 869                               | 11.84            | 180                          | 0.94      | 96.8  |             |
|                              |           | 30             | NM          | 175                | 6.16            | 871                               | 11.92            | 130                          | 0.84      | 91.6  |             |
|                              |           | 35             | NM          | 175                | 6.24            | 870                               | 11.76            | 90                           | 0.79      | 82.9  |             |
|                              |           | 40             | NM          | 175                | 6.05            | 867                               | 11.56            | 39                           | 0.76      | 82.9  |             |
|                              |           | 45             | NM          | 175                | 6.04            | 865                               | 11.67            | 7.4                          | 0.73      | 78.5  |             |
|                              |           | 50             | NM          | 175                | 5.98            | 868                               | 11.83            | 22                           | 0.70      | 69.5  |             |
|                              |           | 55             | NM          | 175                | 5.83            | 868                               | 11.86            | 29                           | 0.73      | 66.6  |             |
|                              |           | 60             | NM          | 175                | 6.08            | 868                               | 11.90            | 21                           | 0.69      | 59.5  |             |

TABLE 4.5

SUMMARY OF MONITORING WELL PURGING PARAMATERS  
FLEETWIDE ASSESSMENT  
ZION STATION  
ZION, ILLINOIS

| Sample Location <sup>1</sup> | Date      | Minutes Purged | Water Level | Flow Rate (mL/min) | pH (Std. Units) | Conductivity (µS/cm) <sup>2</sup> | Temperature (°C) | Turbidity (ntu) <sup>3</sup> | DO (mg/L) | ORP   | Pump Type   |
|------------------------------|-----------|----------------|-------------|--------------------|-----------------|-----------------------------------|------------------|------------------------------|-----------|-------|-------------|
| MW-ZN-06S(U)                 | 5/25/2006 | 5              | NM          | 200                | 9.12            | 839                               | 11.42            | NA                           | 1.62      | 84.1  | Peristaltic |
|                              |           | 10             | NM          | 200                | 9.19            | 835                               | 11.13            | NA                           | 1.14      | 81.2  |             |
|                              |           | 15             | NM          | 200                | 9.15            | 837                               | 11.15            | NA                           | 1.17      | 78.4  |             |
|                              |           | 20             | NM          | 200                | 9.24            | 836                               | 11.20            | 1100                         | 0.97      | 67.9  |             |
|                              |           | 25             | NM          | 200                | 9.25            | 835                               | 11.32            | 850                          | 0.86      | 54.3  |             |
|                              |           | 30             | NM          | 200                | 9.30            | 836                               | 11.33            | 650                          | 0.80      | 41.6  |             |
|                              |           | 35             | NM          | 200                | 9.34            | 835                               | 11.23            | 600                          | 0.75      | 35.6  |             |
|                              |           | 40             | NM          | 200                | 9.36            | 833                               | 11.15            | 550                          | 1.12      | 30.3  |             |
|                              |           | 45             | NM          | 200                | 9.50            | 831                               | 11.25            | 550                          | 0.84      | 26.8  |             |
|                              |           | 50             | NM          | 200                | 9.41            | 831                               | 10.99            | 450                          | 0.76      | 25.4  |             |
|                              |           | 55             | NM          | 200                | 9.38            | 828                               | 11.04            | 450                          | 0.72      | 24.1  |             |
|                              |           | 60             | NM          | 200                | 9.38            | 828                               | 11.06            | 450                          | 0.68      | 22.9  |             |
|                              |           | 65             | NM          | 200                | 9.41            | 827                               | 10.97            | 390                          | 0.67      | 22.4  |             |
|                              |           | 70             | NM          | 200                | 9.53            | 823                               | 11.09            | 340                          | 0.63      | 21.1  |             |
|                              |           | 75             | NM          | 200                | 9.66            | 822                               | 11.02            | 300                          | 0.61      | 17.6  |             |
|                              |           | 80             | NM          | 200                | 9.52            | 823                               | 11.09            | 240                          | 0.61      | 15.7  |             |
|                              |           | 85             | NM          | 200                | 9.39            | 821                               | 11.13            | 170                          | 0.59      | 15.8  |             |
| 90                           | NM        | 200            | 9.38        | 819                | 11.20           | 160                               | 0.56             | 14.5                         |           |       |             |
| 95                           | NM        | 200            | 9.08        | 820                | 11.02           | 140                               | 0.60             | 16.2                         |           |       |             |
| 100                          | NM        | 200            | 9.39        | 820                | 10.82           | 110                               | 0.71             | 15.3                         |           |       |             |
| 105                          | NM        | 200            | 9.42        | 819                | 10.87           | 95                                | 0.65             | 16.4                         |           |       |             |
| 110                          | NM        | 200            | 9.44        | 818                | 10.93           | 95                                | 0.61             | 17.1                         |           |       |             |
| 115                          | NM        | 200            | 9.47        | 820                | 10.69           | 90                                | 0.58             | 18.1                         |           |       |             |
| MW-ZN-06S(U)                 | 5/26/2006 | 5              | NM          | 175                | 8.47            | 816                               | 10.05            | 40                           | 2.79      | 123.5 | Peristaltic |
|                              |           | 10             | NM          | 175                | 8.58            | 814                               | 9.71             | 26                           | 1.99      | 121.4 |             |
|                              |           | 15             | NM          | 175                | 8.58            | 816                               | 9.73             | 28                           | 1.56      | 125.9 |             |
|                              |           | 20             | NM          | 175                | 8.51            | 820                               | 9.66             | 27                           | 1.26      | 131.1 |             |
|                              |           | 25             | NM          | 175                | 8.53            | 820                               | 9.78             | 65                           | 1.11      | 127.4 |             |
|                              |           | 30             | NM          | 175                | 8.58            | 818                               | 10.04            | 140                          | 1.02      | 120.2 |             |
|                              |           | 35             | NM          | 175                | 8.64            | 817                               | 9.94             | 200                          | 0.93      | 118.3 |             |
|                              |           | 40             | NM          | 175                | 8.66            | 818                               | 9.93             | 190                          | 0.93      | 117.5 |             |
|                              |           | 45             | NM          | 175                | 8.68            | 818                               | 10.00            | 180                          | 0.91      | 116.5 |             |
|                              |           | 50             | NM          | 175                | 8.67            | 817                               | 10.03            | 190                          | 0.86      | 116.2 |             |
|                              |           | 55             | NM          | 175                | 8.68            | 818                               | 10.10            | 170                          | 0.86      | 115.2 |             |
|                              |           | 60             | NM          | 175                | 8.63            | 818                               | 10.15            | 150                          | 0.97      | 114.1 |             |

TABLE 4.5

**SUMMARY OF MONITORING WELL PURGING PARAMETERS  
FLEETWIDE ASSESSMENT  
ZION STATION  
ZION, ILLINOIS**

| <i>Sample Location</i> <sup>1</sup> | <i>Date</i> | <i>Minutes Purged</i> | <i>Water Level</i> | <i>Flow Rate (mL/min)</i> | <i>pH (Std. Units)</i> | <i>Conductivity (µS/cm)</i> <sup>2</sup> | <i>Temperature (°C)</i> | <i>Turbidity (ntu)</i> <sup>3</sup> | <i>DO (mg/L)</i> | <i>ORP</i> | <i>Pump Type</i> |
|-------------------------------------|-------------|-----------------------|--------------------|---------------------------|------------------------|--|-------------------------|-------------------------------------|------------------|------------|------------------|
| MW-ZN-07S(U)                        | 5/24/2006   | 5                     | NM                 | 200                       | 8.37                   | 872.0                                    | 10.40                   | 95                                  | 3.18             | 144.0      | Peristaltic      |
|                                     |             | 10                    | NM                 | 200                       | 8.74                   | 871.0                                    | 9.96                    | 85                                  | 1.49             | 130.4      |                  |
|                                     |             | 15                    | NM                 | 200                       | 8.78                   | 873.0                                    | 9.79                    | 60                                  | 1.22             | 129.6      |                  |
|                                     |             | 20                    | NM                 | 200                       | 8.81                   | 876.0                                    | 9.74                    | 70                                  | 1.10             | 129.0      |                  |
|                                     |             | 25                    | NM                 | 200                       | 8.80                   | 880.0                                    | 9.64                    | 110                                 | 1.04             | 128.2      |                  |
|                                     |             | 30                    | NM                 | 200                       | 8.79                   | 874.0                                    | 9.78                    | 210                                 | 0.91             | 124.7      |                  |
|                                     |             | 35                    | NM                 | 200                       | 8.85                   | 873.0                                    | 10.17                   | 200                                 | 0.93             | 121.4      |                  |
|                                     |             | 40                    | NM                 | 200                       | 9.00                   | 875.0                                    | 10.72                   | 200                                 | 0.78             | 106.8      |                  |
| MW-ZN-07S(L)                        | 5/25/2006   | 5                     | NM                 | 200                       | 7.58                   | 878                                      | 11.34                   | 550                                 | 1.48             | 149.5      | Peristaltic      |
|                                     |             | 10                    | NM                 | 200                       | 7.67                   | 878                                      | 11.35                   | 700                                 | 1.18             | 130.6      |                  |
|                                     |             | 15                    | NM                 | 200                       | 8.05                   | 879                                      | 11.40                   | 750                                 | 1.02             | 121.8      |                  |
|                                     |             | 20                    | NM                 | 200                       | 8.45                   | 881                                      | 11.79                   | 650                                 | 0.96             | 109.5      |                  |
|                                     |             | 25                    | NM                 | 200                       | 8.60                   | 881                                      | 11.93                   | 650                                 | 0.88             | 104.1      |                  |
|                                     |             | 30                    | NM                 | 200                       | 8.70                   | 888                                      | 11.90                   | 250                                 | 0.84             | 102.4      |                  |
|                                     |             | 35                    | NM                 | 200                       | 8.77                   | 900                                      | 11.89                   | 130                                 | 0.79             | 98.2       |                  |
|                                     |             | 40                    | NM                 | 200                       | 8.79                   | 905                                      | 11.85                   | 85                                  | 0.75             | 96.8       |                  |
|                                     |             | 45                    | NM                 | 200                       | 8.84                   | 908                                      | 11.91                   | 55                                  | 0.74             | 95.3       |                  |
|                                     |             | 50                    | NM                 | 200                       | 9.11                   | 907                                      | 12.16                   | 50                                  | 0.70             | 84.4       |                  |
|                                     |             | 55                    | NM                 | 200                       | 8.65                   | 907                                      | 12.05                   | 50                                  | 2.42             | 78.0       |                  |
|                                     |             | 60                    | NM                 | 200                       | 9.36                   | 906                                      | 11.95                   | 40                                  | 1.07             | 69.7       |                  |
|                                     |             | 65                    | NM                 | 200                       | 9.49                   | 906                                      | 11.86                   | 36                                  | 0.84             | 66.1       |                  |
|                                     |             | 70                    | NM                 | 200                       | 9.56                   | 907                                      | 12.27                   | 40                                  | 0.72             | 61.0       |                  |
| 75                                  | NM          | 200                   | 9.67               | 910                       | 12.21                  | 35                                       | 0.70                    | 55.8                                |                  |            |                  |
| MW-ZN-08S(L)                        | 5/24/2006   | 5                     | NM                 | 250                       | 7.23                   | 771                                      | 11.55                   | 4.8                                 | 2.84             | 244.9      | Peristaltic      |
|                                     |             | 10                    | NM                 | 250                       | 7.50                   | 773                                      | 11.15                   | 5.1                                 | 1.57             | 238.2      |                  |
|                                     |             | 15                    | NM                 | 250                       | 7.55                   | 771                                      | 11.13                   | 3.0                                 | 1.42             | 247.8      |                  |
|                                     |             | 20                    | NM                 | 250                       | 7.61                   | 771                                      | 11.16                   | 2.9                                 | 1.24             | 242.1      |                  |
|                                     |             | 25                    | NM                 | 250                       | 7.64                   | 774                                      | 11.29                   | 2.3                                 | 1.20             | 227.9      |                  |
|                                     |             | 30                    | NM                 | 250                       | 7.69                   | 775                                      | 11.38                   | 1.8                                 | 1.06             | 222.9      |                  |
|                                     |             | 35                    | NM                 | 250                       | 7.76                   | 775                                      | 11.55                   | 1.6                                 | 0.96             | 225.7      |                  |
|                                     |             | 40                    | NM                 | 250                       | 7.81                   | 777                                      | 11.63                   | 1.1                                 | 0.91             | 220.9      |                  |
|                                     |             | 45                    | NM                 | 250                       | 7.80                   | 778                                      | 11.70                   | 1.4                                 | 0.86             | 225.4      |                  |



TABLE 4.5

**SUMMARY OF MONITORING WELL PURGING PARAMETERS  
FLEETWIDE ASSESSMENT  
ZION STATION  
ZION, ILLINOIS**

| <i>Sample Location</i> <sup>1</sup> | <i>Date</i> | <i>Minutes Purged</i> | <i>Water Level</i> | <i>Flow Rate (mL/min)</i> | <i>pH (Std. Units)</i> | <i>Conductivity (µS/cm)</i> <sup>2</sup> | <i>Temperature (°C)</i> | <i>Turbidity (ntu)</i> <sup>3</sup> | <i>DO (mg/L)</i> | <i>ORP</i> | <i>Pump Type</i> |
|-------------------------------------|-------------|-----------------------|--------------------|---------------------------|------------------------|--|-------------------------|-------------------------------------|------------------|------------|------------------|
| MW-ZN-08S(U)                        | 5/24/2006   | 5                     | NM                 | 250                       | 7.83                   | 737                                      | 11.65                   | 6.6                                 | 2.17             | 218.7      | Peristaltic      |
|                                     |             | 10                    | NM                 | 250                       | 7.49                   | 744                                      | 11.60                   | 4.1                                 | 1.40             | 221.0      |                  |
|                                     |             | 15                    | NM                 | 250                       | 7.88                   | 755                                      | 11.38                   | 3.3                                 | 1.12             | 214.2      |                  |
|                                     |             | 20                    | NM                 | 250                       | 8.05                   | 759                                      | 11.67                   | 3.0                                 | 0.90             | 214.1      |                  |
|                                     |             | 25                    | NM                 | 250                       | 8.02                   | 762                                      | 12.06                   | 2.4                                 | 0.82             | 217.5      |                  |
|                                     |             | 30                    | NM                 | 250                       | 8.16                   | 774                                      | 11.92                   | 2.9                                 | 0.75             | 208.4      |                  |
|                                     |             | 35                    | NM                 | 250                       | 8.07                   | 775                                      | 11.84                   | 2.7                                 | 0.71             | 213.6      |                  |
| MW-ZN-09S                           | 5/26/2006   | 5                     | 10.73              | 350                       | 8.23                   | 358                                      | 12.32                   | 0.80                                | 2.21             | 366.6      | Peristaltic      |
|                                     |             | 10                    | 10.73              | 350                       | 8.35                   | 357                                      | 12.34                   | 0.56                                | 0.03             | 388.3      |                  |
|                                     |             | 15                    | 10.73              | 350                       | 8.36                   | 357                                      | 12.36                   | 0.52                                | 0.00             | 393.1      |                  |
|                                     |             | 20                    | 10.73              | 350                       | 8.35                   | 358                                      | 12.34                   | 0.54                                | 0.00             | 398.7      |                  |
| MW-ZN-10U                           | 7/28/2006   | 5                     | 13.72              | 200                       | 7.22                   | 0.577                                    | 13.10                   | 10.50                               | 1.68             | -73.9      |                  |
|                                     |             | 10                    | 13.72              | 200                       | 7.16                   | 0.555                                    | 12.85                   | 4.04                                | 0.95             | -78.5      |                  |
|                                     |             | 15                    | 13.72              | 200                       | 7.16                   | 0.543                                    | 12.76                   | 7.11                                | 0.94             | -77.1      |                  |
|                                     |             | 20                    | 13.72              | 200                       | 7.17                   | 0.544                                    | 12.81                   | 13.30                               | 0.86             | -84.4      |                  |
|                                     |             | 25                    | 13.72              | 200                       | 7.18                   | 0.550                                    | 12.91                   | 17.00                               | 0.79             | -85.9      |                  |
|                                     |             | 30                    | 13.72              | 200                       | 7.20                   | 0.553                                    | 13.07                   | 13.10                               | 0.83             | -82.5      |                  |
|                                     |             | 35                    | 13.72              | 200                       | 7.23                   | 0.553                                    | 13.08                   | 11.10                               | 0.84             | -85.5      |                  |
|                                     |             | 40                    | 13.72              | 200                       | 7.26                   | 0.548                                    | 12.93                   | 11.50                               | 1.21             | -88.8      |                  |
|                                     |             | 45                    | 13.72              | 200                       | 7.28                   | 0.549                                    | 12.95                   | 7.55                                | 0.66             | -92.7      |                  |
|                                     |             | 50                    | 13.72              | 200                       | 7.29                   | 0.546                                    | 13.01                   | 7.04                                | 0.46             | -94.1      |                  |
|                                     |             | 55                    | 13.72              | 200                       | 7.29                   | 0.548                                    | 13.15                   | 6.44                                | 0.43             | -93.2      |                  |
|                                     |             | 60                    | 13.72              | 200                       | 7.29                   | 0.551                                    | 13.21                   | 6.34                                | 0.45             | -94.9      |                  |
|                                     |             | 65                    | 13.72              | 200                       | 7.30                   | 0.551                                    | 13.18                   | 4.34                                | 0.48             | -96.1      |                  |
|                                     |             | 70                    | 13.72              | 200                       | 7.29                   | 0.551                                    | 13.19                   | 4.12                                | 0.47             | -96        |                  |

TABLE 4.5

SUMMARY OF MONITORING WELL PURGING PARAMETERS  
FLEETWIDE ASSESSMENT  
ZION STATION  
ZION, ILLINOIS

| Sample Location <sup>1</sup> | Date      | Minutes Purged | Water Level | Flow Rate (mL/min) | pH (Std. Units) | Conductivity (µS/cm) <sup>2</sup> | Temperature (°C) | Turbidity (ntu) <sup>3</sup> | DO (mg/L) | ORP    | Pump Type |
|------------------------------|-----------|----------------|-------------|--------------------|-----------------|-----------------------------------|------------------|------------------------------|-----------|--------|-----------|
| MW-ZN-10L                    | 7/28/2006 | 5              | 13.72       | 200                | 7.51            | 0.660                             | 15.02            | 15.60                        | 4.07      | -112.2 |           |
|                              |           | 10             | 13.72       | 200                | 7.36            | 0.617                             | 14.39            | 7.56                         | 1.91      | -107.3 |           |
|                              |           | 15             | 13.72       | 200                | 7.39            | 0.608                             | 14.38            | 19.10                        | 0.86      | -103.5 |           |
|                              |           | 20             | 13.72       | 200                | 7.36            | 0.607                             | 14.55            | 17.90                        | 0.67      | -104.6 |           |
|                              |           | 25             | 13.72       | 200                | 7.35            | 0.603                             | 14.68            | 15.20                        | 0.51      | -101.6 |           |
|                              |           | 30             | 13.72       | 200                | 7.33            | 0.600                             | 14.76            | 15.50                        | 0.45      | -103.3 |           |
|                              |           | 35             | 13.72       | 200                | 7.36            | 0.595                             | 14.66            | 13.80                        | 0.39      | -103.9 |           |
|                              |           | 40             | 13.72       | 200                | 7.35            | 0.594                             | 14.70            | 13.10                        | 0.38      | -103.6 |           |
|                              |           | 45             | 13.72       | 200                | 7.36            | 0.592                             | 14.81            | 11.10                        | 0.36      | -103.9 |           |
|                              |           | 50             | 13.72       | 200                | 7.38            | 0.590                             | 14.78            | 11.00                        | 0.34      | -105.0 |           |
|                              |           | 55             | 13.72       | 200                | 7.35            | 0.585                             | 14.74            | 9.40                         | 0.34      | -103.1 |           |
|                              |           | 60             | 13.72       | 200                | 7.35            | 0.583                             | 14.74            | 9.33                         | 0.31      | -104.3 |           |
|                              |           | 65             | 13.72       | 200                | 7.37            | 0.581                             | 14.79            | 8.21                         | 0.33      | -104.9 |           |
| MW-ZN-11U                    | 7/28/2006 | 15             | 10.65       | 250                | 8.02            | NM                                | 15.7             | 2.6                          | 9.4       | -29.8  |           |
|                              |           | 20             | 10.65       | 250                | 7.86            | NM                                | 15.8             | 34.1                         | 7.4       | -30.5  |           |
|                              |           | 25             | 10.65       | 250                | 7.80            | NM                                | 16.0             | 32.0                         | 6.4       | -39.80 |           |
|                              |           | 30             | 10.65       | 250                | 7.71            | NM                                | 16.0             | 23.0                         | 5.7       | -35.7  |           |
|                              |           | 35             | 10.65       | 250                | 7.66            | NM                                | 15.5             | 15.8                         | 5.2       | -38.7  |           |
|                              |           | 40             | 10.65       | 250                | 7.63            | NM                                | 15.3             | 10.3                         | 5.0       | -40.1  |           |
|                              |           | 45             | 10.65       | 250                | 7.60            | NM                                | 15.3             | 6.1                          | 4.8       | -43.1  |           |
|                              |           | 50             | 10.65       | 250                | 7.58            | NM                                | 15.2             | 4.4                          | 4.6       | -43.1  |           |
| MW-ZN-11L                    | 7/28/2006 | 20             | 10.65       | 250                | 7.78            | NM                                | 14.93            | 19.0                         | 13.9      | -1.6   |           |
|                              |           | 25             | 10.65       | 250                | 7.84            | NM                                | 14.78            | 10.7                         | 11.9      | -3.4   |           |
|                              |           | 30             | 10.65       | 250                | 7.87            | NM                                | 14.93            | 7.4                          | 9.7       | -10.9  |           |
|                              |           | 35             | 10.65       | 250                | 7.85            | NM                                | 14.96            | 5.3                          | 8.9       | -12.8  |           |
|                              |           | 40             | 10.65       | 250                | 7.80            | NM                                | 14.86            | 4.1                          | 8.2       | -23.4  |           |
|                              |           | 45             | 10.65       | 250                | 7.75            | NM                                | 14.97            | 3.7                          | 7.5       | -27.8  |           |
|                              |           | 50             | 10.65       | 250                | 7.72            | NM                                | 14.97            | 3.1                          | 36.5      | -36.8  |           |
|                              |           | 55             | 10.65       | 250                | 7.67            | NM                                | 14.99            | 2.0                          | 9.4       | -37.0  |           |
|                              |           | 60             | 10.65       | 250                | 7.65            | NM                                | 14.88            | 1.7                          | 7.8       | -41.2  |           |
|                              |           | 65             | 10.65       | 250                | 7.61            | NM                                | 15.02            | 1.2                          | 66.6      | -43.9  |           |
|                              |           | 70             | 10.65       | 250                | 7.60            | NM                                | 16.08            | 1.0                          | 6.3       | -44.7  |           |
|                              |           | 75             | 10.65       | 250                | 7.59            | NM                                | 15.10            | 1.0                          | 6.1       | -46.1  |           |

TABLE 4.5

**SUMMARY OF MONITORING WELL PURGING PARAMETERS  
FLEETWIDE ASSESSMENT  
ZION STATION  
ZION, ILLINOIS**

| <i>Sample Location</i> <sup>1</sup> | <i>Date</i> | <i>Minutes Purged</i> | <i>Water Level</i> | <i>Flow Rate (mL/min)</i> | <i>pH (Std. Units)</i> | <i>Conductivity (µS/cm)</i> <sup>2</sup> | <i>Temperature (°C)</i> | <i>Turbidity (ntu)</i> <sup>3</sup> | <i>DO (mg/L)</i> | <i>ORP</i> | <i>Pump Type</i> |
|-------------------------------------|-------------|-----------------------|--------------------|---------------------------|------------------------|--|-------------------------|-------------------------------------|------------------|------------|------------------|
| TW-ZN-100                           | 7/17/2006   | 5                     | 10.62              |                           | 7.89                   | 187.5                                    | 20.7                    | NM                                  | NM               | NM         |                  |
|                                     |             | 10                    | 10.62              |                           | 7.69                   | 163.7                                    | 20.3                    | NM                                  | NM               | NM         |                  |
|                                     |             | 15                    | 10.62              |                           | 7.64                   | 163.3                                    | 10.7                    | NM                                  | NM               | NM         |                  |
| TW-ZN-101                           | 7/17/2006   | 5                     | 10.27              |                           | 7.70                   | 179.9                                    | 21.0                    | NM                                  | NM               | NM         |                  |
|                                     |             | 10                    | 10.27              |                           | 7.68                   | 179.8                                    | 20.8                    | NM                                  | NM               | NM         |                  |
|                                     |             | 15                    | 10.27              |                           | 7.50                   | 181.1                                    | 20.3                    | NM                                  | NM               | NM         |                  |
| TW-ZN-102                           | 7/17/2006   | 5                     | 10.33              |                           | 7.75                   | 143.4                                    | 20.9                    | NM                                  | NM               | NM         |                  |
|                                     |             | 10                    | 10.33              |                           | 7.85                   | 135.9                                    | 20.6                    | NM                                  | NM               | NM         |                  |
|                                     |             | 15                    | 10.33              |                           | 7.87                   | 138.3                                    | 20.7                    | NM                                  | NM               | NM         |                  |
| TW-ZN-103                           | 7/17/2006   | 5                     | 9.03               |                           | 7.93                   | 186.1                                    | 20.9                    | NM                                  | NM               | NM         |                  |
|                                     |             | 10                    | 9.03               |                           | 7.73                   | 182.5                                    | 20.2                    | NM                                  | NM               | NM         |                  |
|                                     |             | 15                    | 9.03               |                           | 7.59                   | 180.5                                    | 19.8                    | NM                                  | NM               | NM         |                  |

## Notes:

<sup>1</sup> Sample locations include the well identifier followed by a sample depth indicator of 'U' for the upper portion of the screen or 'L' for the lower portion of the screen.

<sup>2</sup> µS/cm - microSiemens per centimeter

<sup>3</sup> ntu - nephelometric turbidity units

NM = Not Measured

**ANALYTICAL RESULTS SUMMARY - TRITIUM IN GROUNDWATER AND SURFACE WATER  
FLEETWIDE ASSESSMENT  
ZION STATION  
ZION, ILLINOIS**

| <i>Sample Location</i> <sup>(1)</sup> | <i>Sample Identification</i>  | <i>QC Sample</i> | <i>Sample Date</i> | <i>Tritium (pCi/L)</i> | <i>Result Error</i> |
|---------------------------------------|-------------------------------|------------------|--------------------|------------------------|---------------------|
| MW-ZN-01S(L)                          | WG-ZN-MW-ZN-01L-052606-DS-07  |                  | 5/26/2006          | 586                    | +/-141              |
| MW-ZN-01S(L)                          | GW-062806-PG-02               |                  | 6/28/2006          | ND (200)               | -                   |
| MW-ZN-01S(U)                          | WG-ZN-MW-ZN-01U-052606-DS-05  |                  | 5/26/2006          | 261                    | +/-124              |
| MW-ZN-01S(U)                          | GW-062806-PG-01               |                  | 6/28/2006          | 220                    | +/-123              |
| MW-ZN-02S(L)                          | WG-ZN-MW-ZN-02L-052606-DS-06  |                  | 5/26/2006          | ND (200)               | -                   |
| MW-ZN-02S(U)                          | WG-ZN-MW-ZN-02U-052606-DS-04  |                  | 5/26/2006          | ND (200)               | -                   |
| MW-ZN-03S(L)                          | WG-ZN-MW-ZN-03L-052506-DS-03  |                  | 5/25/2006          | ND (200)               | -                   |
| MW-ZN-03S(U)                          | WG-ZN-MW-ZN-03U-052506-DS-01  |                  | 5/25/2006          | ND (200)               | -                   |
| MW-ZN-03S(U)                          | WG-ZN-MW-ZN-03U-052506-DS-02  | Duplicate (01)   | 5/25/2006          | ND (200)               | -                   |
| MW-ZN-04S(L)                          | WG-ZION-MW-4L-052406-MB-004   |                  | 5/24/2006          | ND (200)               | -                   |
| MW-ZN-04S(U)                          | WG-ZION-MW-4U-052406-MB-002   |                  | 5/24/2006          | ND (200)               | -                   |
| MW-ZN-05S(L)                          | WG-ZION-MW-5L-052606-MS-013   |                  | 5/26/2006          | ND (200)               | -                   |
| MW-ZN-05S(U)                          | WG-ZION-MW-5U-052606-MS-017   |                  | 5/26/2006          | ND (200)               | -                   |
| MW-ZN-06S(L)                          | WG-ZION-MW-6L-052506-MS-009   |                  | 5/25/2006          | ND (200)               | -                   |
| MW-ZN-06S(U)                          | WG-ZION-MW-6U-052606-MS-011   |                  | 5/26/2006          | ND (200)               | -                   |
| MW-ZN-07S(L)                          | WG-ZION-MW-7L-052506-MS-007   |                  | 5/25/2006          | ND (200)               | -                   |
| MW-ZN-07S(U)                          | WG-ZION-MW-7U-052406-MS-005   |                  | 5/24/2006          | ND (200)               | -                   |
| MW-ZN-08S(L)                          | WG-ZION-MW-8L-052406-MS-001   |                  | 5/24/2006          | ND (200)               | -                   |
| MW-ZN-08S(U)                          | WG-ZION-MW-8U-052406-MS-003   |                  | 5/24/2006          | ND (200)               | -                   |
| MW-ZN-09S                             | WG-ZN-MW-ZN-09-052606-DS-08   |                  | 5/26/2006          | ND (200)               | -                   |
| MW-ZN-09S                             | WG-ZN-MW-ZN-09-052606-DS-09   | Duplicate (08)   | 5/26/2006          | ND (200)               | -                   |
| MW-ZN-10S(L)                          | WG-ZN-MW-ZN-10L-072806-MS-005 |                  | 7/28/2006          | ND (200)               | -                   |
| MW-ZN-10S(U)                          | WG-ZN-MW-ZN-10U-072806-MS-003 |                  | 7/28/2006          | ND (200)               | -                   |
| MW-ZN-10S(U)                          | WG-ZN-MW-ZN-10U-072806-MS-004 |                  | 7/28/2006          | ND (200)               | -                   |
| MW-ZN-11S(L)                          | WG-ZN-MW-ZN-11L-072806-TL-002 |                  | 7/28/2006          | ND (200)               | -                   |
| MW-ZN-11S(U)                          | WG-ZN-MW-ZN-11U-072806-TL-001 |                  | 7/28/2006          | ND (200)               | -                   |
| SW-ZN-1                               | WS-ZION-LAKE-052606-MS-015    |                  | 5/26/2006          | ND (200)               | -                   |
| TW-ZN-100                             | GW-071706-JL-TW-ZN-100        |                  | 7/17/2006          | ND (200)               | -                   |
| TW-ZN-101                             | GW-071706-JL-TW-ZN-101        |                  | 7/17/2006          | ND (200)               | -                   |
| TW-ZN-102                             | GW-071706-JL-TW-ZN-102        |                  | 7/17/2006          | ND (200)               | -                   |
| TW-ZN-103                             | GW-071706-JL-TW-ZN-103        |                  | 7/17/2006          | ND (200)               | -                   |

## Notes:

Samples analyzed by: Teledyne Brown Engineering, Inc.

(1) Sample locations include the well identifier followed by a sample depth indicator of 'U' for the upper portion of the screen or 'L' for the lower portion of the screen.

ND ( ) - Not detected at a concentration above the LLD. Value in parentheses is the LLD.

LLD - Lower limit of detection.

-- Non-detect value, +/- value not reported.

TABLE 5.2

**ANALYTICAL RESULTS SUMMARY - RADIONUCLIDES IN GROUNDWATER AND SURFACE WATER  
FLEETWIDE ASSESSMENT  
ZION STATION  
ZION, ILLINOIS**

| <i>Sample Location <sup>(1)</sup> ;<br/>Sample Identification:<br/>Sample Date:</i> |              | <i>MW-ZN-01S(L)<br/>WG-ZN-MW-ZN-01L-052606-DS-07<br/>5/26/2006</i> | <i>MW-ZN-01S(L)<br/>Result<br/>Error</i> | <i>MW-ZN-01S(U)<br/>WG-ZN-MW-ZN-01U-052606-DS-05<br/>5/26/2006</i> | <i>MW-ZN-01S(U)<br/>Result<br/>Error</i> | <i>MW-ZN-02S(L)<br/>WG-ZN-MW-ZN-02L-052606-DS-06<br/>5/26/2006</i> | <i>MW-ZN-02S(L)<br/>Result<br/>Error</i> |
|---|--------------|--|--|--|--|--|--|
|   | <b>Units</b> |  |  |  |  |  |  |
| <b>Target Radionuclides</b>   |              |  |  |  |  |  |  |
| Barium-140  | pCi/L        | ND (60)  | -  | ND (60)  | -  | ND (60)  | -  |
| Cesium-134  | pCi/L        | ND (10)  | -  | ND (10)  | -  | ND (10)  | -  |
| Cesium-137  | pCi/L        | ND (18)  | -  | ND (18)  | -  | ND (18)  | -  |
| Cobalt-58   | pCi/L        | ND (15)  | -  | ND (15)  | -  | ND (15)  | -  |
| Cobalt-60   | pCi/L        | ND (15)  | -  | ND (15)  | -  | ND (15)  | -  |
| Iron-59   | pCi/L        | ND (30)  | -  | ND (30)  | -  | ND (30)  | -  |
| Lanthanum-140   | pCi/L        | ND (15)  | -  | ND (15)  | -  | ND (15)  | -  |
| Manganese-54  | pCi/L        | ND (15)  | -  | ND (15)  | -  | ND (15)  | -  |
| Niobium-95  | pCi/L        | ND (10)  | -  | ND (10)  | -  | ND (10)  | -  |
| Strontium-89/90 (Total)   | pCi/L        | ND (2)   | -  | ND (2)   | -  | ND (2)   | -  |
| Zinc-65   | pCi/L        | ND (30)  | -  | ND (30)  | -  | ND (30)  | -  |
| Zirconium-95  | pCi/L        | ND (10)  | -  | ND (10)  | -  | ND (10)  | -  |
| <b>Non-Target Radionuclides <sup>(2)</sup></b>                                      |              |  |  |  |  |  |  |
| Actinium-228  | pCi/L        | 35.23  | +/-10.3                                  | RNI  | -  | RNI  | -  |
| Potassium-40  | pCi/L        | 53.04  | +/-34.2                                  | RNI  | -  | 81.03  | +/-42.45                                 |

Notes:

Samples analyzed by: Teledyne Brown

(1) - Sample locations include the well identifier followed by a depth indicator of 'U' for the upper portion of the screen or 'L' for the lower portion of the screen.

(2) - Radionuclide is naturally occurring.

RNI- Radionuclide Not Identified during analysis.

ND ( ) - Not detected at a concentration above the LLD. Value in parentheses is the LLD.

LLD - Lower limit of detection.

U\* - Compound/Analyte not detected.

Peak not identified, but forced activity concentration exceeds Minimum

Detectable Concentration and 3 sigma.

-- Non-detect value, +/- value not reported.

TABLE 5.2

**ANALYTICAL RESULTS SUMMARY - RADIONUCLIDES IN GROUNDWATER AND SURFACE WATER  
FLEETWIDE ASSESSMENT  
ZION STATION  
ZION, ILLINOIS**

| <i>Sample Location</i> <sup>(1)</sup> ;<br><i>Sample Identification:</i><br><i>Sample Date:</i> |              | <i>MW-ZN-02S(U)</i><br>WG-ZN-MW-ZN-02U-052606-DS-04<br>5/26/2006 | <i>MW-ZN-02S(U)</i><br><i>Result</i><br><i>Error</i> | <i>MW-ZN-03S(L)</i><br>WG-ZN-MW-ZN-03L-052506-DS-03<br>5/25/2006 | <i>MW-ZN-03S(L)</i><br><i>Result</i><br><i>Error</i> | <i>MW-ZN-03S(U)</i><br>WG-ZN-MW-ZN-03U-052506-DS-01<br>5/25/2006 | <i>MW-ZN-03S(U)</i><br><i>Result</i><br><i>Error</i> |
|---|--------------|--|--|--|--|--|--|
|   | <b>Units</b> |  |  |  |  |  |  |
| <b>Target Radionuclides</b>   |              |  |  |  |  |  |  |
| Barium-140  | pCi/L        | ND (60)  | -  | ND (60)  | -  | ND (60)  | -  |
| Cesium-134  | pCi/L        | ND (10)  | -  | ND (10)  | -  | ND (10)  | -  |
| Cesium-137  | pCi/L        | ND (18)  | -  | ND (18)  | -  | ND (18)  | -  |
| Cobalt-58   | pCi/L        | ND (15)  | -  | ND (15)  | -  | ND (15)  | -  |
| Cobalt-60   | pCi/L        | ND (15)  | -  | ND (15)  | -  | ND (15)  | -  |
| Iron-59   | pCi/L        | ND (30)  | -  | ND (30)  | -  | ND (30)  | -  |
| Lanthanum-140   | pCi/L        | ND (15)  | -  | ND (15)  | -  | ND (15)  | -  |
| Manganese-54  | pCi/L        | ND (15)  | -  | ND (15)  | -  | ND (15)  | -  |
| Niobium-95  | pCi/L        | ND (10)  | -  | ND (10)  | -  | ND (10)  | -  |
| Strontium-89/90 (Total)   | pCi/L        | ND (2)   | -  | ND (2)   | -  | ND (2)   | -  |
| Zinc-65   | pCi/L        | ND (30)  | -  | ND (30)  | -  | ND (30)  | -  |
| Zirconium-95  | pCi/L        | ND (10)  | -  | ND (10)  | -  | ND (10)  | -  |
| <b>Non-Target Radionuclides</b> <sup>(2)</sup>  |              |  |  |  |  |  |  |
| Actinium-228  | pCi/L        | RNI  | -  | RNI  | -  | RNI  | -  |
| Potassium-40  | pCi/L        | 73.65  | +/-44.47   | RNI  | -  | RNI  | -  |

## Notes:

Samples analyzed by: Teledyne Brown

(1) - Sample locations include the well identifier followed by a depth indicator of 'U' for the upper portion of the screen or 'L' for the lower portion of the screen.

(2) - Radionuclide is naturally occurring.

RNI- Radionuclide Not Identified during analysis.

ND ( ) - Not detected at a concentration above the LLD. Val

LLD - Lower limit of detection.

U\* - Compound/Analyte not detected.

Peak not identified, but forced activity concentration exceeds Minimum

Detectable Concentration and 3 sigma.

-- Non-detect value, +/- value not reported.

TABLE 5.2

**ANALYTICAL RESULTS SUMMARY - RADIONUCLIDES IN GROUNDWATER AND SURFACE WATER  
FLEETWIDE ASSESSMENT  
ZION STATION  
ZION, ILLINOIS**

| <i>Sample Location</i> <sup>(1)</sup> :        |              | MW-ZN-03S(U)                 | MW-ZN-03S(U) | MW-ZN-04S(L)                | MW-ZN-04S(L) | MW-ZN-04S(U)                | MW-ZN-04S(U) |
|--|--------------|------------------------------|--------------|-----------------------------|--------------|-----------------------------|--------------|
| <i>Sample Identification:</i>                  |              | WG-ZN-MW-ZN-03U-052506-DS-02 | Result       | WG-ZION-MW-4L-052406-MB-004 | Result       | WG-ZION-MW-4U-052406-MB-002 | Result       |
| <i>Sample Date:</i>                            |              | 5/25/2006                    | Error        | 5/24/2006                   | Error        | 5/24/2006                   | Error        |
|  | <i>Units</i> | <i>Duplicate</i>             |              |                             |              |                             |              |
| <i>Target Radionuclides</i>                    |              |                              |              |                             |              |                             |              |
| Barium-140                                     | pCi/L        | ND (60)                      | -            | ND (60)                     | -            | ND (60)                     | -            |
| Cesium-134                                     | pCi/L        | ND (10) U*                   | -            | ND (10)                     | -            | ND (10)                     | -            |
| Cesium-137                                     | pCi/L        | ND (18)                      | -            | ND (18)                     | -            | ND (18)                     | -            |
| Cobalt-58                                      | pCi/L        | ND (15)                      | -            | ND (15)                     | -            | ND (15)                     | -            |
| Cobalt-60                                      | pCi/L        | ND (15)                      | -            | ND (15)                     | -            | ND (15)                     | -            |
| Iron-59  | pCi/L        | ND (30)                      | -            | ND (30)                     | -            | ND (30)                     | -            |
| Lanthanum-140                                  | pCi/L        | ND (15)                      | -            | ND (15)                     | -            | ND (15)                     | -            |
| Manganese-54                                   | pCi/L        | ND (15)                      | -            | ND (15)                     | -            | ND (15)                     | -            |
| Niobium-95                                     | pCi/L        | ND (10)                      | -            | ND (10)                     | -            | ND (10)                     | -            |
| Strontium-89/90 (Total)                        | pCi/L        | ND (2)                       | -            | ND (2)                      | -            | ND (2)                      | -            |
| Zinc-65  | pCi/L        | ND (30) U*                   | -            | ND (30)                     | -            | ND (30)                     | -            |
| Zirconium-95                                   | pCi/L        | ND (10)                      | -            | ND (10)                     | -            | ND (10)                     | -            |
| <i>Non-Target Radionuclides</i> <sup>(2)</sup> |              |                              |              |                             |              |                             |              |
| Actinium-228                                   | pCi/L        | RNI                          | -            | RNI                         | -            | RNI                         | -            |
| Potassium-40                                   | pCi/L        | RNI                          | -            | 85.89                       | +/-44.24     | RNI                         | -            |

## Notes:

Samples analyzed by: Teledyne Brown

(1) - Sample locations include the well identifier followed by a depth indicator of 'U' for the upper portion of the screen or 'L' for the lower portion of the screen.

(2) - Radionuclide is naturally occurring.

RNI- Radionuclide Not Identified during analysis.

ND ( ) - Not detected at a concentration above the LLD. Val

LLD - Lower limit of detection.

U\* - Compound/Analyte not detected.

Peak not identified, but forced activity concentration exceeds Minimum

Detectable Concentration and 3 sigma.

-- Non-detect value, +/- value not reported.

TABLE 5.2

**ANALYTICAL RESULTS SUMMARY - RADIONUCLIDES IN GROUNDWATER AND SURFACE WATER  
FLEETWIDE ASSESSMENT  
ZION STATION  
ZION, ILLINOIS**

| <i>Sample Location <sup>(1)</sup> :</i>        |              | MW-ZN-05S(L)                | MW-ZN-05S(L) | MW-ZN-05S(U)                | MW-ZN-05S(U) | MW-ZN-06S(L)                | MW-ZN-06S(L) |
|--|--------------|-----------------------------|--------------|-----------------------------|--------------|-----------------------------|--------------|
| <i>Sample Identification:</i>                  |              | WG-ZION-MW-5L-052606-MS-013 | Result       | WG-ZION-MW-5U-052606-MS-017 | Result       | WG-ZION-MW-6L-052506-MS-009 | Result       |
| <i>Sample Date:</i>                            |              | 5/26/2006                   | Error        | 5/26/2006                   | Error        | 5/25/2006                   | Error        |
|  | <i>Units</i> |                             |              |                             |              |                             |              |
| <i>Target Radionuclides</i>                    |              |                             |              |                             |              |                             |              |
| Barium-140                                     | pCi/L        | ND (60)                     | -            | ND (60)                     | -            | ND (60)                     | -            |
| Cesium-134                                     | pCi/L        | ND (10)                     | -            | ND (10)                     | -            | ND (10) U*                  | -            |
| Cesium-137                                     | pCi/L        | ND (18)                     | -            | ND (18)                     | -            | ND (18)                     | -            |
| Cobalt-58                                      | pCi/L        | ND (15)                     | -            | ND (15)                     | -            | ND (15)                     | -            |
| Cobalt-60                                      | pCi/L        | ND (15)                     | -            | ND (15)                     | -            | ND (15)                     | -            |
| Iron-59  | pCi/L        | ND (30)                     | -            | ND (30)                     | -            | ND (30)                     | -            |
| Lanthanum-140                                  | pCi/L        | ND (15)                     | -            | ND (15)                     | -            | ND (15)                     | -            |
| Manganese-54                                   | pCi/L        | ND (15)                     | -            | ND (15)                     | -            | ND (15)                     | -            |
| Niobium-95                                     | pCi/L        | ND (10)                     | -            | ND (10)                     | -            | ND (10) U*                  | -            |
| Strontium-89/90 (Total)                        | pCi/L        | ND (2)                      | -            | ND (2)                      | -            | ND (2)                      | -            |
| Zinc-65  | pCi/L        | ND (30)                     | -            | ND (30)                     | -            | ND (30) U*                  | -            |
| Zirconium-95                                   | pCi/L        | ND (10)                     | -            | ND (10)                     | -            | ND (10)                     | -            |
| <i>Non-Target Radionuclides <sup>(2)</sup></i> |              |                             |              |                             |              |                             |              |
| Actinium-228                                   | pCi/L        | RNI                         | -            | RNI                         | -            | RNI                         | -            |
| Potassium-40                                   | pCi/L        | RNI                         | -            | RNI                         | -            | RNI                         | -            |

## Notes:

Samples analyzed by: Teledyne Brown

(1) - Sample locations include the well identifier followed by a depth indicator of 'U' for the upper portion of the screen or 'L' for the lower portion of the screen.

(2) - Radionuclide is naturally occurring.

RNI- Radionuclide Not Identified during analysis.

ND ( ) - Not detected at a concentration above the LLD. Val

LLD - Lower limit of detection.

U\* - Compound/ Analyte not detected.

Peak not identified, but forced activity concentration exceeds Minimum

Detectable Concentration and 3 sigma.

-- Non-detect value, +/- value not reported.



TABLE 5.2

**ANALYTICAL RESULTS SUMMARY - RADIONUCLIDES IN GROUNDWATER AND SURFACE WATER  
FLEETWIDE ASSESSMENT  
ZION STATION  
ZION, ILLINOIS**

| <i>Sample Location <sup>(1)</sup> :</i>        |              | MW-ZN-06S(U)                | MW-ZN-06S(U) | MW-ZN-07S(L)                | MW-ZN-07S(L) | MW-ZN-07S(U)                | MW-ZN-07S(U) |
|--|--------------|-----------------------------|--------------|-----------------------------|--------------|-----------------------------|--------------|
| <i>Sample Identification:</i>                  |              | WG-ZION-MW-6U-052606-MS-011 | Result       | WG-ZION-MW-7L-052506-MS-007 | Result       | WG-ZION-MW-7U-052406-MS-005 | Result       |
| <i>Sample Date:</i>                            |              | 5/26/2006                   | Error        | 5/23/2006                   | Error        | 5/24/2006                   | Error        |
|  | <i>Units</i> |                             |              |                             |              |                             |              |
| <i>Target Radionuclides</i>                    |              |                             |              |                             |              |                             |              |
| Barium-140                                     | pCi/L        | ND (60)                     | -            | ND (60)                     | -            | ND (60)                     | -            |
| Cesium-134                                     | pCi/L        | ND (10)                     | -            | ND (10) U*                  | -            | ND (10) U*                  | -            |
| Cesium-137                                     | pCi/L        | ND (18)                     | -            | ND (18)                     | -            | ND (18)                     | -            |
| Cobalt-58                                      | pCi/L        | ND (15)                     | -            | ND (15)                     | -            | ND (15)                     | -            |
| Cobalt-60                                      | pCi/L        | ND (15)                     | -            | ND (15)                     | -            | ND (15)                     | -            |
| Iron-59  | pCi/L        | ND (30)                     | -            | ND (30)                     | -            | ND (30)                     | -            |
| Lanthanum-140                                  | pCi/L        | ND (15)                     | -            | ND (15)                     | -            | ND (15)                     | -            |
| Manganese-54                                   | pCi/L        | ND (15)                     | -            | ND (15)                     | -            | ND (15)                     | -            |
| Niobium-95                                     | pCi/L        | ND (10)                     | -            | ND (10)                     | -            | ND (10)                     | -            |
| Strontium-89/90 (Total)                        | pCi/L        | ND (2)                      | -            | ND (2)                      | -            | ND (2)                      | -            |
| Zinc-65  | pCi/L        | ND (30)                     | -            | ND (30)                     | -            | ND (30) U*                  | -            |
| Zirconium-95                                   | pCi/L        | ND (10)                     | -            | ND (10)                     | -            | ND (10)                     | -            |
| <i>Non-Target Radionuclides <sup>(2)</sup></i> |              |                             |              |                             |              |                             |              |
| Actinium-228                                   | pCi/L        | RNI                         | -            | RNI                         | -            | RNI                         | -            |
| Potassium-40                                   | pCi/L        | RNI                         | -            | RNI                         | -            | RNI                         | -            |

## Notes:

Samples analyzed by: Teledyne Brown

(1) - Sample locations include the well identifier followed by a depth indicator of 'U' for the upper portion of the screen or 'L' for the lower portion of the screen.

(2) - Radionuclide is naturally occurring.

RNI- Radionuclide Not Identified during analysis.

ND ( ) - Not detected at a concentration above the LLD. Val

LLD - Lower limit of detection.

U\* - Compound/ Analyte not detected.

Peak not identified, but forced activity concentration exceeds Minimum

Detectable Concentration and 3 sigma.

-- Non-detect value, +/- value not reported.

TABLE 5.2

ANALYTICAL RESULTS SUMMARY - RADIONUCLIDES IN GROUNDWATER AND SURFACE WATER  
FLEETWIDE ASSESSMENT  
ZION STATION  
ZION, ILLINOIS

| Sample Location <sup>(1)</sup> ;<br>Sample Identification:<br>Sample Date: |              | MW-ZN-08S(L)<br>WG-ZION-MW-8L-052406-MS-001<br>5/24/2006 | MW-ZN-08S(L)<br>Result<br>Error | MW-ZN-08S(U)<br>WG-ZION-MW-8U-052406-MS-003<br>5/24/2006 | MW-ZN-08S(U)<br>Result<br>Error | MW-ZN-09S<br>WG-ZN-MW-ZN-09-052606-DS-08<br>5/26/2006 | MW-ZN-09S<br>Result<br>Error |
|--|--------------|--|---------------------------------|--|---------------------------------|---|------------------------------|
|  | <b>Units</b> |  |                                 |  |                                 |   |                              |
| <b>Target Radionuclides</b>  |              |  |                                 |  |                                 |   |                              |
| Barium-140   | pCi/L        | ND (60)  | -                               | ND (60)  | -                               | ND (60)   | -                            |
| Cesium-134   | pCi/L        | ND (10) U*   | -                               | ND (10)  | -                               | ND (10)   | -                            |
| Cesium-137   | pCi/L        | ND (18)  | -                               | ND (18)  | -                               | ND (18)   | -                            |
| Cobalt-58  | pCi/L        | ND (15)  | -                               | ND (15)  | -                               | ND (15)   | -                            |
| Cobalt-60  | pCi/L        | ND (15)  | -                               | ND (15)  | -                               | ND (15)   | -                            |
| Iron-59  | pCi/L        | ND (30)  | -                               | ND (30)  | -                               | ND (30)   | -                            |
| Lanthanum-140  | pCi/L        | ND (15)  | -                               | ND (15)  | -                               | ND (15)   | -                            |
| Manganese-54   | pCi/L        | ND (15)  | -                               | ND (15)  | -                               | ND (15)   | -                            |
| Niobium-95   | pCi/L        | ND (10)  | -                               | ND (10)  | -                               | ND (10)   | -                            |
| Strontium-89/90 (Total)  | pCi/L        | ND (2)   | -                               | ND (2)   | -                               | ND (2)  | -                            |
| Zinc-65  | pCi/L        | ND (30)  | -                               | ND (30)  | -                               | ND (30)   | -                            |
| Zirconium-95   | pCi/L        | ND (10)  | -                               | ND (10)  | -                               | ND (10)   | -                            |
| <b>Non-Target Radionuclides <sup>(2)</sup></b>                             |              |  |                                 |  |                                 |   |                              |
| Actinium-228   | pCi/L        | RNI  | -                               | RNI  | -                               | RNI   | -                            |
| Potassium-40   | pCi/L        | RNI  | -                               | 69.37  | +/-45.71                        | RNI   | -                            |

## Notes:

Samples analyzed by: Teledyne Brown

(1) - Sample locations include the well identifier followed by a depth indicator of 'U' for the upper portion of the screen or 'L' for the lower portion of the screen.

(2) - Radionuclide is naturally occurring.

RNI- Radionuclide Not Identified during analysis.

ND ( ) - Not detected at a concentration above the LLD. Val

LLD - Lower limit of detection.

U\* - Compound/ Analyte not detected.

Peak not identified, but forced activity concentration exceeds Minimum

Detectable Concentration and 3 sigma.

-- Non-detect value, +/- value not reported.

TABLE 5.2

**ANALYTICAL RESULTS SUMMARY - RADIONUCLIDES IN GROUNDWATER AND SURFACE WATER  
FLEETWIDE ASSESSMENT  
ZION STATION  
ZION, ILLINOIS**

| <i>Sample Location <sup>(1)</sup> ;<br/>Sample Identification:<br/>Sample Date:</i> |              | <i>MW-ZN-09S<br/>WG-ZN-MW-ZN-09-052606-DS-09<br/>5/26/2006<br/>Duplicate</i> | <i>MW-ZN-09S<br/>Result<br/>Error</i> | <i>MW-ZN-10S(L)<br/>WG-ZN-MW-ZN-10L-072806-MS-005<br/>7/28/2006</i> | <i>MW-ZN-10S(L)<br/>Result<br/>Error</i> | <i>MW-ZN-10S(U)<br/>WG-ZN-MW-ZN-10U-072806-MS-003<br/>7/28/2006</i> | <i>MW-ZN-10S(U)<br/>Result<br/>Error</i> |
|---|--------------|--|---------------------------------------|---|--|---|--|
|   | <i>Units</i> |  |                                       |   |  |   |  |
| <i>Target Radionuclides</i>   |              |  |                                       |   |  |   |  |
| Barium-140  | pCi/L        | ND (60)  | -                                     | ND (60)   | -  | ND (60)   | -  |
| Cesium-134  | pCi/L        | ND (10)  | -                                     | ND (10)   | -  | ND (10)   | -  |
| Cesium-137  | pCi/L        | ND (18)  | -                                     | ND (18)   | -  | ND (18)   | -  |
| Cobalt-58   | pCi/L        | ND (15)  | -                                     | ND (15)   | -  | ND (15)   | -  |
| Cobalt-60   | pCi/L        | ND (15)  | -                                     | ND (15)   | -  | ND (15)   | -  |
| Iron-59   | pCi/L        | ND (30)  | -                                     | ND (30)   | -  | ND (30)   | -  |
| Lanthanum-140   | pCi/L        | ND (15)  | -                                     | ND (15)   | -  | ND (15)   | -  |
| Manganese-54  | pCi/L        | ND (15)  | -                                     | ND (15)   | -  | ND (15)   | -  |
| Niobium-95  | pCi/L        | ND (10)  | -                                     | ND (10)   | -  | ND (10)   | -  |
| Strontium-89/90 (Total)   | pCi/L        | ND (2)   | -                                     | ND (2)  | -  | ND (2)  | -  |
| Zinc-65   | pCi/L        | ND (30)  | -                                     | ND (30)   | -  | ND (30)   | -  |
| Zirconium-95  | pCi/L        | ND (10)  | -                                     | ND (10)   | -  | ND (10)   | -  |
| <i>Non-Target Radionuclides <sup>(2)</sup></i>                                      |              |  |                                       |   |  |   |  |
| Actinium-228  | pCi/L        | RNI  | -                                     | RNI   | -  | RNI   | -  |
| Potassium-40  | pCi/L        | RNI  | -                                     | RNI   | -  | 83.66   | +/-42.25                                 |

## Notes:

Samples analyzed by: Teledyne Brown

(1) - Sample locations include the well identifier followed by a depth indicator of 'U' for the upper portion of the screen or 'L' for the lower portion of the screen.

(2) - Radionuclide is naturally occurring.

RNI- Radionuclide Not Identified during analysis.

ND ( ) - Not detected at a concentration above the LLD. Val

LLD - Lower limit of detection.

U\* - Compound/ Analyte not detected.

Peak not identified, but forced activity

concentration exceeds Minimum

Detectable Concentration and 3 sigma.

-- Non-detect value, +/- value not reported.

TABLE 5.2

**ANALYTICAL RESULTS SUMMARY - RADIONUCLIDES IN GROUNDWATER AND SURFACE WATER  
FLEETWIDE ASSESSMENT  
ZION STATION  
ZION, ILLINOIS**

| <i>Sample Location <sup>(1)</sup> :</i>        |              | <i>MW-ZN-10S(U)</i>                  | <i>MW-ZN-10S(U)</i> | <i>MW-ZN-11S(L)</i>                  | <i>MW-ZN-11S(L)</i> | <i>MW-ZN-11S(U)</i>                  | <i>MW-ZN-11S(U)</i> |
|--|--------------|--------------------------------------|---------------------|--------------------------------------|---------------------|--------------------------------------|---------------------|
| <i>Sample Identification:</i>                  |              | <i>WG-ZN-MW-ZN-10U-072806-MS-004</i> | <i>Result</i>       | <i>WG-ZN-MW-ZN-11L-072806-TL-002</i> | <i>Result</i>       | <i>WG-ZN-MW-ZN-11U-072806-TL-001</i> | <i>Result</i>       |
| <i>Sample Date:</i>                            |              | <i>7/28/2006</i>                     | <i>Error</i>        | <i>7/28/2006</i>                     | <i>Error</i>        | <i>7/28/2006</i>                     | <i>Error</i>        |
|  | <i>Units</i> |                                      |                     |                                      |                     |                                      |                     |
| <i>Target Radionuclides</i>                    |              |                                      |                     |                                      |                     |                                      |                     |
| Barium-140                                     | pCi/L        | ND (60)                              | -                   | ND (60)                              | -                   | ND (60)                              | -                   |
| Cesium-134                                     | pCi/L        | ND (10) U*                           | -                   | ND (10) U*                           | -                   | ND (10) U*                           | -                   |
| Cesium-137                                     | pCi/L        | ND (18)                              | -                   | ND (18)                              | -                   | ND (18)                              | -                   |
| Cobalt-58                                      | pCi/L        | ND (15)                              | -                   | ND (15)                              | -                   | ND (15)                              | -                   |
| Cobalt-60                                      | pCi/L        | ND (15)                              | -                   | ND (15)                              | -                   | ND (15)                              | -                   |
| Iron-59  | pCi/L        | ND (30)                              | -                   | ND (30)                              | -                   | ND (30)                              | -                   |
| Lanthanum-140                                  | pCi/L        | ND (15)                              | -                   | ND (15)                              | -                   | ND (15)                              | -                   |
| Manganese-54                                   | pCi/L        | ND (15)                              | -                   | ND (15)                              | -                   | ND (15)                              | -                   |
| Niobium-95                                     | pCi/L        | ND (10)                              | -                   | ND (10)                              | -                   | ND (10)                              | -                   |
| Strontium-89/90 (Total)                        | pCi/L        | ND (2)                               | -                   | ND (2)                               | -                   | ND (2)                               | -                   |
| Zinc-65  | pCi/L        | ND (30) U*                           | -                   | ND (30) U*                           | -                   | ND (30) U*                           | -                   |
| Zirconium-95                                   | pCi/L        | ND (10)                              | -                   | ND (10)                              | -                   | ND (10)                              | -                   |
| <i>Non-Target Radionuclides <sup>(2)</sup></i> |              |                                      |                     |                                      |                     |                                      |                     |
| Actinium-228                                   | pCi/L        | RNI                                  | -                   | RNI                                  | -                   | RNI                                  | -                   |
| Potassium-40                                   | pCi/L        | RNI                                  | -                   | RNI                                  | -                   | RNI                                  | -                   |

## Notes:

Samples analyzed by: Teledyne Brown

(1) - Sample locations include the well identifier followed by a depth indicator of 'U' for the upper portion of the screen or 'L' for the lower portion of the screen.

(2) - Radionuclide is naturally occurring.

RNI- Radionuclide Not Identified during analysis.

ND ( ) - Not detected at a concentration above the LLD. Val

LLD - Lower limit of detection.

U\* - Compound/ Analyte not detected.

Peak not identified, but forced activity concentration exceeds Minimum

Detectable Concentration and 3 sigma.

-- Non-detect value, +/- value not reported.

TABLE 5.2

ANALYTICAL RESULTS SUMMARY - RADIONUCLIDES IN GROUNDWATER AND SURFACE WATER  
FLEETWIDE ASSESSMENT  
ZION STATION  
ZION, ILLINOIS

| Sample Location <sup>(1)</sup> ;<br>Sample Identification:<br>Sample Date: | SW-ZN-1<br>WS-ZION-LAKE-052606-MS-015<br>5/26/2006 | SW-ZN-1<br>Result<br>Error | TW-ZN-100<br>GW-071706-JL-TW-ZN-100<br>7/17/2006 | TW-ZN-100<br>Result<br>Error | TW-ZN-101<br>GW-071706-JL-TW-ZN-101<br>7/17/2006 | TW-ZN-101<br>Result<br>Error | TW-ZN-101<br>GW-071706-JL-TW-ZN-101<br>7/17/2006<br>Re-run | TW-ZN-101<br>Result<br>Error |   |
|--|--|----------------------------|--|------------------------------|--|------------------------------|--|------------------------------|---|
|  | Units  |                            |  |                              |  |                              |  |                              |   |
| <b>Target Radionuclides</b>  |  |                            |  |                              |  |                              |  |                              |   |
| Barium-140   | pCi/L  | ND (60)                    | -  | ND (60)                      | -  | ND (60)                      | -  | ND (60)                      | - |
| Cesium-134   | pCi/L  | ND (10)                    | -  | ND (10)                      | -  | ND (10)                      | -  | ND (10) U*                   | - |
| Cesium-137   | pCi/L  | ND (18)                    | -  | ND (18)                      | -  | ND (18)                      | -  | ND (18)                      | - |
| Cobalt-58  | pCi/L  | ND (15)                    | -  | ND (15)                      | -  | ND (15)                      | -  | ND (15)                      | - |
| Cobalt-60  | pCi/L  | ND (15)                    | -  | ND (15)                      | -  | ND (15)                      | -  | ND (15)                      | - |
| Iron-59  | pCi/L  | ND (30)                    | -  | ND (30)                      | -  | ND (30)                      | -  | ND (30)                      | - |
| Lanthanum-140  | pCi/L  | ND (15)                    | -  | ND (15)                      | -  | ND (15)                      | -  | ND (15)                      | - |
| Manganese-54   | pCi/L  | ND (15)                    | -  | ND (15)                      | -  | ND (15)                      | -  | ND (15)                      | - |
| Niobium-95   | pCi/L  | ND (10)                    | -  | ND (10)                      | -  | ND (10)                      | -  | ND (10)                      | - |
| Strontium-89/90 (Total)  | pCi/L  | ND (2)                     | -  | ND (2)                       | -  | ND (2)                       | -  | -                            | - |
| Zinc-65  | pCi/L  | ND (30)                    | -  | ND (30)                      | -  | ND (30)                      | -  | ND (30) U*                   | - |
| Zirconium-95   | pCi/L  | ND (10)                    | -  | ND (10)                      | -  | ND (10)                      | -  | ND (10)                      | - |
| <b>Non-Target Radionuclides <sup>(2)</sup></b>                             |  |                            |  |                              |  |                              |  |                              |   |
| Actinium-228   | pCi/L  | RNI                        | -  | RNI                          | -  | RNI                          | -  | RNI                          | - |
| Potassium-40   | pCi/L  | 106.8                      | +/-48.41   | RNI                          | --   | RNI                          | -  | RNI                          | - |

## Notes:

Samples analyzed by: Teledyne Brown

(1) - Sample locations include the well identifier followed by a depth indicator of 'U' for the upper portion of the screen or 'L' for the lower portion of the screen.

(2) - Radionuclide is naturally occurring.

RNI- Radionuclide Not Identified during analysis.

ND ( ) - Not detected at a concentration above the LLD. Val

LLD - Lower limit of detection.

U\* - Compound/Analyte not detected.

Peak not identified, but forced activity concentration exceeds Minimum

Detectable Concentration and 3 sigma.

-- Non-detect value, +/- value not reported.

TABLE 5.2

**ANALYTICAL RESULTS SUMMARY - RADIONUCLIDES IN GROUNDWATER AND SURFACE WATER  
FLEETWIDE ASSESSMENT  
ZION STATION  
ZION, ILLINOIS**

| <i>Sample Location <sup>(1)</sup> :</i>        |              | TW-ZN-102              | TW-ZN-102 | TW-ZN-103              | TW-ZN-103 |
|--|--------------|------------------------|-----------|------------------------|-----------|
| <i>Sample Identification:</i>                  |              | GW-071706-JL-TW-ZN-102 | Result    | GW-071706-JL-TW-ZN-103 | Result    |
| <i>Sample Date:</i>                            |              | 7/17/2006              | Error     | 7/17/2006              | Error     |
|  | <i>Units</i> |                        |           |                        |           |
| <i>Target Radionuclides</i>                    |              |                        |           |                        |           |
| Barium-140                                     | pCi/L        | ND (60)                | -         | ND (60)                | -         |
| Cesium-134                                     | pCi/L        | ND (10)                | -         | ND (10)                | -         |
| Cesium-137                                     | pCi/L        | ND (18)                | -         | ND (18)                | -         |
| Cobalt-58                                      | pCi/L        | ND (15)                | -         | ND (15)                | -         |
| Cobalt-60                                      | pCi/L        | ND (15)                | -         | ND (15)                | -         |
| Iron-59  | pCi/L        | ND (30)                | -         | ND (30)                | -         |
| Lanthanum-140                                  | pCi/L        | ND (15)                | -         | ND (15)                | -         |
| Manganese-54                                   | pCi/L        | ND (15)                | -         | ND (15)                | -         |
| Niobium-95                                     | pCi/L        | ND (10)                | -         | ND (10)                | -         |
| Strontium-89/90 (Total)                        | pCi/L        | ND (2)                 | -         | ND (2)                 | -         |
| Zinc-65  | pCi/L        | ND (30)                | -         | ND (30)                | -         |
| Zirconium-95                                   | pCi/L        | ND (10)                | -         | ND (10)                | -         |
| <i>Non-Target Radionuclides <sup>(2)</sup></i> |              |                        |           |                        |           |
| Actinium-228                                   | pCi/L        | RNI                    | -         | RNI                    | -         |
| Potassium-40                                   | pCi/L        | RNI                    | -         | RNI                    | -         |

Notes:

Samples analyzed by: Teledyne Brown  
 (1) - Sample locations include the well identifier followed by a depth indicator of 'U' for the upper portion of the screen or 'L' for the lower portion of the screen.  
 (2) - Radionuclide is naturally occurring.  
 RNI- Radionuclide Not Identified during analysis.  
 ND ( ) - Not detected at a concentration above the LLD. Val  
 LLD - Lower limit of detection.  
 U\* - Compound/ Analyte not detected.  
 Peak not identified, but forced activity concentration exceeds Minimum Detectable Concentration and 3 sigma.  
 -- Non-detect value, +/- value not reported.

APPENDIX A

WATER WELL INVENTORY RECORDS

- A.1 BANKS 2006 WATER WELL REPORT
- A.2 ISWS LOGS

A.1 BANKS 2006 WATER WELL REPORT





**Banks  
Information  
Solutions, Inc.**

# **Water Well Report**

TM

**June 7, 2006**

## **CLIENT**

**Conestoga-Rovers & Associates  
8615 W Bryn Mawr Avenue  
Chicago, IL 60631**

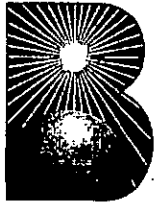
## **SITE**

**Zion Generating Station  
Zion, IL  
Lake County  
060706-001**

**P.O. Box 12851, Capitol Station, Austin, TX 78711  
700 N. Lamar, Suite 200 Austin, TX 78703  
512.478.0059 FAX 512.478.1433 e-mail [banks@banksinfo.com](mailto:banks@banksinfo.com)  
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Water Well Report  
Map of Wells within 1 Mile

(Withheld)



**Banks  
Information  
Solutions, Inc.**

# Water Well Report <sup>TM</sup>

## DETAILS

|                 |            |        |
|-----------------|------------|--------|
| State ID        | 1209702313 | MAP ID |
| Banks ID        | 1709700030 |        |
| Owner Of Well   | [REDACTED] |        |
| Type Of Well    | N/A        |        |
| Depth Drilled   | 62'        |        |
| Completion Date | 1/1/1950   |        |
| Longitude       | [REDACTED] |        |
| Latitude        | [REDACTED] |        |

|                 |            |        |
|-----------------|------------|--------|
| State ID        | 1209702312 | MAP ID |
| Banks ID        | 1709700033 |        |
| Owner Of Well   | [REDACTED] |        |
| Type Of Well    | N/A        |        |
| Depth Drilled   | 200'       |        |
| Completion Date | N/A        |        |
| Longitude       | [REDACTED] |        |
| Latitude        | [REDACTED] |        |

|                 |            |        |
|-----------------|------------|--------|
| State ID        | 1209702317 | MAP ID |
| Banks ID        | 1709700031 |        |
| Owner Of Well   | [REDACTED] |        |
| Type Of Well    | N/A        |        |
| Depth Drilled   | 82'        |        |
| Completion Date | 1/1/1952   |        |
| Longitude       | [REDACTED] |        |
| Latitude        | [REDACTED] |        |

P.O. Box 12851, Capitol Station, Austin, TX 78711  
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Banks  
Information  
Solutions, Inc.

# Water Well Report <sup>TM</sup>

## DETAILS

|                 |            |        |
|-----------------|------------|--------|
| State ID        | 1209702314 | MAP ID |
| Bank ID         | 1709700034 |        |
| Owner of Well   | [REDACTED] |        |
| Type of Well    | N/A        |        |
| Depth in Feet   | 1569'      |        |
| Completion Date | N/A        |        |
| Longitude       | [REDACTED] |        |
| Latitude        | [REDACTED] |        |

|                 |            |        |
|-----------------|------------|--------|
| State ID        | 1209702316 | MAP ID |
| Bank ID         | 1709700032 | 4      |
| Owner of Well   | [REDACTED] |        |
| Type of Well    | N/A        |        |
| Depth in Feet   | 1025'      |        |
| Completion Date | N/A        |        |
| Longitude       | [REDACTED] |        |
| Latitude        | [REDACTED] |        |

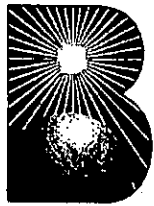
|                 |            |        |
|-----------------|------------|--------|
| State ID        | 1209702051 | MAP ID |
| Bank ID         | 1709700036 | 4      |
| Owner of Well   | [REDACTED] |        |
| Type of Well    | N/A        |        |
| Depth in Feet   | 175'       |        |
| Completion Date | N/A        |        |
| Longitude       | [REDACTED] |        |
| Latitude        | [REDACTED] |        |

P.O. Box 12851, Capitol Station, Austin, TX 78711

700 N. Lamar, Suite 200 Austin, TX 78703

512.478.0059 FAX 512.478.1433 e-mail banks@banksinfo.com

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Banks  
Information  
Solutions, Inc.

# Water Well Report <sup>TM</sup>

## DETAILS

|                 |
|-----------------|
| State ID        |
| Banks ID        |
| Owner Of Well   |
| Type Of Well    |
| Depth Drilled   |
| Completion Date |
| Longitude       |
| Latitude        |

|            |
|------------|
| 1209737424 |
| 1709700039 |
| [REDACTED] |
| N/A        |
| 180'       |
| N/A        |
| [REDACTED] |
| [REDACTED] |

|        |
|--------|
| MAP ID |
| 15     |

|                 |
|-----------------|
| State ID        |
| Banks ID        |
| Owner Of Well   |
| Type Of Well    |
| Depth Drilled   |
| Completion Date |
| Longitude       |
| Latitude        |

|              |
|--------------|
| 1209726844   |
| 1709700040   |
| City of Zion |
| N/A          |
| 15'          |
| 11/1/1972    |
| -87.81565    |
| 42.44982     |

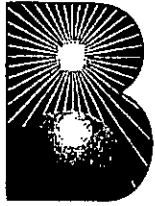
|        |
|--------|
| MAP ID |
| 6      |

|                 |
|-----------------|
| State ID        |
| Banks ID        |
| Owner Of Well   |
| Type Of Well    |
| Depth Drilled   |
| Completion Date |
| Longitude       |
| Latitude        |

|            |
|------------|
| 1209702319 |
| 1709700041 |
| [REDACTED] |
| N/A        |
| 154'       |
| N/A        |
| [REDACTED] |
| [REDACTED] |

|        |
|--------|
| MAP ID |
| 8      |

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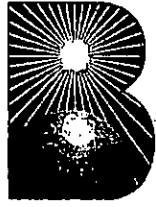
## DETAILS

|                 |                 |        |
|-----------------|-----------------|--------|
| State ID        | 1209702320      | MAP ID |
| Banks ID        | 1709700042      |        |
| Owner Of Well   | Hotel Zion Home |        |
| Type Of Well    | N/A             |        |
| Depth Drilled   | 225'            |        |
| Completion Date | N/A             |        |
| Longitude       | -87.8231        |        |
| Latitude        | 42.44804        |        |

|                 |            |        |
|-----------------|------------|--------|
| State ID        | 1209702926 | MAP ID |
| Banks ID        | 1709700043 |        |
| Owner Of Well   | [REDACTED] |        |
| Type Of Well    | N/A        |        |
| Depth Drilled   | 120'       |        |
| Completion Date | 8/7/1969   |        |
| Longitude       | [REDACTED] |        |
| Latitude        | [REDACTED] |        |

|                 |            |        |
|-----------------|------------|--------|
| State ID        | 1209703060 | MAP ID |
| Banks ID        | 1709700044 | 9      |
| Owner Of Well   | [REDACTED] |        |
| Type Of Well    | N/A        |        |
| Depth Drilled   | 142'       |        |
| Completion Date | 11/20/1970 |        |
| Longitude       | [REDACTED] |        |
| Latitude        | [REDACTED] |        |

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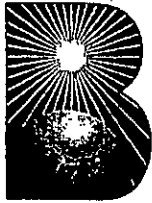
## DETAILS

|                 |              |        |
|-----------------|--------------|--------|
| State ID        | 1209702322   | MAP ID |
| Bank ID         | 1709700045   |        |
| Owner of Well   | Zion Estates |        |
| Type of Well    | N/A          |        |
| Depth Drilled   | 138'         |        |
| Completion Date | N/A          |        |
| Longitude       | -87.80146    |        |
| Latitude        | 42.44612     |        |

|                 |            |        |
|-----------------|------------|--------|
| State ID        | 1209702292 | MAP ID |
| Bank ID         | 1709700065 |        |
| Owner of Well   | [REDACTED] |        |
| Type of Well    | N/A        |        |
| Depth Drilled   | 266'       |        |
| Completion Date | 9/1/1940   |        |
| Longitude       | [REDACTED] |        |
| Latitude        | [REDACTED] |        |

|                 |                |        |
|-----------------|----------------|--------|
| State ID        | 1209725154     | MAP ID |
| Bank ID         | 1709700070     |        |
| Owner of Well   | Busch & Larson |        |
| Type of Well    | N/A            |        |
| Depth Drilled   | 219'           |        |
| Completion Date | 1/1/1976       |        |
| Longitude       | -87.82809      |        |
| Latitude        | 42.46127       |        |

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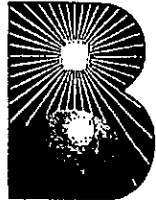
|                 |                |        |
|-----------------|----------------|--------|
| State ID        | 1209725155     | MAP ID |
| Banks ID        | 1709700071     | 12     |
| Owner Of Well   | Busch & Larson |        |
| Type Of Well    | N/A            |        |
| Depth Drilled   | 195'           |        |
| Completion Date | 1/24/1977      |        |
| Longitude       | -87.82865      |        |
| Latitude        | 42.46128       |        |

|                 |            |        |
|-----------------|------------|--------|
| State ID        | 1209733751 | MAP ID |
| Banks ID        | 1709700088 | 12     |
| Owner Of Well   | [REDACTED] |        |
| Type Of Well    | N/A        |        |
| Depth Drilled   | 160'       |        |
| Completion Date | 9/30/1977  |        |
| Longitude       | [REDACTED] |        |
| Latitude        | [REDACTED] |        |

|                 |            |        |
|-----------------|------------|--------|
| State ID        | 1209703280 | MAP ID |
| Banks ID        | 1709700075 | 13     |
| Owner Of Well   | [REDACTED] |        |
| Type Of Well    | N/A        |        |
| Depth Drilled   | 322'       |        |
| Completion Date | 7/1/1971   |        |
| Longitude       | [REDACTED] |        |
| Latitude        | [REDACTED] |        |

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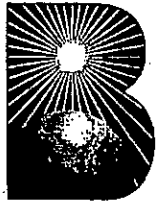
## DETAILS

|                 |            |        |
|-----------------|------------|--------|
| State ID        | 1209702617 | MAP ID |
| Banks ID        | 1709700066 |        |
| Owner Of Well   | [REDACTED] |        |
| Type Of Well    | N/A        |        |
| Depth Drilled   | 146'       |        |
| Completion Date | 1/1/1963   |        |
| Longitude       | [REDACTED] |        |
| Latitude        | [REDACTED] |        |

|                 |            |        |
|-----------------|------------|--------|
| State ID        | 1209702618 | MAP ID |
| Banks ID        | 1709700067 |        |
| Owner Of Well   | [REDACTED] |        |
| Type Of Well    | N/A        |        |
| Depth Drilled   | 160'       |        |
| Completion Date | 1/1/1963   |        |
| Longitude       | [REDACTED] |        |
| Latitude        | [REDACTED] |        |

|                 |            |        |
|-----------------|------------|--------|
| State ID        | 1209702619 | MAP ID |
| Banks ID        | 1709700068 |        |
| Owner Of Well   | [REDACTED] |        |
| Type Of Well    | N/A        |        |
| Depth Drilled   | 137'       |        |
| Completion Date | 1/1/1963   |        |
| Longitude       | [REDACTED] |        |
| Latitude        | [REDACTED] |        |

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|                 |            |        |
|-----------------|------------|--------|
| State ID        | 1209702798 | MAP ID |
| Banks ID        | 1709700069 |        |
| Owner Of Well   | [REDACTED] |        |
| Type Of Well    | N/A        |        |
| Depth Drilled   | 315'       |        |
| Completion Date | 5/1/1968   |        |
| Longitude       | [REDACTED] |        |
| Latitude        | [REDACTED] |        |

|                 |            |        |
|-----------------|------------|--------|
| State ID        | 1209703883 | MAP ID |
| Banks ID        | 1709700074 |        |
| Owner Of Well   | [REDACTED] |        |
| Type Of Well    | N/A        |        |
| Depth Drilled   | 127'       |        |
| Completion Date | 10/27/1972 |        |
| Longitude       | [REDACTED] |        |
| Latitude        | [REDACTED] |        |

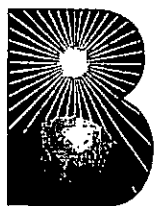
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|-----------------|------------|--------|
| State ID        | 1209703399 | MAP ID |
| Banks ID        | 1709700076 |        |
| Owner Of Well   | [REDACTED] |        |
| Type Of Well    | N/A        |        |
| Depth Drilled   | 242'       |        |
| Completion Date | 10/1/1971  |        |
| Longitude       | [REDACTED] |        |
| Latitude        | [REDACTED] |        |

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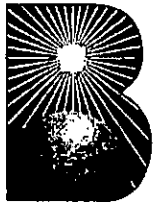
## DETAILS

|                 |                     |        |
|-----------------|---------------------|--------|
| State ID        | 1209724153          | MAP ID |
| Banks ID        | 1709700077          | 15     |
| Owner Of Well   | Si Henarichs Agency |        |
| Type Of Well    | N/A                 |        |
| Depth Drilled   | 138'                |        |
| Completion Date | 11/12/1973          |        |
| Longitude       | -87.82705           |        |
| Latitude        | 42.4684             |        |

|                 |            |        |
|-----------------|------------|--------|
| State ID        | 1209726697 | MAP ID |
| Banks ID        | 1709700080 | 16     |
| Owner Of Well   | [REDACTED] |        |
| Type Of Well    | N/A        |        |
| Depth Drilled   | 145'       |        |
| Completion Date | 9/21/1978  |        |
| Longitude       | [REDACTED] |        |
| Latitude        | [REDACTED] |        |

|                 |            |        |
|-----------------|------------|--------|
| State ID        | 1209726818 | MAP ID |
| Banks ID        | 1709700081 | 17     |
| Owner Of Well   | [REDACTED] |        |
| Type Of Well    | N/A        |        |
| Depth Drilled   | 274'       |        |
| Completion Date | 12/1/1977  |        |
| Longitude       | [REDACTED] |        |
| Latitude        | [REDACTED] |        |

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|                 |
|-----------------|
| State ID        |
| Banks ID        |
| Owner Of Well   |
| Type Of Well    |
| Depth Drilled   |
| Completion Date |
| Longitude       |
| Latitude        |

|            |
|------------|
| 1209725157 |
| 1709700073 |
| [REDACTED] |
| N/A        |
| 190'       |
| 12/1/1976  |
| [REDACTED] |
| [REDACTED] |

|        |
|--------|
| MAP ID |
| 13     |

|                 |
|-----------------|
| State ID        |
| Banks ID        |
| Owner Of Well   |
| Type Of Well    |
| Depth Drilled   |
| Completion Date |
| Longitude       |
| Latitude        |

|            |
|------------|
| 1209727962 |
| 1709700084 |
| [REDACTED] |
| N/A        |
| 168'       |
| 2/14/1986  |
| [REDACTED] |
| [REDACTED] |

|        |
|--------|
| MAP ID |
| 13     |

|                 |
|-----------------|
| State ID        |
| Banks ID        |
| Owner Of Well   |
| Type Of Well    |
| Depth Drilled   |
| Completion Date |
| Longitude       |
| Latitude        |

|                             |
|-----------------------------|
| 1209733750                  |
| 1709700087                  |
| Veterans Administration 265 |
| N/A                         |
| 150'                        |
| 12/8/1983                   |
| -87.82514                   |
| 42.46636                    |

|        |
|--------|
| MAP ID |
| 12     |

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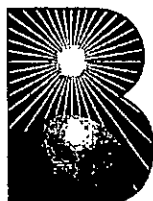
## DETAILS

|                 |            |        |
|-----------------|------------|--------|
| State ID        | 1209702287 | MAP ID |
| Banks ID        | 1709700090 | 20     |
| Owner Of Well   | [REDACTED] |        |
| Type Of Well    | N/A        |        |
| Depth Drilled   | 119'       |        |
| Completion Date | 1/1/1940   |        |
| Longitude       | [REDACTED] |        |
| Latitude        | [REDACTED] |        |

|                 |            |        |
|-----------------|------------|--------|
| State ID        | 1209727833 | MAP ID |
| Banks ID        | 1709700108 | 20     |
| Owner Of Well   | [REDACTED] |        |
| Type Of Well    | N/A        |        |
| Depth Drilled   | 55'        |        |
| Completion Date | 11/30/1985 |        |
| Longitude       | [REDACTED] |        |
| Latitude        | [REDACTED] |        |

|                 |            |        |
|-----------------|------------|--------|
| State ID        | 1209702288 | MAP ID |
| Banks ID        | 1709700091 | 21     |
| Owner Of Well   | Camp Logan |        |
| Type Of Well    | N/A        |        |
| Depth Drilled   | 110'       |        |
| Completion Date | 1/1/1941   |        |
| Longitude       | -87.80954  |        |
| Latitude        | 42.46519   |        |

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|                 |            |        |
|-----------------|------------|--------|
| State ID        | 1209702615 | MAP ID |
| Banks ID        | 1709700094 |        |
| Owner Of Well   | [REDACTED] |        |
| Type Of Well    | N/A        |        |
| Depth Drilled   | 66'        |        |
| Completion Date | 1/1/1963   |        |
| Longitude       | [REDACTED] |        |
| Latitude        | [REDACTED] |        |

|                 |            |        |
|-----------------|------------|--------|
| State ID        | 1209702796 | MAP ID |
| Banks ID        | 1709700096 | 23     |
| Owner Of Well   | [REDACTED] |        |
| Type Of Well    | N/A        |        |
| Depth Drilled   | 160'       |        |
| Completion Date | 8/11/1968  |        |
| Longitude       | [REDACTED] |        |
| Latitude        | [REDACTED] |        |

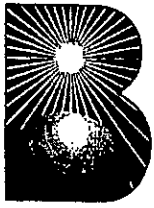
|                 |            |        |
|-----------------|------------|--------|
| State ID        | 1209702797 | MAP ID |
| Banks ID        | 1709700097 |        |
| Owner Of Well   | [REDACTED] |        |
| Type Of Well    | N/A        |        |
| Depth Drilled   | 80'        |        |
| Completion Date | 4/5/1968   |        |
| Longitude       | [REDACTED] |        |
| Latitude        | [REDACTED] |        |

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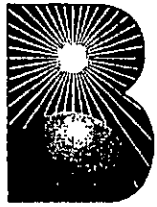
## DETAILS

|                 |            |        |
|-----------------|------------|--------|
| State ID        | 1209725066 | MAP ID |
| Banks ID        | 1709700098 | 25     |
| Owner Of Well   | [REDACTED] |        |
| Type Of Well    | N/A        |        |
| Depth Drilled   | 127'       |        |
| Completion Date | 11/18/1976 |        |
| Longitude       | [REDACTED] |        |
| Latitude        | [REDACTED] |        |

|                 |            |        |
|-----------------|------------|--------|
| State ID        | 1209702614 | MAP ID |
| Banks ID        | 1709700093 | 26     |
| Owner Of Well   | [REDACTED] |        |
| Type Of Well    | N/A        |        |
| Depth Drilled   | 130'       |        |
| Completion Date | 1/1/1963   |        |
| Longitude       | [REDACTED] |        |
| Latitude        | [REDACTED] |        |

|                 |                          |        |
|-----------------|--------------------------|--------|
| State ID        | 1209703882               | MAP ID |
| Banks ID        | 1709700101               | 27     |
| Owner Of Well   | Pitcher Construction Co. |        |
| Type Of Well    | N/A                      |        |
| Depth Drilled   | 138'                     |        |
| Completion Date | 4/3/1973                 |        |
| Longitude       | -87.81686                |        |
| Latitude        | 42.47065                 |        |

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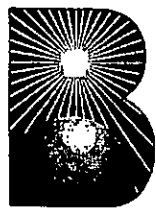
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|-----------------|------------|--------|
| State ID        | 1209703416 | MAP ID |
| Banks ID        | 1709700104 | 26     |
| Owner Of Well   | [REDACTED] |        |
| Type Of Well    | N/A        |        |
| Depth Drilled   | 141'       |        |
| Completion Date | 11/1/1971  |        |
| Longitude       | [REDACTED] |        |
| Latitude        | [REDACTED] |        |

|                 |                   |        |
|-----------------|-------------------|--------|
| State ID        | 1209724152        | MAP ID |
| Banks ID        | 1709700105        | 27     |
| Owner Of Well   | Sihendrick Agency |        |
| Type Of Well    | N/A               |        |
| Depth Drilled   | 266'              |        |
| Completion Date | 1/1/1974          |        |
| Longitude       | -87.82027         |        |
| Latitude        | 42.4628           |        |

|                 |            |        |
|-----------------|------------|--------|
| State ID        | 1209702616 | MAP ID |
| Banks ID        | 1709700095 | 28     |
| Owner Of Well   | [REDACTED] |        |
| Type Of Well    | N/A        |        |
| Depth Drilled   | 177'       |        |
| Completion Date | 1/1/1963   |        |
| Longitude       | [REDACTED] |        |
| Latitude        | [REDACTED] |        |

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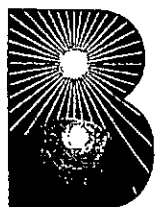
## DETAILS

|                 |            |        |
|-----------------|------------|--------|
| State ID        | 1209703881 | MAP ID |
| Banks ID        | 1709700100 | 28     |
| Owner Of Well   | [REDACTED] |        |
| Type Of Well    | N/A        |        |
| Depth Drilled   | 134'       |        |
| Completion Date | 6/2/1972   |        |
| Longitude       | [REDACTED] |        |
| Latitude        | [REDACTED] |        |

|                 |            |        |
|-----------------|------------|--------|
| State ID        | 1209703921 | MAP ID |
| Banks ID        | 1709700102 | 28     |
| Owner Of Well   | [REDACTED] |        |
| Type Of Well    | N/A        |        |
| Depth Drilled   | 143'       |        |
| Completion Date | 5/1/1973   |        |
| Longitude       | [REDACTED] |        |
| Latitude        | [REDACTED] |        |

|                 |                |        |
|-----------------|----------------|--------|
| State ID        | 1209724846     | MAP ID |
| Banks ID        | 1709700106     | 28     |
| Owner Of Well   | Busch & Larson |        |
| Type Of Well    | N/A            |        |
| Depth Drilled   | 199'           |        |
| Completion Date | 6/12/1976      |        |
| Longitude       | -87.81931      |        |
| Latitude        | 42.46291       |        |

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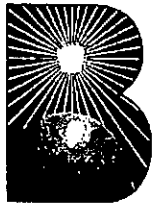
## DETAILS

|                 |            |        |
|-----------------|------------|--------|
| State ID        | 1209724252 | MAP ID |
| Banks ID        | 1709700107 | 29     |
| Owner Of Well   | [REDACTED] |        |
| Type Of Well    | N/A        |        |
| Depth Drilled   | 167'       |        |
| Completion Date | 7/1/1974   |        |
| Longitude       | [REDACTED] |        |
| Latitude        | [REDACTED] |        |

|                 |            |        |
|-----------------|------------|--------|
| State ID        | 1209729270 | MAP ID |
| Banks ID        | 1709700109 | 30     |
| Owner Of Well   | [REDACTED] |        |
| Type Of Well    | N/A        |        |
| Depth Drilled   | 46'        |        |
| Completion Date | 3/3/1987   |        |
| Longitude       | [REDACTED] |        |
| Latitude        | [REDACTED] |        |

|                 |            |        |
|-----------------|------------|--------|
| State ID        | 1209728125 | MAP ID |
| Banks ID        | 1709700110 | 31     |
| Owner Of Well   | [REDACTED] |        |
| Type Of Well    | N/A        |        |
| Depth Drilled   | 136'       |        |
| Completion Date | 5/15/1986  |        |
| Longitude       | [REDACTED] |        |
| Latitude        | [REDACTED] |        |

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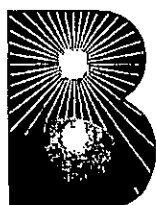
## DETAILS

|                 |            |        |
|-----------------|------------|--------|
| State ID        | 1209703077 | MAP ID |
| Banks ID        | 1709700092 | 32     |
| Owner Of Well   | [REDACTED] |        |
| Type Of Well    | N/A        |        |
| Depth Drilled   | 77'        |        |
| Completion Date | 1/1/1971   |        |
| Longitude       | [REDACTED] |        |
| Latitude        | [REDACTED] |        |

|                 |            |        |
|-----------------|------------|--------|
| State ID        | 1209724431 | MAP ID |
| Banks ID        | 1709700099 | 32     |
| Owner Of Well   | [REDACTED] |        |
| Type Of Well    | N/A        |        |
| Depth Drilled   | 61'        |        |
| Completion Date | 4/1/1975   |        |
| Longitude       | [REDACTED] |        |
| Latitude        | [REDACTED] |        |

|                 |            |        |
|-----------------|------------|--------|
| State ID        | 1209703357 | MAP ID |
| Banks ID        | 1709700103 | 32     |
| Owner Of Well   | [REDACTED] |        |
| Type Of Well    | N/A        |        |
| Depth Drilled   | 147'       |        |
| Completion Date | 9/1/1971   |        |
| Longitude       | [REDACTED] |        |
| Latitude        | [REDACTED] |        |

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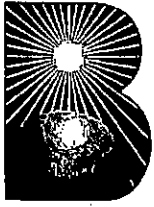
## DETAILS

|                 |            |        |
|-----------------|------------|--------|
| State ID        | 1209731926 | MAP ID |
| Banks ID        | 1709700111 |        |
| Owner Of Well   | [REDACTED] |        |
| Type Of Well    | N/A        |        |
| Depth Drilled   | 56'        |        |
| Completion Date | 2/10/1989  |        |
| Longitude       | [REDACTED] |        |
| Latitude        | [REDACTED] |        |

|                 |            |        |
|-----------------|------------|--------|
| State ID        | 1209733748 | MAP ID |
| Banks ID        | 1709700113 |        |
| Owner Of Well   | [REDACTED] |        |
| Type Of Well    | N/A        |        |
| Depth Drilled   | 49'        |        |
| Completion Date | 5/24/1979  |        |
| Longitude       | [REDACTED] |        |
| Latitude        | [REDACTED] |        |

|                 |            |        |
|-----------------|------------|--------|
| State ID        | 1209733747 | MAP ID |
| Banks ID        | 1709700112 |        |
| Owner Of Well   | [REDACTED] |        |
| Type Of Well    | N/A        |        |
| Depth Drilled   | 89'        |        |
| Completion Date | 4/2/1979   |        |
| Longitude       | [REDACTED] |        |
| Latitude        | [REDACTED] |        |

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## DETAILS

|                 |            |        |
|-----------------|------------|--------|
| State ID        | 1209733749 | MAP ID |
| Banks ID        | 1709700114 | 34     |
| Owner Of Well   | [REDACTED] |        |
| Type Of Well    | N/A        |        |
| Depth Drilled   | 116'       |        |
| Completion Date | 4/5/1977   |        |
| Longitude       | [REDACTED] |        |
| Latitude        | [REDACTED] |        |

|                 |            |        |
|-----------------|------------|--------|
| State ID        | 1209702911 | MAP ID |
| Banks ID        | 1709700115 | 35     |
| Owner Of Well   | [REDACTED] |        |
| Type Of Well    | N/A        |        |
| Depth Drilled   | 123'       |        |
| Completion Date | 7/3/1969   |        |
| Longitude       | [REDACTED] |        |
| Latitude        | [REDACTED] |        |

|                 |            |        |
|-----------------|------------|--------|
| State ID        | 1209702795 | MAP ID |
| Banks ID        | 1709700117 | 37     |
| Owner Of Well   | [REDACTED] |        |
| Type Of Well    | N/A        |        |
| Depth Drilled   | 180'       |        |
| Completion Date | 11/15/1968 |        |
| Longitude       | [REDACTED] |        |
| Latitude        | [REDACTED] |        |

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## DETAILS

|                 |            |        |
|-----------------|------------|--------|
| State ID        | 1209702993 | MAP ID |
| Banks ID        | 1709700116 | 36     |
| Owner Of Well   | [REDACTED] |        |
| Type Of Well    | N/A        |        |
| Depth Drilled   | 125'       |        |
| Completion Date | 11/21/1969 |        |
| Longitude       | [REDACTED] |        |
| Latitude        | [REDACTED] |        |

|                 |                      |        |
|-----------------|----------------------|--------|
| State ID        | 1209733746           | MAP ID |
| Banks ID        | 1709700118           | 37     |
| Owner Of Well   | Progressive Builders |        |
| Type Of Well    | N/A                  |        |
| Depth Drilled   | 104'                 |        |
| Completion Date | 9/27/1979            |        |
| Longitude       | -87.80505            |        |
| Latitude        | 42.46026             |        |

|                 |            |        |
|-----------------|------------|--------|
| State ID        | 1209702454 | MAP ID |
| Banks ID        | 1709700123 | 38     |
| Owner Of Well   | [REDACTED] |        |
| Type Of Well    | N/A        |        |
| Depth Drilled   | 225'       |        |
| Completion Date | 2/1/1968   |        |
| Longitude       | [REDACTED] |        |
| Latitude        | [REDACTED] |        |

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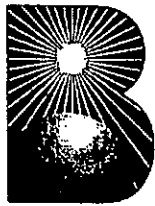
## DETAILS

|                 |            |        |
|-----------------|------------|--------|
| State ID        | 1209702802 | MAP ID |
| Banks ID        | 1709700128 | 39     |
| Owner Of Well   | [REDACTED] |        |
| Type Of Well    | N/A        |        |
| Depth Drilled   | 147'       |        |
| Completion Date | 11/1/1968  |        |
| Longitude       | [REDACTED] |        |
| Latitude        | [REDACTED] |        |

|                 |            |        |
|-----------------|------------|--------|
| State ID        | 1209733862 | MAP ID |
| Banks ID        | 1709700191 | 39     |
| Owner Of Well   | [REDACTED] |        |
| Type Of Well    | N/A        |        |
| Depth Drilled   | 156'       |        |
| Completion Date | 10/5/1979  |        |
| Longitude       | [REDACTED] |        |
| Latitude        | [REDACTED] |        |

|                 |            |        |
|-----------------|------------|--------|
| State ID        | 1209702803 | MAP ID |
| Banks ID        | 1709700129 | 40     |
| Owner Of Well   | [REDACTED] |        |
| Type Of Well    | N/A        |        |
| Depth Drilled   | 146'       |        |
| Completion Date | 12/1/1968  |        |
| Longitude       | [REDACTED] |        |
| Latitude        | [REDACTED] |        |

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|                 |            |        |
|-----------------|------------|--------|
| State ID        | 1209733861 | MAP ID |
| Banks ID        | 1709700190 | 40     |
| Owner Of Well   | [REDACTED] |        |
| Type Of Well    | N/A        |        |
| Depth Drilled   | 195'       |        |
| Completion Date | 5/25/1979  |        |
| Longitude       | [REDACTED] |        |
| Latitude        | [REDACTED] |        |

|                 |                |        |
|-----------------|----------------|--------|
| State ID        | 1209735998     | MAP ID |
| Banks ID        | 1709700209     | 40     |
| Owner Of Well   | J & E Builders |        |
| Type Of Well    | N/A            |        |
| Depth Drilled   | 160'           |        |
| Completion Date | 8/9/1990       |        |
| Longitude       | -87.82687      |        |
| Latitude        | 42.43084       |        |

|                 |            |        |
|-----------------|------------|--------|
| State ID        | 1209736004 | MAP ID |
| Banks ID        | 1709700215 | 40     |
| Owner Of Well   | [REDACTED] |        |
| Type Of Well    | N/A        |        |
| Depth Drilled   | 163'       |        |
| Completion Date | 4/12/1989  |        |
| Longitude       | [REDACTED] |        |
| Latitude        | [REDACTED] |        |

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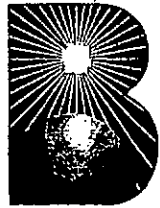
## DETAILS

|                 |            |        |
|-----------------|------------|--------|
| State ID        | 1209736295 | MAP ID |
| Banks ID        | 1709700218 |        |
| Owner Of Well   | [REDACTED] |        |
| Type Of Well    | N/A        |        |
| Depth Drilled   | 187'       |        |
| Completion Date | 7/19/1991  |        |
| Longitude       | [REDACTED] |        |
| Latitude        | [REDACTED] |        |

|                 |                |        |
|-----------------|----------------|--------|
| State ID        | 1209725067     | MAP ID |
| Banks ID        | 1709700130     |        |
| Owner Of Well   | Busch & Larson |        |
| Type Of Well    | N/A            |        |
| Depth Drilled   | 198'           |        |
| Completion Date | 11/1/1976      |        |
| Longitude       | -87.83021      |        |
| Latitude        | 42.43512       |        |

|                 |            |        |
|-----------------|------------|--------|
| State ID        | 1209724432 | MAP ID |
| Banks ID        | 1709700131 |        |
| Owner Of Well   | [REDACTED] |        |
| Type Of Well    | N/A        |        |
| Depth Drilled   | 220'       |        |
| Completion Date | 12/5/1975  |        |
| Longitude       | [REDACTED] |        |
| Latitude        | [REDACTED] |        |

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|                 |            |        |
|-----------------|------------|--------|
| State ID        | 1209738419 | MAP ID |
| Banks ID        | 1709700231 |        |
| Owner Of Well   | [REDACTED] |        |
| Type Of Well    | N/A        |        |
| Depth Drilled   | 165'       |        |
| Completion Date | 7/20/1994  |        |
| Longitude       | [REDACTED] |        |
| Latitude        | [REDACTED] |        |

|                 |            |        |
|-----------------|------------|--------|
| State ID        | 1209737098 | MAP ID |
| Banks ID        | 1709700237 |        |
| Owner Of Well   | [REDACTED] |        |
| Type Of Well    | N/A        |        |
| Depth Drilled   | 159'       |        |
| Completion Date | 8/10/1992  |        |
| Longitude       | [REDACTED] |        |
| Latitude        | [REDACTED] |        |

|                 |                     |        |
|-----------------|---------------------|--------|
| State ID        | 1209745167          | MAP ID |
| Banks ID        | 1709700240          |        |
| Owner Of Well   | Extra Value Liquors |        |
| Type Of Well    | Public Supply       |        |
| Depth Drilled   | 0'                  |        |
| Completion Date | N/A                 |        |
| Longitude       | -87.82689           |        |
| Latitude        | 42.42902            |        |

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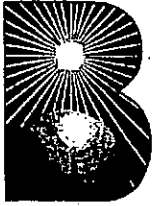
## DETAILS

|                 |               |        |
|-----------------|---------------|--------|
| State ID        | 1209745166    | MAP ID |
| Banks ID        | 1709700241    |        |
| Owner Of Well   | Al's Tap      |        |
| Type Of Well    | Public Supply |        |
| Depth Drilled   | 0'            |        |
| Completion Date | N/A           |        |
| Longitude       | -87.82684     |        |
| Latitude        | 42.42902      |        |

|                 |            |        |
|-----------------|------------|--------|
| State ID        | 1209725159 | MAP ID |
| Banks ID        | 1709700133 | 43     |
| Owner Of Well   | [REDACTED] |        |
| Type Of Well    | N/A        |        |
| Depth Drilled   | 152'       |        |
| Completion Date | 2/1/1977   |        |
| Longitude       | [REDACTED] |        |
| Latitude        | [REDACTED] |        |

|                 |            |        |
|-----------------|------------|--------|
| State ID        | 1209703079 | MAP ID |
| Banks ID        | 1709700138 | 44     |
| Owner Of Well   | [REDACTED] |        |
| Type Of Well    | N/A        |        |
| Depth Drilled   | 165'       |        |
| Completion Date | 1/1/1971   |        |
| Longitude       | [REDACTED] |        |
| Latitude        | [REDACTED] |        |

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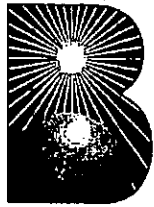
## DETAILS

|                 |            |        |
|-----------------|------------|--------|
| State ID        | 1209703281 | MAP ID |
| Banks ID        | 1709700144 |        |
| Owner Of Well   | [REDACTED] |        |
| Type Of Well    | N/A        |        |
| Depth Drilled   | 65'        |        |
| Completion Date | 5/1/1971   |        |
| Longitude       | [REDACTED] |        |
| Latitude        | [REDACTED] |        |

|                 |            |        |
|-----------------|------------|--------|
| State ID        | 1209702623 | MAP ID |
| Banks ID        | 1709700125 |        |
| Owner Of Well   | [REDACTED] |        |
| Type Of Well    | N/A        |        |
| Depth Drilled   | 185'       |        |
| Completion Date | 1/1/1963   |        |
| Longitude       | [REDACTED] |        |
| Latitude        | [REDACTED] |        |

|                 |                |        |
|-----------------|----------------|--------|
| State ID        | 1209724711     | MAP ID |
| Banks ID        | 1709700146     |        |
| Owner Of Well   | Hamms Concrete |        |
| Type Of Well    | N/A            |        |
| Depth Drilled   | 232'           |        |
| Completion Date | 10/1/1974      |        |
| Longitude       | -87.83257      |        |
| Latitude        | 42.43445       |        |

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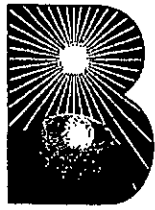
## DETAILS

|                 |            |        |
|-----------------|------------|--------|
| State ID        | 1209729070 | MAP ID |
| Banks ID        | 1709700164 | 245    |
| Owner Of Well   | [REDACTED] |        |
| Type Of Well    | N/A        |        |
| Depth Drilled   | 215'       |        |
| Completion Date | 2/9/1987   |        |
| Longitude       | [REDACTED] |        |
| Latitude        | [REDACTED] |        |

|                 |            |        |
|-----------------|------------|--------|
| State ID        | 1209738345 | MAP ID |
| Banks ID        | 1709700227 | 242    |
| Owner Of Well   | [REDACTED] |        |
| Type Of Well    | N/A        |        |
| Depth Drilled   | 190'       |        |
| Completion Date | 7/6/1994   |        |
| Longitude       | [REDACTED] |        |
| Latitude        | [REDACTED] |        |

|                 |            |        |
|-----------------|------------|--------|
| State ID        | 1209737096 | MAP ID |
| Banks ID        | 1709700235 | 244    |
| Owner Of Well   | [REDACTED] |        |
| Type Of Well    | N/A        |        |
| Depth Drilled   | 269'       |        |
| Completion Date | 6/25/1992  |        |
| Longitude       | [REDACTED] |        |
| Latitude        | [REDACTED] |        |

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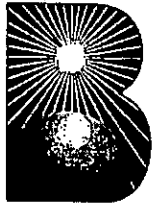
## DETAILS

|                 |            |        |
|-----------------|------------|--------|
| State ID        | 1209702625 | MAP ID |
| Banks ID        | 1709700127 | 45     |
| Owner Of Well   | [REDACTED] |        |
| Type Of Well    | N/A        |        |
| Depth Drilled   | 176'       |        |
| Completion Date | 1/1/1963   |        |
| Longitude       | [REDACTED] |        |
| Latitude        | [REDACTED] |        |

|                 |            |        |
|-----------------|------------|--------|
| State ID        | 1209727858 | MAP ID |
| Banks ID        | 1709700168 | 45     |
| Owner Of Well   | [REDACTED] |        |
| Type Of Well    | N/A        |        |
| Depth Drilled   | 174'       |        |
| Completion Date | 3/13/1986  |        |
| Longitude       | [REDACTED] |        |
| Latitude        | [REDACTED] |        |

|                 |            |        |
|-----------------|------------|--------|
| State ID        | 1209737741 | MAP ID |
| Banks ID        | 1709700229 | 45     |
| Owner Of Well   | [REDACTED] |        |
| Type Of Well    | N/A        |        |
| Depth Drilled   | 180'       |        |
| Completion Date | 8/5/1993   |        |
| Longitude       | [REDACTED] |        |
| Latitude        | [REDACTED] |        |

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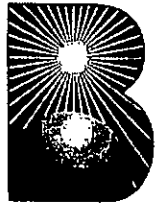
## DETAILS

|                 |                   |        |
|-----------------|-------------------|--------|
| State ID        | 1209701450        | MAP ID |
| Banks ID        | 1709700119        |        |
| Owner Of Well   | Lotz Construction |        |
| Type Of Well    | N/A               |        |
| Depth Drilled   | 144'              |        |
| Completion Date | 6/1/1970          |        |
| Longitude       | -87.82746         |        |
| Latitude        | 42.43267          |        |

|                 |            |        |
|-----------------|------------|--------|
| State ID        | 1209729422 | MAP ID |
| Banks ID        | 1709700172 | 46     |
| Owner Of Well   | [REDACTED] |        |
| Type Of Well    | N/A        |        |
| Depth Drilled   | 150'       |        |
| Completion Date | 6/16/1987  |        |
| Longitude       | [REDACTED] |        |
| Latitude        | [REDACTED] |        |

|                 |            |        |
|-----------------|------------|--------|
| State ID        | 1209733854 | MAP ID |
| Banks ID        | 1709700183 | 46     |
| Owner Of Well   | [REDACTED] |        |
| Type Of Well    | N/A        |        |
| Depth Drilled   | 142'       |        |
| Completion Date | 8/12/1980  |        |
| Longitude       | [REDACTED] |        |
| Latitude        | [REDACTED] |        |

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|                 |                |        |
|-----------------|----------------|--------|
| State ID        | 1209735994     | MAP ID |
| Banks ID        | 1709700205     | 46     |
| Owner Of Well   | C & S Builders |        |
| Type Of Well    | N/A            |        |
| Depth Drilled   | 157'           |        |
| Completion Date | 1/10/1991      |        |
| Longitude       | -87.82925      |        |
| Latitude        | 42.43267       |        |

|                 |            |        |
|-----------------|------------|--------|
| State ID        | 1209735996 | MAP ID |
| Banks ID        | 1709700207 | 46     |
| Owner Of Well   | [REDACTED] |        |
| Type Of Well    | N/A        |        |
| Depth Drilled   | 43'        |        |
| Completion Date | 9/20/1990  |        |
| Longitude       | [REDACTED] |        |
| Latitude        | [REDACTED] |        |

|                 |            |        |
|-----------------|------------|--------|
| State ID        | 1209736294 | MAP ID |
| Banks ID        | 1709700217 | 46     |
| Owner Of Well   | [REDACTED] |        |
| Type Of Well    | N/A        |        |
| Depth Drilled   | 180'       |        |
| Completion Date | 6/1/1991   |        |
| Longitude       | [REDACTED] |        |
| Latitude        | [REDACTED] |        |

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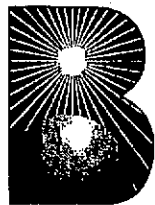
## DETAILS

|                 |            |       |
|-----------------|------------|-------|
| State ID        | 1209728546 | MAFID |
| Banks ID        | 1709700153 |       |
| Owner Of Well   | [REDACTED] |       |
| Type Of Well    | N/A        |       |
| Depth Drilled   | 225'       |       |
| Completion Date | 10/7/1986  |       |
| Longitude       | [REDACTED] |       |
| Latitude        | [REDACTED] |       |

|                 |            |       |
|-----------------|------------|-------|
| State ID        | 1209730365 | MAFID |
| Banks ID        | 1709700165 |       |
| Owner Of Well   | [REDACTED] |       |
| Type Of Well    | N/A        |       |
| Depth Drilled   | 153'       |       |
| Completion Date | 4/25/1988  |       |
| Longitude       | [REDACTED] |       |
| Latitude        | [REDACTED] |       |

|                 |               |       |
|-----------------|---------------|-------|
| State ID        | 1209733858    | MAFID |
| Banks ID        | 1709700187    |       |
| Owner Of Well   | R.L. Humphres |       |
| Type Of Well    | N/A           |       |
| Depth Drilled   | 155'          |       |
| Completion Date | 6/28/1976     |       |
| Longitude       | -87.83052     |       |
| Latitude        | 42.43177      |       |

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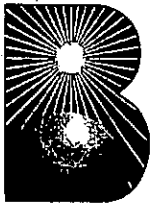
## DETAILS

|                 |            |        |
|-----------------|------------|--------|
| State ID        | 1209733860 | MAP ID |
| Banks ID        | 1709700189 |        |
| Owner Of Well   | [REDACTED] |        |
| Type Of Well    | N/A        |        |
| Depth Drilled   | 170'       |        |
| Completion Date | 11/15/1980 |        |
| Longitude       | [REDACTED] |        |
| Latitude        | [REDACTED] |        |

|                 |                      |        |
|-----------------|----------------------|--------|
| State ID        | 1209733865           | MAP ID |
| Banks ID        | 1709700194           | 47     |
| Owner Of Well   | Pitcher Construction |        |
| Type Of Well    | N/A                  |        |
| Depth Drilled   | 166'                 |        |
| Completion Date | 2/24/1975            |        |
| Longitude       | -87.83052            |        |
| Latitude        | 42.43177             |        |

|                 |                      |        |
|-----------------|----------------------|--------|
| State ID        | 1209733866           | MAP ID |
| Banks ID        | 1709700195           | 47     |
| Owner Of Well   | Pitcher Construction |        |
| Type Of Well    | N/A                  |        |
| Depth Drilled   | 166'                 |        |
| Completion Date | 6/16/1975            |        |
| Longitude       | -87.83052            |        |
| Latitude        | 42.43177             |        |

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## DETAILS

|                 |                          |        |
|-----------------|--------------------------|--------|
| State ID        | 1209733867               | MAP ID |
| Bank ID         | 1709700196               |        |
| Owner Of Well   | Pitcher Construction Co. |        |
| Type Of Well    | N/A                      |        |
| Depth Drilled   | 169'                     |        |
| Completion Date | 10/11/1976               |        |
| Longitude       | -87.83047                |        |
| Latitude        | 42.43177                 |        |

|                 |                   |        |
|-----------------|-------------------|--------|
| State ID        | 1209736002        | MAP ID |
| Bank ID         | 1709700213        |        |
| Owner Of Well   | Lucy's Appliances |        |
| Type Of Well    | N/A               |        |
| Depth Drilled   | 155'              |        |
| Completion Date | 11/9/1990         |        |
| Longitude       | -87.83052         |        |
| Latitude        | 42.43177          |        |

|                 |            |        |
|-----------------|------------|--------|
| State ID        | 1209736005 | MAP ID |
| Bank ID         | 1709700216 |        |
| Owner Of Well   | [REDACTED] |        |
| Type Of Well    | N/A        |        |
| Depth Drilled   | 166'       |        |
| Completion Date | 9/28/1990  |        |
| Longitude       | [REDACTED] |        |
| Latitude        | [REDACTED] |        |

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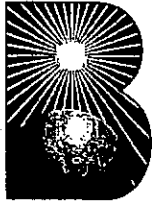
## DETAILS

|                 |            |        |
|-----------------|------------|--------|
| State ID        | 1209738700 | MAP ID |
| Banks ID        | 1709700199 | 48     |
| Owner Of Well   | [REDACTED] |        |
| Type Of Well    | N/A        |        |
| Depth Drilled   | 180'       |        |
| Completion Date | 9/15/1983  |        |
| Longitude       | [REDACTED] |        |
| Latitude        | [REDACTED] |        |

|                 |            |        |
|-----------------|------------|--------|
| State ID        | 1209724485 | MAP ID |
| Banks ID        | 1709700135 | 49     |
| Owner Of Well   | [REDACTED] |        |
| Type Of Well    | N/A        |        |
| Depth Drilled   | 186'       |        |
| Completion Date | 8/1/1975   |        |
| Longitude       | [REDACTED] |        |
| Latitude        | [REDACTED] |        |

|                 |            |        |
|-----------------|------------|--------|
| State ID        | 1209724592 | MAP ID |
| Banks ID        | 1709700139 | 49     |
| Owner Of Well   | [REDACTED] |        |
| Type Of Well    | N/A        |        |
| Depth Drilled   | 173'       |        |
| Completion Date | 9/1/1975   |        |
| Longitude       | [REDACTED] |        |
| Latitude        | [REDACTED] |        |

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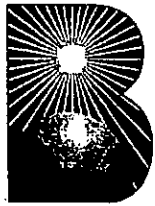
## DETAILS

|                 |            |        |
|-----------------|------------|--------|
| State ID        | 1209703922 | MAP ID |
| Banks ID        | 1709700143 | 70     |
| Owner Of Well   | [REDACTED] |        |
| Type Of Well    | N/A        |        |
| Depth Drilled   | 176'       |        |
| Completion Date | 5/1/1973   |        |
| Longitude       | [REDACTED] |        |
| Latitude        | [REDACTED] |        |

|                 |            |        |
|-----------------|------------|--------|
| State ID        | 1209727421 | MAP ID |
| Banks ID        | 1709700156 | 716    |
| Owner Of Well   | [REDACTED] |        |
| Type Of Well    | N/A        |        |
| Depth Drilled   | 175'       |        |
| Completion Date | 7/31/1985  |        |
| Longitude       | [REDACTED] |        |
| Latitude        | [REDACTED] |        |

|                 |                 |        |
|-----------------|-----------------|--------|
| State ID        | 1209727949      | MAP ID |
| Banks ID        | 1709700171      | 707    |
| Owner Of Well   | Brooks Builders |        |
| Type Of Well    | N/A             |        |
| Depth Drilled   | 194'            |        |
| Completion Date | 4/1/1986        |        |
| Longitude       | -87.83044       |        |
| Latitude        | 42.42855        |        |

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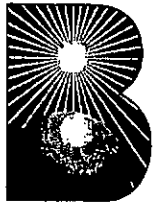
## DETAILS

|                 |            |        |
|-----------------|------------|--------|
| State ID        | 1209735999 | MAP ID |
| Banks ID        | 1709700210 | 49     |
| Owner Of Well   | [REDACTED] |        |
| Type Of Well    | N/A        |        |
| Depth Drilled   | 168'       |        |
| Completion Date | 4/27/1990  |        |
| Longitude       | [REDACTED] |        |
| Latitude        | [REDACTED] |        |

|                 |            |        |
|-----------------|------------|--------|
| State ID        | 1209736000 | MAP ID |
| Banks ID        | 1709700211 | 49     |
| Owner Of Well   | [REDACTED] |        |
| Type Of Well    | N/A        |        |
| Depth Drilled   | 200'       |        |
| Completion Date | 3/22/1990  |        |
| Longitude       | [REDACTED] |        |
| Latitude        | [REDACTED] |        |

|                 |            |        |
|-----------------|------------|--------|
| State ID        | 1209736001 | MAP ID |
| Banks ID        | 1709700212 | 49     |
| Owner Of Well   | [REDACTED] |        |
| Type Of Well    | N/A        |        |
| Depth Drilled   | 156'       |        |
| Completion Date | 10/27/1989 |        |
| Longitude       | [REDACTED] |        |
| Latitude        | [REDACTED] |        |

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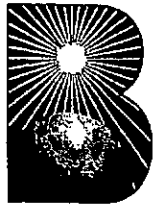
## DETAILS

|                 |            |        |
|-----------------|------------|--------|
| State ID        | 1209726713 | MAP ID |
| Banks ID        | 1709700163 | 50     |
| Owner Of Well   | [REDACTED] |        |
| Type Of Well    | N/A        |        |
| Depth Drilled   | 160'       |        |
| Completion Date | 8/1/1978   |        |
| Longitude       | [REDACTED] |        |
| Latitude        | [REDACTED] |        |

|                 |            |        |
|-----------------|------------|--------|
| State ID        | 1209737885 | MAP ID |
| Banks ID        | 1709700221 |        |
| Owner Of Well   | [REDACTED] |        |
| Type Of Well    | N/A        |        |
| Depth Drilled   | 175'       |        |
| Completion Date | 10/15/1993 |        |
| Longitude       | [REDACTED] |        |
| Latitude        | [REDACTED] |        |

|                 |              |        |
|-----------------|--------------|--------|
| State ID        | 1209738706   | MAP ID |
| Banks ID        | 1709700223   | 50     |
| Owner Of Well   | Ram Builders |        |
| Type Of Well    | N/A          |        |
| Depth Drilled   | 182'         |        |
| Completion Date | 1/23/1995    |        |
| Longitude       | -87.83414    |        |
| Latitude        | 42.43451     |        |

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## DETAILS

|                 |            |        |
|-----------------|------------|--------|
| State ID        | 1209737740 | MAP ID |
| Banks ID        | 1709700228 | 50     |
| Owner Of Well   | [REDACTED] |        |
| Type Of Well    | N/A        |        |
| Depth Drilled   | 170'       |        |
| Completion Date | 7/2/1993   |        |
| Longitude       | [REDACTED] |        |
| Latitude        | [REDACTED] |        |

|                 |            |        |
|-----------------|------------|--------|
| State ID        | 1209725218 | MAP ID |
| Banks ID        | 1709700136 | 51     |
| Owner Of Well   | [REDACTED] |        |
| Type Of Well    | N/A        |        |
| Depth Drilled   | 167'       |        |
| Completion Date | 4/1/1977   |        |
| Longitude       | [REDACTED] |        |
| Latitude        | [REDACTED] |        |

|                 |            |        |
|-----------------|------------|--------|
| State ID        | 1209727931 | MAP ID |
| Banks ID        | 1709700170 | 51     |
| Owner Of Well   | [REDACTED] |        |
| Type Of Well    | N/A        |        |
| Depth Drilled   | 222'       |        |
| Completion Date | 2/10/1986  |        |
| Longitude       | [REDACTED] |        |
| Latitude        | [REDACTED] |        |

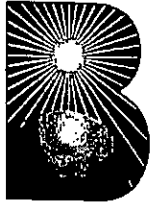
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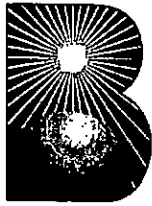
## DETAILS

|                 |            |        |
|-----------------|------------|--------|
| State ID        | 1209736482 | MAP ID |
| Banks ID        | 1709700220 | 51     |
| Owner Of Well   | [REDACTED] |        |
| Type Of Well    | N/A        |        |
| Depth Drilled   | 172'       |        |
| Completion Date | 12/17/1991 |        |
| Longitude       | [REDACTED] |        |
| Latitude        | [REDACTED] |        |

|                 |            |        |
|-----------------|------------|--------|
| State ID        | 1209737425 | MAP ID |
| Banks ID        | 1709700224 | 51     |
| Owner Of Well   | [REDACTED] |        |
| Type Of Well    | N/A        |        |
| Depth Drilled   | 170'       |        |
| Completion Date | 10/2/1992  |        |
| Longitude       | [REDACTED] |        |
| Latitude        | [REDACTED] |        |

|                 |            |        |
|-----------------|------------|--------|
| State ID        | 1209703010 | MAP ID |
| Banks ID        | 1709700120 | 52     |
| Owner Of Well   | [REDACTED] |        |
| Type Of Well    | N/A        |        |
| Depth Drilled   | 190'       |        |
| Completion Date | 10/1/1969  |        |
| Longitude       | [REDACTED] |        |
| Latitude        | [REDACTED] |        |

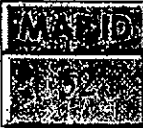
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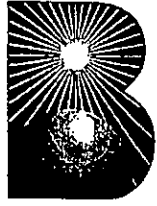
## DETAILS

|                 |            |   |
|-----------------|------------|---|
| State ID        | 1209729906 |  |
| Banks ID        | 1709700157 |   |
| Owner Of Well   | [REDACTED] |   |
| Type Of Well    | N/A        |   |
| Depth Drilled   | 169'       |   |
| Completion Date | 8/17/1987  |   |
| Longitude       | [REDACTED] |   |
| Latitude        | [REDACTED] |   |

|                 |            |  |
|-----------------|------------|--|
| State ID        | 1209727465 |  |
| Banks ID        | 1709700158 |  |
| Owner Of Well   | [REDACTED] |  |
| Type Of Well    | N/A        |  |
| Depth Drilled   | 164'       |  |
| Completion Date | 7/20/1985  |  |
| Longitude       | [REDACTED] |  |
| Latitude        | [REDACTED] |  |

|                 |            |   |
|-----------------|------------|---|
| State ID        | 1209730397 |  |
| Banks ID        | 1709700166 |   |
| Owner Of Well   | [REDACTED] |   |
| Type Of Well    | N/A        |   |
| Depth Drilled   | 196'       |   |
| Completion Date | 11/11/1987 |   |
| Longitude       | [REDACTED] |   |
| Latitude        | [REDACTED] |   |

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## DETAILS

|                 |            |        |
|-----------------|------------|--------|
| State ID        | 1209733855 | MAP ID |
| Banks ID        | 1709700184 | S2     |
| Owner Of Well   | [REDACTED] |        |
| Type Of Well    | N/A        |        |
| Depth Drilled   | 55'        |        |
| Completion Date | 12/23/1982 |        |
| Longitude       | [REDACTED] |        |
| Latitude        | [REDACTED] |        |

|                 |              |        |
|-----------------|--------------|--------|
| State ID        | 1209738624   | MAP ID |
| Banks ID        | 1709700222   | S2     |
| Owner Of Well   | Ram Builders |        |
| Type Of Well    | N/A          |        |
| Depth Drilled   | 172'         |        |
| Completion Date | 9/20/1994    |        |
| Longitude       | -87.83289    |        |
| Latitude        | 42.4336      |        |

|                 |              |        |
|-----------------|--------------|--------|
| State ID        | 1209738151   | MAP ID |
| Banks ID        | 1709700225   | S2     |
| Owner Of Well   | Ram Builders |        |
| Type Of Well    | N/A          |        |
| Depth Drilled   | 170'         |        |
| Completion Date | 3/14/1994    |        |
| Longitude       | -87.83293    |        |
| Latitude        | 42.43365     |        |

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## DETAILS

|                 |            |        |
|-----------------|------------|--------|
| State ID        | 1209702314 | MAP ID |
| Bank ID         | 1709700034 |        |
| Owner of Well   | [REDACTED] |        |
| Type of Well    | N/A        |        |
| Depth in Feet   | 1569'      |        |
| Completion Date | N/A        |        |
| Longitude       | [REDACTED] |        |
| Latitude        | [REDACTED] |        |

|                 |            |        |
|-----------------|------------|--------|
| State ID        | 1209702316 | MAP ID |
| Bank ID         | 1709700032 | 4      |
| Owner of Well   | [REDACTED] |        |
| Type of Well    | N/A        |        |
| Depth in Feet   | 1025'      |        |
| Completion Date | N/A        |        |
| Longitude       | [REDACTED] |        |
| Latitude        | [REDACTED] |        |

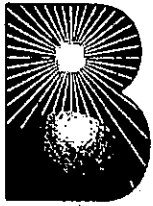
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|-----------------|------------|--------|
| State ID        | 1209702051 | MAP ID |
| Bank ID         | 1709700036 | 4      |
| Owner of Well   | [REDACTED] |        |
| Type of Well    | N/A        |        |
| Depth in Feet   | 175'       |        |
| Completion Date | N/A        |        |
| Longitude       | [REDACTED] |        |
| Latitude        | [REDACTED] |        |

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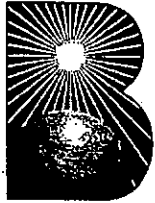
## DETAILS

|                 |            |        |
|-----------------|------------|--------|
| State ID        | 1209737424 | MAP ID |
| Banks ID        | 1709700039 |        |
| Owner Of Well   | [REDACTED] |        |
| Type Of Well    | N/A        |        |
| Depth Drilled   | 180'       |        |
| Completion Date | N/A        |        |
| Longitude       | [REDACTED] |        |
| Latitude        | [REDACTED] |        |

|                 |            |        |
|-----------------|------------|--------|
| State ID        | 1209726844 | MAP ID |
| Banks ID        | 1709700040 |        |
| Owner Of Well   | [REDACTED] |        |
| Type Of Well    | N/A        |        |
| Depth Drilled   | 15'        |        |
| Completion Date | 11/1/1972  |        |
| Longitude       | [REDACTED] |        |
| Latitude        | [REDACTED] |        |

|                 |            |        |
|-----------------|------------|--------|
| State ID        | 1209702319 | MAP ID |
| Banks ID        | 1709700041 |        |
| Owner Of Well   | [REDACTED] |        |
| Type Of Well    | N/A        |        |
| Depth Drilled   | 154'       |        |
| Completion Date | N/A        |        |
| Longitude       | [REDACTED] |        |
| Latitude        | [REDACTED] |        |

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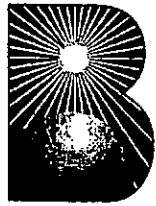
## DETAILS

|                 |            |        |
|-----------------|------------|--------|
| State ID        | 1209727174 | MAP ID |
| Banks ID        | 1709700175 |        |
| Owner Of Well   | [REDACTED] |        |
| Type Of Well    | N/A        |        |
| Depth Drilled   | 220'       |        |
| Completion Date | 3/11/1985  |        |
| Longitude       | [REDACTED] |        |
| Latitude        | [REDACTED] |        |

|                 |                |        |
|-----------------|----------------|--------|
| State ID        | 1209733851     | MAP ID |
| Banks ID        | 1709700180     | 53     |
| Owner Of Well   | Busch & Larson |        |
| Type Of Well    | N/A            |        |
| Depth Drilled   | 198'           |        |
| Completion Date | 3/2/1979       |        |
| Longitude       | -87.82992      |        |
| Latitude        | 42.4311        |        |

|                 |            |        |
|-----------------|------------|--------|
| State ID        | 1209737097 | MAP ID |
| Banks ID        | 1709700236 | 53     |
| Owner Of Well   | [REDACTED] |        |
| Type Of Well    | N/A        |        |
| Depth Drilled   | 168'       |        |
| Completion Date | 6/10/1992  |        |
| Longitude       | [REDACTED] |        |
| Latitude        | [REDACTED] |        |

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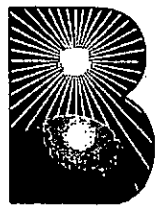
## DETAILS

|                 |            |        |
|-----------------|------------|--------|
| State ID        | 1209727293 | MAP ID |
| Banks ID        | 1709700239 | 53     |
| Owner Of Well   | [REDACTED] |        |
| Type Of Well    | N/A        |        |
| Depth Drilled   | 175'       |        |
| Completion Date | 2/19/1990  |        |
| Longitude       | [REDACTED] |        |
| Latitude        | [REDACTED] |        |

|                 |                          |        |
|-----------------|--------------------------|--------|
| State ID        | 1209747796               | MAP ID |
| Banks ID        | 1709700246               | 54     |
| Owner Of Well   | IL Beach Park/Concession |        |
| Type Of Well    | N/A                      |        |
| Depth Drilled   | 8'                       |        |
| Completion Date | 7/18/2002                |        |
| Longitude       | -87.80718                |        |
| Latitude        | 42.43252                 |        |

|                 |                          |        |
|-----------------|--------------------------|--------|
| State ID        | 1209747797               | MAP ID |
| Banks ID        | 1709700247               | 54     |
| Owner Of Well   | IL Beach Park/Concession |        |
| Type Of Well    | N/A                      |        |
| Depth Drilled   | 15'                      |        |
| Completion Date | 7/18/2002                |        |
| Longitude       | -87.80718                |        |
| Latitude        | 42.43252                 |        |

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## DETAILS

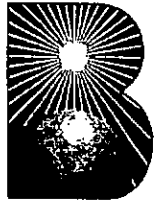
|                 |                          |        |
|-----------------|--------------------------|--------|
| State ID        | 1209747800               | MAP ID |
| Banks ID        | 1709700249               | 54     |
| Owner Of Well   | IL Beack Park/Concession |        |
| Type Of Well    | N/A                      |        |
| Depth Drilled   | 8'                       |        |
| Completion Date | 7/18/2002                |        |
| Longitude       | -87.80724                |        |
| Latitude        | 42.43251                 |        |

|                 |                          |        |
|-----------------|--------------------------|--------|
| State ID        | 1209747799               | MAP ID |
| Banks ID        | 1709700248               | 55     |
| Owner Of Well   | IL Beach Park/Concession |        |
| Type Of Well    | N/A                      |        |
| Depth Drilled   | 15'                      |        |
| Completion Date | 7/18/2002                |        |
| Longitude       | -87.80658                |        |
| Latitude        | 42.43023                 |        |

|                 |                          |        |
|-----------------|--------------------------|--------|
| State ID        | 1209747798               | MAP ID |
| Banks ID        | 1709700251               | 55     |
| Owner Of Well   | IL Beach Park/Concession |        |
| Type Of Well    | N/A                      |        |
| Depth Drilled   | 15'                      |        |
| Completion Date | 7/18/2002                |        |
| Longitude       | -87.80658                |        |
| Latitude        | 42.43023                 |        |

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## DETAILS

|                 |            |        |
|-----------------|------------|--------|
| State ID        | 1209702324 | MAP ID |
| Banks ID        | 1709700252 | 56     |
| Owner Of Well   | [REDACTED] |        |
| Type Of Well    | N/A        |        |
| Depth Drilled   | 149'       |        |
| Completion Date | N/A        |        |
| Longitude       | [REDACTED] |        |
| Latitude        | [REDACTED] |        |

|                 |            |        |
|-----------------|------------|--------|
| State ID        | 1209702325 | MAP ID |
| Banks ID        | 1709700253 | 57     |
| Owner Of Well   | [REDACTED] |        |
| Type Of Well    | N/A        |        |
| Depth Drilled   | 156'       |        |
| Completion Date | N/A        |        |
| Longitude       | [REDACTED] |        |
| Latitude        | [REDACTED] |        |

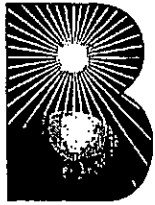
|                 |                  |        |
|-----------------|------------------|--------|
| State ID        | 1209702321       | MAP ID |
| Banks ID        | 1709700254       | 58     |
| Owner Of Well   | Beach State Park |        |
| Type Of Well    | N/A              |        |
| Depth Drilled   | 510'             |        |
| Completion Date | N/A              |        |
| Longitude       | -87.80473        |        |
| Latitude        | 42.43066         |        |

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## DETAILS

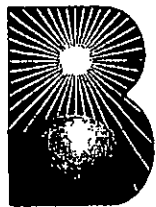
|                        |                          |               |
|------------------------|--------------------------|---------------|
| <b>State ID</b>        | 1209747795               | <b>MAP ID</b> |
| <b>Banks ID</b>        | 1709700255               | 59            |
| <b>Owner Of Well</b>   | IL Beach Park/Concession |               |
| <b>Type Of Well</b>    | N/A                      |               |
| <b>Depth Drilled</b>   | 8'                       |               |
| <b>Completion Date</b> | 7/18/2002                |               |
| <b>Longitude</b>       | -87.80472                |               |
| <b>Latitude</b>        | 42.43249                 |               |

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# Water Well Report <sup>TM</sup>

## SUMMARY

### Water Well Report <sup>TM</sup> Research Mapping Protocol

The Banks Information Solutions, Inc. Water Well Report <sup>TM</sup> is prepared from existing state water well databases and additional file data/records research conducted at Texas' regulatory authorities. Submission of driller's log records upon completion of a drilled water well became mandatory in 1985. The state of Texas has processed these records into several different filing systems within two state regulatory authorities. The water well files, records and map locations are maintained by the Texas Commission on Environmental Quality (TCEQ) and the Texas Water Development Board (TWDB). Actual water well site locations of this report are geocoded and geoplotted directly from the drilling records, drilling schedules, and driller's logs and maps submitted by the water well driller and maintained at these two primary water well regulatory authorities. Below is a description of the four filing systems utilized for well drilling records.

### Texas Water Development Board (TWDB)

Texas Water Development Board maintains a file system of located water well locations. These well files are water well site locations that have been verified with a field inventory inspection by TWDB personnel. The wells are assigned a State Identification Number unique to that well and plotted on county base maps, U.S.G.S. 7.5 minute topographical quadrangle maps, and in-house geographic information system. Records will also include analytical data attached with each drilling record. This is the current protocol for maintaining water well records within the TWDB.

### Texas Commission on Environmental Quality (TCEQ)

The Texas Commission on Environmental Quality maintains a file system of plotted, partially numbered, and un-numbered water well locations. Plotted water well files are water well site locations that have been determined from map information submitted on water well logs and subsequently plotted on TWDB county highway base maps. This type of mapping and filing procedure ceased in June 1986. Partially numbered water well files are water well site locations processed from 1986 through 1990. These wells are provided a State Identification Number which establishes the well location somewhere within a 2.5 minute quadrant of a 7.5 minute quadrangle map, but the site location has never been precisely mapped or verified by a State of Texas staff member. Un-numbered water well files are water well site locations that have been processed since June 1990. These well records are filed solely on their county location and are not provided a State Identification Number nor are they mapped. This is the current protocol for maintaining water well records within the TCEQ.

### Disclaimer

Banks Information Solutions, Inc. has performed a thorough and diligent search of all wells recorded with the Texas Water Development Board and the Texas Commission on Environmental Quality. All mapped locations are based on information obtained from the TWDB and the TCEQ. Although Banks performs quality assurance and quality control on all research projects, we recognize that any inaccuracies of the records and mapped well locations could possibly be traced to the appropriate regulatory authority or the water well driller. Many water well schedules may have never been submitted to the regulatory authority by the water well driller and, thus, may explain the possible unaccountability of private drilled wells. It is uncertain if the above listing provides 100% of the existing well locations within the area of review. Therefore, Banks Information Solutions, Inc. cannot guarantee the accuracy of the data or well location(s) of those maps and records maintained by Texas' regulatory authorities.

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MAP ID

| Water Well          | Top | Bottom |
|---------------------|-----|--------|
| Total Depth         |     | 200    |
| Driller's Log filed |     |        |



Permit Date: Permit #:

COMPANY Alco Oil & Gas Corp.  
 FARM [REDACTED]  
 DATE DRILLED [REDACTED]  
 ELEVATION 6450L  
 LOCATION NE SW SE  
 LATITUDE [REDACTED]  
 COUNTY Lake

NO.  
 COUNTY NO. 02312  
 LONGITUDE [REDACTED]  
 API 120970231200

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21 - 46N - 12E









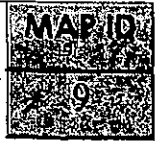








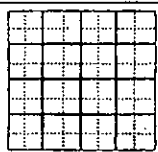




| Water Well  | Top            | Bottom |
|---|----------------|--------|
| fill; yellow clay   | 0              | 2      |
| topsoil   | 2              | 3      |
| yellow clay   | 3              | 5      |
| sand  | 5              | 34     |
| very sandy clay   | 34             | 50     |
| blue clay   | 50             | 78     |
| sand & some gravel  | 78             | 95     |
| gravel  | 95             | 99     |
| limestone   | 99             | 121    |
| Total Depth   |                | 120    |
| Casing: 5" GALV T&C 14.81 from 0' to 99'                      |                |        |
| Size hole below casing: 5"                                    |                |        |
| Water from limestone at 99' to 120'.                          |                |        |
| Static level 15' below casing top which is 1' above GL        |                |        |
| Pumping level 50' when pumping at 20 gpm for 0 hours          |                |        |
| Permanent pump installed at 63' on , with a capacity of 5 gpm |                |        |
| Driller's Log filed   |                |        |
| Location source: Location from permit                         |                |        |
| Permit Date:  | Permit #: 7951 |        |



COMPANY Hoover Water Well Servic  
 FARM [REDACTED]  
 DATE DRILLED August 7, 1969 NO.  
 ELEVATION 590GL COUNTY NO. 02926  
 LOCATION 50'S 800'E NW/c  
 LATITUDE [REDACTED] LONGITUDE [REDACTED]  
 COUNTY Lake API 120970292600 23 - 46N - 12E

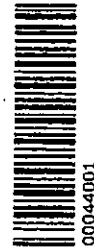




Page 1 ILLINOIS STATE GEOLOGICAL SURVEY

| Water Well         | Top | Bottom     |
|--------------------|-----|------------|
| sand               | 0   | 34         |
| blue clay          | 34  | 48         |
| hardpan            | 48  | 83         |
| sand               | 83  | 91         |
| hardpan            | 91  | 102        |
| limestone          | 102 | 142        |
| <b>Total Depth</b> |     | <b>142</b> |

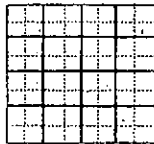
Casing: 4" GALV T&C 10.89 PPF from 0' to 102'  
 Size hole below casing: 4"  
 Water from limestone at 102' to 142'.  
 Static level 10' below casing top which is 1' above GL  
 Pumping level 142' when pumping at 2 gpm for 0 hours  
 Permanent pump installed at 126' on , with a capacity of 8 gpm  
 Driller's Log filed  
 Location source: Location from permit



00044001

Permit Date: October 28, 1970 Permit #: 10571

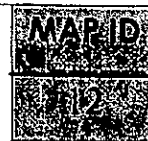
COMPANY Hoover Water Well Service  
 FARM [REDACTED]  
 DATE DRILLED November 20, 1970 NO. [REDACTED]  
 ELEVATION 590GL COUNTY NO. 03060  
 LOCATION 50'S 1150'E NW/c NW  
 LATITUDE [REDACTED] LONGITUDE [REDACTED]  
 COUNTY Lake API 120970306000 23 - 46N - 12E











Page 1 ILLINOIS STATE GEOLOGICAL SURVEY

| Water Well          | Top | Bottom |
|---------------------|-----|--------|
| Total Depth         |     | 219    |
| Driller's Log filed |     |        |



00070001

Permit Date: Permit #: 0

COMPANY Boyesen, Henry, Jr.  
 FARM Busch & Larson  
 DATE DRILLED January 1, 1976 NO.  
 ELEVATION 0 COUNTY NO. 25154  
 LOCATION 200'S line, 50'E line of SW NE SE  
 LATITUDE 42.461250' LONGITUDE 87.827997  
 COUNTY Lake API 120972515400

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16 - 46N - 12E





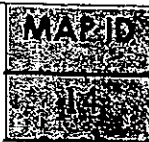












Page 1 ILLINOIS STATE GEOLOGICAL SURVEY

| Water Well          | Top          | Bottom |
|---------------------|--------------|--------|
| Total Depth         |              | 315    |
| Driller's log filed |              |        |
| Permit Date:        | Permit No. 0 |        |



COMPANY Hoover Water Well Service  
 FARM [REDACTED]  
 DATE DRILLED May 1, 1968  
 ELEVATION 0 COUNTY NO. 02798  
 LOCATION 2500' N line, 50' W line of NW  
 LATITUDE [REDACTED] LONGITUDE [REDACTED]  
 COUNTY Lake API: 120970279800 15 - 46N - 12E

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Additional well log details and notes, including depth measurements and geological observations.





Page 1 ILLINOIS STATE GEOLOGICAL SURVEY

| Water Well          | Top | Bottom |
|---------------------|-----|--------|
| Total Depth         |     | 242    |
| Driller's Log filed |     |        |



00076001

Permit Date: Permit #: 0

COMPANY Hoover, L. R.  
 FARM [REDACTED]  
 DATE DRILLED October 1, 1971 NO.  
 ELEVATION 0 COUNTY NO. 03399  
 LOCATION 75'N line, 50'E line of SE  
 LATITUDE [REDACTED] LONGITUDE [REDACTED]  
 COUNTY Lake API 120970339900

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16 - 46N - 12E



| Water Well   | Top | Bottom |
|--|-----|--------|
| yellow sand & gravel   | 0   | 24     |
| gravel   | 24  | 42     |
| hardpan, dry gravel  | 42  | 89     |
| sand, gravel, blue clay  | 89  | 127    |
| large gravel & boulders  | 127 | 138    |
| Total Depth.   |     | 138    |
| Casing: 5" GALV T&C 14.81 PPP from 0' to 138'                  |     |        |
| Size hole below casing: 5"                                     |     |        |
| Water from large gravel at 127' to 138'                        |     |        |
| Static level 75' below casing top which is 1' above GL         |     |        |
| Pumping level 135' when pumping at 3 gpm for 8 hours           |     |        |
| Permanent pump installed at 126' on . with a capacity of 8 gpm |     |        |
| Driller's Log filed  |     |        |
| Location source: Location from permit                          |     |        |



00077001

Permit Date: October 10, 1973 Permit #: 25536

COMPANY Hoover, L. R.  
 FARM S1 Henrichs Agency  
 DATE DRILLED November 12, 1973 NO.  
 ELEVATION 0 COUNTY NO. 24153  
 LOCATION 1150'S 450'W NE/c NE  
 LATITUDE 42.468423 LONGITUDE - 87.827003  
 COUNTY Lake API 120972415300

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16 - 46N - 12E

MAP ID  
16

| Water Well  | Top | Bottom |
|---|-----|--------|
| gravel  | 0   | 4      |
| sand  | 4   | 20     |
| hardpan   | 20  | 90     |
| blue clay   | 90  | 127    |
| hardpan   | 127 | 130    |
| limestone   | 130 | 145    |
| Total Depth   |     | 145    |
| Casing: 5" GALV 15# from 0' to 130'   |     |        |
| Size hole below casing: 5"  |     |        |
| Water from limestone at 130' to 145'.   |     |        |
| Static level 75' below casing top which is 1' above GL                            |     |        |
| Pumping level 130' when pumping at 10 gpm for 4 hours                             |     |        |
| Permanent pump installed at 140' on September 30, 1978, with a capacity of 10 gpm |     |        |
| Driller's Log filed   |     |        |
| Location source: Platbook verified  |     |        |
| Permit Date: September 21, 1978   |     |        |
| Permit #: 79780   |     |        |



COMPANY Gross, Emil E.  
 FARM [REDACTED]  
 DATE DRILLED September 21, 1978 NO.  
 ELEVATION 0 COUNTY NO. 26697  
 LOCATION [REDACTED]  
 LATITUDE [REDACTED] LONGITUDE [REDACTED]  
 COUNTY Lake API 120972669700

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16 - 46N - 12E

MAP ID

17

Page 1 ILLINOIS STATE GEOLOGICAL SURVEY

| Water Well          | Top | Bottom |
|---------------------|-----|--------|
| Total Depth         |     | 274    |
| Driller's Log filed |     |        |



Permit Date:

Permit #: 0

COMPANY Hoover, L. R.

FARM [REDACTED]

DATE DRILLED December 1, 1977

NO.

ELEVATION 0

COUNTY NO. 26818

LOCATION 100' N line, 330' W line of NW NE SE

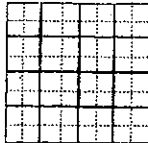
LATITUDE [REDACTED]

LONGITUDE [REDACTED]

COUNTY Lake

API 120972681800

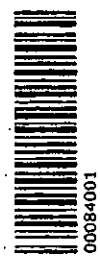
16 - 46N - 12E



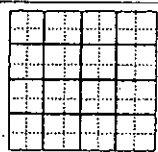




| Private Water Well  | Top | Bottom |
|---|-----|--------|
| sandy clay  | 0   | 22     |
| hardpan   | 22  | 62     |
| clay  | 62  | 70     |
| stoney clay   | 70  | 107    |
| elick clay  | 107 | 127    |
| gravel  | 127 | 129    |
| limestone   | 129 | 168    |
| Total Depth   |     | 168    |
| Casing: 5" ASTM A-53 T&C 15#/FT from 0' to 129'                               |     |        |
| Size hole below casing: 5"  |     |        |
| Water from rock at 0' to 0'.  |     |        |
| Static level 100' below casing top which is 1' above GL                       |     |        |
| Pumping level 129' when pumping at 8 gpm for 1 hour                           |     |        |
| Additional location info: Lot 8, Sheridan Lake View subdivision, 2nd Addition |     |        |
| Location source: Location from permit   |     |        |
| Permit Date: February 24, 1986  |     |        |
| Permit #: 122381  |     |        |



COMPANY Hoover, Lonny R.  
 FARM [REDACTED]  
 DATE DRILLED February 14, 1986 NO. [REDACTED]  
 ELEVATION 0 COUNTY NO. 27962  
 LOCATION SE NE SE  
 LATITUDE [REDACTED] LONGITUDE [REDACTED]  
 COUNTY Lake API 120972796200 16 - 46N - 12E







MAP ID  
20

Page 1 ILLINOIS STATE GEOLOGICAL SURVEY

| Water Well          | Top | Bottom |
|---------------------|-----|--------|
| Total Depth         |     | 119    |
| Driller's Log filed |     |        |



Permit Date: Permit #: 0

COMPANY Green M L  
 FARM [REDACTED]  
 DATE DRILLED January 1, 1940 NO. 1  
 ELEVATION 0 COUNTY NO. 02287  
 LOCATION 420' N line, 1800' E line of SW  
 LATITUDE [REDACTED] LONGITUDE [REDACTED]  
 COUNTY Lake API 120970228700

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15 - 46N - 12R





MAP ID  
22

| Water Well          | Top | Bottom |
|---------------------|-----|--------|
| Total Depth         |     | 66     |
| Driller's Log filed |     |        |



Permit Date: Permit #: 0

COMPANY Hoover Water Well Service  
FARM [REDACTED]  
DATE DRILLED January 1, 1963 NO.  
ELEVATION 621GL COUNTY NO. 02615  
LOCATION SW NW SW  
LATITUDE [REDACTED] LONGITUDE [REDACTED]  
COUNTY Lake API 120970261500

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15 - 46N - 12E

















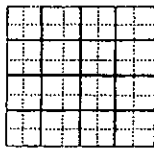




| Water Well   | Top               | Bottom |
|--|-------------------|--------|
| topsoil  | 0                 | 3      |
| sand   | 3                 | 14     |
| hardpan  | 14                | 85     |
| blue clay  | 85                | 130    |
| gravel   | 130               | 134    |
| Total Depth  |                   | 134    |
| Casing: 4" GALV 11# from 0' to 134'                            |                   |        |
| Water from gravel at 130' to 134'.                             |                   |        |
| Static level 55' below casing top which is 1' above GL         |                   |        |
| Pumping level 65' when pumping at 10 gpm for 4 hours           |                   |        |
| Permanent pump installed at 84' on . with a capacity of 10 gpm |                   |        |
| Driller's Log filed  |                   |        |
| Additional location info: [REDACTED]                           |                   |        |
| Location source: Location from permit                          |                   |        |
| Permit Date:   | Permit #: NF24790 |        |



COMPANY Gross, Emil E.  
 FARM [REDACTED]  
 DATE DRILLED June 2, 1972 NO. [REDACTED]  
 ELEVATION 0 COUNTY NO. 03881  
 LOCATION NE SW  
 LATITUDE [REDACTED] LONGITUDE [REDACTED]  
 COUNTY Lake API 120970388100 15 - 46N - 12E











| Water Well          | Top | Bottom |
|---------------------|-----|--------|
| Total Depth         |     | 167    |
| Driller's Log filed |     |        |



Permit Date: Permit #: 0

COMPANY Hoover, L. R.  
 FARM [REDACTED]  
 DATE DRILLED July 1, 1974 NO.  
 ELEVATION 0 COUNTY NO. 24252  
 LOCATION 35 [REDACTED]  
 LATITUDE [REDACTED] LONGITUDE - [REDACTED]  
 COUNTY Lake API 120972425200

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15 - 46N - 12E

MAP ID  
30

Page 1 ILLINOIS STATE GEOLOGICAL SURVEY

| Private Water Well | Top | Bottom |
|--------------------|-----|--------|
| yellow clay        | 0   | 12     |
| sand               | 12  | 18     |
| hardpan            | 18  | 40     |
| brown clay         | 40  | 43     |
| sand-gravel        | 43  | 46     |
| Total Depth        |     | 46     |

Casing: 4" GALV STEEL 11# from 0' to 44'

Screen: 3' of 4" diameter 15 slot  
Size hole below casing: 4"

Water from sand-gravel at 43' to 46'.  
Static level 18' below casing top which is 1' above GL  
Pumping level 18' when pumping at 10 gpm for 0 hours  
Permanent pump installed at 30' on , with a capacity of 10 gpm

Additional location info: [REDACTED]

Address of well [REDACTED]

Location source: Field verified.

Permit Date: March 27, 1987      Permit #: 13Q221



COMPANY Gross, Michael

FARM [REDACTED]

DATE DRILLED March 3, 1987      NO.

