



**Revision 1**

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# **HYDROGEOLOGIC INVESTIGATION REPORT**

## **FLEETWIDE ASSESSMENT QUAD CITIES GENERATING STATION CORDOVA, ILLINOIS**

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

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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 Quad Cities Generating Station in Cordova, Illinois (Station). CRA prepared this HIR for Exelon Generation Company, LLC (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 radioactively contaminated 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 Areas for Further Evaluation (AFE) and sample locations for the Station.

CRA installed 22 monitoring wells and collected 32 groundwater samples (22 from newly installed monitoring wells, two from existing monitoring wells near the AFEs, and eight from water supply wells) and two surface water samples at the Station. All groundwater and surface water samples were analyzed for tritium, strontium-89/90, and gamma-emitting radionuclides.

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 detected at concentrations greater than LLD of 200 pCi/L in groundwater samples from nine wells in the vicinity of and south/southwest of the Service and Reactor Buildings, from two wells north/northwest of the Turbine Building, and in surface water samples collected from the Spray Canal. The concentrations of tritium in groundwater greater than the LLD of 200 pCi/L ranged from  $250 \pm 126$  to  $9,640 \pm 660$  pCi/L with the exception of MW-QC-102I at  $32,600 \pm 977$ , which is greater than the United States Environmental Protection

Agency (USEPA) drinking water standard of 20,000 pCi/L. These tritium detections are likely related to the historical releases;

- Tritium was detected in the Station's Spray Canal at  $497 \pm 140$  pCi/L and  $550 \pm 14$  pCi/L, which is well below USEPA's drinking water standard of 20,000 pCi/L. The tritium in the Spray Canal is likely associated with the canal's water supply, the Big Fish Well ( $740$  pCi/L  $\pm 152$ );
- Based on the results of this investigation, tritium has not migrated off site at detectable concentrations;
- Based on the results of this investigation, there is no current risk of exposure to radionuclides associated with licensed plant operations through any of the 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) 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. The investigations pertain to Exelon's Quad Cities Generating Station in Cordova, Illinois (Station) (see Figure 1.1) between May and July 2006. The Station is defined as all property, structures, systems, and components owned and operated by Exelon located at 22710 206th Avenue North, Cordova, 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

This section presents a summary of the Station location and definition, an 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 located at 22710 206th Avenue North, Cordova, Illinois (see Figure 1.1). The Station property consists of approximately 784 acres. The Station is owned by Exelon Nuclear (75 percent) and MidAmerican Energy (25 percent). Figure 2.1 presents a Station base map with the Station infrastructure shown.

### 2.2 OVERVIEW OF COOLING WATER OPERATIONS

The Station consists of two nuclear reactors, associated structures and ancillary buildings, a 310-foot main stack, intake and discharge canals, and a former Spray Canal. The Spray Canal is approximately 3 miles long and was used for condenser cooling water until 1983, at which time it was changed to a facility to raise game fish for release into the Mississippi River.

The Station's generating system consists of a two-unit nuclear-powered steam electric plant. Each unit is a boiling water reactor (BWR) that produces a net electrical power output of 930 megawatts. Unit 1 began commercial operation on February 18, 1973, and Unit 2 began commercial operation on March 10, 1973. The Station currently operates under the Nuclear Regulatory Commission (NRC) Operating Licenses DPR-29 and DPR-30 and is permitted to discharge liquid waste to the Mississippi River under its National Pollutant Discharge Elimination System (NPDES) permit IL0005037.

A BWR plant consists of two separate fluid loops. A separate loop design avoids mixing the fluids of one loop with the fluids of the other. The loops are called the primary loop and the cooling loop.

The main purpose of the primary loop is to transfer the energy generated from fission in the fuel to the turbine generator. It is a closed loop system. Nuclear fission creates heat in the fuel. This heat produces steam, which is passed through a steam dryer and

moisture separator. The steam turns the turbine generator, which makes electricity. The unused steam is exhausted to the condenser where it is condensed into water. The resulting water is pumped out of the condenser with a series of pumps, reheated, and pumped back to the reactor vessel.

The main purpose of the cooling loop is to use cooler river water to condense the steam in the condenser and transfer the heat to the environment. This loop is a single pass process. The cooling water is pumped to the discharge bay and then discharged back to the Mississippi River.

The total flow of river water through Units 1 and 2 for condenser circulating water and service water is approximately 970,000 gallons per minute (gpm). Water is withdrawn from the river at the intake bay through a canal that is perpendicular to the river flow. The Station uses a two-pipe diffuser system to discharge cooling water to the Mississippi River from the discharge bay. The pipes are 16 feet in diameter and lie on the bottom of the river across the main river flow. Water is discharged into the deepest part of the river through regularly spaced jet nozzles in the pipes.

Radioactive liquid wastes (radwastes) are collected in sumps and drain tanks at various locations at the Station and then transferred to tanks in the Radwaste Building for processing, storage, and release. Liquid wastes that can be reused are returned to the Contaminated Condensate Storage Tanks (CCSTs). Liquid wastes that cannot be reused are returned to the Radwaste System for reprocessing or discharging to the river (NRC, 2004). Liquid wastes are discharged via the River Discharge Tank (RDT). Water from the RDT is pumped out to the diffuser house that empties into the south diffuser below the water surface. The liquid waste mixes with the effluent from the discharge bay prior to dispersion out the diffuser pipe.

### **2.3        SURROUNDING LAND USE**

The area surrounding the Station to the north, east, and south is rural farmland and woods. There is an industrial park 1 mile further to the north, and the Cordova Energy Center, a gas-fired power plant, is located 1 mile to the southeast.

The Station is located on the east bank of the Mississippi River opposite the mouth of the Wapsipinicon River. The Upper Mississippi River National Wildlife and Fish Refuge is across the river from the Station and also on islands in the river about 2 miles downstream from the Station.

## 2.4 STATION SETTING

The following section presents a general summary of the topography, surface water features, geology, hydrogeology, and groundwater flow conditions near the Station. The information was primarily gathered from Chapter 2.5 of the Quad Cities Station Updated Final Safety Analysis Report (UFSAR, Revision 8, October 2005). The main references the UFSAR relies upon are listed in Section 10.0. CRA checked and verified all UFSAR references that apply to this HIR.

### 2.4.1 TOPOGRAPHY AND SURFACE WATER FEATURES

The Station is located in Rock Island County, which is within the Galesburg Plain physiographic subsection of the Till Plains Section of the Central Lowland Province. A flat to gently rolling topography in the Central Lowland Province characterizes almost all of Illinois. The Galesburg Plain is level to undulating and is largely an Illinoian stage glacial drift but only locally is there prominent glacial topography. Much of the surface topography mimics the underlying bedrock surface.

The Station's natural grade level is at an elevation of 594.5 feet above mean sea level (AMSL). The Station is on moderately high ground on the east bank of the Mississippi River. The ground surface rises from the river to form steep bluffs approximately 20 to 40 feet in height. The bluffs are breached in places by gullies extending short distances inland.

The Station is on the east side of the Mississippi River opposite the mouth of the Wapsipinicon River. The Upper Mississippi River near the Station is composed of a series of slack-water pools during low flow. The pools are formed by navigation dams located on the river both above and below the Station. The Station is located near Pool #14; the normal elevation of this pool is 572 feet AMSL (Blume, 1966).

Station surface water bodies include the former Spray Canal, discharge bay, intake bay, and dredge ponds. Silt pumped from the intake bay and from the Mississippi River in front of the intake bay is deposited in the dredge ponds. The dredge ponds contain river sediment so tritium impact from the Station is not anticipated.

## 2.4.2 GEOLOGY

The region is on the extreme northwest flank of the Illinois Basin. The upper bedrock consists of Paleozoic sedimentary strata that dip gently, at approximately 15 to 20 feet per mile, to the southeast toward the center of the Illinois Basin. The region is on the south limb of the Savanna-Sabula Anticline (also known as the Plum River Fault Zone), which trends east-west through Carroll County, several miles north of the Station. The Paleozoic sedimentary rocks are of Silurian and older age and are on the order of 3,000 feet thick. They are underlain by Precambrian crystalline rocks (granite and granodiorite) (Blume, 1966).

Beneath the Station are unconsolidated sediments comprised of clay, silt, sand, and gravel deposited as glacial till, outwash, and river alluvium deposits. The unconsolidated sediments are underlain by bedrock of Silurian (Niagaran/Alexandrian Dolomite), Ordovician (Maquoketa Shale, Galena - Platteville Dolomite, and Glenwood - St. Peter Sandstone), and Cambrian age (dolomites, sandstones, and shales) (Blume, 1966).

The Niagaran Dolomite is fossiliferous and sandy. In an abandoned Niagaran Dolomite quarry, which is located approximately 1 mile south of Cordova, there is a high degree of fracturing in the dolomite, and the dolomite was weather-stained along fractures but was a hard competent crystalline rock. Exploration test borings indicate that the upper bedrock surface is weathered to varying depths. Deep borings indicate that the Silurian Dolomite (Niagaran and Alexandrian Formations) is approximately 250 to 300 feet thick (Blume, 1966).

Figure 2.2 presents the stratigraphic column for the Rock Island area and the area to the south and southeast. Although the stratigraphic column shows the Pennsylvanian, Mississippian, and Devonian systems, these systems are not present in northern Rock Island County, where the first bedrock encountered beneath the overburden is Silurian Dolomite. Figure 2.3 presents a bedrock geologic map with a cross-section location. The Station is adjacent to the northern portion of the cross-section and is underlain by Silurian Dolomite. The cross-section in Figure 2.4 shows the sequence and structure of the bedrock in the Station area (J.E. Bruckmann and R.E. Bergstrom, 1968).

The dolomite bedrock surface in northern Rock Island County has been eroded by the ancient Mississippi drainage system. The Meredosia Channel, the upper portion of the Princeton Bedrock Valley system, is drift-filled lowland connecting the present Mississippi River Valley and the Green River Lowland to the east. The mean elevation of the bedrock surface in the channel is approximately 450 feet AMSL. However, a

glacially scoured groove more than 100 feet deep, nearly 4 miles long, and 3,000 feet wide is present along a portion of the south wall of the channel. It is thought that the Meredosia Channel was entered at least once by glaciers during each of the four major glaciations, with the glaciers entering first from the west and later from the east (L.D. McGinnis and P.C. Heigold). The channel has been filled with unconsolidated sediments.

The Station is on a rock hill that was left as an erosional remnant between channels (Blume, 1966), as is shown on Figure 2.5. The depth to bedrock beneath the Station is approximately 50 feet. South of the Station, the thickness of the sand and gravel increases greatly, to as much as 300 feet, due to the presence of the buried Meredosia Channel that cuts into the dolomite bedrock (Blume, 1966). Figure 2.6 shows the approximate northern extent of the Meredosia Channel.

### 2.4.3 HYDROGEOLOGY

Groundwater can be obtained from three aquifer systems:

- unconsolidated alluvial and outwash sand and gravel deposits, 40 to 60 feet thick in the vicinity of the Station;
- shallow Silurian dolomitic formations, approximately 200 to 250 feet thick; and
- artesian sandstone aquifers of Cambrian-Ordovician age.

The potential yield from the upper unconsolidated aquifer is unknown because of lack of local pumping data. But in other parts of the Mississippi Valley, this aquifer is generally capable of yielding large quantities of water on a long-term basis. The groundwater elevation in the unconsolidated aquifer ranged between 17 and 21 feet below ground surface (bgs) on the Station. The groundwater flow direction in this unit was anticipated in a westerly direction toward the Mississippi River. However, as noted in Section 2.4.2, the Station sits on bedrock high with buried bedrock valleys of the Meredosia Channel to the north and south (see Figure 2.5). These buried channels contain thick (greater than 200 feet) deposits of sand and gravel. The buried channels will likely affect the groundwater flow in the upper consolidated aquifer beneath the Station. It is also likely that the groundwater table will undergo seasonal fluctuations and that a temporary reversal of groundwater flow direction may occur from the Mississippi River (Blume, 1966). Based on published records, it is known that the Army Corps of Engineers maintains the water level in the Mississippi River adjacent to the Station at an elevation of 572 feet AMSL.

In addition to these natural effects, the groundwater flow direction may be affected locally by structure basements and foundations, and by sheet piles beneath the Station to a depth of 36 feet bgs at the river along the discharge bay and the inlet to the Spray Canal (sheet pile locations are illustrated on Figure 2.6)

The Silurian Dolomite formations yield moderate to high quantities of water, particularly in areas where unconsolidated sand and gravel sediments are present. Dolomite aquifers immediately below the alluvium and outwash deposits are slowly recharged from water in these deposits. Wells in the Cambrian-Ordovician sandstone artesian aquifers produce large quantities of water. Groundwater in the deep artesian aquifers is independent of the shallow near surface aquifers (Blume, 1966).

## 2.5 AREA GROUNDWATER USE

CRA performed a comprehensive private well survey in the vicinity of the Station. CRA obtained water well information from the Illinois State Geological Survey and the Illinois State Water Survey. Eighty-seven private wells were identified as potentially within 1 mile of the Station. CRA notes that the Illinois State Geological Survey and the Illinois State Water Survey data sources are not updated with abandoned or closed well information and distances from a referenced point may not be accurately reported. The private wells range in depth between 20 and 250 feet bgs with the oldest private well dating back to 1909 and the most recent private well being installed on November 3, 2005. Fifteen public, industrial, and commercial wells were identified as potentially within 1 mile of the Station. The public, industrial, and commercial wells range in depth from 58 to 1,800 feet bgs with the oldest well dating back to 1966 and the most recent well being installed in 2004. Thirteen of the public, industrial, and commercial wells are listed as being located at the Station. The remaining two public, industrial, and commercial wells list the owner as "Saddle Club Farms", a horse farm/dinner club no longer in operation that was located over 1 mile from the Station. Copies of the well logs obtained are provided in Appendix A.

The Station receives potable water from three wells:

- Well #1 (drilled 1966, 242 feet deep, cased to 52 feet bgs);
- Well #5 (drilled 1969, 264 feet deep, cased to 59 feet bgs); and
- Fish House Well #10 (drilled 2004, 135 feet deep).

None of these wells are of a suitable depth or construction to use for determining groundwater contours. The well locations are shown on Figure 2.6 (see Appendix A for well information).

The following water supply wells are also located at the Station:

- Fire Training Well (drilled 1987, 225 feet deep);
- Big Fish Well (drilled 1984, 175 feet deep);
- Little Fish Well (drilled 1986, 60 feet deep);
- Dry Cask Storage Well (also know as East Well, drilled approximately 1960, 84 feet deep); and
- Sewage Treatment Plant (STP) Sand Point Well (drilled 1985, 30 feet deep).



### 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 at the Station.

CRA's identification of AFEs involved the following components:

- Station inspection on March 22, 2006 accompanied by Station personnel;
- 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, CRA installed additional monitoring wells.

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 liquid. Maps depicting each of these systems were developed and provided to CRA for review. The locations of some of these systems are presented on Figure 3.1. The Station identified a total of 16 systems that contain or could contain potentially radioactively contaminated liquid. The following presents a list of these systems.

<i>System Identification</i>	<i>Description</i>
1000	Residual Heat Removal (RHR)/RHR Service Water
1300	Reactor Core Isolation Cooling
1400	Core Spray
2000	Radwaste includes Reactor Building Equipment and Floor Drains
2300	High Pressure Coolant Injection
2600	Sewage Treatment Plant
2600	Wastewater Treatment Plant
3000	Main Steam
3300	Condensate Transfer
4400	Circulating Water System
4900	Turbine Building Floor Drains
5400/9300	Off Gas
5650	Electro Hydraulic Control (EHC)
5700	Heating System/Heating Ventilation and Air Conditioning
5773	Heating Boilers
8900	High Rad Sample System (HRSS)

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 radioactively contaminated liquid. 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 radiological contaminated liquid stored or conveyed;
- amount of radiological contaminated liquid stored or conveyed;
- existing controls (i.e., containment and detection); and
- maintenance history.

System components, which were located inside a building or 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 radioactive 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 as 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 reviewed information concerning confirmed or potential historical releases of radionuclides at the Station, including reports and documentation previously prepared by Exelon and compiled for CRA's review. CRA evaluated this information in identifying 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 also 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**

The pre-operational REMP report was conducted to establish background radioactivity levels prior to operation of the Station. The program was completed in December 1971 by Eberline Instrument Corporation for the Commonwealth Edison Company. The pre-operational REMP report included monitoring for atmospheric radiation, fall-out, domestic water, surface water, marine life, and foodstuffs.

Atmospheric radiation monitoring consisted of gas and air particulate radioactivity measurements; fall-out monitoring consisted of radioactivity measurements of soil, vegetation, and rain water; domestic water monitoring consisted of well water sample analysis; surface water samples were collected from the Mississippi River near the Station, the Davenport Water Works, and the East Moline Water Works; and foodstuffs monitoring included samples of milk.

The pre-operational REMP surface water tritium analytical results ranged from non detect at an unspecified Lower Limit of Detection (LLD) to  $1,590 \pm 850$  picoCuries/liter (pCi/L).

Gross alpha groundwater analytical results ranged from non detect at unspecified LLDs to a maximum detected activity of  $2.00 \pm 0.9$  pCi/L. Gross beta groundwater analytical

results (including tritium) ranged from non detect at unspecified LLDs to a maximum detected activity of  $34.2 \pm 2.3$  pCi/L.

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

The REMP was initiated at the Station in 1968. The REMP includes the collection of multi-media samples including air, surface water, groundwater, fish, clams, crabs, 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.

As part of REMP, surface water samples are collected at two locations and groundwater samples are collected at two locations. The Station collects quarterly groundwater samples from two off-site wells (sample locations Q-35 and Q-36) and analyzes the samples for tritium. Quarterly composites of weekly samples of Mississippi River water collected upstream (Q-34) and downstream (Q-33) from the Station are analyzed for tritium. The REMP reports for 2001 through 2004 state that tritium concentrations remained below the LLD of 200 pCi/L in all of the groundwater and river water samples. According to the Station, tritium concentrations in the well water and river water samples have remained less than the LLD of 200 pCi/L since this testing was first initiated.

The report reviewed by CRA was prepared by Station personnel and is entitled "Annual Radiological Environmental Operating Report for the Quad Cities Nuclear Power Station, dated May 2005". This report concluded that the operation of the Quad Cities Station had no adverse radiological impacts on the environment.

### **3.3.3 HISTORIC INVESTIGATIONS**

No historic investigations related to radionuclides impact to groundwater were completed at the Station.

### 3.3.4 POWER PLANT DOCUMENTS - UFSAR REPORT

During the construction of the Station, a series of comprehensive investigations of regional and local geology, surface water, and groundwater conditions were conducted. These studies are documented in UFSAR Revision 8, October 2005.

### 3.4 IDENTIFIED AREAS OF 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, 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 that have the potential for the release of radioactively contaminated liquid 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 Station 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 flow beneath several systems that contain radioactively contaminated liquid 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 identified five AFEs (see Figure 3.1).

#### AFE-Quad Cities-1 - Piping West of Radwaste Building/Floor Drain Surge Tank

This area was identified as an AFE due to its proximity to buried piping west of the Radwaste Building where historic releases have occurred and due to its proximity to the Floor Drain Surge Tank, which conveys waste and liquids potentially containing tritium.