ELEVATION 0      COUNTY NO. 29270

LOCATION [REDACTED]

LATITUDE [REDACTED]      LONGITUDE [REDACTED]

COUNTY Lake      API 120972927000      15 - 46N - 12E

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| Private Water Well  | Top | Bottom |
|---------------------|-----|--------|
| gravel, sand & clay | 0   | 20     |
| sandy clay          | 20  | 60     |
| hardpan             | 60  | 76     |
| limestone           | 102 | 102    |
| clay                | 76  | 102    |
| no record           | 102 | 136    |
| Total Depth         |     | 136    |

Casing: 5" ASTM A-53 T&C 15#/FT from 0' to 102'  
 Size hole below casing: 5"  
 Water from rock at 0' to 0'.  
 Static level 40' below casing top which is 1' above GL  
 Pumping level 126' when pumping at 2 gpm for 1 hour  
 Permanent pump installed at 126' on May 15, 1986, with a capacity of 4 gpm

Additional location info: [REDACTED]

Address of well: [REDACTED]

Location source: Field verified

Permit Date: April 22, 1986 Permit #: 122294

COMPANY Hoover, Lenny R.  
 FARM [REDACTED]  
 DATE DRILLED May 15, 1986 NO.  
 ELEVATION 0 COUNTY NO. 28125  
 LOCATION [REDACTED]  
 LATITUDE [REDACTED] LONGITUDE [REDACTED]  
 COUNTY Lake API 120972812500 15 - 46N - 12E

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| Private Water Well | Top | Bottom |
|--------------------|-----|--------|
| yellow clay        | 0   | 16     |
| blue clay & gravel | 16  | 51     |
| coarse sand        | 51  | 56     |
| Total Depth        |     | 56     |

Casing: 4" GALV STEEL 11# from 0' to 54'

Screen: 4' of 4" diameter 15 slot  
Size hole below casing: 4"

Water from coarse sand at 51' to 56'

Static level 16' below casing top which is 1' above GL  
Pumping level 18' when pumping at 0 gpm for 0 hours  
Permanent pump installed at 20' on , with a capacity of 0 gpm

Address of well: [REDACTED]

Location source: Location from permit



Permit Date: January 17, 1989 Permit #: 008843

COMPANY Gross, Michael  
 FARM [REDACTED]  
 DATE DRILLED February 10, 1989 NO.  
 ELEVATION 0 COUNTY NO. 31926  
 LOCATION NW SE NW  
 LATITUDE [REDACTED] LONGITUDE [REDACTED]  
 COUNTY Lake API 120973192600

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15 - 46N - 12E

MAP ID

| Private Water Well   | Top | Bottom |
|--|-----|--------|
| sand   | 0   | 30     |
| hardpan  | 30  | 43     |
| coarse sand  | 43  | 49     |
| Total Depth  |     | 49     |
| Casing: 4" GALV STL T&C 14.814 from 0' to 46'                                |     |        |
| Screen: 4' of 4" diameter 15 slot  |     |        |
| Size hole below casing: 4"   |     |        |
| Water from coarse sand at 43' to 49'   |     |        |
| Static level 35' below casing top which is 1' above GL                       |     |        |
| Pumping level 35' when pumping at 14 gpm for 1 hour                          |     |        |
| Permanent pump installed at 38' on August 29, 1979, with a capacity of 8 gpm |     |        |
| Location source: Location from permit  |     |        |
| Permit Date: October 9, 1979   |     |        |
| Permit #: 90222  |     |        |



COMPANY Hoover, Lonny R.  
 FARM [REDACTED]  
 DATE DRILLED May 24, 1979 NO.  
 ELEVATION 0 COUNTY NO. 33748  
 LOCATION [REDACTED]  
 LATITUDE [REDACTED] LONGITUDE [REDACTED]  
 COUNTY Lake API 120973374800

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15 - 46N - 12E





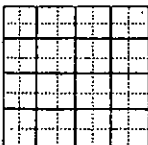




| Water Well  | Top | Bottom |
|---|-----|--------|
| sand  | 0   | 7      |
| sand & gravel   | 7   | 33     |
| sandy blue clay   | 33  | 90     |
| soft blue clay  | 90  | 111    |
| gravel, some water  | 111 | 120    |
| gravel, water   | 120 | 123    |
| Total Depth   |     | 123    |
| Casing: 5" GALV T&C 14.81 from 0' to 123'                     |     |        |
| Size hole below casing: 5"                                    |     |        |
| Water from gravel at 120' to 123'                             |     |        |
| Static level 18' below casing top which is 1' above GL        |     |        |
| Pumping level 24' when pumping at 20 gpm for 8 hours          |     |        |
| Permanent pump installed at 42' on , with a capacity of 8 gpm |     |        |
| Driller's Log filed   |     |        |
| Location source: Platbook verified                            |     |        |
| Permit Date: June 11, 1969                                    |     |        |
| Permit #: 7646  |     |        |



COMPANY Hoover Water Well Servic  
 FARM [REDACTED]  
 DATE DRILLED July 3, 1969 NO.  
 ELEVATION 0 COUNTY NO. 02911  
 LOCATION [REDACTED]  
 LATITUDE [REDACTED] LONGITUDE [REDACTED]  
 COUNTY Lake API 120970291100 14 - 46N - 12E

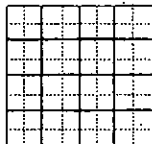




| Water Well   | Top            | Bottom |
|--|----------------|--------|
| sand   | 0              | 35     |
| hardpan  | 35             | 81     |
| blue clay  | 81             | 128    |
| limestone  | 128            | 180    |
| Total Depth  |                | 180    |
| Casing: 5" GALV T&C 14.81 from 0' to 128'                      |                |        |
| Size hole below casing: 5"                                     |                |        |
| Water from limestone at 128' to 180'                           |                |        |
| Static level 14' below casing top which is 1' above GL         |                |        |
| Pumping level 180' when pumping at 3 gpm for 0 hours           |                |        |
| Permanent pump installed at 168' on , with a capacity of 8 gpm |                |        |
| Driller's Log filed  |                |        |
| Location source: location from permit                          |                |        |
| Permit Date:   | Permit #: 6287 |        |



COMPANY Hoover Water Well Servic  
 FARM [REDACTED]  
 DATE DRILLED November 15, 1968 NO. 1  
 ELEVATION 0 COUNTY NO. 02795  
 LOCATION [REDACTED]  
 LATITUDE [REDACTED] LONGITUDE [REDACTED]  
 COUNTY Lake API 120970279500 14 - 46N - 12E

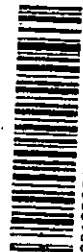






MAP ID

| Water Well          | Top | Bottom |
|---------------------|-----|--------|
| Total Depth         |     | 225    |
| Driller's Log filed |     |        |



00123001

Permit Date: Permit #: 0

COMPANY Hoover Water Well Servic  
FARM [REDACTED]  
DATE DRILLED February 1, 1968 NO. 1  
ELEVATION 0 COUNTY NO. 02454  
LOCATION [REDACTED]  
LATITUDE [REDACTED] LONGITUDE [REDACTED]  
COUNTY Lake API 120970245400

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28 - 46N - 12E







MAP ID  
40

Page 1 ILLINOIS STATE GEOLOGICAL SURVEY

| Water Well          | Top | Bottom |
|---------------------|-----|--------|
| Total Depth         |     | 146    |
| Driller's Log filed |     |        |



Permit Date: Permit #: 0

COMPANY Hoover Water Well Servic  
FARM [REDACTED]  
DATE DRILLED December 1, 1968 NO. 1  
ELEVATION 0 COUNTY NO. 02803  
LOCATION [REDACTED]  
LATITUDE [REDACTED] LONGITUDE - [REDACTED]  
COUNTY Lake API 120970280300

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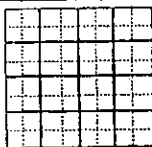


Page 1 ILLINOIS STATE GEOLOGICAL SURVEY

| Private Water Well  | Top | Bottom |
|---|-----|--------|
| top soil & fill   | 0   | 3      |
| sand  | 3   | 12     |
| yellow clay   | 12  | 22     |
| blue clay   | 22  | 55     |
| sand  | 55  | 60     |
| hardpan   | 60  | 120    |
| blue clay   | 120 | 122    |
| limestone, gravel   | 122 | 135    |
| limestone   | 135 | 160    |
| Total Depth   |     | 160    |
| Casing: 5" ASTM A-120 T&C 15#FT from 0' to 135'                               |     |        |
| Grout: CLAY SLURRY from 0 to 20.  |     |        |
| Size hole below casing: 5"  |     |        |
| Water from limestone at 135' to 160'.   |     |        |
| Static level 115' below casing top which is 1' above GL                       |     |        |
| Pumping level 125' when pumping at 11 gpm for 0 hours                         |     |        |
| Permanent pump installed at 158' on August 15, 1990, with a capacity of 8 gpm |     |        |
| Additional location info: [REDACTED]  |     |        |
| Address of well: [REDACTED]   |     |        |
| Location source: Location from permit   |     |        |
| Permit Date: April 3, 1990  |     |        |
| Permit #:   |     |        |



COMPANY Boyce, Kenneth D.  
 FARM G & E Builders  
 DATE DRILLED August 9, 1990 NO.  
 ELEVATION 0 COUNTY NO. 35998  
 LOCATION NE SE SE  
 LATITUDE 42.430811 LONGITUDE - 87.826778  
 COUNTY Lake API 120973599800 28 - 46N - 12E





| Water Well          | Top | Bottom |
|---------------------|-----|--------|
| Total Depth         |     | 198    |
| Driller's Log filed |     |        |



00130001

Permit Date: Permit #: 0

COMPANY Boysen, Henry, Jr.  
 FARM Busch & Larson  
 DATE DRILLED November 1, 1976 NO.  
 ELEVATION 0 COUNTY NO. 25067  
 LOCATION 100' N line, 75' W line of NW NE SE  
 LATITUDE 42.435096 LONGITUDE - 87.830119  
 COUNTY Lake API 120972506700

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28 - 46N - 12E















| Water Well          | Top | Bottom |
|---------------------|-----|--------|
| Total Depth         |     | 152    |
| Driller's Log filed |     |        |



Permit Date: Permit #: 0

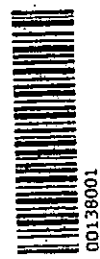
COMPANY Hoover Water Well Service  
 FARM [REDACTED]  
 DATE DRILLED February 1, 1977 NO.  
 ELEVATION 0 COUNTY NO. 25159  
 LOCATION [REDACTED]  
 LATITUDE [REDACTED] LONGITUDE [REDACTED]  
 COUNTY Lake API 120972515900

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28 - 46N - 12E

MAP ID  
43

| Water Well          | Top | Bottom |
|---------------------|-----|--------|
| Total Depth         |     | 165    |
| Driller's Log filed |     |        |



Permit Date: Permit #: 0

COMPANY Hoover Water Well Servic  
FARM [REDACTED]  
DATE DRILLED January 1, 1971 NO.  
ELEVATION 0 COUNTY NO. 03079  
LOCATION [REDACTED]  
LATITUDE [REDACTED] LONGITUDE [REDACTED]  
COUNTY Lake API 120970307900

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28 - 46N - 12E

MAP ID  
43

| Water Well          | Top | Bottom |
|---------------------|-----|--------|
| Total Depth         |     | 65     |
| Driller's Log filed |     |        |



Permit Date: Permit #: 0

COMPANY Hoover Water Well Service  
FARM [REDACTED]  
DATE DRILLED May 1, 1971 NO.  
ELEVATION 0 COUNTY NO. 03281.  
LOCATION [REDACTED]  
LATITUDE [REDACTED] LONGITUDE [REDACTED]  
COUNTY Lake API 120970328100

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28 - 46N - 12E













Page 1 ILLINOIS STATE GEOLOGICAL SURVEY

| Private Water Well  | Top | Bottom |
|---|-----|--------|
| limestone   | 0   | 269    |
| Total Depth   |     | 269    |
| Size hole below casing: 5"  |     |        |
| Water from limestone at 225' to 269'  |     |        |
| Static level 165' below casing top which is 1' above GL                     |     |        |
| Pumping level 268' when pumping at 2 gpm for 3 hours                        |     |        |
| Permanent pump installed at 268' on June 26, 1992, with a capacity of 5 gpm |     |        |
| Additional location info: [REDACTED]  |     |        |
| Location source: Location from permit                                       |     |        |



Permit Date: June 3, 1992      Permit #:

COMPANY Boyce, Kenneth D.

FARM [REDACTED]

DATE DRILLED June 25, 1992      NO.

ELEVATION 0      COUNTY-NO. 37096

LOCATION NE NW SE

LATITUDE [REDACTED]      LONGITUDE [REDACTED]

COUNTY Lake      API 120973709600      28 - 46N - 12E

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MAP ID

45

Page 1 ILLINOIS STATE GEOLOGICAL SURVEY

| Water Well          | Top | Bottom |
|---------------------|-----|--------|
| Total Depth         |     | 176    |
| Driller's Log filed |     |        |

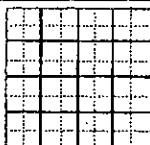


00127001

Permit Date:

Permit #: 0

COMPANY Hoover Water Well Servic  
FARM [REDACTED]  
DATE DRILLED January 1, 1963 NO.  
ELEVATION 639GL COUNTY NO. 02625  
LOCATION SE SW SE  
LATITUDE [REDACTED] LONGITUDE [REDACTED]  
COUNTY Lake API 120970262500



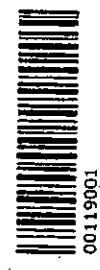
28 - 46N - 12R





**MAP ID**  
46

| Water Well          | Top | Bottom |
|---------------------|-----|--------|
| Total Depth         |     | 144    |
| Driller's Log filed |     |        |



Permit Date: Permit #: 0

COMPANY Hoover Water Well Servic  
 FARM Lotz Const  
 DATE DRILLED June 1, 1970 NO.  
 ELEVATION 0 COUNTY NO. 01450  
 LOCATION 1000'N line, 500'E line of SE  
 LATITUDE 42.432601 LONGITUDE - 87.827410  
 COUNTY Lake API 120970145000 28 - 46N - 12E

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Page 1 ILLINOIS STATE GEOLOGICAL SURVEY

| Private Water Well | Top | Bottom |
|--------------------|-----|--------|
| black dirt         | 0   | 1      |
| yellow clay        | 1   | 11     |
| blue clay          | 31  | 91     |
| sand               | 91  | 120    |
| clay               | 120 | 170    |
| Total Depth        |     | 170    |

Casing: 4" GALV-11# from 0' to 170'

Size hole below casing: 0"

Water from gravel at 160' to 170'.

Static level 1' below casing top which is 1' above GL

Pumping level 110' when pumping at 10 gpm for 1 hour

Permanent pump installed at 146' on November 12, 1980, with a capacity of 10 gpm

Additional location info: [REDACTED]

Location source: Location from permit



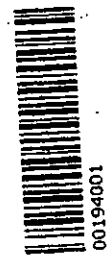
Permit Date: September 29, 1980 Permit #: 96352

COMPANY Gross, Eugene J.  
 FARM [REDACTED]  
 DATE DRILLED November 15, 1980 NO.  
 ELEVATION 0 COUNTY NO. 33860  
 LOCATION SE  
 LATITUDE [REDACTED] LONGITUDE [REDACTED]  
 COUNTY Lake API 120973386000 28 - 46N - 12E

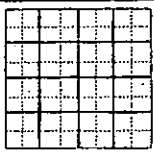
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| Private Water Well  | Top | Bottom     |
|---|-----|------------|
| brown clay  | 0   | 10         |
| blue clay   | 10  | 110        |
| hardpan   | 110 | 160        |
| rock  | 160 | 166        |
| <b>Total Depth</b>  |     | <b>166</b> |
| Casing: 4" GALV #11 from 0' to 0'                               |     |            |
| Size hole below casing: 4"                                      |     |            |
| Water from rock at 160' to 166'                                 |     |            |
| Static level 90' below casing top which is 1' above GL          |     |            |
| Pumping level 120' when pumping at 10 gpm for 2 hours           |     |            |
| Permanent pump installed at 126' on , with a capacity of 10 gpm |     |            |
| Additional Lot 4, Sheridan Road Park subdivision.               |     |            |
| Location info: Block #14  |     |            |
| Location source: Location from permit                           |     |            |
| Permit Date: February 10, 1975                                  |     |            |
| Permit #: 3600  |     |            |



COMPANY Gross, Eugene J.  
 FARM Pitcher Construction  
 DATE DRILLED February 24, 1975 NO.  
 ELEVATION 0 COUNTY NO. 33865  
 LOCATION SE  
 LATITUDE 42.431744 LONGITUDE - 87.830421  
 COUNTY Lake API 120973386500 28 - 46N - 12E





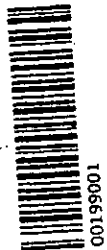








| Private Water Well  | Top | Bottom     |
|---|-----|------------|
| yellow clay   | 0   | 10         |
| hardpan   | 10  | 80         |
| blue clay   | 80  | 100        |
| hardpan   | 100 | 150        |
| gravel  | 150 | 155        |
| limestone   | 155 | 180        |
| <b>Total Depth</b>  |     | <b>180</b> |
| Casing: 5" STEEL from 0' to 155'                                |     |            |
| Size hole below casing: 0"                                      |     |            |
| Water from limestone at 0' to 0'                                |     |            |
| Static level 5' below casing top which is 120' above GL         |     |            |
| Pumping level 120' when pumping at 20 gpm for 0 hours           |     |            |
| Permanent pump installed at 180' on . with a capacity of 11 gpm |     |            |
| Location source: Location from permit                           |     |            |
| Permit Date: August 2, 1983                                     |     |            |
| Permit #: 108530  |     |            |



COMPANY Gross, Michael  
 FARM [REDACTED]  
 DATE DRILLED September 15, 1983 NO.  
 ELEVATION 0 COUNTY NO. 33870  
 LOCATION [REDACTED]  
 LATITUDE [REDACTED] LONGITUDE [REDACTED]  
 COUNTY Lake API 120973387000 28 - 46N - 12E

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MAP ID  
40

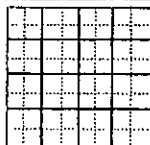
Page 1 ILLINOIS STATE GEOLOGICAL SURVEY

| Water Well          | Top | Bottom |
|---------------------|-----|--------|
| Total Depth         |     | 173    |
| Driller's Log filed |     |        |



Permit Date: Permit #: 0

COMPANY Hoover, L. R.  
FARM [REDACTED]  
DATE DRILLED September 1, 1975 NO.  
ELEVATION 0 COUNTY NO. 24592  
LOCATION [REDACTED]  
LATITUDE [REDACTED] LONGITUDE [REDACTED]  
COUNTY Lake API 120972459200



28 - 46N - 12E

MAP ID

49

| Water Well          | Top | Bottom |
|---------------------|-----|--------|
| Total Depth         |     | 176    |
| Driller's Log filed |     |        |



00143001

Permit Date: Permit #: 0

COMPANY Hoover, L. R.  
FARM [REDACTED]  
DATE DRILLED May 1, 1973 NO.  
ELEVATION 0 COUNTY NO. 01522  
LOCATION [REDACTED]  
LATITUDE [REDACTED] LONGITUDE [REDACTED]  
COUNTY Lake. API 120970392200

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28 - 46N - 12E























MAP ID  
51

| Water Well          | Top | Bottom |
|---------------------|-----|--------|
| Total Depth         |     | 167    |
| Driller's Log filed |     |        |

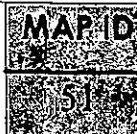


Permit Date: Permit #: 0

COMPANY Hoover, L. R.  
 FARM [REDACTED]  
 DATE DRILLED April 1, 1977 NO.  
 ELEVATION 0 COUNTY NO. 25218  
 LOCATION [REDACTED]  
 LATITUDE [REDACTED] LONGITUDE [REDACTED]  
 COUNTY Lake API 120972521800

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28 - 46N - 12E



| Private Water Well  | Top | Bottom |
|---|-----|--------|
| sand & gravel   | 0   | 20     |
| hardpan   | 20  | 42     |
| mud sand  | 42  | 50     |
| hardpan   | 50  | 74     |
| mud sand  | 74  | 85     |
| blue clay   | 85  | 120    |
| blue clay & gravel  | 120 | 163    |
| limestone   | 163 | 222    |
| Total Depth   |     | 222    |
| Casing: 5" GALV STEEL 15# from 0' to 163'                       |     |        |
| Size hole below casing: 5"                                      |     |        |
| Water from limestone at 163' to 222'.                           |     |        |
| Static level 110' below casing top which is 1' above GL         |     |        |
| Pumping level 220' when pumping at 1 gpm for 3 hours            |     |        |
| Permanent pump installed at 220' on , with a capacity of 10 gpm |     |        |
| Address of well: [REDACTED]                                     |     |        |
| Location source: Field verified                                 |     |        |
| Permit Date: February 7, 1986 Permit #: 122257                  |     |        |

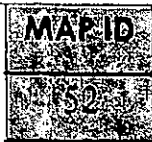


COMPANY Gross, Michael  
 FARM [REDACTED]  
 DATE DRILLED February 10, 1986 NO.  
 ELEVATION 0 COUNTY NO. 27931  
 LOCATION [REDACTED]  
 LATITUDE [REDACTED] LONGITUDE [REDACTED]  
 COUNTY Lake API 120972793100 28 - 46N - 12E









Page 1 ILLINOIS STATE GEOLOGICAL SURVEY

| Water Well         | Top | Bottom |
|--------------------|-----|--------|
| clay               | 0   | 4      |
| sandy clay         | 4   | 22     |
| gravel & clay      | 22  | 28     |
| hardpan            | 28  | 70     |
| sand & runny clay  | 70  | 81     |
| sandy clay         | 81  | 110    |
| hardpan            | 110 | 140    |
| hardpan & boulders | 140 | 148    |
| limestone          | 152 | 152    |
| gravel             | 148 | 152    |
| Total Depth        |     | 190    |

Casing: 4" GALV T&C 10.89 PPF from 0' to 152'

Site hole below casing: 4"

Water from limestone at 0' to 152'

Static level 80' below casing top which is 1' above GL

Pumping level 160' when pumping at 2 gpm for 0 hours

Driller's Log filed

Location source: Platbook verified



Permit Date: Permit #: NFG7232

COMPANY Hoover Water Well Servic

FARM [REDACTED]

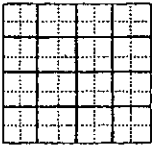
DATE DRILLED October 1, 1969 NO. [REDACTED]

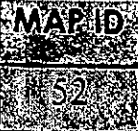
ELEVATION 0 COUNTY NO. 03010

LOCATION 600' N line, 600' W line of SE [REDACTED]

LATITUDE [REDACTED] LONGITUDE [REDACTED]

COUNTY Lake API 120970301000 28 - 46N - 12E





| Private Water Well | Top | Bottom |
|--------------------|-----|--------|
| fill & black dirt  | 0   | 2      |
| sand               | 2   | 12     |
| yellow clay & sand | 12  | 22     |
| blue clay          | 22  | 60     |
| hardpan            | 60  | 161    |
| rubble             | 161 | 165    |
| limestone          | 165 | 169    |
| Total Depth        |     | 169    |

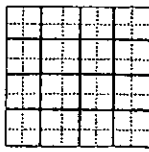
Casing: 5" ASTM A120 T/C 15#/FT from 0' to 165'  
Grout: CLAY SLURRY from 0 to 20.  
Size hole below casing: 5"  
Water from limestone at 165' to 169'.  
Static level 121' below casing top which is 1' above GL  
Pumping level 126' when pumping at 12 gpm for 2 hours  
Permanent pump installed at 160' on August 17, 1987, with a capacity of 10 gpm

Additional location info: [REDACTED]  
Location source: Location from permit

Permit Date: August 13, 1987      Permit #: 134374



COMPANY Boyce, Kenneth D.  
FARM [REDACTED]  
DATE DRILLED August 17, 1987      NO.  
ELEVATION 0      COUNTY NO. 29906  
LOCATION NW SE  
LATITUDE [REDACTED]      LONGITUDE [REDACTED]  
COUNTY Lake      API 120972990600      28 - 46N - 12E













| Private Water Well | Top | Bottom |
|--------------------|-----|--------|
| top soil           | 0   | 2      |
| sand & gravel      | 2   | 17     |
| blue clay          | 17  | 25     |
| sand & gravel      | 25  | 29     |
| blue clay          | 29  | 61     |
| sand & gravel      | 61  | 65     |
| hardpan            | 65  | 137    |
| blue clay          | 137 | 154    |
| rubble             | 154 | 161    |
| limestone          | 161 | 172    |
| Total Depth        |     | 172    |

Casing: 5" ASTM A53 15#/FT from 0' to 161'

Grout: CLAY SLURRY from 0 to 20.

Size hole below casing: 5"

Water from limestone at 161' to 172'.

Static level 120' below casing top which is 1' above GL.

Pumping level 135' when pumping at 9 gpm for 4 hours

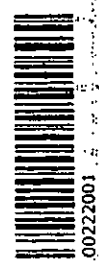
Permanent pump installed at 168' on September 21, 1994, with a capacity of 8 gpm

Additional location info: [REDACTED]

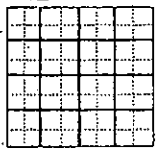
Address of well: [REDACTED]

Location source: Location from permit

Permit Date: June 13, 1994 Permit #:



COMPANY Boyce, Kenneth D.  
 FARM [REDACTED] Builders  
 DATE DRILLED September 20, 1994 NO.  
 ELEVATION 0 COUNTY NO. 38624  
 LOCATION NW SE  
 LATITUDE 42.433576 LONGITUDE - 87.832838  
 COUNTY Lake API 120973862400 28 - 46N - 12E



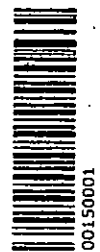




MAP ID  
53

Page 1 ILLINOIS STATE GEOLOGICAL SURVEY

| Water Well          | Top | Bottom |
|---------------------|-----|--------|
| Total Depth         |     | 18'    |
| Driller's Log filed |     |        |



Permit Date: Permit #: 0

COMPANY Hoover, L. R.  
 FARM English Constr  
 DATE DRILLED November 1, 1976 NO.  
 ELEVATION 0 COUNTY NO. 24992  
 LOCATION 750'S line, 1000'E line of section  
 LATITUDE 42.430173 LONGITUDE - 87.829285  
 COUNTY Lake API 120972499200

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28 - 46N - 12E





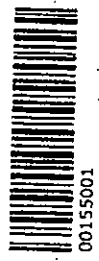
| Private Water Well   | Top | Bottom |
|----------------------|-----|--------|
| yellow clay & gravel | 0   | 17     |
| hardpan              | 17  | 35     |
| blue clay            | 35  | 40     |
| hardpan              | 40  | 80     |
| mud sand             | 80  | 100    |
| sandy clay           | 100 | 110    |
| blue clay            | 110 | 125    |
| hardpan              | 125 | 135    |
| blue clay            | 135 | 145    |
| gravel               | 145 | 147    |
| sand & gravel        | 147 | 162    |
| limestone            | 162 | 200    |
| Total Depth          |     | 200    |

Casing: 5" GALV STEEL from 0' to 162' .  
 Size hole below casing: 5"  
 Water from limestone at 162' to 200'.  
 Static level 140' below casing top which is 1' above GL  
 Pumping level 140' when pumping at 12 gpm for 0 hours  
 Permanent pump installed at 198' on , with a capacity of 10 gpm  
 Location source: Location from permit

Permit Date: May 24, 1985 Permit #: 116065

COMPANY Gross, Michael  
 FARM [REDACTED]  
 DATE DRILLED July 11, 1985 NO.  
 ELEVATION 0 COUNTY NO. 27349  
 LOCATION NW SE SE  
 LATITUDE [REDACTED] LONGITUDE [REDACTED]  
 COUNTY Lake API 120972734900 28 - 46N - 12E

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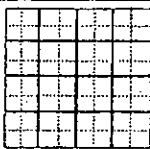
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| Water Well          | Top       | Bottom |
|---------------------|-----------|--------|
| Total Depth         |           | 198    |
| Driller's Log filed |           |        |
| Permit Date:        | Permit #: | 0      |



COMPANY  
FARM Busch & Larson  
DATE DRILLED March 1, 1979 NO.  
ELEVATION 0 COUNTY NO. 26821  
LOCATION 250'N line, 50'W line of SE SE  
LATITUDE 42.431056 LONGITUDE - 87.830241  
COUNTY Lake API 120972682100 28 - 46N - 12E



| Private Water Well  | Top | Bottom |
|---|-----|--------|
| clay fill   | 0   | 1      |
| original top soil   | 1   | 2      |
| sandy brown clay  | 2   | 12     |
| blue clay   | 12  | 30     |
| blue clay & gravel  | 30  | 66     |
| blue clay   | 66  | 115    |
| gvl & clay-brkn ls  | 135 | 156    |
| limestone   | 156 | 220    |
| Total Depth   |     | 220    |
| Casing: 5" PVC from -1' to 136'   |     |        |
| 5" BLACK STEEL from 136' to 157'  |     |        |
| Size hole below casing: 5"  |     |        |
| Water from limestone at 156' to 220'  |     |        |
| Static level 107' below casing top which is 1' above GL                       |     |        |
| Pumping level 0' when pumping at 3 gpm for 0 hours                            |     |        |
| Permanent pump installed at 180' on March 12, 1985, with a capacity of 10 gpm |     |        |
| Address of well: [REDACTED]   |     |        |
| Location source: Location from permit   |     |        |
| Permit Date: February 27, 1985  |     |        |
| Permit #: 116661  |     |        |



COMPANY Gaffke, George E.  
 FARM [REDACTED]  
 DATE DRILLED March 11, 1985 NO.  
 ELEVATION 0 COUNTY NO. 27174  
 LOCATION [REDACTED]  
 LATITUDE [REDACTED] LONGITUDE [REDACTED]  
 COUNTY Lake API 120972717400

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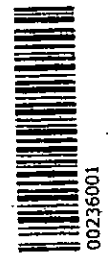
28 - 46N - 12E



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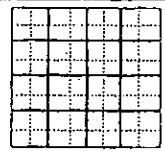
Page 1 ILLINOIS STATE GEOLOGICAL SURVEY

| Private Water Well   | Top | Bottom |
|--|-----|--------|
| no record  | 0   | 140    |
| rock   | 140 | 168    |
| Total Depth  |     | 168    |
| Casing: 4" STEEL 11# from 0' to 140'   |     |        |
| Size hole below casing: 4"   |     |        |
| Water from rock at 0' to 168'  |     |        |
| Static level 120' below casing top which is 1' above GL                      |     |        |
| Pumping level 168' when pumping at 0 gpm for 2 hours                         |     |        |
| Permanent pump installed at 168' on June 15, 1992, with a capacity of 10 gpm |     |        |
| Additional location info: Lot #4, B. Sheridan Rd. Park subdivision.          |     |        |
| Location source: Location from permit  |     |        |



Permit Date: May 15, 1992 Permit #:

COMPANY Gross, Eugene J.  
 FARM [REDACTED]  
 DATE DRILLED June 10, 1992 NO. [REDACTED]  
 ELEVATION 0 COUNTY NO. 37097  
 LOCATION NW SE SE [REDACTED]  
 LATITUDE [REDACTED] LONGITUDE [REDACTED]  
 COUNTY Lake API 120973709700 28 - 46N - 12E





| Private Water Well                          | Top       | Bottom |
|---|-----------|--------|
| topsoil                                     | 0         | 2      |
| sand & yellow clay                          | 2         | 12     |
| yellow clay                                 | 12        | 18     |
| blue clay                                   | 18        | 69     |
| sand  | 69        | 75     |
| hardpan                                     | 75        | 163    |
| rubble                                      | 163       | 167    |
| limestone                                   | 167       | 175    |
| Total Depth                                 |           | 175    |
| Casing: 5" ASTM T/C 15#/ from 0' to 167'    |           |        |
| Grout: CLAY SLURRY from 0 to 20.            |           |        |
| Size hole below casing: 5"                  |           |        |
| Water from limestone at 167' to 175'.       |           |        |
| Pump: 1/2 hp pump with a capacity of 8 gpm. |           |        |
| Additional location info: [REDACTED]        |           |        |
| Address of well: [REDACTED]                 |           |        |
| Location source: Location from the driller  |           |        |
| Permit Date:                                | Permit #: |        |



00239001

COMPANY Boyce, Kenneth D.  
 FARM [REDACTED]  
 DATE DRILLED February 19, 1990 NO.  
 ELEVATION 0 COUNTY NO. 27293  
 LOCATION NW SE SE  
 LATITUDE [REDACTED] LONGITUDE [REDACTED]  
 COUNTY Lake API 120972729300 28 - 46N - 12E

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MAP ID  
54

Page 1 ILLINOIS STATE GEOLOGICAL SURVEY

|             | Top | Bottom |
|-------------|-----|--------|
| Total Depth |     | 15     |



Permit Date: Permit #:

COMPANY STS Consultants  
FARM IL Beach PK/Concession  
DATE DRILLED July 18, 2002 NO. B-3  
ELEVATION 588GL COUNTY NO. 47797  
LOCATION SE NE SE  
LATITUDE 42.432491 LONGITUDE - 87.807080  
COUNTY Lake API 120974779700

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27 - 46N - 12E



**MAP ID**  
54

Page 1 ILLINOIS STATE GEOLOGICAL SURVEY

|             | Top | Bottom |
|-------------|-----|--------|
| Total Depth |     | 8      |



Permit Date: Permit #:

COMPANY STS Consultants  
 FARM 3L Beach Pk/Concession  
 DATE DRILLED July 18, 2002 NO. B-7  
 ELEVATION 587GL COUNTY NO. 47800  
 LOCATION SE NE SE  
 LATITUDE 42.432491 LONGITUDE - 87.807080  
 COUNTY Lake API 120974780000

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27 - 46N - 12E

MAP ID  
55

|             | Top | Bottom |
|-------------|-----|--------|
| Total Depth |     | 15     |



00248001

Permit Date: Permit #:

COMPANY STS Consultants  
 FARM IL Beach Pk/Concession  
 DATE DRILLED July 18, 2002 NO. B-5  
 ELEVATION 588GL COUNTY NO. 47799  
 LOCATION SE NE SE  
 LATITUDE 42.430204 LONGITUDE - 87.806483  
 COUNTY Lake API 120974779900

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27 - 46N - 12E



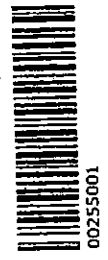






MAP ID  
59

|             | Top | Bottom |
|-------------|-----|--------|
| Total Depth |     | 8      |



Permit Date:

Permit #:

COMPANY STS Consultants  
 FARM IL Beach Pk/Concession  
 DATE DRILLED July 18, 2002 NO. B-1  
 ELEVATION 585GL COUNTY NO. 47795  
 LOCATION SW NW SW  
 LATITUDE 42.432468 LONGITUDE - 87.804623  
 COUNTY Lake API 120974779500

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26 - 46N - 12E

## A.2 ISWS LOGS



# Illinois State Water Survey PICS Database

Thursday, June 8, 2006

County: LAKE

Township: 46N

Range: 12E

Sections: 14-17,20-2326

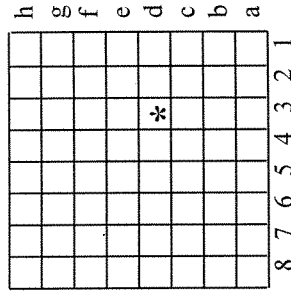
Records Found: 11

Questions: Contact the Illinois State Water Survey's Ground Water Division @ (217)-333-9043

**Publication:** Please cite the Illinois State Water Survey's PICS (Public-Industrial-Commercial) Database in all publications based wholly or partially on this information.

Note: The data in the PICS Database is a listing of municipal and commercial wells which are known to the Illinois State Water Survey (ISWS). This information was initially entered from public water supply data and supplemented with the Illinois State Water Inventory Project data. This database is updated as additional information is received and verified.

**This data cannot be resold or redistributed. The Illinois State Water Survey must be acknowledged in any use of this material.**



Location of a 10-acre-plot within a section:

The origin can be found at the lower right-hand-corner of an 8 x 8 grid. In this example, the well is in the 10-acre plot '3d'.

| SWSID    | FIPS | TWN | RNG | SEC | PLOT | NAME                      | DB ID | WELL # | DEPTH | STATUS | SEALED TYPE | YEAR    |         |                     |
|----------|------|-----|-----|-----|------|---------------------------|-------|--------|-------|--------|-------------|---------|---------|---------------------|
|          |      |     |     |     |      |                           |       |        |       |        |             | DRILLER | DRILLER |                     |
| 09795790 | 097  | 46N | 12E | 14  | 1D   | LAKE CO PWD - ZION BENTON | 10087 | 1      |       | I      |             |         | 1955    |                     |
| 09769850 | 097  | 46N | 12E | 15  | 2E   | ILLINOIS BEACH STATE PARK | 11890 | 101    | 100   | U      |             |         |         |                     |
| 09795125 | 097  | 46N | 12E | 15  | 8E   | AVALON MHP                | 2726  | 1      | 83    | S      |             | 1995    | --      | --                  |
| 09795245 | 097  | 46N | 12E | 15  | 8F   | HOLLY HOCK HILL MHP       | 2725  | 1      | 126   | I      | --          |         | 1956    | --                  |
| 09792000 | 097  | 46N | 12E | 21  | 1A   | ZION                      | 2727  | 3      | 995   | S      | S           | 1958    | 1935    | JP MILLER/VARNER    |
| 09792000 | 097  | 46N | 12E | 21  | 1B   | ZION                      | 2728  | 1      | 1093  | D      | D           | --      | 1926    | LAYNE-BOWLER/VARNER |
| 09792000 | 097  | 46N | 12E | 21  | 6B   | ZION                      | 2729  | 2      | 220   | S      |             | 1969    | 1932    | --                  |
| 09707430 | 097  | 46N | 12E | 22  | 5A   | ZION INDUSTRIES INC       | 11883 | 1      | 93    | U      |             |         |         |                     |
| 09730130 | 097  | 46N | 12E | 23  | 6B   | EXELON - ZION STATION     | 11887 | 1      |       | I      |             |         |         |                     |
| 09795790 | 097  | 46N | 12E | 23  | 6D   | LAKE CO PWD - ZION BENTON | 2731  | 2      | 23    | A      | --          |         | 1959    | RANNEY WELL CO      |
| 09795790 | 097  | 46N | 12E | 23  | 6E   | LAKE CO PWD - ZION BENTON | 2730  | 1      | 33    | A      | --          |         | 1952    | RANNEY WELL CO      |

City Zion County Lake

Section 23.6d Twp. No. 46N Range 12E

Location (in feet from section corner) 2950'S, 1560'E, NW cor

Owner Lake Co Water Dist Authority Collector # 2

Contractor Ramsey Water Supplies Co Address now Lake Co PWD - Zion Benton

Date drilled 1959 Elev. above sea level top of well 571

Depth 23 ft Water from #2 pumped to #1

Log 4 perforated laterals 120', 144', 88' & 204' respectively, from north to south, 75° < between pipes

Were drill cuttings saved \_\_\_\_\_ Where filed \_\_\_\_\_

Size hole 13 ft If reduced, where and how much \_\_\_\_\_

Casing record concrete 13' dia casing

Distance to water when not pumping \_\_\_\_\_ Distance to water is \_\_\_\_\_

feet after pumping at \_\_\_\_\_ G. P. M. for \_\_\_\_\_ hours.

Reference point for above measurements \_\_\_\_\_

Type of pump Being submersible Distance to cylinder \_\_\_\_\_

Length of cylinder \_\_\_\_\_ Length of suction pipe below cylinder \_\_\_\_\_

Length stroke \_\_\_\_\_ Speed \_\_\_\_\_

Hours used per day \_\_\_\_\_ Type of power electric motor

Rating of motor 15 HP Rating of pump in G. P. M. 1200

Can following be measured: (1) Static water level \_\_\_\_\_

(2) Pumping level \_\_\_\_\_ (3) Discharge \_\_\_\_\_

(4) Influence on other wells \_\_\_\_\_

Temperature of water \_\_\_\_\_ Was water sample collected \_\_\_\_\_

Date \_\_\_\_\_ Effect of water on meters, hot water

coils, etc. \_\_\_\_\_

Date of Analysis \_\_\_\_\_ Analysis No. \_\_\_\_\_

Recorder Robert T. Lasman

Date Jan 8, 1960

City Zion County Lake  
Section 23 Twp. No. 46 N Range 12 E

Location (in feet from section corner) 1056 E. of SW corner 2450 S + 1500 E  
now Lake Co PWD - Zion Benton 11/2/58

Owner Lake Co. Public Water Supply Authority

Contractor Ranney Collector Address \_\_\_\_\_

Date drilled \_\_\_\_\_ Elev. above sea level top of well 591.33

Depth 33'

Log \_\_\_\_\_

Were drill cuttings saved \_\_\_\_\_ Where filed \_\_\_\_\_

Size hole 13' If reduced, where and how much \_\_\_\_\_

Casing record \_\_\_\_\_

Distance to water when not pumping 15' Distance to water is 22'

feet after pumping at 700 G. P. M. for 1 hours.

Reference point for above measurements \_\_\_\_\_

# 1 Type of pump Pomona # AV 2516 Distance to cylinder 28' 5/8" x 8" x 1 7/16"

Length of cylinder 4' 5/8", 5 Sta. 12" Length of suction pipe below cylinder 1' x 8"

Length stroke \_\_\_\_\_ Speed \_\_\_\_\_

Hours used per day \_\_\_\_\_ Type of power F.M. # F 318925

Rating of motor 60HP, 1765RPM Rating of pump in G. P. M. 750

Can following be measured: (1) Static water level Yes

(2) Pumping level Yes (3) Discharge Yes

(4) Influence on other wells no

Temperature of water 50.4° F Was water sample collected Yes

Date 11-20-58 Effect of water on meters, hot water

coils, etc. \_\_\_\_\_

Date of Analysis \_\_\_\_\_ Analysis No. \_\_\_\_\_

Recorder WJ Wood

Date 11-21-58

Hanson

City Jim County Lake

Section 23.62 Twp. No. 96N Range 12E

Location (in feet from section corner) 2450' S, 1500' E, NW cor

Owner Lake Co Water Dist Authority Collector #1

Contractor Ramsey Water Supplies Co Address now Lake Co PWD - Zion Benton

Date drilled 1952, 1957 Elev. above sea level top of well 591.33

Depth 33' 5 collector pipes, 3-12" dia 47', 76' & 104'

Log 2-8" dia 96' & 164'

fan shaped 30° between pipes

Were drill cuttings saved \_\_\_\_\_ Where filed \_\_\_\_\_

Size hole 13ft If reduced, where and how much \_\_\_\_\_

Casing record 13' dia concrete caisson

Distance to water when not pumping \_\_\_\_\_ Distance to water is \_\_\_\_\_

feet after pumping at \_\_\_\_\_ G. P. M. for \_\_\_\_\_ hours.

Reference point for above measurements \_\_\_\_\_

Type of pump 2 F-M Porona Turbines Distance to cylinder 28' x 8"

Length of cylinder 12" 5 stages Length of suction pipe below cylinder 1 x 8"

Length stroke \_\_\_\_\_ Speed \_\_\_\_\_  
1 pump has, in addition to the motor, a 2 gear drive and a 80 HP Continental gasoline engine

Hours used per day \_\_\_\_\_ Type of power F-M electric motor

Rating of motor 60 HP Rating of pump in G. P. M. 750 / 230' TDH (each)

Can following be measured: (1) Static water level Yes

(2) Pumping level Yes (3) Discharge Yes

(4) Influence on other wells \_\_\_\_\_

Temperature of water \_\_\_\_\_ Was water sample collected \_\_\_\_\_

Date \_\_\_\_\_ Effect of water on meters, hot water

coils, etc. \_\_\_\_\_

Date of Analysis \_\_\_\_\_ Analysis No. \_\_\_\_\_

Recorder Robert T. Basman

Date Jan 8, 1960

Burt Hanson 1961 Min R

City 7/100 County Jamez

Section 213 Twp. No. 4611 Range 12E

Location (in feet from section corner) 2450'S, 1500'E, NW cor

Owner Lake Co Public Water Supply Authority now Lake Co PWD - Zion Benton

Contractor Ranney collector Address \_\_\_\_\_

Date drilled \_\_\_\_\_ Elev. above sea level top of well 591.33

Depth 33'

Log \_\_\_\_\_

Were drill cuttings saved \_\_\_\_\_ Where filed \_\_\_\_\_

Size hole 13' If reduced, where and how much \_\_\_\_\_

Casing record \_\_\_\_\_

Distance to water when not pumping 15' Distance to water is 22'

feet after pumping at 700 G. P. M. for 1 hours.

Reference point for above measurements \_\_\_\_\_

Type of pump \_\_\_\_\_ Distance to cylinder \_\_\_\_\_

Length of cylinder \_\_\_\_\_ Length of suction pipe below cylinder \_\_\_\_\_

Length stroke \_\_\_\_\_ Speed \_\_\_\_\_

Hours used per day \_\_\_\_\_ Type of power \_\_\_\_\_

Rating of motor \_\_\_\_\_ Rating of pump in G. P. M. \_\_\_\_\_

Can following be measured: (1) Static water level \_\_\_\_\_

(2) Pumping level \_\_\_\_\_ (3) Discharge \_\_\_\_\_

(4) Influence on other wells \_\_\_\_\_

Temperature of water 50.4°F Was water sample collected Yes

Date 11-20-58 Effect of water on meters, hot water

coils, etc. Complete data sent to Hanson

Date of Analysis \_\_\_\_\_ Analysis No. 148254

Recorder WJ Wood

Date 11-21-58

{ 64 616 }  
{ 64 65 }

Revised 21

STATE WATER SURVEY WELL DATA.

44

Date July 31 1925

Recorder W. L. ...

Authority \_\_\_\_\_

Owner City of ... City ... County ...

When drilled \_\_\_\_\_ Contractor \_\_\_\_\_ Address \_\_\_\_\_

Location (give location from section corner if possible) \_\_\_\_\_

1480' North + 510' East from S.E. cor. Sec 21 - 46N - 12E

Elevation top of well 635. Depth 1025

Log See City Report -

163' to Sandstone 896 to top of P. Sand -

Casing record \_\_\_\_\_

10x  
896  
130

Size hole \_\_\_\_\_

Were drill cuttings saved? \_\_\_\_\_ Were they sent to State Geological Survey? \_\_\_\_\_ Distance to water when not pumping \_\_\_\_\_. After pumping at \_\_\_\_\_ gpm. for \_\_\_\_\_ hours, Reference point for above measurements \_\_\_\_\_

Type of pump Turbine <sup>75HP</sup> Distance to cylinder \_\_\_\_\_

Length of suction pipe below cylinder \_\_\_\_\_

Length stroke \_\_\_\_\_ Speed \_\_\_\_\_ Hours used per day \_\_\_\_\_

Type of power Motor

Can following be measured: Water level not pumping \_\_\_\_\_ Pumping \_\_\_\_\_

Discharge 400 gpm Influence on other wells \_\_\_\_\_

Temperature of water 16° C - Were water samples collected Yes

Date \_\_\_\_\_ Analysis number 64616 Effect of water on

meters, hot water coils See 56083

Cost of well \_\_\_\_\_

s. patent

City ZION County Lake

Section 2702 E 1546 Ave Twp. No. \_\_\_\_\_ Range \_\_\_\_\_

Location (in feet from section corner) \_\_\_\_\_

Owner City of Zion Authority \_\_\_\_\_

Contractor Layne Bowler Address \_\_\_\_\_

Date drilled 1925 Elev. above sea level top of well \_\_\_\_\_

Depth 1120' - originally 1025'

Log \_\_\_\_\_

Were drill cuttings saved \_\_\_\_\_ Where filed State Water Survey

Size hole 1 1/2 If reduced, where and how much \_\_\_\_\_

Casing record \_\_\_\_\_

Distance to water when not pumping 96 (4-1548) Distance to water is ~~325~~ 325'

feet after pumping at 380 G. P. M. for 2 hours.

Reference point for above measurements Floor of Bldg.

Type of pump Layne Centrifugal Distance to cylinder 1350

Length of cylinder Bowl 9 1/4" Length of suction pipe below cylinder Bowl 10"

Length stroke \_\_\_\_\_ Speed 1100 RPM

Hours used per day 8 to 24 Type of power Electric

Rating of motor 60 Rating of pump in G. P. M. 350

Can following be measured: (1) Static water level \_\_\_\_\_

(2) Pumping level \_\_\_\_\_ (3) Discharge \_\_\_\_\_

(4) Influence on other wells \_\_\_\_\_

Temperature of water \_\_\_\_\_ Was water sample collected 5-27-48

Date \_\_\_\_\_ Effect of water on meters, hot water

coils, etc. Build up of deposit

Date of Analysis \_\_\_\_\_ Analysis No. 114865-

Recorder \_\_\_\_\_

Date \_\_\_\_\_



Well No.

City Zion County Lake

Section 21 Twp. No. 43 N Range 11 E

Location (in feet from section corner) 1230 S, 510 W, of N.E. Cor. of S.E. 1/4 of Sec 21

Owner City of Zion Authority Mr. Erwin Craig, W.W. Supt

Contractor Vorner Well Drilling Co Deepened well Address Dubuque Ia.

Date drilled Deepened 10 1944 Elev. above sea level top of well 523

Depth 1100

Log on file

Were drill cuttings saved Yes Where filed S.G.S

Size hole top 16" bot 9 5/8" If reduced, where and how much 16" @ 0-166; 15" from 166-312; 12" from 312-1028; 12" 1028-1100

Casing record 16" to 166; 12" from 312 to 578.5

Distance to water when not pumping 65-68 in Jan 1944 Distance to water is 254 ft on 9/10

feet after pumping at 400 G. P. M. for 1 hours on 8/10/44

Reference point for above measurements Pump Base

Type of pump Layne-Bowler 10" turbine Distance to turbine cylinder 350

Length of cylinder 13 stages (9'-7") Length of suction pipe below cylinder 10' of 6"

Length stroke 350' of 6" Column pipe Speed 1800 R.P.M

Hours used per day \_\_\_\_\_ Type of power Electric

Rating of motor 60 H.P. Rating of pump in G. P. M. 400

Can following be measured: (1) Static water level Yes - if proper gauge is used.

(2) Pumping level Yes (3) Discharge No

(4) Influence on other wells Yes on No 3 and Creamery well

Temperature of water 59.5° Was water sample collected Yes

Date Aug. 10 1944 Effect of water on meters, hot water coils, etc. \_\_\_\_\_

Date of Analysis \_\_\_\_\_ Analysis No. 100,996

Recorder J. L. Geils

Date 8/10/44

WELL No. 1

11/11/46

City Zion County Lake

Section 21 Twp. No. 46 N Range 12 E

Location (in feet from section corner) 1120' N, 510' E, of S.W. corner

Owner City of Zion Authority Erwin Craig, W.W. Supt.

Contractor Layne Bowler Address Zion, Ill.

Date drilled 1926 Elev. above sea level top of well \_\_\_\_\_

Depth 1100' (deepened by Varner in 1943)

Log See S.W.S files

Were drill cuttings saved \_\_\_\_\_ Where filed \_\_\_\_\_

Size hole \_\_\_\_\_ If reduced, where and how much \_\_\_\_\_

Casing record \_\_\_\_\_

Distance to water when not pumping 68' (1943) Distance to water is 232' (Sept. 5, 1946)

feet after pumping at 400 G. P. M. for 4 1/2 hours.

Reference point for above measurements Pump base

Type of pump Layne turbine Distance to bowls cylinder 350'

Length of column cylinder 350'-6" φ Length of suction pipe below cylinder 10'-6" φ

Length stroke \_\_\_\_\_ Speed \_\_\_\_\_

Hours used per day over 10 hrs Type of power elect.

Rating of motor 6 HP Rating of pump in G. P. M. 400

Can following be measured: (1) Static water level Yes

(2) Pumping level Yes (3) Discharge No

(4) Influence on other wells Yes on No. 3 + Creamery Well -

Temperature of water 59.4° Was water sample collected Yes after 4 1/2 hrs @ 400

Date Sept. 5, 1946 Effect of water on meters, hot water

coils, etc. Water is treated

Date of Analysis \_\_\_\_\_ Analysis No. 157588

Recorder O. F. Geils

Date Sept. 6, 1946

630  
232  
398

630  
62  
568

2H=7.2  
Running  
in cap)

# Varner Well Drilling Company

INCORPORATED

905 Du buque Bldg.

Telephone 3691

DUBUQUE, IOWA.

ZION REPAIRS NO. 1 WELL  
ZION, ILLINOIS

DATE STARTED July 29, 1943 DATE COMPLETED January 13, 1944

DIAMETER 15" from surface to 575'; 12" from 575' to 1025'; 10" from 1025' to 1100'

DEPTH 1100'

CASING Approx. 163' of 16" O.D. from surface; 12" from 313' to 75'

Pulled pump and checked hole to 1018', cleaned to 1020'

Shot hole at 925' with 166# shot, 950' with 167# shot, and 985' with 167# shot.

Measured hole and cleaned out from 930' to 1025'

Installed 322' test pump - Results: 6.00 P.M. 460 GPM - Water below bowls  
6.30 P.M. 390 GPM - Water below bowls  
7.00 P.M. 370 GPM - Water below bowls

Removed pump cleaned to 1025' and drilling new 10" hole.

1025' to 1027' - 2' - Limestone  
1027' to 1035' - 8' - Grey Dolomite  
1035' to 1040' - 5' - Brown Lime Rock and red Shale  
1040' to 1044' - 4' - Brown Shale and Sand  
1044' to 1065' - 21' - Brown Sand

Shot hole at 1065' with 200# shot, hole filled to 960'

Cleaned out hole to 1065'

Shot hole at 908' with 250# shot and 970' with 250# shot. Checked hole to 920' and cleaned out to 1065'. Drilling new 10" hole.

1065' to 1070' - 5' - Brown Limestone  
1070' to 1080' - 10' - Brown Limestone  
1080' to 1086' - 6' - Brown Sandstone

Install 340' of pump and run test, pumping level 340' and pump 435 GPM

Removed pump and cleaned hole to 1086', drilling new 10" hole from 1086' to 1093' - 7' - Sandstone - Very Hard

Install pump and running test - Water drops quickly - Remove pump, hole filled 25'

Clean hole to 1093' and drilled hole to 1100' bottom.

Set new Layne & Bowler Pump - Total pump installed - 369'.

WELL INVENTORY SCHEDULE

Well No. 46112E-21161  
Owner's No. 1

Location Zion County Lake

Feet from Sec. Cor. 1120' N, 510' W, SE cor

Owner City of Zion Address Log Chaisman, Dept

Driller Hayne & Bowler Address \_\_\_\_\_

Date drilled 1926 Method Cable tool

Depth 1100 Hole record 16" 0-163', 15" 163-575 1/2', 12" 575 1/2'-1100'

Casing record 16" 0-163' (slotted 105-130'), 12" 313-575 1/2', 10" 307-375' (19

Screen record slotted 16" casing 105-130'

Log \_\_\_\_\_ Drill cuttings \_\_\_\_\_ Sample set no. \_\_\_\_\_

Chief aquifer Artesian from \_\_\_\_\_ to \_\_\_\_\_ Other aquifer \_\_\_\_\_

Land surface elev. 632.78 Topography \_\_\_\_\_

Nonpumping level 108.41 <sup>above</sup> (below) measuring point on 10-31-62 at \_\_\_\_\_ AM  
(date) \_\_\_\_\_ PM

Pumping level \_\_\_\_\_ <sup>above</sup> below measuring point after pumping at \_\_\_\_\_ AM  
\_\_\_\_\_ gpm for \_\_\_\_\_ hours on \_\_\_\_\_ at \_\_\_\_\_ PM  
(date) \_\_\_\_\_

Measuring point (MP) for above measurements air vent plug, at 250

Airline and measuring equipment Steel tape

Pump and power \_\_\_\_\_

Use of water Standby use since 1957

Water quality \_\_\_\_\_

Analysis No. and date \_\_\_\_\_ Temp. \_\_\_\_\_

Data collected by \_\_\_\_\_ Date \_\_\_\_\_

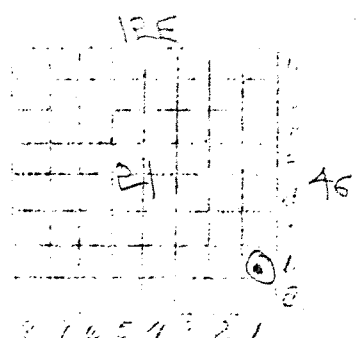
Source of information Paul A. C.

Can well be used in pumping test? \_\_\_\_\_ Are nearby observation

wells available? \_\_\_\_\_ Are pumping records available? Yes

Are water level records available? Yes

Remarks: Shot in 1926 in 200 feet sandstone  
in 1943, deepened from 1025 to 1100' and shot at  
925', 950', 970', 985'.



WELL No. 2

Mineral  
Sealed

City Zion County Lake

Section 21 Twp. No. 46 N Range 12 E

Location (in feet from section corner) 1120' N; 510' W. of the SE. corner.

Owner CITY of Zion Authority Erwin Craig W. W. Supt.

Send copy of mineral analysis to

Contractor \_\_\_\_\_ Address Zion, Ill.

Date drilled 1932 Elev. above sea level top of well 651

Depth 220'

Log \_\_\_\_\_

Were drill cuttings saved ? Where filed ?

Size hole 10" If reduced, where and how much \_\_\_\_\_

Casing record 160' of 10"

Distance to water when not pumping 18' (May 1944) Distance to water is breaks suction occasionally

feet after pumping at 40 G. P. M. for continuously hours.

Reference point for above measurements Pump base

Type of pump Layne turbine Distance to cylinder bowls 119'

Length of cylinder column 119'-6" Length of suction pipe below cylinder 30' of 4"  $\phi$

Length stroke \_\_\_\_\_ Speed \_\_\_\_\_

Hours used per day Continuously Type of power Elect.

Rating of motor 20 Rating of pump in G. P. M. 50

Can following be measured: (1) Static water level No

(2) Pumping level No (3) Discharge No

(4) Influence on other wells None reported

Temp of water 51.2° F Was water sample collected Yes

Date Sept. 5, 1946 Effect of water on meters, hot water

coils, etc. Very soft

Date of Analysis \_\_\_\_\_ Analysis No. 107589

Recorder J. F. Heile

Date Sept. 6, 1946

City Tracy County Colo

Section 21 Twp. No. 46 N Range 12 E

Location (in feet from section corner) 8 N 137 W SE 21

Owner City of Tracy Authority Mr. Erwin D. N.W. Scott

Contractor Yarnor Well Drilling Co. Denver Address Dubouge St.

Date drilled 2-28-1922 Elev. above sea level top of well 529.16

Depth 1023

Log See 353

629  
75  
-54

Were drill cuttings saved no Where filed 353

Size hole 12 1/2" If reduced, where and how much 2 1/2" from 148.10' from 121-564.10' from 321-926'

Casing record See 353

Distance to water when not pumping 75.4' Distance to water is 277'

feet after pumping at (277' to pressure) G. P. M. for (Same for 10) hours (2)

Reference point for above measurements Top of casing Did you observe?

Type of pump Packless turbine Distance to cylinder 300'

Length of cylinder 300' Length of suction pipe below cylinder 35'

Length stroke \_\_\_\_\_ Speed \_\_\_\_\_

Hours used per day 2-28-1922 Type of power Elect.

Rating of motor 3-40 Rating of pump in G. P. M. 350

Can following be measured: (1) Static water level Yes (300' Air Line)

(2) Pumping level Yes (3) Discharge No

(4) Influence on other wells No will influence No. 2

Temperature of water 60.3° Was water sample collected Yes

Date 2-28-1922 Effect of water on meters, hot water coils, etc. \_\_\_\_\_

Date of Analysis \_\_\_\_\_ Analysis No. 100,997

Recorder \_\_\_\_\_

Date \_\_\_\_\_

John C. Moore Corporation, Rochester, N. Y. Binder and holes in leaves, each Patented 1906. 386790

*Abandoned*

TOWN **Zion City** TOWNSHIP **Benton**  
 COMPANY **J. P. Miller Well Co.**  
 FARM **Zion City** No. **3** T. **46**  
 AUTHORITY **James J. Craig, City Eng.** N  
 ELEVATION **629.4**  
 COLLECTOR **Workman** DATE DRILLED **1935**  
 CONFIDENTIAL **137' W., 78'n. of SE corner**

Map No. **1**  
 R. **12E**  
 Sec. **21**

|  |  |  |
|--|--|--|
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

| No. | STRATA   | Thickness |     | Depth |     |
|-----|--|-----------|-----|-------|-----|
|     |  | Feet      | In. | Feet  | In. |
|     | Drift  | 125       |     | 125   |     |
|     | Sand and gravel, very little water   | 5         |     | 130   |     |
|     | Drift  | 16        |     | 146   |     |
|     | Sand, sample of water to Water Survey  | 1         |     | 147   |     |
|     | Lime rock, gray  | 183       |     | 330   |     |
|     | Marl, red  | 20        |     | 350   |     |
|     | Lime, gray   | 20        |     | 370   |     |
|     | Shale, blue  | 190       |     | 560   |     |
|     | Lime, gray, hard   | 303       |     | 863   |     |
|     | Sand, gray   | 11        |     | 874   |     |
|     | Lime, dark   | 26        |     | 900   |     |
|     | Sand, gray   | 93        |     | 993   |     |
|     | Marl red   | 2         |     | 995   |     |
|     | All measurements to derrick floor.   |           |     |       |     |
|     | 143'2" of 12 1/2" drive pipe with steel shoe 0 to 143'2"                           |           |     |       |     |
|     | 254'4" of 10" drive pipe with steel shoe 309'8" to 564'0"                          |           |     |       |     |
|     | Static level 58' at 915' depth   |           |     |       |     |
|     | Static level (no operations) 51' at 995' depth                                     |           |     |       |     |
|     | Before shooting water level 32 1/2'  |           |     |       |     |
|     | First shot - 40 # 60% at 980'  |           |     |       |     |
|     | Second shot - 55 # 60% at 955'   |           |     |       |     |
|     | Water level 35'  |           |     |       |     |
|     | Third shot 50 # 60% at 925'  |           |     |       |     |
|     | 10" casing damaged a little. 7 1/2" bailer will go through but 10" drill will not. |           |     |       |     |
|     | Well not completed to date. April 30, 1935   |           |     |       |     |

County **Lake**

Index No. **0121**

T.—DRILL RECORD

46244—10M—11-35 Illinois Geological Survey, Urbana

*Assigned to 1023 in 1942 by Varner*

CITY OF SIEN, ILL.  
Well No. 3

Date Started - 11-2-42

Date Completed - 1-2-43

Removed 350 ft. of 7 5/8 O. D. Extra Heavy Column, 10" Bowls and 35 ft. of suction pipe.

Swedged 10" liner with 9 7/8" O. D. swedge

Clean Hole to 980 feet.

Well Shot with 100 lbs. shots at 930ft., 945 ft., and 915 ft.

Bailed and drilled sand shot loose from 11-17-42 to 11-8-42

Cleaned hole to 996 ft. level.

Drilled 9 5/8" hole from 996 ft. to 1023 ft.

Installed test pump and run test - 12-15-42

17 ft. of sand fill cleared out after test.

Reinstalled owners pump and it is reported by Mr. Erwin Craig, Supt., well delivery is over 400 G.P.M. - Jan. 16, 1943.

2  
13  
18  
—  
08  
10



City near Zion County Lake

Section 35 26 Twp. No. 46 N Range 12 E

Location (in feet from section corner) NW 1/4 700' N x 500' E SW/c

Owner Jll. Beach State Park Authority driller's log

Contractor S. B. Geiger Address Chicago

Date drilled Aug. 1947 Elev. above sea level top of well 585 ± T. M.

Depth 1002'

Log (over)

(also took 5 ~~series~~ samples at 1, 5, 15, 30, and 60 minutes.)

Were drill cuttings saved yes Where filed S. G. S.

Size hole 8" If reduced, where and how much —

Casing record 124' of 8" pipe 150' of 6" liner 290' to 440'

Distance to water when not pumping 12' Distance to water is 137

feet after pumping at 38 G. P. M. for 4 1/2 hours.

Reference point for above measurements top of casing

Type of pump test Distance to faulst cylinder 152'

Length of faulst cylinder 5' Length of suction pipe below cylinder 12'

Length stroke \_\_\_\_\_ Speed \_\_\_\_\_

Hours used per day \_\_\_\_\_ Type of power \_\_\_\_\_

Rating of motor \_\_\_\_\_ Rating of pump in G. P. M. \_\_\_\_\_

Can following be measured: (1) Static water level \_\_\_\_\_

(2) Pumping level \_\_\_\_\_ (3) Discharge \_\_\_\_\_

(4) Influence on other wells none

Temperature of water 54.4 Was water sample collected 8-18-47

Date \_\_\_\_\_ Effect of water on meters, hot water

coils, etc. very slight H<sub>2</sub>S odor

Date of Analysis \_\_\_\_\_ Analysis No. \_\_\_\_\_

pH 7.6 Recorder F. K. B.

Date 8-20-47

| Thickness | Depth | Description              |
|-----------|-------|--------------------------|
| 45        | 45    | drift sands              |
| 3         | 48    | blue mud                 |
| 4         | 52    | blue sand (sand)         |
| 28        | 80    | blue shale               |
| 6         | 86    | blue shale               |
| 26        | 122   | blue shale               |
| 12        | 134   | blue sand ← * note below |
| 6         | 140   | blue sand                |
| 20        | 160   | blue sand                |
| 10        | 170   | blue sand                |
| 5         | 175   | shale, gray              |
| 35        | 210   | lime, buff               |
| 12        | 222   | sand, lime               |
| 72        | 294   | lime                     |
| 5         | 300   | red shale                |
| 5         | 305   | gray shale, fossils      |
| 28        | 333   | blue shale               |
| 47        | 440   | limestone                |
| 395       | 835   | brown sandy lime         |
| 157       | 992   | St Peter Sand            |
| 8         | 1000  | Red Rock                 |

\* Small Crevices at 126'. Water level up to 30', muddy.

Ill. Dept. of Public Health  
Yellow Copy: Well Contractor  
Golden Copy: Well Owner

# Well Construction Report

THIS FORM MUST BE COMPLETED WITHIN 30 DAYS OF WELL COMPLETION AND SENT TO THE ILLINOIS DEPARTMENT OF PUBLIC HEALTH DIVISION OF ENVIRONMENTAL HEALTH 525 WEST JEFFERSON STREET SPRINGFIELD, ILLINOIS 62761

GEOLOGICAL AND WATER SURVEYS WELL RECORD  
**RICK KRABBE, PROJECT DRILLER**  
License No. 102-00324  
9. Driller LAYNE - WESTERN  
10. Well Site Address THUNDERHAWK C.C. - 1240 3RD ST  
11. Property Owner LAKE COUNTY FOREST Well No. 1  
12. Permit No. WW97-03-0391 Date Issued 5/19/97  
13. Location: County LAKE  
Sec. 30N  
Twp. 46N  
Rge. 12E

Thunderhawk  
GOLF COURSE

1500' W & 1500'S OF  
NE CORNER

|  |  |  |  |  |  |
|--|--|--|--|--|--|
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |

Show location in section plat

| Diam. (in) | Kind and Weight | at depth  |         |
|------------|-----------------|-----------|---------|
|            |                 | From (ft) | To (ft) |
| 18"        | STEEL - 70.59#  | + 2       | 206     |
| 14"        | " - 54.57#      | + 3       | 634     |
| 10"        | " - 40.48#      | 1056      | 1179    |

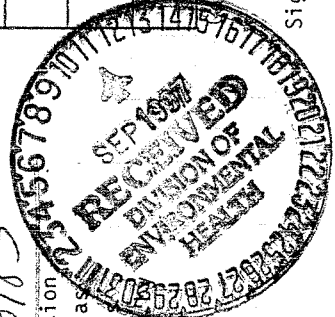
NW SE NE

| Type of Well | Hole Diam. in.                    | Depth ft    |
|--------------|-----------------------------------|-------------|
| a. Bored     | Yes ___ No ___                    |             |
| b. Driven    | Drive Pipe Diam. in.              | Depth ft    |
| c. Drilled   | Finished in Drift                 | In Rock ___ |
| d. Grout:    | (KIND) FROM (Ft.) TO (Ft.)        |             |
|              | <u>CEMENT</u> <u>0</u> <u>634</u> |             |

2. Well furnishes water for human consumption? Yes \_\_\_ No X
3. Date well drilled JUNE - JULY, 1997 Yes \_\_\_ No \_\_\_
4. Permanent pump installed? Yes X Date 6/97 No \_\_\_
- Manufacturer BYRON JACKSON Type SUBM.
- Location \_\_\_\_\_
- Capacity 800 gpm. Depth of setting 690 ft.
5. Well top sealed? Yes X No \_\_\_ Type WELDED PLATE
6. Pitless adapter installed? Yes \_\_\_ No X
- Manufacturer \_\_\_\_\_ Model No. \_\_\_\_\_
- How attached to casing? \_\_\_\_\_
7. Well disinfected? Yes X No \_\_\_
8. Pump and equipment disinfected Yes X No \_\_\_

16. Screen: Diam. \_\_\_ in, Length \_\_\_ in, Slot Size \_\_\_
17. Size hole below casing 10 in. 18. Ground Elev. 710 ft msl.
19. Static level 215 ft below casing top which is 3 ft. above ground level. Pumping level 513 ft, pumping gpm for 24 hours.

| Earth Materials Passed Through | Depth of |        |
|--------------------------------|----------|--------|
|                                | Top      | Bottom |
| <u>SEE ATTACHED</u>            |          |        |
|                                |          |        |
|                                |          |        |
|                                |          |        |
|                                |          |        |



00440183

IMPORTANT NOTICE  
This State Agency is requesting disclosure of information that is necessary to accomplish the statutory purpose as outlined under Public Act 85-0863. Disclosure of this information is mandatory. This form has been approved by the Forms Management Center.

PRESS FIRMLY WITH BLACK PEN OR TYPE  
Do Not Use Ball Pen

IL482-0126  
PCS 09705242 #1 0001126

Continue on separate sheet if necessary.

Signed Gregory R. Buehler Date 9/8/97





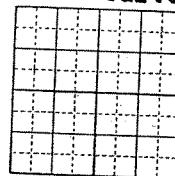
ILLINOIS GEOLOGICAL SURVEY, URBANA

| Strata  | Thickness | Top | Bottom |
|---|-----------|-----|--------|
| <b>PLEISTOCENE SERIES</b>                                       |           |     |        |
| Sand, yellowish brown   | 25        |     | 25     |
| Till, sandy, gravelly, dark yellowish brown                     | 25        |     | 50     |
| Till, pinkish brown   | 40        |     | 90     |
| Gravel, light gray  | 5         |     | 95     |
| Till, calcareous, pinkish brown                                 | 20        |     | 115    |
| No sample   | 5         |     | 120    |
| <b>SILURIAN SYSTEM</b>  |           |     |        |
| <b>Niagaran Series</b>  |           |     |        |
| Dolomite, white to yellowish gray; cherty in lower portion      | 150       |     | 270    |
| <b>Alexandrian Series</b>                                       |           |     |        |
| Dolomite, white to yellowish gray, cherty at top                | 25        |     | 295    |
| <b>ORDOVICIAN SYSTEM</b>  |           |     |        |
| <b>Maquoketa formation</b>                                      |           |     |        |
| Shale, dolomitic, green; some dolomite streak at top            | 200       |     | 495    |
| <b>Galena formation</b>   |           |     |        |
| Dolomite, sandy, pale brown to buff, some yellowish gray at top | 155       |     | 650    |
| <b>Decorah formation</b>  |           |     |        |
| Dolomite, brown to gray   | 38        |     | 688    |
| <b>Platteville formation</b>                                    |           |     |        |
| Dolomite, brownish to gray                                      | 142       |     | 830    |
| <b>Glenwood formation</b>                                       |           |     |        |
| Dolomite buff to brown  | 45        |     | 875    |
| Sandstone, white dolomitic, fine to coarse                      | 25        |     | 900    |
| <b>St. Peter formation</b>                                      |           |     |        |
| Sandstone, yellowish white, fine to coarse, incoherent          | 102       |     | 1002   |

Sample study summary log furnished by State Geological Survey.

COMPANY Geiger  
 FARM 21110015 Beach State Park  
 DATE DRILLED 1947  
 AUTHORITY L. Selkregg  
 ELEVATION 630' est. T.M.  
 LOCATION 4500'S. 29th St., Zion, Ill.  
 COUNTY LAKE S.S. #17181

NO. COUNTY NO.



23-46N-12E

26

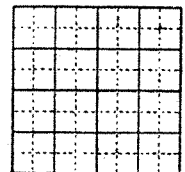


## ILLINOIS GEOLOGICAL SURVEY, URBANA

| Strata  | Thickness | XXX<br>Thickness | Bottom |
|---|-----------|------------------|--------|
| <b>PLEISTOCENE SYSTEM</b>                                       |           |                  |        |
| Sand, yellowish brown   |           | 25               | 25     |
| Till, sandy, gravelly, dark yellowish brown                     |           | 25               | 50     |
| Till, pinkish brown   |           | 40               | 90     |
| Gravel, light grey  |           | 5                | 95     |
| Till, calcareous, pinkish brown                                 |           | 20               | 115    |
| No sample   |           | 5                | 120    |
| <b>SILURIAN SYSTEM</b>  |           |                  |        |
| Niagaran Series   |           |                  |        |
| Dolomite, white to yellowish gray, some cherty in lower portion |           | 150              | 270    |
| Alexandrian Series  |           |                  |        |
| Dolomite, white to yellowish gray, cherty at top                |           | 25               | 295    |
| <b>ORDOVICIAN SYSTEM</b>  |           |                  |        |
| Maquoketa formation   |           |                  |        |
| Shale, dolomitic, green; some dolomite streak at top            |           | 200              | 495    |
| Galena formation  |           |                  |        |
| Dolomite, sandy, pale brown to buff, some yellowish gray at top |           | 155              | 650    |
| Decorah formation   |           |                  |        |
| Dolomite, brown to gray   |           | 38               | 688    |
| Platteville formation   |           |                  |        |
| Dolomite, brownish to gray                                      |           | 142              | 830    |

COMPANY Geiger  
 FARM Beach State Park  
 DATE DRILLED 1947  
 AUTHORITY Summary Sample Study  
 ELEVATION 630' est. I.M.  
 LOCATION 4500'S 29th St., Zion, Ill.  
 COUNTY LAKE S.S. #17181

NO.  
 COUNTY NO.



2623-46N-12E

ILLINOIS GEOLOGICAL SURVEY, URBANA

| Strata   | <del>Thickness</del> | Top | Bottom |
|--|----------------------|-----|--------|
| Glenwood formation   |                      |     |        |
| Dolomite, buff to brown                                    |                      | 45  | 875    |
| Sandstone, white, dolomitic,<br>fine to coarse             |                      | 25  | 900    |
| St. Peter formation  |                      |     |        |
| Sandstone, yellowish, white,<br>fine to coarse, incoherent |                      | 102 | 1002   |

Geiger Beach State Park

COUNTY LAKE S.S. #17181 23-46N-12E

**WATER WELL SEALING FORM**

Lake County Health Department  
Division of Environmental Health

FILE

WW 95-03-0980

3010 Grand Avenue  
Waukegan, IL 60085  
(708) 360-6740

121 E. Grand Avenue  
Lake Villa, IL 60046  
(708) 356-6222

118 S. Main Street  
Wauconda, IL 60084  
(708) 526-1125

**This form shall be submitted to the Lake County Health Department at the time of the sealing of potable wells, boring or monitoring wells. Such wells are to be sealed not more than 30 days after they are abandoned in accordance with the sealing requirements in the Water Well Construction Code.**

1. Owner of Property Avalon Mobile Home Park 1639 Sheridan Rd Zion Ill 60099  
Name Address Zip

2. Well Location: Same  
Street 8e City County

General Description: Section 15, Township 46, Range 12 P.I.N#: 04-15-118-002

4. Drilling Permit No. (and date, if known)

5. Type of Well: Drilled x Driven Dug Other

6. Total Depth 90 Static Level 15 Diameter (inches) 5

7. Formation clear of obstruction? Yes x No Depth to Obstruction

**8. DETAILS OF PLUGGING:**

From 0 To 90 feet

Kind of Plug 3/4 Bentonite

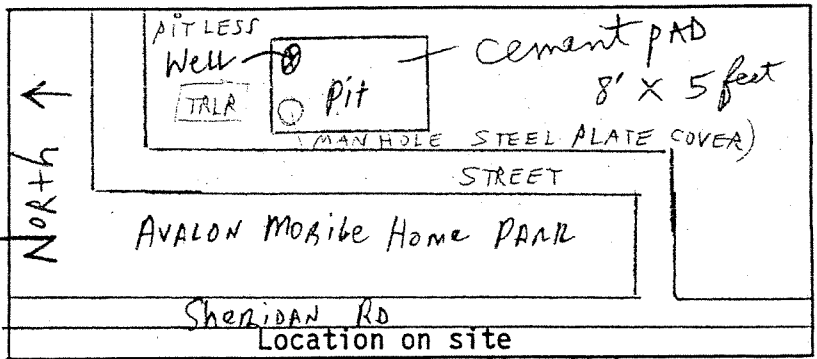
From To feet

Kind of plug

From To feet

Kind of plug

From To feet



**9. CASING RECORD**

Upper 3 feet of casing removed? Yes x No

If well casing consists of brick, stone, concrete blocks, porous tile, or other porous material, casing was removed to a depth of 10 feet below the surface. Yes No

10. Date well was Sealed: Oct 27 95  
Month Day Year

11. Licensed water well driller or other person approved by the Department performing well sealing:

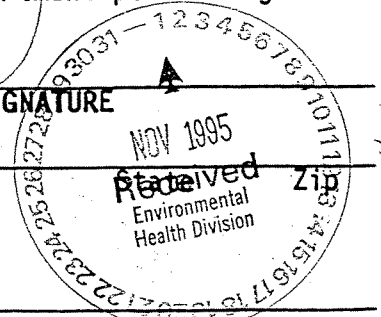
William D. Maade  
Name (PRINT)

P.O. Box 250 Russell Ill. 60075  
Address

102-000-783  
License Number

City

SIGNATURE



SEALING OF WELL OBSERVED BY Eric Nyström Lake County Health Department  
signature Division of Environmental Health

Sealing Method approved by Eric Nyström Date 10-27-95  
AT site.

COA 43032



# Illinois Environmental Protection Agency

Bureau of Water - Division of Public Water Supplies

Inspection Report - Elgin Regional Office

|   |  |                                       |                          |   |                        |                      |                                     |      |            |
|---|--|---------------------------------------|--------------------------|---|------------------------|----------------------|-------------------------------------|------|------------|
| FACILITY NAME                                       |  | Holly Hock Hill Mobile Home Park      |                          | FACILITY NUMBER                               |                        | IL0975245            |                                     |      |            |
| PLANT PHONE   |  | 1-847-336-5955                        |                          | COUNTY  |                        | Lake                 |                                     |      |            |
| INSPECTION DATE                                     |  | December 9, 2003                      |                          | INSPECTED BY:                                 |                        | Chris Johnston       |                                     |      |            |
| <b>SEND CORRESPONDENCE TO</b>                       |  |                                       |                          | <b>EXEMPTION / LABORATORY FEE STATUS</b>      |                        |                      |                                     |      |            |
| NAME OR ENTITY                                      |  | Mr. Harris DeJong                     |                          | CHLORINE (Date)                               |                        | Not exempt           |                                     |      |            |
| ADDRESS   |  | P.O. Box 66                           |                          | CERTIFIED OPERATOR                            |                        | May 23, 1991         |                                     |      |            |
| CITY, STATE, ZIP                                    |  | Wadsworth, Illinois 60083             |                          | LAB FEE PARTICIPANT (Y/N)                     |                        | No                   |                                     |      |            |
| <b>CONTACT INFORMATION</b>                          |  |                                       |                          |   |                        |                      |                                     |      |            |
| CERTIFIED OPERATOR                                  |  | Mr. Harris DeJong                     |                          | CLASS   |                        | "C"                  |                                     |      |            |
| PHONE:  |  | 1-847-336-5955                        |                          | FAX:  |                        | 1-847-336-5956       |                                     |      |            |
| PAGER:  |  | 1-847-370-0367                        |                          | OTHER:  |                        | None                 |                                     |      |            |
| OWNER - RESPONSIBLE PERSONNEL                       |  | Mr. Harris DeJong                     |                          | TITLE OR POSITION                             |                        | Owner                |                                     |      |            |
| PHONE:  |  | 1-847-336-5955                        |                          | FAX:  |                        | 1-847-336-5956       |                                     |      |            |
| OTHER CONTACTS                                      |  | NAME                                  |                          | TITLE OR POSITION                             |                        | PHONE                |                                     |      |            |
|   |  | Mr. Brad DeJong                       |                          | Assistant                                     |                        | 1-847-528-2420       |                                     |      |            |
|   |  | Mr. Roy Hogan                         |                          | Residential Manager                           |                        | 1-847-731-0091       |                                     |      |            |
| HOME PAGE ADDRESS                                   |  | None                                  |                          |   |                        |                      |                                     |      |            |
| <b>FACILITY STATUS</b>                              |  |                                       |                          |   |                        |                      |                                     |      |            |
| Open  |  | Critical Review                       |                          | Restricted Status                             | X                      | Reason               | Insufficient hydropneumatic storage | Date | 12/16/1983 |
| <b>BRIEF DESCRIPTION OF SYSTEM AND SERVICE AREA</b> |  |                                       |                          |   |                        |                      |                                     |      |            |
| <b>SERVICE CONNECTIONS</b>                          |  |                                       |                          |   |                        |                      | <b># METERS</b>                     |      |            |
| NUMBER OF DIRECT SERVICES                           |  |                                       |                          |   | 29                     | 0                    |                                     |      |            |
| DIRECT SERVICES OUTSIDE CORPORATE LIMITS            |  |                                       |                          |   | 0                      | 0                    |                                     |      |            |
| Residential Customers                               |  |                                       |                          |   | 29                     | 0                    |                                     |      |            |
| Commercial Customers                                |  |                                       |                          |   | 0                      | 0                    |                                     |      |            |
| Industrial Customers                                |  |                                       |                          |   | 0                      | 0                    |                                     |      |            |
| <b>SATELLITE WATER SYSTEMS / INTERCONNECTIONS</b>   |  |                                       |                          |   | <b>FACILITY NUMBER</b> | <b>Source?</b>       | <b>Customer?</b>                    |      |            |
| None  |  |                                       |                          |   | N/a                    | N/a                  | N/a                                 |      |            |
| <b>ADEQUACY OF SUPPLY</b>                           |  |                                       |                          |   |                        |                      |                                     |      |            |
| DATE RANGE  |  | FROM                                  | January 2002             | TO  | December 2002          | PLANT CAPACITY (MGD) | 0.036 MGD                           |      |            |
| LIMITING FACTOR FOR PLANT CAPACITY?                 |  |                                       |                          |   |                        |                      | Capacity of well #1                 |      |            |
| ANNUAL PUMPAGE (MG)                                 |  | RAW                                   | N/a                      | FINISHED                                      | 1.433914 MG            |                      |                                     |      |            |
| AVERAGE DAILY (MGD)                                 |  | RAW                                   | N/a                      | FINISHED                                      | 0.003936 MGD           |                      |                                     |      |            |
| MAX 7 Day Average (MGD)                             |  | RAW                                   | N/a                      | FINISHED                                      | 0.006667 MGD           |                      |                                     |      |            |
| Historical MAX 7-Day Average (MGD)                  |  | RAW                                   | N/a                      | FINISHED                                      | 0.006667 MGD           |                      |                                     |      |            |
| POPULATION  |  | 52                                    | Estimated or Census Data |   |                        | Census               |                                     |      |            |
|   |  | How was Estimated Population Figured? |                          |   |                        |                      | N/a                                 |      |            |
| AVERAGE DAILY PER CAPITA USAGE:                     |  | 76 gpppd                              |                          | Time to Produce Average Daily (Finished)      |                        | 2.6 hours            |                                     |      |            |
|   |  |                                       |                          | Time to Produce MAX 7- Day Average (Finished) |                        | 4.4 hours            |                                     |      |            |

**TREATMENT APPLICATION POINT SUMMARY**

| TAP #   | Location or Description  | Source Name  | Source ID                  | Status (A, I or X) | Well Depth              | Casing Length              | Aquifer                    | Current Production (GPM)       | GWUDI Eval. (DATE) | Waivers                  |                          |
|---|--|--|----------------------------|--------------------|-------------------------|----------------------------|----------------------------|--------------------------------|--------------------|--------------------------|--------------------------|
|   |  |  |                            |                    |                         |                            |                            |                                |                    | VOC                      | SOC                      |
| TP 01   | Treatment for well #1 inside wellhouse at 1601 Sheridan Rd., 60099   | Well #1  | WL20228                    | A                  | 126 feet                | 126 feet                   | Drift                      | 25 gpm @ 5.0 HP & unknown head | March 28, 1994     | No application submitted | No application submitted |
| Source Use (Disconnected sources, backups, seasonal use, etc) |  | Operates automatically off system pressure.  |                            |                    |                         |                            |                            |                                |                    |                          |                          |
| Bacteriological History (Raw water samples)                   |  | No detections in the last 12 months.   |                            |                    |                         |                            |                            |                                |                    |                          |                          |
| TREATMENT   | Disinfectant Used  |  | Fluoridation Chemical Used |                    | Other Chemical Addition |                            | Other Treatment            |                                |                    |                          |                          |
|   | Sodium Hypochlorite (10% strength, diluted 50%. A peristaltic pump rated 85 gpd @ 25 psi is used).   |  | None                       |                    | None                    |                            | N/a                        |                                |                    |                          |                          |
|   | Installation Deficiencies  |  |                            |                    |                         |                            | General Condition of Plant |                                |                    |                          |                          |
|   | 1. The majority of the 960 gallon hydropneumatic tank is buried, and the tank does not have bypass piping.<br>2. Two, 82 gallon bladder tanks.<br>3. No containment or protective curbings for the sodium hypochlorite tank.<br>4. The chlorine solution tank is not calibrated, is not provided with a scale, and is not vented properly, and was installed without a construction permit.<br>5. Insufficient hydropneumatic storage. |  |                            |                    |                         |                            | Fair                       |                                |                    |                          |                          |
| Other Comments regarding this TAP                             |  | At this location is a wellhouse for well #2, treatment for well #2, a 960 gallon hydropneumatic tank (majority buried, with only the face entering the pit), and two, 82 gallon bladder tanks.<br><br>Had a 1,1,1-trichloroethane detection of 2 ppb on April 8, 1987. Followup samples had no detections. |                            |                    |                         |                            |                            | Emergency Power                |                    | Manual generator         |                          |
| <b>Well #1 (ID WL20228) Inorganic Statistics</b>              |  |  |                            |                    |                         |                            |                            |                                |                    |                          |                          |
| Inorganic (type)  |  |  |                            |                    |                         | Concentration (mg/L)       |                            |                                |                    |                          |                          |
| Iron  |  |  |                            |                    |                         | 0.11 mg/L (April 3, 2002)  |                            |                                |                    |                          |                          |
| Manganese   |  |  |                            |                    |                         | 0.004 mg/L (April 3, 2002) |                            |                                |                    |                          |                          |
| Hardness as CaCO <sub>3</sub>                                 |  |  |                            |                    |                         | 106 mg/L (May 6, 1996)     |                            |                                |                    |                          |                          |
| Alkalinity as CaCO <sub>3</sub>                               |  |  |                            |                    |                         | 164 mg/L (May 6, 1996)     |                            |                                |                    |                          |                          |
| Total Dissolved Solids  |  |  |                            |                    |                         | 348 mg/L (May 6, 1996)     |                            |                                |                    |                          |                          |
| Natural Fluoride  |  |  |                            |                    |                         | 1.1 mg/L (April 3, 2002)   |                            |                                |                    |                          |                          |
| pH  |  |  |                            |                    |                         | 7.93 (May 6, 1996)         |                            |                                |                    |                          |                          |

| Operating Reports / Records  |                            |                         |                             |                                  |                          |   |                                    |                                       |  |  |   |    |   |     |
|--|----------------------------|-------------------------|-----------------------------|----------------------------------|--------------------------|---|------------------------------------|---------------------------------------|--|--|---|----|---|-----|
| Monthly Reports Being Submitted?   | Content of Monthly Reports |                         |                             |                                  |                          |   |                                    |                                       |  |  |   |    |   |     |
|  | Report for each TAP?       |                         |                             | Daily Production from Each Well? |                          | Daily Measured Residuals?   |                                    | Daily Dosage Calculations?            |  | Notes and Other Observations   |   |    |   |     |
|  | Yes                        | No                      | Late                        | Yes                              | No                       | Yes   | No                                 | Yes                                   | No   |  |   |    |   | Yes |
| X  |                            |                         | X                           |                                  |                          | X   |                                    | X                                     |  | X  |   |    | Daily Operating Reports being sent average three readings per month. These reports do not include any monthly totals, averages, maximums, minimums, or chlorine data. |     |
| Cross Connection control Ordinance   |                            |                         |                             |                                  |                          |   |                                    |                                       |  |  |   |    |   |     |
| Does the system have an ordinance?   |                            | Date Approved (by IEPA) |                             | Program Enforced?                |                          | Do Private Wells Exist in the Service Area?   |                                    |                                       |  |  |   |    |   |     |
| Yes  | No                         |                         |                             | Yes                              | No                       | Yes   | No                                 |                                       |  |  |   |    |   |     |
| X  |                            | November 1983           |                             | X                                |                          |   | X                                  |                                       |  |  |   |    |   |     |
| Monitoring   |                            |                         |                             |                                  |                          |   |                                    |                                       |  |  |   |    |   |     |
| Bacteriological Summary  |                            |                         |                             |                                  |                          |   |                                    |                                       |  |  |   |    |   |     |
| Monitoring History ( Last 12 Months)   |                            |                         |                             |                                  |                          |   |                                    |                                       |  |  |   |    |   |     |
|  |                            |                         |                             | Raw                              | Finished                 | Distribution  | Primary Lab                        |                                       | Phone  |  | FAX                                       |    |   |     |
| Number of Samples  |                            |                         |                             | 0                                | 0                        | 12  | North Shore Sanitary District      |                                       | 1-847-623-6060                                 |  | 1-847-623-0804                            |    |   |     |
| Number Satisfactory  |                            |                         |                             | 0                                | 0                        | 12  | Secondary Lab                      |                                       | Phone  |  | FAX                                       |    |   |     |
| Number Invalid   |                            |                         |                             | 0                                | 0                        | 0   |                                    |                                       |  |  |   |    |   |     |
| Number Unsatisfactory  |                            |                         |                             | 0                                | 0                        | 0   | PDC                                |                                       | 1-309-692-9688                                 |  | 1-309-692-9689                            |    |   |     |
| Fecal / E. Coli. Positive  |                            |                         |                             | 0                                | 0                        | 0   | Coliform Monitoring Plan Approved? |                                       | All Major Portions of system included in Plan? |  | Chlorine Residuals taken at Sample Sites? |    | Monitoring FREE Residual?   |     |
|  |                            |                         |                             |                                  |                          |   | Yes                                | No                                    | Yes  | No   | Yes                                       | No | Yes   | No  |
| Monitoring Violations  |                            |                         |                             | 0                                | MCL Violations           |   | 0                                  | X                                     | X  |  | X   |    | X   |     |
| Fluoridation Summary (Last 12 months)  |                            |                         |                             |                                  |                          |   |                                    |                                       |  |  |   |    |   |     |
| TAP No   | No. of Samples             | Minimum (mg/l)          | Maximum (mg/l)              | Average                          | Violations (list months) |   |                                    | Notes and Observations (Fluoridation) |  |  |   |    |   |     |
| N/a  | N/a                        | N/a                     | N/a                         | N/a                              | N/a                      |   |                                    | Does not add fluoride, and exempt     |  |  |   |    |   |     |
| Viability / Financial Management   |                            |                         |                             |                                  |                          |   |                                    |                                       |  |  |   |    |   |     |
| Service Fee (Minimum Charge)   |                            |                         | None - included in the rent |                                  |                          | Other source(s) of income used to maintain the water system                           |                                    |                                       |  | Rental fees  |   |    |   |     |
| Direct Charge (cost per 1,000 gallons)   |                            |                         | N/a                         |                                  |                          | Does the Utility have an ACTIVE program to ensure all customers pay bills?            |                                    |                                       |  | N/a  |   |    |   |     |
| Billing Frequency  |                            |                         | N/a                         |                                  |                          | Does the utility have a fund to cover major repairs?                                  |                                    |                                       |  | Yes  |   |    |   |     |
| ICC Regulated? (Y/N)   |                            |                         | N/a                         |                                  |                          | Name and phone no. of person responsible for system repairs.                          |                                    |                                       |  | Mr. Harris DeJong<br>1-847-370-0367<br>Beach Park Pump & Well, at 847-249-0628, normally works on the well |   |    |   |     |
| Date of Last Rate Increase   |                            |                         | N/a                         |                                  |                          | Name and Phone No. of Person Responsible for Financial Management of the Water System |                                    |                                       |  | Mr. Harris DeJong<br>1-847-370-0367  |   |    |   |     |
|  |                            |                         |                             |                                  |                          | Major Water Supply Concerns expressed by Residents/ Customers.                        |                                    |                                       |  | Reportedly None  |   |    |   |     |
| What was the most recent major repair or improvement involving This Water System (Include Dates) |                            |                         |                             |                                  |                          |   |                                    |                                       |  |  |   |    |   |     |
| 1998 - new well pump.  |                            |                         |                             |                                  |                          |   |                                    |                                       |  |  |   |    |   |     |
| Planned, Anticipated or Needed Upgrades and Improvements (Include dates or timeframe if known)   |                            |                         |                             | Water meters at residences       |                          |   |                                    |                                       |  |  |   |    |   |     |
|  |                            |                         |                             |                                  |                          |   |                                    |                                       |  |  |   |    |   |     |
|  |                            |                         |                             |                                  |                          |   |                                    |                                       |  |  |   |    |   |     |
|  |                            |                         |                             |                                  |                          |   |                                    |                                       |  |  |   |    |   |     |


| Service Area / Pressure Zone / Distribution System |        |                     |            |                           |     |                            |     |                           |   |          |   |  |
|--|--------|---------------------|------------|---------------------------|-----|----------------------------|-----|---------------------------|---|----------|---|--|
| Water Source(s)                                    |        |                     |            | TP 01                     |     |                            |     |                           |   |          |   |  |
| Location or Description                            |        |                     |            | Service Area Population   |     | No. of Service Connections |     |                           | Finished Water Storage ( Show Capacities) |          |   |  |
|  |        |                     |            |                           |     |                            |     |                           | Ground                                    | Elevated | Hydropneumatic  |  |
| Entire distribution system                         |        |                     |            | 52                        |     | 29                         |     |                           | None                                      | None     | 960 gallons   |  |
|  |        |                     |            |                           |     |                            |     |                           | ---                                       | ---      | *82 gallons   |  |
|  |        |                     |            |                           |     |                            |     |                           | ---                                       | ---      | *82 gallons   |  |
| Maximum System Pressure                            |        | Location            |            | Minimum System Pressure   |     | Location                   |     |                           | Free Chlorine Residual ( mg/l)            |          | Location  |  |
| 50 psi   |        | Low point of system |            | 30 psi                    |     | High point of system       |     |                           | 0.4 mg/L                                  |          | Distribution system   |  |
| Flushing Program                                   |        |                     |            | Fire Protection Provided? |     | Current Map Available?     |     | Valve Maintenance Program |   |          | Notes and Other Observations  |  |
| None   | Yearly | 2 x year            | More Often | No                        | Yes | No                         | Yes | No Valves                 | No Program                                | OK       |   |  |
|  | X      |                     |            | X                         |     |                            | X   |                           |   | X        | *Bladder Tanks.<br>The distribution system consists of 2,356 feet of main, all of which is less than 4-inches in diameter. The area is served by sanitary sewers. |  |

# ZION CITY WELL No. 1

LAYNE-BOWLER CHICAGO COMPANY, - DRILLERS

SAMPLE SET # 485, STATE GEOLOGICAL SURVEY, URBANA, ILL.

Studied April 1927, by L.E. Workman.

|            |           | 163 | 143        |                        |     | No samples   |  |  |   |   |
|------------|-----------|-----|------------|------------------------|-----|--|--|--|---|---|
| SILURIAN   | NIAGARA   | 162 | 137        |                        | 163 | <br>Dolomite, light gray and buff, very finely crystalline. |  |  |   |   |
|            |           |     | 300        |                        |     |  |  |  |   |   |
|            |           |     | 20         | 320                    |     |  |  | Dolomite, buff, medium crystalline                   |   |   |
|            |           |     | 22         | 322                    |     |  |  | Dolomite, greenish gray, finely crystalline          |   |   |
|            |           |     | 27         | 325                    |     |  |  | Shale, light blue, soft shale, red, soft             |   |   |
|            |           |     | 30         | 360                    |     |  |  | Dolomite, red, yellow, gray, and green; shale, brown |   |   |
|            |           |     | 16         | 376                    |     |  |  | No samples   |   |   |
|            |           |     | 24         | 400                    |     |  |  | Shale, dolomitic, greenish gray                      |   |   |
|            |           |     | 20         | 420                    |     |  |  | No samples   |   |   |
|            |           |     | 2          | 425                    |     |  |  | Dolomite, light gray, finely crystalline             |   |   |
| ORDOVICIAN | MAQUOKETA | 222 | 49         |                        |     | No samples   |  |  |   |   |
|            |           |     |            | 419                    |     |  |  |  |   |   |
|            |           |     | 26         | 500                    |     |  | Shale, dolomitic, brownish gray, soft    |  |   |   |
|            |           |     | 47         |                        |     |  | No samples                               |  |   |   |
|            |           |     |            | 597                    |     |  |  |  |   |   |
|            |           |     | ORDOVICIAN | GALENA-<br>PLATTEVILLE | 219 | 198  |  |  | Dolomite, light brown, finely crystalline |   |
|            |           |     |            |                        |     |  | 795                                      |  |   |   |
|            |           |     |            |                        |     | 95   |  |  |   | Dolomite, buff, finely crystalline to dense |
|            |           |     |            |                        |     | 6  | 890                                      |  |   | Sandstone, dolomitic, buff, fine            |
|            |           |     |            |                        |     | 6  | 895                                      |  |   | Dolomite, sandy, gray                       |
| 12         | 899       |     |            |                        |     |  | Sandstone, dolomitic, buff, very fine    |  |   |   |
| 24         | 885       |     |            |                        |     |  | Dolomite, silty and sandy, gray          |  |   |   |
| 8          | 897       |     |            |                        |     |  | Dolomite, very fine sandy, buff and gray |  |   |   |
| ORDOVICIAN | ST. PETER | 129 |            |                        |     | 127  |  |  | Sandstone, white and buff, fine to medium |   |
|            |           |     |            |                        |     | 2  | 1022                                     |  |   | Shale, sandy, red and gray, soft            |

APPENDIX B

BORING LOGS

- B.1 2006 STRATIGRAPHIC AND INSTRUMENTATION LOGS
- B.2 HISTORICAL GEOTECHNICAL LOGS

**B.1 2006 STRATIGRAPHIC AND INSTRUMENTATION LOGS**



# STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: ZION GENERATION STATION  
 PROJECT NUMBER: 45136-30  
 CLIENT: EXELON GENERATION COMPANY LLC  
 LOCATION: ZION, ILLINOIS

HOLE DESIGNATION: MW-ZN-01S  
 DATE COMPLETED: May 1, 2006  
 DRILLING METHOD: Vacuum/HSA  
 FIELD PERSONNEL: D. NICHOLLS

| DEPTH<br>ft BGS | STRATIGRAPHIC DESCRIPTION & REMARKS  | ELEV.<br>ft<br>AMSL | Monitoring Well | SAMPLE |          |         |           |
|-----------------|--|---------------------|-----------------|--------|----------|---------|-----------|
|                 |  |                     |                 | NUMBER | INTERVAL | REC (%) | 'N' VALUE |
|                 | TOP OF RISER<br>GROUND SURFACE   | 594.10<br>591.43    |                 |        |          |         |           |
| 2               | GRAVEL<br>SAND (FILL) - trace to some gravel, trace organics, fine to medium grained, brown, moist | 591.33              |                 |        |          |         |           |
| 10              | SP-SAND, trace to some gravel, loose to compact, wet, fine to medium grained, brown                | 581.43              |                 | 1      |          | 0       | 10        |
| 14              |  |                     |                 | 2      |          | 55      | 16        |
| 18              | SM-SAND, with trace to some silt, trace gravel, compact, fine grained, brown, wet                  | 574.43              |                 | 3      |          | 80      | 15        |
| 22              |  |                     |                 | 4      |          | 80      | 19        |
| 24              | - dense to very dense at 23.0ft BGS  |                     |                 | 5      |          | 65      | 29        |
| 24              | SP-SAND, trace to some silt, compact to dense, fine grained, brown, wet                            | 567.43              |                 | 6      |          | 95      | 44        |
| 28              | - getting coarser and grey for next 6" at 27.5ft BGS   |                     |                 | 7      |          | 95      | 62        |
| 30              | ML-SILT, dense, fine grained, grey, wet  | 562.18              |                 | 8      |          | 90      | 21        |
| 32              |  |                     |                 | 9      |          | 90      | 44        |
| 34              |  |                     |                 | 10     |          | 100     | 25        |
| 36              |  |                     |                 | 11     |          | 75      | 28        |
| 38              |  |                     |                 | 12     |          | 0       | 29        |
|                 | CL-CLAY, till (clay, trace to some silt, trace   | 552.43<br>551.93    |                 | 13     |          | 70      | 50        |

**NOTES:** MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

OVERBURDEN LOG 45136-30.GPJ CRA\_CORP.GDT 6/15/06





# STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: ZION GENERATION STATION  
 PROJECT NUMBER: 45136-30  
 CLIENT: EXELON GENERATION COMPANY LLC  
 LOCATION: ZION, ILLINOIS

HOLE DESIGNATION: MW-ZN-01S  
 DATE COMPLETED: May 1, 2006  
 DRILLING METHOD: Vacuum/HSA  
 FIELD PERSONNEL: D. NICHOLLS

| DEPTH<br>ft BGS  | STRATIGRAPHIC DESCRIPTION & REMARKS  | ELEV.<br>ft<br>AMSL | Monitoring Well  | SAMPLE |          |         |           |  |
|--|--|---------------------|--|--------|----------|---------|-----------|--|
|  |  |                     |  | NUMBER | INTERVAL | REC (%) | 'N' VALUE |  |
| 42<br>44<br>46<br>48<br>50<br>52<br>54<br>56<br>58<br>60<br>62<br>64<br>66<br>68<br>70<br>72<br>74<br>76<br>78 | <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;">             gravel), dense, grey, gravel, very well embedded in finer matrix, dry, till<br/>             END OF BOREHOLE @ 39.5ft BGS           </div> |                     | <u>WELL DETAILS</u><br>Screened interval:<br>572.43 to 551.93ft AMSL<br>19.00 to 39.50ft BGS<br>Length: 20.5ft<br>Diameter: 2in<br>Slot Size: 10<br>Material: PVC<br>Sand Pack:<br>574.43 to 551.93ft AMSL<br>17.00 to 39.50ft BGS<br>Material: #5 Quartz Sand |        |          |         |           |  |

**NOTES:** MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

OVERBURDEN LOG 45136-30.GPJ CRA\_CORP.GDT 6/15/06



# STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: ZION GENERATION STATION  
 PROJECT NUMBER: 45136-30  
 CLIENT: EXELON GENERATION COMPANY LLC  
 LOCATION: ZION, ILLINOIS

HOLE DESIGNATION: MW-ZN-02S  
 DATE COMPLETED: May 2, 2006  
 DRILLING METHOD: Vacuum/HSA  
 FIELD PERSONNEL: D. NICHOLLS

| DEPTH<br>ft BGS | STRATIGRAPHIC DESCRIPTION & REMARKS  | ELEV.<br>ft<br>AMSL        | Monitoring Well                        | SAMPLE |          |         |           |
|-----------------|--|----------------------------|--|--------|----------|---------|-----------|
|                 |  |                            |  | NUMBER | INTERVAL | REC (%) | 'N' VALUE |
|                 | TOP OF RISER<br>GROUND SURFACE   | 593.78<br>591.21           | 4" Ø above ground<br>protective casing |        |          |         |           |
| 2               | GRAVEL & GRASS<br>SAND with GRAVEL (FILL), presence of organics (trace), fine grained, brown, moist  | 591.11                     | Concrete                               |        |          |         |           |
| 4               |  |                            | Bentonite and Cuttings                 |        |          |         |           |
| 6               |  |                            | 2" Ø PVC Well Riser                    |        |          |         |           |
| 8               |  |                            | Bentonite Seal                         |        |          |         |           |
| 10              | SAND (FILL), trace to with silt, trace gravel, very loose to compact, fine grained, brown, moist   | 581.21                     | 4.25" Ø Borehole                       | 1      |          | 15      | 8         |
| 12              |  |                            |  | 2      |          | 15      | 4         |
| 14              | - trace organics, piece of wood, black (1cm x 1cm) at 13.5ft BGS<br>- getting wet at 14.0ft BGS  |                            |  | 3      |          | 30      | -         |
| 16              |  |                            |  | 4      |          | 30      | 18        |
| 18              |  |                            |  | 5      |          | 30      | 19        |
| 20              | CL-SILTY CLAY TILL (silty clay, trace sand, trace gravel), fine grained, brownish-grey, wet  | 571.21<br>570.96           | 2" Ø PVC Well Screen                   | 6      |          | 30      | 5         |
| 22              | SM-SILT & SAND, trace clay, trace gravel, very loose, fine grained, brown, wet, clay till lenses observed within sandy material between 0.5" to 4" in thickness  |                            | Sand                                   | 7      |          | 40      | 6         |
| 24              |  |                            |  | 8      |          | 95      | 20        |
| 26              |  |                            |  | 9      |          | 50      | 9         |
| 28              |  |                            |  | 10     |          | 30      | 4         |
| 30              |  |                            |  | 11     |          | 50      | 17        |
| 32              |  |                            |  | 12     |          | 40      | 19        |
| 34              |  |                            |  | 13     |          | 10      | 64        |
| 36              | SW-SAND, medium to coarse grained, trace silt, compact, wet  | 556.21<br>555.71<br>555.21 | Bentonite                              | 14     |          | 25      | 2         |
| 38              | CL-CLAY TILL (clay, trace to with silt, trace gravel, trace sand), compact, grey, moist, coarse material well embedded in fine matrix<br>SILT & SAND, trace clay, trace gravel, very loose to loose, brown, wet, 1" to 3" thick lenses |                            |  |        |          |         |           |

**NOTES:** MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

OVERBURDEN LOG 45136-30.GPJ CRA CORP.GDT 6/15/06

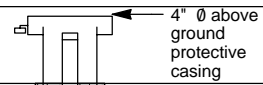
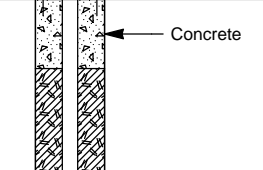


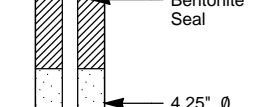
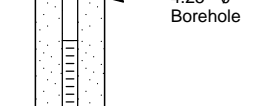
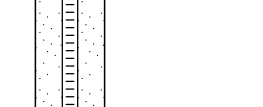
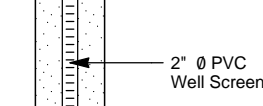




# STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: ZION GENERATION STATION  
 PROJECT NUMBER: 45136-30  
 CLIENT: EXELON GENERATION COMPANY LLC  
 LOCATION: ZION, ILLINOIS

HOLE DESIGNATION: MW-ZN-03S  
 DATE COMPLETED: May 2, 2006  
 DRILLING METHOD: Vacuum/HSA  
 FIELD PERSONNEL: D. NICHOLLS

| DEPTH<br>ft BGS | STRATIGRAPHIC DESCRIPTION & REMARKS  | ELEV.<br>ft<br>AMSL | Monitoring Well   | SAMPLE |          |         |           |
|-----------------|--|---------------------|---|--------|----------|---------|-----------|
|                 |  |                     |   | NUMBER | INTERVAL | REC (%) | 'N' VALUE |
|                 | TOP OF RISER<br>GROUND SURFACE   | 594.02<br>591.54    |  <p>4" Ø above ground protective casing</p> |        |          |         |           |
| 2               | GRAVEL<br>SAND (FILL), trace to with silt, trace to with gravel, fine grained, brown, moist  | 591.44              |  <p>Concrete</p>                            |        |          |         |           |
| 4               |  |                     |   |        |          |         |           |
| 6               |  |                     |  <p>Bentonite and Cuttings</p>              |        |          |         |           |
| 8               |  |                     |  <p>2" Ø PVC Well Riser</p>                 |        |          |         |           |
| 10              | SM-SAND WITH SILT, fine grained, trace gravel, compact, brown, moist   | 581.54              |   |        |          |         |           |
| 12              | CL-SILTY CLAY TILL (silty clay, trace gravel, trace sand), compact, moist, grey  | 580.54              |  <p>Bentonite Seal</p>                     | 1      |          | 70      | 25        |
| 14              | ML-SILT & SAND, trace gravel, very loose to loose, greyish brown, wet  | 579.54              |   | 2      |          | 50      | 9         |
| 16              |  |                     |  <p>4.25" Ø Borehole</p>                  | 3      |          | 20      | 6         |
| 18              | ML-SILT WITH SAND, trace clay, trace gravel, fine grained, very loose, brownish-grey, wet, 0.5" to 2" clay lenses, with silt, trace gravel, trace sand, very loose, wet, brownish-grey | 574.54              |   | 4      |          | 20      | 6         |
| 20              |  |                     |   | 5      |          | 20      | 4         |
| 22              |  |                     |  <p>2" Ø PVC Well Screen</p>              | 6      |          | 30      | 18        |
| 24              |  |                     |  <p>Sand</p>                              | 7      |          | 15      | 35        |
| 26              |  |                     |   | 8      |          | 10      | 1         |
| 28              |  |                     |   | 9      |          | 15      | 7         |
| 30              |  |                     |   | 10     |          | 5       | 1         |
| 32              |  |                     |   | 11     |          | 30      | 5         |
| 34              |  |                     |   | 12     |          | 100     | 8         |
| 36              | CL-CLAY TILL (clay, some silt, trace sand and gravel), loose, grey, wet<br>END OF BOREHOLE @ 36.0ft BGS  | 556.54<br>555.54    |   | 13     |          | 40      | 10        |
| 38              |  |                     |   |        |          |         |           |

**WELL DETAILS**  
 Screened interval:  
 576.29 to 555.54ft AMSL  
 15.25 to 36.00ft BGS  
 Length: 20.75ft

**NOTES:** MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

OVERBURDEN LOG 45136-30.GPJ CRA CORP.GDT 6/15/06



# STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: ZION GENERATION STATION  
 PROJECT NUMBER: 45136-30  
 CLIENT: EXELON GENERATION COMPANY LLC  
 LOCATION: ZION, ILLINOIS

HOLE DESIGNATION: MW-ZN-03S  
 DATE COMPLETED: May 2, 2006  
 DRILLING METHOD: Vacuum/HSA  
 FIELD PERSONNEL: D. NICHOLLS

| DEPTH<br>ft BGS  | STRATIGRAPHIC DESCRIPTION & REMARKS | ELEV.<br>ft<br>AMSL | Monitoring Well  | SAMPLE |          |         |           |  |
|--|-------------------------------------|---------------------|--|--------|----------|---------|-----------|--|
|  |                                     |                     |  | NUMBER | INTERVAL | REC (%) | 'N' VALUE |  |
| 42<br>44<br>46<br>48<br>50<br>52<br>54<br>56<br>58<br>60<br>62<br>64<br>66<br>68<br>70<br>72<br>74<br>76<br>78 |                                     |                     | Diameter: 2in<br>Slot Size: 10<br>Material: PVC<br>Sand Pack:<br>578.54 to 555.54ft AMSL<br>13.00 to 36.00ft BGS<br>Material: #5 Quartz Sand |        |          |         |           |  |

**NOTES:** MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

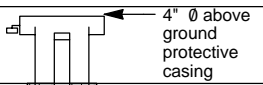

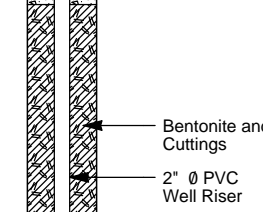

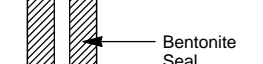

OVERBURDEN LOG 45136-30.GPJ CRA\_CORP.GDT 6/15/06



# STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: ZION GENERATION STATION  
 PROJECT NUMBER: 45136-30  
 CLIENT: EXELON GENERATION COMPANY LLC  
 LOCATION: ZION, ILLINOIS

HOLE DESIGNATION: MW-ZN-04S  
 DATE COMPLETED: May 3, 2006  
 DRILLING METHOD: Vacuum/HSA  
 FIELD PERSONNEL: D. NICHOLLS

| DEPTH<br>ft BGS | STRATIGRAPHIC DESCRIPTION & REMARKS   | ELEV.<br>ft<br>AMSL | Monitoring Well   | SAMPLE   |          |         |           |    |
|-----------------|---|---------------------|---|--|----------|---------|-----------|----|
|                 |   |                     |   | NUMBER   | INTERVAL | REC (%) | 'N' VALUE |    |
|                 | TOP OF RISER<br>GROUND SURFACE  | 593.82<br>591.01    |  <p style="font-size: small;">4" Ø above ground protective casing</p>                               |  |          |         |           |    |
| 2               | SAND & SILT (FILL), trace gravel, trace cobbles, fine grained, brown, dry   |                     |  <p style="font-size: small;">Concrete</p>  |  |          |         |           |    |
| 4               |   |                     |   |  |          |         |           |    |
| 6               | SM-SAND & SILT(FILL), trace clay, trace gravel, loose to compact, fine grained, brown, moist<br><br>- 3" thick layer of silty clay till (silty clay, trace sand & gravel), compact grey, moist at 11.0ft BGS<br>- getting wet at 12.0ft BGS<br>- thick layer of sandy organic material, very soft, black, wet (no odor presence of roots) at 13.8ft BGS<br><br>- 3" thick layer of silty clay till (silty clay, trace sand & gravel), compact grey, moist at 23.0ft BGS<br>- getting softer (very soft), saturated at 24.0ft BGS<br><br>- silt with sand, trace clay, compact, brown, wet at 29.0ft BGS<br>- 0.5" x 0.4" diagonal layer of dark grey to black organic material, very loose, fine grained, wet at 30.0ft BGS | 583.01              |  <p style="font-size: small;">Bentonite and Cuttings<br/>2" Ø PVC Well Riser<br/>Bentonite Seal</p> | 1  |          | 40      | 1         |    |
| 8               |   |                     |   |  |          |         |           |    |
| 10              |   |                     |   |  | 2        |         | 95        | 29 |
| 12              |   |                     |   |  | 3        |         | 70        | 18 |
| 14              |   |                     |   |  <p style="font-size: small;">4.25" Ø Borehole</p>     | 4        |         | 80        | 35 |
| 16              |   |                     |   |  | 5        |         | 100       | 25 |
| 18              |   |                     |   |  | 6        |         | 90        | 23 |
| 20              |   |                     |   |  | 7        |         | 100       | 24 |
| 22              |   |                     |   |  | 8        |         | 55        | 29 |
| 24              |   |                     |   |  <p style="font-size: small;">Sand</p>                 | 9        |         | 90        | 41 |
| 26              |   |                     |   |  | 10       |         | 65        | 10 |
| 28              |   |                     |   |  <p style="font-size: small;">2" Ø PVC Well Screen</p> | 11       |         | 80        | 15 |
| 30              |   |                     |   |  | 12       |         | 70        | 31 |
| 32              |   |                     |   | 13   |          | 100     | 20        |    |
| 34              | ML-SILT, trace to with sand, trace clay, loose, grey wet  | 557.51              |   |  |          |         |           |    |
| 36              | CL-CLAY TILL (clay with silt, trace sand & gravel), dense, grey, dry  | 555.21              |   |  |          |         |           |    |
| 38              | END OF BOREHOLE @ 36.0ft BGS  | 555.01              |   |  |          |         |           |    |

**WELL DETAILS**  
 Screened interval:  
 576.01 to 556.01ft AMSL  
 15.00 to 35.00ft BGS  
 Length: 20ft

**NOTES:** MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

OVERBURDEN LOG 45136-30.GPJ CRA\_CORP.GDT 6/15/06



# STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: ZION GENERATION STATION  
 PROJECT NUMBER: 45136-30  
 CLIENT: EXELON GENERATION COMPANY LLC  
 LOCATION: ZION, ILLINOIS

HOLE DESIGNATION: MW-ZN-04S  
 DATE COMPLETED: May 3, 2006  
 DRILLING METHOD: Vacuum/HSA  
 FIELD PERSONNEL: D. NICHOLLS

| DEPTH<br>ft BGS  | STRATIGRAPHIC DESCRIPTION & REMARKS | ELEV.<br>ft<br>AMSL | Monitoring Well  | SAMPLE |          |         |           |  |
|--|-------------------------------------|---------------------|--|--------|----------|---------|-----------|--|
|  |                                     |                     |  | NUMBER | INTERVAL | REC (%) | 'N' VALUE |  |
| 42<br>44<br>46<br>48<br>50<br>52<br>54<br>56<br>58<br>60<br>62<br>64<br>66<br>68<br>70<br>72<br>74<br>76<br>78 |                                     |                     | Diameter: 2in<br>Slot Size: 10<br>Material: PVC<br>Sand Pack:<br>578.01 to 556.01ft AMSL<br>13.00 to 35.00ft BGS<br>Material: #5 Quartz Sand |        |          |         |           |  |

**NOTES:** MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

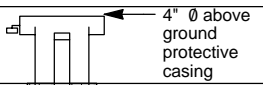
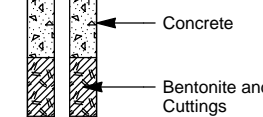
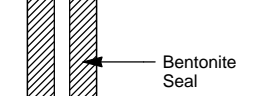

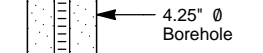
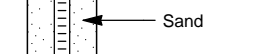

OVERBURDEN LOG 45136-30.GPJ CRA\_CORP.GDT 6/15/06



# STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: ZION GENERATION STATION  
 PROJECT NUMBER: 45136-30  
 CLIENT: EXELON GENERATION COMPANY LLC  
 LOCATION: ZION, ILLINOIS

HOLE DESIGNATION: MW-ZN-05S  
 DATE COMPLETED: May 4, 2006  
 DRILLING METHOD: Vacuum/HSA  
 FIELD PERSONNEL: D. NICHOLLS

| DEPTH<br>ft BGS | STRATIGRAPHIC DESCRIPTION & REMARKS   | ELEV.<br>ft<br>AMSL | Monitoring Well  | SAMPLE |          |         |           |           |
|-----------------|---|---------------------|--|--------|----------|---------|-----------|-----------|
|                 |   |                     |  | NUMBER | INTERVAL | REC (%) | 'N' VALUE | PID (PPM) |
|                 | TOP OF RISER<br>GROUND SURFACE  | 588.64<br>585.72    |  <p style="font-size: small;">4" Ø above ground protective casing</p>                              |        |          |         |           |           |
| 2               | SAND & SILT (FILL), trace gravel, fine grained, brown, dry                                |                     |  <p style="font-size: small;">Concrete</p> <p style="font-size: small;">Bentonite and Cuttings</p> |        |          |         |           |           |
| 4               | SM-SAND, trace to some silt, very soft, fine to medium grained, brown, wet                | 581.72              |  <p style="font-size: small;">Bentonite Seal</p>   | 1      |          | 40      | 1         | 3.0       |
| 6               |   |                     |  | 2      |          | 70      | 29        | 4.5       |
| 8               | GP-GRAVEL & SAND, trace silt, loose to compact, medium to coarse grained, dark brown, wet | 578.92<br>577.72    |  <p style="font-size: small;">2" Ø PVC Well Riser</p>  | 3      |          | 70      | 18        | 11        |
| 10              | SM-SAND, trace silt, compact, fine to medium grained, brown, wet, trace gravel            |                     |  | 4      |          | 60      | 35        | 10.2      |
| 12              | - finer, silt & sand, (4" thick layer, black) at 9.0ft BGS                                |                     |  | 5      |          | 65      | 25        | 9.8       |
| 14              | - finer, silt & sand, (4" thick layer, black) at 11.5ft BGS                               |                     |  <p style="font-size: small;">4.25" Ø Borehole</p>  | 6      |          | 60      | 23        | 11        |
| 16              | - finer, silt & sand, (4" thick layer, black) at 13.0ft BGS                               |                     |  | 7      |          | 70      | 24        | 9.8       |
| 18              | - silt, grey at 15.0ft BGS  |                     |  | 8      |          | 80      | 29        | 10.1      |
| 20              | SP-SAND, trace silt, medium to coarse grained, brown to grey, wet                         | 566.72<br>565.72    |  <p style="font-size: small;">Sand</p>   | 9      |          | 75      | 41        | 10.3      |
| 22              | SM-SAND, trace silt, compact, fine to medium grained, brown, wet, trace gravel            |                     |  | 10     |          | 70      | 10        | 9.7       |
| 24              | - finer, silt & sand at 21.5ft BGS  |                     |  | 11     |          | 4.5     | 15        | 18        |
| 26              | CL-CLAY, trace silt, trace sand, trace of brown to black organics, compact, wet           | 561.72              |  <p style="font-size: small;">2" Ø PVC Well Screen</p>   | 12     |          | 80      | 41        | 10.1      |
| 28              | SP-SAND, medium to coarse grained, grey compact, wet                                      | 560.22<br>559.72    |  | 13     |          | 50      | 20        | 8.4       |
| 30              | SM-SAND, trace silt, compact, grey, fine grained, wet                                     | 558.72              |  |        |          |         |           |           |
| 32              | ML-SILT, trace sand, compact, grey, fine grained, moist                                   |                     |  |        |          |         |           |           |
| 34              | END OF BOREHOLE @ 30.0ft BGS  | 555.72              |  |        |          |         |           |           |
| 36              |   |                     |  |        |          |         |           |           |
| 38              |   |                     |  |        |          |         |           |           |

**WELL DETAILS**  
 Screened interval:  
 575.72 to 555.72ft AMSL  
 10.00 to 30.00ft BGS  
 Length: 20ft  
 Diameter: 2in  
 Slot Size: 10  
 Material: PVC  
 Sand Pack:  
 577.82 to 555.72ft AMSL  
 7.90 to 30.00ft BGS  
 Material: #5 Quartz Sand

**NOTES:** MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

OVERBURDEN LOG 45136-30.GPJ CRA CORP.GDT 6/15/06

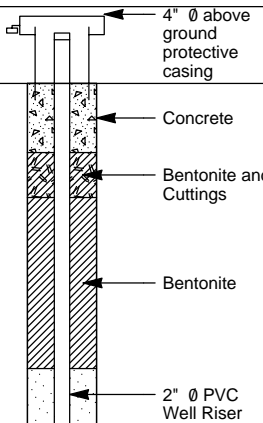
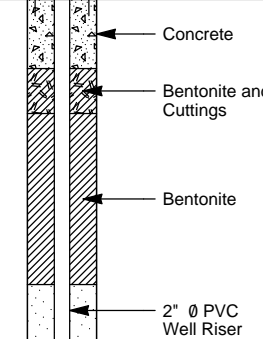
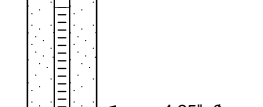
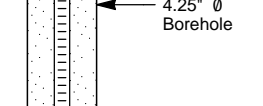
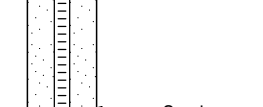
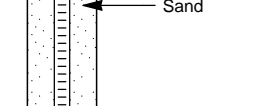




# STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: ZION GENERATION STATION  
 PROJECT NUMBER: 45136-30  
 CLIENT: EXELON GENERATION COMPANY LLC  
 LOCATION: ZION, ILLINOIS

HOLE DESIGNATION: MW-ZN-06S  
 DATE COMPLETED: May 5, 2006  
 DRILLING METHOD: Vacuum/HSA  
 FIELD PERSONNEL: D. NICHOLLS

| DEPTH<br>ft BGS | STRATIGRAPHIC DESCRIPTION & REMARKS   | ELEV.<br>ft<br>AMSL | Monitoring Well   | SAMPLE |          |         |           |           |
|-----------------|---|---------------------|---|--------|----------|---------|-----------|-----------|
|                 |   |                     |   | NUMBER | INTERVAL | REC (%) | 'N' VALUE | PID (PPM) |
|                 | TOP OF RISER<br>GROUND SURFACE  | 592.66<br>589.78    |  <p style="font-size: small;">4" Ø above ground protective casing</p>   |        |          |         |           |           |
| 2               | SAND with SILT, trace gravel, brown, moist  |                     |  <p style="font-size: small;">Concrete</p> <p style="font-size: small;">Bentonite and Cuttings</p> <p style="font-size: small;">Bentonite</p> |        |          |         |           |           |
| 10              | SM-SAND, some silt, soft, fine, grained, brown, wet   | 579.78              |  <p style="font-size: small;">2" Ø PVC Well Riser</p>   | 1      |          | 70      | 18        | 1.0       |
| 12              | GM-SAND & GRAVEL, medium to coarse grained, compact, grey, wet  | 577.78              |   | 2      |          | 60      | 17        | 2.0       |
| 14              | SM-SAND, some silt, soft, fine, grained, brown, wet   | 576.78              |  <p style="font-size: small;">4.25" Ø Borehole</p>   | 3      |          | 60      | 46        | 1.0       |
| 16              | GM-SAND & GRAVEL, medium to coarse grained, compact, grey, wet  | 574.78              |   | 4      |          | 40      | 40        | 1.0       |
| 18              | SM-SAND, some silt, soft, fine, grained, brown, wet   | 573.78              |   | 5      |          | 70      | 24        |           |
| 20              | GM-SAND & GRAVEL, medium to coarse grained, compact, grey, wet  |                     |  <p style="font-size: small;">Sand</p>  | 6      |          | 60      | 58        |           |
| 22              | ML-SILT, some sand, fine grained, greyish brown, trace gravel, compact to dense, wet  |                     |   | 7      |          | 60      | 51        |           |
| 24              |   |                     |  <p style="font-size: small;">2" Ø PVC Well Screen</p>  | 8      |          | 60      | 51        |           |
| 26              | GM-SAND & GRAVEL, trace silt, compact to dense, brown, wet, coarser grained   | 564.78<br>564.18    |   | 9      |          | 50      | 37        |           |
| 28              | ML-SILT, trace sand, brown, dense, fine grained, wet  |                     |   | 10     |          | 70      | 40        |           |
| 30              | CL-CLAY, (clay till, trace silt, trace sand & gravel), gravel well embedded in finer matrix, very dense, grey, moist to dry | 560.78<br>559.78    |   |        |          |         |           |           |
| 32              | END OF BOREHOLE @ 30.0ft BGS  |                     |   |        |          |         |           |           |

**WELL DETAILS**  
 Screened interval:  
 579.78 to 559.78ft AMSL  
 10.00 to 30.00ft BGS  
 Length: 20ft  
 Diameter: 2in  
 Slot Size: 10  
 Material: PVC  
 Sand Pack:  
 581.53 to 559.78ft AMSL  
 8.25 to 30.00ft BGS  
 Material: #5 Quartz Sand

**NOTES:** MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

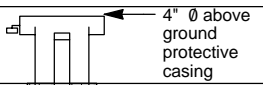
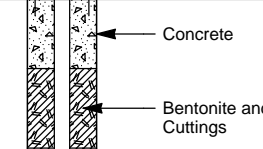


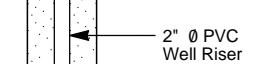

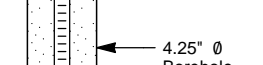

OVERBURDEN LOG 45136-30.GPJ CRA\_CORP.GDT 6/15/06



# STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: ZION GENERATION STATION  
 PROJECT NUMBER: 45136-30  
 CLIENT: EXELON GENERATION COMPANY LLC  
 LOCATION: ZION, ILLINOIS

HOLE DESIGNATION: MW-ZN-07S  
 DATE COMPLETED: May 8, 2006  
 DRILLING METHOD: Vacuum/HSA  
 FIELD PERSONNEL: D. NICHOLLS

| DEPTH<br>ft BGS | STRATIGRAPHIC DESCRIPTION & REMARKS  | ELEV.<br>ft<br>AMSL | Monitoring Well   | SAMPLE |          |         |           |
|-----------------|--|---------------------|---|--------|----------|---------|-----------|
|                 |  |                     |   | NUMBER | INTERVAL | REC (%) | 'N' VALUE |
|                 | TOP OF RISER<br>GROUND SURFACE   | 589.82<br>587.08    |  <p style="text-align: center;">4" Ø above ground protective casing</p> |        |          |         |           |
| 2               | SAND with SILT, trace gravel, fine grained, brown, moist                               |                     |  <p style="text-align: center;">Concrete</p>                            |        |          |         |           |
| 4               | SM-SAND WITH SILT, trace gravel, very loose, fine grained, brown, wet                  | 583.08              |  <p style="text-align: center;">Bentonite and Cuttings</p>              | 1      |          | 40      | 0         |
| 6               | GM-GRAVELLY SAND, trace silt, loose to compact, medium grained, brown, wet             | 581.08              |  <p style="text-align: center;">Bentonite Seal</p>                      | 2      |          | 50      | 16        |
| 8               | SM-SAND, trace silt, trace to with gravel, fine to coarse grained, compact, brown, wet | 579.08              |  <p style="text-align: center;">2" Ø PVC Well Riser</p>                 | 3      |          | 40      | 25        |
| 10              | - less gravel at 10.0ft BGS  |                     |   | 4      |          | 50      | 50        |
| 12              | GM-GRAVELLY SAND, trace silt, loose to compact, medium grained, brown, wet             | 575.58              |  <p style="text-align: center;">4.25" Ø Borehole</p>                    | 5      |          | 60      | 29        |
| 14              |  |                     |   | 6      |          | 50      | 56        |
| 16              | ML-SILT & SAND, loose to compact, fine grained, brown, wet                             | 571.28              |   | 7      |          | 50      | 43        |
| 18              | SW-SAND, coarse grained, compact to dense, brown, wet                                  | 570.08<br>569.58    |  <p style="text-align: center;">Sand</p>                                | 8      |          | 70      | 35        |
| 20              | ML-SILT & SAND, trace gravel, dense, brown, fine grained, wet                          |                     |   | 9      |          | 50      | 19        |
| 22              | ML-SILT, trace sand, compact, grey, wet, fine grained                                  | 565.28<br>565.08    |   | 10     |          | 50      | 82        |
| 24              | SM-SAND & SILT, compact, brown, wet, fine grained                                      | 563.58<br>563.08    |  <p style="text-align: center;">2" Ø PVC Well Screen</p>               | 11     |          | 50      | 31        |
| 26              | ML-SILT, trace sand, very dense, grey, wet   | 562.08              |   | 12     |          | 80      | 28        |
| 28              | SM-SAND & SILT, compact, brown, wet, fine grained                                      | 561.08              |   | 13     |          | 0       | 50        |
| 30              | ML-SILT, trace sand, grey, wet, fine grained   | 560.08              |   |        |          |         |           |
| 32              | END OF BOREHOLE @ 30.0ft BGS   | 557.08              |   |        |          |         |           |

**WELL DETAILS**  
 Screened interval:  
 577.08 to 557.08ft AMSL  
 10.00 to 30.00ft BGS  
 Length: 20ft  
 Diameter: 2in  
 Slot Size: 10  
 Material: PVC  
 Sand Pack:  
 579.28 to 557.08ft AMSL  
 7.80 to 30.00ft BGS  
 Material: #5 Quartz Sand

**NOTES:** MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

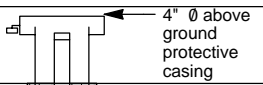
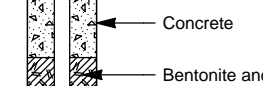
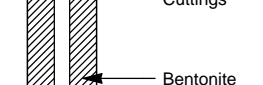
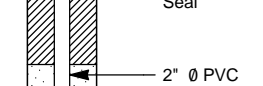
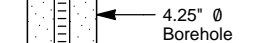
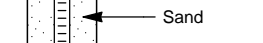
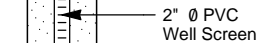
OVERBURDEN LOG 45136-30.GPJ CRA CORP.GDT 6/15/06



# STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: ZION GENERATION STATION  
 PROJECT NUMBER: 45136-30  
 CLIENT: EXELON GENERATION COMPANY LLC  
 LOCATION: ZION, ILLINOIS

HOLE DESIGNATION: MW-ZN-08S  
 DATE COMPLETED: May 5, 2006  
 DRILLING METHOD: Vacuum/HSA  
 FIELD PERSONNEL: D. NICHOLLS

| DEPTH<br>ft BGS | STRATIGRAPHIC DESCRIPTION & REMARKS  | ELEV.<br>ft<br>AMSL | Monitoring Well  | SAMPLE |          |         |           |           |
|-----------------|--|---------------------|--|--------|----------|---------|-----------|-----------|
|                 |  |                     |  | NUMBER | INTERVAL | REC (%) | 'N' VALUE | PID (PPM) |
|                 | TOP OF RISER<br>GROUND SURFACE   | 588.73<br>585.85    |  <p style="font-size: small;">4" Ø above ground protective casing</p>                              |        |          |         |           |           |
| 2               | SAND, trace silt, trace gravel, trace organics, fine grained, moist                      |                     |  <p style="font-size: small;">Concrete</p> <p style="font-size: small;">Bentonite and Cuttings</p> |        |          |         |           |           |
| 4               |  |                     |  <p style="font-size: small;">Bentonite Seal</p>   |        |          |         |           |           |
| 6               | SM-SAND, trace silt, trace gravel, compact, fine to coarse grained, brown, wet           | 579.85              |  |        |          |         |           |           |
| 8               | GP-GRAVEL, trace sand, medium to coarse grained, compact, brown, wet                     | 578.85              |  | 1      |          | 60      | 25        | 10.6      |
| 10              | ML-SILT, trace sand, loose to compact, fine grained, brown, wet                          | 577.85              |  <p style="font-size: small;">2" Ø PVC Well Riser</p>  | 2      |          | 70      | 13        | 13.8      |
| 12              | SM-SAND, trace gravel, medium to coarse grained, loose to compact, brown, wet            | 576.85              |  | 3      |          | 85      | 28        | 11.6      |
| 14              | ML-SILT, trace fine sand, brown, compact to dense, wet                                   | 574.35<br>573.85    |  | 4      |          | 60      | 11        | 11.0      |
| 16              | SM-SAND & SILT, fine to medium grained, very loose to compact, brown, wet                |                     |  <p style="font-size: small;">4.25" Ø Borehole</p>  | 5      |          | 80      | 33        | 9.1       |
| 18              | ML-SILT, trace sand, compact to dense, fine grained, brown, wet                          | 570.35<br>569.85    |  | 6      |          | 70      | 19        | 9.7       |
| 20              | SM-SAND, trace silt, fine to coarse grained, very loose to loose, brown, wet             | 568.35<br>567.85    |  | 7      |          | 60      | 13        | 10.4      |
| 22              | ML-SILT, trace sand, compact, brownish-grey, wet   | 566.85              |  <p style="font-size: small;">Sand</p>   | 8      |          | 70      | 54        | 9.3       |
| 24              | SM-SAND, trace silt, medium to coarse grained, loose, brown, wet                         |                     |  | 9      |          | 60      | 24        | 9.6       |
| 26              | ML-SILT, trace sand, compact to dense, grey, wet   |                     |  | 10     |          | 60      | 11        | 10.2      |
| 28              | - SM, 6" thick layer of sand, medium to coarse grained, compact brown, wet at 21.0ft BGS |                     |  <p style="font-size: small;">2" Ø PVC Well Screen</p>   | 11     |          | 80      | 23        | 10.4      |
| 30              | - SM, 6" thick layer of sand, medium to coarse grained, compact brown, wet at 23.0ft BGS | 557.85              |  | 12     |          |         |           |           |
| 32              | - CL, 2" thick layer of clay, trace silt, grey, wet, compact at 25.5ft BGS               |                     |  |        |          |         |           |           |
| 34              | - SM, 6" thick layer of sand, medium to coarse grained, compact brown, wet at 25.9ft BGS |                     |  |        |          |         |           |           |
| 36              | - SM, 6" thick layer of sand, medium to coarse grained, compact brown, wet at 27.6ft BGS |                     |  |        |          |         |           |           |
| 38              | ML-SAND & SILT, compact to very dense, fine to coarse grained, brown, wet                | 555.85              |  |        |          |         | 57        | --        |
|                 | END OF BOREHOLE @ 30.0ft BGS   |                     |  |        |          |         |           |           |

**WELL DETAILS**  
 Screened interval:  
 575.85 to 555.85ft AMSL  
 10.00 to 30.00ft BGS  
 Length: 20ft  
 Diameter: 2in  
 Slot Size: 10  
 Material: PVC  
 Sand Pack:  
 578.15 to 555.85ft AMSL  
 7.70 to 30.00ft BGS  
 Material: #5 Quartz Sand

**NOTES:** MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

OVERBURDEN LOG 45136-30.GPJ CRA CORP.GDT 6/15/06



# STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: ZION GENERATION STATION  
 PROJECT NUMBER: 45136-30  
 CLIENT: EXELON GENERATION COMPANY LLC  
 LOCATION: ZION, ILLINOIS

HOLE DESIGNATION: MW-ZN-09S  
 DATE COMPLETED: May 3, 2006  
 DRILLING METHOD: Vacuum/HSA  
 FIELD PERSONNEL: D. NICHOLLS

| DEPTH<br>ft BGS | STRATIGRAPHIC DESCRIPTION & REMARKS   | ELEV.<br>ft<br>AMSL | Monitoring Well  | SAMPLE |          |         |           |           |
|-----------------|---|---------------------|--|--------|----------|---------|-----------|-----------|
|                 |   |                     |  | NUMBER | INTERVAL | REC (%) | 'N' VALUE | PID (PPM) |
|                 | TOP OF RISER<br>GROUND SURFACE  | 593.84<br>591.18    | <p style="font-size: small;">4" Ø above ground protective casing<br/>Concrete<br/>Bentonite and Cuttings<br/>Bentonite Seal<br/>2" Ø PVC Well Riser<br/>4.25" Ø Borehole<br/>Sand<br/>2" Ø PVC Well Screen</p> |        |          |         |           |           |
| 2               | SAND WITH SILT (FILL), trace gravel, trace cobbles, fine grained, moist   |                     |  |        |          |         |           |           |
| 4               |   |                     |  |        |          |         |           |           |
| 6               |   |                     |  |        |          |         |           |           |
| 8               |   |                     |  |        |          |         |           |           |
| 10              |   |                     |  |        |          |         |           |           |
|                 | SM-SAND & SILT (FILL), trace gravel, up to 2" diameter trace cobbles, very loose to compact, fine grained, moist to wet | 581.18              |  | 1      |          | 75      | 25        | 5.2       |
| 12              | GM-GRAVEL WITH SAND (FILL), trace silt, very loose, grey, well rounded gravel, wet                                      |                     |  | 2      |          | 20      | 10        | 6.0       |
| 14              |   |                     |  | 3      |          | 5       | 1         | 6.0       |
| 16              |   |                     |  | 4      |          | 90      | 3         | 4.0       |
| 18              |   | 573.68              |  | 5      |          | 50      | 1         | 4.0       |
| 20              | END OF BOREHOLE @ 20.0ft BGS  | 571.18              |  |        |          |         |           |           |
| 22              | Refusal on Unknown Material   |                     |  |        |          |         |           |           |
| 24              |   |                     |  |        |          |         |           |           |
| 26              |   |                     |  |        |          |         |           |           |
| 28              |   |                     |  |        |          |         |           |           |
| 30              |   |                     |  |        |          |         |           |           |
| 32              |   |                     |  |        |          |         |           |           |
| 34              |   |                     |  |        |          |         |           |           |
| 36              |   |                     |  |        |          |         |           |           |
| 38              |   |                     |  |        |          |         |           |           |

**WELL DETAILS**  
 Screened interval:  
 582.18 to 572.18ft AMSL  
 9.00 to 19.00ft BGS  
 Length: 10ft  
 Diameter: 2in  
 Slot Size: 10  
 Material: PVC  
 Sand Pack:  
 584.43 to 572.18ft AMSL  
 6.75 to 19.00ft BGS  
 Material: #5 Quartz Sand

**NOTES:** MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

OVERBURDEN LOG 45136-30.GPJ CRA\_CORP.GDT 6/15/06



# STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: ZION GENERATION STATION  
 PROJECT NUMBER: 45136-30  
 CLIENT: EXELON GENERATION COMPANY LLC  
 LOCATION: ZION, ILLINOIS

HOLE DESIGNATION: MW-ZN-10  
 DATE COMPLETED: July 13, 2006  
 DRILLING METHOD: Vacuum/HSA  
 FIELD PERSONNEL: D. NICHOLLS

| DEPTH<br>ft BGS | STRATIGRAPHIC DESCRIPTION & REMARKS  | ELEV.<br>ft<br>AMSL | Monitoring Well | SAMPLE |          |         |           |           |
|-----------------|--|---------------------|-----------------|--------|----------|---------|-----------|-----------|
|                 |  |                     |                 | NUMBER | INTERVAL | REC (%) | 'N' VALUE | PID (PPM) |
|                 | TOP OF RISER<br>GROUND SURFACE   | 593.7<br>591.0      |                 |        |          |         |           |           |
| 2               | Vac cleared to 11.0ft BGS  |                     |                 |        |          |         |           |           |
| 4               | Sand, fine grained, trace to some silt, some gravel, dry to moist, brown   |                     |                 |        |          |         |           |           |
| 6               |  |                     |                 |        |          |         |           |           |
| 8               |  |                     |                 |        |          |         |           |           |
| 10              |  |                     |                 |        |          |         |           |           |
| 12              | Sand, some silt and gravel, fine grained, loose, dark brown, wet   | 580.0               |                 |        |          |         |           | 0         |
| 14              | Silty and fine sand, trace gravel, trace clay, loose to compact, lighter brown, moist  | 579.0               |                 |        |          |         |           | 0         |
| 16              | - saturated at 15.0ft BGS  |                     |                 |        |          |         |           | 0         |
| 18              | - trace organics, black, fine grained at 16.5ft BGS  |                     |                 |        |          |         |           | 0         |
| 20              | - 4" thick layer of silty clay, soft, trace organics, trace silt, trace of gravel embedded within finer matrix at 18.0ft BGS |                     |                 |        |          |         |           | 0         |
| 22              |  |                     |                 |        |          |         |           | 0         |
| 24              | Sand, trace silt, fine to medium grained, loose, grayish brown, wet  | 568.0               |                 |        |          |         |           | 0         |
| 26              | Silt and fine sand, loose, fine grained, brownish gray, wet  | 566.0               |                 |        |          |         |           | 0         |
| 28              | Sand, trace gravel, trace silt, loose, brown, wet  | 564.5               |                 |        |          |         |           | 0         |
| 30              | - compact at 30.0ft BGS  |                     |                 |        |          |         |           | 0         |
| 32              |  |                     |                 |        |          |         |           | 0         |
| 34              | Silt, trace sand, compact, fine grained, wet, brownish gray  | 558.5               |                 |        |          |         |           | 0         |
| 34              | END OF BOREHOLE @ 34.0ft BGS   | 557.0               |                 |        |          |         |           | 0         |

**NOTES:** MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

OVERBURDEN LOG 45136-30.GPJ CRA\_CORP.GDT 8/6/06



# STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: ZION GENERATION STATION  
 PROJECT NUMBER: 45136-30  
 CLIENT: EXELON GENERATION COMPANY LLC  
 LOCATION: ZION, ILLINOIS

HOLE DESIGNATION: MW-ZN-10  
 DATE COMPLETED: July 13, 2006  
 DRILLING METHOD: Vacuum/HSA  
 FIELD PERSONNEL: D. NICHOLLS

| DEPTH<br>ft BGS  | STRATIGRAPHIC DESCRIPTION & REMARKS | ELEV.<br>ft<br>AMSL | Monitoring Well  | SAMPLE |          |         |          |           |
|--|-------------------------------------|---------------------|--|--------|----------|---------|----------|-----------|
|  |                                     |                     |  | NUMBER | INTERVAL | REC (%) | N' VALUE | PID (PPM) |
| 42<br>44<br>46<br>48<br>50<br>52<br>54<br>56<br>58<br>60<br>62<br>64<br>66<br>68<br>70<br>72<br>74<br>76<br>78 |                                     |                     | <u>WELL DETAILS</u><br>Screened interval:<br>577.0 to 557.0ft AMSL<br>14.0 to 34.0ft BGS<br>Length: 20ft<br>Diameter: 2in<br>Slot Size: 10<br>Material: PVC<br>Sand Pack:<br>579.0 to 557.0ft AMSL<br>12.0 to 34.0ft BGS<br>Material: Silica Sand #5 |        |          |         |          |           |

**NOTES:** MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

OVERBURDEN LOG 45136-30.GPJ CRA\_CORP.GDT 8/6/06



# STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: ZION GENERATION STATION  
 PROJECT NUMBER: 45136-30  
 CLIENT: EXELON GENERATION COMPANY LLC  
 LOCATION: ZION, ILLINOIS

HOLE DESIGNATION: MW-ZN-11  
 DATE COMPLETED: July 14, 2006  
 DRILLING METHOD: Vacuum/HSA  
 FIELD PERSONNEL: D. NICHOLLS

| DEPTH<br>ft BGS | STRATIGRAPHIC DESCRIPTION & REMARKS   | ELEV.<br>ft<br>AMSL | Monitoring Well | SAMPLE |          |         |          |           |
|-----------------|---|---------------------|-----------------|--------|----------|---------|----------|-----------|
|                 |   |                     |                 | NUMBER | INTERVAL | REC (%) | N' VALUE | PID (PPM) |
|                 | TOP OF RISER<br>GROUND SURFACE  | 589.5<br>586.5      |                 |        |          |         |          |           |
| 2               | Vac cleared to 10.0ft BGS   |                     |                 |        |          |         |          |           |
| 4               | Sand, some gravel, trace of silt, fine grained, brown, moist                                |                     |                 |        |          |         |          |           |
| 6               |   |                     |                 |        |          |         |          |           |
| 8               |   |                     |                 |        |          |         |          |           |
| 10              | - wet at 9.0ft BGS  |                     |                 |        |          |         |          |           |
| 12              | Sand, trace silt, trace gravel, fine to medium grained, compact, brown, wet                 | 576.5               |                 |        |          |         |          | 0         |
| 14              |   |                     |                 |        |          |         |          | 0         |
| 16              | - 7" thick layer of gravel with coarse sand, dense, wet, brown at 16.0ft BGS                |                     |                 |        |          |         |          | 0         |
| 18              | - 8" thick layer of gravel with coarse sand, dense, wet, brown at 17.0ft BGS                |                     |                 |        |          |         |          | 0         |
| 20              | - 6" thick layer of silt, trace sand, dense, fine grained, grayish-brown, wet at 19.5ft BGS |                     |                 |        |          |         |          | 0         |
| 22              | - 8" thick layer of gravel with coarse sand, dense, wet, brown at 21.0ft BGS                |                     |                 |        |          |         |          | 0         |
| 24              | - 6" thick layer of coarse sand, dense, wet, brown at 23.0ft BGS                            |                     |                 |        |          |         |          | 0         |
| 26              | - 6" thick layer of silt, trace sand, dense, fine grained, grayish-brown, wet at 23.5ft BGS |                     |                 |        |          |         |          | 0         |
| 28              | Silt, trace sand, compact, fine grained, grayish-brown, wet                                 | 559.5               |                 |        |          |         |          | 0         |
| 30              | Sand, trace silt, trace gravel, fine to medium grained, compact, brown, wet                 | 558.5               |                 |        |          |         |          | 0         |
| 32              | Silt, trace sand, compact, fine grained, grayish-brown, wet                                 | 557.5               |                 |        |          |         |          | 0         |
| 34              | END OF BOREHOLE @ 30.0ft BGS  | 556.5               |                 |        |          |         |          | 0         |
| 36              |   |                     |                 |        |          |         |          |           |
| 38              |   |                     |                 |        |          |         |          |           |

**WELL DETAILS**  
 Screened interval:  
 576.5 to 556.5ft AMSL  
 10.0 to 30.0ft BGS  
 Length: 20ft  
 Diameter: 2in  
 Slot Size: 10  
 Material: PVC  
 Sand Pack:  
 578.5 to 556.5ft AMSL  
 8.0 to 30.0ft BGS  
 Material: Silica Sand #5

**NOTES:** MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

OVERBURDEN LOG 45136-30.GPJ CRA\_CORP.GDT 8/6/06



# STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: ZION GENERATION STATION  
 PROJECT NUMBER: 45136-30  
 CLIENT: EXELON GENERATION COMPANY LLC  
 LOCATION: ZION, ILLINOIS

HOLE DESIGNATION: TW-ZN-100  
 DATE COMPLETED: July 7, 2006  
 DRILLING METHOD: Geoprobe  
 FIELD PERSONNEL: M. BORKOWSKI

| DEPTH<br>ft BGS | STRATIGRAPHIC DESCRIPTION & REMARKS                | ELEV.<br>ft<br>AMSL | Monitoring Well   | SAMPLE |          |         |          |  |
|-----------------|--|---------------------|---|--------|----------|---------|----------|--|
|                 |  |                     |   | NUMBER | INTERVAL | REC (%) | N' VALUE |  |
|                 | TOP OF RISER<br>GROUND SURFACE                     | 590.0<br>585.3      |   |        |          |         |          |  |
| 2               | (SW) Fine grained sand, dry                        |                     |   |        |          |         |          |  |
| 4               |  |                     |   |        |          |         |          |  |
| 6               |  |                     |   |        |          |         |          |  |
| 8               | (SP) Med-Fine grained sand, saturated              | 577.8               |   |        |          |         |          |  |
| 10              |  |                     |   |        |          |         |          |  |
| 12              |  |                     |   |        |          |         |          |  |
| 14              | (SP) Coarse grained sand, larger stones, saturated | 571.8               |   |        |          |         |          |  |
| 16              |  |                     |   |        |          |         |          |  |
| 18              |  |                     |   |        |          |         |          |  |
| 20              |  |                     |   |        |          |         |          |  |
| 22              | END OF BOREHOLE @ 21.5ft BGS                       | 563.8               | <p><b>WELL DETAILS</b></p> <p>Screened interval:<br/>           578.8 to 563.8ft AMSL<br/>           6.5 to 21.5ft BGS</p> <p>Length: 15ft<br/>           Diameter: 1in<br/>           Slot Size: 10<br/>           Material: PVC</p> <p>Sand Pack:<br/>           579.8 to 563.8ft AMSL<br/>           5.5 to 21.5ft BGS<br/>           Material: Sand</p> |        |          |         |          |  |
| 24              |  |                     |   |        |          |         |          |  |
| 26              |  |                     |   |        |          |         |          |  |
| 28              |  |                     |   |        |          |         |          |  |
| 30              |  |                     |   |        |          |         |          |  |
| 32              |  |                     |   |        |          |         |          |  |
| 34              |  |                     |   |        |          |         |          |  |
| 36              |  |                     |   |        |          |         |          |  |
| 38              |  |                     |   |        |          |         |          |  |

**NOTES:** MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

OVERBURDEN LOG 45136-30.GPJ CRA\_CORP.GDT 8/6/06





# STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: ZION GENERATION STATION  
 PROJECT NUMBER: 45136-30  
 CLIENT: EXELON GENERATION COMPANY LLC  
 LOCATION: ZION, ILLINOIS

HOLE DESIGNATION: TW-ZN-101  
 DATE COMPLETED: July 7, 2006  
 DRILLING METHOD: Geoprobe  
 FIELD PERSONNEL: M. BORKOWSKI

| DEPTH<br>ft BGS | STRATIGRAPHIC DESCRIPTION & REMARKS                | ELEV.<br>ft<br>AMSL | Monitoring Well   | SAMPLE |          |         |          |
|-----------------|--|---------------------|---|--------|----------|---------|----------|
|                 |  |                     |   | NUMBER | INTERVAL | REC (%) | N' VALUE |
|                 | TOP OF RISER<br>GROUND SURFACE                     | 588.7<br>584.3      |   |        |          |         |          |
| 2               | (SW) Fine grained sand, dry                        |                     |   |        |          |         |          |
| 4               |  |                     |   |        |          |         |          |
| 6               |  |                     |   |        |          |         |          |
| 8               | (SP) Med-Fine grained sand, saturated              | 576.8               |   |        |          |         |          |
| 10              |  |                     |   |        |          |         |          |
| 12              |  |                     |   |        |          |         |          |
| 14              | (SP) Coarse grained sand, larger stones, saturated | 570.8               |   |        |          |         |          |
| 16              |  |                     |   |        |          |         |          |
| 18              |  |                     |   |        |          |         |          |
| 20              | END OF BOREHOLE @ 19.0ft BGS                       | 565.3               | <p><u>WELL DETAILS</u><br/>           Screened interval:<br/>           580.3 to 565.3ft AMSL<br/>           4.0 to 19.0ft BGS<br/>           Length: 15ft<br/>           Diameter: 1in<br/>           Slot Size: 10<br/>           Material: PVC<br/>           Sand Pack:<br/>           581.3 to 565.3ft AMSL<br/>           3.0 to 19.0ft BGS<br/>           Material: Sand</p> |        |          |         |          |
| 22              |  |                     |   |        |          |         |          |
| 24              |  |                     |   |        |          |         |          |
| 26              |  |                     |   |        |          |         |          |
| 28              |  |                     |   |        |          |         |          |
| 30              |  |                     |   |        |          |         |          |
| 32              |  |                     |   |        |          |         |          |
| 34              |  |                     |   |        |          |         |          |
| 36              |  |                     |   |        |          |         |          |
| 38              |  |                     |   |        |          |         |          |

**NOTES:** MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

OVERBURDEN LOG 45136-30.GPJ CRA\_CORP.GDT 8/6/06



# STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: ZION GENERATION STATION  
 PROJECT NUMBER: 45136-30  
 CLIENT: EXELON GENERATION COMPANY LLC  
 LOCATION: ZION, ILLINOIS

HOLE DESIGNATION: TW-ZN-102  
 DATE COMPLETED: July 7, 2006  
 DRILLING METHOD: Geoprobe  
 FIELD PERSONNEL: M. BORKOWSKI

| DEPTH<br>ft BGS | STRATIGRAPHIC DESCRIPTION & REMARKS                | ELEV.<br>ft<br>AMSL | Monitoring Well | SAMPLE |          |         |           |
|-----------------|--|---------------------|-----------------|--------|----------|---------|-----------|
|                 |  |                     |                 | NUMBER | INTERVAL | REC (%) | 'N' VALUE |
|                 | TOP OF RISER<br>GROUND SURFACE                     | 588.6<br>584.3      |                 |        |          |         |           |
| 2               | (SW) Fine grained sand, dry                        |                     |                 |        |          |         |           |
| 4               |  |                     |                 |        |          |         |           |
| 6               | (SP) Med-Fine grained sand, saturated              |                     |                 |        |          |         |           |
| 8               |  |                     |                 |        |          |         |           |
| 10              |  |                     |                 |        |          |         |           |
| 12              | (SP) Coarse grained sand, larger stones, saturated |                     |                 |        |          |         |           |
| 14              |  |                     |                 |        |          |         |           |
| 16              |  |                     |                 |        |          |         |           |
| 18              |  |                     |                 |        |          |         |           |
| 20              | END OF BOREHOLE @ 21.0ft BGS                       |                     |                 |        |          |         |           |
| 22              |  |                     |                 |        |          |         |           |
| 24              |  |                     |                 |        |          |         |           |
| 26              |  |                     |                 |        |          |         |           |
| 28              |  |                     |                 |        |          |         |           |
| 30              |  |                     |                 |        |          |         |           |
| 32              |  |                     |                 |        |          |         |           |
| 34              |  |                     |                 |        |          |         |           |
| 36              |  |                     |                 |        |          |         |           |
| 38              |  |                     |                 |        |          |         |           |

**WELL DETAILS**  
 Screened interval:  
 578.3 to 563.3ft AMSL  
 6.0 to 21.0ft BGS  
 Length: 15ft  
 Diameter: 1in  
 Slot Size: 10  
 Material: PVC  
 Sand Pack:  
 579.3 to 563.3ft AMSL  
 5.0 to 21.0ft BGS  
 Material: Sand

**NOTES:** MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

OVERBURDEN LOG 45136-30.GPJ CRA\_CORP.GDT 8/6/06



# STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: ZION GENERATION STATION  
 PROJECT NUMBER: 45136-30  
 CLIENT: EXELON GENERATION COMPANY LLC  
 LOCATION: ZION, ILLINOIS

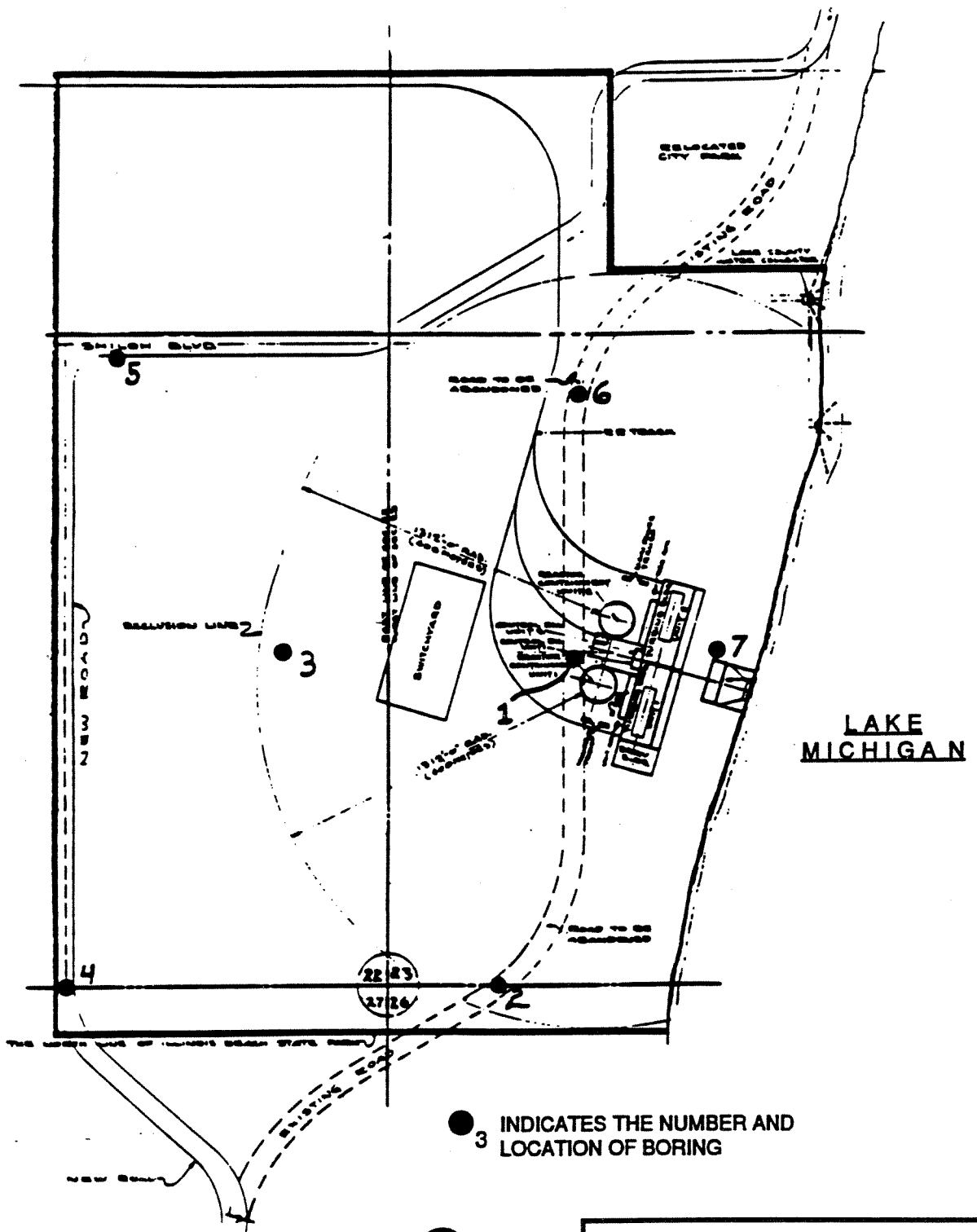
HOLE DESIGNATION: TW-ZN-103  
 DATE COMPLETED: July 7, 2006  
 DRILLING METHOD: Geoprobe  
 FIELD PERSONNEL: M. BORKOWSKI

| DEPTH<br>ft BGS | STRATIGRAPHIC DESCRIPTION & REMARKS                | ELEV.<br>ft<br>AMSL | Monitoring Well  | SAMPLE |          |         |          |  |
|-----------------|--|---------------------|--|--------|----------|---------|----------|--|
|                 |  |                     |  | NUMBER | INTERVAL | REC (%) | N' VALUE |  |
|                 | TOP OF RISER<br>GROUND SURFACE                     | 587.5<br>583.7      |  |        |          |         |          |  |
| 2               | (SW) Fine grained sand, dry                        |                     |  |        |          |         |          |  |
| 4               |  |                     |  |        |          |         |          |  |
| 6               |  |                     |  |        |          |         |          |  |
| 8               | (SP) Med-Fine grained sand, saturated              | 576.2               |  |        |          |         |          |  |
| 10              |  |                     |  |        |          |         |          |  |
| 12              |  |                     |  |        |          |         |          |  |
| 14              | (SP) Coarse grained sand, larger stones, saturated | 570.2               |  |        |          |         |          |  |
| 16              |  |                     |  |        |          |         |          |  |
| 18              |  |                     |  |        |          |         |          |  |
| 20              |  |                     |  |        |          |         |          |  |
| 22              |  |                     |  |        |          |         |          |  |
| 24              |  |                     |  |        |          |         |          |  |
| 26              |  |                     |  |        |          |         |          |  |
| 28              |  |                     |  |        |          |         |          |  |
| 30              | END OF BOREHOLE @ 30.0ft BGS                       | 553.7               |  |        |          |         |          |  |
| 32              |  |                     | <p><u>WELL DETAILS</u><br/>           Screened interval:<br/>               573.7 to 553.7ft AMSL<br/>               10.0 to 30.0ft BGS<br/>           Length: 20ft<br/>           Diameter: 1in<br/>           Slot Size: 10<br/>           Material: PVC<br/>           Sand Pack:<br/>               574.7 to 553.7ft AMSL<br/>               9.0 to 30.0ft BGS<br/>           Material: Sand</p> |        |          |         |          |  |
| 34              |  |                     |  |        |          |         |          |  |
| 36              |  |                     |  |        |          |         |          |  |
| 38              |  |                     |  |        |          |         |          |  |

**NOTES:** MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

OVERBURDEN LOG 45136-30.GPJ CRA\_CORP.GDT 8/6/06

## B.2 HISTORICAL GEOTECHNICAL LOGS



ZION STATION DSAR

Figure 2-18

BORING LOCATION MAP

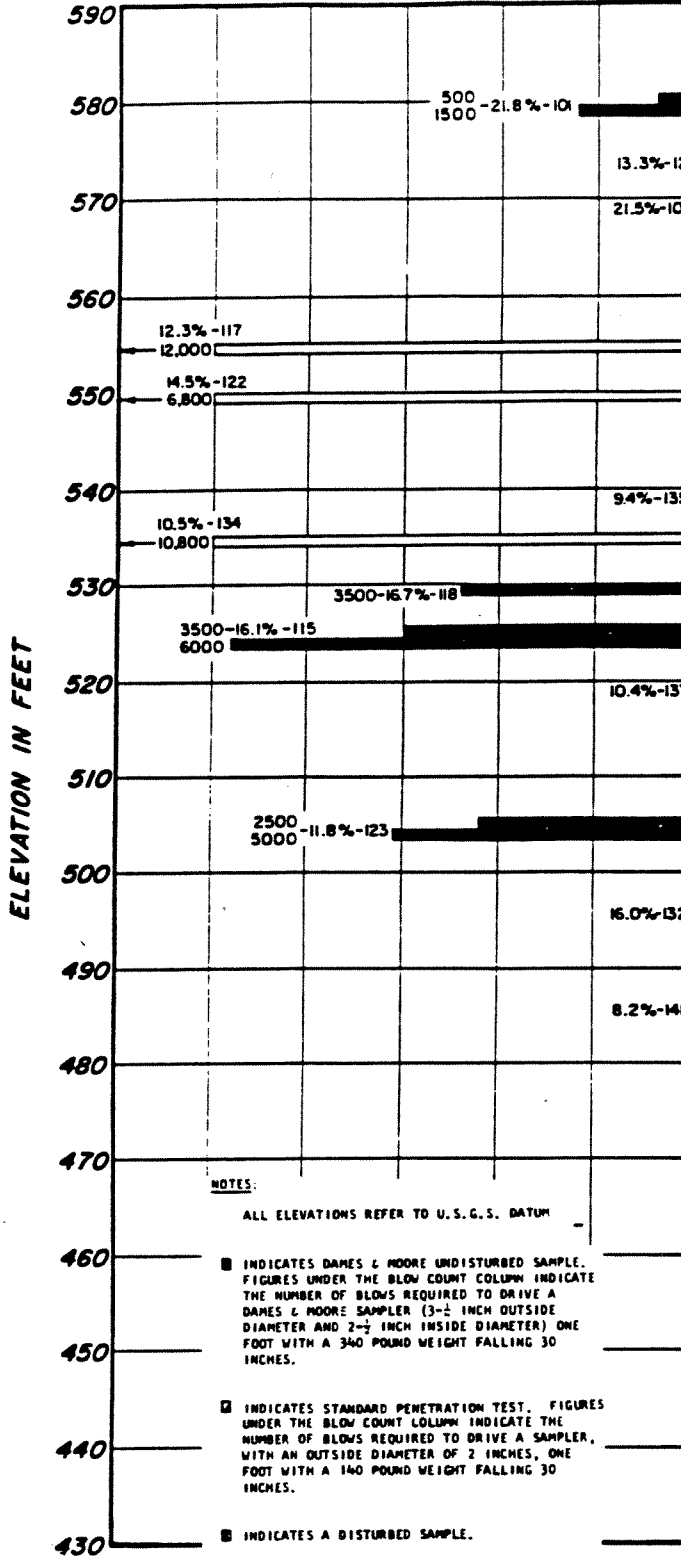
AUGUST 1998

SHEARING STRENGTH IN LBS./SQ.FT.

BORING 1

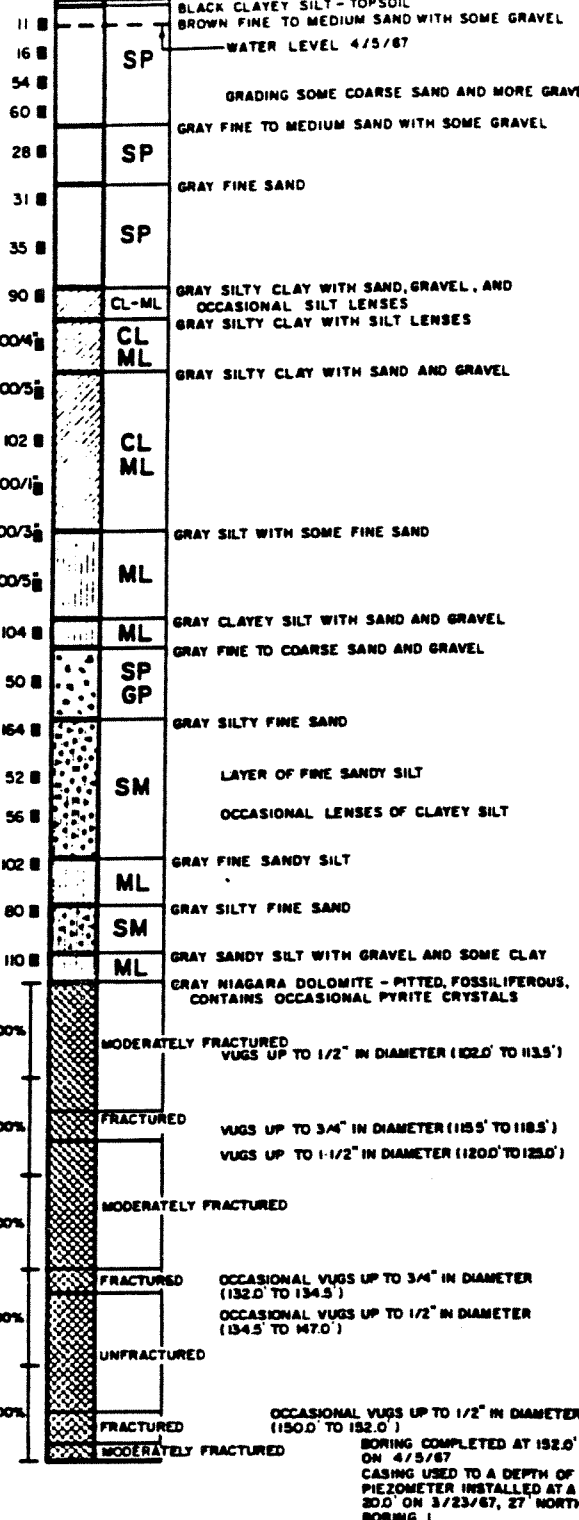
SURFACE ELEVATION 585.22

6000 5000 4000 3000 2000 1000 0



BLOW COUNT SAMPLES

SYMBOLS DESCRIPTIONS



NOTES:

ALL ELEVATIONS REFER TO U.S.G.S. DATUM

■ INDICATES DAMES & MOORE UNDISTURBED SAMPLE. FIGURES UNDER THE BLOW COUNT COLUMN INDICATE THE NUMBER OF BLOWS REQUIRED TO DRIVE A DAMES & MOORE SAMPLER (3-1/2 INCH OUTSIDE DIAMETER AND 2-1/2 INCH INSIDE DIAMETER) ONE FOOT WITH A 340 POUND WEIGHT FALLING 30 INCHES.

□ INDICATES STANDARD PENETRATION TEST. FIGURES UNDER THE BLOW COUNT COLUMN INDICATE THE NUMBER OF BLOWS REQUIRED TO DRIVE A SAMPLER, WITH AN OUTSIDE DIAMETER OF 2 INCHES, ONE FOOT WITH A 140 POUND WEIGHT FALLING 30 INCHES.

■ INDICATES A DISTURBED SAMPLE.

□ INDICATES A SAMPLING ATTEMPT WITH NO RECOVERY.

100% I INDICATES DEPTH, LENGTH, AND PERCENT OF CORE RUN RECOVERED.

NOMENCLATURE

SEVERELY FRACTURED  
FRACTURED  
MODERATELY FRACTURED  
UNFRACTURED

LENGTH OF CORE PIECES

LESS THAN 3"  
3" TO 6"  
6" TO 12"  
GREATER THAN 12"

DAMES & MOORE

ZION STATION DSAR

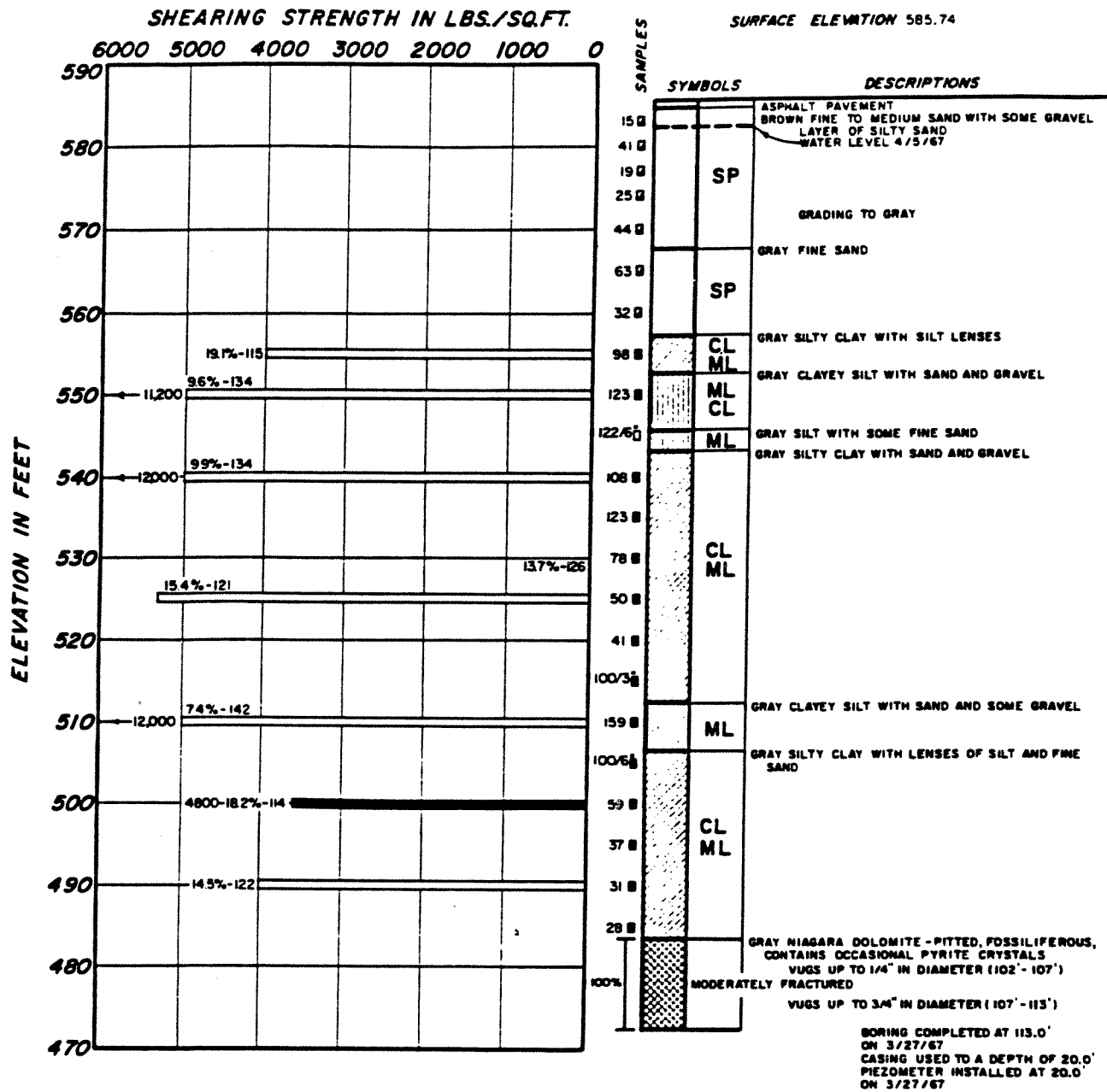
Figure 2-19

LOG OF BORINGS, (BORING 1)

AUGUST 1998

BORING 2

SURFACE ELEVATION 585.74



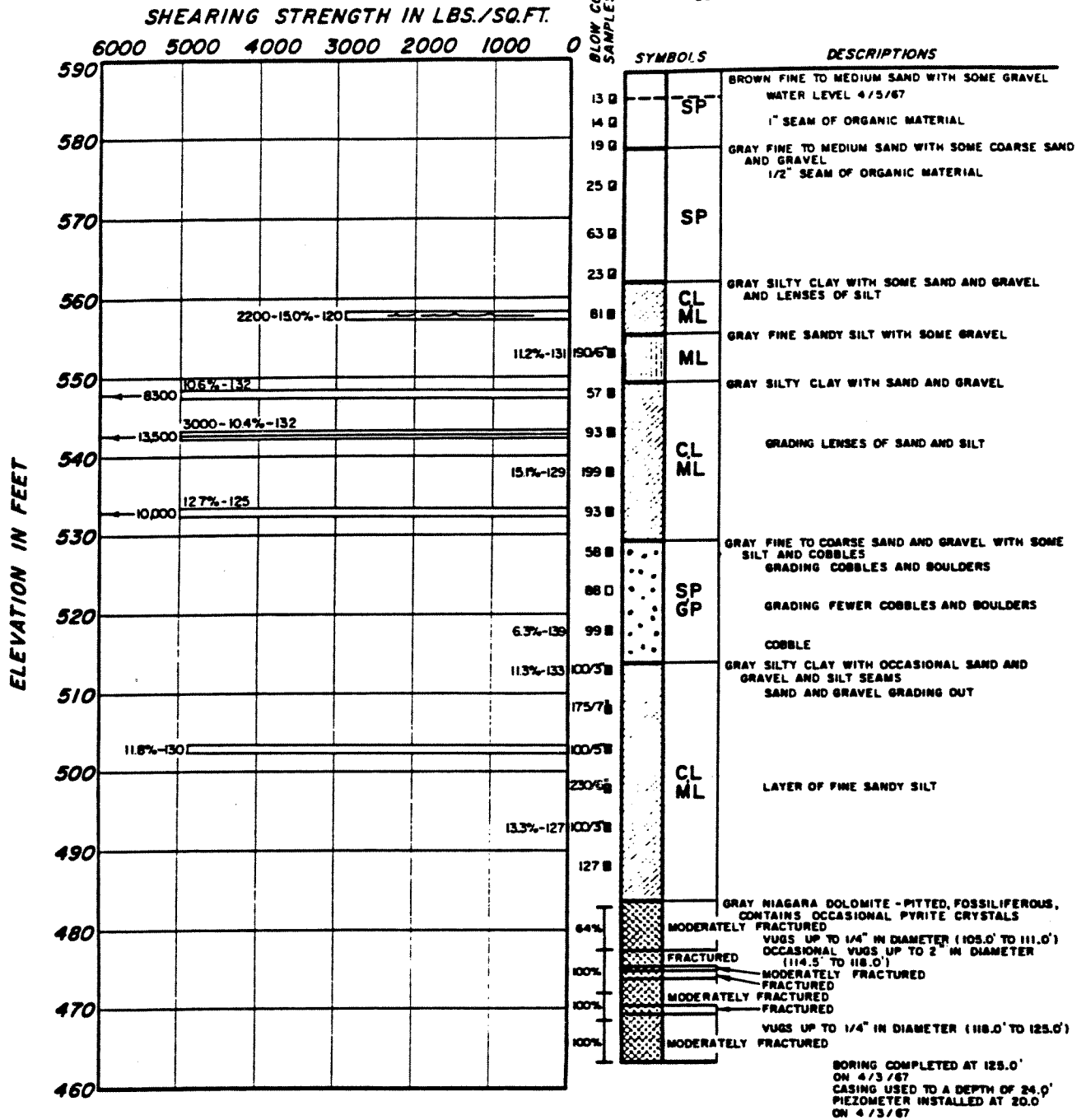
ZION STATION DSAR

Figure 2-20

LOG OF BORINGS, (BORING 2)

AUGUST 1998

**BORING 3**  
SURFACE ELEVATION 588.14

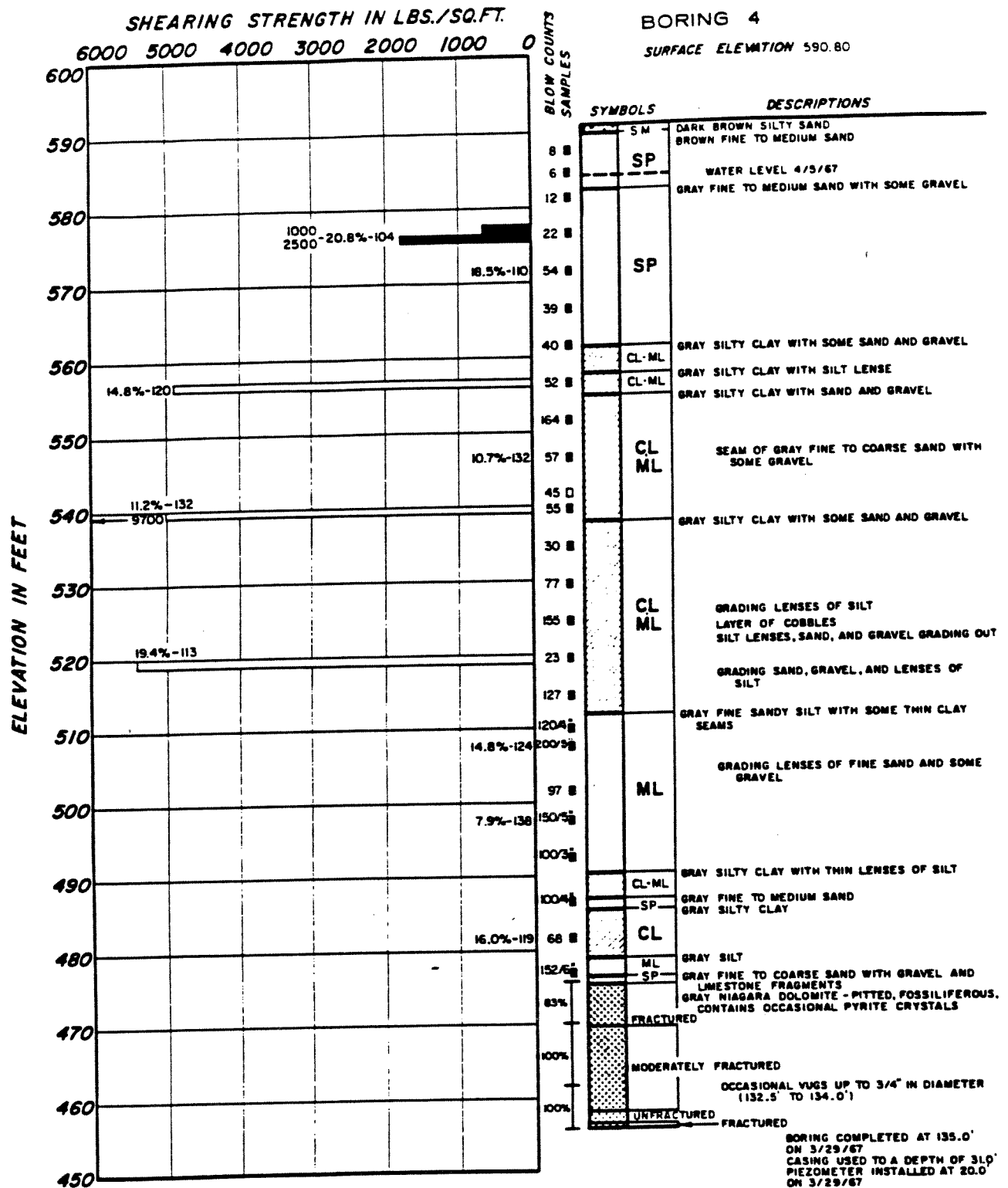


**ZION STATION DSAR**

Figure 2-21

**LOG OF BORINGS, (BORING 3)**





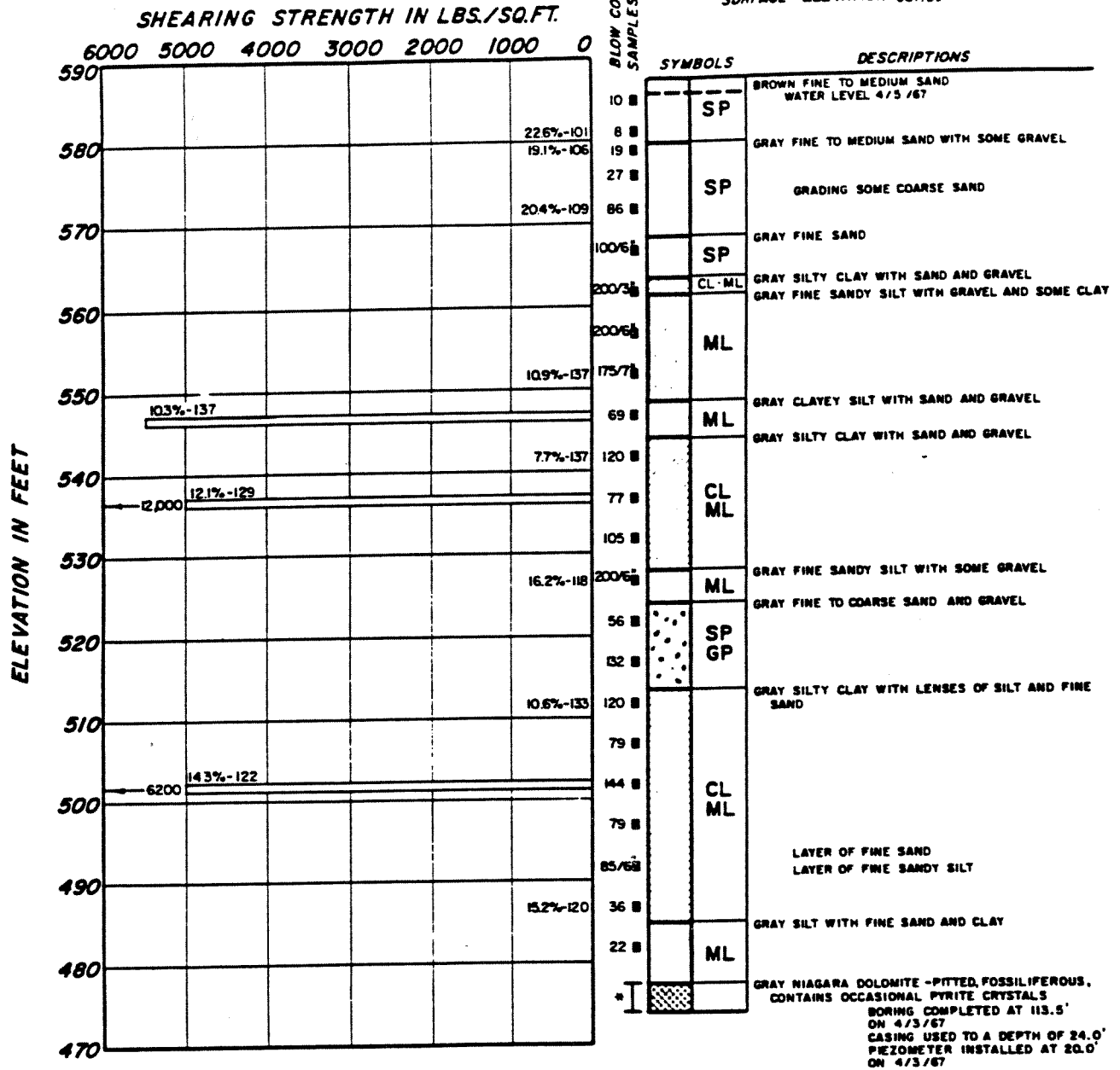
**ZION STATION DSAR**

Figure 2-22

**LOG OF BORINGS, (BORING 4)**

**BORING 5**

SURFACE ELEVATION 587.39



\* CORE BARREL SHEARED OFF IN BORING AND WAS NOT RETRIEVED

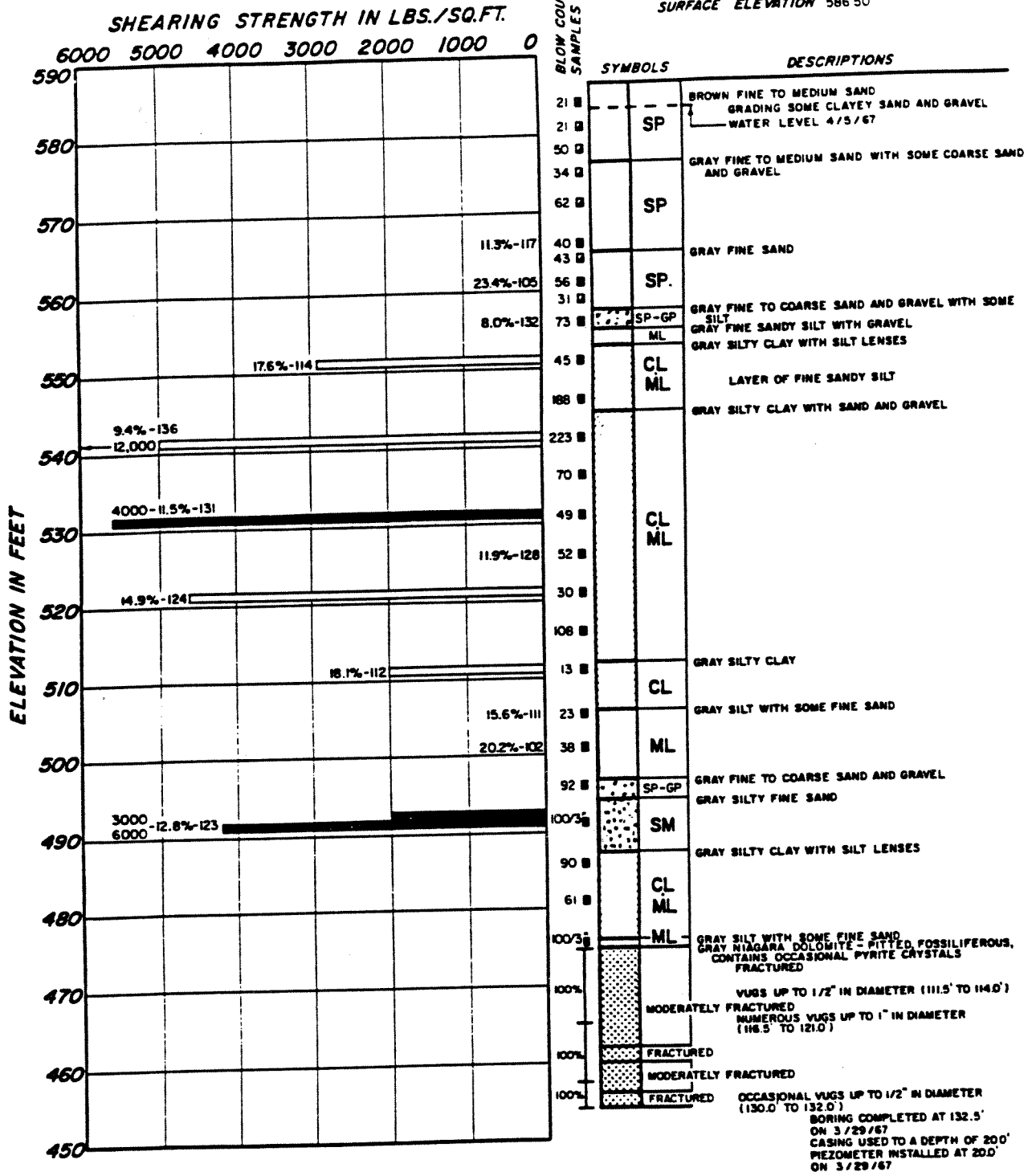
ZION STATION DSAR

Figure 2-23

LOG OF BORINGS, (BORING 5)

**BORING 6**

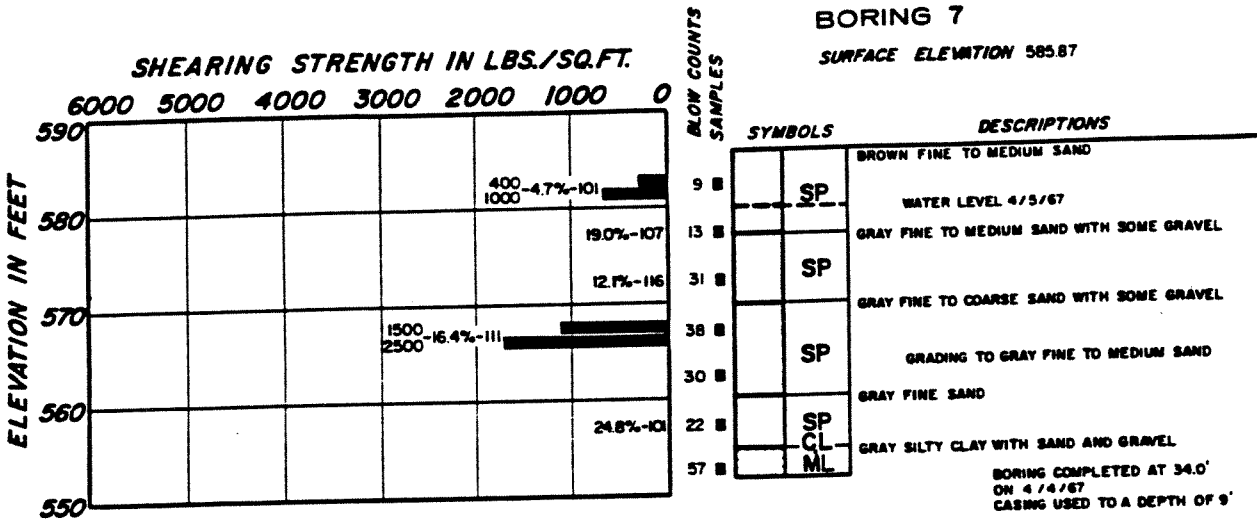
SURFACE ELEVATION 586.50



**ZION STATION DSAR**

Figure 2-24

LOG OF BORINGS, (BORING 6)



ZION STATION DSAR

Figure 2-25

LOG OF BORINGS, (BORING 7)

APPENDIX C

QUALITY ASSURANCE PROGRAM - TELEDYNE BROWN ENGINEERING, INC.

# Quality Assurance Manual

For


## Teledyne Brown Engineering Environmental Services

2508 Quality Lane

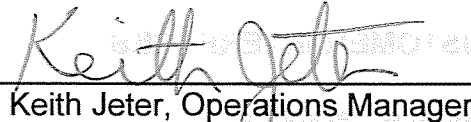
Knoxville, Tennessee 37931-3133

865-690-6819

Generated by:

  
Lynne Perry, QA Manager

Approved by:

  
Keith Jeter, Operations Manager

Copy No.:

Original

Issued To:

Lynne Perry

Date:

10/26/05

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## REVISION HISTORY

|            |   |                 |            |
|------------|---|-----------------|------------|
| Revision 7 | Complete re-write   | January 1, 2005 | Bill Meyer |
| Revision 8 | Updated organization chart, minor change to 1.0, 4.4, 7.5.3.2, 10.2.3, and 12.3 |                 |            |

## 1.0

### Knoxville QAM Section Introduction

This Quality Assurance Manual (QAM) and related Procedures describes the Knoxville Environmental Services Laboratory's QA system. This system is designed to meet multiple quality standards imposed by Customers and regulatory agencies including:

- NRC's 10 CFR 50 Appendix B
- NRC's Regulatory Guide 4.15
- DOE's Order 414.1
- DOE's QSAS
- ANSI N 42.23
- ANSI N 13.30
- NELAC Standard, Chapter 5

The Environmental Services (ES) Laboratory does low level radioactivity analyses for Power Plants and other customers. It primarily analyzes environmental samples (natural products from around plants such as milk), in-plant samples (air filters, waters), bioassay samples from customer's employees, and waste disposal samples (liquids and solids).

Potable and non-potable water samples are tested using methods based on EPA standards as cited in State licenses (see Procedure 4010). The listing [current as of initial printing of this Manual – see current index for revision status and additions / deletions] of implementing Procedures (SOPs) covering Administration, Methods, Counting Instruments, Technical, Miscellaneous, and LIMS is shown in Table 1-1. Reference to these Procedures by number is made throughout this QAM.

**Table 1-1**

| Number        | Title  |
|---------------|--|
| <b>Part 1</b> | <b>Administrative Procedures</b>   |
| 1001          | Validation and Verification of Computer Programs for Radiochemistry Data Reduction |
| 1002          | Organization and Responsibility  |
| 1003          | Control, Retention, and Disposal of Quality Assurance Records                      |
| 1004          | Definitions  |
| 1005          | Data Integrity   |
| 1006          | Job Descriptions   |
| 1007          | Training and Certifications  |
| 1008          | Procedure and Document Control   |
| 1009          | Calibration System   |
| 1010          | Nonconformance Controls  |
| 1011          | 10CFR21 Reporting  |
| 1012          | Corrective Action and Preventive Action  |

| <b>Number</b> | <b>Title</b>   |
|---------------|--|
| 1013          | Internal Audits and Management Reviews   |
| 1014          | RFP, Contract Review, and Order Entry (formerly 4001)                                  |
| 1015          | Procurement Controls   |
| <b>Part 2</b> | <b>Method Procedures</b>   |
| 2001          | Alpha Isotopic and Plutonium-241   |
| 2002          | Carbon-14 Activity in Various Matrices   |
| 2003          | Carbon-14 and Tritium in Soils, Solids, and Biological Samples; Harvey Oxidizer Method |
| 2004          | Cerium-141 and Cerium-144 by Radiochemical Separation                                  |
| 2005          | Cesium-137 by Radiochemical Separation   |
| 2006          | Iron-55 Activity in Various Matrices   |
| 2007          | Gamma Emitting Radioisotope Analysis   |
| 2008          | Gross Alpha and/or Gross Beta Activity in Various Matrices                             |
| 2009          | Gross Beta Minus Potassium-40 Activity in Urine and Fecal Samples                      |
| 2010          | Tritium and Carbon-14 Analysis by Liquid Scintillation                                 |
| 2011          | Tritium Analysis in Drinking Water by Liquid Scintillation                             |
| 2012          | Radioiodine in Various Matrices  |
| 2013          | Radionickel Activity in Various Matrices   |
| 2014          | Phosphorus-32 Activity in Various Matrices   |
| 2015          | Lead-210 Activity in Various Matrices  |
| 2016          | Radium-226 Analysis in Various Matrices  |
| 2017          | Total Radium in Water Samples  |
| 2018          | Radiostrontium Analysis by Chemical Separation   |
| 2019          | Radiostrontium Analysis by Ion Exchange  |
| 2020          | Sulfur-35 Analysis   |
| 2021          | Technetium-99 Analysis by Eichrom Resin Separation                                     |
| 2022          | Total Uranium Analysis by KPA  |
| 2023          | Compositing of Samples   |
| 2024          | Dry Ashing of Environmental Samples  |
| 2025          | Preparation and Standardization of Carrier Solutions                                   |
| 2026          | Radioactive Reference Standard Solutions and Records                                   |
| 2027          | Glassware Washing and Storage  |
| 2028          | Moisture Content of Various Matrices   |
| 2029          | Polonium-210 Activity in Various Matrices  |
| 2030          | Promethium-147 Analysis  |

| <b>Number</b> | <b>Title</b>   |
|---------------|--|
| <b>Part 3</b> | <b>Instrument Procedures</b>   |
| 3001          | Calibration and Control of Gamma-Ray Spectrometers                             |
| 3002          | Calibration of Alpha Spectrometers   |
| 3003          | Calibration and Control of Alpha and Beta Counting Instruments                 |
| 3004          | Calibration and Control of Liquid Scintillation Counters                       |
| 3005          | Calibration and Operation of pH Meters   |
| 3006          | Balance Calibration and Check  |
| 3008          | Negative Results Evaluation Policy   |
| 3009          | Use and Maintenance of Mechanical Pipettors                                    |
| 3010          | Microwave Digestion System Use and Maintenance                                 |
| <b>Part 4</b> | <b>Technical Procedures</b>  |
| 4001          | Not Used   |
| 4002          | QC Checks on Data  |
| 4003          | Sample Regent and Control  |
| 4004          | Data Package Preparation and Reporting   |
| 4005          | Blank, Spike, and Duplicate Controls   |
| 4006          | Inter-Laboratory Comparison Study Process                                      |
| 4007          | Method Basis and Initial Validation Process                                    |
| 4008          | Not Used   |
| 4009          | MDL Controls   |
| 4010          | State Certification Process  |
| 4011          | Accuracy, Precision, Efficiency, and Bias Controls and Data Quality Objectives |
| 4012          | Not Used   |
| 4013          | Not Used   |
| 4014          | Facility Operation and Control   |
| 4015          | Documentation of Analytical Laboratory Logbooks (formerly 1002)                |
| 4016          | Total Propagated Uncertainty (formerly 1004)                                   |
| 4017          | LIMS Operation   |
| 4018          | Instrument Calibration System  |
| 4019          | Radioactive Reference Material Standards                                       |
| <b>Part 5</b> | <b>Miscellaneous Procedures</b>  |
| 5001          | Laboratory Hood Operations   |
| 5002          | Operation and Maintenance of Deionized Water System                            |
| 5003          | Waste Management   |
| 5004          | Acid Neutralization and Purification System Operation Procedure                |

|               |   |
|---------------|---|
| <b>Part 6</b> | <b>LIMS</b>   |
| 6001          | LIMS Raw Data Processing and Reporting              |
| 6002          | Software Development and/or Pilots of COTS Packages |
| 6003          | Software Change and Version Control                 |
| 6004          | Backup of Data and System Files                     |
| 6005          | Disaster Recovery Plan                              |
| 6006          | LIMS Hardware                                       |
| 6007          | LIMS User Access                                    |
| 6008          | LIMS Training                                       |
| 6009          | LIMS Security                                       |

## **2.0 QUALITY SYSTEM**

The TBE-ES QA system is designed to comply with multiple customer- and regulatory agency-imposed specifications related to quality. This quality system applies to all activities of TBE-ES that affect the quality of analyses performed by the laboratory.

### **2.1 Policy**

The TBE quality policy, given in Company Policy P-501, is “TBE will continually improve our processes and effectiveness in providing products and services that exceed our customer’s expectations.”

This policy is amplified by this Laboratory’s commitment, as attested to by the title page signatures, to perform all work to good professional practices and to deliver high quality services to our customers with full data integrity. (See Section 4.0 and Procedure 1005).

### **2.2 Quality System Structure**

The Quality System is operated by the organizations described in Section 3.0 of this Manual. The Quality System is described in this Manual and in the Procedures Manual, both of which are maintained by the QA Manager. Procedures are divided into 6 sections – Administrative, Methods, Equipments, Technical, Miscellaneous, and LIMS. This Manual is structured as shown in the Table of Contents and refers to Procedures when applicable. Cross references to the various imposed quality specifications are contained in Appendices to this Manual.

### **2.3 Quality System Objectives**

The Quality System is established to meet the objective of assuring all operations are planned and executed in accordance with system requirements. The Quality System also assures that performance evaluations are performed (see Procedure 4006), and that appropriate verifications are performed (see Procedures in the 1000 and 4000 series) to further assure compliance. Verification includes

examination of final reports (prior to submittal to customers) to determine their quality (see Procedure 4004).

To further these objectives, various in-process assessments of data, as well as assessments of the system, via internal audits and management reviews, are performed. Both internal experts and customer / regulatory agencies perform further assessments of the system and compliance to requirements.

#### **2.4 Personnel Orientation, Training, and Qualification**

TBE provides indoctrination and training to employees and performs proficiency evaluation of technical personnel. This effort is described in Section 4.0.



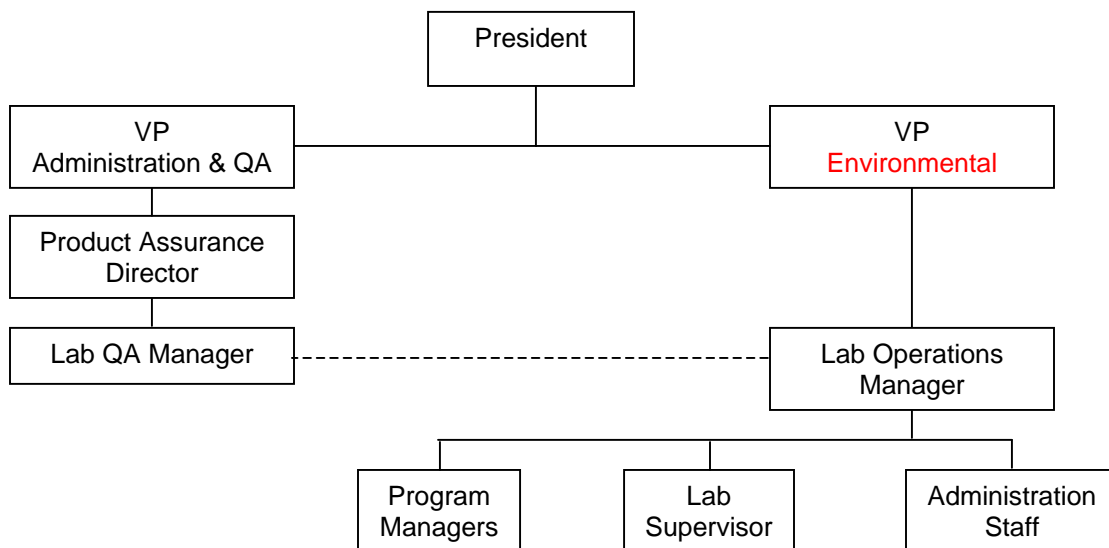
### 3.0 ORGANIZATION, AUTHORITY, AND RESPONSIBILITY

TBE has established an effective organization for conducting laboratory analyses at the Knoxville Environmental Services Laboratory. The basic organization is shown in Figure 3-1. Detail organization charts with names, authorities, and responsibilities are given in Procedure 1002. Job descriptions are given in Procedure 1006.

This organization provides clearly established Quality Assurance authorities, duties, and functions. QA has the organizational freedom needed to:

- (1) Identify problems
- (2) Stop nonconforming work
- (3) Initiate investigations
- (4) Recommend corrective and preventive actions
- (5) Provide solutions or recommend solutions
- (6) Verify implementation of actions

All Laboratory personnel have the authority and resources to do their assigned duties and have the freedom to act on problems. The QA personnel have direct, independent access to Company management as shown in Figure 3-1.



**Figure 3.1. Laboratory Organization**

## **4.0 PERSONNEL ORIENTATION, DATA INTEGRITY, TRAINING, AND QUALIFICATION**

### **4.1 Orientation**

All laboratory personnel must receive orientation to the quality program if their work can affect quality. Orientation includes a brief review of customer- and regulatory agency-imposed quality requirements, the structure of the QAM, and the implementing procedures. The goal of orientation is to cover the nature and goals of the QA program.

### **4.2 Data Integrity**

The primary output of the Laboratory is data. Special emphasis and training in data integrity is given to all personnel whose work provides or supports data delivery. The Laboratory Data Integrity Procedure (Procedure 1005) describes training, personnel attestations, and monitoring operations. Annual reviews are required.

### **4.3 Training**

The Quality Assurance Manager (QAM) maintains a training matrix indicating which laboratory personnel need training in which specific Procedures. This matrix is updated when personnel change or change assignments. All personnel are trained per these requirements and procedures. This training program is described in Procedure 1007. The assigned responsibilities for employees are described in Procedure 1002 (See Section 3.0) on Organization and in Procedure 1006, Job Descriptions. Refresher training or re-training is given annually as appropriate.

### **4.4 Qualification**

Personnel are qualified as required by their job description. Management and non-analysts are evaluated based on past experience, education, and management's assessment of their capabilities. Formal qualification is required of analysts and related **technical** personnel who perform laboratory functions. Each applicable person is given training and then formally evaluated by the Operations Manager (or his designees) and by QA. Each analyst must initially demonstrate capability to perform each assigned analytical effort. Each year, thereafter, he or she must perform similar analyses on Interlab Comparison Samples (see Procedure 4006) or on equivalent blanks and spikes samples. Acceptable results extend qualifications (certification). Unacceptable results require retraining in the subject method / Procedures. (See Procedure 1007 for added information, records, forms, etc. used.)

### **4.5 Records**

Records of training subjects, contents, attendees, instructors, and certifications are maintained by QA.

## **5.0 CUSTOMER INTERFACES**

### **5.1 Interface Personnel**

The Laboratory has designated Program Managers as the primary interface with all customers. Other interfaces may be the QA Manager or the Lab Operations Manager.

### **5.2 Bid Requests and Tenders**

The Program Managers respond to customer requests for bids and proposals per Procedure 1014 for bids, proposals, and contract reviews. They clarify customer requests so both the customer and the lab staff understand requests. As responses are developed, internal reviews are conducted to ensure that requirements are adequately defined and documented and to verify that the Laboratory has adequate resources in physical capabilities, personal skills, and technical information to perform the work. Accreditation needs are reviewed. If subcontracts are required to perform any analysis, the subcontractor is similarly evaluated and the client notified in writing of the effort. Most qualifications are routine with standard pricing and the review of these quotes is performed by the Program Manager. Larger or more complex quotes are reviewed by the Operations Manager and the QA Manager (or designees). Evidence of review is by initialing and dating applicable papers, signatures on quotations, or by memo.

### **5.3 Contracts**

The Program Manager's receive contract awards (oral or written) and generate the work planning for initiation preparation (charge numbers, data structure or contents in LIMS, etc.). They review contracts for possible differences from quotations and, if acceptable, contracts are processed. Documentation of the review is by initials and date as a minimum. Contract changes receive similar reviews and planning.

### **5.4 TBE's Expectation of Customers**

TBE expects customers to provide samples suitable for lab analysis. These expectations include:

- Accurate and unambiguous identification of samples
- Proper collection and preservation of samples
- Use of appropriate containers free from external and internal contamination
- Integrity preservation during shipment and timely delivery of samples that are age sensitive
- Adequate sized samples that allow for retest, if needed
- Specification of unique MOA/MDC requirements
- Alerting the lab about abnormal samples (high activity, different chemical contents, etc.)
- Chain of custody initiation, when required.

## **5.5 Customer Satisfaction**

TBE's quality policy centers on customer satisfaction (See 2.0). TBE will work to satisfy customers through full compliance with contract requirements, providing accurate data and properly responding to any questions or complaints. Customers are provided full cooperation in their monitoring of Laboratory performance. Customers are notified if any applicable State Accreditation is withdrawn, revoked, or suspended.

### **5.5.1 Customer Complaints**

Any customer complaints are documented and tracked to closure. Most complaints concern analysis data and are received by Program Managers. They log each such complaint, order retests for verification, and provide documented results to customers. Complaints may also be received by QA or Operations.

If complaints are other than re-test type, the nonconformance and corrective action systems (Sections 12 and 13) are used to resolve them and record all actions taken.

### **5.5.2 Customer Confidentiality**

All laboratory personnel maintain confidentiality of customer-unique information.

## **6.0 DOCUMENTATION GENERATION & CONTROL**

### **6.1 General**

The documentation generation and control system is detailed in Procedure 1008. An overview is given below. The basic quality system documents are described in Section 2.0.

### **6.2 New Documentation**

Each Procedure and this QAM is written by appropriate personnel, validated if applicable (see Section 7.0), reviewed for adequacy, completeness, and correctness, and, if acceptable, accepted by the authorized approver [QA Manager, Operations Manager (or their designee)]. Both approvals are required if a Procedure affects both QA and Operations. (See Responsibilities in Section 3.0). These procedures control the quality measurements and their accuracy.

Each document carries a unique identification number, a revision level, dates, page numbers and total page count, and approver identification and sign off. If TBE writes code for software, the software is version identified and issued after Verification and Validation per Section 7.0.

### **6.3 Documentation Changes**

Each change is reviewed in the same manner and by the same people as new documentation. Revision identifications are updated and changes indicated by side bars, italicized words, or by revision description when practical. Obsolete revisions are maintained by QA after being identified as obsolete.

### **6.4 Documentation Lists and Distributions**

Computer indexes of documents are maintained by Quality showing the current authorized revision level of each document. These revisions are placed on the Laboratory server and obsolete ones are removed so that all personnel have only the current documents. If hard copies are produced and distributed, separate distribution lists are maintained indicating who has them and their revision level(s). Copies downloaded off the server are uncontrolled unless verified by the user (on the computer) to be the latest revision.

### **6.5 Other Documentation**

In addition to TBE-generated documentation, QA maintains copies of applicable specifications, regulations, and standard methods.

### **6.6 Documentation Reviews**

Each issued document is reviewed at least every third year by the approving personnel. This review determines continued suitability for use and compliance with requirements.

## **7.0 DESIGN OF LABORATORY CONTROLS**

### **7.1 General**

The Laboratory and its operating procedures are designed specifically for low level (environmental and in-plant) radioactive sample analysis. The various aspects of the laboratory design include the following which are discussed in subsequent paragraphs of this Section:

- (a) Facility
- (b) Technical Processes and Methods
- (c) Verification of Design of Processes, Methods, and Software.
- (d) Design of Quality Controls
- (e) Counting Instrument Controls

### **7.2 Facility**

The facility was designed and built in 2000 to facilitate correct performance of operations in accordance with good laboratory practices and regulatory requirements. It provides security for operations and samples. It separates sample storage areas based on activity levels, separates wet chemistry from counting instrumentation for contamination control, and provides space and electronic systems for documentation, analysis, and record storage. Procedure 4014 describes the facility, room uses, layouts, etc.

### **7.3 Technical Processes and Methods**

#### **7.3.1 Operational Flow**

The laboratory design provides for sample receipt and storage (including special environmental provisions for perishable items) where samples are received from clients and other labs (see Section 9.0). The samples are logged into the computer based Laboratory Information Management System (LIMS) and receive unique identification numbers and bar code labels. (See Procedure 4017 for LIMS description and user procedures). The Program Managers then plan the work and assure LIMS contains any special instructions to analysts. Samples then go to sample preparation, wet chemistry (for chemical separation), and counting based on the radionuclides. See Procedures in the 2000 and 3000 series. Analysts perform the required tasks with data being entered into logbooks, LIMS, and counting equipment data systems as appropriate. Results are collected and reviewed by the Operations Manager and Program Managers and reports to clients are generated (See Section 14.0). All records (electronic or hard copy) are maintained in files or in back-up electronic copies (see Section 15.0). After the required hold periods and client notification and approval, samples are disposed of in compliance with regulatory requirements (see Procedures 5003 and 5004).

### **7.3.2 Methods**

The laboratory methods documented in the 2000 and 3000 series of Procedures were primarily developed by senior TBE laboratory personnel based on years of experience at our prior facility in New Jersey. They have been improved, supplemented and implemented here. Where EPA or other accepted national methods exist (primarily for water analyses under State certification programs - see Procedure 4010), the TBE methods conform to the imposed requirements or State accepted alternate requirements. Any method modifications are documented and described in the Procedure. There are no nationally recognized methods for most other analysis methods but references to other method documents are noted where applicable.

### **7.3.3 Data Reduction and Analysis**

Whenever possible automatic data capture and computerized data reduction programs are used. Calculations are either performed using commercial software (counting system operating systems) or TBE developed and validated software is used (see 7.4 below). Analysis of reduced data is performed as described in Section 14.0 and Procedure 4004.

## **7.4 Verification of Technical Processes, Methods, and Software**

### **7.4.1 Operational Flow Verification**

The entire QA Manual and related procedures describe the verification of elements of the technical process flow and the establishment of quality check points, reviews, and controls.

### **7.4.2 Method Verifications**

Methods are verified and validated per Procedure 4007 prior to use unless otherwise agreed to by the client. For most TBE methods initial validation occurred well in the past. New or significantly revised Methods receive initial validation by demonstration of their performance using known analytes (NIST traceable) in appropriate matrices. Sufficient samples are run to obtain statistical data that provides evidence of process capability and control, establishes detection levels (see procedure 4009), bias and precision data (see Procedure 4011). All method procedures and validation data are available to respective clients. Also see Section 7.5 below for the Demonstration of Capability program.

### **7.4.3 Data Reduction and Analysis Verification**

Data reduction and analysis verification is performed by personnel who did not generate the data. (See Section 14.0).

## **7.5 Design of Quality Controls**

### **7.5.1 General**

There are multiple quality controls designed into the laboratory operations. Many of these are described elsewhere in this manual and include personnel qualification (Section 4.0), Document control (6.0), Sample identification and control (9.0), Use of reference standards (10.0), intra- and inter- laboratory tests (10.0), etc. This Section describes the basic quality control systems used to verify Method capability and performance.

### **7.5.2 Demonstration of Capability (D of C)**

The demonstration of capability system verifies and documents that the method, analyst, and the equipment can perform within acceptable limits. The D of C is certified for each combination of analyte, method, and instrument type. D of C's are certified based on objective evidence at least annually. This program is combined with the analyst D of C program (See Section 4.0). Initial D of C's use the method validation effort as covered above. Subsequent D of C's use Inter-Laboratory samples (Procedure 4006) or, if necessary, laboratory generated samples using NIST traceable standards. If results are outside of control limits, re-demonstration is required after investigation and corrective action is accomplished (See Sections 12.0 and 13.0)

### **7.5.3 Process Control Checks**

Process control checks are designed to include Inter-Lab samples, Intra-lab QC check samples, and customer provided check samples. 10% of laboratory analysis samples are for process control purposes.

**7.5.3.1 Inter- Lab Samples.** Inter-lab samples are procured or obtained from sources providing analytes of interest in matrices similar to normal client samples. These samples may be used for Demonstration of Capability of analyst's, equipment and methods. They also provide for independent insight into the lab's process capabilities. Any value reported as being in the warning zone (over 2 sigma) is reviewed and improvements taken. Any value failing (over 3 sigma) is documented on an NCR and formal investigation per Section 12.0 and 13.0 is performed. If root causes are not clearly understood and fixed, re-tests are required using lab prepared samples (See Procedure 4006).

**7.5.3.2 QC Samples.** QC samples, along with Inter-lab samples and customer check samples, are 10% of the annual lab workload for the applicable analyte and method. If batch processing is used, some specifications require specific checks with each batch or each day rather than as continuous process controls. (See Procedure 4005)

QC samples consist of multiple types of samples including:

- (a) Method blanks
- (b) Blank spikes
- (c) Matrix spikes



- (d) Duplicates
- (e) Tracers and carriers

Acceptance limits for these samples are given in Procedures or in lab standards. The number, frequency, and use of these sample types varies with the method, matrix, and supplemental requirements. The patterns of use versus method and the use of the resulting test data is described in Procedure 4005.

**7.5.3.3 Customer Provided Check Samples.** Customers may provide blind check samples and duplicates to aid in their evaluation of the Laboratory. When the lab is notified that samples are check samples their results are included in the QC sample percentage counts. Any reported problems are treated as formal complaints and investigated per Section 5.

## **7.6 Counting Instrument Controls**

The calibration of instruments is their primary control and is described in Section 11.0. In addition, counting procedures (3000 series) also specify use of background checks (method blank data is not used for this) to evaluate possible counting equipment contamination. Instrument calibration checks using a lab standard from a different source than the one used for calibration are also used. Background data can be used to adjust client and test data. Checks with lab standards indicate potential calibration changes.

## **8.0 PURCHASING AND SUBCONTRACT CONTROLS**

### **8.1 General**

Procurement and Subcontracts efforts use the Huntsville-based Cost Point computer system to process orders. The Laboratory-generated Purchase Requisitions are electronically copied into Purchase Orders in Huntsville. The Laboratory also specifies sources to be used. Procured items and services are received at the Laboratory where receiving checks and inspections are made. Laboratory Procedure 1015 provides details on the procurement control system at the Laboratory and references the Huntsville procedures as applicable.

### **8.2 Source Selection**

Sources for procurements of items and services are evaluated and approved by QA as described in Procedure 1015. Nationally recognized catalog item sources are approved by the QA Manager based on reputation. Maintenance services by an approved distributor or the equipment manufacturing company are pre-approved. Sources for other services are evaluated by QA, based on service criticality to the quality system, by phone, mail out, or site visit.

Subcontract sources for laboratory analysis services are only placed with accredited laboratories (by NELAP, NUPIC, State, Client, etc.) as applicable for the type of analysis to be performed. QA maintains lists of approved vendors and records of evaluations performed.

### **8.3 Procurement of Supplies and Support Services**

#### **8.3.1 Catalog Supplies**

The Laboratory procures reagents, processing chemicals, laboratory “glassware,” consumables, and other catalog items from nationally known vendors and to applicable laboratory grades, purities, concentrations, accuracy levels, etc. Purchase Requisitions for these items specify catalog numbers or similar call-outs for these off-the-shelf items. Requisitions are generated by the personnel in the lab needing the item and are approved by the Operations or Production Manager. Reagents are analytical reagent grade only.

#### **8.3.2 Support Services**

Purchase Requisitions for support services (such as balance calibration, equipment maintenance, etc.) are processed as in 8.3.1 but technical requirements are specified and reviewed before approvals are given.

### **8.3.3 Equipment and Software**

Purchase Requisitions for new equipment, software programs, and major facility modifications affecting the quality system are reviewed and approved by the Operations Manager and the QA Manager.

### **8.4 Subcontracting of Analytical Services**

When necessary, the Laboratory may subcontract analytical services required by a client. This may be because of special needs, infrequency of analysis, etc. Applicable quality and regulatory requirements are imposed in the Purchase Requisition and undergo a technical review by QA. TBE reserves the right of access by TBE and our client for verification purposes.

### **8.5 Acceptance of Items or Services**

Items and services affecting the quality system are verified at receipt based on objective evidence supplied by the vendor. Supply items are reviewed by the requisitioner and, if acceptable, are accepted via annotation on the vendor packing list or similar document. Similarly, equipment services are accepted by the requisitioning lab person. Calibration services are accepted by QA based on certification reviews. (See Section 11.0.)

Data reports from analytical subcontractors are evaluated by Program Managers and subsequently by the Operations Manager (or designee) as part of client report reviews.

Items are not used until accepted and if items or services are rejected, QA is notified and nonconformance controls per Section 12.0 are followed. Vendors may be removed from the approved vendor's list if their performance is unacceptable.

## **9.0 TEST SAMPLE IDENTIFICATION AND CONTROL**

### **9.1 Sample Identification**

Incoming samples are inspected for customer identification, container condition, chain of custody forms, and radioactivity levels. If acceptable, the sample information is entered into LIMS which generates bar coded labels for attachment to the sample(s). The labels are attached and samples stored in the assigned location. If environmental controls are needed (refrigeration, freezing, etc.), the samples are placed in these storage locations. If not acceptable, the Program Manager is notified, the customer contacted, and the problem resolved (return of sample, added data receipts, etc.). See Procedure 4003 for more information on sample receipt.

### **9.2 LIMS**

The LIMS is used to schedule work, provide special information to analysts, and record all actions taken on samples. See Procedure 4017 and the 6000 series of procedures for more information on LIMS operations.

### **9.3 Sample Control**

The sample, with its bar coded label, is logged out to the applicable lab operation where the sample is processed per the applicable methods (Procedures 2000 and 3000). The LIMS-assigned numbers are used for identification through all operations to record data. Data is entered into LIMS, log books (kept by the analysts) or equipment data systems to record data. The combination of LIMS, logbooks, and equipment data systems provide the Chain of Custody data and document all actions taken on samples. Unused sample portions are returned to its storage area for possible verification use. Samples are discarded after required time limits are passed and after client notification and approval, if required.

## **10.0 SPECIAL PROCESSES, INSPECTION, AND TEST**

### **10.1 Special Processes**

The Laboratory's special processes are the methods used to analyze a sample and control equipment. These methods are defined in Procedures in the 2000 and 3000 series. These processes are performed to the qualified methods (see Section 7.0) by qualified people (see 4.0).

### **10.2 Inspections and Tests**

The quality of the process is monitored by indirect means. This program involves calibration checks on counting equipments (see Section 11.0), intra-laboratory checks, and inter-laboratory checks. In addition, some customers submit quality control check samples (blinds, duplicates, external reference standards). All generated data gets independent reviews.

#### **10.2.1 Intra Laboratory Checks (QC Checks)**

The quantity and types of checks varies with the method, but basic checks which may include blanks, spiked blanks, matrix spikes, matrix spike duplicates, and duplicates are used as appropriate for customer samples. This process is described in Procedure 4005 and in Section 7.0.

#### **10.2.2 Inter Laboratory Checks**

TBE participates in Inter-lab performance evaluation (check) programs with multiple higher level labs. These programs provide blind matrices for the types of matrix/analyte combinations routinely processed by the Lab, if available. This program is described in Procedure 4006.

#### **10.2.3 Data Reviews**

**Raw** data and reports are reviewed by the Operations Manager, or designees. This review checks for data logic, expected results, procedure compliance, etc. (See Section 14.0).

### **10.3 Control of Sampling of Samples**

Samples for analysis are supplied by customers preferably in quantities sufficient to allow re-verification analyses if needed. The samples are prepared for analysis by analysts and then an aliquot (partial sample extraction) is taken from the homogeneous customer sample for the initial analysis. Methods specify standard volumes of sample material required. Sampling data is recorded in LIMS and/or logbooks.

### **10.4 Reference Standards / Material**

#### **10.4.1 Weights and Temperatures**

Reference standards are used by the Laboratory's calibration vendor to calibrate the Labs working instruments measuring weights and thermometers.

#### **10.4.2 Radioactive Materials**

Reference radioactive standards, traceable to NIST, are procured from higher level laboratories. These reference materials are maintained in the standards area and are diluted down for use by laboratory analysts. All original and diluted volumes are fully traceable to source, procedure, analyst, dilution, and acquisition dates. See Section 11.0 and Procedure 1009.

## **11.0 EQUIPMENT MAINTENANCE AND CALIBRATION**

### **11.1 General**

There are two types of equipment used by the Laboratory: support equipment (scales, glassware, weights, thermometers, etc.) and instruments for counting. Standards traceable to NIST are used for calibration and are of the needed accuracy for laboratory operations. Procedures 1009, 4018, and 4019 describe the calibration and maintenance programs.

### **11.2 Support Equipment**

Analytical support equipment is purchased with the necessary accuracies and appropriate calibration data. If needed, initial calibration by the Laboratory or its calibration vendor is performed. Recalibration schedules are established and equipment recalibrated by the scheduled date by a calibration vendor or by Laboratory personnel. Maintenance is performed, as needed, per manufacturer's manuals or lab procedures.

In addition to calibrations and recalibrations, checks are made on the continued accuracy of items as described in Procedure 1009. Records are maintained of calibration and specified checks.

### **11.3 Instruments**

Instruments receive initial calibration using radioactive sources traceable to NIST. The initial calibration establishes statistical limits of variation that are used to set control limits for future checks and recalibration. This process is described in Procedure 4018. Instruments are maintained per Instrument Manual requirements. Recalibrations are performed per the Procedure.

Between calibrations, check sources are used to assure no significant changes have occurred in the calibration of items. Background checks are performed to check for possible radioactive contamination. Background values are used to adjust sample results. Hardware and software are safeguarded from adjustments that could invalidate calibrations or results.

### **11.4 Nonconformances and Corrective Actions**

If calibrations or checks indicate a problem, the nonconformance system (Section 12.0) and corrective action system (Section 13.0) are initiated to document the problem and its resolution. Equipment is promptly removed from service if questionable.

## 11.5 Records

Records of calibrations are maintained. Calibration certificates from calibration vendors are maintained by QA. Other calibration data and check data is maintained in log books, LIMS, or instrument software as appropriate and as described in Procedures 1009, 4018, and 4019.



## **12.0 NONCONFORMANCE CONTROLS**

### **12.1 General**

The nonconformance control system is implemented whenever a nonconforming condition on any aspect of Laboratory analysis, testing, or results exist. The system takes graded actions based on the nature and severity of the nonconformance. Nonconforming items or processes are controlled to prevent inadvertent use. Nonconformances are documented and dispositioned. Notification is made to affected organizations, including clients. Procedure 1010 describes the procedures followed. Sample results are only reported after resolution.

### **12.2 Responsibility and Authority**

Each Laboratory employee has the responsibility to report nonconformances and the authority to stop performing nonconforming work or using nonconforming equipment. Laboratory supervision can disposition and take corrective actions on minor problems. Any significant problem is documented by QA using the Laboratory's NCR system per Procedure 1010. QA conducts or assures the conduct of cause analyses, disposition of items or data, and initiation of corrective action if the nonconformance could recur.

### **12.3 10CFR21 Reporting**

The QA Manager reviews NCRs for possible need of customer and/or NRC notification per the requirements of 10CFR21. Procedure 1011 is followed in this review and for any required reporting.

## **13.0 CORRECTIVE AND PREVENTIVE ACTIONS**

### **13.1 General**

The Laboratory takes corrective actions on significant nonconformances (see Section 12.0). It also initiates preventive and improvement actions per the Company Quality Policy (see Section 2.0). The procedures for Corrective Action/Preventive Action systems are contained in Procedure 1012.

### **13.2 Corrective Actions**

Corrective actions are taken by Operations and Quality to promptly correct significant conditions adverse to quality. The condition is identified and cause analysis is performed to identify root causes. Solutions are evaluated and the optimum one selected that will prevent recurrence, can be implemented by the Laboratory, allows the Laboratory to meet its other goals, and is commensurate with the significance of the problem. All steps are documented, action plans developed for major efforts, and reports made to Management. QA verifies the implementation effectiveness. Procedure 1012 provides instructions and designates authorities and responsibilities.

### **13.3 Preventive Actions**

Preventive actions are improvements intended to reduce the potential for nonconformances. Possible preventive actions are developed from suggestions from employees and from analysis of Laboratory technical and quality systems by management. If preventive actions or improvements are selected for investigation, the issues, investigation, recommendations, and implementation actions are documented. Follow up verifies effectiveness.

## **14.0 RESULTS ANALYSIS AND REPORTING**

### **14.1 General**

The Laboratory's role is to provide measurement-based information to clients that is technically valid, legally defensible, and of known quality.

### **14.2 Results Review**

The results obtained from analytical efforts are collected and reviewed by the Operations Manager and the Program Manager. This review verifies the reasonableness and consistency of the results. It includes review of sample and the related QC activity data. Procedure 4002 describes the process. Any deficiencies are corrected by re-analyses, recalculations, or corrective actions per Sections 12.0 and 13.0. Use of the LIMS with its automatic data loading features (see Procedure 4017) minimizes the possibility of transcription or calculation errors.

### **14.3 Reports**

Reports range from simple results reporting to elaborate analytical reports based on the client requirements and imposed specifications and standards. (See Procedure 4004.) Reports present results accurately, clearly, unambiguously, objectively, and as required by the applicable Method(s). Reports include reproduction restrictions, information on any deviations from methods, and any needed data qualifiers based on QC data. If any data is supplied by analytical subcontractors (see Section 8.0), it is clearly identified and attributed to that Laboratory by either name or accreditation number.

If results are faxed or transmitted electronically, confidentiality statements are included in case of receipt by other than the intended client.

Reports are approved by the Program Manager and Operations Manager and record copies kept in file (See Section 15.0).

## **15.0 RECORDS**

### **15.1 General**

The Laboratory collects generated data and information related to quality or technical data and maintains them as records. Records are identified, prepared, reviewed, placed in storage, and maintained as set forth in Procedure 1003.

### **15.2 Type of Records**

All original observations, calculations, derived data, calibration data, and test reports are included. In addition QA data such as audits, management reviews, corrective and preventive actions, manuals, and procedures are included.

### **15.3 Storage and Retention**

Records are stored in files after completion in the lab. Files are in specified locations and under the control of custodians. Filing systems provide for retrieval. Electronic files are kept on Company servers (with regular back up) or on media stored in fireproof file cabinets. Records are kept in Laboratory files for at least 2 years after the last entry and then in Company files for another year as a minimum. Some customers specify larger periods – up to 7 years – which is also met. Generic records supporting multiple customers are kept for the longest applicable period.

### **15.4 Destruction or Disposal**

Records may be destroyed after the retention period and after client notification and acceptance, if required. If the Laboratory closes, records will go in to company storage in Huntsville unless otherwise directed by customers. If the Laboratory is sold, either the new owner will accept record ownership or the records will go into Company storage as stated above.

## **16.0 ASSESSMENTS**

### **16.1 General**

Assessments consist of internal audits and management reviews as set forth in Procedure 1013.

### **16.2 Audits**

Internal audits are planned, performed at least annually on all areas of the quality system, and are performed by qualified people who are as independent as possible from the activity audited. (The Laboratory's small size inhibits full independence in some technical areas.) Audits are coordinated by the Quality Manager who assures audit plans and checklists are generated and the results documented. Reports include descriptions of any findings and provide the auditor's assessment of the effectiveness of the audited activity. Report data includes personnel contacted.

Audit findings are reviewed with management and corrective actions agreed to and scheduled. Follow up is performed by QA to verify accomplishment and effectiveness of the corrective action.

### **16.3 Management Reviews**

The Annual Quality Assurance Report, prepared for some clients, is the Management Review vehicle. These reports cover audit results, corrective and preventive actions, external assessments, and QC and inter-laboratory performance checks. The report is reviewed with Management by the QA Manager for the continued suitability of the Quality Program and its effectiveness. Any needed improvements are defined, documented, and implemented. Follow ups are made to verify implementation and effectiveness.

APPENDIX D

LABORATORY ANALYTICAL REPORTS



2508 Quality Lane  
Knoxville, TN 37931  
865-690-6819 (Phone)

**Work Order #: L28833 R2**

**Exelon**

**July 18, 2006**



Kathy Shaw  
Conestoga-Rovers & Associates  
45 Farmington Valley Road  
Plainville CT 06062

**Case Narrative - L28833  
EX001-3ESPZION-06**

07/18/2006 16:27

**Sample Receipt**

The following samples were received on June 2, 2006 in good condition, unless otherwise noted.

**Revision 1:**

Includes the rerun strontium results for L28833-19. The ID was also corrected.

**Revision 2:**

Includes the recount for Total Strontium of sample WS-ZION-LAKE-052606-MS-015 (L28833-19). This sample was recounted to meet the client required MDC of 2.0 pCi/L.

*Cross Reference Table*

| Client ID                    | Laboratory ID | Station ID(if applicable) |
|------------------------------|---------------|---------------------------|
| WG-ZION-MW-4U-052406-MB-002  | L28833-1      |                           |
| WG-ZION-MW-4L-052406-MB-004  | L28833-2      |                           |
| WG-ZION-MW-7L-052506-MS-007  | L28833-3      |                           |
| WG-ZION-MW-6L-052506-MS-009  | L28833-4      |                           |
| WG-ZION-MW-8U-052406-MS-003  | L28833-5      |                           |
| WG-ZION-MW-8L-052406-MS-001  | L28833-6      |                           |
| WG-ZION-MW-7U-052406-MS-005  | L28833-7      |                           |
| WG-ZN-MW-ZN-03U-052506-DS-01 | L28833-8      |                           |
| WG-ZN-MW-ZN-03U-052506-DS-02 | L28833-9      |                           |
| WG-ZN-MW-ZN-03L-052506-DS-03 | L28833-10     |                           |
| WG-ZN-MW-ZN-02U-052606-DS-04 | L28833-11     |                           |
| WG-ZN-MW-ZN-02L-052606-DS-06 | L28833-12     |                           |
| WG-ZN-MW-ZN-01U-052606-DS-05 | L28833-13     |                           |
| WG-ZN-MW-ZN-01L-052606-DS-07 | L28833-14     |                           |
| WG-ZN-MW-ZN-09-052606-DS-08  | L28833-15     |                           |
| WG-ZN-MW-ZN-09-052606-DS-09  | L28833-16     |                           |
| WG-ZION-MW-6U-052606-MS-011  | L28833-17     |                           |
| WG-ZION-MW-5L-052606-MS-013  | L28833-18     |                           |
| WS-ZION-LAKE-052606-MS-015   | L28833-19     |                           |
| WG-ZION-MW-5U-052606-MS-017  | L28833-20     |                           |

*Analytical Method Cross Reference Table*

| Radiological Parameter | TBE Knoxville Method | Reference Method |
|------------------------|----------------------|------------------|
| Gamma Spectrometry     | TBE-2007             | EPA 901.1        |
| H-3                    | TBE-2010             | EPA 906.0        |
| TOTAL SR               | TBE-2018             | EPA 905.0        |





**Case Narrative - L28833**  
**EX001-3ESPZION-06**

07/18/2006 16:27

**Gamma Spectroscopy**

**Quality Control**

Quality control samples were analyzed as WG4095, WG4096.

**Duplicate Sample**

Duplicates were analyzed for the following samples. All duplicate results were within acceptance limits, unless otherwise noted.

| <u>Client ID</u>             | <u>Laboratory ID</u> | <u>QC Sample #</u> |
|------------------------------|----------------------|--------------------|
| WG-DN-DSP-121-052606-JH-014  | L28821-1             | WG4095-3           |
| WG-ZN-MW-ZN-01U-052606-DS-05 | L28833-13            | WG4096-3           |

**H-3**

**Quality Control**

Quality control samples were analyzed as WG4107.

**Method Blank**

All blanks were within acceptance limits, unless otherwise noted.

**Laboratory Control Sample**

All laboratory control samples were within acceptance limits, unless otherwise noted.

**Duplicate Sample**

Duplicates were analyzed for the following samples. All duplicate results were within acceptance limits, unless otherwise noted.

| <u>Client ID</u>            | <u>Laboratory ID</u> | <u>QC Sample #</u> |
|-----------------------------|----------------------|--------------------|
| WG-ZION-MW-4U-052406-MB-002 | L28833-1             | WG4107-3           |



**Case Narrative - L28833  
EX001-3ESPZION-06**

07/18/2006 16:27

**TOTAL SR**

**Quality Control**

Quality control samples were analyzed as WG4121.

**Method Blank**

All blanks were within acceptance limits, unless otherwise noted.

**Laboratory Control Sample**

All laboratory control samples were within acceptance limits, unless otherwise noted.

**Duplicate Sample**

Duplicates were analyzed for the following samples. All duplicate results were within acceptance limits, unless otherwise noted.

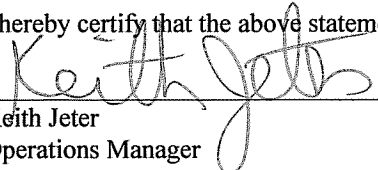
| <u>Client ID</u>            | <u>Laboratory ID</u> | <u>QC Sample #</u> |
|-----------------------------|----------------------|--------------------|
| WG-ZION-MW-4U-052406-MB-002 | L28833-1             | WG4121-3           |

**Certification**

This is to certify that Teledyne Brown Engineering - Environmental Services, located at 2508 Quality Lane, Knoxville, Tennessee, 37931, has analyzed, tested and documented samples as specified in the applicable purchase order.

This also certifies that requirements of applicable codes, standards and specifications have been fully met and that any quality assurance documentation which verified conformance to the purchase order is on file and may be examined upon request.

I hereby certify that the above statements are true and correct.

  
\_\_\_\_\_  
Keith Jeter  
Operations Manager

# Sample Receipt Summary

420000

**CONESTOGA-ROVERS & ASSOCIATES**

8615 W. Bryn Mawr Avenue  
 Chicago, Illinois 60631  
 (773)380-9933 phone  
 (773)380-6421 fax



SHIPPED TO  
 (Laboratory Name): Teledyne Brown

REFERENCE NUMBER:  
4513630

PROJECT NAME:  
Zion Generating Station

**CHAIN-OF-CUSTODY RECORD**

SAMPLER'S SIGNATURE: [Signature] PRINTED NAME: D. Souther

PARAMETERS:  
TtHum, Sr 82/90

**REMARKS**

| SEQ. No. | DATE    | TIME  | SAMPLE IDENTIFICATION No.    | SAMPLE MATRIX | No OF CONTAINERS | PARAMETERS | REMARKS |
|----------|---------|-------|------------------------------|---------------|------------------|------------|---------|
| 1        | 9/26/06 | 14:48 | W6-ZN-MW-ZN-09-052606-DS-08  | W             | 2                | X          |         |
| 2        | 9/26/06 | 15:10 | W6-ZN-MW-ZN-09-052606-DS-09  | W             | 2                | X          |         |
| 3        | 9/26/06 | 08:45 | W6-ZN-MW-ZN-09-052606-MS-011 | W             | 2                | X          |         |
|          |         |       |                              |               |                  |            |         |
|          |         |       |                              |               |                  |            |         |
|          |         |       |                              |               |                  |            |         |
|          |         |       |                              |               |                  |            |         |
|          |         |       |                              |               |                  |            |         |
|          |         |       |                              |               |                  |            |         |
|          |         |       |                              |               |                  |            |         |
|          |         |       |                              |               |                  |            |         |
|          |         |       |                              |               |                  |            |         |
|          |         |       |                              |               |                  |            |         |
|          |         |       |                              |               |                  |            |         |
|          |         |       |                              |               |                  |            |         |
|          |         |       |                              |               |                  |            |         |
|          |         |       |                              |               |                  |            |         |
|          |         |       |                              |               |                  |            |         |
|          |         |       |                              |               |                  |            |         |
|          |         |       |                              |               |                  |            |         |
|          |         |       |                              |               |                  |            |         |
|          |         |       |                              |               |                  |            |         |
|          |         |       |                              |               |                  |            |         |
|          |         |       |                              |               |                  |            |         |
|          |         |       |                              |               |                  |            |         |

**TOTAL NUMBER OF CONTAINERS**

6

| RELINQUISHED BY:     | DATE:   | TIME: | RECEIVED BY:  | DATE:   | TIME: |
|----------------------|---------|-------|---------------|---------|-------|
| ① <u>[Signature]</u> | 5/31/06 | 12:15 | <u>Ruboye</u> | 5-31-06 | 12:15 |
| ②                    |         |       |               |         |       |
| ③                    |         |       |               |         |       |
| ④                    |         |       |               |         |       |

**METHOD OF SHIPMENT:**

- White - Fully Executed Copy
- Yellow - Receiving Laboratory Copy
- Pink - Shipper Copy
- Goldentod - Sampler Copy

**SAMPLE TEAM:**

D. Souther  
M. Sivrek

**AIR BILL No.**

RECEIVED FOR LABORATORY BY:

[Signature]

12787

DATE: 6-2-06 TIME: 11:00 AM

L 5 0 0 0 0

**CONESTOGA-ROVERS & ASSOCIATES**  
 8615 W. Bryn Mawr Avenue  
 Chicago, Illinois 60631  
 (773)380-9933 phone  
 (773)380-6421 fax



SHIPPED TO  
 (Laboratory Name): *Telodyne Biosci*

REFERENCE NUMBER:  
 45136-30

PROJECT NAME:  
 Exelon Zion

CHAIN-OF-CUSTODY RECORD

SAMPLER'S SIGNATURE: *Marcia R Sivek* PRINTED NAME: Marcia R Sivek

PARAMETERS  
*Phthalates  
 PCBs  
 PAHs  
 etc*

REMARKS

| SEQ. No.                            | DATE  | TIME | SAMPLE IDENTIFICATION No.     | SAMPLE MATRIX | No. OF CONTAINERS |
|-------------------------------------|-------|------|-------------------------------|---------------|-------------------|
| 5/24/06                             | 13:15 |      | WIS-Zion-MW-5L-052606-MIS-013 | Water         | 1                 |
| 5/24/06                             | 11:00 |      | WIS-Zion-Lake-052606-MIS-015  | Water         | 2                 |
| 5/24/06                             | 16:20 |      | WIS-Zion-MW-5L-052606-MIS-017 | Water         | 2                 |
| TOTAL NUMBER OF CONTAINERS <u>6</u> |       |      |                               |               |                   |

|   |                              |                             |                              |
|---|------------------------------|-----------------------------|------------------------------|
| RELINQUISHED BY:<br>① <i>Marcia Sivek</i> | DATE: 5/31/06<br>TIME: 12:07 | RECEIVED BY: <i>Ruboyke</i> | DATE: 5/31/06<br>TIME: 12:07 |
| RELINQUISHED BY:<br>②                     | DATE: _____<br>TIME: _____   | RECEIVED BY:                | DATE: _____<br>TIME: _____   |
| RELINQUISHED BY:<br>③                     | DATE: _____<br>TIME: _____   | RECEIVED BY:                | DATE: _____<br>TIME: _____   |

**METHOD OF SHIPMENT:**  
 White - Fully Executed Copy  
 Yellow - Receiving Laboratory Copy  
 Pink - Shipper Copy  
 Goldenrod - Sampler Copy

**AIR BILL No.** 12789

**RECEIVED FOR LABORATORY BY:** *B. Wilkerson*  
 DATE: 6.2.06 TIME: 11:00 AM

**SAMPLE TEAM:**  
*M. Sivek*  
*D. Sauter*

L 2 0 0 0 0

**CONESTOGA-ROVERS & ASSOCIATES**

8615 W. Bryn Mawr Avenue  
Chicago, Illinois 60631  
(773)380-9933 phone  
(773)380-6421 fax



SHIPPED TO  
(Laboratory Name): **Teledyne Brown**

REFERENCE NUMBER:  
**45136-30**

PROJECT NAME:

**Zion Generating Station**

**CHAIN-OF-CUSTODY RECORD**

SAMPLER'S SIGNATURE: *Marcia Sivick* PRINTED NAME: **Marcia Sivick**

PARAMETERS: **THM, Sr, Pb**

REMARKS

| SEQ. No. | DATE    | TIME  | SAMPLE IDENTIFICATION No.    | SAMPLE MATRIX | No. OF CONTAINERS | REMARKS |
|----------|---------|-------|------------------------------|---------------|-------------------|---------|
| 1        | 5/25/06 | 10:58 | WG-ZN-MW-ZN-034-052506-DS-01 | W             | 2                 | X X X   |
| 2        | 5/25/06 | 11:15 | WG-ZN-MW-ZN-034-052506-DS-02 | W             | 2                 | X X X   |
| 3        | 5/25/06 | 14:22 | WG-ZN-MW-ZN-034-052506-DS-03 | W             | 2                 | X X X   |
|          |         |       |                              |               |                   |         |
|          |         |       |                              |               |                   |         |
|          |         |       |                              |               |                   |         |
|          |         |       |                              |               |                   |         |
|          |         |       |                              |               |                   |         |
|          |         |       |                              |               |                   |         |
|          |         |       |                              |               |                   |         |
|          |         |       |                              |               |                   |         |
|          |         |       |                              |               |                   |         |
|          |         |       |                              |               |                   |         |
|          |         |       |                              |               |                   |         |
|          |         |       |                              |               |                   |         |
|          |         |       |                              |               |                   |         |
|          |         |       |                              |               |                   |         |
|          |         |       |                              |               |                   |         |
|          |         |       |                              |               |                   |         |
|          |         |       |                              |               |                   |         |
|          |         |       |                              |               |                   |         |

**TOTAL NUMBER OF CONTAINERS**

|   |               |                            |               |
|---|---------------|----------------------------|---------------|
| RELINQUISHED BY: ① <i>Marcia Sivick</i> | DATE: 5/31/06 | RECEIVED BY: <i>subose</i> | DATE: 5-31-06 |
| RELINQUISHED BY: ②                      | TIME: 12:21   | RECEIVED BY: ②             | TIME: 12:21   |
| RELINQUISHED BY: ③                      | DATE:         | RECEIVED BY: ③             | DATE:         |
| RELINQUISHED BY: ④                      | TIME:         | RECEIVED BY: ④             | TIME:         |
|   |               |                            |               |

**METHOD OF SHIPMENT:**

- White - Fully Executed Copy
- Yellow - Receiving Laboratory Copy
- Pink - Shipper Copy
- Goldenrod - Sampler Copy

**SAMPLE TEAM:**

*M Sivick*  
*D Sauter*

**AIR BILL No.**

RECEIVED FOR LABORATORY BY: *B. Wilkerson*

12790

DATE: 6-2-06 TIME: 11:00 AM

L-28833

**CONESTOGA-ROVERS & ASSOCIATES**  
 8615 W. Bryn Mawr Avenue  
 Chicago, Illinois 60631  
 (773)380-9933 phone  
 (773)380-6421 fax



SHIPPED TO  
 (Laboratory Name): *Teledyne Brown*

REFERENCE NUMBER:  
 45736-30

PROJECT NAME:  
 Exelon - Zion

**CHAIN-OF-CUSTODY RECORD**

| SEQ. No.                            | DATE    | TIME  | SAMPLE IDENTIFICATION No.    | SAMPLE MATRIX | No. OF CONTAINERS | PARAMETERS | REMARKS |
|-------------------------------------|---------|-------|------------------------------|---------------|-------------------|------------|---------|
|                                     |         |       |                              |               |                   |            |         |
| 1                                   | 5/24/06 | 9:53  | WG-ZN-MW-ZN-02U-052606-05-04 | Water         | 2                 | ✓          |         |
| 2                                   | 5/24/06 | 12:30 | WG-ZN-MW-ZN-02L-052606-05-06 | Water         | 2                 | ✓          |         |
| 3                                   | 5/24/06 | 11:02 | WG-ZN-MW-ZN-01U-052606-05-05 | Water         | 2                 | ✓          |         |
| 4                                   | 5/24/06 | 13:40 | WG-ZN-MW-ZN-01L-052606-05-07 | Water         | 2                 | ✓          |         |
| TOTAL NUMBER OF CONTAINERS <b>8</b> |         |       |                              |               |                   |            |         |

|   |                              |                                  |                              |
|---|------------------------------|----------------------------------|------------------------------|
| RELINQUISHED BY:<br>① <i>Marcia Lavelle</i> | DATE: 5/24/06<br>TIME: 11:45 | RECEIVED BY:<br>② <i>Ruboyce</i> | DATE: 5-31-06<br>TIME: 11:45 |
| RELINQUISHED BY:<br>②                       | DATE: _____<br>TIME: _____   | RECEIVED BY:<br>③                | DATE: _____<br>TIME: _____   |
| RELINQUISHED BY:<br>③                       | DATE: _____<br>TIME: _____   | RECEIVED BY:<br>④                | DATE: _____<br>TIME: _____   |

**METHOD OF SHIPMENT:**

White - Fully Executed Copy  
 Yellow - Receiving Laboratory Copy  
 Pink - Shipper Copy  
 Goldenrod - Sampler Copy

**AIR BILL No.**

**SAMPLE TEAM:**  
*D. Soutter, M. Suck*

**RECEIVED FOR LABORATORY BY:**  
*B. Wilkerson*

DATE: *6-2-06* TIME: *11:00 AM*

12791

L 20000

**CONESTOGA-ROVERS & ASSOCIATES**  
 8615 W. Bryn Mawr Avenue  
 Chicago, Illinois 60631  
 (773)380-9933 phone  
 (773)380-6421 fax



SHIPPED TO  
 (Laboratory Name): **Teledyne Brown**

REFERENCE NUMBER:  
**45136-30**

PROJECT NAME:  
**Zion Generating Station**

**CHAIN-OF-CUSTODY RECORD**

SAMPLER'S SIGNATURE: *Marcia Sivik* PRINTED NAME: **Marcia Sivik**

PARAMETERS  
*Trichloroethylene  
 Spec. Analysis*

| SEQ. No.                            | DATE    | TIME  | SAMPLE IDENTIFICATION No.                        | SAMPLE MATRIX | No. OF CONTAINERS | REMARKS |
|-------------------------------------|---------|-------|--|---------------|-------------------|---------|
| 1                                   | 5/24/06 | 13:45 | <del>MB-002</del><br>W6-Zion-MW-4U-052406-MB-002 | VL            | 2                 | X X +   |
| 2                                   | 5/24/06 | 13:45 | W6-Zion-MW-4L-052406-MB-004                      | VL            | 2                 | X X     |
| TOTAL NUMBER OF CONTAINERS <b>4</b> |         |       |  |               |                   |         |

RELINQUISHED BY: *Marcia Sivik* DATE: **5/24/06** TIME: **11:55** RECEIVED BY: *Ruboye* DATE: **5-31-06** TIME: **11:55**

RELINQUISHED BY: \_\_\_\_\_ DATE: \_\_\_\_\_ TIME: \_\_\_\_\_ RECEIVED BY: \_\_\_\_\_ DATE: \_\_\_\_\_ TIME: \_\_\_\_\_

RELINQUISHED BY: \_\_\_\_\_ DATE: \_\_\_\_\_ TIME: \_\_\_\_\_ RECEIVED BY: \_\_\_\_\_ DATE: \_\_\_\_\_ TIME: \_\_\_\_\_

AIR BILL No.

**METHOD OF SHIPMENT:**  
 White - Fully Executed Copy  
 Yellow - Receiving Laboratory Copy  
 Pink - Shipper Copy  
 Goldenrod - Sampler Copy

**RECEIVED FOR LABORATORY BY:**  
*B. Wilherson* **12831**  
 DATE: **6-2-06** TIME: **11:00 AM**



L28833

**CONESTOGA-ROVERS & ASSOCIATES**  
 8615 W. Bryn Mawr Avenue  
 Chicago, Illinois 60631  
 (773)380-9933 phone  
 (773)380-6421 fax



SHIPPED TO  
 (Laboratory Name): **Teledyne Brown**

REFERENCE NUMBER:  
**45136-30**

PROJECT NAME:  
**Zion Generating Station**

**CHAIN-OF-CUSTODY RECORD**

SAMPLER'S SIGNATURE: *Marcia Sivek*  
 PRINTED NAME: **Marcia Sivek**

PARAMETERS:  
*Station Sp. Grav. & Temp. Parameters*

REMARKS

| SEQ. No.                             | DATE    | TIME  | SAMPLE IDENTIFICATION No.   | SAMPLE MATRIX | No. OF CONTAINERS |
|--------------------------------------|---------|-------|-----------------------------|---------------|-------------------|
| 1                                    | 5/25/06 | 9:15  | WG-ZION-MW-7L-052506-MS-007 | W             | 2                 |
| 2                                    | 5/25/06 | 11:23 | WG-ZION-MW-6L-052506-MS-009 | W             | 2                 |
| 3                                    | 5/24/06 | 11:35 | WG-ZION-MW-8U-052406-MS-003 | W             | 2                 |
| 4                                    | 5/24/06 | 10:14 | WG-ZION-MW-8L-052406-MS-001 | W             | 2                 |
| 5                                    | 5/24/06 | 14:35 | WG-ZION-MW-7U-052406-MS-005 | W             | 2                 |
| TOTAL NUMBER OF CONTAINERS <b>10</b> |         |       |                             |               |                   |

|   |                               |               |               |
|---|-------------------------------|---------------|---------------|
| RELINQUISHED BY:<br><b>Marcia Sivek</b> | RECEIVED BY:<br><b>Embaye</b> | DATE: 5/31/06 | DATE: 5/31/06 |
|   |                               | TIME: 12:05   | TIME: 12:05   |
| RELINQUISHED BY:<br><b>3</b>            | RECEIVED BY:<br><b>3</b>      | DATE:         | DATE:         |
|   |                               | TIME:         | TIME:         |
| RELINQUISHED BY:<br><b>4</b>            | RECEIVED BY:<br><b>4</b>      | DATE:         | DATE:         |
|   |                               | TIME:         | TIME:         |

**METHOD OF SHIPMENT:**

- White - Fully Executed Copy
- Yellow - Receiving Laboratory Copy
- Pink - Shipper Copy
- Goldenrod - Sampler Copy

**AIR BILL No.**

**SAMPLE TEAM:**  
 Marcia Sivek  
 Doug Souther

**RECEIVED FOR LABORATORY BY:**  
 B. Withers

DATE: 6-2-06 TIME: 11:00 AM

12833

**Teledyne Brown Engineering**  
**Sample Receipt Verification/Variance Report**

06/05/06 13:15

SR #: SR08705

Client: Exelon

Project #: EX001-3ESPZION-06

LIMS #: L28833

Initiated By: BWILKERSON  
 Init Date: 06/05/06      Receive Date: 06/05/06

**Notification of Variance**

Person Notified: \_\_\_\_\_      Contacted By: \_\_\_\_\_  
 Notify Date: \_\_\_\_\_  
 Notify Method: \_\_\_\_\_  
 Notify Comment: \_\_\_\_\_

**Client Response**

Person Responding: \_\_\_\_\_  
 Response Date: \_\_\_\_\_  
 Response Method: \_\_\_\_\_  
 Response Comment \_\_\_\_\_

| Criteria   | Yes | No | NA | Comment          |
|--|-----|----|----|------------------|
| 1 Shipping container custody seals present and intact.             |     |    | NA |                  |
| 2 Sample container custody seals present and intact.               |     |    | NA |                  |
| 3 Sample containers received in good condition                     | Y   |    |    |                  |
| 4 Chain of custody received with samples                           | Y   |    |    |                  |
| 5 All samples listed on chain of custody received                  | Y   |    |    |                  |
| 6 Sample container labels present and legible.                     | Y   |    |    |                  |
| 7 Information on container labels correspond with chain of custody | Y   |    |    |                  |
| 8 Sample(s) properly preserved and in appropriate container(s)     | Y   |    |    | Ph at or below 2 |
| 9 Other (Describe)   |     |    | NA |                  |

# Internal Chain of Custody

\*\*\*\*\*

Sample # L28833-1    Containernum 1

Prod    Analyst  
GELI    EJ  
H-3    SO  
SR-90 (FAST)    LCB

|                  |               |                  |             |                  |
|------------------|---------------|------------------|-------------|------------------|
| Relinquish Date  | Relinquish By |                  | Received By |                  |
| 06/02/2006 00:00 |               |                  | 099999      | Sample Custodian |
| 06/08/2006 13:55 | 099999        | Sample Custodian | 029709      | Susan Ogletree   |
| 06/08/2006 13:59 | 029709        | Susan Ogletree   | 099999      | Sample Custodian |

\*\*\*\*\*

Sample # L28833-1    Containernum 2

Prod    Analyst  
GELI    EJ  
H-3    SO  
SR-90 (FAST)    LCB

|                  |               |  |             |                  |
|------------------|---------------|--|-------------|------------------|
| Relinquish Date  | Relinquish By |  | Received By |                  |
| 06/02/2006 00:00 |               |  | 099999      | Sample Custodian |

\*\*\*\*\*

Sample # L28833-2    Containernum 1

Prod    Analyst  
GELI    EJ  
H-3    SO  
SR-90 (FAST)    LCB

|                  |               |                  |             |                  |
|------------------|---------------|------------------|-------------|------------------|
| Relinquish Date  | Relinquish By |                  | Received By |                  |
| 06/02/2006 00:00 |               |                  | 099999      | Sample Custodian |
| 06/08/2006 13:55 | 099999        | Sample Custodian | 029709      | Susan Ogletree   |
| 06/08/2006 13:59 | 029709        | Susan Ogletree   | 099999      | Sample Custodian |

\*\*\*\*\*

Sample # L28833-2    Containernum 2

Prod    Analyst  
GELI    EJ  
H-3    SO  
SR-90 (FAST)    LCB

|                  |               |  |             |                  |
|------------------|---------------|--|-------------|------------------|
| Relinquish Date  | Relinquish By |  | Received By |                  |
| 06/02/2006 00:00 |               |  | 099999      | Sample Custodian |

\*\*\*\*\*

Sample # L28833-3    Containernum 1

Prod    Analyst  
GELI    EJ  
H-3    SO  
SR-90 (FAST)    LCB

|                  |               |                  |             |                  |
|------------------|---------------|------------------|-------------|------------------|
| Relinquish Date  | Relinquish By |                  | Received By |                  |
| 06/02/2006 00:00 |               |                  | 099999      | Sample Custodian |
| 06/08/2006 13:55 | 099999        | Sample Custodian | 029709      | Susan Ogletree   |
| 06/08/2006 13:59 | 029709        | Susan Ogletree   | 099999      | Sample Custodian |

\*\*\*\*\*

Sample # L28833-3    Containernum 2

```

*****
Sample # L28833-3          Containernum  2

Prod          Analyst
GELI          EJ
H-3          SO
SR-90 (FAST) LCB

Relinquish Date Relinquish By          Received By
06/02/2006 00:00          099999          Sample Custodian
    
```

```

*****
Sample # L28833-4          Containernum  1

Prod          Analyst
GELI          EJ
H-3          SO
SR-90 (FAST) LCB

Relinquish Date Relinquish By          Received By
06/02/2006 00:00          099999          Sample Custodian
06/08/2006 13:55          099999          Sample Custodian          029709          Susan Ogletree
06/08/2006 13:59          029709          Susan Ogletree          099999          Sample Custodian
    
```

```

*****
Sample # L28833-4          Containernum  2

Prod          Analyst
GELI          EJ
H-3          SO
SR-90 (FAST) LCB

Relinquish Date Relinquish By          Received By
06/02/2006 00:00          099999          Sample Custodian
    
```

```

*****
Sample # L28833-5          Containernum  1

Prod          Analyst
GELI          EJ
H-3          SO
SR-90 (FAST) LCB

Relinquish Date Relinquish By          Received By
06/02/2006 00:00          099999          Sample Custodian
06/08/2006 13:55          099999          Sample Custodian          029709          Susan Ogletree
06/08/2006 13:59          029709          Susan Ogletree          099999          Sample Custodian
    
```

```

*****
Sample # L28833-5          Containernum  2

Prod          Analyst
GELI          EJ
H-3          SO
SR-90 (FAST) LCB

Relinquish Date Relinquish By          Received By
06/02/2006 00:00          099999          Sample Custodian
    
```

```

*****
Sample # L28833-6          Containernum  1

Prod          Analyst
GELI          EJ
    
```

\*\*\*\*\*  
Sample # L28833-6 Containernum 1

H-3 SO  
SR-90 (FAST) LCB

| Relinquish Date  | Relinquish By           | Received By             |
|------------------|-------------------------|-------------------------|
| 06/02/2006 00:00 |                         | 099999 Sample Custodian |
| 06/08/2006 13:55 | 099999 Sample Custodian | 029709 Susan Ogletree   |
| 06/08/2006 13:59 | 029709 Susan Ogletree   | 099999 Sample Custodian |

\*\*\*\*\*  
Sample # L28833-6 Containernum 2

Prod Analyst  
GELI EJ  
H-3 SO  
SR-90 (FAST) LCB

| Relinquish Date  | Relinquish By | Received By             |
|------------------|---------------|-------------------------|
| 06/02/2006 00:00 |               | 099999 Sample Custodian |

\*\*\*\*\*  
Sample # L28833-7 Containernum 1

Prod Analyst  
GELI EJ  
H-3 SO  
SR-90 (FAST) LCB

| Relinquish Date  | Relinquish By           | Received By             |
|------------------|-------------------------|-------------------------|
| 06/02/2006 00:00 |                         | 099999 Sample Custodian |
| 06/08/2006 13:55 | 099999 Sample Custodian | 029709 Susan Ogletree   |
| 06/08/2006 13:59 | 029709 Susan Ogletree   | 099999 Sample Custodian |

\*\*\*\*\*  
Sample # L28833-7 Containernum 2

Prod Analyst  
GELI EJ  
H-3 SO  
SR-90 (FAST) LCB

| Relinquish Date  | Relinquish By | Received By             |
|------------------|---------------|-------------------------|
| 06/02/2006 00:00 |               | 099999 Sample Custodian |

\*\*\*\*\*  
Sample # L28833-8 Containernum 1

Prod Analyst  
GELI EJ  
H-3 SO  
SR-90 (FAST) LCB

| Relinquish Date  | Relinquish By           | Received By             |
|------------------|-------------------------|-------------------------|
| 06/02/2006 00:00 |                         | 099999 Sample Custodian |
| 06/08/2006 13:55 | 099999 Sample Custodian | 029709 Susan Ogletree   |
| 06/08/2006 13:59 | 029709 Susan Ogletree   | 099999 Sample Custodian |

\*\*\*\*\*  
Sample # L28833-8 Containernum 2

Prod Analyst

\*\*\*\*\*

Sample # L28833-8 Containernum 2

GELI EJ  
H-3 SO  
SR-90 (FAST) LCB

Relinquish Date Relinquish By Received By  
06/02/2006 00:00 099999 Sample Custodian

\*\*\*\*\*

Sample # L28833-9 Containernum 1

Prod Analyst  
GELI EJ  
H-3 SO  
SR-90 (FAST) LCB

Relinquish Date Relinquish By Received By  
06/02/2006 00:00 099999 Sample Custodian  
06/08/2006 13:55 099999 Sample Custodian 029709 Susan Ogletree  
06/08/2006 13:59 029709 Susan Ogletree 099999 Sample Custodian

\*\*\*\*\*

Sample # L28833-9 Containernum 2

Prod Analyst  
GELI EJ  
H-3 SO  
SR-90 (FAST) LCB

Relinquish Date Relinquish By Received By  
06/02/2006 00:00 099999 Sample Custodian

\*\*\*\*\*

Sample # L28833-10 Containernum 1

Prod Analyst  
GELI EJ  
H-3 SO  
SR-90 (FAST) LCB

Relinquish Date Relinquish By Received By  
06/02/2006 00:00 099999 Sample Custodian  
06/08/2006 13:55 099999 Sample Custodian 029709 Susan Ogletree  
06/08/2006 13:59 029709 Susan Ogletree 099999 Sample Custodian

\*\*\*\*\*

Sample # L28833-10 Containernum 2

Prod Analyst  
GELI EJ  
H-3 SO  
SR-90 (FAST) LCB

Relinquish Date Relinquish By Received By  
06/02/2006 00:00 099999 Sample Custodian

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Sample # L28833-11 Containernum 1

Prod Analyst  
GELI EJ





\*\*\*\*\*  
Sample # L28833-13   Containernum 2

GELI   EJ  
H-3   SO  
SR-90 (FAST)                               LCB

Relinquish Date Relinquish By   Received By  
06/02/2006 00:00   099999                   Sample Custodian

\*\*\*\*\*  
Sample # L28833-14   Containernum 1

Prod   Analyst  
GELI   EJ  
H-3   SO  
SR-90 (FAST)                               LCB

Relinquish Date Relinquish By   Received By  
06/02/2006 00:00   099999                   Sample Custodian  
06/08/2006 13:55           099999                   Sample Custodian                   029709                   Susan Ogletree  
06/08/2006 13:59           029709                   Susan Ogletree                   099999                   Sample Custodian

\*\*\*\*\*  
Sample # L28833-14   Containernum 2

Prod   Analyst  
GELI   EJ  
H-3   SO  
SR-90 (FAST)                               LCB

Relinquish Date Relinquish By   Received By  
06/02/2006 00:00   099999                   Sample Custodian

\*\*\*\*\*  
Sample # L28833-15   Containernum 1

Prod   Analyst  
GELI   EJ  
H-3   SO  
SR-90 (FAST)                               LCB

Relinquish Date Relinquish By   Received By  
06/02/2006 00:00   099999                   Sample Custodian  
06/08/2006 13:55           099999                   Sample Custodian                   029709                   Susan Ogletree  
06/08/2006 13:59           029709                   Susan Ogletree                   099999                   Sample Custodian

\*\*\*\*\*  
Sample # L28833-15   Containernum 2

Prod   Analyst  
GELI   EJ  
H-3   SO  
SR-90 (FAST)                               LCB

Relinquish Date Relinquish By   Received By  
06/02/2006 00:00   099999                   Sample Custodian

\*\*\*\*\*  
Sample # L28833-16   Containernum 1

Prod   Analyst  
GELI   EJ

\*\*\*\*\*
Sample # L28833-16 Containernum 1

H-3 SO
SR-90 (FAST) LCB

Relinquish Date Relinquish By Received By
06/02/2006 00:00 099999 Sample Custodian
06/08/2006 13:55 099999 Sample Custodian 029709 Susan Ogletree
06/08/2006 13:59 029709 Susan Ogletree 099999 Sample Custodian

\*\*\*\*\*
Sample # L28833-16 Containernum 2

Prod Analyst
GELI EJ
H-3 SO
SR-90 (FAST) LCB

Relinquish Date Relinquish By Received By
06/02/2006 00:00 099999 Sample Custodian

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Sample # L28833-17 Containernum 1

Prod Analyst
GELI EJ
H-3 SO
SR-90 (FAST) LCB

Relinquish Date Relinquish By Received By
06/02/2006 00:00 099999 Sample Custodian
06/08/2006 13:55 099999 Sample Custodian 029709 Susan Ogletree
06/08/2006 13:59 029709 Susan Ogletree 099999 Sample Custodian

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Sample # L28833-17 Containernum 2

Prod Analyst
GELI EJ
H-3 SO
SR-90 (FAST) LCB

Relinquish Date Relinquish By Received By
06/02/2006 00:00 099999 Sample Custodian

\*\*\*\*\*
Sample # L28833-18 Containernum 1

Prod Analyst
GELI EJ
H-3 SO
SR-90 (FAST) LCB

Relinquish Date Relinquish By Received By
06/02/2006 00:00 099999 Sample Custodian
06/08/2006 13:55 099999 Sample Custodian 029709 Susan Ogletree
06/08/2006 13:59 029709 Susan Ogletree 099999 Sample Custodian

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Sample # L28833-18 Containernum 2

Prod Analyst

Internal Chain of Custody

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 Sample # L28833-18                      Containernum    2

GELI                                      EJ  
 H-3                                        SO  
 SR-90 (FAST)                            LCB

|                  |               |             |                  |
|------------------|---------------|-------------|------------------|
| Relinquish Date  | Relinquish By | Received By | Sample Custodian |
| 06/02/2006 00:00 |               | 099999      | Sample Custodian |

\*\*\*\*\*  
 Sample # L28833-19                      Containernum    1

Prod                                      Analyst  
 GELI                                      EJ  
 H-3                                        SO  
 SR-90 (FAST)                            LCB

|                  |               |                  |                              |
|------------------|---------------|------------------|------------------------------|
| Relinquish Date  | Relinquish By | Received By      | Sample Custodian             |
| 06/02/2006 00:00 |               | 099999           | Sample Custodian             |
| 06/08/2006 13:55 | 099999        | Sample Custodian | 029709      Susan Ogletree   |
| 06/08/2006 13:59 | 029709        | Susan Ogletree   | 099999      Sample Custodian |

\*\*\*\*\*  
 Sample # L28833-19                      Containernum    2

Prod                                      Analyst  
 GELI                                      EJ  
 H-3                                        SO  
 SR-90 (FAST)                            LCB

|                  |               |             |                  |
|------------------|---------------|-------------|------------------|
| Relinquish Date  | Relinquish By | Received By | Sample Custodian |
| 06/02/2006 00:00 |               | 099999      | Sample Custodian |

\*\*\*\*\*  
 Sample # L28833-20                      Containernum    1

Prod                                      Analyst  
 GELI                                      EJ  
 H-3                                        SO  
 SR-90 (FAST)                            LCB

|                  |               |                  |                              |
|------------------|---------------|------------------|------------------------------|
| Relinquish Date  | Relinquish By | Received By      | Sample Custodian             |
| 06/02/2006 00:00 |               | 099999           | Sample Custodian             |
| 06/08/2006 13:55 | 099999        | Sample Custodian | 029709      Susan Ogletree   |
| 06/08/2006 13:59 | 029709        | Susan Ogletree   | 099999      Sample Custodian |

\*\*\*\*\*  
 Sample # L28833-20                      Containernum    2

Prod                                      Analyst  
 GELI                                      EJ  
 H-3                                        SO  
 SR-90 (FAST)                            LCB

|                  |               |             |                  |
|------------------|---------------|-------------|------------------|
| Relinquish Date  | Relinquish By | Received By | Sample Custodian |
| 06/02/2006 00:00 |               | 099999      | Sample Custodian |

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**L28833-1**      **WG**      **WG-ZION-MW-4U-052406-MB-002**

| <u>Process step</u> | <u>Prod</u>  | <u>Analyst</u> | <u>Date</u> |
|---------------------|--------------|----------------|-------------|
| Login               |              | BWILKERSON     | 06/02/06    |
| Aliquot             | GELI         | EJ             | 06/08/06    |
| Aliquot             | H-3          | SO             | 06/08/06    |
| Aliquot             | SR-90 (FAST) | LCB            | 06/09/06    |
| Count Room          | GELI         | MVW            | 06/08/06    |
| Count Room          | H-3          | KPW            | 06/08/06    |
| Count Room          | SR-90 (FAST) | KPW            | 06/10/06    |

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**L28833-2**      **WG**      **WG-ZION-MW-4L-052406-MB-004**

| <u>Process step</u> | <u>Prod</u>  | <u>Analyst</u> | <u>Date</u> |
|---------------------|--------------|----------------|-------------|
| Login               |              | BWILKERSON     | 06/02/06    |
| Aliquot             | GELI         | EJ             | 06/08/06    |
| Aliquot             | H-3          | SO             | 06/08/06    |
| Aliquot             | SR-90 (FAST) | LCB            | 06/09/06    |
| Count Room          | GELI         | MVW            | 06/08/06    |
| Count Room          | H-3          | KPW            | 06/09/06    |
| Count Room          | SR-90 (FAST) | KPW            | 06/10/06    |

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**L28833-3**      **WG**      **WG-ZION-MW-7L-052506-MS-007**

| <u>Process step</u> | <u>Prod</u>  | <u>Analyst</u> | <u>Date</u> |
|---------------------|--------------|----------------|-------------|
| Login               |              | BWILKERSON     | 06/02/06    |
| Aliquot             | GELI         | EJ             | 06/08/06    |
| Aliquot             | H-3          | SO             | 06/08/06    |
| Aliquot             | SR-90 (FAST) | LCB            | 06/09/06    |
| Count Room          | GELI         | MVW            | 06/09/06    |
| Count Room          | H-3          | KPW            | 06/09/06    |
| Count Room          | SR-90 (FAST) | KPW            | 06/10/06    |

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**L28833-4**      **WG**      **WG-ZION-MW-6L-052506-MS-009**

| <u>Process step</u> | <u>Prod</u>  | <u>Analyst</u> | <u>Date</u> |
|---------------------|--------------|----------------|-------------|
| Login               |              | BWILKERSON     | 06/02/06    |
| Aliquot             | GELI         | EJ             | 06/08/06    |
| Aliquot             | H-3          | SO             | 06/08/06    |
| Aliquot             | SR-90 (FAST) | LCB            | 06/09/06    |
| Count Room          | GELI         | MVW            | 06/09/06    |
| Count Room          | H-3          | KPW            | 06/09/06    |
| Count Room          | SR-90 (FAST) | KPW            | 06/10/06    |

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**L28833-5**      **WG**      **WG-ZION-MW-8U-052406-MS-003**

| <u>Process step</u> | <u>Prod</u>  | <u>Analyst</u> | <u>Date</u> |
|---------------------|--------------|----------------|-------------|
| Login               |              | BWILKERSON     | 06/02/06    |
| Aliquot             | GELI         | EJ             | 06/08/06    |
| Aliquot             | H-3          | SO             | 06/08/06    |
| Aliquot             | SR-90 (FAST) | LCB            | 06/09/06    |
| Count Room          | GELI         | MVW            | 06/09/06    |

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|                     |              |                                     |                |             |
|---------------------|--------------|-------------------------------------|----------------|-------------|
| <b>L28833-5</b>     | <b>WG</b>    | <b>WG-ZION-MW-8U-052406-MS-003</b>  |                |             |
| Count Room          | H-3          |                                     | KPW            | 06/09/06    |
| Count Room          | SR-90 (FAST) |                                     | KPW            | 06/10/06    |
| *****               |              |                                     |                |             |
| <b>L28833-6</b>     | <b>WG</b>    | <b>WG-ZION-MW-8L-052406-MS-001</b>  |                |             |
| <u>Process step</u> | <u>Prod</u>  |                                     | <u>Analyst</u> | <u>Date</u> |
| Login               |              |                                     | BWILKERSON     | 06/02/06    |
| Aliquot             | GELI         |                                     | EJ             | 06/08/06    |
| Aliquot             | H-3          |                                     | SO             | 06/08/06    |
| Aliquot             | SR-90 (FAST) |                                     | LCB            | 06/09/06    |
| Count Room          | GELI         |                                     | MVW            | 06/09/06    |
| Count Room          | H-3          |                                     | KPW            | 06/09/06    |
| Count Room          | SR-90 (FAST) |                                     | KPW            | 06/10/06    |
| *****               |              |                                     |                |             |
| <b>L28833-7</b>     | <b>WG</b>    | <b>WG-ZION-MW-7U-052406-MS-005</b>  |                |             |
| <u>Process step</u> | <u>Prod</u>  |                                     | <u>Analyst</u> | <u>Date</u> |
| Login               |              |                                     | BWILKERSON     | 06/02/06    |
| Aliquot             | GELI         |                                     | EJ             | 06/08/06    |
| Aliquot             | H-3          |                                     | SO             | 06/08/06    |
| Aliquot             | SR-90 (FAST) |                                     | LCB            | 06/09/06    |
| Count Room          | GELI         |                                     | MVW            | 06/09/06    |
| Count Room          | H-3          |                                     | KPW            | 06/09/06    |
| Count Room          | SR-90 (FAST) |                                     | KPW            | 06/10/06    |
| *****               |              |                                     |                |             |
| <b>L28833-8</b>     | <b>WG</b>    | <b>WG-ZN-MW-ZN-03U-052506-DS-01</b> |                |             |
| <u>Process step</u> | <u>Prod</u>  |                                     | <u>Analyst</u> | <u>Date</u> |
| Login               |              |                                     | BWILKERSON     | 06/02/06    |
| Aliquot             | GELI         |                                     | EJ             | 06/08/06    |
| Aliquot             | H-3          |                                     | SO             | 06/08/06    |
| Aliquot             | SR-90 (FAST) |                                     | LCB            | 06/09/06    |
| Count Room          | GELI         |                                     | MVW            | 06/09/06    |
| Count Room          | H-3          |                                     | KPW            | 06/09/06    |
| Count Room          | SR-90 (FAST) |                                     | KPW            | 06/10/06    |
| *****               |              |                                     |                |             |
| <b>L28833-9</b>     | <b>WG</b>    | <b>WG-ZN-MW-ZN-03U-052506-DS-02</b> |                |             |
| <u>Process step</u> | <u>Prod</u>  |                                     | <u>Analyst</u> | <u>Date</u> |
| Login               |              |                                     | BWILKERSON     | 06/02/06    |
| Aliquot             | GELI         |                                     | EJ             | 06/08/06    |
| Aliquot             | H-3          |                                     | SO             | 06/08/06    |
| Aliquot             | SR-90 (FAST) |                                     | LCB            | 06/09/06    |
| Count Room          | GELI         |                                     | MVW            | 06/09/06    |
| Count Room          | H-3          |                                     | KPW            | 06/09/06    |
| Count Room          | SR-90 (FAST) |                                     | KPW            | 06/10/06    |
| *****               |              |                                     |                |             |
| <b>L28833-10</b>    | <b>WG</b>    | <b>WG-ZN-MW-ZN-03L-052506-DS-03</b> |                |             |
| <u>Process step</u> | <u>Prod</u>  |                                     | <u>Analyst</u> | <u>Date</u> |
| Login               |              |                                     | BWILKERSON     | 06/02/06    |

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|                  |              |                                     |     |          |
|------------------|--------------|-------------------------------------|-----|----------|
| <b>L28833-10</b> | <b>WG</b>    | <b>WG-ZN-MW-ZN-03L-052506-DS-03</b> |     |          |
| Aliquot          | GELI         |                                     | EJ  | 06/08/06 |
| Aliquot          | H-3          |                                     | SO  | 06/08/06 |
| Aliquot          | SR-90 (FAST) |                                     | LCB | 06/09/06 |
| Count Room       | GELI         |                                     | MVW | 06/09/06 |
| Count Room       | H-3          |                                     | KPW | 06/09/06 |
| Count Room       | SR-90 (FAST) |                                     | KPW | 06/10/06 |

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|                     |              |                                     |                |             |
|---------------------|--------------|-------------------------------------|----------------|-------------|
| <b>L28833-11</b>    | <b>WG</b>    | <b>WG-ZN-MW-ZN-02U-052606-DS-04</b> |                |             |
| <u>Process step</u> | <u>Prod</u>  |                                     | <u>Analyst</u> | <u>Date</u> |
| Login               |              |                                     | BWILKERSON     | 06/02/06    |
| Aliquot             | GELI         |                                     | EJ             | 06/08/06    |
| Aliquot             | H-3          |                                     | SO             | 06/08/06    |
| Aliquot             | SR-90 (FAST) |                                     | LCB            | 06/09/06    |
| Count Room          | GELI         |                                     | MVW            | 06/09/06    |
| Count Room          | H-3          |                                     | KPW            | 06/09/06    |
| Count Room          | SR-90 (FAST) |                                     | KPW            | 06/10/06    |

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|                     |              |                                     |                |             |
|---------------------|--------------|-------------------------------------|----------------|-------------|
| <b>L28833-12</b>    | <b>WG</b>    | <b>WG-ZN-MW-ZN-02L-052606-DS-06</b> |                |             |
| <u>Process step</u> | <u>Prod</u>  |                                     | <u>Analyst</u> | <u>Date</u> |
| Login               |              |                                     | BWILKERSON     | 06/02/06    |
| Aliquot             | GELI         |                                     | EJ             | 06/08/06    |
| Aliquot             | H-3          |                                     | SO             | 06/08/06    |
| Aliquot             | SR-90 (FAST) |                                     | LCB            | 06/09/06    |
| Count Room          | GELI         |                                     | MVW            | 06/09/06    |
| Count Room          | H-3          |                                     | KPW            | 06/09/06    |
| Count Room          | SR-90 (FAST) |                                     | KPW            | 06/10/06    |

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|                     |              |                                     |                |             |
|---------------------|--------------|-------------------------------------|----------------|-------------|
| <b>L28833-13</b>    | <b>WG</b>    | <b>WG-ZN-MW-ZN-01U-052606-DS-05</b> |                |             |
| <u>Process step</u> | <u>Prod</u>  |                                     | <u>Analyst</u> | <u>Date</u> |
| Login               |              |                                     | BWILKERSON     | 06/02/06    |
| Aliquot             | GELI         |                                     | EJ             | 06/08/06    |
| Aliquot             | H-3          |                                     | SO             | 06/08/06    |
| Aliquot             | SR-90 (FAST) |                                     | LCB            | 06/09/06    |
| Count Room          | GELI         |                                     | MVW            | 06/09/06    |
| Count Room          | H-3          |                                     | KPW            | 06/09/06    |
| Count Room          | SR-90 (FAST) |                                     | KPW            | 06/10/06    |

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|                     |              |                                     |                |             |
|---------------------|--------------|-------------------------------------|----------------|-------------|
| <b>L28833-14</b>    | <b>WG</b>    | <b>WG-ZN-MW-ZN-01L-052606-DS-07</b> |                |             |
| <u>Process step</u> | <u>Prod</u>  |                                     | <u>Analyst</u> | <u>Date</u> |
| Login               |              |                                     | RCHARLES       | 06/02/06    |
| Aliquot             | GELI         |                                     | EJ             | 06/08/06    |
| Aliquot             | H-3          |                                     | SO             | 06/08/06    |
| Aliquot             | SR-90 (FAST) |                                     | LCB            | 06/09/06    |
| Count Room          | GELI         |                                     | MVW            | 06/09/06    |
| Count Room          | H-3          |                                     | KPW            | 06/09/06    |
| Count Room          | SR-90 (FAST) |                                     | KPW            | 06/10/06    |

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| L28833-15           |              | WG | WG-ZN-MW-ZN-09-052606-DS-08 |             |
|---------------------|--------------|----|-----------------------------|-------------|
| <u>Process step</u> | <u>Prod</u>  |    | <u>Analyst</u>              | <u>Date</u> |
| Login               |              |    | BWILKERSON                  | 06/02/06    |
| Aliquot             | GELI         |    | EJ                          | 06/08/06    |
| Aliquot             | H-3          |    | SO                          | 06/08/06    |
| Aliquot             | SR-90 (FAST) |    | LCB                         | 06/09/06    |
| Count Room          | GELI         |    | MVW                         | 06/09/06    |
| Count Room          | H-3          |    | KPW                         | 06/09/06    |
| Count Room          | SR-90 (FAST) |    | KPW                         | 06/10/06    |

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| L28833-16           |              | WG | WG-ZN-MW-ZN-09-052606-DS-09 |             |
|---------------------|--------------|----|-----------------------------|-------------|
| <u>Process step</u> | <u>Prod</u>  |    | <u>Analyst</u>              | <u>Date</u> |
| Login               |              |    | BWILKERSON                  | 06/02/06    |
| Aliquot             | GELI         |    | EJ                          | 06/08/06    |
| Aliquot             | H-3          |    | SO                          | 06/08/06    |
| Aliquot             | SR-90 (FAST) |    | LCB                         | 06/09/06    |
| Count Room          | GELI         |    | MVW                         | 06/09/06    |
| Count Room          | H-3          |    | KPW                         | 06/09/06    |
| Count Room          | SR-90 (FAST) |    | KPW                         | 06/10/06    |

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| L28833-17           |              | WG | WG-ZION-MW-6U-052606-MS-011 |             |
|---------------------|--------------|----|-----------------------------|-------------|
| <u>Process step</u> | <u>Prod</u>  |    | <u>Analyst</u>              | <u>Date</u> |
| Login               |              |    | BWILKERSON                  | 06/02/06    |
| Aliquot             | GELI         |    | EJ                          | 06/08/06    |
| Aliquot             | H-3          |    | SO                          | 06/08/06    |
| Aliquot             | SR-90 (FAST) |    | LCB                         | 06/09/06    |
| Count Room          | GELI         |    | MVW                         | 06/09/06    |
| Count Room          | H-3          |    | KPW                         | 06/09/06    |
| Count Room          | SR-90 (FAST) |    | KPW                         | 06/10/06    |

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| L28833-18           |              | WG | WG-ZION-MW-5L-052606-MS-013 |             |
|---------------------|--------------|----|-----------------------------|-------------|
| <u>Process step</u> | <u>Prod</u>  |    | <u>Analyst</u>              | <u>Date</u> |
| Login               |              |    | BWILKERSON                  | 06/02/06    |
| Aliquot             | GELI         |    | EJ                          | 06/08/06    |
| Aliquot             | H-3          |    | SO                          | 06/08/06    |
| Aliquot             | SR-90 (FAST) |    | LCB                         | 06/09/06    |
| Count Room          | GELI         |    | MVW                         | 06/09/06    |
| Count Room          | H-3          |    | KPW                         | 06/09/06    |
| Count Room          | SR-90 (FAST) |    | KPW                         | 06/10/06    |

\*\*\*\*\*

| L28833-19           |              | WG | WS-ZION-LAKE-052606-MS-015 |             |
|---------------------|--------------|----|----------------------------|-------------|
| <u>Process step</u> | <u>Prod</u>  |    | <u>Analyst</u>             | <u>Date</u> |
| Login               |              |    | RCHARLES                   | 06/02/06    |
| Aliquot             | GELI         |    | EJ                         | 06/08/06    |
| Aliquot             | H-3          |    | SO                         | 06/08/06    |
| Aliquot             | SR-90 (FAST) |    | LCB                        | 06/09/06    |
| Count Room          | GELI         |    | MVW                        | 06/09/06    |

07/18/06

Teledyne Brown Engineering  
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Supplemental Sheet

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|                     |              |                                    |                |             |
|---------------------|--------------|------------------------------------|----------------|-------------|
| <b>L28833-19</b>    | <b>WG</b>    | <b>WS-ZION-LAKE-052606-MS-015</b>  |                |             |
| Count Room          | H-3          |                                    | KPW            | 06/09/06    |
| Count Room          | SR-90 (FAST) |                                    | KPW            | 06/10/06    |
| *****               |              |                                    |                |             |
| <b>L28833-19C1</b>  | <b>WG</b>    | <b>WS-ZION-LAKE-052606-MS-015</b>  |                |             |
| <u>Process step</u> | <u>Prod</u>  |                                    | <u>Analyst</u> | <u>Date</u> |
| Login               |              |                                    | RCHARLES       | 06/02/06    |
| Aliquot             | SR-90 (FAST) |                                    | LCB            | 06/09/06    |
| Count Room          | SR-90 (FAST) |                                    | KOJ            | 06/21/06    |
| *****               |              |                                    |                |             |
| <b>L28833-20</b>    | <b>WG</b>    | <b>WG-ZION-MW-5U-052606-MS-017</b> |                |             |
| <u>Process step</u> | <u>Prod</u>  |                                    | <u>Analyst</u> | <u>Date</u> |
| Login               |              |                                    | BWILKERSON     | 06/02/06    |
| Aliquot             | GELI         |                                    | EJ             | 06/08/06    |
| Aliquot             | H-3          |                                    | SO             | 06/08/06    |
| Aliquot             | SR-90 (FAST) |                                    | LCB            | 06/09/06    |
| Count Room          | GELI         |                                    | MVW            | 06/09/06    |
| Count Room          | H-3          |                                    | KPW            | 06/09/06    |
| Count Room          | SR-90 (FAST) |                                    | KPW            | 06/10/06    |



# Analytical Results Summary

**Report of Analysis**  
 07/18/06 11:52

**L28833**

Conestoga-Rovers & Associates

EX001-3ESPZION-06

Kathy Shaw

Sample ID: **WG-ZION-MW-4U-052406-MB-002** Matrix: Ground Water (WG)  
 Station: Collect Start: 05/24/2006 00:00  
 Description: Collect Stop: Volume:  
 LIMS Number: L28833-1 Receive Date: 06/02/2006 % Moisture:

| Radionuclide | SOP# | Activity Conc | Uncertainty 2 Sigma | MDC             | Units | Run # | Aliquot Volume | Aliquot Units | Reference Date | Count Date | Count Time | Count Units | Flag Values |
|--------------|------|---------------|---------------------|-----------------|-------|-------|----------------|---------------|----------------|------------|------------|-------------|-------------|
| H-3          | 2010 | -3.91E+01     | 1.04E+02            | <b>1.76E+02</b> | pCi/L |       | 10             | ml            |                | 06/08/06   | 60         | M           | U           |
| TOTAL SR     | 2018 | 5.15E-01      | 7.41E-01            | <b>1.39E+00</b> | pCi/L |       | 450            | ml            | 05/24/06 00:00 | 06/10/06   | 150        | M           | U           |
| MN-54        | 2007 | 1.15E+00      | 2.23E+00            | <b>3.76E+00</b> | pCi/L |       | 3239.8         | ml            | 05/24/06 00:00 | 06/08/06   | 34625      | Sec         | U           |
| CO-58        | 2007 | -8.73E-01     | 2.30E+00            | <b>3.74E+00</b> | pCi/L |       | 3239.8         | ml            | 05/24/06 00:00 | 06/08/06   | 34625      | Sec         | U           |
| FE-59        | 2007 | -4.37E-01     | 4.83E+00            | <b>7.98E+00</b> | pCi/L |       | 3239.8         | ml            | 05/24/06 00:00 | 06/08/06   | 34625      | Sec         | U           |
| CO-60        | 2007 | 6.79E-01      | 2.13E+00            | <b>3.56E+00</b> | pCi/L |       | 3239.8         | ml            | 05/24/06 00:00 | 06/08/06   | 34625      | Sec         | U           |
| ZN-65        | 2007 | 1.23E-01      | 4.59E+00            | <b>7.62E+00</b> | pCi/L |       | 3239.8         | ml            | 05/24/06 00:00 | 06/08/06   | 34625      | Sec         | U           |
| NB-95        | 2007 | 9.94E-01      | 2.41E+00            | <b>4.07E+00</b> | pCi/L |       | 3239.8         | ml            | 05/24/06 00:00 | 06/08/06   | 34625      | Sec         | U           |
| ZR-95        | 2007 | -3.72E+00     | 4.24E+00            | <b>6.78E+00</b> | pCi/L |       | 3239.8         | ml            | 05/24/06 00:00 | 06/08/06   | 34625      | Sec         | U           |
| CS-134       | 2007 | 5.59E+00      | 4.71E+00            | <b>3.84E+00</b> | pCi/L |       | 3239.8         | ml            | 05/24/06 00:00 | 06/08/06   | 34625      | Sec         | U           |
| CS-137       | 2007 | -4.71E-01     | 2.30E+00            | <b>3.73E+00</b> | pCi/L |       | 3239.8         | ml            | 05/24/06 00:00 | 06/08/06   | 34625      | Sec         | U           |
| BA-140       | 2007 | 6.99E+00      | 1.72E+01            | <b>2.88E+01</b> | pCi/L |       | 3239.8         | ml            | 05/24/06 00:00 | 06/08/06   | 34625      | Sec         | U           |
| LA-140       | 2007 | 2.08E+00      | 5.62E+00            | <b>9.50E+00</b> | pCi/L |       | 3239.8         | ml            | 05/24/06 00:00 | 06/08/06   | 34625      | Sec         | U           |

Flag Values  
 U = Compound/Analyte not detected or less than 3 sigma  
 + = Activity concentration exceeds MDC and 3 sigma, peak identified (gamma only)  
 U\* = Compound/Analyte not detected, Peak not identified, but forced activity concentration exceeds MDC and 3 sigma  
 High = Activity concentration exceeds customer reporting value  
 Spec = MDC exceeds customer technical specification  
 L = Low recovery  
 H = High recovery  
**Flag Values**  
 No = Peak not identified in gamma spectrum  
 Yes = Peak identified in gamma spectrum  
 \*\*\*\* Results are reported on an as received basis unless otherwise noted  
 MDC - Minimum Detectable Concentration

**Flag Values**  
 Bolded text indicates reportable value.

# Report of Analysis

07/18/06 11:52

**L28833**

Conestoga-Rovers & Associates

EX001-3ESPZION-06

Kathy Shaw

| Radionuclide | SOP# | Activity Conc   | Uncertainty 2 Sigma | MDC      | Units | Run # | Aliquot Volume | Aliquot Units | Reference Date | Count Date | Count Time | Count Units | Flag Values |
|--------------|------|-----------------|---------------------|----------|-------|-------|----------------|---------------|----------------|------------|------------|-------------|-------------|
| H-3          | 2010 | 2.93E+01        | 1.05E+02            | 1.70E+02 | pCi/L |       | 10             | ml            |                | 06/09/06   | 60         | M           | U           |
| TOTAL SR     | 2018 | 5.54E-01        | 5.03E-01            | 9.20E-01 | pCi/L |       | 450            | ml            | 05/24/06 13:45 | 06/10/06   | 150        | M           | U           |
| K-40         | 2007 | <b>8.59E+01</b> | 4.42E+01            | 3.27E+01 | pCi/L |       | 3310.82        | ml            | 05/24/06 13:45 | 06/08/06   | 34628      | Sec         | +           |
| MN-54        | 2007 | -1.16E+00       | 2.19E+00            | 3.51E+00 | pCi/L |       | 3310.82        | ml            | 05/24/06 13:45 | 06/08/06   | 34628      | Sec         | U           |
| CO-58        | 2007 | -1.96E+00       | 2.29E+00            | 3.61E+00 | pCi/L |       | 3310.82        | ml            | 05/24/06 13:45 | 06/08/06   | 34628      | Sec         | U           |
| FE-59        | 2007 | 2.74E+00        | 4.75E+00            | 8.08E+00 | pCi/L |       | 3310.82        | ml            | 05/24/06 13:45 | 06/08/06   | 34628      | Sec         | U           |
| CO-60        | 2007 | 8.46E-02        | 2.28E+00            | 3.74E+00 | pCi/L |       | 3310.82        | ml            | 05/24/06 13:45 | 06/08/06   | 34628      | Sec         | U           |
| ZN-65        | 2007 | 6.17E+00        | 4.52E+00            | 7.96E+00 | pCi/L |       | 3310.82        | ml            | 05/24/06 13:45 | 06/08/06   | 34628      | Sec         | U           |
| NB-95        | 2007 | 5.11E-01        | 2.34E+00            | 3.87E+00 | pCi/L |       | 3310.82        | ml            | 05/24/06 13:45 | 06/08/06   | 34628      | Sec         | U           |
| ZR-95        | 2007 | 1.27E-01        | 4.15E+00            | 6.83E+00 | pCi/L |       | 3310.82        | ml            | 05/24/06 13:45 | 06/08/06   | 34628      | Sec         | U           |
| CS-134       | 2007 | 4.36E+00        | 3.99E+00            | 3.80E+00 | pCi/L |       | 3310.82        | ml            | 05/24/06 13:45 | 06/08/06   | 34628      | Sec         | U           |
| CS-137       | 2007 | -1.55E-01       | 2.18E+00            | 3.60E+00 | pCi/L |       | 3310.82        | ml            | 05/24/06 13:45 | 06/08/06   | 34628      | Sec         | U           |
| BA-140       | 2007 | 3.53E+00        | 1.65E+01            | 2.70E+01 | pCi/L |       | 3310.82        | ml            | 05/24/06 13:45 | 06/08/06   | 34628      | Sec         | U           |
| LA-140       | 2007 | 2.06E+00        | 5.50E+00            | 9.33E+00 | pCi/L |       | 3310.82        | ml            | 05/24/06 13:45 | 06/08/06   | 34628      | Sec         | U           |

Sample ID: **WG-ZION-MW-4L-052406-MB-004** Matrix: Ground Water (WG)

Station: Volume:

Description: % Moisture:

LIMS Number: L28833-2

Collect Start: 05/24/2006 13:45

Collect Stop:

Receive Date: 06/02/2006

Flag Values  
 U = Compound/Analyte not detected or less than 3 sigma  
 + = Activity concentration exceeds MDC and 3 sigma; peak identified (gamma only)  
 U\* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma  
 High = Activity concentration exceeds customer reporting value  
 Spec = MDC exceeds customer technical specification  
 L = Low recovery  
 H = High recovery

No = Peak not identified in gamma spectrum  
 Yes = Peak identified in gamma spectrum  
 \*\*\*\* Results are reported on an as received basis unless otherwise noted

MDC - Minimum Detectable Concentration

# Report of Analysis

07/18/06 11:52

**L28833**

Conestoga-Rovers & Associates

EX001-3ESPZION-06

Kathy Shaw

| Radionuclide | SOP# | Activity Conc | Uncertainty 2 Sigma | MDC      | Units | Run # | Aliquot Volume | Aliquot Units | Reference Date | Count Date | Count Time | Count Units | Flag Values |
|--------------|------|---------------|---------------------|----------|-------|-------|----------------|---------------|----------------|------------|------------|-------------|-------------|
| H-3          | 2010 | -2.27E+01     | 1.00E+02            | 1.68E+02 | pCi/L |       | 10             | ml            |                | 06/09/06   | 60         | M           | U           |
| TOTAL SR     | 2018 | 4.12E-01      | 6.46E-01            | 1.22E+00 | pCi/L |       | 450            | ml            | 05/25/06 09:15 | 06/10/06   | 150        | M           | U           |
| MN-54        | 2007 | 3.41E-01      | 2.84E+00            | 4.68E+00 | pCi/L |       | 3096.32        | ml            | 05/25/06 09:15 | 06/09/06   | 14466      | Sec         | U           |
| CO-58        | 2007 | 7.18E-02      | 3.39E+00            | 5.54E+00 | pCi/L |       | 3096.32        | ml            | 05/25/06 09:15 | 06/09/06   | 14466      | Sec         | U           |
| FE-59        | 2007 | 2.78E+00      | 6.90E+00            | 1.16E+01 | pCi/L |       | 3096.32        | ml            | 05/25/06 09:15 | 06/09/06   | 14466      | Sec         | U           |
| CO-60        | 2007 | -1.53E-01     | 3.31E+00            | 5.64E+00 | pCi/L |       | 3096.32        | ml            | 05/25/06 09:15 | 06/09/06   | 14466      | Sec         | U           |
| ZN-65        | 2007 | 9.12E+00      | 7.95E+00            | 1.22E+01 | pCi/L |       | 3096.32        | ml            | 05/25/06 09:15 | 06/09/06   | 14466      | Sec         | U           |
| NB-95        | 2007 | 2.82E+00      | 3.27E+00            | 5.64E+00 | pCi/L |       | 3096.32        | ml            | 05/25/06 09:15 | 06/09/06   | 14466      | Sec         | U           |
| ZR-95        | 2007 | 1.25E+00      | 5.64E+00            | 9.40E+00 | pCi/L |       | 3096.32        | ml            | 05/25/06 09:15 | 06/09/06   | 14466      | Sec         | U           |
| CS-134       | 2007 | 1.03E+01      | 4.84E+00            | 6.29E+00 | pCi/L |       | 3096.32        | ml            | 05/25/06 09:15 | 06/09/06   | 14466      | Sec         | U*          |
| CS-137       | 2007 | 1.25E+00      | 2.93E+00            | 4.99E+00 | pCi/L |       | 3096.32        | ml            | 05/25/06 09:15 | 06/09/06   | 14466      | Sec         | U           |
| BA-140       | 2007 | -5.88E+00     | 2.12E+01            | 3.42E+01 | pCi/L |       | 3096.32        | ml            | 05/25/06 09:15 | 06/09/06   | 14466      | Sec         | U           |
| LA-140       | 2007 | -5.79E-01     | 7.18E+00            | 1.18E+01 | pCi/L |       | 3096.32        | ml            | 05/25/06 09:15 | 06/09/06   | 14466      | Sec         | U           |

Sample ID: **WG-ZION-MW-7L-052506-MS-007** Matrix: Ground Water (WG)

Station: Collect Start: 05/25/2006 09:15 Volume:

Description: Collect Stop: Receive Date: 06/02/2006 % Moisture:

LIMS Number: L28833-3

Flag Values  
 U = Compound/Analyte not detected or less than 3 sigma  
 + = Activity concentration exceeds MDC and 3 sigma; peak identified (gamma only)  
 U\* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma  
 High = Activity concentration exceeds customer reporting value  
 Spec = MDC exceeds customer technical specification  
 L = Low recovery  
 H = High recovery  
**Bolded text indicates reportable value.**

No = Peak not identified in gamma spectrum  
 Yes = Peak identified in gamma spectrum  
 \*\*\*\* Results are reported on an as received basis unless otherwise noted