#### AFE-Quad Cities-2 – Historic Releases Area South of Station Blackout Building (SBO)

This area was identified as an AFE due to its proximity to three reports of historic releases in this area. Historic releases related to this AFE occurred on August 17, 1975, December 10, 1979, and March 21, 1986. The locations of the releases are shown on Figure 3.2.

- On August 17, 1975, a Unit 2 feedwater valve leaked, releasing radioactively contaminated water to the soil east of the Trackway 2 (TW-2) rollup door. The impacted soil was excavated and shipped off site. Approximately 12,500 gallons of water were released: 8,500 gallons of feedwater and 4,000 gallons of fire suppression system water. Approximately 2,570 gallons of water entered the Unit 2 Oil/Water Separator, which was recovered and released through a permitted discharge point. Approximately 100 gallons of the water was released to Station surface soils in the vicinity of the TW-2 rollup door. Tritium was detected in Unit 2 Oil/Water Separator output at a concentration 97,000 pCi/L.

- On December 10, 1979, approximately 4,200 gallons of radioactively contaminated Residual Heat Removal (RHR) water was spilled into a storm drain system and on the surrounding blacktop east of the Unit 1 Reactor Building. Water which entered the Unit 1 Oil/Water Separator was recovered and released through a permitted discharge point. Based on subsequent sampling of the Unit 1 Oil/Water Separator, an estimated 25 millicuries were released through the discharge bay, which is a permitted pathway, and the remaining 12.8 millicuries went into the ground.
- On March 21, 1986, approximately 10 to 25 gallons of reactor water that contained tritium and radionuclides leaked onto the asphalt east of the Unit 1 Reactor Building from the Integrated Leak Rate Compressor. A small area of contaminated asphalt was removed. None of the water entered the storm drain.

All three of these historic releases occurred east of the Reactor Building, with the 1975 release occurring near the northeast corner of the Reactor Building and the 1979 and 1986 releases occurring at the current location of the Station Blackout Building (SBO).

#### AFE-Quad Cities-3 - CCSTs and Ancillary Piping

This area was identified as an AFE due to its proximity to the CCSTs and associated piping, which are not provided with secondary containment. Any historic releases from this storage system could potentially impact groundwater downgradient of the CCSTs.

#### AFE-Quad Cities-4 - Unit 1 Oil/Water Separator

This area was identified as an AFE as potential releases from the CCSTs and the south side of the plant would discharge to the Unit 1 Oil/Water Separator.

#### AFE-Quad Cities-5 - Unit 2 Oil/Water Separator

This area was identified as an AFE as potential releases from the north side of the plant would discharge to the Unit 2 Oil/Water Separator.



## 4.0 FIELD METHODS

The field investigations for this HIR were completed from May through July 2006. The initial field investigations completed for this HIR in May and June 2006 were focused near the five AFEs identified for the Station. Additional field investigations were completed in June and July 2006 to determine the vertical and lateral extent of tritium in groundwater. CRA supervised the installation of monitoring wells at the Station and collected samples from the newly installed monitoring wells, the existing monitoring wells, and the existing water supply wells, as well as from surface water locations. The field investigations were completed in accordance with the methodologies presented in the Work Plan (CRA 2006).

In 2002, CRA installed three monitoring wells (MW-1, MW-2, and MW-3), which were screened from 17 to 27 feet bgs and located in the northwest portion of the Protected Area (PA). CRA collected groundwater samples as part of a separate hydrogeologic assessment for non-radionuclide parameters. No impacts were detected.

### 4.1 SURFACE WATER GAUGING POINT INSTALLATION AND MONITORING

Figure 4.1 presents the location of the three new surface water gauging points installed as part of this investigation. SW-QC-1 and SW-QC-2 are located on bridges that cross the Station Spray Canal. A third surface water gauging point (SW-QC-3) was installed at the discharge bay near MW-QC-103I. These gauging points were used for surface water elevation monitoring.

### 4.2 GROUNDWATER MONITORING WELL INSTALLATION

Twenty-two new monitoring wells were installed at the Station as part of the fleetwide hydrogeologic investigation. Eleven monitoring wells were installed during the initial field investigations conducted in May 2006. These locations were selected based on a review of all data provided, the hydrogeology at the Station, and the current understanding of identified AFEs. An additional 11 monitoring wells were installed during the additional field investigations conducted in June and July 2006. These locations were selected based on a review of the hydrogeology at the Station, the current understanding of identified AFEs, and the analytical results from groundwater sampling conducted at the initial 11 monitoring wells and the eight water supply wells.

Monitoring well construction logs are provided in Appendix B. Figure 4.1 presents the location of the 22 new monitoring wells. Table 4.1 summarizes the monitoring well completion details.

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, an air knife was used to verify utilities were not present at the proposed location to a depth of 10 feet bgs.

Specific installation protocols for the 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, 5 or 10 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 bentonite 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 bentonite grout;
- the remaining portion of the annulus was filled with concrete and a 6-inch diameter protective above-grade or flush mount casing. The well head was fitted with a water-tight, lockable cap; and
- cement-filled bollard posts were installed around selected monitoring well locations.

The shallow soil borings completed in unconsolidated materials that were to be used for monitoring well installation were installed using 4.25-inch inside diameter HSA drilling techniques. The borehole depths ranged from 29 to 70 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 to reduce the volume of sediment in the monitoring well, monitoring well development was conducted in accordance with this procedure:

- Monitoring wells were surged using a pre-cleaned surge block for a period of at least 20 minutes.
- Water was purged from the monitoring well using an electronic submersible pump.
- Groundwater was collected at regular intervals with the pH, temperature, and conductivity measured using field instruments. These instruments were calibrated daily according to the manufacturer's specifications. Additional observations such as color, odor, and turbidity of the purged water were recorded.
- Development continued until the turbidity and silt content of the monitoring wells was 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 well development parameters is provided in Table 4.2.

### 4.4 SURVEY

The new monitoring wells and surface water gauging points 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 well location to the nearest 1.0 foot. A reference point was also marked at each gauging point.

### 4.5 GROUNDWATER AND SURFACE WATER ELEVATION MEASUREMENTS

On May 24, 2006 and July 26, 2006, CRA collected water level measurements from new monitoring wells and surface water gauging points installed in accordance with the Work Plan and from two existing monitoring wells. CRA collected additional water level measurements at the surface water gauging points on June 22, 2006. Based on the

measured depth to water from the reference point and the surveyed elevation of the reference point, the groundwater elevation was calculated. A summary of groundwater elevations is provided in Table 4.3. A summary of surface water elevations is provided in Table 4.4.

Prior to the water level measurements, the wells 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 protective casing of each monitoring well. Surface water measurements were made from the designated location at each surface water gauging point.

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 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 well location.

#### **4.6            GROUNDWATER AND SURFACE WATER SAMPLE COLLECTION**

CRA conducted two rounds of groundwater and surface water sampling during the completion of the Work Plan for these hydrogeologic investigations. A total of 13 monitoring wells and eight water supply wells were sampled on May 31 and June 1, 2006. An additional 11 monitoring wells were sampled on July 27 and 28, 2006. Of the 24 monitoring wells sampled, 22 were newly installed. The sampling was scheduled to allow for 2 weeks to elapse between well development and groundwater sample collection. The two existing wells were selected for inclusion in this monitoring program based on their proximity to the AFEs. The new wells were installed to complete the monitoring network in the vicinity of the AFEs.

At the monitoring well locations, CRA conducted the sampling using dedicated tubing and a peristaltic pump or a submersible electronic pump, and employed low-flow purging techniques as described in Puls and Barcelona (1996).

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

- the wells were located and identified;
- 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 (mL/min). 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 every 5 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 (NTU); and

- once purging was complete, the groundwater samples were collected directly from the pump/tubing directly into the sample containers.

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

A groundwater sample key is presented in Table 4.5. Purging parameters for the monitoring wells are presented in Table 4.6.

Water samples collected on May 31 and June 1, 2006 from the existing water supply wells were collected from existing taps or spigots on the well pump header or distribution. Prior to collecting a water sample, the water was allowed to flow from the tap or spigot for several minutes. Water purging parameters for these supply wells are presented in Table 4.7.

CRA containerized the water purged from the Station monitoring wells during sampling as well as 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.

Surface water samples were collected on May 31, 2006 at the two gauging points along the Station Spray Canal. The surface water sampling locations (SW-QC-1 and SW-QC-2) are presented on Figure 4.1.

The surface water samples were collected by submerging a disposable bailer in the Spray Canal. The samples were poured directly from the disposable bailer into the sample containers. The samples were shipped to Teledyne Brown for analysis.

#### **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 memoranda 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-QC-SW-QC-001-053106-JH-002. A summary of sample identification numbers is presented in Table 4.5.

WG	-	Sample matrix - groundwater
WS	-	Sample matrix - surface water
RB	-	Sample matrix - rinse blank
QC	-	Station code
SW-QC-001	-	Sample location
053106	-	Date
JH	-	Sampler initial
002	-	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 five 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.

##### Rinsate Blank Samples

Rinsate blanks were collected to verify that decontamination procedures conducted in the field were adequate. Rinsate blanks were collected by routing Station-supplied demineralized water through decontaminated sampling equipment. Rinsate blanks were collected at a frequency of one rinsate blank for every day samples were collected using non-disposable or non-dedicated equipment. Three rinsate blanks were collected.

##### Split Samples

Split samples were collected by CRA for the NRC for tritium simultaneously with the actual sample at each sample location. Split samples were delivered to the Station personnel and made available to the NRC. In addition, split samples were collected May 31, 2006 at monitoring wells MW-QC-106I and MW-QC-107I for the NRC and were given to the NRC representative.

#### 4.11 ANALYSES

Groundwater and surface water samples were analyzed for tritium and gamma-emitting radionuclides as listed in NUREG-1302 and strontium-89/90 as listed in 40 CFR 141.25.



## 5.0 RESULTS SUMMARY

This section provides a summary of Station 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

The geology encountered during monitoring well installation is consistent with the geology described in Section 2.4.2. The geology beneath the Station consists of unconsolidated sediments comprised of sand and gravel deposited as outwash and river alluvium deposits. The unconsolidated sediments are underlain by bedrock of Silurian (Niagaran/Alexandrian Dolomite), Ordovician (Maquoketa Shale, Galena - Platteville Dolomite, and Glenwood - St. Peter Sandstone), and Cambrian age (dolomites, sandstones, and shales).

Figure 5.1 displays the locations of the hydrogeologic cross-sections across the Station. These hydrogeologic cross-sections are presented on Figures 5.2 to 5.5. These cross-section locations were chosen because of their close proximity to the AFEs and structures potentially influencing groundwater flow patterns.

The new shallow, intermediate, and deep interval wells installed pursuant to the Work Plan were installed in the overburden. The Station is underlain by overburden deposits consisting primarily of unconsolidated sediments comprised of fine- to coarse-grained sands and trace gravel (see Section 2.4.2). The monitoring well logs are presented in Appendix B.

Figure 5.2 is a southwest-northeast cross-section (A-A') through the middle of the Station. It begins near monitoring well MW-QC-114I at the southwestern corner of the Station and terminates near the access road in the northeast portion of the Station. This cross-section also shows the relationship between the groundwater and geology, excavated areas, and Reactor/Turbine Building foundations that were set on the bedrock. The Service Building foundation in this area was constructed on concrete piers within the sand overburden fill to a depth of approximately 589.5 feet AMSL. The Service Building foundation is not seated in bedrock. Engineered compacted fill was placed around the foundation of the Service Building to the ground surface. The storm drain piping along this sectional line is located in the compacted engineered fill. The northern extent of the buried paleochannel or the Meredosia Channel is located to the

south of the Service Building. May 2006 groundwater elevations in the upper unconsolidated aquifer along this cross-section drop slightly from north (573.85 feet AMSL at MW-QC-101S) to south (572.51 feet AMSL at MW-QC-108S) due to the presence of the Meredosia Channel.

Figure 5.3 is a southeast-northwest profile (B-B') that intersects AFE-Quad Cities-2. This cross-section shows the relationship between the groundwater and geology, sheet piles, utilities, and building foundations. Sheet piles installed as part of the Station construction are located to the west of the Service Building. The sheet piles were set into the top of the dolomite bedrock. The discharge bay was also excavated into the top of dolomite bedrock in this portion of the Station. The northern extent of the buried paleochannel or the Meredosia Channel is located to the south of the Service Building. The surface of the dolomite bedrock in this portion of the Station drops approximately 100 feet based on the bedrock topography map (Figure 2.5). May 2006 groundwater elevations in the upper unconsolidated aquifer along this cross section drop slightly from northwest (573.09 feet AMSL at MW-QC-103I) to the southeast (572.77 feet AMSL at MW-QC-102I) due to the competing influence of the Meredosia Channel and the sheet piles.

Figure 5.4 is an east-west cross-section (C-C') through the Station to the Mississippi River. This profile shows the relationship between the groundwater and geology, excavated areas, building foundations, and the Mississippi River. The Reactor Building, Turbine Building, and Crib House foundations in this area were constructed to approximate depths of 548, 542.5, and 545 feet AMSL, respectively. The Reactor Building, Turbine Building, and Crib House foundations are seated in bedrock. Engineered compacted fill was placed around these buildings to the ground surface. The storm drain piping along this sectional line is located in the compacted engineered fill. May 2006 groundwater elevations in the fill overburden sand along this cross-section are relatively flat from east (573.85 feet AMSL at MW-QC-101S) to the west (573.82 feet AMSL at MW-QC-106S). Groundwater in the overburden flows around the building foundations to the southwest.

Figure 5.5 is a north-south cross-section (D-D') through the Station. This cross-section shows the relationship between the groundwater and geology, excavated areas, and building foundations. Engineered compacted fill was placed around the foundation of the Service Building to the ground surface. The storm drain piping along this sectional line is located in the compacted engineered fill. The northern extent of the buried Meredosia Channel is located to the south of the Service Building. Dolomite bedrock in this portion of the Station drops approximately 100 feet. May 2006 groundwater elevations in the upper unconsolidated aquifer along this cross-section drop from north

(574.30 feet AMSL at MW-1) to south (572.51 feet AMSL at MW-QC-108S) in response to the presence of the Meredosia Channel.

## 5.2 STATION HYDROGEOLOGY

Figure 5.1 presents the monitoring well network in relationship to the hydrogeologic cross-section locations. Hydrogeologic cross-sections are presented on Figures 5.2 to 5.5. The cross-sections show the overburden that overlies the dolomite bedrock. In general, the overburden consists of naturally occurring unconsolidated sand or sand fill (fill is present where the Station was excavated prior to construction of the buildings).

### 5.2.1 MAN-MADE INFLUENCES ON GROUNDWATER FLOW

The PA (Figure 1.2) is located at the west area of the Station and is surrounded by the lined Spray Canal. The Spray Canal was constructed with a polyvinyl chloride (PVC) liner underlain by 6 inches of sand covered by 1 foot of crushed rock. The polyethylene sheeting was placed on 1 foot of compacted sand and gravel.

The canal flows counter-clockwise around the Station during the time when the canal is being filled with water pumped from the Big Fish water supply well. The Station fills the canal in the spring for a 3-month period to a depth of approximately 3 feet. The depth of the water in the Spray Canal during the hydrogeologic investigation ranged from 4.21 feet at SW-QC-1 on May 31, 2006 to 1.61 feet at SW-QC-2 on July 26, 2006. The Spray Canal was initially operated as a component of the cooling water operations at the Station. Cooling water from the condenser was pumped to the Spray Canal to further reduce the water temperature prior to discharge from the discharge bay. The operation of the Spray Canal as part of cooling water operations was suspended in 1983. The Spray Canal was modified for use in fish hatchery operations. The Station fills the canal as part of a fish hatchery program for the Mississippi River.

When the canal is not being filled, there is no flow; however, there is a residual amount of water in some parts of the canal. Due to the higher head in the canal than the surrounding groundwater elevation (approximately 25 feet of head difference as of June 2006) there may be some groundwater recharge from the Spray Canal into the overburden. There is some evidence that seepage through the canal liner exists. Based on the HIR water level measurements and an understanding of the construction of the Spray Canal, the water leakage does not appear to have a significant effect on the groundwater flow direction within the PA.

During construction of the structures and buildings in the PA, a dam was constructed to minimize groundwater infiltration into the excavation and water was pumped from the excavation. This excavation was greater than 40 feet deep and on top of the underlying dolomite bedrock formations (UFSAR, 2005). The dam was constructed at the current location of the inlet bay and was subsequently removed after the completion of plant construction activities.

Sheet piles were installed around the discharge bay and the western portion of the Spray Canal as part of Station construction activities. The discharge bay sheet piles extend below the water table to an elevation of 535 feet AMSL, but not to the top of competent bedrock. They are set on crushed stone and rip rap. As such, groundwater flow is intercepted by the sheet pile walls, but will continue to flow beneath and through the sheet piles. The sheet piles are shown on Figures 5.3 and 2.6. The foundations or basements associated with the Reactor Building and the Turbine Building extend to depths below the water table and are set into the top of competent bedrock (see Figure 5.4). The total depth of the Reactor Building is 548 to 550 feet AMSL. The total depth of the majority of the Turbine Building is 542.5 feet AMSL. These basements are barriers to groundwater flow in the overburden.

The Station structures and utilities were reviewed to assess their impact on groundwater flow conditions. All non-process related utilities (e.g., storm drains) are above the groundwater table and do not appear to impact groundwater flow.

The Station and surrounding land is generally flat and is covered by paved areas, roadways, and parking lots. These areas are drained by a storm water system that drains to the north and south of the Station and passes by the location of MW-QC-102S (see Figure 3.1). The south storm water system drains to an Oil/Water Separator (Unit 1) at the south end of the PA whose outfall discharges to the discharge bay. The north storm water system drains to an Oil/Water Separator (Unit 2) at the north end of the PA whose outfall discharges to the intake bay.

The water level in the discharge bay fluctuates. The discharge bay water level was measured on May 31, 2006 at 576.91 feet AMSL, on June 22, 2006 at 576.53 feet AMSL, and on July 26, 2006 at 576.36 feet AMSL (see Table 4.4). The discharge bay water level was approximately 4 feet higher than the water level measured in nearby monitoring wells MS-QC-103I and MW-QC-105I (see Table 4.3) but does not appear to significantly affect groundwater flow direction in this area.

## 5.2.2 GROUNDWATER FLOW DIRECTIONS

Groundwater level measurements were collected in May and July 2006. Groundwater contours for the upper unconsolidated aquifer for these dates are presented on Figures 5.6 and 5.7, respectively. The May 2006 groundwater contour maps are based on data obtained from 13 wells while the groundwater contour maps from July 2006 are based on data from 24 monitoring wells.

Examination of Figure 5.6 shows that groundwater flow in May 2006 is primarily to the southwest towards the Mississippi River and the southern buried valley of the Meredosia Channel. Groundwater levels on the north side of the Station are approximately 2 feet above the controlled river level elevation. As discussed in the previous section, the foundations of the Reactor and Turbine Buildings restrict the groundwater flow, which causes the groundwater to flow around the buildings. The groundwater flow in the upper unconsolidated aquifer may have been affected by the pumping of the Big Fish Well to supplement the water level in the Spray Canal.