MDC - Minimum Detectable Concentration

Report of Analysis  
07/18/06 11:52

L28833

Conestoga-Rovers & Associates  
EX001-3ESPZION-06

Kathy Shaw

| Radionuclide | SOP# | Activity Conc | Uncertainty 2 Sigma | MDC      | Units | Run # | Aliquot Volume | Aliquot Units | Reference Date | Count Date | Count Time | Count Units | Flag Values |
|--------------|------|---------------|---------------------|----------|-------|-------|----------------|---------------|----------------|------------|------------|-------------|-------------|
| H-3          | 2010 | 7.65E+01      | 1.10E+02            | 1.73E+02 | pCi/L |       | 10             | ml            |                | 06/09/06   | 60         | M           | U           |
| TOTAL SR     | 2018 | 1.77E+00      | 7.16E-01            | 1.15E+00 | pCi/L |       | 450            | ml            | 05/25/06 11:23 | 06/10/06   | 150        | M           | +           |
| MN-54        | 2007 | -1.25E+00     | 3.23E+00            | 5.27E+00 | pCi/L |       | 3292.8         | ml            | 05/25/06 11:23 | 06/09/06   | 21901      | Sec         | U           |
| CO-58        | 2007 | -4.17E-01     | 3.62E+00            | 5.95E+00 | pCi/L |       | 3292.8         | ml            | 05/25/06 11:23 | 06/09/06   | 21901      | Sec         | U           |
| FE-59        | 2007 | 1.28E+00      | 7.47E+00            | 1.25E+01 | pCi/L |       | 3292.8         | ml            | 05/25/06 11:23 | 06/09/06   | 21901      | Sec         | U           |
| CO-60        | 2007 | -4.56E-01     | 3.17E+00            | 5.15E+00 | pCi/L |       | 3292.8         | ml            | 05/25/06 11:23 | 06/09/06   | 21901      | Sec         | U           |
| ZN-65        | 2007 | 3.95E+01      | 1.03E+01            | 1.74E+01 | pCi/L |       | 3292.8         | ml            | 05/25/06 11:23 | 06/09/06   | 21901      | Sec         | U*          |
| NB-95        | 2007 | 1.19E+01      | 4.11E+00            | 6.75E+00 | pCi/L |       | 3292.8         | ml            | 05/25/06 11:23 | 06/09/06   | 21901      | Sec         | U*          |
| ZR-95        | 2007 | 1.61E+00      | 6.23E+00            | 9.94E+00 | pCi/L |       | 3292.8         | ml            | 05/25/06 11:23 | 06/09/06   | 21901      | Sec         | U           |
| CS-134       | 2007 | 5.95E+01      | 7.43E+00            | 9.60E+00 | pCi/L |       | 3292.8         | ml            | 05/25/06 11:23 | 06/09/06   | 21901      | Sec         | U*          |
| CS-137       | 2007 | 2.21E+00      | 3.28E+00            | 5.50E+00 | pCi/L |       | 3292.8         | ml            | 05/25/06 11:23 | 06/09/06   | 21901      | Sec         | U           |
| BA-140       | 2007 | -3.08E+00     | 2.38E+01            | 3.90E+01 | pCi/L |       | 3292.8         | ml            | 05/25/06 11:23 | 06/09/06   | 21901      | Sec         | U           |
| LA-140       | 2007 | -1.80E+00     | 7.88E+00            | 1.28E+01 | pCi/L |       | 3292.8         | ml            | 05/25/06 11:23 | 06/09/06   | 21901      | Sec         | U           |

Sample ID: WG-ZION-MW-6L-052506-MS-009  
Station: Ground Water  
Description: Matrix: Volume: Moisture:  
LIMS Number: L28833-4

Collect Start: 05/25/2006 11:23  
Collect Stop:  
Receive Date: 06/02/2006

Flag Values  
U = Compound/Analyte not detected or less than 3 sigma  
+ = Activity concentration exceeds MDC and 3 sigma; peak identified (gamma only)  
U\* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma  
High = Activity concentration exceeds customer reporting value  
Spec = MDC exceeds customer technical specification  
L = Low recovery  
H = High recovery

No = Peak not identified in gamma spectrum  
Yes = Peak identified in gamma spectrum  
\*\*\*\* Results are reported on an as received basis unless otherwise noted

MDC - Minimum Detectable Concentration

Report of Analysis  
07/18/06 11:52  
**L28833**

Conestoga-Rovers & Associates  
EX001-3ESPZION-06

Kathy Shaw

| Radionuclide | SOP# | Activity Conc | Uncertainty 2 Sigma | MDC      | Units | Run # | Aliquot Volume | Aliquot Units | Reference Date | Count Date | Count Time | Count Units | Flag Values |
|--------------|------|---------------|---------------------|----------|-------|-------|----------------|---------------|----------------|------------|------------|-------------|-------------|
| H-3          | 2010 | 2.41E+01      | 1.09E+02            | 1.78E+02 | pCi/L |       | 10             | ml            |                | 06/09/06   | 60         | M           | U           |
| TOTAL SR     | 2018 | 1.25E+00      | 8.11E-01            | 1.42E+00 | pCi/L |       | 450            | ml            | 05/24/06 11:35 | 06/10/06   | 150        | M           | U           |
| K-40         | 2007 | 6.94E+01      | 4.57E+01            | 4.68E+01 | pCi/L |       | 3209.5         | ml            | 05/24/06 11:35 | 06/09/06   | 14641      | Sec         | +           |
| MN-54        | 2007 | 1.35E+00      | 2.89E+00            | 4.88E+00 | pCi/L |       | 3209.5         | ml            | 05/24/06 11:35 | 06/09/06   | 14641      | Sec         | U           |
| CO-58        | 2007 | 6.14E-01      | 3.51E+00            | 5.18E+00 | pCi/L |       | 3209.5         | ml            | 05/24/06 11:35 | 06/09/06   | 14641      | Sec         | U           |
| FE-59        | 2007 | -4.98E+00     | 7.42E+00            | 1.17E+01 | pCi/L |       | 3209.5         | ml            | 05/24/06 11:35 | 06/09/06   | 14641      | Sec         | U           |
| CO-60        | 2007 | 5.01E-01      | 2.95E+00            | 4.91E+00 | pCi/L |       | 3209.5         | ml            | 05/24/06 11:35 | 06/09/06   | 14641      | Sec         | U           |
| ZN-65        | 2007 | 5.49E+00      | 8.37E+00            | 1.24E+01 | pCi/L |       | 3209.5         | ml            | 05/24/06 11:35 | 06/09/06   | 14641      | Sec         | U           |
| NB-95        | 2007 | 4.21E+00      | 3.45E+00            | 6.07E+00 | pCi/L |       | 3209.5         | ml            | 05/24/06 11:35 | 06/09/06   | 14641      | Sec         | U           |
| ZR-95        | 2007 | -4.02E+00     | 6.06E+00            | 9.56E+00 | pCi/L |       | 3209.5         | ml            | 05/24/06 11:35 | 06/09/06   | 14641      | Sec         | U           |
| CS-134       | 2007 | 4.44E+00      | 7.23E+00            | 5.76E+00 | pCi/L |       | 3209.5         | ml            | 05/24/06 11:35 | 06/09/06   | 14641      | Sec         | U           |
| CS-137       | 2007 | 3.52E+00      | 3.19E+00            | 5.59E+00 | pCi/L |       | 3209.5         | ml            | 05/24/06 11:35 | 06/09/06   | 14641      | Sec         | U           |
| BA-140       | 2007 | 5.57E+00      | 2.54E+01            | 4.18E+01 | pCi/L |       | 3209.5         | ml            | 05/24/06 11:35 | 06/09/06   | 14641      | Sec         | U           |
| LA-140       | 2007 | 4.91E-01      | 7.97E+00            | 1.33E+01 | pCi/L |       | 3209.5         | ml            | 05/24/06 11:35 | 06/09/06   | 14641      | Sec         | U           |

Sample ID: WG-ZION-MW-8U-052406-MS-003

Station: Matrix: Ground Water (WG)

Description: Volume:

LIMS Number: L28833-5 % Moisture:

Collect Start: 05/24/2006 11:35

Collect Stop:

Receive Date: 06/02/2006

Flag Values  
U = Compound/Analyte not detected or less than 3 sigma  
+ = Activity concentration exceeds MDC and 3 sigma; peak identified (gamma only)  
U\* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma  
High = Activity concentration exceeds customer reporting value  
Spec = MDC exceeds customer technical specification  
L = Low recovery  
H = High recovery

**Bolded text indicates reportable value.**

No = Peak not identified in gamma spectrum  
Yes = Peak identified in gamma spectrum  
\*\*\*\* Results are reported on an as received basis unless otherwise noted

MDC - Minimum Detectable Concentration

# Report of Analysis

07/18/06 11:52

**L28833**

Conestoga-Rovers & Associates

EX001-3ESPZION-06

Kathy Shaw

| Radionuclide | SOP# | Activity Conc   | Uncertainty 2 Sigma | MDC             | Units | Run # | Aliquot Volume | Aliquot Units | Reference Date | Count Date | Count Time | Count Units | Flag Values |
|--------------|------|-----------------|---------------------|-----------------|-------|-------|----------------|---------------|----------------|------------|------------|-------------|-------------|
| H-3          | 2010 | 1.46E+02        | 1.12E+02            | <b>1.70E+02</b> | pCi/L |       | 10             | ml            |                | 06/09/06   | 60         | M           | U           |
| TOTAL SR     | 2018 | <b>1.55E+00</b> | 7.03E-01            | 1.16E+00        | pCi/L |       | 450            | ml            | 05/24/06 10:14 | 06/10/06   | 150        | M           | +           |
| MN-54        | 2007 | 7.64E-02        | 2.89E+00            | <b>4.80E+00</b> | pCi/L |       | 3083.2         | ml            | 05/24/06 10:14 | 06/09/06   | 14771      | Sec         | U           |
| CO-58        | 2007 | 1.49E-02        | 3.36E+00            | <b>5.47E+00</b> | pCi/L |       | 3083.2         | ml            | 05/24/06 10:14 | 06/09/06   | 14771      | Sec         | U           |
| FE-59        | 2007 | 6.33E-01        | 6.66E+00            | <b>1.11E+01</b> | pCi/L |       | 3083.2         | ml            | 05/24/06 10:14 | 06/09/06   | 14771      | Sec         | U           |
| CO-60        | 2007 | -2.20E+00       | 2.95E+00            | <b>4.54E+00</b> | pCi/L |       | 3083.2         | ml            | 05/24/06 10:14 | 06/09/06   | 14771      | Sec         | U           |
| ZN-65        | 2007 | 9.40E+00        | 7.78E+00            | <b>1.19E+01</b> | pCi/L |       | 3083.2         | ml            | 05/24/06 10:14 | 06/09/06   | 14771      | Sec         | U           |
| NB-95        | 2007 | 1.92E+00        | 3.51E+00            | <b>5.89E+00</b> | pCi/L |       | 3083.2         | ml            | 05/24/06 10:14 | 06/09/06   | 14771      | Sec         | U           |
| ZR-95        | 2007 | -4.74E+00       | 6.12E+00            | <b>9.61E+00</b> | pCi/L |       | 3083.2         | ml            | 05/24/06 10:14 | 06/09/06   | 14771      | Sec         | U           |
| CS-134       | 2007 | 1.55E+01        | 6.88E+00            | <b>6.39E+00</b> | pCi/L |       | 3083.2         | ml            | 05/24/06 10:14 | 06/09/06   | 14771      | Sec         | U           |
| CS-137       | 2007 | -1.69E-01       | 3.19E+00            | <b>5.10E+00</b> | pCi/L |       | 3083.2         | ml            | 05/24/06 10:14 | 06/09/06   | 14771      | Sec         | U*          |
| BA-140       | 2007 | 2.71E+00        | 2.35E+01            | <b>3.86E+01</b> | pCi/L |       | 3083.2         | ml            | 05/24/06 10:14 | 06/09/06   | 14771      | Sec         | U           |
| LA-140       | 2007 | -6.01E+00       | 7.84E+00            | <b>1.21E+01</b> | pCi/L |       | 3083.2         | ml            | 05/24/06 10:14 | 06/09/06   | 14771      | Sec         | U           |

Sample ID: **WG-ZION-MW-8L-052406-MS-001** Matrix: Ground Water (WG)

Station: Volume:

Description: % Moisture:

LIMS Number: L28833-6

Collect Start: 05/24/2006 10:14

Collect Stop:

Receive Date: 06/02/2006

**Flag Values**

- U = Compound/Analyte not detected or less than 3 sigma
- + = Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)
- U\* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
- High = Activity concentration exceeds customer reporting value
- Spec = MDC exceeds customer technical specification
- L = Low recovery
- H = High recovery

**Bolded text indicates reportable value.**

- No = Peak not identified in gamma spectrum
- Yes = Peak identified in gamma spectrum
- \*\*\*\* Results are reported on an as received basis unless otherwise noted

MDC - Minimum Detectable Concentration

Report of Analysis  
07/18/06 11:52  
L28833

Conestoga-Rovers & Associates  
EX001-3ESPZION-06

Kathy Shaw

| Radionuclide | SOP# | Activity Conc | Uncertainty 2 Sigma | MDC      | Units | Run # | Aliquot Volume | Aliquot Units | Reference Date | Count Date | Count Time | Count Units | Flag Values |
|--------------|------|---------------|---------------------|----------|-------|-------|----------------|---------------|----------------|------------|------------|-------------|-------------|
| H-3          | 2010 | 1.05E+01      | 1.04E+02            | 1.71E+02 | pCi/L |       | 10             | ml            |                | 06/09/06   | 60         | M           | U           |
| TOTAL SR     | 2018 | 1.27E+00      | 5.63E-01            | 9.35E-01 | pCi/L |       | 450            | ml            | 05/24/06 14:35 | 06/10/06   | 150        | M           | +           |
| MN-54        | 2007 | -6.66E-01     | 3.12E+00            | 5.03E+00 | pCi/L |       | 3260.8         | ml            | 05/24/06 14:35 | 06/09/06   | 17561      | Sec         | U           |
| CO-58        | 2007 | -2.13E+00     | 3.33E+00            | 5.24E+00 | pCi/L |       | 3260.8         | ml            | 05/24/06 14:35 | 06/09/06   | 17561      | Sec         | U           |
| FE-59        | 2007 | -3.75E-01     | 6.84E+00            | 1.12E+01 | pCi/L |       | 3260.8         | ml            | 05/24/06 14:35 | 06/09/06   | 17561      | Sec         | U           |
| CO-60        | 2007 | -3.73E-01     | 3.12E+00            | 5.09E+00 | pCi/L |       | 3260.8         | ml            | 05/24/06 14:35 | 06/09/06   | 17561      | Sec         | U           |
| ZN-65        | 2007 | 1.42E+01      | 7.41E+00            | 1.20E+01 | pCi/L |       | 3260.8         | ml            | 05/24/06 14:35 | 06/09/06   | 17561      | Sec         | U*          |
| NB-95        | 2007 | 2.89E+00      | 3.59E+00            | 6.12E+00 | pCi/L |       | 3260.8         | ml            | 05/24/06 14:35 | 06/09/06   | 17561      | Sec         | U           |
| ZR-95        | 2007 | -5.33E+00     | 6.28E+00            | 9.87E+00 | pCi/L |       | 3260.8         | ml            | 05/24/06 14:35 | 06/09/06   | 17561      | Sec         | U           |
| CS-134       | 2007 | 1.78E+01      | 6.30E+00            | 6.41E+00 | pCi/L |       | 3260.8         | ml            | 05/24/06 14:35 | 06/09/06   | 17561      | Sec         | U*          |
| CS-137       | 2007 | 9.02E-01      | 3.26E+00            | 5.47E+00 | pCi/L |       | 3260.8         | ml            | 05/24/06 14:35 | 06/09/06   | 17561      | Sec         | U           |
| BA-140       | 2007 | -4.53E+00     | 2.49E+01            | 4.05E+01 | pCi/L |       | 3260.8         | ml            | 05/24/06 14:35 | 06/09/06   | 17561      | Sec         | U           |
| LA-140       | 2007 | -6.30E+00     | 7.87E+00            | 1.22E+01 | pCi/L |       | 3260.8         | ml            | 05/24/06 14:35 | 06/09/06   | 17561      | Sec         | U           |

Sample ID: WG-ZION-MW-7U-052406-MS-005  
Station: Matrix: Ground Water (WG)  
Description: Volume:  
LIMS Number: L28833-7 % Moisture:

Collect Start: 05/24/2006 14:35  
Collect Stop:  
Receive Date: 06/02/2006

Flag Values  
U = Compound/Analyte not detected or less than 3 sigma  
+ = Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)  
U\* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma  
High = Activity concentration exceeds customer reporting value  
Spec = MDC exceeds customer technical specification  
L = Low recovery  
H = High recovery

No = Peak not identified in gamma spectrum  
Yes = Peak identified in gamma spectrum  
\*\*\*\* Results are reported on an as received basis unless otherwise noted

MDC - Minimum Detectable Concentration

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**Bolded text indicates reportable value.**



# Report of Analysis

07/18/06 11:52

**L28833**

Conestoga-Rovers & Associates

EX001-3ESPZION-06

Kathy Shaw

| Radionuclide | SOP# | Activity Conc | Uncertainty 2 Sigma | MDC      | Units | Run # | Aliquot Volume | Aliquot Units | Reference Date | Count Date | Count Time | Count Units | Flag Values |
|--------------|------|---------------|---------------------|----------|-------|-------|----------------|---------------|----------------|------------|------------|-------------|-------------|
| H-3          | 2010 | 1.13E+02      | 1.13E+02            | 1.74E+02 | pCi/L |       | 10             | ml            |                | 06/09/06   | 60         | M           | U           |
| TOTAL SR     | 2018 | 5.17E-01      | 6.55E-01            | 1.23E+00 | pCi/L |       | 450            | ml            | 05/25/06 10:58 | 06/10/06   | 150        | M           | U           |
| MN-54        | 2007 | -5.33E-01     | 2.29E+00            | 3.71E+00 | pCi/L |       | 3044.14        | ml            | 05/25/06 10:58 | 06/09/06   | 15001      | Sec         | U           |
| CO-58        | 2007 | -3.71E+00     | 2.50E+00            | 3.67E+00 | pCi/L |       | 3044.14        | ml            | 05/25/06 10:58 | 06/09/06   | 15001      | Sec         | U           |
| FE-59        | 2007 | 8.70E+00      | 5.63E+00            | 1.04E+01 | pCi/L |       | 3044.14        | ml            | 05/25/06 10:58 | 06/09/06   | 15001      | Sec         | U           |
| CO-60        | 2007 | -4.71E-02     | 2.34E+00            | 3.80E+00 | pCi/L |       | 3044.14        | ml            | 05/25/06 10:58 | 06/09/06   | 15001      | Sec         | U           |
| ZN-65        | 2007 | 6.96E+00      | 5.64E+00            | 1.01E+01 | pCi/L |       | 3044.14        | ml            | 05/25/06 10:58 | 06/09/06   | 15001      | Sec         | U           |
| NB-95        | 2007 | -8.82E-01     | 2.63E+00            | 4.27E+00 | pCi/L |       | 3044.14        | ml            | 05/25/06 10:58 | 06/09/06   | 15001      | Sec         | U           |
| ZR-95        | 2007 | -1.09E+00     | 4.67E+00            | 7.62E+00 | pCi/L |       | 3044.14        | ml            | 05/25/06 10:58 | 06/09/06   | 15001      | Sec         | U           |
| CS-134       | 2007 | 4.16E+00      | 3.91E+00            | 4.41E+00 | pCi/L |       | 3044.14        | ml            | 05/25/06 10:58 | 06/09/06   | 15001      | Sec         | U           |
| CS-137       | 2007 | 1.36E+00      | 2.57E+00            | 4.32E+00 | pCi/L |       | 3044.14        | ml            | 05/25/06 10:58 | 06/09/06   | 15001      | Sec         | U           |
| BA-140       | 2007 | -9.99E-01     | 1.65E+01            | 2.71E+01 | pCi/L |       | 3044.14        | ml            | 05/25/06 10:58 | 06/09/06   | 15001      | Sec         | U           |
| LA-140       | 2007 | -2.85E+00     | 5.65E+00            | 8.74E+00 | pCi/L |       | 3044.14        | ml            | 05/25/06 10:58 | 06/09/06   | 15001      | Sec         | U           |

Sample ID: **WG-ZN-MW-ZN-03U-052506-DS-01** Matrix: Ground Water (WG)

Station: Volume:

Description: % Moisture:

LIMS Number: L28833-8

Collect Start: 05/25/2006 10:58

Collect Stop:

Receive Date: 06/02/2006

Flag Values  
 U = Compound/Analyte not detected or less than 3 sigma  
 + = Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)  
 U\* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma  
 High = Activity concentration exceeds customer reporting value  
 Spec = MDC exceeds customer technical specification  
 L = Low recovery  
 H = High recovery

No = Peak not identified in gamma spectrum  
 Yes = Peak identified in gamma spectrum  
 \*\*\*\* Results are reported on an as received basis unless otherwise noted

MDC - Minimum Detectable Concentration

# Report of Analysis

07/18/06 11:52

**L28833**

Conestoga-Rovers & Associates

EX001-3ESPZION-06

Kathy Shaw

Sample ID: **WG-ZN-MW-ZN-03U-052506-DS-02** Matrix: Ground Water (WG)  
 Station: Volume:  
 Description: % Moisture:  
 LIMS Number: L28833-9 Collect Start: 05/25/2006 11:15 Collect Stop: Receive Date: 06/02/2006

| Radionuclide | SOP# | Activity Conc | Uncertainty 2 Sigma | MDC      | Units | Run # | Aliquot Volume | Aliquot Units | Reference Date | Count Date | Count Time | Count Units | Flag Values |
|--------------|------|---------------|---------------------|----------|-------|-------|----------------|---------------|----------------|------------|------------|-------------|-------------|
| H-3          | 2010 | 1.13E+02      | 1.08E+02            | 1.66E+02 | pCi/L |       | 10             | ml            |                | 06/09/06   | 60         | M           | U           |
| TOTAL SR     | 2018 | 8.04E-01      | 6.40E-01            | 1.15E+00 | pCi/L |       | 450            | ml            | 05/25/06 11:15 | 06/10/06   | 150        | M           | U           |
| MN-54        | 2007 | -8.66E-01     | 2.93E+00            | 4.94E+00 | pCi/L |       | 3006.76        | ml            | 05/25/06 11:15 | 06/09/06   | 15126      | Sec         | U           |
| CO-58        | 2007 | -2.10E+00     | 3.03E+00            | 5.00E+00 | pCi/L |       | 3006.76        | ml            | 05/25/06 11:15 | 06/09/06   | 15126      | Sec         | U           |
| FE-59        | 2007 | 1.60E+00      | 6.10E+00            | 1.09E+01 | pCi/L |       | 3006.76        | ml            | 05/25/06 11:15 | 06/09/06   | 15126      | Sec         | U           |
| CO-60        | 2007 | 3.16E+00      | 2.86E+00            | 5.38E+00 | pCi/L |       | 3006.76        | ml            | 05/25/06 11:15 | 06/09/06   | 15126      | Sec         | U           |
| ZN-65        | 2007 | 1.80E+01      | 7.34E+00            | 1.30E+01 | pCi/L |       | 3006.76        | ml            | 05/25/06 11:15 | 06/09/06   | 15126      | Sec         | U*          |
| NB-95        | 2007 | 5.30E+00      | 3.26E+00            | 6.06E+00 | pCi/L |       | 3006.76        | ml            | 05/25/06 11:15 | 06/09/06   | 15126      | Sec         | U           |
| ZR-95        | 2007 | -3.82E+00     | 5.40E+00            | 8.95E+00 | pCi/L |       | 3006.76        | ml            | 05/25/06 11:15 | 06/09/06   | 15126      | Sec         | U           |
| CS-134       | 2007 | 2.05E+01      | 4.31E+00            | 7.59E+00 | pCi/L |       | 3006.76        | ml            | 05/25/06 11:15 | 06/09/06   | 15126      | Sec         | U           |
| CS-137       | 2007 | 4.48E+00      | 3.07E+00            | 5.65E+00 | pCi/L |       | 3006.76        | ml            | 05/25/06 11:15 | 06/09/06   | 15126      | Sec         | U*          |
| BA-140       | 2007 | -1.42E+01     | 2.22E+01            | 3.64E+01 | pCi/L |       | 3006.76        | ml            | 05/25/06 11:15 | 06/09/06   | 15126      | Sec         | U           |
| LA-140       | 2007 | 4.24E+00      | 6.04E+00            | 1.15E+01 | pCi/L |       | 3006.76        | ml            | 05/25/06 11:15 | 06/09/06   | 15126      | Sec         | U           |

Flag Values  
 U = Compound/Analyte not detected or less than 3 sigma  
 + = Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)  
 U\* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma  
 High = Activity concentration exceeds customer reporting value  
 Spec = MDC exceeds customer technical specification  
 L = Low recovery  
 H = High recovery

**Bolded text indicates reportable value.**

No = Peak not identified in gamma spectrum  
 Yes = Peak identified in gamma spectrum  
 \*\*\*\* Results are reported on an as received basis unless otherwise noted

MDC - Minimum Detectable Concentration

# Report of Analysis

07/18/06 11:52

**L28833**

Conestoga-Rovers & Associates

EX001-3ESPZION-06

Kathy Shaw

| Radionuclide | SOP# | Activity Conc | Uncertainty 2 Sigma | MDC      | Units | Run # | Aliquot Volume | Aliquot Units | Reference Date | Count Date | Count Time | Count Units | Flag Values |
|--------------|------|---------------|---------------------|----------|-------|-------|----------------|---------------|----------------|------------|------------|-------------|-------------|
| H-3          | 2010 | 1.42E+02      | 1.07E+02            | 1.62E+02 | pCi/L |       | 10             | ml            | 05/25/06 14:22 | 06/09/06   | 60         | M           | U           |
| TOTAL SR     | 2018 | 1.06E+00      | 6.80E-01            | 1.19E+00 | pCi/L |       | 450            | ml            | 05/25/06 14:22 | 06/10/06   | 150        | M           | U           |
| MIN-54       | 2007 | -2.09E+00     | 2.95E+00            | 4.54E+00 | pCi/L |       | 3027.97        | ml            | 05/25/06 14:22 | 06/09/06   | 12460      | Sec         | U           |
| CO-58        | 2007 | -2.84E+00     | 3.48E+00            | 5.35E+00 | pCi/L |       | 3027.97        | ml            | 05/25/06 14:22 | 06/09/06   | 12460      | Sec         | U           |
| FE-59        | 2007 | 8.16E+00      | 7.48E+00            | 1.33E+01 | pCi/L |       | 3027.97        | ml            | 05/25/06 14:22 | 06/09/06   | 12460      | Sec         | U           |
| CO-60        | 2007 | -3.92E-01     | 3.34E+00            | 5.33E+00 | pCi/L |       | 3027.97        | ml            | 05/25/06 14:22 | 06/09/06   | 12460      | Sec         | U           |
| ZN-65        | 2007 | 1.39E+00      | 6.68E+00            | 1.11E+01 | pCi/L |       | 3027.97        | ml            | 05/25/06 14:22 | 06/09/06   | 12460      | Sec         | U           |
| NB-95        | 2007 | 5.28E+00      | 3.64E+00            | 6.52E+00 | pCi/L |       | 3027.97        | ml            | 05/25/06 14:22 | 06/09/06   | 12460      | Sec         | U           |
| ZR-95        | 2007 | -1.88E+00     | 6.16E+00            | 9.91E+00 | pCi/L |       | 3027.97        | ml            | 05/25/06 14:22 | 06/09/06   | 12460      | Sec         | U           |
| CS-134       | 2007 | -3.24E+00     | 4.37E+00            | 5.64E+00 | pCi/L |       | 3027.97        | ml            | 05/25/06 14:22 | 06/09/06   | 12460      | Sec         | U           |
| CS-137       | 2007 | 3.15E+00      | 3.33E+00            | 5.83E+00 | pCi/L |       | 3027.97        | ml            | 05/25/06 14:22 | 06/09/06   | 12460      | Sec         | U           |
| BA-140       | 2007 | -1.03E+00     | 2.34E+01            | 3.82E+01 | pCi/L |       | 3027.97        | ml            | 05/25/06 14:22 | 06/09/06   | 12460      | Sec         | U           |
| LA-140       | 2007 | 1.27E+00      | 7.63E+00            | 1.29E+01 | pCi/L |       | 3027.97        | ml            | 05/25/06 14:22 | 06/09/06   | 12460      | Sec         | U           |

Sample ID: **WG-ZN-MW-ZN-03L-052506-DS-03** Matrix: Ground Water (WG)

Station: Collect Start: 05/25/2006 14:22 Volume:

Description: Collect Stop: Receive Date: 06/02/2006 % Moisture:

LIMS Number: L28833-10

Flag Values  
 U = Compound/Analyte not detected or less than 3 sigma  
 + = Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)  
 U\* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma  
 High = Activity concentration exceeds customer reporting value  
 Spec = MDC exceeds customer technical specification  
 L = Low recovery  
 H = High recovery

**Bolded text indicates reportable value.**

# Report of Analysis

07/18/06 11:52  
**L28833**

Conestoga-Rovers & Associates  
EX001-3ESPZION-06

Kathy Shaw

| Radionuclide | SOP# | Activity Conc | Uncertainty 2 Sigma | MDC      | Units | Run # | Aliquot Volume | Aliquot Units | Reference Date | Count Date | Count Time | Count Units | Flag Values |
|--------------|------|---------------|---------------------|----------|-------|-------|----------------|---------------|----------------|------------|------------|-------------|-------------|
| H-3          | 2010 | -1.25E+01     | 1.01E+02            | 1.68E+02 | pCi/L |       | 10             | ml            |                | 06/09/06   | 60         | M           | U           |
| TOTAL SR     | 2018 | 6.77E-01      | 6.50E-01            | 1.18E+00 | pCi/L |       | 450            | ml            | 05/26/06 09:53 | 06/10/06   | 150        | M           | U           |
| K-40         | 2007 | 7.37E+01      | 4.45E+01            | 4.75E+01 | pCi/L |       | 3001.26        | ml            | 05/26/06 09:53 | 06/09/06   | 11970      | Sec         | +           |
| MIN-54       | 2007 | -6.90E-01     | 2.79E+00            | 4.54E+00 | pCi/L |       | 3001.26        | ml            | 05/26/06 09:53 | 06/09/06   | 11970      | Sec         | U           |
| CO-58        | 2007 | -6.45E-01     | 3.21E+00            | 5.25E+00 | pCi/L |       | 3001.26        | ml            | 05/26/06 09:53 | 06/09/06   | 11970      | Sec         | U           |
| FE-59        | 2007 | -1.72E+00     | 6.37E+00            | 1.03E+01 | pCi/L |       | 3001.26        | ml            | 05/26/06 09:53 | 06/09/06   | 11970      | Sec         | U           |
| CO-60        | 2007 | -2.86E+00     | 2.76E+00            | 4.06E+00 | pCi/L |       | 3001.26        | ml            | 05/26/06 09:53 | 06/09/06   | 11970      | Sec         | U           |
| ZN-65        | 2007 | 3.24E-01      | 6.00E+00            | 9.97E+00 | pCi/L |       | 3001.26        | ml            | 05/26/06 09:53 | 06/09/06   | 11970      | Sec         | U           |
| NB-95        | 2007 | 7.28E-01      | 3.07E+00            | 5.18E+00 | pCi/L |       | 3001.26        | ml            | 05/26/06 09:53 | 06/09/06   | 11970      | Sec         | U           |
| ZR-95        | 2007 | -1.33E+00     | 5.71E+00            | 9.13E+00 | pCi/L |       | 3001.26        | ml            | 05/26/06 09:53 | 06/09/06   | 11970      | Sec         | U           |
| CS-134       | 2007 | -1.13E-01     | 3.67E+00            | 5.09E+00 | pCi/L |       | 3001.26        | ml            | 05/26/06 09:53 | 06/09/06   | 11970      | Sec         | U           |
| CS-137       | 2007 | 6.15E-01      | 2.95E+00            | 4.89E+00 | pCi/L |       | 3001.26        | ml            | 05/26/06 09:53 | 06/09/06   | 11970      | Sec         | U           |
| BA-140       | 2007 | -5.11E-01     | 1.99E+01            | 3.29E+01 | pCi/L |       | 3001.26        | ml            | 05/26/06 09:53 | 06/09/06   | 11970      | Sec         | U           |
| LA-140       | 2007 | -3.32E+00     | 6.68E+00            | 1.05E+01 | pCi/L |       | 3001.26        | ml            | 05/26/06 09:53 | 06/09/06   | 11970      | Sec         | U           |

Matrix: Ground Water  
Volume:  
% Moisture:

Collect Start: 05/26/2006 09:53  
Collect Stop:  
Receive Date: 06/02/2006

Sample ID: WG-ZN-MW-ZN-02U-052606-DS-04  
Station:  
Description:  
LIMS Number: L28833-11

Flag Values  
U = Compound/Analyte not detected or less than 3 sigma  
+ = Activity concentration exceeds MDC and 3 sigma; peak identified (gamma only)  
U\* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma  
High = Activity concentration exceeds customer reporting value  
Spec = MDC exceeds customer technical specification  
L = Low recovery  
H = High recovery

No = Peak not identified in gamma spectrum  
Yes = Peak identified in gamma spectrum  
\*\*\*\* Results are reported on an as received basis unless otherwise noted

MDC - Minimum Detectable Concentration

Report of Analysis  
07/18/06 11:52

L28833

Conestoga-Rovers & Associates

EX001-3ESPZION-06

Kathy Shaw

| Radionuclide | SOP# | Activity Conc | Uncertainty 2 Sigma | MDC      | Units | Run # | Aliquot Volume | Aliquot Units | Reference Date | Count Date | Count Time | Count Units | Flag Values |
|--------------|------|---------------|---------------------|----------|-------|-------|----------------|---------------|----------------|------------|------------|-------------|-------------|
| H-3          | 2010 | -1.15E+02     | 9.68E+01            | 1.73E+02 | pCi/L |       | 10             | ml            |                | 06/09/06   | 60         | M           | U           |
| TOTAL SR     | 2018 | 7.27E-01      | 6.81E-01            | 1.24E+00 | pCi/L |       | 450            | ml            | 05/26/06 12:30 | 06/10/06   | 150        | M           | U           |
| K-40         | 2007 | 8.10E+01      | 4.25E+01            | 4.82E+01 | pCi/L |       | 3057.05        | ml            | 05/26/06 12:30 | 06/09/06   | 15481      | Sec         | +           |
| MN-54        | 2007 | -9.45E-01     | 2.85E+00            | 4.55E+00 | pCi/L |       | 3057.05        | ml            | 05/26/06 12:30 | 06/09/06   | 15481      | Sec         | U           |
| CO-58        | 2007 | -1.53E+00     | 3.35E+00            | 5.34E+00 | pCi/L |       | 3057.05        | ml            | 05/26/06 12:30 | 06/09/06   | 15481      | Sec         | U           |
| FE-59        | 2007 | 6.49E-01      | 6.47E+00            | 1.08E+01 | pCi/L |       | 3057.05        | ml            | 05/26/06 12:30 | 06/09/06   | 15481      | Sec         | U           |
| CO-60        | 2007 | -1.72E-01     | 2.86E+00            | 4.66E+00 | pCi/L |       | 3057.05        | ml            | 05/26/06 12:30 | 06/09/06   | 15481      | Sec         | U           |
| ZN-65        | 2007 | 6.91E+00      | 6.46E+00            | 1.15E+01 | pCi/L |       | 3057.05        | ml            | 05/26/06 12:30 | 06/09/06   | 15481      | Sec         | U           |
| NB-95        | 2007 | 3.09E+00      | 3.17E+00            | 5.52E+00 | pCi/L |       | 3057.05        | ml            | 05/26/06 12:30 | 06/09/06   | 15481      | Sec         | U           |
| ZR-95        | 2007 | -1.70E+00     | 5.88E+00            | 9.50E+00 | pCi/L |       | 3057.05        | ml            | 05/26/06 12:30 | 06/09/06   | 15481      | Sec         | U           |
| CS-134       | 2007 | 2.88E+00      | 6.97E+00            | 5.38E+00 | pCi/L |       | 3057.05        | ml            | 05/26/06 12:30 | 06/09/06   | 15481      | Sec         | U           |
| CS-137       | 2007 | 5.95E-01      | 3.19E+00            | 5.33E+00 | pCi/L |       | 3057.05        | ml            | 05/26/06 12:30 | 06/09/06   | 15481      | Sec         | U           |
| BA-140       | 2007 | 3.12E+00      | 2.16E+01            | 3.54E+01 | pCi/L |       | 3057.05        | ml            | 05/26/06 12:30 | 06/09/06   | 15481      | Sec         | U           |
| LA-140       | 2007 | -5.60E+00     | 7.46E+00            | 1.15E+01 | pCi/L |       | 3057.05        | ml            | 05/26/06 12:30 | 06/09/06   | 15481      | Sec         | U           |

Sample ID: WG-ZN-MW-ZN-02L-052606-DS-06 Matrix: Ground Water (WG)

Collect Start: 05/26/2006 12:30

Station: Volume:

Collect Stop: % Moisture:

Description: Receive Date: 06/02/2006

LIMS Number: L28833-12

Flag Values  
U = Compound/Analyte not detected or less than 3 sigma  
+ = Activity concentration exceeds MDC and 3 sigma; peak identified (gamma only)  
U\* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma  
High = Activity concentration exceeds customer reporting value  
Spec = MDC exceeds customer technical specification  
L = Low recovery  
H = High recovery

No = Peak not identified in gamma spectrum  
Yes = Peak identified in gamma spectrum  
\*\*\*\* Results are reported on an as received basis unless otherwise noted

MDC - Minimum Detectable Concentration

# Report of Analysis

07/18/06 11:52

**L28833**

Conestoga-Rovers & Associates

EX001-3ESPZION-06



Kathy Shaw

| Radionuclide | SOP# | Activity Conc | Uncertainty 2 Sigma | MDC      | Units | Run # | Aliquot Volume | Aliquot Units | Reference Date | Count Date | Count Time | Count Units | Flag Values |
|--------------|------|---------------|---------------------|----------|-------|-------|----------------|---------------|----------------|------------|------------|-------------|-------------|
| H-3          | 2010 | 2.61E+02      | 1.24E+02            | 1.77E+02 | pCi/L |       | 10             | ml            | 05/26/06 11:02 | 06/09/06   | 60         | M           | +           |
| TOTAL SR     | 2018 | 6.78E-01      | 6.79E-01            | 1.25E+00 | pCi/L |       | 450            | ml            | 05/26/06 11:02 | 06/10/06   | 150        | M           | U           |
| MN-54        | 2007 | -8.72E-02     | 3.42E+00            | 5.67E+00 | pCi/L |       | 3002.48        | ml            | 05/26/06 11:02 | 06/09/06   | 11483      | Sec         | U           |
| CO-58        | 2007 | -1.35E+00     | 3.37E+00            | 5.33E+00 | pCi/L |       | 3002.48        | ml            | 05/26/06 11:02 | 06/09/06   | 11483      | Sec         | U           |
| FE-59        | 2007 | 4.25E+00      | 7.57E+00            | 1.31E+01 | pCi/L |       | 3002.48        | ml            | 05/26/06 11:02 | 06/09/06   | 11483      | Sec         | U           |
| CO-60        | 2007 | 3.65E+00      | 3.57E+00            | 6.32E+00 | pCi/L |       | 3002.48        | ml            | 05/26/06 11:02 | 06/09/06   | 11483      | Sec         | U           |
| ZN-65        | 2007 | 2.54E+00      | 7.23E+00            | 1.23E+01 | pCi/L |       | 3002.48        | ml            | 05/26/06 11:02 | 06/09/06   | 11483      | Sec         | U           |
| NB-95        | 2007 | 3.52E+00      | 3.44E+00            | 5.98E+00 | pCi/L |       | 3002.48        | ml            | 05/26/06 11:02 | 06/09/06   | 11483      | Sec         | U           |
| ZR-95        | 2007 | -4.17E+00     | 6.28E+00            | 9.84E+00 | pCi/L |       | 3002.48        | ml            | 05/26/06 11:02 | 06/09/06   | 11483      | Sec         | U           |
| CS-134       | 2007 | 3.58E+00      | 6.16E+00            | 6.16E+00 | pCi/L |       | 3002.48        | ml            | 05/26/06 11:02 | 06/09/06   | 11483      | Sec         | U           |
| CS-137       | 2007 | 7.41E-01      | 3.64E+00            | 5.95E+00 | pCi/L |       | 3002.48        | ml            | 05/26/06 11:02 | 06/09/06   | 11483      | Sec         | U           |
| BA-140       | 2007 | 1.05E+01      | 2.29E+01            | 3.84E+01 | pCi/L |       | 3002.48        | ml            | 05/26/06 11:02 | 06/09/06   | 11483      | Sec         | U           |
| LA-140       | 2007 | -2.50E+00     | 7.73E+00            | 1.23E+01 | pCi/L |       | 3002.48        | ml            | 05/26/06 11:02 | 06/09/06   | 11483      | Sec         | U           |

Sample ID: **WG-ZN-MW-ZN-01U-052606-DS-05** Matrix: Ground Water (WG)

Station: Collect Start: 05/26/2006 11:02

Description: Collect Stop: Volume: % Moisture:

LIMS Number: L28833-13 Receive Date: 06/02/2006

Flag Values  
 U = Compound/Analyte not detected or less than 3 sigma  
 + = Activity concentration exceeds MDC and 3 sigma; peak identified (gamma only)  
 U\* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma  
 High = Activity concentration exceeds customer reporting value  
 Spec = MDC exceeds customer technical specification  
 L = Low recovery  
 H = High recovery  
**Bolded text indicates reportable value.**

No = Peak not identified in gamma spectrum  
 Yes = Peak identified in gamma spectrum  
 \*\*\*\* Results are reported on an as received basis unless otherwise noted

MDC - Minimum Detectable Concentration

# Report of Analysis

07/18/06 11:52  
**L28833**

Conestoga-Rovers & Associates  
EX001-3ESPZION-06

Kathy Shaw

| Sample ID: <b>WG-ZN-MW-ZN-01L-052606-DS-07</b> |      |                 |                     |                 |       |       |                |               |                | Matrix: Ground Water |            | (WG)        |             |
|--|------|-----------------|---------------------|-----------------|-------|-------|----------------|---------------|----------------|----------------------|------------|-------------|-------------|
| Station: Collect Start: 05/26/2006 13:40       |      |                 |                     |                 |       |       |                |               |                | Volume:              |            |             |             |
| Description: Receive Date: 06/02/2006          |      |                 |                     |                 |       |       |                |               |                | % Moisture:          |            |             |             |
| LIMS Number: L28833-14                         |      |                 |                     |                 |       |       |                |               |                |                      |            |             |             |
| Radionuclide                                   | SOP# | Activity Conc   | Uncertainty 2 Sigma | MDC             | Units | Run # | Aliquot Volume | Aliquot Units | Reference Date | Count Date           | Count Time | Count Units | Flag Values |
| H-3  | 2010 | <b>5.86E+02</b> | 1.41E+02            | 1.76E+02        | pCi/L |       | 10             | ml            |                | 06/09/06             | 60         | M           | +           |
| TOTAL SR                                       | 2018 | 1.03E+00        | 7.27E-01            | <b>1.28E+00</b> | pCi/L |       | 450            | ml            | 05/26/06 13:40 | 06/10/06             | 150        | M           | U           |
| K-40   | 2007 | <b>5.30E+01</b> | 3.42E+01            | 3.75E+01        | pCi/L |       | 3024.01        | ml            | 05/26/06 13:40 | 06/09/06             | 14400      | Sec         | +           |
| MN-54  | 2007 | 1.38E+00        | 2.50E+00            | <b>4.26E+00</b> | pCi/L |       | 3024.01        | ml            | 05/26/06 13:40 | 06/09/06             | 14400      | Sec         | U           |
| CO-58  | 2007 | -2.57E+00       | 2.84E+00            | <b>4.46E+00</b> | pCi/L |       | 3024.01        | ml            | 05/26/06 13:40 | 06/09/06             | 14400      | Sec         | U           |
| FE-59  | 2007 | 8.62E+00        | 5.77E+00            | <b>1.04E+01</b> | pCi/L |       | 3024.01        | ml            | 05/26/06 13:40 | 06/09/06             | 14400      | Sec         | U           |
| CO-60  | 2007 | 1.86E+00        | 2.44E+00            | <b>4.23E+00</b> | pCi/L |       | 3024.01        | ml            | 05/26/06 13:40 | 06/09/06             | 14400      | Sec         | U           |
| ZN-65  | 2007 | 6.08E+00        | 5.58E+00            | <b>9.85E+00</b> | pCi/L |       | 3024.01        | ml            | 05/26/06 13:40 | 06/09/06             | 14400      | Sec         | U           |
| NB-95  | 2007 | 1.54E+00        | 2.72E+00            | <b>4.65E+00</b> | pCi/L |       | 3024.01        | ml            | 05/26/06 13:40 | 06/09/06             | 14400      | Sec         | U           |
| ZR-95  | 2007 | -1.90E+00       | 4.93E+00            | <b>7.81E+00</b> | pCi/L |       | 3024.01        | ml            | 05/26/06 13:40 | 06/09/06             | 14400      | Sec         | U           |
| CS-134   | 2007 | 7.77E+00        | 5.91E+00            | <b>5.13E+00</b> | pCi/L |       | 3024.01        | ml            | 05/26/06 13:40 | 06/09/06             | 14400      | Sec         | U           |
| CS-137   | 2007 | 1.85E+00        | 2.60E+00            | <b>4.42E+00</b> | pCi/L |       | 3024.01        | ml            | 05/26/06 13:40 | 06/09/06             | 14400      | Sec         | U           |
| BA-140   | 2007 | -7.65E+00       | 1.76E+01            | <b>2.86E+01</b> | pCi/L |       | 3024.01        | ml            | 05/26/06 13:40 | 06/09/06             | 14400      | Sec         | U           |
| LA-140   | 2007 | 5.00E+00        | 5.74E+00            | <b>1.01E+01</b> | pCi/L |       | 3024.01        | ml            | 05/26/06 13:40 | 06/09/06             | 14400      | Sec         | U           |
| AC-228   | 2007 | <b>3.52E+01</b> | 1.03E+01            | 1.45E+01        | pCi/L |       | 3024.01        | ml            | 05/26/06 13:40 | 06/09/06             | 14400      | Sec         | +           |

Flag Values  
 U = Compound/Analyte not detected or less than 3 sigma  
 + = Activity concentration exceeds MDC and 3 sigma; peak identified (gamma only)  
 U\* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma  
 High = Activity concentration exceeds customer reporting value  
 Spec = MDC exceeds customer technical specification  
 L = Low recovery  
 H = High recovery

No = Peak not identified in gamma spectrum  
 Yes = Peak identified in gamma spectrum  
 \*\*\*\* Results are reported on an as received basis unless otherwise noted

MDC - Minimum Detectable Concentration

# Report of Analysis

07/18/06 11:52

**L28833**

Conestoga-Rovers & Associates

EX001-3ESPZION-06

Kathy Shaw

| Radionuclide | SOP# | Activity Conc | Uncertainty 2 Sigma | MDC      | Units | Run # | Aliquot Volume | Aliquot Units | Reference Date | Count Date | Count Time | Count Units | Flag Values |
|--------------|------|---------------|---------------------|----------|-------|-------|----------------|---------------|----------------|------------|------------|-------------|-------------|
| H-3          | 2010 | -2.95E+01     | 7.87E+01            | 1.33E+02 | pCi/L |       | 10             | ml            |                | 06/09/06   | 60         | M           | U           |
| TOTAL SR     | 2018 | 1.08E+00      | 8.82E-01            | 1.58E+00 | pCi/L |       | 450            | ml            | 05/26/06 14:48 | 06/10/06   | 150        | M           | U           |
| MN-54        | 2007 | 7.46E-01      | 2.35E+00            | 3.95E+00 | pCi/L |       | 3045.16        | ml            | 05/26/06 14:48 | 06/09/06   | 14592      | Sec         | U           |
| CO-58        | 2007 | -2.43E+00     | 2.65E+00            | 4.09E+00 | pCi/L |       | 3045.16        | ml            | 05/26/06 14:48 | 06/09/06   | 14592      | Sec         | U           |
| FE-59        | 2007 | -7.20E-01     | 5.38E+00            | 8.80E+00 | pCi/L |       | 3045.16        | ml            | 05/26/06 14:48 | 06/09/06   | 14592      | Sec         | U           |
| CO-60        | 2007 | 1.06E+00      | 2.25E+00            | 3.86E+00 | pCi/L |       | 3045.16        | ml            | 05/26/06 14:48 | 06/09/06   | 14592      | Sec         | U           |
| ZN-65        | 2007 | -3.15E+00     | 6.67E+00            | 8.76E+00 | pCi/L |       | 3045.16        | ml            | 05/26/06 14:48 | 06/09/06   | 14592      | Sec         | U           |
| NB-95        | 2007 | 5.26E-01      | 2.60E+00            | 4.36E+00 | pCi/L |       | 3045.16        | ml            | 05/26/06 14:48 | 06/09/06   | 14592      | Sec         | U           |
| ZR-95        | 2007 | -4.54E+00     | 4.58E+00            | 7.08E+00 | pCi/L |       | 3045.16        | ml            | 05/26/06 14:48 | 06/09/06   | 14592      | Sec         | U           |
| CS-134       | 2007 | 3.02E+00      | 3.37E+00            | 4.28E+00 | pCi/L |       | 3045.16        | ml            | 05/26/06 14:48 | 06/09/06   | 14592      | Sec         | U           |
| CS-137       | 2007 | 1.45E+00      | 2.54E+00            | 4.28E+00 | pCi/L |       | 3045.16        | ml            | 05/26/06 14:48 | 06/09/06   | 14592      | Sec         | U           |
| BA-140       | 2007 | 8.09E+00      | 1.61E+01            | 2.73E+01 | pCi/L |       | 3045.16        | ml            | 05/26/06 14:48 | 06/09/06   | 14592      | Sec         | U           |
| LA-140       | 2007 | -2.86E+00     | 5.64E+00            | 8.73E+00 | pCi/L |       | 3045.16        | ml            | 05/26/06 14:48 | 06/09/06   | 14592      | Sec         | U           |

Sample ID: **WG-ZN-MW-ZN-09-052606-DS-08** Matrix: Ground Water (WG)

Station: Collect Start: 05/26/2006 14:48

Collect Stop: 06/02/2006

Description: Volume: % Moisture:

LIMS Number: L28833-15

Flag Values  
 U = Compound/Analyte not detected or less than 3 sigma  
 + = Activity concentration exceeds MDC and 3 sigma; peak identified (gamma only)  
 U\* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma  
 High = Activity concentration exceeds customer reporting value  
 Spec = MDC exceeds customer technical specification  
 L = Low recovery  
 H = High recovery

No = Peak not identified in gamma spectrum  
 Yes = Peak identified in gamma spectrum  
 \*\*\*\* Results are reported on an as received basis unless otherwise noted

MDC - Minimum Detectable Concentration



# Report of Analysis

07/18/06 11:52

**L28833**

Conestoga-Rovers & Associates

EX001-3ESPZION-06

Kathy Shaw

| Station:                                      | Matrix:      | (WG)          |                     |                 |       |       |                |               |                |            |            |             |             |
|---|--------------|---------------|---------------------|-----------------|-------|-------|----------------|---------------|----------------|------------|------------|-------------|-------------|
| Sample ID: <b>WG-ZN-MW-ZN-09-052606-DS-09</b> | Ground Water |               |                     |                 |       |       |                |               |                |            |            |             |             |
| Station:                                      | Volume:      |               |                     |                 |       |       |                |               |                |            |            |             |             |
| Description:                                  | % Moisture:  |               |                     |                 |       |       |                |               |                |            |            |             |             |
| LIMS Number: L28833-16                        |              |               |                     |                 |       |       |                |               |                |            |            |             |             |
| Collect Start: 05/26/2006 15:10               |              |               |                     |                 |       |       |                |               |                |            |            |             |             |
| Collect Stop:                                 |              |               |                     |                 |       |       |                |               |                |            |            |             |             |
| Receive Date: 06/02/2006                      |              |               |                     |                 |       |       |                |               |                |            |            |             |             |
| Radionuclide                                  | SOP#         | Activity Conc | Uncertainty 2 Sigma | MDC             | Units | Run # | Aliquot Volume | Aliquot Units | Reference Date | Count Date | Count Time | Count Units | Flag Values |
| H-3   | 2010         | -1.09E+01     | 1.07E+02            | <b>1.77E+02</b> | pCi/L |       | 10             | ml            |                | 06/09/06   | 60         | M           | U           |
| TOTAL SR                                      | 2018         | 5.19E-01      | 8.23E-01            | <b>1.55E+00</b> | pCi/L |       | 450            | ml            | 05/26/06 15:10 | 06/10/06   | 150        | M           | U           |
| MIN-54  | 2007         | 1.12E+00      | 2.71E+00            | <b>4.81E+00</b> | pCi/L |       | 3037.16        | ml            | 05/26/06 15:10 | 06/09/06   | 13307      | Sec         | U           |
| CO-58   | 2007         | -2.66E+00     | 3.07E+00            | <b>5.02E+00</b> | pCi/L |       | 3037.16        | ml            | 05/26/06 15:10 | 06/09/06   | 13307      | Sec         | U           |
| FE-59   | 2007         | 4.01E-02      | 5.86E+00            | <b>1.03E+01</b> | pCi/L |       | 3037.16        | ml            | 05/26/06 15:10 | 06/09/06   | 13307      | Sec         | U           |
| CO-60   | 2007         | -3.91E-01     | 2.54E+00            | <b>4.44E+00</b> | pCi/L |       | 3037.16        | ml            | 05/26/06 15:10 | 06/09/06   | 13307      | Sec         | U           |
| ZN-65   | 2007         | 1.16E+00      | 5.79E+00            | <b>1.03E+01</b> | pCi/L |       | 3037.16        | ml            | 05/26/06 15:10 | 06/09/06   | 13307      | Sec         | U           |
| NB-95   | 2007         | 1.94E-01      | 3.09E+00            | <b>5.37E+00</b> | pCi/L |       | 3037.16        | ml            | 05/26/06 15:10 | 06/09/06   | 13307      | Sec         | U           |
| ZR-95   | 2007         | 1.74E+00      | 5.63E+00            | <b>9.91E+00</b> | pCi/L |       | 3037.16        | ml            | 05/26/06 15:10 | 06/09/06   | 13307      | Sec         | U           |
| CS-134  | 2007         | -3.59E-01     | 3.09E+00            | <b>5.31E+00</b> | pCi/L |       | 3037.16        | ml            | 05/26/06 15:10 | 06/09/06   | 13307      | Sec         | U           |
| CS-137  | 2007         | -5.27E-01     | 2.92E+00            | <b>5.02E+00</b> | pCi/L |       | 3037.16        | ml            | 05/26/06 15:10 | 06/09/06   | 13307      | Sec         | U           |
| BA-140  | 2007         | 4.36E+00      | 2.00E+01            | <b>3.43E+01</b> | pCi/L |       | 3037.16        | ml            | 05/26/06 15:10 | 06/09/06   | 13307      | Sec         | U           |
| LA-140  | 2007         | 1.47E+00      | 6.02E+00            | <b>1.11E+01</b> | pCi/L |       | 3037.16        | ml            | 05/26/06 15:10 | 06/09/06   | 13307      | Sec         | U           |

Flag Values  
 U = Compound/Analyte not detected or less than 3 sigma  
 + = Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)  
 U\* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma  
 High = Activity concentration exceeds customer reporting value  
 Spec = MDC exceeds customer technical specification  
 L = Low recovery  
 H = High recovery

**Flag Values**  
 U = Peak not identified in gamma spectrum  
 + = Peak identified in gamma spectrum  
 U\* = Results are reported on an as received basis unless otherwise noted  
 MDC - Minimum Detectable Concentration

Report of Analysis  
07/18/06 11:52

L28833

Conestoga-Rovers & Associates  
EX001-3ESPZION-06

Kathy Shaw

| Radionuclide | SOP# | Activity Conc | Uncertainty 2 Sigma | MDC      | Units | Run # | Aliquot Volume | Aliquot Units | Reference Date | Count Date | Count Time | Count Units | Flag Values |
|--------------|------|---------------|---------------------|----------|-------|-------|----------------|---------------|----------------|------------|------------|-------------|-------------|
| H-3          | 2010 | -2.36E+01     | 1.04E+02            | 1.74E+02 | pCi/L |       | 10             | ml            |                | 06/09/06   | 60         | M           | U           |
| TOTAL SR     | 2018 | 9.89E-01      | 6.85E-01            | 1.21E+00 | pCi/L |       | 450            | ml            | 05/26/06 08:45 | 06/10/06   | 150        | M           | U           |
| MN-54        | 2007 | 5.91E-01      | 3.17E+00            | 5.22E+00 | pCi/L |       | 3063.8         | ml            | 05/26/06 08:45 | 06/09/06   | 15361      | Sec         | U           |
| CO-58        | 2007 | 2.60E+00      | 3.34E+00            | 5.71E+00 | pCi/L |       | 3063.8         | ml            | 05/26/06 08:45 | 06/09/06   | 15361      | Sec         | U           |
| FE-59        | 2007 | 9.82E-01      | 7.06E+00            | 1.17E+01 | pCi/L |       | 3063.8         | ml            | 05/26/06 08:45 | 06/09/06   | 15361      | Sec         | U           |
| CO-60        | 2007 | -1.49E+00     | 2.93E+00            | 4.62E+00 | pCi/L |       | 3063.8         | ml            | 05/26/06 08:45 | 06/09/06   | 15361      | Sec         | U           |
| ZN-65        | 2007 | -9.87E-01     | 6.62E+00            | 1.07E+01 | pCi/L |       | 3063.8         | ml            | 05/26/06 08:45 | 06/09/06   | 15361      | Sec         | U           |
| NB-95        | 2007 | 3.26E+00      | 3.37E+00            | 5.82E+00 | pCi/L |       | 3063.8         | ml            | 05/26/06 08:45 | 06/09/06   | 15361      | Sec         | U           |
| ZR-95        | 2007 | -2.29E+00     | 6.14E+00            | 9.87E+00 | pCi/L |       | 3063.8         | ml            | 05/26/06 08:45 | 06/09/06   | 15361      | Sec         | U           |
| CS-134       | 2007 | -4.89E-01     | 3.40E+00            | 5.48E+00 | pCi/L |       | 3063.8         | ml            | 05/26/06 08:45 | 06/09/06   | 15361      | Sec         | U           |
| CS-137       | 2007 | -1.39E+00     | 3.28E+00            | 5.30E+00 | pCi/L |       | 3063.8         | ml            | 05/26/06 08:45 | 06/09/06   | 15361      | Sec         | U           |
| BA-140       | 2007 | -1.35E+01     | 2.32E+01            | 3.68E+01 | pCi/L |       | 3063.8         | ml            | 05/26/06 08:45 | 06/09/06   | 15361      | Sec         | U           |
| LA-140       | 2007 | 4.81E-01      | 7.01E+00            | 1.17E+01 | pCi/L |       | 3063.8         | ml            | 05/26/06 08:45 | 06/09/06   | 15361      | Sec         | U           |

Sample ID: WG-ZION-MW-6U-052606-MS-011  
Station: Matrix: Ground Water (WG)

Description: Volume:

LIMS Number: L28833-17 % Moisture:

Collect Start: 05/26/2006 08:45

Collect Stop:

Receive Date: 06/02/2006

Flag Values  
U = Compound/Analyte not detected or less than 3 sigma  
+ = Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)  
U\* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma  
High = Activity concentration exceeds customer reporting value  
Spec = MDC exceeds customer technical specification  
L = Low recovery  
H = High recovery

No = Peak not identified in gamma spectrum  
Yes = Peak identified in gamma spectrum  
\*\*\*\* Results are reported on an as received basis unless otherwise noted

MDC - Minimum Detectable Concentration





**L28833**

Conestoga-Rovers & Associates  
 EX001-3ESPZION-06

Kathy Shaw

| Radionuclide | SOP# | Activity Conc   | Uncertainty 2 Sigma | MDC             | Units | Run # | Aliquot Volume | Aliquot Units | Reference Date | Count Date | Count Time | Count Units | Flag Values |
|--------------|------|-----------------|---------------------|-----------------|-------|-------|----------------|---------------|----------------|------------|------------|-------------|-------------|
| H-3          | 2010 | -1.29E+01       | 1.05E+02            | <b>1.74E+02</b> | pCi/L |       | 10             | ml            |                | 06/09/06   | 60         | M           | U           |
| TOTAL SR     | 2018 | <b>1.93E+00</b> | 7.99E-01            | 1.30E+00        | pCi/L |       | 450            | ml            | 05/26/06 16:00 | 06/10/06   | 150        | M           | +           |
| MN-54        | 2007 | 1.78E+00        | 2.52E+00            | <b>4.33E+00</b> | pCi/L |       | 3004.12        | ml            | 05/26/06 16:00 | 06/09/06   | 14433      | Sec         | U           |
| CO-58        | 2007 | -7.30E-04       | 2.61E+00            | <b>4.33E+00</b> | pCi/L |       | 3004.12        | ml            | 05/26/06 16:00 | 06/09/06   | 14433      | Sec         | U           |
| FE-59        | 2007 | 1.20E+00        | 5.53E+00            | <b>9.30E+00</b> | pCi/L |       | 3004.12        | ml            | 05/26/06 16:00 | 06/09/06   | 14433      | Sec         | U           |
| CO-60        | 2007 | -5.85E-01       | 2.52E+00            | <b>4.04E+00</b> | pCi/L |       | 3004.12        | ml            | 05/26/06 16:00 | 06/09/06   | 14433      | Sec         | U           |
| ZN-65        | 2007 | -1.34E+00       | 5.28E+00            | <b>8.58E+00</b> | pCi/L |       | 3004.12        | ml            | 05/26/06 16:00 | 06/09/06   | 14433      | Sec         | U           |
| NB-95        | 2007 | 1.30E+00        | 2.77E+00            | <b>4.72E+00</b> | pCi/L |       | 3004.12        | ml            | 05/26/06 16:00 | 06/09/06   | 14433      | Sec         | U           |
| ZR-95        | 2007 | -4.26E+00       | 4.81E+00            | <b>7.37E+00</b> | pCi/L |       | 3004.12        | ml            | 05/26/06 16:00 | 06/09/06   | 14433      | Sec         | U           |
| CS-134       | 2007 | -1.15E+00       | 2.82E+00            | <b>4.57E+00</b> | pCi/L |       | 3004.12        | ml            | 05/26/06 16:00 | 06/09/06   | 14433      | Sec         | U           |
| CS-137       | 2007 | -8.16E-01       | 2.66E+00            | <b>4.28E+00</b> | pCi/L |       | 3004.12        | ml            | 05/26/06 16:00 | 06/09/06   | 14433      | Sec         | U           |
| BA-140       | 2007 | 1.18E+01        | 1.75E+01            | <b>3.01E+01</b> | pCi/L |       | 3004.12        | ml            | 05/26/06 16:00 | 06/09/06   | 14433      | Sec         | U           |
| LA-140       | 2007 | -3.67E+00       | 6.17E+00            | <b>9.63E+00</b> | pCi/L |       | 3004.12        | ml            | 05/26/06 16:00 | 06/09/06   | 14433      | Sec         | U           |

Sample ID: **WG-ZION-MW-5U-052606-MS-017**  
 Station:  
 Description:  
 LIMS Number: L28833-20

Collect Start: 05/26/2006 16:00  
 Collect Stop:  
 Receive Date: 06/02/2006

Matrix: Ground Water  
 Volume:  
 % Moisture:

Flag Values  
 U = Compound/Analyte not detected or less than 3 sigma  
 + = Activity concentration exceeds MDC and 3 sigma; peak identified (gamma only)  
 U\* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma  
 High = Activity concentration exceeds customer reporting value  
 Spec = MDC exceeds customer technical specification  
 L = Low recovery  
 H = High recovery  
**Bolded text indicates reportable value.**

No = Peak not identified in gamma spectrum  
 Yes = Peak identified in gamma spectrum  
 \*\*\*\* Results are reported on an as received basis unless otherwise noted

MDC - Minimum Detectable Concentration

# QC Results Summary

# QC Summary Report for L28833

7/18/2006 4:29:02PM



H-3

## Method Blank Summary

| <u>TBE Sample ID</u> | <u>Radionuclide</u> | <u>Matrix</u> | <u>Count</u> | <u>Date/Time</u> | <u>Blank Result</u> | <u>Units</u> | <u>Qualifier</u> | <u>P/F</u> |
|----------------------|---------------------|---------------|--------------|------------------|---------------------|--------------|------------------|------------|
| WG4107-1             | H-3                 | WO            | 06/08/2006   | 21:15            | < 1.710E+00         | pCi/Total    | U                | P          |

## LCS Sample Summary

| <u>TBE Sample ID</u> | <u>Radionuclide</u> | <u>Matrix</u> | <u>Count</u> | <u>Date/Time</u> | <u>Spike Value</u> | <u>LCS Result</u> | <u>Units</u> | <u>Spike Recovery</u> | <u>Range</u> | <u>Qualifier</u> | <u>P/F</u> |
|----------------------|---------------------|---------------|--------------|------------------|--------------------|-------------------|--------------|-----------------------|--------------|------------------|------------|
| WG4107-2             | H-3                 | WO            | 06/08/2006   | 22:19            | 5.05E+002          | 4.580E+02         | pCi/Total    | 90.7                  | 70-130       | +                | P          |

Spike ID: 3H-041706-1  
Spike conc: 5.05E+002  
Spike Vol: 1.00E+000

## Duplicate Summary

| <u>TBE Sample ID</u> | <u>Radionuclide</u> | <u>Matrix</u> | <u>Count</u> | <u>Date/Time</u> | <u>Original Result</u> | <u>DUP Result</u> | <u>Units</u> | <u>RPD</u> | <u>Range</u> | <u>Qualifier</u> | <u>P/F</u> |
|----------------------|---------------------|---------------|--------------|------------------|------------------------|-------------------|--------------|------------|--------------|------------------|------------|
| WG4107-3<br>L28833-1 | H-3                 | WG            | 06/08/2006   | 22:38            | < 1.760E+02            | < 1.740E+02       | pCi/L        |            | <30          | **               | NE         |

+ Positive Result  
U Compound/analyte was analyzed, peak not identified and/or not detected above MDC  
\* < 5 times the MDC are not evaluated  
\*\* Nuclide not detected  
\*\*\* Spiking level < 5 times activity  
P Pass  
F Fail  
NE Not evaluated

# QC Summary Report for L28833

7/18/2006 4:29:02PM



L28833

H-3

Associated Samples for

WG4107

SAMPLENUM

CLIENTID

|           |                              |
|-----------|------------------------------|
| L28833-1  | WG-ZION-MW-4U-052406-MB-002  |
| L28833-2  | WG-ZION-MW-4L-052406-MB-004  |
| L28833-3  | WG-ZION-MW-7L-052506-MS-007  |
| L28833-4  | WG-ZION-MW-6L-052506-MS-009  |
| L28833-5  | WG-ZION-MW-8U-052406-MS-003  |
| L28833-6  | WG-ZION-MW-8L-052406-MS-001  |
| L28833-7  | WG-ZION-MW-7U-052406-MS-005  |
| L28833-8  | WG-ZN-MW-ZN-03U-052506-DS-01 |
| L28833-9  | WG-ZN-MW-ZN-03U-052506-DS-02 |
| L28833-10 | WG-ZN-MW-ZN-03L-052506-DS-03 |
| L28833-11 | WG-ZN-MW-ZN-02U-052606-DS-04 |
| L28833-12 | WG-ZN-MW-ZN-02L-052606-DS-06 |
| L28833-13 | WG-ZN-MW-ZN-01U-052606-DS-05 |
| L28833-14 | WG-ZN-MW-ZN-01L-052606-DS-07 |
| L28833-15 | WG-ZN-MW-ZN-09-052606-DS-08  |
| L28833-16 | WG-ZN-MW-ZN-09-052606-DS-09  |
| L28833-17 | WG-ZION-MW-6U-052606-MS-011  |
| L28833-18 | WG-ZION-MW-5L-052606-MS-013  |
| L28833-19 | WS-ZION-LAKE-052606-MS-015   |
| L28833-20 | WG-ZION-MW-5U-052606-MS-017  |

+ Positive Result  
 U Compound/analyte was analyzed, peak not identified and/or not detected above MDC  
 \* < 5 times the MDC are not evaluated  
 \*\* Nuclide not detected  
 \*\*\* Spiking level < 5 times activity  
 P Pass  
 F Fail  
 NE Not evaluated



# QC Summary Report for L28833

7/18/2006 4:29:02PM



## TOTAL SR

### Method Blank Summary

| <u>TBE Sample ID</u> | <u>Radionuclide</u> | <u>Matrix</u> | <u>Count Date/Time</u> | <u>Blank Result</u> | <u>Units</u> | <u>Qualifier</u> |
|----------------------|---------------------|---------------|------------------------|---------------------|--------------|------------------|
| WG4121-1             | TOTAL SR            | WO            | 06/11/2006 14:39       | < 6.730E-01         | pCi/Total    | U P              |

### LCS Sample Summary

| <u>TBE Sample ID</u> | <u>Radionuclide</u> | <u>Matrix</u> | <u>Count Date/Time</u> | <u>Spike Value</u> | <u>LCS Result</u> | <u>Units</u> | <u>Spike Recovery</u> | <u>Range</u> | <u>Qualifier</u> |
|----------------------|---------------------|---------------|------------------------|--------------------|-------------------|--------------|-----------------------|--------------|------------------|
| WG4121-2             | TOTAL SR            | WO            | 06/10/2006 18:17       | 5.84E+001          | 6.570E+01         | pCi/Total    | 112.6                 | 70-130       | + P              |

Spike ID: 90SR-011905  
 Spike conc: 2.34E+002  
 Spike Vol: 2.50E-001

### Duplicate Summary

| <u>TBE Sample ID</u> | <u>Radionuclide</u> | <u>Matrix</u> | <u>Count Date/Time</u> | <u>Original Result</u> | <u>DUP Result</u> | <u>Units</u> | <u>RPD</u> | <u>Range</u> | <u>Qualifier</u> |
|----------------------|---------------------|---------------|------------------------|------------------------|-------------------|--------------|------------|--------------|------------------|
| WG4121-3<br>L28833-1 | TOTAL SR            | WG            | 06/10/2006 18:17       | < 1.390E+00            | < 1.230E+00       | pCi/L        |            | <30          | ** NE            |

+ Positive Result  
 U Compound/analyte was analyzed, peak not identified and/or not detected above MDC  
 \* < 5 times the MDC are not evaluated  
 \*\* Nuclide not detected  
 \*\*\* Spiking level < 5 times activity  
 P Pass  
 F Fail  
 NE Not evaluated

# Raw Data

| Work Order: L28833                                  | Customer: ExeLon           |                     |                 |                    |                   |              |                    |                 |            |              |                 |            |              |             |                         |         |
|---|----------------------------|---------------------|-----------------|--------------------|-------------------|--------------|--------------------|-----------------|------------|--------------|-----------------|------------|--------------|-------------|-------------------------|---------|
| Nuclide: H-3  | Project: EX001-3ESFZION-06 |                     |                 |                    |                   |              |                    |                 |            |              |                 |            |              |             |                         |         |
| Sample ID   | Run Analysis               | Reference Date/time | Volume/ Aliquot | Scavenge Date/time | Milking Date/time | Mount Weight | Recovery Date/time | Count Date/time | Counter ID | Total counts | Sample dt (min) | Bkg counts | Bkg dt (min) | Eff. Factor | Decay & Ingrowth Factor | Analyst |
| L28833-1  | H-3                        |                     | 10 ml           |                    |                   | 0            | 08-jun-06 23:42    | 08-jun-06 23:42 | LS7        | 98           | 60              | 1.82       | 60           | .208        |                         | SO      |
| WG-ZION-MW-4U-052406-MB-002                         |                            |                     |                 |                    |                   |              |                    |                 |            |              |                 |            |              |             |                         |         |
| Activity: -3.91E+01 Error: 1.04E+02 MDC: 1.76E+02 * |                            |                     |                 |                    |                   |              |                    |                 |            |              |                 |            |              |             |                         |         |
| L28833-2  | H-3                        |                     | 10 ml           |                    |                   | 0            | 09-jun-06 00:46    | 09-jun-06 00:46 | LS7        | 118          | 60              | 1.82       | 60           | .216        |                         | SO      |
| WG-ZION-MW-4L-052406-MB-004                         |                            |                     |                 |                    |                   |              |                    |                 |            |              |                 |            |              |             |                         |         |
| Activity: 2.93E+01 Error: 1.05E+02 MDC: 1.7E+02 *   |                            |                     |                 |                    |                   |              |                    |                 |            |              |                 |            |              |             |                         |         |
| L28833-3  | H-3                        |                     | 10 ml           |                    |                   | 0            | 09-jun-06 01:50    | 09-jun-06 01:50 | LS7        | 103          | 60              | 1.82       | 60           | .219        |                         | SO      |
| WG-ZION-MW-7L-052506-MS-007                         |                            |                     |                 |                    |                   |              |                    |                 |            |              |                 |            |              |             |                         |         |
| Activity: -2.27E+01 Error: 1E+02 MDC: 1.68E+02 *    |                            |                     |                 |                    |                   |              |                    |                 |            |              |                 |            |              |             |                         |         |
| L28833-4  | H-3                        |                     | 10 ml           |                    |                   | 0            | 09-jun-06 02:54    | 09-jun-06 02:54 | LS7        | 131          | 60              | 1.82       | 60           | .212        |                         | SO      |
| WG-ZION-MW-6L-052506-MS-009                         |                            |                     |                 |                    |                   |              |                    |                 |            |              |                 |            |              |             |                         |         |
| Activity: 7.65E+01 Error: 1.1E+02 MDC: 1.73E+02 *   |                            |                     |                 |                    |                   |              |                    |                 |            |              |                 |            |              |             |                         |         |
| L28833-5  | H-3                        |                     | 10 ml           |                    |                   | 0            | 09-jun-06 03:58    | 09-jun-06 03:58 | LS7        | 116          | 60              | 1.82       | 60           | .206        |                         | SO      |
| WG-ZION-MW-8U-052406-MS-003                         |                            |                     |                 |                    |                   |              |                    |                 |            |              |                 |            |              |             |                         |         |
| Activity: 2.41E+01 Error: 1.09E+02 MDC: 1.78E+02 *  |                            |                     |                 |                    |                   |              |                    |                 |            |              |                 |            |              |             |                         |         |
| L28833-6  | H-3                        |                     | 10 ml           |                    |                   | 0            | 09-jun-06 05:01    | 09-jun-06 05:01 | LS7        | 151          | 60              | 1.82       | 60           | .216        |                         | SO      |
| WG-ZION-MW-8L-052406-MS-001                         |                            |                     |                 |                    |                   |              |                    |                 |            |              |                 |            |              |             |                         |         |
| Activity: 1.46E+02 Error: 1.12E+02 MDC: 1.7E+02 *   |                            |                     |                 |                    |                   |              |                    |                 |            |              |                 |            |              |             |                         |         |
| L28833-7  | H-3                        |                     | 10 ml           |                    |                   | 0            | 09-jun-06 06:05    | 09-jun-06 06:05 | LS7        | 112          | 60              | 1.82       | 60           | .215        |                         | SO      |
| WG-ZION-MW-7U-052406-MS-005                         |                            |                     |                 |                    |                   |              |                    |                 |            |              |                 |            |              |             |                         |         |
| Activity: 1.05E+01 Error: 1.04E+02 MDC: 1.71E+02 *  |                            |                     |                 |                    |                   |              |                    |                 |            |              |                 |            |              |             |                         |         |
| L28833-8  | H-3                        |                     | 10 ml           |                    |                   | 0            | 09-jun-06 07:09    | 09-jun-06 07:09 | LS7        | 141          | 60              | 1.82       | 60           | .211        |                         | SO      |
| WG-ZN-MW-ZN-03U-052506-DS-01                        |                            |                     |                 |                    |                   |              |                    |                 |            |              |                 |            |              |             |                         |         |
| Activity: 1.13E+02 Error: 1.13E+02 MDC: 1.74E+02 *  |                            |                     |                 |                    |                   |              |                    |                 |            |              |                 |            |              |             |                         |         |
| L28833-9  | H-3                        |                     | 10 ml           |                    |                   | 0            | 09-jun-06 08:13    | 09-jun-06 08:13 | LS7        | 142          | 60              | 1.82       | 60           | .222        |                         | SO      |
| WG-ZN-MW-ZN-03U-052506-DS-02                        |                            |                     |                 |                    |                   |              |                    |                 |            |              |                 |            |              |             |                         |         |
| Activity: 1.13E+02 Error: 1.08E+02 MDC: 1.66E+02 *  |                            |                     |                 |                    |                   |              |                    |                 |            |              |                 |            |              |             |                         |         |
| L28833-10   | H-3                        |                     | 10 ml           |                    |                   | 0            | 09-jun-06 09:17    | 09-jun-06 09:17 | LS7        | 152          | 60              | 1.82       | 60           | .226        |                         | SO      |
| WG-ZN-MW-ZN-03L-052506-DS-03                        |                            |                     |                 |                    |                   |              |                    |                 |            |              |                 |            |              |             |                         |         |
| Activity: 1.42E+02 Error: 1.07E+02 MDC: 1.62E+02 *  |                            |                     |                 |                    |                   |              |                    |                 |            |              |                 |            |              |             |                         |         |
| L28833-11   | H-3                        |                     | 10 ml           |                    |                   | 0            | 09-jun-06 10:21    | 09-jun-06 10:21 | LS7        | 106          | 60              | 1.82       | 60           | .218        |                         | L28833  |
| WG-ZN-MW-ZN-02U-052606-DS-04                        |                            |                     |                 |                    |                   |              |                    |                 |            |              |                 |            |              |             |                         |         |
| Activity: -1.25E+01 Error: 1.01E+02 MDC: 1.68E+02 * |                            |                     |                 |                    |                   |              |                    |                 |            |              |                 |            |              |             |                         |         |
| L28833-12   | H-3                        |                     | 10 ml           |                    |                   | 0            | 09-jun-06 11:24    | 09-jun-06 11:24 | LS7        | 77           | 60              | 1.82       | 60           | .212        |                         | SO      |
| WG-ZN-MW-ZN-02L-052606-DS-06                        |                            |                     |                 |                    |                   |              |                    |                 |            |              |                 |            |              |             |                         |         |
| Activity: -1.15E+02 Error: 9.68E+01 MDC: 1.73E+02 * |                            |                     |                 |                    |                   |              |                    |                 |            |              |                 |            |              |             |                         |         |

| Work Order:   | L28833       |                     | Customer:       | Eselon             |                   |              |                    |                 |            |              |                 |            |              |             |                         |         |
|---|--------------|---------------------|-----------------|--------------------|-------------------|--------------|--------------------|-----------------|------------|--------------|-----------------|------------|--------------|-------------|-------------------------|---------|
| Nuclide:  | H-3          |                     | Project:        | EX001-3ESPZION-06  |                   |              |                    |                 |            |              |                 |            |              |             |                         |         |
| Sample ID   | Run Analysis | Reference Date/time | Volume/ Aliquot | Scavenge Date/time | Milking Date/time | Mount Weight | Recovery Date/time | Count Date/time | Counter ID | Total counts | Sample dt (min) | Bkg counts | Bkg dt (min) | Eff. Factor | Decay & Ingrowth Factor | Analyst |
| L28833-13   | H-3          |                     | 10 ml           |                    |                   | 0            |                    | 09-jun-06 12:28 | LS7        | 181          | 60              | 1.82       | 60           | .207        |                         | SO      |
| Activity: 2.61E+02 * Error: 1.24E+02 MDC: 1.77E+02  |              |                     |                 |                    |                   |              |                    |                 |            |              |                 |            |              |             |                         |         |
| L28833-14   | H-3          |                     | 10 ml           |                    |                   | 0            |                    | 09-jun-06 13:31 | LS7        | 271          | 60              | 1.82       | 60           | .208        |                         | SO      |
| Activity: 5.86E+02 * Error: 1.41E+02 MDC: 1.76E+02  |              |                     |                 |                    |                   |              |                    |                 |            |              |                 |            |              |             |                         |         |
| L28833-15   | H-3          |                     | 10 ml           |                    |                   | 0            |                    | 09-jun-06 14:35 | LS7        | 98           | 60              | 1.82       | 60           | .276        |                         | SO      |
| Activity: -2.95E+01 Error: 7.87E+01 MDC: 1.33E+02 * |              |                     |                 |                    |                   |              |                    |                 |            |              |                 |            |              |             |                         |         |
| L28833-16   | H-3          |                     | 10 ml           |                    |                   | 0            |                    | 09-jun-06 15:39 | LS7        | 106          | 60              | 1.82       | 60           | .207        |                         | SO      |
| Activity: -1.09E+01 Error: 1.07E+02 MDC: 1.77E+02 * |              |                     |                 |                    |                   |              |                    |                 |            |              |                 |            |              |             |                         |         |
| L28833-17   | H-3          |                     | 10 ml           |                    |                   | 0            |                    | 09-jun-06 16:42 | LS7        | 103          | 60              | 1.82       | 60           | .211        |                         | SO      |
| Activity: -2.36E+01 Error: 1.04E+02 MDC: 1.74E+02 * |              |                     |                 |                    |                   |              |                    |                 |            |              |                 |            |              |             |                         |         |
| L28833-18   | H-3          |                     | 10 ml           |                    |                   | 0            |                    | 09-jun-06 17:46 | LS7        | 111          | 60              | 1.82       | 60           | .208        |                         | SO      |
| Activity: 6.5E+00 Error: 1.07E+02 MDC: 1.76E+02 *   |              |                     |                 |                    |                   |              |                    |                 |            |              |                 |            |              |             |                         |         |
| L28833-19   | H-3          |                     | 10 ml           |                    |                   | 0            |                    | 09-jun-06 18:50 | LS7        | 106          | 60              | 1.82       | 60           | .211        |                         | SO      |
| Activity: -1.29E+01 Error: 1.05E+02 MDC: 1.74E+02 * |              |                     |                 |                    |                   |              |                    |                 |            |              |                 |            |              |             |                         |         |
| L28833-20   | H-3          |                     | 10 ml           |                    |                   | 0            |                    | 09-jun-06 19:54 | LS7        | 106          | 60              | 1.82       | 60           | .211        |                         | SO      |
| Activity: -1.29E+01 Error: 1.05E+02 MDC: 1.74E+02 * |              |                     |                 |                    |                   |              |                    |                 |            |              |                 |            |              |             |                         |         |

Work Order: L28833 Customer: Exelon

Nuclide: SR-90 (FAST) Project: EX001-3ESPZION-06

| Sample ID                    | Run Analysis    | Reference          | Volume/<br>Aliquot | Scavenge<br>Date/time | Milking<br>Date/time | Mount<br>Weight | Recovery | Date/time          | Count | Counter<br>ID | Total<br>counts | Sample<br>dt (min) | Bkg<br>counts | Bkg<br>dt (min) | Eff. | Ingrrowth<br>Factor | Decay & |  |
|------------------------------|-----------------|--------------------|--------------------|-----------------------|----------------------|-----------------|----------|--------------------|-------|---------------|-----------------|--------------------|---------------|-----------------|------|---------------------|---------|--|
| L28833-1                     | TOTAL SR        | 24-may-06<br>00:00 | 450 ml             | 10-jun-06<br>12:00    | 10-jun-06<br>17:17   | 0               | 69.35    | 10-jun-06<br>17:17 | 150   | X1A           | 134             | 150                | 308           | 400             | .346 | .999                | LCB     |  |
| WG-ZION-MW-4U-052406-MB-002  |                 |                    |                    |                       |                      |                 |          |                    |       |               |                 |                    |               |                 |      |                     |         |  |
| Activity: 5.15E-01           | Error: 7.41E-01 | MDC: 1.39E+00      |                    |                       |                      |                 |          |                    |       |               |                 |                    |               |                 |      |                     |         |  |
| L28833-2                     | TOTAL SR        | 24-may-06<br>13:45 | 450 ml             | 10-jun-06<br>12:00    | 10-jun-06<br>17:17   | 0               | 111.56   | 10-jun-06<br>17:17 | 150   | X1B           | 160             | 150                | 342           | 400             | .343 | .999                | LCB     |  |
| WG-ZION-MW-4L-052406-MB-004  |                 |                    |                    |                       |                      |                 |          |                    |       |               |                 |                    |               |                 |      |                     |         |  |
| Activity: 5.54E-01           | Error: 5.03E-01 | MDC: 9.2E-01       |                    |                       |                      |                 |          |                    |       |               |                 |                    |               |                 |      |                     |         |  |
| L28833-3                     | TOTAL SR        | 25-may-06<br>09:15 | 450 ml             | 10-jun-06<br>12:00    | 10-jun-06<br>17:17   | 0               | 80.11    | 10-jun-06<br>17:17 | 150   | X1D           | 134             | 150                | 312           | 400             | .344 | .999                | LCB     |  |
| WG-ZION-MW-7L-052506-MS-007  |                 |                    |                    |                       |                      |                 |          |                    |       |               |                 |                    |               |                 |      |                     |         |  |
| Activity: 4.12E-01           | Error: 6.46E-01 | MDC: 1.22E+00      |                    |                       |                      |                 |          |                    |       |               |                 |                    |               |                 |      |                     |         |  |
| L28833-4                     | TOTAL SR        | 25-may-06<br>11:23 | 450 ml             | 10-jun-06<br>12:00    | 10-jun-06<br>17:17   | 0               | 75.81    | 10-jun-06<br>17:17 | 150   | X2A           | 170             | 150                | 264           | 400             | .354 | .999                | LCB     |  |
| WG-ZION-MW-6L-052506-MS-009  |                 |                    |                    |                       |                      |                 |          |                    |       |               |                 |                    |               |                 |      |                     |         |  |
| Activity: 1.77E+00           | Error: 7.16E-01 | MDC: 1.15E+00      |                    |                       |                      |                 |          |                    |       |               |                 |                    |               |                 |      |                     |         |  |
| L28833-5                     | TOTAL SR        | 24-may-06<br>11:35 | 450 ml             | 10-jun-06<br>12:00    | 10-jun-06<br>17:17   | 0               | 66.13    | 10-jun-06<br>17:17 | 150   | X2B           | 151             | 150                | 289           | 400             | .345 | .999                | LCB     |  |
| WG-ZION-MW-8U-052406-MS-003  |                 |                    |                    |                       |                      |                 |          |                    |       |               |                 |                    |               |                 |      |                     |         |  |
| Activity: 1.25E+00           | Error: 8.11E-01 | MDC: 1.42E+00      |                    |                       |                      |                 |          |                    |       |               |                 |                    |               |                 |      |                     |         |  |
| L28833-6                     | TOTAL SR        | 24-may-06<br>10:14 | 450 ml             | 10-jun-06<br>12:00    | 10-jun-06<br>17:17   | 0               | 79.30    | 10-jun-06<br>17:17 | 150   | X2C           | 167             | 150                | 277           | 400             | .344 | .999                | LCB     |  |
| WG-ZION-MW-8L-052406-MS-001  |                 |                    |                    |                       |                      |                 |          |                    |       |               |                 |                    |               |                 |      |                     |         |  |
| Activity: 1.55E+00           | Error: 7.03E-01 | MDC: 1.16E+00      |                    |                       |                      |                 |          |                    |       |               |                 |                    |               |                 |      |                     |         |  |
| L28833-7                     | TOTAL SR        | 24-may-06<br>14:35 | 450 ml             | 10-jun-06<br>12:00    | 10-jun-06<br>17:17   | 0               | 104.03   | 10-jun-06<br>17:17 | 150   | X2D           | 183             | 150                | 307           | 400             | .343 | .999                | LCB     |  |
| WG-ZION-MW-7U-052406-MS-005  |                 |                    |                    |                       |                      |                 |          |                    |       |               |                 |                    |               |                 |      |                     |         |  |
| Activity: 1.27E+00           | Error: 5.63E-01 | MDC: 9.35E-01      |                    |                       |                      |                 |          |                    |       |               |                 |                    |               |                 |      |                     |         |  |
| L28833-8                     | TOTAL SR        | 25-may-06<br>10:58 | 450 ml             | 10-jun-06<br>12:00    | 10-jun-06<br>17:17   | 0               | 88.17    | 10-jun-06<br>17:17 | 150   | X3A           | 159             | 150                | 363           | 400             | .335 | .999                | LCB     |  |
| WG-ZN-MW-ZN-03U-052506-DS-01 |                 |                    |                    |                       |                      |                 |          |                    |       |               |                 |                    |               |                 |      |                     |         |  |
| Activity: 5.17E-01           | Error: 6.55E-01 | MDC: 1.23E+00      |                    |                       |                      |                 |          |                    |       |               |                 |                    |               |                 |      |                     |         |  |
| L28833-9                     | TOTAL SR        | 25-may-06<br>11:15 | 450 ml             | 10-jun-06<br>12:00    | 10-jun-06<br>17:17   | 0               | 86.29    | 10-jun-06<br>17:17 | 150   | X3B           | 156             | 150                | 321           | 400             | .343 | .999                | LCB     |  |
| WG-ZN-MW-ZN-03U-052506-DS-02 |                 |                    |                    |                       |                      |                 |          |                    |       |               |                 |                    |               |                 |      |                     |         |  |
| Activity: 8.04E-01           | Error: 6.4E-01  | MDC: 1.15E+00      |                    |                       |                      |                 |          |                    |       |               |                 |                    |               |                 |      |                     |         |  |
| L28833-10                    | TOTAL SR        | 25-may-06<br>14:22 | 450 ml             | 10-jun-06<br>12:00    | 10-jun-06<br>17:17   | 0               | 79.57    | 10-jun-06<br>17:17 | 150   | X3C           | 154             | 150                | 294           | 400             | .345 | .999                | LCB     |  |
| WG-ZN-MW-ZN-03L-052506-DS-03 |                 |                    |                    |                       |                      |                 |          |                    |       |               |                 |                    |               |                 |      |                     |         |  |
| Activity: 1.06E+00           | Error: 6.8E-01  | MDC: 1.19E+00      |                    |                       |                      |                 |          |                    |       |               |                 |                    |               |                 |      |                     |         |  |
| L28833-11                    | TOTAL SR        | 26-may-06<br>09:53 | 450 ml             | 10-jun-06<br>12:00    | 10-jun-06<br>17:18   | 0               | 75.81    | 10-jun-06<br>17:18 | 150   | X4A           | 134             | 150                | 284           | 400             | .358 | .999                | LCB     |  |
| WG-ZN-MW-ZN-02U-052606-DS-04 |                 |                    |                    |                       |                      |                 |          |                    |       |               |                 |                    |               |                 |      |                     |         |  |
| Activity: 6.77E-01           | Error: 6.5E-01  | MDC: 1.18E+00      |                    |                       |                      |                 |          |                    |       |               |                 |                    |               |                 |      |                     |         |  |
| L28833-12                    | TOTAL SR        | 26-may-06<br>12:30 | 450 ml             | 10-jun-06<br>12:00    | 10-jun-06<br>17:18   | 0               | 75.81    | 10-jun-06<br>17:18 | 150   | X4C           | 141             | 150                | 299           | 400             | .35  | .999                | LCB     |  |
| WG-ZN-MW-ZN-02L-052606-DS-06 |                 |                    |                    |                       |                      |                 |          |                    |       |               |                 |                    |               |                 |      |                     |         |  |
| Activity: 7.27E-01           | Error: 6.81E-01 | MDC: 1.24E+00      |                    |                       |                      |                 |          |                    |       |               |                 |                    |               |                 |      |                     |         |  |

Work Order: L28833 Customer: Exelon

Nuclide: SR-90 (FAST) Project: EX001-3ESPZION-06

| Sample ID  | Run Analysis | Reference Date/time | Volume/ Aliquot | Scavenge Date/time | Milking Date/time | Mount Weight | Recovery | Count Date/time | Counter ID | Total counts | Sample dt (min) | Bkg counts | Bkg dt (min) | Eff. Factor | Decay & Ingrowth Factor | Analyst |
|--|--------------|---------------------|-----------------|--------------------|-------------------|--------------|----------|-----------------|------------|--------------|-----------------|------------|--------------|-------------|-------------------------|---------|
| L28833-13  | TOTAL SR     | 26-may-06 11:02     | 450 ml          | 10-jun-06 12:00    | 10-jun-06 12:00   | 0            | 79.57    | 10-jun-06 17:18 | X4D        | 156          | 150             | 340        | 400          | .353        | .999                    | LCB     |
| WG-ZN-MW-ZN-01U-052606-DS-05                       |              |                     |                 |                    |                   |              |          |                 |            |              |                 |            |              |             |                         |         |
| Activity: 6.78E-01 Error: 6.79E-01 MDC: 1.25E+00 * |              |                     |                 |                    |                   |              |          |                 |            |              |                 |            |              |             |                         |         |
| L28833-14  | TOTAL SR     | 26-may-06 13:40     | 450 ml          | 10-jun-06 12:00    | 10-jun-06 12:00   | 0            | 72.85    | 10-jun-06 18:17 | Y1A        | 143          | 150             | 279        | 400          | .341        | .999                    | LCB     |
| WG-ZN-MW-ZN-01L-052606-DS-07                       |              |                     |                 |                    |                   |              |          |                 |            |              |                 |            |              |             |                         |         |
| Activity: 1.03E+00 Error: 7.27E-01 MDC: 1.28E+00 * |              |                     |                 |                    |                   |              |          |                 |            |              |                 |            |              |             |                         |         |
| L28833-15  | TOTAL SR     | 26-may-06 14:48     | 450 ml          | 10-jun-06 12:00    | 10-jun-06 12:00   | 0            | 57.26    | 10-jun-06 18:17 | Y1B        | 137          | 150             | 279        | 400          | .351        | .999                    | LCB     |
| WG-ZN-MW-ZN-09-052606-DS-08                        |              |                     |                 |                    |                   |              |          |                 |            |              |                 |            |              |             |                         |         |
| Activity: 1.08E+00 Error: 8.82E-01 MDC: 1.58E+00 * |              |                     |                 |                    |                   |              |          |                 |            |              |                 |            |              |             |                         |         |
| L28833-16  | TOTAL SR     | 26-may-06 15:10     | 450 ml          | 10-jun-06 12:00    | 10-jun-06 12:00   | 0            | 61.56    | 10-jun-06 18:17 | Y1C        | 129          | 150             | 300        | 400          | .345        | .999                    | LCB     |
| WG-ZN-MW-ZN-09-052606-DS-09                        |              |                     |                 |                    |                   |              |          |                 |            |              |                 |            |              |             |                         |         |
| Activity: 5.19E-01 Error: 8.23E-01 MDC: 1.55E+00 * |              |                     |                 |                    |                   |              |          |                 |            |              |                 |            |              |             |                         |         |
| L28833-17  | TOTAL SR     | 26-may-06 08:45     | 450 ml          | 10-jun-06 12:00    | 10-jun-06 12:00   | 0            | 75.81    | 10-jun-06 18:17 | Y1D        | 155          | 150             | 305        | 400          | .362        | .999                    | LCB     |
| WG-ZION-MW-6U-052606-MS-011                        |              |                     |                 |                    |                   |              |          |                 |            |              |                 |            |              |             |                         |         |
| Activity: 9.89E-01 Error: 6.85E-01 MDC: 1.21E+00 * |              |                     |                 |                    |                   |              |          |                 |            |              |                 |            |              |             |                         |         |
| L28833-18  | TOTAL SR     | 26-may-06 13:15     | 450 ml          | 10-jun-06 12:00    | 10-jun-06 12:00   | 0            | 73.92    | 10-jun-06 18:17 | Y2A        | 147          | 150             | 280        | 400          | .349        | .999                    | LCB     |
| WG-ZION-MW-5L-052606-MS-013                        |              |                     |                 |                    |                   |              |          |                 |            |              |                 |            |              |             |                         |         |
| Activity: 1.09E+00 Error: 7.08E-01 MDC: 1.24E+00 * |              |                     |                 |                    |                   |              |          |                 |            |              |                 |            |              |             |                         |         |
| L28833-19  | TOTAL SR     | 26-may-06 11:00     | 450 ml          | 10-jun-06 12:00    | 10-jun-06 12:00   | 0            | 47.04    | 10-jun-06 18:17 | Y2B        | 134          | 150             | 315        | 400          | .356        | .999                    | LCB     |
| WS-ZION-LAKE-052606-MS-015                         |              |                     |                 |                    |                   |              |          |                 |            |              |                 |            |              |             |                         |         |
| Activity: 6.33E-01 Error: 1.06E+00 MDC: 2.02E+00 * |              |                     |                 |                    |                   |              |          |                 |            |              |                 |            |              |             |                         |         |
| L28833-19  | C1 TOTAL SR  | 26-may-06 11:00     | 450 ml          | 10-jun-06 12:00    | 10-jun-06 12:00   | 0            | 47.04    | 21-jun-06 19:42 | Y1A        | 154          | 200             | 279        | 400          | .341        | .998                    | LCB     |
| WS-ZION-LAKE-052606-MS-015                         |              |                     |                 |                    |                   |              |          |                 |            |              |                 |            |              |             |                         |         |
| Activity: 4.54E-01 Error: 9.36E-01 MDC: 1.72E+00 * |              |                     |                 |                    |                   |              |          |                 |            |              |                 |            |              |             |                         |         |
| L28833-20  | TOTAL SR     | 26-may-06 16:00     | 450 ml          | 10-jun-06 12:00    | 10-jun-06 12:00   | 0            | 68.82    | 10-jun-06 18:17 | Y2C        | 170          | 150             | 268        | 400          | .35         | .999                    | LCB     |
| WG-ZION-MW-5U-052606-MS-017                        |              |                     |                 |                    |                   |              |          |                 |            |              |                 |            |              |             |                         |         |
| Activity: 1.93E+00 * Error: 7.99E-01 MDC: 1.3E+00  |              |                     |                 |                    |                   |              |          |                 |            |              |                 |            |              |             |                         |         |

Sec. Review:    Analyst:    LIMS: \_\_\_\_\_

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VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 9-JUN-2006 04:07:49.20  
TBE10 12892256 HpGe \*\*\*\*\* Aquisition Date/Time: 8-JUN-2006 18:30:30.14

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LIMS No., Customer Name, Client ID: WG L28833-1 EXELON ZION

Sample ID        : 10L28833-1                    Smple Date: 24-MAY-2006 00:00:00.  
Sample Type     : WG                            Geometry    : 1035L091004  
Quantity        : 3.23980E+00 L                         BKGFILE    : 10BG060306MT  
Start Channel   : 80                            Energy Tol  : 1.00000                    Real Time  : 0 09:37:11.03  
End Channel     : 4090                                      Pk Srch Sens: 5.00000                   Live time  : 0 09:37:05.47  
MDA Constant   : 0.00                            Library Used: LIBD

| Pk | It | Energy   | Area | Bkgnd | FWHM | Channel | %Eff     | Cts/Sec  | %Err  | Fit      |
|----|----|----------|------|-------|------|---------|----------|----------|-------|----------|
| 1  | 1  | 65.58*   | 731  | 1590  | 4.51 | 130.27  | 6.12E-01 | 2.11E-02 | 12.0  | 1.42E+01 |
| 2  | 1  | 92.57*   | 20   | 1039  | 1.47 | 184.27  | 1.30E+00 | 5.67E-04 | 353.1 | 2.69E-01 |
| 3  | 1  | 139.97   | 248  | 1041  | 1.37 | 279.13  | 1.68E+00 | 7.16E-03 | 24.2  | 1.05E+00 |
| 4  | 1  | 185.82*  | 78   | 865   | 1.27 | 370.86  | 1.59E+00 | 2.26E-03 | 82.6  | 1.62E+00 |
| 5  | 1  | 198.61*  | 176  | 891   | 1.55 | 396.46  | 1.55E+00 | 5.09E-03 | 36.8  | 2.87E+00 |
| 6  | 1  | 238.69*  | 118  | 918   | 3.55 | 476.66  | 1.40E+00 | 3.40E-03 | 60.9  | 4.71E+00 |
| 7  | 1  | 352.15*  | 41   | 418   | 1.97 | 703.68  | 1.06E+00 | 1.19E-03 | 120.4 | 1.42E+00 |
| 8  | 1  | 596.12   | 95   | 281   | 1.67 | 1191.91 | 7.06E-01 | 2.75E-03 | 40.3  | 1.69E+00 |
| 9  | 1  | 609.23*  | 62   | 234   | 1.87 | 1218.16 | 6.94E-01 | 1.78E-03 | 64.3  | 1.44E+00 |
| 10 | 1  | 912.38*  | 38   | 154   | 1.03 | 1824.89 | 5.06E-01 | 1.10E-03 | 85.3  | 1.42E+01 |
| 11 | 1  | 1461.08* | 45   | 69    | 2.04 | 2923.31 | 3.56E-01 | 1.30E-03 | 64.2  | 9.17E-01 |
| 12 | 1  | 1714.17  | 81   | 40    | 9.66 | 3430.07 | 3.19E-01 | 2.35E-03 | 23.4  | 2.93E+00 |

Flag: "\*" = Peak area was modified by background subtraction

### Nuclide Line Activity Report

Nuclide Type: natural

| Nuclide | Energy  | Area  | %Abn   | %Eff      | Uncorrected pCi/L | Decay Corr pCi/L | 2-Sigma %Error |
|---------|---------|-------|--------|-----------|-------------------|------------------|----------------|
| K-40    | 1460.81 | 45    | 10.67* | 3.559E-01 | 2.853E+01         | 2.853E+01        | 128.45         |
| RA-226  | 186.21  | 78    | 3.28*  | 1.594E+00 | 3.601E+01         | 3.601E+01        | 165.29         |
| TH-228  | 238.63  | 118   | 44.60* | 1.400E+00 | 4.541E+00         | 4.614E+00        | 121.75         |
|         | 240.98  | ----- | 3.95   | 1.392E+00 | -----             | Line Not Found   | -----          |
| U-235   | 143.76  | ----- | 10.50* | 1.683E+00 | -----             | Line Not Found   | -----          |
|         | 163.35  | ----- | 4.70   | 1.659E+00 | -----             | Line Not Found   | -----          |
|         | 185.71  | 78    | 54.00  | 1.594E+00 | 2.187E+00         | 2.187E+00        | 165.29         |
|         | 205.31  | ----- | 4.70   | 1.524E+00 | -----             | Line Not Found   | -----          |

Flag: "\*" = Keyline

## Summary of Nuclide Activity

Page : 2

Sample ID : 10L28833-1

Acquisition date : 8-JUN-2006 18:30:30

|   |    |        |
|---|----|--------|
| Total number of lines in spectrum             | 12 |        |
| Number of unidentified lines                  | 9  |        |
| Number of lines tentatively identified by NID | 3  | 25.00% |

Nuclide Type : natural

| Nuclide          | Hlife     | Decay | Uncorrected<br>pCi/L | Decay Corr<br>pCi/L | Decay Corr<br>2-Sigma Error | 2-Sigma<br>%Error | Flags |
|------------------|-----------|-------|----------------------|---------------------|-----------------------------|-------------------|-------|
| K-40             | 1.28E+09Y | 1.00  | 2.853E+01            | 2.853E+01           | 3.664E+01                   | 128.45            |       |
| RA-226           | 1600.00Y  | 1.00  | 3.601E+01            | 3.601E+01           | 5.953E+01                   | 165.29            |       |
| TH-228           | 1.91Y     | 1.02  | 4.541E+00            | 4.614E+00           | 5.617E+00                   | 121.75            |       |
| U-235            | 7.04E+08Y | 1.00  | 2.187E+00            | 2.187E+00           | 3.616E+00                   | 165.29            | K     |
| Total Activity : |           |       | 7.127E+01            | 7.134E+01           |                             |                   |       |

|                        |           |           |
|------------------------|-----------|-----------|
| Grand Total Activity : | 7.127E+01 | 7.134E+01 |
|------------------------|-----------|-----------|

Flags: "K" = Keyline not found  
 "E" = Manually edited

"M" = Manually accepted  
 "A" = Nuclide specific abn. limit



Unidentified Energy Lines  
Sample ID : 10L28833-1

Page : 3  
Acquisition date : 8-JUN-2006 18:30:30

| It | Energy  | Area | Bkgnd | FWHM | Channel | Left | Pw | Cts/Sec  | %Err | %Eff     | Flags |
|----|---------|------|-------|------|---------|------|----|----------|------|----------|-------|
| 1  | 65.58   | 731  | 1590  | 4.51 | 130.27  | 123  | 13 | 2.11E-02 | 24.0 | 6.12E-01 |       |
| 1  | 92.57   | 20   | 1039  | 1.47 | 184.27  | 180  | 9  | 5.67E-04 | **** | 1.30E+00 |       |
| 1  | 139.97  | 248  | 1041  | 1.37 | 279.13  | 275  | 9  | 7.16E-03 | 48.5 | 1.68E+00 |       |
| 1  | 198.61  | 176  | 891   | 1.55 | 396.46  | 391  | 10 | 5.09E-03 | 73.5 | 1.55E+00 |       |
| 1  | 352.15  | 41   | 418   | 1.97 | 703.68  | 697  | 13 | 1.19E-03 | **** | 1.06E+00 |       |
| 1  | 596.12  | 95   | 281   | 1.67 | 1191.91 | 1184 | 15 | 2.75E-03 | 80.6 | 7.06E-01 |       |
| 1  | 609.23  | 62   | 234   | 1.87 | 1218.16 | 1212 | 14 | 1.78E-03 | **** | 6.94E-01 |       |
| 1  | 912.38  | 38   | 154   | 1.03 | 1824.89 | 1815 | 17 | 1.10E-03 | **** | 5.06E-01 |       |
| 1  | 1714.17 | 81   | 40    | 9.66 | 3430.07 | 3418 | 24 | 2.35E-03 | 46.7 | 3.19E-01 |       |

Flags: "T" = Tentatively associated

#### Summary of Nuclide Activity

|   |                     |
|---|---------------------|
| Total number of lines in spectrum             | 12                  |
| Number of unidentified lines                  | 9                   |
| Number of lines tentatively identified by NID | 3            25.00% |

Nuclide Type : natural

| Nuclide          | Hlife     | Decay | Wtd Mean    | Wtd Mean   | Decay Corr | 2-Sigma | 2-Sigma | Error | %Error | Flags |
|------------------|-----------|-------|-------------|------------|------------|---------|---------|-------|--------|-------|
|                  |           |       | Uncorrected | Decay Corr |            |         |         |       |        |       |
| K-40             | 1.28E+09Y | 1.00  | 2.853E+01   | 2.853E+01  | 3.664E+01  | 128.45  |         |       |        |       |
| RA-226           | 1600.00Y  | 1.00  | 3.601E+01   | 3.601E+01  | 5.953E+01  | 165.29  |         |       |        |       |
| TH-228           | 1.91Y     | 1.02  | 4.541E+00   | 4.614E+00  | 5.617E+00  | 121.75  |         |       |        |       |
| Total Activity : |           |       | 6.908E+01   | 6.915E+01  |            |         |         |       |        |       |

Grand Total Activity : 6.908E+01    6.915E+01

Flags: "K" = Keyline not found            "M" = Manually accepted  
"E" = Manually edited                    "A" = Nuclide specific abn. limit

#### Interference Report

No interference correction performed

#### Combined Activity-MDA Report

---- Identified Nuclides ----

| Nuclide | Activity<br>(pCi/L) | Act error | MDA<br>(pCi/L) | MDA error | Act/MDA |
|---------|---------------------|-----------|----------------|-----------|---------|
| K-40    | 2.853E+01           | 3.664E+01 | 3.090E+01      | 0.000E+00 | 0.923   |
| RA-226  | 3.601E+01           | 5.953E+01 | 8.461E+01      | 0.000E+00 | 0.426   |
| TH-228  | 4.614E+00           | 5.617E+00 | 6.260E+00      | 0.000E+00 | 0.737   |

---- Non-Identified Nuclides ----

Key-Line

| Nuclide | (pCi/L)    | Ided      | (pCi/L)   |           |        |
|---------|------------|-----------|-----------|-----------|--------|
| BE-7    | 1.631E+00  | 2.152E+01 | 3.577E+01 | 0.000E+00 | 0.046  |
| NA-24   | -7.951E+01 | 5.032E+01 | Half-Life | too short |        |
| CR-51   | 1.079E+00  | 2.650E+01 | 4.365E+01 | 0.000E+00 | 0.025  |
| MN-54   | 1.151E+00  | 2.232E+00 | 3.760E+00 | 0.000E+00 | 0.306  |
| CO-57   | 1.301E+00  | 2.229E+00 | 3.720E+00 | 0.000E+00 | 0.350  |
| CO-58   | -8.728E-01 | 2.301E+00 | 3.740E+00 | 0.000E+00 | -0.233 |
| FE-59   | -4.366E-01 | 4.831E+00 | 7.981E+00 | 0.000E+00 | -0.055 |
| CO-60   | 6.794E-01  | 2.128E+00 | 3.557E+00 | 0.000E+00 | 0.191  |
| ZN-65   | 1.233E-01  | 4.590E+00 | 7.619E+00 | 0.000E+00 | 0.016  |
| SE-75   | 5.496E-01  | 3.110E+00 | 5.176E+00 | 0.000E+00 | 0.106  |
| SR-85   | 2.455E+01  | 2.911E+00 | 5.717E+00 | 0.000E+00 | 4.294  |
| Y-88    | 4.119E-01  | 2.431E+00 | 4.031E+00 | 0.000E+00 | 0.102  |
| NB-94   | -6.836E-01 | 2.108E+00 | 3.385E+00 | 0.000E+00 | -0.202 |
| NB-95   | 9.936E-01  | 2.414E+00 | 4.068E+00 | 0.000E+00 | 0.244  |
| ZR-95   | -3.724E+00 | 4.240E+00 | 6.783E+00 | 0.000E+00 | -0.549 |
| MO-99   | -1.461E+02 | 8.446E+02 | 1.393E+03 | 0.000E+00 | -0.105 |
| RU-103  | 2.386E+00  | 2.891E+00 | 4.902E+00 | 0.000E+00 | 0.487  |
| RU-106  | 1.479E+01  | 2.191E+01 | 3.531E+01 | 0.000E+00 | 0.419  |
| AG-110m | 4.897E-01  | 2.137E+00 | 3.520E+00 | 0.000E+00 | 0.139  |
| SN-113  | 1.837E+00  | 2.975E+00 | 4.938E+00 | 0.000E+00 | 0.372  |
| SB-124  | -2.052E+00 | 6.108E+00 | 4.057E+00 | 0.000E+00 | -0.506 |
| SB-125  | -3.841E+00 | 6.421E+00 | 1.024E+01 | 0.000E+00 | -0.375 |
| TE-129M | -3.139E+01 | 3.278E+01 | 5.293E+01 | 0.000E+00 | -0.593 |
| I-131   | 3.856E+00  | 8.326E+00 | 1.380E+01 | 0.000E+00 | 0.279  |
| BA-133  | 3.124E+00  | 3.409E+00 | 4.887E+00 | 0.000E+00 | 0.639  |
| CS-134  | 5.586E+00  | 4.710E+00 | 3.840E+00 | 0.000E+00 | 1.455  |
| CS-136  | -2.920E+00 | 4.557E+00 | 7.313E+00 | 0.000E+00 | -0.399 |
| CS-137  | -4.710E-01 | 2.301E+00 | 3.725E+00 | 0.000E+00 | -0.126 |
| CE-139  | 6.655E-01  | 2.355E+00 | 3.877E+00 | 0.000E+00 | 0.172  |
| BA-140  | 6.993E+00  | 1.722E+01 | 2.879E+01 | 0.000E+00 | 0.243  |
| LA-140  | 2.081E+00  | 5.616E+00 | 9.496E+00 | 0.000E+00 | 0.219  |
| CE-141  | -1.111E+00 | 6.038E+00 | 8.391E+00 | 0.000E+00 | -0.132 |
| CE-144  | -6.395E+00 | 2.027E+01 | 2.819E+01 | 0.000E+00 | -0.227 |
| EU-152  | -9.625E+00 | 8.175E+00 | 1.082E+01 | 0.000E+00 | -0.890 |
| EU-154  | 3.426E+00  | 4.527E+00 | 7.575E+00 | 0.000E+00 | 0.452  |
| AC-228  | -6.355E+00 | 8.980E+00 | 1.271E+01 | 0.000E+00 | -0.500 |
| TH-232  | -6.321E+00 | 8.933E+00 | 1.265E+01 | 0.000E+00 | -0.500 |
| U-235   | 1.998E+01  | 1.989E+01 | 2.846E+01 | 0.000E+00 | 0.702  |
| U-238   | 1.069E+02  | 2.341E+02 | 3.907E+02 | 0.000E+00 | 0.274  |
| AM-241  | -1.088E+01 | 2.115E+01 | 2.893E+01 | 0.000E+00 | -0.376 |

|              |                                     |   |
|--------------|-------------------------------------|---|
| A,10L28833-1 | ,06/09/2006 04:07,05/24/2006 00:00, | 3.240E+00,WG L28833-1 EX                  |
| B,10L28833-1 | ,LIBD                               | ,06/07/2006 09:32,1035L091004             |
| C,K-40       | ,YES,                               | 2.853E+01, 3.664E+01, 3.090E+01,, 0.923   |
| C,RA-226     | ,YES,                               | 3.601E+01, 5.953E+01, 8.461E+01,, 0.426   |
| C,TH-228     | ,YES,                               | 4.614E+00, 5.617E+00, 6.260E+00,, 0.737   |
| C,BE-7       | ,NO,                                | 1.631E+00, 2.152E+01, 3.577E+01,, 0.046   |
| C,CR-51      | ,NO,                                | 1.079E+00, 2.650E+01, 4.365E+01,, 0.025   |
| C,MN-54      | ,NO,                                | 1.151E+00, 2.232E+00, 3.760E+00,, 0.306   |
| C,CO-57      | ,NO,                                | 1.301E+00, 2.229E+00, 3.720E+00,, 0.350   |
| C,CO-58      | ,NO,                                | -8.728E-01, 2.301E+00, 3.740E+00,, -0.233 |
| C,FE-59      | ,NO,                                | -4.366E-01, 4.831E+00, 7.981E+00,, -0.055 |
| C,CO-60      | ,NO,                                | 6.794E-01, 2.128E+00, 3.557E+00,, 0.191   |
| C,ZN-65      | ,NO,                                | 1.233E-01, 4.590E+00, 7.619E+00,, 0.016   |
| C,SE-75      | ,NO,                                | 5.496E-01, 3.110E+00, 5.176E+00,, 0.106   |
| C,SR-85      | ,NO,                                | 2.455E+01, 2.911E+00, 5.717E+00,, 4.294   |
| C,Y-88       | ,NO,                                | 4.119E-01, 2.431E+00, 4.031E+00,, 0.102   |
| C,NB-94      | ,NO,                                | -6.836E-01, 2.108E+00, 3.385E+00,, -0.202 |
| C,NB-95      | ,NO,                                | 9.936E-01, 2.414E+00, 4.068E+00,, 0.244   |
| C,ZR-95      | ,NO,                                | -3.724E+00, 4.240E+00, 6.783E+00,, -0.549 |
| C,MO-99      | ,NO,                                | -1.461E+02, 8.446E+02, 1.393E+03,, -0.105 |
| C,RU-103     | ,NO,                                | 2.386E+00, 2.891E+00, 4.902E+00,, 0.487   |
| C,RU-106     | ,NO,                                | 1.479E+01, 2.191E+01, 3.531E+01,, 0.419   |
| C,AG-110m    | ,NO,                                | 4.897E-01, 2.137E+00, 3.520E+00,, 0.139   |
| C,SN-113     | ,NO,                                | 1.837E+00, 2.975E+00, 4.938E+00,, 0.372   |
| C,SB-124     | ,NO,                                | -2.052E+00, 6.108E+00, 4.057E+00,, -0.506 |
| C,SB-125     | ,NO,                                | -3.841E+00, 6.421E+00, 1.024E+01,, -0.375 |
| C,TE-129M    | ,NO,                                | -3.139E+01, 3.278E+01, 5.293E+01,, -0.593 |
| C,I-131      | ,NO,                                | 3.856E+00, 8.326E+00, 1.380E+01,, 0.279   |
| C,BA-133     | ,NO,                                | 3.124E+00, 3.409E+00, 4.887E+00,, 0.639   |
| C,CS-134     | ,NO,                                | 5.586E+00, 4.710E+00, 3.840E+00,, 1.455   |
| C,CS-136     | ,NO,                                | -2.920E+00, 4.557E+00, 7.313E+00,, -0.399 |
| C,CS-137     | ,NO,                                | -4.710E-01, 2.301E+00, 3.725E+00,, -0.126 |
| C,CE-139     | ,NO,                                | 6.655E-01, 2.355E+00, 3.877E+00,, 0.172   |
| C,BA-140     | ,NO,                                | 6.993E+00, 1.722E+01, 2.879E+01,, 0.243   |
| C,LA-140     | ,NO,                                | 2.081E+00, 5.616E+00, 9.496E+00,, 0.219   |
| C,CE-141     | ,NO,                                | -1.111E+00, 6.038E+00, 8.391E+00,, -0.132 |
| C,CE-144     | ,NO,                                | -6.395E+00, 2.027E+01, 2.819E+01,, -0.227 |
| C,EU-152     | ,NO,                                | -9.625E+00, 8.175E+00, 1.082E+01,, -0.890 |
| C,EU-154     | ,NO,                                | 3.426E+00, 4.527E+00, 7.575E+00,, 0.452   |
| C,AC-228     | ,NO,                                | -6.355E+00, 8.980E+00, 1.271E+01,, -0.500 |
| C,TH-232     | ,NO,                                | -6.321E+00, 8.933E+00, 1.265E+01,, -0.500 |
| C,U-235      | ,NO,                                | 1.998E+01, 1.989E+01, 2.846E+01,, 0.702   |
| C,U-238      | ,NO,                                | 1.069E+02, 2.341E+02, 3.907E+02,, 0.274   |
| C,AM-241     | ,NO,                                | -1.088E+01, 2.115E+01, 2.893E+01,, -0.376 |



Summary of Nuclide Activity  
 Sample ID : 11L28833-2

Page : 2  
 Acquisition date : 8-JUN-2006 18:30:32

Total number of lines in spectrum 12  
 Number of unidentified lines 8  
 Number of lines tentatively identified by NID 4 33.33%

Nuclide Type : natural

| Nuclide          | Hlife     | Decay | Uncorrected<br>pCi/L | Decay Corr<br>pCi/L | Decay Corr<br>2-Sigma Error | 2-Sigma<br>%Error | Flags |
|------------------|-----------|-------|----------------------|---------------------|-----------------------------|-------------------|-------|
| K-40             | 1.28E+09Y | 1.00  | 8.589E+01            | 8.589E+01           | 4.424E+01                   | 51.51             |       |
| RA-226           | 1600.00Y  | 1.00  | 3.144E+01            | 3.144E+01           | 5.853E+01                   | 186.16            |       |
| TH-228           | 1.91Y     | 1.02  | 6.729E-01            | 6.833E-01           | 45.54E-01                   | 666.54            |       |
| U-235            | 7.04E+08Y | 1.00  | 1.910E+00            | 1.910E+00           | 3.555E+00                   | 186.16            | K     |
| Total Activity : |           |       | 1.199E+02            | 1.199E+02           |                             |                   |       |

Grand Total Activity : 1.199E+02 1.199E+02

Flags: "K" = Keyline not found  
 "E" = Manually edited

"M" = Manually accepted  
 "A" = Nuclide specific abn. limit

Unidentified Energy Lines  
Sample ID : 11L28833-2

Page : 3  
Acquisition date : 8-JUN-2006 18:30:32

| It | Energy | Area | Bkgnd | FWHM | Channel | Left | Pw | Cts/Sec  | %Err | %Eff     | Flags |
|----|--------|------|-------|------|---------|------|----|----------|------|----------|-------|
| 0  | 66.16  | 238  | 2248  | 1.25 | 131.32  | 128  | 9  | 6.87E-03 | 73.0 | 5.98E-01 |       |
| 0  | 92.51  | 103  | 1421  | 1.54 | 184.19  | 178  | 13 | 2.96E-03 | **** | 1.27E+00 |       |
| 0  | 139.76 | 207  | 890   | 1.31 | 278.95  | 275  | 9  | 5.97E-03 | 60.5 | 1.69E+00 |       |
| 0  | 198.44 | 239  | 900   | 1.39 | 396.63  | 392  | 10 | 6.89E-03 | 48.8 | 1.57E+00 |       |
| 0  | 295.60 | 95   | 545   | 2.66 | 591.42  | 587  | 11 | 2.74E-03 | **** | 1.23E+00 |       |
| 0  | 352.04 | 97   | 424   | 1.37 | 704.53  | 700  | 10 | 2.79E-03 | **** | 1.08E+00 |       |
| 0  | 582.83 | 69   | 185   | 0.98 | 1166.86 | 1162 | 11 | 2.01E-03 | **** | 7.27E-01 | T     |
| 0  | 595.98 | 135  | 252   | 1.77 | 1193.18 | 1187 | 12 | 3.91E-03 | 50.0 | 7.14E-01 |       |
| 0  | 609.22 | 134  | 335   | 1.98 | 1219.70 | 1213 | 18 | 3.88E-03 | 72.6 | 7.02E-01 |       |

Flags: "T" = Tentatively associated

### Summary of Nuclide Activity

|   |          |
|---|----------|
| Total number of lines in spectrum             | 12       |
| Number of unidentified lines                  | 8        |
| Number of lines tentatively identified by NID | 4 33.33% |

Nuclide Type : natural

| Nuclide          | Hlife     | Decay | Wtd Mean<br>Uncorrected<br>pCi/L | Wtd Mean<br>Decay Corr<br>pCi/L | Decay Corr<br>2-Sigma Error | 2-Sigma<br>%Error | Flags |
|------------------|-----------|-------|----------------------------------|---------------------------------|-----------------------------|-------------------|-------|
| K-40             | 1.28E+09Y | 1.00  | 8.589E+01                        | 8.589E+01                       | 4.424E+01                   | 51.51             |       |
| RA-226           | 1600.00Y  | 1.00  | 3.144E+01                        | 3.144E+01                       | 5.853E+01                   | 186.16            |       |
| TH-228           | 1.91Y     | 1.02  | 6.729E-01                        | 6.833E-01                       | 45.54E-01                   | 666.54            |       |
| Total Activity : |           |       | 1.180E+02                        | 1.180E+02                       |                             |                   |       |

Grand Total Activity : 1.180E+02 1.180E+02

Flags: "K" = Keyline not found  
"E" = Manually edited

"M" = Manually accepted  
"A" = Nuclide specific abn. limit

### Interference Report

No interference correction performed

### Combined Activity-MDA Report

---- Identified Nuclides ----

| Nuclide | Activity<br>(pCi/L) | Act error | MDA<br>(pCi/L) | MDA error | Act/MDA |
|---------|---------------------|-----------|----------------|-----------|---------|
| K-40    | 8.589E+01           | 4.424E+01 | 3.267E+01      | 0.000E+00 | 2.629   |
| RA-226  | 3.144E+01           | 5.853E+01 | 8.119E+01      | 0.000E+00 | 0.387   |
| TH-228  | 6.833E-01           | 4.554E+00 | 6.099E+00      | 0.000E+00 | 0.112   |

---- Non-Identified Nuclides ----

Key Line

| Nuclide | (pCi/L)    | Ided      | (pCi/L)   |           |        |
|---------|------------|-----------|-----------|-----------|--------|
| BE-7    | 1.490E+01  | 2.090E+01 | 3.487E+01 | 0.000E+00 | 0.427  |
| NA-24   | -1.643E+00 | 2.884E+01 | Half-Life | too short |        |
| CR-51   | -2.581E+01 | 2.499E+01 | 4.033E+01 | 0.000E+00 | -0.640 |
| MN-54   | -1.161E+00 | 2.194E+00 | 3.513E+00 | 0.000E+00 | -0.330 |
| CO-57   | -7.031E-01 | 2.104E+00 | 3.450E+00 | 0.000E+00 | -0.204 |
| CO-58   | -1.960E+00 | 2.286E+00 | 3.606E+00 | 0.000E+00 | -0.544 |
| FE-59   | 2.742E+00  | 4.749E+00 | 8.081E+00 | 0.000E+00 | 0.339  |
| CO-60   | 8.458E-02  | 2.276E+00 | 3.740E+00 | 0.000E+00 | 0.023  |
| ZN-65   | 6.174E+00  | 4.524E+00 | 7.957E+00 | 0.000E+00 | 0.776  |
| SE-75   | -2.683E+00 | 2.913E+00 | 4.751E+00 | 0.000E+00 | -0.565 |
| SR-85   | 1.941E+01  | 2.813E+00 | 5.331E+00 | 0.000E+00 | 3.641  |
| Y-88    | -1.159E+00 | 2.632E+00 | 4.206E+00 | 0.000E+00 | -0.276 |
| NB-94   | -1.548E+00 | 2.000E+00 | 3.204E+00 | 0.000E+00 | -0.483 |
| NB-95   | 5.113E-01  | 2.336E+00 | 3.874E+00 | 0.000E+00 | 0.132  |
| ZR-95   | 1.272E-01  | 4.145E+00 | 6.827E+00 | 0.000E+00 | 0.019  |
| MO-99   | 4.913E+02  | 7.378E+02 | 1.246E+03 | 0.000E+00 | 0.394  |
| RU-103  | 4.086E+00  | 2.789E+00 | 4.749E+00 | 0.000E+00 | 0.860  |
| RU-106  | 1.510E+01  | 2.169E+01 | 3.371E+01 | 0.000E+00 | 0.448  |
| AG-110m | -9.195E-01 | 2.035E+00 | 3.309E+00 | 0.000E+00 | -0.278 |
| SN-113  | 6.063E-01  | 2.824E+00 | 4.670E+00 | 0.000E+00 | 0.130  |
| SB-124  | 2.479E+00  | 5.162E+00 | 3.943E+00 | 0.000E+00 | 0.629  |
| SB-125  | -1.396E+00 | 5.866E+00 | 9.542E+00 | 0.000E+00 | -0.146 |
| TE-129M | 1.519E+01  | 3.121E+01 | 5.178E+01 | 0.000E+00 | 0.293  |
| I-131   | -1.081E+00 | 7.781E+00 | 1.277E+01 | 0.000E+00 | -0.085 |
| BA-133  | 5.095E+00  | 3.359E+00 | 4.954E+00 | 0.000E+00 | 1.029  |
| CS-134  | 4.360E+00  | 3.990E+00 | 3.800E+00 | 0.000E+00 | 1.147  |
| CS-136  | -2.461E+00 | 4.373E+00 | 6.987E+00 | 0.000E+00 | -0.352 |
| CS-137  | -1.545E-01 | 2.181E+00 | 3.599E+00 | 0.000E+00 | -0.043 |
| CE-139  | 8.543E-02  | 2.167E+00 | 3.549E+00 | 0.000E+00 | 0.024  |
| BA-140  | 3.534E+00  | 1.650E+01 | 2.701E+01 | 0.000E+00 | 0.131  |
| LA-140  | 2.063E+00  | 5.498E+00 | 9.329E+00 | 0.000E+00 | 0.221  |
| CE-141  | 2.813E+00  | 5.585E+00 | 7.878E+00 | 0.000E+00 | 0.357  |
| CE-144  | -8.023E+00 | 1.883E+01 | 2.601E+01 | 0.000E+00 | -0.308 |
| EU-152  | -1.875E+01 | 8.020E+00 | 1.022E+01 | 0.000E+00 | -1.835 |
| EU-154  | 3.134E-01  | 4.258E+00 | 7.027E+00 | 0.000E+00 | 0.045  |
| AC-228  | -1.780E+00 | 1.032E+01 | 1.365E+01 | 0.000E+00 | -0.130 |
| TH-232  | -1.771E+00 | 1.026E+01 | 1.358E+01 | 0.000E+00 | -0.130 |
| U-235   | 2.904E+01  | 1.877E+01 | 2.715E+01 | 0.000E+00 | 1.070  |
| U-238   | -5.091E+01 | 2.181E+02 | 3.586E+02 | 0.000E+00 | -0.142 |
| AM-241  | -2.352E+01 | 3.181E+01 | 4.302E+01 | 0.000E+00 | -0.547 |

|              |             |                  |            |              |             |
|--------------|-------------|------------------|------------|--------------|-------------|
| A,11L28833-2 | ,06/09/2006 | 04:08,05/24/2006 | 13:45,     | 3.311E+00,WG | L28833-2 EX |
| B,11L28833-2 | ,LIBD       | ,06/07/2006      | 09:40,     | 1135L090204  |             |
| C,K-40       | ,YES,       | 8.589E+01,       | 4.424E+01, | 3.267E+01,,  | 2.629       |
| C,RA-226     | ,YES,       | 3.144E+01,       | 5.853E+01, | 8.119E+01,,  | 0.387       |
| C,TH-228     | ,YES,       | 6.833E-01,       | 4.554E+00, | 6.099E+00,,  | 0.112       |
| C,BE-7       | ,NO,        | 1.490E+01,       | 2.090E+01, | 3.487E+01,,  | 0.427       |
| C,CR-51      | ,NO,        | -2.581E+01,      | 2.499E+01, | 4.033E+01,,  | -0.640      |
| C,MN-54      | ,NO,        | -1.161E+00,      | 2.194E+00, | 3.513E+00,,  | -0.330      |
| C,CO-57      | ,NO,        | -7.031E-01,      | 2.104E+00, | 3.450E+00,,  | -0.204      |
| C,CO-58      | ,NO,        | -1.960E+00,      | 2.286E+00, | 3.606E+00,,  | -0.544      |
| C,FE-59      | ,NO,        | 2.742E+00,       | 4.749E+00, | 8.081E+00,,  | 0.339       |
| C,CO-60      | ,NO,        | 8.458E-02,       | 2.276E+00, | 3.740E+00,,  | 0.023       |
| C,ZN-65      | ,NO,        | 6.174E+00,       | 4.524E+00, | 7.957E+00,,  | 0.776       |
| C,SE-75      | ,NO,        | -2.683E+00,      | 2.913E+00, | 4.751E+00,,  | -0.565      |
| C,SR-85      | ,NO,        | 1.941E+01,       | 2.813E+00, | 5.331E+00,,  | 3.641       |
| C,Y-88       | ,NO,        | -1.159E+00,      | 2.632E+00, | 4.206E+00,,  | -0.276      |
| C,NB-94      | ,NO,        | -1.548E+00,      | 2.000E+00, | 3.204E+00,,  | -0.483      |
| C,NB-95      | ,NO,        | 5.113E-01,       | 2.336E+00, | 3.874E+00,,  | 0.132       |
| C,ZR-95      | ,NO,        | 1.272E-01,       | 4.145E+00, | 6.827E+00,,  | 0.019       |
| C,MO-99      | ,NO,        | 4.913E+02,       | 7.378E+02, | 1.246E+03,,  | 0.394       |
| C,RU-103     | ,NO,        | 4.086E+00,       | 2.789E+00, | 4.749E+00,,  | 0.860       |
| C,RU-106     | ,NO,        | 1.510E+01,       | 2.169E+01, | 3.371E+01,,  | 0.448       |
| C,AG-110m    | ,NO,        | -9.195E-01,      | 2.035E+00, | 3.309E+00,,  | -0.278      |
| C,SN-113     | ,NO,        | 6.063E-01,       | 2.824E+00, | 4.670E+00,,  | 0.130       |
| C,SB-124     | ,NO,        | 2.479E+00,       | 5.162E+00, | 3.943E+00,,  | 0.629       |
| C,SB-125     | ,NO,        | -1.396E+00,      | 5.866E+00, | 9.542E+00,,  | -0.146      |
| C,TE-129M    | ,NO,        | 1.519E+01,       | 3.121E+01, | 5.178E+01,,  | 0.293       |
| C,I-131      | ,NO,        | -1.081E+00,      | 7.781E+00, | 1.277E+01,,  | -0.085      |
| C,BA-133     | ,NO,        | 5.095E+00,       | 3.359E+00, | 4.954E+00,,  | 1.029       |
| C,CS-134     | ,NO,        | 4.360E+00,       | 3.990E+00, | 3.800E+00,,  | 1.147       |
| C,CS-136     | ,NO,        | -2.461E+00,      | 4.373E+00, | 6.987E+00,,  | -0.352      |
| C,CS-137     | ,NO,        | -1.545E-01,      | 2.181E+00, | 3.599E+00,,  | -0.043      |
| C,CE-139     | ,NO,        | 8.543E-02,       | 2.167E+00, | 3.549E+00,,  | 0.024       |
| C,BA-140     | ,NO,        | 3.534E+00,       | 1.650E+01, | 2.701E+01,,  | 0.131       |
| C,LA-140     | ,NO,        | 2.063E+00,       | 5.498E+00, | 9.329E+00,,  | 0.221       |
| C,CE-141     | ,NO,        | 2.813E+00,       | 5.585E+00, | 7.878E+00,,  | 0.357       |
| C,CE-144     | ,NO,        | -8.023E+00,      | 1.883E+01, | 2.601E+01,,  | -0.308      |
| C,EU-152     | ,NO,        | -1.875E+01,      | 8.020E+00, | 1.022E+01,,  | -1.835      |
| C,EU-154     | ,NO,        | 3.134E-01,       | 4.258E+00, | 7.027E+00,,  | 0.045       |
| C,AC-228     | ,NO,        | -1.780E+00,      | 1.032E+01, | 1.365E+01,,  | -0.130      |
| C,TH-232     | ,NO,        | -1.771E+00,      | 1.026E+01, | 1.358E+01,,  | -0.130      |
| C,U-235      | ,NO,        | 2.904E+01,       | 1.877E+01, | 2.715E+01,,  | 1.070       |
| C,U-238      | ,NO,        | -5.091E+01,      | 2.181E+02, | 3.586E+02,,  | -0.142      |
| C,AM-241     | ,NO,        | -2.352E+01,      | 3.181E+01, | 4.302E+01,,  | -0.547      |



Sec. Review: Analyst: LIMS: \_\_\_\_\_

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VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 9-JUN-2006 09:52:03.07  
 TBE04 P-40312B HpGe \*\*\*\*\* Aquisition Date/Time: 9-JUN-2006 05:02:56.11

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LIMS No., Customer Name, Client ID: WG L28833-3 EXELON ZION

Sample ID : 04L28833-3                      Smple Date: 25-MAY-2006 09:15:00.  
 Sample Type : WG                            Geometry : 043L082004  
 Quantity : 3.09630E+00 L                    BKGFILE : 04BG060305MT  
 Start Channel : 90                      Energy Tol : 1.00000                    Real Time : 0 04:01:08.08  
 End Channel : 4090                    Pk Srch Sens: 5.00000                    Live time : 0 04:01:05.55  
 MDA Constant : 0.00                      Library Used: LIBD

| Pk | It | Energy   | Area | Bkgnd | FWHM | Channel | %Eff     | Cts/Sec  | %Err  | Fit      |
|----|----|----------|------|-------|------|---------|----------|----------|-------|----------|
| 1  | 1  | 66.34*   | 134  | 355   | 1.27 | 133.13  | 6.64E-01 | 9.27E-03 | 25.6  | 3.14E+00 |
| 2  | 3  | 77.14    | 78   | 414   | 1.34 | 154.74  | 1.06E+00 | 5.36E-03 | 49.8  | 4.48E+00 |
| 3  | 1  | 92.82*   | 77   | 393   | 2.12 | 186.09  | 1.54E+00 | 5.33E-03 | 52.2  | 7.96E-01 |
| 4  | 1  | 140.19*  | 113  | 382   | 1.33 | 280.82  | 2.04E+00 | 7.84E-03 | 33.2  | 3.44E+00 |
| 5  | 1  | 185.45*  | 35   | 468   | 1.57 | 371.32  | 1.92E+00 | 2.43E-03 | 128.2 | 9.13E-01 |
| 6  | 1  | 198.31*  | 78   | 353   | 1.75 | 397.04  | 1.87E+00 | 5.38E-03 | 49.6  | 2.54E+00 |
| 7  | 1  | 238.56*  | 28   | 191   | 1.01 | 477.54  | 1.68E+00 | 1.94E-03 | 93.9  | 2.23E+00 |
| 8  | 1  | 241.73*  | 31   | 132   | 0.98 | 483.87  | 1.67E+00 | 2.12E-03 | 67.3  | 4.67E+00 |
| 9  | 1  | 295.21*  | 64   | 184   | 1.36 | 590.80  | 1.45E+00 | 4.40E-03 | 43.1  | 1.21E+00 |
| 10 | 1  | 351.89*  | 104  | 198   | 1.60 | 704.14  | 1.28E+00 | 7.17E-03 | 32.4  | 1.01E+00 |
| 11 | 1  | 595.75   | 46   | 87    | 1.52 | 1191.73 | 8.63E-01 | 3.19E-03 | 40.2  | 9.88E-01 |
| 12 | 1  | 609.09*  | 158  | 127   | 1.53 | 1218.41 | 8.49E-01 | 1.09E-02 | 18.5  | 1.73E+00 |
| 13 | 1  | 1119.96* | 9    | 45    | 3.18 | 2239.70 | 5.27E-01 | 5.94E-04 | 179.1 | 2.51E+00 |
| 14 | 1  | 1237.78* | 18   | 40    | 3.21 | 2475.21 | 4.88E-01 | 1.27E-03 | 94.2  | 1.13E+00 |
| 15 | 1  | 1377.60  | 22   | 48    | 1.81 | 2754.67 | 4.49E-01 | 1.52E-03 | 73.4  | 1.01E+00 |
| 16 | 1  | 1460.68* | 1    | 38    | 1.83 | 2920.73 | 4.30E-01 | 7.02E-05 | ***** | 7.69E-01 |
| 17 | 1  | 1764.49* | 42   | 11    | 2.91 | 3527.90 | 3.77E-01 | 2.90E-03 | 26.8  | 4.84E-01 |
| 18 | 1  | 1780.00  | 20   | 20    | 0.80 | 3558.89 | 3.75E-01 | 1.37E-03 | 49.8  | 7.24E+00 |

Flag: "\*" = Peak area was modified by background subtraction

## Nuclide Line Activity Report

Nuclide Type: natural

| Nuclide | Energy  | Area  | %Abn   | %Eff      | Uncorrected pCi/L | Decay Corr pCi/L | 2-Sigma %Error |
|---------|---------|-------|--------|-----------|-------------------|------------------|----------------|
| K-40    | 1460.81 | 1     | 10.67* | 4.296E-01 | 1.338E+00         | 1.338E+00        | 3296.67        |
| RA-226  | 186.21  | 35    | 3.28*  | 1.923E+00 | 3.358E+01         | 3.358E+01        | 256.33         |
| TH-228  | 238.63  | 28    | 44.60* | 1.680E+00 | 2.257E+00         | 2.291E+00        | 187.82         |
|         | 240.98  | 31    | 3.95   | 1.666E+00 | 2.817E+01         | 2.859E+01        | 134.63         |
| U-235   | 143.76  | ----- | 10.50* | 2.041E+00 | -----             | Line Not Found   | -----          |
|         | 163.35  | ----- | 4.70   | 2.007E+00 | -----             | Line Not Found   | -----          |
|         | 185.71  | 35    | 54.00  | 1.923E+00 | 2.040E+00         | 2.040E+00        | 256.33         |
|         | 205.31  | ----- | 4.70   | 1.833E+00 | -----             | Line Not Found   | -----          |

Flag: "\*" = Keyline

## Summary of Nuclide Activity

Page : 2

Sample ID : 04L28833-3

Acquisition date : 9-JUN-2006 05:02:56

|   |    |        |
|---|----|--------|
| Total number of lines in spectrum             | 18 |        |
| Number of unidentified lines                  | 14 |        |
| Number of lines tentatively identified by NID | 4  | 22.22% |

Nuclide Type : natural

| Nuclide | Hlife     | Decay            | Uncorrected<br>pCi/L | Decay Corr<br>pCi/L | Decay Corr<br>2-Sigma Error | 2-Sigma<br>%Error | Flags |
|---------|-----------|------------------|----------------------|---------------------|-----------------------------|-------------------|-------|
| K-40    | 1.28E+09Y | 1.00             | 1.338E+00            | 1.338E+00           | 44.10E+00                   | 3296.67           |       |
| RA-226  | 1600.00Y  | 1.00             | 3.358E+01            | 3.358E+01           | 8.608E+01                   | 256.33            |       |
| TH-228  | 1.91Y     | 1.01             | 2.257E+00            | 2.291E+00           | 4.302E+00                   | 187.82            |       |
| U-235   | 7.04E+08Y | 1.00             | 2.040E+00            | 2.040E+00           | 5.229E+00                   | 256.33            | K     |
|         |           |                  | -----                | -----               |                             |                   |       |
|         |           | Total Activity : | 3.922E+01            | 3.925E+01           |                             |                   |       |

Grand Total Activity : 3.922E+01 3.925E+01

Flags: "K" = Keyline not found  
 "E" = Manually edited

"M" = Manually accepted  
 "A" = Nuclide specific abn. limit

Unidentified Energy Lines  
Sample ID : 04L28833-3

Page : 3  
Acquisition date : 9-JUN-2006 05:02:56

| It | Energy  | Area | Bkgnd | FWHM | Channel | Left | Pw | Cts/Sec  | %Err | %Eff     | Flags |
|----|---------|------|-------|------|---------|------|----|----------|------|----------|-------|
| 1  | 66.34   | 134  | 355   | 1.27 | 133.13  | 130  | 7  | 9.27E-03 | 51.2 | 6.64E-01 |       |
| 3  | 77.14   | 78   | 414   | 1.34 | 154.74  | 147  | 12 | 5.36E-03 | 99.7 | 1.06E+00 |       |
| 1  | 92.82   | 77   | 393   | 2.12 | 186.09  | 182  | 10 | 5.33E-03 | **** | 1.54E+00 |       |
| 1  | 140.19  | 113  | 382   | 1.33 | 280.82  | 276  | 9  | 7.84E-03 | 66.4 | 2.04E+00 |       |
| 1  | 198.31  | 78   | 353   | 1.75 | 397.04  | 391  | 11 | 5.38E-03 | 99.2 | 1.87E+00 |       |
| 1  | 295.21  | 64   | 184   | 1.36 | 590.80  | 587  | 9  | 4.40E-03 | 86.1 | 1.45E+00 |       |
| 1  | 351.89  | 104  | 198   | 1.60 | 704.14  | 699  | 13 | 7.17E-03 | 64.8 | 1.28E+00 |       |
| 1  | 595.75  | 46   | 87    | 1.52 | 1191.73 | 1186 | 10 | 3.19E-03 | 80.5 | 8.63E-01 |       |
| 1  | 609.09  | 158  | 127   | 1.53 | 1218.41 | 1213 | 14 | 1.09E-02 | 37.1 | 8.49E-01 |       |
| 1  | 1119.96 | 9    | 45    | 3.18 | 2239.70 | 2234 | 12 | 5.94E-04 | **** | 5.27E-01 |       |
| 1  | 1237.78 | 18   | 40    | 3.21 | 2475.21 | 2467 | 19 | 1.27E-03 | **** | 4.88E-01 |       |
| 1  | 1377.60 | 22   | 48    | 1.81 | 2754.67 | 2747 | 16 | 1.52E-03 | **** | 4.49E-01 |       |
| 1  | 1764.49 | 42   | 11    | 2.91 | 3527.90 | 3522 | 12 | 2.90E-03 | 53.6 | 3.77E-01 |       |
| 1  | 1780.00 | 20   | 20    | 0.80 | 3558.89 | 3550 | 12 | 1.37E-03 | 99.6 | 3.75E-01 |       |

Flags: "T" = Tentatively associated

### Summary of Nuclide Activity

|   |                               |
|---|-------------------------------|
| Total number of lines in spectrum             | 18                            |
| Number of unidentified lines                  | 14                            |
| Number of lines tentatively identified by NID | 4                      22.22% |

Nuclide Type : natural

| Nuclide          | Hlife     | Decay | Wtd Mean    | Wtd Mean   | Decay Corr | 2-Sigma | 2-Sigma Error | %Error | Flags |
|------------------|-----------|-------|-------------|------------|------------|---------|---------------|--------|-------|
|                  |           |       | Uncorrected | Decay Corr |            |         |               |        |       |
| K-40             | 1.28E+09Y | 1.00  | 1.338E+00   | 1.338E+00  | 44.10E+00  | 3296.67 |               |        |       |
| RA-226           | 1600.00Y  | 1.00  | 3.358E+01   | 3.358E+01  | 8.608E+01  | 256.33  |               |        |       |
| TH-228           | 1.91Y     | 1.01  | 2.577E+00   | 2.615E+00  | 4.276E+00  | 163.49  |               |        |       |
| Total Activity : |           |       | 3.750E+01   | 3.754E+01  |            |         |               |        |       |

Grand Total Activity : 3.750E+01                      3.754E+01

Flags: "K" = Keyline not found                      "M" = Manually accepted  
"E" = Manually edited                                      "A" = Nuclide specific abn. limit

### Interference Report

No interference correction performed

### Combined Activity-MDA Report

---- Identified Nuclides ----

| Nuclide | Activity<br>(pCi/L) | Act error | MDA<br>(pCi/L) | MDA error | Act/MDA |
|---------|---------------------|-----------|----------------|-----------|---------|
| K-40    | 1.338E+00           | 4.410E+01 | 4.110E+01      | 0.000E+00 | 0.033   |
| RA-226  | 3.358E+01           | 8.608E+01 | 1.019E+02      | 0.000E+00 | 0.330   |
| TH-228  | 2.615E+00           | 4.276E+00 | 8.115E+00      | 0.000E+00 | 0.322   |

## ---- Non-Identified Nuclides ----

| Nuclide | Key-Line<br>Activity<br>(pCi/L) | K.L.<br>Ided | Act error | MDA<br>(pCi/L) | MDA error | Act/MDA |
|---------|---------------------------------|--------------|-----------|----------------|-----------|---------|
| BE-7    | 1.672E+00                       |              | 2.753E+01 | 4.564E+01      | 0.000E+00 | 0.037   |
| NA-24   | -3.128E+01                      |              | 2.945E+01 | Half-Life      | too short |         |
| CR-51   | -3.334E+01                      |              | 3.443E+01 | 5.458E+01      | 0.000E+00 | -0.611  |
| MN-54   | 3.413E-01                       |              | 2.842E+00 | 4.675E+00      | 0.000E+00 | 0.073   |
| CO-57   | 2.755E+00                       |              | 2.471E+00 | 4.264E+00      | 0.000E+00 | 0.646   |
| CO-58   | 7.177E-02                       |              | 3.386E+00 | 5.544E+00      | 0.000E+00 | 0.013   |
| FE-59   | 2.776E+00                       |              | 6.899E+00 | 1.162E+01      | 0.000E+00 | 0.239   |
| CO-60   | -1.532E-01                      |              | 3.309E+00 | 5.635E+00      | 0.000E+00 | -0.027  |
| ZN-65   | 9.119E+00                       |              | 7.950E+00 | 1.220E+01      | 0.000E+00 | 0.747   |
| SE-75   | -4.500E+00                      |              | 3.861E+00 | 6.161E+00      | 0.000E+00 | -0.730  |
| SR-85   | 1.796E+01                       |              | 3.800E+00 | 7.308E+00      | 0.000E+00 | 2.458   |
| Y-88    | -1.565E+00                      |              | 3.616E+00 | 5.643E+00      | 0.000E+00 | -0.277  |
| NB-94   | 1.607E+00                       |              | 2.581E+00 | 4.422E+00      | 0.000E+00 | 0.364   |
| NB-95   | 2.824E+00                       |              | 3.268E+00 | 5.644E+00      | 0.000E+00 | 0.500   |
| ZR-95   | 1.245E+00                       |              | 5.638E+00 | 9.395E+00      | 0.000E+00 | 0.133   |
| MO-99   | -5.890E+02                      |              | 8.344E+02 | 1.308E+03      | 0.000E+00 | -0.450  |
| RU-103  | 2.315E+00                       |              | 3.622E+00 | 6.154E+00      | 0.000E+00 | 0.376   |
| RU-106  | 1.208E+01                       |              | 2.704E+01 | 4.379E+01      | 0.000E+00 | 0.276   |
| AG-110m | -1.553E+00                      |              | 2.767E+00 | 4.442E+00      | 0.000E+00 | -0.350  |
| SN-113  | -3.300E-01                      |              | 3.929E+00 | 6.363E+00      | 0.000E+00 | -0.052  |
| SB-124  | 5.455E+00                       |              | 6.240E+00 | 5.422E+00      | 0.000E+00 | 1.006   |
| SB-125  | -4.801E-01                      |              | 7.960E+00 | 1.322E+01      | 0.000E+00 | -0.036  |
| TE-129M | 3.826E+00                       |              | 3.915E+01 | 6.519E+01      | 0.000E+00 | 0.059   |
| I-131   | -2.037E-01                      |              | 9.891E+00 | 1.614E+01      | 0.000E+00 | -0.013  |
| BA-133  | 8.105E+00                       |              | 4.721E+00 | 7.195E+00      | 0.000E+00 | 1.126   |
| CS-134  | 1.029E+01                       |              | 4.842E+00 | 6.290E+00      | 0.000E+00 | 1.636   |
| CS-136  | 3.716E+00                       |              | 6.304E+00 | 1.068E+01      | 0.000E+00 | 0.348   |
| CS-137  | 1.251E+00                       |              | 2.933E+00 | 4.987E+00      | 0.000E+00 | 0.251   |
| CE-139  | -1.393E+00                      |              | 2.708E+00 | 4.401E+00      | 0.000E+00 | -0.317  |
| BA-140  | -5.884E+00                      |              | 2.117E+01 | 3.418E+01      | 0.000E+00 | -0.172  |
| LA-140  | -5.793E-01                      |              | 7.181E+00 | 1.179E+01      | 0.000E+00 | -0.049  |
| CE-141  | 7.468E-01                       |              | 6.833E+00 | 9.749E+00      | 0.000E+00 | 0.077   |
| CE-144  | 2.625E+01                       |              | 2.221E+01 | 3.326E+01      | 0.000E+00 | 0.789   |
| EU-152  | -6.206E+00                      |              | 1.008E+01 | 1.345E+01      | 0.000E+00 | -0.461  |
| EU-154  | 5.494E+00                       |              | 5.024E+00 | 8.661E+00      | 0.000E+00 | 0.634   |
| AC-228  | -7.453E-01                      |              | 1.040E+01 | 1.768E+01      | 0.000E+00 | -0.042  |
| TH-232  | -7.416E-01                      |              | 1.034E+01 | 1.759E+01      | 0.000E+00 | -0.042  |
| U-235   | 3.507E+00                       |              | 2.327E+01 | 3.326E+01      | 0.000E+00 | 0.105   |
| U-238   | 1.620E+02                       |              | 3.034E+02 | 5.195E+02      | 0.000E+00 | 0.312   |
| AM-241  | -1.358E+01                      |              | 2.814E+01 | 4.383E+01      | 0.000E+00 | -0.310  |

|              |             |                  |            |              |          |    |
|--------------|-------------|------------------|------------|--------------|----------|----|
| A,04L28833-3 | ,06/09/2006 | 09:52,05/25/2006 | 09:15,     | 3.096E+00,WG | L28833-3 | EX |
| B,04L28833-3 | ,LIBD       | ,06/02/2006      | 09:04,     | 043L082004   |          |    |
| C,K-40       | ,YES,       | 1.338E+00,       | 4.410E+01, | 4.110E+01,,  | 0.033    |    |
| C,RA-226     | ,YES,       | 3.358E+01,       | 8.608E+01, | 1.019E+02,,  | 0.330    |    |
| C,TH-228     | ,YES,       | 2.615E+00,       | 4.276E+00, | 8.115E+00,,  | 0.322    |    |
| C,BE-7       | ,NO,        | 1.672E+00,       | 2.753E+01, | 4.564E+01,,  | 0.037    |    |
| C,CR-51      | ,NO,        | -3.334E+01,      | 3.443E+01, | 5.458E+01,,  | -0.611   |    |
| C,MN-54      | ,NO,        | 3.413E-01,       | 2.842E+00, | 4.675E+00,,  | 0.073    |    |
| C,CO-57      | ,NO,        | 2.755E+00,       | 2.471E+00, | 4.264E+00,,  | 0.646    |    |
| C,CO-58      | ,NO,        | 7.177E-02,       | 3.386E+00, | 5.544E+00,,  | 0.013    |    |
| C,FE-59      | ,NO,        | 2.776E+00,       | 6.899E+00, | 1.162E+01,,  | 0.239    |    |
| C,CO-60      | ,NO,        | -1.532E-01,      | 3.309E+00, | 5.635E+00,,  | -0.027   |    |
| C,ZN-65      | ,NO,        | 9.119E+00,       | 7.950E+00, | 1.220E+01,,  | 0.747    |    |
| C,SE-75      | ,NO,        | -4.500E+00,      | 3.861E+00, | 6.161E+00,,  | -0.730   |    |
| C,SR-85      | ,NO,        | 1.796E+01,       | 3.800E+00, | 7.308E+00,,  | 2.458    |    |
| C,Y-88       | ,NO,        | -1.565E+00,      | 3.616E+00, | 5.643E+00,,  | -0.277   |    |
| C,NB-94      | ,NO,        | 1.607E+00,       | 2.581E+00, | 4.422E+00,,  | 0.364    |    |
| C,NB-95      | ,NO,        | 2.824E+00,       | 3.268E+00, | 5.644E+00,,  | 0.500    |    |
| C,ZR-95      | ,NO,        | 1.245E+00,       | 5.638E+00, | 9.395E+00,,  | 0.133    |    |
| C,MO-99      | ,NO,        | -5.890E+02,      | 8.344E+02, | 1.308E+03,,  | -0.450   |    |
| C,RU-103     | ,NO,        | 2.315E+00,       | 3.622E+00, | 6.154E+00,,  | 0.376    |    |
| C,RU-106     | ,NO,        | 1.208E+01,       | 2.704E+01, | 4.379E+01,,  | 0.276    |    |
| C,AG-110m    | ,NO,        | -1.553E+00,      | 2.767E+00, | 4.442E+00,,  | -0.350   |    |
| C,SN-113     | ,NO,        | -3.300E-01,      | 3.929E+00, | 6.363E+00,,  | -0.052   |    |
| C,SB-124     | ,NO,        | 5.455E+00,       | 6.240E+00, | 5.422E+00,,  | 1.006    |    |
| C,SB-125     | ,NO,        | -4.801E-01,      | 7.960E+00, | 1.322E+01,,  | -0.036   |    |
| C,TE-129M    | ,NO,        | 3.826E+00,       | 3.915E+01, | 6.519E+01,,  | 0.059    |    |
| C,I-131      | ,NO,        | -2.037E-01,      | 9.891E+00, | 1.614E+01,,  | -0.013   |    |
| C,BA-133     | ,NO,        | 8.105E+00,       | 4.721E+00, | 7.195E+00,,  | 1.126    |    |
| C,CS-134     | ,NO,        | 1.029E+01,       | 4.842E+00, | 6.290E+00,,  | 1.636    |    |
| C,CS-136     | ,NO,        | 3.716E+00,       | 6.304E+00, | 1.068E+01,,  | 0.348    |    |
| C,CS-137     | ,NO,        | 1.251E+00,       | 2.933E+00, | 4.987E+00,,  | 0.251    |    |
| C,CE-139     | ,NO,        | -1.393E+00,      | 2.708E+00, | 4.401E+00,,  | -0.317   |    |
| C,BA-140     | ,NO,        | -5.884E+00,      | 2.117E+01, | 3.418E+01,,  | -0.172   |    |
| C,LA-140     | ,NO,        | -5.793E-01,      | 7.181E+00, | 1.179E+01,,  | -0.049   |    |
| C,CE-141     | ,NO,        | 7.468E-01,       | 6.833E+00, | 9.749E+00,,  | 0.077    |    |
| C,CE-144     | ,NO,        | 2.625E+01,       | 2.221E+01, | 3.326E+01,,  | 0.789    |    |
| C,EU-152     | ,NO,        | -6.206E+00,      | 1.008E+01, | 1.345E+01,,  | -0.461   |    |
| C,EU-154     | ,NO,        | 5.494E+00,       | 5.024E+00, | 8.661E+00,,  | 0.634    |    |
| C,AC-228     | ,NO,        | -7.453E-01,      | 1.040E+01, | 1.768E+01,,  | -0.042   |    |
| C,TH-232     | ,NO,        | -7.416E-01,      | 1.034E+01, | 1.759E+01,,  | -0.042   |    |
| C,U-235      | ,NO,        | 3.507E+00,       | 2.327E+01, | 3.326E+01,,  | 0.105    |    |
| C,U-238      | ,NO,        | 1.620E+02,       | 3.034E+02, | 5.195E+02,,  | 0.312    |    |
| C,AM-241     | ,NO,        | -1.358E+01,      | 2.814E+01, | 4.383E+01,,  | -0.310   |    |

Sec. Review: *M* Analyst: LIMS: \_\_\_\_\_

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VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 9-JUN-2006 11:09:03.15  
 TBE10 12892256 HpGe \*\*\*\*\* Aquisition Date/Time: 9-JUN-2006 05:03:53.83

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LIMS No., Customer Name, Client ID: WG L28833-4 EXELON ZION

Sample ID : 10L28833-4                      Smple Date: 25-MAY-2006 11:23:00.  
 Sample Type : WG                              Geometry : 1035L091004  
 Quantity : 3.29280E+00 L                      BKGFILE : 10BG060306MT  
 Start Channel : 80                      Energy Tol : 1.00000                      Real Time : 0 06:05:05.09  
 End Channel : 4090                      Pk Srch Sens: 5.00000                      Live time : 0 06:05:00.60  
 MDA Constant : 0.00                      Library Used: LIBD

| Pk | It | Energy   | Area | Bkgnd | FWHM | Channel | %Eff     | Cts/Sec  | %Err | Fit      |
|----|----|----------|------|-------|------|---------|----------|----------|------|----------|
| 1  | 1  | 66.42*   | 208  | 1061  | 1.57 | 131.96  | 6.37E-01 | 9.52E-03 | 29.9 | 8.96E-01 |
| 2  | 2  | 74.88*   | 192  | 1087  | 1.49 | 148.87  | 8.82E-01 | 8.78E-03 | 34.0 | 3.02E+00 |
| 3  | 2  | 77.17*   | 467  | 821   | 1.22 | 153.46  | 9.45E-01 | 2.13E-02 | 11.9 |          |
| 4  | 1  | 87.34*   | 118  | 849   | 1.18 | 173.82  | 1.19E+00 | 5.39E-03 | 43.9 | 1.17E+00 |
| 5  | 1  | 140.25   | 187  | 827   | 1.47 | 279.69  | 1.68E+00 | 8.52E-03 | 27.6 | 4.87E-01 |
| 6  | 1  | 198.38*  | 81   | 696   | 1.56 | 395.98  | 1.55E+00 | 3.70E-03 | 65.0 | 1.29E+00 |
| 7  | 1  | 238.51*  | 56   | 525   | 1.57 | 476.29  | 1.40E+00 | 2.55E-03 | 84.0 | 2.43E+00 |
| 8  | 1  | 242.26   | 535  | 506   | 1.57 | 483.80  | 1.39E+00 | 2.44E-02 | 8.7  |          |
| 9  | 1  | 295.35   | 906  | 498   | 1.24 | 590.02  | 1.21E+00 | 4.14E-02 | 5.8  | 6.71E-01 |
| 10 | 1  | 352.06*  | 1448 | 508   | 1.28 | 703.50  | 1.07E+00 | 6.61E-02 | 4.4  | 8.93E-01 |
| 11 | 1  | 596.16   | 140  | 222   | 4.46 | 1192.00 | 7.06E-01 | 6.37E-03 | 24.5 | 1.80E+00 |
| 12 | 1  | 609.45*  | 1472 | 199   | 1.50 | 1218.60 | 6.94E-01 | 6.72E-02 | 3.5  | 1.82E+00 |
| 13 | 1  | 768.79   | 144  | 103   | 1.59 | 1537.50 | 5.78E-01 | 6.60E-03 | 16.5 | 1.72E+00 |
| 14 | 1  | 934.10   | 91   | 117   | 2.90 | 1868.36 | 4.97E-01 | 4.17E-03 | 31.0 | 2.91E+00 |
| 15 | 1  | 1120.51* | 307  | 72    | 1.79 | 2241.52 | 4.33E-01 | 1.40E-02 | 8.6  | 1.48E+00 |
| 16 | 1  | 1155.68  | 57   | 53    | 2.53 | 2311.91 | 4.23E-01 | 2.62E-03 | 29.1 | 1.89E+00 |
| 17 | 1  | 1238.43* | 82   | 93    | 1.54 | 2477.57 | 4.01E-01 | 3.73E-03 | 27.3 | 1.86E+00 |
| 18 | 1  | 1378.03  | 128  | 22    | 2.08 | 2757.04 | 3.71E-01 | 5.87E-03 | 11.3 | 1.26E+00 |
| 19 | 1  | 1408.28  | 64   | 33    | 2.73 | 2817.61 | 3.65E-01 | 2.91E-03 | 21.8 | 6.15E-01 |
| 20 | 1  | 1461.03* | 31   | 65    | 2.18 | 2923.22 | 3.56E-01 | 1.43E-03 | 77.6 | 7.72E-01 |
| 21 | 1  | 1729.84  | 68   | 15    | 2.48 | 3461.44 | 3.17E-01 | 3.09E-03 | 18.6 | 1.25E+00 |
| 22 | 1  | 1764.93* | 208  | 63    | 2.10 | 3531.71 | 3.13E-01 | 9.51E-03 | 12.4 | 2.51E+00 |
| 23 | 1  | 2007.94  | 21   | 11    | 2.74 | 4018.34 | 2.90E-01 | 9.79E-04 | 35.3 | 2.92E+00 |

Flag: "\*" = Peak area was modified by background subtraction

## Nuclide Line Activity Report

Nuclide Type: natural

| Nuclide | Energy  | Area  | %Abn   | %Eff      | Uncorrected pCi/L | Decay Corr pCi/L | 2-Sigma %Error |
|---------|---------|-------|--------|-----------|-------------------|------------------|----------------|
| K-40    | 1460.81 | 31    | 10.67* | 3.559E-01 | 3.100E+01         | 3.100E+01        | 155.29         |
| TH-228  | 238.63  | 56    | 44.60* | 1.401E+00 | 3.353E+00         | 3.403E+00        | 168.00         |
|         | 240.98  | ----- | 3.95   | 1.392E+00 | -----             | Line Not Found   | -----          |

Flag: "\*" = Keyline

## Summary of Nuclide Activity

Sample ID : 10L28833-4

Acquisition date : 9-JUN-2006 05:03:53

|   |    |        |
|---|----|--------|
| Total number of lines in spectrum             | 23 |        |
| Number of unidentified lines                  | 20 |        |
| Number of lines tentatively identified by NID | 3  | 13.04% |

Nuclide Type : natural

| Nuclide | Hlife     | Decay            | Uncorrected<br>pCi/L | Decay Corr<br>pCi/L | Decay Corr<br>2-Sigma Error | 2-Sigma<br>%Error | Flags |
|---------|-----------|------------------|----------------------|---------------------|-----------------------------|-------------------|-------|
| K-40    | 1.28E+09Y | 1.00             | 3.100E+01            | 3.100E+01           | 4.813E+01                   | 155.29            |       |
| TH-228  | 1.91Y     | 1.01             | 3.353E+00            | 3.403E+00           | 5.717E+00                   | 168.00            |       |
|         |           |                  | -----                | -----               |                             |                   |       |
|         |           | Total Activity : | 3.435E+01            | 3.440E+01           |                             |                   |       |

|                        |           |           |
|------------------------|-----------|-----------|
| Grand Total Activity : | 3.435E+01 | 3.440E+01 |
|------------------------|-----------|-----------|

Flags: "K" = Keyline not found  
 "E" = Manually edited

"M" = Manually accepted  
 "A" = Nuclide specific abn. limit

Unidentified Energy Lines  
Sample ID : 10L28833-4

Page : 3  
Acquisition date : 9-JUN-2006 05:03:53

| It | Energy  | Area | Bkgnd | FWHM | Channel | Left | Pw | Cts/Sec  | %Err | %Eff     | Flags |
|----|---------|------|-------|------|---------|------|----|----------|------|----------|-------|
| 1  | 66.42   | 208  | 1061  | 1.57 | 131.96  | 128  | 9  | 9.52E-03 | 59.8 | 6.37E-01 |       |
| 2  | 74.88   | 192  | 1087  | 1.49 | 148.87  | 142  | 17 | 8.78E-03 | 68.1 | 8.82E-01 |       |
| 2  | 77.17   | 467  | 821   | 1.22 | 153.46  | 142  | 17 | 2.13E-02 | 23.8 | 9.45E-01 |       |
| 1  | 87.34   | 118  | 849   | 1.18 | 173.82  | 171  | 7  | 5.39E-03 | 87.7 | 1.19E+00 |       |
| 1  | 140.25  | 187  | 827   | 1.47 | 279.69  | 276  | 8  | 8.52E-03 | 55.3 | 1.68E+00 |       |
| 1  | 198.38  | 81   | 696   | 1.56 | 395.98  | 392  | 9  | 3.70E-03 | **** | 1.55E+00 |       |
| 1  | 242.26  | 535  | 506   | 1.57 | 483.80  | 472  | 21 | 2.44E-02 | 17.5 | 1.39E+00 |       |
| 1  | 295.35  | 906  | 498   | 1.24 | 590.02  | 585  | 11 | 4.14E-02 | 11.6 | 1.21E+00 |       |
| 1  | 352.06  | 1448 | 508   | 1.28 | 703.50  | 697  | 14 | 6.61E-02 | 8.8  | 1.07E+00 |       |
| 1  | 596.16  | 140  | 222   | 4.46 | 1192.00 | 1183 | 15 | 6.37E-03 | 49.0 | 7.06E-01 |       |
| 1  | 609.45  | 1472 | 199   | 1.50 | 1218.60 | 1211 | 15 | 6.72E-02 | 7.0  | 6.94E-01 |       |
| 1  | 768.79  | 144  | 103   | 1.59 | 1537.50 | 1532 | 12 | 6.60E-03 | 33.1 | 5.78E-01 |       |
| 1  | 934.10  | 91   | 117   | 2.90 | 1868.36 | 1860 | 19 | 4.17E-03 | 62.1 | 4.97E-01 |       |
| 1  | 1120.51 | 307  | 72    | 1.79 | 2241.52 | 2235 | 13 | 1.40E-02 | 17.2 | 4.33E-01 |       |
| 1  | 1155.68 | 57   | 53    | 2.53 | 2311.91 | 2306 | 12 | 2.62E-03 | 58.3 | 4.23E-01 |       |
| 1  | 1238.43 | 82   | 93    | 1.54 | 2477.57 | 2471 | 12 | 3.73E-03 | 54.6 | 4.01E-01 |       |
| 1  | 1378.03 | 128  | 22    | 2.08 | 2757.04 | 2752 | 11 | 5.87E-03 | 22.6 | 3.71E-01 |       |
| 1  | 1408.28 | 64   | 33    | 2.73 | 2817.61 | 2812 | 12 | 2.91E-03 | 43.7 | 3.65E-01 | T     |
| 1  | 1729.84 | 68   | 15    | 2.48 | 3461.44 | 3454 | 16 | 3.09E-03 | 37.2 | 3.17E-01 |       |
| 1  | 1764.93 | 208  | 63    | 2.10 | 3531.71 | 3523 | 20 | 9.51E-03 | 24.9 | 3.13E-01 |       |
| 1  | 2007.94 | 21   | 11    | 2.74 | 4018.34 | 4013 | 10 | 9.79E-04 | 70.6 | 2.90E-01 |       |

Flags: "T" = Tentatively associated

#### Summary of Nuclide Activity

|   |    |        |
|---|----|--------|
| Total number of lines in spectrum             | 23 |        |
| Number of unidentified lines                  | 20 |        |
| Number of lines tentatively identified by NID | 3  | 13.04% |

Nuclide Type : natural

| Nuclide          | Hlife     | Decay | Wtd Mean<br>Uncorrected<br>pCi/L | Wtd Mean<br>Decay Corr<br>pCi/L | Decay Corr<br>2-Sigma Error | 2-Sigma<br>%Error | Flags |
|------------------|-----------|-------|----------------------------------|---------------------------------|-----------------------------|-------------------|-------|
| K-40             | 1.28E+09Y | 1.00  | 3.100E+01                        | 3.100E+01                       | 4.813E+01                   | 155.29            |       |
| TH-228           | 1.91Y     | 1.01  | 3.353E+00                        | 3.403E+00                       | 5.717E+00                   | 168.00            |       |
| Total Activity : |           |       | 3.435E+01                        | 3.440E+01                       |                             |                   |       |

Grand Total Activity : 3.435E+01 3.440E+01

Flags: "K" = Keyline not found  
"E" = Manually edited

"M" = Manually accepted  
"A" = Nuclide specific abn. limit

#### Interference Report

No interference correction performed

#### Combined Activity-MDA Report

---- Identified Nuclides ----



| Nuclide | Activity<br>(pCi/L) | Act error | MDA<br>(pCi/L) | MDA error | Act/MDA |
|---------|---------------------|-----------|----------------|-----------|---------|
| K-40    | 3.100E+01           | 4.813E+01 | 5.135E+01      | 0.000E+00 | 0.604   |
| TH-228  | 3.403E+00           | 5.717E+00 | 9.243E+00      | 0.000E+00 | 0.368   |

---- Non-Identified Nuclides ----

| Nuclide | Key-Line<br>Activity<br>(pCi/L) | K.L.<br>Ided | Act error | MDA<br>(pCi/L)      | MDA error | Act/MDA |
|---------|---------------------------------|--------------|-----------|---------------------|-----------|---------|
| BE-7    | 3.414E+01                       |              | 3.158E+01 | 5.415E+01           | 0.000E+00 | 0.631   |
| NA-24   | -4.350E+01                      |              | 2.917E+01 | Half-Life too short |           |         |
| CR-51   | -3.210E+01                      |              | 3.724E+01 | 5.989E+01           | 0.000E+00 | -0.536  |
| MN-54   | -1.251E+00                      |              | 3.245E+00 | 5.265E+00           | 0.000E+00 | -0.238  |
| CO-57   | -1.421E+00                      |              | 3.226E+00 | 5.295E+00           | 0.000E+00 | -0.268  |
| CO-58   | -4.167E-01                      |              | 3.615E+00 | 5.946E+00           | 0.000E+00 | -0.070  |
| FE-59   | 1.276E+00                       |              | 7.469E+00 | 1.250E+01           | 0.000E+00 | 0.102   |
| CO-60   | -4.557E-01                      |              | 3.168E+00 | 5.146E+00           | 0.000E+00 | -0.089  |
| ZN-65   | 3.949E+01                       |              | 1.025E+01 | 1.735E+01           | 0.000E+00 | 2.276   |
| SE-75   | -2.281E+00                      |              | 4.394E+00 | 7.200E+00           | 0.000E+00 | -0.317  |
| SR-85   | 2.052E+01                       |              | 3.917E+00 | 7.360E+00           | 0.000E+00 | 2.788   |
| Y-88    | -2.833E+00                      |              | 3.725E+00 | 5.747E+00           | 0.000E+00 | -0.493  |
| NB-94   | -2.074E-01                      |              | 2.999E+00 | 4.865E+00           | 0.000E+00 | -0.043  |
| NB-95   | 1.193E+01                       |              | 4.111E+00 | 6.745E+00           | 0.000E+00 | 1.768   |
| ZR-95   | 1.610E+00                       |              | 6.228E+00 | 9.942E+00           | 0.000E+00 | 0.162   |
| MO-99   | -3.790E+02                      |              | 9.433E+02 | 1.540E+03           | 0.000E+00 | -0.246  |
| RU-103  | 7.419E-01                       |              | 3.891E+00 | 6.484E+00           | 0.000E+00 | 0.114   |
| RU-106  | -1.335E+01                      |              | 2.981E+01 | 4.580E+01           | 0.000E+00 | -0.291  |
| AG-110m | -2.770E+00                      |              | 3.075E+00 | 4.826E+00           | 0.000E+00 | -0.574  |
| SN-113  | -5.295E-01                      |              | 4.460E+00 | 7.247E+00           | 0.000E+00 | -0.073  |
| SB-124  | 3.395E+00                       |              | 7.588E+00 | 5.690E+00           | 0.000E+00 | 0.597   |
| SB-125  | 1.670E-01                       |              | 9.617E+00 | 1.563E+01           | 0.000E+00 | 0.011   |
| TE-129M | 4.595E+00                       |              | 4.646E+01 | 7.746E+01           | 0.000E+00 | 0.059   |
| I-131   | 6.244E+00                       |              | 1.128E+01 | 1.850E+01           | 0.000E+00 | 0.338   |
| BA-133  | 7.729E+01                       |              | 6.616E+00 | 1.215E+01           | 0.000E+00 | 6.359   |
| CS-134  | 5.946E+01                       |              | 7.426E+00 | 9.596E+00           | 0.000E+00 | 6.197   |
| CS-136  | -2.942E+00                      |              | 6.772E+00 | 1.097E+01           | 0.000E+00 | -0.268  |
| CS-137  | 2.207E+00                       |              | 3.275E+00 | 5.497E+00           | 0.000E+00 | 0.402   |
| CE-139  | -1.690E+00                      |              | 3.407E+00 | 5.530E+00           | 0.000E+00 | -0.306  |
| BA-140  | -3.077E+00                      |              | 2.376E+01 | 3.901E+01           | 0.000E+00 | -0.079  |
| LA-140  | -1.796E+00                      |              | 7.877E+00 | 1.283E+01           | 0.000E+00 | -0.140  |
| CE-141  | -4.035E-01                      |              | 8.544E+00 | 1.191E+01           | 0.000E+00 | -0.034  |
| CE-144  | -8.456E+00                      |              | 2.922E+01 | 4.062E+01           | 0.000E+00 | -0.208  |
| EU-152  | -7.117E+00                      |              | 1.160E+01 | 1.566E+01           | 0.000E+00 | -0.454  |
| EU-154  | -3.779E+00                      |              | 6.609E+00 | 1.082E+01           | 0.000E+00 | -0.349  |
| RA-226  | -7.880E+01                      |              | 8.248E+01 | 1.274E+02           | 0.000E+00 | -0.619  |
| AC-228  | -9.281E-01                      |              | 1.269E+01 | 1.994E+01           | 0.000E+00 | -0.047  |
| TH-232  | -9.236E-01                      |              | 1.262E+01 | 1.984E+01           | 0.000E+00 | -0.047  |
| U-235   | 2.076E+01                       |              | 2.913E+01 | 4.142E+01           | 0.000E+00 | 0.501   |
| U-238   | -4.178E+02                      |              | 3.417E+02 | 5.214E+02           | 0.000E+00 | -0.801  |
| AM-241  | -2.925E+01                      |              | 3.172E+01 | 4.462E+01           | 0.000E+00 | -0.656  |

|              |             |                  |             |              |             |
|--------------|-------------|------------------|-------------|--------------|-------------|
| A,10L28833-4 | ,06/09/2006 | 11:09,05/25/2006 | 11:23,      | 3.293E+00,WG | L28833-4 EX |
| B,10L28833-4 | ,LIBD       |                  | ,06/07/2006 | 09:32,       | 1035L091004 |
| C,K-40       | ,YES,       | 3.100E+01,       | 4.813E+01,  | 5.135E+01,,  | 0.604       |
| C,TH-228     | ,YES,       | 3.403E+00,       | 5.717E+00,  | 9.243E+00,,  | 0.368       |
| C,BE-7       | ,NO,        | 3.414E+01,       | 3.158E+01,  | 5.415E+01,,  | 0.631       |
| C,CR-51      | ,NO,        | -3.210E+01,      | 3.724E+01,  | 5.989E+01,,  | -0.536      |
| C,MN-54      | ,NO,        | -1.251E+00,      | 3.245E+00,  | 5.265E+00,,  | -0.238      |
| C,CO-57      | ,NO,        | -1.421E+00,      | 3.226E+00,  | 5.295E+00,,  | -0.268      |
| C,CO-58      | ,NO,        | -4.167E-01,      | 3.615E+00,  | 5.946E+00,,  | -0.070      |
| C,FE-59      | ,NO,        | 1.276E+00,       | 7.469E+00,  | 1.250E+01,,  | 0.102       |
| C,CO-60      | ,NO,        | -4.557E-01,      | 3.168E+00,  | 5.146E+00,,  | -0.089      |
| C,ZN-65      | ,NO,        | 3.949E+01,       | 1.025E+01,  | 1.735E+01,,  | 2.276       |
| C,SE-75      | ,NO,        | -2.281E+00,      | 4.394E+00,  | 7.200E+00,,  | -0.317      |
| C,SR-85      | ,NO,        | 2.052E+01,       | 3.917E+00,  | 7.360E+00,,  | 2.788       |
| C,Y-88       | ,NO,        | -2.833E+00,      | 3.725E+00,  | 5.747E+00,,  | -0.493      |
| C,NB-94      | ,NO,        | -2.074E-01,      | 2.999E+00,  | 4.865E+00,,  | -0.043      |
| C,NB-95      | ,NO,        | 1.193E+01,       | 4.111E+00,  | 6.745E+00,,  | 1.768       |
| C,ZR-95      | ,NO,        | 1.610E+00,       | 6.228E+00,  | 9.942E+00,,  | 0.162       |
| C,MO-99      | ,NO,        | -3.790E+02,      | 9.433E+02,  | 1.540E+03,,  | -0.246      |
| C,RU-103     | ,NO,        | 7.419E-01,       | 3.891E+00,  | 6.484E+00,,  | 0.114       |
| C,RU-106     | ,NO,        | -1.335E+01,      | 2.981E+01,  | 4.580E+01,,  | -0.291      |
| C,AG-110m    | ,NO,        | -2.770E+00,      | 3.075E+00,  | 4.826E+00,,  | -0.574      |
| C,SN-113     | ,NO,        | -5.295E-01,      | 4.460E+00,  | 7.247E+00,,  | -0.073      |
| C,SB-124     | ,NO,        | 3.395E+00,       | 7.588E+00,  | 5.690E+00,,  | 0.597       |
| C,SB-125     | ,NO,        | 1.670E-01,       | 9.617E+00,  | 1.563E+01,,  | 0.011       |
| C,TE-129M    | ,NO,        | 4.595E+00,       | 4.646E+01,  | 7.746E+01,,  | 0.059       |
| C,I-131      | ,NO,        | 6.244E+00,       | 1.128E+01,  | 1.850E+01,,  | 0.338       |
| C,BA-133     | ,NO,        | 7.729E+01,       | 6.616E+00,  | 1.215E+01,,  | 6.359       |
| C,CS-134     | ,NO,        | 5.946E+01,       | 7.426E+00,  | 9.596E+00,,  | 6.197       |
| C,CS-136     | ,NO,        | -2.942E+00,      | 6.772E+00,  | 1.097E+01,,  | -0.268      |
| C,CS-137     | ,NO,        | 2.207E+00,       | 3.275E+00,  | 5.497E+00,,  | 0.402       |
| C,CE-139     | ,NO,        | -1.690E+00,      | 3.407E+00,  | 5.530E+00,,  | -0.306      |
| C,BA-140     | ,NO,        | -3.077E+00,      | 2.376E+01,  | 3.901E+01,,  | -0.079      |
| C,LA-140     | ,NO,        | -1.796E+00,      | 7.877E+00,  | 1.283E+01,,  | -0.140      |
| C,CE-141     | ,NO,        | -4.035E-01,      | 8.544E+00,  | 1.191E+01,,  | -0.034      |
| C,CE-144     | ,NO,        | -8.456E+00,      | 2.922E+01,  | 4.062E+01,,  | -0.208      |
| C,EU-152     | ,NO,        | -7.117E+00,      | 1.160E+01,  | 1.566E+01,,  | -0.454      |
| C,EU-154     | ,NO,        | -3.779E+00,      | 6.609E+00,  | 1.082E+01,,  | -0.349      |
| C,RA-226     | ,NO,        | -7.880E+01,      | 8.248E+01,  | 1.274E+02,,  | -0.619      |
| C,AC-228     | ,NO,        | -9.281E-01,      | 1.269E+01,  | 1.994E+01,,  | -0.047      |
| C,TH-232     | ,NO,        | -9.236E-01,      | 1.262E+01,  | 1.984E+01,,  | -0.047      |
| C,U-235      | ,NO,        | 2.076E+01,       | 2.913E+01,  | 4.142E+01,,  | 0.501       |
| C,U-238      | ,NO,        | -4.178E+02,      | 3.417E+02,  | 5.214E+02,,  | -0.801      |
| C,AM-241     | ,NO,        | -2.925E+01,      | 3.172E+01,  | 4.462E+01,,  | -0.656      |



## Summary of Nuclide Activity

Page : 2

Sample ID : 11L28833-5

Acquisition date : 9-JUN-2006 05:04:04

|   |    |        |
|---|----|--------|
| Total number of lines in spectrum             | 12 |        |
| Number of unidentified lines                  | 8  |        |
| Number of lines tentatively identified by NID | 4  | 33.33% |

Nuclide Type : natural

| Nuclide          | Hlife     | Decay | Uncorrected<br>pCi/L | Decay Corr<br>pCi/L | Decay Corr<br>2-Sigma Error | 2-Sigma<br>%Error | Flags |
|------------------|-----------|-------|----------------------|---------------------|-----------------------------|-------------------|-------|
| K-40             | 1.28E+09Y | 1.00  | 6.937E+01            | 6.937E+01           | 4.571E+01                   | 65.89             |       |
| AC-228           | 5.75Y     | 1.01  | 6.601E+00            | 6.635E+00           | 12.59E+00                   | 189.68            |       |
| U-235            | 7.04E+08Y | 1.00  | 5.092E+00            | 5.092E+00           | 5.350E+00                   | 105.08            | K     |
| Total Activity : |           |       | 8.106E+01            | 8.109E+01           |                             |                   |       |

Grand Total Activity : 8.106E+01 8.109E+01

Flags: "K" = Keyline not found  
 "E" = Manually edited

"M" = Manually accepted  
 "A" = Nuclide specific abn. limit

## Unidentified Energy Lines

Page : 3

Sample ID : 11L28833-5

Acquisition date : 9-JUN-2006 05:04:04

| It | Energy  | Area | Bkgnd | FWHM | Channel | Left | Pw | Cts/Sec  | %Err | %Eff     | Flags |
|----|---------|------|-------|------|---------|------|----|----------|------|----------|-------|
| 0  | 66.53   | 120  | 628   | 1.53 | 132.08  | 130  | 6  | 8.20E-03 | 68.9 | 6.94E-01 |       |
| 0  | 139.89  | 57   | 441   | 1.79 | 279.22  | 275  | 9  | 3.91E-03 | **** | 1.90E+00 |       |
| 0  | 295.30  | 90   | 262   | 1.29 | 590.83  | 585  | 12 | 6.15E-03 | 78.4 | 1.37E+00 |       |
| 0  | 352.00  | 93   | 180   | 0.98 | 704.46  | 699  | 11 | 6.34E-03 | 65.7 | 1.20E+00 |       |
| 0  | 596.19  | 82   | 86    | 1.58 | 1193.61 | 1189 | 11 | 5.59E-03 | 49.5 | 8.03E-01 |       |
| 0  | 609.36  | 91   | 91    | 1.38 | 1219.98 | 1215 | 11 | 6.21E-03 | 51.0 | 7.90E-01 |       |
| 0  | 819.42  | 20   | 21    | 1.04 | 1640.39 | 1637 | 6  | 1.35E-03 | 87.4 | 6.25E-01 | T     |
| 0  | 1120.90 | 20   | 50    | 1.16 | 2243.23 | 2237 | 10 | 1.38E-03 | **** | 4.86E-01 |       |
| 0  | 1761.69 | 49   | 13    | 1.79 | 3522.36 | 3515 | 14 | 3.35E-03 | 43.0 | 3.39E-01 |       |

Flags: "T" = Tentatively associated

## Summary of Nuclide Activity

Total number of lines in spectrum 12  
 Number of unidentified lines 8  
 Number of lines tentatively identified by NID 4 33.33%

Nuclide Type : natural

| Nuclide          | Hlife     | Decay | Wtd Mean    | Wtd Mean   | Decay Corr | 2-Sigma | 2-Sigma Error | %Error | Flags |
|------------------|-----------|-------|-------------|------------|------------|---------|---------------|--------|-------|
|                  |           |       | Uncorrected | Decay Corr |            |         |               |        |       |
| K-40             | 1.28E+09Y | 1.00  | 6.937E+01   | 6.937E+01  | 4.571E+01  | 65.89   |               |        |       |
| AC-228           | 5.75Y     | 1.01  | 6.601E+00   | 6.635E+00  | 12.59E+00  | 189.68  |               |        |       |
| U-235            | 7.04E+08Y | 1.00  | 5.092E+00   | 5.092E+00  | 5.350E+00  | 105.08  |               |        |       |
| Total Activity : |           |       | 8.106E+01   | 8.109E+01  |            |         |               |        |       |

Grand Total Activity : 8.106E+01 8.109E+01

Flags: "K" = Keyline not found  
 "E" = Manually edited

"M" = Manually accepted  
 "A" = Nuclide specific abn. limit

## Interference Report

No interference correction performed

## Combined Activity-MDA Report

---- Identified Nuclides ----

| Nuclide | Activity (pCi/L) | Act error | MDA (pCi/L) | MDA error | Act/MDA |
|---------|------------------|-----------|-------------|-----------|---------|
| K-40    | 6.937E+01        | 4.571E+01 | 4.681E+01   | 0.000E+00 | 1.482   |
| AC-228  | 6.635E+00        | 1.259E+01 | 1.716E+01   | 0.000E+00 | 0.387   |
| U-235   | 5.092E+00        | 5.350E+00 | 4.012E+01   | 0.000E+00 | 0.127   |

---- Non-Identified Nuclides ----

| Key-Line | Activity | K.L. | Act error | MDA | MDA error | Act/MDA |
|----------|----------|------|-----------|-----|-----------|---------|
|----------|----------|------|-----------|-----|-----------|---------|

| Nuclide | (pCi/L)    | Ided | (pCi/L)   | (pCi/L)             |                  |
|---------|------------|------|-----------|---------------------|------------------|
| BE-7    | -8.778E+00 |      | 3.104E+01 | 4.998E+01           | 0.000E+00 -0.176 |
| NA-24   | -5.485E+01 |      | 6.601E+01 | Half-Life too short |                  |
| CR-51   | -3.258E+01 |      | 3.809E+01 | 6.113E+01           | 0.000E+00 -0.533 |
| MN-54   | 1.353E+00  |      | 2.887E+00 | 4.875E+00           | 0.000E+00 0.277  |
| CO-57   | 1.401E+00  |      | 3.152E+00 | 5.251E+00           | 0.000E+00 0.267  |
| CO-58   | 6.135E-01  |      | 3.505E+00 | 5.183E+00           | 0.000E+00 0.118  |
| FE-59   | -4.976E+00 |      | 7.417E+00 | 1.170E+01           | 0.000E+00 -0.425 |
| CO-60   | 5.012E-01  |      | 2.945E+00 | 4.906E+00           | 0.000E+00 0.102  |
| ZN-65   | 5.494E+00  |      | 8.373E+00 | 1.243E+01           | 0.000E+00 0.442  |
| SE-75   | -4.768E+00 |      | 4.453E+00 | 7.164E+00           | 0.000E+00 -0.666 |
| SR-85   | 1.630E+01  |      | 4.038E+00 | 7.541E+00           | 0.000E+00 2.161  |
| Y-88    | -3.280E+00 |      | 3.491E+00 | 5.116E+00           | 0.000E+00 -0.641 |
| NB-94   | -3.292E-01 |      | 2.836E+00 | 4.648E+00           | 0.000E+00 -0.071 |
| NB-95   | 4.210E+00  |      | 3.447E+00 | 6.069E+00           | 0.000E+00 0.694  |
| ZR-95   | -4.021E+00 |      | 6.060E+00 | 9.555E+00           | 0.000E+00 -0.421 |
| MO-99   | -3.556E+01 |      | 1.146E+03 | 1.882E+03           | 0.000E+00 -0.019 |
| RU-103  | 1.534E+00  |      | 3.803E+00 | 6.320E+00           | 0.000E+00 0.243  |
| RU-106  | 1.402E+01  |      | 2.970E+01 | 4.984E+01           | 0.000E+00 0.281  |
| AG-110m | 1.080E+00  |      | 2.956E+00 | 4.990E+00           | 0.000E+00 0.216  |
| SN-113  | 1.022E+00  |      | 4.399E+00 | 7.297E+00           | 0.000E+00 0.140  |
| SB-124  | -2.488E+00 |      | 8.333E+00 | 5.573E+00           | 0.000E+00 -0.446 |
| SB-125  | 1.062E+00  |      | 8.784E+00 | 1.447E+01           | 0.000E+00 0.073  |
| TE-129M | -3.779E+00 |      | 4.636E+01 | 7.547E+01           | 0.000E+00 -0.050 |
| I-131   | -1.255E+01 |      | 1.200E+01 | 1.894E+01           | 0.000E+00 -0.663 |
| BA-133  | 8.957E+00  |      | 4.962E+00 | 7.608E+00           | 0.000E+00 1.177  |
| CS-134  | 4.438E+00  |      | 7.227E+00 | 5.756E+00           | 0.000E+00 0.771  |
| CS-136  | 4.196E+00  | +    | 3.668E+00 | 1.082E+01           | 0.000E+00 0.388  |
| CS-137  | 3.518E+00  |      | 3.188E+00 | 5.589E+00           | 0.000E+00 0.629  |
| CE-139  | -6.947E-01 |      | 3.181E+00 | 5.176E+00           | 0.000E+00 -0.134 |
| BA-140  | 5.571E+00  |      | 2.543E+01 | 4.177E+01           | 0.000E+00 0.133  |
| LA-140  | 4.906E-01  |      | 7.965E+00 | 1.329E+01           | 0.000E+00 0.037  |
| CE-141  | 1.234E+00  |      | 8.461E+00 | 1.185E+01           | 0.000E+00 0.104  |
| CE-144  | 7.753E+00  |      | 2.879E+01 | 4.058E+01           | 0.000E+00 0.191  |
| EU-152  | -4.330E+00 |      | 1.132E+01 | 1.547E+01           | 0.000E+00 -0.280 |
| EU-154  | 8.465E-01  |      | 6.394E+00 | 1.057E+01           | 0.000E+00 0.080  |
| RA-226  | 1.905E+01  |      | 7.913E+01 | 1.261E+02           | 0.000E+00 0.151  |
| TH-228  | -9.760E-01 |      | 6.422E+00 | 1.002E+01           | 0.000E+00 -0.097 |
| TH-232  | 6.601E+00  | +    | 1.252E+01 | 2.003E+01           | 0.000E+00 0.330  |
| U-238   | -1.246E+02 |      | 3.181E+02 | 5.141E+02           | 0.000E+00 -0.242 |
| AM-241  | -2.479E+01 |      | 4.324E+01 | 6.271E+01           | 0.000E+00 -0.395 |

|              |             |                  |             |                  |             |
|--------------|-------------|------------------|-------------|------------------|-------------|
| A,11L28833-5 | ,06/09/2006 | 09:39,05/24/2006 | 11:35,      | 3.210E+00,WG     | L28833-5 EX |
| B,11L28833-5 | ,LIBD       |                  | ,06/07/2006 | 09:40,113L082304 |             |
| C,K-40       | ,YES,       | 6.937E+01,       | 4.571E+01,  | 4.681E+01,,      | 1.482       |
| C,AC-228     | ,YES,       | 6.635E+00,       | 1.259E+01,  | 1.716E+01,,      | 0.387       |
| C,U-235      | ,YES,       | 5.092E+00,       | 5.350E+00,  | 4.012E+01,,      | 0.127       |
| C,BE-7       | ,NO,        | -8.778E+00,      | 3.104E+01,  | 4.998E+01,,      | -0.176      |
| C,CR-51      | ,NO,        | -3.258E+01,      | 3.809E+01,  | 6.113E+01,,      | -0.533      |
| C,MN-54      | ,NO,        | 1.353E+00,       | 2.887E+00,  | 4.875E+00,,      | 0.277       |
| C,CO-57      | ,NO,        | 1.401E+00,       | 3.152E+00,  | 5.251E+00,,      | 0.267       |
| C,CO-58      | ,NO,        | 6.135E-01,       | 3.505E+00,  | 5.183E+00,,      | 0.118       |
| C,FE-59      | ,NO,        | -4.976E+00,      | 7.417E+00,  | 1.170E+01,,      | -0.425      |
| C,CO-60      | ,NO,        | 5.012E-01,       | 2.945E+00,  | 4.906E+00,,      | 0.102       |
| C,ZN-65      | ,NO,        | 5.494E+00,       | 8.373E+00,  | 1.243E+01,,      | 0.442       |
| C,SE-75      | ,NO,        | -4.768E+00,      | 4.453E+00,  | 7.164E+00,,      | -0.666      |
| C,SR-85      | ,NO,        | 1.630E+01,       | 4.038E+00,  | 7.541E+00,,      | 2.161       |
| C,Y-88       | ,NO,        | -3.280E+00,      | 3.491E+00,  | 5.116E+00,,      | -0.641      |
| C,NB-94      | ,NO,        | -3.292E-01,      | 2.836E+00,  | 4.648E+00,,      | -0.071      |
| C,NB-95      | ,NO,        | 4.210E+00,       | 3.447E+00,  | 6.069E+00,,      | 0.694       |
| C,ZR-95      | ,NO,        | -4.021E+00,      | 6.060E+00,  | 9.555E+00,,      | -0.421      |
| C,MO-99      | ,NO,        | -3.556E+01,      | 1.146E+03,  | 1.882E+03,,      | -0.019      |
| C,RU-103     | ,NO,        | 1.534E+00,       | 3.803E+00,  | 6.320E+00,,      | 0.243       |
| C,RU-106     | ,NO,        | 1.402E+01,       | 2.970E+01,  | 4.984E+01,,      | 0.281       |
| C,AG-110m    | ,NO,        | 1.080E+00,       | 2.956E+00,  | 4.990E+00,,      | 0.216       |
| C,SN-113     | ,NO,        | 1.022E+00,       | 4.399E+00,  | 7.297E+00,,      | 0.140       |
| C,SB-124     | ,NO,        | -2.488E+00,      | 8.333E+00,  | 5.573E+00,,      | -0.446      |
| C,SB-125     | ,NO,        | 1.062E+00,       | 8.784E+00,  | 1.447E+01,,      | 0.073       |
| C,TE-129M    | ,NO,        | -3.779E+00,      | 4.636E+01,  | 7.547E+01,,      | -0.050      |
| C,I-131      | ,NO,        | -1.255E+01,      | 1.200E+01,  | 1.894E+01,,      | -0.663      |
| C,BA-133     | ,NO,        | 8.957E+00,       | 4.962E+00,  | 7.608E+00,,      | 1.177       |
| C,CS-134     | ,NO,        | 4.438E+00,       | 7.227E+00,  | 5.756E+00,,      | 0.771       |
| C,CS-136     | ,NO,        | 4.196E+00,       | 3.668E+00,  | 1.082E+01,,      | 0.388       |
| C,CS-137     | ,NO,        | 3.518E+00,       | 3.188E+00,  | 5.589E+00,,      | 0.629       |
| C,CE-139     | ,NO,        | -6.947E-01,      | 3.181E+00,  | 5.176E+00,,      | -0.134      |
| C,BA-140     | ,NO,        | 5.571E+00,       | 2.543E+01,  | 4.177E+01,,      | 0.133       |
| C,LA-140     | ,NO,        | 4.906E-01,       | 7.965E+00,  | 1.329E+01,,      | 0.037       |
| C,CE-141     | ,NO,        | 1.234E+00,       | 8.461E+00,  | 1.185E+01,,      | 0.104       |
| C,CE-144     | ,NO,        | 7.753E+00,       | 2.879E+01,  | 4.058E+01,,      | 0.191       |
| C,EU-152     | ,NO,        | -4.330E+00,      | 1.132E+01,  | 1.547E+01,,      | -0.280      |
| C,EU-154     | ,NO,        | 8.465E-01,       | 6.394E+00,  | 1.057E+01,,      | 0.080       |
| C,RA-226     | ,NO,        | 1.905E+01,       | 7.913E+01,  | 1.261E+02,,      | 0.151       |
| C,TH-228     | ,NO,        | -9.760E-01,      | 6.422E+00,  | 1.002E+01,,      | -0.097      |
| C,TH-232     | ,NO,        | 6.601E+00,       | 1.252E+01,  | 2.003E+01,,      | 0.330       |
| C,U-238      | ,NO,        | -1.246E+02,      | 3.181E+02,  | 5.141E+02,,      | -0.242      |
| C,AM-241     | ,NO,        | -2.479E+01,      | 4.324E+01,  | 6.271E+01,,      | -0.395      |

Sec. Review: Analyst: LIMS: \_\_\_\_\_

VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 9-JUN-2006 09:35:51.65  
 TBE13 P-10727B HpGe \*\*\*\*\* Aquisition Date/Time: 9-JUN-2006 05:04:15.79

LIMS No., Customer Name, Client ID: WG L28833-6 EXELON ZION

Sample ID : 13L28833-6 Smple Date: 24-MAY-2006 10:14:00.  
 Sample Type : WG Geometry : 133L082404  
 Quantity : 3.08320E+00 L BKGFILE : 13BG060306MT  
 Start Channel : 25 Energy Tol : 1.00000 Real Time : 0 04:06:15.51  
 End Channel : 4090 Pk Srch Sens: 5.00000 Live time : 0 04:06:11.14  
 MDA Constant : 0.00 Library Used: LIBD

| Pk | It | Energy   | Area | Bkgnd | FWHM  | Channel | %Eff     | Cts/Sec  | %Err  | Fit      |
|----|----|----------|------|-------|-------|---------|----------|----------|-------|----------|
| 1  | 10 | 33.87    | 155  | 14    | 1.18  | 67.88   | 1.16E-02 | 1.05E-02 | 14.1  | 2.32E+00 |
| 2  | 10 | 36.00    | 280  | 124   | 2.43  | 72.15   | 2.13E-02 | 1.89E-02 | 15.7  |          |
| 3  | 10 | 39.14    | 219  | 238   | 2.27  | 78.42   | 4.50E-02 | 1.48E-02 | 19.5  |          |
| 4  | 10 | 42.89    | 174  | 391   | 2.55  | 85.90   | 9.17E-02 | 1.18E-02 | 26.4  |          |
| 5  | 10 | 45.96*   | 194  | 329   | 2.10  | 92.04   | 1.47E-01 | 1.31E-02 | 17.3  |          |
| 6  | 1  | 92.84*   | 97   | 800   | 1.77  | 185.75  | 1.74E+00 | 6.54E-03 | 64.4  | 9.99E+00 |
| 7  | 1  | 139.52*  | 128  | 573   | 2.42  | 279.05  | 2.27E+00 | 8.65E-03 | 37.6  | 3.14E+00 |
| 8  | 1  | 185.62*  | 40   | 514   | 1.09  | 371.21  | 2.18E+00 | 2.73E-03 | 116.7 | 5.79E-01 |
| 9  | 1  | 198.20*  | 27   | 445   | 1.91  | 396.36  | 2.13E+00 | 1.80E-03 | 154.0 | 5.38E+00 |
| 10 | 1  | 238.13*  | 28   | 450   | 1.66  | 476.19  | 1.94E+00 | 1.87E-03 | 168.8 | 3.65E+00 |
| 11 | 1  | 295.00*  | 145  | 306   | 2.06  | 589.89  | 1.70E+00 | 9.82E-03 | 27.3  | 2.40E+00 |
| 12 | 1  | 351.71*  | 107  | 238   | 1.15  | 703.28  | 1.51E+00 | 7.23E-03 | 32.0  | 1.04E+00 |
| 13 | 1  | 582.86*  | 12   | 178   | 1.66  | 1165.57 | 1.04E+00 | 8.41E-04 | 261.5 | 1.52E+00 |
| 14 | 1  | 596.10   | 63   | 148   | 2.02  | 1192.06 | 1.02E+00 | 4.26E-03 | 42.3  | 1.93E+00 |
| 15 | 1  | 609.01*  | 245  | 117   | 1.73  | 1217.89 | 1.01E+00 | 1.66E-02 | 11.9  | 1.81E+00 |
| 16 | 1  | 911.47*  | 24   | 131   | 11.25 | 1823.13 | 7.36E-01 | 1.65E-03 | 119.8 | 2.76E+00 |
| 17 | 1  | 1120.12* | 30   | 58    | 2.00  | 2240.84 | 6.27E-01 | 2.06E-03 | 59.3  | 4.24E+00 |
| 18 | 1  | 1460.82* | 8    | 23    | 2.75  | 2923.23 | 5.14E-01 | 5.13E-04 | 254.0 | 3.00E+00 |
| 19 | 1  | 1763.76* | 46   | 33    | 2.78  | 3530.33 | 4.55E-01 | 3.10E-03 | 35.5  | 1.68E+00 |

Flag: "\*" = Peak area was modified by background subtraction

## Nuclide Line Activity Report

Nuclide Type: natural

| Nuclide | Energy  | Area  | %Abn   | %Eff      | Uncorrected pCi/L | Decay Corr pCi/L | 2-Sigma %Error |
|---------|---------|-------|--------|-----------|-------------------|------------------|----------------|
| K-40    | 1460.81 | 8     | 10.67* | 5.143E-01 | 8.200E+00         | 8.200E+00        | 508.00         |
| RA-226  | 186.21  | 40    | 3.28*  | 2.179E+00 | 3.349E+01         | 3.349E+01        | 233.32         |
| AC-228  | 835.50  | ----- | 1.75   | 7.877E-01 | -----             | Line Not Found   | -----          |
|         | 911.07  | 24    | 27.70* | 7.358E-01 | 7.099E+00         | 7.136E+00        | 239.51         |
| TH-228  | 238.63  | 28    | 44.60* | 1.940E+00 | 1.894E+00         | 1.924E+00        | 337.51         |
|         | 240.98  | ----- | 3.95   | 1.927E+00 | -----             | Line Not Found   | -----          |
| TH-232  | 583.14  | 12    | 30.25  | 1.040E+00 | 2.344E+00         | 2.344E+00        | 522.96         |
|         | 911.07  | 24    | 27.70* | 7.358E-01 | 7.099E+00         | 7.099E+00        | 239.51         |
|         | 969.11  | ----- | 16.60  | 7.014E-01 | -----             | Line Not Found   | -----          |
| U-235   | 143.76  | ----- | 10.50* | 2.278E+00 | -----             | Line Not Found   | -----          |
|         | 163.35  | ----- | 4.70   | 2.256E+00 | -----             | Line Not Found   | -----          |



|        |       |       |           |           |                |        |
|--------|-------|-------|-----------|-----------|----------------|--------|
| 185.71 | 40    | 54.00 | 2.179E+00 | 2.034E+00 | 2.034E+00      | 233.32 |
| 205.31 | ----- | 4.70  | 2.093E+00 | -----     | Line Not Found | -----  |

Flag: "\*" = Keyline

## Summary of Nuclide Activity

Page : 2

Sample ID : 13L28833-6

Acquisition date : 9-JUN-2006 05:04:15

|   |    |        |
|---|----|--------|
| Total number of lines in spectrum             | 19 |        |
| Number of unidentified lines                  | 14 |        |
| Number of lines tentatively identified by NID | 5  | 26.32% |

Nuclide Type : natural

| Nuclide | Hlife     | Decay            | Uncorrected<br>pCi/L | Decay Corr<br>pCi/L | Decay Corr<br>2-Sigma Error | 2-Sigma<br>%Error | Flags |
|---------|-----------|------------------|----------------------|---------------------|-----------------------------|-------------------|-------|
| K-40    | 1.28E+09Y | 1.00             | 8.200E+00            | 8.200E+00           | 41.66E+00                   | 508.00            |       |
| RA-226  | 1600.00Y  | 1.00             | 3.349E+01            | 3.349E+01           | 7.814E+01                   | 233.32            |       |
| AC-228  | 5.75Y     | 1.01             | 7.099E+00            | 7.136E+00           | 17.09E+00                   | 239.51            |       |
| TH-228  | 1.91Y     | 1.02             | 1.894E+00            | 1.924E+00           | 6.494E+00                   | 337.51            |       |
| TH-232  | 1.41E+10Y | 1.00             | 7.099E+00            | 7.099E+00           | 17.00E+00                   | 239.51            |       |
| U-235   | 7.04E+08Y | 1.00             | 2.034E+00            | 2.034E+00           | 4.746E+00                   | 233.32            | K     |
|         |           |                  | -----                | -----               |                             |                   |       |
|         |           | Total Activity : | 5.981E+01            | 5.988E+01           |                             |                   |       |

|                        |           |           |
|------------------------|-----------|-----------|
| Grand Total Activity : | 5.981E+01 | 5.988E+01 |
|------------------------|-----------|-----------|

Flags: "K" = Keyline not found  
"E" = Manually edited

"M" = Manually accepted  
"A" = Nuclide specific abn. limit

## Unidentified Energy Lines

Page : 3

Sample ID : 13L28833-6

Acquisition date : 9-JUN-2006 05:04:15

| It | Energy  | Area | Bkgnd | FWHM | Channel | Left | Pw | Cts/Sec  | %Err | %Eff     | Flags |
|----|---------|------|-------|------|---------|------|----|----------|------|----------|-------|
| 10 | 33.87   | 155  | 14    | 1.18 | 67.88   | 64   | 33 | 1.05E-02 | 28.2 | 1.16E-02 |       |
| 10 | 36.00   | 280  | 124   | 2.43 | 72.15   | 64   | 33 | 1.89E-02 | 31.3 | 2.13E-02 |       |
| 10 | 39.14   | 219  | 238   | 2.27 | 78.42   | 64   | 33 | 1.48E-02 | 39.0 | 4.50E-02 |       |
| 10 | 42.89   | 174  | 391   | 2.55 | 85.90   | 64   | 33 | 1.18E-02 | 52.7 | 9.17E-02 |       |
| 10 | 45.96   | 194  | 329   | 2.10 | 92.04   | 64   | 33 | 1.31E-02 | 34.6 | 1.47E-01 |       |
| 1  | 92.84   | 97   | 800   | 1.77 | 185.75  | 181  | 12 | 6.54E-03 | **** | 1.74E+00 |       |
| 1  | 139.52  | 128  | 573   | 2.42 | 279.05  | 274  | 10 | 8.65E-03 | 75.2 | 2.27E+00 |       |
| 1  | 198.20  | 27   | 445   | 1.91 | 396.36  | 392  | 9  | 1.80E-03 | **** | 2.13E+00 |       |
| 1  | 295.00  | 145  | 306   | 2.06 | 589.89  | 584  | 12 | 9.82E-03 | 54.6 | 1.70E+00 |       |
| 1  | 351.71  | 107  | 238   | 1.15 | 703.28  | 699  | 10 | 7.23E-03 | 63.9 | 1.51E+00 |       |
| 1  | 596.10  | 63   | 148   | 2.02 | 1192.06 | 1187 | 13 | 4.26E-03 | 84.5 | 1.02E+00 |       |
| 1  | 609.01  | 245  | 117   | 1.73 | 1217.89 | 1212 | 12 | 1.66E-02 | 23.8 | 1.01E+00 |       |
| 1  | 1120.12 | 30   | 58    | 2.00 | 2240.84 | 2235 | 11 | 2.06E-03 | **** | 6.27E-01 |       |
| 1  | 1763.76 | 46   | 33    | 2.78 | 3530.33 | 3522 | 15 | 3.10E-03 | 71.0 | 4.55E-01 |       |

Flags: "T" = Tentatively associated

## Summary of Nuclide Activity

|   |    |        |
|---|----|--------|
| Total number of lines in spectrum             | 19 |        |
| Number of unidentified lines                  | 14 |        |
| Number of lines tentatively identified by NID | 5  | 26.32% |

Nuclide Type : natural

| Nuclide          | Hlife     | Decay | Wtd Mean             |                     | Decay Corr<br>2-Sigma Error | 2-Sigma<br>%Error | Flags |
|------------------|-----------|-------|----------------------|---------------------|-----------------------------|-------------------|-------|
|                  |           |       | Uncorrected<br>pCi/L | Decay Corr<br>pCi/L |                             |                   |       |
| K-40             | 1.28E+09Y | 1.00  | 8.200E+00            | 8.200E+00           | 41.66E+00                   | 508.00            |       |
| RA-226           | 1600.00Y  | 1.00  | 3.349E+01            | 3.349E+01           | 7.814E+01                   | 233.32            |       |
| AC-228           | 5.75Y     | 1.01  | 4.755E+00            | 4.780E+00           | 21.07E+00                   | 440.78            |       |
| TH-228           | 1.91Y     | 1.02  | 1.894E+00            | 1.924E+00           | 6.494E+00                   | 337.51            |       |
| TH-232           | 1.41E+10Y | 1.00  | 2.344E+00            | 2.344E+00           | 12.26E+00                   | 522.96            |       |
| Total Activity : |           |       | 5.068E+01            | 5.074E+01           |                             |                   |       |

Grand Total Activity : 5.068E+01 5.074E+01

Flags: "K" = Keyline not found "M" = Manually accepted  
 "E" = Manually edited "A" = Nuclide specific abn. limit

## Interference Report

| Interfering |        | Interfered |        |
|-------------|--------|------------|--------|
| Nuclide     | Line   | Nuclide    | Line   |
| TH-232      | 911.07 | AC-228     | 911.07 |

## Combined Activity-MDA Report

---- Identified Nuclides ----

| Activity | Act error | MDA | MDA error | Act/MDA |
|----------|-----------|-----|-----------|---------|
|----------|-----------|-----|-----------|---------|

| Nuclide | (pCi/L)   |           | (pCi/L)   |           |       |
|---------|-----------|-----------|-----------|-----------|-------|
| K-40    | 8.200E+00 | 4.166E+01 | 4.301E+01 | 0.000E+00 | 0.191 |
| RA-226  | 3.349E+01 | 7.814E+01 | 1.079E+02 | 0.000E+00 | 0.310 |
| AC-228  | 4.780E+00 | 2.107E+01 | 1.788E+01 | 0.000E+00 | 0.267 |
| TH-228  | 1.924E+00 | 6.494E+00 | 8.318E+00 | 0.000E+00 | 0.231 |
| TH-232  | 2.344E+00 | 1.226E+01 | 1.790E+01 | 0.000E+00 | 0.131 |

---- Non-Identified Nuclides ----

| Nuclide | Key-Line<br>Activity<br>(pCi/L) | K.L.<br>Ided | Act error | MDA<br>(pCi/L)      | MDA error | Act/MDA |
|---------|---------------------------------|--------------|-----------|---------------------|-----------|---------|
| BE-7    | 9.289E-01                       |              | 2.876E+01 | 4.743E+01           | 0.000E+00 | 0.020   |
| NA-24   | -8.487E+01                      |              | 6.771E+01 | Half-Life too short |           |         |
| CR-51   | -6.588E+00                      |              | 3.582E+01 | 5.852E+01           | 0.000E+00 | -0.113  |
| MN-54   | 7.643E-02                       |              | 2.885E+00 | 4.797E+00           | 0.000E+00 | 0.016   |
| CO-57   | 1.017E+00                       |              | 2.855E+00 | 4.659E+00           | 0.000E+00 | 0.218   |
| CO-58   | 1.488E-02                       |              | 3.360E+00 | 5.472E+00           | 0.000E+00 | 0.003   |
| FE-59   | 6.329E-01                       |              | 6.660E+00 | 1.112E+01           | 0.000E+00 | 0.057   |
| CO-60   | -2.200E+00                      |              | 2.945E+00 | 4.539E+00           | 0.000E+00 | -0.485  |
| ZN-65   | 9.402E+00                       |              | 7.775E+00 | 1.193E+01           | 0.000E+00 | 0.788   |
| SE-75   | 4.218E-01                       |              | 4.038E+00 | 6.725E+00           | 0.000E+00 | 0.063   |
| SR-85   | 2.330E+01                       |              | 3.784E+00 | 7.361E+00           | 0.000E+00 | 3.166   |
| Y-88    | -2.558E+00                      |              | 3.296E+00 | 5.057E+00           | 0.000E+00 | -0.506  |
| NB-94   | -1.241E+00                      |              | 2.812E+00 | 4.529E+00           | 0.000E+00 | -0.274  |
| NB-95   | 1.923E+00                       |              | 3.508E+00 | 5.887E+00           | 0.000E+00 | 0.327   |
| ZR-95   | -4.738E+00                      |              | 6.117E+00 | 9.613E+00           | 0.000E+00 | -0.493  |
| MO-99   | 2.093E+02                       |              | 1.180E+03 | 1.951E+03           | 0.000E+00 | 0.107   |
| RU-103  | 1.958E+00                       |              | 3.721E+00 | 6.243E+00           | 0.000E+00 | 0.314   |
| RU-106  | -6.076E+00                      |              | 2.846E+01 | 4.561E+01           | 0.000E+00 | -0.133  |
| AG-110m | 1.207E+00                       |              | 2.832E+00 | 4.773E+00           | 0.000E+00 | 0.253   |
| SN-113  | 2.890E+00                       |              | 4.063E+00 | 6.770E+00           | 0.000E+00 | 0.427   |
| SB-124  | -4.119E-04                      |              | 7.756E+00 | 5.309E+00           | 0.000E+00 | 0.000   |
| SB-125  | -3.221E+00                      |              | 8.264E+00 | 1.351E+01           | 0.000E+00 | -0.238  |
| TE-129M | 1.141E+01                       |              | 4.254E+01 | 7.099E+01           | 0.000E+00 | 0.161   |
| I-131   | 1.320E+00                       |              | 1.123E+01 | 1.839E+01           | 0.000E+00 | 0.072   |
| BA-133  | 1.246E+01                       |              | 4.809E+00 | 7.449E+00           | 0.000E+00 | 1.673   |
| CS-134  | 1.546E+01                       |              | 6.876E+00 | 6.385E+00           | 0.000E+00 | 2.422   |
| CS-136  | 2.128E+00                       |              | 6.465E+00 | 1.071E+01           | 0.000E+00 | 0.199   |
| CS-137  | -1.687E-01                      |              | 3.192E+00 | 5.095E+00           | 0.000E+00 | -0.033  |
| CE-139  | -3.657E-01                      |              | 2.907E+00 | 4.783E+00           | 0.000E+00 | -0.076  |
| BA-140  | 2.712E+00                       |              | 2.350E+01 | 3.862E+01           | 0.000E+00 | 0.070   |
| LA-140  | -6.006E+00                      |              | 7.844E+00 | 1.209E+01           | 0.000E+00 | -0.497  |
| CE-141  | 6.508E+00                       |              | 7.662E+00 | 1.113E+01           | 0.000E+00 | 0.585   |
| CE-144  | 1.164E+01                       |              | 2.484E+01 | 3.582E+01           | 0.000E+00 | 0.325   |
| EU-152  | -7.804E+00                      |              | 1.104E+01 | 1.471E+01           | 0.000E+00 | -0.531  |
| EU-154  | 2.098E+00                       |              | 5.827E+00 | 9.507E+00           | 0.000E+00 | 0.221   |
| U-235   | 3.551E+00                       |              | 2.649E+01 | 3.720E+01           | 0.000E+00 | 0.095   |
| U-238   | 1.933E+02                       |              | 3.413E+02 | 5.588E+02           | 0.000E+00 | 0.346   |
| AM-241  | -1.931E+01                      |              | 2.549E+01 | 4.165E+01           | 0.000E+00 | -0.464  |

| Code         | Response | Value 1     | Value 2          | Value 3     | Value 4          | Value 5     |
|--------------|----------|-------------|------------------|-------------|------------------|-------------|
| A,13L28833-6 |          | ,06/09/2006 | 09:35,05/24/2006 | 10:14,      | 3.083E+00,WG     | L28833-6 EX |
| B,13L28833-6 |          | ,LIBD       |                  | ,06/07/2006 | 09:34,133L082404 |             |
| C,K-40       | ,YES,    | 8.200E+00,  | 4.166E+01,       | 4.301E+01,, | 0.191            |             |
| C,RA-226     | ,YES,    | 3.349E+01,  | 7.814E+01,       | 1.079E+02,, | 0.310            |             |
| C,AC-228     | ,YES,    | 4.780E+00,  | 2.107E+01,       | 1.788E+01,, | 0.267            |             |
| C,TH-228     | ,YES,    | 1.924E+00,  | 6.494E+00,       | 8.318E+00,, | 0.231            |             |
| C,TH-232     | ,YES,    | 2.344E+00,  | 1.226E+01,       | 1.790E+01,, | 0.131            |             |
| C,BE-7       | ,NO,     | 9.289E-01,  | 2.876E+01,       | 4.743E+01,, | 0.020            |             |
| C,CR-51      | ,NO,     | -6.588E+00, | 3.582E+01,       | 5.852E+01,, | -0.113           |             |
| C,MN-54      | ,NO,     | 7.643E-02,  | 2.885E+00,       | 4.797E+00,, | 0.016            |             |
| C,CO-57      | ,NO,     | 1.017E+00,  | 2.855E+00,       | 4.659E+00,, | 0.218            |             |
| C,CO-58      | ,NO,     | 1.488E-02,  | 3.360E+00,       | 5.472E+00,, | 0.003            |             |
| C,FE-59      | ,NO,     | 6.329E-01,  | 6.660E+00,       | 1.112E+01,, | 0.057            |             |
| C,CO-60      | ,NO,     | -2.200E+00, | 2.945E+00,       | 4.539E+00,, | -0.485           |             |
| C,ZN-65      | ,NO,     | 9.402E+00,  | 7.775E+00,       | 1.193E+01,, | 0.788            |             |
| C,SE-75      | ,NO,     | 4.218E-01,  | 4.038E+00,       | 6.725E+00,, | 0.063            |             |
| C,SR-85      | ,NO,     | 2.330E+01,  | 3.784E+00,       | 7.361E+00,, | 3.166            |             |
| C,Y-88       | ,NO,     | -2.558E+00, | 3.296E+00,       | 5.057E+00,, | -0.506           |             |
| C,NB-94      | ,NO,     | -1.241E+00, | 2.812E+00,       | 4.529E+00,, | -0.274           |             |
| C,NB-95      | ,NO,     | 1.923E+00,  | 3.508E+00,       | 5.887E+00,, | 0.327            |             |
| C,ZR-95      | ,NO,     | -4.738E+00, | 6.117E+00,       | 9.613E+00,, | -0.493           |             |
| C,MO-99      | ,NO,     | 2.093E+02,  | 1.180E+03,       | 1.951E+03,, | 0.107            |             |
| C,RU-103     | ,NO,     | 1.958E+00,  | 3.721E+00,       | 6.243E+00,, | 0.314            |             |
| C,RU-106     | ,NO,     | -6.076E+00, | 2.846E+01,       | 4.561E+01,, | -0.133           |             |
| C,AG-110m    | ,NO,     | 1.207E+00,  | 2.832E+00,       | 4.773E+00,, | 0.253            |             |
| C,SN-113     | ,NO,     | 2.890E+00,  | 4.063E+00,       | 6.770E+00,, | 0.427            |             |
| C,SB-124     | ,NO,     | -4.119E-04, | 7.756E+00,       | 5.309E+00,, | 0.000            |             |
| C,SB-125     | ,NO,     | -3.221E+00, | 8.264E+00,       | 1.351E+01,, | -0.238           |             |
| C,TE-129M    | ,NO,     | 1.141E+01,  | 4.254E+01,       | 7.099E+01,, | 0.161            |             |
| C,I-131      | ,NO,     | 1.320E+00,  | 1.123E+01,       | 1.839E+01,, | 0.072            |             |
| C,BA-133     | ,NO,     | 1.246E+01,  | 4.809E+00,       | 7.449E+00,, | 1.673            |             |
| C,CS-134     | ,NO,     | 1.546E+01,  | 6.876E+00,       | 6.385E+00,, | 2.422            |             |
| C,CS-136     | ,NO,     | 2.128E+00,  | 6.465E+00,       | 1.071E+01,, | 0.199            |             |
| C,CS-137     | ,NO,     | -1.687E-01, | 3.192E+00,       | 5.095E+00,, | -0.033           |             |
| C,CE-139     | ,NO,     | -3.657E-01, | 2.907E+00,       | 4.783E+00,, | -0.076           |             |
| C,BA-140     | ,NO,     | 2.712E+00,  | 2.350E+01,       | 3.862E+01,, | 0.070            |             |
| C,LA-140     | ,NO,     | -6.006E+00, | 7.844E+00,       | 1.209E+01,, | -0.497           |             |
| C,CE-141     | ,NO,     | 6.508E+00,  | 7.662E+00,       | 1.113E+01,, | 0.585            |             |
| C,CE-144     | ,NO,     | 1.164E+01,  | 2.484E+01,       | 3.582E+01,, | 0.325            |             |
| C,EU-152     | ,NO,     | -7.804E+00, | 1.104E+01,       | 1.471E+01,, | -0.531           |             |
| C,EU-154     | ,NO,     | 2.098E+00,  | 5.827E+00,       | 9.507E+00,, | 0.221            |             |
| C,U-235      | ,NO,     | 3.551E+00,  | 2.649E+01,       | 3.720E+01,, | 0.095            |             |
| C,U-238      | ,NO,     | 1.933E+02,  | 3.413E+02,       | 5.588E+02,, | 0.346            |             |
| C,AM-241     | ,NO,     | -1.931E+01, | 2.549E+01,       | 4.165E+01,, | -0.464           |             |



## Summary of Nuclide Activity

Page : 2

Sample ID : 14L28833-7

Acquisition date : 9-JUN-2006 05:04:26

|   |    |        |
|---|----|--------|
| Total number of lines in spectrum             | 11 |        |
| Number of unidentified lines                  | 9  |        |
| Number of lines tentatively identified by NID | 2  | 18.18% |

Nuclide Type : natural

| Nuclide          | Hlife     | Decay | Uncorrected<br>pCi/L | Decay Corr<br>pCi/L | Decay Corr<br>2-Sigma Error | 2-Sigma<br>%Error | Flags |
|------------------|-----------|-------|----------------------|---------------------|-----------------------------|-------------------|-------|
| RA-226           | 1600.00Y  | 1.00  | 5.264E+00            | 5.264E+00           | 77.12E+00                   | 1465.14           |       |
| TH-228           | 1.91Y     | 1.02  | 8.127E-01            | 8.254E-01           | 60.42E-01                   | 732.02            |       |
| U-235            | 7.04E+08Y | 1.00  | 3.197E-01            | 3.197E-01           | 46.84E-01                   | 1465.14           | K     |
| Total Activity : |           |       | 6.396E+00            | 6.409E+00           |                             |                   |       |

Grand Total Activity : 6.396E+00 6.409E+00

Flags: "K" = Keyline not found  
 "E" = Manually edited

"M" = Manually accepted  
 "A" = Nuclide specific abn. limit

Unidentified Energy Lines

Sample ID : 14L28833-7

Acquisition date : 9-JUN-2006 05:04:26

| It | Energy  | Area | Bkgnd | FWHM | Channel | Left | Pw | Cts/Sec  | %Err | %Eff     | Flags |
|----|---------|------|-------|------|---------|------|----|----------|------|----------|-------|
| 1  | 66.57   | 121  | 585   | 1.24 | 134.13  | 131  | 8  | 6.91E-03 | 71.6 | 4.59E-01 |       |
| 1  | 139.78  | 191  | 731   | 2.62 | 280.92  | 274  | 13 | 1.09E-02 | 60.3 | 1.67E+00 |       |
| 1  | 198.59  | 72   | 470   | 1.32 | 398.79  | 395  | 9  | 4.12E-03 | **** | 1.60E+00 |       |
| 1  | 295.38  | 143  | 304   | 1.47 | 592.65  | 588  | 10 | 8.12E-03 | 48.8 | 1.29E+00 |       |
| 1  | 352.18  | 85   | 267   | 1.71 | 706.34  | 700  | 11 | 4.84E-03 | 86.9 | 1.14E+00 |       |
| 1  | 596.01  | 111  | 98    | 2.16 | 1193.80 | 1189 | 11 | 6.34E-03 | 39.7 | 7.79E-01 |       |
| 1  | 609.01  | 157  | 219   | 2.17 | 1219.77 | 1210 | 19 | 8.93E-03 | 51.6 | 7.66E-01 |       |
| 1  | 1119.65 | 46   | 67    | 2.82 | 2237.45 | 2231 | 18 | 2.62E-03 | 95.0 | 4.81E-01 |       |
| 1  | 1765.09 | 43   | 19    | 2.48 | 3517.89 | 3511 | 13 | 2.45E-03 | 65.5 | 3.44E-01 |       |

Flags: "T" = Tentatively associated

Summary of Nuclide Activity

|   |    |        |
|---|----|--------|
| Total number of lines in spectrum             | 11 |        |
| Number of unidentified lines                  | 9  |        |
| Number of lines tentatively identified by NID | 2  | 18.18% |

Nuclide Type : natural

| Nuclide          | Hlife    | Decay | Wtd Mean    | Wtd Mean   | Decay Corr | 2-Sigma | 2-Sigma Error | %Error | Flags |
|------------------|----------|-------|-------------|------------|------------|---------|---------------|--------|-------|
|                  |          |       | Uncorrected | Decay Corr |            |         |               |        |       |
| RA-226           | 1600.00Y | 1.00  | 5.264E+00   | 5.264E+00  | 77.12E+00  | 1465.14 |               |        |       |
| TH-228           | 1.91Y    | 1.02  | 8.127E-01   | 8.254E-01  | 60.42E-01  | 732.02  |               |        |       |
| Total Activity : |          |       | 6.076E+00   | 6.089E+00  |            |         |               |        |       |

Grand Total Activity : 6.076E+00 6.089E+00

Flags: "K" = Keyline not found "M" = Manually accepted  
 "E" = Manually edited "A" = Nuclide specific abn. limit

Interference Report

No interference correction performed

Combined Activity-MDA Report

---- Identified Nuclides ----

| Nuclide | Activity (pCi/L) | Act error | MDA (pCi/L) | MDA error | Act/MDA |
|---------|------------------|-----------|-------------|-----------|---------|
| RA-226  | 5.264E+00        | 7.712E+01 | 1.233E+02   | 0.000E+00 | 0.043   |
| TH-228  | 8.254E-01        | 6.042E+00 | 8.966E+00   | 0.000E+00 | 0.092   |

---- Non-Identified Nuclides ----

| Nuclide | Key-Line Activity (pCi/L) | K.L. Ided | Act error | MDA (pCi/L) | MDA error | Act/MDA |
|---------|---------------------------|-----------|-----------|-------------|-----------|---------|
|---------|---------------------------|-----------|-----------|-------------|-----------|---------|



|         |            |           |                     |           |        |
|---------|------------|-----------|---------------------|-----------|--------|
| BE-7    | 4.080E+00  | 3.158E+01 | 5.229E+01           | 0.000E+00 | 0.078  |
| NA-24   | -9.852E+01 | 5.444E+01 | Half-Life too short |           |        |
| K-40    | -1.400E+01 | 4.228E+01 | 7.575E+01           | 0.000E+00 | -0.185 |
| CR-51   | 2.880E+00  | 3.824E+01 | 6.284E+01           | 0.000E+00 | 0.046  |
| MN-54   | -6.662E-01 | 3.122E+00 | 5.032E+00           | 0.000E+00 | -0.132 |
| CO-57   | -7.707E-01 | 3.177E+00 | 5.244E+00           | 0.000E+00 | -0.147 |
| CO-58   | -2.126E+00 | 3.325E+00 | 5.237E+00           | 0.000E+00 | -0.406 |
| FE-59   | -3.750E-01 | 6.840E+00 | 1.115E+01           | 0.000E+00 | -0.034 |
| CO-60   | -3.732E-01 | 3.116E+00 | 5.086E+00           | 0.000E+00 | -0.073 |
| ZN-65   | 1.418E+01  | 7.407E+00 | 1.196E+01           | 0.000E+00 | 1.186  |
| SE-75   | -3.504E+00 | 4.440E+00 | 7.185E+00           | 0.000E+00 | -0.488 |
| SR-85   | 2.392E+01  | 4.055E+00 | 7.814E+00           | 0.000E+00 | 3.061  |
| Y-88    | -1.366E+00 | 3.859E+00 | 6.132E+00           | 0.000E+00 | -0.223 |
| NB-94   | -7.005E-01 | 2.889E+00 | 4.709E+00           | 0.000E+00 | -0.149 |
| NB-95   | 2.886E+00  | 3.592E+00 | 6.118E+00           | 0.000E+00 | 0.472  |
| ZR-95   | -5.329E+00 | 6.282E+00 | 9.865E+00           | 0.000E+00 | -0.540 |
| MO-99   | 9.464E+02  | 1.164E+03 | 1.989E+03           | 0.000E+00 | 0.476  |
| RU-103  | 2.462E+00  | 3.776E+00 | 6.373E+00           | 0.000E+00 | 0.386  |
| RU-106  | 1.497E+01  | 3.025E+01 | 4.822E+01           | 0.000E+00 | 0.311  |
| AG-110m | -2.018E+00 | 3.087E+00 | 4.957E+00           | 0.000E+00 | -0.407 |
| SN-113  | 1.658E+00  | 4.417E+00 | 7.261E+00           | 0.000E+00 | 0.228  |
| SB-124  | 7.201E+00  | 7.111E+00 | 5.871E+00           | 0.000E+00 | 1.226  |
| SB-125  | -3.578E+00 | 8.777E+00 | 1.433E+01           | 0.000E+00 | -0.250 |
| TE-129M | 1.993E+01  | 4.505E+01 | 7.566E+01           | 0.000E+00 | 0.263  |
| I-131   | -6.065E+00 | 1.181E+01 | 1.887E+01           | 0.000E+00 | -0.321 |
| BA-133  | 1.512E+01  | 5.105E+00 | 8.002E+00           | 0.000E+00 | 1.889  |
| CS-134  | 1.779E+01  | 6.298E+00 | 6.407E+00           | 0.000E+00 | 2.777  |
| CS-136  | 3.041E+00  | 6.332E+00 | 1.062E+01           | 0.000E+00 | 0.286  |
| CS-137  | 9.017E-01  | 3.262E+00 | 5.467E+00           | 0.000E+00 | 0.165  |
| CE-139  | -1.436E+00 | 3.306E+00 | 5.368E+00           | 0.000E+00 | -0.267 |
| BA-140  | -4.530E+00 | 2.492E+01 | 4.045E+01           | 0.000E+00 | -0.112 |
| LA-140  | -6.301E+00 | 7.871E+00 | 1.219E+01           | 0.000E+00 | -0.517 |
| CE-141  | -1.009E+00 | 8.298E+00 | 1.157E+01           | 0.000E+00 | -0.087 |
| CE-144  | -3.475E+00 | 2.850E+01 | 3.991E+01           | 0.000E+00 | -0.087 |
| EU-152  | -6.083E+00 | 1.167E+01 | 1.566E+01           | 0.000E+00 | -0.388 |
| EU-154  | -3.331E-01 | 6.438E+00 | 1.067E+01           | 0.000E+00 | -0.031 |
| AC-228  | 2.821E-02  | 1.165E+01 | 1.889E+01           | 0.000E+00 | 0.001  |
| TH-232  | 2.806E-02  | 1.159E+01 | 1.879E+01           | 0.000E+00 | 0.001  |
| U-235   | 8.790E+00  | 2.793E+01 | 3.954E+01           | 0.000E+00 | 0.222  |
| U-238   | 1.097E+02  | 3.497E+02 | 5.859E+02           | 0.000E+00 | 0.187  |
| AM-241  | -7.455E+01 | 4.638E+01 | 6.630E+01           | 0.000E+00 | -1.125 |

|              |             |                  |            |              |             |
|--------------|-------------|------------------|------------|--------------|-------------|
| A,14L28833-7 | ,06/09/2006 | 09:57,05/24/2006 | 14:35,     | 3.261E+00,WG | L28833-7 EX |
| B,14L28833-7 | ,LIBD       | ,06/02/2006      | 08:23,     | 1435L091304  |             |
| C,RA-226     | ,YES,       | 5.264E+00,       | 7.712E+01, | 1.233E+02,,  | 0.043       |
| C,TH-228     | ,YES,       | 8.254E-01,       | 6.042E+00, | 8.966E+00,,  | 0.092       |
| C,BE-7       | ,NO,        | 4.080E+00,       | 3.158E+01, | 5.229E+01,,  | 0.078       |
| C,K-40       | ,NO,        | -1.400E+01,      | 4.228E+01, | 7.575E+01,,  | -0.185      |
| C,CR-51      | ,NO,        | 2.880E+00,       | 3.824E+01, | 6.284E+01,,  | 0.046       |
| C,MN-54      | ,NO,        | -6.662E-01,      | 3.122E+00, | 5.032E+00,,  | -0.132      |
| C,CO-57      | ,NO,        | -7.707E-01,      | 3.177E+00, | 5.244E+00,,  | -0.147      |
| C,CO-58      | ,NO,        | -2.126E+00,      | 3.325E+00, | 5.237E+00,,  | -0.406      |
| C,FE-59      | ,NO,        | -3.750E-01,      | 6.840E+00, | 1.115E+01,,  | -0.034      |
| C,CO-60      | ,NO,        | -3.732E-01,      | 3.116E+00, | 5.086E+00,,  | -0.073      |
| C,ZN-65      | ,NO,        | 1.418E+01,       | 7.407E+00, | 1.196E+01,,  | 1.186       |
| C,SE-75      | ,NO,        | -3.504E+00,      | 4.440E+00, | 7.185E+00,,  | -0.488      |
| C,SR-85      | ,NO,        | 2.392E+01,       | 4.055E+00, | 7.814E+00,,  | 3.061       |
| C,Y-88       | ,NO,        | -1.366E+00,      | 3.859E+00, | 6.132E+00,,  | -0.223      |
| C,NB-94      | ,NO,        | -7.005E-01,      | 2.889E+00, | 4.709E+00,,  | -0.149      |
| C,NB-95      | ,NO,        | 2.886E+00,       | 3.592E+00, | 6.118E+00,,  | 0.472       |
| C,ZR-95      | ,NO,        | -5.329E+00,      | 6.282E+00, | 9.865E+00,,  | -0.540      |
| C,MO-99      | ,NO,        | 9.464E+02,       | 1.164E+03, | 1.989E+03,,  | 0.476       |
| C,RU-103     | ,NO,        | 2.462E+00,       | 3.776E+00, | 6.373E+00,,  | 0.386       |
| C,RU-106     | ,NO,        | 1.497E+01,       | 3.025E+01, | 4.822E+01,,  | 0.311       |
| C,AG-110m    | ,NO,        | -2.018E+00,      | 3.087E+00, | 4.957E+00,,  | -0.407      |
| C,SN-113     | ,NO,        | 1.658E+00,       | 4.417E+00, | 7.261E+00,,  | 0.228       |
| C,SB-124     | ,NO,        | 7.201E+00,       | 7.111E+00, | 5.871E+00,,  | 1.226       |
| C,SB-125     | ,NO,        | -3.578E+00,      | 8.777E+00, | 1.433E+01,,  | -0.250      |
| C,TE-129M    | ,NO,        | 1.993E+01,       | 4.505E+01, | 7.566E+01,,  | 0.263       |
| C,I-131      | ,NO,        | -6.065E+00,      | 1.181E+01, | 1.887E+01,,  | -0.321      |
| C,BA-133     | ,NO,        | 1.512E+01,       | 5.105E+00, | 8.002E+00,,  | 1.889       |
| C,CS-134     | ,NO,        | 1.779E+01,       | 6.298E+00, | 6.407E+00,,  | 2.777       |
| C,CS-136     | ,NO,        | 3.041E+00,       | 6.332E+00, | 1.062E+01,,  | 0.286       |
| C,CS-137     | ,NO,        | 9.017E-01,       | 3.262E+00, | 5.467E+00,,  | 0.165       |
| C,CE-139     | ,NO,        | -1.436E+00,      | 3.306E+00, | 5.368E+00,,  | -0.267      |
| C,BA-140     | ,NO,        | -4.530E+00,      | 2.492E+01, | 4.045E+01,,  | -0.112      |
| C,LA-140     | ,NO,        | -6.301E+00,      | 7.871E+00, | 1.219E+01,,  | -0.517      |
| C,CE-141     | ,NO,        | -1.009E+00,      | 8.298E+00, | 1.157E+01,,  | -0.087      |
| C,CE-144     | ,NO,        | -3.475E+00,      | 2.850E+01, | 3.991E+01,,  | -0.087      |
| C,EU-152     | ,NO,        | -6.083E+00,      | 1.167E+01, | 1.566E+01,,  | -0.388      |
| C,EU-154     | ,NO,        | -3.331E-01,      | 6.438E+00, | 1.067E+01,,  | -0.031      |
| C,AC-228     | ,NO,        | 2.821E-02,       | 1.165E+01, | 1.889E+01,,  | 0.001       |
| C,TH-232     | ,NO,        | 2.806E-02,       | 1.159E+01, | 1.879E+01,,  | 0.001       |
| C,U-235      | ,NO,        | 8.790E+00,       | 2.793E+01, | 3.954E+01,,  | 0.222       |
| C,U-238      | ,NO,        | 1.097E+02,       | 3.497E+02, | 5.859E+02,,  | 0.187       |
| C,AM-241     | ,NO,        | -7.455E+01,      | 4.638E+01, | 6.630E+01,,  | -1.125      |



Summary of Nuclide Activity  
Sample ID : 15L28833-8

Page : 2  
Acquisition date : 9-JUN-2006 05:04:37

|   |   |       |
|---|---|-------|
| Total number of lines in spectrum             | 5 |       |
| Number of unidentified lines                  | 5 |       |
| Number of lines tentatively identified by NID | 0 | 0.00% |

\*\*\*\* There are no nuclides meeting summary criteria \*\*\*\*

Flags: "K" = Keyline not found                    "M" = Manually accepted  
      "E" = Manually edited                     "A" = Nuclide specific abn. limit

## Unidentified Energy Lines

Page : 3

Sample ID : 15L28833-8

Acquisition date : 9-JUN-2006 05:04:37

| It | Energy  | Area | Bkgnd | FWHM | Channel | Left | Pw | Cts/Sec  | %Err | %Eff     | Flags |
|----|---------|------|-------|------|---------|------|----|----------|------|----------|-------|
| 1  | 139.57  | 116  | 410   | 1.50 | 267.41  | 263  | 9  | 7.70E-03 | 66.0 | 2.70E+00 |       |
| 1  | 198.53  | 86   | 285   | 1.31 | 385.99  | 382  | 8  | 5.76E-03 | 71.0 | 2.44E+00 |       |
| 1  | 595.37  | 40   | 59    | 2.24 | 1183.79 | 1181 | 9  | 2.65E-03 | 77.0 | 1.01E+00 |       |
| 1  | 608.60  | 81   | 78    | 1.65 | 1210.40 | 1205 | 10 | 5.39E-03 | 47.1 | 9.91E-01 |       |
| 1  | 1763.20 | 30   | 10    | 2.03 | 3529.17 | 3521 | 13 | 2.00E-03 | 57.2 | 4.07E-01 |       |

Flags: "T" = Tentatively associated

## Summary of Nuclide Activity

|   |       |
|---|-------|
| Total number of lines in spectrum             | 5     |
| Number of unidentified lines                  | 5     |
| Number of lines tentatively identified by NID | 0     |
|   | 0.00% |

\*\*\*\* There are no nuclides meeting summary criteria \*\*\*\*

Flags: "K" = Keyline not found                    "M" = Manually accepted  
 "E" = Manually edited                            "A" = Nuclide specific abn. limit

## Interference Report

No interference correction performed

## Combined Activity-MDA Report

---- Non-Identified Nuclides ----

| Nuclide | Key-Line<br>Activity<br>(pCi/L) | K.L.<br>Ided | Act error | MDA<br>(pCi/L)      | MDA error | Act/MDA |
|---------|---------------------------------|--------------|-----------|---------------------|-----------|---------|
| BE-7    | 3.438E-01                       |              | 2.149E+01 | 3.578E+01           | 0.000E+00 | 0.010   |
| NA-24   | -1.178E+01                      |              | 1.715E+01 | Half-Life too short |           |         |
| K-40    | 8.573E+01                       |              | 3.365E+01 | 6.407E+01           | 0.000E+00 | 1.338   |
| CR-51   | 1.606E+00                       |              | 2.614E+01 | 4.333E+01           | 0.000E+00 | 0.037   |
| MN-54   | -5.334E-01                      |              | 2.291E+00 | 3.710E+00           | 0.000E+00 | -0.144  |
| CO-57   | 2.253E-02                       |              | 2.050E+00 | 3.240E+00           | 0.000E+00 | 0.007   |
| CO-58   | -3.706E+00                      |              | 2.499E+00 | 3.669E+00           | 0.000E+00 | -1.010  |
| FE-59   | 8.700E+00                       |              | 5.627E+00 | 1.035E+01           | 0.000E+00 | 0.841   |
| CO-60   | -4.711E-02                      |              | 2.339E+00 | 3.802E+00           | 0.000E+00 | -0.012  |
| ZN-65   | 6.956E+00                       |              | 5.638E+00 | 1.010E+01           | 0.000E+00 | 0.688   |
| SE-75   | 3.890E+00                       |              | 2.950E+00 | 5.005E+00           | 0.000E+00 | 0.777   |
| SR-85   | 8.482E+00                       |              | 2.798E+00 | 5.195E+00           | 0.000E+00 | 1.633   |
| Y-88    | -5.042E-01                      |              | 2.844E+00 | 4.614E+00           | 0.000E+00 | -0.109  |
| NB-94   | 2.428E+00                       |              | 2.192E+00 | 3.804E+00           | 0.000E+00 | 0.638   |
| NB-95   | -8.819E-01                      |              | 2.634E+00 | 4.269E+00           | 0.000E+00 | -0.207  |
| ZR-95   | -1.092E+00                      |              | 4.667E+00 | 7.622E+00           | 0.000E+00 | -0.143  |
| MO-99   | 1.056E+02                       |              | 7.027E+02 | 1.178E+03           | 0.000E+00 | 0.090   |
| RU-103  | 3.893E-01                       |              | 2.719E+00 | 4.546E+00           | 0.000E+00 | 0.086   |
| RU-106  | 1.319E+01                       |              | 2.152E+01 | 3.649E+01           | 0.000E+00 | 0.361   |
| AG-110m | 4.374E-01                       |              | 2.379E+00 | 3.922E+00           | 0.000E+00 | 0.112   |
| SN-113  | -8.807E-01                      |              | 2.966E+00 | 4.781E+00           | 0.000E+00 | -0.184  |
| SB-124  | -6.768E-01                      |              | 5.981E+00 | 4.267E+00           | 0.000E+00 | -0.159  |
| SB-125  | -3.507E+00                      |              | 6.161E+00 | 9.722E+00           | 0.000E+00 | -0.361  |

|         |            |           |           |           |        |
|---------|------------|-----------|-----------|-----------|--------|
| TE-129M | 9.827E+00  | 3.402E+01 | 5.590E+01 | 0.000E+00 | 0.176  |
| I-131   | 5.212E+00  | 7.605E+00 | 1.286E+01 | 0.000E+00 | 0.405  |
| BA-133  | -3.320E+00 | 3.094E+00 | 4.860E+00 | 0.000E+00 | -0.683 |
| CS-134  | 4.159E+00  | 3.906E+00 | 4.405E+00 | 0.000E+00 | 0.944  |
| CS-136  | 1.923E+00  | 4.874E+00 | 8.252E+00 | 0.000E+00 | 0.233  |
| CS-137  | 1.364E+00  | 2.571E+00 | 4.323E+00 | 0.000E+00 | 0.315  |
| CE-139  | 6.305E-02  | 2.056E+00 | 3.403E+00 | 0.000E+00 | 0.019  |
| BA-140  | -9.985E-01 | 1.648E+01 | 2.713E+01 | 0.000E+00 | -0.037 |
| LA-140  | -2.851E+00 | 5.652E+00 | 8.735E+00 | 0.000E+00 | -0.326 |
| CE-141  | 3.692E+00  | 5.060E+00 | 7.410E+00 | 0.000E+00 | 0.498  |
| CE-144  | 2.601E-02  | 1.734E+01 | 2.478E+01 | 0.000E+00 | 0.001  |
| EU-152  | -1.492E+01 | 6.953E+00 | 1.044E+01 | 0.000E+00 | -1.430 |
| EU-154  | 9.722E-01  | 4.168E+00 | 6.630E+00 | 0.000E+00 | 0.147  |
| RA-226  | -8.261E-02 | 5.064E+01 | 8.102E+01 | 0.000E+00 | -0.001 |
| AC-228  | 1.249E+01  | 8.058E+00 | 1.469E+01 | 0.000E+00 | 0.851  |
| TH-228  | 3.450E+00  | 4.112E+00 | 6.625E+00 | 0.000E+00 | 0.521  |
| TH-232  | 1.243E+01  | 8.018E+00 | 1.462E+01 | 0.000E+00 | 0.851  |
| U-235   | 2.114E+01  | 1.683E+01 | 2.517E+01 | 0.000E+00 | 0.840  |
| U-238   | 1.372E+02  | 2.586E+02 | 4.379E+02 | 0.000E+00 | 0.313  |
| AM-241  | -1.995E+01 | 2.082E+01 | 3.351E+01 | 0.000E+00 | -0.595 |

|              |             |                  |            |              |             |
|--------------|-------------|------------------|------------|--------------|-------------|
| A,15L28833-8 | ,06/09/2006 | 09:34,05/25/2006 | 10:58,     | 3.044E+00,WG | L28833-8 EX |
| B,15L28833-8 | ,LIBD       | ,06/06/2006      | 10:43,     | 153L082604   |             |
| C,BE-7       | ,NO ,       | 3.438E-01,       | 2.149E+01, | 3.578E+01,,  | 0.010       |
| C,K-40       | ,NO ,       | 8.573E+01,       | 3.365E+01, | 6.407E+01,,  | 1.338       |
| C,CR-51      | ,NO ,       | 1.606E+00,       | 2.614E+01, | 4.333E+01,,  | 0.037       |
| C,MN-54      | ,NO ,       | -5.334E-01,      | 2.291E+00, | 3.710E+00,,  | -0.144      |
| C,CO-57      | ,NO ,       | 2.253E-02,       | 2.050E+00, | 3.240E+00,,  | 0.007       |
| C,CO-58      | ,NO ,       | -3.706E+00,      | 2.499E+00, | 3.669E+00,,  | -1.010      |
| C,FE-59      | ,NO ,       | 8.700E+00,       | 5.627E+00, | 1.035E+01,,  | 0.841       |
| C,CO-60      | ,NO ,       | -4.711E-02,      | 2.339E+00, | 3.802E+00,,  | -0.012      |
| C,ZN-65      | ,NO ,       | 6.956E+00,       | 5.638E+00, | 1.010E+01,,  | 0.688       |
| C,SE-75      | ,NO ,       | 3.890E+00,       | 2.950E+00, | 5.005E+00,,  | 0.777       |
| C,SR-85      | ,NO ,       | 8.482E+00,       | 2.798E+00, | 5.195E+00,,  | 1.633       |
| C,Y-88       | ,NO ,       | -5.042E-01,      | 2.844E+00, | 4.614E+00,,  | -0.109      |
| C,NB-94      | ,NO ,       | 2.428E+00,       | 2.192E+00, | 3.804E+00,,  | 0.638       |
| C,NB-95      | ,NO ,       | -8.819E-01,      | 2.634E+00, | 4.269E+00,,  | -0.207      |
| C,ZR-95      | ,NO ,       | -1.092E+00,      | 4.667E+00, | 7.622E+00,,  | -0.143      |
| C,MO-99      | ,NO ,       | 1.056E+02,       | 7.027E+02, | 1.178E+03,,  | 0.090       |
| C,RU-103     | ,NO ,       | 3.893E-01,       | 2.719E+00, | 4.546E+00,,  | 0.086       |
| C,RU-106     | ,NO ,       | 1.319E+01,       | 2.152E+01, | 3.649E+01,,  | 0.361       |
| C,AG-110m    | ,NO ,       | 4.374E-01,       | 2.379E+00, | 3.922E+00,,  | 0.112       |
| C,SN-113     | ,NO ,       | -8.807E-01,      | 2.966E+00, | 4.781E+00,,  | -0.184      |
| C,SB-124     | ,NO ,       | -6.768E-01,      | 5.981E+00, | 4.267E+00,,  | -0.159      |
| C,SB-125     | ,NO ,       | -3.507E+00,      | 6.161E+00, | 9.722E+00,,  | -0.361      |
| C,TE-129M    | ,NO ,       | 9.827E+00,       | 3.402E+01, | 5.590E+01,,  | 0.176       |
| C,I-131      | ,NO ,       | 5.212E+00,       | 7.605E+00, | 1.286E+01,,  | 0.405       |
| C,BA-133     | ,NO ,       | -3.320E+00,      | 3.094E+00, | 4.860E+00,,  | -0.683      |
| C,CS-134     | ,NO ,       | 4.159E+00,       | 3.906E+00, | 4.405E+00,,  | 0.944       |
| C,CS-136     | ,NO ,       | 1.923E+00,       | 4.874E+00, | 8.252E+00,,  | 0.233       |
| C,CS-137     | ,NO ,       | 1.364E+00,       | 2.571E+00, | 4.323E+00,,  | 0.315       |
| C,CE-139     | ,NO ,       | 6.305E-02,       | 2.056E+00, | 3.403E+00,,  | 0.019       |
| C,BA-140     | ,NO ,       | -9.985E-01,      | 1.648E+01, | 2.713E+01,,  | -0.037      |
| C,LA-140     | ,NO ,       | -2.851E+00,      | 5.652E+00, | 8.735E+00,,  | -0.326      |
| C,CE-141     | ,NO ,       | 3.692E+00,       | 5.060E+00, | 7.410E+00,,  | 0.498       |
| C,CE-144     | ,NO ,       | 2.601E-02,       | 1.734E+01, | 2.478E+01,,  | 0.001       |
| C,EU-152     | ,NO ,       | -1.492E+01,      | 6.953E+00, | 1.044E+01,,  | -1.430      |
| C,EU-154     | ,NO ,       | 9.722E-01,       | 4.168E+00, | 6.630E+00,,  | 0.147       |
| C,RA-226     | ,NO ,       | -8.261E-02,      | 5.064E+01, | 8.102E+01,,  | -0.001      |
| C,AC-228     | ,NO ,       | 1.249E+01,       | 8.058E+00, | 1.469E+01,,  | 0.851       |
| C,TH-228     | ,NO ,       | 3.450E+00,       | 4.112E+00, | 6.625E+00,,  | 0.521       |
| C,TH-232     | ,NO ,       | 1.243E+01,       | 8.018E+00, | 1.462E+01,,  | 0.851       |
| C,U-235      | ,NO ,       | 2.114E+01,       | 1.683E+01, | 2.517E+01,,  | 0.840       |
| C,U-238      | ,NO ,       | 1.372E+02,       | 2.586E+02, | 4.379E+02,,  | 0.313       |
| C,AM-241     | ,NO ,       | -1.995E+01,      | 2.082E+01, | 3.351E+01,,  | -0.595      |





## Summary of Nuclide Activity

Page : 2

Sample ID : 23L28833-9

Acquisition date : 9-JUN-2006 05:04:50

|   |    |        |
|---|----|--------|
| Total number of lines in spectrum             | 12 |        |
| Number of unidentified lines                  | 9  |        |
| Number of lines tentatively identified by NID | 3  | 25.00% |

Nuclide Type : natural

| Nuclide          | Hlife    | Decay | Uncorrected<br>pCi/L | Decay Corr<br>pCi/L | Decay Corr<br>2-Sigma Error | 2-Sigma<br>%Error | Flags |
|------------------|----------|-------|----------------------|---------------------|-----------------------------|-------------------|-------|
| RA-226           | 1600.00Y | 1.00  | 2.487E+01            | 2.487E+01           | 8.917E+01                   | 358.58            |       |
| AC-228           | 5.75Y    | 1.00  | 1.411E+01            | 1.418E+01           | 0.884E+01                   | 62.37             |       |
| Total Activity : |          |       | 3.898E+01            | 3.904E+01           |                             |                   |       |

Grand Total Activity : 3.898E+01      3.904E+01

Flags: "K" = Keyline not found  
 "E" = Manually edited

"M" = Manually accepted  
 "A" = Nuclide specific abn. limit

Unidentified Energy Lines  
 Sample ID : 23L28833-9

Acquisition date : 9-JUN-2006 05:04:50

| It | Energy  | Area | Bkgnd | FWHM | Channel | Left | Pw | Cts/Sec  | %Err | %Eff     | Flags |
|----|---------|------|-------|------|---------|------|----|----------|------|----------|-------|
| 4  | 33.62   | 47   | 33    | 0.93 | 67.56   | 65   | 17 | 3.08E-03 | 94.4 | 8.00E-02 |       |
| 4  | 35.24   | 21   | 115   | 1.57 | 70.81   | 65   | 17 | 1.42E-03 | **** | 1.06E-01 |       |
| 0  | 92.29   | 45   | 653   | 1.46 | 184.83  | 181  | 9  | 2.95E-03 | **** | 1.93E+00 |       |
| 0  | 198.20  | 110  | 472   | 0.99 | 396.49  | 392  | 9  | 7.25E-03 | 77.8 | 2.11E+00 |       |
| 0  | 240.43  | 230  | 571   | 4.43 | 480.89  | 474  | 15 | 1.52E-02 | 47.4 | 1.89E+00 | T     |
| 0  | 294.94  | 150  | 332   | 1.03 | 589.85  | 585  | 11 | 9.93E-03 | 52.2 | 1.64E+00 |       |
| 0  | 351.46  | 182  | 280   | 1.07 | 702.82  | 698  | 11 | 1.21E-02 | 41.0 | 1.44E+00 |       |
| 0  | 608.80  | 386  | 127   | 1.25 | 1217.28 | 1211 | 13 | 2.55E-02 | 17.1 | 9.41E-01 |       |
| 0  | 1119.88 | 71   | 36    | 1.37 | 2239.28 | 2234 | 11 | 4.72E-03 | 45.1 | 6.16E-01 |       |
| 0  | 1764.29 | 55   | 22    | 1.32 | 3528.49 | 3522 | 14 | 3.64E-03 | 52.3 | 4.38E-01 |       |

Flags: "T" = Tentatively associated

Summary of Nuclide Activity

|   |        |
|---|--------|
| Total number of lines in spectrum             | 12     |
| Number of unidentified lines                  | 9      |
| Number of lines tentatively identified by NID | 3      |
|   | 25.00% |

Nuclide Type : natural

| Nuclide          | Hlife    | Decay | Wtd Mean<br>Uncorrected<br>pCi/L | Wtd Mean<br>Decay Corr<br>pCi/L | Decay Corr<br>2-Sigma Error | 2-Sigma<br>%Error | Flags |
|------------------|----------|-------|----------------------------------|---------------------------------|-----------------------------|-------------------|-------|
| RA-226           | 1600.00Y | 1.00  | 2.487E+01                        | 2.487E+01                       | 8.917E+01                   | 358.58            |       |
| AC-228           | 5.75Y    | 1.00  | 1.411E+01                        | 1.418E+01                       | 0.884E+01                   | 62.37             |       |
| Total Activity : |          |       | 3.898E+01                        | 3.904E+01                       |                             |                   |       |

Grand Total Activity : 3.898E+01 3.904E+01

Flags: "K" = Keyline not found "M" = Manually accepted  
 "E" = Manually edited "A" = Nuclide specific abn. limit

Interference Report

No interference correction performed

Combined Activity-MDA Report

---- Identified Nuclides ----

| Nuclide | Activity<br>(pCi/L) | Act error | MDA<br>(pCi/L) | MDA error | Act/MDA |
|---------|---------------------|-----------|----------------|-----------|---------|
| RA-226  | 2.487E+01           | 8.917E+01 | 1.216E+02      | 0.000E+00 | 0.205   |
| AC-228  | 1.418E+01           | 8.843E+00 | 1.687E+01      | 0.000E+00 | 0.840   |

---- Non-Identified Nuclides ----

| Nuclide | Key-Line<br>Activity<br>(pCi/L) | K.L.<br>Ided | Act error | MDA<br>(pCi/L) | MDA error | Act/MDA |
|---------|---------------------------------|--------------|-----------|----------------|-----------|---------|
|---------|---------------------------------|--------------|-----------|----------------|-----------|---------|

|         |            |             |                     |           |        |
|---------|------------|-------------|---------------------|-----------|--------|
| BE-7    | 8.751E+00  | 2.875E+01   | 4.924E+01           | 0.000E+00 | 0.178  |
| NA-24   | -3.395E+01 | 1.936E+01   | Half-Life too short |           |        |
| K-40    | -3.174E+01 | 4.190E+01   | 8.014E+01           | 0.000E+00 | -0.396 |
| CR-51   | -2.381E+01 | 3.649E+01   | 6.077E+01           | 0.000E+00 | -0.392 |
| MN-54   | -8.655E-01 | 2.929E+00   | 4.941E+00           | 0.000E+00 | -0.175 |
| CO-57   | -6.784E-01 | 3.153E+00   | 5.268E+00           | 0.000E+00 | -0.129 |
| CO-58   | -2.098E+00 | 3.025E+00   | 4.998E+00           | 0.000E+00 | -0.420 |
| FE-59   | 1.604E+00  | 6.096E+00   | 1.085E+01           | 0.000E+00 | 0.148  |
| CO-60   | 3.159E+00  | 2.861E+00   | 5.375E+00           | 0.000E+00 | 0.588  |
| ZN-65   | 1.804E+01  | 7.339E+00   | 1.295E+01           | 0.000E+00 | 1.394  |
| SE-75   | 2.082E+00  | 4.282E+00   | 7.393E+00           | 0.000E+00 | 0.282  |
| SR-85   | 1.421E+01  | 3.748E+00   | 7.073E+00           | 0.000E+00 | 2.009  |
| Y-88    | -1.295E+00 | 3.149E+00   | 5.397E+00           | 0.000E+00 | -0.240 |
| NB-94   | 1.900E+00  | 2.593E+00   | 4.635E+00           | 0.000E+00 | 0.410  |
| NB-95   | 5.301E+00  | 3.264E+00   | 6.055E+00           | 0.000E+00 | 0.875  |
| ZR-95   | -3.824E+00 | 5.404E+00   | 8.948E+00           | 0.000E+00 | -0.427 |
| MO-99   | 5.920E+02  | 7.934E+02   | 1.429E+03           | 0.000E+00 | 0.414  |
| RU-103  | 3.525E+00  | 3.689E+00   | 6.480E+00           | 0.000E+00 | 0.544  |
| RU-106  | 4.142E+00  | 2.572E+01   | 4.485E+01           | 0.000E+00 | 0.092  |
| AG-110m | 1.973E+00  | 2.801E+00   | 5.001E+00           | 0.000E+00 | 0.395  |
| SN-113  | -1.283E+00 | 4.071E+00   | 6.824E+00           | 0.000E+00 | -0.188 |
| SB-124  | -5.914E+00 | 4.129E+00   | 5.444E+00           | 0.000E+00 | -1.086 |
| SB-125  | 6.788E+00  | 8.379E+00   | 1.463E+01           | 0.000E+00 | 0.464  |
| TE-129M | 2.652E+01  | 4.341E+01   | 7.526E+01           | 0.000E+00 | 0.352  |
| I-131   | -5.250E+00 | 1.052E+01   | 1.755E+01           | 0.000E+00 | -0.299 |
| BA-133  | 1.080E+01  | 4.849E+00   | 7.692E+00           | 0.000E+00 | 1.404  |
| CS-134  | 2.049E+01  | 4.305E+00   | 7.587E+00           | 0.000E+00 | 2.700  |
| CS-136  | -1.258E+00 | 5.719E+00   | 9.719E+00           | 0.000E+00 | -0.129 |
| CS-137  | 4.484E+00  | 3.065E+00   | 5.646E+00           | 0.000E+00 | 0.794  |
| CE-139  | -1.456E+00 | 3.279E+00   | 5.418E+00           | 0.000E+00 | -0.269 |
| BA-140  | -1.419E+01 | 2.224E+01   | 3.642E+01           | 0.000E+00 | -0.389 |
| LA-140  | 4.241E+00  | 6.039E+00   | 1.145E+01           | 0.000E+00 | 0.370  |
| CE-141  | -5.646E+00 | 7.241E+00   | 1.192E+01           | 0.000E+00 | -0.474 |
| CE-144  | -3.229E+01 | 2.476E+01   | 4.040E+01           | 0.000E+00 | -0.799 |
| EU-152  | -1.894E+00 | 1.069E+01   | 1.524E+01           | 0.000E+00 | -0.124 |
| EU-154  | 2.577E+00  | 6.460E+00   | 1.092E+01           | 0.000E+00 | 0.236  |
| TH-228  | 2.711E+00  | 7.269E+00   | 1.021E+01           | 0.000E+00 | 0.266  |
| TH-232  | 1.411E+01  | + 8.800E+00 | 1.662E+01           | 0.000E+00 | 0.849  |
| U-235   | -1.593E+00 | 2.533E+01   | 4.099E+01           | 0.000E+00 | -0.039 |
| U-238   | 3.093E+01  | 3.288E+02   | 5.535E+02           | 0.000E+00 | 0.056  |
| AM-241  | -9.892E+00 | 1.742E+01   | 2.834E+01           | 0.000E+00 | -0.349 |

|              |             |                  |             |                  |             |
|--------------|-------------|------------------|-------------|------------------|-------------|
| A,23L28833-9 | ,06/09/2006 | 09:38,05/25/2006 | 11:15,      | 3.007E+00,WG     | L28833-9 EX |
| B,23L28833-9 | ,LIBD       |                  | ,06/01/2006 | 10:14,233L082404 |             |
| C,RA-226     | ,YES,       | 2.487E+01,       | 8.917E+01,  | 1.216E+02,,      | 0.205       |
| C,AC-228     | ,YES,       | 1.418E+01,       | 8.843E+00,  | 1.687E+01,,      | 0.840       |
| C,BE-7       | ,NO,        | 8.751E+00,       | 2.875E+01,  | 4.924E+01,,      | 0.178       |
| C,K-40       | ,NO,        | -3.174E+01,      | 4.190E+01,  | 8.014E+01,,      | -0.396      |
| C,CR-51      | ,NO,        | -2.381E+01,      | 3.649E+01,  | 6.077E+01,,      | -0.392      |
| C,MN-54      | ,NO,        | -8.655E-01,      | 2.929E+00,  | 4.941E+00,,      | -0.175      |
| C,CO-57      | ,NO,        | -6.784E-01,      | 3.153E+00,  | 5.268E+00,,      | -0.129      |
| C,CO-58      | ,NO,        | -2.098E+00,      | 3.025E+00,  | 4.998E+00,,      | -0.420      |
| C,FE-59      | ,NO,        | 1.604E+00,       | 6.096E+00,  | 1.085E+01,,      | 0.148       |
| C,CO-60      | ,NO,        | 3.159E+00,       | 2.861E+00,  | 5.375E+00,,      | 0.588       |
| C,ZN-65      | ,NO,        | 1.804E+01,       | 7.339E+00,  | 1.295E+01,,      | 1.394       |
| C,SE-75      | ,NO,        | 2.082E+00,       | 4.282E+00,  | 7.393E+00,,      | 0.282       |
| C,SR-85      | ,NO,        | 1.421E+01,       | 3.748E+00,  | 7.073E+00,,      | 2.009       |
| C,Y-88       | ,NO,        | -1.295E+00,      | 3.149E+00,  | 5.397E+00,,      | -0.240      |
| C,NB-94      | ,NO,        | 1.900E+00,       | 2.593E+00,  | 4.635E+00,,      | 0.410       |
| C,NB-95      | ,NO,        | 5.301E+00,       | 3.264E+00,  | 6.055E+00,,      | 0.875       |
| C,ZR-95      | ,NO,        | -3.824E+00,      | 5.404E+00,  | 8.948E+00,,      | -0.427      |
| C,MO-99      | ,NO,        | 5.920E+02,       | 7.934E+02,  | 1.429E+03,,      | 0.414       |
| C,RU-103     | ,NO,        | 3.525E+00,       | 3.689E+00,  | 6.480E+00,,      | 0.544       |
| C,RU-106     | ,NO,        | 4.142E+00,       | 2.572E+01,  | 4.485E+01,,      | 0.092       |
| C,AG-110m    | ,NO,        | 1.973E+00,       | 2.801E+00,  | 5.001E+00,,      | 0.395       |
| C,SN-113     | ,NO,        | -1.283E+00,      | 4.071E+00,  | 6.824E+00,,      | -0.188      |
| C,SB-124     | ,NO,        | -5.914E+00,      | 4.129E+00,  | 5.444E+00,,      | -1.086      |
| C,SB-125     | ,NO,        | 6.788E+00,       | 8.379E+00,  | 1.463E+01,,      | 0.464       |
| C,TE-129M    | ,NO,        | 2.652E+01,       | 4.341E+01,  | 7.526E+01,,      | 0.352       |
| C,I-131      | ,NO,        | -5.250E+00,      | 1.052E+01,  | 1.755E+01,,      | -0.299      |
| C,BA-133     | ,NO,        | 1.080E+01,       | 4.849E+00,  | 7.692E+00,,      | 1.404       |
| C,CS-134     | ,NO,        | 2.049E+01,       | 4.305E+00,  | 7.587E+00,,      | 2.700       |
| C,CS-136     | ,NO,        | -1.258E+00,      | 5.719E+00,  | 9.719E+00,,      | -0.129      |
| C,CS-137     | ,NO,        | 4.484E+00,       | 3.065E+00,  | 5.646E+00,,      | 0.794       |
| C,CE-139     | ,NO,        | -1.456E+00,      | 3.279E+00,  | 5.418E+00,,      | -0.269      |
| C,BA-140     | ,NO,        | -1.419E+01,      | 2.224E+01,  | 3.642E+01,,      | -0.389      |
| C,LA-140     | ,NO,        | 4.241E+00,       | 6.039E+00,  | 1.145E+01,,      | 0.370       |
| C,CE-141     | ,NO,        | -5.646E+00,      | 7.241E+00,  | 1.192E+01,,      | -0.474      |
| C,CE-144     | ,NO,        | -3.229E+01,      | 2.476E+01,  | 4.040E+01,,      | -0.799      |
| C,EU-152     | ,NO,        | -1.894E+00,      | 1.069E+01,  | 1.524E+01,,      | -0.124      |
| C,EU-154     | ,NO,        | 2.577E+00,       | 6.460E+00,  | 1.092E+01,,      | 0.236       |
| C,TH-228     | ,NO,        | 2.711E+00,       | 7.269E+00,  | 1.021E+01,,      | 0.266       |
| C,TH-232     | ,NO,        | 1.411E+01,       | 8.800E+00,  | 1.662E+01,,      | 0.849       |
| C,U-235      | ,NO,        | -1.593E+00,      | 2.533E+01,  | 4.099E+01,,      | -0.039      |
| C,U-238      | ,NO,        | 3.093E+01,       | 3.288E+02,  | 5.535E+02,,      | 0.056       |
| C,AM-241     | ,NO,        | -9.892E+00,      | 1.742E+01,  | 2.834E+01,,      | -0.349      |

Sec. Review: Analyst: LIMS: \_\_\_\_\_

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VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 9-JUN-2006 12:55:40.65  
 TBE04 P-40312B HpGe \*\*\*\*\* Aquisition Date/Time: 9-JUN-2006 09:27:48.87

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LIMS No., Customer Name, Client ID: WGL28833-10 EXELON/ZION

Sample ID : 04L28833-10                      Smple Date: 25-MAY-2006 14:22:00.  
 Sample Type : WG                              Geometry : 043L082004  
 Quantity : 3.02800E+00 L                      BKGFILE : 04BG060306MT  
 Start Channel : 90                      Energy Tol : 1.00000                      Real Time : 0 03:27:42.58  
 End Channel : 4090                      Pk Srch Sens: 5.00000                      Live time : 0 03:27:40.47  
 MDA Constant : 0.00                      Library Used: LIBD

| Pk | It | Energy   | Area | Bkgnd | FWHM | Channel | %Eff     | Cts/Sec  | %Err  | Fit      |
|----|----|----------|------|-------|------|---------|----------|----------|-------|----------|
| 1  | 1  | 66.47*   | 76   | 272   | 1.05 | 133.40  | 6.69E-01 | 6.11E-03 | 39.9  | 1.43E+00 |
| 2  | 1  | 139.98   | 69   | 312   | 1.25 | 280.41  | 2.04E+00 | 5.50E-03 | 48.8  | 2.67E+00 |
| 3  | 1  | 185.35*  | 15   | 210   | 1.37 | 371.13  | 1.92E+00 | 1.24E-03 | 184.6 | 8.43E-01 |
| 4  | 1  | 238.84*  | 11   | 353   | 3.09 | 478.08  | 1.68E+00 | 8.85E-04 | 379.9 | 3.64E+00 |
| 5  | 1  | 352.07*  | 77   | 130   | 1.98 | 704.51  | 1.28E+00 | 6.20E-03 | 34.3  | 1.21E+00 |
| 6  | 1  | 583.35*  | 23   | 56    | 1.97 | 1166.93 | 8.77E-01 | 1.85E-03 | 70.4  | 2.99E+00 |
| 7  | 1  | 609.39*  | 39   | 82    | 1.24 | 1219.00 | 8.48E-01 | 3.10E-03 | 52.4  | 3.12E+00 |
| 8  | 1  | 1240.89  | 32   | 48    | 0.55 | 2481.43 | 4.87E-01 | 2.60E-03 | 48.5  | 1.78E+01 |
| 9  | 1  | 1460.78* | 5    | 37    | 1.86 | 2920.93 | 4.30E-01 | 3.73E-04 | 376.4 | 1.15E+00 |
| 10 | 1  | 1764.27* | 14   | 14    | 2.66 | 3527.46 | 3.77E-01 | 1.13E-03 | 66.6  | 4.83E-01 |

Flag: "\*" = Peak area was modified by background subtraction

## Nuclide Line Activity Report

Nuclide Type: natural

| Nuclide | Energy  | Area  | %Abn   | %Eff      | Uncorrected<br>pCi/L | Decay Corr<br>pCi/L | 2-Sigma<br>%Error |
|---------|---------|-------|--------|-----------|----------------------|---------------------|-------------------|
| K-40    | 1460.81 | 5     | 10.67* | 4.296E-01 | 7.259E+00            | 7.259E+00           | 752.85            |
| RA-226  | 186.21  | 15    | 3.28*  | 1.924E+00 | 1.754E+01            | 1.754E+01           | 369.19            |
| TH-228  | 238.63  | 11    | 44.60* | 1.679E+00 | 1.056E+00            | 1.071E+00           | 759.85            |
|         | 240.98  | ----- | 3.95   | 1.669E+00 | -----                | Line Not Found      | -----             |
| U-235   | 143.76  | ----- | 10.50* | 2.041E+00 | -----                | Line Not Found      | -----             |
|         | 163.35  | ----- | 4.70   | 2.007E+00 | -----                | Line Not Found      | -----             |
|         | 185.71  | 15    | 54.00  | 1.924E+00 | 1.065E+00            | 1.065E+00           | 369.19            |
|         | 205.31  | ----- | 4.70   | 1.833E+00 | -----                | Line Not Found      | -----             |

Flag: "\*" = Keyline

Summary of Nuclide Activity  
 Sample ID : 04L28833-10

Page : 2  
 Acquisition date : 9-JUN-2006 09:27:48

Total number of lines in spectrum 10  
 Number of unidentified lines 6  
 Number of lines tentatively identified by NID 4 40.00%

Nuclide Type : natural

| Nuclide          | Hlife     | Decay | Uncorrected<br>pCi/L | Decay Corr<br>pCi/L | Decay Corr<br>2-Sigma Error | 2-Sigma<br>%Error | Flags |
|------------------|-----------|-------|----------------------|---------------------|-----------------------------|-------------------|-------|
| K-40             | 1.28E+09Y | 1.00  | 7.259E+00            | 7.259E+00           | 54.65E+00                   | 752.85            |       |
| RA-226           | 1600.00Y  | 1.00  | 1.754E+01            | 1.754E+01           | 6.476E+01                   | 369.19            |       |
| TH-228           | 1.91Y     | 1.01  | 1.056E+00            | 1.071E+00           | 8.139E+00                   | 759.85            |       |
| U-235            | 7.04E+08Y | 1.00  | 1.065E+00            | 1.065E+00           | 3.933E+00                   | 369.19            | K     |
| Total Activity : |           |       | 2.692E+01            | 2.694E+01           |                             |                   |       |

Grand Total Activity : 2.692E+01 2.694E+01

Flags: "K" = Keyline not found  
 "E" = Manually edited

"M" = Manually accepted  
 "A" = Nuclide specific abn. limit

Unidentified Energy Lines

Sample ID : 04L28833-10

Acquisition date : 9-JUN-2006 09:27:48

| It | Energy  | Area | Bkgnd | FWHM | Channel | Left | Pw | Cts/Sec  | %Err | %Eff     | Flags |
|----|---------|------|-------|------|---------|------|----|----------|------|----------|-------|
| 1  | 66.47   | 76   | 272   | 1.05 | 133.40  | 130  | 7  | 6.11E-03 | 79.7 | 6.69E-01 |       |
| 1  | 139.98  | 69   | 312   | 1.25 | 280.41  | 277  | 9  | 5.50E-03 | 97.5 | 2.04E+00 |       |
| 1  | 352.07  | 77   | 130   | 1.98 | 704.51  | 699  | 12 | 6.20E-03 | 68.6 | 1.28E+00 |       |
| 1  | 583.35  | 23   | 56    | 1.97 | 1166.93 | 1163 | 9  | 1.85E-03 | **** | 8.77E-01 | T     |
| 1  | 609.39  | 39   | 82    | 1.24 | 1219.00 | 1214 | 9  | 3.10E-03 | **** | 8.48E-01 |       |
| 1  | 1240.89 | 32   | 48    | 0.55 | 2481.43 | 2470 | 16 | 2.60E-03 | 96.9 | 4.87E-01 |       |
| 1  | 1764.27 | 14   | 14    | 2.66 | 3527.46 | 3521 | 11 | 1.13E-03 | **** | 3.77E-01 |       |

Flags: "T" = Tentatively associated

Summary of Nuclide Activity

Total number of lines in spectrum 10  
 Number of unidentified lines 6  
 Number of lines tentatively identified by NID 4 40.00%

Nuclide Type : natural

| Nuclide          | Hlife     | Decay | Wtd Mean    | Wtd Mean   | Decay Corr | 2-Sigma Error | 2-Sigma | %Error | Flags |
|------------------|-----------|-------|-------------|------------|------------|---------------|---------|--------|-------|
|                  |           |       | Uncorrected | Decay Corr |            |               |         |        |       |
| K-40             | 1.28E+09Y | 1.00  | 7.259E+00   | 7.259E+00  | 54.65E+00  | 752.85        |         |        |       |
| RA-226           | 1600.00Y  | 1.00  | 1.754E+01   | 1.754E+01  | 6.476E+01  | 369.19        |         |        |       |
| TH-228           | 1.91Y     | 1.01  | 1.056E+00   | 1.071E+00  | 8.139E+00  | 759.85        |         |        |       |
| Total Activity : |           |       | 2.586E+01   | 2.587E+01  |            |               |         |        |       |

Grand Total Activity : 2.586E+01 2.587E+01

Flags: "K" = Keyline not found "M" = Manually accepted  
 "E" = Manually edited "A" = Nuclide specific abn. limit

Interference Report

No interference correction performed

Combined Activity-MDA Report

---- Identified Nuclides ----

| Nuclide | Activity (pCi/L) | Act error | MDA (pCi/L) | MDA error | Act/MDA |
|---------|------------------|-----------|-------------|-----------|---------|
| K-40    | 7.259E+00        | 5.465E+01 | 5.149E+01   | 0.000E+00 | 0.141   |
| RA-226  | 1.754E+01        | 6.476E+01 | 1.089E+02   | 0.000E+00 | 0.161   |
| TH-228  | 1.071E+00        | 8.139E+00 | 8.641E+00   | 0.000E+00 | 0.124   |

---- Non-Identified Nuclides ----

| Nuclide | Key-Line Activity (pCi/L) | K.L. Ided | Act error | MDA (pCi/L) | MDA error | Act/MDA |
|---------|---------------------------|-----------|-----------|-------------|-----------|---------|
|---------|---------------------------|-----------|-----------|-------------|-----------|---------|

|         |            |           |                     |           |        |
|---------|------------|-----------|---------------------|-----------|--------|
| BE-7    | 5.338E+00  | 2.977E+01 | 4.968E+01           | 0.000E+00 | 0.107  |
| NA-24   | -3.215E+01 | 2.460E+01 | Half-Life too short |           |        |
| CR-51   | -1.806E+01 | 3.493E+01 | 5.618E+01           | 0.000E+00 | -0.321 |
| MN-54   | -2.094E+00 | 2.952E+00 | 4.542E+00           | 0.000E+00 | -0.461 |
| CO-57   | 2.717E-01  | 2.780E+00 | 4.667E+00           | 0.000E+00 | 0.058  |
| CO-58   | -2.840E+00 | 3.480E+00 | 5.346E+00           | 0.000E+00 | -0.531 |
| FE-59   | 8.160E+00  | 7.478E+00 | 1.328E+01           | 0.000E+00 | 0.615  |
| CO-60   | -3.920E-01 | 3.339E+00 | 5.333E+00           | 0.000E+00 | -0.074 |
| ZN-65   | 1.390E+00  | 6.676E+00 | 1.110E+01           | 0.000E+00 | 0.125  |
| SE-75   | -1.384E+00 | 4.050E+00 | 6.649E+00           | 0.000E+00 | -0.208 |
| SR-85   | 2.100E+01  | 4.150E+00 | 8.154E+00           | 0.000E+00 | 2.576  |
| Y-88    | -6.627E-01 | 3.370E+00 | 5.368E+00           | 0.000E+00 | -0.123 |
| NB-94   | 6.094E-01  | 2.805E+00 | 4.700E+00           | 0.000E+00 | 0.130  |
| NB-95   | 5.277E+00  | 3.638E+00 | 6.517E+00           | 0.000E+00 | 0.810  |
| ZR-95   | -1.880E+00 | 6.161E+00 | 9.911E+00           | 0.000E+00 | -0.190 |
| MO-99   | 1.430E+02  | 9.674E+02 | 1.608E+03           | 0.000E+00 | 0.089  |
| RU-103  | 1.816E+00  | 3.962E+00 | 6.688E+00           | 0.000E+00 | 0.271  |
| RU-106  | -1.039E+01 | 3.009E+01 | 4.778E+01           | 0.000E+00 | -0.217 |
| AG-110m | 5.385E-02  | 3.185E+00 | 5.292E+00           | 0.000E+00 | 0.010  |
| SN-113  | 1.753E+00  | 4.081E+00 | 6.781E+00           | 0.000E+00 | 0.258  |
| SB-124  | -9.013E+00 | 4.776E+00 | 5.474E+00           | 0.000E+00 | -1.646 |
| SB-125  | 2.002E+00  | 8.337E+00 | 1.405E+01           | 0.000E+00 | 0.143  |
| TE-129M | 6.786E+00  | 4.335E+01 | 7.244E+01           | 0.000E+00 | 0.094  |
| I-131   | 9.703E+00  | 1.066E+01 | 1.816E+01           | 0.000E+00 | 0.534  |
| BA-133  | 3.131E+00  | 4.997E+00 | 7.215E+00           | 0.000E+00 | 0.434  |
| CS-134  | -3.241E+00 | 4.368E+00 | 5.644E+00           | 0.000E+00 | -0.574 |
| CS-136  | 1.690E+00  | 6.270E+00 | 1.045E+01           | 0.000E+00 | 0.162  |
| CS-137  | 3.152E+00  | 3.325E+00 | 5.829E+00           | 0.000E+00 | 0.541  |
| CE-139  | 1.095E+00  | 2.864E+00 | 4.786E+00           | 0.000E+00 | 0.229  |
| BA-140  | -1.028E+00 | 2.335E+01 | 3.820E+01           | 0.000E+00 | -0.027 |
| LA-140  | 1.273E+00  | 7.631E+00 | 1.285E+01           | 0.000E+00 | 0.099  |
| CE-141  | 3.180E+00  | 7.208E+00 | 1.045E+01           | 0.000E+00 | 0.304  |
| CE-144  | 1.016E+01  | 2.406E+01 | 3.622E+01           | 0.000E+00 | 0.281  |
| EU-152  | -5.760E+00 | 1.154E+01 | 1.550E+01           | 0.000E+00 | -0.371 |
| EU-154  | 5.762E+00  | 5.677E+00 | 9.780E+00           | 0.000E+00 | 0.589  |
| AC-228  | -8.668E+00 | 1.231E+01 | 1.929E+01           | 0.000E+00 | -0.449 |
| TH-232  | -8.625E+00 | 1.225E+01 | 1.919E+01           | 0.000E+00 | -0.449 |
| U-235   | 7.006E+00  | 2.426E+01 | 3.494E+01           | 0.000E+00 | 0.201  |
| U-238   | -1.172E+02 | 3.231E+02 | 5.162E+02           | 0.000E+00 | -0.227 |
| AM-241  | -4.419E+01 | 2.932E+01 | 4.372E+01           | 0.000E+00 | -1.011 |



|               |             |                  |             |                       |        |
|---------------|-------------|------------------|-------------|-----------------------|--------|
| A,04L28833-10 | ,06/09/2006 | 12:55,05/25/2006 | 14:22,      | 3.028E+00,WGL28833-10 | EX     |
| B,04L28833-10 | ,LIBD       |                  | ,06/02/2006 | 09:04,043L082004      |        |
| C,K-40        | ,YES,       | 7.259E+00,       | 5.465E+01,  | 5.149E+01,,           | 0.141  |
| C,RA-226      | ,YES,       | 1.754E+01,       | 6.476E+01,  | 1.089E+02,,           | 0.161  |
| C,TH-228      | ,YES,       | 1.071E+00,       | 8.139E+00,  | 8.641E+00,,           | 0.124  |
| C,BE-7        | ,NO,        | 5.338E+00,       | 2.977E+01,  | 4.968E+01,,           | 0.107  |
| C,CR-51       | ,NO,        | -1.806E+01,      | 3.493E+01,  | 5.618E+01,,           | -0.321 |
| C,MN-54       | ,NO,        | -2.094E+00,      | 2.952E+00,  | 4.542E+00,,           | -0.461 |
| C,CO-57       | ,NO,        | 2.717E-01,       | 2.780E+00,  | 4.667E+00,,           | 0.058  |
| C,CO-58       | ,NO,        | -2.840E+00,      | 3.480E+00,  | 5.346E+00,,           | -0.531 |
| C,FE-59       | ,NO,        | 8.160E+00,       | 7.478E+00,  | 1.328E+01,,           | 0.615  |
| C,CO-60       | ,NO,        | -3.920E-01,      | 3.339E+00,  | 5.333E+00,,           | -0.074 |
| C,ZN-65       | ,NO,        | 1.390E+00,       | 6.676E+00,  | 1.110E+01,,           | 0.125  |
| C,SE-75       | ,NO,        | -1.384E+00,      | 4.050E+00,  | 6.649E+00,,           | -0.208 |
| C,SR-85       | ,NO,        | 2.100E+01,       | 4.150E+00,  | 8.154E+00,,           | 2.576  |
| C,Y-88        | ,NO,        | -6.627E-01,      | 3.370E+00,  | 5.368E+00,,           | -0.123 |
| C,NB-94       | ,NO,        | 6.094E-01,       | 2.805E+00,  | 4.700E+00,,           | 0.130  |
| C,NB-95       | ,NO,        | 5.277E+00,       | 3.638E+00,  | 6.517E+00,,           | 0.810  |
| C,ZR-95       | ,NO,        | -1.880E+00,      | 6.161E+00,  | 9.911E+00,,           | -0.190 |
| C,MO-99       | ,NO,        | 1.430E+02,       | 9.674E+02,  | 1.608E+03,,           | 0.089  |
| C,RU-103      | ,NO,        | 1.816E+00,       | 3.962E+00,  | 6.688E+00,,           | 0.271  |
| C,RU-106      | ,NO,        | -1.039E+01,      | 3.009E+01,  | 4.778E+01,,           | -0.217 |
| C,AG-110m     | ,NO,        | 5.385E-02,       | 3.185E+00,  | 5.292E+00,,           | 0.010  |
| C,SN-113      | ,NO,        | 1.753E+00,       | 4.081E+00,  | 6.781E+00,,           | 0.258  |
| C,SB-124      | ,NO,        | -9.013E+00,      | 4.776E+00,  | 5.474E+00,,           | -1.646 |
| C,SB-125      | ,NO,        | 2.002E+00,       | 8.337E+00,  | 1.405E+01,,           | 0.143  |
| C,TE-129M     | ,NO,        | 6.786E+00,       | 4.335E+01,  | 7.244E+01,,           | 0.094  |
| C,I-131       | ,NO,        | 9.703E+00,       | 1.066E+01,  | 1.816E+01,,           | 0.534  |
| C,BA-133      | ,NO,        | 3.131E+00,       | 4.997E+00,  | 7.215E+00,,           | 0.434  |
| C,CS-134      | ,NO,        | -3.241E+00,      | 4.368E+00,  | 5.644E+00,,           | -0.574 |
| C,CS-136      | ,NO,        | 1.690E+00,       | 6.270E+00,  | 1.045E+01,,           | 0.162  |
| C,CS-137      | ,NO,        | 3.152E+00,       | 3.325E+00,  | 5.829E+00,,           | 0.541  |
| C,CE-139      | ,NO,        | 1.095E+00,       | 2.864E+00,  | 4.786E+00,,           | 0.229  |
| C,BA-140      | ,NO,        | -1.028E+00,      | 2.335E+01,  | 3.820E+01,,           | -0.027 |
| C,LA-140      | ,NO,        | 1.273E+00,       | 7.631E+00,  | 1.285E+01,,           | 0.099  |
| C,CE-141      | ,NO,        | 3.180E+00,       | 7.208E+00,  | 1.045E+01,,           | 0.304  |
| C,CE-144      | ,NO,        | 1.016E+01,       | 2.406E+01,  | 3.622E+01,,           | 0.281  |
| C,EU-152      | ,NO,        | -5.760E+00,      | 1.154E+01,  | 1.550E+01,,           | -0.371 |
| C,EU-154      | ,NO,        | 5.762E+00,       | 5.677E+00,  | 9.780E+00,,           | 0.589  |
| C,AC-228      | ,NO,        | -8.668E+00,      | 1.231E+01,  | 1.929E+01,,           | -0.449 |
| C,TH-232      | ,NO,        | -8.625E+00,      | 1.225E+01,  | 1.919E+01,,           | -0.449 |
| C,U-235       | ,NO,        | 7.006E+00,       | 2.426E+01,  | 3.494E+01,,           | 0.201  |
| C,U-238       | ,NO,        | -1.172E+02,      | 3.231E+02,  | 5.162E+02,,           | -0.227 |
| C,AM-241      | ,NO,        | -4.419E+01,      | 2.932E+01,  | 4.372E+01,,           | -1.011 |



Summary of Nuclide Activity  
 Sample ID : 07L28833-11

Page : 2  
 Acquisition date : 9-JUN-2006 09:27:51

|   |   |        |
|---|---|--------|
| Total number of lines in spectrum             | 5 |        |
| Number of unidentified lines                  | 4 |        |
| Number of lines tentatively identified by NID | 1 | 20.00% |

Nuclide Type : natural

| Nuclide          | Hlife     | Decay | Uncorrected<br>pCi/L | Decay Corr<br>pCi/L | Decay Corr<br>2-Sigma Error | 2-Sigma<br>%Error | Flags |
|------------------|-----------|-------|----------------------|---------------------|-----------------------------|-------------------|-------|
| K-40             | 1.28E+09Y | 1.00  | 7.365E+01            | 7.365E+01           | 4.447E+01                   | 60.38             |       |
| Total Activity : |           |       | 7.365E+01            | 7.365E+01           |                             |                   |       |

Grand Total Activity : 7.365E+01 7.365E+01

Flags: "K" = Keyline not found  
 "E" = Manually edited

"M" = Manually accepted  
 "A" = Nuclide specific abn. limit

Unidentified Energy Lines  
Sample ID : 07L28833-11

Page : 3  
Acquisition date : 9-JUN-2006 09:27:51

| It | Energy | Area | Bkgnd | FWHM | Channel | Left | Pw | Cts/Sec  | %Err | %Eff     | Flags |
|----|--------|------|-------|------|---------|------|----|----------|------|----------|-------|
| 1  | 66.45  | 85   | 335   | 1.04 | 133.48  | 131  | 8  | 7.08E-03 | 81.1 | 8.11E-01 |       |
| 1  | 140.25 | 76   | 284   | 1.27 | 281.19  | 277  | 8  | 6.32E-03 | 86.3 | 2.36E+00 |       |
| 1  | 198.41 | 98   | 243   | 1.78 | 397.59  | 393  | 10 | 8.17E-03 | 68.5 | 2.25E+00 |       |
| 1  | 596.05 | 44   | 144   | 1.89 | 1193.28 | 1188 | 15 | 3.71E-03 | **** | 1.10E+00 |       |

Flags: "T" = Tentatively associated

#### Summary of Nuclide Activity

|   |               |
|---|---------------|
| Total number of lines in spectrum             | 5             |
| Number of unidentified lines                  | 4             |
| Number of lines tentatively identified by NID | 1      20.00% |

Nuclide Type : natural

| Nuclide          | Hlife     | Decay | Wtd Mean    | Wtd Mean   | Decay Corr | 2-Sigma Error | 2-Sigma | Flags |
|------------------|-----------|-------|-------------|------------|------------|---------------|---------|-------|
|                  |           |       | Uncorrected | Decay Corr |            |               |         |       |
| K-40             | 1.28E+09Y | 1.00  | 7.365E+01   | 7.365E+01  | 4.447E+01  | 60.38         |         |       |
| Total Activity : |           |       | 7.365E+01   | 7.365E+01  |            |               |         |       |

Grand Total Activity : 7.365E+01      7.365E+01

Flags: "K" = Keyline not found      "M" = Manually accepted  
"E" = Manually edited      "A" = Nuclide specific abn. limit

#### Interference Report

No interference correction performed

#### Combined Activity-MDA Report

---- Identified Nuclides ----

| Nuclide | Activity (pCi/L) | Act error | MDA (pCi/L) | MDA error | Act/MDA |
|---------|------------------|-----------|-------------|-----------|---------|
| K-40    | 7.365E+01        | 4.447E+01 | 4.745E+01   | 0.000E+00 | 1.552   |

---- Non-Identified Nuclides ----

| Nuclide | Key-Line Activity (pCi/L) | K.L. Ided | Act error | MDA (pCi/L)         | MDA error | Act/MDA |
|---------|---------------------------|-----------|-----------|---------------------|-----------|---------|
| BE-7    | 2.391E+01                 |           | 2.694E+01 | 4.583E+01           | 0.000E+00 | 0.522   |
| NA-24   | -5.289E+00                |           | 8.221E+00 | Half-Life too short |           |         |
| CR-51   | -2.746E+01                |           | 3.154E+01 | 5.073E+01           | 0.000E+00 | -0.541  |
| MN-54   | -6.901E-01                |           | 2.790E+00 | 4.538E+00           | 0.000E+00 | -0.152  |
| CO-57   | 2.065E-02                 |           | 2.775E+00 | 4.537E+00           | 0.000E+00 | 0.005   |
| CO-58   | -6.447E-01                |           | 3.211E+00 | 5.252E+00           | 0.000E+00 | -0.123  |
| FE-59   | -1.722E+00                |           | 6.367E+00 | 1.034E+01           | 0.000E+00 | -0.166  |

|         |            |           |           |           |        |
|---------|------------|-----------|-----------|-----------|--------|
| CO-60   | -2.860E+00 | 2.757E+00 | 4.057E+00 | 0.000E+00 | -0.705 |
| ZN-65   | 3.236E-01  | 6.001E+00 | 9.968E+00 | 0.000E+00 | 0.032  |
| SE-75   | -1.683E+00 | 3.864E+00 | 6.206E+00 | 0.000E+00 | -0.271 |
| SR-85   | 2.531E+01  | 3.864E+00 | 7.778E+00 | 0.000E+00 | 3.254  |
| Y-88    | 1.674E+00  | 3.029E+00 | 5.302E+00 | 0.000E+00 | 0.316  |
| NB-94   | 2.107E+00  | 2.894E+00 | 4.907E+00 | 0.000E+00 | 0.429  |
| NB-95   | 7.277E-01  | 3.074E+00 | 5.180E+00 | 0.000E+00 | 0.140  |
| ZR-95   | -1.325E+00 | 5.708E+00 | 9.133E+00 | 0.000E+00 | -0.145 |
| MO-99   | -1.262E+02 | 6.841E+02 | 1.099E+03 | 0.000E+00 | -0.115 |
| RU-103  | 1.256E+00  | 3.571E+00 | 5.902E+00 | 0.000E+00 | 0.213  |
| RU-106  | -9.470E+00 | 2.725E+01 | 4.397E+01 | 0.000E+00 | -0.215 |
| AG-110m | 1.101E-01  | 2.753E+00 | 4.522E+00 | 0.000E+00 | 0.024  |
| SN-113  | 1.026E-01  | 3.693E+00 | 6.090E+00 | 0.000E+00 | 0.017  |
| SB-124  | -1.534E+01 | 4.722E+00 | 5.043E+00 | 0.000E+00 | -3.042 |
| SB-125  | 4.035E+00  | 7.904E+00 | 1.326E+01 | 0.000E+00 | 0.304  |
| TE-129M | 9.987E-01  | 4.021E+01 | 6.569E+01 | 0.000E+00 | 0.015  |
| I-131   | -1.547E+00 | 8.910E+00 | 1.462E+01 | 0.000E+00 | -0.106 |
| BA-133  | 4.223E+00  | 3.775E+00 | 6.528E+00 | 0.000E+00 | 0.647  |
| CS-134  | -1.129E-01 | 3.674E+00 | 5.093E+00 | 0.000E+00 | -0.022 |
| CS-136  | -1.693E+00 | 5.562E+00 | 9.024E+00 | 0.000E+00 | -0.188 |
| CS-137  | 6.152E-01  | 2.948E+00 | 4.890E+00 | 0.000E+00 | 0.126  |
| CE-139  | -8.620E-01 | 2.723E+00 | 4.501E+00 | 0.000E+00 | -0.191 |
| BA-140  | -5.109E-01 | 1.986E+01 | 3.292E+01 | 0.000E+00 | -0.016 |
| LA-140  | -3.317E+00 | 6.676E+00 | 1.046E+01 | 0.000E+00 | -0.317 |
| CE-141  | 4.992E+00  | 7.032E+00 | 1.001E+01 | 0.000E+00 | 0.499  |
| CE-144  | -6.107E+00 | 2.459E+01 | 3.367E+01 | 0.000E+00 | -0.181 |
| EU-152  | -1.603E+01 | 8.807E+00 | 1.355E+01 | 0.000E+00 | -1.183 |
| EU-154  | -3.081E+00 | 5.651E+00 | 9.081E+00 | 0.000E+00 | -0.339 |
| RA-226  | 1.762E+00  | 7.093E+01 | 1.180E+02 | 0.000E+00 | 0.015  |
| AC-228  | 7.111E+00  | 1.120E+01 | 1.892E+01 | 0.000E+00 | 0.376  |
| TH-228  | 6.525E+00  | 5.184E+00 | 8.895E+00 | 0.000E+00 | 0.733  |
| TH-232  | 7.078E+00  | 1.115E+01 | 1.883E+01 | 0.000E+00 | 0.376  |
| U-235   | 1.246E+01  | 2.495E+01 | 3.519E+01 | 0.000E+00 | 0.354  |
| U-238   | 5.128E+02  | 3.057E+02 | 5.560E+02 | 0.000E+00 | 0.922  |
| AM-241  | -2.700E+01 | 2.717E+01 | 4.012E+01 | 0.000E+00 | -0.673 |

|               |             |                  |            |              |             |
|---------------|-------------|------------------|------------|--------------|-------------|
| A,07L28833-11 | ,06/09/2006 | 12:47,05/26/2006 | 09:53,     | 3.001E+00,WG | L28833-11 E |
| B,07L28833-11 | ,LIBD       | ,06/07/2006      | 09:32,     | 073L082504   |             |
| C,K-40        | ,YES,       | 7.365E+01,       | 4.447E+01, | 4.745E+01,,  | 1.552       |
| C,BE-7        | ,NO,        | 2.391E+01,       | 2.694E+01, | 4.583E+01,,  | 0.522       |
| C,CR-51       | ,NO,        | -2.746E+01,      | 3.154E+01, | 5.073E+01,,  | -0.541      |
| C,MN-54       | ,NO,        | -6.901E-01,      | 2.790E+00, | 4.538E+00,,  | -0.152      |
| C,CO-57       | ,NO,        | 2.065E-02,       | 2.775E+00, | 4.537E+00,,  | 0.005       |
| C,CO-58       | ,NO,        | -6.447E-01,      | 3.211E+00, | 5.252E+00,,  | -0.123      |
| C,FE-59       | ,NO,        | -1.722E+00,      | 6.367E+00, | 1.034E+01,,  | -0.166      |
| C,CO-60       | ,NO,        | -2.860E+00,      | 2.757E+00, | 4.057E+00,,  | -0.705      |
| C,ZN-65       | ,NO,        | 3.236E-01,       | 6.001E+00, | 9.968E+00,,  | 0.032       |
| C,SE-75       | ,NO,        | -1.683E+00,      | 3.864E+00, | 6.206E+00,,  | -0.271      |
| C,SR-85       | ,NO,        | 2.531E+01,       | 3.864E+00, | 7.778E+00,,  | 3.254       |
| C,Y-88        | ,NO,        | 1.674E+00,       | 3.029E+00, | 5.302E+00,,  | 0.316       |
| C,NB-94       | ,NO,        | 2.107E+00,       | 2.894E+00, | 4.907E+00,,  | 0.429       |
| C,NB-95       | ,NO,        | 7.277E-01,       | 3.074E+00, | 5.180E+00,,  | 0.140       |
| C,ZR-95       | ,NO,        | -1.325E+00,      | 5.708E+00, | 9.133E+00,,  | -0.145      |
| C,MO-99       | ,NO,        | -1.262E+02,      | 6.841E+02, | 1.099E+03,,  | -0.115      |
| C,RU-103      | ,NO,        | 1.256E+00,       | 3.571E+00, | 5.902E+00,,  | 0.213       |
| C,RU-106      | ,NO,        | -9.470E+00,      | 2.725E+01, | 4.397E+01,,  | -0.215      |
| C,AG-110m     | ,NO,        | 1.101E-01,       | 2.753E+00, | 4.522E+00,,  | 0.024       |
| C,SN-113      | ,NO,        | 1.026E-01,       | 3.693E+00, | 6.090E+00,,  | 0.017       |
| C,SB-124      | ,NO,        | -1.534E+01,      | 4.722E+00, | 5.043E+00,,  | -3.042      |
| C,SB-125      | ,NO,        | 4.035E+00,       | 7.904E+00, | 1.326E+01,,  | 0.304       |
| C,TE-129M     | ,NO,        | 9.987E-01,       | 4.021E+01, | 6.569E+01,,  | 0.015       |
| C,I-131       | ,NO,        | -1.547E+00,      | 8.910E+00, | 1.462E+01,,  | -0.106      |
| C,BA-133      | ,NO,        | 4.223E+00,       | 3.775E+00, | 6.528E+00,,  | 0.647       |
| C,CS-134      | ,NO,        | -1.129E-01,      | 3.674E+00, | 5.093E+00,,  | -0.022      |
| C,CS-136      | ,NO,        | -1.693E+00,      | 5.562E+00, | 9.024E+00,,  | -0.188      |
| C,CS-137      | ,NO,        | 6.152E-01,       | 2.948E+00, | 4.890E+00,,  | 0.126       |
| C,CE-139      | ,NO,        | -8.620E-01,      | 2.723E+00, | 4.501E+00,,  | -0.191      |
| C,BA-140      | ,NO,        | -5.109E-01,      | 1.986E+01, | 3.292E+01,,  | -0.016      |
| C,LA-140      | ,NO,        | -3.317E+00,      | 6.676E+00, | 1.046E+01,,  | -0.317      |
| C,CE-141      | ,NO,        | 4.992E+00,       | 7.032E+00, | 1.001E+01,,  | 0.499       |
| C,CE-144      | ,NO,        | -6.107E+00,      | 2.459E+01, | 3.367E+01,,  | -0.181      |
| C,EU-152      | ,NO,        | -1.603E+01,      | 8.807E+00, | 1.355E+01,,  | -1.183      |
| C,EU-154      | ,NO,        | -3.081E+00,      | 5.651E+00, | 9.081E+00,,  | -0.339      |
| C,RA-226      | ,NO,        | 1.762E+00,       | 7.093E+01, | 1.180E+02,,  | 0.015       |
| C,AC-228      | ,NO,        | 7.111E+00,       | 1.120E+01, | 1.892E+01,,  | 0.376       |
| C,TH-228      | ,NO,        | 6.525E+00,       | 5.184E+00, | 8.895E+00,,  | 0.733       |
| C,TH-232      | ,NO,        | 7.078E+00,       | 1.115E+01, | 1.883E+01,,  | 0.376       |
| C,U-235       | ,NO,        | 1.246E+01,       | 2.495E+01, | 3.519E+01,,  | 0.354       |
| C,U-238       | ,NO,        | 5.128E+02,       | 3.057E+02, | 5.560E+02,,  | 0.922       |
| C,AM-241      | ,NO,        | -2.700E+01,      | 2.717E+01, | 4.012E+01,,  | -0.673      |

Sec. Review: *JN* Analyst: LIMS: \_\_\_\_\_

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VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 9-JUN-2006 13:48:59.47  
 TBE11 P-20610B HpGe \*\*\*\*\* Aquisition Date/Time: 9-JUN-2006 09:30:42.78

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LIMS No., Customer Name, Client ID: WG L28833-12 EXELON/ZION

Sample ID : 11L28833-12                      Smple Date: 26-MAY-2006 12:30:00.  
 Sample Type : WG                              Geometry : 113L082304  
 Quantity : 3.05700E+00 L                      BKGFILE : 11BG060306MT  
 Start Channel : 40                      Energy Tol : 1.00000                      Real Time : 0 04:18:06.26  
 End Channel : 4090                      Pk Srch Sens: 5.00000                      Live time : 0 04:18:00.76  
 MDA Constant : 0.00                      Library Used: LIBD

| Pk | It | Energy   | Area | Bkgnd | FWHM | Channel | %Eff     | Cts/Sec  | %Err  | Fit |
|----|----|----------|------|-------|------|---------|----------|----------|-------|-----|
| 1  | 0  | 66.10    | 208  | 889   | 1.94 | 131.20  | 6.79E-01 | 1.34E-02 | 26.9  |     |
| 2  | 0  | 139.59*  | 100  | 327   | 0.90 | 278.61  | 1.90E+00 | 6.43E-03 | 35.7  |     |
| 3  | 0  | 185.69*  | 32   | 327   | 1.49 | 371.06  | 1.80E+00 | 2.05E-03 | 116.2 |     |
| 4  | 0  | 198.81   | 144  | 444   | 0.93 | 397.37  | 1.75E+00 | 9.29E-03 | 30.6  |     |
| 5  | 0  | 351.58*  | 56   | 193   | 2.32 | 703.61  | 1.20E+00 | 3.62E-03 | 56.5  |     |
| 6  | 0  | 595.83   | 89   | 92    | 1.48 | 1192.90 | 8.04E-01 | 5.77E-03 | 24.2  |     |
| 7  | 0  | 609.42*  | 14   | 110   | 1.20 | 1220.09 | 7.90E-01 | 9.12E-04 | 159.1 |     |
| 8  | 0  | 912.72   | 65   | 75    | 6.44 | 1827.03 | 5.74E-01 | 4.23E-03 | 35.5  |     |
| 9  | 0  | 1460.40* | 59   | 12    | 1.61 | 2921.31 | 3.92E-01 | 3.83E-03 | 26.2  |     |