The Big Fish Well was completed in the upper unconsolidated aquifer at a depth of approximately 175 feet bgs. This well is capable of pumping on the order of 1,800 gallons per minute (gpm). In a typical year, the Big Fish Well is operated for up to 2 weeks in April to fill the Spray Canal. The well is then operated twice a week, running between 5 to 8 hours during each event through to early August to maintain a minimum water level in the canal.

Groundwater flow directions for the July 2006 water level monitoring event are shown on Figure 5.7. This figure provides a more complete representation of groundwater flow in the upper unconsolidated aquifer at the Station, given the larger data set and broader distribution of monitoring wells. In general, groundwater levels are approximately 2 feet lower than those measured in May 2006 (see Table 4.3). This indicates that seasonal fluctuations in the water table occur. In general, groundwater flows from the east to the west towards the Mississippi River. However, the groundwater flow diverges to a southerly and northerly component and flows towards both the buried valleys of the Meredosia Channel (see Figure 2.5 for Meredosia Channel detail). In July 2006, the river elevation was higher than all groundwater levels near the river, indicating that flow from the river to the aquifer is occurring. This will result in localized reversal in the flow direction. The river recharge also resulted in a much flatter hydraulic gradient at the Station than that measured in May 2006, when groundwater discharge to the river occurred. The data also show that basement walls restrict the groundwater flow, which causes the groundwater to flow around the buildings.

The water level in the discharge bay will fluctuate. The discharge bay water level was measured on May 31, 2006 at 576.91 feet AMSL, on June 22, 2006 at 576.53 feet AMSL, and on July 26, 2006 at 576.36 feet AMSL (see Table 4.4). The discharge bay water level was approximately 4 feet higher than the water level measured in nearby monitoring wells MS-QC-103I and MW-QC-105I (see Table 4.3) but does not appear to significantly affect groundwater flow direction in this area.

A comparison of the water levels in monitoring wells located on the east side of the sheet piles with river levels indicates that the sheet piles are not acting as an effective hydraulic barrier. This is illustrated on the groundwater contour map (Figure 5.6) by the minimal changes in contour spacing when the river level is compared to groundwater elevations in adjacent wells. There are no sheet piles along the river bank. The river bank protection consists of rip-rap (rocks) present to prevent erosion.

### 5.2.3 VERTICAL HYDRAULIC GRADIENTS

The HIR included the installation of monitoring well clusters in the upper unconsolidated aquifer to determine not only the vertical distribution of impacted groundwater (as necessary), but also the vertical hydraulic gradient within the aquifer. Vertical hydraulic gradients were calculated at the well pairs and are provided in Table 5.1. Downward vertical hydraulic gradients were calculated for four well pairs: MW-QC-101 and MW-QC-108, where the vertical hydraulic gradient was very slight, 0.001 feet/foot; MW-QC-106, where the vertical hydraulic gradient was 0.003 feet/foot; and MW-QC-109, where the vertical hydraulic gradient was 0.006 feet/foot. An upward vertical gradient was calculated for the remaining well pair, MW-QC-102, where the vertical hydraulic gradient was -0.003 feet/foot (May 30, 2006) and -0.0004 feet/foot (July 26, 2006).

The calculated vertical hydraulic gradients at the Station are slight and vary with proximity to the canal and Mississippi River. There were no significant vertical hydraulic gradients observed.

### 5.2.4 LATERAL GROUNDWATER FLOW AND VELOCITY

The calculated horizontal hydraulic gradient in the upper unconsolidated aquifer along the east side of the PA based on the May 2006 data is 0.002 feet/foot and based on the June 2006 data, after the installation of additional monitoring wells, is 0.0004 feet/foot. The horizontal hydraulic gradient was calculated by dividing the change in

groundwater elevation along the groundwater flow path by the corresponding distance along the flow path. The groundwater flow direction in this area is from the northeast to southwest during both monitoring events. Figure 5.6 displays the May 2006 groundwater elevation contours and Figure 5.7 displays the July 2006 groundwater elevation contours.

The calculated horizontal hydraulic gradient in the upper unconsolidated aquifer along the west side of the Turbine Building based on the May 2006 data is 0.004 feet/foot and based in the June 2006 data is 0.003 feet/foot. The general groundwater flow direction in this area is from east-northeast to west-southwest (Figure 5.6).

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 at the Illinois-Indiana border of the shallow aquifer along Lake Michigan (USGS, 1996). The aquifer media tested in this study was consistent with unconsolidated aquifer material at the Station. 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. The hydraulic gradient range of 0.0004 to 0.004, based on the collected May 2006 and July 2006 data, with a hydraulic conductivity of 12 feet per day and an assumed porosity of 0.32, yields a velocity of 6 to 54 feet per year (USEPA, 1996). The hydraulic gradient and the calculated groundwater velocity are subject to seasonal fluctuation.

### 5.3 GROUNDWATER QUALITY

CRA personnel collected 32 groundwater samples from 22 newly installed monitoring wells, two previously installed groundwater monitoring wells, and eight existing water supply 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 in Appendix D.

The analytical data 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 does 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.

### 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 5.2. and shown on Figure 5.8.

The tritium groundwater data have been divided into upper and intermediate intervals of the upper unconsolidated aquifer. CRA evaluated the groundwater data using upper and intermediate overburden data sets to better understand the potential vertical distribution of tritium in Station groundwater.

Concentrations of tritium in groundwater samples collected south of the Turbine and Reactor Buildings and in the SBO Area ranged from  $262 \pm 130$  pCi/L to  $32,600 \pm 977$  pCi/L. The groundwater sample collected from MW-QC-102I, screened in the intermediate interval of the upper unconsolidated aquifer, had a tritium concentration of  $32,600 \pm 977$  pCi/L. The following wells in the upper unconsolidated aquifer also revealed tritium concentrations greater than the LLD of 200 pCi/L, but less than 20,000 pCi/L: shallow wells MW-QC-102S, MW-QC-104S, and MW-QC-108S; intermediate wells MW-QC-108I, MW-QC-109I, and MW-QC-111I; deep well MW-QC-102D; and the Big Fish Well.

In addition, the following two groundwater samples collected north and northwest of the Turbine and Reactor Buildings revealed tritium concentrations greater than the LLD that ranged from  $250 \pm 126$  pCi/L (shallow overburden monitoring well MW-2) to  $371 \pm 134$  pCi/L (water supply well Little Fish Well).

Strontium-89/90 was not detected at a concentration greater than the LLD of 2.0 pCi/L. A summary of the strontium-89/90 results for the groundwater samples collected as part of this HIR is presented in Table 5.3 and shown on Figure 5.9.

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

Gamma-emitting target radionuclides were not detected at concentrations greater than their respective LLDs. A summary of the gamma-emitting radionuclide results for the



groundwater samples collected as part of this investigation that is the subject of this HIR is provided in Table 5.3 and shown on Figure 5.9.

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.

### **5.3.3 SUMMARY OF FIELD MEASUREMENTS**

Table 4.6 presents monitoring well purging parameters collected during the well purging and sampling activities. These field measurements included pH, dissolved oxygen, ORP, conductivity, turbidity, and temperature. The field parameters were typical of a shallow sand aquifer with carbonate source rock (i.e., the underlying limestones and shales). As such, the pH values were found to be approximately 7.0 and the conductivity was indicative of a shallow water table system subject to surface water recharge. The conductivity of the water purged from MW-QC-104S was elevated when compared to the readings from other sampling locations.

## **5.4 SURFACE WATER QUALITY**

Two surface water samples were collected from the two gauging points located at the Spray Canal shown on Figure 4.1. The samples were 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 reports are presented in Appendix D.

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

A summary of the tritium results for the surface water samples collected in this investigation is provided in Table 5.2 and shown on Figure 5.8. Surface water samples collected from locations SW-QC-1 and SW-QC-2 contained tritium at concentrations of  $550 \pm 143$  pCi/L and  $497 \pm 140$  pCi/L, respectively.

Strontium-89/90 was not detected at concentrations that were greater than the LLD of 2.0 pCi/L. A summary of the strontium-89/90 analytical results for surface water samples collected in this investigation is presented in Table 5.3 and shown on Figure 5.9.

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

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Gamma-emitting target radionuclides were not detected at concentrations greater than their respective LLDs. A summary of the gamma-emitting radionuclides results for the surface water samples collected in this investigation is provided in Table 5.3 and shown on Figure 5.9.

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.

## 6.0 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 concentrations greater than their respective LLDs. 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 groundwater samples collected at concentrations greater than the LLD of 2.0 pCi/L. Tritium was detected in 13 of the 34 total sample locations. Concentrations of tritium ranged between  $250 \pm 126$  pCi/L to  $32,600 \pm 977$  pCi/L.

Since only tritium was detected at concentrations greater than the LLD during the fleetwide investigation, 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 from the body 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 GROUNDWATER / SURFACE WATER**

This section provides an overview of the lateral and vertical distribution of tritium detected in groundwater and the distribution of tritium in surface water at the Station. Tritium has been the only parameter detected in the upper unconsolidated aquifer at a concentration greater than the LLD of 200 pCi/L. This observation is based upon the studies recently completed at the Station. Consequently, this section of the report will focus on the distribution of tritium in the upper and intermediate intervals of the upper unconsolidated aquifer.

Tritium concentrations that are greater than the LLD of 200 pCi/L are limited to three areas at the Station. The first area is located to the north and northwest of the Turbine Building. The second larger area is located to the south and southwest of the Reactor, Service, and SBO Buildings. Tritium was also detected in the Spray Canal, the third area. The tritium detections are summarized in Table 5.2 and shown on Figure 5.8.

#### North and Northwest of Turbine Building

Tritium was detected at concentrations slightly above the LLD of 200 pCi/L in MW-2, completed to 27 feet bgs in the upper zone of the upper unconsolidated aquifer, and the Little Fish Well, completed to 60 feet bgs. Both of these wells are located north and northwest of the Turbine Building. Groundwater in this area of the Station has been determined to flow from northeast to southwest towards the Mississippi River based on the May 2006 groundwater elevations, with a more westerly flow component present during July 2006.

Historical tritium analytical data for groundwater samples collected from the Little Fish Well are available back to 2003. These samples were analyzed in accordance with NUREG 1302 to an LLD of 3,000 pCi/L (LLD of 200 pCi/L for the five March 10, 2006 samples). Tritium was not detected in any of the samples collected at concentrations greater than the LLD.

As part of the May 31, 2006 sampling event, tritium was detected in the Little Fish Well at concentrations of  $371 \pm 134$  pCi/L. Tritium was not detected at concentrations greater than the LLD (200 pCi/L) in the sample from the Fish House Well. The Fish House Well is screened within the Niagaran Dolomite of the Hunton Megagroup. The driller's well log shows that competent dolomite begins at 69 feet bgs and that the well was cemented with bentonite grout to a depth of 71 feet bgs. Therefore, the Fish House Well draws water from the dolomite aquifer from 71 feet bgs and deeper. Based on the Fish House Well information, the adjacent 60 foot deep Little Fish Well, screened from 50 to 60 feet bgs, is screened within the upper unconsolidated aquifer (the sand aquifer above the dolomite). The Spray Canal is located north and hydraulically upgradient of well MW-2 and the Little Fish Well. Tritium was detected in surface water samples collected from the Spray Canal. The upper unconsolidated aquifer in this portion of the Station may be partially recharged from surface water in the Spray Canal at the dam/end of the canal when it is in use during the spring and summer, as discussed previously in Section 5.2.1.

### South/Southwest of Reactor, Service, and SBO Buildings

Tritium has been detected at concentrations greater than the LLD of 200 pCi/L in the area south and southwest of the Reactor, Service, and SBO Buildings. Specifically, monitoring wells MW-QC-102S, MW-QC-102I, MW-QC-102D, MW-QC-104S, MW-QC-108S, MW-QC-108I, MW-QC-109I, and MW-QC-111I, and the Big Fish Well contained concentrations of tritium greater than the LLD. Groundwater flow direction in this area of the Station varies seasonally, and groundwater flows either from northeast to southwest towards the Mississippi River or from east to west towards the Mississippi River.

The concentration of tritium in the Big Fish Well, screened at three intervals from 77 feet to 175 feet in the unconsolidated deposits of the Meredosia Channel, has been reported as less than the Station LLD of 3,000 pCi/L (2003 through 2006 samples). The new monitoring wells in this area are screened from 18 to 70 feet bgs within the unconsolidated aquifer. The highest concentration of tritium,  $32,600 \pm 977$  pCi/L, was detected in the groundwater sample collected at MW-QC-102I. Tritium was also detected in the groundwater sample collected from MW-QC-109I at  $1,140 \pm 182$  pCi/L in the vicinity of historical release referenced in AFE-Quad Cities-2 in Section 3.4. Tritium was detected as far south as MW-QC-111I at a concentration of  $420 \pm 133$  pCi/L, but was not detected in either MW-QC-114I or MW-QC-115S, which are located further south of MW-QC-111I. Tritium detections above the LLD are limited to a localized area between the Reactor and Service Buildings to the north and the Spray Canal to the south. Tritium has not been detected above the LLD of 200 pCi/L in wells adjacent to the Mississippi River (MW-QC-112I, MW-QC-113I, MW-QC-114I, and the STP Sand Point Well) or beyond the area delineated by the Spray Canal.

Wells with tritium detections greater than the LLD of 200 pCi/L, MW-QC-102S, MW-QC-102I, MW-QC-102D, MW-QC-104S, MW-QC-108S, MW-QC-108I, MW-QC-109I, MW-QC-111I, and the Big Fish Well, are downgradient of the AFE-Quad Cities-2 SBO Area, which is the likely source of tritium in these wells. Figure 6.1 presents a profile depicting detected tritium concentrations along cross-section A-A'. Figure 6.2 presents a plan view depicting detected tritium concentrations.

### Surface Water

Tritium was detected in the surface water samples collected from the Spray Canal at sampling points SW-QC-1 and SW-QC-2 at concentrations of  $550 \pm 143$  pCi/L and  $497 \pm 140$  pCi/L, respectively. The Spray Canal is filled with water pumped from the Big Fish Well, which is impacted by tritium.

### 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.

Tritium has not been detected at concentrations greater than the LLD of 200 pCi/L in samples collected from bedrock potable supply wells located at the Station (Well #1, Well #5, and Fish House Well #10). As such, CRA's conceptual hydrogeologic model focuses on the migration of groundwater and tritium in the upper unconsolidated aquifer.

Within the upper unconsolidated aquifer, tritium was not detected in monitoring wells installed adjacent to the Mississippi River (STP Sand Point Well, MW-QC-103I, MW-QC-105I, MW-QC-106S, MW-QC-106I, MW-QC-112I, MW-QC-113I, and MW-QC-114I). Tritium was also not detected in the monitoring wells installed adjacent to residential properties (MW-QC-115S and MW-QC-116S). Therefore, the vertical and horizontal extent of tritium impact to Station groundwater is limited to the Station property.

The groundwater flow in May within the upper unconsolidated aquifer beneath the Station is from northeast to southwest, toward the southern buried valley of the Meredosia Channel. As shown on Figure 5.6, groundwater flow appears to divide around the Reactor and Turbine Buildings, as a result of the foundations sitting on bedrock. Groundwater may also undergo seasonal fluctuations as a result of the filling of the Spray Canal and water level change within the Mississippi River. CRA observed seasonal changes in the two rounds of groundwater levels collected. The groundwater flow in July is, in general, from east to west, but the groundwater flow diverges to a southerly and northerly component toward the buried valleys of the Meredosia Channel (see Figure 5.7). There is no indication from this HIR investigation that tritium-impacted groundwater is migrating off Station.

#### Hydrogeologic Framework

Groundwater flow within the upper unconsolidated aquifer at the Station is to the southwest toward the Mississippi River in May 2006 and generally to the west toward the Mississippi River in July 2006, with southerly and northerly components present.

Groundwater moving within the overburden is separated from the deeper regional bedrock aquifer zones by the upper dolomite. In the vicinity of the Turbine and Reactor Buildings, groundwater flow in the upper unconsolidated aquifer is affected by the building foundations, as they extend to the bedrock. This results in a deviation of the flow around the buildings.

In May 2006, groundwater from the west side of the Turbine Building discharges into the intake bay and the Mississippi River to the southwest. The southern component of flow is also influenced, to some degree, by the pumping of the Big Fish Well and by the Meredosia Channel. The Big Fish Well was constructed in the Meredosia Channel, an ancient channel of the Mississippi River that eroded the bedrock. This channel has been filled over time with unconsolidated sediments ranging from approximately 50 to 300 feet deep (Blume, 1966). The well construction logs indicate that the Big Fish Well was screened over three intervals (77 to 97, 118 to 148, and 157 to 175 feet bgs) and has an overall depth of 175 feet. Pumping tests performed on this well indicate that it can pump at a sustained rate of 1,800 gpm.

In a typical year, the Big Fish Well is operated for up to 2 weeks in April to fill the Spray Canal. The Big Fish Well is then operated twice a week, running between 5 to 8 hours during each event through to early August to maintain a minimum water level in the canal. The canal is used for a fish hatchery. During the time of sustained pump operation, the water table should draw down around the well. Given the constraints imposed by the presence of the Turbine/Reactor Building foundation, groundwater will flow in a north to south direction towards the Big Fish Well, within the capture zone of the well when the pump is operated. However, given the high rate of hydraulic conductivity present in the shallow aquifer, the shallow unconsolidated aquifer will recharge quickly after the pumping has stopped. Pumping of the Big Fish Well draws water from the upper unconsolidated aquifer. Pumping at this location may draw surface water from the Mississippi River east towards the southern portion of the Station.

The northern edge of the Meredosia Channel runs along the southern portion of the Station as shown on Figure 2.6. This channel eroded the top of the dolomite bedrock in this portion of the Station and further influences overburden groundwater flow at the Station to a further southern flow. CRA believes that the location of the channel directs overburden groundwater flow in a southwest direction.

In July 2006, general groundwater flow in the upper unconsolidated aquifer is to the west toward the Mississippi River. However, the groundwater flow diverges to a southerly and northerly component and flows towards both buried valleys of the



Meredosia Channel. The southern component of flow is also influenced, to some degree, by the pumping of the Big Fish Well.

#### Sources and Migration of Tritium

Tritium was detected above the LLD of 200 pCi/L in three areas at the Station:

- north and northwest of the Turbine Building;
- south/southwest of the Reactor, Service, and SBO Buildings; and
- surface water.

This distribution of tritium (both within the shallow water table zone and within the deeper portions of the upper unconsolidated aquifer) is likely related to the following water release history:

- historical releases of tritium to the subsurface that have been documented by the Station that are associated with AFE-Quad Cities-2; and
- potential recharge of the upper unconsolidated aquifer from the Spray Canal.

All tritium detections appear to be related to historical releases at AFE-Quad Cities-2. The groundwater data suggest that a release of tritium has occurred in AFE-Quad Cities-2 to the north and upgradient of MW-QC-102S and MW-QC-102I, possibly in the vicinity of MW-QC-109S and MW-QC-109I. The effect of the periodic operation of the Big Fish Well pump is to pull the release in the direction of the Big Fish Well. This is explained by tritium detections in groundwater samples from MW-QC-102S, MW-QC-102I, MW-QC-102D, MW-QC-108S, MW-QC-108I, MW-QC-111I, and the Big Fish Well. CRA notes that the historical releases associated with AFE-Quad Cities-2 occurred as long ago as 21 years. The effects of groundwater flow (advection), diffusion, and dilution have resulted in the current distribution of tritium to the south and west of AFE-Quad Cities-2. There is no indication from the HIR investigation that tritium-impacted groundwater is migrating off the Station property.