Flag: "\*" = Peak area was modified by background subtraction

## Nuclide Line Activity Report

Nuclide Type: natural

| Nuclide | Energy  | Area  | %Abn   | %Eff      | Uncorrected<br>pCi/L | Decay Corr<br>pCi/L | 2-Sigma<br>%Error |
|---------|---------|-------|--------|-----------|----------------------|---------------------|-------------------|
| K-40    | 1460.81 | 59    | 10.67* | 3.920E-01 | 8.103E+01            | 8.103E+01           | 52.39             |
| RA-226  | 186.21  | 32    | 3.28*  | 1.799E+00 | 3.071E+01            | 3.071E+01           | 232.32            |
| U-235   | 143.76  | ----- | 10.50* | 1.906E+00 | -----                | Line Not Found      | -----             |
|         | 163.35  | ----- | 4.70   | 1.876E+00 | -----                | Line Not Found      | -----             |
|         | 185.71  | 32    | 54.00  | 1.799E+00 | 1.865E+00            | 1.865E+00           | 232.32            |
|         | 205.31  | ----- | 4.70   | 1.718E+00 | -----                | Line Not Found      | -----             |

Flag: "\*" = Keyline

Summary of Nuclide Activity  
 Sample ID : 11L28833-12

Page : 2  
 Acquisition date : 9-JUN-2006 09:30:42

Total number of lines in spectrum 9  
 Number of unidentified lines 7  
 Number of lines tentatively identified by NID 2 22.22%

Nuclide Type : natural

| Nuclide          | Hlife     | Decay | Uncorrected<br>pCi/L | Decay Corr<br>pCi/L | Decay Corr<br>2-Sigma Error | 2-Sigma<br>%Error | Flags |
|------------------|-----------|-------|----------------------|---------------------|-----------------------------|-------------------|-------|
| K-40             | 1.28E+09Y | 1.00  | 8.103E+01            | 8.103E+01           | 4.245E+01                   | 52.39             |       |
| RA-226           | 1600.00Y  | 1.00  | 3.071E+01            | 3.071E+01           | 7.134E+01                   | 232.32            |       |
| U-235            | 7.04E+08Y | 1.00  | 1.865E+00            | 1.865E+00           | 4.333E+00                   | 232.32            | K     |
| Total Activity : |           |       | 1.136E+02            | 1.136E+02           |                             |                   |       |

Grand Total Activity : 1.136E+02 1.136E+02

Flags: "K" = Keyline not found  
 "E" = Manually edited

"M" = Manually accepted  
 "A" = Nuclide specific abn. limit



Unidentified Energy Lines  
Sample ID : 11L28833-12

Page : 3  
Acquisition date : 9-JUN-2006 09:30:42

| It | Energy | Area | Bkgnd | FWHM | Channel | Left | Pw | Cts/Sec  | %Err | %Eff     | Flags |
|----|--------|------|-------|------|---------|------|----|----------|------|----------|-------|
| 0  | 66.10  | 208  | 889   | 1.94 | 131.20  | 128  | 9  | 1.34E-02 | 53.7 | 6.79E-01 |       |
| 0  | 139.59 | 100  | 327   | 0.90 | 278.61  | 275  | 8  | 6.43E-03 | 71.4 | 1.90E+00 |       |
| 0  | 198.81 | 144  | 444   | 0.93 | 397.37  | 391  | 12 | 9.29E-03 | 61.2 | 1.75E+00 |       |
| 0  | 351.58 | 56   | 193   | 2.32 | 703.61  | 698  | 12 | 3.62E-03 | **** | 1.20E+00 |       |
| 0  | 595.83 | 89   | 92    | 1.48 | 1192.90 | 1188 | 13 | 5.77E-03 | 48.4 | 8.04E-01 |       |
| 0  | 609.42 | 14   | 110   | 1.20 | 1220.09 | 1213 | 10 | 9.12E-04 | **** | 7.90E-01 |       |
| 0  | 912.72 | 65   | 75    | 6.44 | 1827.03 | 1817 | 20 | 4.23E-03 | 71.0 | 5.74E-01 |       |

Flags: "T" = Tentatively associated

### Summary of Nuclide Activity

|   |        |
|---|--------|
| Total number of lines in spectrum             | 9      |
| Number of unidentified lines                  | 7      |
| Number of lines tentatively identified by NID | 2      |
|   | 22.22% |

Nuclide Type : natural

| Nuclide          | Hlife     | Decay | Wtd Mean<br>Uncorrected<br>pCi/L | Wtd Mean<br>Decay Corr<br>pCi/L | Decay Corr<br>2-Sigma Error | 2-Sigma<br>%Error | Flags |
|------------------|-----------|-------|----------------------------------|---------------------------------|-----------------------------|-------------------|-------|
| K-40             | 1.28E+09Y | 1.00  | 8.103E+01                        | 8.103E+01                       | 4.245E+01                   | 52.39             |       |
| RA-226           | 1600.00Y  | 1.00  | 3.071E+01                        | 3.071E+01                       | 7.134E+01                   | 232.32            |       |
| Total Activity : |           |       | 1.117E+02                        | 1.117E+02                       |                             |                   |       |

Grand Total Activity : 1.117E+02 1.117E+02

Flags: "K" = Keyline not found  
"E" = Manually edited

"M" = Manually accepted  
"A" = Nuclide specific abn. limit

### Interference Report

No interference correction performed

### Combined Activity-MDA Report

---- Identified Nuclides ----

| Nuclide | Activity<br>(pCi/L) | Act error | MDA<br>(pCi/L) | MDA error | Act/MDA |
|---------|---------------------|-----------|----------------|-----------|---------|
| K-40    | 8.103E+01           | 4.245E+01 | 4.823E+01      | 0.000E+00 | 1.680   |
| RA-226  | 3.071E+01           | 7.134E+01 | 1.144E+02      | 0.000E+00 | 0.268   |

---- Non-Identified Nuclides ----

| Nuclide | Key-Line<br>Activity<br>(pCi/L) | K.L.<br>Ided | Act error | MDA<br>(pCi/L)      | MDA error | Act/MDA |
|---------|---------------------------------|--------------|-----------|---------------------|-----------|---------|
| BE-7    | -5.739E+00                      |              | 2.962E+01 | 4.789E+01           | 0.000E+00 | -0.120  |
| NA-24   | -1.203E+00                      |              | 8.495E+00 | Half-Life too short |           |         |

|         |            |           |           |           |        |
|---------|------------|-----------|-----------|-----------|--------|
| CR-51   | -1.409E+01 | 3.490E+01 | 5.690E+01 | 0.000E+00 | -0.248 |
| MN-54   | -9.446E-01 | 2.846E+00 | 4.554E+00 | 0.000E+00 | -0.207 |
| CO-57   | 1.270E+00  | 3.013E+00 | 5.019E+00 | 0.000E+00 | 0.253  |
| CO-58   | -1.527E+00 | 3.352E+00 | 5.337E+00 | 0.000E+00 | -0.286 |
| FE-59   | 6.492E-01  | 6.470E+00 | 1.079E+01 | 0.000E+00 | 0.060  |
| CO-60   | -1.722E-01 | 2.859E+00 | 4.661E+00 | 0.000E+00 | -0.037 |
| ZN-65   | 6.905E+00  | 6.458E+00 | 1.148E+01 | 0.000E+00 | 0.601  |
| SE-75   | -3.001E+00 | 4.251E+00 | 6.915E+00 | 0.000E+00 | -0.434 |
| SR-85   | 2.117E+01  | 4.052E+00 | 7.797E+00 | 0.000E+00 | 2.715  |
| Y-88    | 1.295E+00  | 3.547E+00 | 6.066E+00 | 0.000E+00 | 0.213  |
| NB-94   | -1.518E+00 | 2.900E+00 | 4.646E+00 | 0.000E+00 | -0.327 |
| NB-95   | 3.088E+00  | 3.168E+00 | 5.522E+00 | 0.000E+00 | 0.559  |
| ZR-95   | -1.698E+00 | 5.880E+00 | 9.498E+00 | 0.000E+00 | -0.179 |
| MO-99   | -6.682E+01 | 7.302E+02 | 1.195E+03 | 0.000E+00 | -0.056 |
| RU-103  | 4.214E+00  | 3.838E+00 | 6.574E+00 | 0.000E+00 | 0.641  |
| RU-106  | 9.194E+00  | 2.686E+01 | 4.537E+01 | 0.000E+00 | 0.203  |
| AG-110m | 2.330E+00  | 3.001E+00 | 5.172E+00 | 0.000E+00 | 0.450  |
| SN-113  | -7.286E-01 | 4.144E+00 | 6.760E+00 | 0.000E+00 | -0.108 |
| SB-124  | -2.680E+00 | 8.279E+00 | 5.514E+00 | 0.000E+00 | -0.486 |
| SB-125  | 1.366E+00  | 8.657E+00 | 1.428E+01 | 0.000E+00 | 0.096  |
| TE-129M | 4.792E+00  | 4.277E+01 | 7.026E+01 | 0.000E+00 | 0.068  |
| I-131   | 4.199E+00  | 9.769E+00 | 1.637E+01 | 0.000E+00 | 0.256  |
| BA-133  | 4.690E+00  | 4.787E+00 | 7.055E+00 | 0.000E+00 | 0.665  |
| CS-134  | 2.879E+00  | 6.971E+00 | 5.381E+00 | 0.000E+00 | 0.535  |
| CS-136  | 2.607E+00  | 5.862E+00 | 9.886E+00 | 0.000E+00 | 0.264  |
| CS-137  | 5.953E-01  | 3.190E+00 | 5.330E+00 | 0.000E+00 | 0.112  |
| CE-139  | -2.153E+00 | 3.055E+00 | 4.903E+00 | 0.000E+00 | -0.439 |
| BA-140  | 3.121E+00  | 2.160E+01 | 3.536E+01 | 0.000E+00 | 0.088  |
| LA-140  | -5.596E+00 | 7.459E+00 | 1.151E+01 | 0.000E+00 | -0.486 |
| CE-141  | 2.630E-01  | 7.478E+00 | 1.043E+01 | 0.000E+00 | 0.025  |
| CE-144  | 2.527E+00  | 2.669E+01 | 3.740E+01 | 0.000E+00 | 0.068  |
| EU-152  | -1.072E+01 | 1.160E+01 | 1.537E+01 | 0.000E+00 | -0.697 |
| EU-154  | 1.576E+00  | 6.177E+00 | 1.024E+01 | 0.000E+00 | 0.154  |
| AC-228  | -2.608E+00 | 1.504E+01 | 2.007E+01 | 0.000E+00 | -0.130 |
| TH-228  | 8.145E+00  | 6.160E+00 | 9.946E+00 | 0.000E+00 | 0.819  |
| TH-232  | -2.596E+00 | 1.497E+01 | 1.997E+01 | 0.000E+00 | -0.130 |
| U-235   | 1.814E+01  | 2.582E+01 | 3.696E+01 | 0.000E+00 | 0.491  |
| U-238   | -2.199E+02 | 3.184E+02 | 5.032E+02 | 0.000E+00 | -0.437 |
| AM-241  | 1.311E+01  | 4.562E+01 | 6.308E+01 | 0.000E+00 | 0.208  |

|               |             |                  |             |                  |             |
|---------------|-------------|------------------|-------------|------------------|-------------|
| A,11L28833-12 | ,06/09/2006 | 13:49,05/26/2006 | 12:30,      | 3.057E+00,WG     | L28833-12 E |
| B,11L28833-12 | ,LIBD       |                  | ,06/07/2006 | 09:40,113L082304 |             |
| C,K-40        | ,YES,       | 8.103E+01,       | 4.245E+01,  | 4.823E+01,,      | 1.680       |
| C,RA-226      | ,YES,       | 3.071E+01,       | 7.134E+01,  | 1.144E+02,,      | 0.268       |
| C,BE-7        | ,NO,        | -5.739E+00,      | 2.962E+01,  | 4.789E+01,,      | -0.120      |
| C,CR-51       | ,NO,        | -1.409E+01,      | 3.490E+01,  | 5.690E+01,,      | -0.248      |
| C,MN-54       | ,NO,        | -9.446E-01,      | 2.846E+00,  | 4.554E+00,,      | -0.207      |
| C,CO-57       | ,NO,        | 1.270E+00,       | 3.013E+00,  | 5.019E+00,,      | 0.253       |
| C,CO-58       | ,NO,        | -1.527E+00,      | 3.352E+00,  | 5.337E+00,,      | -0.286      |
| C,FE-59       | ,NO,        | 6.492E-01,       | 6.470E+00,  | 1.079E+01,,      | 0.060       |
| C,CO-60       | ,NO,        | -1.722E-01,      | 2.859E+00,  | 4.661E+00,,      | -0.037      |
| C,ZN-65       | ,NO,        | 6.905E+00,       | 6.458E+00,  | 1.148E+01,,      | 0.601       |
| C,SE-75       | ,NO,        | -3.001E+00,      | 4.251E+00,  | 6.915E+00,,      | -0.434      |
| C,SR-85       | ,NO,        | 2.117E+01,       | 4.052E+00,  | 7.797E+00,,      | 2.715       |
| C,Y-88        | ,NO,        | 1.295E+00,       | 3.547E+00,  | 6.066E+00,,      | 0.213       |
| C,NB-94       | ,NO,        | -1.518E+00,      | 2.900E+00,  | 4.646E+00,,      | -0.327      |
| C,NB-95       | ,NO,        | 3.088E+00,       | 3.168E+00,  | 5.522E+00,,      | 0.559       |
| C,ZR-95       | ,NO,        | -1.698E+00,      | 5.880E+00,  | 9.498E+00,,      | -0.179      |
| C,MO-99       | ,NO,        | -6.682E+01,      | 7.302E+02,  | 1.195E+03,,      | -0.056      |
| C,RU-103      | ,NO,        | 4.214E+00,       | 3.838E+00,  | 6.574E+00,,      | 0.641       |
| C,RU-106      | ,NO,        | 9.194E+00,       | 2.686E+01,  | 4.537E+01,,      | 0.203       |
| C,AG-110m     | ,NO,        | 2.330E+00,       | 3.001E+00,  | 5.172E+00,,      | 0.450       |
| C,SN-113      | ,NO,        | -7.286E-01,      | 4.144E+00,  | 6.760E+00,,      | -0.108      |
| C,SB-124      | ,NO,        | -2.680E+00,      | 8.279E+00,  | 5.514E+00,,      | -0.486      |
| C,SB-125      | ,NO,        | 1.366E+00,       | 8.657E+00,  | 1.428E+01,,      | 0.096       |
| C,TE-129M     | ,NO,        | 4.792E+00,       | 4.277E+01,  | 7.026E+01,,      | 0.068       |
| C,I-131       | ,NO,        | 4.199E+00,       | 9.769E+00,  | 1.637E+01,,      | 0.256       |
| C,BA-133      | ,NO,        | 4.690E+00,       | 4.787E+00,  | 7.055E+00,,      | 0.665       |
| C,CS-134      | ,NO,        | 2.879E+00,       | 6.971E+00,  | 5.381E+00,,      | 0.535       |
| C,CS-136      | ,NO,        | 2.607E+00,       | 5.862E+00,  | 9.886E+00,,      | 0.264       |
| C,CS-137      | ,NO,        | 5.953E-01,       | 3.190E+00,  | 5.330E+00,,      | 0.112       |
| C,CE-139      | ,NO,        | -2.153E+00,      | 3.055E+00,  | 4.903E+00,,      | -0.439      |
| C,BA-140      | ,NO,        | 3.121E+00,       | 2.160E+01,  | 3.536E+01,,      | 0.088       |
| C,LA-140      | ,NO,        | -5.596E+00,      | 7.459E+00,  | 1.151E+01,,      | -0.486      |
| C,CE-141      | ,NO,        | 2.630E-01,       | 7.478E+00,  | 1.043E+01,,      | 0.025       |
| C,CE-144      | ,NO,        | 2.527E+00,       | 2.669E+01,  | 3.740E+01,,      | 0.068       |
| C,EU-152      | ,NO,        | -1.072E+01,      | 1.160E+01,  | 1.537E+01,,      | -0.697      |
| C,EU-154      | ,NO,        | 1.576E+00,       | 6.177E+00,  | 1.024E+01,,      | 0.154       |
| C,AC-228      | ,NO,        | -2.608E+00,      | 1.504E+01,  | 2.007E+01,,      | -0.130      |
| C,TH-228      | ,NO,        | 8.145E+00,       | 6.160E+00,  | 9.946E+00,,      | 0.819       |
| C,TH-232      | ,NO,        | -2.596E+00,      | 1.497E+01,  | 1.997E+01,,      | -0.130      |
| C,U-235       | ,NO,        | 1.814E+01,       | 2.582E+01,  | 3.696E+01,,      | 0.491       |
| C,U-238       | ,NO,        | -2.199E+02,      | 3.184E+02,  | 5.032E+02,,      | -0.437      |
| C,AM-241      | ,NO,        | 1.311E+01,       | 4.562E+01,  | 6.308E+01,,      | 0.208       |



Summary of Nuclide Activity  
 Sample ID : 13L28833-13

Acquisition date : 9-JUN-2006 09:47:29

|   |    |        |
|---|----|--------|
| Total number of lines in spectrum             | 15 |        |
| Number of unidentified lines                  | 13 |        |
| Number of lines tentatively identified by NID | 2  | 13.33% |

Nuclide Type : natural

| Nuclide          | Hlife     | Decay | Uncorrected<br>pCi/L | Decay Corr<br>pCi/L | Decay Corr<br>2-Sigma Error | 2-Sigma<br>%Error | Flags |
|------------------|-----------|-------|----------------------|---------------------|-----------------------------|-------------------|-------|
| RA-226           | 1600.00Y  | 1.00  | 1.873E+01            | 1.873E+01           | 7.582E+01                   | 404.80            |       |
| U-235            | 7.04E+08Y | 1.00  | 2.147E+01            | 2.147E+01           | 1.933E+01                   | 90.06             |       |
| Total Activity : |           |       | 4.020E+01            | 4.020E+01           |                             |                   |       |

Grand Total Activity : 4.020E+01 4.020E+01

Flags: "K" = Keyline not found  
 "E" = Manually edited

"M" = Manually accepted  
 "A" = Nuclide specific abn. limit

Unidentified Energy Lines  
Sample ID : 13L28833-13

Page : 3  
Acquisition date : 9-JUN-2006 09:47:29

| It | Energy  | Area | Bkgnd | FWHM | Channel | Left | Pw | Cts/Sec  | %Err | %Eff     | Flags |
|----|---------|------|-------|------|---------|------|----|----------|------|----------|-------|
| 6  | 45.32   | 105  | 223   | 1.54 | 90.78   | 87   | 13 | 9.16E-03 | 52.1 | 1.34E-01 |       |
| 6  | 46.47   | 56   | 267   | 1.44 | 93.06   | 87   | 13 | 4.89E-03 | **** | 1.58E-01 |       |
| 1  | 65.22   | 139  | 719   | 3.53 | 130.55  | 123  | 14 | 1.21E-02 | 84.3 | 7.84E-01 |       |
| 1  | 92.94   | 49   | 490   | 1.72 | 185.94  | 179  | 12 | 4.26E-03 | **** | 1.74E+00 |       |
| 1  | 139.86  | 90   | 300   | 1.61 | 279.73  | 276  | 8  | 7.81E-03 | 74.8 | 2.27E+00 |       |
| 1  | 198.42  | 50   | 281   | 1.10 | 396.78  | 392  | 9  | 4.39E-03 | **** | 2.12E+00 |       |
| 1  | 294.83  | 20   | 179   | 1.66 | 589.53  | 585  | 9  | 1.76E-03 | **** | 1.70E+00 |       |
| 1  | 351.73  | 29   | 149   | 1.19 | 703.31  | 699  | 9  | 2.50E-03 | **** | 1.51E+00 |       |
| 1  | 595.98  | 71   | 76    | 1.65 | 1191.83 | 1184 | 12 | 6.16E-03 | 54.6 | 1.02E+00 |       |
| 1  | 609.26  | 37   | 111   | 1.45 | 1218.39 | 1213 | 14 | 3.21E-03 | **** | 1.01E+00 |       |
| 1  | 912.49  | 19   | 46    | 3.86 | 1825.17 | 1819 | 14 | 1.66E-03 | **** | 7.35E-01 |       |
| 1  | 1764.44 | 11   | 24    | 3.33 | 3531.69 | 3527 | 12 | 9.57E-04 | **** | 4.55E-01 |       |
| 1  | 1858.05 | 13   | 7     | 1.67 | 3719.35 | 3715 | 9  | 1.16E-03 | 86.1 | 4.42E-01 |       |

Flags: "T" = Tentatively associated

#### Summary of Nuclide Activity

|   |                     |
|---|---------------------|
| Total number of lines in spectrum             | 15                  |
| Number of unidentified lines                  | 13                  |
| Number of lines tentatively identified by NID | 2            13.33% |

Nuclide Type : natural

| Nuclide          | Hlife     | Decay | Wtd Mean<br>Uncorrected<br>pCi/L | Wtd Mean<br>Decay Corr<br>pCi/L | Decay Corr<br>2-Sigma Error | 2-Sigma<br>%Error | Flags |
|------------------|-----------|-------|----------------------------------|---------------------------------|-----------------------------|-------------------|-------|
| U-235            | 7.04E+08Y | 1.00  | 2.229E+00                        | 2.229E+00                       | 4.480E+00                   | 200.97            |       |
| Total Activity : |           |       | 2.229E+00                        | 2.229E+00                       |                             |                   |       |

Grand Total Activity : 2.229E+00    2.229E+00

Flags: "K" = Keyline not found                    "M" = Manually accepted  
"E" = Manually edited                            "A" = Nuclide specific abn. limit

#### Interference Report

| Interfering |        | Interfered |        |
|-------------|--------|------------|--------|
| Nuclide     | Line   | Nuclide    | Line   |
| U-235       | 185.71 | RA-226     | 186.21 |

#### Combined Activity-MDA Report

---- Identified Nuclides ----

| Nuclide | Activity<br>(pCi/L) | Act error | MDA<br>(pCi/L) | MDA error | Act/MDA |
|---------|---------------------|-----------|----------------|-----------|---------|
| U-235   | 2.229E+00           | 4.480E+00 | 4.044E+01      | 0.000E+00 | 0.055   |

---- Non-Identified Nuclides ----

| Nuclide | Key-Line<br>Activity<br>(pCi/L) | K.L.<br>Ided | Act error | MDA<br>(pCi/L)      | MDA error | Act/MDA |
|---------|---------------------------------|--------------|-----------|---------------------|-----------|---------|
| BE-7    | -1.170E+01                      |              | 3.072E+01 | 4.967E+01           | 0.000E+00 | -0.236  |
| NA-24   | -1.177E+01                      |              | 9.457E+00 | Half-Life too short |           |         |
| K-40    | 6.527E+00                       |              | 4.764E+01 | 8.936E+01           | 0.000E+00 | 0.073   |
| CR-51   | -2.134E-01                      |              | 3.640E+01 | 5.979E+01           | 0.000E+00 | -0.004  |
| MN-54   | -8.724E-02                      |              | 3.421E+00 | 5.673E+00           | 0.000E+00 | -0.015  |
| CO-57   | -2.539E+00                      |              | 3.143E+00 | 4.963E+00           | 0.000E+00 | -0.512  |
| CO-58   | -1.345E+00                      |              | 3.368E+00 | 5.330E+00           | 0.000E+00 | -0.252  |
| FE-59   | 4.248E+00                       |              | 7.573E+00 | 1.305E+01           | 0.000E+00 | 0.326   |
| CO-60   | 3.653E+00                       |              | 3.574E+00 | 6.316E+00           | 0.000E+00 | 0.578   |
| ZN-65   | 2.541E+00                       |              | 7.228E+00 | 1.227E+01           | 0.000E+00 | 0.207   |
| SE-75   | -1.866E+00                      |              | 4.547E+00 | 7.448E+00           | 0.000E+00 | -0.251  |
| SR-85   | 2.492E+01                       |              | 4.356E+00 | 8.529E+00           | 0.000E+00 | 2.921   |
| Y-88    | -1.440E+00                      |              | 3.796E+00 | 6.028E+00           | 0.000E+00 | -0.239  |
| NB-94   | 2.759E+00                       |              | 3.165E+00 | 5.449E+00           | 0.000E+00 | 0.506   |
| NB-95   | 3.515E+00                       |              | 3.440E+00 | 5.983E+00           | 0.000E+00 | 0.588   |
| ZR-95   | -4.174E+00                      |              | 6.282E+00 | 9.840E+00           | 0.000E+00 | -0.424  |
| MO-99   | 3.025E+02                       |              | 8.078E+02 | 1.354E+03           | 0.000E+00 | 0.223   |
| RU-103  | 4.902E-01                       |              | 3.962E+00 | 6.549E+00           | 0.000E+00 | 0.075   |
| RU-106  | 1.758E+00                       |              | 3.120E+01 | 4.854E+01           | 0.000E+00 | 0.036   |
| AG-110m | 7.522E-01                       |              | 3.323E+00 | 5.557E+00           | 0.000E+00 | 0.135   |
| SN-113  | -7.701E-02                      |              | 4.574E+00 | 7.423E+00           | 0.000E+00 | -0.010  |
| SB-124  | 8.011E-01                       |              | 8.457E+00 | 5.915E+00           | 0.000E+00 | 0.135   |
| SB-125  | -4.107E+00                      |              | 9.070E+00 | 1.474E+01           | 0.000E+00 | -0.279  |
| TE-129M | -5.604E+01                      |              | 4.452E+01 | 6.891E+01           | 0.000E+00 | -0.813  |
| I-131   | -9.078E-02                      |              | 1.082E+01 | 1.763E+01           | 0.000E+00 | -0.005  |
| BA-133  | 5.831E+00                       |              | 5.156E+00 | 7.591E+00           | 0.000E+00 | 0.768   |
| CS-134  | 3.583E+00                       |              | 6.162E+00 | 6.161E+00           | 0.000E+00 | 0.582   |
| CS-136  | -4.968E+00                      |              | 6.133E+00 | 9.397E+00           | 0.000E+00 | -0.529  |
| CS-137  | 7.409E-01                       |              | 3.644E+00 | 5.947E+00           | 0.000E+00 | 0.125   |
| CE-139  | 4.468E+00                       |              | 3.150E+00 | 5.409E+00           | 0.000E+00 | 0.826   |
| BA-140  | 1.048E+01                       |              | 2.294E+01 | 3.842E+01           | 0.000E+00 | 0.273   |
| LA-140  | -2.504E+00                      |              | 7.728E+00 | 1.230E+01           | 0.000E+00 | -0.204  |
| CE-141  | 5.780E+00                       |              | 8.122E+00 | 1.180E+01           | 0.000E+00 | 0.490   |
| CE-144  | -2.552E+00                      |              | 2.781E+01 | 3.934E+01           | 0.000E+00 | -0.065  |
| EU-152  | -6.701E+00                      |              | 1.243E+01 | 1.663E+01           | 0.000E+00 | -0.403  |
| EU-154  | -6.816E+00                      |              | 6.335E+00 | 9.913E+00           | 0.000E+00 | -0.688  |
| RA-226  | 1.873E+01                       |              | 7.582E+01 | 1.380E+02           | 0.000E+00 | 0.136   |
| AC-228  | -2.769E+00                      |              | 1.315E+01 | 2.099E+01           | 0.000E+00 | -0.132  |
| TH-228  | 4.266E+00                       |              | 6.471E+00 | 1.069E+01           | 0.000E+00 | 0.399   |
| TH-232  | -2.757E+00                      |              | 1.309E+01 | 2.089E+01           | 0.000E+00 | -0.132  |
| U-238   | 1.774E+02                       |              | 3.776E+02 | 6.237E+02           | 0.000E+00 | 0.285   |
| AM-241  | 4.589E+01                       |              | 3.024E+01 | 4.573E+01           | 0.000E+00 | 1.004   |

|               |             |             |             |             |              |             |
|---------------|-------------|-------------|-------------|-------------|--------------|-------------|
| A,13L28833-13 | ,06/09/2006 | 12:59,      | 05/26/2006  | 11:02,      | 3.003E+00,WG | L28833-13 E |
| B,13L28833-13 | ,LIBD       |             | ,06/07/2006 | 09:34,      | 133L082404   |             |
| C,U-235       | ,YES,       | 2.229E+00,  | 4.480E+00,  | 4.044E+01,, | 0.055        |             |
| C,BE-7        | ,NO ,       | -1.170E+01, | 3.072E+01,  | 4.967E+01,, | -0.236       |             |
| C,K-40        | ,NO ,       | 6.527E+00,  | 4.764E+01,  | 8.936E+01,, | 0.073        |             |
| C,CR-51       | ,NO ,       | -2.134E-01, | 3.640E+01,  | 5.979E+01,, | -0.004       |             |
| C,MN-54       | ,NO ,       | -8.724E-02, | 3.421E+00,  | 5.673E+00,, | -0.015       |             |
| C,CO-57       | ,NO ,       | -2.539E+00, | 3.143E+00,  | 4.963E+00,, | -0.512       |             |
| C,CO-58       | ,NO ,       | -1.345E+00, | 3.368E+00,  | 5.330E+00,, | -0.252       |             |
| C,FE-59       | ,NO ,       | 4.248E+00,  | 7.573E+00,  | 1.305E+01,, | 0.326        |             |
| C,CO-60       | ,NO ,       | 3.653E+00,  | 3.574E+00,  | 6.316E+00,, | 0.578        |             |
| C,ZN-65       | ,NO ,       | 2.541E+00,  | 7.228E+00,  | 1.227E+01,, | 0.207        |             |
| C,SE-75       | ,NO ,       | -1.866E+00, | 4.547E+00,  | 7.448E+00,, | -0.251       |             |
| C,SR-85       | ,NO ,       | 2.492E+01,  | 4.356E+00,  | 8.529E+00,, | 2.921        |             |
| C,Y-88        | ,NO ,       | -1.440E+00, | 3.796E+00,  | 6.028E+00,, | -0.239       |             |
| C,NB-94       | ,NO ,       | 2.759E+00,  | 3.165E+00,  | 5.449E+00,, | 0.506        |             |
| C,NB-95       | ,NO ,       | 3.515E+00,  | 3.440E+00,  | 5.983E+00,, | 0.588        |             |
| C,ZR-95       | ,NO ,       | -4.174E+00, | 6.282E+00,  | 9.840E+00,, | -0.424       |             |
| C,MO-99       | ,NO ,       | 3.025E+02,  | 8.078E+02,  | 1.354E+03,, | 0.223        |             |
| C,RU-103      | ,NO ,       | 4.902E-01,  | 3.962E+00,  | 6.549E+00,, | 0.075        |             |
| C,RU-106      | ,NO ,       | 1.758E+00,  | 3.120E+01,  | 4.854E+01,, | 0.036        |             |
| C,AG-110m     | ,NO ,       | 7.522E-01,  | 3.323E+00,  | 5.557E+00,, | 0.135        |             |
| C,SN-113      | ,NO ,       | -7.701E-02, | 4.574E+00,  | 7.423E+00,, | -0.010       |             |
| C,SB-124      | ,NO ,       | 8.011E-01,  | 8.457E+00,  | 5.915E+00,, | 0.135        |             |
| C,SB-125      | ,NO ,       | -4.107E+00, | 9.070E+00,  | 1.474E+01,, | -0.279       |             |
| C,TE-129M     | ,NO ,       | -5.604E+01, | 4.452E+01,  | 6.891E+01,, | -0.813       |             |
| C,I-131       | ,NO ,       | -9.078E-02, | 1.082E+01,  | 1.763E+01,, | -0.005       |             |
| C,BA-133      | ,NO ,       | 5.831E+00,  | 5.156E+00,  | 7.591E+00,, | 0.768        |             |
| C,CS-134      | ,NO ,       | 3.583E+00,  | 6.162E+00,  | 6.161E+00,, | 0.582        |             |
| C,CS-136      | ,NO ,       | -4.968E+00, | 6.133E+00,  | 9.397E+00,, | -0.529       |             |
| C,CS-137      | ,NO ,       | 7.409E-01,  | 3.644E+00,  | 5.947E+00,, | 0.125        |             |
| C,CE-139      | ,NO ,       | 4.468E+00,  | 3.150E+00,  | 5.409E+00,, | 0.826        |             |
| C,BA-140      | ,NO ,       | 1.048E+01,  | 2.294E+01,  | 3.842E+01,, | 0.273        |             |
| C,LA-140      | ,NO ,       | -2.504E+00, | 7.728E+00,  | 1.230E+01,, | -0.204       |             |
| C,CE-141      | ,NO ,       | 5.780E+00,  | 8.122E+00,  | 1.180E+01,, | 0.490        |             |
| C,CE-144      | ,NO ,       | -2.552E+00, | 2.781E+01,  | 3.934E+01,, | -0.065       |             |
| C,EU-152      | ,NO ,       | -6.701E+00, | 1.243E+01,  | 1.663E+01,, | -0.403       |             |
| C,EU-154      | ,NO ,       | -6.816E+00, | 6.335E+00,  | 9.913E+00,, | -0.688       |             |
| C,RA-226      | ,NO ,       | 1.873E+01,  | 7.582E+01,  | 1.380E+02,, | 0.136        |             |
| C,AC-228      | ,NO ,       | -2.769E+00, | 1.315E+01,  | 2.099E+01,, | -0.132       |             |
| C,TH-228      | ,NO ,       | 4.266E+00,  | 6.471E+00,  | 1.069E+01,, | 0.399        |             |
| C,TH-232      | ,NO ,       | -2.757E+00, | 1.309E+01,  | 2.089E+01,, | -0.132       |             |
| C,U-238       | ,NO ,       | 1.774E+02,  | 3.776E+02,  | 6.237E+02,, | 0.285        |             |
| C,AM-241      | ,NO ,       | 4.589E+01,  | 3.024E+01,  | 4.573E+01,, | 1.004        |             |





Summary of Nuclide Activity  
 Sample ID : 07L28833-14

Page : 2  
 Acquisition date : 9-JUN-2006 05:03:38

Total number of lines in spectrum 10  
 Number of unidentified lines 7  
 Number of lines tentatively identified by NID 3 30.00%

Nuclide Type : natural

| Nuclide          | Hlife     | Decay | Uncorrected<br>pCi/L | Decay Corr<br>pCi/L | Decay Corr<br>2-Sigma Error | 2-Sigma<br>%Error | Flags |
|------------------|-----------|-------|----------------------|---------------------|-----------------------------|-------------------|-------|
| K-40             | 1.28E+09Y | 1.00  | 5.304E+01            | 5.304E+01           | 3.420E+01                   | 64.48             |       |
| AC-228           | 5.75Y     | 1.00  | 3.507E+01            | 3.523E+01           | 1.030E+01                   | 29.23             |       |
| TH-228           | 1.91Y     | 1.01  | 6.528E+00            | 6.617E+00           | 4.976E+00                   | 75.19             |       |
| Total Activity : |           |       | 9.464E+01            | 9.489E+01           |                             |                   |       |

Grand Total Activity : 9.464E+01 9.489E+01

Flags: "K" = Keyline not found  
 "E" = Manually edited

"M" = Manually accepted  
 "A" = Nuclide specific abn. limit

Unidentified Energy Lines  
Sample ID : 07L28833-14

Page : 3  
Acquisition date : 9-JUN-2006 05:03:38

| It | Energy  | Area | Bkgnd | FWHM | Channel | Left | Pw | Cts/Sec  | %Err | %Eff     | Flags |
|----|---------|------|-------|------|---------|------|----|----------|------|----------|-------|
| 1  | 66.15   | 116  | 427   | 1.49 | 132.87  | 130  | 8  | 8.03E-03 | 68.0 | 7.99E-01 |       |
| 1  | 295.40  | 109  | 237   | 1.81 | 591.70  | 587  | 11 | 7.60E-03 | 61.7 | 1.81E+00 |       |
| 1  | 351.81  | 104  | 209   | 1.08 | 704.59  | 699  | 11 | 7.22E-03 | 64.1 | 1.61E+00 |       |
| 1  | 595.72  | 91   | 115   | 2.64 | 1192.61 | 1188 | 15 | 6.33E-03 | 55.4 | 1.10E+00 |       |
| 1  | 609.23  | 147  | 141   | 1.44 | 1219.63 | 1214 | 13 | 1.02E-02 | 40.2 | 1.09E+00 |       |
| 2  | 1464.01 | 37   | 10    | 2.11 | 2929.00 | 2915 | 21 | 2.54E-03 | 77.1 | 5.82E-01 |       |
| 1  | 1765.16 | 34   | 22    | 2.98 | 3530.90 | 3523 | 15 | 2.39E-03 | 80.2 | 5.12E-01 |       |

Flags: "T" = Tentatively associated

### Summary of Nuclide Activity

|   |        |
|---|--------|
| Total number of lines in spectrum             | 10     |
| Number of unidentified lines                  | 7      |
| Number of lines tentatively identified by NID | 3      |
|   | 30.00% |

Nuclide Type : natural

| Nuclide          | Hlife     | Decay | Wtd Mean             | Wtd Mean            | Decay Corr<br>2-Sigma Error | 2-Sigma | Flags |
|------------------|-----------|-------|----------------------|---------------------|-----------------------------|---------|-------|
|                  |           |       | Uncorrected<br>pCi/L | Decay Corr<br>pCi/L |                             |         |       |
| K-40             | 1.28E+09Y | 1.00  | 5.304E+01            | 5.304E+01           | 3.420E+01                   | 64.48   |       |
| AC-228           | 5.75Y     | 1.00  | 3.507E+01            | 3.523E+01           | 1.030E+01                   | 29.23   |       |
| TH-228           | 1.91Y     | 1.01  | 6.528E+00            | 6.617E+00           | 4.976E+00                   | 75.19   |       |
| Total Activity : |           |       | 9.464E+01            | 9.489E+01           |                             |         |       |

Grand Total Activity : 9.464E+01 9.489E+01

Flags: "K" = Keyline not found "M" = Manually accepted  
"E" = Manually edited "A" = Nuclide specific abn. limit

### Interference Report

No interference correction performed

### Combined Activity-MDA Report

---- Identified Nuclides ----

| Nuclide | Activity<br>(pCi/L) | Act error | MDA<br>(pCi/L) | MDA error | Act/MDA |
|---------|---------------------|-----------|----------------|-----------|---------|
| K-40    | 5.304E+01           | 3.420E+01 | 3.751E+01      | 0.000E+00 | 1.414   |
| AC-228  | 3.523E+01           | 1.030E+01 | 1.451E+01      | 0.000E+00 | 2.428   |
| TH-228  | 6.617E+00           | 4.976E+00 | 7.245E+00      | 0.000E+00 | 0.913   |

---- Non-Identified Nuclides ----

| Nuclide | Key-Line<br>Activity<br>(pCi/L) | K.L.<br>Ided | Act error | MDA<br>(pCi/L) | MDA error | Act/MDA |
|---------|---------------------------------|--------------|-----------|----------------|-----------|---------|
|---------|---------------------------------|--------------|-----------|----------------|-----------|---------|

|         |            |           |           |           |        |
|---------|------------|-----------|-----------|-----------|--------|
| BE-7    | 2.542E+01  | 2.465E+01 | 4.202E+01 | 0.000E+00 | 0.605  |
| NA-24   | -2.699E+00 | 5.797E+00 | Half-Life | too short |        |
| CR-51   | -2.000E+01 | 2.851E+01 | 4.630E+01 | 0.000E+00 | -0.432 |
| MN-54   | 1.376E+00  | 2.499E+00 | 4.259E+00 | 0.000E+00 | 0.323  |
| CO-57   | -1.725E-01 | 2.543E+00 | 4.149E+00 | 0.000E+00 | -0.042 |
| CO-58   | -2.574E+00 | 2.839E+00 | 4.459E+00 | 0.000E+00 | -0.577 |
| FE-59   | 8.619E+00  | 5.771E+00 | 1.043E+01 | 0.000E+00 | 0.826  |
| CO-60   | 1.856E+00  | 2.437E+00 | 4.229E+00 | 0.000E+00 | 0.439  |
| ZN-65   | 6.078E+00  | 5.582E+00 | 9.850E+00 | 0.000E+00 | 0.617  |
| SE-75   | 4.361E-01  | 3.549E+00 | 5.818E+00 | 0.000E+00 | 0.075  |
| SR-85   | 2.046E+01  | 3.377E+00 | 6.658E+00 | 0.000E+00 | 3.074  |
| Y-88    | 1.855E-01  | 2.804E+00 | 4.672E+00 | 0.000E+00 | 0.040  |
| NB-94   | -8.191E-01 | 2.495E+00 | 4.002E+00 | 0.000E+00 | -0.205 |
| NB-95   | 1.535E+00  | 2.715E+00 | 4.650E+00 | 0.000E+00 | 0.330  |
| ZR-95   | -1.902E+00 | 4.926E+00 | 7.813E+00 | 0.000E+00 | -0.243 |
| MO-99   | 1.638E+02  | 5.824E+02 | 9.626E+02 | 0.000E+00 | 0.170  |
| RU-103  | 1.380E+00  | 3.271E+00 | 5.413E+00 | 0.000E+00 | 0.255  |
| RU-106  | -3.303E+00 | 2.531E+01 | 4.024E+01 | 0.000E+00 | -0.082 |
| AG-110m | -9.994E-01 | 2.480E+00 | 3.975E+00 | 0.000E+00 | -0.251 |
| SN-113  | 1.146E+00  | 3.403E+00 | 5.681E+00 | 0.000E+00 | 0.202  |
| SB-124  | -1.588E+00 | 6.582E+00 | 4.401E+00 | 0.000E+00 | -0.361 |
| SB-125  | 6.533E-02  | 7.205E+00 | 1.181E+01 | 0.000E+00 | 0.006  |
| TE-129M | 2.160E+01  | 3.693E+01 | 6.182E+01 | 0.000E+00 | 0.349  |
| I-131   | -2.620E+00 | 7.944E+00 | 1.296E+01 | 0.000E+00 | -0.202 |
| BA-133  | 9.456E+00  | 4.157E+00 | 6.514E+00 | 0.000E+00 | 1.452  |
| CS-134  | 7.772E+00  | 5.911E+00 | 5.130E+00 | 0.000E+00 | 1.515  |
| CS-136  | -2.253E+00 | 4.807E+00 | 7.730E+00 | 0.000E+00 | -0.291 |
| CS-137  | 1.850E+00  | 2.599E+00 | 4.424E+00 | 0.000E+00 | 0.418  |
| CE-139  | -1.321E+00 | 2.547E+00 | 4.191E+00 | 0.000E+00 | -0.315 |
| BA-140  | -7.654E+00 | 1.762E+01 | 2.863E+01 | 0.000E+00 | -0.267 |
| LA-140  | 4.997E+00  | 5.741E+00 | 1.012E+01 | 0.000E+00 | 0.494  |
| CE-141  | -9.192E+00 | 5.569E+00 | 8.619E+00 | 0.000E+00 | -1.066 |
| CE-144  | -2.681E+01 | 2.012E+01 | 3.160E+01 | 0.000E+00 | -0.849 |
| EU-152  | -5.574E+00 | 9.466E+00 | 1.288E+01 | 0.000E+00 | -0.433 |
| EU-154  | -9.050E-01 | 5.205E+00 | 8.464E+00 | 0.000E+00 | -0.107 |
| RA-226  | -3.224E+01 | 6.366E+01 | 1.037E+02 | 0.000E+00 | -0.311 |
| TH-232  | 3.507E+01  | 1.025E+01 | 1.606E+01 | 0.000E+00 | 2.183  |
| U-235   | -1.984E+01 | 1.916E+01 | 3.021E+01 | 0.000E+00 | -0.657 |
| U-238   | 2.516E+02  | 2.883E+02 | 4.958E+02 | 0.000E+00 | 0.508  |
| AM-241  | -4.279E+01 | 2.559E+01 | 3.572E+01 | 0.000E+00 | -1.198 |

|               |             |             |             |             |              |           |   |
|---------------|-------------|-------------|-------------|-------------|--------------|-----------|---|
| A,07L28833-14 | ,06/09/2006 | 09:53,      | 05/26/2006  | 13:40,      | 3.024E+00,WG | L28833-14 | E |
| B,07L28833-14 | ,LIBD       |             | ,06/07/2006 | 09:32,      | 073L082504   |           |   |
| C,K-40        | ,YES,       | 5.304E+01,  | 3.420E+01,  | 3.751E+01,, | 1.414        |           |   |
| C,AC-228      | ,YES,       | 3.523E+01,  | 1.030E+01,  | 1.451E+01,, | 2.428        |           |   |
| C,TH-228      | ,YES,       | 6.617E+00,  | 4.976E+00,  | 7.245E+00,, | 0.913        |           |   |
| C,BE-7        | ,NO ,       | 2.542E+01,  | 2.465E+01,  | 4.202E+01,, | 0.605        |           |   |
| C,CR-51       | ,NO ,       | -2.000E+01, | 2.851E+01,  | 4.630E+01,, | -0.432       |           |   |
| C,MN-54       | ,NO ,       | 1.376E+00,  | 2.499E+00,  | 4.259E+00,, | 0.323        |           |   |
| C,CO-57       | ,NO ,       | -1.725E-01, | 2.543E+00,  | 4.149E+00,, | -0.042       |           |   |
| C,CO-58       | ,NO ,       | -2.574E+00, | 2.839E+00,  | 4.459E+00,, | -0.577       |           |   |
| C,FE-59       | ,NO ,       | 8.619E+00,  | 5.771E+00,  | 1.043E+01,, | 0.826        |           |   |
| C,CO-60       | ,NO ,       | 1.856E+00,  | 2.437E+00,  | 4.229E+00,, | 0.439        |           |   |
| C,ZN-65       | ,NO ,       | 6.078E+00,  | 5.582E+00,  | 9.850E+00,, | 0.617        |           |   |
| C,SE-75       | ,NO ,       | 4.361E-01,  | 3.549E+00,  | 5.818E+00,, | 0.075        |           |   |
| C,SR-85       | ,NO ,       | 2.046E+01,  | 3.377E+00,  | 6.658E+00,, | 3.074        |           |   |
| C,Y-88        | ,NO ,       | 1.855E-01,  | 2.804E+00,  | 4.672E+00,, | 0.040        |           |   |
| C,NB-94       | ,NO ,       | -8.191E-01, | 2.495E+00,  | 4.002E+00,, | -0.205       |           |   |
| C,NB-95       | ,NO ,       | 1.535E+00,  | 2.715E+00,  | 4.650E+00,, | 0.330        |           |   |
| C,ZR-95       | ,NO ,       | -1.902E+00, | 4.926E+00,  | 7.813E+00,, | -0.243       |           |   |
| C,MO-99       | ,NO ,       | 1.638E+02,  | 5.824E+02,  | 9.626E+02,, | 0.170        |           |   |
| C,RU-103      | ,NO ,       | 1.380E+00,  | 3.271E+00,  | 5.413E+00,, | 0.255        |           |   |
| C,RU-106      | ,NO ,       | -3.303E+00, | 2.531E+01,  | 4.024E+01,, | -0.082       |           |   |
| C,AG-110m     | ,NO ,       | -9.994E-01, | 2.480E+00,  | 3.975E+00,, | -0.251       |           |   |
| C,SN-113      | ,NO ,       | 1.146E+00,  | 3.403E+00,  | 5.681E+00,, | 0.202        |           |   |
| C,SB-124      | ,NO ,       | -1.588E+00, | 6.582E+00,  | 4.401E+00,, | -0.361       |           |   |
| C,SB-125      | ,NO ,       | 6.533E-02,  | 7.205E+00,  | 1.181E+01,, | 0.006        |           |   |
| C,TE-129M     | ,NO ,       | 2.160E+01,  | 3.693E+01,  | 6.182E+01,, | 0.349        |           |   |
| C,I-131       | ,NO ,       | -2.620E+00, | 7.944E+00,  | 1.296E+01,, | -0.202       |           |   |
| C,BA-133      | ,NO ,       | 9.456E+00,  | 4.157E+00,  | 6.514E+00,, | 1.452        |           |   |
| C,CS-134      | ,NO ,       | 7.772E+00,  | 5.911E+00,  | 5.130E+00,, | 1.515        |           |   |
| C,CS-136      | ,NO ,       | -2.253E+00, | 4.807E+00,  | 7.730E+00,, | -0.291       |           |   |
| C,CS-137      | ,NO ,       | 1.850E+00,  | 2.599E+00,  | 4.424E+00,, | 0.418        |           |   |
| C,CE-139      | ,NO ,       | -1.321E+00, | 2.547E+00,  | 4.191E+00,, | -0.315       |           |   |
| C,BA-140      | ,NO ,       | -7.654E+00, | 1.762E+01,  | 2.863E+01,, | -0.267       |           |   |
| C,LA-140      | ,NO ,       | 4.997E+00,  | 5.741E+00,  | 1.012E+01,, | 0.494        |           |   |
| C,CE-141      | ,NO ,       | -9.192E+00, | 5.569E+00,  | 8.619E+00,, | -1.066       |           |   |
| C,CE-144      | ,NO ,       | -2.681E+01, | 2.012E+01,  | 3.160E+01,, | -0.849       |           |   |
| C,EU-152      | ,NO ,       | -5.574E+00, | 9.466E+00,  | 1.288E+01,, | -0.433       |           |   |
| C,EU-154      | ,NO ,       | -9.050E-01, | 5.205E+00,  | 8.464E+00,, | -0.107       |           |   |
| C,RA-226      | ,NO ,       | -3.224E+01, | 6.366E+01,  | 1.037E+02,, | -0.311       |           |   |
| C,TH-232      | ,NO ,       | 3.507E+01,  | 1.025E+01,  | 1.606E+01,, | 2.183        |           |   |
| C,U-235       | ,NO ,       | -1.984E+01, | 1.916E+01,  | 3.021E+01,, | -0.657       |           |   |
| C,U-238       | ,NO ,       | 2.516E+02,  | 2.883E+02,  | 4.958E+02,, | 0.508        |           |   |
| C,AM-241      | ,NO ,       | -4.279E+01, | 2.559E+01,  | 3.572E+01,, | -1.198       |           |   |

Sec. Review: Analyst: *M* LIMS: \_\_\_\_\_

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VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 9-JUN-2006 13:50:50.63  
 TBE15 P-10635B HpGe \*\*\*\*\* Aquisition Date/Time: 9-JUN-2006 09:47:32.21

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LIMS No., Customer Name, Client ID: WG L28833-15 EXELON/ZION

Sample ID : 15L28833-15 Smple Date: 26-MAY-2006 14:48:00.  
 Sample Type : WG Geometry : 153L082604  
 Quantity : 3.04520E+00 L BKGFILE : 15BG060306MT  
 Start Channel : 40 Energy Tol : 1.50000 Real Time : 0 04:03:13.90  
 End Channel : 4090 Pk Srch Sens: 5.00000 Live time : 0 04:03:12.45  
 MDA Constant : 0.00 Library Used: LIBD

| Pk | It | Energy  | Area | Bkgnd | FWHM  | Channel | %Eff     | Cts/Sec  | %Err | Fit      |
|----|----|---------|------|-------|-------|---------|----------|----------|------|----------|
| 1  | 1  | 66.30   | 67   | 331   | 0.88  | 120.06  | 8.71E-01 | 4.59E-03 | 44.4 | 8.35E-01 |
| 2  | 1  | 139.61  | 38   | 354   | 1.13  | 267.51  | 2.70E+00 | 2.59E-03 | 88.4 | 3.00E+00 |
| 3  | 1  | 595.31  | 57   | 44    | 1.92  | 1183.68 | 1.01E+00 | 3.93E-03 | 23.8 | 2.61E+00 |
| 4  | 1  | 608.50  | 83   | 90    | 2.12  | 1210.20 | 9.91E-01 | 5.68E-03 | 26.3 | 2.22E+00 |
| 5  | 1  | 1126.55 | 557  | 67    | 14.23 | 2251.03 | 5.83E-01 | 3.82E-02 | 5.0  | 7.70E+01 |

Flag: "\*" = Peak area was modified by background subtraction

Nuclide Line Activity Report

Flag: "\*" = Keyline

Summary of Nuclide Activity  
Sample ID : 15L28833-15

Acquisition date : 9-JUN-2006 09:47:32

|   |   |       |
|---|---|-------|
| Total number of lines in spectrum             | 5 |       |
| Number of unidentified lines                  | 5 |       |
| Number of lines tentatively identified by NID | 0 | 0.00% |

\*\*\*\* There are no nuclides meeting summary criteria \*\*\*\*

Flags: "K" = Keyline not found  
"E" = Manually edited

"M" = Manually accepted  
"A" = Nuclide specific abn. limit

Unidentified Energy Lines  
Sample ID : 15L28833-15

Acquisition date : 9-JUN-2006 09:47:32

| It | Energy  | Area | Bkgnd | FWHM  | Channel | Left | Pw | Cts/Sec  | %Err | %Eff     | Flags |
|----|---------|------|-------|-------|---------|------|----|----------|------|----------|-------|
| 1  | 66.30   | 67   | 331   | 0.88  | 120.06  | 118  | 6  | 4.59E-03 | 88.7 | 8.71E-01 |       |
| 1  | 139.61  | 38   | 354   | 1.13  | 267.51  | 264  | 8  | 2.59E-03 | **** | 2.70E+00 |       |
| 1  | 595.31  | 57   | 44    | 1.92  | 1183.68 | 1180 | 8  | 3.93E-03 | 47.6 | 1.01E+00 |       |
| 1  | 608.50  | 83   | 90    | 2.12  | 1210.20 | 1206 | 13 | 5.68E-03 | 52.6 | 9.91E-01 |       |
| 1  | 1126.55 | 557  | 67    | 14.23 | 2251.03 | 2229 | 36 | 3.82E-02 | 10.0 | 5.83E-01 |       |

Flags: "T" = Tentatively associated

### Summary of Nuclide Activity

Total number of lines in spectrum 5  
 Number of unidentified lines 5  
 Number of lines tentatively identified by NID 0 0.00%  
 \*\*\*\* There are no nuclides meeting summary criteria \*\*\*\*

Flags: "K" = Keyline not found "M" = Manually accepted  
 "E" = Manually edited "A" = Nuclide specific abn. limit

### Interference Report

No interference correction performed

### Combined Activity-MDA Report

---- Non-Identified Nuclides ----

| Nuclide | Key-Line<br>Activity<br>(pCi/L) | K.L.<br>Ided | Act error | MDA<br>(pCi/L)      | MDA error | Act/MDA |
|---------|---------------------------------|--------------|-----------|---------------------|-----------|---------|
| BE-7    | 1.963E+01                       |              | 2.125E+01 | 3.699E+01           | 0.000E+00 | 0.531   |
| NA-24   | -5.409E+00                      |              | 5.914E+00 | Half-Life too short |           |         |
| K-40    | 8.149E+01                       |              | 3.446E+01 | 6.511E+01           | 0.000E+00 | 1.252   |
| CR-51   | -2.984E-01                      |              | 2.395E+01 | 3.959E+01           | 0.000E+00 | -0.008  |
| MN-54   | 7.464E-01                       |              | 2.347E+00 | 3.951E+00           | 0.000E+00 | 0.189   |
| CO-57   | 1.155E+00                       |              | 2.002E+00 | 3.218E+00           | 0.000E+00 | 0.359   |
| CO-58   | -2.428E+00                      |              | 2.650E+00 | 4.093E+00           | 0.000E+00 | -0.593  |
| FE-59   | -7.202E-01                      |              | 5.381E+00 | 8.799E+00           | 0.000E+00 | -0.082  |
| CO-60   | 1.056E+00                       |              | 2.252E+00 | 3.856E+00           | 0.000E+00 | 0.274   |
| ZN-65   | -3.149E+00                      |              | 6.673E+00 | 8.755E+00           | 0.000E+00 | -0.360  |
| SE-75   | 2.006E+00                       |              | 3.093E+00 | 5.119E+00           | 0.000E+00 | 0.392   |
| SR-85   | 6.715E+00                       |              | 2.892E+00 | 5.232E+00           | 0.000E+00 | 1.283   |
| Y-88    | 1.717E+00                       |              | 3.011E+00 | 5.288E+00           | 0.000E+00 | 0.325   |
| NB-94   | 2.143E+00                       |              | 2.174E+00 | 3.754E+00           | 0.000E+00 | 0.571   |
| NB-95   | 5.259E-01                       |              | 2.596E+00 | 4.357E+00           | 0.000E+00 | 0.121   |
| ZR-95   | -4.538E+00                      |              | 4.576E+00 | 7.075E+00           | 0.000E+00 | -0.641  |
| MO-99   | -2.262E+02                      |              | 5.204E+02 | 8.377E+02           | 0.000E+00 | -0.270  |
| RU-103  | -1.999E+00                      |              | 2.754E+00 | 4.396E+00           | 0.000E+00 | -0.455  |
| RU-106  | 7.905E+00                       |              | 2.116E+01 | 3.543E+01           | 0.000E+00 | 0.223   |
| AG-110m | -5.229E-01                      |              | 2.426E+00 | 3.902E+00           | 0.000E+00 | -0.134  |
| SN-113  | 1.968E+00                       |              | 3.095E+00 | 5.208E+00           | 0.000E+00 | 0.378   |
| SB-124  | -4.662E-01                      |              | 5.921E+00 | 4.255E+00           | 0.000E+00 | -0.110  |
| SB-125  | 4.513E+00                       |              | 6.415E+00 | 1.080E+01           | 0.000E+00 | 0.418   |



|         |            |           |           |           |        |
|---------|------------|-----------|-----------|-----------|--------|
| TE-129M | 6.830E+00  | 3.220E+01 | 5.274E+01 | 0.000E+00 | 0.130  |
| I-131   | 3.420E-01  | 6.967E+00 | 1.147E+01 | 0.000E+00 | 0.030  |
| BA-133  | -1.531E+00 | 2.993E+00 | 4.810E+00 | 0.000E+00 | -0.318 |
| CS-134  | 3.019E+00  | 3.372E+00 | 4.283E+00 | 0.000E+00 | 0.705  |
| CS-136  | 4.536E-01  | 4.683E+00 | 7.775E+00 | 0.000E+00 | 0.058  |
| CS-137  | 1.452E+00  | 2.537E+00 | 4.282E+00 | 0.000E+00 | 0.339  |
| CE-139  | 2.148E-01  | 2.017E+00 | 3.345E+00 | 0.000E+00 | 0.064  |
| BA-140  | 8.093E+00  | 1.607E+01 | 2.730E+01 | 0.000E+00 | 0.296  |
| LA-140  | -2.859E+00 | 5.641E+00 | 8.729E+00 | 0.000E+00 | -0.328 |
| CE-141  | 4.774E+00  | 4.896E+00 | 7.249E+00 | 0.000E+00 | 0.659  |
| CE-144  | -1.826E+00 | 1.658E+01 | 2.359E+01 | 0.000E+00 | -0.077 |
| EU-152  | -6.020E+00 | 7.021E+00 | 1.116E+01 | 0.000E+00 | -0.539 |
| EU-154  | 2.998E+00  | 4.124E+00 | 6.660E+00 | 0.000E+00 | 0.450  |
| RA-226  | -4.404E+01 | 5.200E+01 | 8.129E+01 | 0.000E+00 | -0.542 |
| AC-228  | 1.375E+01  | 8.776E+00 | 1.592E+01 | 0.000E+00 | 0.863  |
| TH-228  | 1.633E-01  | 4.132E+00 | 6.491E+00 | 0.000E+00 | 0.025  |
| TH-232  | 1.368E+01  | 8.736E+00 | 1.585E+01 | 0.000E+00 | 0.863  |
| U-235   | 1.199E+01  | 1.715E+01 | 2.511E+01 | 0.000E+00 | 0.477  |
| U-238   | 2.614E+01  | 2.549E+02 | 4.179E+02 | 0.000E+00 | 0.063  |
| AM-241  | -3.729E+01 | 2.197E+01 | 3.374E+01 | 0.000E+00 | -1.105 |

|               |             |                  |             |                  |             |
|---------------|-------------|------------------|-------------|------------------|-------------|
| A,15L28833-15 | ,06/09/2006 | 13:50,05/26/2006 | 14:48,      | 3.045E+00,WG     | L28833-15 E |
| B,15L28833-15 | ,LIBD       |                  | ,06/06/2006 | 10:43,153L082604 |             |
| C,BE-7        | ,NO         | 1.963E+01,       | 2.125E+01,  | 3.699E+01,,      | 0.531       |
| C,K-40        | ,NO         | 8.149E+01,       | 3.446E+01,  | 6.511E+01,,      | 1.252       |
| C,CR-51       | ,NO         | -2.984E-01,      | 2.395E+01,  | 3.959E+01,,      | -0.008      |
| C,MN-54       | ,NO         | 7.464E-01,       | 2.347E+00,  | 3.951E+00,,      | 0.189       |
| C,CO-57       | ,NO         | 1.155E+00,       | 2.002E+00,  | 3.218E+00,,      | 0.359       |
| C,CO-58       | ,NO         | -2.428E+00,      | 2.650E+00,  | 4.093E+00,,      | -0.593      |
| C,FE-59       | ,NO         | -7.202E-01,      | 5.381E+00,  | 8.799E+00,,      | -0.082      |
| C,CO-60       | ,NO         | 1.056E+00,       | 2.252E+00,  | 3.856E+00,,      | 0.274       |
| C,ZN-65       | ,NO         | -3.149E+00,      | 6.673E+00,  | 8.755E+00,,      | -0.360      |
| C,SE-75       | ,NO         | 2.006E+00,       | 3.093E+00,  | 5.119E+00,,      | 0.392       |
| C,SR-85       | ,NO         | 6.715E+00,       | 2.892E+00,  | 5.232E+00,,      | 1.283       |
| C,Y-88        | ,NO         | 1.717E+00,       | 3.011E+00,  | 5.288E+00,,      | 0.325       |
| C,NB-94       | ,NO         | 2.143E+00,       | 2.174E+00,  | 3.754E+00,,      | 0.571       |
| C,NB-95       | ,NO         | 5.259E-01,       | 2.596E+00,  | 4.357E+00,,      | 0.121       |
| C,ZR-95       | ,NO         | -4.538E+00,      | 4.576E+00,  | 7.075E+00,,      | -0.641      |
| C,MO-99       | ,NO         | -2.262E+02,      | 5.204E+02,  | 8.377E+02,,      | -0.270      |
| C,RU-103      | ,NO         | -1.999E+00,      | 2.754E+00,  | 4.396E+00,,      | -0.455      |
| C,RU-106      | ,NO         | 7.905E+00,       | 2.116E+01,  | 3.543E+01,,      | 0.223       |
| C,AG-110m     | ,NO         | -5.229E-01,      | 2.426E+00,  | 3.902E+00,,      | -0.134      |
| C,SN-113      | ,NO         | 1.968E+00,       | 3.095E+00,  | 5.208E+00,,      | 0.378       |
| C,SB-124      | ,NO         | -4.662E-01,      | 5.921E+00,  | 4.255E+00,,      | -0.110      |
| C,SB-125      | ,NO         | 4.513E+00,       | 6.415E+00,  | 1.080E+01,,      | 0.418       |
| C,TE-129M     | ,NO         | 6.830E+00,       | 3.220E+01,  | 5.274E+01,,      | 0.130       |
| C,I-131       | ,NO         | 3.420E-01,       | 6.967E+00,  | 1.147E+01,,      | 0.030       |
| C,BA-133      | ,NO         | -1.531E+00,      | 2.993E+00,  | 4.810E+00,,      | -0.318      |
| C,CS-134      | ,NO         | 3.019E+00,       | 3.372E+00,  | 4.283E+00,,      | 0.705       |
| C,CS-136      | ,NO         | 4.536E-01,       | 4.683E+00,  | 7.775E+00,,      | 0.058       |
| C,CS-137      | ,NO         | 1.452E+00,       | 2.537E+00,  | 4.282E+00,,      | 0.339       |
| C,CE-139      | ,NO         | 2.148E-01,       | 2.017E+00,  | 3.345E+00,,      | 0.064       |
| C,BA-140      | ,NO         | 8.093E+00,       | 1.607E+01,  | 2.730E+01,,      | 0.296       |
| C,LA-140      | ,NO         | -2.859E+00,      | 5.641E+00,  | 8.729E+00,,      | -0.328      |
| C,CE-141      | ,NO         | 4.774E+00,       | 4.896E+00,  | 7.249E+00,,      | 0.659       |
| C,CE-144      | ,NO         | -1.826E+00,      | 1.658E+01,  | 2.359E+01,,      | -0.077      |
| C,EU-152      | ,NO         | -6.020E+00,      | 7.021E+00,  | 1.116E+01,,      | -0.539      |
| C,EU-154      | ,NO         | 2.998E+00,       | 4.124E+00,  | 6.660E+00,,      | 0.450       |
| C,RA-226      | ,NO         | -4.404E+01,      | 5.200E+01,  | 8.129E+01,,      | -0.542      |
| C,AC-228      | ,NO         | 1.375E+01,       | 8.776E+00,  | 1.592E+01,,      | 0.863       |
| C,TH-228      | ,NO         | 1.633E-01,       | 4.132E+00,  | 6.491E+00,,      | 0.025       |
| C,TH-232      | ,NO         | 1.368E+01,       | 8.736E+00,  | 1.585E+01,,      | 0.863       |
| C,U-235       | ,NO         | 1.199E+01,       | 1.715E+01,  | 2.511E+01,,      | 0.477       |
| C,U-238       | ,NO         | 2.614E+01,       | 2.549E+02,  | 4.179E+02,,      | 0.063       |
| C,AM-241      | ,NO         | -3.729E+01,      | 2.197E+01,  | 3.374E+01,,      | -1.105      |

Sec. Review: Analyst: LIMS: \_\_\_\_\_

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VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 9-JUN-2006 13:31:47.46  
 TBE23 03017322 HpGe \*\*\*\*\* Aquisition Date/Time: 9-JUN-2006 09:49:36.24

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LIMS No., Customer Name, Client ID: WG L28833-16 EXELON/ZION

Sample ID : 23L28833-16 Smple Date: 26-MAY-2006 15:10:00.  
 Sample Type : WG Geometry : 233L082404  
 Quantity : 3.03720E+00 L BKGFILE : 23BG060306MT  
 Start Channel : 50 Energy Tol : 1.50000 Real Time : 0 03:41:55.75  
 End Channel : 4090 Pk Srch Sens: 5.00000 Live time : 0 03:41:46.83  
 MDA Constant : 0.00 Library Used: LIBD

| Pk | It | Energy  | Area | Bkgnd | FWHM | Channel | %Eff     | Cts/Sec  | %Err  | Fit      |
|----|----|---------|------|-------|------|---------|----------|----------|-------|----------|
| 1  | 4  | 33.72*  | 30   | 14    | 1.09 | 67.77   | 8.15E-02 | 2.28E-03 | 57.0  | 1.37E+00 |
| 2  | 4  | 35.08*  | 20   | 99    | 1.76 | 70.48   | 1.03E-01 | 1.51E-03 | 163.0 |          |
| 3  | 0  | 64.55*  | 212  | 854   | 2.11 | 129.38  | 1.09E+00 | 1.59E-02 | 33.9  |          |
| 4  | 0  | 92.77*  | 69   | 754   | 1.50 | 185.79  | 1.94E+00 | 5.15E-03 | 88.8  |          |
| 5  | 0  | 140.01* | 71   | 526   | 1.13 | 280.20  | 2.32E+00 | 5.33E-03 | 64.3  |          |
| 6  | 0  | 185.46* | 28   | 526   | 1.27 | 371.03  | 2.18E+00 | 2.14E-03 | 176.9 |          |
| 7  | 0  | 198.02* | 51   | 377   | 1.54 | 396.13  | 2.11E+00 | 3.86E-03 | 73.4  |          |
| 8  | 0  | 510.98* | 49   | 131   | 2.97 | 1021.72 | 1.07E+00 | 3.68E-03 | 83.0  |          |
| 9  | 0  | 595.65  | 82   | 78    | 1.61 | 1190.98 | 9.56E-01 | 6.14E-03 | 24.9  |          |

Flag: "\*" = Peak area was modified by background subtraction

## Nuclide Line Activity Report

Nuclide Type: natural

| Nuclide | Energy | Area | %Abn  | %Eff      | Uncorrected<br>pCi/L | Decay Corr<br>pCi/L | 2-Sigma<br>%Error |
|---------|--------|------|-------|-----------|----------------------|---------------------|-------------------|
| RA-226  | 186.21 | 28   | 3.28* | 2.176E+00 | 2.664E+01            | 2.665E+01           | 353.72            |

Flag: "\*" = Keyline

## Summary of Nuclide Activity

Page : 2

Sample ID : 23L28833-16

Acquisition date : 9-JUN-2006 09:49:36

|   |   |        |
|---|---|--------|
| Total number of lines in spectrum             | 9 |        |
| Number of unidentified lines                  | 8 |        |
| Number of lines tentatively identified by NID | 1 | 11.11% |

Nuclide Type : natural

| Nuclide | Hlife    | Decay            | Uncorrected<br>pCi/L | Decay Corr<br>pCi/L | Decay Corr<br>2-Sigma Error | 2-Sigma<br>%Error | Flags |
|---------|----------|------------------|----------------------|---------------------|-----------------------------|-------------------|-------|
| RA-226  | 1600.00Y | 1.00             | 2.664E+01            | 2.665E+01           | 9.425E+01                   | 353.72            |       |
|         |          |                  | -----                | -----               |                             |                   |       |
|         |          | Total Activity : | 2.664E+01            | 2.665E+01           |                             |                   |       |

|                        |           |           |
|------------------------|-----------|-----------|
| Grand Total Activity : | 2.664E+01 | 2.665E+01 |
|------------------------|-----------|-----------|

Flags: "K" = Keyline not found  
 "E" = Manually edited

"M" = Manually accepted  
 "A" = Nuclide specific abn. limit

Unidentified Energy Lines  
Sample ID : 23L28833-16

Page : 3  
Acquisition date : 9-JUN-2006 09:49:36

| It | Energy | Area | Bkgnd | FWHM | Channel | Left | Pw | Cts/Sec  | %Err | %Eff     | Flags |
|----|--------|------|-------|------|---------|------|----|----------|------|----------|-------|
| 4  | 33.72  | 30   | 14    | 1.09 | 67.77   | 65   | 20 | 2.28E-03 | **** | 8.15E-02 |       |
| 4  | 35.08  | 20   | 99    | 1.76 | 70.48   | 65   | 20 | 1.51E-03 | **** | 1.03E-01 |       |
| 0  | 64.55  | 212  | 854   | 2.11 | 129.38  | 122  | 18 | 1.59E-02 | 67.7 | 1.09E+00 |       |
| 0  | 92.77  | 69   | 754   | 1.50 | 185.79  | 180  | 13 | 5.15E-03 | **** | 1.94E+00 |       |
| 0  | 140.01 | 71   | 526   | 1.13 | 280.20  | 276  | 10 | 5.33E-03 | **** | 2.32E+00 |       |
| 0  | 198.02 | 51   | 377   | 1.54 | 396.13  | 392  | 9  | 3.86E-03 | **** | 2.11E+00 |       |
| 0  | 510.98 | 49   | 131   | 2.97 | 1021.72 | 1012 | 25 | 3.68E-03 | **** | 1.07E+00 |       |
| 0  | 595.65 | 82   | 78    | 1.61 | 1190.98 | 1183 | 13 | 6.14E-03 | 49.8 | 9.56E-01 |       |

Flags: "T" = Tentatively associated

#### Summary of Nuclide Activity

|   |               |
|---|---------------|
| Total number of lines in spectrum             | 9             |
| Number of unidentified lines                  | 8             |
| Number of lines tentatively identified by NID | 1      11.11% |

Nuclide Type : natural

| Nuclide          | Hlife    | Decay | Wtd Mean    | Wtd Mean   | Decay Corr | 2-Sigma | 2-Sigma Error | %Error | Flags |
|------------------|----------|-------|-------------|------------|------------|---------|---------------|--------|-------|
|                  |          |       | Uncorrected | Decay Corr |            |         |               |        |       |
| RA-226           | 1600.00Y | 1.00  | 2.664E+01   | 2.665E+01  | 9.425E+01  | 353.72  |               |        |       |
| Total Activity : |          |       | 2.664E+01   | 2.665E+01  |            |         |               |        |       |

Grand Total Activity : 2.664E+01      2.665E+01

Flags: "K" = Keyline not found      "M" = Manually accepted  
"E" = Manually edited      "A" = Nuclide specific abn. limit

#### Interference Report

No interference correction performed

#### Combined Activity-MDA Report

---- Identified Nuclides ----

| Nuclide | Activity (pCi/L) | Act error | MDA (pCi/L) | MDA error | Act/MDA |
|---------|------------------|-----------|-------------|-----------|---------|
| RA-226  | 2.665E+01        | 9.425E+01 | 1.230E+02   | 0.000E+00 | 0.217   |

---- Non-Identified Nuclides ----

| Nuclide | Key-Line Activity (pCi/L) | K.L. Ided | Act error | MDA (pCi/L)         | MDA error | Act/MDA |
|---------|---------------------------|-----------|-----------|---------------------|-----------|---------|
| BE-7    | -1.429E+01                |           | 2.932E+01 | 4.860E+01           | 0.000E+00 | -0.294  |
| NA-24   | -8.608E+00                |           | 6.607E+00 | Half-Life too short |           |         |
| K-40    | 2.142E+00                 |           | 4.305E+01 | 8.644E+01           | 0.000E+00 | 0.025   |

|         |            |           |           |           |        |
|---------|------------|-----------|-----------|-----------|--------|
| CR-51   | -6.180E+00 | 3.404E+01 | 5.771E+01 | 0.000E+00 | -0.107 |
| MN-54   | 1.119E+00  | 2.708E+00 | 4.811E+00 | 0.000E+00 | 0.233  |
| CO-57   | -1.996E+00 | 3.011E+00 | 4.991E+00 | 0.000E+00 | -0.400 |
| CO-58   | -2.659E+00 | 3.074E+00 | 5.020E+00 | 0.000E+00 | -0.530 |
| FE-59   | 4.014E-02  | 5.856E+00 | 1.034E+01 | 0.000E+00 | 0.004  |
| CO-60   | -3.912E-01 | 2.539E+00 | 4.436E+00 | 0.000E+00 | -0.088 |
| ZN-65   | 1.159E+00  | 5.790E+00 | 1.033E+01 | 0.000E+00 | 0.112  |
| SE-75   | -1.722E+00 | 4.278E+00 | 7.226E+00 | 0.000E+00 | -0.238 |
| SR-85   | 1.797E+01  | 3.871E+00 | 7.036E+00 | 0.000E+00 | 2.554  |
| Y-88    | -1.567E+00 | 3.475E+00 | 5.935E+00 | 0.000E+00 | -0.264 |
| NB-94   | -1.494E-01 | 2.686E+00 | 4.634E+00 | 0.000E+00 | -0.032 |
| NB-95   | 1.935E-01  | 3.089E+00 | 5.366E+00 | 0.000E+00 | 0.036  |
| ZR-95   | 1.744E+00  | 5.629E+00 | 9.914E+00 | 0.000E+00 | 0.176  |
| MO-99   | 3.483E+02  | 6.488E+02 | 1.162E+03 | 0.000E+00 | 0.300  |
| RU-103  | 7.386E-01  | 3.655E+00 | 6.172E+00 | 0.000E+00 | 0.120  |
| RU-106  | -9.479E+00 | 2.540E+01 | 4.328E+01 | 0.000E+00 | -0.219 |
| AG-110m | 6.336E-01  | 2.695E+00 | 4.749E+00 | 0.000E+00 | 0.133  |
| SN-113  | 1.564E+00  | 4.003E+00 | 6.923E+00 | 0.000E+00 | 0.226  |
| SB-124  | -8.562E+00 | 3.518E+00 | 5.379E+00 | 0.000E+00 | -1.592 |
| SB-125  | -2.678E+00 | 8.385E+00 | 1.406E+01 | 0.000E+00 | -0.191 |
| TE-129M | -1.557E+01 | 4.094E+01 | 6.838E+01 | 0.000E+00 | -0.228 |
| I-131   | 1.249E+00  | 9.580E+00 | 1.641E+01 | 0.000E+00 | 0.076  |
| BA-133  | 1.619E+00  | 4.129E+00 | 7.128E+00 | 0.000E+00 | 0.227  |
| CS-134  | -3.592E-01 | 3.091E+00 | 5.307E+00 | 0.000E+00 | -0.068 |
| CS-136  | -7.091E-01 | 5.302E+00 | 9.110E+00 | 0.000E+00 | -0.078 |
| CS-137  | -5.272E-01 | 2.919E+00 | 5.021E+00 | 0.000E+00 | -0.105 |
| CE-139  | 6.385E-01  | 3.265E+00 | 5.483E+00 | 0.000E+00 | 0.116  |
| BA-140  | 4.358E+00  | 1.995E+01 | 3.433E+01 | 0.000E+00 | 0.127  |
| LA-140  | 1.467E+00  | 6.022E+00 | 1.108E+01 | 0.000E+00 | 0.132  |
| CE-141  | 7.456E+00  | 8.045E+00 | 1.180E+01 | 0.000E+00 | 0.632  |
| CE-144  | -8.699E+00 | 2.785E+01 | 3.928E+01 | 0.000E+00 | -0.221 |
| EU-152  | -6.785E+00 | 9.090E+00 | 1.506E+01 | 0.000E+00 | -0.450 |
| EU-154  | 4.183E-01  | 6.124E+00 | 1.032E+01 | 0.000E+00 | 0.041  |
| AC-228  | 1.119E+01  | 1.154E+01 | 1.979E+01 | 0.000E+00 | 0.566  |
| TH-228  | -4.247E-01 | 5.909E+00 | 9.503E+00 | 0.000E+00 | -0.045 |
| TH-232  | 1.114E+01  | 1.148E+01 | 1.970E+01 | 0.000E+00 | 0.566  |
| U-235   | 1.789E+01  | 2.863E+01 | 4.092E+01 | 0.000E+00 | 0.437  |
| U-238   | -2.404E+02 | 3.152E+02 | 5.030E+02 | 0.000E+00 | -0.478 |
| AM-241  | 1.315E+01  | 1.931E+01 | 2.782E+01 | 0.000E+00 | 0.473  |

|               |             |             |            |             |             |              |            |
|---------------|-------------|-------------|------------|-------------|-------------|--------------|------------|
| A,23L28833-16 | ,06/09/2006 | 13:31,      | 05/26/2006 | 15:10,      | 3.037E+00,  | WG L28833-16 | E          |
| B,23L28833-16 | ,LIBD       |             |            |             | ,06/01/2006 | 10:14,       | 233L082404 |
| C,RA-226      | ,YES,       | 2.665E+01,  | 9.425E+01, | 1.230E+02,, | 0.217       |              |            |
| C,BE-7        | ,NO ,       | -1.429E+01, | 2.932E+01, | 4.860E+01,, | -0.294      |              |            |
| C,K-40        | ,NO ,       | 2.142E+00,  | 4.305E+01, | 8.644E+01,, | 0.025       |              |            |
| C,CR-51       | ,NO ,       | -6.180E+00, | 3.404E+01, | 5.771E+01,, | -0.107      |              |            |
| C,MN-54       | ,NO ,       | 1.119E+00,  | 2.708E+00, | 4.811E+00,, | 0.233       |              |            |
| C,CO-57       | ,NO ,       | -1.996E+00, | 3.011E+00, | 4.991E+00,, | -0.400      |              |            |
| C,CO-58       | ,NO ,       | -2.659E+00, | 3.074E+00, | 5.020E+00,, | -0.530      |              |            |
| C,FE-59       | ,NO ,       | 4.014E-02,  | 5.856E+00, | 1.034E+01,, | 0.004       |              |            |
| C,CO-60       | ,NO ,       | -3.912E-01, | 2.539E+00, | 4.436E+00,, | -0.088      |              |            |
| C,ZN-65       | ,NO ,       | 1.159E+00,  | 5.790E+00, | 1.033E+01,, | 0.112       |              |            |
| C,SE-75       | ,NO ,       | -1.722E+00, | 4.278E+00, | 7.226E+00,, | -0.238      |              |            |
| C,SR-85       | ,NO ,       | 1.797E+01,  | 3.871E+00, | 7.036E+00,, | 2.554       |              |            |
| C,Y-88        | ,NO ,       | -1.567E+00, | 3.475E+00, | 5.935E+00,, | -0.264      |              |            |
| C,NB-94       | ,NO ,       | -1.494E-01, | 2.686E+00, | 4.634E+00,, | -0.032      |              |            |
| C,NB-95       | ,NO ,       | 1.935E-01,  | 3.089E+00, | 5.366E+00,, | 0.036       |              |            |
| C,ZR-95       | ,NO ,       | 1.744E+00,  | 5.629E+00, | 9.914E+00,, | 0.176       |              |            |
| C,MO-99       | ,NO ,       | 3.483E+02,  | 6.488E+02, | 1.162E+03,, | 0.300       |              |            |
| C,RU-103      | ,NO ,       | 7.386E-01,  | 3.655E+00, | 6.172E+00,, | 0.120       |              |            |
| C,RU-106      | ,NO ,       | -9.479E+00, | 2.540E+01, | 4.328E+01,, | -0.219      |              |            |
| C,AG-110m     | ,NO ,       | 6.336E-01,  | 2.695E+00, | 4.749E+00,, | 0.133       |              |            |
| C,SN-113      | ,NO ,       | 1.564E+00,  | 4.003E+00, | 6.923E+00,, | 0.226       |              |            |
| C,SB-124      | ,NO ,       | -8.562E+00, | 3.518E+00, | 5.379E+00,, | -1.592      |              |            |
| C,SB-125      | ,NO ,       | -2.678E+00, | 8.385E+00, | 1.406E+01,, | -0.191      |              |            |
| C,TE-129M     | ,NO ,       | -1.557E+01, | 4.094E+01, | 6.838E+01,, | -0.228      |              |            |
| C,I-131       | ,NO ,       | 1.249E+00,  | 9.580E+00, | 1.641E+01,, | 0.076       |              |            |
| C,BA-133      | ,NO ,       | 1.619E+00,  | 4.129E+00, | 7.128E+00,, | 0.227       |              |            |
| C,CS-134      | ,NO ,       | -3.592E-01, | 3.091E+00, | 5.307E+00,, | -0.068      |              |            |
| C,CS-136      | ,NO ,       | -7.091E-01, | 5.302E+00, | 9.110E+00,, | -0.078      |              |            |
| C,CS-137      | ,NO ,       | -5.272E-01, | 2.919E+00, | 5.021E+00,, | -0.105      |              |            |
| C,CE-139      | ,NO ,       | 6.385E-01,  | 3.265E+00, | 5.483E+00,, | 0.116       |              |            |
| C,BA-140      | ,NO ,       | 4.358E+00,  | 1.995E+01, | 3.433E+01,, | 0.127       |              |            |
| C,LA-140      | ,NO ,       | 1.467E+00,  | 6.022E+00, | 1.108E+01,, | 0.132       |              |            |
| C,CE-141      | ,NO ,       | 7.456E+00,  | 8.045E+00, | 1.180E+01,, | 0.632       |              |            |
| C,CE-144      | ,NO ,       | -8.699E+00, | 2.785E+01, | 3.928E+01,, | -0.221      |              |            |
| C,EU-152      | ,NO ,       | -6.785E+00, | 9.090E+00, | 1.506E+01,, | -0.450      |              |            |
| C,EU-154      | ,NO ,       | 4.183E-01,  | 6.124E+00, | 1.032E+01,, | 0.041       |              |            |
| C,AC-228      | ,NO ,       | 1.119E+01,  | 1.154E+01, | 1.979E+01,, | 0.566       |              |            |
| C,TH-228      | ,NO ,       | -4.247E-01, | 5.909E+00, | 9.503E+00,, | -0.045      |              |            |
| C,TH-232      | ,NO ,       | 1.114E+01,  | 1.148E+01, | 1.970E+01,, | 0.566       |              |            |
| C,U-235       | ,NO ,       | 1.789E+01,  | 2.863E+01, | 4.092E+01,, | 0.437       |              |            |
| C,U-238       | ,NO ,       | -2.404E+02, | 3.152E+02, | 5.030E+02,, | -0.478      |              |            |
| C,AM-241      | ,NO ,       | 1.315E+01,  | 1.931E+01, | 2.782E+01,, | 0.473       |              |            |





Summary of Nuclide Activity  
 Sample ID : 14L28833-17

Page : 2  
 Acquisition date : 9-JUN-2006 10:00:28

|   |   |        |
|---|---|--------|
| Total number of lines in spectrum             | 6 |        |
| Number of unidentified lines                  | 5 |        |
| Number of lines tentatively identified by NID | 1 | 16.67% |

Nuclide Type : natural

| Nuclide | Hlife | Decay            | Uncorrected<br>pCi/L | Decay Corr<br>pCi/L | Decay Corr<br>2-Sigma Error | 2-Sigma<br>%Error | Flags |
|---------|-------|------------------|----------------------|---------------------|-----------------------------|-------------------|-------|
| TH-228  | 1.91Y | 1.01             | 3.271E-01            | 3.317E-01           | 53.44E-01                   | 1610.96           |       |
|         |       |                  | -----                | -----               |                             |                   |       |
|         |       | Total Activity : | 3.271E-01            | 3.317E-01           |                             |                   |       |

Grand Total Activity : 3.271E-01      3.317E-01

Flags: "K" = Keyline not found  
 "E" = Manually edited

"M" = Manually accepted  
 "A" = Nuclide specific abn. limit

Unidentified Energy Lines  
Sample ID : 14L28833-17

Page : 3  
Acquisition date : 9-JUN-2006 10:00:28

| It | Energy | Area | Bkgnd | FWHM | Channel | Left | Pw | Cts/Sec  | %Err | %Eff     | Flags |
|----|--------|------|-------|------|---------|------|----|----------|------|----------|-------|
| 1  | 65.59  | 192  | 738   | 2.54 | 132.17  | 126  | 13 | 1.25E-02 | 60.2 | 4.90E-01 |       |
| 1  | 92.86  | 16   | 394   | 1.37 | 186.86  | 183  | 8  | 1.02E-03 | **** | 1.28E+00 |       |
| 1  | 140.03 | 130  | 366   | 1.39 | 281.43  | 278  | 8  | 8.48E-03 | 53.7 | 1.90E+00 |       |
| 1  | 198.53 | 160  | 381   | 2.02 | 398.67  | 394  | 11 | 1.04E-02 | 52.2 | 1.83E+00 |       |
| 1  | 596.25 | 80   | 88    | 2.07 | 1194.27 | 1189 | 11 | 5.22E-03 | 50.7 | 8.47E-01 |       |

Flags: "T" = Tentatively associated

### Summary of Nuclide Activity

|   |   |        |
|---|---|--------|
| Total number of lines in spectrum             | 6 |        |
| Number of unidentified lines                  | 5 |        |
| Number of lines tentatively identified by NID | 1 | 16.67% |

Nuclide Type : natural

| Nuclide          | Hlife | Decay | Wtd Mean<br>Uncorrected<br>pCi/L | Wtd Mean<br>Decay Corr<br>pCi/L | Decay Corr<br>2-Sigma Error | 2-Sigma<br>%Error | Flags |
|------------------|-------|-------|----------------------------------|---------------------------------|-----------------------------|-------------------|-------|
| TH-228           | 1.91Y | 1.01  | 3.271E-01                        | 3.317E-01                       | 53.44E-01                   | 1610.96           |       |
| Total Activity : |       |       | 3.271E-01                        | 3.317E-01                       |                             |                   |       |

Grand Total Activity : 3.271E-01 3.317E-01

Flags: "K" = Keyline not found "M" = Manually accepted  
"E" = Manually edited "A" = Nuclide specific abn. limit

### Interference Report

No interference correction performed

### Combined Activity-MDA Report

---- Identified Nuclides ----

| Nuclide | Activity<br>(pCi/L) | Act error | MDA<br>(pCi/L) | MDA error | Act/MDA |
|---------|---------------------|-----------|----------------|-----------|---------|
| TH-228  | 3.317E-01           | 5.344E+00 | 8.738E+00      | 0.000E+00 | 0.038   |

---- Non-Identified Nuclides ----

| Nuclide | Key-Line<br>Activity<br>(pCi/L) | K.L.<br>Ided | Act error | MDA<br>(pCi/L)      | MDA error | Act/MDA |
|---------|---------------------------------|--------------|-----------|---------------------|-----------|---------|
| BE-7    | -2.339E+00                      |              | 3.137E+01 | 5.152E+01           | 0.000E+00 | -0.045  |
| NA-24   | -3.724E+00                      |              | 1.031E+01 | Half-Life too short |           |         |
| K-40    | -2.118E+01                      |              | 4.371E+01 | 7.827E+01           | 0.000E+00 | -0.271  |
| CR-51   | -5.432E+01                      |              | 3.747E+01 | 5.844E+01           | 0.000E+00 | -0.929  |
| MN-54   | 5.905E-01                       |              | 3.168E+00 | 5.223E+00           | 0.000E+00 | 0.113   |
| CO-57   | -1.626E-01                      |              | 3.109E+00 | 5.153E+00           | 0.000E+00 | -0.032  |

|         |            |           |           |           |        |
|---------|------------|-----------|-----------|-----------|--------|
| CO-58   | 2.601E+00  | 3.338E+00 | 5.706E+00 | 0.000E+00 | 0.456  |
| FE-59   | 9.816E-01  | 7.059E+00 | 1.166E+01 | 0.000E+00 | 0.084  |
| CO-60   | -1.487E+00 | 2.932E+00 | 4.618E+00 | 0.000E+00 | -0.322 |
| ZN-65   | -9.873E-01 | 6.623E+00 | 1.071E+01 | 0.000E+00 | -0.092 |
| SE-75   | 8.831E-01  | 4.246E+00 | 7.069E+00 | 0.000E+00 | 0.125  |
| SR-85   | 1.719E+01  | 4.028E+00 | 7.543E+00 | 0.000E+00 | 2.280  |
| Y-88    | 3.853E-01  | 3.654E+00 | 6.045E+00 | 0.000E+00 | 0.064  |
| NB-94   | 7.757E-01  | 3.015E+00 | 5.035E+00 | 0.000E+00 | 0.154  |
| NB-95   | 3.258E+00  | 3.369E+00 | 5.823E+00 | 0.000E+00 | 0.560  |
| ZR-95   | -2.292E+00 | 6.141E+00 | 9.865E+00 | 0.000E+00 | -0.232 |
| MO-99   | -3.469E+02 | 8.072E+02 | 1.295E+03 | 0.000E+00 | -0.268 |
| RU-103  | 1.145E+00  | 3.883E+00 | 6.464E+00 | 0.000E+00 | 0.177  |
| RU-106  | 1.353E+01  | 2.926E+01 | 4.967E+01 | 0.000E+00 | 0.272  |
| AG-110m | -4.904E-02 | 3.095E+00 | 5.120E+00 | 0.000E+00 | -0.010 |
| SN-113  | 6.719E-01  | 4.250E+00 | 6.938E+00 | 0.000E+00 | 0.097  |
| SB-124  | -6.773E+00 | 4.732E+00 | 5.815E+00 | 0.000E+00 | -1.165 |
| SB-125  | 2.884E+00  | 8.684E+00 | 1.458E+01 | 0.000E+00 | 0.198  |
| TE-129M | -3.092E+01 | 4.531E+01 | 7.265E+01 | 0.000E+00 | -0.426 |
| I-131   | 3.115E-01  | 1.078E+01 | 1.757E+01 | 0.000E+00 | 0.018  |
| BA-133  | 4.531E+00  | 4.356E+00 | 7.362E+00 | 0.000E+00 | 0.615  |
| CS-134  | -4.888E-01 | 3.396E+00 | 5.483E+00 | 0.000E+00 | -0.089 |
| CS-136  | -6.228E-01 | 6.327E+00 | 1.027E+01 | 0.000E+00 | -0.061 |
| CS-137  | -1.394E+00 | 3.276E+00 | 5.302E+00 | 0.000E+00 | -0.263 |
| CE-139  | -3.553E-01 | 3.109E+00 | 5.084E+00 | 0.000E+00 | -0.070 |
| BA-140  | -1.347E+01 | 2.315E+01 | 3.682E+01 | 0.000E+00 | -0.366 |
| LA-140  | 4.811E-01  | 7.013E+00 | 1.168E+01 | 0.000E+00 | 0.041  |
| CE-141  | 3.984E+00  | 7.704E+00 | 1.100E+01 | 0.000E+00 | 0.362  |
| CE-144  | 3.271E+00  | 2.710E+01 | 3.827E+01 | 0.000E+00 | 0.085  |
| EU-152  | -1.657E+01 | 9.783E+00 | 1.500E+01 | 0.000E+00 | -1.105 |
| EU-154  | 2.530E+00  | 6.242E+00 | 1.046E+01 | 0.000E+00 | 0.242  |
| RA-226  | 2.997E+00  | 7.737E+01 | 1.228E+02 | 0.000E+00 | 0.024  |
| AC-228  | 1.853E+00  | 1.135E+01 | 1.869E+01 | 0.000E+00 | 0.099  |
| TH-232  | 1.844E+00  | 1.130E+01 | 1.860E+01 | 0.000E+00 | 0.099  |
| U-235   | 2.282E+01  | 2.696E+01 | 3.895E+01 | 0.000E+00 | 0.586  |
| U-238   | 2.841E+02  | 3.177E+02 | 5.539E+02 | 0.000E+00 | 0.513  |
| AM-241  | -6.292E+01 | 4.761E+01 | 6.340E+01 | 0.000E+00 | -0.992 |

|               |       | 06/09/2006  | 14:16,05/26/2006 | 08:45,      | 3.064E+00,WG     | L28833-17 E |
|---------------|-------|-------------|------------------|-------------|------------------|-------------|
| A,14L28833-17 |       | ,06/09/2006 | 14:16,05/26/2006 | 08:45,      | 3.064E+00,WG     | L28833-17 E |
| B,14L28833-17 |       | ,LIBD       |                  | ,06/02/2006 | 08:23,143L082304 |             |
| C,TH-228      | ,YES, | 3.317E-01,  | 5.344E+00,       | 8.738E+00,, | 0.038            |             |
| C,BE-7        | ,NO,  | -2.339E+00, | 3.137E+01,       | 5.152E+01,, | -0.045           |             |
| C,K-40        | ,NO,  | -2.118E+01, | 4.371E+01,       | 7.827E+01,, | -0.271           |             |
| C,CR-51       | ,NO,  | -5.432E+01, | 3.747E+01,       | 5.844E+01,, | -0.929           |             |
| C,MN-54       | ,NO,  | 5.905E-01,  | 3.168E+00,       | 5.223E+00,, | 0.113            |             |
| C,CO-57       | ,NO,  | -1.626E-01, | 3.109E+00,       | 5.153E+00,, | -0.032           |             |
| C,CO-58       | ,NO,  | 2.601E+00,  | 3.338E+00,       | 5.706E+00,, | 0.456            |             |
| C,FE-59       | ,NO,  | 9.816E-01,  | 7.059E+00,       | 1.166E+01,, | 0.084            |             |
| C,CO-60       | ,NO,  | -1.487E+00, | 2.932E+00,       | 4.618E+00,, | -0.322           |             |
| C,ZN-65       | ,NO,  | -9.873E-01, | 6.623E+00,       | 1.071E+01,, | -0.092           |             |
| C,SE-75       | ,NO,  | 8.831E-01,  | 4.246E+00,       | 7.069E+00,, | 0.125            |             |
| C,SR-85       | ,NO,  | 1.719E+01,  | 4.028E+00,       | 7.543E+00,, | 2.280            |             |
| C,Y-88        | ,NO,  | 3.853E-01,  | 3.654E+00,       | 6.045E+00,, | 0.064            |             |
| C,NB-94       | ,NO,  | 7.757E-01,  | 3.015E+00,       | 5.035E+00,, | 0.154            |             |
| C,NB-95       | ,NO,  | 3.258E+00,  | 3.369E+00,       | 5.823E+00,, | 0.560            |             |
| C,ZR-95       | ,NO,  | -2.292E+00, | 6.141E+00,       | 9.865E+00,, | -0.232           |             |
| C,MO-99       | ,NO,  | -3.469E+02, | 8.072E+02,       | 1.295E+03,, | -0.268           |             |
| C,RU-103      | ,NO,  | 1.145E+00,  | 3.883E+00,       | 6.464E+00,, | 0.177            |             |
| C,RU-106      | ,NO,  | 1.353E+01,  | 2.926E+01,       | 4.967E+01,, | 0.272            |             |
| C,AG-110m     | ,NO,  | -4.904E-02, | 3.095E+00,       | 5.120E+00,, | -0.010           |             |
| C,SN-113      | ,NO,  | 6.719E-01,  | 4.250E+00,       | 6.938E+00,, | 0.097            |             |
| C,SB-124      | ,NO,  | -6.773E+00, | 4.732E+00,       | 5.815E+00,, | -1.165           |             |
| C,SB-125      | ,NO,  | 2.884E+00,  | 8.684E+00,       | 1.458E+01,, | 0.198            |             |
| C,TE-129M     | ,NO,  | -3.092E+01, | 4.531E+01,       | 7.265E+01,, | -0.426           |             |
| C,I-131       | ,NO,  | 3.115E-01,  | 1.078E+01,       | 1.757E+01,, | 0.018            |             |
| C,BA-133      | ,NO,  | 4.531E+00,  | 4.356E+00,       | 7.362E+00,, | 0.615            |             |
| C,CS-134      | ,NO,  | -4.888E-01, | 3.396E+00,       | 5.483E+00,, | -0.089           |             |
| C,CS-136      | ,NO,  | -6.228E-01, | 6.327E+00,       | 1.027E+01,, | -0.061           |             |
| C,CS-137      | ,NO,  | -1.394E+00, | 3.276E+00,       | 5.302E+00,, | -0.263           |             |
| C,CE-139      | ,NO,  | -3.553E-01, | 3.109E+00,       | 5.084E+00,, | -0.070           |             |
| C,BA-140      | ,NO,  | -1.347E+01, | 2.315E+01,       | 3.682E+01,, | -0.366           |             |
| C,LA-140      | ,NO,  | 4.811E-01,  | 7.013E+00,       | 1.168E+01,, | 0.041            |             |
| C,CE-141      | ,NO,  | 3.984E+00,  | 7.704E+00,       | 1.100E+01,, | 0.362            |             |
| C,CE-144      | ,NO,  | 3.271E+00,  | 2.710E+01,       | 3.827E+01,, | 0.085            |             |
| C,EU-152      | ,NO,  | -1.657E+01, | 9.783E+00,       | 1.500E+01,, | -1.105           |             |
| C,EU-154      | ,NO,  | 2.530E+00,  | 6.242E+00,       | 1.046E+01,, | 0.242            |             |
| C,RA-226      | ,NO,  | 2.997E+00,  | 7.737E+01,       | 1.228E+02,, | 0.024            |             |
| C,AC-228      | ,NO,  | 1.853E+00,  | 1.135E+01,       | 1.869E+01,, | 0.099            |             |
| C,TH-232      | ,NO,  | 1.844E+00,  | 1.130E+01,       | 1.860E+01,, | 0.099            |             |
| C,U-235       | ,NO,  | 2.282E+01,  | 2.696E+01,       | 3.895E+01,, | 0.586            |             |
| C,U-238       | ,NO,  | 2.841E+02,  | 3.177E+02,       | 5.539E+02,, | 0.513            |             |
| C,AM-241      | ,NO,  | -6.292E+01, | 4.761E+01,       | 6.340E+01,, | -0.992           |             |



Summary of Nuclide Activity  
 Sample ID : 10L28833-18

Page : 2  
 Acquisition date : 9-JUN-2006 11:15:18

Total number of lines in spectrum 11  
 Number of unidentified lines 9  
 Number of lines tentatively identified by NID 2 18.18%

Nuclide Type : natural

| Nuclide          | Hlife     | Decay | Uncorrected<br>pCi/L | Decay Corr<br>pCi/L | Decay Corr<br>2-Sigma Error | 2-Sigma<br>%Error | Flags |
|------------------|-----------|-------|----------------------|---------------------|-----------------------------|-------------------|-------|
| K-40             | 1.28E+09Y | 1.00  | 7.532E+00            | 7.532E+00           | 53.32E+00                   | 708.00            |       |
| RA-226           | 1600.00Y  | 1.00  | 6.465E+00            | 6.465E+00           | 61.91E+00                   | 957.50            |       |
| U-235            | 7.04E+08Y | 1.00  | 3.927E-01            | 3.927E-01           | 37.60E-01                   | 957.50            | K     |
| Total Activity : |           |       | 1.439E+01            | 1.439E+01           |                             |                   |       |

Grand Total Activity : 1.439E+01 1.439E+01

Flags: "K" = Keyline not found  
 "E" = Manually edited

"M" = Manually accepted  
 "A" = Nuclide specific abn. limit

## Unidentified Energy Lines

Page : 3

Sample ID : 10L28833-18

Acquisition date : 9-JUN-2006 11:15:18

| It | Energy  | Area | Bkgnd | FWHM | Channel | Left | Pw | Cts/Sec  | %Err | %Eff     | Flags |
|----|---------|------|-------|------|---------|------|----|----------|------|----------|-------|
| 1  | 66.49   | 55   | 482   | 1.31 | 132.09  | 129  | 7  | 3.19E-03 | **** | 7.33E-01 |       |
| 1  | 92.82   | 37   | 447   | 1.48 | 184.78  | 181  | 8  | 2.15E-03 | **** | 1.52E+00 |       |
| 1  | 140.06  | 134  | 526   | 1.75 | 279.30  | 275  | 9  | 7.82E-03 | 64.0 | 1.91E+00 |       |
| 1  | 198.66  | 66   | 476   | 1.64 | 396.55  | 391  | 11 | 3.82E-03 | **** | 1.71E+00 |       |
| 1  | 352.21  | 10   | 178   | 1.97 | 703.81  | 699  | 10 | 5.66E-04 | **** | 1.17E+00 |       |
| 1  | 596.03  | 60   | 115   | 2.51 | 1191.74 | 1187 | 12 | 3.52E-03 | 75.4 | 7.85E-01 |       |
| 1  | 609.66  | 60   | 99    | 1.89 | 1219.02 | 1213 | 12 | 3.51E-03 | 80.9 | 7.72E-01 |       |
| 1  | 1756.33 | 61   | 24    | 1.05 | 3514.48 | 3508 | 11 | 3.53E-03 | 33.0 | 3.40E-01 |       |
| 1  | 1765.19 | 6    | 17    | 1.84 | 3532.22 | 3525 | 14 | 3.25E-04 | **** | 3.39E-01 |       |

Flags: "T" = Tentatively associated

## Summary of Nuclide Activity

Total number of lines in spectrum 11  
 Number of unidentified lines 9  
 Number of lines tentatively identified by NID 2 18.18%

Nuclide Type : natural

| Nuclide          | Hlife     | Decay | Wtd Mean    | Wtd Mean   | Decay Corr | 2-Sigma | 2-Sigma Error | %Error | Flags |
|------------------|-----------|-------|-------------|------------|------------|---------|---------------|--------|-------|
|                  |           |       | Uncorrected | Decay Corr |            |         |               |        |       |
| K-40             | 1.28E+09Y | 1.00  | 7.532E+00   | 7.532E+00  | 53.32E+00  | 708.00  |               |        |       |
| RA-226           | 1600.00Y  | 1.00  | 6.465E+00   | 6.465E+00  | 61.91E+00  | 957.50  |               |        |       |
| Total Activity : |           |       | 1.400E+01   | 1.400E+01  |            |         |               |        |       |

Grand Total Activity : 1.400E+01 1.400E+01

Flags: "K" = Keyline not found

"M" = Manually accepted

"E" = Manually edited

"A" = Nuclide specific abn. limit

## Interference Report

No interference correction performed

## Combined Activity-MDA Report

---- Identified Nuclides ----

| Nuclide | Activity<br>(pCi/L) | Act error | MDA<br>(pCi/L) | MDA error | Act/MDA |
|---------|---------------------|-----------|----------------|-----------|---------|
| K-40    | 7.532E+00           | 5.332E+01 | 4.374E+01      | 0.000E+00 | 0.172   |
| RA-226  | 6.465E+00           | 6.191E+01 | 1.183E+02      | 0.000E+00 | 0.055   |

---- Non-Identified Nuclides ----

| Nuclide | Key-Line<br>Activity<br>(pCi/L) | K.L.<br>Ided | Act error | MDA<br>(pCi/L) | MDA error | Act/MDA |
|---------|---------------------------------|--------------|-----------|----------------|-----------|---------|
|---------|---------------------------------|--------------|-----------|----------------|-----------|---------|

|         |            |           |                     |           |        |
|---------|------------|-----------|---------------------|-----------|--------|
| BE-7    | 2.328E+01  | 2.846E+01 | 4.887E+01           | 0.000E+00 | 0.476  |
| NA-24   | -2.581E+00 | 8.309E+00 | Half-Life too short |           |        |
| CR-51   | -4.573E+01 | 3.618E+01 | 5.698E+01           | 0.000E+00 | -0.803 |
| MN-54   | 6.623E-01  | 2.984E+00 | 4.988E+00           | 0.000E+00 | 0.133  |
| CO-57   | -1.671E+00 | 2.983E+00 | 4.872E+00           | 0.000E+00 | -0.343 |
| CO-58   | 1.443E-01  | 3.118E+00 | 5.169E+00           | 0.000E+00 | 0.028  |
| FE-59   | 2.312E+00  | 6.878E+00 | 1.166E+01           | 0.000E+00 | 0.198  |
| CO-60   | 2.030E+00  | 2.842E+00 | 4.949E+00           | 0.000E+00 | 0.410  |
| ZN-65   | 4.035E+00  | 6.155E+00 | 1.066E+01           | 0.000E+00 | 0.378  |
| SE-75   | -2.232E+00 | 4.292E+00 | 7.006E+00           | 0.000E+00 | -0.319 |
| SR-85   | 2.254E+01  | 4.014E+00 | 7.796E+00           | 0.000E+00 | 2.891  |
| Y-88    | -6.658E-01 | 3.564E+00 | 5.728E+00           | 0.000E+00 | -0.116 |
| NB-94   | -2.853E+00 | 2.871E+00 | 4.409E+00           | 0.000E+00 | -0.647 |
| NB-95   | 1.594E+00  | 3.140E+00 | 5.357E+00           | 0.000E+00 | 0.298  |
| ZR-95   | 2.815E+00  | 5.564E+00 | 9.500E+00           | 0.000E+00 | 0.296  |
| MO-99   | 5.787E+01  | 7.249E+02 | 1.210E+03           | 0.000E+00 | 0.048  |
| RU-103  | 8.651E-01  | 3.823E+00 | 6.391E+00           | 0.000E+00 | 0.135  |
| RU-106  | 2.201E+01  | 2.861E+01 | 4.754E+01           | 0.000E+00 | 0.463  |
| AG-110m | 1.021E+00  | 2.806E+00 | 4.676E+00           | 0.000E+00 | 0.218  |
| SN-113  | -2.715E+00 | 4.142E+00 | 6.573E+00           | 0.000E+00 | -0.413 |
| SB-124  | -5.155E-01 | 7.978E+00 | 5.494E+00           | 0.000E+00 | -0.094 |
| SB-125  | 5.952E+00  | 8.581E+00 | 1.435E+01           | 0.000E+00 | 0.415  |
| TE-129M | 1.905E+01  | 4.132E+01 | 7.004E+01           | 0.000E+00 | 0.272  |
| I-131   | -1.517E+00 | 1.013E+01 | 1.648E+01           | 0.000E+00 | -0.092 |
| BA-133  | 3.472E+00  | 5.025E+00 | 7.206E+00           | 0.000E+00 | 0.482  |
| CS-134  | 2.831E+00  | 6.984E+00 | 5.256E+00           | 0.000E+00 | 0.539  |
| CS-136  | -1.784E+00 | 5.788E+00 | 9.382E+00           | 0.000E+00 | -0.190 |
| CS-137  | 8.393E-01  | 3.053E+00 | 5.060E+00           | 0.000E+00 | 0.166  |
| CE-139  | 1.363E+00  | 3.186E+00 | 5.272E+00           | 0.000E+00 | 0.258  |
| BA-140  | 3.707E+00  | 2.168E+01 | 3.605E+01           | 0.000E+00 | 0.103  |
| LA-140  | 1.014E+00  | 7.291E+00 | 1.220E+01           | 0.000E+00 | 0.083  |
| CE-141  | 1.734E+00  | 7.890E+00 | 1.110E+01           | 0.000E+00 | 0.156  |
| CE-144  | 5.491E+00  | 2.747E+01 | 3.875E+01           | 0.000E+00 | 0.142  |
| EU-152  | -1.022E+01 | 1.151E+01 | 1.519E+01           | 0.000E+00 | -0.673 |
| EU-154  | -2.930E+00 | 6.078E+00 | 9.941E+00           | 0.000E+00 | -0.295 |
| AC-228  | 2.270E-01  | 1.200E+01 | 1.905E+01           | 0.000E+00 | 0.012  |
| TH-228  | 2.589E+00  | 6.151E+00 | 1.006E+01           | 0.000E+00 | 0.257  |
| TH-232  | 2.260E-01  | 1.194E+01 | 1.897E+01           | 0.000E+00 | 0.012  |
| U-235   | 1.818E+01  | 2.749E+01 | 3.924E+01           | 0.000E+00 | 0.463  |
| U-238   | 5.363E+02  | 3.347E+02 | 6.019E+02           | 0.000E+00 | 0.891  |
| AM-241  | -2.845E+01 | 2.834E+01 | 4.080E+01           | 0.000E+00 | -0.697 |



| A, 10L28833-18 |        | , 06/09/2006 16:01, 05/26/2006 13:15, |            | 3.017E+00, WG L28833-18 E      |        |
|----------------|--------|---------------------------------------|------------|--------------------------------|--------|
| B, 10L28833-18 |        | , LIBD                                |            | , 06/07/2006 09:32, 103L083004 |        |
| C, K-40        | , YES, | 7.532E+00,                            | 5.332E+01, | 4.374E+01,,                    | 0.172  |
| C, RA-226      | , YES, | 6.465E+00,                            | 6.191E+01, | 1.183E+02,,                    | 0.055  |
| C, BE-7        | , NO,  | 2.328E+01,                            | 2.846E+01, | 4.887E+01,,                    | 0.476  |
| C, CR-51       | , NO,  | -4.573E+01,                           | 3.618E+01, | 5.698E+01,,                    | -0.803 |
| C, MN-54       | , NO,  | 6.623E-01,                            | 2.984E+00, | 4.988E+00,,                    | 0.133  |
| C, CO-57       | , NO,  | -1.671E+00,                           | 2.983E+00, | 4.872E+00,,                    | -0.343 |
| C, CO-58       | , NO,  | 1.443E-01,                            | 3.118E+00, | 5.169E+00,,                    | 0.028  |
| C, FE-59       | , NO,  | 2.312E+00,                            | 6.878E+00, | 1.166E+01,,                    | 0.198  |
| C, CO-60       | , NO,  | 2.030E+00,                            | 2.842E+00, | 4.949E+00,,                    | 0.410  |
| C, ZN-65       | , NO,  | 4.035E+00,                            | 6.155E+00, | 1.066E+01,,                    | 0.378  |
| C, SE-75       | , NO,  | -2.232E+00,                           | 4.292E+00, | 7.006E+00,,                    | -0.319 |
| C, SR-85       | , NO,  | 2.254E+01,                            | 4.014E+00, | 7.796E+00,,                    | 2.891  |
| C, Y-88        | , NO,  | -6.658E-01,                           | 3.564E+00, | 5.728E+00,,                    | -0.116 |
| C, NB-94       | , NO,  | -2.853E+00,                           | 2.871E+00, | 4.409E+00,,                    | -0.647 |
| C, NB-95       | , NO,  | 1.594E+00,                            | 3.140E+00, | 5.357E+00,,                    | 0.298  |
| C, ZR-95       | , NO,  | 2.815E+00,                            | 5.564E+00, | 9.500E+00,,                    | 0.296  |
| C, MO-99       | , NO,  | 5.787E+01,                            | 7.249E+02, | 1.210E+03,,                    | 0.048  |
| C, RU-103      | , NO,  | 8.651E-01,                            | 3.823E+00, | 6.391E+00,,                    | 0.135  |
| C, RU-106      | , NO,  | 2.201E+01,                            | 2.861E+01, | 4.754E+01,,                    | 0.463  |
| C, AG-110m     | , NO,  | 1.021E+00,                            | 2.806E+00, | 4.676E+00,,                    | 0.218  |
| C, SN-113      | , NO,  | -2.715E+00,                           | 4.142E+00, | 6.573E+00,,                    | -0.413 |
| C, SB-124      | , NO,  | -5.155E-01,                           | 7.978E+00, | 5.494E+00,,                    | -0.094 |
| C, SB-125      | , NO,  | 5.952E+00,                            | 8.581E+00, | 1.435E+01,,                    | 0.415  |
| C, TE-129M     | , NO,  | 1.905E+01,                            | 4.132E+01, | 7.004E+01,,                    | 0.272  |
| C, I-131       | , NO,  | -1.517E+00,                           | 1.013E+01, | 1.648E+01,,                    | -0.092 |
| C, BA-133      | , NO,  | 3.472E+00,                            | 5.025E+00, | 7.206E+00,,                    | 0.482  |
| C, CS-134      | , NO,  | 2.831E+00,                            | 6.984E+00, | 5.256E+00,,                    | 0.539  |
| C, CS-136      | , NO,  | -1.784E+00,                           | 5.788E+00, | 9.382E+00,,                    | -0.190 |
| C, CS-137      | , NO,  | 8.393E-01,                            | 3.053E+00, | 5.060E+00,,                    | 0.166  |
| C, CE-139      | , NO,  | 1.363E+00,                            | 3.186E+00, | 5.272E+00,,                    | 0.258  |
| C, BA-140      | , NO,  | 3.707E+00,                            | 2.168E+01, | 3.605E+01,,                    | 0.103  |
| C, LA-140      | , NO,  | 1.014E+00,                            | 7.291E+00, | 1.220E+01,,                    | 0.083  |
| C, CE-141      | , NO,  | 1.734E+00,                            | 7.890E+00, | 1.110E+01,,                    | 0.156  |
| C, CE-144      | , NO,  | 5.491E+00,                            | 2.747E+01, | 3.875E+01,,                    | 0.142  |
| C, EU-152      | , NO,  | -1.022E+01,                           | 1.151E+01, | 1.519E+01,,                    | -0.673 |
| C, EU-154      | , NO,  | -2.930E+00,                           | 6.078E+00, | 9.941E+00,,                    | -0.295 |
| C, AC-228      | , NO,  | 2.270E-01,                            | 1.200E+01, | 1.905E+01,,                    | 0.012  |
| C, TH-228      | , NO,  | 2.589E+00,                            | 6.151E+00, | 1.006E+01,,                    | 0.257  |
| C, TH-232      | , NO,  | 2.260E-01,                            | 1.194E+01, | 1.897E+01,,                    | 0.012  |
| C, U-235       | , NO,  | 1.818E+01,                            | 2.749E+01, | 3.924E+01,,                    | 0.463  |
| C, U-238       | , NO,  | 5.363E+02,                            | 3.347E+02, | 6.019E+02,,                    | 0.891  |
| C, AM-241      | , NO,  | -2.845E+01,                           | 2.834E+01, | 4.080E+01,,                    | -0.697 |

Sec. Review:   Analyst:   LIMS:   \_\_\_

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VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 9-JUN-2006 16:51:42.84  
 TBE04 P-40312B HpGe \*\*\*\*\* Aquisition Date/Time: 9-JUN-2006 12:57:07.37

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LIMS No., Customer Name, Client ID: WG L28833-19 EXELON/ZION

Sample ID       : 04L28833-19                               Smple Date: 26-MAY-2006 11:00:00.  
 Sample Type    : WG                                        Geometry     : 043L082004  
 Quantity       : 3.02650E+00 L                            BKGFILE     : 04BG060306MT  
 Start Channel  : 90           Energy Tol   : 1.00000     Real Time    : 0 03:54:32.42  
 End Channel    : 4090       Pk Srch Sens: 5.00000     Live time    : 0 03:54:30.05  
 MDA Constant  : 0.00       Library Used: LIBD

| Pk | It | Energy  | Area | Bkgnd | FWHM | Channel | %Eff     | Cts/Sec  | %Err | Fit      |
|----|----|---------|------|-------|------|---------|----------|----------|------|----------|
| 1  | 1  | 53.26   | 76   | 288   | 1.61 | 106.99  | 2.38E-01 | 5.37E-03 | 42.3 | 1.44E+00 |
| 2  | 1  | 66.01*  | 92   | 383   | 1.26 | 132.48  | 6.52E-01 | 6.53E-03 | 40.1 | 6.38E+00 |
| 3  | 1  | 139.38  | 212  | 380   | 2.54 | 279.21  | 2.04E+00 | 1.51E-02 | 19.7 | 3.04E+00 |
| 4  | 1  | 198.50* | 37   | 301   | 2.00 | 397.42  | 1.86E+00 | 2.62E-03 | 98.6 | 2.27E+00 |
| 5  | 1  | 295.39  | 47   | 185   | 2.07 | 591.18  | 1.45E+00 | 3.31E-03 | 57.1 | 1.82E+00 |
| 6  | 1  | 584.42  | 96   | 74    | 1.02 | 1169.07 | 8.76E-01 | 6.79E-03 | 19.8 | 3.48E+01 |
| 7  | 1  | 597.14  | 109  | 89    | 1.16 | 1194.52 | 8.62E-01 | 7.73E-03 | 18.1 | 6.79E+01 |
| 8  | 1  | 609.35* | 31   | 88    | 2.20 | 1218.93 | 8.48E-01 | 2.24E-03 | 75.4 | 8.22E-01 |
| 9  | 1  | 1461.69 | 77   | 40    | 2.94 | 2922.74 | 4.29E-01 | 5.48E-03 | 22.7 | 1.41E+00 |
| 10 | 1  | 1504.07 | 36   | 18    | 1.37 | 3007.44 | 4.20E-01 | 2.56E-03 | 25.8 | 1.97E+01 |

Flag: "\*" = Peak area was modified by background subtraction

## Nuclide Line Activity Report

Nuclide Type: natural

| Nuclide | Energy  | Area | %Abn   | %Eff      | Uncorrected<br>pCi/L | Decay Corr<br>pCi/L | 2-Sigma<br>%Error |
|---------|---------|------|--------|-----------|----------------------|---------------------|-------------------|
| K-40    | 1460.81 | 77   | 10.67* | 4.294E-01 | 1.068E+02            | 1.068E+02           | 45.33             |

Flag: "\*" = Keyline

## Summary of Nuclide Activity

Page : 2

Sample ID : 04L28833-19

Acquisition date : 9-JUN-2006 12:57:07

|   |    |        |
|---|----|--------|
| Total number of lines in spectrum             | 10 |        |
| Number of unidentified lines                  | 8  |        |
| Number of lines tentatively identified by NID | 2  | 20.00% |

Nuclide Type : natural

| Nuclide          | Hlife     | Decay | Uncorrected<br>pCi/L | Decay Corr<br>pCi/L | Decay Corr<br>2-Sigma Error | 2-Sigma<br>%Error | Flags |
|------------------|-----------|-------|----------------------|---------------------|-----------------------------|-------------------|-------|
| K-40             | 1.28E+09Y | 1.00  | 1.068E+02            | 1.068E+02           | 0.484E+02                   | 45.33             |       |
| Total Activity : |           |       | 1.068E+02            | 1.068E+02           |                             |                   |       |

Grand Total Activity : 1.068E+02 1.068E+02

Flags: "K" = Keyline not found  
 "E" = Manually edited

"M" = Manually accepted  
 "A" = Nuclide specific abn. limit

Unidentified Energy Lines  
 Sample ID : 04L28833-19

Page : 3  
 Acquisition date : 9-JUN-2006 12:57:07

| It | Energy  | Area | Bkgnd | FWHM | Channel | Left | Pw | Cts/Sec  | %Err | %Eff     | Flags |
|----|---------|------|-------|------|---------|------|----|----------|------|----------|-------|
| 1  | 53.26   | 76   | 288   | 1.61 | 106.99  | 102  | 9  | 5.37E-03 | 84.6 | 2.38E-01 |       |
| 1  | 66.01   | 92   | 383   | 1.26 | 132.48  | 130  | 8  | 6.53E-03 | 80.1 | 6.52E-01 |       |
| 1  | 139.38  | 212  | 380   | 2.54 | 279.21  | 273  | 12 | 1.51E-02 | 39.3 | 2.04E+00 |       |
| 1  | 198.50  | 37   | 301   | 2.00 | 397.42  | 392  | 10 | 2.62E-03 | **** | 1.86E+00 |       |
| 1  | 295.39  | 47   | 185   | 2.07 | 591.18  | 585  | 10 | 3.31E-03 | **** | 1.45E+00 |       |
| 1  | 584.42  | 96   | 74    | 1.02 | 1169.07 | 1163 | 12 | 6.79E-03 | 39.7 | 8.76E-01 |       |
| 1  | 597.14  | 109  | 89    | 1.16 | 1194.52 | 1189 | 12 | 7.73E-03 | 36.2 | 8.62E-01 |       |
| 1  | 609.35  | 31   | 88    | 2.20 | 1218.93 | 1212 | 14 | 2.24E-03 | **** | 8.48E-01 |       |
| 1  | 1504.07 | 36   | 18    | 1.37 | 3007.44 | 3000 | 12 | 2.56E-03 | 51.6 | 4.20E-01 | T     |

Flags: "T" = Tentatively associated

#### Summary of Nuclide Activity

|   |                     |
|---|---------------------|
| Total number of lines in spectrum             | 10                  |
| Number of unidentified lines                  | 8                   |
| Number of lines tentatively identified by NID | 2            20.00% |

Nuclide Type : natural

| Nuclide          | Hlife     | Decay | Wtd Mean<br>Uncorrected<br>pCi/L | Wtd Mean<br>Decay Corr<br>pCi/L | Decay Corr<br>2-Sigma Error | 2-Sigma<br>%Error | Flags |
|------------------|-----------|-------|----------------------------------|---------------------------------|-----------------------------|-------------------|-------|
| K-40             | 1.28E+09Y | 1.00  | 1.068E+02                        | 1.068E+02                       | 0.484E+02                   | 45.33             |       |
| Total Activity : |           |       | 1.068E+02                        | 1.068E+02                       |                             |                   |       |

Grand Total Activity : 1.068E+02    1.068E+02

Flags: "K" = Keyline not found            "M" = Manually accepted  
 "E" = Manually edited                    "A" = Nuclide specific abn. limit

#### Interference Report

No interference correction performed

#### Combined Activity-MDA Report

---- Identified Nuclides ----

| Nuclide | Activity<br>(pCi/L) | Act error | MDA<br>(pCi/L) | MDA error | Act/MDA |
|---------|---------------------|-----------|----------------|-----------|---------|
| K-40    | 1.068E+02           | 4.841E+01 | 4.700E+01      | 0.000E+00 | 2.272   |

---- Non-Identified Nuclides ----

| Nuclide | Key-Line<br>Activity<br>(pCi/L) | K.L.<br>Ided | Act error | MDA<br>(pCi/L)      | MDA error | Act/MDA |
|---------|---------------------------------|--------------|-----------|---------------------|-----------|---------|
| BE-7    | 1.160E+01                       |              | 2.575E+01 | 4.360E+01           | 0.000E+00 | 0.266   |
| NA-24   | -9.450E+00                      |              | 9.874E+00 | Half-Life too short |           |         |

|         |            |           |           |           |        |
|---------|------------|-----------|-----------|-----------|--------|
| CR-51   | -3.720E+01 | 3.250E+01 | 5.092E+01 | 0.000E+00 | -0.731 |
| MN-54   | -3.822E+00 | 2.709E+00 | 3.926E+00 | 0.000E+00 | -0.974 |
| CO-57   | -1.996E-01 | 2.482E+00 | 4.146E+00 | 0.000E+00 | -0.048 |
| CO-58   | -3.183E-01 | 3.106E+00 | 5.042E+00 | 0.000E+00 | -0.063 |
| FE-59   | -9.613E-01 | 6.421E+00 | 1.037E+01 | 0.000E+00 | -0.093 |
| CO-60   | 3.259E+00  | 3.444E+00 | 5.958E+00 | 0.000E+00 | 0.547  |
| ZN-65   | 2.344E+00  | 6.120E+00 | 1.031E+01 | 0.000E+00 | 0.227  |
| SE-75   | 6.755E-01  | 3.700E+00 | 6.199E+00 | 0.000E+00 | 0.109  |
| SR-85   | 1.712E+01  | 3.759E+00 | 7.245E+00 | 0.000E+00 | 2.363  |
| Y-88    | 1.362E+00  | 3.481E+00 | 5.935E+00 | 0.000E+00 | 0.229  |
| NB-94   | -1.142E-01 | 2.663E+00 | 4.388E+00 | 0.000E+00 | -0.026 |
| NB-95   | 1.677E+00  | 3.156E+00 | 5.363E+00 | 0.000E+00 | 0.313  |
| ZR-95   | -2.554E+00 | 5.355E+00 | 8.504E+00 | 0.000E+00 | -0.300 |
| MO-99   | 5.371E+02  | 7.273E+02 | 1.254E+03 | 0.000E+00 | 0.428  |
| RU-103  | 2.155E+00  | 3.592E+00 | 6.100E+00 | 0.000E+00 | 0.353  |
| RU-106  | -4.685E+00 | 2.602E+01 | 4.110E+01 | 0.000E+00 | -0.114 |
| AG-110m | 4.746E-01  | 2.852E+00 | 4.782E+00 | 0.000E+00 | 0.099  |
| SN-113  | 2.394E+00  | 3.864E+00 | 6.469E+00 | 0.000E+00 | 0.370  |
| SB-124  | 4.083E+00  | 6.218E+00 | 5.221E+00 | 0.000E+00 | 0.782  |
| SB-125  | -2.216E+00 | 7.559E+00 | 1.240E+01 | 0.000E+00 | -0.179 |
| TE-129M | -9.875E+00 | 4.168E+01 | 6.827E+01 | 0.000E+00 | -0.145 |
| I-131   | -5.399E+00 | 9.042E+00 | 1.433E+01 | 0.000E+00 | -0.377 |
| BA-133  | 5.229E+00  | 3.995E+00 | 6.889E+00 | 0.000E+00 | 0.759  |
| CS-134  | 5.371E+00  | 5.437E+00 | 4.846E+00 | 0.000E+00 | 1.108  |
| CS-136  | -3.768E+00 | 5.746E+00 | 8.943E+00 | 0.000E+00 | -0.421 |
| CS-137  | -1.940E+00 | 3.145E+00 | 5.030E+00 | 0.000E+00 | -0.386 |
| CE-139  | 1.472E-01  | 2.730E+00 | 4.512E+00 | 0.000E+00 | 0.033  |
| BA-140  | 6.186E+00  | 2.005E+01 | 3.348E+01 | 0.000E+00 | 0.185  |
| LA-140  | -1.485E+00 | 7.365E+00 | 1.195E+01 | 0.000E+00 | -0.124 |
| CE-141  | 1.822E+00  | 6.593E+00 | 9.479E+00 | 0.000E+00 | 0.192  |
| CE-144  | 2.244E-01  | 2.218E+01 | 3.168E+01 | 0.000E+00 | 0.007  |
| EU-152  | -1.439E+01 | 8.897E+00 | 1.355E+01 | 0.000E+00 | -1.062 |
| EU-154  | -1.645E+00 | 5.086E+00 | 8.432E+00 | 0.000E+00 | -0.195 |
| RA-226  | -3.532E+00 | 6.749E+01 | 1.075E+02 | 0.000E+00 | -0.033 |
| AC-228  | -6.101E+00 | 1.135E+01 | 1.786E+01 | 0.000E+00 | -0.342 |
| TH-228  | 9.238E+00  | 5.550E+00 | 9.464E+00 | 0.000E+00 | 0.976  |
| TH-232  | -6.073E+00 | 1.130E+01 | 1.778E+01 | 0.000E+00 | -0.342 |
| U-235   | -1.272E+00 | 2.296E+01 | 3.255E+01 | 0.000E+00 | -0.039 |
| U-238   | 2.169E+02  | 3.261E+02 | 5.627E+02 | 0.000E+00 | 0.385  |
| AM-241  | -3.622E+01 | 3.102E+01 | 4.190E+01 | 0.000E+00 | -0.864 |

|               |             |                  |            |              |             |
|---------------|-------------|------------------|------------|--------------|-------------|
| A,04L28833-19 | ,06/09/2006 | 16:51,05/26/2006 | 11:00,     | 3.026E+00,WG | L28833-19 E |
| B,04L28833-19 | ,LIBD       | ,06/02/2006      | 09:04,     | 043L082004   |             |
| C,K-40        | ,YES,       | 1.068E+02,       | 4.841E+01, | 4.700E+01,,  | 2.272       |
| C,BE-7        | ,NO,        | 1.160E+01,       | 2.575E+01, | 4.360E+01,,  | 0.266       |
| C,CR-51       | ,NO,        | -3.720E+01,      | 3.250E+01, | 5.092E+01,,  | -0.731      |
| C,MN-54       | ,NO,        | -3.822E+00,      | 2.709E+00, | 3.926E+00,,  | -0.974      |
| C,CO-57       | ,NO,        | -1.996E-01,      | 2.482E+00, | 4.146E+00,,  | -0.048      |
| C,CO-58       | ,NO,        | -3.183E-01,      | 3.106E+00, | 5.042E+00,,  | -0.063      |
| C,FE-59       | ,NO,        | -9.613E-01,      | 6.421E+00, | 1.037E+01,,  | -0.093      |
| C,CO-60       | ,NO,        | 3.259E+00,       | 3.444E+00, | 5.958E+00,,  | 0.547       |
| C,ZN-65       | ,NO,        | 2.344E+00,       | 6.120E+00, | 1.031E+01,,  | 0.227       |
| C,SE-75       | ,NO,        | 6.755E-01,       | 3.700E+00, | 6.199E+00,,  | 0.109       |
| C,SR-85       | ,NO,        | 1.712E+01,       | 3.759E+00, | 7.245E+00,,  | 2.363       |
| C,Y-88        | ,NO,        | 1.362E+00,       | 3.481E+00, | 5.935E+00,,  | 0.229       |
| C,NB-94       | ,NO,        | -1.142E-01,      | 2.663E+00, | 4.388E+00,,  | -0.026      |
| C,NB-95       | ,NO,        | 1.677E+00,       | 3.156E+00, | 5.363E+00,,  | 0.313       |
| C,ZR-95       | ,NO,        | -2.554E+00,      | 5.355E+00, | 8.504E+00,,  | -0.300      |
| C,MO-99       | ,NO,        | 5.371E+02,       | 7.273E+02, | 1.254E+03,,  | 0.428       |
| C,RU-103      | ,NO,        | 2.155E+00,       | 3.592E+00, | 6.100E+00,,  | 0.353       |
| C,RU-106      | ,NO,        | -4.685E+00,      | 2.602E+01, | 4.110E+01,,  | -0.114      |
| C,AG-110m     | ,NO,        | 4.746E-01,       | 2.852E+00, | 4.782E+00,,  | 0.099       |
| C,SN-113      | ,NO,        | 2.394E+00,       | 3.864E+00, | 6.469E+00,,  | 0.370       |
| C,SB-124      | ,NO,        | 4.083E+00,       | 6.218E+00, | 5.221E+00,,  | 0.782       |
| C,SB-125      | ,NO,        | -2.216E+00,      | 7.559E+00, | 1.240E+01,,  | -0.179      |
| C,TE-129M     | ,NO,        | -9.875E+00,      | 4.168E+01, | 6.827E+01,,  | -0.145      |
| C,I-131       | ,NO,        | -5.399E+00,      | 9.042E+00, | 1.433E+01,,  | -0.377      |
| C,BA-133      | ,NO,        | 5.229E+00,       | 3.995E+00, | 6.889E+00,,  | 0.759       |
| C,CS-134      | ,NO,        | 5.371E+00,       | 5.437E+00, | 4.846E+00,,  | 1.108       |
| C,CS-136      | ,NO,        | -3.768E+00,      | 5.746E+00, | 8.943E+00,,  | -0.421      |
| C,CS-137      | ,NO,        | -1.940E+00,      | 3.145E+00, | 5.030E+00,,  | -0.386      |
| C,CE-139      | ,NO,        | 1.472E-01,       | 2.730E+00, | 4.512E+00,,  | 0.033       |
| C,BA-140      | ,NO,        | 6.186E+00,       | 2.005E+01, | 3.348E+01,,  | 0.185       |
| C,LA-140      | ,NO,        | -1.485E+00,      | 7.365E+00, | 1.195E+01,,  | -0.124      |
| C,CE-141      | ,NO,        | 1.822E+00,       | 6.593E+00, | 9.479E+00,,  | 0.192       |
| C,CE-144      | ,NO,        | 2.244E-01,       | 2.218E+01, | 3.168E+01,,  | 0.007       |
| C,EU-152      | ,NO,        | -1.439E+01,      | 8.897E+00, | 1.355E+01,,  | -1.062      |
| C,EU-154      | ,NO,        | -1.645E+00,      | 5.086E+00, | 8.432E+00,,  | -0.195      |
| C,RA-226      | ,NO,        | -3.532E+00,      | 6.749E+01, | 1.075E+02,,  | -0.033      |
| C,AC-228      | ,NO,        | -6.101E+00,      | 1.135E+01, | 1.786E+01,,  | -0.342      |
| C,TH-228      | ,NO,        | 9.238E+00,       | 5.550E+00, | 9.464E+00,,  | 0.976       |
| C,TH-232      | ,NO,        | -6.073E+00,      | 1.130E+01, | 1.778E+01,,  | -0.342      |
| C,U-235       | ,NO,        | -1.272E+00,      | 2.296E+01, | 3.255E+01,,  | -0.039      |
| C,U-238       | ,NO,        | 2.169E+02,       | 3.261E+02, | 5.627E+02,,  | 0.385       |
| C,AM-241      | ,NO,        | -3.622E+01,      | 3.102E+01, | 4.190E+01,,  | -0.864      |

Sec. Review: Analyst: LIMS: \_\_\_\_\_

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VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 9-JUN-2006 16:51:56.96  
 TBE07 P-10768B HpGe \*\*\*\*\* Aquisition Date/Time: 9-JUN-2006 12:51:13.46

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LIMS No., Customer Name, Client ID: WGL28833-20 EXELON/ZION

Sample ID : 07L28833-20 Smple Date: 26-MAY-2006 16:00:00.  
 Sample Type : WG Geometry : 073L082504  
 Quantity : 3.00410E+00 L BKGFILE : 07BG060306MT  
 Start Channel : 40 Energy Tol : 1.00000 Real Time : 0 04:00:35.31  
 End Channel : 4090 Pk Srch Sens: 5.00000 Live time : 0 04:00:32.54  
 MDA Constant : 0.00 Library Used: LIBD

| Pk | It | Energy  | Area | Bkgnd | FWHM | Channel | %Eff     | Cts/Sec  | %Err | Fit      |
|----|----|---------|------|-------|------|---------|----------|----------|------|----------|
| 1  | 5  | 66.48*  | 135  | 341   | 1.28 | 133.53  | 8.12E-01 | 9.36E-03 | 26.5 | 1.57E+00 |
| 2  | 1  | 139.67* | 125  | 386   | 1.28 | 280.02  | 2.36E+00 | 8.68E-03 | 31.4 | 1.96E+00 |
| 3  | 1  | 198.48* | 105  | 356   | 1.57 | 397.73  | 2.24E+00 | 7.29E-03 | 38.8 | 4.77E-01 |
| 4  | 1  | 499.83  | 46   | 66    | 1.47 | 1000.76 | 1.25E+00 | 3.16E-03 | 32.8 | 1.79E+00 |
| 5  | 1  | 596.12  | 84   | 108   | 1.67 | 1193.40 | 1.10E+00 | 5.85E-03 | 27.8 | 8.09E-01 |

Flag: "\*" = Peak area was modified by background subtraction

## Nuclide Line Activity Report

Flag: "\*" = Keyline

## Summary of Nuclide Activity

Page : 2

Sample ID : 07L28833-20

Acquisition date : 9-JUN-2006 12:51:13

|   |   |       |
|---|---|-------|
| Total number of lines in spectrum             | 5 |       |
| Number of unidentified lines                  | 5 |       |
| Number of lines tentatively identified by NID | 0 | 0.00% |

\*\*\*\* There are no nuclides meeting summary criteria \*\*\*\*

Flags: "K" = Keyline not found  
"E" = Manually edited

"M" = Manually accepted  
"A" = Nuclide specific abn. limit



Unidentified Energy Lines  
Sample ID : 07L28833-20

Page : 3  
Acquisition date : 9-JUN-2006 12:51:13

| It | Energy | Area | Bkgnd | FWHM | Channel | Left | Pw | Cts/Sec  | %Err | %Eff     | Flags |
|----|--------|------|-------|------|---------|------|----|----------|------|----------|-------|
| 5  | 66.48  | 135  | 341   | 1.28 | 133.53  | 122  | 16 | 9.36E-03 | 52.9 | 8.12E-01 |       |
| 1  | 139.67 | 125  | 386   | 1.28 | 280.02  | 276  | 9  | 8.68E-03 | 62.7 | 2.36E+00 |       |
| 1  | 198.48 | 105  | 356   | 1.57 | 397.73  | 393  | 11 | 7.29E-03 | 77.6 | 2.24E+00 |       |
| 1  | 499.83 | 46   | 66    | 1.47 | 1000.76 | 998  | 7  | 3.16E-03 | 65.5 | 1.25E+00 |       |
| 1  | 596.12 | 84   | 108   | 1.67 | 1193.40 | 1187 | 13 | 5.85E-03 | 55.5 | 1.10E+00 |       |

Flags: "T" = Tentatively associated

#### Summary of Nuclide Activity

|   |   |       |
|---|---|-------|
| Total number of lines in spectrum             | 5 |       |
| Number of unidentified lines                  | 5 |       |
| Number of lines tentatively identified by NID | 0 | 0.00% |

\*\*\*\* There are no nuclides meeting summary criteria \*\*\*\*

Flags: "K" = Keyline not found                    "M" = Manually accepted  
      "E" = Manually edited                     "A" = Nuclide specific abn. limit

#### Interference Report

No interference correction performed

#### Combined Activity-MDA Report

---- Non-Identified Nuclides ----

| Nuclide | Key-Line<br>Activity<br>(pCi/L) | K.L.<br>Ided | Act error | MDA<br>(pCi/L)      | MDA error | Act/MDA |
|---------|---------------------------------|--------------|-----------|---------------------|-----------|---------|
| BE-7    | 1.504E+00                       |              | 2.491E+01 | 4.067E+01           | 0.000E+00 | 0.037   |
| NA-24   | 9.916E+00                       |              | 6.542E+00 | Half-Life too short |           |         |
| K-40    | 4.822E+00                       |              | 3.458E+01 | 6.116E+01           | 0.000E+00 | 0.079   |
| CR-51   | -3.936E+01                      |              | 2.845E+01 | 4.502E+01           | 0.000E+00 | -0.874  |
| MN-54   | 1.784E+00                       |              | 2.518E+00 | 4.328E+00           | 0.000E+00 | 0.412   |
| CO-57   | -8.443E-01                      |              | 2.393E+00 | 3.872E+00           | 0.000E+00 | -0.218  |
| CO-58   | -7.301E-04                      |              | 2.614E+00 | 4.327E+00           | 0.000E+00 | 0.000   |
| FE-59   | 1.200E+00                       |              | 5.533E+00 | 9.299E+00           | 0.000E+00 | 0.129   |
| CO-60   | -5.849E-01                      |              | 2.522E+00 | 4.039E+00           | 0.000E+00 | -0.145  |
| ZN-65   | -1.335E+00                      |              | 5.277E+00 | 8.583E+00           | 0.000E+00 | -0.156  |
| SE-75   | -3.694E+00                      |              | 3.545E+00 | 5.580E+00           | 0.000E+00 | -0.662  |
| SR-85   | 1.910E+01                       |              | 3.320E+00 | 6.518E+00           | 0.000E+00 | 2.930   |
| Y-88    | -1.462E+00                      |              | 2.865E+00 | 4.512E+00           | 0.000E+00 | -0.324  |
| NB-94   | -6.452E-01                      |              | 2.488E+00 | 4.005E+00           | 0.000E+00 | -0.161  |
| NB-95   | 1.303E+00                       |              | 2.770E+00 | 4.720E+00           | 0.000E+00 | 0.276   |
| ZR-95   | -4.256E+00                      |              | 4.807E+00 | 7.368E+00           | 0.000E+00 | -0.578  |
| MO-99   | -5.494E+02                      |              | 6.306E+02 | 9.730E+02           | 0.000E+00 | -0.565  |
| RU-103  | 2.063E+00                       |              | 3.200E+00 | 5.352E+00           | 0.000E+00 | 0.386   |
| RU-106  | -9.765E+00                      |              | 2.394E+01 | 3.856E+01           | 0.000E+00 | -0.253  |
| AG-110m | 6.319E-01                       |              | 2.478E+00 | 4.117E+00           | 0.000E+00 | 0.153   |
| SN-113  | -6.138E-01                      |              | 3.367E+00 | 5.503E+00           | 0.000E+00 | -0.112  |
| SB-124  | -8.298E+00                      |              | 3.905E+00 | 4.644E+00           | 0.000E+00 | -1.787  |
| SB-125  | -5.714E+00                      |              | 7.191E+00 | 1.137E+01           | 0.000E+00 | -0.502  |

|         |            |           |           |           |        |
|---------|------------|-----------|-----------|-----------|--------|
| TE-129M | -1.506E+01 | 3.546E+01 | 5.670E+01 | 0.000E+00 | -0.266 |
| I-131   | -3.223E+00 | 7.792E+00 | 1.267E+01 | 0.000E+00 | -0.254 |
| BA-133  | 2.105E+00  | 3.446E+00 | 5.832E+00 | 0.000E+00 | 0.361  |
| CS-134  | -1.154E+00 | 2.821E+00 | 4.569E+00 | 0.000E+00 | -0.253 |
| CS-136  | -1.290E+00 | 4.701E+00 | 7.645E+00 | 0.000E+00 | -0.169 |
| CS-137  | -8.162E-01 | 2.656E+00 | 4.278E+00 | 0.000E+00 | -0.191 |
| CE-139  | 5.681E-01  | 2.413E+00 | 4.052E+00 | 0.000E+00 | 0.140  |
| BA-140  | 1.177E+01  | 1.754E+01 | 3.006E+01 | 0.000E+00 | 0.392  |
| LA-140  | -3.672E+00 | 6.173E+00 | 9.634E+00 | 0.000E+00 | -0.381 |
| CE-141  | 1.073E-01  | 6.174E+00 | 8.521E+00 | 0.000E+00 | 0.013  |
| CE-144  | 3.818E+00  | 2.197E+01 | 3.066E+01 | 0.000E+00 | 0.125  |
| EU-152  | -1.107E+01 | 8.139E+00 | 1.285E+01 | 0.000E+00 | -0.861 |
| EU-154  | -8.965E-01 | 4.879E+00 | 7.930E+00 | 0.000E+00 | -0.113 |
| RA-226  | -7.153E+00 | 6.253E+01 | 1.029E+02 | 0.000E+00 | -0.070 |
| AC-228  | 1.742E+00  | 9.904E+00 | 1.604E+01 | 0.000E+00 | 0.109  |
| TH-228  | 1.512E+00  | 4.975E+00 | 8.206E+00 | 0.000E+00 | 0.184  |
| TH-232  | 1.734E+00  | 9.859E+00 | 1.597E+01 | 0.000E+00 | 0.109  |
| U-235   | 7.527E+00  | 2.193E+01 | 3.070E+01 | 0.000E+00 | 0.245  |
| U-238   | 3.803E+02  | 2.717E+02 | 4.834E+02 | 0.000E+00 | 0.787  |
| AM-241  | 5.418E+00  | 2.542E+01 | 3.532E+01 | 0.000E+00 | 0.153  |

|               |             |                  |                  |                       |        |
|---------------|-------------|------------------|------------------|-----------------------|--------|
| A,07L28833-20 | ,06/09/2006 | 16:51,05/26/2006 | 16:00,           | 3.004E+00,WGL28833-20 | EX     |
| B,07L28833-20 | ,LIBD       | ,06/07/2006      | 09:32,073L082504 |                       |        |
| C,BE-7        | ,NO ,       | 1.504E+00,       | 2.491E+01,       | 4.067E+01,,           | 0.037  |
| C,K-40        | ,NO ,       | 4.822E+00,       | 3.458E+01,       | 6.116E+01,,           | 0.079  |
| C,CR-51       | ,NO ,       | -3.936E+01,      | 2.845E+01,       | 4.502E+01,,           | -0.874 |
| C,MN-54       | ,NO ,       | 1.784E+00,       | 2.518E+00,       | 4.328E+00,,           | 0.412  |
| C,CO-57       | ,NO ,       | -8.443E-01,      | 2.393E+00,       | 3.872E+00,,           | -0.218 |
| C,CO-58       | ,NO ,       | -7.301E-04,      | 2.614E+00,       | 4.327E+00,,           | 0.000  |
| C,FE-59       | ,NO ,       | 1.200E+00,       | 5.533E+00,       | 9.299E+00,,           | 0.129  |
| C,CO-60       | ,NO ,       | -5.849E-01,      | 2.522E+00,       | 4.039E+00,,           | -0.145 |
| C,ZN-65       | ,NO ,       | -1.335E+00,      | 5.277E+00,       | 8.583E+00,,           | -0.156 |
| C,SE-75       | ,NO ,       | -3.694E+00,      | 3.545E+00,       | 5.580E+00,,           | -0.662 |
| C,SR-85       | ,NO ,       | 1.910E+01,       | 3.320E+00,       | 6.518E+00,,           | 2.930  |
| C,Y-88        | ,NO ,       | -1.462E+00,      | 2.865E+00,       | 4.512E+00,,           | -0.324 |
| C,NB-94       | ,NO ,       | -6.452E-01,      | 2.488E+00,       | 4.005E+00,,           | -0.161 |
| C,NB-95       | ,NO ,       | 1.303E+00,       | 2.770E+00,       | 4.720E+00,,           | 0.276  |
| C,ZR-95       | ,NO ,       | -4.256E+00,      | 4.807E+00,       | 7.368E+00,,           | -0.578 |
| C,MO-99       | ,NO ,       | -5.494E+02,      | 6.306E+02,       | 9.730E+02,,           | -0.565 |
| C,RU-103      | ,NO ,       | 2.063E+00,       | 3.200E+00,       | 5.352E+00,,           | 0.386  |
| C,RU-106      | ,NO ,       | -9.765E+00,      | 2.394E+01,       | 3.856E+01,,           | -0.253 |
| C,AG-110m     | ,NO ,       | 6.319E-01,       | 2.478E+00,       | 4.117E+00,,           | 0.153  |
| C,SN-113      | ,NO ,       | -6.138E-01,      | 3.367E+00,       | 5.503E+00,,           | -0.112 |
| C,SB-124      | ,NO ,       | -8.298E+00,      | 3.905E+00,       | 4.644E+00,,           | -1.787 |
| C,SB-125      | ,NO ,       | -5.714E+00,      | 7.191E+00,       | 1.137E+01,,           | -0.502 |
| C,TE-129M     | ,NO ,       | -1.506E+01,      | 3.546E+01,       | 5.670E+01,,           | -0.266 |
| C,I-131       | ,NO ,       | -3.223E+00,      | 7.792E+00,       | 1.267E+01,,           | -0.254 |
| C,BA-133      | ,NO ,       | 2.105E+00,       | 3.446E+00,       | 5.832E+00,,           | 0.361  |
| C,CS-134      | ,NO ,       | -1.154E+00,      | 2.821E+00,       | 4.569E+00,,           | -0.253 |
| C,CS-136      | ,NO ,       | -1.290E+00,      | 4.701E+00,       | 7.645E+00,,           | -0.169 |
| C,CS-137      | ,NO ,       | -8.162E-01,      | 2.656E+00,       | 4.278E+00,,           | -0.191 |
| C,CE-139      | ,NO ,       | 5.681E-01,       | 2.413E+00,       | 4.052E+00,,           | 0.140  |
| C,BA-140      | ,NO ,       | 1.177E+01,       | 1.754E+01,       | 3.006E+01,,           | 0.392  |
| C,LA-140      | ,NO ,       | -3.672E+00,      | 6.173E+00,       | 9.634E+00,,           | -0.381 |
| C,CE-141      | ,NO ,       | 1.073E-01,       | 6.174E+00,       | 8.521E+00,,           | 0.013  |
| C,CE-144      | ,NO ,       | 3.818E+00,       | 2.197E+01,       | 3.066E+01,,           | 0.125  |
| C,EU-152      | ,NO ,       | -1.107E+01,      | 8.139E+00,       | 1.285E+01,,           | -0.861 |
| C,EU-154      | ,NO ,       | -8.965E-01,      | 4.879E+00,       | 7.930E+00,,           | -0.113 |
| C,RA-226      | ,NO ,       | -7.153E+00,      | 6.253E+01,       | 1.029E+02,,           | -0.070 |
| C,AC-228      | ,NO ,       | 1.742E+00,       | 9.904E+00,       | 1.604E+01,,           | 0.109  |
| C,TH-228      | ,NO ,       | 1.512E+00,       | 4.975E+00,       | 8.206E+00,,           | 0.184  |
| C,TH-232      | ,NO ,       | 1.734E+00,       | 9.859E+00,       | 1.597E+01,,           | 0.109  |
| C,U-235       | ,NO ,       | 7.527E+00,       | 2.193E+01,       | 3.070E+01,,           | 0.245  |
| C,U-238       | ,NO ,       | 3.803E+02,       | 2.717E+02,       | 4.834E+02,,           | 0.787  |
| C,AM-241      | ,NO ,       | 5.418E+00,       | 2.542E+01,       | 3.532E+01,,           | 0.153  |

Sec. Review: Analyst: LIMS: \_\_\_\_\_

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VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 9-JUN-2006 16:58:12.75  
 TBE23 03017322 HpGe \*\*\*\*\* Aquisition Date/Time: 9-JUN-2006 13:33:50.55

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LIMS No., Customer Name, Client ID: WG4096-3 WG EXELON/ZION

Sample ID : 23WG4096-3 Smple Date: 26-MAY-2006 11:02:00.  
 Sample Type : WG Geometry : 233L082404  
 Quantity : 3.00250E+00 L BKGFILE : 23BG060306MT  
 Start Channel : 50 Energy Tol : 1.50000 Real Time : 0 03:24:06.25  
 End Channel : 4090 Pk Srch Sens: 5.00000 Live time : 0 03:23:57.84  
 MDA Constant : 0.00 Library Used: LIBD

| Pk | It | Energy  | Area | Bkgnd | FWHM | Channel | %Eff     | Cts/Sec  | %Err  | Fit      |
|----|----|---------|------|-------|------|---------|----------|----------|-------|----------|
| 1  | 6  | 33.81*  | 67   | 10    | 1.24 | 67.94   | 8.28E-02 | 5.45E-03 | 24.4  | 2.59E+00 |
| 2  | 6  | 35.72*  | 44   | 96    | 2.13 | 71.75   | 1.14E-01 | 3.59E-03 | 76.0  |          |
| 3  | 6  | 38.36*  | 48   | 174   | 1.93 | 77.03   | 1.67E-01 | 3.94E-03 | 66.7  |          |
| 4  | 6  | 40.90*  | 7    | 192   | 1.78 | 82.11   | 2.29E-01 | 5.32E-04 | 409.9 |          |
| 5  | 2  | 63.10*  | 79   | 385   | 1.51 | 126.48  | 1.03E+00 | 6.49E-03 | 50.3  | 1.68E+00 |
| 6  | 2  | 66.17   | 94   | 402   | 1.51 | 132.61  | 1.15E+00 | 7.70E-03 | 39.9  |          |
| 7  | 0  | 92.57*  | 32   | 539   | 1.08 | 185.38  | 1.94E+00 | 2.59E-03 | 150.7 |          |
| 8  | 0  | 185.72* | 76   | 354   | 1.21 | 371.55  | 2.17E+00 | 6.21E-03 | 53.3  |          |
| 9  | 0  | 198.06* | 70   | 303   | 1.02 | 396.22  | 2.11E+00 | 5.71E-03 | 47.7  |          |
| 10 | 0  | 595.32  | 43   | 108   | 1.79 | 1190.33 | 9.57E-01 | 3.52E-03 | 53.5  |          |
| 11 | 0  | 608.94* | 22   | 71    | 1.68 | 1217.55 | 9.41E-01 | 1.82E-03 | 88.6  |          |

Flag: "\*" = Peak area was modified by background subtraction

## Nuclide Line Activity Report

Nuclide Type: natural

| Nuclide | Energy | Area | %Abn  | %Eff      | Uncorrected<br>pCi/L | Decay Corr<br>pCi/L | 2-Sigma<br>%Error |
|---------|--------|------|-------|-----------|----------------------|---------------------|-------------------|
| RA-226  | 186.21 | 76   | 3.28* | 2.174E+00 | 7.839E+01            | 7.839E+01           | 106.58            |

Flag: "\*" = Keyline

Summary of Nuclide Activity  
 Sample ID : 23WG4096-3

Page : 2  
 Acquisition date : 9-JUN-2006 13:33:50

|   |    |       |
|---|----|-------|
| Total number of lines in spectrum             | 11 |       |
| Number of unidentified lines                  | 10 |       |
| Number of lines tentatively identified by NID | 1  | 9.09% |

Nuclide Type : natural

| Nuclide | Hlife    | Decay            | Uncorrected<br>pCi/L | Decay Corr<br>pCi/L | Decay Corr<br>2-Sigma Error | 2-Sigma<br>%Error | Flags |
|---------|----------|------------------|----------------------|---------------------|-----------------------------|-------------------|-------|
| RA-226  | 1600.00Y | 1.00             | 7.839E+01            | 7.839E+01           | 8.355E+01                   | 106.58            |       |
|         |          |                  | -----                | -----               |                             |                   |       |
|         |          | Total Activity : | 7.839E+01            | 7.839E+01           |                             |                   |       |

Grand Total Activity : 7.839E+01 7.839E+01

Flags: "K" = Keyline not found  
 "E" = Manually edited

"M" = Manually accepted  
 "A" = Nuclide specific abn. limit

Unidentified Energy Lines  
Sample ID : 23WG4096-3

Page : 3  
Acquisition date : 9-JUN-2006 13:33:50

| It | Energy | Area | Bkgnd | FWHM | Channel | Left | Pw | Cts/Sec  | %Err | %Eff     | Flags |
|----|--------|------|-------|------|---------|------|----|----------|------|----------|-------|
| 6  | 33.81  | 67   | 10    | 1.24 | 67.94   | 65   | 22 | 5.45E-03 | 48.7 | 8.28E-02 |       |
| 6  | 35.72  | 44   | 96    | 2.13 | 71.75   | 65   | 22 | 3.59E-03 | **** | 1.14E-01 |       |
| 6  | 38.36  | 48   | 174   | 1.93 | 77.03   | 65   | 22 | 3.94E-03 | **** | 1.67E-01 |       |
| 6  | 40.90  | 7    | 192   | 1.78 | 82.11   | 65   | 22 | 5.32E-04 | **** | 2.29E-01 |       |
| 2  | 63.10  | 79   | 385   | 1.51 | 126.48  | 121  | 17 | 6.49E-03 | **** | 1.03E+00 |       |
| 2  | 66.17  | 94   | 402   | 1.51 | 132.61  | 121  | 17 | 7.70E-03 | 79.8 | 1.15E+00 |       |
| 0  | 92.57  | 32   | 539   | 1.08 | 185.38  | 181  | 10 | 2.59E-03 | **** | 1.94E+00 |       |
| 0  | 198.06 | 70   | 303   | 1.02 | 396.22  | 392  | 8  | 5.71E-03 | 95.4 | 2.11E+00 |       |
| 0  | 595.32 | 43   | 108   | 1.79 | 1190.33 | 1182 | 14 | 3.52E-03 | **** | 9.57E-01 |       |
| 0  | 608.94 | 22   | 71    | 1.68 | 1217.55 | 1213 | 10 | 1.82E-03 | **** | 9.41E-01 |       |

Flags: "T" = Tentatively associated

#### Summary of Nuclide Activity

|   |                              |
|---|------------------------------|
| Total number of lines in spectrum             | 11                           |
| Number of unidentified lines                  | 10                           |
| Number of lines tentatively identified by NID | 1                      9.09% |

Nuclide Type : natural

| Nuclide          | Hlife    | Decay | Wtd Mean<br>Uncorrected<br>pCi/L | Wtd Mean<br>Decay Corr<br>pCi/L | Decay Corr<br>2-Sigma Error | 2-Sigma<br>%Error | Flags |
|------------------|----------|-------|----------------------------------|---------------------------------|-----------------------------|-------------------|-------|
| RA-226           | 1600.00Y | 1.00  | 7.839E+01                        | 7.839E+01                       | 8.355E+01                   | 106.58            |       |
| Total Activity : |          |       | 7.839E+01                        | 7.839E+01                       |                             |                   |       |

Grand Total Activity : 7.839E+01                      7.839E+01

Flags: "K" = Keyline not found                      "M" = Manually accepted  
"E" = Manually edited                                      "A" = Nuclide specific abn. limit

#### Interference Report

No interference correction performed

#### Combined Activity-MDA Report

---- Identified Nuclides ----

| Nuclide | Activity<br>(pCi/L) | Act error | MDA<br>(pCi/L) | MDA error | Act/MDA |
|---------|---------------------|-----------|----------------|-----------|---------|
| RA-226  | 7.839E+01           | 8.355E+01 | 1.302E+02      | 0.000E+00 | 0.602   |

---- Non-Identified Nuclides ----

| Nuclide | Key-Line<br>Activity<br>(pCi/L) | K.L.<br>Ided | Act error | MDA<br>(pCi/L) | MDA error | Act/MDA |
|---------|---------------------------------|--------------|-----------|----------------|-----------|---------|
| BE-7    | -2.621E+00                      |              | 2.970E+01 | 5.032E+01      | 0.000E+00 | -0.052  |

|         |            |           |                     |           |        |
|---------|------------|-----------|---------------------|-----------|--------|
| NA-24   | -9.422E+00 | 8.958E+00 | Half-Life too short |           |        |
| K-40    | -3.420E+01 | 4.132E+01 | 8.278E+01           | 0.000E+00 | -0.413 |
| CR-51   | 2.026E+01  | 3.719E+01 | 6.467E+01           | 0.000E+00 | 0.313  |
| MN-54   | 1.489E+00  | 2.677E+00 | 4.842E+00           | 0.000E+00 | 0.308  |
| CO-57   | -3.032E-01 | 3.231E+00 | 5.428E+00           | 0.000E+00 | -0.056 |
| CO-58   | -2.066E+00 | 3.083E+00 | 5.108E+00           | 0.000E+00 | -0.404 |
| FE-59   | 9.146E-01  | 6.093E+00 | 1.092E+01           | 0.000E+00 | 0.084  |
| CO-60   | 2.721E+00  | 2.806E+00 | 5.387E+00           | 0.000E+00 | 0.505  |
| ZN-65   | 5.210E+00  | 6.495E+00 | 1.203E+01           | 0.000E+00 | 0.433  |
| SE-75   | -1.018E+00 | 4.437E+00 | 7.542E+00           | 0.000E+00 | -0.135 |
| SR-85   | 1.819E+01  | 4.069E+00 | 7.970E+00           | 0.000E+00 | 2.282  |
| Y-88    | -7.127E-01 | 2.910E+00 | 5.159E+00           | 0.000E+00 | -0.138 |
| NB-94   | 2.822E-01  | 2.787E+00 | 4.866E+00           | 0.000E+00 | 0.058  |
| NB-95   | 5.656E-01  | 3.294E+00 | 5.772E+00           | 0.000E+00 | 0.098  |
| ZR-95   | -2.584E+00 | 5.852E+00 | 9.872E+00           | 0.000E+00 | -0.262 |
| MO-99   | 6.849E+01  | 7.346E+02 | 1.286E+03           | 0.000E+00 | 0.053  |
| RU-103  | 1.902E+00  | 3.786E+00 | 6.598E+00           | 0.000E+00 | 0.288  |
| RU-106  | -6.521E+00 | 2.800E+01 | 4.809E+01           | 0.000E+00 | -0.136 |
| AG-110m | 4.102E+00  | 2.843E+00 | 5.358E+00           | 0.000E+00 | 0.766  |
| SN-113  | -3.025E+00 | 4.087E+00 | 6.747E+00           | 0.000E+00 | -0.448 |
| SB-124  | 2.713E+00  | 6.847E+00 | 5.631E+00           | 0.000E+00 | 0.482  |
| SB-125  | 1.545E+00  | 8.279E+00 | 1.426E+01           | 0.000E+00 | 0.108  |
| TE-129M | -1.379E+01 | 4.527E+01 | 7.591E+01           | 0.000E+00 | -0.182 |
| I-131   | -2.246E+00 | 1.028E+01 | 1.740E+01           | 0.000E+00 | -0.129 |
| BA-133  | 1.092E+00  | 4.222E+00 | 7.275E+00           | 0.000E+00 | 0.150  |
| CS-134  | 4.401E+00  | 5.170E+00 | 5.815E+00           | 0.000E+00 | 0.757  |
| CS-136  | 8.412E-01  | 5.486E+00 | 9.655E+00           | 0.000E+00 | 0.087  |
| CS-137  | 5.283E-02  | 3.158E+00 | 5.497E+00           | 0.000E+00 | 0.010  |
| CE-139  | -1.571E-01 | 3.402E+00 | 5.687E+00           | 0.000E+00 | -0.028 |
| BA-140  | -1.966E+00 | 2.281E+01 | 3.857E+01           | 0.000E+00 | -0.051 |
| LA-140  | 1.605E+00  | 6.168E+00 | 1.147E+01           | 0.000E+00 | 0.140  |
| CE-141  | 8.202E-01  | 7.312E+00 | 1.230E+01           | 0.000E+00 | 0.067  |
| CE-144  | 2.407E+00  | 2.534E+01 | 4.267E+01           | 0.000E+00 | 0.056  |
| EU-152  | -1.958E-01 | 1.002E+01 | 1.706E+01           | 0.000E+00 | -0.011 |
| EU-154  | -2.373E+00 | 6.586E+00 | 1.099E+01           | 0.000E+00 | -0.216 |
| AC-228  | 9.368E+00  | 1.149E+01 | 1.973E+01           | 0.000E+00 | 0.475  |
| TH-228  | 4.261E+00  | 6.372E+00 | 1.054E+01           | 0.000E+00 | 0.404  |
| TH-232  | 9.325E+00  | 1.144E+01 | 1.964E+01           | 0.000E+00 | 0.475  |
| U-235   | -4.890E+00 | 2.598E+01 | 4.221E+01           | 0.000E+00 | -0.116 |
| U-238   | 1.114E+02  | 3.340E+02 | 5.813E+02           | 0.000E+00 | 0.192  |
| AM-241  | 2.852E+01  | 2.072E+01 | 3.067E+01           | 0.000E+00 | 0.930  |

|              |             |                  |            |                    |        |
|--------------|-------------|------------------|------------|--------------------|--------|
| A,23WG4096-3 | ,06/09/2006 | 16:58,05/26/2006 | 11:02,     | 3.003E+00,WG4096-3 | WG EX  |
| B,23WG4096-3 | ,LIBD       | ,06/01/2006      | 10:14,     | 233L082404         |        |
| C,RA-226     | ,YES,       | 7.839E+01,       | 8.355E+01, | 1.302E+02,,        | 0.602  |
| C,BE-7       | ,NO ,       | -2.621E+00,      | 2.970E+01, | 5.032E+01,,        | -0.052 |
| C,K-40       | ,NO ,       | -3.420E+01,      | 4.132E+01, | 8.278E+01,,        | -0.413 |
| C,CR-51      | ,NO ,       | 2.026E+01,       | 3.719E+01, | 6.467E+01,,        | 0.313  |
| C,MN-54      | ,NO ,       | 1.489E+00,       | 2.677E+00, | 4.842E+00,,        | 0.308  |
| C,CO-57      | ,NO ,       | -3.032E-01,      | 3.231E+00, | 5.428E+00,,        | -0.056 |
| C,CO-58      | ,NO ,       | -2.066E+00,      | 3.083E+00, | 5.108E+00,,        | -0.404 |
| C,FE-59      | ,NO ,       | 9.146E-01,       | 6.093E+00, | 1.092E+01,,        | 0.084  |
| C,CO-60      | ,NO ,       | 2.721E+00,       | 2.806E+00, | 5.387E+00,,        | 0.505  |
| C,ZN-65      | ,NO ,       | 5.210E+00,       | 6.495E+00, | 1.203E+01,,        | 0.433  |
| C,SE-75      | ,NO ,       | -1.018E+00,      | 4.437E+00, | 7.542E+00,,        | -0.135 |
| C,SR-85      | ,NO ,       | 1.819E+01,       | 4.069E+00, | 7.970E+00,,        | 2.282  |
| C,Y-88       | ,NO ,       | -7.127E-01,      | 2.910E+00, | 5.159E+00,,        | -0.138 |
| C,NB-94      | ,NO ,       | 2.822E-01,       | 2.787E+00, | 4.866E+00,,        | 0.058  |
| C,NB-95      | ,NO ,       | 5.656E-01,       | 3.294E+00, | 5.772E+00,,        | 0.098  |
| C,ZR-95      | ,NO ,       | -2.584E+00,      | 5.852E+00, | 9.872E+00,,        | -0.262 |
| C,MO-99      | ,NO ,       | 6.849E+01,       | 7.346E+02, | 1.286E+03,,        | 0.053  |
| C,RU-103     | ,NO ,       | 1.902E+00,       | 3.786E+00, | 6.598E+00,,        | 0.288  |
| C,RU-106     | ,NO ,       | -6.521E+00,      | 2.800E+01, | 4.809E+01,,        | -0.136 |
| C,AG-110m    | ,NO ,       | 4.102E+00,       | 2.843E+00, | 5.358E+00,,        | 0.766  |
| C,SN-113     | ,NO ,       | -3.025E+00,      | 4.087E+00, | 6.747E+00,,        | -0.448 |
| C,SB-124     | ,NO ,       | 2.713E+00,       | 6.847E+00, | 5.631E+00,,        | 0.482  |
| C,SB-125     | ,NO ,       | 1.545E+00,       | 8.279E+00, | 1.426E+01,,        | 0.108  |
| C,TE-129M    | ,NO ,       | -1.379E+01,      | 4.527E+01, | 7.591E+01,,        | -0.182 |
| C,I-131      | ,NO ,       | -2.246E+00,      | 1.028E+01, | 1.740E+01,,        | -0.129 |
| C,BA-133     | ,NO ,       | 1.092E+00,       | 4.222E+00, | 7.275E+00,,        | 0.150  |
| C,CS-134     | ,NO ,       | 4.401E+00,       | 5.170E+00, | 5.815E+00,,        | 0.757  |
| C,CS-136     | ,NO ,       | 8.412E-01,       | 5.486E+00, | 9.655E+00,,        | 0.087  |
| C,CS-137     | ,NO ,       | 5.283E-02,       | 3.158E+00, | 5.497E+00,,        | 0.010  |
| C,CE-139     | ,NO ,       | -1.571E-01,      | 3.402E+00, | 5.687E+00,,        | -0.028 |
| C,BA-140     | ,NO ,       | -1.966E+00,      | 2.281E+01, | 3.857E+01,,        | -0.051 |
| C,LA-140     | ,NO ,       | 1.605E+00,       | 6.168E+00, | 1.147E+01,,        | 0.140  |
| C,CE-141     | ,NO ,       | 8.202E-01,       | 7.312E+00, | 1.230E+01,,        | 0.067  |
| C,CE-144     | ,NO ,       | 2.407E+00,       | 2.534E+01, | 4.267E+01,,        | 0.056  |
| C,EU-152     | ,NO ,       | -1.958E-01,      | 1.002E+01, | 1.706E+01,,        | -0.011 |
| C,EU-154     | ,NO ,       | -2.373E+00,      | 6.586E+00, | 1.099E+01,,        | -0.216 |
| C,AC-228     | ,NO ,       | 9.368E+00,       | 1.149E+01, | 1.973E+01,,        | 0.475  |
| C,TH-228     | ,NO ,       | 4.261E+00,       | 6.372E+00, | 1.054E+01,,        | 0.404  |
| C,TH-232     | ,NO ,       | 9.325E+00,       | 1.144E+01, | 1.964E+01,,        | 0.475  |
| C,U-235      | ,NO ,       | -4.890E+00,      | 2.598E+01, | 4.221E+01,,        | -0.116 |
| C,U-238      | ,NO ,       | 1.114E+02,       | 3.340E+02, | 5.813E+02,,        | 0.192  |
| C,AM-241     | ,NO ,       | 2.852E+01,       | 2.072E+01, | 3.067E+01,,        | 0.930  |





2508 Quality Lane  
Knoxville, TN 37931  
865-690-6819 (Phone)

**Work Order #: L29109**

**Exelon**

**July 6, 2006**



Kathy Shaw  
 Conestoga-Rovers & Associates  
 45 Farmington Valley Road  
 Plainville CT 06062

**Case Narrative - L29109**  
**EX001-3ESPZION-06**

07/06/2006 15:27

**Sample Receipt**

The following samples were received on June 30, 2006 in good condition, unless otherwise noted.