In addition, the tritium detected in the Spray Canal is also likely attributable to historic releases in the AFE-Quad Cities-2. The Spray Canal is filled from water pumped from the Big Fish Well. Tritium was detected at a concentration of  $740 \pm 152$  pCi/L in the groundwater sample collected from the Big Fish Well. The source of tritium detected in the Spray Canal, therefore, is likely the same as the source of tritium in the Big Fish Well, which is historic releases from AFE-Quad Cities-2.

The Spray Canal potentially recharges overburden groundwater downgradient of the Spray Canal. Water from the Spray Canal enters the upper unconsolidated aquifer in the northern portion of the Site and water drawn from the Little Fish Well is partially recharged from the Spray Canal in this area of the Site. Therefore, the source of tritium detected in the Little Fish Well and MW-2 is also the historic releases associated with AFE-Quad Cities-2.

Based on the results of the hydrogeologic investigation that is the subject of this HIR, tritium-impacted groundwater is not migrating off the Station property.

Naturally occurring isotopes not produced by the Station were identified and excluded from this report.

## 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 99 percent confidence range ( $\pm 3$  sigma) for determining whether to report the sample activity concentration as detected or not. This 3-sigma confidence interval typically equates to 150 ( $\pm 135.75$ ) pCi/L.

Exelon has specified an 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 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 percent abundance) and  ${}^7\text{Li}$  (7.5 percent 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. Concentrations of tritium in precipitation, increased during the 1950 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 radionuclide analyses. 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 worldwide 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 until 1975 followed by a gradual decline since that time. Tritium concentrations in Midwest precipitation have typically been less than 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, MN) 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 damped 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, most 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 less than 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 less than 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 USEPA 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.

Routine surface water measurements for tritium sampling locations upstream of the Quad Cities Generating Station show that concentrations in the Mississippi River are consistently less than 200 pCi/L (Exelon, 2005).

Pre-operational REMP quarterly and semi-annual surface water composite samples collected from downstream and on-Station locations were analyzed for tritium. Tritium was not detected (LLD 1,000 pCi/L) in surface water samples collected from the Davenport Water Works, the Moline Water Works, and the Inlet Canal for 1969, 1970, and 1971 (1st quarter).

1971 2nd quarter tritium results were as follows:

- East Moline Water Treatment Plant -  $540 \pm 370$  pCi/L;
- Davenport Water Treatment Plant -  $540 \pm 370$  pCi/L; and
- Intake and Discharge Canal -  $180 \pm 370$  pCi/L.

1971 3rd quarter tritium results were as follows:

- East Moline Water Treatment Plant -  $700 \pm 230$  pCi/L;
- Davenport Water Treatment Plant -  $730 \pm 230$  pCi/L; and
- Intake and Discharge Canal -  $590 \pm 210$  pCi/L.

1971 4th quarter tritium results were as follows:

- East Moline Water Treatment Plant -  $770 \pm 200$  pCi/L;
- Davenport Water Treatment Plant -  $850 \pm 200$  pCi/L;
- Intake Canal -  $610 \pm 200$  pCi/L; and
- Discharge Canal -  $420 \pm 200$  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 has 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 and less than the tritium concentrations found in precipitation and surface water.

### 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 the 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 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 near crystalline basement rock, however, can potentially show elevated concentrations of tritium due to lithogenic sources.

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

Two potential exposure pathways were considered during the evaluation of tritium in groundwater:

- potential groundwater migration on and off the Station property to private and public groundwater users; and
- potential groundwater migration off the Station property to a surface water body.

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

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

Tritiated groundwater would migrate to the south-southwest and the north-northwest with groundwater flow away from the Station towards the Mississippi River.

The Station receives its potable water from the three potable wells on the property (Well #1, Well #5, and Fish House Well #10). The three potable wells are cased off through the upper unconsolidated (sand) aquifer and are screened in the Dolomite bedrock aquifer beneath the upper unconsolidated aquifer. Well #1 and Well #5 are upgradient of the source area. Although tritium was detected in the Little Fish Well, which is near the Fish House Well but screened in the upper unconsolidated aquifer, tritium was not detected in the deeper Fish House Well; this proves that the Fish House Well is isolated from the upper unconsolidated aquifer. The potable wells were sampled as part of the investigation and did not contain tritium or other radionuclides above background levels.

Although there is a potentially complete exposure pathway to these supply wells, there is no current risk of exposure associated with groundwater ingestion at the Station.

Residences are present both north and south of the Station. Tritium was not detected in monitoring wells installed adjacent to residential properties (MW-QC-115S and MW-QC-116S).

Although there is a potentially complete exposure pathway to the residential wells, there is no current risk of exposure associated with groundwater ingestion off the Station property.

### **7.3.2 GROUNDWATER MIGRATION TO SURFACE WATER USERS OFF THE STATION PROPERTY**

Under this potential exposure route groundwater would migrate from the Station property to the Mississippi River. Potential exposures could occur if the groundwater discharge to the surface water body was sufficient to increase tritium levels in the Mississippi River to detectable levels above background. Based on the results of the HIR, tritium has not migrated off the Station property at detectable concentrations. Tritium was not detected in the groundwater samples collected adjacent to the Mississippi River (STP Sand Point Well, MW-QC-112I, MW-QC-113I, and MW-QC-114I), which is somewhat indicative of river water quality.



This exposure pathway is incomplete as tritium was not detected above the LLD of 200 pCi/L in groundwater samples collected from monitoring wells installed adjacent to the Mississippi River. Therefore, there is no current risk of exposure to surface water users off the Station property.

#### 7.4 SUMMARY OF POTENTIAL TRITIUM EXPOSURE PATHWAYS

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 a surface water body.

In summary, 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 standards (20,000 pCi/L).

#### 7.5 OTHER RADIONUCLIDES

Target radionuclides were not detected in the groundwater and surface water samples at concentrations greater than their respective LLDs. 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 this Station, CRA concludes:

### Groundwater Flow

- Groundwater flow beneath the Station fluctuates seasonally. Groundwater was observed to flow to the south-southwest in May 2006 and toward the west in July 2006. Station groundwater discharges to the Mississippi River. Groundwater flows beneath the Station at a rate of approximately 6 to 54 feet per year.
- Groundwater flow at the Station is affected by the presence of a natural paleochannel, the Meredosia Channel. The northern extent of this paleochannel runs along the southern portion of the Station. The bedrock surface in this portion of the Station drops more than 100 feet.
- Groundwater flow within the PA is affected by the construction (basements/foundations) of the Reactor/Turbine Building structure, which was constructed into the Niagaran Dolomite. This building is a barrier to local lateral flow in the upper unconsolidated aquifer.
- The deeper bedrock water supply aquifers are not separated from the upper unconsolidated aquifer.
- Water from the Spray Canal enters the upper unconsolidated aquifer in the northern portion of the Station, and water drawn from the Little Fish Well is partially recharged from the Spray Canal in this area of the Station.

### Groundwater Quality

- Gamma-emitting radionuclides associated with licensed plant operations were not detected at concentrations greater than their respective LLDs in the samples 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 of the groundwater samples collected as part of this investigation.
- Tritium was detected at concentrations greater than the LLD of 200 pCi/L in 11 of the 32 groundwater samples collected as part of this investigation.
- Tritium concentrations were identified in groundwater in two areas at the Station: wells downgradient of AFE-Quad Cities-2 (including the Big Fish Well) and wells downgradient of the Spray Canal (MW-2 and Little Fish Well).

- All tritium concentrations appear to be related to historical releases at AFE-Quad Cities-2. Tritium is present in wells south and southwest of AFE-Quad Cities-2, including the Big Fish Well.
- Tritium was not detected in monitoring wells installed adjacent to the Mississippi River at concentrations greater than the LLD of 200 pCi/L (STP Sand Point Well, MW-QC-103I, MW-QC-105I, MW-QC-106S, MW-QC-106I, MW-QC-112I, MW-QC-113I, and MW-QC-114I).
- Tritium was not detected in the monitoring wells installed adjacent to residential properties at concentrations greater than the LLD of 200 pCi/L (MW-QC-115S and MW-QC-116S).

#### Surface Water Quality

- Gamma-emitting radionuclides associated with licensed plant operations were not detected at concentrations greater than their respective LLDs in the two surface water samples collected as part of this investigation.
- Strontium-89/90 was not detected at a concentration greater than the LLD of 2.0 pCi/L in the two surface water samples collected as part of this investigation.
- Tritium was detected at concentrations greater than the LLD of 200 pCi/L in two surface water locations, SW-QC-1 and SW-QC-2, at concentrations of  $550 \pm 143$  pCi/L and  $497 \pm 140$  pCi/L, respectively.
- The likely source of tritium in the Spray Canal is historic releases associated with AFE-Quad Cities-2.

#### AFE-Quad Cities-1 - Piping West of Radwaste Building/Floor Drain Surge Tank

- Strontium-89/90 was not detected in the groundwater monitoring well at a concentration greater than the LLD of 2.0 pCi/L in the vicinity of AFE-Quad Cities-1.
- Gamma-emitting radionuclides associated with licensed plant operations were not detected at concentrations greater than their respective LLDs in the groundwater monitoring well in the vicinity of AFE-Quad Cities-1.
- Tritium was not detected at a concentration greater than the LLD (200 pCi/L) in the groundwater sample collected from new monitoring well MW-QC-103I located to the southwest of this AFE area.
- There is no impact to groundwater from AFE-Quad Cities-1.

AFE-Quad Cities-2 - Historic Releases Area Near Station Blackout Building (SBO)

- Strontium-89/90 was not detected at a concentration greater than the LLD of 2.0 pCi/L in the groundwater monitoring wells in the vicinity of AFE-Quad Cities-2.
- Gamma-emitting radionuclides associated with licensed plant operations were not detected in the groundwater monitoring wells at concentrations greater than their respective LLDs in the vicinity of AFE-Quad Cities-2.
- Tritium was detected in groundwater samples from monitoring wells MW-QC-102S (9,410 ± 655 pCi/L sample and 9,640 ± 660 pCi/L sample duplicate), MW-QC-102I (32,600 ± 977 pCi/L sample and 31,800 ± 972 pCi/L sample duplicate), MW-QC-102D (3,930J ± 450 pCi/L), MW-QC-108S (1,460 ± 217 pCi/L), MW-QC-108I (1,890J ± 252 pCi/L), MW-QC-109I (768J ± 156 pCi/L), and MW-QC-111I (420J ± 133 pCi/L); and from water supply well Big Fish Well (740 ± 152 pCi/L).
- Water from the Big Fish Well fills the Spray Canal. Tritium was detected in Spray Canal surface water samples from sampling points SW-QC-1 (550 ± 143 pCi/L) and SW-QC-2 (497 ± 140 pCi/L).
- The Spray Canal potentially recharges overburden groundwater downgradient of the Spray Canal. Tritium was detected in water supply well Little Fish Well (371 ± 134 pCi/L) and monitoring well MW-2 (250 ± 126 pCi/L).
- Additional delineation of tritium in groundwater is not necessary.
- There have been three historical releases that have influenced the AFE.

AFE-Quad Cities-3 - CCSTs and Ancillary Piping

- Strontium-89/90 was not detected in the groundwater monitoring well at a concentration greater than the LLD of 2.0 pCi/L in the vicinity of AFE-Quad Cities-3.
- Gamma-emitting radionuclides associated with licensed plant operation were not detected at concentrations greater than their respective LLDs in the groundwater monitoring well in the vicinity of AFE-Quad Cities-3.
- Tritium was detected in the groundwater sample collected from new monitoring well MW-QC-104S (262 ± 130 pCi/L). This value is slightly greater than the LLD of 200 pCi/L.

AFE-Quad Cities-4 - No. 1 Oil/Water Separator

- Strontium-89/90 was not detected in the groundwater monitoring well at a concentration greater than the LLD of 2.0 pCi/L in the vicinity of AFE-Quad Cities-4.

- Gamma-emitting radionuclides associated with licensed plant operations were not detected at concentrations greater than their respective LLDs in the groundwater monitoring well in the vicinity of AFE-Quad Cities-4.
- Tritium was not detected at a concentration greater than the LLD (200 pCi/L) in the groundwater sample collected from new monitoring well MW-QC-105I located immediately to the northeast of this AFE area.
- There have been no impacts to groundwater from AFE-Quad Cities-4.

#### AFE-Quad Cities-5 - No. 2 Oil/Water Separator

- Strontium-89/90 was not detected in the groundwater monitoring wells at a concentration greater than the LLD of 2.0 pCi/L in the vicinity of AFE-Quad Cities-5.
- Gamma-emitting radionuclides associated with licensed plant operation were not detected in the groundwater monitoring wells at concentrations greater than their respective LLDs in the vicinity of AFE-Quad Cities-5.
- Tritium was not detected at a concentration greater than the LLD (200 pCi/L) in the groundwater sample collected from monitoring wells MW-QC-106S and MW-QC-106I located immediately southwest of this AFE area.
- There is no impact to groundwater from AFE-Quad Cities-5.

#### Potential Receptors

- Based on the results of this investigation, there is no current risk of exposure to radionuclides associated with licensed plant operations through any of the potential exposure pathways.

#### General Conclusions

- Based upon the results of this investigation, there are no known active releases into the groundwater at the Station.
- Based on the results of this investigation, tritium has not migrated off the Station property at detectable concentrations.

## 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

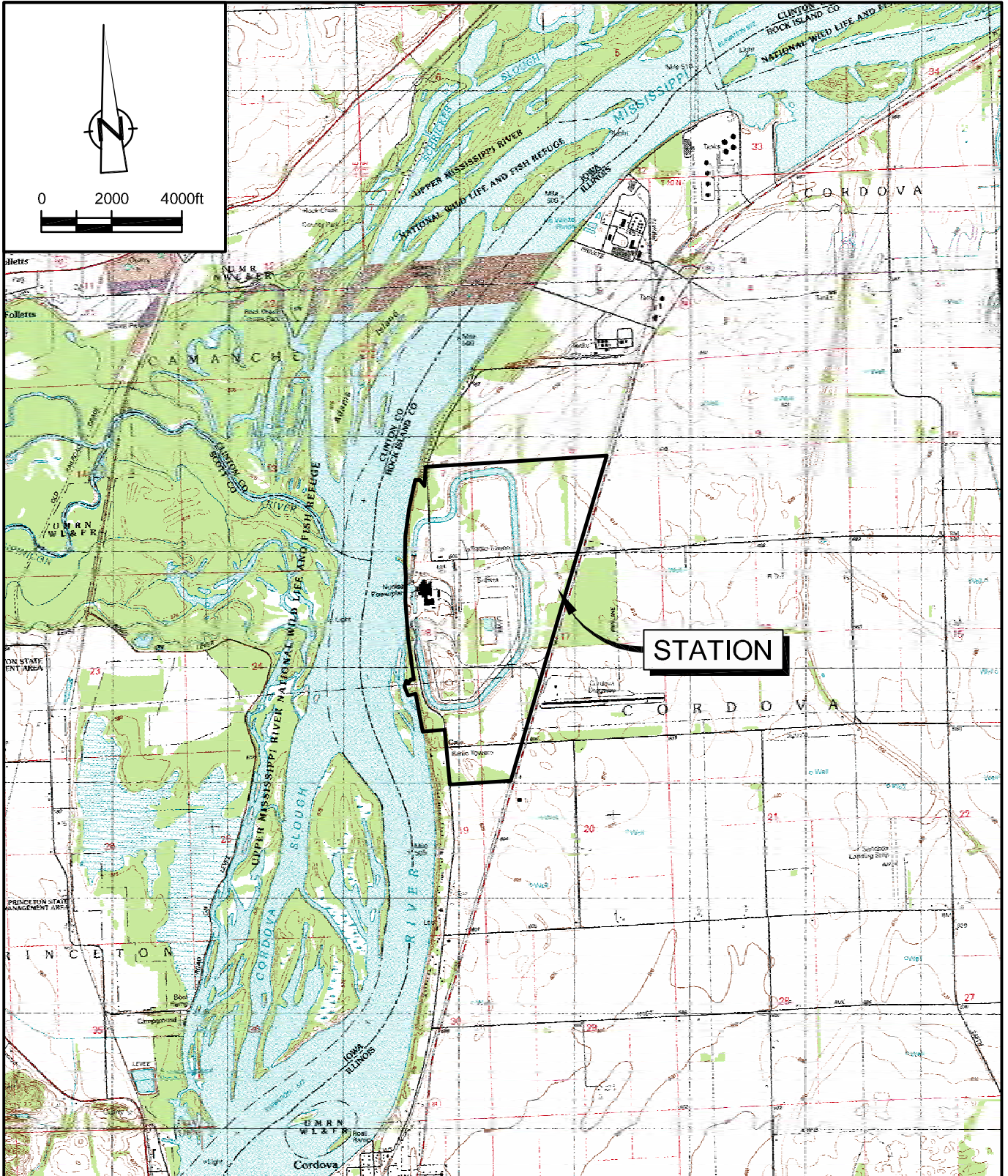
Based upon the information collected to date, CRA recommends that Exelon conduct periodic monitoring of selected sample locations.

## 10.0 REFERENCES

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SOURCE: USGS QUADRANGLE MAP;  
 QUAD CITIES MOSAIC, ILLINOIS  
 1986 (EDITED: 1991)

figure 1.1

**STATION LOCATION MAP**  
**QUAD CITIES GENERATING STATION**  
**EXELON GENERATION COMPANY, LLC**  
*Cordova, Illinois*



# FIGURE 1.2 STATION BOUNDARIES AND FEATURES

(Withheld)

# FIGURE 2.1 STATION BASE MAP

(Withheld)



SYSTEM	SERIES	GROUP OR FORMATION	GRAPHIC LOG	THICKNESS (FT)	DESCRIPTION	DRILLING & CASING CONDITIONS	WATER-YIELDING PROPERTIES
QUATERNARY	PLEISTOCENE			0-230	Unconsolidated glacial deposits, loess and alluvium	Wells usually need careful development and screens	Variable; large yields from thicker sand & gravel deposits in bedrock valleys
PENNSYLVANIAN				0-400	Mainly shale with sandstone, limestone, and coal	Casing usually required	Generally unfavorable as aquifer; domestic and farm supplies obtained from thin limestone and sandstone beds locally
MISSISSIPPIAN	VALMEYERAN	Salem-Warsaw Fm		0-30	Sh, ss, and ls	Casing usually required	Not water yielding at most places
		Keokuk Ls		0-170	Limestone		Generally creviced, water yielding; wells penetrate ls from 30 to more than 150 ft; dependable aquifer for farm supplies in much of area
		Burlington Ls					
DEVONIAN	KINDERHOOKIAN	Chouteau		0-275	Shale	Casing required	Not water yielding at most places; limestones within shale are source of small farm supplies locally
		New Albany Group					
SILURIAN	NIAGARAN	Hunton Megagroup		20-140	Limestone		Devonian limestone locally water yielding from crevices; Silurian dolomite more dependable aquifer for farm supplies in most areas; satisfactory wells may require penetration from 25-150 ft into Silurian; dolomite usually "tighter" in lower half
				0-375	Dolomite, cherty at base		
ORDOVICIAN	CHAMPLAINIAN	Maquoketa Group		200-215	Green to blue and brown shale with limestone and dolomite	Shale requires casing	Generally not water yielding
		Ottawa Mg		300-320	Dolomite with shaly zone near middle; limestone in lower part	Crevicing not common	Not important as aquifer; crevices yield some water
		Galena and Platteville Groups					
		Ancell Gr (Glenwood St. Peter Ss)		70-250	Sandstone; green shale; cherty shale at base	Shale may require casing; sand may cave	Dependable source of ground water

(1)

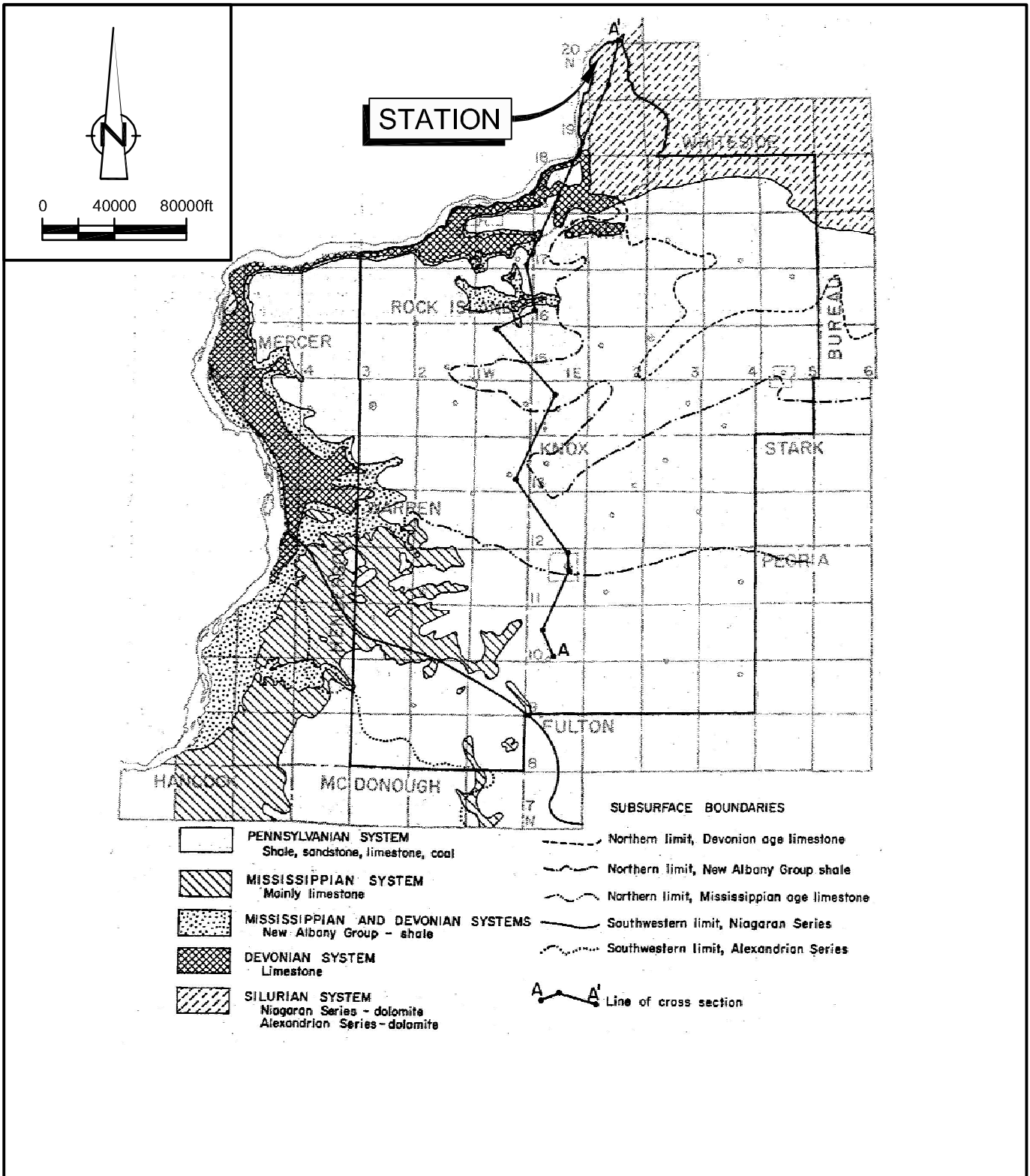
SOURCE: J.E. BRUECKMANN AND R.E. BERGSTROM, GROUND-WATER GEOLOGY OF THE ROCK ISLAND, MONMOUTH, GALESBURG, AND KEWANEE AREA, ILLINOIS, 1968

SYSTEM	SERIES	GROUP OR FORMATION	GRAPHIC LOG	THICKNESS (FT)	DESCRIPTION	DRILLING & CASING CONDITIONS	WATER-YIELDING PROPERTIES		
ORDOVICIAN	CANADIAN	Prairie du Chien Group	Shakopee		80-275	Dolomite with some shale and sandstone	Casing not required; crevices encountered locally	Some water from sandstones and creviced dolomite; not developed for large supplies	
			New Richmond Ss		40-90	Sandstone with some dolomite			
			Oneota Dol		200-300	Dolomite, cherty			
CAMBRIAN	CROIXAN	Eminence Fm		50-120	Dolomitic sandstone and sandy dolomite		May cave	Widespread and important aquifer for large supplies	
		Potosi Dol		150-200	Dolomite with drusy quartz				
		Franconia Fm		120-200	Green sandstone, shale, and dolomite				
		Ironton-Galesville Ss		100-200	Sandstone, partly dolomitic				
		Eau Claire Fm		225-300	Sandstone and shale with some dolomite	Weak shales may require casing			Some water from sandstone
		Mt. Simon Ss		800-1300	Sandstone, beds of shale and siltstone	Casing not required			Water yielding
PRECAMBRIAN					Igneous rock		Not water yielding		

(2)

figure 2.2

REGIONAL STRATIGRAPHIC COLUMN  
 QUAD CITIES GENERATING STATION  
 EXELON GENERATION COMPANY, LLC  
 Cordova, Illinois



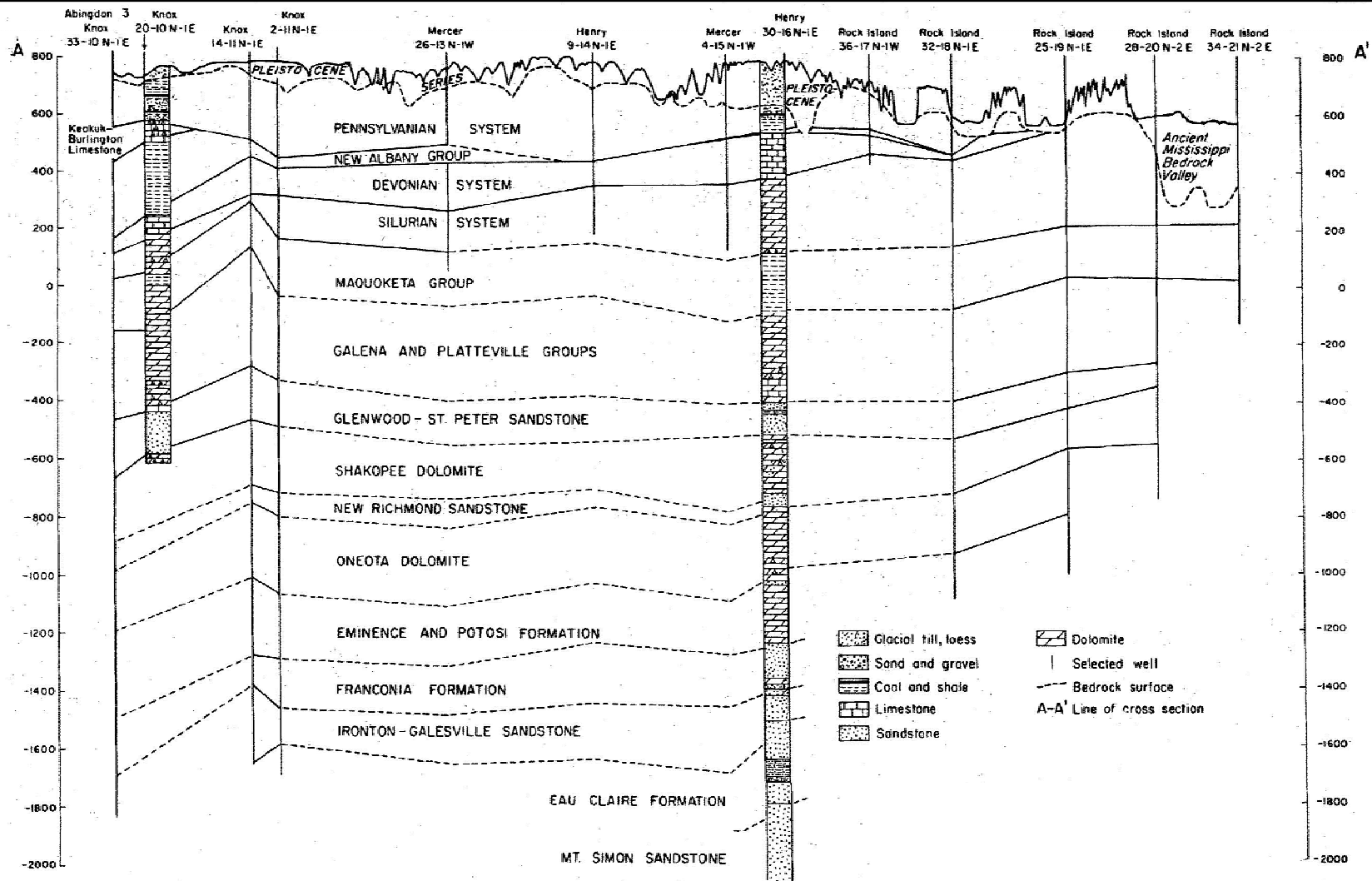
SOURCE: ILLINOIS STATE GEOLOGICAL SURVEY CIRCULAR 488;  
FIG. 4 - BEDROCK GEOLOGIC MAP WITH SELECTED  
SUBSURFACE GEOLOGIC BOUNDARIES.

figure 2.3

BEDROCK GEOLOGIC MAP WITH  
CROSS-SECTION LOCATION  
QUAD CITIES GENERATING STATION  
EXELON GENERATION COMPANY, LLC  
Cordova, Illinois

Exelon



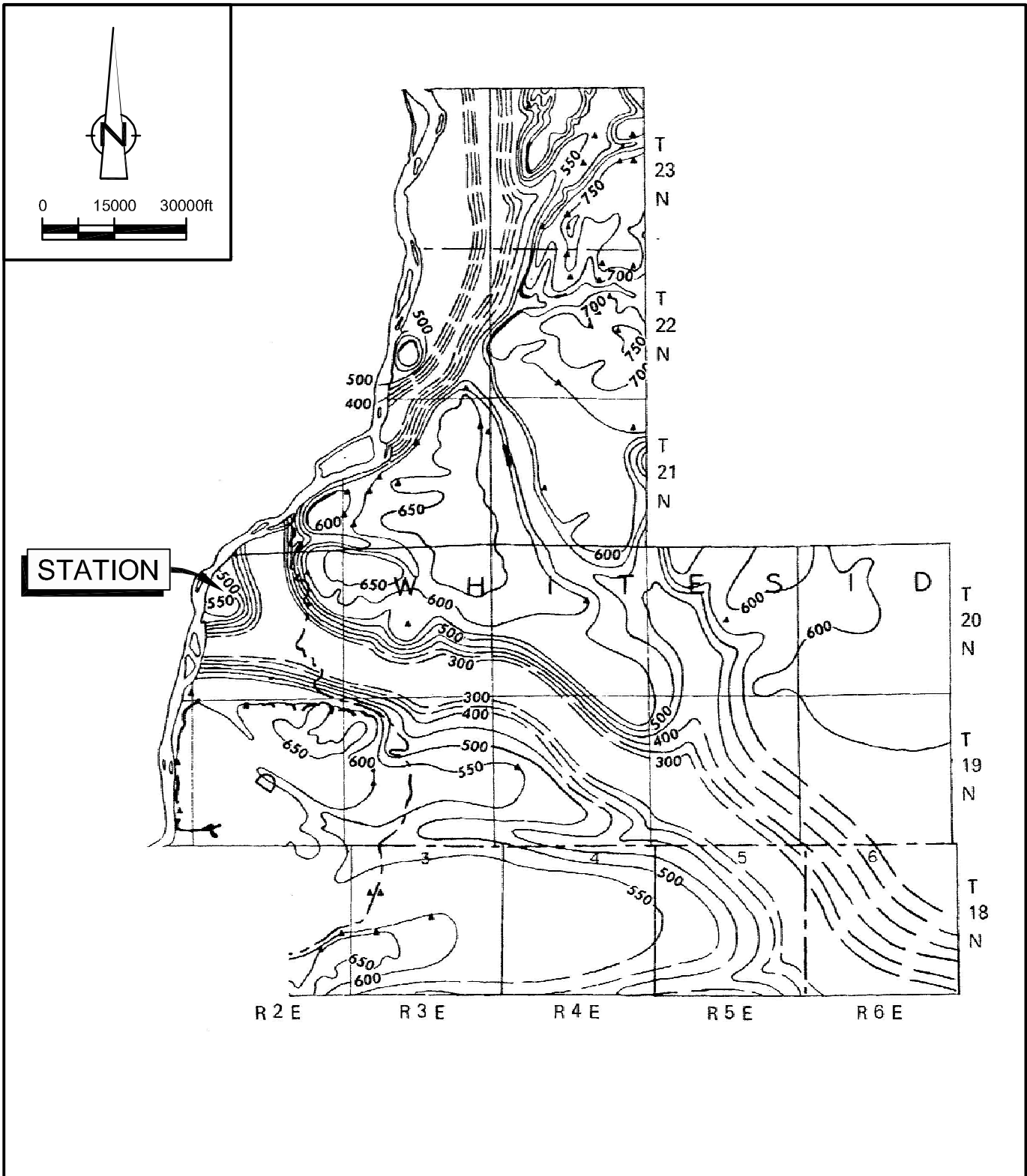


SOURCE: ILLINOIS STATE GEOLOGICAL SURVEY CIRCULAR 488; FIG. 5 - CROSS SECTION OF FORMATIONS, BEDROCK SURFACE, AND LAND SURFACE FROM ABINGDON, KNOX COUNTY, TO NORTHERN ROCK ISLAND COUNTY.

figure 2.4

CROSS-SECTION OF FORMATIONS, BEDROCK SURFACE, AND LAND SURFACES FROM ABINGDON, KNOX COUNTY, TO NORTHERN ROCK ISLAND COUNTY  
 QUAD CITIES GENERATING STATION  
 EXELON GENERATION COMPANY, LLC  
 Cordova, Illinois





SOURCE: ILLINOIS STATE GEOLOGICAL SURVEY CIRCULAR 488;  
 FIG. 7 - BEDROCK TOPOGRAPHY OF THE MEREDOSIAS  
 CHANNEL AREA, FROM HORBERG (1950 [1957]).

figure 2.5

BEDROCK TOPOGRAPHY OF THE  
 MEREDOSIAS CHANNEL AREA  
 QUAD CITIES GENERATING STATION  
 EXELON GENERATION COMPANY, LLC  
 Cordova, Illinois





# FIGURE 2.6 WATER WELL LOCATIONS

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# FIGURE 3.1 AREAS FOR FURTHER EVALUATION

(Withheld)

# FIGURE 3.2 HISTORICAL RELEASE LOCATIONS FOR AFE QUAD CITIES 2

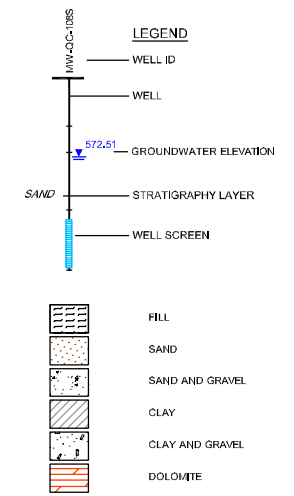
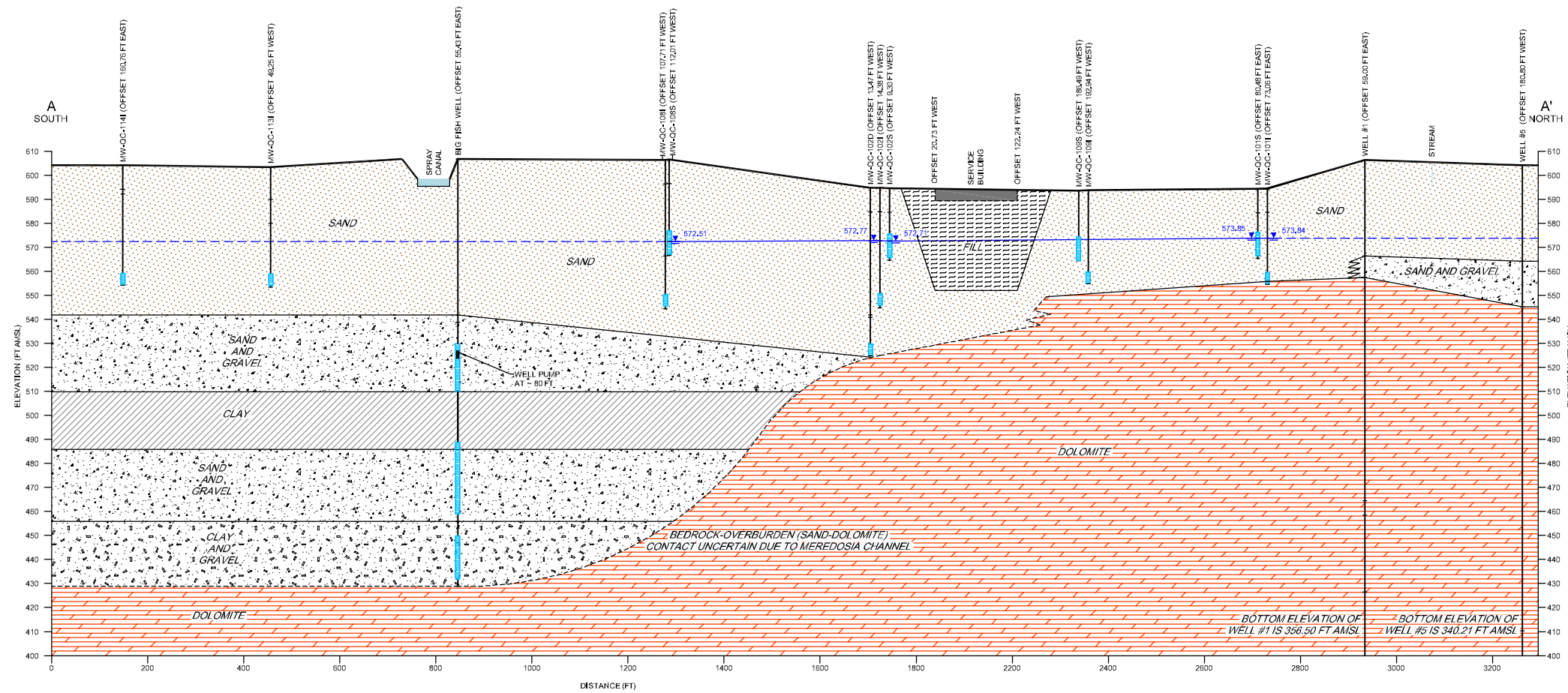
(Withheld)