*Cross Reference Table*

| Client ID       | Laboratory ID | Station ID(if applicable) |
|-----------------|---------------|---------------------------|
| GW-062806-PG-01 | L29109-1      |                           |
| GW-062806-PG-02 | L29109-2      |                           |

*Analytical Method Cross Reference Table*

| Radiological Parameter | TBE Knoxville Method | Reference Method |
|------------------------|----------------------|------------------|
| H-3 (DIST)             | TBE-2010             |                  |



**Case Narrative - L29109**  
**EX001-3ESPZION-06**

07/06/2006 15:27

**H-3**

**Quality Control**

Quality control samples were analyzed as WG4198.

Method Blank

All blanks were within acceptance limits, unless otherwise noted.

Laboratory Control Sample

All laboratory control samples were within acceptance limits, unless otherwise noted.

**H-3 (DIST)**

**Quality Control**

Quality control samples were analyzed as WG4198.

Duplicate Sample

Duplicates were analyzed for the following samples. All duplicate results were within acceptance limits, unless otherwise noted.

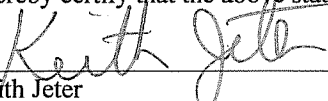
| <u>Client ID</u> | <u>Laboratory ID</u> | <u>QC Sample #</u> |
|------------------|----------------------|--------------------|
| GW-062806-PG-01  | L29109-1             | WG4198-3           |

**Certification**

This is to certify that Teledyne Brown Engineering - Environmental Services, located at 2508 Quality Lane, Knoxville, Tennessee, 37931, has analyzed, tested and documented samples as specified in the applicable purchase order.

This also certifies that requirements of applicable codes, standards and specifications have been fully met and that any quality assurance documentation which verified conformance to the purchase order is on file and may be examined upon request.

I hereby certify that the above statements are true and correct.

  
 \_\_\_\_\_  
 Keith Jeter  
 Operations Manager

# Sample Receipt Summary

**Teledyne Brown Engineering**  
**Sample Receipt Verification/Variance Report**

06/30/06 11:35

SR #: SR09163

Client: Exelon

Project #: EX001-3ESPZION-06

LIMS #: L29109

|  |
|--|
| Initiated By: PMARSHALL<br>Init Date: 06/30/06      Receive Date: 06/30/06 |
|--|

**Notification of Variance**

|                  |               |
|------------------|---------------|
| Person Notified: | Contacted By: |
| Notify Date:     |               |
| Notify Method:   |               |
| Notify Comment:  |               |

**Client Response**

Person Responding:  
 Response Date:  
 Response Method:  
 Response Comment

| Criteria   | Yes | No | NA | Comment |
|--|-----|----|----|---------|
| 1 Shipping container custody seals present and intact.             |     |    | NA |         |
| 2 Sample container custody seals present and intact.               |     |    | NA |         |
| 3 Sample containers received in good condition                     | Y   |    |    |         |
| 4 Chain of custody received with samples                           | Y   |    |    |         |
| 5 All samples listed on chain of custody received                  | Y   |    |    |         |
| 6 Sample container labels present and legible.                     | Y   |    |    |         |
| 7 Information on container labels correspond with chain of custody | Y   |    |    |         |
| 8 Sample(s) properly preserved and in appropriate container(s)     |     |    | NA |         |
| 9 Other (Describe)   |     |    | NA |         |



# Internal Chain of Custody





L29109

\*\*\*\*\*

L29109-1      WG      GW-062806-PG-01

| <u>Process step</u> | <u>Prod</u> | <u>Analyst</u> | <u>Date</u> |
|---------------------|-------------|----------------|-------------|
| Login               |             | RCHARLES       | 06/30/06    |
| Aliquot             | H-3 (DIST)  | EJ             | 07/05/06    |
| Count Room          | H-3 (DIST)  | KOJ            | 07/05/06    |

\*\*\*\*\*

L29109-2      WG      GW-062806-PG-02

| <u>Process step</u> | <u>Prod</u> | <u>Analyst</u> | <u>Date</u> |
|---------------------|-------------|----------------|-------------|
| Login               |             | RCHARLES       | 06/30/06    |
| Aliquot             | H-3 (DIST)  | EJ             | 07/05/06    |
| Count Room          | H-3 (DIST)  | KOJ            | 07/05/06    |

# Analytical Results Summary

**Report of Analysis**  
 07/06/06 15:53

**L29109**

Conestoga-Rovers & Associates

EX001-3ESPZION-06

Athy Shaw

| Radionuclide  | SOP# | Activity Conc | Uncertainty 2 Sigma | MDC      | Units | Run # | Aliquot Volume | Aliquot Units | Reference Date | Count Date | Count Time | Count Units | Flag Values |
|---|------|---------------|---------------------|----------|-------|-------|----------------|---------------|----------------|------------|------------|-------------|-------------|
| -3 (DIST)   | 2010 | 2.20E+02      | 1.23E+02            | 1.81E+02 | pCi/L |       | 10             | ml            |                | 07/05/06   | 60         | M           | +           |
| Sample ID: <b>GW-062806-PG-01</b> Matrix: Ground Water (WG)<br>Station: Collect Start: 06/28/2006 10:50<br>Description: Collect Stop: Volume:<br>LIMS Number: L29109-1 Receive Date: 06/30/2006 % Moisture: |      |               |                     |          |       |       |                |               |                |            |            |             |             |
| -3 (DIST)   | 2010 | 1.44E+02      | 1.22E+02            | 1.86E+02 | pCi/L |       | 10             | ml            |                | 07/05/06   | 60         | M           | U           |
| Sample ID: <b>GW-062806-PG-02</b> Matrix: Ground Water (WG)<br>Station: Collect Start: 06/28/2006 12:40<br>Description: Collect Stop: Volume:<br>LIMS Number: L29109-2 Receive Date: 06/30/2006 % Moisture: |      |               |                     |          |       |       |                |               |                |            |            |             |             |

lag Values = Compound/Analyte not detected or less than 3 sigma  
 = Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)  
 \* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma  
 igh = Activity concentration exceeds customer reporting value  
 pec = MDC exceeds customer technical specification  
 = Low recovery  
 = High recovery

**bolded text indicates reportable value.**

No = Peak not identified in gamma spectrum  
 Yes = Peak identified in gamma spectrum  
 \*\*\*\* Results are reported on an as received basis unless otherwise noted

MDC - Minimum Detectable Concentration

# QC Results Summary

QC Summary Report

for L29109

7/6/2006 3:31:19PM



H-3

Method Blank Summary

|                     |                     |               |                        |                     |              |                  |            |
|---------------------|---------------------|---------------|------------------------|---------------------|--------------|------------------|------------|
| <u>BE Sample ID</u> | <u>Radionuclide</u> | <u>Matrix</u> | <u>Count Date/Time</u> | <u>Blank Result</u> | <u>Units</u> | <u>Qualifier</u> | <u>P/F</u> |
| G4198-1             | H-3                 | WO            | 07/05/2006 12:32       | < 1.730E+00         | pCi/Total    | U                | P          |

LCS Sample Summary

|                     |                     |               |                        |                    |                   |              |                       |              |                  |            |
|---------------------|---------------------|---------------|------------------------|--------------------|-------------------|--------------|-----------------------|--------------|------------------|------------|
| <u>BE Sample ID</u> | <u>Radionuclide</u> | <u>Matrix</u> | <u>Count Date/Time</u> | <u>Spike Value</u> | <u>LCS Result</u> | <u>Units</u> | <u>Spike Recovery</u> | <u>Range</u> | <u>Qualifier</u> | <u>P/F</u> |
| G4198-2             | H-3                 | WO            | 07/05/2006 13:36       | 5.05E+002          | 5.000E+02         | pCi/Total    | 99.1                  | 70-130       | +                | P          |

Spike ID: 3H-041706-1  
 Spike conc: 5.05E+002  
 Spike Vol: 1.00E+000

L29109 H-3

Associated Samples for WG4198

|                  |                 |
|------------------|-----------------|
| <u>SAMPLENUM</u> | <u>CLIENTID</u> |
| L29109-1         | GW-062806-PG-01 |
| L29109-2         | GW-062806-PG-02 |

Positive Result  
 Compound/analyte was analyzed, peak not identified and/or not detected above MDC  
 < 5 times the MDC are not evaluated  
 Nuclide not detected  
 Spiking level < 5 times activity  
 Pass  
 Fail  
 Not evaluated

# QC Summary Report

for L29109

7/6/2006 3:31:19PM



H-3 (DIST)

## Duplicate Summary

| <u>BE Sample ID</u> | <u>Radionuclide</u> | <u>Matrix</u> | <u>Count Date/Time</u> | <u>Original Result</u> | <u>DUP Result</u> | <u>Units</u> | <u>RPD</u> | <u>Range Qualifier</u> | <u>P/F</u> |
|---------------------|---------------------|---------------|------------------------|------------------------|-------------------|--------------|------------|------------------------|------------|
| /G4198-3<br>29109-1 | H-3 (DIST)          | WG            | 07/05/2006 17:04       | 2.200E+02              | <1.890E+02        | pCi/L        |            | <30                    | * NE       |

Positive Result  
 Compound/analyte was analyzed, peak not identified and/or not detected above MDC  
 < 5 times the MDC are not evaluated  
 Nuclide not detected  
 Spiking level < 5 times activity  
 Pass  
 Fail  
 Not evaluated

# Raw Data

ork Order: L29109 Customer: Exelon

Project: EX001-3ESFZION-06

| Sample ID         | Run Analysis | Reference Date/time | Volume/ Aliquot | Scavenge Date/time | Milking Date/time | Mount Weight | Recovery Date/time | Count Date/time | Counter ID | Total counts | Sample dt (min) | Bkg counts | Bkg dt (min) | Eff. Factor | Decay & Ingrowth Factor |
|-------------------|--------------|---------------------|-----------------|--------------------|-------------------|--------------|--------------------|-----------------|------------|--------------|-----------------|------------|--------------|-------------|-------------------------|
| L29109-1          | H-3 DIST     |                     | 10 ml           |                    |                   | 0            | 05-jul-06 14:58    | 05-jul-06 14:58 | LS7        | 181          | 60              | 1.99       | 60           | .211        | EJ                      |
| 3W-062806-PG-01   |              |                     |                 |                    |                   |              |                    |                 |            |              |                 |            |              |             |                         |
| ctivity: 2.2E+02  |              |                     |                 |                    |                   |              |                    |                 |            |              |                 |            |              |             |                         |
| L29109-2          | H-3 DIST     |                     | 10 ml           |                    |                   | 0            | 05-jul-06 16:01    | 05-jul-06 16:01 | LS7        | 159          | 60              | 1.99       | 60           | .206        | EJ                      |
| 3W-062806-PG-02   |              |                     |                 |                    |                   |              |                    |                 |            |              |                 |            |              |             |                         |
| ctivity: 1.44E+02 |              |                     |                 |                    |                   |              |                    |                 |            |              |                 |            |              |             |                         |



ork Order: L29053 Customer: Environmental Monitoring and T

uclide: H-3 Project : EN003-3REG-02

| Sample ID | Run Analysis | Reference Date/time | Volume/ Aliquot | Scavenge Date/time | Milking Date/time | Mount Weight | Recovery | Count Date/time | Counter ID | Total counts | Sample dt(min) | Bkg counts | Bkg dt(min) | Eff. Factor | Decay & Ingrowth Factor | Analyst |
|-----------|--------------|---------------------|-----------------|--------------------|-------------------|--------------|----------|-----------------|------------|--------------|----------------|------------|-------------|-------------|-------------------------|---------|
| L29053-1  | H-3          |                     | 10 ml           |                    |                   | 0            |          | 02-jul-06 04:52 | LS5        | 1598         | 26.66          | 4.07       | 135         | .162        |                         | EJ      |

06050861-01A  
 ctivity: 1.56E+04 \* Error: 8.44E+02 MDC: 5.09E+02



2508 Quality Lane  
Knoxville, TN 37931  
865-690-6819 (Phone)

**Work Order #: L29321 R1**

**Exelon**

**July 28, 2006**

Kathy Shaw  
 Conestoga-Rovers & Associates  
 45 Farmington Valley Road  
 Plainville CT 06062

**Case Narrative - L29321**  
**EX001-3ESPZION-06**

07/28/2006 14:16

**Sample Receipt**

The following samples were received on July 21, 2006 in good condition, unless otherwise noted.

Revision 1:

Zinc-65 was detected in sample GW-071706-JL-TW-ZN-101 (L29321-2) at slightly above the detection level. The sample was recounted and the Zn-65 did not confirm. The original results should be considered a false positive.

*Cross Reference Table*

| Client ID              | Laboratory ID | Station ID(if applicable) |
|------------------------|---------------|---------------------------|
| GW-071706-JL-TW-ZN-102 | L29321-1      |                           |
| GW-071706-JL-TW-ZN-101 | L29321-2      |                           |
| GW-071706-JL-TW-ZN-103 | L29321-3      |                           |
| GW-071706-JLTW-ZN-100  | L29321-4      |                           |

*Analytical Method Cross Reference Table*

| Radiological Parameter | TBE Knoxville Method | Reference Method |
|------------------------|----------------------|------------------|
| Gamma Spectrometry     | TBE-2007             | EPA 901.1        |
| H-3 (DIST)             | TBE-2010             |                  |
| TOTAL SR               | TBE-2018             | EPA 905.0        |

**Case Narrative - L29321  
EX001-3ESPZION-06**

07/28/2006 14:16

**Gamma Spectroscopy**

Client requested confirmation analysis.

**Quality Control**

Quality control samples were analyzed as WG4249.

Duplicate Sample

Duplicates were analyzed for the following samples. All duplicate results were within acceptance limits, unless otherwise noted.

| <u>Client ID</u>       | <u>Laboratory ID</u> | <u>QC Sample #</u> |
|------------------------|----------------------|--------------------|
| GW-071706-JL-TW-ZN-102 | L29321-1             | WG4249-1           |

**H-3 (DIST)**

**Quality Control**

Quality control samples were analyzed as WG4251.

Method Blank

All blanks were within acceptance limits, unless otherwise noted.

Laboratory Control Sample

All laboratory control samples were within acceptance limits, unless otherwise noted.

Duplicate Sample

Duplicates were analyzed for the following samples. All duplicate results were within acceptance limits, unless otherwise noted.

| <u>Client ID</u>       | <u>Laboratory ID</u> | <u>QC Sample #</u> |
|------------------------|----------------------|--------------------|
| GW-071706-JL-TW-ZN-102 | L29321-1             | WG4251-3           |

**Case Narrative - L29321**  
**EX001-3ESPZION-06**

07/28/2006 14:16

**TOTAL SR**

**Quality Control**

Quality control samples were analyzed as WG4253.

Method Blank

All blanks were within acceptance limits, unless otherwise noted.

Laboratory Control Sample

All laboratory control samples were within acceptance limits, unless otherwise noted.

Duplicate Sample

Duplicates were analyzed for the following samples. All duplicate results were within acceptance limits, unless otherwise noted.

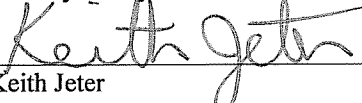
| <u>Client ID</u>       | <u>Laboratory ID</u> | <u>QC Sample #</u> |
|------------------------|----------------------|--------------------|
| GW-071706-JL-TW-ZN-102 | L29321-1             | WG4253-3           |

**Certification**

This is to certify that Teledyne Brown Engineering - Environmental Services, located at 2508 Quality Lane, Knoxville, Tennessee, 37931, has analyzed, tested and documented samples as specified in the applicable purchase order.

This also certifies that requirements of applicable codes, standards and specifications have been fully met and that any quality assurance documentation which verified conformance to the purchase order is on file and may be examined upon request.

I hereby certify that the above statements are true and correct.

  
\_\_\_\_\_  
Keith Jeter  
Operations Manager

# Sample Receipt Summary







TELEDYNE BROWN ENGINEERING  
2508 Quality Lane  
Knoxville, TN 37931-3133

**ACKNOWLEDGEMENT**  
This is not an invoice

July 24, 2006

Kathy Shaw  
Conestoga-Rovers & Associates  
45 Farmington Valley Road  
Plainville, CT 06062

The following sample(s) were received at Teledyne Brown Engineering Knoxville laboratory on July 21, 2006. The sample(s) have been scheduled for the analyses listed below and the report is scheduled for completion by July 24, 2006. Please review the following login information and pricing. Contact me if anything is incorrect or you have questions about the status of your sample(s).

Thank you for choosing Teledyne Brown Engineering for your analytical needs.

Sincerely,  
Rebecca Charles  
Project Manager  
(865)934-0379

Project ID: EX001-3ESPZION-06  
P.O. #: 00411203  
Release #:  
Contract#: 00411203  
Kathy Shaw, FAX#:860-747-1900, larry.walton@exeloncorp.com

| Client ID/<br>Station  | Laboratory ID<br>Analysis | Vol/Units<br>Price | Start Collect<br>Date/Time | End Collect<br>Date/Time |
|------------------------|---------------------------|--------------------|----------------------------|--------------------------|
| GW-071706-JL-TW-ZN-102 | L29321-1                  |                    | 07/17/06:0835              |                          |
| WG                     | GELI                      | 135.00             |                            |                          |
| WG                     | H-3 (DIST)                | 135.00             |                            |                          |
| WG                     | SR-90 (FAST)              | 175.00             |                            |                          |
| GW-071706-JL-TW-ZN-101 | L29321-2                  |                    | 07/17/06:0935              |                          |
| WG                     | GELI                      | 135.00             |                            |                          |
| WG                     | H-3 (DIST)                | 135.00             |                            |                          |
| WG                     | SR-90 (FAST)              | 175.00             |                            |                          |
| GW-071706-JL-TW-ZN-103 | L29321-3                  |                    | 07/17/06:1045              |                          |
| WG                     | GELI                      | 135.00             |                            |                          |
| WG                     | H-3 (DIST)                | 135.00             |                            |                          |
| WG                     | SR-90 (FAST)              | 175.00             |                            |                          |
| GW-071706-JL-TW-ZN-100 | L29321-4                  |                    | 07/17/06:1130              |                          |
| WG                     | GELI                      | 135.00             |                            |                          |
| WG                     | H-3 (DIST)                | 135.00             |                            |                          |
| WG                     | SR-90 (FAST)              | 175.00             |                            |                          |

| Client ID/<br>Station | Laboratory ID<br>Analysis | Vol/Units<br>Price | Start Collect<br>Date/Time | End Collect<br>Date/Time |
|-----------------------|---------------------------|--------------------|----------------------------|--------------------------|
|-----------------------|---------------------------|--------------------|----------------------------|--------------------------|

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End of document

# **Internal Chain of Custody**





L29321

\*\*\*\*\*

L29321-1      WG      GW-071706-JL-TW-ZN-102

| <u>Process step</u> | <u>Prod</u>  | <u>Analyst</u> | <u>Date</u> |
|---------------------|--------------|----------------|-------------|
| Login               |              | KTHURMAN       | 07/21/06    |
| Aliquot             | GELI         | DW             | 07/21/06    |
| Aliquot             | H-3 (DIST)   | DW             | 07/21/06    |
| Aliquot             | SR-90 (FAST) | LCB            | 07/21/06    |
| Count Room          | GELI         | ILL            | 07/21/06    |
| Count Room          | H-3 (DIST)   | KOJ            | 07/21/06    |
| Count Room          | SR-90 (FAST) | KOJ            | 07/24/06    |

\*\*\*\*\*

L29321-2      WG      GW-071706-JL-TW-ZN-101

| <u>Process step</u> | <u>Prod</u>  | <u>Analyst</u> | <u>Date</u> |
|---------------------|--------------|----------------|-------------|
| Login               |              | RCHARLES       | 07/21/06    |
| Aliquot             | GELI         | DW             | 07/21/06    |
| Aliquot             | H-3 (DIST)   | DW             | 07/21/06    |
| Aliquot             | SR-90 (FAST) | LCB            | 07/21/06    |
| Count Room          | GELI         | ILL            | 07/21/06    |
| Count Room          | H-3 (DIST)   | KOJ            | 07/21/06    |
| Count Room          | SR-90 (FAST) | KOJ            | 07/24/06    |

\*\*\*\*\*

L29321-2R1    WG      GW-071706-JL-TW-ZN-101

| <u>Process step</u> | <u>Prod</u> | <u>Analyst</u> | <u>Date</u> |
|---------------------|-------------|----------------|-------------|
| Login               |             | RCHARLES       | 07/21/06    |
| Aliquot             | GELI        | DW             | 07/25/06    |
| Count Room          | GELI        | ILL            | 07/27/06    |

\*\*\*\*\*

L29321-3      WG      GW-071706-JL-TW-ZN-103

| <u>Process step</u> | <u>Prod</u>  | <u>Analyst</u> | <u>Date</u> |
|---------------------|--------------|----------------|-------------|
| Login               |              | KTHURMAN       | 07/21/06    |
| Aliquot             | GELI         | DW             | 07/21/06    |
| Aliquot             | H-3 (DIST)   | DW             | 07/21/06    |
| Aliquot             | SR-90 (FAST) | LCB            | 07/21/06    |
| Count Room          | GELI         | ILL            | 07/21/06    |
| Count Room          | H-3 (DIST)   | KOJ            | 07/22/06    |
| Count Room          | SR-90 (FAST) | KOJ            | 07/24/06    |

\*\*\*\*\*

L29321-4      WG      GW-071706-JL-TW-ZN-100

| <u>Process step</u> | <u>Prod</u>  | <u>Analyst</u> | <u>Date</u> |
|---------------------|--------------|----------------|-------------|
| Login               |              | KTHURMAN       | 07/21/06    |
| Aliquot             | GELI         | DW             | 07/21/06    |
| Aliquot             | H-3 (DIST)   | DW             | 07/21/06    |
| Aliquot             | SR-90 (FAST) | LCB            | 07/21/06    |
| Count Room          | GELI         | ILL            | 07/21/06    |
| Count Room          | H-3 (DIST)   | KOJ            | 07/22/06    |
| Count Room          | SR-90 (FAST) | KOJ            | 07/24/06    |

# **Analytical Results Summary**

**L29321**

Conestoga-Rovers & Associates

EX001-3ESPZION-06

Kathy Shaw

|  |                                 |                      |      |
|--|---------------------------------|----------------------|------|
| Sample ID: <b>GW-071706-JL-TW-ZN-102</b> | Collect Start: 07/17/2006 08:35 | Matrix: Ground Water | (WG) |
| Station:                                 | Collect Stop:                   | Volume:              |      |
| Description:                             | Receive Date: 07/21/2006        | % Moisture:          |      |
| LIMS Number: L29321-1                    |                                 |                      |      |

| Radionuclide | SOP# | Activity Conc | Uncertainty 2 Sigma | MDC             | Units | Run # | Aliquot Volume | Aliquot Units | Reference Date | Count Date | Count Time | Count Units | Flag Values |
|--------------|------|---------------|---------------------|-----------------|-------|-------|----------------|---------------|----------------|------------|------------|-------------|-------------|
| H-3 (DIST)   | 2010 | -5.53E+01     | 1.07E+02            | <b>1.82E+02</b> | pCi/L |       | 10             | ml            |                | 07/21/06   | 60         | M           | U           |
| TOTAL SR     | 2018 | -2.87E-02     | 5.34E-01            | <b>1.12E+00</b> | pCi/L |       | 450            | ml            | 07/17/06 08:35 | 07/24/06   | 100        | M           | U           |
| MN-54        | 2007 | 2.87E+00      | 3.41E+00            | <b>5.92E+00</b> | pCi/L |       | 3182.86        | ml            | 07/17/06 08:35 | 07/21/06   | 7866       | Sec         | U           |
| CO-58        | 2007 | -2.83E+00     | 3.10E+00            | <b>4.67E+00</b> | pCi/L |       | 3182.86        | ml            | 07/17/06 08:35 | 07/21/06   | 7866       | Sec         | U           |
| FE-59        | 2007 | -1.01E-01     | 7.21E+00            | <b>1.18E+01</b> | pCi/L |       | 3182.86        | ml            | 07/17/06 08:35 | 07/21/06   | 7866       | Sec         | U           |
| CO-60        | 2007 | -1.83E+00     | 3.52E+00            | <b>5.45E+00</b> | pCi/L |       | 3182.86        | ml            | 07/17/06 08:35 | 07/21/06   | 7866       | Sec         | U           |
| ZN-65        | 2007 | 5.56E+00      | 7.71E+00            | <b>1.33E+01</b> | pCi/L |       | 3182.86        | ml            | 07/17/06 08:35 | 07/21/06   | 7866       | Sec         | U           |
| NB-95        | 2007 | -4.06E-01     | 3.51E+00            | <b>5.73E+00</b> | pCi/L |       | 3182.86        | ml            | 07/17/06 08:35 | 07/21/06   | 7866       | Sec         | U           |
| ZR-95        | 2007 | -4.75E+00     | 5.84E+00            | <b>9.03E+00</b> | pCi/L |       | 3182.86        | ml            | 07/17/06 08:35 | 07/21/06   | 7866       | Sec         | U           |
| CS-134       | 2007 | 4.95E+00      | 4.60E+00            | <b>6.88E+00</b> | pCi/L |       | 3182.86        | ml            | 07/17/06 08:35 | 07/21/06   | 7866       | Sec         | U           |
| CS-137       | 2007 | -1.63E-01     | 3.25E+00            | <b>5.28E+00</b> | pCi/L |       | 3182.86        | ml            | 07/17/06 08:35 | 07/21/06   | 7866       | Sec         | U           |
| BA-140       | 2007 | 8.53E+00      | 1.34E+01            | <b>2.31E+01</b> | pCi/L |       | 3182.86        | ml            | 07/17/06 08:35 | 07/21/06   | 7866       | Sec         | U           |
| LA-140       | 2007 | 1.63E+00      | 4.45E+00            | <b>7.61E+00</b> | pCi/L |       | 3182.86        | ml            | 07/17/06 08:35 | 07/21/06   | 7866       | Sec         | U           |

Flag Values  
 U = Compound/Analyte not detected or less than 3 sigma  
 + = Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)  
 U\* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma  
 High = Activity concentration exceeds customer reporting value  
 Spec = MDC exceeds customer technical specification  
 L = Low recovery  
 H = High recovery

No = Peak not identified in gamma spectrum  
 Yes = Peak identified in gamma spectrum  
 \*\*\*\* Results are reported on an as received basis unless otherwise noted

MDC - Minimum Detectable Concentration

**Bolded text indicates reportable value.**



# Report of Analysis

07/28/06 12:31

**L29321**

Conestoga-Rovers & Associates

EX001-3ESPZION-06



Kathy Shaw

Sample ID: **GW-071706-JL-TW-ZN-101**

Station:

Description:

LIMS Number: L29321-2

Collect Start: 07/17/2006 09:35

Collect Stop:

Receive Date: 07/21/2006

Matrix: Ground Water

Volume:

% Moisture:

(WG)

| Radionuclide | SOP# | Activity Conc | Uncertainty 2 Sigma | MDC      | Units | Run # | Aliquot Volume | Aliquot Units | Reference Date | Count Date | Count Time | Count Units | Flag Values |
|--------------|------|---------------|---------------------|----------|-------|-------|----------------|---------------|----------------|------------|------------|-------------|-------------|
| H-3 (DIST)   | 2010 | 9.15E+01      | 1.16E+02            | 1.82E+02 | pCi/L |       | 10             | ml            |                | 07/21/06   | 60         | M           | U           |
| TOTAL SR     | 2018 | 2.60E-01      | 5.84E-01            | 1.16E+00 | pCi/L |       | 450            | ml            | 07/17/06 09:35 | 07/24/06   | 100        | M           | U           |
| MN-54        | 2007 | 4.88E+00      | 3.26E+00            | 6.07E+00 | pCi/L |       | 3438.68        | ml            | 07/17/06 09:35 | 07/21/06   | 8341       | Sec         | U           |
| MN-54        | 2007 | 9.92E-01      | 1.19E+00            | 2.01E+00 | pCi/L | R1    | 3074.94        | ml            | 07/17/06 09:35 | 07/27/06   | 62041      | Sec         | U           |
| CO-58        | 2007 | 5.51E-01      | 3.15E+00            | 5.25E+00 | pCi/L |       | 3438.68        | ml            | 07/17/06 09:35 | 07/21/06   | 8341       | Sec         | U           |
| CO-58        | 2007 | -6.02E-01     | 1.23E+00            | 2.01E+00 | pCi/L | R1    | 3074.94        | ml            | 07/17/06 09:35 | 07/27/06   | 62041      | Sec         | U           |
| FE-59        | 2007 | 5.96E+00      | 6.49E+00            | 1.17E+01 | pCi/L |       | 3438.68        | ml            | 07/17/06 09:35 | 07/21/06   | 8341       | Sec         | U           |
| FE-59        | 2007 | 2.85E+00      | 2.57E+00            | 4.41E+00 | pCi/L | R1    | 3074.94        | ml            | 07/17/06 09:35 | 07/27/06   | 62041      | Sec         | U           |
| CO-60        | 2007 | 1.80E+00      | 3.66E+00            | 6.55E+00 | pCi/L |       | 3438.68        | ml            | 07/17/06 09:35 | 07/21/06   | 8341       | Sec         | U           |
| CO-60        | 2007 | 5.60E-01      | 1.20E+00            | 1.99E+00 | pCi/L | R1    | 3074.94        | ml            | 07/17/06 09:35 | 07/27/06   | 62041      | Sec         | U           |
| ZN-65        | 2007 | 1.60E+01      | 5.63E+00            | 1.04E+01 | pCi/L |       | 3438.68        | ml            | 07/17/06 09:35 | 07/21/06   | 8341       | Sec         | +           |
| ZN-65        | 2007 | 4.48E+00      | 2.53E+00            | 4.42E+00 | pCi/L | R1    | 3074.94        | ml            | 07/17/06 09:35 | 07/27/06   | 62041      | Sec         | U*          |
| NB-95        | 2007 | -7.53E-01     | 3.32E+00            | 5.35E+00 | pCi/L |       | 3438.68        | ml            | 07/17/06 09:35 | 07/21/06   | 8341       | Sec         | U           |
| NB-95        | 2007 | 1.00E+00      | 1.27E+00            | 2.10E+00 | pCi/L | R1    | 3074.94        | ml            | 07/17/06 09:35 | 07/27/06   | 62041      | Sec         | U           |
| ZR-95        | 2007 | 1.77E+00      | 5.76E+00            | 9.75E+00 | pCi/L |       | 3438.68        | ml            | 07/17/06 09:35 | 07/21/06   | 8341       | Sec         | U           |
| ZR-95        | 2007 | -2.30E+00     | 2.22E+00            | 3.49E+00 | pCi/L | R1    | 3074.94        | ml            | 07/17/06 09:35 | 07/27/06   | 62041      | Sec         | U           |
| CS-134       | 2007 | 2.29E+00      | 7.39E+00            | 6.09E+00 | pCi/L |       | 3438.68        | ml            | 07/17/06 09:35 | 07/21/06   | 8341       | Sec         | U           |
| CS-134       | 2007 | 5.96E+00      | 2.51E+00            | 2.17E+00 | pCi/L | R1    | 3074.94        | ml            | 07/17/06 09:35 | 07/27/06   | 62041      | Sec         | U*          |
| CS-137       | 2007 | 1.80E+00      | 3.65E+00            | 6.31E+00 | pCi/L |       | 3438.68        | ml            | 07/17/06 09:35 | 07/21/06   | 8341       | Sec         | U           |
| CS-137       | 2007 | -3.88E-01     | 1.29E+00            | 2.10E+00 | pCi/L | R1    | 3074.94        | ml            | 07/17/06 09:35 | 07/27/06   | 62041      | Sec         | U           |
| BA-140       | 2007 | 3.07E+00      | 1.45E+01            | 2.42E+01 | pCi/L |       | 3438.68        | ml            | 07/17/06 09:35 | 07/21/06   | 8341       | Sec         | U           |
| BA-140       | 2007 | 6.17E+00      | 7.00E+00            | 1.19E+01 | pCi/L | R1    | 3074.94        | ml            | 07/17/06 09:35 | 07/27/06   | 62041      | Sec         | U           |
| LA-140       | 2007 | 2.62E+00      | 4.98E+00            | 8.69E+00 | pCi/L |       | 3438.68        | ml            | 07/17/06 09:35 | 07/21/06   | 8341       | Sec         | U           |
| LA-140       | 2007 | -1.91E+00     | 2.34E+00            | 3.71E+00 | pCi/L | R1    | 3074.94        | ml            | 07/17/06 09:35 | 07/27/06   | 62041      | Sec         | U           |

**Flag Values**

- U = Compound/Analyte not detected or less than 3 sigma
- + = Activity concentration exceeds MDC and 3 sigma, peak identified (gamma only)
- U\* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
- High = Activity concentration exceeds customer reporting value
- Spec = MDC exceeds customer technical specification
- L = Low recovery
- H = High recovery

- No = Peak not identified in gamma spectrum
- Yes = Peak identified in gamma spectrum
- \*\*\*\* Results are reported on an as received basis unless otherwise noted

MDC - Minimum Detectable Concentration

**Bolded text indicates reportable value.**

**Report of Analysis**  
 07/28/06 12:31

**L29321**

Conestoga-Rovers & Associates

EX001-3ESPZION-06

Kathy Shaw

| Sample ID: <b>GW-071706-JL-TW-ZN-103</b> |      | Collect Start: 07/17/2006 10:45 |                     | Matrix: Ground Water |       | (WG)  |                |               |                |            |            |             |             |
|--|------|---------------------------------|---------------------|----------------------|-------|-------|----------------|---------------|----------------|------------|------------|-------------|-------------|
| Station:                                 |      | Collect Stop:                   |                     | Volume:              |       |       |                |               |                |            |            |             |             |
| Description:                             |      | Receive Date: 07/21/2006        |                     | % Moisture:          |       |       |                |               |                |            |            |             |             |
| LIMS Number: L29321-3                    |      |                                 |                     |                      |       |       |                |               |                |            |            |             |             |
| Radionuclide                             | SOP# | Activity Conc                   | Uncertainty 2 Sigma | MDC                  | Units | Run # | Aliquot Volume | Aliquot Units | Reference Date | Count Date | Count Time | Count Units | Flag Values |
| H-3 (DIST)                               | 2010 | 6.61E+01                        | 1.15E+02            | <b>1.83E+02</b>      | pCi/L |       | 10             | ml            |                | 07/22/06   | 60         | M           | U           |
| TOTAL SR                                 | 2018 | 4.01E-01                        | 5.66E-01            | <b>1.09E+00</b>      | pCi/L |       | 450            | ml            | 07/17/06 10:45 | 07/24/06   | 100        | M           | U           |
| MN-54                                    | 2007 | 4.58E-01                        | 3.42E+00            | <b>5.72E+00</b>      | pCi/L |       | 3547.51        | ml            | 07/17/06 10:45 | 07/21/06   | 7876       | Sec         | U           |
| CO-58                                    | 2007 | 2.22E+00                        | 3.53E+00            | <b>6.13E+00</b>      | pCi/L |       | 3547.51        | ml            | 07/17/06 10:45 | 07/21/06   | 7876       | Sec         | U           |
| FE-59                                    | 2007 | 8.34E-01                        | 6.62E+00            | <b>1.11E+01</b>      | pCi/L |       | 3547.51        | ml            | 07/17/06 10:45 | 07/21/06   | 7876       | Sec         | U           |
| CO-60                                    | 2007 | 1.09E+00                        | 3.54E+00            | <b>5.99E+00</b>      | pCi/L |       | 3547.51        | ml            | 07/17/06 10:45 | 07/21/06   | 7876       | Sec         | U           |
| ZN-65                                    | 2007 | 7.32E+00                        | 9.36E+00            | <b>1.43E+01</b>      | pCi/L |       | 3547.51        | ml            | 07/17/06 10:45 | 07/21/06   | 7876       | Sec         | U           |
| NB-95                                    | 2007 | -4.22E-01                       | 3.55E+00            | <b>5.71E+00</b>      | pCi/L |       | 3547.51        | ml            | 07/17/06 10:45 | 07/21/06   | 7876       | Sec         | U           |
| ZR-95                                    | 2007 | 1.71E+00                        | 5.80E+00            | <b>9.67E+00</b>      | pCi/L |       | 3547.51        | ml            | 07/17/06 10:45 | 07/21/06   | 7876       | Sec         | U           |
| CS-134                                   | 2007 | 5.48E+00                        | 7.28E+00            | <b>6.40E+00</b>      | pCi/L |       | 3547.51        | ml            | 07/17/06 10:45 | 07/21/06   | 7876       | Sec         | U           |
| CS-137                                   | 2007 | 3.50E-01                        | 3.67E+00            | <b>6.04E+00</b>      | pCi/L |       | 3547.51        | ml            | 07/17/06 10:45 | 07/21/06   | 7876       | Sec         | U           |
| BA-140                                   | 2007 | -1.67E+00                       | 1.53E+01            | <b>2.53E+01</b>      | pCi/L |       | 3547.51        | ml            | 07/17/06 10:45 | 07/21/06   | 7876       | Sec         | U           |
| LA-140                                   | 2007 | -1.12E+00                       | 4.86E+00            | <b>7.80E+00</b>      | pCi/L |       | 3547.51        | ml            | 07/17/06 10:45 | 07/21/06   | 7876       | Sec         | U           |

Flag Values  
 U = Compound/Analyte not detected or less than 3 sigma  
 + = Activity concentration exceeds MDC and 3 sigma; peak identified (gamma only)  
 U\* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma  
 High = Activity concentration exceeds customer reporting value  
 Spec = MDC exceeds customer technical specification  
 L = Low recovery  
 H = High recovery

No = Peak not identified in gamma spectrum  
 Yes = Peak identified in gamma spectrum  
 \*\*\*\* Results are reported on an as received basis unless otherwise noted

MDC - Minimum Detectable Concentration

**Bolded text indicates reportable value.**

Report of Analysis  
07/28/06 12:31  
**L29321**

Conestoga-Rovers & Associates  
EX001-3ESPZION-06

Kathy Shaw

| Sample ID: GW-071706-JLTV-ZN-100 |      | Station:                        |                     | Matrix: Ground Water |       | (WG)        |                |               |                |            |            |             |             |
|----------------------------------|------|---------------------------------|---------------------|----------------------|-------|-------------|----------------|---------------|----------------|------------|------------|-------------|-------------|
| Description:                     |      | Collect Start: 07/17/2006 11:30 |                     | Collect Stop:        |       | Volume:     |                |               |                |            |            |             |             |
| LIMS Number: L29321-4            |      | Receive Date: 07/21/2006        |                     | Reference Date:      |       | % Moisture: |                |               |                |            |            |             |             |
| Radionuclide                     | SOP# | Activity Conc                   | Uncertainty 2 Sigma | MDC                  | Units | Run #       | Aliquot Volume | Aliquot Units | Reference Date | Count Date | Count Time | Count Units | Flag Values |
| H-3 (DIST)                       | 2010 | 8.66E+01                        | 1.18E+02            | <b>1.85E+02</b>      | pCi/L |             | 10             | ml            |                | 07/22/06   | 60         | M           | U           |
| TOTAL SR                         | 2018 | 1.13E+00                        | 6.58E-01            | <b>1.15E+00</b>      | pCi/L |             | 450            | ml            | 07/17/06 11:30 | 07/24/06   | 100        | M           | U           |
| MN-54                            | 2007 | 4.14E+00                        | 3.62E+00            | <b>6.83E+00</b>      | pCi/L |             | 3562.61        | ml            | 07/17/06 11:30 | 07/21/06   | 7921       | Sec         | No          |
| CO-58                            | 2007 | 2.49E-01                        | 3.53E+00            | <b>6.22E+00</b>      | pCi/L |             | 3562.61        | ml            | 07/17/06 11:30 | 07/21/06   | 7921       | Sec         | No          |
| FE-59                            | 2007 | -4.75E-01                       | 6.61E+00            | <b>1.17E+01</b>      | pCi/L |             | 3562.61        | ml            | 07/17/06 11:30 | 07/21/06   | 7921       | Sec         | No          |
| CO-60                            | 2007 | 6.82E-01                        | 3.50E+00            | <b>6.36E+00</b>      | pCi/L |             | 3562.61        | ml            | 07/17/06 11:30 | 07/21/06   | 7921       | Sec         | No          |
| ZN-65                            | 2007 | -4.36E-01                       | 7.28E+00            | <b>1.29E+01</b>      | pCi/L |             | 3562.61        | ml            | 07/17/06 11:30 | 07/21/06   | 7921       | Sec         | No          |
| NB-95                            | 2007 | 2.80E+00                        | 3.60E+00            | <b>6.65E+00</b>      | pCi/L |             | 3562.61        | ml            | 07/17/06 11:30 | 07/21/06   | 7921       | Sec         | No          |
| ZR-95                            | 2007 | -4.07E+00                       | 5.94E+00            | <b>9.89E+00</b>      | pCi/L |             | 3562.61        | ml            | 07/17/06 11:30 | 07/21/06   | 7921       | Sec         | No          |
| CS-134                           | 2007 | 3.73E+00                        | 5.12E+00            | <b>7.74E+00</b>      | pCi/L |             | 3562.61        | ml            | 07/17/06 11:30 | 07/21/06   | 7921       | Sec         | No          |
| CS-137                           | 2007 | 1.10E+00                        | 3.69E+00            | <b>6.64E+00</b>      | pCi/L |             | 3562.61        | ml            | 07/17/06 11:30 | 07/21/06   | 7921       | Sec         | No          |
| BA-140                           | 2007 | -2.45E+00                       | 1.48E+01            | <b>2.53E+01</b>      | pCi/L |             | 3562.61        | ml            | 07/17/06 11:30 | 07/21/06   | 7921       | Sec         | No          |
| LA-140                           | 2007 | 4.56E+00                        | 5.01E+00            | <b>9.85E+00</b>      | pCi/L |             | 3562.61        | ml            | 07/17/06 11:30 | 07/21/06   | 7921       | Sec         | No          |

Flag Values

- U = Compound/Analyte not detected or less than 3 sigma
- + = Activity concentration exceeds MDC and 3 sigma, peak identified (gamma only)
- U\* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
- High = Activity concentration exceeds customer reporting value
- Spec = MDC exceeds customer technical specification
- L = Low recovery
- H = High recovery

**Bolded text indicates reportable value.**

No = Peak not identified in gamma spectrum  
 Yes = Peak identified in gamma spectrum  
 \*\*\*\* Results are reported on an as received basis unless otherwise noted

MDC - Minimum Detectable Concentration

# QC Results Summary

# QC Summary Report

for L29321

7/28/2006 1:55:18PM



H-3 (DIST)

## Method Blank Summary

| <u>TBE Sample ID</u> | <u>Radionuclide</u> | <u>Matrix</u> | <u>Count Date/Time</u> | <u>Blank Result</u> | <u>Units</u> | <u>Qualifier</u> |
|----------------------|---------------------|---------------|------------------------|---------------------|--------------|------------------|
| WG4251-1             | H-3 (DIST)          | WO            | 07/21/2006 19:56       | < 1.870E+00         | pCi/Total    | U P              |

## LCS Sample Summary

| <u>TBE Sample ID</u> | <u>Radionuclide</u> | <u>Matrix</u> | <u>Count Date/Time</u> | <u>Spike Value</u> | <u>LCS Result</u> | <u>Units</u> | <u>Spike Recovery</u> | <u>Range</u> | <u>Qualifier</u> |
|----------------------|---------------------|---------------|------------------------|--------------------|-------------------|--------------|-----------------------|--------------|------------------|
| WG4251-2             | H-3 (DIST)          | WO            | 07/21/2006 21:00       | 5.05E+002          | 5.010E+02         | pCi/Total    | 99.3                  | 70-130       | + P              |

Spike ID: 3H-041706-1  
Spike conc: 5.05E+002  
Spike Vol: 1.00E+000

## Duplicate Summary

| <u>TBE Sample ID</u> | <u>Radionuclide</u> | <u>Matrix</u> | <u>Count Date/Time</u> | <u>Original Result</u> | <u>DUP Result</u> | <u>Units</u> | <u>RPD</u> | <u>Range</u> | <u>Qualifier</u> |
|----------------------|---------------------|---------------|------------------------|------------------------|-------------------|--------------|------------|--------------|------------------|
| WG4251-3<br>L29321-1 | H-3 (DIST)          | WG            | 07/21/2006 21:18       | < 1.820E+02            | < 1.850E+02       | pCi/L        |            | <30          | ** NE            |

+ Positive Result  
U Compound/analyte was analyzed, peak not identified and/or not detected above MDC  
\* < 5 times the MDC are not evaluated  
\*\* Nuclide not detected  
\*\*\* Spiking level < 5 times activity  
P Pass  
F Fail  
NE Not evaluated

# QC Summary Report

for L29321

7/28/2006 1:55:18PM



## TOTAL SR

### Method Blank Summary

| <u>TBE Sample ID</u> | <u>Radionuclide</u> | <u>Matrix</u> | <u>Count Date/Time</u> | <u>Blank Result</u> | <u>Units</u> | <u>Qualifier</u> | <u>P/F</u> |
|----------------------|---------------------|---------------|------------------------|---------------------|--------------|------------------|------------|
| WG4253-1             | TOTAL SR            | WO            | 07/24/2006 14:14       | < 5.150E-01         | pCi/Total    | U                | P          |

### LCS Sample Summary

| <u>TBE Sample ID</u> | <u>Radionuclide</u> | <u>Matrix</u> | <u>Count Date/Time</u> | <u>Spike Value</u> | <u>LCS Result</u> | <u>Units</u> | <u>Spike Recovery</u> | <u>Range</u> | <u>Qualifier</u> | <u>P/F</u> |
|----------------------|---------------------|---------------|------------------------|--------------------|-------------------|--------------|-----------------------|--------------|------------------|------------|
| WG4253-2             | TOTAL SR            | WO            | 07/24/2006 14:14       | 5.84E+001          | 4.170E+01         | pCi/Total    | 71.4                  | 70-130       | +                | P          |

Spike ID: 90SR-011905  
 Spike conc: 2.34E+002  
 Spike Vol: 2.50E-001

### Duplicate Summary

| <u>TBE Sample ID</u> | <u>Radionuclide</u> | <u>Matrix</u> | <u>Count Date/Time</u> | <u>Original Result</u> | <u>DUP Result</u> | <u>Units</u> | <u>RPD</u> | <u>Range</u> | <u>Qualifier</u> | <u>P/F</u> |
|----------------------|---------------------|---------------|------------------------|------------------------|-------------------|--------------|------------|--------------|------------------|------------|
| WG4253-3<br>L29321-1 | TOTAL SR            | WG            | 07/24/2006 14:14       | < 1.120E+00            | < 1.170E+00       | pCi/L        |            | <30          | **               | NE         |

+ Positive Result  
 U Compound/analyte was analyzed, peak not identified and/or not detected above MDC  
 \* < 5 times the MDC are not evaluated  
 \*\* Nuclide not detected  
 \*\*\* Spiking level < 5 times activity  
 P Pass  
 F Fail  
 NE Not evaluated

# Raw Data

Work Order: L29321

Customer: Exelon

Nuclide: H-3 (DIST)

Project : EX001-3ESPZION-06

| Sample ID   | Run # | Analysis | Reference Date/time | Volume/ Aliquot | Scavenge Date/time | Milking Date/time | Mount Weight | Recovery | Count Date/time | Counter ID | Total counts | Sample dt (min) | Bkg counts | Bkg dt (min) | Eff. Factor | Decay & Ingrowth Factor | Analyst |
|---|-------|----------|---------------------|-----------------|--------------------|-------------------|--------------|----------|-----------------|------------|--------------|-----------------|------------|--------------|-------------|-------------------------|---------|
| L29321-1  |       | H-3 DIST |                     | 10 ml           |                    |                   | 0            |          | 21-Jul-06 22:22 | LS7        | 106          | 60              | 2.03       | 60           | .212        |                         | DW      |
| GW-071706-JL-TW-ZN-102                              |       |          |                     |                 |                    |                   |              |          |                 |            |              |                 |            |              |             |                         |         |
| Activity: -5.53E+01 Error: 1.07E+02 MDC: 1.82E+02 * |       |          |                     |                 |                    |                   |              |          |                 |            |              |                 |            |              |             |                         |         |
| L29321-2  |       | H-3 DIST |                     | 10 ml           |                    |                   | 0            |          | 21-Jul-06 23:26 | LS7        | 148          | 60              | 2.03       | 60           | .212        |                         | DW      |
| GW-071706-JL-TW-ZN-101                              |       |          |                     |                 |                    |                   |              |          |                 |            |              |                 |            |              |             |                         |         |
| Activity: 9.15E+01 Error: 1.16E+02 MDC: 1.82E+02 *  |       |          |                     |                 |                    |                   |              |          |                 |            |              |                 |            |              |             |                         |         |
| L29321-3  |       | H-3 DIST |                     | 10 ml           |                    |                   | 0            |          | 22-Jul-06 00:30 | LS7        | 140          | 60              | 2.03       | 60           | .212        |                         | DW      |
| GW-071706-JL-TW-ZN-103                              |       |          |                     |                 |                    |                   |              |          |                 |            |              |                 |            |              |             |                         |         |
| Activity: 6.61E+01 Error: 1.15E+02 MDC: 1.83E+02 *  |       |          |                     |                 |                    |                   |              |          |                 |            |              |                 |            |              |             |                         |         |
| L29321-4  |       | H-3 DIST |                     | 10 ml           |                    |                   | 0            |          | 22-Jul-06 01:33 | LS7        | 146          | 60              | 2.03       | 60           | .208        |                         | DW      |
| GW-071706-JL-TW-ZN-100                              |       |          |                     |                 |                    |                   |              |          |                 |            |              |                 |            |              |             |                         |         |
| Activity: 8.66E+01 Error: 1.18E+02 MDC: 1.85E+02 *  |       |          |                     |                 |                    |                   |              |          |                 |            |              |                 |            |              |             |                         |         |





Sec. Review: Analyst: *gw* LIMS: \_\_\_\_\_

=====

VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 21-JUL-2006 16:03:39.47  
TBE07 P-10768B HpGe \*\*\*\*\* Aquisition Date/Time: 21-JUL-2006 13:40:12.01

-----

LIMS No., Customer Name, Client ID: L29321-1 WG ZION

Sample ID : 07L29321-1                      Smple Date: 17-JUL-2006 08:35:00.  
Sample Type : WG                              Geometry : 073L082504  
Quantity : 3.18290E+00 L                      BKGFILE : 07BG070106MT  
Start Channel : 40                      Energy Tol : 1.50000                      Real Time : 0 02:11:07.16  
End Channel : 4090                      Pk Srch Sens: 5.00000                      Live time : 0 02:11:05.55  
MDA Constant : 0.00                      Library Used: LIBD

| Pk | It | Energy   | Area | Bkgnd | FWHM | Channel | %Eff     | Cts/Sec  | %Err | Fit      |
|----|----|----------|------|-------|------|---------|----------|----------|------|----------|
| 1  | 1  | 66.15*   | 61   | 241   | 1.37 | 133.14  | 7.98E-01 | 7.76E-03 | 47.1 | 6.77E-01 |
| 2  | 1  | 139.64*  | 58   | 167   | 1.34 | 280.31  | 2.36E+00 | 7.37E-03 | 40.9 | 1.33E+00 |
| 3  | 1  | 352.10*  | 71   | 102   | 1.97 | 705.66  | 1.61E+00 | 9.06E-03 | 34.0 | 4.29E+00 |
| 4  | 1  | 609.10*  | 68   | 74    | 1.59 | 1220.06 | 1.09E+00 | 8.62E-03 | 31.3 | 2.17E+00 |
| 5  | 1  | 912.73*  | 65   | 30    | 1.13 | 1827.68 | 8.13E-01 | 8.23E-03 | 23.4 | 4.76E+01 |
| 6  | 1  | 1461.20* | 20   | 3     | 2.99 | 2924.81 | 5.83E-01 | 2.53E-03 | 55.7 | 7.39E-01 |

Flag: "\*" = Peak area was modified by background subtraction

### Nuclide Line Activity Report

Nuclide Type: natural

| Nuclide | Energy  | Area | %Abn   | %Eff      | Uncorrected<br>pCi/L | Decay Corr<br>pCi/L | 2-Sigma<br>%Error |
|---------|---------|------|--------|-----------|----------------------|---------------------|-------------------|
| K-40    | 1460.81 | 20   | 10.67* | 5.826E-01 | 3.459E+01            | 3.459E+01           | 111.38            |

Flag: "\*" = Keyline

Summary of Nuclide Activity  
Sample ID : 07L29321-1

Page : 2  
Acquisition date : 21-JUL-2006 13:40:12

Total number of lines in spectrum 6  
Number of unidentified lines 5  
Number of lines tentatively identified by NID 1 16.67%

Nuclide Type : natural

| Nuclide          | Hlife     | Decay | Uncorrected<br>pCi/L | Decay Corr<br>pCi/L | Decay Corr<br>2-Sigma Error | 2-Sigma<br>%Error | Flags |
|------------------|-----------|-------|----------------------|---------------------|-----------------------------|-------------------|-------|
| K-40             | 1.28E+09Y | 1.00  | 3.459E+01            | 3.459E+01           | 3.853E+01                   | 111.38            |       |
| Total Activity : |           |       | 3.459E+01            | 3.459E+01           |                             |                   |       |

Grand Total Activity : 3.459E+01 3.459E+01

Flags: "K" = Keyline not found  
"E" = Manually edited

"M" = Manually accepted  
"A" = Nuclide specific abn. limit

| It | Energy | Area | Bkgnd | FWHM | Channel | Left | Pw | Cts/Sec  | %Err | %Eff     | Flags |
|----|--------|------|-------|------|---------|------|----|----------|------|----------|-------|
| 1  | 66.15  | 61   | 241   | 1.37 | 133.14  | 130  | 8  | 7.76E-03 | 94.3 | 7.98E-01 |       |
| 1  | 139.64 | 58   | 167   | 1.34 | 280.31  | 277  | 7  | 7.37E-03 | 81.7 | 2.36E+00 |       |
| 1  | 352.10 | 71   | 102   | 1.97 | 705.66  | 700  | 12 | 9.06E-03 | 68.0 | 1.61E+00 |       |
| 1  | 609.10 | 68   | 74    | 1.59 | 1220.06 | 1215 | 13 | 8.62E-03 | 62.5 | 1.09E+00 |       |
| 1  | 912.73 | 65   | 30    | 1.13 | 1827.68 | 1821 | 18 | 8.23E-03 | 46.9 | 8.13E-01 |       |

Flags: "T" = Tentatively associated

Summary of Nuclide Activity

Total number of lines in spectrum 6  
 Number of unidentified lines 5  
 Number of lines tentatively identified by NID 1 16.67%

Nuclide Type : natural

| Nuclide          | Hlife     | Decay | Wtd Mean<br>Uncorrected<br>pCi/L | Wtd Mean<br>Decay Corr<br>pCi/L | Decay Corr<br>2-Sigma Error | 2-Sigma<br>%Error | Flags |
|------------------|-----------|-------|----------------------------------|---------------------------------|-----------------------------|-------------------|-------|
| K-40             | 1.28E+09Y | 1.00  | 3.459E+01                        | 3.459E+01                       | 3.853E+01                   | 111.38            |       |
| Total Activity : |           |       | 3.459E+01                        | 3.459E+01                       |                             |                   |       |

Grand Total Activity : 3.459E+01 3.459E+01

Flags: "K" = Keyline not found "M" = Manually accepted  
 "E" = Manually edited "A" = Nuclide specific abn. limit

Interference Report

No interference correction performed

Combined Activity-MDA Report

---- Identified Nuclides ----

| Nuclide | Activity<br>(pCi/L) | Act error | MDA<br>(pCi/L) | MDA error | Act/MDA |
|---------|---------------------|-----------|----------------|-----------|---------|
| K-40    | 3.459E+01           | 3.853E+01 | 6.680E+01      | 0.000E+00 | 0.518   |

---- Non-Identified Nuclides ----

| Nuclide | Key-Line<br>Activity<br>(pCi/L) | K.L.<br>Ided | Act error | MDA<br>(pCi/L) | MDA error | Act/MDA |
|---------|---------------------------------|--------------|-----------|----------------|-----------|---------|
| BE-7    | 3.532E+00                       |              | 2.821E+01 | 4.628E+01      | 0.000E+00 | 0.076   |
| NA-24   | -2.351E+02                      |              | 3.645E+02 | 5.504E+02      | 0.000E+00 | -0.427  |
| CR-51   | -9.525E+00                      |              | 2.891E+01 | 4.628E+01      | 0.000E+00 | -0.206  |
| MN-54   | 2.869E+00                       |              | 3.407E+00 | 5.917E+00      | 0.000E+00 | 0.485   |
| CO-57   | -1.348E+00                      |              | 2.931E+00 | 4.633E+00      | 0.000E+00 | -0.291  |
| CO-58   | -2.832E+00                      |              | 3.095E+00 | 4.672E+00      | 0.000E+00 | -0.606  |

|         |            |           |           |           |        |
|---------|------------|-----------|-----------|-----------|--------|
| FE-59   | -1.009E-01 | 7.211E+00 | 1.176E+01 | 0.000E+00 | -0.009 |
| CO-60   | -1.831E+00 | 3.522E+00 | 5.454E+00 | 0.000E+00 | -0.336 |
| ZN-65   | 5.563E+00  | 7.707E+00 | 1.328E+01 | 0.000E+00 | 0.419  |
| SE-75   | -6.344E-01 | 4.154E+00 | 6.810E+00 | 0.000E+00 | -0.093 |
| SR-85   | 1.922E+01  | 3.898E+00 | 7.799E+00 | 0.000E+00 | 2.465  |
| Y-88    | -1.555E+00 | 3.864E+00 | 6.058E+00 | 0.000E+00 | -0.257 |
| NB-94   | -2.822E+00 | 3.003E+00 | 4.642E+00 | 0.000E+00 | -0.608 |
| NB-95   | -4.063E-01 | 3.508E+00 | 5.734E+00 | 0.000E+00 | -0.071 |
| ZR-95   | -4.750E+00 | 5.840E+00 | 9.033E+00 | 0.000E+00 | -0.526 |
| MO-99   | -2.790E+01 | 7.023E+01 | 1.127E+02 | 0.000E+00 | -0.248 |
| RU-103  | -1.263E+00 | 3.464E+00 | 5.492E+00 | 0.000E+00 | -0.230 |
| RU-106  | 1.343E+01  | 3.101E+01 | 5.031E+01 | 0.000E+00 | 0.267  |
| AG-110m | 3.899E-01  | 2.931E+00 | 4.826E+00 | 0.000E+00 | 0.081  |
| SN-113  | -3.971E+00 | 3.993E+00 | 6.221E+00 | 0.000E+00 | -0.638 |
| SB-124  | -3.503E+00 | 4.301E+00 | 5.490E+00 | 0.000E+00 | -0.638 |
| SB-125  | -6.151E+00 | 8.935E+00 | 1.406E+01 | 0.000E+00 | -0.438 |
| TE-129M | -1.242E+01 | 3.800E+01 | 6.078E+01 | 0.000E+00 | -0.204 |
| I-131   | 2.386E+00  | 4.375E+00 | 7.479E+00 | 0.000E+00 | 0.319  |
| BA-133  | 9.312E+00  | 5.146E+00 | 8.194E+00 | 0.000E+00 | 1.136  |
| CS-134  | 4.945E+00  | 4.597E+00 | 6.883E+00 | 0.000E+00 | 0.718  |
| CS-136  | 3.154E+00  | 3.495E+00 | 6.172E+00 | 0.000E+00 | 0.511  |
| CS-137  | -1.634E-01 | 3.253E+00 | 5.277E+00 | 0.000E+00 | -0.031 |
| CE-139  | 1.113E+00  | 2.947E+00 | 4.921E+00 | 0.000E+00 | 0.226  |
| BA-140  | 8.530E+00  | 1.338E+01 | 2.308E+01 | 0.000E+00 | 0.370  |
| LA-140  | 1.625E+00  | 4.451E+00 | 7.605E+00 | 0.000E+00 | 0.214  |
| CE-141  | 2.256E+00  | 6.300E+00 | 9.137E+00 | 0.000E+00 | 0.247  |
| CE-144  | 1.974E+00  | 2.602E+01 | 3.728E+01 | 0.000E+00 | 0.053  |
| EU-152  | 5.447E+00  | 1.182E+01 | 1.677E+01 | 0.000E+00 | 0.325  |
| EU-154  | -5.263E+00 | 6.237E+00 | 9.693E+00 | 0.000E+00 | -0.543 |
| RA-226  | -9.488E+00 | 7.784E+01 | 1.283E+02 | 0.000E+00 | -0.074 |
| AC-228  | 3.408E+00  | 1.464E+01 | 2.181E+01 | 0.000E+00 | 0.156  |
| TH-228  | 4.661E+00  | 5.924E+00 | 1.046E+01 | 0.000E+00 | 0.445  |
| TH-232  | 3.403E+00  | 1.462E+01 | 2.178E+01 | 0.000E+00 | 0.156  |
| U-235   | 1.445E+01  | 2.614E+01 | 3.835E+01 | 0.000E+00 | 0.377  |
| U-238   | -2.740E+02 | 3.449E+02 | 5.260E+02 | 0.000E+00 | -0.521 |
| AM-241  | -2.229E+01 | 2.916E+01 | 4.359E+01 | 0.000E+00 | -0.511 |

|              |                                     |   |
|--------------|-------------------------------------|---|
| A,07L29321-1 | ,07/21/2006 16:03,07/17/2006 08:35, | 3.183E+00,L29321-1 WG ZI                  |
| B,07L29321-1 | ,LIBD                               | ,07/21/2006 09:34,073L082504              |
| C,K-40       | ,YES,                               | 3.459E+01, 3.853E+01, 6.680E+01,, 0.518   |
| C,BE-7       | ,NO ,                               | 3.532E+00, 2.821E+01, 4.628E+01,, 0.076   |
| C,NA-24      | ,NO ,                               | -2.351E+02, 3.645E+02, 5.504E+02,, -0.427 |
| C,CR-51      | ,NO ,                               | -9.525E+00, 2.891E+01, 4.628E+01,, -0.206 |
| C,MN-54      | ,NO ,                               | 2.869E+00, 3.407E+00, 5.917E+00,, 0.485   |
| C,CO-57      | ,NO ,                               | -1.348E+00, 2.931E+00, 4.633E+00,, -0.291 |
| C,CO-58      | ,NO ,                               | -2.832E+00, 3.095E+00, 4.672E+00,, -0.606 |
| C,FE-59      | ,NO ,                               | -1.009E-01, 7.211E+00, 1.176E+01,, -0.009 |
| C,CO-60      | ,NO ,                               | -1.831E+00, 3.522E+00, 5.454E+00,, -0.336 |
| C,ZN-65      | ,NO ,                               | 5.563E+00, 7.707E+00, 1.328E+01,, 0.419   |
| C,SE-75      | ,NO ,                               | -6.344E-01, 4.154E+00, 6.810E+00,, -0.093 |
| C,SR-85      | ,NO ,                               | 1.922E+01, 3.898E+00, 7.799E+00,, 2.465   |
| C,Y-88       | ,NO ,                               | -1.555E+00, 3.864E+00, 6.058E+00,, -0.257 |
| C,NB-94      | ,NO ,                               | -2.822E+00, 3.003E+00, 4.642E+00,, -0.608 |
| C,NB-95      | ,NO ,                               | -4.063E-01, 3.508E+00, 5.734E+00,, -0.071 |
| C,ZR-95      | ,NO ,                               | -4.750E+00, 5.840E+00, 9.033E+00,, -0.526 |
| C,MO-99      | ,NO ,                               | -2.790E+01, 7.023E+01, 1.127E+02,, -0.248 |
| C,RU-103     | ,NO ,                               | -1.263E+00, 3.464E+00, 5.492E+00,, -0.230 |
| C,RU-106     | ,NO ,                               | 1.343E+01, 3.101E+01, 5.031E+01,, 0.267   |
| C,AG-110m    | ,NO ,                               | 3.899E-01, 2.931E+00, 4.826E+00,, 0.081   |
| C,SN-113     | ,NO ,                               | -3.971E+00, 3.993E+00, 6.221E+00,, -0.638 |
| C,SB-124     | ,NO ,                               | -3.503E+00, 4.301E+00, 5.490E+00,, -0.638 |
| C,SB-125     | ,NO ,                               | -6.151E+00, 8.935E+00, 1.406E+01,, -0.438 |
| C,TE-129M    | ,NO ,                               | -1.242E+01, 3.800E+01, 6.078E+01,, -0.204 |
| C,I-131      | ,NO ,                               | 2.386E+00, 4.375E+00, 7.479E+00,, 0.319   |
| C,BA-133     | ,NO ,                               | 9.312E+00, 5.146E+00, 8.194E+00,, 1.136   |
| C,CS-134     | ,NO ,                               | 4.945E+00, 4.597E+00, 6.883E+00,, 0.718   |
| C,CS-136     | ,NO ,                               | 3.154E+00, 3.495E+00, 6.172E+00,, 0.511   |
| C,CS-137     | ,NO ,                               | -1.634E-01, 3.253E+00, 5.277E+00,, -0.031 |
| C,CE-139     | ,NO ,                               | 1.113E+00, 2.947E+00, 4.921E+00,, 0.226   |
| C,BA-140     | ,NO ,                               | 8.530E+00, 1.338E+01, 2.308E+01,, 0.370   |
| C,LA-140     | ,NO ,                               | 1.625E+00, 4.451E+00, 7.605E+00,, 0.214   |
| C,CE-141     | ,NO ,                               | 2.256E+00, 6.300E+00, 9.137E+00,, 0.247   |
| C,CE-144     | ,NO ,                               | 1.974E+00, 2.602E+01, 3.728E+01,, 0.053   |
| C,EU-152     | ,NO ,                               | 5.447E+00, 1.182E+01, 1.677E+01,, 0.325   |
| C,EU-154     | ,NO ,                               | -5.263E+00, 6.237E+00, 9.693E+00,, -0.543 |
| C,RA-226     | ,NO ,                               | -9.488E+00, 7.784E+01, 1.283E+02,, -0.074 |
| C,AC-228     | ,NO ,                               | 3.408E+00, 1.464E+01, 2.181E+01,, 0.156   |
| C,TH-228     | ,NO ,                               | 4.661E+00, 5.924E+00, 1.046E+01,, 0.445   |
| C,TH-232     | ,NO ,                               | 3.403E+00, 1.462E+01, 2.178E+01,, 0.156   |
| C,U-235      | ,NO ,                               | 1.445E+01, 2.614E+01, 3.835E+01,, 0.377   |
| C,U-238      | ,NO ,                               | -2.740E+02, 3.449E+02, 5.260E+02,, -0.521 |
| C,AM-241     | ,NO ,                               | -2.229E+01, 2.916E+01, 4.359E+01,, -0.511 |

Sec. Review: Analyst: LIMS: ✓

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VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 28-JUL-2006 09:15:00.44  
TBE07 P-10768B HpGe \*\*\*\*\* Aquisition Date/Time: 27-JUL-2006 16:00:40.08

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LIMS No., Customer Name, Client ID: L29321-2R1 WG ZION

Sample ID : 07L29321-2R1 Smple Date: 17-JUL-2006 09:35:00.  
Sample Type : WG Geometry : 073L082504  
Quantity : 3.07490E+00 L BKGFILE : 07BG070106MT  
Start Channel : 40 Energy Tol : 1.50000 Real Time : 0 17:14:13.14  
End Channel : 4090 Pk Srch Sens: 5.00000 Live time : 0 17:14:00.89  
MDA Constant : 0.00 Library Used: LIBD

| Pk | It | Energy  | Area | Bkgnd | FWHM | Channel | %Eff     | Cts/Sec  | %Err | Fit      |
|----|----|---------|------|-------|------|---------|----------|----------|------|----------|
| 1  | 5  | 66.31*  | 706  | 1600  | 1.37 | 133.39  | 8.05E-01 | 1.14E-02 | 12.0 | 3.01E+00 |
| 2  | 1  | 69.47   | 206  | 1244  | 1.34 | 139.72  | 9.31E-01 | 3.32E-03 | 27.8 | 1.05E+00 |
| 3  | 1  | 139.80* | 575  | 1739  | 1.63 | 280.56  | 2.36E+00 | 9.26E-03 | 15.6 | 2.99E+00 |
| 4  | 1  | 174.88  | 237  | 1353  | 1.60 | 350.81  | 2.34E+00 | 3.82E-03 | 27.3 | 3.81E+00 |
| 5  | 1  | 198.40* | 438  | 1237  | 1.05 | 397.90  | 2.25E+00 | 7.05E-03 | 17.2 | 1.20E+00 |
| 6  | 1  | 253.23  | 157  | 928   | 1.47 | 507.68  | 1.99E+00 | 2.53E-03 | 34.4 | 7.82E-01 |
| 7  | 1  | 499.46  | 126  | 364   | 1.76 | 1000.61 | 1.25E+00 | 2.03E-03 | 27.9 | 3.45E+00 |
| 8  | 1  | 596.15  | 291  | 562   | 2.09 | 1194.14 | 1.10E+00 | 4.70E-03 | 17.8 | 3.62E+00 |
| 9  | 1  | 609.27* | 107  | 505   | 1.50 | 1220.39 | 1.09E+00 | 1.72E-03 | 56.2 | 6.38E-01 |

Flag: "\*" = Peak area was modified by background subtraction

#### Nuclide Line Activity Report

Flag: "\*" = Keyline

Summary of Nuclide Activity

Sample ID : 07L29321-2R1

Acquisition date : 27-JUL-2006 16:00:40

|   |   |       |
|---|---|-------|
| Total number of lines in spectrum             | 9 |       |
| Number of unidentified lines                  | 9 |       |
| Number of lines tentatively identified by NID | 0 | 0.00% |

\*\*\*\* There are no nuclides meeting summary criteria \*\*\*\*

Flags: "K" = Keyline not found

"M" = Manually accepted

"E" = Manually edited

"A" = Nuclide specific abn. limit



| It | Energy | Area | Bkgnd | FWHM | Channel | Left | Pw | Cts/Sec  | %Err | %Eff     | Flags |
|----|--------|------|-------|------|---------|------|----|----------|------|----------|-------|
| 5  | 66.31  | 706  | 1600  | 1.37 | 133.39  | 124  | 14 | 1.14E-02 | 23.9 | 8.05E-01 |       |
| 1  | 69.47  | 206  | 1244  | 1.34 | 139.72  | 138  | 6  | 3.32E-03 | 55.6 | 9.31E-01 |       |
| 1  | 139.80 | 575  | 1739  | 1.63 | 280.56  | 275  | 10 | 9.26E-03 | 31.1 | 2.36E+00 |       |
| 1  | 174.88 | 237  | 1353  | 1.60 | 350.81  | 347  | 8  | 3.82E-03 | 54.5 | 2.34E+00 |       |
| 1  | 198.40 | 438  | 1237  | 1.05 | 397.90  | 394  | 8  | 7.05E-03 | 34.5 | 2.25E+00 |       |
| 1  | 253.23 | 157  | 928   | 1.47 | 507.68  | 505  | 8  | 2.53E-03 | 68.9 | 1.99E+00 |       |
| 1  | 499.46 | 126  | 364   | 1.76 | 1000.61 | 997  | 8  | 2.03E-03 | 55.8 | 1.25E+00 |       |
| 1  | 596.15 | 291  | 562   | 2.09 | 1194.14 | 1189 | 13 | 4.70E-03 | 35.7 | 1.10E+00 |       |
| 1  | 609.27 | 107  | 505   | 1.50 | 1220.39 | 1215 | 12 | 1.72E-03 | **** | 1.09E+00 |       |

Flags: "T" = Tentatively associated

Summary of Nuclide Activity

Total number of lines in spectrum 9  
 Number of unidentified lines 9  
 Number of lines tentatively identified by NID 0 0.00%  
 \*\*\*\* There are no nuclides meeting summary criteria \*\*\*\*

Flags: "K" = Keyline not found "M" = Manually accepted  
 "E" = Manually edited "A" = Nuclide specific abn. limit

Interference Report

No interference correction performed

Combined Activity-MDA Report

---- Non-Identified Nuclides ----

| Nuclide | Key-Line Activity (pCi/L) | K.L. Ided | Act error | MDA (pCi/L)         | MDA error | Act/MDA |
|---------|---------------------------|-----------|-----------|---------------------|-----------|---------|
| BE-7    | 1.327E+00                 |           | 1.108E+01 | 1.815E+01           | 0.000E+00 | 0.073   |
| NA-24   | -1.351E-01                |           | 7.785E-02 | Half-Life too short |           |         |
| K-40    | 1.318E+01                 |           | 1.934E+01 | 3.104E+01           | 0.000E+00 | 0.425   |
| CR-51   | -1.153E+01                |           | 1.280E+01 | 2.044E+01           | 0.000E+00 | -0.564  |
| MN-54   | 9.921E-01                 |           | 1.187E+00 | 2.008E+00           | 0.000E+00 | 0.494   |
| CO-57   | -7.565E-01                |           | 1.125E+00 | 1.835E+00           | 0.000E+00 | -0.412  |
| CO-58   | -6.020E-01                |           | 1.231E+00 | 2.012E+00           | 0.000E+00 | -0.299  |
| FE-59   | 2.845E+00                 |           | 2.573E+00 | 4.409E+00           | 0.000E+00 | 0.645   |
| CO-60   | 5.603E-01                 |           | 1.196E+00 | 1.988E+00           | 0.000E+00 | 0.282   |
| ZN-65   | 4.478E+00                 |           | 2.534E+00 | 4.420E+00           | 0.000E+00 | 1.013   |
| SE-75   | 3.000E-02                 |           | 1.601E+00 | 2.628E+00           | 0.000E+00 | 0.011   |
| SR-85   | 2.055E+01                 |           | 1.575E+00 | 3.085E+00           | 0.000E+00 | 6.663   |
| Y-88    | -1.062E+00                |           | 1.332E+00 | 2.122E+00           | 0.000E+00 | -0.500  |
| NB-94   | 3.461E-01                 |           | 1.185E+00 | 1.951E+00           | 0.000E+00 | 0.177   |
| NB-95   | 1.002E+00                 |           | 1.265E+00 | 2.101E+00           | 0.000E+00 | 0.477   |
| ZR-95   | -2.300E+00                |           | 2.216E+00 | 3.493E+00           | 0.000E+00 | -0.658  |
| MO-99   | -1.987E+01                |           | 1.223E+02 | 1.984E+02           | 0.000E+00 | -0.100  |
| RU-103  | 1.634E+00                 |           | 1.408E+00 | 2.352E+00           | 0.000E+00 | 0.695   |
| RU-106  | -1.122E+00                |           | 1.091E+01 | 1.794E+01           | 0.000E+00 | -0.063  |

|         |            |           |           |           |        |
|---------|------------|-----------|-----------|-----------|--------|
| AG-110m | -5.479E-01 | 1.179E+00 | 1.912E+00 | 0.000E+00 | -0.287 |
| SN-113  | 1.259E+00  | 1.528E+00 | 2.566E+00 | 0.000E+00 | 0.491  |
| SB-124  | 2.291E+00  | 2.745E+00 | 2.107E+00 | 0.000E+00 | 1.087  |
| SB-125  | 2.061E+00  | 3.318E+00 | 5.525E+00 | 0.000E+00 | 0.373  |
| TE-129M | 1.686E+00  | 1.596E+01 | 2.618E+01 | 0.000E+00 | 0.064  |
| I-131   | -9.018E-01 | 2.784E+00 | 4.592E+00 | 0.000E+00 | -0.196 |
| BA-133  | 2.888E+00  | 1.633E+00 | 2.796E+00 | 0.000E+00 | 1.033  |
| CS-134  | 5.962E+00  | 2.510E+00 | 2.172E+00 | 0.000E+00 | 2.745  |
| CS-136  | 1.444E+00  | 1.912E+00 | 3.235E+00 | 0.000E+00 | 0.446  |
| CS-137  | -3.877E-01 | 1.287E+00 | 2.096E+00 | 0.000E+00 | -0.185 |
| CE-139  | 7.532E-01  | 1.187E+00 | 1.909E+00 | 0.000E+00 | 0.395  |
| BA-140  | 6.169E+00  | 6.999E+00 | 1.188E+01 | 0.000E+00 | 0.519  |
| LA-140  | -1.908E+00 | 2.340E+00 | 3.712E+00 | 0.000E+00 | -0.514 |
| CE-141  | -9.986E-01 | 2.963E+00 | 3.807E+00 | 0.000E+00 | -0.262 |
| CE-144  | -9.689E+00 | 1.024E+01 | 1.404E+01 | 0.000E+00 | -0.690 |
| EU-152  | -1.827E+01 | 3.767E+00 | 5.746E+00 | 0.000E+00 | -3.180 |
| EU-154  | -8.917E-01 | 2.314E+00 | 3.787E+00 | 0.000E+00 | -0.235 |
| RA-226  | 1.697E+00  | 3.227E+01 | 4.761E+01 | 0.000E+00 | 0.036  |
| AC-228  | 1.095E+00  | 5.789E+00 | 7.728E+00 | 0.000E+00 | 0.142  |
| TH-228  | 3.003E+00  | 2.378E+00 | 3.813E+00 | 0.000E+00 | 0.788  |
| TH-232  | 1.091E+00  | 5.769E+00 | 7.701E+00 | 0.000E+00 | 0.142  |
| U-235   | 2.930E+00  | 1.095E+01 | 1.427E+01 | 0.000E+00 | 0.205  |
| U-238   | 1.172E+02  | 1.277E+02 | 2.147E+02 | 0.000E+00 | 0.546  |
| AM-241  | 4.402E+00  | 1.187E+01 | 1.665E+01 | 0.000E+00 | 0.264  |

| A,07L29321-2R1 | ,07/28/2006 | 09:15,07/17/2006 | 09:35,      | 3.075E+00,L29321-2R1 | WG     |
|----------------|-------------|------------------|-------------|----------------------|--------|
| B,07L29321-2R1 | ,LIBD       |                  | ,07/24/2006 | 09:06,073L082504     |        |
| C,BE-7         | ,NO         | 1.327E+00,       | 1.108E+01,  | 1.815E+01,,          | 0.073  |
| C,K-40         | ,NO         | 1.318E+01,       | 1.934E+01,  | 3.104E+01,,          | 0.425  |
| C,CR-51        | ,NO         | -1.153E+01,      | 1.280E+01,  | 2.044E+01,,          | -0.564 |
| C,MN-54        | ,NO         | 9.921E-01,       | 1.187E+00,  | 2.008E+00,,          | 0.494  |
| C,CO-57        | ,NO         | -7.565E-01,      | 1.125E+00,  | 1.835E+00,,          | -0.412 |
| C,CO-58        | ,NO         | -6.020E-01,      | 1.231E+00,  | 2.012E+00,,          | -0.299 |
| C,FE-59        | ,NO         | 2.845E+00,       | 2.573E+00,  | 4.409E+00,,          | 0.645  |
| C,CO-60        | ,NO         | 5.603E-01,       | 1.196E+00,  | 1.988E+00,,          | 0.282  |
| C,ZN-65        | ,NO         | 4.478E+00,       | 2.534E+00,  | 4.420E+00,,          | 1.013  |
| C,SE-75        | ,NO         | 3.000E-02,       | 1.601E+00,  | 2.628E+00,,          | 0.011  |
| C,SR-85        | ,NO         | 2.055E+01,       | 1.575E+00,  | 3.085E+00,,          | 6.663  |
| C,Y-88         | ,NO         | -1.062E+00,      | 1.332E+00,  | 2.122E+00,,          | -0.500 |
| C,NB-94        | ,NO         | 3.461E-01,       | 1.185E+00,  | 1.951E+00,,          | 0.177  |
| C,NB-95        | ,NO         | 1.002E+00,       | 1.265E+00,  | 2.101E+00,,          | 0.477  |
| C,ZR-95        | ,NO         | -2.300E+00,      | 2.216E+00,  | 3.493E+00,,          | -0.658 |
| C,MO-99        | ,NO         | -1.987E+01,      | 1.223E+02,  | 1.984E+02,,          | -0.100 |
| C,RU-103       | ,NO         | 1.634E+00,       | 1.408E+00,  | 2.352E+00,,          | 0.695  |
| C,RU-106       | ,NO         | -1.122E+00,      | 1.091E+01,  | 1.794E+01,,          | -0.063 |
| C,AG-110m      | ,NO         | -5.479E-01,      | 1.179E+00,  | 1.912E+00,,          | -0.287 |
| C,SN-113       | ,NO         | 1.259E+00,       | 1.528E+00,  | 2.566E+00,,          | 0.491  |
| C,SB-124       | ,NO         | 2.291E+00,       | 2.745E+00,  | 2.107E+00,,          | 1.087  |
| C,SB-125       | ,NO         | 2.061E+00,       | 3.318E+00,  | 5.525E+00,,          | 0.373  |
| C,TE-129M      | ,NO         | 1.686E+00,       | 1.596E+01,  | 2.618E+01,,          | 0.064  |
| C,I-131        | ,NO         | -9.018E-01,      | 2.784E+00,  | 4.592E+00,,          | -0.196 |
| C,BA-133       | ,NO         | 2.888E+00,       | 1.633E+00,  | 2.796E+00,,          | 1.033  |
| C,CS-134       | ,NO         | 5.962E+00,       | 2.510E+00,  | 2.172E+00,,          | 2.745  |
| C,CS-136       | ,NO         | 1.444E+00,       | 1.912E+00,  | 3.235E+00,,          | 0.446  |
| C,CS-137       | ,NO         | -3.877E-01,      | 1.287E+00,  | 2.096E+00,,          | -0.185 |
| C,CE-139       | ,NO         | 7.532E-01,       | 1.187E+00,  | 1.909E+00,,          | 0.395  |
| C,BA-140       | ,NO         | 6.169E+00,       | 6.999E+00,  | 1.188E+01,,          | 0.519  |
| C,LA-140       | ,NO         | -1.908E+00,      | 2.340E+00,  | 3.712E+00,,          | -0.514 |
| C,CE-141       | ,NO         | -9.986E-01,      | 2.963E+00,  | 3.807E+00,,          | -0.262 |
| C,CE-144       | ,NO         | -9.689E+00,      | 1.024E+01,  | 1.404E+01,,          | -0.690 |
| C,EU-152       | ,NO         | -1.827E+01,      | 3.767E+00,  | 5.746E+00,,          | -3.180 |
| C,EU-154       | ,NO         | -8.917E-01,      | 2.314E+00,  | 3.787E+00,,          | -0.235 |
| C,RA-226       | ,NO         | 1.697E+00,       | 3.227E+01,  | 4.761E+01,,          | 0.036  |
| C,AC-228       | ,NO         | 1.095E+00,       | 5.789E+00,  | 7.728E+00,,          | 0.142  |
| C,TH-228       | ,NO         | 3.003E+00,       | 2.378E+00,  | 3.813E+00,,          | 0.788  |
| C,TH-232       | ,NO         | 1.091E+00,       | 5.769E+00,  | 7.701E+00,,          | 0.142  |
| C,U-235        | ,NO         | 2.930E+00,       | 1.095E+01,  | 1.427E+01,,          | 0.205  |
| C,U-238        | ,NO         | 1.172E+02,       | 1.277E+02,  | 2.147E+02,,          | 0.546  |
| C,AM-241       | ,NO         | 4.402E+00,       | 1.187E+01,  | 1.665E+01,,          | 0.264  |



Summary of Nuclide Activity

Sample ID : 13L29321-3

Acquisition date : 21-JUL-2006 13:43:20

|   |   |       |
|---|---|-------|
| Total number of lines in spectrum             | 9 |       |
| Number of unidentified lines                  | 9 |       |
| Number of lines tentatively identified by NID | 0 | 0.00% |

\*\*\*\* There are no nuclides meeting summary criteria \*\*\*\*

Flags: "K" = Keyline not found

"M" = Manually accepted

"E" = Manually edited

"A" = Nuclide specific abn. limit

| It | Energy  | Area | Bkgnd | FWHM | Channel | Left | Pw | Cts/Sec  | %Err | %Eff     | Flags |
|----|---------|------|-------|------|---------|------|----|----------|------|----------|-------|
| 1  | 63.73   | 90   | 472   | 4.22 | 127.68  | 121  | 16 | 1.15E-02 | **** | 6.35E-01 |       |
| 1  | 198.26  | 64   | 206   | 1.80 | 396.75  | 393  | 9  | 8.16E-03 | 86.6 | 1.90E+00 |       |
| 1  | 295.24  | 33   | 90    | 1.32 | 590.76  | 587  | 8  | 4.23E-03 | **** | 1.52E+00 |       |
| 1  | 352.06  | 52   | 93    | 1.84 | 704.46  | 700  | 10 | 6.55E-03 | 84.2 | 1.34E+00 |       |
| 1  | 594.98  | 108  | 67    | 5.25 | 1190.63 | 1187 | 15 | 1.38E-02 | 36.5 | 9.12E-01 |       |
| 1  | 609.28  | 23   | 90    | 1.58 | 1219.26 | 1213 | 12 | 2.91E-03 | **** | 8.96E-01 |       |
| 1  | 847.96  | 23   | 22    | 5.00 | 1697.19 | 1692 | 13 | 2.98E-03 | **** | 7.01E-01 |       |
| 1  | 1120.14 | 18   | 24    | 1.72 | 2242.45 | 2238 | 8  | 2.24E-03 | **** | 5.69E-01 |       |
| 1  | 1763.69 | 11   | 23    | 5.43 | 3532.80 | 3525 | 15 | 1.40E-03 | **** | 4.11E-01 |       |

Flags: "T" = Tentatively associated

Summary of Nuclide Activity

Total number of lines in spectrum 9  
 Number of unidentified lines 9  
 Number of lines tentatively identified by NID 0 0.00%  
 \*\*\*\* There are no nuclides meeting summary criteria \*\*\*\*

Flags: "K" = Keyline not found "M" = Manually accepted  
 "E" = Manually edited "A" = Nuclide specific abn. limit

Interference Report

No interference correction performed

Combined Activity-MDA Report

---- Non-Identified Nuclides ----

| Nuclide | Key-Line Activity (pCi/L) | K.L. Ided | Act error | MDA (pCi/L) | MDA error | Act/MDA |
|---------|---------------------------|-----------|-----------|-------------|-----------|---------|
| BE-7    | -2.139E+01                |           | 2.907E+01 | 4.508E+01   | 0.000E+00 | -0.474  |
| NA-24   | -1.077E+02                |           | 3.679E+02 | 5.807E+02   | 0.000E+00 | -0.185  |
| K-40    | -4.555E+01                |           | 5.008E+01 | 9.407E+01   | 0.000E+00 | -0.484  |
| CR-51   | -2.716E+01                |           | 3.065E+01 | 4.717E+01   | 0.000E+00 | -0.576  |
| MN-54   | 4.584E-01                 |           | 3.417E+00 | 5.722E+00   | 0.000E+00 | 0.080   |
| CO-57   | 1.094E+00                 |           | 3.181E+00 | 5.273E+00   | 0.000E+00 | 0.207   |
| CO-58   | 2.216E+00                 |           | 3.526E+00 | 6.130E+00   | 0.000E+00 | 0.362   |
| FE-59   | 8.338E-01                 |           | 6.618E+00 | 1.112E+01   | 0.000E+00 | 0.075   |
| CO-60   | 1.087E+00                 |           | 3.538E+00 | 5.985E+00   | 0.000E+00 | 0.182   |
| ZN-65   | 7.318E+00                 |           | 9.363E+00 | 1.434E+01   | 0.000E+00 | 0.510   |
| SE-75   | -1.784E+00                |           | 4.526E+00 | 7.265E+00   | 0.000E+00 | -0.246  |
| SR-85   | 1.466E+01                 |           | 4.377E+00 | 8.167E+00   | 0.000E+00 | 1.794   |
| Y-88    | -5.502E-01                |           | 3.632E+00 | 5.784E+00   | 0.000E+00 | -0.095  |
| NB-94   | -2.191E+00                |           | 3.437E+00 | 5.357E+00   | 0.000E+00 | -0.409  |
| NB-95   | -4.223E-01                |           | 3.549E+00 | 5.711E+00   | 0.000E+00 | -0.074  |
| ZR-95   | 1.712E+00                 |           | 5.798E+00 | 9.665E+00   | 0.000E+00 | 0.177   |
| MO-99   | 5.390E+01                 |           | 6.928E+01 | 1.199E+02   | 0.000E+00 | 0.449   |
| RU-103  | 2.703E+00                 |           | 3.827E+00 | 6.486E+00   | 0.000E+00 | 0.417   |
| RU-106  | -1.418E+01                |           | 3.244E+01 | 5.187E+01   | 0.000E+00 | -0.273  |

|         |            |           |           |           |        |
|---------|------------|-----------|-----------|-----------|--------|
| AG-110m | -5.290E-01 | 3.228E+00 | 5.236E+00 | 0.000E+00 | -0.101 |
| SN-113  | 8.167E-01  | 4.503E+00 | 7.509E+00 | 0.000E+00 | 0.109  |
| SB-124  | 1.061E+00  | 7.423E+00 | 5.721E+00 | 0.000E+00 | 0.185  |
| SB-125  | -2.947E+00 | 9.317E+00 | 1.500E+01 | 0.000E+00 | -0.196 |
| TE-129M | 3.686E+01  | 4.326E+01 | 7.416E+01 | 0.000E+00 | 0.497  |
| I-131   | -2.688E+00 | 4.636E+00 | 7.445E+00 | 0.000E+00 | -0.361 |
| BA-133  | 4.521E+00  | 5.230E+00 | 7.881E+00 | 0.000E+00 | 0.574  |
| CS-134  | 5.482E+00  | 7.282E+00 | 6.399E+00 | 0.000E+00 | 0.857  |
| CS-136  | -1.316E+00 | 4.074E+00 | 6.586E+00 | 0.000E+00 | -0.200 |
| CS-137  | 3.504E-01  | 3.668E+00 | 6.043E+00 | 0.000E+00 | 0.058  |
| CE-139  | 1.553E+00  | 3.443E+00 | 5.646E+00 | 0.000E+00 | 0.275  |
| BA-140  | -1.674E+00 | 1.528E+01 | 2.528E+01 | 0.000E+00 | -0.066 |
| LA-140  | -1.117E+00 | 4.863E+00 | 7.795E+00 | 0.000E+00 | -0.143 |
| CE-141  | -7.042E-01 | 6.252E+00 | 1.011E+01 | 0.000E+00 | -0.070 |
| CE-144  | -1.372E+01 | 2.546E+01 | 4.067E+01 | 0.000E+00 | -0.337 |
| EU-152  | -1.069E+01 | 1.222E+01 | 1.739E+01 | 0.000E+00 | -0.614 |
| EU-154  | -1.434E-01 | 6.710E+00 | 1.097E+01 | 0.000E+00 | -0.013 |
| RA-226  | 2.467E+01  | 8.582E+01 | 1.495E+02 | 0.000E+00 | 0.165  |
| AC-228  | -4.857E+00 | 1.393E+01 | 2.323E+01 | 0.000E+00 | -0.209 |
| TH-228  | -5.543E-01 | 6.446E+00 | 1.093E+01 | 0.000E+00 | -0.051 |
| TH-232  | -4.850E+00 | 1.391E+01 | 2.320E+01 | 0.000E+00 | -0.209 |
| U-235   | -1.409E+01 | 2.638E+01 | 4.206E+01 | 0.000E+00 | -0.335 |
| U-238   | 2.697E+01  | 3.982E+02 | 6.588E+02 | 0.000E+00 | 0.041  |
| AM-241  | 4.753E+01  | 3.126E+01 | 4.731E+01 | 0.000E+00 | 1.005  |

A,13L29321-3 ,07/21/2006 15:54,07/17/2006 10:45, 3.547E+00,L29321-3 WG ZI  
 B,13L29321-3 ,LIBD ,07/19/2006 10:01,1335L090904

|           |     |               |            |             |        |
|-----------|-----|---------------|------------|-------------|--------|
| C,BE-7    | ,NO | , -2.139E+01, | 2.907E+01, | 4.508E+01,, | -0.474 |
| C,NA-24   | ,NO | , -1.077E+02, | 3.679E+02, | 5.807E+02,, | -0.185 |
| C,K-40    | ,NO | , -4.555E+01, | 5.008E+01, | 9.407E+01,, | -0.484 |
| C,CR-51   | ,NO | , -2.716E+01, | 3.065E+01, | 4.717E+01,, | -0.576 |
| C,MN-54   | ,NO | , 4.584E-01,  | 3.417E+00, | 5.722E+00,, | 0.080  |
| C,CO-57   | ,NO | , 1.094E+00,  | 3.181E+00, | 5.273E+00,, | 0.207  |
| C,CO-58   | ,NO | , 2.216E+00,  | 3.526E+00, | 6.130E+00,, | 0.362  |
| C,FE-59   | ,NO | , 8.338E-01,  | 6.618E+00, | 1.112E+01,, | 0.075  |
| C,CO-60   | ,NO | , 1.087E+00,  | 3.538E+00, | 5.985E+00,, | 0.182  |
| C,ZN-65   | ,NO | , 7.318E+00,  | 9.363E+00, | 1.434E+01,, | 0.510  |
| C,SE-75   | ,NO | , -1.784E+00, | 4.526E+00, | 7.265E+00,, | -0.246 |
| C,SR-85   | ,NO | , 1.466E+01,  | 4.377E+00, | 8.167E+00,, | 1.794  |
| C,Y-88    | ,NO | , -5.502E-01, | 3.632E+00, | 5.784E+00,, | -0.095 |
| C,NB-94   | ,NO | , -2.191E+00, | 3.437E+00, | 5.357E+00,, | -0.409 |
| C,NB-95   | ,NO | , -4.223E-01, | 3.549E+00, | 5.711E+00,, | -0.074 |
| C,ZR-95   | ,NO | , 1.712E+00,  | 5.798E+00, | 9.665E+00,, | 0.177  |
| C,MO-99   | ,NO | , 5.390E+01,  | 6.928E+01, | 1.199E+02,, | 0.449  |
| C,RU-103  | ,NO | , 2.703E+00,  | 3.827E+00, | 6.486E+00,, | 0.417  |
| C,RU-106  | ,NO | , -1.418E+01, | 3.244E+01, | 5.187E+01,, | -0.273 |
| C,AG-110m | ,NO | , -5.290E-01, | 3.228E+00, | 5.236E+00,, | -0.101 |
| C,SN-113  | ,NO | , 8.167E-01,  | 4.503E+00, | 7.509E+00,, | 0.109  |
| C,SB-124  | ,NO | , 1.061E+00,  | 7.423E+00, | 5.721E+00,, | 0.185  |
| C,SB-125  | ,NO | , -2.947E+00, | 9.317E+00, | 1.500E+01,, | -0.196 |
| C,TE-129M | ,NO | , 3.686E+01,  | 4.326E+01, | 7.416E+01,, | 0.497  |
| C,I-131   | ,NO | , -2.688E+00, | 4.636E+00, | 7.445E+00,, | -0.361 |
| C,BA-133  | ,NO | , 4.521E+00,  | 5.230E+00, | 7.881E+00,, | 0.574  |
| C,CS-134  | ,NO | , 5.482E+00,  | 7.282E+00, | 6.399E+00,, | 0.857  |
| C,CS-136  | ,NO | , -1.316E+00, | 4.074E+00, | 6.586E+00,, | -0.200 |
| C,CS-137  | ,NO | , 3.504E-01,  | 3.668E+00, | 6.043E+00,, | 0.058  |
| C,CE-139  | ,NO | , 1.553E+00,  | 3.443E+00, | 5.646E+00,, | 0.275  |
| C,BA-140  | ,NO | , -1.674E+00, | 1.528E+01, | 2.528E+01,, | -0.066 |
| C,LA-140  | ,NO | , -1.117E+00, | 4.863E+00, | 7.795E+00,, | -0.143 |
| C,CE-141  | ,NO | , -7.042E-01, | 6.252E+00, | 1.011E+01,, | -0.070 |
| C,CE-144  | ,NO | , -1.372E+01, | 2.546E+01, | 4.067E+01,, | -0.337 |
| C,EU-152  | ,NO | , -1.069E+01, | 1.222E+01, | 1.739E+01,, | -0.614 |
| C,EU-154  | ,NO | , -1.434E-01, | 6.710E+00, | 1.097E+01,, | -0.013 |
| C,RA-226  | ,NO | , 2.467E+01,  | 8.582E+01, | 1.495E+02,, | 0.165  |
| C,AC-228  | ,NO | , -4.857E+00, | 1.393E+01, | 2.323E+01,, | -0.209 |
| C,TH-228  | ,NO | , -5.543E-01, | 6.446E+00, | 1.093E+01,, | -0.051 |
| C,TH-232  | ,NO | , -4.850E+00, | 1.391E+01, | 2.320E+01,, | -0.209 |
| C,U-235   | ,NO | , -1.409E+01, | 2.638E+01, | 4.206E+01,, | -0.335 |
| C,U-238   | ,NO | , 2.697E+01,  | 3.982E+02, | 6.588E+02,, | 0.041  |
| C,AM-241  | ,NO | , 4.753E+01,  | 3.126E+01, | 4.731E+01,, | 1.005  |



Sec. Review: Analyst: LIMS: \_\_\_\_\_

VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 21-JUL-2006 15:55:45.47  
TBE23 03017322 HpGe \*\*\*\*\* Aquisition Date/Time: 21-JUL-2006 13:43:22.18

LIMS No., Customer Name, Client ID: L29321-4 WG ZION

Sample ID : 23L29321-4 Smple Date: 17-JUL-2006 11:30:00.  
Sample Type : WG Geometry : 2335L090704  
Quantity : 3.56260E+00 L BKGFILE : 23BG070106MT  
Start Channel : 50 Energy Tol : 1.50000 Real Time : 0 02:12:06.53  
End Channel : 4090 Pk Srch Sens: 5.00000 Live time : 0 02:12:01.06  
MDA Constant : 0.00 Library Used: LIBD

| Pk | It | Energy   | Area | Bkgnd | FWHM | Channel | %Eff     | Cts/Sec  | %Err  | Fit      |
|----|----|----------|------|-------|------|---------|----------|----------|-------|----------|
| 1  | 0  | 63.23*   | 26   | 215   | 1.38 | 126.67  | 9.39E-01 | 3.28E-03 | 98.7  | 0.00E+00 |
| 2  | 0  | 185.72*  | 19   | 420   | 1.40 | 371.36  | 1.95E+00 | 2.36E-03 | 246.9 |          |
| 3  | 0  | 198.49   | 117  | 290   | 1.22 | 396.87  | 1.90E+00 | 1.47E-02 | 30.9  |          |
| 4  | 0  | 295.18*  | 59   | 146   | 1.57 | 590.08  | 1.50E+00 | 7.39E-03 | 42.5  |          |
| 5  | 0  | 352.39*  | 84   | 145   | 1.56 | 704.42  | 1.32E+00 | 1.06E-02 | 33.8  |          |
| 6  | 0  | 609.09*  | 98   | 54    | 1.62 | 1217.59 | 8.59E-01 | 1.24E-02 | 19.5  |          |
| 7  | 0  | 1460.91* | 12   | 6     | 2.12 | 2922.10 | 4.59E-01 | 1.57E-03 | 92.9  |          |
| 8  | 0  | 1764.21* | 27   | 0     | 2.09 | 3529.67 | 4.01E-01 | 3.39E-03 | 26.1  |          |

Flag: "\*" = Peak area was modified by background subtraction

### Nuclide Line Activity Report

Nuclide Type: natural

| Nuclide | Energy  | Area | %Abn   | %Eff      | Uncorrected pCi/L | Decay Corr pCi/L | 2-Sigma %Error |
|---------|---------|------|--------|-----------|-------------------|------------------|----------------|
| K-40    | 1460.81 | 12   | 10.67* | 4.594E-01 | 2.425E+01         | 2.425E+01        | 185.87         |
| RA-226  | 186.21  | 19   | 3.28*  | 1.947E+00 | 2.801E+01         | 2.801E+01        | 493.89         |

Flag: "\*" = Keyline

Summary of Nuclide Activity

Sample ID : 23L29321-4

Acquisition date : 21-JUL-2006 13:43:22

Total number of lines in spectrum 8  
 Number of unidentified lines 6  
 Number of lines tentatively identified by NID 2 25.00%

Nuclide Type : natural

| Nuclide          | Hlife     | Decay | Uncorrected<br>pCi/L | Decay Corr<br>pCi/L | Decay Corr<br>2-Sigma Error | 2-Sigma<br>%Error | Flags |
|------------------|-----------|-------|----------------------|---------------------|-----------------------------|-------------------|-------|
| K-40             | 1.28E+09Y | 1.00  | 2.425E+01            | 2.425E+01           | 4.507E+01                   | 185.87            |       |
| RA-226           | 1600.00Y  | 1.00  | 2.801E+01            | 2.801E+01           | 13.83E+01                   | 493.89            |       |
| Total Activity : |           |       | 5.226E+01            | 5.226E+01           |                             |                   |       |

Grand Total Activity : 5.226E+01 5.226E+01

Flags: "K" = Keyline not found  
 "E" = Manually edited

"M" = Manually accepted  
 "A" = Nuclide specific abn. limit

| It | Energy  | Area | Bkgnd | FWHM | Channel | Left | Pw | Cts/Sec  | %Err | %Eff     | Flags |
|----|---------|------|-------|------|---------|------|----|----------|------|----------|-------|
| 0  | 63.23   | 26   | 215   | 1.38 | 126.67  | 124  | 6  | 3.28E-03 | **** | 9.39E-01 |       |
| 0  | 198.49  | 117  | 290   | 1.22 | 396.87  | 391  | 12 | 1.47E-02 | 61.8 | 1.90E+00 |       |
| 0  | 295.18  | 59   | 146   | 1.57 | 590.08  | 584  | 10 | 7.39E-03 | 84.9 | 1.50E+00 |       |
| 0  | 352.39  | 84   | 145   | 1.56 | 704.42  | 696  | 14 | 1.06E-02 | 67.7 | 1.32E+00 |       |
| 0  | 609.09  | 98   | 54    | 1.62 | 1217.59 | 1211 | 12 | 1.24E-02 | 39.0 | 8.59E-01 |       |
| 0  | 1764.21 | 27   | 0     | 2.09 | 3529.67 | 3524 | 13 | 3.39E-03 | 52.2 | 4.01E-01 |       |

Flags: "T" = Tentatively associated

Summary of Nuclide Activity

Total number of lines in spectrum 8  
 Number of unidentified lines 6  
 Number of lines tentatively identified by NID 2 25.00%

Nuclide Type : natural

| Nuclide          | Hlife     | Decay | Wtd Mean<br>Uncorrected<br>pCi/L | Wtd Mean<br>Decay Corr<br>pCi/L | Decay Corr<br>2-Sigma Error | 2-Sigma<br>%Error | Flags |
|------------------|-----------|-------|----------------------------------|---------------------------------|-----------------------------|-------------------|-------|
| K-40             | 1.28E+09Y | 1.00  | 2.425E+01                        | 2.425E+01                       | 4.507E+01                   | 185.87            |       |
| RA-226           | 1600.00Y  | 1.00  | 2.801E+01                        | 2.801E+01                       | 13.83E+01                   | 493.89            |       |
| Total Activity : |           |       | 5.226E+01                        | 5.226E+01                       |                             |                   |       |

Grand Total Activity : 5.226E+01 5.226E+01

Flags: "K" = Keyline not found "M" = Manually accepted  
 "E" = Manually edited "A" = Nuclide specific abn. limit

Interference Report

No interference correction performed

Combined Activity-MDA Report

---- Identified Nuclides ----

| Nuclide | Activity<br>(pCi/L) | Act error | MDA<br>(pCi/L) | MDA error | Act/MDA |
|---------|---------------------|-----------|----------------|-----------|---------|
| K-40    | 2.425E+01           | 4.507E+01 | 5.692E+01      | 0.000E+00 | 0.426   |
| RA-226  | 2.801E+01           | 1.383E+02 | 1.615E+02      | 0.000E+00 | 0.173   |

---- Non-Identified Nuclides ----

| Nuclide | Key-Line<br>Activity<br>(pCi/L) | K.L.<br>Ided | Act error | MDA<br>(pCi/L) | MDA error | Act/MDA |
|---------|---------------------------------|--------------|-----------|----------------|-----------|---------|
| BE-7    | -1.218E+01                      |              | 2.915E+01 | 4.927E+01      | 0.000E+00 | -0.247  |
| NA-24   | -5.503E+01                      |              | 3.426E+02 | 6.116E+02      | 0.000E+00 | -0.090  |
| CR-51   | -2.468E+01                      |              | 3.367E+01 | 5.509E+01      | 0.000E+00 | -0.448  |

|         |            |           |           |           |        |
|---------|------------|-----------|-----------|-----------|--------|
| MN-54   | 4.144E+00  | 3.620E+00 | 6.834E+00 | 0.000E+00 | 0.606  |
| CO-57   | -1.562E+00 | 3.900E+00 | 6.476E+00 | 0.000E+00 | -0.241 |
| CO-58   | 2.493E-01  | 3.532E+00 | 6.221E+00 | 0.000E+00 | 0.040  |
| FE-59   | -4.749E-01 | 6.608E+00 | 1.169E+01 | 0.000E+00 | -0.041 |
| CO-60   | 6.815E-01  | 3.501E+00 | 6.355E+00 | 0.000E+00 | 0.107  |
| ZN-65   | -4.356E-01 | 7.276E+00 | 1.285E+01 | 0.000E+00 | -0.034 |
| SE-75   | 9.380E-01  | 5.022E+00 | 8.604E+00 | 0.000E+00 | 0.109  |
| SR-85   | 1.385E+01  | 4.039E+00 | 7.985E+00 | 0.000E+00 | 1.735  |
| Y-88    | -2.825E-01 | 3.934E+00 | 7.155E+00 | 0.000E+00 | -0.039 |
| NB-94   | -1.787E-01 | 3.140E+00 | 5.510E+00 | 0.000E+00 | -0.032 |
| NB-95   | 2.795E+00  | 3.602E+00 | 6.649E+00 | 0.000E+00 | 0.420  |
| ZR-95   | -4.065E+00 | 5.939E+00 | 9.889E+00 | 0.000E+00 | -0.411 |
| MO-99   | 1.039E+01  | 6.683E+01 | 1.195E+02 | 0.000E+00 | 0.087  |
| RU-103  | 1.151E+00  | 3.666E+00 | 6.456E+00 | 0.000E+00 | 0.178  |
| RU-106  | -4.765E+01 | 3.298E+01 | 5.060E+01 | 0.000E+00 | -0.942 |
| AG-110m | 4.373E-01  | 3.407E+00 | 6.054E+00 | 0.000E+00 | 0.072  |
| SN-113  | 1.185E+00  | 4.510E+00 | 7.946E+00 | 0.000E+00 | 0.149  |
| SB-124  | -2.950E+00 | 4.940E+00 | 6.716E+00 | 0.000E+00 | -0.439 |
| SB-125  | -4.431E+00 | 9.686E+00 | 1.640E+01 | 0.000E+00 | -0.270 |
| TE-129M | -1.301E+01 | 4.312E+01 | 7.335E+01 | 0.000E+00 | -0.177 |
| I-131   | 2.659E+00  | 5.153E+00 | 8.940E+00 | 0.000E+00 | 0.297  |
| BA-133  | 3.517E+00  | 6.080E+00 | 9.033E+00 | 0.000E+00 | 0.389  |
| CS-134  | 3.731E+00  | 5.117E+00 | 7.735E+00 | 0.000E+00 | 0.482  |
| CS-136  | -1.415E+00 | 4.069E+00 | 6.941E+00 | 0.000E+00 | -0.204 |
| CS-137  | 1.096E+00  | 3.692E+00 | 6.641E+00 | 0.000E+00 | 0.165  |
| CE-139  | -1.868E+00 | 3.927E+00 | 6.436E+00 | 0.000E+00 | -0.290 |
| BA-140  | -2.450E+00 | 1.477E+01 | 2.526E+01 | 0.000E+00 | -0.097 |
| LA-140  | 4.560E+00  | 5.009E+00 | 9.845E+00 | 0.000E+00 | 0.463  |
| CE-141  | -5.713E+00 | 7.276E+00 | 1.187E+01 | 0.000E+00 | -0.481 |
| CE-144  | -1.658E+01 | 3.022E+01 | 4.981E+01 | 0.000E+00 | -0.333 |
| EU-152  | -5.254E+00 | 1.397E+01 | 1.942E+01 | 0.000E+00 | -0.271 |
| EU-154  | 1.318E+00  | 8.072E+00 | 1.362E+01 | 0.000E+00 | 0.097  |
| AC-228  | -8.539E+00 | 1.174E+01 | 1.970E+01 | 0.000E+00 | -0.434 |
| TH-228  | 6.994E+00  | 6.973E+00 | 1.226E+01 | 0.000E+00 | 0.571  |
| TH-232  | -8.528E+00 | 1.172E+01 | 1.967E+01 | 0.000E+00 | -0.434 |
| U-235   | -7.902E+00 | 3.084E+01 | 5.083E+01 | 0.000E+00 | -0.155 |
| U-238   | -9.627E+01 | 3.605E+02 | 6.410E+02 | 0.000E+00 | -0.150 |
| AM-241  | -7.768E+00 | 2.336E+01 | 3.248E+01 | 0.000E+00 | -0.239 |

| A, 23L29321-4 |        | , 07/21/2006 15:55, 07/17/2006 11:30, |            | 3.563E+00, L29321-4 WG ZI       |        |
|---------------|--------|---------------------------------------|------------|---------------------------------|--------|
| B, 23L29321-4 |        | , LIBD                                |            | , 07/21/2006 13:20, 2335L090704 |        |
| C, K-40       | , YES, | 2.425E+01,                            | 4.507E+01, | 5.692E+01,,                     | 0.426  |
| C, RA-226     | , YES, | 2.801E+01,                            | 1.383E+02, | 1.615E+02,,                     | 0.173  |
| C, BE-7       | , NO , | -1.218E+01,                           | 2.915E+01, | 4.927E+01,,                     | -0.247 |
| C, NA-24      | , NO , | -5.503E+01,                           | 3.426E+02, | 6.116E+02,,                     | -0.090 |
| C, CR-51      | , NO , | -2.468E+01,                           | 3.367E+01, | 5.509E+01,,                     | -0.448 |
| C, MN-54      | , NO , | 4.144E+00,                            | 3.620E+00, | 6.834E+00,,                     | 0.606  |
| C, CO-57      | , NO , | -1.562E+00,                           | 3.900E+00, | 6.476E+00,,                     | -0.241 |
| C, CO-58      | , NO , | 2.493E-01,                            | 3.532E+00, | 6.221E+00,,                     | 0.040  |
| C, FE-59      | , NO , | -4.749E-01,                           | 6.608E+00, | 1.169E+01,,                     | -0.041 |
| C, CO-60      | , NO , | 6.815E-01,                            | 3.501E+00, | 6.355E+00,,                     | 0.107  |
| C, ZN-65      | , NO , | -4.356E-01,                           | 7.276E+00, | 1.285E+01,,                     | -0.034 |
| C, SE-75      | , NO , | 9.380E-01,                            | 5.022E+00, | 8.604E+00,,                     | 0.109  |
| C, SR-85      | , NO , | 1.385E+01,                            | 4.039E+00, | 7.985E+00,,                     | 1.735  |
| C, Y-88       | , NO , | -2.825E-01,                           | 3.934E+00, | 7.155E+00,,                     | -0.039 |
| C, NB-94      | , NO , | -1.787E-01,                           | 3.140E+00, | 5.510E+00,,                     | -0.032 |
| C, NB-95      | , NO , | 2.795E+00,                            | 3.602E+00, | 6.649E+00,,                     | 0.420  |
| C, ZR-95      | , NO , | -4.065E+00,                           | 5.939E+00, | 9.889E+00,,                     | -0.411 |
| C, MO-99      | , NO , | 1.039E+01,                            | 6.683E+01, | 1.195E+02,,                     | 0.087  |
| C, RU-103     | , NO , | 1.151E+00,                            | 3.666E+00, | 6.456E+00,,                     | 0.178  |
| C, RU-106     | , NO , | -4.765E+01,                           | 3.298E+01, | 5.060E+01,,                     | -0.942 |
| C, AG-110m    | , NO , | 4.373E-01,                            | 3.407E+00, | 6.054E+00,,                     | 0.072  |
| C, SN-113     | , NO , | 1.185E+00,                            | 4.510E+00, | 7.946E+00,,                     | 0.149  |
| C, SB-124     | , NO , | -2.950E+00,                           | 4.940E+00, | 6.716E+00,,                     | -0.439 |
| C, SB-125     | , NO , | -4.431E+00,                           | 9.686E+00, | 1.640E+01,,                     | -0.270 |
| C, TE-129M    | , NO , | -1.301E+01,                           | 4.312E+01, | 7.335E+01,,                     | -0.177 |
| C, I-131      | , NO , | 2.659E+00,                            | 5.153E+00, | 8.940E+00,,                     | 0.297  |
| C, BA-133     | , NO , | 3.517E+00,                            | 6.080E+00, | 9.033E+00,,                     | 0.389  |
| C, CS-134     | , NO , | 3.731E+00,                            | 5.117E+00, | 7.735E+00,,                     | 0.482  |
| C, CS-136     | , NO , | -1.415E+00,                           | 4.069E+00, | 6.941E+00,,                     | -0.204 |
| C, CS-137     | , NO , | 1.096E+00,                            | 3.692E+00, | 6.641E+00,,                     | 0.165  |
| C, CE-139     | , NO , | -1.868E+00,                           | 3.927E+00, | 6.436E+00,,                     | -0.290 |
| C, BA-140     | , NO , | -2.450E+00,                           | 1.477E+01, | 2.526E+01,,                     | -0.097 |
| C, LA-140     | , NO , | 4.560E+00,                            | 5.009E+00, | 9.845E+00,,                     | 0.463  |
| C, CE-141     | , NO , | -5.713E+00,                           | 7.276E+00, | 1.187E+01,,                     | -0.481 |
| C, CE-144     | , NO , | -1.658E+01,                           | 3.022E+01, | 4.981E+01,,                     | -0.333 |
| C, EU-152     | , NO , | -5.254E+00,                           | 1.397E+01, | 1.942E+01,,                     | -0.271 |
| C, EU-154     | , NO , | 1.318E+00,                            | 8.072E+00, | 1.362E+01,,                     | 0.097  |
| C, AC-228     | , NO , | -8.539E+00,                           | 1.174E+01, | 1.970E+01,,                     | -0.434 |
| C, TH-228     | , NO , | 6.994E+00,                            | 6.973E+00, | 1.226E+01,,                     | 0.571  |
| C, TH-232     | , NO , | -8.528E+00,                           | 1.172E+01, | 1.967E+01,,                     | -0.434 |
| C, U-235      | , NO , | -7.902E+00,                           | 3.084E+01, | 5.083E+01,,                     | -0.155 |
| C, U-238      | , NO , | -9.627E+01,                           | 3.605E+02, | 6.410E+02,,                     | -0.150 |
| C, AM-241     | , NO , | -7.768E+00,                           | 2.336E+01, | 3.248E+01,,                     | -0.239 |



2508 Quality Lane  
Knoxville, TN 37931  
865-690-6819 (Phone)

**Work Order #: L29402 R1**

**Exelon**

**August 1, 2006**



Kathy Shaw  
Conestoga-Rovers & Associates  
45 Farmington Valley Road  
Plainville CT 06062

**Case Narrative - L29402**  
**EX001-3ESPZION-06**

08/01/2006 16:32

**Sample Receipt**

The following samples were received on July 28, 2006 in good condition, unless otherwise noted.

CRA submitted a revised chain of custody on July 31, 2006 with corrected client IDs.

**Revision 1:**

CRA submitted a second revised chain of custody on August 1, 2006 with corrected sample IDs. Report is revised to contain corrected sample IDs.

*Cross Reference Table*

| Client ID                     | Laboratory ID | Station ID(if applicable) |
|-------------------------------|---------------|---------------------------|
| WG-ZN-MW-ZN-10U-072806-MS-003 | L29402-1      |                           |
| WG-ZN-MW-ZN-10U-072806-MS-004 | L29402-2      |                           |
| WG-ZN-MW-ZN-10L-072806-MS-005 | L29402-3      |                           |
| WG-ZN-MW-ZN-11U-072806-TL-001 | L29402-4      |                           |
| WG-ZN-MW-ZN-11L-072806-TL-002 | L29402-5      |                           |

*Analytical Method Cross Reference Table*

| Radiological Parameter | TBE Knoxville Method | Reference Method |
|------------------------|----------------------|------------------|
| Gamma Spectrometry     | TBE-2007             | EPA 901.1        |
| H-3 (DIST)             | TBE-2010             |                  |
| TOTAL SR               | TBE-2018             | EPA 905.0        |



**TELEDYNE  
BROWN ENGINEERING, INC.**

A Teledyne Technologies Company  
2508 Quality Lane  
Knoxville, TN 37931-3133

**Case Narrative - L29402  
EX001-3ESPZION-06**

08/01/2006 16:32

**Gamma Spectroscopy**

**Quality Control**

Quality control samples were analyzed as WG4276.

**Duplicate Sample**

Duplicates were analyzed for the following samples. All duplicate results were within acceptance limits, unless otherwise noted.

| <u>Client ID</u>                | <u>Laboratory ID</u> | <u>QC Sample #</u> |
|---------------------------------|----------------------|--------------------|
| WG-ZION-MW-ZN-10U-072806-MS-003 | L29402-1             | WG4276-1           |

**H-3 (DIST)**

**Quality Control**

Quality control samples were analyzed as WG4273.

**Method Blank**

All blanks were within acceptance limits, unless otherwise noted.

**Laboratory Control Sample**

All laboratory control samples were within acceptance limits, unless otherwise noted.

**Duplicate Sample**

Duplicates were analyzed for the following samples. All duplicate results were within acceptance limits, unless otherwise noted.

| <u>Client ID</u>                | <u>Laboratory ID</u> | <u>QC Sample #</u> |
|---------------------------------|----------------------|--------------------|
| WG-ZION-MW-ZN-10U-072806-MS-003 | L29402-1             | WG4273-3           |





**Case Narrative - L29402  
EX001-3ESPZION-06**

08/01/2006 16:32

**TOTAL SR**

**Quality Control**

Quality control samples were analyzed as WG4278.

Method Blank

All blanks were within acceptance limits, unless otherwise noted.

Laboratory Control Sample

All laboratory control samples were within acceptance limits, unless otherwise noted.

Duplicate Sample

Duplicates were analyzed for the following samples. All duplicate results were within acceptance limits, unless otherwise noted.

| <u>Client ID</u>               | <u>Laboratory ID</u> | <u>QC Sample #</u> |
|--------------------------------|----------------------|--------------------|
| WG-QC-MW-QC-1111-072706-NZ-006 | L29389-6             | WG4278-3           |

**Certification**

This is to certify that Teledyne Brown Engineering - Environmental Services, located at 2508 Quality Lane, Knoxville, Tennessee, 37931, has analyzed, tested and documented samples as specified in the applicable purchase order.

This also certifies that requirements of applicable codes, standards and specifications have been fully met and that any quality assurance documentation which verified conformance to the purchase order is on file and may be examined upon request.

I hereby certify that the above statements are true and correct.

*R. Charles for K. Jeter*  
 \_\_\_\_\_  
 Keith Jeter  
 Operations Manager

# Sample Receipt Summary

07/31/06 08:36

SR #: SR09617

Client: Exelon

Project #: EX001-3ESPZION-06

LIMS #: L29402

Initiated By: PMARSHALL  
Init Date: 07/28/06 Receive Date: 07/28/06

**Notification of Variance**

Person Notified: Contacted By:  
Notify Date:  
Notify Method:  
Notify Comment:

**Client Response**

Person Responding:  
Response Date:  
Response Method:  
Response Comment

| Criteria   | Yes | No | NA | Comment                                       |
|--|-----|----|----|---|
| 1 Shipping container custody seals present and intact.             |     |    | NA |   |
| 2 Sample container custody seals present and intact.               |     |    | NA |   |
| 3 Sample containers received in good condition                     | Y   |    |    |   |
| 4 Chain of custody received with samples                           | Y   |    |    |   |
| 5 All samples listed on chain of custody received                  | Y   |    |    |   |
| 6 Sample container labels present and legible.                     | Y   |    |    |   |
| 7 Information on container labels correspond with chain of custody | Y   |    |    |   |
| 8 Sample(s) properly preserved and in appropriate container(s)     |     |    | NA |   |
| 9 Other (Describe)   |     |    | NA | Unpreserved and preserved containers provided |



7/31/06

TELEDYNE BROWN ENGINEERING  
2508 Quality Lane  
Knoxville, TN 37931-3133

## ACKNOWLEDGEMENT

This is not an invoice

Kathy Shaw  
Conestoga-Rovers & Associates  
45 Farmington Valley Road  
Plainville, CT 06062

July 31, 2006

The following sample(s) were received at Teledyne Brown Engineering Knoxville laboratory on July 28, 2006. The sample(s) have been scheduled for the analyses listed below and the report is scheduled for completion by July 31, 2006. Please review the following login information and pricing. Contact me if anything is incorrect or you have questions about the status of your sample(s).

Thank you for choosing Teledyne Brown Engineering for your analytical needs.

Sincerely,  
Rebecca Charles  
Project Manager  
(865)934-0379

Project ID: EX001-3ESPZION-06  
P.O. #: 00411203  
Release #:  
Contract#: 00411203  
Kathy Shaw, FAX#:860-747-1900, larry.walton@exeloncorp.com

| Client ID/<br>Station        | Laboratory ID<br>Analysis | Vol/Units<br>Price | Start Collect<br>Date/Time | End Collect<br>Date/Time |
|------------------------------|---------------------------|--------------------|----------------------------|--------------------------|
| WG-ZION-MW-ZN-10U-072806-MS- | L29402-1                  |                    | 07/28/06:0915              |                          |
| WG                           | GELI                      | 162.00             |                            |                          |
| WG                           | H-3 (DIST)                | 162.00             |                            |                          |
| WG                           | SR-90 (FAST)              | 210.00             |                            |                          |
| WG-ZION-MW-ZN-10U-072806-MS- | L29402-2                  |                    | 07/28/06:1000              |                          |
| WG                           | GELI                      | 162.00             |                            |                          |
| WG                           | H-3 (DIST)                | 162.00             |                            |                          |
| WG                           | SR-90 (FAST)              | 210.00             |                            |                          |
| WG-ZION-MW-ZN-10L-072806-MS- | L29402-3                  |                    | 07/28/06:1125              |                          |
| WG                           | GELI                      | 162.00             |                            |                          |
| WG                           | H-3 (DIST)                | 162.00             |                            |                          |
| WG                           | SR-90 (FAST)              | 210.00             |                            |                          |
| WG-ZION-MW-11-U-072806-TL-00 | L29402-4                  |                    | 07/28/06:1112              |                          |
| WG                           | GELI                      | 162.00             |                            |                          |
| WG                           | H-3 (DIST)                | 162.00             |                            |                          |
| WG                           | SR-90 (FAST)              | 210.00             |                            |                          |
| WG-ZION-MW-11-L-072806-TL-00 | L29402-5                  |                    | 07/28/06:0945              |                          |

| Client ID/<br>Station | Laboratory ID<br>Analysis | Vol/Units<br>Price | Start Collect<br>Date/Time | End Collect<br>Date/Time |
|-----------------------|---------------------------|--------------------|----------------------------|--------------------------|
| WG                    | GELI                      | 162.00             |                            |                          |
| WG                    | H-3 (DIST)                | 162.00             |                            |                          |
| WG                    | SR-90 (FAST)              | 210.00             |                            |                          |

---

End of document

**Charles, Rebecca**

---

**From:** Shaw, Kathy [kshaw@croworld.com]  
**Sent:** Monday, July 31, 2006 4:15 PM  
**To:** Charles, Rebecca  
**Cc:** Larry.Walton@exeloncorp.com; Reid, James  
**Subject:** RE: acknowledgements

Hi Rebecca,

I have attached a revised copy of the Zion COC with explanations on a couple of items. I made sample ID changes to samples 001 and 002, making them the same format as samples 003 - 005. Also, I added Gamma scan to the column with SR 89/90; all of these containers were preserved. Extra non-preserved containers were also collected for 2 samples as I noted on the revised COC, they are not needed. Please revise your sample acknowledgement form for these ID changes and if you can add the truncated numbers to the ends of the samples, that would help too.

I never received a sample acknowledgement form from the samples collected 7/27/06 at Braidwood, please forward.

Thanks,  
Kathy

---

**From:** Charles, Rebecca [mailto:Rebecca.Charles@tbe.com]  
**Sent:** Monday, July 31, 2006 1:00 PM  
**To:** zigmund.karpa@exeloncorp.com; Czech, Julie; Larry.Walton@exeloncorp.com; Rick.maldonado@exeloncorp.com; Scott.sklenar@exeloncorp.com; Shaw, Kathy; wayne.stotts@exeloncorp.com  
**Subject:** acknowledgements

Rebecca Charles  
Teledyne Brown Engineering  
Project Manager  
(865) 934-0379  
(865) 934-0396 (fax)

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8/1/2006





**CONESTOGA-ROVERS & ASSOCIATES**  
 8615 W. Bryn Mawr Avenue  
 Chicago, Illinois 60631  
 (773)380-9933 phone  
 (773)380-6421 fax



SHIPPED TO  
 (Laboratory Name): **Teledyne Brown**

REFERENCE NUMBER:  
**45156-30**

PROJECT NAME:  
**Exelon ZION**

**CHAIN-OF-CUSTODY RECORD**

SAMPLER'S SIGNATURE: *Marcia Sivel* PRINTED NAME: **Marcia Sivel**

| SEQ. No. | DATE    | TIME  | SAMPLE IDENTIFICATION No.     | SAMPLE MATRIX | No. OF CONTAINERS | PARAMETERS | REMARKS  |
|----------|---------|-------|-------------------------------|---------------|-------------------|------------|--|
| 1        | 7/15/06 | 7:15  | WB-ZN-MN-ZN-10U-072806-MS-003 | W             | 2                 | 1 1 1      | 1-See below preserved<br>1-See below not preserved |
| 2        | 7/15/06 | 8:00  | WB-ZN-MN-ZN-10U-072806-MS-004 | W             | 2                 | 1 1 1      |  |
| 3        | 7/15/06 | 11:25 | WB-ZN-MN-ZN-10L-072806-MS-005 | W             | 3                 | 1 1 1      |  |
| 4        | 7/15/06 | 11:13 | WB-ZN-MN-ZN-11U-072806-TL-001 | W             | 2                 | 1 1        |  |
| 5        | 7/15/06 | 9:45  | WB-ZN-MN-ZN-11L-072806-TL-002 | W             | 2                 | 1 1        |  |
|          |         |       | revision: 7/21/06 KMJ         |               |                   |            |  |
|          |         |       | revision II: 8/1/06 KMJ       |               |                   |            |  |
|          |         |       | Zion → ZN in Sample ID        |               |                   |            |  |

TOTAL NUMBER OF CONTAINERS: **13**

|                                      |               |                                  |               |
|--------------------------------------|---------------|----------------------------------|---------------|
| RELINQUISHED BY: <i>Marcia Sivel</i> | DATE: 7/15/06 | RECEIVED BY: <i>Marcia Sivel</i> | DATE: 7/28/06 |
| TIME: 7:15                           | TIME: 8:00    | TIME: 12:20                      | TIME: 12:20   |
| RELINQUISHED BY:                     | DATE:         | RECEIVED BY:                     | DATE:         |
| RELINQUISHED BY:                     | DATE:         | RECEIVED BY:                     | DATE:         |

**METHOD OF SHIPMENT:**

White - Fully Executed Copy  
 Yellow - Receiving Laboratory Copy  
 Pink - Shipper Copy  
 Goldenrod - Sampler Copy

**SAMPLE TEAM:**  
*Marcia Sivel*

**RECEIVED FOR LABORATORY BY:**  
 DATE: \_\_\_\_\_ TIME: \_\_\_\_\_

**AIR BILL No.:** **12466**

**Charles, Rebecca**

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**From:** Shaw, Kathy [kshaw@croworld.com]  
**Sent:** Tuesday, August 01, 2006 4:02 PM  
**To:** Charles, Rebecca  
**Cc:** Larry.Walton@exeloncorp.com; Reid, James; Cameron, Mary; Soutter, Doug; Filing  
**Subject:** Zion COC revII

Hi Rebecca,

I have another revision of the Zion COC revised yesterday. Our database can only accept 30 characters for sample IDs; so we had to shorten the Zion IDs to accommodate their system. I changed the Zion in the IDs to ZN, please make these changes in your LIMs system.

Thank you,

**Kathy Shaw - Chemist**

**Conestoga-Rovers & Associates**  
45 Farmington Valley Drive  
Plainville, Connecticut 06062  
PH 860 747-1800  
Fax 860 747-1900  
CRAWORLD.COM

# **Internal Chain of Custody**







08/01/06

Teledyne Brown Engineering  
Internal Chain of Custody  
Supplemental Sheet

L29402

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L29402-1      WG      WG-ZN-MW-ZN-10U-072806-MS-003

| <u>Process step</u> | <u>Prod</u>  | <u>Analyst</u> | <u>Date</u> |
|---------------------|--------------|----------------|-------------|
| Login               |              | RCHARLES       | 07/28/06    |
| Aliquot             | GELI         | DW             | 07/29/06    |
| Aliquot             | SR-90 (FAST) | LCB            | 07/29/06    |
| Aliquot             | H-3 (DIST)   | EJ             | 07/31/06    |
| Count Room          | GELI         | KOJ            | 07/30/06    |
| Count Room          | H-3 (DIST)   | KOJ            | 07/31/06    |
| Count Room          | SR-90 (FAST) | KOJ            | 07/31/06    |

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L29402-2      WG      WG-ZN-MW-ZN-10U-072806-MS-004

| <u>Process step</u> | <u>Prod</u>  | <u>Analyst</u> | <u>Date</u> |
|---------------------|--------------|----------------|-------------|
| Login               |              | RCHARLES       | 07/28/06    |
| Aliquot             | GELI         | DW             | 07/29/06    |
| Aliquot             | SR-90 (FAST) | LCB            | 07/29/06    |
| Aliquot             | H-3 (DIST)   | EJ             | 07/31/06    |
| Count Room          | GELI         | KOJ            | 07/30/06    |
| Count Room          | H-3 (DIST)   | KOJ            | 07/31/06    |
| Count Room          | SR-90 (FAST) | KOJ            | 07/31/06    |

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L29402-3      WG      WG-ZN-MW-ZN-10L-072806-MS-005

| <u>Process step</u> | <u>Prod</u>  | <u>Analyst</u> | <u>Date</u> |
|---------------------|--------------|----------------|-------------|
| Login               |              | RCHARLES       | 07/28/06    |
| Aliquot             | GELI         | DW             | 07/29/06    |
| Aliquot             | SR-90 (FAST) | LCB            | 07/29/06    |
| Aliquot             | H-3 (DIST)   | EJ             | 07/31/06    |
| Count Room          | GELI         | KOJ            | 07/30/06    |
| Count Room          | H-3 (DIST)   | KOJ            | 07/31/06    |
| Count Room          | SR-90 (FAST) | KOJ            | 07/31/06    |

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L29402-4      WG      WG-ZN-MW-ZN-11U-072806-TL-001

| <u>Process step</u> | <u>Prod</u>  | <u>Analyst</u> | <u>Date</u> |
|---------------------|--------------|----------------|-------------|
| Login               |              | RCHARLES       | 07/28/06    |
| Aliquot             | GELI         | DW             | 07/29/06    |
| Aliquot             | SR-90 (FAST) | LCB            | 07/29/06    |
| Aliquot             | H-3 (DIST)   | EJ             | 07/31/06    |
| Count Room          | GELI         | KOJ            | 07/30/06    |
| Count Room          | H-3 (DIST)   | KOJ            | 07/31/06    |
| Count Room          | SR-90 (FAST) | KOJ            | 07/31/06    |

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L29402-5      WG      WG-ZN-MW-ZN-11L-072806-TL-002

| <u>Process step</u> | <u>Prod</u>  | <u>Analyst</u> | <u>Date</u> |
|---------------------|--------------|----------------|-------------|
| Login               |              | RCHARLES       | 07/28/06    |
| Aliquot             | GELI         | DW             | 07/29/06    |
| Aliquot             | SR-90 (FAST) | LCB            | 07/29/06    |
| Aliquot             | H-3 (DIST)   | EJ             | 07/31/06    |
| Count Room          | GELI         | KOJ            | 07/30/06    |

08/01/06

Teledyne Brown Engineering  
Internal Chain of Custody  
Supplemental Sheet

L29402

|            |              |                               |     |          |
|------------|--------------|-------------------------------|-----|----------|
| L29402-5   | WG           | WG-ZN-MW-ZN-11L-072806-TL-002 |     |          |
| Count Room | H-3 (DIST)   |                               | KOJ | 08/01/06 |
| Count Room | SR-90 (FAST) |                               | KOJ | 07/31/06 |



# Analytical Results Summary



# Report of Analysis

08/01/06 16:02

**L29402**

Conestoga-Rovers & Associates

EX001-3ESPZION-06



Kathy Shaw

Sample ID: **WG-ZN-MW-ZN-10U-072806-MS-004**

Station:

Description:

LIMS Number: L29402-2

Collect Start: 07/28/2006 10:00

Collect Stop:

Receive Date: 07/28/2006

Matrix: Ground Water

Volume:

% Moisture:

(WG)

| Radionuclide | SOP# | Activity Conc | Uncertainty 2 Sigma | MDC             | Units | Run # | Aliquot Volume | Aliquot Units | Reference Date | Count Date | Count Time | Count Units | Flag Values |
|--------------|------|---------------|---------------------|-----------------|-------|-------|----------------|---------------|----------------|------------|------------|-------------|-------------|
| H-3 (DIST)   | 2010 | 8.33E+01      | 1.16E+02            | <b>1.83E+02</b> | pCi/L |       | 10             | ml            | 07/28/06 10:00 | 07/31/06   | 60         | M           | U           |
| TOTAL SR     | 2018 | 3.54E-01      | 6.77E-01            | <b>1.35E+00</b> | pCi/L |       | 450            | ml            | 07/28/06 10:00 | 07/31/06   | 80         | M           | U           |
| MN-54        | 2007 | -6.00E-02     | 2.56E+00            | <b>4.20E+00</b> | pCi/L |       | 3385.34        | ml            | 07/28/06 10:00 | 07/30/06   | 21600      | Sec         | U           |
| CO-58        | 2007 | -2.52E-01     | 2.60E+00            | <b>4.25E+00</b> | pCi/L |       | 3385.34        | ml            | 07/28/06 10:00 | 07/30/06   | 21600      | Sec         | U           |
| FE-59        | 2007 | 2.92E+00      | 4.83E+00            | <b>8.31E+00</b> | pCi/L |       | 3385.34        | ml            | 07/28/06 10:00 | 07/30/06   | 21600      | Sec         | U           |
| CO-60        | 2007 | -2.97E-02     | 2.51E+00            | <b>4.12E+00</b> | pCi/L |       | 3385.34        | ml            | 07/28/06 10:00 | 07/30/06   | 21600      | Sec         | U           |
| ZN-65        | 2007 | 1.39E+01      | 6.60E+00            | <b>1.08E+01</b> | pCi/L |       | 3385.34        | ml            | 07/28/06 10:00 | 07/30/06   | 21600      | Sec         | U*          |
| NB-95        | 2007 | 3.75E-01      | 2.60E+00            | <b>4.31E+00</b> | pCi/L |       | 3385.34        | ml            | 07/28/06 10:00 | 07/30/06   | 21600      | Sec         | U           |
| ZR-95        | 2007 | 2.19E+00      | 5.04E+00            | <b>7.60E+00</b> | pCi/L |       | 3385.34        | ml            | 07/28/06 10:00 | 07/30/06   | 21600      | Sec         | U           |
| CS-134       | 2007 | 1.23E+01      | 6.29E+00            | <b>5.78E+00</b> | pCi/L |       | 3385.34        | ml            | 07/28/06 10:00 | 07/30/06   | 21600      | Sec         | U*          |
| CS-137       | 2007 | 6.34E-01      | 2.77E+00            | <b>4.64E+00</b> | pCi/L |       | 3385.34        | ml            | 07/28/06 10:00 | 07/30/06   | 21600      | Sec         | U           |
| BA-140       | 2007 | -1.73E+00     | 1.03E+01            | <b>1.66E+01</b> | pCi/L |       | 3385.34        | ml            | 07/28/06 10:00 | 07/30/06   | 21600      | Sec         | U           |
| LA-140       | 2007 | 4.14E-02      | 3.13E+00            | <b>5.10E+00</b> | pCi/L |       | 3385.34        | ml            | 07/28/06 10:00 | 07/30/06   | 21600      | Sec         | U           |

Flag Values  
 U = Compound/Analyte not detected or less than 3 sigma  
 + = Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)  
 U\* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma  
 High = Activity concentration exceeds customer reporting value  
 Spec = MDC exceeds customer technical specification  
 L = Low recovery  
 H = High recovery

No = Peak not identified in gamma spectrum  
 Yes = Peak identified in gamma spectrum  
 \*\*\*\* Results are reported on an as received basis unless otherwise noted

MDC - Minimum Detectable Concentration

**Bolded text indicates reportable value.**

**Report of Analysis**  
 08/01/06 16:02

**L29402**

Conestoga-Rovers & Associates

EX001-3ESPZION-06

Kathy Shaw

| Radionuclide  | SOP# | Activity Conc | Uncertainty 2 Sigma | MDC      | Units | Run # | Aliquot Volume | Aliquot Units | Reference Date | Count Date | Count Time | Count Units | Flag Values |
|---|------|---------------|---------------------|----------|-------|-------|----------------|---------------|----------------|------------|------------|-------------|-------------|
| Sample ID: <b>WG-ZN-MW-ZN-10L-072806-MS-005</b> Matrix: Ground Water (WG)<br>Station: Collect Start: 07/28/2006 11:25<br>Description: Collect Stop: Volume:<br>LIMS Number: L29402-3 Receive Date: 07/28/2006 % Moisture: |      |               |                     |          |       |       |                |               |                |            |            |             |             |
| H-3 (DIST)  | 2010 | 1.93E+01      | 1.13E+02            | 1.83E+02 | pCi/L |       | 10             | ml            |                | 07/31/06   | 60         | M           | U           |
| TOTAL SR  | 2018 | 2.74E-01      | 7.81E-01            | 1.59E+00 | pCi/L |       | 450            | ml            | 07/28/06 11:25 | 07/31/06   | 80         | M           | U           |
| MN-54   | 2007 | 6.57E-01      | 3.25E+00            | 5.36E+00 | pCi/L |       | 3372.05        | ml            | 07/28/06 11:25 | 07/30/06   | 9600       | Sec         | U           |
| CO-58   | 2007 | 1.28E+00      | 3.17E+00            | 5.34E+00 | pCi/L |       | 3372.05        | ml            | 07/28/06 11:25 | 07/30/06   | 9600       | Sec         | U           |
| FE-59   | 2007 | -1.42E+00     | 5.74E+00            | 9.22E+00 | pCi/L |       | 3372.05        | ml            | 07/28/06 11:25 | 07/30/06   | 9600       | Sec         | U           |
| CO-60   | 2007 | 2.24E-01      | 3.04E+00            | 5.03E+00 | pCi/L |       | 3372.05        | ml            | 07/28/06 11:25 | 07/30/06   | 9600       | Sec         | U           |
| ZN-65   | 2007 | 1.11E+00      | 7.73E+00            | 1.12E+01 | pCi/L |       | 3372.05        | ml            | 07/28/06 11:25 | 07/30/06   | 9600       | Sec         | U           |
| NB-95   | 2007 | 2.64E+00      | 3.20E+00            | 5.59E+00 | pCi/L |       | 3372.05        | ml            | 07/28/06 11:25 | 07/30/06   | 9600       | Sec         | U           |
| ZR-95   | 2007 | 3.40E-01      | 5.68E+00            | 9.27E+00 | pCi/L |       | 3372.05        | ml            | 07/28/06 11:25 | 07/30/06   | 9600       | Sec         | U           |
| CS-134  | 2007 | -4.36E-01     | 3.67E+00            | 5.09E+00 | pCi/L |       | 3372.05        | ml            | 07/28/06 11:25 | 07/30/06   | 9600       | Sec         | U           |
| CS-137  | 2007 | 6.32E-01      | 3.55E+00            | 5.88E+00 | pCi/L |       | 3372.05        | ml            | 07/28/06 11:25 | 07/30/06   | 9600       | Sec         | U           |
| BA-140  | 2007 | -2.09E+00     | 1.25E+01            | 2.04E+01 | pCi/L |       | 3372.05        | ml            | 07/28/06 11:25 | 07/30/06   | 9600       | Sec         | U           |
| LA-140  | 2007 | -2.68E+00     | 4.09E+00            | 5.91E+00 | pCi/L |       | 3372.05        | ml            | 07/28/06 11:25 | 07/30/06   | 9600       | Sec         | U           |

Flag Values  
 U = Compound/Analyte not detected or less than 3 sigma  
 + = Activity concentration exceeds MDC and 3 sigma; peak identified (gamma only)  
 U\* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma  
 High = Activity concentration exceeds customer reporting value  
 Spec = MDC exceeds customer technical specification  
 L = Low recovery  
 H = High recovery

No = Peak not identified in gamma spectrum  
 Yes = Peak identified in gamma spectrum  
 \*\*\*\* Results are reported on an as received basis unless otherwise noted

MDC - Minimum Detectable Concentration

**Bolded text indicates reportable value.**



# Report of Analysis

08/01/06 16:02

**L29402**

Conestoga-Rovers & Associates

EX001-3ESPZION-06

Kathy Shaw

| Matrix: Ground Water (WG)       |      |               |                     |          |       |       |                |               |                |            |            |             |             |
|---------------------------------|------|---------------|---------------------|----------|-------|-------|----------------|---------------|----------------|------------|------------|-------------|-------------|
| Collect Start: 07/28/2006 09:45 |      |               |                     |          |       |       |                |               |                |            |            |             |             |
| Collect Stop:                   |      |               |                     |          |       |       |                |               |                |            |            |             |             |
| Receive Date: 07/28/2006        |      |               |                     |          |       |       |                |               |                |            |            |             |             |
| % Moisture:                     |      |               |                     |          |       |       |                |               |                |            |            |             |             |
| LIMS Number: L29402-5           |      |               |                     |          |       |       |                |               |                |            |            |             |             |
| Radionuclide                    | SOP# | Activity Conc | Uncertainty 2 Sigma | MDC      | Units | Run # | Aliquot Volume | Aliquot Units | Reference Date | Count Date | Count Time | Count Units | Flag Values |
| H-3 (DIST)                      | 2010 | .00E+00       | 1.09E+02            | 1.79E+02 | pCi/L |       | 10             | ml            | 07/28/06 09:45 | 08/01/06   | 60         | M           | U           |
| TOTAL SR                        | 2018 | -2.50E-01     | 5.04E-01            | 1.08E+00 | pCi/L |       | 450            | ml            | 07/28/06 09:45 | 07/31/06   | 120        | M           | U           |
| MN-54                           | 2007 | 1.85E+00      | 2.83E+00            | 4.83E+00 | pCi/L |       | 3471.48        | ml            | 07/28/06 09:45 | 07/30/06   | 21600      | Sec         | U           |
| CO-58                           | 2007 | 9.43E-01      | 2.79E+00            | 4.71E+00 | pCi/L |       | 3471.48        | ml            | 07/28/06 09:45 | 07/30/06   | 21600      | Sec         | U           |
| FE-59                           | 2007 | 5.45E+00      | 5.51E+00            | 9.71E+00 | pCi/L |       | 3471.48        | ml            | 07/28/06 09:45 | 07/30/06   | 21600      | Sec         | U           |
| CO-60                           | 2007 | 2.49E+00      | 3.06E+00            | 5.32E+00 | pCi/L |       | 3471.48        | ml            | 07/28/06 09:45 | 07/30/06   | 21600      | Sec         | U           |
| ZN-65                           | 2007 | 1.05E+01      | 7.39E+00            | 1.16E+01 | pCi/L |       | 3471.48        | ml            | 07/28/06 09:45 | 07/30/06   | 21600      | Sec         | U           |
| NB-95                           | 2007 | 1.66E+00      | 2.93E+00            | 4.99E+00 | pCi/L |       | 3471.48        | ml            | 07/28/06 09:45 | 07/30/06   | 21600      | Sec         | U           |
| ZR-95                           | 2007 | -4.88E+00     | 5.20E+00            | 8.22E+00 | pCi/L |       | 3471.48        | ml            | 07/28/06 09:45 | 07/30/06   | 21600      | Sec         | U           |
| CS-134                          | 2007 | 2.00E+01      | 5.36E+00            | 6.62E+00 | pCi/L |       | 3471.48        | ml            | 07/28/06 09:45 | 07/30/06   | 21600      | Sec         | U*          |
| CS-137                          | 2007 | 7.30E-01      | 3.13E+00            | 5.17E+00 | pCi/L |       | 3471.48        | ml            | 07/28/06 09:45 | 07/30/06   | 21600      | Sec         | U           |
| BA-140                          | 2007 | 1.24E+01      | 1.20E+01            | 2.06E+01 | pCi/L |       | 3471.48        | ml            | 07/28/06 09:45 | 07/30/06   | 21600      | Sec         | U           |
| LA-140                          | 2007 | 1.71E+00      | 4.10E+00            | 6.99E+00 | pCi/L |       | 3471.48        | ml            | 07/28/06 09:45 | 07/30/06   | 21600      | Sec         | U           |

Flag Values  
 U = Compound/Analyte not detected or less than 3 sigma  
 + = Activity concentration exceeds MDC and 3 sigma; peak identified (gamma only)  
 U\* = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma  
 High = Activity concentration exceeds customer reporting value  
 Spec = MDC exceeds customer technical specification  
 L = Low recovery  
 H = High recovery  
**Bolded text indicates reportable value.**

No = Peak not identified in gamma spectrum  
 Yes = Peak identified in gamma spectrum  
 \*\*\*\* Results are reported on an as received basis unless otherwise noted

MDC - Minimum Detectable Concentration

# QC Results Summary

# QC Summary Report

for L29402

8/1/2006 4:05:22PM



H-3 (DIST)

## Method Blank Summary

| <u>TBE Sample ID</u> | <u>Radionuclide</u> | <u>Matrix</u> | <u>Count Date/Time</u> | <u>Blank Result</u> | <u>Units</u> | <u>Qualifier</u> | <u>P/F</u> |
|----------------------|---------------------|---------------|------------------------|---------------------|--------------|------------------|------------|
| WG4273-1             | H-3 (DIST)          | WO            | 07/31/2006 17:40       | < 1.810E+00         | pCi/Total    | U                | P          |

## LCS Sample Summary

| <u>TBE Sample ID</u> | <u>Radionuclide</u> | <u>Matrix</u> | <u>Count Date/Time</u> | <u>Spike Value</u> | <u>LCS Result</u> | <u>Units</u> | <u>Spike Recovery</u> | <u>Range</u> | <u>Qualifier</u> | <u>P/F</u> |
|----------------------|---------------------|---------------|------------------------|--------------------|-------------------|--------------|-----------------------|--------------|------------------|------------|
| WG4273-2             | H-3 (DIST)          | WO            | 07/31/2006 18:44       | 5.05E+002          | 4.760E+02         | pCi/Total    | 94.3                  | 70-130       | +                | P          |

Spike ID: 3H-041706-1

Spike conc: 5.05E+002

Spike Vol: 1.00E+000

## Duplicate Summary

| <u>TBE Sample ID</u> | <u>Radionuclide</u> | <u>Matrix</u> | <u>Count Date/Time</u> | <u>Original Result</u> | <u>DUP Result</u> | <u>Units</u> | <u>RPD</u> | <u>Range</u> | <u>Qualifier</u> | <u>P/F</u> |
|----------------------|---------------------|---------------|------------------------|------------------------|-------------------|--------------|------------|--------------|------------------|------------|
| WG4273-3<br>L29402-1 | H-3 (DIST)          | WG            | 07/31/2006 19:03       | < 1.780E+02            | < 1.820E+02       | pCi/L        |            | <30          | **               | NE         |

+ Positive Result  
 U Compound/analyte was analyzed, peak not identified and/or not detected above MDC  
 \* < 5 times the MDC are not evaluated  
 \*\* Nuclide not detected  
 \*\*\* Spiking level < 5 times activity  
 P Pass  
 F Fail  
 NE Not evaluated



# QC Summary Report

for L29402

8/1/2006 4:05:22PM



## TOTAL SR

### Method Blank Summary

| <u>TBE Sample ID</u> | <u>Radionuclide</u> | <u>Matrix</u> | <u>Count Date/Time</u> | <u>Blank Result</u> | <u>Units</u> | <u>Qualifier</u> |
|----------------------|---------------------|---------------|------------------------|---------------------|--------------|------------------|
| WG4278-1             | TOTAL SR            | WO            | 07/31/2006 17:05       | < 8.500E-01         | pCi/Total    | U P              |

### LCS Sample Summary

| <u>TBE Sample ID</u> | <u>Radionuclide</u> | <u>Matrix</u> | <u>Count Date/Time</u> | <u>Spike Value</u> | <u>LCS Result</u> | <u>Units</u> | <u>Spike Recovery</u> | <u>Range</u> | <u>Qualifier</u> |
|----------------------|---------------------|---------------|------------------------|--------------------|-------------------|--------------|-----------------------|--------------|------------------|
| WG4278-2             | TOTAL SR            | WO            | 07/31/2006 17:05       | 5.84E+001          | 6.400E+01         | pCi/Total    | 109.6                 | 70-130       | + P              |

Spike ID: 90SR-011905  
 Spike conc: 2.34E+002  
 Spike Vol: 2.50E-001

### Duplicate Summary

| <u>TBE Sample ID</u> | <u>Radionuclide</u> | <u>Matrix</u> | <u>Count Date/Time</u> | <u>Original Result</u> | <u>DUP Result</u> | <u>Units</u> | <u>RPD</u> | <u>Range</u> | <u>Qualifier</u> |
|----------------------|---------------------|---------------|------------------------|------------------------|-------------------|--------------|------------|--------------|------------------|
| WG4278-3<br>L29389-6 | TOTAL SR            | WG            | 07/31/2006 17:05       | < 1.890E+00            | < 1.620E+00       | pCi/L        |            | <30          | ** NE            |

+ Positive Result  
 U Compound/analyte was analyzed, peak not identified and/or not detected above MDC  
 \* < 5 times the MDC are not evaluated  
 \*\* Nuclide not detected  
 \*\*\* Spiking level < 5 times activity  
 P Pass  
 F Fail  
 NE Not evaluated

# Raw Data

Page: 1

| Work Order: L29402                                 | Customer: Exelon           |                     |                 |                    |                   |              |                    |                 |            |              |                 |            |              |             |                 |                 |
|--|----------------------------|---------------------|-----------------|--------------------|-------------------|--------------|--------------------|-----------------|------------|--------------|-----------------|------------|--------------|-------------|-----------------|-----------------|
| Nuclide: H-3 (DIST)                                | Project: EX001-3ESFZION-06 |                     |                 |                    |                   |              |                    |                 |            |              |                 |            |              |             |                 |                 |
| Sample ID  | Run Analysis               | Reference Date/time | Volume/ Aliquot | Scavenge Date/time | Milking Date/time | Mount Weight | Recovery Date/time | Count Date/time | Counter ID | Total counts | Sample dt (min) | Bkg counts | Bkg dt (min) | Eff. Factor | Ingrowth Factor | Decay & Analyst |
| L29402-1   | H-3 DIST                   |                     | 10 ml           |                    |                   | 0            | 31-jul-06 20:06    | 31-jul-06 20:06 | LS7        | 149          | 60              | 2.03       | 60           | .217        |                 | EJ              |
| WG-ZN-MW-ZN-10U-072806-MS-003                      |                            |                     |                 |                    |                   |              |                    |                 |            |              |                 |            |              |             |                 |                 |
| Activity: 9.34E+01 Error: 1.14E+02 MDC: 1.78E+02 * |                            |                     |                 |                    |                   |              |                    |                 |            |              |                 |            |              |             |                 |                 |
| L29402-2   | H-3 DIST                   |                     | 10 ml           |                    |                   | 0            | 31-jul-06 21:10    | 31-jul-06 21:10 | LS7        | 145          | 60              | 2.03       | 60           | .211        |                 | EJ              |
| WG-ZN-MW-ZN-10U-072806-MS-004                      |                            |                     |                 |                    |                   |              |                    |                 |            |              |                 |            |              |             |                 |                 |
| Activity: 8.33E+01 Error: 1.16E+02 MDC: 1.83E+02 * |                            |                     |                 |                    |                   |              |                    |                 |            |              |                 |            |              |             |                 |                 |
| L29402-3   | H-3 DIST                   |                     | 10 ml           |                    |                   | 0            | 31-jul-06 22:13    | 31-jul-06 22:13 | LS7        | 127          | 60              | 2.03       | 60           | .211        |                 | EJ              |
| WG-ZN-MW-ZN-10L-072806-MS-005                      |                            |                     |                 |                    |                   |              |                    |                 |            |              |                 |            |              |             |                 |                 |
| Activity: 1.93E+01 Error: 1.13E+02 MDC: 1.83E+02 * |                            |                     |                 |                    |                   |              |                    |                 |            |              |                 |            |              |             |                 |                 |
| L29402-4   | H-3 DIST                   |                     | 10 ml           |                    |                   | 0            | 31-jul-06 23:17    | 31-jul-06 23:17 | LS7        | 117          | 60              | 2.03       | 60           | .212        |                 | EJ              |
| WG-ZN-MW-ZN-11U-072806-TL-001                      |                            |                     |                 |                    |                   |              |                    |                 |            |              |                 |            |              |             |                 |                 |
| Activity: -1.7E+01 Error: 1.09E+02 MDC: 1.82E+02 * |                            |                     |                 |                    |                   |              |                    |                 |            |              |                 |            |              |             |                 |                 |
| L29402-5   | H-3 DIST                   |                     | 10 ml           |                    |                   | 0            | 01-aug-06 00:20    | 01-aug-06 00:20 | LS7        | 122          | 60              | 2.03       | 60           | .216        |                 | EJ              |
| WG-ZN-MW-ZN-11L-072806-TL-002                      |                            |                     |                 |                    |                   |              |                    |                 |            |              |                 |            |              |             |                 |                 |
| Activity: 0E+00 Error: 1.09E+02 MDC: 1.79E+02 *    |                            |                     |                 |                    |                   |              |                    |                 |            |              |                 |            |              |             |                 |                 |



Sec. Review: Analyst: LIMS:           

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VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 1-AUG-2006 09:59:57.87  
 TBE04 P-40312B HpGe \*\*\*\*\* Aquisition Date/Time: 30-JUL-2006 21:03:58.22

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LIMS No., Customer Name, Client ID: WG L29402-1 EX ZION

Sample ID : 04L29402-1 Smple Date: 28-JUL-2006 09:15:00.  
 Sample Type : WG Geometry : 0435L090804  
 Quantity : 3.32390E+00 L BKGFILE : 04BG072806MT  
 Start Channel : 90 Energy Tol : 1.50000 Real Time : 0 02:40:30.62  
 End Channel : 4090 Pk Srch Sens: 5.00000 Live time : 0 02:40:28.87  
 MDA Constant : 0.00 Library Used: LIBD

| Pk | It | Energy   | Area | Bkgnd | FWHM | Channel | %Eff     | Cts/Sec  | %Err  | Fit      |
|----|----|----------|------|-------|------|---------|----------|----------|-------|----------|
| 1  | 1  | 66.08*   | 72   | 263   | 1.49 | 133.05  | 6.39E-01 | 7.51E-03 | 40.1  | 3.27E+00 |
| 2  | 1  | 140.10*  | 13   | 279   | 0.99 | 281.18  | 1.82E+00 | 1.38E-03 | 249.5 | 4.38E+00 |
| 3  | 1  | 185.37*  | 37   | 258   | 2.53 | 371.77  | 1.73E+00 | 3.84E-03 | 86.1  | 2.14E+00 |
| 4  | 1  | 198.15*  | 84   | 199   | 1.59 | 397.35  | 1.68E+00 | 8.76E-03 | 33.5  | 4.24E-01 |
| 5  | 3  | 238.46*  | 5    | 96    | 1.24 | 478.01  | 1.52E+00 | 4.91E-04 | 364.8 | 1.47E+00 |
| 6  | 3  | 241.92   | 54   | 172   | 1.33 | 484.93  | 1.51E+00 | 5.60E-03 | 43.0  |          |
| 7  | 1  | 295.15*  | 79   | 166   | 1.15 | 591.43  | 1.32E+00 | 8.19E-03 | 33.0  | 8.92E-01 |
| 8  | 1  | 351.87*  | 161  | 134   | 1.17 | 704.91  | 1.17E+00 | 1.68E-02 | 17.3  | 1.62E+00 |
| 9  | 1  | 595.73   | 50   | 46    | 1.51 | 1192.77 | 7.86E-01 | 5.14E-03 | 30.7  | 6.16E-01 |
| 10 | 1  | 609.15*  | 136  | 78    | 1.60 | 1219.59 | 7.73E-01 | 1.41E-02 | 16.4  | 1.62E+00 |
| 11 | 1  | 768.25   | 21   | 29    | 1.52 | 1537.83 | 6.46E-01 | 2.15E-03 | 55.0  | 1.15E+00 |
| 12 | 1  | 1120.46* | 28   | 38    | 1.94 | 2242.12 | 4.81E-01 | 2.89E-03 | 52.4  | 1.90E+00 |
| 13 | 1  | 1460.66* | 41   | 3     | 2.85 | 2922.16 | 3.92E-01 | 4.30E-03 | 25.3  | 7.98E-01 |
| 14 | 1  | 1763.85* | 33   | 3     | 2.95 | 3528.06 | 3.43E-01 | 3.38E-03 | 24.3  | 2.12E-01 |

Flag: "\*" = Peak area was modified by background subtraction

## Nuclide Line Activity Report

Nuclide Type: natural

| Nuclide | Energy  | Area  | %Abn   | %Eff      | Uncorrected<br>pCi/L | Decay Corr<br>pCi/L | 2-Sigma<br>%Error |
|---------|---------|-------|--------|-----------|----------------------|---------------------|-------------------|
| K-40    | 1460.81 | 41    | 10.67* | 3.921E-01 | 8.366E+01            | 8.366E+01           | 50.51             |
| RA-226  | 186.21  | 37    | 3.28*  | 1.728E+00 | 5.511E+01            | 5.511E+01           | 172.16            |
| TH-228  | 238.63  | 5     | 44.60* | 1.521E+00 | 5.886E-01            | 5.901E-01           | 729.66            |
|         | 240.98  | 54    | 3.95   | 1.508E+00 | 7.649E+01            | 7.668E+01           | 86.08             |
| U-235   | 143.76  | ----- | 10.50* | 1.822E+00 | -----                | Line Not Found      | -----             |
|         | 163.35  | ----- | 4.70   | 1.796E+00 | -----                | Line Not Found      | -----             |
|         | 185.71  | 37    | 54.00  | 1.728E+00 | 3.347E+00            | 3.347E+00           | 172.16            |
|         | 205.31  | ----- | 4.70   | 1.652E+00 | -----                | Line Not Found      | -----             |

Flag: "\*" = Keyline

Summary of Nuclide Activity  
 Sample ID : 04L29402-1

Page : 2  
 Acquisition date : 30-JUL-2006 21:03:58

Total number of lines in spectrum 14  
 Number of unidentified lines 10  
 Number of lines tentatively identified by NID 4 28.57%

Nuclide Type : natural

| Nuclide          | Hlife     | Decay | Uncorrected<br>pCi/L | Decay Corr<br>pCi/L | Decay Corr<br>2-Sigma Error | 2-Sigma<br>%Error | Flags |
|------------------|-----------|-------|----------------------|---------------------|-----------------------------|-------------------|-------|
| K-40             | 1.28E+09Y | 1.00  | 8.366E+01            | 8.366E+01           | 4.225E+01                   | 50.51             |       |
| RA-226           | 1600.00Y  | 1.00  | 5.511E+01            | 5.511E+01           | 9.487E+01                   | 172.16            |       |
| TH-228           | 1.91Y     | 1.00  | 5.886E-01            | 5.901E-01           | 43.05E-01                   | 729.66            |       |
| U-235            | 7.04E+08Y | 1.00  | 3.347E+00            | 3.347E+00           | 5.762E+00                   | 172.16            | K     |
| Total Activity : |           |       | 1.427E+02            | 1.427E+02           |                             |                   |       |

Grand Total Activity : 1.427E+02 1.427E+02

Flags: "K" = Keyline not found  
 "E" = Manually edited

"M" = Manually accepted  
 "A" = Nuclide specific abn. limit

Unidentified Energy Lines  
Sample ID : 04L29402-1

Page : 3  
Acquisition date : 30-JUL-2006 21:03:58

| It | Energy  | Area | Bkgnd | FWHM | Channel | Left | Pw | Cts/Sec  | %Err | %Eff     | Flags |
|----|---------|------|-------|------|---------|------|----|----------|------|----------|-------|
| 1  | 66.08   | 72   | 263   | 1.49 | 133.05  | 130  | 7  | 7.51E-03 | 80.2 | 6.39E-01 |       |
| 1  | 140.10  | 13   | 279   | 0.99 | 281.18  | 277  | 10 | 1.38E-03 | **** | 1.82E+00 |       |
| 1  | 198.15  | 84   | 199   | 1.59 | 397.35  | 394  | 10 | 8.76E-03 | 67.0 | 1.68E+00 |       |
| 1  | 295.15  | 79   | 166   | 1.15 | 591.43  | 587  | 10 | 8.19E-03 | 66.1 | 1.32E+00 |       |
| 1  | 351.87  | 161  | 134   | 1.17 | 704.91  | 700  | 12 | 1.68E-02 | 34.7 | 1.17E+00 |       |
| 1  | 595.73  | 50   | 46    | 1.51 | 1192.77 | 1188 | 11 | 5.14E-03 | 61.3 | 7.86E-01 |       |
| 1  | 609.15  | 136  | 78    | 1.60 | 1219.59 | 1215 | 12 | 1.41E-02 | 32.8 | 7.73E-01 |       |
| 1  | 768.25  | 21   | 29    | 1.52 | 1537.83 | 1532 | 10 | 2.15E-03 | **** | 6.46E-01 |       |
| 1  | 1120.46 | 28   | 38    | 1.94 | 2242.12 | 2239 | 12 | 2.89E-03 | **** | 4.81E-01 |       |
| 1  | 1763.85 | 33   | 3     | 2.95 | 3528.06 | 3521 | 14 | 3.38E-03 | 48.6 | 3.43E-01 |       |

Flags: "T" = Tentatively associated

#### Summary of Nuclide Activity

|   |                               |
|---|-------------------------------|
| Total number of lines in spectrum             | 14                            |
| Number of unidentified lines                  | 10                            |
| Number of lines tentatively identified by NID | 4                      28.57% |

Nuclide Type : natural

| Nuclide          | Hlife     | Decay | Wtd Mean             |                     | Decay Corr<br>2-Sigma Error | 2-Sigma<br>%Error | Flags |
|------------------|-----------|-------|----------------------|---------------------|-----------------------------|-------------------|-------|
|                  |           |       | Uncorrected<br>pCi/L | Decay Corr<br>pCi/L |                             |                   |       |
| K-40             | 1.28E+09Y | 1.00  | 8.366E+01            | 8.366E+01           | 4.225E+01                   | 50.51             |       |
| RA-226           | 1600.00Y  | 1.00  | 5.511E+01            | 5.511E+01           | 9.487E+01                   | 172.16            |       |
| TH-228           | 1.91Y     | 1.00  | 9.101E-01            | 9.124E-01           | 42.96E-01                   | 470.87            |       |
| Total Activity : |           |       | 1.397E+02            | 1.397E+02           |                             |                   |       |

Grand Total Activity : 1.397E+02      1.397E+02

Flags: "K" = Keyline not found                      "M" = Manually accepted  
"E" = Manually edited                              "A" = Nuclide specific abn. limit

#### Interference Report

No interference correction performed

#### Combined Activity-MDA Report

---- Identified Nuclides ----

| Nuclide | Activity<br>(pCi/L) | Act error | MDA<br>(pCi/L) | MDA error | Act/MDA |
|---------|---------------------|-----------|----------------|-----------|---------|
| K-40    | 8.366E+01           | 4.225E+01 | 4.482E+01      | 0.000E+00 | 1.866   |
| RA-226  | 5.511E+01           | 9.487E+01 | 1.157E+02      | 0.000E+00 | 0.476   |
| TH-228  | 9.124E-01           | 4.296E+00 | 1.003E+01      | 0.000E+00 | 0.091   |

---- Non-Identified Nuclides ----

Key-Line

| Nuclide | Activity<br>(pCi/L) | K.L.<br>Ided | Act error | MDA<br>(pCi/L) | MDA error | Act/MDA |
|---------|---------------------|--------------|-----------|----------------|-----------|---------|
| BE-7    | -2.705E+00          |              | 2.491E+01 | 4.055E+01      | 0.000E+00 | -0.067  |
| NA-24   | -3.883E+01          |              | 6.565E+01 | 1.020E+02      | 0.000E+00 | -0.381  |
| CR-51   | 8.196E+00           |              | 2.723E+01 | 4.486E+01      | 0.000E+00 | 0.183   |
| MN-54   | 2.454E+00           |              | 3.109E+00 | 5.427E+00      | 0.000E+00 | 0.452   |
| CO-57   | 5.269E-02           |              | 2.884E+00 | 4.706E+00      | 0.000E+00 | 0.011   |
| CO-58   | 2.373E+00           |              | 2.870E+00 | 5.062E+00      | 0.000E+00 | 0.469   |
| FE-59   | -1.040E+00          |              | 5.881E+00 | 9.473E+00      | 0.000E+00 | -0.110  |
| CO-60   | 1.956E+00           |              | 3.666E+00 | 6.769E+00      | 0.000E+00 | 0.289   |
| ZN-65   | 3.056E+00           |              | 8.117E+00 | 1.189E+01      | 0.000E+00 | 0.257   |
| SE-75   | -5.072E-01          |              | 4.220E+00 | 6.874E+00      | 0.000E+00 | -0.074  |
| SR-85   | 8.153E+00           |              | 3.896E+00 | 7.024E+00      | 0.000E+00 | 1.161   |
| Y-88    | -2.029E-01          |              | 3.963E+00 | 6.514E+00      | 0.000E+00 | -0.031  |
| NB-94   | -1.179E+00          |              | 3.047E+00 | 4.874E+00      | 0.000E+00 | -0.242  |
| NB-95   | 1.308E+00           |              | 3.306E+00 | 5.596E+00      | 0.000E+00 | 0.234   |
| ZR-95   | 7.276E-01           |              | 5.804E+00 | 9.628E+00      | 0.000E+00 | 0.076   |
| MO-99   | 3.002E+01           |              | 3.909E+01 | 6.888E+01      | 0.000E+00 | 0.436   |
| RU-103  | 5.363E-01           |              | 3.176E+00 | 5.259E+00      | 0.000E+00 | 0.102   |
| RU-106  | 1.762E+00           |              | 2.731E+01 | 4.571E+01      | 0.000E+00 | 0.039   |
| AG-110m | -1.866E+00          |              | 2.981E+00 | 4.690E+00      | 0.000E+00 | -0.398  |
| SN-113  | 2.420E+00           |              | 4.000E+00 | 6.881E+00      | 0.000E+00 | 0.352   |
| SB-124  | 3.550E+00           |              | 5.321E+00 | 5.067E+00      | 0.000E+00 | 0.701   |
| SB-125  | 6.787E+00           |              | 8.458E+00 | 1.470E+01      | 0.000E+00 | 0.462   |
| TE-129M | 1.857E+01           |              | 3.352E+01 | 5.730E+01      | 0.000E+00 | 0.324   |
| I-131   | -3.511E+00          |              | 3.675E+00 | 5.785E+00      | 0.000E+00 | -0.607  |
| BA-133  | 2.150E+00           |              | 4.709E+00 | 7.002E+00      | 0.000E+00 | 0.307   |
| CS-134  | 4.965E-01           |              | 4.679E+00 | 5.513E+00      | 0.000E+00 | 0.090   |
| CS-136  | -6.442E-01          |              | 3.021E+00 | 4.816E+00      | 0.000E+00 | -0.134  |
| CS-137  | 2.743E+00           |              | 3.384E+00 | 5.955E+00      | 0.000E+00 | 0.461   |
| CE-139  | -3.099E-01          |              | 2.974E+00 | 4.753E+00      | 0.000E+00 | -0.065  |
| BA-140  | 1.125E+01           |              | 1.230E+01 | 2.138E+01      | 0.000E+00 | 0.526   |
| LA-140  | -3.122E+00          |              | 4.012E+00 | 5.797E+00      | 0.000E+00 | -0.539  |
| CE-141  | 3.592E+00           |              | 5.993E+00 | 8.651E+00      | 0.000E+00 | 0.415   |
| CE-144  | 3.803E+00           |              | 2.435E+01 | 3.749E+01      | 0.000E+00 | 0.101   |
| EU-152  | -7.308E-01          |              | 1.081E+01 | 1.602E+01      | 0.000E+00 | -0.046  |
| EU-154  | -5.304E-01          |              | 6.011E+00 | 9.761E+00      | 0.000E+00 | -0.054  |
| AC-228  | -1.107E+01          |              | 1.308E+01 | 2.082E+01      | 0.000E+00 | -0.531  |
| TH-232  | -1.106E+01          |              | 1.307E+01 | 2.081E+01      | 0.000E+00 | -0.531  |
| U-235   | 5.917E+00           |              | 2.688E+01 | 3.798E+01      | 0.000E+00 | 0.156   |
| U-238   | -1.825E+02          |              | 3.479E+02 | 5.454E+02      | 0.000E+00 | -0.335  |
| AM-241  | -5.037E-01          |              | 2.773E+01 | 4.534E+01      | 0.000E+00 | -0.011  |



|              |             |                  |             |                   |             |
|--------------|-------------|------------------|-------------|-------------------|-------------|
| A,04L29402-1 | ,08/01/2006 | 09:59,07/28/2006 | 09:15,      | 3.324E+00,WG      | L29402-1 EX |
| B,04L29402-1 | ,LIBD       |                  | ,07/28/2006 | 09:49,0435L090804 |             |
| C,K-40       | ,YES,       | 8.366E+01,       | 4.225E+01,  | 4.482E+01,,       | 1.866       |
| C,RA-226     | ,YES,       | 5.511E+01,       | 9.487E+01,  | 1.157E+02,,       | 0.476       |
| C,TH-228     | ,YES,       | 9.124E-01,       | 4.296E+00,  | 1.003E+01,,       | 0.091       |
| C,BE-7       | ,NO,        | -2.705E+00,      | 2.491E+01,  | 4.055E+01,,       | -0.067      |
| C,NA-24      | ,NO,        | -3.883E+01,      | 6.565E+01,  | 1.020E+02,,       | -0.381      |
| C,CR-51      | ,NO,        | 8.196E+00,       | 2.723E+01,  | 4.486E+01,,       | 0.183       |
| C,MN-54      | ,NO,        | 2.454E+00,       | 3.109E+00,  | 5.427E+00,,       | 0.452       |
| C,CO-57      | ,NO,        | 5.269E-02,       | 2.884E+00,  | 4.706E+00,,       | 0.011       |
| C,CO-58      | ,NO,        | 2.373E+00,       | 2.870E+00,  | 5.062E+00,,       | 0.469       |
| C,FE-59      | ,NO,        | -1.040E+00,      | 5.881E+00,  | 9.473E+00,,       | -0.110      |
| C,CO-60      | ,NO,        | 1.956E+00,       | 3.666E+00,  | 6.769E+00,,       | 0.289       |
| C,ZN-65      | ,NO,        | 3.056E+00,       | 8.117E+00,  | 1.189E+01,,       | 0.257       |
| C,SE-75      | ,NO,        | -5.072E-01,      | 4.220E+00,  | 6.874E+00,,       | -0.074      |
| C,SR-85      | ,NO,        | 8.153E+00,       | 3.896E+00,  | 7.024E+00,,       | 1.161       |
| C,Y-88       | ,NO,        | -2.029E-01,      | 3.963E+00,  | 6.514E+00,,       | -0.031      |
| C,NB-94      | ,NO,        | -1.179E+00,      | 3.047E+00,  | 4.874E+00,,       | -0.242      |
| C,NB-95      | ,NO,        | 1.308E+00,       | 3.306E+00,  | 5.596E+00,,       | 0.234       |
| C,ZR-95      | ,NO,        | 7.276E-01,       | 5.804E+00,  | 9.628E+00,,       | 0.076       |
| C,MO-99      | ,NO,        | 3.002E+01,       | 3.909E+01,  | 6.888E+01,,       | 0.436       |
| C,RU-103     | ,NO,        | 5.363E-01,       | 3.176E+00,  | 5.259E+00,,       | 0.102       |
| C,RU-106     | ,NO,        | 1.762E+00,       | 2.731E+01,  | 4.571E+01,,       | 0.039       |
| C,AG-110m    | ,NO,        | -1.866E+00,      | 2.981E+00,  | 4.690E+00,,       | -0.398      |
| C,SN-113     | ,NO,        | 2.420E+00,       | 4.000E+00,  | 6.881E+00,,       | 0.352       |
| C,SB-124     | ,NO,        | 3.550E+00,       | 5.321E+00,  | 5.067E+00,,       | 0.701       |
| C,SB-125     | ,NO,        | 6.787E+00,       | 8.458E+00,  | 1.470E+01,,       | 0.462       |
| C,TE-129M    | ,NO,        | 1.857E+01,       | 3.352E+01,  | 5.730E+01,,       | 0.324       |
| C,I-131      | ,NO,        | -3.511E+00,      | 3.675E+00,  | 5.785E+00,,       | -0.607      |
| C,BA-133     | ,NO,        | 2.150E+00,       | 4.709E+00,  | 7.002E+00,,       | 0.307       |
| C,CS-134     | ,NO,        | 4.965E-01,       | 4.679E+00,  | 5.513E+00,,       | 0.090       |
| C,CS-136     | ,NO,        | -6.442E-01,      | 3.021E+00,  | 4.816E+00,,       | -0.134      |
| C,CS-137     | ,NO,        | 2.743E+00,       | 3.384E+00,  | 5.955E+00,,       | 0.461       |
| C,CE-139     | ,NO,        | -3.099E-01,      | 2.974E+00,  | 4.753E+00,,       | -0.065      |
| C,BA-140     | ,NO,        | 1.125E+01,       | 1.230E+01,  | 2.138E+01,,       | 0.526       |
| C,LA-140     | ,NO,        | -3.122E+00,      | 4.012E+00,  | 5.797E+00,,       | -0.539      |
| C,CE-141     | ,NO,        | 3.592E+00,       | 5.993E+00,  | 8.651E+00,,       | 0.415       |
| C,CE-144     | ,NO,        | 3.803E+00,       | 2.435E+01,  | 3.749E+01,,       | 0.101       |
| C,EU-152     | ,NO,        | -7.308E-01,      | 1.081E+01,  | 1.602E+01,,       | -0.046      |
| C,EU-154     | ,NO,        | -5.304E-01,      | 6.011E+00,  | 9.761E+00,,       | -0.054      |
| C,AC-228     | ,NO,        | -1.107E+01,      | 1.308E+01,  | 2.082E+01,,       | -0.531      |
| C,TH-232     | ,NO,        | -1.106E+01,      | 1.307E+01,  | 2.081E+01,,       | -0.531      |
| C,U-235      | ,NO,        | 5.917E+00,       | 2.688E+01,  | 3.798E+01,,       | 0.156       |
| C,U-238      | ,NO,        | -1.825E+02,      | 3.479E+02,  | 5.454E+02,,       | -0.335      |
| C,AM-241     | ,NO,        | -5.037E-01,      | 2.773E+01,  | 4.534E+01,,       | -0.011      |

Sec. Review: Analyst: LIMS: 

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VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 31-JUL-2006 03:08:55.49  
 TBE10 12892256 HpGe \*\*\*\*\* Aquisition Date/Time: 30-JUL-2006 21:08:39.33

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LIMS No., Customer Name, Client ID: WG L29402-2 EX ZION

Sample ID : 10L29402-2                      Smple Date: 28-JUL-2006 10:00:00.  
 Sample Type : WG                              Geometry : 1035L091004  
 Quantity : 3.38530E+00 L                      BKGFILE : 10BG072806MT  
 Start Channel : 80                      Energy Tol : 1.00000                      Real Time : 0 06:00:03.85  
 End Channel : 4090                      Pk Srch Sens: 5.00000                      Live time : 0 06:00:00.00  
 MDA Constant : 0.00                      Library Used: LIBD

| Pk | It | Energy   | Area | Bkgnd | FWHM | Channel | %Eff     | Cts/Sec  | %Err | Fit      |
|----|----|----------|------|-------|------|---------|----------|----------|------|----------|
| 1  | 1  | 65.92    | 203  | 779   | 1.38 | 131.26  | 6.22E-01 | 9.40E-03 | 24.7 | 2.10E+00 |
| 2  | 1  | 77.34    | 135  | 553   | 1.07 | 154.12  | 9.50E-01 | 6.26E-03 | 28.9 | 8.42E-01 |
| 3  | 1  | 85.77    | 128  | 1209  | 3.60 | 171.00  | 1.16E+00 | 5.92E-03 | 58.7 | 4.80E+00 |
| 4  | 1  | 92.86*   | 125  | 726   | 1.52 | 185.20  | 1.30E+00 | 5.77E-03 | 42.5 | 7.43E+00 |
| 5  | 1  | 139.59   | 252  | 894   | 1.76 | 278.75  | 1.68E+00 | 1.17E-02 | 23.6 | 2.02E+00 |
| 6  | 1  | 198.32*  | 113  | 554   | 1.51 | 396.31  | 1.55E+00 | 5.25E-03 | 41.4 | 5.46E-01 |
| 7  | 1  | 238.68*  | 119  | 405   | 1.54 | 477.11  | 1.40E+00 | 5.49E-03 | 34.2 | 1.24E+00 |
| 8  | 1  | 242.05   | 136  | 405   | 1.55 | 483.84  | 1.39E+00 | 6.29E-03 | 28.2 |          |
| 9  | 1  | 295.30*  | 128  | 480   | 1.06 | 590.45  | 1.21E+00 | 5.91E-03 | 35.4 | 3.55E+00 |
| 10 | 1  | 351.82*  | 359  | 350   | 1.33 | 703.60  | 1.07E+00 | 1.66E-02 | 12.6 | 1.02E+00 |
| 11 | 1  | 408.71   | 51   | 154   | 3.32 | 817.48  | 9.49E-01 | 2.35E-03 | 48.0 | 2.64E+00 |
| 12 | 1  | 595.92   | 66   | 163   | 1.95 | 1192.25 | 7.06E-01 | 3.05E-03 | 41.9 | 9.27E-01 |
| 13 | 1  | 609.32*  | 348  | 126   | 1.53 | 1219.07 | 6.94E-01 | 1.61E-02 | 9.4  | 2.04E+00 |
| 14 | 1  | 767.42   | 52   | 94    | 4.08 | 1535.57 | 5.79E-01 | 2.39E-03 | 42.3 | 3.05E+00 |
| 15 | 1  | 1120.29* | 85   | 78    | 2.01 | 2242.00 | 4.33E-01 | 3.95E-03 | 27.0 | 3.52E+00 |
| 16 | 1  | 1239.31  | 54   | 80    | 1.03 | 2480.26 | 4.01E-01 | 2.49E-03 | 38.4 | 1.22E+01 |
| 17 | 1  | 1461.08* | 24   | 29    | 2.69 | 2924.24 | 3.56E-01 | 1.10E-03 | 84.1 | 2.32E+00 |
| 18 | 1  | 1765.28* | 40   | 33    | 3.15 | 3533.24 | 3.13E-01 | 1.84E-03 | 40.9 | 2.35E+00 |

Flag: "\*" = Peak area was modified by background subtraction

## Nuclide Line Activity Report

Nuclide Type: natural

| Nuclide | Energy  | Area  | %Abn   | %Eff      | Uncorrected<br>pCi/L | Decay Corr<br>pCi/L | 2-Sigma<br>%Error |
|---------|---------|-------|--------|-----------|----------------------|---------------------|-------------------|
| K-40    | 1460.81 | 24    | 10.67* | 3.559E-01 | 2.317E+01            | 2.317E+01           | 168.18            |
| TH-228  | 238.63  | 119   | 44.60* | 1.400E+00 | 7.019E+00            | 7.037E+00           | 68.41             |
|         | 240.98  | ----- | 3.95   | 1.392E+00 | -----                | Line Not Found      | -----             |

Flag: "\*" = Keyline

Summary of Nuclide Activity  
 Sample ID : 10L29402-2

Page : 2  
 Acquisition date : 30-JUL-2006 21:08:39

Total number of lines in spectrum 18  
 Number of unidentified lines 16  
 Number of lines tentatively identified by NID 2 11.11%

Nuclide Type : natural

| Nuclide          | Hlife     | Decay | Uncorrected<br>pCi/L | Decay Corr<br>pCi/L | Decay Corr<br>2-Sigma Error | 2-Sigma<br>%Error | Flags |
|------------------|-----------|-------|----------------------|---------------------|-----------------------------|-------------------|-------|
| K-40             | 1.28E+09Y | 1.00  | 2.317E+01            | 2.317E+01           | 3.896E+01                   | 168.18            |       |
| TH-228           | 1.91Y     | 1.00  | 7.019E+00            | 7.037E+00           | 4.814E+00                   | 68.41             |       |
| Total Activity : |           |       | 3.019E+01            | 3.020E+01           |                             |                   |       |

Grand Total Activity : 3.019E+01 3.020E+01

Flags: "K" = Keyline not found  
 "E" = Manually edited

"M" = Manually accepted  
 "A" = Nuclide specific abn. limit

Unidentified Energy Lines  
 Sample ID : 10L29402-2

Page : 3  
 Acquisition date : 30-JUL-2006 21:08:39

| It | Energy  | Area | Bkgnd | FWHM | Channel | Left | Pw | Cts/Sec  | %Err | %Eff     | Flags |
|----|---------|------|-------|------|---------|------|----|----------|------|----------|-------|
| 1  | 65.92   | 203  | 779   | 1.38 | 131.26  | 128  | 8  | 9.40E-03 | 49.4 | 6.22E-01 |       |
| 1  | 77.34   | 135  | 553   | 1.07 | 154.12  | 152  | 6  | 6.26E-03 | 57.7 | 9.50E-01 |       |
| 1  | 85.77   | 128  | 1209  | 3.60 | 171.00  | 163  | 14 | 5.92E-03 | **** | 1.16E+00 |       |
| 1  | 92.86   | 125  | 726   | 1.52 | 185.20  | 181  | 9  | 5.77E-03 | 84.9 | 1.30E+00 |       |
| 1  | 139.59  | 252  | 894   | 1.76 | 278.75  | 273  | 11 | 1.17E-02 | 47.3 | 1.68E+00 |       |
| 1  | 198.32  | 113  | 554   | 1.51 | 396.31  | 392  | 9  | 5.25E-03 | 82.8 | 1.55E+00 |       |
| 1  | 242.05  | 136  | 405   | 1.55 | 483.84  | 471  | 18 | 6.29E-03 | 56.4 | 1.39E+00 |       |
| 1  | 295.30  | 128  | 480   | 1.06 | 590.45  | 585  | 11 | 5.91E-03 | 70.8 | 1.21E+00 |       |
| 1  | 351.82  | 359  | 350   | 1.33 | 703.60  | 698  | 13 | 1.66E-02 | 25.2 | 1.07E+00 |       |
| 1  | 408.71  | 51   | 154   | 3.32 | 817.48  | 814  | 10 | 2.35E-03 | 96.0 | 9.49E-01 |       |
| 1  | 595.92  | 66   | 163   | 1.95 | 1192.25 | 1186 | 13 | 3.05E-03 | 83.9 | 7.06E-01 |       |
| 1  | 609.32  | 348  | 126   | 1.53 | 1219.07 | 1214 | 13 | 1.61E-02 | 18.8 | 6.94E-01 |       |
| 1  | 767.42  | 52   | 94    | 4.08 | 1535.57 | 1528 | 14 | 2.39E-03 | 84.7 | 5.79E-01 |       |
| 1  | 1120.29 | 85   | 78    | 2.01 | 2242.00 | 2235 | 17 | 3.95E-03 | 53.9 | 4.33E-01 |       |
| 1  | 1239.31 | 54   | 80    | 1.03 | 2480.26 | 2470 | 16 | 2.49E-03 | 76.8 | 4.01E-01 |       |
| 1  | 1765.28 | 40   | 33    | 3.15 | 3533.24 | 3525 | 17 | 1.84E-03 | 81.8 | 3.13E-01 |       |

Flags: "T" = Tentatively associated

#### Summary of Nuclide Activity

|   |                               |
|---|-------------------------------|
| Total number of lines in spectrum             | 18                            |
| Number of unidentified lines                  | 16                            |
| Number of lines tentatively identified by NID | 2                      11.11% |

Nuclide Type : natural

| Nuclide          | Hlife     | Decay | Wtd Mean    | Wtd Mean   | Decay Corr | 2-Sigma | 2-Sigma | Error | 2-Sigma | %Error | Flags |
|------------------|-----------|-------|-------------|------------|------------|---------|---------|-------|---------|--------|-------|
|                  |           |       | Uncorrected | Decay Corr |            |         |         |       |         |        |       |
| K-40             | 1.28E+09Y | 1.00  | 2.317E+01   | 2.317E+01  | 3.896E+01  | 168.18  |         |       |         |        |       |
| TH-228           | 1.91Y     | 1.00  | 7.019E+00   | 7.037E+00  | 4.814E+00  | 68.41   |         |       |         |        |       |
| Total Activity : |           |       | 3.019E+01   | 3.020E+01  |            |         |         |       |         |        |       |

Grand Total Activity : 3.019E+01      3.020E+01

Flags: "K" = Keyline not found  
 "E" = Manually edited

"M" = Manually accepted  
 "A" = Nuclide specific abn. limit

#### Interference Report

No interference correction performed

#### Combined Activity-MDA Report

---- Identified Nuclides ----

| Nuclide | Activity<br>(pCi/L) | Act error | MDA<br>(pCi/L) | MDA error | Act/MDA |
|---------|---------------------|-----------|----------------|-----------|---------|
| K-40    | 2.317E+01           | 3.896E+01 | 3.825E+01      | 0.000E+00 | 0.606   |
| TH-228  | 7.037E+00           | 4.814E+00 | 7.745E+00      | 0.000E+00 | 0.909   |

## ---- Non-Identified Nuclides ----

| Nuclide | Key-Line<br>Activity<br>(pCi/L) | K.L.<br>Ided | Act error | MDA<br>(pCi/L) | MDA error | Act/MDA |
|---------|---------------------------------|--------------|-----------|----------------|-----------|---------|
| BE-7    | -2.171E+01                      |              | 2.230E+01 | 3.500E+01      | 0.000E+00 | -0.620  |
| NA-24   | -1.892E+01                      |              | 4.776E+01 | 7.607E+01      | 0.000E+00 | -0.249  |
| CR-51   | -1.883E+01                      |              | 2.340E+01 | 3.784E+01      | 0.000E+00 | -0.498  |
| MN-54   | -6.004E-02                      |              | 2.562E+00 | 4.198E+00      | 0.000E+00 | -0.014  |
| CO-57   | 5.674E-01                       |              | 2.791E+00 | 4.623E+00      | 0.000E+00 | 0.123   |
| CO-58   | -2.524E-01                      |              | 2.600E+00 | 4.249E+00      | 0.000E+00 | -0.059  |
| FE-59   | 2.920E+00                       |              | 4.829E+00 | 8.306E+00      | 0.000E+00 | 0.352   |
| CO-60   | -2.967E-02                      |              | 2.508E+00 | 4.117E+00      | 0.000E+00 | -0.007  |
| ZN-65   | 1.386E+01                       |              | 6.604E+00 | 1.084E+01      | 0.000E+00 | 1.279   |
| SE-75   | -1.929E-01                      |              | 3.489E+00 | 5.804E+00      | 0.000E+00 | -0.033  |
| SR-85   | 1.820E+01                       |              | 3.030E+00 | 5.835E+00      | 0.000E+00 | 3.119   |
| Y-88    | -7.384E-01                      |              | 2.741E+00 | 4.416E+00      | 0.000E+00 | -0.167  |
| NB-94   | -4.360E-01                      |              | 2.537E+00 | 4.160E+00      | 0.000E+00 | -0.105  |
| NB-95   | 3.753E-01                       |              | 2.598E+00 | 4.309E+00      | 0.000E+00 | 0.087   |
| ZR-95   | 2.194E+00                       |              | 5.042E+00 | 7.602E+00      | 0.000E+00 | 0.289   |
| MO-99   | 3.838E+01                       |              | 3.693E+01 | 6.398E+01      | 0.000E+00 | 0.600   |
| RU-103  | -4.511E-01                      |              | 2.677E+00 | 4.339E+00      | 0.000E+00 | -0.104  |
| RU-106  | 6.299E+00                       |              | 2.307E+01 | 3.783E+01      | 0.000E+00 | 0.167   |
| AG-110m | -1.590E+00                      |              | 2.500E+00 | 4.018E+00      | 0.000E+00 | -0.396  |
| SN-113  | 6.588E-01                       |              | 3.488E+00 | 5.778E+00      | 0.000E+00 | 0.114   |
| SB-124  | -1.899E+00                      |              | 6.177E+00 | 4.182E+00      | 0.000E+00 | -0.454  |
| SB-125  | 2.600E+00                       |              | 7.432E+00 | 1.235E+01      | 0.000E+00 | 0.210   |
| TE-129M | -9.026E-01                      |              | 3.041E+01 | 4.971E+01      | 0.000E+00 | -0.018  |
| I-131   | -1.509E-01                      |              | 3.204E+00 | 5.278E+00      | 0.000E+00 | -0.029  |
| BA-133  | 1.878E+01                       |              | 4.590E+00 | 7.501E+00      | 0.000E+00 | 2.504   |
| CS-134  | 1.227E+01                       |              | 6.294E+00 | 5.775E+00      | 0.000E+00 | 2.125   |
| CS-136  | -7.841E-01                      |              | 2.803E+00 | 4.531E+00      | 0.000E+00 | -0.173  |
| CS-137  | 6.339E-01                       |              | 2.773E+00 | 4.643E+00      | 0.000E+00 | 0.137   |
| CE-139  | -4.299E-01                      |              | 2.742E+00 | 4.478E+00      | 0.000E+00 | -0.096  |
| BA-140  | -1.726E+00                      |              | 1.029E+01 | 1.662E+01      | 0.000E+00 | -0.104  |
| LA-140  | 4.139E-02                       |              | 3.129E+00 | 5.100E+00      | 0.000E+00 | 0.008   |
| CE-141  | 9.325E-01                       |              | 5.823E+00 | 8.158E+00      | 0.000E+00 | 0.114   |
| CE-144  | 2.812E+00                       |              | 2.483E+01 | 3.482E+01      | 0.000E+00 | 0.081   |
| EU-152  | -2.385E+00                      |              | 1.009E+01 | 1.396E+01      | 0.000E+00 | -0.171  |
| EU-154  | 3.107E+00                       |              | 5.807E+00 | 9.677E+00      | 0.000E+00 | 0.321   |
| RA-226  | -1.887E+00                      |              | 7.015E+01 | 1.133E+02      | 0.000E+00 | -0.017  |
| AC-228  | -1.226E+00                      |              | 1.035E+01 | 1.690E+01      | 0.000E+00 | -0.073  |
| TH-232  | -1.225E+00                      |              | 1.034E+01 | 1.689E+01      | 0.000E+00 | -0.073  |
| U-235   | 3.166E+01                       |              | 2.576E+01 | 3.719E+01      | 0.000E+00 | 0.851   |
| U-238   | 1.024E+00                       |              | 2.834E+02 | 4.613E+02      | 0.000E+00 | 0.002   |
| AM-241  | 2.039E+01                       |              | 2.819E+01 | 3.956E+01      | 0.000E+00 | 0.515   |

| A, 10L29402-2 |        | , 07/31/2006 03:08, 07/28/2006 10:00, |            | 3.385E+00, WG L29402-2 FX       |        |
|---------------|--------|---------------------------------------|------------|---------------------------------|--------|
| B, 10L29402-2 |        | , LIBD                                |            | , 07/28/2006 09:50, 1035L091004 |        |
| C, K-40       | , YES, | 2.317E+01,                            | 3.896E+01, | 3.825E+01,,                     | 0.606  |
| C, TH-228     | , YES, | 7.037E+00,                            | 4.814E+00, | 7.745E+00,,                     | 0.909  |
| C, BE-7       | , NO,  | -2.171E+01,                           | 2.230E+01, | 3.500E+01,,                     | -0.620 |
| C, NA-24      | , NO,  | -1.892E+01,                           | 4.776E+01, | 7.607E+01,,                     | -0.249 |
| C, CR-51      | , NO,  | -1.883E+01,                           | 2.340E+01, | 3.784E+01,,                     | -0.498 |
| C, MN-54      | , NO,  | -6.004E-02,                           | 2.562E+00, | 4.198E+00,,                     | -0.014 |
| C, CO-57      | , NO,  | 5.674E-01,                            | 2.791E+00, | 4.623E+00,,                     | 0.123  |
| C, CO-58      | , NO,  | -2.524E-01,                           | 2.600E+00, | 4.249E+00,,                     | -0.059 |
| C, FE-59      | , NO,  | 2.920E+00,                            | 4.829E+00, | 8.306E+00,,                     | 0.352  |
| C, CO-60      | , NO,  | -2.967E-02,                           | 2.508E+00, | 4.117E+00,,                     | -0.007 |
| C, ZN-65      | , NO,  | 1.386E+01,                            | 6.604E+00, | 1.084E+01,,                     | 1.279  |
| C, SE-75      | , NO,  | -1.929E-01,                           | 3.489E+00, | 5.804E+00,,                     | -0.033 |
| C, SR-85      | , NO,  | 1.820E+01,                            | 3.030E+00, | 5.835E+00,,                     | 3.119  |
| C, Y-88       | , NO,  | -7.384E-01,                           | 2.741E+00, | 4.416E+00,,                     | -0.167 |
| C, NB-94      | , NO,  | -4.360E-01,                           | 2.537E+00, | 4.160E+00,,                     | -0.105 |
| C, NB-95      | , NO,  | 3.753E-01,                            | 2.598E+00, | 4.309E+00,,                     | 0.087  |
| C, ZR-95      | , NO,  | 2.194E+00,                            | 5.042E+00, | 7.602E+00,,                     | 0.289  |
| C, MO-99      | , NO,  | 3.838E+01,                            | 3.693E+01, | 6.398E+01,,                     | 0.600  |
| C, RU-103     | , NO,  | -4.511E-01,                           | 2.677E+00, | 4.339E+00,,                     | -0.104 |
| C, RU-106     | , NO,  | 6.299E+00,                            | 2.307E+01, | 3.783E+01,,                     | 0.167  |
| C, AG-110m    | , NO,  | -1.590E+00,                           | 2.500E+00, | 4.018E+00,,                     | -0.396 |
| C, SN-113     | , NO,  | 6.588E-01,                            | 3.488E+00, | 5.778E+00,,                     | 0.114  |
| C, SB-124     | , NO,  | -1.899E+00,                           | 6.177E+00, | 4.182E+00,,                     | -0.454 |
| C, SB-125     | , NO,  | 2.600E+00,                            | 7.432E+00, | 1.235E+01,,                     | 0.210  |
| C, TE-129M    | , NO,  | -9.026E-01,                           | 3.041E+01, | 4.971E+01,,                     | -0.018 |
| C, I-131      | , NO,  | -1.509E-01,                           | 3.204E+00, | 5.278E+00,,                     | -0.029 |
| C, BA-133     | , NO,  | 1.878E+01,                            | 4.590E+00, | 7.501E+00,,                     | 2.504  |
| C, CS-134     | , NO,  | 1.227E+01,                            | 6.294E+00, | 5.775E+00,,                     | 2.125  |
| C, CS-136     | , NO,  | -7.841E-01,                           | 2.803E+00, | 4.531E+00,,                     | -0.173 |
| C, CS-137     | , NO,  | 6.339E-01,                            | 2.773E+00, | 4.643E+00,,                     | 0.137  |
| C, CE-139     | , NO,  | -4.299E-01,                           | 2.742E+00, | 4.478E+00,,                     | -0.096 |
| C, BA-140     | , NO,  | -1.726E+00,                           | 1.029E+01, | 1.662E+01,,                     | -0.104 |
| C, LA-140     | , NO,  | 4.139E-02,                            | 3.129E+00, | 5.100E+00,,                     | 0.008  |
| C, CE-141     | , NO,  | 9.325E-01,                            | 5.823E+00, | 8.158E+00,,                     | 0.114  |
| C, CE-144     | , NO,  | 2.812E+00,                            | 2.483E+01, | 3.482E+01,,                     | 0.081  |
| C, EU-152     | , NO,  | -2.385E+00,                           | 1.009E+01, | 1.396E+01,,                     | -0.171 |
| C, EU-154     | , NO,  | 3.107E+00,                            | 5.807E+00, | 9.677E+00,,                     | 0.321  |
| C, RA-226     | , NO,  | -1.887E+00,                           | 7.015E+01, | 1.133E+02,,                     | -0.017 |
| C, AC-228     | , NO,  | -1.226E+00,                           | 1.035E+01, | 1.690E+01,,                     | -0.073 |
| C, TH-232     | , NO,  | -1.225E+00,                           | 1.034E+01, | 1.689E+01,,                     | -0.073 |
| C, U-235      | , NO,  | 3.166E+01,                            | 2.576E+01, | 3.719E+01,,                     | 0.851  |
| C, U-238      | , NO,  | 1.024E+00,                            | 2.834E+02, | 4.613E+02,,                     | 0.002  |
| C, AM-241     | , NO,  | 2.039E+01,                            | 2.819E+01, | 3.956E+01,,                     | 0.515  |

Sec. Review: Analyst: LIMS: ✓

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VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 30-JUL-2006 23:48:57.03  
 TBE11 P-20610B HpGe \*\*\*\*\* Aquisition Date/Time: 30-JUL-2006 21:08:42.83

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LIMS No., Customer Name, Client ID: WG L29402-3 EX ZION

Sample ID : 11L29402-3                      Smple Date: 28-JUL-2006 11:25:00.  
 Sample Type : WG                              Geometry : 1135L090204  
 Quantity : 3.37210E+00 L                      BKGFILE : 11BG072806MT  
 Start Channel : 40                      Energy Tol : 1.00000                      Real Time : 0 02:40:03.78  
 End Channel : 4090                      Pk Srch Sens: 5.00000                      Live time : 0 02:40:00.00  
 MDA Constant : 0.00                      Library Used: LIBD

| Pk | It | Energy   | Area | Bkgnd | FWHM | Channel | %Eff     | Cts/Sec  | %Err  | Fit      |
|----|----|----------|------|-------|------|---------|----------|----------|-------|----------|
| 1  | 0  | 139.80*  | 69   | 256   | 1.20 | 279.38  | 1.69E+00 | 7.22E-03 | 41.0  |          |
| 2  | 0  | 198.20*  | 46   | 238   | 1.00 | 396.53  | 1.57E+00 | 4.81E-03 | 65.2  |          |
| 3  | 6  | 238.60*  | 13   | 144   | 1.07 | 477.56  | 1.42E+00 | 1.39E-03 | 156.1 | 1.16E+00 |
| 4  | 6  | 241.89   | 85   | 263   | 2.33 | 484.16  | 1.41E+00 | 8.84E-03 | 40.9  |          |
| 5  | 0  | 295.02*  | 97   | 211   | 1.35 | 590.69  | 1.23E+00 | 1.01E-02 | 32.2  |          |
| 6  | 0  | 351.85*  | 181  | 133   | 1.59 | 704.62  | 1.08E+00 | 1.89E-02 | 15.7  |          |
| 7  | 0  | 582.76*  | 20   | 24    | 1.76 | 1167.28 | 7.27E-01 | 2.06E-03 | 58.3  |          |
| 8  | 0  | 595.98   | 43   | 46    | 1.35 | 1193.75 | 7.14E-01 | 4.53E-03 | 32.7  |          |
| 9  | 0  | 609.21*  | 172  | 78    | 1.63 | 1220.26 | 7.02E-01 | 1.79E-02 | 13.6  |          |
| 10 | 0  | 913.73   | 100  | 14    | 9.07 | 1829.71 | 5.12E-01 | 1.04E-02 | 14.6  |          |
| 11 | 0  | 1119.93* | 37   | 23    | 1.99 | 2241.99 | 4.37E-01 | 3.88E-03 | 32.9  |          |
| 12 | 0  | 1460.57* | 14   | 18    | 1.84 | 2922.35 | 3.54E-01 | 1.45E-03 | 89.0  |          |
| 13 | 0  | 1762.75* | 40   | 11    | 2.86 | 3525.17 | 3.04E-01 | 4.13E-03 | 26.0  |          |
| 14 | 0  | 1845.57  | 12   | 11    | 0.84 | 3690.25 | 2.93E-01 | 1.25E-03 | 60.8  |          |
| 15 | 0  | 1938.34  | 12   | 1     | 1.28 | 3875.11 | 2.82E-01 | 1.21E-03 | 33.7  |          |

Flag: "\*" = Peak area was modified by background subtraction

## Nuclide Line Activity Report

Nuclide Type: natural

| Nuclide | Energy  | Area | %Abn   | %Eff      | Uncorrected<br>pCi/L | Decay Corr<br>pCi/L | 2-Sigma<br>%Error |
|---------|---------|------|--------|-----------|----------------------|---------------------|-------------------|
| K-40    | 1460.81 | 14   | 10.67* | 3.540E-01 | 3.080E+01            | 3.080E+01           | 177.98            |
| TH-228  | 238.63  | 13   | 44.60* | 1.421E+00 | 1.756E+00            | 1.760E+00           | 312.10            |
|         | 240.98  | 85   | 3.95   | 1.409E+00 | 1.273E+02            | 1.276E+02           | 81.83             |

Flag: "\*" = Keyline

## Summary of Nuclide Activity

Page : 2

Sample ID : 11L29402-3

Acquisition date : 30-JUL-2006 21:08:42

|   |    |        |
|---|----|--------|
| Total number of lines in spectrum             | 15 |        |
| Number of unidentified lines                  | 11 |        |
| Number of lines tentatively identified by NID | 4  | 26.67% |

Nuclide Type : natural

| Nuclide | Hlife     | Decay            | Uncorrected<br>pCi/L | Decay Corr<br>pCi/L | Decay Corr<br>2-Sigma Error | 2-Sigma<br>%Error | Flags |
|---------|-----------|------------------|----------------------|---------------------|-----------------------------|-------------------|-------|
| K-40    | 1.28E+09Y | 1.00             | 3.080E+01            | 3.080E+01           | 5.482E+01                   | 177.98            |       |
| TH-228  | 1.91Y     | 1.00             | 1.756E+00            | 1.760E+00           | 5.494E+00                   | 312.10            |       |
|         |           |                  | -----                | -----               |                             |                   |       |
|         |           | Total Activity : | 3.256E+01            | 3.256E+01           |                             |                   |       |

|                        |           |           |
|------------------------|-----------|-----------|
| Grand Total Activity : | 3.256E+01 | 3.256E+01 |
|------------------------|-----------|-----------|

Flags: "K" = Keyline not found

"M" = Manually accepted

"E" = Manually edited

"A" = Nuclide specific abn. limit



Unidentified Energy Lines  
 Sample ID : 11L29402-3

Page : 3  
 Acquisition date : 30-JUL-2006 21:08:42

| It | Energy  | Area | Bkgnd | FWHM | Channel | Left | Pw | Cts/Sec  | %Err | %Eff     | Flags |
|----|---------|------|-------|------|---------|------|----|----------|------|----------|-------|
| 0  | 139.80  | 69   | 256   | 1.20 | 279.38  | 276  | 7  | 7.22E-03 | 81.9 | 1.69E+00 |       |
| 0  | 198.20  | 46   | 238   | 1.00 | 396.53  | 393  | 10 | 4.81E-03 | **** | 1.57E+00 |       |
| 0  | 295.02  | 97   | 211   | 1.35 | 590.69  | 587  | 12 | 1.01E-02 | 64.5 | 1.23E+00 |       |
| 0  | 351.85  | 181  | 133   | 1.59 | 704.62  | 698  | 13 | 1.89E-02 | 31.3 | 1.08E+00 |       |
| 0  | 582.76  | 20   | 24    | 1.76 | 1167.28 | 1163 | 8  | 2.06E-03 | **** | 7.27E-01 | T     |
| 0  | 595.98  | 43   | 46    | 1.35 | 1193.75 | 1189 | 10 | 4.53E-03 | 65.3 | 7.14E-01 |       |
| 0  | 609.21  | 172  | 78    | 1.63 | 1220.26 | 1216 | 13 | 1.79E-02 | 27.2 | 7.02E-01 |       |
| 0  | 913.73  | 100  | 14    | 9.07 | 1829.71 | 1817 | 28 | 1.04E-02 | 29.1 | 5.12E-01 |       |
| 0  | 1119.93 | 37   | 23    | 1.99 | 2241.99 | 2235 | 13 | 3.88E-03 | 65.8 | 4.37E-01 |       |
| 0  | 1762.75 | 40   | 11    | 2.86 | 3525.17 | 3518 | 14 | 4.13E-03 | 52.0 | 3.04E-01 |       |
| 0  | 1845.57 | 12   | 11    | 0.84 | 3690.25 | 3682 | 11 | 1.25E-03 | **** | 2.93E-01 |       |
| 0  | 1938.34 | 12   | 1     | 1.28 | 3875.11 | 3872 | 6  | 1.21E-03 | 67.5 | 2.82E-01 |       |

Flags: "T" = Tentatively associated

Summary of Nuclide Activity

Total number of lines in spectrum 15  
 Number of unidentified lines 11  
 Number of lines tentatively identified by NID 4 26.67%

Nuclide Type : natural

| Nuclide          | Hlife     | Decay | Wtd Mean<br>Uncorrected<br>pCi/L | Wtd Mean<br>Decay Corr<br>pCi/L | Decay Corr<br>2-Sigma Error | 2-Sigma<br>%Error | Flags |
|------------------|-----------|-------|----------------------------------|---------------------------------|-----------------------------|-------------------|-------|
| K-40             | 1.28E+09Y | 1.00  | 3.080E+01                        | 3.080E+01                       | 5.482E+01                   | 177.98            |       |
| TH-228           | 1.91Y     | 1.00  | 2.103E+00                        | 2.108E+00                       | 5.486E+00                   | 260.30            |       |
| Total Activity : |           |       | 3.290E+01                        | 3.291E+01                       |                             |                   |       |

Grand Total Activity : 3.290E+01 3.291E+01

Flags: "K" = Keyline not found "M" = Manually accepted  
 "E" = Manually edited "A" = Nuclide specific abn. limit

Interference Report

No interference correction performed

Combined Activity-MDA Report

---- Identified Nuclides ----

| Nuclide | Activity<br>(pCi/L) | Act error | MDA<br>(pCi/L) | MDA error | Act/MDA |
|---------|---------------------|-----------|----------------|-----------|---------|
| K-40    | 3.080E+01           | 5.482E+01 | 4.437E+01      | 0.000E+00 | 0.694   |
| TH-228  | 2.108E+00           | 5.486E+00 | 9.066E+00      | 0.000E+00 | 0.232   |

---- Non-Identified Nuclides ----

Key-Line

| Nuclide | Activity<br>(pCi/L) | K.L.<br>Ided | Act error | MDA<br>(pCi/L) | MDA error | Act/MDA |
|---------|---------------------|--------------|-----------|----------------|-----------|---------|
| BE-7    | 1.094E+01           |              | 2.638E+01 | 4.496E+01      | 0.000E+00 | 0.243   |
| NA-24   | 1.673E+01           |              | 4.654E+01 | 8.015E+01      | 0.000E+00 | 0.209   |
| CR-51   | 6.869E-01           |              | 2.880E+01 | 4.630E+01      | 0.000E+00 | 0.015   |
| MN-54   | 6.568E-01           |              | 3.252E+00 | 5.357E+00      | 0.000E+00 | 0.123   |
| CO-57   | -2.455E-01          |              | 3.145E+00 | 5.183E+00      | 0.000E+00 | -0.047  |
| CO-58   | 1.276E+00           |              | 3.174E+00 | 5.341E+00      | 0.000E+00 | 0.239   |
| FE-59   | -1.423E+00          |              | 5.741E+00 | 9.224E+00      | 0.000E+00 | -0.154  |
| CO-60   | 2.243E-01           |              | 3.039E+00 | 5.033E+00      | 0.000E+00 | 0.045   |
| ZN-65   | 1.106E+00           |              | 7.728E+00 | 1.118E+01      | 0.000E+00 | 0.099   |
| SE-75   | -2.405E+00          |              | 4.252E+00 | 6.660E+00      | 0.000E+00 | -0.361  |
| SR-85   | -3.607E+00          |              | 4.217E+00 | 6.657E+00      | 0.000E+00 | -0.542  |
| Y-88    | -2.875E-01          |              | 4.379E+00 | 6.316E+00      | 0.000E+00 | -0.046  |
| NB-94   | 2.813E+00           |              | 3.371E+00 | 5.852E+00      | 0.000E+00 | 0.481   |
| NB-95   | 2.638E+00           |              | 3.202E+00 | 5.590E+00      | 0.000E+00 | 0.472   |
| ZR-95   | 3.399E-01           |              | 5.680E+00 | 9.269E+00      | 0.000E+00 | 0.037   |
| MO-99   | -4.157E+01          |              | 4.611E+01 | 6.846E+01      | 0.000E+00 | -0.607  |
| RU-103  | 1.929E+00           |              | 3.364E+00 | 5.778E+00      | 0.000E+00 | 0.334   |
| RU-106  | 3.872E+00           |              | 2.913E+01 | 4.825E+01      | 0.000E+00 | 0.080   |
| AG-110m | 1.032E+00           |              | 3.043E+00 | 5.121E+00      | 0.000E+00 | 0.202   |
| SN-113  | -4.121E-01          |              | 3.933E+00 | 6.519E+00      | 0.000E+00 | -0.063  |
| SB-124  | -2.624E+00          |              | 4.767E+00 | 5.018E+00      | 0.000E+00 | -0.523  |
| SB-125  | 1.025E+01           |              | 9.507E+00 | 1.683E+01      | 0.000E+00 | 0.609   |
| TE-129M | -2.196E+01          |              | 3.731E+01 | 5.937E+01      | 0.000E+00 | -0.370  |
| I-131   | -1.854E+00          |              | 3.823E+00 | 6.209E+00      | 0.000E+00 | -0.299  |
| BA-133  | -1.103E+00          |              | 5.016E+00 | 7.111E+00      | 0.000E+00 | -0.155  |
| CS-134  | -4.362E-01          |              | 3.670E+00 | 5.090E+00      | 0.000E+00 | -0.086  |
| CS-136  | -1.339E+00          |              | 3.644E+00 | 5.669E+00      | 0.000E+00 | -0.236  |
| CS-137  | 6.320E-01           |              | 3.547E+00 | 5.880E+00      | 0.000E+00 | 0.107   |
| CE-139  | -1.272E+00          |              | 3.263E+00 | 5.268E+00      | 0.000E+00 | -0.241  |
| BA-140  | -2.088E+00          |              | 1.252E+01 | 2.035E+01      | 0.000E+00 | -0.103  |
| LA-140  | -2.677E+00          |              | 4.089E+00 | 5.911E+00      | 0.000E+00 | -0.453  |
| CE-141  | -9.295E-01          |              | 5.999E+00 | 9.243E+00      | 0.000E+00 | -0.101  |
| CE-144  | -9.258E+00          |              | 2.605E+01 | 3.988E+01      | 0.000E+00 | -0.232  |
| EU-152  | -6.886E+00          |              | 1.028E+01 | 1.464E+01      | 0.000E+00 | -0.470  |
| EU-154  | -3.983E+00          |              | 6.607E+00 | 1.067E+01      | 0.000E+00 | -0.373  |
| RA-226  | 3.140E+01           |              | 8.010E+01 | 1.343E+02      | 0.000E+00 | 0.234   |
| AC-228  | 1.787E+00           |              | 1.222E+01 | 2.207E+01      | 0.000E+00 | 0.081   |
| TH-232  | 1.785E+00           |              | 1.221E+01 | 2.205E+01      | 0.000E+00 | 0.081   |
| U-235   | 4.340E+00           |              | 2.828E+01 | 4.067E+01      | 0.000E+00 | 0.107   |
| U-238   | -2.114E+02          |              | 3.325E+02 | 5.133E+02      | 0.000E+00 | -0.412  |
| AM-241  | 8.569E-03           |              | 3.704E+01 | 6.213E+01      | 0.000E+00 | 0.000   |

|               |             |                  |             |                   |             |
|---------------|-------------|------------------|-------------|-------------------|-------------|
| A, 11L29402-3 | ,07/30/2006 | 23:48,07/28/2006 | 11:25,      | 3.372E+00,WG      | L29402-3 EX |
| B, 11L29402-3 | ,LIBD       |                  | ,07/28/2006 | 09:50,1135L090204 |             |
| C, K-40       | ,YES,       | 3.080E+01,       | 5.482E+01,  | 4.437E+01,,       | 0.694       |
| C, TH-228     | ,YES,       | 2.108E+00,       | 5.486E+00,  | 9.066E+00,,       | 0.232       |
| C, BE-7       | ,NO ,       | 1.094E+01,       | 2.638E+01,  | 4.496E+01,,       | 0.243       |
| C, NA-24      | ,NO ,       | 1.673E+01,       | 4.654E+01,  | 8.015E+01,,       | 0.209       |
| C, CR-51      | ,NO ,       | 6.869E-01,       | 2.880E+01,  | 4.630E+01,,       | 0.015       |
| C, MN-54      | ,NO ,       | 6.568E-01,       | 3.252E+00,  | 5.357E+00,,       | 0.123       |
| C, CO-57      | ,NO ,       | -2.455E-01,      | 3.145E+00,  | 5.183E+00,,       | -0.047      |
| C, CO-58      | ,NO ,       | 1.276E+00,       | 3.174E+00,  | 5.341E+00,,       | 0.239       |
| C, FE-59      | ,NO ,       | -1.423E+00,      | 5.741E+00,  | 9.224E+00,,       | -0.154      |
| C, CO-60      | ,NO ,       | 2.243E-01,       | 3.039E+00,  | 5.033E+00,,       | 0.045       |
| C, ZN-65      | ,NO ,       | 1.106E+00,       | 7.728E+00,  | 1.118E+01,,       | 0.099       |
| C, SE-75      | ,NO ,       | -2.405E+00,      | 4.252E+00,  | 6.660E+00,,       | -0.361      |
| C, SR-85      | ,NO ,       | -3.607E+00,      | 4.217E+00,  | 6.657E+00,,       | -0.542      |
| C, Y-88       | ,NO ,       | -2.875E-01,      | 4.379E+00,  | 6.316E+00,,       | -0.046      |
| C, NB-94      | ,NO ,       | 2.813E+00,       | 3.371E+00,  | 5.852E+00,,       | 0.481       |
| C, NB-95      | ,NO ,       | 2.638E+00,       | 3.202E+00,  | 5.590E+00,,       | 0.472       |
| C, ZR-95      | ,NO ,       | 3.399E-01,       | 5.680E+00,  | 9.269E+00,,       | 0.037       |
| C, MO-99      | ,NO ,       | -4.157E+01,      | 4.611E+01,  | 6.846E+01,,       | -0.607      |
| C, RU-103     | ,NO ,       | 1.929E+00,       | 3.364E+00,  | 5.778E+00,,       | 0.334       |
| C, RU-106     | ,NO ,       | 3.872E+00,       | 2.913E+01,  | 4.825E+01,,       | 0.080       |
| C, AG-110m    | ,NO ,       | 1.032E+00,       | 3.043E+00,  | 5.121E+00,,       | 0.202       |
| C, SN-113     | ,NO ,       | -4.121E-01,      | 3.933E+00,  | 6.519E+00,,       | -0.063      |
| C, SB-124     | ,NO ,       | -2.624E+00,      | 4.767E+00,  | 5.018E+00,,       | -0.523      |
| C, SB-125     | ,NO ,       | 1.025E+01,       | 9.507E+00,  | 1.683E+01,,       | 0.609       |
| C, TE-129M    | ,NO ,       | -2.196E+01,      | 3.731E+01,  | 5.937E+01,,       | -0.370      |
| C, I-131      | ,NO ,       | -1.854E+00,      | 3.823E+00,  | 6.209E+00,,       | -0.299      |
| C, BA-133     | ,NO ,       | -1.103E+00,      | 5.016E+00,  | 7.111E+00,,       | -0.155      |
| C, CS-134     | ,NO ,       | -4.362E-01,      | 3.670E+00,  | 5.090E+00,,       | -0.086      |
| C, CS-136     | ,NO ,       | -1.339E+00,      | 3.644E+00,  | 5.669E+00,,       | -0.236      |
| C, CS-137     | ,NO ,       | 6.320E-01,       | 3.547E+00,  | 5.880E+00,,       | 0.107       |
| C, CE-139     | ,NO ,       | -1.272E+00,      | 3.263E+00,  | 5.268E+00,,       | -0.241      |
| C, BA-140     | ,NO ,       | -2.088E+00,      | 1.252E+01,  | 2.035E+01,,       | -0.103      |
| C, LA-140     | ,NO ,       | -2.677E+00,      | 4.089E+00,  | 5.911E+00,,       | -0.453      |
| C, CE-141     | ,NO ,       | -9.295E-01,      | 5.999E+00,  | 9.243E+00,,       | -0.101      |
| C, CE-144     | ,NO ,       | -9.258E+00,      | 2.605E+01,  | 3.988E+01,,       | -0.232      |
| C, EU-152     | ,NO ,       | -6.886E+00,      | 1.028E+01,  | 1.464E+01,,       | -0.470      |
| C, EU-154     | ,NO ,       | -3.983E+00,      | 6.607E+00,  | 1.067E+01,,       | -0.373      |
| C, RA-226     | ,NO ,       | 3.140E+01,       | 8.010E+01,  | 1.343E+02,,       | 0.234       |
| C, AC-228     | ,NO ,       | 1.787E+00,       | 1.222E+01,  | 2.207E+01,,       | 0.081       |
| C, TH-232     | ,NO ,       | 1.785E+00,       | 1.221E+01,  | 2.205E+01,,       | 0.081       |
| C, U-235      | ,NO ,       | 4.340E+00,       | 2.828E+01,  | 4.067E+01,,       | 0.107       |
| C, U-238      | ,NO ,       | -2.114E+02,      | 3.325E+02,  | 5.133E+02,,       | -0.412      |
| C, AM-241     | ,NO ,       | 8.569E-03,       | 3.704E+01,  | 6.213E+01,,       | 0.000       |

Sec. Review: 109 Analyst: W LIMS: ✓

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VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 31-JUL-2006 03:09:03.44  
 TBE14 P-10933A HpGe \*\*\*\*\* Aquisition Date/Time: 30-JUL-2006 21:08:47.79

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LIMS No., Customer Name, Client ID: WG L29402-4 EX ZION

Sample ID : 14L29402-4 Smple Date: 28-JUL-2006 11:12:00.  
 Sample Type : WG Geometry : 1435L091304  
 Quantity : 3.36510E+00 L BKGFILE : 14BG072806MT  
 Start Channel : 90 Energy Tol : 1.00000 Real Time : 0 06:00:03.85  
 End Channel : 4090 Pk Srch Sens: 5.00000 Live time : 0 06:00:00.00  
 MDA Constant : 0.00 Library Used: LIBD

| Pk | It | Energy   | Area | Bkgnd | FWHM | Channel | %Eff     | Cts/Sec  | %Err  | Fit      |
|----|----|----------|------|-------|------|---------|----------|----------|-------|----------|
| 1  | 1  | 65.77*   | 320  | 1315  | 2.82 | 132.85  | 4.37E-01 | 1.48E-02 | 24.9  | 2.04E+00 |
| 2  | 1  | 74.89*   | 111  | 990   | 2.02 | 151.18  | 6.93E-01 | 5.14E-03 | 60.9  | 4.90E+00 |
| 3  | 1  | 140.21*  | 265  | 772   | 1.95 | 282.39  | 1.67E+00 | 1.23E-02 | 20.9  | 3.77E+00 |
| 4  | 1  | 185.54*  | 43   | 785   | 1.57 | 373.43  | 1.64E+00 | 2.00E-03 | 132.5 | 8.01E-01 |
| 5  | 1  | 198.71*  | 114  | 595   | 1.24 | 399.86  | 1.60E+00 | 5.30E-03 | 41.3  | 1.57E+00 |
| 6  | 1  | 238.96*  | 76   | 606   | 1.30 | 480.66  | 1.47E+00 | 3.53E-03 | 64.7  | 8.19E-01 |
| 7  | 1  | 295.81*  | 163  | 643   | 1.86 | 594.73  | 1.29E+00 | 7.54E-03 | 35.1  | 5.21E+00 |
| 8  | 1  | 352.20*  | 445  | 475   | 1.57 | 707.83  | 1.14E+00 | 2.06E-02 | 12.4  | 1.24E+00 |
| 9  | 1  | 583.75*  | 28   | 178   | 2.85 | 1171.74 | 7.91E-01 | 1.28E-03 | 113.2 | 2.44E+00 |
| 10 | 1  | 596.05   | 68   | 238   | 1.12 | 1196.35 | 7.79E-01 | 3.17E-03 | 51.0  | 1.51E+00 |
| 11 | 1  | 609.40*  | 404  | 209   | 1.62 | 1223.07 | 7.66E-01 | 1.87E-02 | 9.7   | 1.29E+00 |
| 12 | 1  | 768.23   | 89   | 127   | 5.35 | 1540.76 | 6.43E-01 | 4.12E-03 | 29.1  | 2.96E+00 |
| 13 | 1  | 1120.11* | 101  | 65    | 1.87 | 2243.20 | 4.81E-01 | 4.67E-03 | 19.5  | 1.21E+00 |
| 14 | 1  | 1238.52* | 47   | 100   | 3.69 | 2479.16 | 4.45E-01 | 2.19E-03 | 57.4  | 1.66E+00 |
| 15 | 1  | 1461.16* | 18   | 52    | 2.18 | 2922.26 | 3.93E-01 | 8.52E-04 | 129.7 | 2.05E+00 |
| 16 | 1  | 1766.01* | 74   | 58    | 2.39 | 3527.78 | 3.43E-01 | 3.44E-03 | 30.2  | 7.64E-01 |

Flag: "\*" = Peak area was modified by background subtraction

### Nuclide Line Activity Report

Nuclide Type: natural

| Nuclide | Energy  | Area  | %Abn   | %Eff      | Uncorrected pCi/L | Decay Corr pCi/L | 2-Sigma %Error |
|---------|---------|-------|--------|-----------|-------------------|------------------|----------------|
| K-40    | 1460.81 | 18    | 10.67* | 3.927E-01 | 1.633E+01         | 1.633E+01        | 259.40         |
| RA-226  | 186.21  | 43    | 3.28*  | 1.641E+00 | 2.979E+01         | 2.979E+01        | 265.07         |
| TH-228  | 238.63  | 76    | 44.60* | 1.467E+00 | 4.327E+00         | 4.338E+00        | 129.49         |
|         | 240.98  | ----- | 3.95   | 1.461E+00 | -----             | Line Not Found   | -----          |
| U-235   | 143.76  | ----- | 10.50* | 1.680E+00 | -----             | Line Not Found   | -----          |
|         | 163.35  | ----- | 4.70   | 1.685E+00 | -----             | Line Not Found   | -----          |
|         | 185.71  | 43    | 54.00  | 1.641E+00 | 1.810E+00         | 1.810E+00        | 265.07         |
|         | 205.31  | ----- | 4.70   | 1.582E+00 | -----             | Line Not Found   | -----          |

Flag: "\*" = Keyline

Summary of Nuclide Activity  
 Sample ID : 14L29402-4

Page : 2  
 Acquisition date : 30-JUL-2006 21:08:47

Total number of lines in spectrum 16  
 Number of unidentified lines 12  
 Number of lines tentatively identified by NID 4 25.00%

Nuclide Type : natural

| Nuclide          | Hlife     | Decay | Uncorrected<br>pCi/L | Decay Corr<br>pCi/L | Decay Corr<br>2-Sigma Error | 2-Sigma<br>%Error | Flags |
|------------------|-----------|-------|----------------------|---------------------|-----------------------------|-------------------|-------|
| K-40             | 1.28E+09Y | 1.00  | 1.633E+01            | 1.633E+01           | 4.237E+01                   | 259.40            |       |
| RA-226           | 1600.00Y  | 1.00  | 2.979E+01            | 2.979E+01           | 7.897E+01                   | 265.07            |       |
| TH-228           | 1.91Y     | 1.00  | 4.327E+00            | 4.338E+00           | 5.618E+00                   | 129.49            |       |
| U-235            | 7.04E+08Y | 1.00  | 1.810E+00            | 1.810E+00           | 4.797E+00                   | 265.07            | K     |
| Total Activity : |           |       | 5.226E+01            | 5.227E+01           |                             |                   |       |

Grand Total Activity : 5.226E+01 5.227E+01

Flags: "K" = Keyline not found  
 "E" = Manually edited

"M" = Manually accepted  
 "A" = Nuclide specific abn. limit

Unidentified Energy Lines  
 Sample ID : 14L29402-4

Page : 3  
 Acquisition date : 30-JUL-2006 21:08:47

| It | Energy  | Area | Bkgnd | FWHM | Channel | Left | Pw | Cts/Sec  | %Err | %Eff     | Flags |
|----|---------|------|-------|------|---------|------|----|----------|------|----------|-------|
| 1  | 65.77   | 320  | 1315  | 2.82 | 132.85  | 126  | 14 | 1.48E-02 | 49.9 | 4.37E-01 |       |
| 1  | 74.89   | 111  | 990   | 2.02 | 151.18  | 145  | 12 | 5.14E-03 | **** | 6.93E-01 |       |
| 1  | 140.21  | 265  | 772   | 1.95 | 282.39  | 277  | 10 | 1.23E-02 | 41.8 | 1.67E+00 |       |
| 1  | 198.71  | 114  | 595   | 1.24 | 399.86  | 396  | 9  | 5.30E-03 | 82.6 | 1.60E+00 |       |
| 1  | 295.81  | 163  | 643   | 1.86 | 594.73  | 587  | 14 | 7.54E-03 | 70.2 | 1.29E+00 |       |
| 1  | 352.20  | 445  | 475   | 1.57 | 707.83  | 700  | 16 | 2.06E-02 | 24.8 | 1.14E+00 |       |
| 1  | 583.75  | 28   | 178   | 2.85 | 1171.74 | 1166 | 13 | 1.28E-03 | **** | 7.91E-01 | T     |
| 1  | 596.05  | 68   | 238   | 1.12 | 1196.35 | 1190 | 15 | 3.17E-03 | **** | 7.79E-01 |       |
| 1  | 609.40  | 404  | 209   | 1.62 | 1223.07 | 1216 | 14 | 1.87E-02 | 19.3 | 7.66E-01 |       |
| 1  | 768.23  | 89   | 127   | 5.35 | 1540.76 | 1537 | 15 | 4.12E-03 | 58.2 | 6.43E-01 |       |
| 1  | 1120.11 | 101  | 65    | 1.87 | 2243.20 | 2238 | 10 | 4.67E-03 | 39.1 | 4.81E-01 |       |
| 1  | 1238.52 | 47   | 100   | 3.69 | 2479.16 | 2466 | 21 | 2.19E-03 | **** | 4.45E-01 |       |
| 1  | 1766.01 | 74   | 58    | 2.39 | 3527.78 | 3518 | 21 | 3.44E-03 | 60.3 | 3.43E-01 |       |

Flags: "T" = Tentatively associated

### Summary of Nuclide Activity

Total number of lines in spectrum 16  
 Number of unidentified lines 12  
 Number of lines tentatively identified by NID 4 25.00%

Nuclide Type : natural

| Nuclide          | Hlife     | Decay | Wtd Mean<br>Uncorrected<br>pCi/L | Wtd Mean<br>Decay Corr<br>pCi/L | Decay Corr<br>2-Sigma<br>Error | 2-Sigma<br>%Error | Flags |
|------------------|-----------|-------|----------------------------------|---------------------------------|--------------------------------|-------------------|-------|
| K-40             | 1.28E+09Y | 1.00  | 1.633E+01                        | 1.633E+01                       | 4.237E+01                      | 259.40            |       |
| RA-226           | 1600.00Y  | 1.00  | 2.979E+01                        | 2.979E+01                       | 7.897E+01                      | 265.07            |       |
| TH-228           | 1.91Y     | 1.00  | 4.327E+00                        | 4.338E+00                       | 5.618E+00                      | 129.49            |       |
| Total Activity : |           |       | 5.045E+01                        | 5.046E+01                       |                                |                   |       |

Grand Total Activity : 5.045E+01 5.046E+01

Flags: "K" = Keyline not found "M" = Manually accepted  
 "E" = Manually edited "A" = Nuclide specific abn. limit

### Interference Report

No interference correction performed

### Combined Activity-MDA Report

---- Identified Nuclides ----

| Nuclide | Activity<br>(pCi/L) | Act error | MDA<br>(pCi/L) | MDA error | Act/MDA |
|---------|---------------------|-----------|----------------|-----------|---------|
| K-40    | 1.633E+01           | 4.237E+01 | 4.628E+01      | 0.000E+00 | 0.353   |
| RA-226  | 2.979E+01           | 7.897E+01 | 1.219E+02      | 0.000E+00 | 0.244   |
| TH-228  | 4.338E+00           | 5.618E+00 | 8.736E+00      | 0.000E+00 | 0.497   |

## ---- Non-Identified Nuclides ----

| Nuclide | Key-Line<br>Activity<br>(pCi/L) | K.L.<br>Ided | Act error | MDA<br>(pCi/L) | MDA error | Act/MDA |
|---------|---------------------------------|--------------|-----------|----------------|-----------|---------|
| BE-7    | 1.182E+01                       |              | 2.448E+01 | 4.118E+01      | 0.000E+00 | 0.287   |
| NA-24   | -3.631E+01                      |              | 4.876E+01 | 7.725E+01      | 0.000E+00 | -0.470  |
| CR-51   | -1.784E+01                      |              | 2.614E+01 | 4.203E+01      | 0.000E+00 | -0.424  |
| MN-54   | -1.966E-01                      |              | 2.652E+00 | 4.389E+00      | 0.000E+00 | -0.045  |
| CO-57   | -1.163E+00                      |              | 3.167E+00 | 5.125E+00      | 0.000E+00 | -0.227  |
| CO-58   | 1.565E-01                       |              | 2.925E+00 | 4.770E+00      | 0.000E+00 | 0.033   |
| FE-59   | 1.928E+00                       |              | 5.015E+00 | 8.412E+00      | 0.000E+00 | 0.229   |
| CO-60   | 2.989E-01                       |              | 2.873E+00 | 4.709E+00      | 0.000E+00 | 0.063   |
| ZN-65   | 1.686E+01                       |              | 7.585E+00 | 1.204E+01      | 0.000E+00 | 1.400   |
| SE-75   | -4.149E+00                      |              | 3.942E+00 | 6.327E+00      | 0.000E+00 | -0.656  |
| SR-85   | 1.844E+01                       |              | 3.126E+00 | 5.952E+00      | 0.000E+00 | 3.098   |
| Y-88    | -5.495E-02                      |              | 2.855E+00 | 4.664E+00      | 0.000E+00 | -0.012  |
| NB-94   | 1.085E+00                       |              | 2.688E+00 | 4.467E+00      | 0.000E+00 | 0.243   |
| NB-95   | 1.684E+00                       |              | 3.330E+00 | 4.703E+00      | 0.000E+00 | 0.358   |
| ZR-95   | -2.760E+00                      |              | 5.199E+00 | 7.815E+00      | 0.000E+00 | -0.353  |
| MO-99   | -4.288E+00                      |              | 3.835E+01 | 6.228E+01      | 0.000E+00 | -0.069  |
| RU-103  | 3.386E+00                       |              | 2.949E+00 | 5.059E+00      | 0.000E+00 | 0.669   |
| RU-106  | 6.634E+00                       |              | 2.774E+01 | 4.369E+01      | 0.000E+00 | 0.152   |
| AG-110m | -1.143E+00                      |              | 2.703E+00 | 4.354E+00      | 0.000E+00 | -0.262  |
| SN-113  | -3.376E+00                      |              | 3.788E+00 | 5.997E+00      | 0.000E+00 | -0.563  |
| SB-124  | -8.563E-01                      |              | 7.346E+00 | 4.844E+00      | 0.000E+00 | -0.177  |
| SB-125  | 3.577E+00                       |              | 8.167E+00 | 1.375E+01      | 0.000E+00 | 0.260   |
| TE-129M | 4.646E+00                       |              | 3.352E+01 | 5.585E+01      | 0.000E+00 | 0.083   |
| I-131   | -1.059E+00                      |              | 3.841E+00 | 5.846E+00      | 0.000E+00 | -0.181  |
| BA-133  | 2.728E+01                       |              | 5.231E+00 | 8.517E+00      | 0.000E+00 | 3.202   |
| CS-134  | 1.810E+01                       |              | 7.448E+00 | 6.541E+00      | 0.000E+00 | 2.767   |
| CS-136  | 6.349E-01                       |              | 3.171E+00 | 5.203E+00      | 0.000E+00 | 0.122   |
| CS-137  | 1.205E+00                       |              | 3.014E+00 | 5.019E+00      | 0.000E+00 | 0.240   |
| CE-139  | -2.056E+00                      |              | 3.013E+00 | 4.949E+00      | 0.000E+00 | -0.415  |
| BA-140  | 4.109E+00                       |              | 1.142E+01 | 1.909E+01      | 0.000E+00 | 0.215   |
| LA-140  | 8.175E-02                       |              | 3.468E+00 | 5.722E+00      | 0.000E+00 | 0.014   |
| CE-141  | 2.308E+00                       |              | 6.567E+00 | 9.068E+00      | 0.000E+00 | 0.254   |
| CE-144  | -7.254E+00                      |              | 2.831E+01 | 3.852E+01      | 0.000E+00 | -0.188  |
| EU-152  | -7.372E+00                      |              | 1.113E+01 | 1.487E+01      | 0.000E+00 | -0.496  |
| EU-154  | 1.938E+00                       |              | 6.615E+00 | 1.083E+01      | 0.000E+00 | 0.179   |
| AC-228  | 6.229E+00                       |              | 1.076E+01 | 1.763E+01      | 0.000E+00 | 0.353   |
| TH-232  | 6.223E+00                       |              | 1.075E+01 | 1.762E+01      | 0.000E+00 | 0.353   |
| U-235   | 5.032E+01                       |              | 2.923E+01 | 4.148E+01      | 0.000E+00 | 1.213   |
| U-238   | -2.279E+01                      |              | 2.996E+02 | 4.920E+02      | 0.000E+00 | -0.046  |
| AM-241  | 3.956E+00                       |              | 5.091E+01 | 7.109E+01      | 0.000E+00 | 0.056   |

|              |             |                  |             |                   |             |
|--------------|-------------|------------------|-------------|-------------------|-------------|
| A,14L29402-4 | ,07/31/2006 | 03:09,07/28/2006 | 11:12,      | 3.365E+00,WG      | L29402-4 EX |
| B,14L29402-4 | ,LIBD       |                  | ,07/27/2006 | 14:28,1435L091304 |             |
| C,K-40       | ,YES,       | 1.633E+01,       | 4.237E+01,  | 4.628E+01,,       | 0.353       |
| C,RA-226     | ,YES,       | 2.979E+01,       | 7.897E+01,  | 1.219E+02,,       | -0.244      |
| C,TH-228     | ,YES,       | 4.338E+00,       | 5.618E+00,  | 8.736E+00,,       | 0.497       |
| C,BE-7       | ,NO ,       | 1.182E+01,       | 2.448E+01,  | 4.118E+01,,       | 0.287       |
| C,NA-24      | ,NO ,       | -3.631E+01,      | 4.876E+01,  | 7.725E+01,,       | -0.470      |
| C,CR-51      | ,NO ,       | -1.784E+01,      | 2.614E+01,  | 4.203E+01,,       | -0.424      |
| C,MN-54      | ,NO ,       | -1.966E-01,      | 2.652E+00,  | 4.389E+00,,       | -0.045      |
| C,CO-57      | ,NO ,       | -1.163E+00,      | 3.167E+00,  | 5.125E+00,,       | -0.227      |
| C,CO-58      | ,NO ,       | 1.565E-01,       | 2.925E+00,  | 4.770E+00,,       | 0.033       |
| C,FE-59      | ,NO ,       | 1.928E+00,       | 5.015E+00,  | 8.412E+00,,       | 0.229       |
| C,CO-60      | ,NO ,       | 2.989E-01,       | 2.873E+00,  | 4.709E+00,,       | 0.063       |
| C,ZN-65      | ,NO ,       | 1.686E+01,       | 7.585E+00,  | 1.204E+01,,       | 1.400       |
| C,SE-75      | ,NO ,       | -4.149E+00,      | 3.942E+00,  | 6.327E+00,,       | -0.656      |
| C,SR-85      | ,NO ,       | 1.844E+01,       | 3.126E+00,  | 5.952E+00,,       | 3.098       |
| C,Y-88       | ,NO ,       | -5.495E-02,      | 2.855E+00,  | 4.664E+00,,       | -0.012      |
| C,NB-94      | ,NO ,       | 1.085E+00,       | 2.688E+00,  | 4.467E+00,,       | 0.243       |
| C,NB-95      | ,NO ,       | 1.684E+00,       | 3.330E+00,  | 4.703E+00,,       | 0.358       |
| C,ZR-95      | ,NO ,       | -2.760E+00,      | 5.199E+00,  | 7.815E+00,,       | -0.353      |
| C,MO-99      | ,NO ,       | -4.288E+00,      | 3.835E+01,  | 6.228E+01,,       | -0.069      |
| C,RU-103     | ,NO ,       | 3.386E+00,       | 2.949E+00,  | 5.059E+00,,       | 0.669       |
| C,RU-106     | ,NO ,       | 6.634E+00,       | 2.774E+01,  | 4.369E+01,,       | 0.152       |
| C,AG-110m    | ,NO ,       | -1.143E+00,      | 2.703E+00,  | 4.354E+00,,       | -0.262      |
| C,SN-113     | ,NO ,       | -3.376E+00,      | 3.788E+00,  | 5.997E+00,,       | -0.563      |
| C,SB-124     | ,NO ,       | -8.563E-01,      | 7.346E+00,  | 4.844E+00,,       | -0.177      |
| C,SB-125     | ,NO ,       | 3.577E+00,       | 8.167E+00,  | 1.375E+01,,       | 0.260       |
| C,TE-129M    | ,NO ,       | 4.646E+00,       | 3.352E+01,  | 5.585E+01,,       | 0.083       |
| C,I-131      | ,NO ,       | -1.059E+00,      | 3.841E+00,  | 5.846E+00,,       | -0.181      |
| C,BA-133     | ,NO ,       | 2.728E+01,       | 5.231E+00,  | 8.517E+00,,       | 3.202       |
| C,CS-134     | ,NO ,       | 1.810E+01,       | 7.448E+00,  | 6.541E+00,,       | 2.767       |
| C,CS-136     | ,NO ,       | 6.349E-01,       | 3.171E+00,  | 5.203E+00,,       | 0.122       |
| C,CS-137     | ,NO ,       | 1.205E+00,       | 3.014E+00,  | 5.019E+00,,       | 0.240       |
| C,CE-139     | ,NO ,       | -2.056E+00,      | 3.013E+00,  | 4.949E+00,,       | -0.415      |
| C,BA-140     | ,NO ,       | 4.109E+00,       | 1.142E+01,  | 1.909E+01,,       | 0.215       |
| C,LA-140     | ,NO ,       | 8.175E-02,       | 3.468E+00,  | 5.722E+00,,       | 0.014       |
| C,CE-141     | ,NO ,       | 2.308E+00,       | 6.567E+00,  | 9.068E+00,,       | 0.254       |
| C,CE-144     | ,NO ,       | -7.254E+00,      | 2.831E+01,  | 3.852E+01,,       | -0.188      |
| C,EU-152     | ,NO ,       | -7.372E+00,      | 1.113E+01,  | 1.487E+01,,       | -0.496      |
| C,EU-154     | ,NO ,       | 1.938E+00,       | 6.615E+00,  | 1.083E+01,,       | 0.179       |
| C,AC-228     | ,NO ,       | 6.229E+00,       | 1.076E+01,  | 1.763E+01,,       | 0.353       |
| C,TH-232     | ,NO ,       | 6.223E+00,       | 1.075E+01,  | 1.762E+01,,       | 0.353       |
| C,U-235      | ,NO ,       | 5.032E+01,       | 2.923E+01,  | 4.148E+01,,       | 1.213       |
| C,U-238      | ,NO ,       | -2.279E+01,      | 2.996E+02,  | 4.920E+02,,       | -0.046      |
| C,AM-241     | ,NO ,       | 3.956E+00,       | 5.091E+01,  | 7.109E+01,,       | 0.056       |





## Summary of Nuclide Activity

Page : 2

Sample ID : 15L29402-5

Acquisition date : 30-JUL-2006 21:08:51

|   |   |       |
|---|---|-------|
| Total number of lines in spectrum             | 7 |       |
| Number of unidentified lines                  | 7 |       |
| Number of lines tentatively identified by NID | 0 | 0.00% |

\*\*\*\* There are no nuclides meeting summary criteria \*\*\*\*

Flags: "K" = Keyline not found

"E" = Manually edited

"M" = Manually accepted

"A" = Nuclide specific abn. limit

Unidentified Energy Lines  
Sample ID : 15L29402-5

Page : 3  
Acquisition date : 30-JUL-2006 21:08:51

| It | Energy  | Area | Bkgnd | FWHM | Channel | Left | Pw | Cts/Sec  | %Err | %Eff     | Flags |
|----|---------|------|-------|------|---------|------|----|----------|------|----------|-------|
| 1  | 66.15   | 152  | 616   | 1.79 | 119.63  | 116  | 8  | 7.06E-03 | 61.4 | 4.31E-01 |       |
| 1  | 139.58  | 81   | 400   | 1.17 | 267.42  | 265  | 6  | 3.76E-03 | 85.9 | 1.48E+00 |       |
| 1  | 295.19  | 68   | 326   | 1.37 | 580.55  | 576  | 9  | 3.14E-03 | **** | 1.05E+00 |       |
| 1  | 351.71  | 224  | 305   | 1.53 | 694.27  | 687  | 14 | 1.04E-02 | 38.2 | 9.16E-01 |       |
| 1  | 595.70  | 87   | 129   | 1.47 | 1185.02 | 1179 | 12 | 4.04E-03 | 56.4 | 5.97E-01 |       |
| 1  | 608.82  | 190  | 197   | 1.60 | 1211.39 | 1205 | 15 | 8.81E-03 | 37.6 | 5.87E-01 |       |
| 1  | 1120.26 | 59   | 49    | 3.14 | 2239.34 | 2231 | 15 | 2.72E-03 | 63.7 | 3.58E-01 |       |

Flags: "T" = Tentatively associated

#### Summary of Nuclide Activity

Total number of lines in spectrum 7  
 Number of unidentified lines 7  
 Number of lines tentatively identified by NID 0 0.00%  
 \*\*\*\* There are no nuclides meeting summary criteria \*\*\*\*

Flags: "K" = Keyline not found "M" = Manually accepted  
 "E" = Manually edited "A" = Nuclide specific abn. limit

#### Interference Report

No interference correction performed

#### Combined Activity-MDA Report

---- Non-Identified Nuclides ----

| Nuclide | Key-Line<br>Activity<br>(pCi/L) | K.L.<br>Ided | Act error | MDA<br>(pCi/L) | MDA error | Act/MDA |
|---------|---------------------------------|--------------|-----------|----------------|-----------|---------|
| BE-7    | 7.008E+00                       |              | 2.558E+01 | 4.289E+01      | 0.000E+00 | 0.163   |
| NA-24   | -7.559E+00                      |              | 5.890E+01 | 9.560E+01      | 0.000E+00 | -0.079  |
| K-40    | 2.767E+01                       |              | 4.217E+01 | 7.972E+01      | 0.000E+00 | 0.347   |
| CR-51   | -1.011E+01                      |              | 2.623E+01 | 4.265E+01      | 0.000E+00 | -0.237  |
| MN-54   | 1.845E+00                       |              | 2.827E+00 | 4.834E+00      | 0.000E+00 | 0.382   |
| CO-57   | 1.513E+00                       |              | 2.885E+00 | 4.819E+00      | 0.000E+00 | 0.314   |
| CO-58   | 9.429E-01                       |              | 2.794E+00 | 4.707E+00      | 0.000E+00 | 0.200   |
| FE-59   | 5.450E+00                       |              | 5.510E+00 | 9.710E+00      | 0.000E+00 | 0.561   |
| CO-60   | 2.493E+00                       |              | 3.060E+00 | 5.324E+00      | 0.000E+00 | 0.468   |
| ZN-65   | 1.049E+01                       |              | 7.390E+00 | 1.162E+01      | 0.000E+00 | 0.902   |
| SE-75   | -2.292E+00                      |              | 3.958E+00 | 6.462E+00      | 0.000E+00 | -0.355  |
| SR-85   | 1.472E+01                       |              | 3.300E+00 | 6.204E+00      | 0.000E+00 | 2.372   |
| Y-88    | -3.134E+00                      |              | 3.177E+00 | 4.696E+00      | 0.000E+00 | -0.667  |
| NB-94   | -1.164E+00                      |              | 2.937E+00 | 4.686E+00      | 0.000E+00 | -0.248  |
| NB-95   | 1.664E+00                       |              | 2.927E+00 | 4.993E+00      | 0.000E+00 | 0.333   |
| ZR-95   | -4.879E+00                      |              | 5.202E+00 | 8.217E+00      | 0.000E+00 | -0.594  |
| MO-99   | -3.835E+01                      |              | 4.104E+01 | 6.491E+01      | 0.000E+00 | -0.591  |
| RU-103  | 1.428E+00                       |              | 3.066E+00 | 5.169E+00      | 0.000E+00 | 0.276   |
| RU-106  | -1.762E+01                      |              | 2.923E+01 | 4.441E+01      | 0.000E+00 | -0.397  |
| AG-110m | -1.090E+00                      |              | 2.766E+00 | 4.424E+00      | 0.000E+00 | -0.246  |
| SN-113  | -4.726E-01                      |              | 3.989E+00 | 6.480E+00      | 0.000E+00 | -0.073  |

|         |            |           |           |           |        |
|---------|------------|-----------|-----------|-----------|--------|
| SB-124  | 2.914E+00  | 6.275E+00 | 4.784E+00 | 0.000E+00 | 0.609  |
| SB-125  | 8.578E-01  | 8.703E+00 | 1.419E+01 | 0.000E+00 | 0.060  |
| TE-129M | -3.758E+01 | 3.461E+01 | 5.517E+01 | 0.000E+00 | -0.681 |
| I-131   | 2.085E-01  | 3.722E+00 | 6.102E+00 | 0.000E+00 | 0.034  |
| BA-133  | 1.794E+01  | 4.978E+00 | 8.000E+00 | 0.000E+00 | 2.242  |
| CS-134  | 2.004E+01  | 5.364E+00 | 6.618E+00 | 0.000E+00 | 3.028  |
| CS-136  | -3.914E-01 | 3.069E+00 | 5.036E+00 | 0.000E+00 | -0.078 |
| CS-137  | 7.304E-01  | 3.126E+00 | 5.165E+00 | 0.000E+00 | 0.141  |
| CE-139  | -9.157E-01 | 2.816E+00 | 4.578E+00 | 0.000E+00 | -0.200 |
| BA-140  | 1.241E+01  | 1.198E+01 | 2.062E+01 | 0.000E+00 | 0.602  |
| LA-140  | 1.708E+00  | 4.096E+00 | 6.989E+00 | 0.000E+00 | 0.244  |
| CE-141  | -5.783E-02 | 6.001E+00 | 8.371E+00 | 0.000E+00 | -0.007 |
| CE-144  | 6.682E+00  | 2.591E+01 | 3.656E+01 | 0.000E+00 | 0.183  |
| EU-152  | -1.194E+01 | 1.103E+01 | 1.446E+01 | 0.000E+00 | -0.826 |
| EU-154  | 1.268E+00  | 6.215E+00 | 1.014E+01 | 0.000E+00 | 0.125  |
| RA-226  | -2.661E+01 | 7.474E+01 | 1.191E+02 | 0.000E+00 | -0.223 |
| AC-228  | 1.371E+00  | 1.156E+01 | 1.900E+01 | 0.000E+00 | 0.072  |
| TH-228  | 8.326E+00  | 5.718E+00 | 9.715E+00 | 0.000E+00 | 0.857  |
| TH-232  | 1.370E+00  | 1.155E+01 | 1.898E+01 | 0.000E+00 | 0.072  |
| U-235   | 2.971E+00  | 2.704E+01 | 3.759E+01 | 0.000E+00 | 0.079  |
| U-238   | 2.418E+01  | 3.398E+02 | 5.558E+02 | 0.000E+00 | 0.044  |
| AM-241  | -4.193E+01 | 4.422E+01 | 5.947E+01 | 0.000E+00 | -0.705 |

A,15L29402-5 ,07/31/2006 03:09,07/28/2006 09:45, 3.471E+00,WG L29402-5 EX  
 B,15L29402-5 ,LIBD ,07/28/2006 10:09,1535L090104  
 C,BE-7 ,NO , 7.008E+00, 2.558E+01, 4.289E+01,, 0.163  
 C,NA-24 ,NO , -7.559E+00, 5.890E+01, 9.560E+01,, -0.079  
 C,K-40 ,NO , 2.767E+01, 4.217E+01, 7.972E+01,, 0.347  
 C,CR-51 ,NO , -1.011E+01, 2.623E+01, 4.265E+01,, -0.237  
 C,MN-54 ,NO , 1.845E+00, 2.827E+00, 4.834E+00,, 0.382  
 C,CO-57 ,NO , 1.513E+00, 2.885E+00, 4.819E+00,, 0.314  
 C,CO-58 ,NO , 9.429E-01, 2.794E+00, 4.707E+00,, 0.200  
 C,FE-59 ,NO , 5.450E+00, 5.510E+00, 9.710E+00,, 0.561  
 C,CO-60 ,NO , 2.493E+00, 3.060E+00, 5.324E+00,, 0.468  
 C,ZN-65 ,NO , 1.049E+01, 7.390E+00, 1.162E+01,, 0.902  
 C,SE-75 ,NO , -2.292E+00, 3.958E+00, 6.462E+00,, -0.355  
 C,SR-85 ,NO , 1.472E+01, 3.300E+00, 6.204E+00,, 2.372  
 C,Y-88 ,NO , -3.134E+00, 3.177E+00, 4.696E+00,, -0.667  
 C,NB-94 ,NO , -1.164E+00, 2.937E+00, 4.686E+00,, -0.248  
 C,NB-95 ,NO , 1.664E+00, 2.927E+00, 4.993E+00,, 0.333  
 C,ZR-95 ,NO , -4.879E+00, 5.202E+00, 8.217E+00,, -0.594  
 C,MO-99 ,NO , -3.835E+01, 4.104E+01, 6.491E+01,, -0.591  
 C,RU-103 ,NO , 1.428E+00, 3.066E+00, 5.169E+00,, 0.276  
 C,RU-106 ,NO , -1.762E+01, 2.923E+01, 4.441E+01,, -0.397  
 C,AG-110m ,NO , -1.090E+00, 2.766E+00, 4.424E+00,, -0.246  
 C,SN-113 ,NO , -4.726E-01, 3.989E+00, 6.480E+00,, -0.073  
 C,SB-124 ,NO , 2.914E+00, 6.275E+00, 4.784E+00,, 0.609  
 C,SB-125 ,NO , 8.578E-01, 8.703E+00, 1.419E+01,, 0.060  
 C,TE-129M ,NO , -3.758E+01, 3.461E+01, 5.517E+01,, -0.681  
 C,I-131 ,NO , 2.085E-01, 3.722E+00, 6.102E+00,, 0.034  
 C,BA-133 ,NO , 1.794E+01, 4.978E+00, 8.000E+00,, 2.242  
 C,CS-134 ,NO , 2.004E+01, 5.364E+00, 6.618E+00,, 3.028  
 C,CS-136 ,NO , -3.914E-01, 3.069E+00, 5.036E+00,, -0.078  
 C,CS-137 ,NO , 7.304E-01, 3.126E+00, 5.165E+00,, 0.141  
 C,CE-139 ,NO , -9.157E-01, 2.816E+00, 4.578E+00,, -0.200  
 C,BA-140 ,NO , 1.241E+01, 1.198E+01, 2.062E+01,, 0.602  
 C,LA-140 ,NO , 1.708E+00, 4.096E+00, 6.989E+00,, 0.244  
 C,CE-141 ,NO , -5.783E-02, 6.001E+00, 8.371E+00,, -0.007  
 C,CE-144 ,NO , 6.682E+00, 2.591E+01, 3.656E+01,, 0.183  
 C,EU-152 ,NO , -1.194E+01, 1.103E+01, 1.446E+01,, -0.826  
 C,EU-154 ,NO , 1.268E+00, 6.215E+00, 1.014E+01,, 0.125  
 C,RA-226 ,NO , -2.661E+01, 7.474E+01, 1.191E+02,, -0.223  
 C,AC-228 ,NO , 1.371E+00, 1.156E+01, 1.900E+01,, 0.072  
 C,TH-228 ,NO , 8.326E+00, 5.718E+00, 9.715E+00,, 0.857  
 C,TH-232 ,NO , 1.370E+00, 1.155E+01, 1.898E+01,, 0.072  
 C,U-235 ,NO , 2.971E+00, 2.704E+01, 3.759E+01,, 0.079  
 C,U-238 ,NO , 2.418E+01, 3.398E+02, 5.558E+02,, 0.044  
 C,AM-241 ,NO , -4.193E+01, 4.422E+01, 5.947E+01,, -0.705

Sec. Review: Analyst: LIMS:

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VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 31-JUL-2006 03:53:31.86  
 TBE07 P-10768B HpGe \*\*\*\*\* Aquisition Date/Time: 30-JUL-2006 23:53:22.27

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LIMS No., Customer Name, Client ID: WG WG4276-1 EX ZION

Sample ID : 07WG4276-1 Smple Date: 28-JUL-2006 07:15:00.  
 Sample Type : WG Geometry : 0735L090904  
 Quantity : 3.32390E+00 L BKGFILE : 07BG072806MT  
 Start Channel : 40 Energy Tol : 1.00000 Real Time : 0 04:00:03.04  
 End Channel : 4090 Pk Srch Sens: 5.00000 Live time : 0 04:00:00.00  
 MDA Constant : 0.00 Library Used: LIBD

| Pk | It | Energy   | Area | Bkgnd | FWHM | Channel | %Eff     | Cts/Sec  | %Err | Fit      |
|----|----|----------|------|-------|------|---------|----------|----------|------|----------|
| 1  | 1  | 53.03    | 94   | 306   | 1.36 | 106.89  | 2.85E-01 | 6.53E-03 | 33.7 | 6.49E-01 |
| 2  | 1  | 66.34*   | 108  | 346   | 1.03 | 133.54  | 7.25E-01 | 7.50E-03 | 30.2 | 2.31E+00 |
| 3  | 1  | 139.87*  | 101  | 407   | 1.34 | 280.80  | 2.09E+00 | 6.99E-03 | 39.3 | 2.49E+00 |
| 4  | 1  | 198.43*  | 126  | 299   | 1.22 | 398.07  | 1.98E+00 | 8.72E-03 | 26.6 | 5.86E-01 |
| 5  | 1  | 295.23*  | 107  | 288   | 1.13 | 591.88  | 1.61E+00 | 7.42E-03 | 33.1 | 2.16E+00 |
| 6  | 1  | 351.83*  | 305  | 221   | 1.09 | 705.20  | 1.43E+00 | 2.12E-02 | 11.8 | 1.98E+00 |
| 7  | 1  | 595.68   | 67   | 128   | 2.05 | 1193.35 | 9.97E-01 | 4.65E-03 | 36.3 | 1.66E+00 |
| 8  | 1  | 609.45*  | 239  | 161   | 1.68 | 1220.92 | 9.80E-01 | 1.66E-02 | 14.2 | 2.03E+00 |
| 9  | 1  | 831.67   | 28   | 55    | 2.07 | 1665.62 | 7.82E-01 | 1.96E-03 | 52.3 | 2.16E+00 |
| 10 | 1  | 907.79   | 36   | 20    | 1.95 | 1817.94 | 7.32E-01 | 2.51E-03 | 22.6 | 1.99E+00 |
| 11 | 1  | 1120.33* | 85   | 42    | 2.59 | 2243.17 | 6.26E-01 | 5.88E-03 | 19.6 | 1.97E+00 |
| 12 | 1  | 1730.79  | 15   | 24    | 1.60 | 3463.93 | 4.60E-01 | 1.06E-03 | 78.1 | 7.62E-01 |
| 13 | 1  | 1764.99* | 56   | 19    | 2.74 | 3532.30 | 4.54E-01 | 3.87E-03 | 25.2 | 2.47E+00 |

Flag: "\*" = Peak area was modified by background subtraction

#### Nuclide Line Activity Report

Flag: "\*" = Keyline

## Summary of Nuclide Activity

Page : 2

Sample ID : 07WG4276-1

Acquisition date : 30-JUL-2006 23:53:22

|   |    |       |
|---|----|-------|
| Total number of lines in spectrum             | 13 |       |
| Number of unidentified lines                  | 13 |       |
| Number of lines tentatively identified by NID | 0  | 0.00% |

\*\*\*\* There are no nuclides meeting summary criteria \*\*\*\*

Flags: "K" = Keyline not found

"M" = Manually accepted

"E" = Manually edited

"A" = Nuclide specific abn. limit

Unidentified Energy Lines  
Sample ID : 07WG4276-1

Page : 3  
Acquisition date : 30-JUL-2006 23:53:23

| It | Energy  | Area | Bkgnd | FWHM | Channel | Left | Pw | Cts/Sec  | %Err | %Eff     | Flags |
|----|---------|------|-------|------|---------|------|----|----------|------|----------|-------|
| 1  | 53.03   | 94   | 306   | 1.36 | 106.89  | 104  | 8  | 6.53E-03 | 67.3 | 2.85E-01 |       |
| 1  | 66.34   | 108  | 346   | 1.03 | 133.54  | 131  | 6  | 7.50E-03 | 60.4 | 7.25E-01 |       |
| 1  | 139.87  | 101  | 407   | 1.34 | 280.80  | 276  | 9  | 6.99E-03 | 78.6 | 2.09E+00 |       |
| 1  | 198.43  | 126  | 299   | 1.22 | 398.07  | 394  | 8  | 8.72E-03 | 53.1 | 1.98E+00 |       |
| 1  | 295.23  | 107  | 288   | 1.13 | 591.88  | 587  | 10 | 7.42E-03 | 66.1 | 1.61E+00 |       |
| 1  | 351.83  | 305  | 221   | 1.09 | 705.20  | 700  | 12 | 2.12E-02 | 23.7 | 1.43E+00 |       |
| 1  | 595.68  | 67   | 128   | 2.05 | 1193.35 | 1189 | 12 | 4.65E-03 | 72.6 | 9.97E-01 |       |
| 1  | 609.45  | 239  | 161   | 1.68 | 1220.92 | 1215 | 15 | 1.66E-02 | 28.3 | 9.80E-01 |       |
| 1  | 831.67  | 28   | 55    | 2.07 | 1665.62 | 1660 | 10 | 1.96E-03 | **** | 7.82E-01 |       |
| 1  | 907.79  | 36   | 20    | 1.95 | 1817.94 | 1815 | 17 | 2.51E-03 | 45.3 | 7.32E-01 |       |
| 1  | 1120.33 | 85   | 42    | 2.59 | 2243.17 | 2236 | 14 | 5.88E-03 | 39.2 | 6.26E-01 |       |
| 1  | 1730.79 | 15   | 24    | 1.60 | 3463.93 | 3456 | 15 | 1.06E-03 | **** | 4.60E-01 |       |
| 1  | 1764.99 | 56   | 19    | 2.74 | 3532.30 | 3526 | 16 | 3.87E-03 | 50.5 | 4.54E-01 |       |

Flags: "T" = Tentatively associated

#### Summary of Nuclide Activity

Total number of lines in spectrum 13  
 Number of unidentified lines 13  
 Number of lines tentatively identified by NID 0 0.00%  
 \*\*\*\* There are no nuclides meeting summary criteria \*\*\*\*

Flags: "K" = Keyline not found "M" = Manually accepted  
 "E" = Manually edited "A" = Nuclide specific abn. limit

#### Interference Report

No interference correction performed

#### Combined Activity-MDA Report

---- Non-Identified Nuclides ----

| Nuclide | Key-Line<br>Activity<br>(pCi/L) | K.L.<br>Ided | Act error | MDA<br>(pCi/L) | MDA error | Act/MDA |
|---------|---------------------------------|--------------|-----------|----------------|-----------|---------|
| BE-7    | -3.899E+00                      |              | 2.057E+01 | 3.370E+01      | 0.000E+00 | -0.116  |
| NA-24   | -3.487E+01                      |              | 6.251E+01 | 9.807E+01      | 0.000E+00 | -0.356  |
| K-40    | -1.114E+01                      |              | 3.314E+01 | 6.189E+01      | 0.000E+00 | -0.180  |
| CR-51   | -3.733E+00                      |              | 2.299E+01 | 3.767E+01      | 0.000E+00 | -0.099  |
| MN-54   | 1.404E+00                       |              | 3.072E+00 | 4.373E+00      | 0.000E+00 | 0.321   |
| CO-57   | 9.824E-01                       |              | 2.527E+00 | 4.131E+00      | 0.000E+00 | 0.238   |
| CO-58   | -2.661E-01                      |              | 2.551E+00 | 4.139E+00      | 0.000E+00 | -0.064  |
| FE-59   | 5.041E+00                       |              | 4.840E+00 | 8.454E+00      | 0.000E+00 | 0.596   |
| CO-60   | 3.885E-01                       |              | 2.525E+00 | 4.197E+00      | 0.000E+00 | 0.093   |
| ZN-65   | 1.738E+01                       |              | 6.579E+00 | 1.117E+01      | 0.000E+00 | 1.556   |
| SE-75   | -2.283E-01                      |              | 3.377E+00 | 5.617E+00      | 0.000E+00 | -0.041  |
| SR-85   | 2.095E+01                       |              | 3.136E+00 | 6.212E+00      | 0.000E+00 | 3.372   |
| Y-88    | 1.854E-02                       |              | 2.765E+00 | 4.506E+00      | 0.000E+00 | 0.004   |
| NB-94   | -1.187E+00                      |              | 2.520E+00 | 4.060E+00      | 0.000E+00 | -0.292  |
| NB-95   | 1.924E+00                       |              | 2.620E+00 | 4.463E+00      | 0.000E+00 | 0.431   |



|         |            |           |           |           |        |
|---------|------------|-----------|-----------|-----------|--------|
| ZR-95   | -1.311E+00 | 4.512E+00 | 7.284E+00 | 0.000E+00 | -0.180 |
| MO-99   | 2.569E+00  | 3.706E+01 | 6.117E+01 | 0.000E+00 | 0.042  |
| RU-103  | 2.070E+00  | 2.562E+00 | 4.375E+00 | 0.000E+00 | 0.473  |
| RU-106  | -3.049E+00 | 2.505E+01 | 3.840E+01 | 0.000E+00 | -0.079 |
| AG-110m | -1.970E+00 | 2.454E+00 | 3.900E+00 | 0.000E+00 | -0.505 |
| SN-113  | -2.577E-01 | 3.286E+00 | 5.326E+00 | 0.000E+00 | -0.048 |
| SB-124  | -5.865E-01 | 5.953E+00 | 4.209E+00 | 0.000E+00 | -0.139 |
| SB-125  | -4.500E+00 | 6.762E+00 | 1.093E+01 | 0.000E+00 | -0.412 |
| TE-129M | 5.870E-01  | 2.975E+01 | 4.934E+01 | 0.000E+00 | 0.012  |
| I-131   | 6.465E-01  | 3.113E+00 | 5.130E+00 | 0.000E+00 | 0.126  |
| BA-133  | 1.252E+01  | 4.221E+00 | 6.769E+00 | 0.000E+00 | 1.850  |
| CS-134  | 9.149E+00  | 6.009E+00 | 5.409E+00 | 0.000E+00 | 1.691  |
| CS-136  | -1.774E-01 | 2.721E+00 | 4.362E+00 | 0.000E+00 | -0.041 |
| CS-137  | 2.659E+00  | 2.711E+00 | 4.715E+00 | 0.000E+00 | 0.564  |
| CE-139  | -3.043E+00 | 2.504E+00 | 4.009E+00 | 0.000E+00 | -0.759 |
| BA-140  | 5.517E+00  | 1.007E+01 | 1.696E+01 | 0.000E+00 | 0.325  |
| LA-140  | 1.694E+00  | 3.446E+00 | 5.905E+00 | 0.000E+00 | 0.287  |
| CE-141  | 2.837E+00  | 5.063E+00 | 7.378E+00 | 0.000E+00 | 0.385  |
| CE-144  | -2.502E+01 | 2.176E+01 | 2.981E+01 | 0.000E+00 | -0.839 |
| EU-152  | -1.035E+01 | 9.480E+00 | 1.236E+01 | 0.000E+00 | -0.837 |
| EU-154  | -1.956E+00 | 5.331E+00 | 8.531E+00 | 0.000E+00 | -0.229 |
| RA-226  | -1.044E+02 | 6.480E+01 | 1.036E+02 | 0.000E+00 | -1.008 |
| AC-228  | -1.274E+00 | 9.790E+00 | 1.667E+01 | 0.000E+00 | -0.076 |
| TH-228  | 5.975E+00  | 5.038E+00 | 8.617E+00 | 0.000E+00 | 0.693  |
| TH-232  | -1.273E+00 | 9.781E+00 | 1.665E+01 | 0.000E+00 | -0.076 |
| U-235   | 4.517E-01  | 2.251E+01 | 3.210E+01 | 0.000E+00 | 0.014  |
| U-238   | 5.207E+01  | 2.943E+02 | 4.796E+02 | 0.000E+00 | 0.109  |
| AM-241  | -5.565E+01 | 2.897E+01 | 3.631E+01 | 0.000E+00 | -1.532 |

|              |             |                  |             |                   |             |
|--------------|-------------|------------------|-------------|-------------------|-------------|
| A,07WG4276-1 | ,07/31/2006 | 03:53,07/28/2006 | 07:15,      | 3.324E+00,WG      | WG4276-1 EX |
| B,07WG4276-1 | ,LIBD       |                  | ,07/28/2006 | 09:50,0735L090904 |             |
| C,BE-7       | ,NO         | , -3.899E+00,    | 2.057E+01,  | 3.370E+01,,       | -0.116      |
| C,NA-24      | ,NO         | , -3.487E+01,    | 6.251E+01,  | 9.807E+01,,       | -0.356      |
| C,K-40       | ,NO         | , -1.114E+01,    | 3.314E+01,  | 6.189E+01,,       | -0.180      |
| C,CR-51      | ,NO         | , -3.733E+00,    | 2.299E+01,  | 3.767E+01,,       | -0.099      |
| C,MN-54      | ,NO         | , 1.404E+00,     | 3.072E+00,  | 4.373E+00,,       | 0.321       |
| C,CO-57      | ,NO         | , 9.824E-01,     | 2.527E+00,  | 4.131E+00,,       | 0.238       |
| C,CO-58      | ,NO         | , -2.661E-01,    | 2.551E+00,  | 4.139E+00,,       | -0.064      |
| C,FE-59      | ,NO         | , 5.041E+00,     | 4.840E+00,  | 8.454E+00,,       | 0.596       |
| C,CO-60      | ,NO         | , 3.885E-01,     | 2.525E+00,  | 4.197E+00,,       | 0.093       |
| C,ZN-65      | ,NO         | , 1.738E+01,     | 6.579E+00,  | 1.117E+01,,       | 1.556       |
| C,SE-75      | ,NO         | , -2.283E-01,    | 3.377E+00,  | 5.617E+00,,       | -0.041      |
| C,SR-85      | ,NO         | , 2.095E+01,     | 3.136E+00,  | 6.212E+00,,       | 3.372       |
| C,Y-88       | ,NO         | , 1.854E-02,     | 2.765E+00,  | 4.506E+00,,       | 0.004       |
| C,NB-94      | ,NO         | , -1.187E+00,    | 2.520E+00,  | 4.060E+00,,       | -0.292      |
| C,NB-95      | ,NO         | , 1.924E+00,     | 2.620E+00,  | 4.463E+00,,       | 0.431       |
| C,ZR-95      | ,NO         | , -1.311E+00,    | 4.512E+00,  | 7.284E+00,,       | -0.180      |
| C,MO-99      | ,NO         | , 2.569E+00,     | 3.706E+01,  | 6.117E+01,,       | 0.042       |
| C,RU-103     | ,NO         | , 2.070E+00,     | 2.562E+00,  | 4.375E+00,,       | 0.473       |
| C,RU-106     | ,NO         | , -3.049E+00,    | 2.505E+01,  | 3.840E+01,,       | -0.079      |
| C,AG-110m    | ,NO         | , -1.970E+00,    | 2.454E+00,  | 3.900E+00,,       | -0.505      |
| C,SN-113     | ,NO         | , -2.577E-01,    | 3.286E+00,  | 5.326E+00,,       | -0.048      |
| C,SB-124     | ,NO         | , -5.865E-01,    | 5.953E+00,  | 4.209E+00,,       | -0.139      |
| C,SB-125     | ,NO         | , -4.500E+00,    | 6.762E+00,  | 1.093E+01,,       | -0.412      |
| C,TE-129M    | ,NO         | , 5.870E-01,     | 2.975E+01,  | 4.934E+01,,       | 0.012       |
| C,I-131      | ,NO         | , 6.465E-01,     | 3.113E+00,  | 5.130E+00,,       | 0.126       |
| C,BA-133     | ,NO         | , 1.252E+01,     | 4.221E+00,  | 6.769E+00,,       | 1.850       |
| C,CS-134     | ,NO         | , 9.149E+00,     | 6.009E+00,  | 5.409E+00,,       | 1.691       |
| C,CS-136     | ,NO         | , -1.774E-01,    | 2.721E+00,  | 4.362E+00,,       | -0.041      |
| C,CS-137     | ,NO         | , 2.659E+00,     | 2.711E+00,  | 4.715E+00,,       | 0.564       |
| C,CE-139     | ,NO         | , -3.043E+00,    | 2.504E+00,  | 4.009E+00,,       | -0.759      |
| C,BA-140     | ,NO         | , 5.517E+00,     | 1.007E+01,  | 1.696E+01,,       | 0.325       |
| C,LA-140     | ,NO         | , 1.694E+00,     | 3.446E+00,  | 5.905E+00,,       | 0.287       |
| C,CE-141     | ,NO         | , 2.837E+00,     | 5.063E+00,  | 7.378E+00,,       | 0.385       |
| C,CE-144     | ,NO         | , -2.502E+01,    | 2.176E+01,  | 2.981E+01,,       | -0.839      |
| C,EU-152     | ,NO         | , -1.035E+01,    | 9.480E+00,  | 1.236E+01,,       | -0.837      |
| C,EU-154     | ,NO         | , -1.956E+00,    | 5.331E+00,  | 8.531E+00,,       | -0.229      |
| C,RA-226     | ,NO         | , -1.044E+02,    | 6.480E+01,  | 1.036E+02,,       | -1.008      |
| C,AC-228     | ,NO         | , -1.274E+00,    | 9.790E+00,  | 1.667E+01,,       | -0.076      |
| C,TH-228     | ,NO         | , 5.975E+00,     | 5.038E+00,  | 8.617E+00,,       | 0.693       |
| C,TH-232     | ,NO         | , -1.273E+00,    | 9.781E+00,  | 1.665E+01,,       | -0.076      |
| C,U-235      | ,NO         | , 4.517E-01,     | 2.251E+01,  | 3.210E+01,,       | 0.014       |
| C,U-238      | ,NO         | , 5.207E+01,     | 2.943E+02,  | 4.796E+02,,       | 0.109       |
| C,AM-241     | ,NO         | , -5.565E+01,    | 2.897E+01,  | 3.631E+01,,       | -1.532      |

APPENDIX E

DATA VALIDATION MEMORANDUM



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## MEMORANDUM

TO: Steve Quigley REF. NO.: 45136-30

FROM: Kathy Shaw/ks/11/CT  DATE: July 6, 2006

Revision Date: August 23, 2006

RE: Data Quality Assessment and Verification  
Fleetwide Assessment - Hydrogeologic Investigation  
Zion Station - Zion, Illinois

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This memorandum details a data verification of the radiochemical data resulting from the collection of 25 groundwater, one (1) surface water and three (3) quality control samples from the Zion Station in Zion, Illinois. The sample summary detailing sample identification, sample location, quality control samples, and analytical parameters is presented in Table 1. Sample analysis was completed at Teledyne Brown Engineering in Knoxville, Tennessee (TBE) in accordance with the methodologies presented in Table 2. The quality control criteria used to assess the data were established by the methods.<sup>1</sup>

### Sample Quantitation

The laboratory reported several radionuclides with activity concentrations above the minimum detectable concentration (MDC) and greater than the three (3) sigma critical level (99% confidence interval), but qualified them as not detected due to the presence of interference preventing identification of the major peaks, with a U\* flag. Based on the laboratory qualification definition these concentrations should be qualified as not-detected (U\*) above the laboratory reported MDC.

### Sample Preservation

Samples collected for gamma scan and total strontium analyses are to be preserved to a pH of less than or equal to two (2) during shipment and laboratory storage with nitric acid at the time of collection. The samples were shipped and maintained in accordance with the sample preservation requirements.

### Method Blank Samples

Contamination of samples contributed by laboratory conditions or procedures was monitored by concurrent preparation and analysis of method blank samples. The method blank samples were reported to be free of radioactive material contamination produced by the laboratory conditions or procedures.

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<sup>1</sup>PRESCRIBED PROCEDURE FOR MEASUREMENT OF RADIOACTIVITY IN DRINKING WATER EPA-600/4-80-032

Laboratory Control Sample Analysis

The laboratory control sample (LCS) is a sample containing a known amount of a radionuclide that is equivalent to internal or external control samples prepared by the analytical laboratory or a Federal/State agency. The LCS percent recoveries were within the laboratory or agency control limits, indicating that an acceptable level of overall performance was achieved.

Duplicate Sample Analyses

The laboratory precision of matrix-specific measurement system was monitored by the analyses of duplicate samples. The duplicate relative percent difference (RPD) data were within the acceptance criteria. No targeted analytes were reported as detected in the laboratory duplicate sample sets.

Field Quality Assurance/Quality Control

The field quality assurance/quality control consisted of three (3) field duplicate sample sets. No targeted radionuclides were reported as detected in the field duplicate sample sets.

Overall Assessment

The data were found to exhibit acceptable levels of accuracy and precision, based on the provided information, and may be used with the qualifications noted.

**TABLE 1**  
**SAMPLE KEY**  
**FLEETWIDE ASSESSMENT**  
**ZION STATION**  
**ZION , ILLINOIS**

| <i>Sample Location</i> | <i>Sample Identification</i> | <i>QC Sample</i> | <i>Date</i> | <i>Sample Matix</i> | <i>Analysis</i>                  |
|------------------------|------------------------------|------------------|-------------|---------------------|----------------------------------|
| MW-ZN-08S(L)           | WG-Zion-MW-8L-052406-MS-001  |                  | 5/24/06     | Groundwater         | Tritium/Strontium/Gamma Spectrum |
| MW-ZN-04S(U)           | WG-Zion-MW-4U-052406-MB-002  |                  | 5/24/06     | Groundwater         | Tritium/Strontium/Gamma Spectrum |
| MW-ZN-08S(U)           | WG-Zion-MW-8U-052406-MS-003  |                  | 5/24/06     | Groundwater         | Tritium/Strontium/Gamma Spectrum |
| MW-ZN-04S(L)           | WG-Zion-MW-4L-052406-MB-004  |                  | 5/24/06     | Groundwater         | Tritium/Strontium/Gamma Spectrum |
| MW-ZN-07S(U)           | WG-Zion-MW-7U-052406-MS-005  |                  | 5/24/06     | Groundwater         | Tritium/Strontium/Gamma Spectrum |
| MW-ZN-07S(L)           | WG-Zion-MW-7L-052506-MS-007  |                  | 5/25/06     | Groundwater         | Tritium/Strontium/Gamma Spectrum |
| MW-ZN-06S(L)           | WG-Zion-MW-6L-052506-MS-009  |                  | 5/25/06     | Groundwater         | Tritium/Strontium/Gamma Spectrum |
| MW-ZN-03S(U)           | WG-ZN-MW-ZN-03U-052506-DS-01 |                  | 5/25/06     | Groundwater         | Tritium/Strontium/Gamma Spectrum |
| MW-ZN-03S(U)           | WG-ZN-MW-ZN-03U-052506-DS-02 | Duplicate (01)   | 5/25/06     | Groundwater         | Tritium/Strontium/Gamma Spectrum |
| MW-ZN-03S(L)           | WG-ZN-MW-ZN-03L-052506-DS-03 |                  | 5/25/06     | Groundwater         | Tritium/Strontium/Gamma Spectrum |
| MW-ZN-02S(U)           | WG-ZN-MW-ZN-02U-052606-DS-04 |                  | 5/26/06     | Groundwater         | Tritium/Strontium/Gamma Spectrum |
| MW-ZN-01S(U)           | WG-ZN-MW-ZN-01U-052606-DS-05 |                  | 5/26/06     | Groundwater         | Tritium/Strontium/Gamma Spectrum |
| MW-ZN-02S(L)           | WG-ZN-MW-ZN-02L-052606-DS-06 |                  | 5/26/06     | Groundwater         | Tritium/Strontium/Gamma Spectrum |
| MW-ZN-01S(L)           | WG-ZN-MW-ZN-01L-052606-DS-07 |                  | 5/26/06     | Groundwater         | Tritium/Strontium/Gamma Spectrum |
| MW-ZN-09S              | WG-ZN-MW-ZN-09-052606-DS-08  |                  | 5/26/06     | Groundwater         | Tritium/Strontium/Gamma Spectrum |
| MW-ZN-09S              | WG-ZN-MW-ZN-09-052606-DS-09  | Duplicate (08)   | 5/26/06     | Groundwater         | Tritium/Strontium/Gamma Spectrum |
| MW-ZN-06S(U)           | WG-Zion-MW-6U-052606-MS-011  |                  | 5/26/06     | Groundwater         | Tritium/Strontium/Gamma Spectrum |
| MW-ZN-05S(L)           | WG-Zion-MW-5L-052606-MS-013  |                  | 5/26/06     | Groundwater         | Tritium/Strontium/Gamma Spectrum |
| SW-ZN-1                | WS-Zion-Lake-052606-MS-015   |                  | 5/26/06     | Surface Water       | Tritium/Strontium/Gamma Spectrum |
| MW-ZN-05S(U)           | WG-Zion-MW-5U-052606-MS-017  |                  | 5/26/06     | Groundwater         | Tritium/Strontium/Gamma Spectrum |
| TW-ZN-100              | GW-071706-JL-TW-ZN-100       |                  | 7/17/2006   | Groundwater         | Tritium/Strontium/Gamma Spectrum |
| TW-ZN-101              | GW-071706-JL-TW-ZN-101       |                  | 7/17/2006   | Groundwater         | Tritium/Strontium/Gamma Spectrum |
| TW-ZN-102              | GW-071706-JL-TW-ZN-102       |                  | 7/17/2006   | Groundwater         | Tritium/Strontium/Gamma Spectrum |
| TW-ZN-103              | GW-071706-JL-TW-ZN-103       |                  | 7/17/2006   | Groundwater         | Tritium/Strontium/Gamma Spectrum |

**TABLE 1**  
**SAMPLE KEY**  
**FLEETWIDE ASSESSMENT**  
**ZION STATION**  
**ZION , ILLINOIS**

| <i>Sample Location</i> | <i>Sample Identification</i>  | <i>QC Sample</i> | <i>Date</i> | <i>Sample Matix</i> | <i>Analysis</i>                  |
|------------------------|-------------------------------|------------------|-------------|---------------------|----------------------------------|
| MW-ZN-10S(U)           | WG-ZN-MW-ZN-10U-072806-MS-003 |                  | 7/28/2006   | Groundwater         | Tritium/Strontium/Gamma Spectrum |
| MW-ZN-10S(U)           | WG-ZN-MW-ZN-10U-072806-MS-004 | Duplicate (003)  | 7/28/2006   | Groundwater         | Tritium/Strontium/Gamma Spectrum |
| MW-ZN-10S(L)           | WG-ZN-MW-ZN-10L-072806-MS-005 |                  | 7/28/2006   | Groundwater         | Tritium/Strontium/Gamma Spectrum |
| MW-ZN-11S(U)           | WG-ZN-MW-ZN-11U-072806-TL-001 |                  | 7/28/2006   | Groundwater         | Tritium/Strontium/Gamma Spectrum |
| MW-ZN-11S(L)           | WG-ZN-MW-ZN-11L-072806-TL-002 |                  | 7/28/2006   | Groundwater         | Tritium/Strontium/Gamma Spectrum |

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QC - Quality Control  
 Gamma Spectrum - Barium-140, Cesium-134, Cesium-137, Cobalt-58, Cobalt-60, Iron-59, Lanthanum-140,  
 Manganese-54, Niobium-95, Zinc-65, Zirconium-95  
 Isotopes not listed in Table 1, but typically detected in environmental samples  
 (i.e. Ac-228, K-40, Be-7, Ra-226, Th-228, Th-232, etc.) were reported if detected.

TABLE 2

SUMMARY OF ANALYTICAL METHODS, HOLDING TIME PERIODS, AND PRESERVATIVES  
FLEETWIDE ASSESSMENT  
ZION STATION  
ZION, ILLINOIS

| <i>Parameter</i>          | <i>Method</i> <sup>1</sup> | <i>Matrix</i> | <i>Holding Time</i> | <i>Preservation</i> |
|---------------------------|----------------------------|---------------|---------------------|---------------------|
| Tritium                   | EPA 906.0                  | Water         | - 6 months          | None                |
| Strontium - 89/90 (Total) | EPA 905.0                  | Water         | - 6 months          | HNO3 to pH<2        |
| Gamma Spectrum            | EPA 901.1                  | Water         | - 6 months          | HNO3 to pH<2        |

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<sup>1</sup> EPA-60/40-80-032 August 1980 "Prescribed Procedures For Measurement of Radioactivity In Drinking Water"