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

(Withheld)

# FIGURE 5.1 GEOLOGIC CROSS-SECTION LOCATIONS

(Withheld)



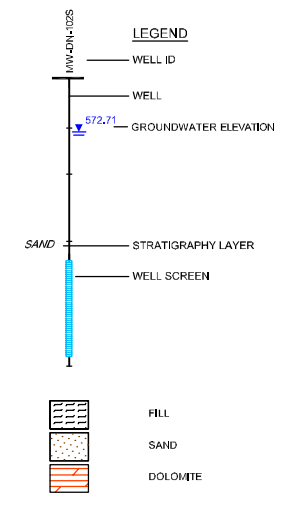
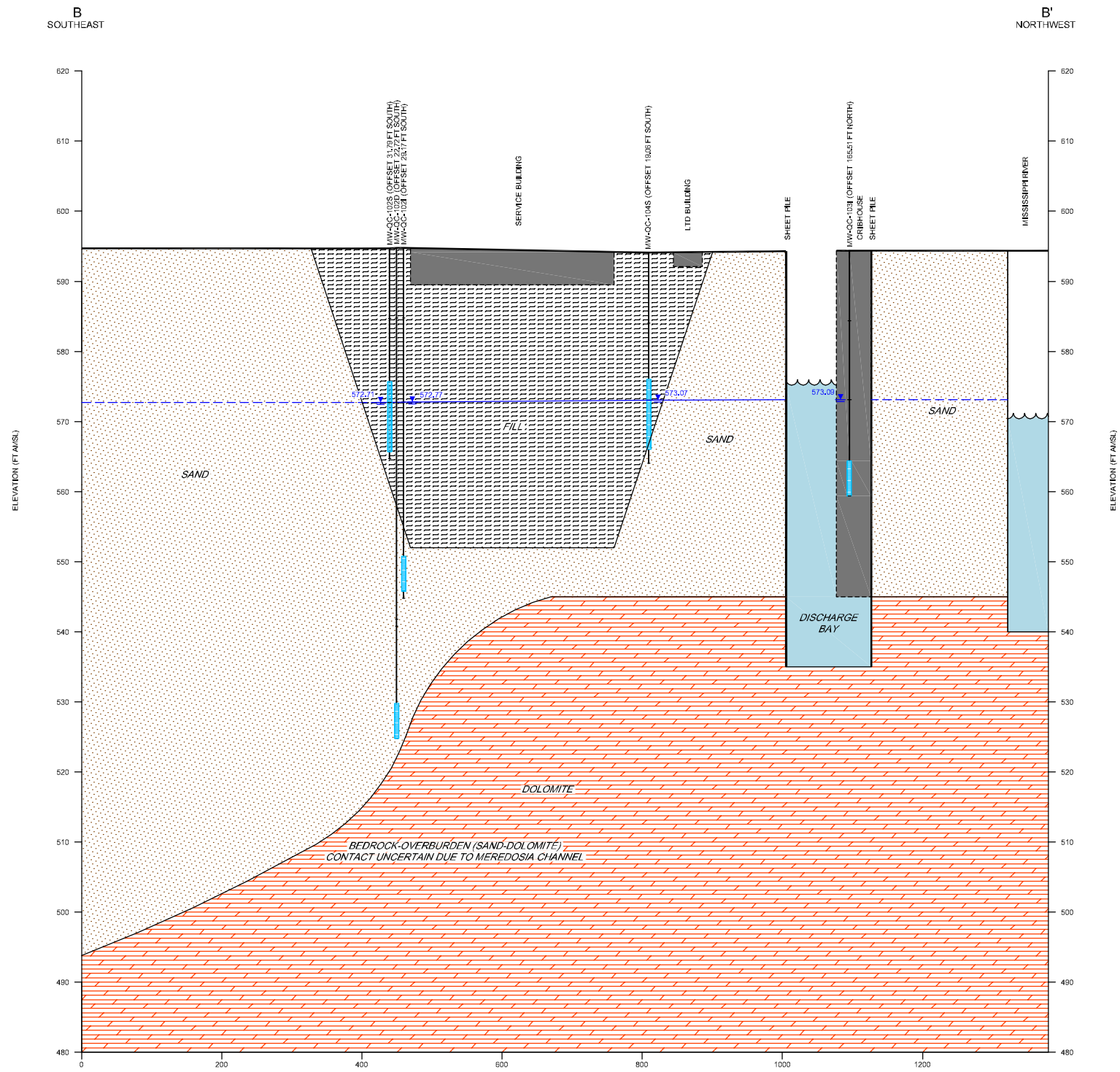
SCALE VERIFICATION  
THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.

EXELON GENERATION COMPANY, LLC.  
FLEETWIDE ASSESSMENT  
GEOLOGIC CROSS-SECTION A-A'  
QUAD CITIES GENERATING STATION  
CORDOVA, ILLINOIS



Source References

Project Manager: S. QUIGLEY	Reviewed By: M. KELLY	Date: AUGUST 2006
Scale: AS SHOWN	Project N°: 45136-28	Report N°: 020 Drawing N°: figure 5.2



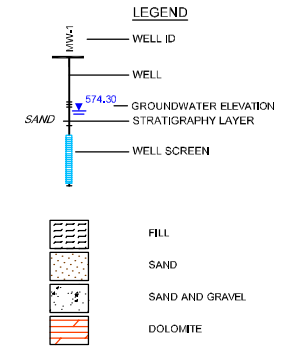
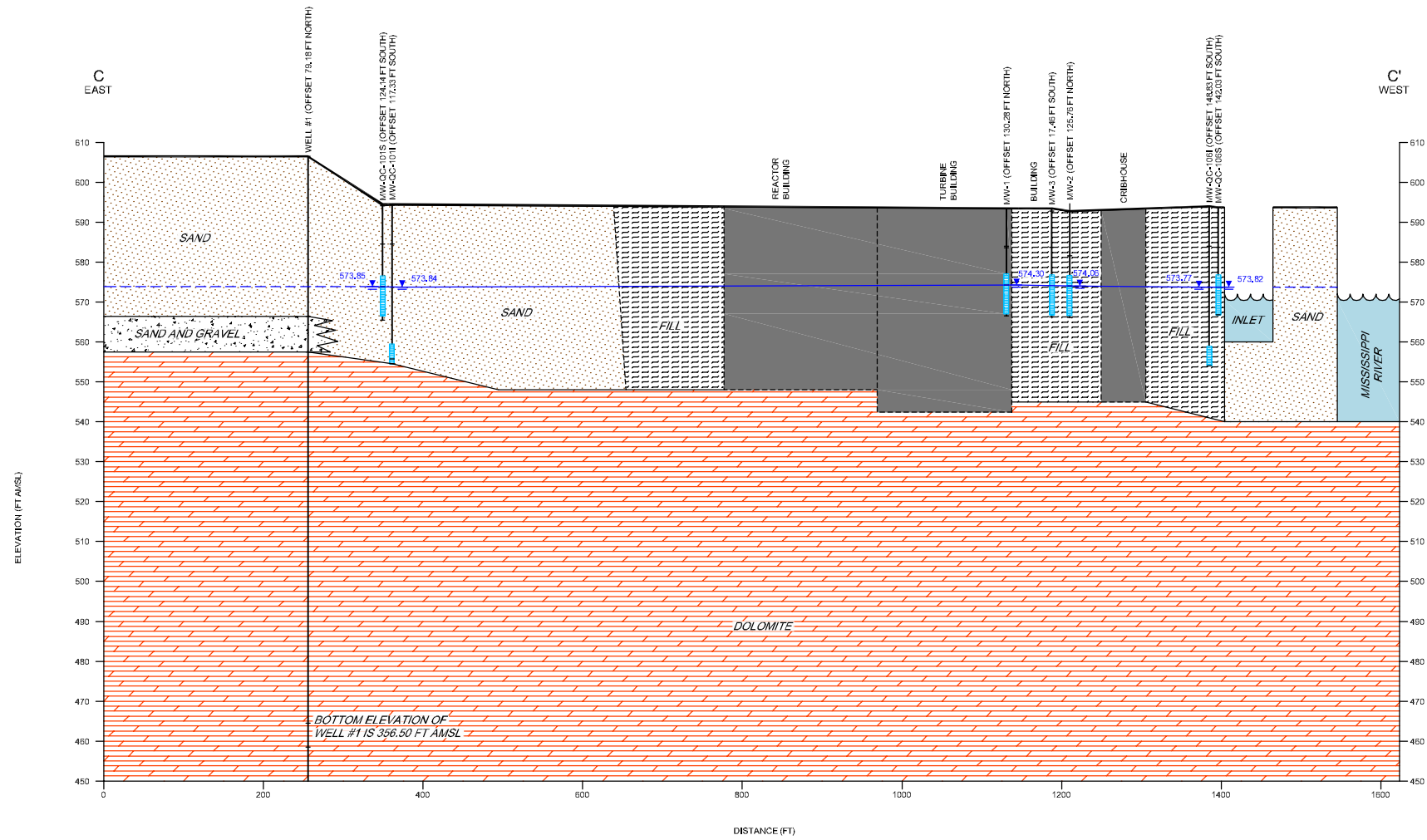
SCALE VERIFICATION  
THIS BAR MEASURES 1" ON ORIGINAL. ADJUST SCALE ACCORDINGLY.

EXELON GENERATION COMPANY, LLC.  
FLEETWIDE ASSESSMENT  
GEOLOGIC CROSS-SECTION B-B'  
QUAD CITIES GENERATING STATION  
CORDOVA, ILLINOIS



Source References

Project Manager: S. QUIGLEY	Reviewed By: M. KELLY	Date: AUGUST 2006
Scale: AS SHOWN	Project N°: 45136-28	Report N°: 020 Drawing N°: figure 5.3



**SCALE VERIFICATION**

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

**EXELON GENERATION COMPANY, LLC.**

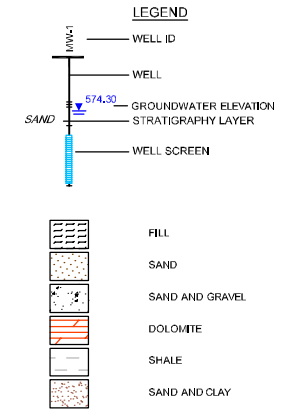
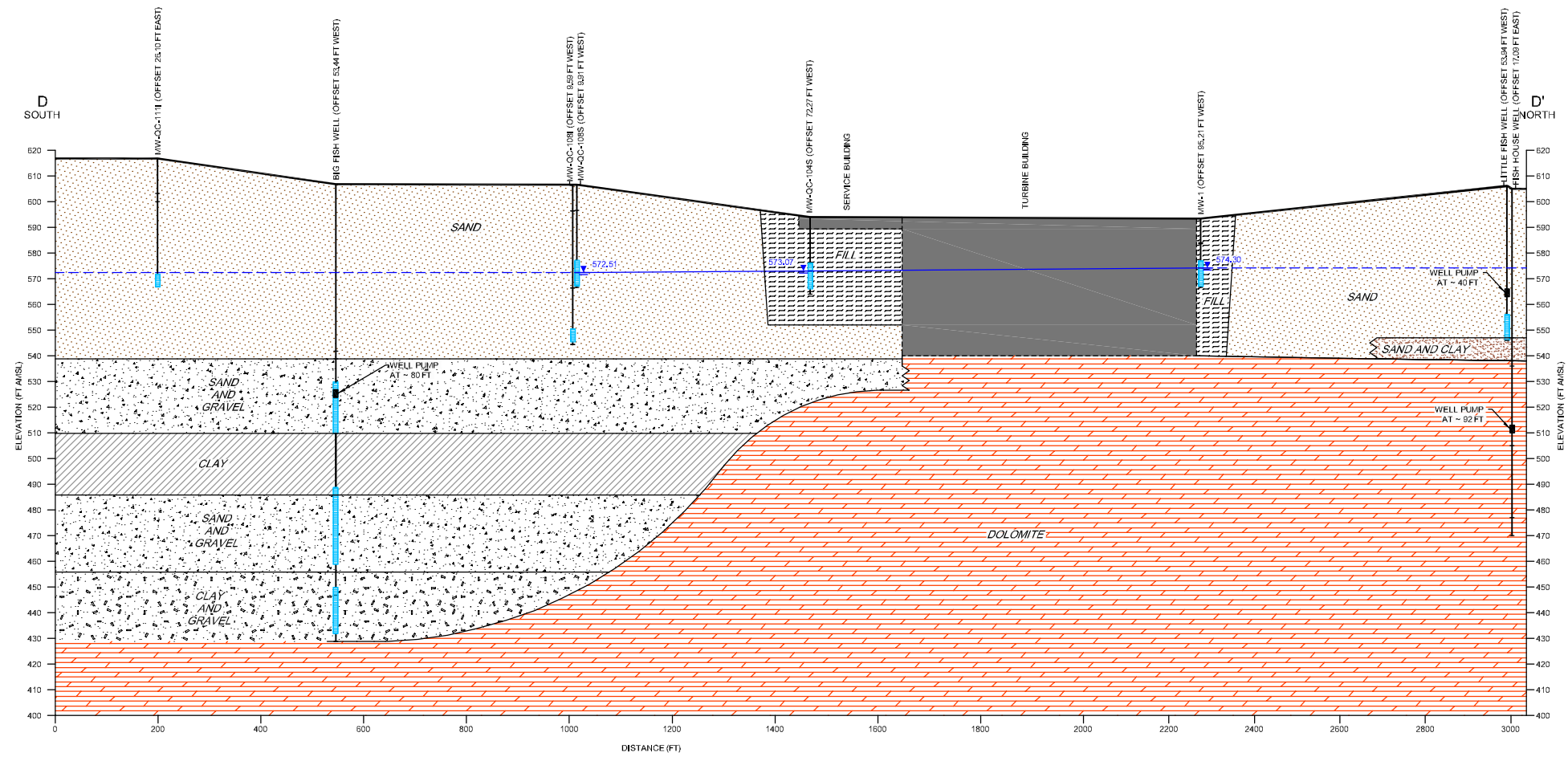
FLEETWIDE ASSESSMENT

GEOLOGIC CROSS-SECTION C-C'  
QUAD CITIES GENERATING STATION  
CORDOVA, ILLINOIS



Source References

Project Manager: S. QUIGLEY	Reviewed By: M. KELLY	Date: AUGUST 2006
Scale: AS SHOWN	Project N°: 45136-28	Report N°: 020 Drawing N°: figure 5.4



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

**EXELON GENERATION COMPANY, LLC.**  
**FLEETWIDE ASSESSMENT**  
**GEOLOGIC CROSS-SECTION D-D'**  
**QUAD CITIES GENERATING STATION**  
**CORDOVA, ILLINOIS**

Source References			
Project Manager: S. QUIGLEY	Reviewed By: M. KELLY	Date: AUGUST 2006	
Scale: AS SHOWN	Project N°: 45136-28	Report N°: 020	Drawing N°: figure 5.5



**FIGURE 5.6 POTENTIOMETRIC  
SURFACE CONTOURS – MAY 2006**

(Withheld)

**FIGURE 5.7 POTENTIOMETRIC  
SURFACE CONTOURS – JULY 2006**

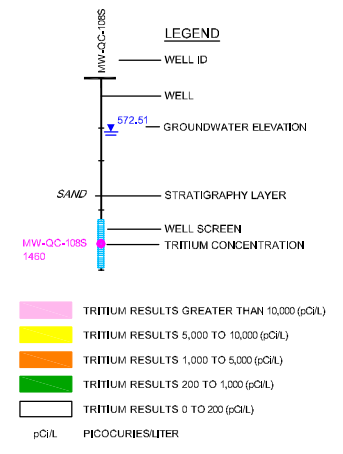
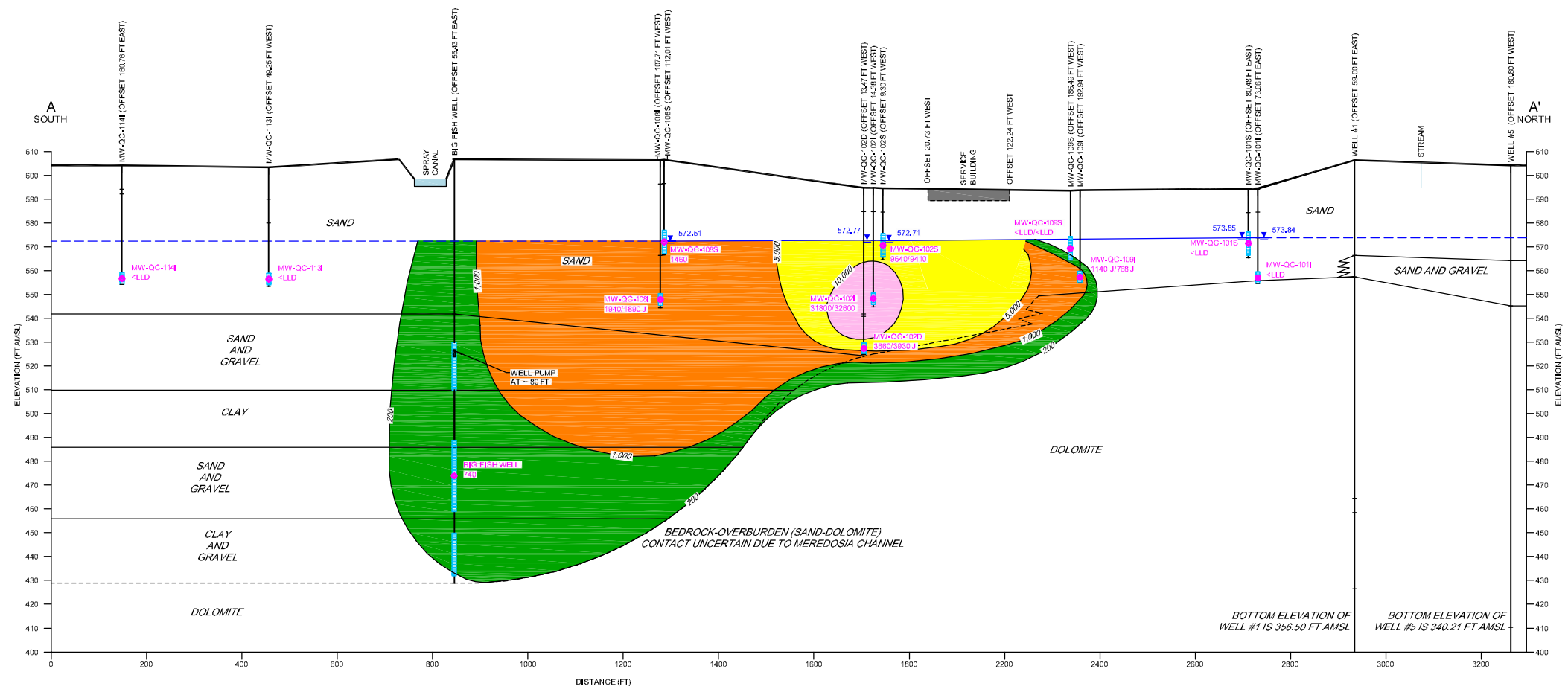
(Withheld)

FIGURE 5.8 TRITIUM  
CONCENTRATIONS -  
GROUNDWATER AND SURFACE  
WATER

(Withheld)

FIGURE 5.9 RADIONUCLIDE  
CONCENTRATIONS -  
GROUNDWATER AND SURFACE  
WATER

(Withheld)



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

EXELON GENERATION COMPANY, LLC.  
 FLEETWIDE ASSESSMENT  
 TRITIUM PLUME CROSS-SECTION  
 QUAD CITIES GENERATING STATION  
 CORDOVA, ILLINOIS



Source References

Project Manager: S. QUIGLEY	Reviewed By: M. KELLY	Date: AUGUST 2006
Scale: AS SHOWN	Project N°: 45136-28	Report N°: 020 Drawing N°: figure 6.1

FIGURE 6.2 TRITIUM PLUME MAP  
PLAN VIEW

(Withheld)

TABLE 4.1

**SUMMARY OF MONITORING WELL INSTALLATION DETAILS  
FLEETWIDE ASSESSMENT  
QUAD CITIES GENERATING STATION  
CORDOVA, ILLINOIS**

Sample Location	X-coord. (UTM Coordinates) <sup>(1)</sup>	Y-coord. (UTM Coordinates) <sup>(1)</sup>	Surface Elevation (ft AMSL) <sup>(2)</sup>	Reference Elevation (ft AMSL)	Installation Date	Boring Total Depth (ft bgs) <sup>(3)</sup>	Screened Interval				Well Construction <sup>(4)</sup>	Hydrogeologic Unit Screened
							Top (ft bgs)	Bottom	Top (ft AMSL)	Bottom		
MW-1	2374174.31	15167246.22	594.10	593.44	1/8/2002	27.5	17	27	577.10	567.10	2-inch PVC Screen	Sand
MW-2	2374095.24	15167236.04	593.70	592.90	1/8/2002	27.5	17	27	576.70	566.70	2-inch PVC Screen	Sand
MW-3	2374127.66	15167094.77	593.80	593.44	1/8/2002	27.5	17	27	576.80	566.80	2-inch PVC Screen	Sand
MW-QC-101S	2374971.49	15167048.04	594.52	597.03	5/3/2006	29	18	28	576.52	566.52	2-inch PVC Screen	Sand
MW-QC-101I	2374966.40	15167054.51	594.58	597.10	5/3/2006	40	35	40	559.58	554.58	2-inch PVC Screen	Sand
MW-QC-102S	2374545.85	15166383.76	594.69	596.83	5/8/2006	30	19	29	575.69	565.69	2-inch PVC Screen	Sand
MW-QC-102I	2374540.07	15166383.51	594.76	597.14	5/5/2006	50	44	49	550.76	545.76	2-inch PVC Screen	Sand
MW-QC-102D	2374538.06	15166377.34	594.80	597.27	6/20/2006	70	65	70	529.80	524.80	2-inch PVC Screen	Sand
MW-QC-103I	2374012.83	15166772.84	594.39	596.44	5/10/2006	35	30	35	564.39	559.39	2-inch PVC Screen	Sand
MW-QC-104S	2374197.08	15166486.39	594.07	596.08	5/11/2006	28	18	28	576.07	566.07	2-inch PVC Screen	Sand
MW-QC-105I	2374091.76	15166468.31	593.11	595.36	5/9/2006	50	45	50	548.11	543.11	2-inch PVC Screen	Sand
MW-QC-106S	2373919.55	15167239.81	593.79	596.24	5/10/2006	27	17	27	576.79	566.79	2-inch PVC Screen	Sand
MW-QC-106I	2373919.31	15167246.61	594.00	596.19	5/10/2006	40	35	40	559.00	554.00	2-inch PVC Screen	Sand
MW-QC-107I	2375644.68	15167623.47	606.62	609.05	5/2/2006	39	29	39	577.62	567.62	2-inch PVC Screen	Sand
MW-QC-108S	2374259.34	15166032.65	606.64	608.64	5/15/2006	40	29.5	39.5	577.14	567.14	2-inch PVC Screen	Sand
MW-QC-108I	2374259.66	15166023.53	606.41	608.54	6/13/2006	62	56.0	61.0	550.41	545.41	2-inch PVC Screen	Sand
MW-QC-109S	2374559.94	15166815.03	593.93	593.72	7/12/2006	29	19.5	29.5	574.43	564.43	2-inch PVC Screen	Sand
MW-QC-109I	2374554.96	15166819.53	593.93	593.82	7/13/2006	39	34.0	39.0	559.93	554.93	2-inch PVC Screen	Sand
MW-QC-110I	2374719.18	15165737.66	605.20	604.85	7/11/2006	50	45.0	50.0	560.20	555.20	2-inch PVC Screen	Sand
MW-QC-111I	2374295.16	15165216.74	616.74	618.97	7/12/2006	50	45.0	50.0	571.74	566.74	2-inch PVC Screen	Sand
MW-QC-112I	2373920.24	15165723.47	601.99	604.90	7/10/2006	50	44.0	49.0	557.99	552.99	2-inch PVC Screen	Sand
MW-QC-113I	2373950.50	15165260.09	603.49	605.23	7/11/2006	50	44.5	49.5	558.99	553.99	2-inch PVC Screen	Sand
MW-QC-114I	2374003.52	15164891.14	604.22	607.30	7/10/2006	50	45.0	50.0	559.22	554.22	2-inch PVC Screen	Sand
MW-QC-115S	2374898.80	15163051.45	607.23	609.89	7/13/2006	40	30.0	40.0	577.23	567.23	2-inch PVC Screen	Sand
MW-QC-116S	2374329.41	15169726.03	609.58	612.33	7/13/2006	44	34.0	44.0	575.58	565.58	2-inch PVC Screen	Sand

## Notes:

- (1) Universal Transverse Mercator (UTM), Zone 15, NAD 83, in feet
- (2) ft AMSL - feet above mean sea level
- (3) ft bgs - feet below ground surface
- (4) PVC - polyvinyl chloride

TABLE 4.2

**SUMMARY OF MONITORING WELL DEVELOPMENT PARAMETERS  
FLEETWIDE ASSESSMENT  
QUAD CITIES GENERATING STATION  
CORDOVA, ILLINOIS**

<i>Sample Location</i>	<i>Date</i>	<i>Well Volume (gallons)</i>	<i>Volume Purged (gallons)</i>	<i>pH (Std. Units) <sup>(1)</sup></i>	<i>Conductivity (<math>\mu</math>S/cm) <sup>(2)</sup></i>	<i>Temperature (<math>^{\circ}</math>C) <sup>(3)</sup></i>	<i>Turbidity (NTU) <sup>(4)</sup></i>	<i>Observations</i>
MW-QC-101S	5/12/2006	1.2	1.2	6.13	680	23.4	560	Cloudy, brown
			2.4	6.90	690	23.4	110	Cloudy, brown
			3.6	6.91	723	23.6	57	Slightly cloudy
			4.8	6.91	730	23.6	23	Clear
			6.0	6.92	734	23.6	9.3	Clear
MW-QC-101H	5/12/2006	3.0	3	6.87	590	23.2	210	Cloudy
			6	6.89	610	22.7	97	Slightly cloudy
			9	6.94	620	22.7	66	Slightly cloudy
			12	6.90	628	22.7	27	Clear
			15	6.90	630	22.7	10	Clear
MW-QC-102S	5/11/2006	1.31	1.3	6.87	720	25.3	293	Cloudy
			2.6	6.89	730	25.1	56.2	Slightly cloudy
			3.9	6.86	740	25.1	20.1	Clear
			5.2	6.86	740	25.1	8.2	Clear
			6.5	6.87	730	25.1	5.1	Clear
MW-QC-102I	5/11/2006	4.45	4.5	7.23	690	24.2	29.3	Clear
			9.0	7.04	698	24.2	10.1	Clear
			13.5	7.00	720	24.2	4.3	Clear
			18.0	6.97	720	24.2	2.7	Clear
MW-QC-102D	6/21/2006	7.5	2	7.55	540	22.7	>1,000	Cloudy, brown
			55	8.19	388	21.3	160	Cloudy, brown
			110	8.13	178.9	22.9	57.7	Cloudy, brown
			165	8.18	186.6	21.9	103	Cloudy, brown
			220	8.26	176.7	20.8	17.7	Clear
			275	7.74	168.3	19.1	8.67	Clear
			330	7.82	167.2	19.4	14.0	Clear



TABLE 4.2

**SUMMARY OF MONITORING WELL DEVELOPMENT PARAMETERS  
FLEETWIDE ASSESSMENT  
QUAD CITIES GENERATING STATION  
CORDOVA, ILLINOIS**

<i>Sample Location</i>	<i>Date</i>	<i>Well Volume (gallons)</i>	<i>Volume Purged (gallons)</i>	<i>pH (Std. Units) <sup>(1)</sup></i>	<i>Conductivity (µS/cm) <sup>(2)</sup></i>	<i>Temperature (°C) <sup>(3)</sup></i>	<i>Turbidity (NTU) <sup>(4)</sup></i>	<i>Observations</i>
			340	7.88	167.6	19.8	19.8	Clear
			350	7.89	168.3	19.7	22.0	Clear
MW-QC-103I	5/11/2006	2.3	22.5	6.75	602	22.3	157.5	Turbid, brown
			25.0	6.76	602	22.3	141.8	Cloudy, brown
			27.5	6.78	602	22.3	102.8	Cloudy, brown
MW-QC-104S	5/11/2006	1.24	1.25	6.73	730	25.7	30	Slightly cloudy
			2.50	6.82	780	25.6	19.9	Clear
			3.75	6.80	820	25.5	5.2	Clear
			5.00	6.86	810	25.4	5.0	Clear
			6.25	6.86	815	25.4	5.0	Clear
MW-QC-105I	5/11/2006	5.0	30	6.72	524	25.7	36.8	Sl. cloudy, light orange
			36	6.75	525	25.7	29.2	Clear
			42	6.78	525	25.7	25.6	Clear
			48	6.72	524	25.8	21.3	Clear
MW-QC-106S	5/11/2006	1.25	6.0	6.77	900	14.0	22.1	Clear
			7.5	6.64	900	14.0	18.4	Clear
			9.0	6.63	900	14.1	11.5	Clear
			10.5	6.62	900	14.1	6.28	Clear
			12.0	6.61	900	14.1	4.81	Clear
MW-QC-106I	5/11/2006	3.35	24	6.71	834	14.6	51.5	Slightly cloudy, brown
			28	6.68	833	14.6	31.5	Slightly cloudy, brown
			32	6.79	830	14.6	21.3	Clear
			36	6.75	830	14.7	7.7	Clear
			40	6.73	829	14.6	4.4	Clear

TABLE 4.2

**SUMMARY OF MONITORING WELL DEVELOPMENT PARAMETERS  
FLEETWIDE ASSESSMENT  
QUAD CITIES GENERATING STATION  
CORDOVA, ILLINOIS**

<i>Sample Location</i>	<i>Date</i>	<i>Well Volume (gallons)</i>	<i>Volume Purged (gallons)</i>	<i>pH (Std. Units) <sup>(1)</sup></i>	<i>Conductivity (µS/cm) <sup>(2)</sup></i>	<i>Temperature (°C) <sup>(3)</sup></i>	<i>Turbidity (NTU) <sup>(4)</sup></i>	<i>Observations</i>
MW-QC-1071	5/12/2006	1.04	1	6.72	680	22.1	590	Turbid
			2	6.80	720	22.3	210	Cloudy
			3	6.95	760	21.4	57	Slightly cloudy
			4	6.90	770	22.3	15	Clear
			5	6.95	780	22.1	7.2	Clear
MW-QC-108S	5/16/2006	1.19	16.5	6.87	794	13.7	8.41	Clear
			18.0	6.87	801	13.9	6.54	Clear
			19.5	6.84	793	13.8	3.14	Clear
MW-QC-108I	6/15/2006	4.5	55	7.57	452	23.8	13.7	Clear
			110	7.61	436	24.3	7.90	Clear
			165	7.61	427	24.6	3.23	Clear
			220	7.61	428	24.5	1.60	Clear
			275	7.66	429	24.0	4.25	Clear
			285	7.65	427	23.4	2.83	Clear
			295	7.63	428	23.4	1.40	Clear
			305	7.62	427	23.3	1.54	Clear
MW-QC-109S	7/14/2006	0.5	5	6.68	2,380	19.1	502	Cloudy, brown
			10	7.20	946	18.6	320	Cloudy, brown
			15	7.18	950	18.5	300	Cloudy, brown
			20	7.04	947	18.2	195	Cloudy, brown
			25	7.02	951	18.4	87	Slightly cloudy, brown
			30	7.01	960	18.4	62	Slightly cloudy, brown
			35	7.00	970	18.6	55	Slightly cloudy, brown
			40	6.98	965	18.8	50	Clear
			45	6.99	967	18.6	40	Clear
			50	7.00	968	18.6	15	Clear

TABLE 4.2

**SUMMARY OF MONITORING WELL DEVELOPMENT PARAMETERS  
FLEETWIDE ASSESSMENT  
QUAD CITIES GENERATING STATION  
CORDOVA, ILLINOIS**

<i>Sample Location</i>	<i>Date</i>	<i>Well Volume (gallons)</i>	<i>Volume Purged (gallons)</i>	<i>pH (Std. Units) <sup>(1)</sup></i>	<i>Conductivity (µS/cm) <sup>(2)</sup></i>	<i>Temperature (°C) <sup>(3)</sup></i>	<i>Turbidity (NTU) <sup>(4)</sup></i>	<i>Observations</i>
MW-QC-109I	7/14/2006	2.7	15	6.86	2,380	19.1	>1,000	Cloudy
			30	7.14	1,270	18.6	595	Cloudy
			45	7.16	1,280	18.4	320	Cloudy
			60	7.12	1,270	18.2	105	Slightly cloudy
			75	7.14	1,300	18.2	20	Clear
			90	7.04	1,190	18.6	18	Clear
			105	7.00	1,200	18.6	10	Clear
			120	6.98	1,200	18.6	5	Clear
			135	6.98	1,200	18.6	4	Clear
			150	7.00	1,210	18.6	4	Clear
MW-QC-110I	7/12/2006	2.5	75	7.80	341	16.7	1	Clear
			100	7.77	342	15.9	1	Clear
			125	7.46	342	15.2	1	Clear
			150	7.45	344	14.9	0	Clear
			175	7.61	345	15.0	0	Clear
			200	7.72	345	15.2	0	Clear
MW-QC-111I	7/13/2006	0.8	25	6.67	450	16.8	321	Cloudy
			50	6.57	465	16.0	12	Clear
			75	6.52	457	16.0	3	Clear
			100	6.41	451	16.6	1	Clear
			125	6.44	453	15.9	1	Clear
			150	6.47	451	16.0	4	Clear
			175	6.28	455	15.7	1	Clear
			200	6.47	453	15.7	1	Clear
MW-QC-112I	7/12/2006	2.7	25	7.23	516	15.6	4	Clear
			50	7.14	501	15.2	1	Clear

TABLE 4.2

**SUMMARY OF MONITORING WELL DEVELOPMENT PARAMETERS  
FLEETWIDE ASSESSMENT  
QUAD CITIES GENERATING STATION  
CORDOVA, ILLINOIS**

<i>Sample Location</i>	<i>Date</i>	<i>Well Volume (gallons)</i>	<i>Volume Purged (gallons)</i>	<i>pH (Std. Units) <sup>(1)</sup></i>	<i>Conductivity (<math>\mu</math>S/cm) <sup>(2)</sup></i>	<i>Temperature (<math>^{\circ}</math>C) <sup>(3)</sup></i>	<i>Turbidity (NTU) <sup>(4)</sup></i>	<i>Observations</i>
			75	7.09	499	14.9	1	Clear
			100	7.11	498	15.2	1	Clear
			125	7.06	499	15.8	1	Clear
			150	7.15	497	15.1	1	Clear
			175	7.12	497	15.1	1	Clear
			200	7.09	496	15.1	0	Clear
MW-QC-113I	7/12/2006	2.9	25	7.47	501	15.8	12	Clear
			50	7.55	488	15.3	11	Clear
			75	7.50	494	15.4	9	Clear
			100	7.38	503	15.4	2	Clear
			125	7.55	503	15.3	2	Clear
			150	7.49	495	15.2	2	Clear
			175	7.51	496	15.2	1	Clear
			200	7.50	495	15.2	1	Clear
MW-QC-114I	7/12/2006	2.8	25	7.38	519	15.9	4	Clear
			50	6.39	486	15.2	1	Clear
			75	7.26	504	15.7	1	Clear
			90	7.23	496	15.3	1	Clear
			100	7.28	483	15.1	1	Clear
MW-QC-115I	7/14/2006	0.8	0.8	6.33	442	15.2	229	Cloudy, light brown
			1.6	8.87	453	14.3	45	Clear
			2.4	8.40	439	14.0	12	Clear
			3.2	8.13	437	13.8	8	Clear
			4.0	7.45	436	15.1	46	Clear
			4.8	6.60	436	13.8	41	Clear
			5.6	6.00	436	13.7	12	Clear

TABLE 4.2

SUMMARY OF MONITORING WELL DEVELOPMENT PARAMETERS  
 FLEETWIDE ASSESSMENT  
 QUAD CITIES GENERATING STATION  
 CORDOVA, ILLINOIS

<i>Sample Location</i>	<i>Date</i>	<i>Well Volume (gallons)</i>	<i>Volume Purged (gallons)</i>	<i>pH (Std. Units) <sup>(1)</sup></i>	<i>Conductivity (μS/cm) <sup>(2)</sup></i>	<i>Temperature (°C) <sup>(3)</sup></i>	<i>Turbidity (NTU) <sup>(4)</sup></i>	<i>Observations</i>
			6.4	6.12	431	14.0	7	Clear
			7.2	5.81	433	13.7	5	Clear
			8.0	5.84	431	13.8	3	Clear
MW-QC-116S	7/14/2006	1.0	1.0	NM <sup>(5)</sup>	412	13.3	622	Cloudy, brown
			2.0	NM	412	15.9	29	Clear
			3.0	NM	376	14.5	8	Clear
			4.0	NM	370	14.2	5	Clear
			5.0	NM	370	14.0	3	Clear
			6.0	NM	369	14.0	3	Clear
			7.0	NM	371	13.9	2	Clear
			8	NM	371	13.9	2	Clear
			9	NM	371	13.7	2	Clear
			10	NM	371	13.8	2	Clear

Notes:

- (1) Std. Units - standard units
- (2) μS/cm - microSiemens per centimeter
- (3) ° C - degrees Celsius
- (4) NTU - nephelometric turbidity units
- (5) NM - not measrued; meter malfunction

TABLE 4.3

**SUMMARY OF GROUNDWATER ELEVATIONS  
FLEETWIDE ASSESSMENT  
QUAD CITIES GENERATING STATION  
CORDOVA, ILLINOIS**

Sample Location	Reference Elevation (ft AMSL) <sup>(1)</sup>	Total Depth (ft below Reference)	May 30, 2006		July 26, 2006	
			Depth to Water (ft below Reference)	Groundwater Elevation (ft AMSL)	Depth to Water (ft below Reference)	Groundwater Elevation (ft AMSL)
<i>Shallow Wells</i>						
MW-QC-101S	597.03	30.65	23.18	573.85	24.93	572.10
MW-QC-102S	596.83	30.92	24.12	572.71	25.04	571.79
MW-QC-104S	596.08	30.15	23.01	573.07	24.07	572.01
MW-QC-106S	596.24	29.87	22.42	573.82	24.50	571.74
MW-QC-108S	608.64	42.31	36.13	572.51	36.90	571.74
MW-QC-109S	593.72	29.45	NI <sup>(2)</sup>	--	21.99	571.73
MW-QC-115S	609.89	42.72	NI	--	38.29	571.60
MW-QC-116S	612.33	46.35	NI	--	40.61	571.72
MW-1	593.44	26.61	19.14	574.30	21.29	572.15
MW-2	592.90	26.65	18.84	574.06	20.82	572.08
<i>Intermediate Wells</i>						
MW-QC-101I	597.10	42.19	23.26	573.84	25.02	572.08
MW-QC-102I	597.14	51.60	24.37	572.77	25.27	571.87
MW-QC-103I	596.44	37.36	23.35	573.09	24.82	571.62
MW-QC-105I	595.36	52.53	22.43	572.93	23.55	571.81
MW-QC-106I	596.19	41.98	22.42	573.77	24.49	571.70
MW-QC-107I	609.05	41.53	34.94	574.11	36.51	572.54
MW-QC-108I	608.54	64.20	NI	--	36.82	571.72
MW-QC-109I	593.82	39.04	NI	--	22.16	571.66
MW-QC-110I	604.85	49.44	NI	--	33.12	571.73
MW-QC-111I	618.97	52.57	NI	--	47.31	571.66
MW-QC-112I	604.90	50.00	NI	--	32.98	571.92
MW-QC-113I	605.23	52.37	NI	--	34.62	570.61
MW-QC-114I	607.30	52.85	NI	--	35.60	571.70
<i>Deep Wells</i>						
MW-QC-102D	597.27	71.81	NI	--	25.48	571.79

## Notes:

(1) ft AMSL - feet above mean sea level

(2) NI - not installed

TABLE 4.4

**SUMMARY OF SURFACE WATER ELEVATIONS  
FLEETWIDE ASSESSMENT  
QUAD CITIES GENERATING STATION  
CORDOVA, ILLINOIS**

<i>Sample Location</i>	<i>Reference Elevation (ft AMSL) <sup>(1)</sup></i>	<i>Total Depth (ft Below Reference)</i>	<i>Total Depth Elevation (ft AMSL)</i>	<i>May 31, 2006</i>		<i>June 22, 2006</i>		<i>July 26, 2006</i>	
				<i>Depth to Water (ft Below Reference)</i>	<i>Surface Water Elevation (ft AMSL)</i>	<i>Depth to Water (ft Below Reference)</i>	<i>Surface Water Elevation (ft AMSL)</i>	<i>Depth to Water (ft Below Reference)</i>	<i>Surface Water Elevation (ft AMSL)</i>
SW-QC-1	611.14	16.92	594.22	12.71	598.43	14.00	597.14	14.27	596.87
SW-QC-2	611.12	15.86	595.26	12.72	598.40	14.01	597.11	14.25	596.87
Discharge Bay	594.25	-- <sup>(2)</sup>	--	17.34	576.91	17.72	576.53	17.89	576.36
Mississippi River	--	--	--	--	572.09 <sup>(3)</sup>	--	572.23 <sup>(3)</sup>	--	572.03 <sup>(3)</sup>

## Note:

- (1) ft AMSL - feet above mean sea level
- (2) Total depth of the discharge bay was not measured due to the turbulence of the water
- (3) www.rivergages.com; Mississippi River at Lock and Dam 14 (Pool); river elevation on the date specified at 12 PM

TABLE 4.5

**SAMPLE KEY  
FLEETWIDE ASSESSMENT  
QUAD CITIES GENERATING STATION  
CORDOVA, ILLINOIS**

<i>Sample Location</i>	<i>Sample Identification</i>	<i>QC Sample</i>	<i>Sample Date</i>	<i>Matrix</i>	<i>Analysis</i>
Fire Training Well	WG-QC-MW-QC-FTW-053106-JH-001		5/31/2006	Groundwater	Tritium / Target Radionuclides
SW-QC-1	WS-QC-SW-QC-001-053106-JH-002		5/31/2006	Surface Water	Tritium / Target Radionuclides
SW-QC-2	WS-QC-SW-QC-002-053106-JH-003		5/31/2006	Surface Water	Tritium / Target Radionuclides
Fish House Well	WG-QC-MW-QC-FHW-053106-JH-004		5/31/2006	Groundwater	Tritium / Target Radionuclides
Little Fish Well	WG-QC-MW-QC-LFW-053106-JH-005		5/31/2006	Groundwater	Tritium / Target Radionuclides
Dry Cask Storage Well	WG-QC-MW-QC-DCS-060106-JH-006		6/1/2006	Groundwater	Tritium / Target Radionuclides
Big Fish Well	WG-QC-MW-QC-BFW-060106-JH-007		6/1/2006	Groundwater	Tritium / Target Radionuclides
STP Sand Point Well	WG-QC-MW-QC-STP-060106-JH-008		6/1/2006	Groundwater	Tritium / Target Radionuclides
WELL #1	WG-QC-MW-QC-WELL#1-060106-JH-009		6/1/2006	Groundwater	Tritium / Target Radionuclides
WELL #5	WG-QC-MW-QC-WELL#5-060106-JH-010		6/1/2006	Groundwater	Tritium / Target Radionuclides
MW-QC-107I	WG-QC-MW-QC-107I-053106-JH-011		5/31/2006	Groundwater	Tritium / Target Radionuclides
MW-QC-108S	WG-QC-MW-QC-108S-053106-JH-012		5/31/2006	Groundwater	Tritium / Target Radionuclides
Rinsate	RB-QC-MW-QC-108S-053106-JH-013	Rinsate	5/31/2006	Water	Tritium / Target Radionuclides
MW-QC-106I	WG-QC-MW-QC-106I-053106-JH-014		5/31/2006	Groundwater	Tritium / Target Radionuclides
MW-QC-106S	WG-QC-MW-QC-106S-053106-JH-015		5/31/2006	Groundwater	Tritium / Target Radionuclides
MW-QC-102I	WG-QC-MW-QC-102I-053106-JH-016		5/31/2006	Groundwater	Tritium / Target Radionuclides
MW-QC-102I	WG-QC-MW-QC-102I-053106-JH-017	Duplicate (016)	5/31/2006	Groundwater	Tritium / Target Radionuclides
MW-QC-102S	WG-QC-MW-QC-102S-053106-JH-018		5/31/2006	Groundwater	Tritium / Target Radionuclides
MW-QC-102S	WG-QC-MW-QC-102S-053106-JH-019	Duplicate (018)	5/31/2006	Groundwater	Tritium / Target Radionuclides
MW-QC-103I	WG-QC-MW-QC-103I-060106-JH-020		6/1/2006	Groundwater	Tritium / Target Radionuclides
MW-QC-103I	WG-QC-MW-QC-103I-060106-JH-021	Duplicate (020)	6/1/2006	Groundwater	Tritium / Target Radionuclides
MW-1	WG-QC-MW-1-060106-JH-022		6/1/2006	Groundwater	Tritium / Target Radionuclides
MW-2	WG-QC-MW-2-060106-JH-023		6/1/2006	Groundwater	Tritium / Target Radionuclides
MW-QC-105I	WG-QC-MW-QC-105I-060106-JH-024		6/1/2006	Groundwater	Tritium / Target Radionuclides
MW-QC-104S	WG-QC-MW-QC-104S-060106-JH-025		6/1/2006	Groundwater	Tritium / Target Radionuclides
MW-QC-101S	WG-QC-MW-QC-101S-060106-JH-026		6/1/2006	Groundwater	Tritium / Target Radionuclides
MW-QC-101I	WG-QC-MW-QC-101I-060106-JH-027		6/1/2006	Groundwater	Tritium / Target Radionuclides
MW-QC-108I	WG-QC-MW-QC-108I-072706-NZ-001		7/27/2006	Groundwater	Tritium / Target Radionuclides
MW-QC-110I	WG-QC-MW-QC-110I-072706-NZ-002		7/27/2006	Groundwater	Tritium / Target Radionuclides
MW-QC-114I	WG-QC-MW-QC-114I-072706-NZ-003		7/27/2006	Groundwater	Tritium / Target Radionuclides
MW-QC-113I	WG-QC-MW-QC-113I-072706-NZ-004		7/27/2006	Groundwater	Tritium / Target Radionuclides
MW-QC-112I	WG-QC-MW-QC-112I-072706-NZ-005		7/27/2006	Groundwater	Tritium / Target Radionuclides
MW-QC-111I	WG-QC-MW-QC-111I-072706-NZ-006		7/27/2006	Groundwater	Tritium / Target Radionuclides



TABLE 4.5

**SAMPLE KEY  
FLEETWIDE ASSESSMENT  
QUAD CITIES GENERATING STATION  
CORDOVA, ILLINOIS**

<i>Sample Location</i>	<i>Sample Identification</i>	<i>QC Sample</i>	<i>Sample Date</i>	<i>Matrix</i>	<i>Analysis</i>
MW-QC-115S	RB-QC-MW-QC-115S-072706-NZ-007	Rinsate	7/27/2006	Water	Tritium / Target Radionuclides
MW-QC-116S	WG-QC-MW-QC-116S-072806-NZ-008		7/28/2006	Groundwater	Tritium / Target Radionuclides
MW-QC-115S	WG-QC-MW-QC-115S-072806-NZ-009		7/28/2006	Groundwater	Tritium / Target Radionuclides
MW-QC-109S	WG-QC-MW-QC-109S-072806-NZ-010		7/28/2006	Groundwater	Tritium / Target Radionuclides
MW-QC-109S	WG-QC-MW-QC-109S-072806-NZ-011	Duplicate (010)	7/28/2006	Groundwater	Tritium / Target Radionuclides
MW-QC-109I	WG-QC-MW-QC-109I-072806-NZ-012		7/28/2006	Groundwater	Tritium / Target Radionuclides
MW-QC-109I	WG-QC-MW-QC-109I-072806-NZ-013	Duplicate (012)	7/28/2006	Groundwater	Tritium / Target Radionuclides
MW-QC-102D	RB-QC-MW-QC-102D-072806-NZ-014	Rinsate	7/28/2006	Water	Tritium / Target Radionuclides
MW-QC-102D	WG-QC-MW-QC-102D-072806-NZ-015		7/28/2006	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 (020) - Duplicate of sample number in parenthesis

TABLE 4.6

**SUMMARY OF MONITORING WELL PURGING PARAMETERS  
FLEETWIDE ASSESSMENT  
QUAD CITIES GENERATING STATION  
CORDOVA, ILLINOIS**

<i>Sample Location</i>	<i>Date</i>	<i>Time</i>	<i>Pumping Rate (mL/min) <sup>(1)</sup></i>	<i>pH (Std. Units) <sup>(2)</sup></i>	<i>Temperature (°C) <sup>(3)</sup></i>	<i>Conductivity (µS/cm) <sup>(4)</sup></i>	<i>ORP <sup>(5)</sup> (mV) <sup>(6)</sup></i>	<i>DO <sup>(7)</sup> (mg/L) <sup>(8)</sup></i>	<i>Turbidity (NTU) <sup>(9)</sup></i>	<i>Volume Purged (gallons)</i>
MW-QC-101S	6/1/2006	14:00	420	7.40	15.0	0.873	95.8	8.56	4.28	2.2
		14:05	420	7.39	15.0	0.870	94.8	8.46	3.26	
		14:10	420	7.39	15.0	0.869	94.7	8.48	2.21	
MW-QC-101I	6/1/2006	13:55	460	7.69	16.5	1.681	129.6	7.12	16.0	3.0
		14:00	460	7.66	16.4	1.680	123.2	6.96	13.0	
		14:05	460	7.66	16.5	1.678	116.6	7.04	10.87	
MW-QC-102S	5/31/2006	15:50	420	6.90	17.6	0.963	152.6	1.71	38.2	2.2
		15:55	420	6.90	17.6	0.961	151.2	1.65	40.8	
		16:00	420	6.91	17.6	0.960	149.7	1.52	38.2	
MW-QC-102I	5/31/2006	15:45	460	7.43	17.6	1.079	86.1	1.00	12.0	3.0
		15:50	460	7.41	17.5	1.082	84.2	0.98	9.6	
		15:55	460	7.40	17.6	1.082	83.2	0.98	4.7	
MW-QC-102D	7/28/2006	12:10	400	8.27	18.0	0.476	71	4.91	14.9	4.2
		12:15	400	8.26	18.0	0.478	71	4.87	7.1	
		12:20	400	8.27	18.0	0.480	71	4.89	4.7	
MW-QC-103I	6/1/2006	7:35	420	7.45	24.2	0.589	49.9	0.29	36.5	3.3
		7:40	420	7.45	24.2	0.590	46.1	0.28	32.8	
		7:45	420	7.45	24.2	0.591	42.8	0.27	27.4	
MW-QC-104S	6/1/2006	12:45	480	6.77	20.3	2.695	87.7	0.31	31.0	2.5
		12:50	480	6.76	20.3	2.617	78.6	0.34	26.0	
		12:55	480	6.75	20.3	2.614	70.7	0.25	23.0	

TABLE 4.6

**SUMMARY OF MONITORING WELL PURGING PARAMETERS  
FLEETWIDE ASSESSMENT  
QUAD CITIES GENERATING STATION  
CORDOVA, ILLINOIS**

<i>Sample Location</i>	<i>Date</i>	<i>Time</i>	<i>Pumping Rate (mL/min) <sup>(1)</sup></i>	<i>pH (Std. Units) <sup>(2)</sup></i>	<i>Temperature (°C) <sup>(3)</sup></i>	<i>Conductivity (µS/cm) <sup>(4)</sup></i>	<i>ORP <sup>(5)</sup> (mV) <sup>(6)</sup></i>	<i>DO <sup>(7)</sup> (mg/L) <sup>(8)</sup></i>	<i>Turbidity (NTU) <sup>(9)</sup></i>	<i>Volume Purged (gallons)</i>
MW-QC-105I	6/1/2006	11:05	450	7.74	24.4	0.469	-3.5	0.61	10.0	2.5
		11:10	450	7.72	24.4	0.463	-2.9	0.32	9.2	
		11:15	450	7.71	24.4	0.463	-3.8	0.33	8.0	
MW-QC-106S	5/31/2006	14:25	360	7.24	14.5	0.414	162.9	9.31	10.77	1.5
		14:30	360	7.24	14.5	0.413	159.2	9.24	9.42	
		14:35	360	7.24	14.5	0.413	157	9.25	8.07	
MW-QC-106I	5/31/2006	14:30	300	6.95	16.0	0.669	37.6	0.48	3.47	2.7
		14:35	300	6.94	16.0	0.670	39.2	0.46	3.40	
		14:40	300	6.93	16.0	0.672	38.7	0.45	3.40	
MW-QC-107I	5/31/2006	8:55	360	6.86	16.2	0.537	137.3	7.91	13.0	3.8
		9:00	360	6.83	16.2	0.540	131.3	7.87	37.47	
		9:05	360	6.79	16.1	0.540	124.7	7.63	13.3	
MW-QC-108S	5/31/2006	10:20	400	6.79	20.6	0.636	61.7	0.39	17.7	1.6
		10:25	400	6.79	20.6	0.633	59.4	0.46	11.8	
		10:30	400	6.79	20.6	0.628	56.3	0.62	7.92	
MW-QC-108I	7/27/2006	8:20	400	7.39	20.9	0.491	71	0.67	5.12	3.2
		8:25	400	7.39	20.9	0.491	70	0.66	4.33	
		8:30	400	7.39	20.9	0.491	71	0.67	4.12	
MW-QC-109S	7/28/2006	9:45	400	6.84	17.7	3.320	77	1.06	6.3	3.2
		9:50	400	6.84	17.7	3.340	76	1.04	5.60	
		9:55	400	6.83	17.7	3.350	76	1.03	4.96	

**SUMMARY OF MONITORING WELL PURGING PARAMETERS  
FLEETWIDE ASSESSMENT  
QUAD CITIES GENERATING STATION  
CORDOVA, ILLINOIS**

<i>Sample Location</i>	<i>Date</i>	<i>Time</i>	<i>Pumping Rate (mL/min) <sup>(1)</sup></i>	<i>pH (Std. Units) <sup>(2)</sup></i>	<i>Temperature (°C) <sup>(3)</sup></i>	<i>Conductivity (µS/cm) <sup>(4)</sup></i>	<i>ORP <sup>(5)</sup> (mV) <sup>(6)</sup></i>	<i>DO <sup>(7)</sup> (mg/L) <sup>(8)</sup></i>	<i>Turbidity (NTU) <sup>(9)</sup></i>	<i>Volume Purged (gallons)</i>
MW-QC-109I	7/28/2006	10:55	400	7.14	18.4	1.477	75	0.36	17.8	5.3
		11:00	400	7.14	18.4	1.470	75	0.35	9.5	
		11:05	400	7.14	18.4	1.471	75	0.34	4.5	
MW-QC-110I	7/27/2006	9:05	400	7.62	14.8	0.286	72	8.90	4.75	2.6
		9:10	400	7.64	14.8	0.287	71	8.88	3.12	
		9:15	400	7.63	14.8	0.286	72	8.87	2.98	
MW-QC-111I	7/27/2006	13:45	400	6.49	15.6	0.402	75	3.43	2.14	2.6
		13:50	400	6.48	15.5	0.403	76	3.45	1.95	
		13:55	400	6.47	15.5	0.405	77	3.44	1.78	
MW-QC-112I	7/27/2006	13:00	400	7.21	14.5	0.440	76	0.49	7.21	2.6
		13:05	400	7.20	14.5	0.442	77	0.47	5.14	
		13:10	400	7.19	14.5	0.441	77	0.46	4.95	
MW-QC-113I	7/27/2006	10:40	400	7.38	16.4	0.446	75	0.41	20	2.6
		10:45	400	7.37	16.4	0.446	75	0.40	15.10	
		10:50	400	7.37	16.4	0.447	75	0.40	8.58	
MW-QC-114I	7/27/2006	9:55	400	7.34	14.9	0.428	72	0.49	10.8	2.6
		10:00	400	7.31	15.0	0.428	72	0.48	7.65	
		10:05	400	7.31	15.0	0.428	73	0.47	4.95	
MW-QC-115S	7/28/2006	7:35	400	7.30	13.7	0.388	88	8.00	10.40	3.2
		7:40	400	7.28	13.7	0.386	87	8.00	7.26	
		7:45	400	7.30	13.7	0.387	88	8.01	4.97	

**SUMMARY OF MONITORING WELL PURGING PARAMETERS  
FLEETWIDE ASSESSMENT  
QUAD CITIES GENERATING STATION  
CORDOVA, ILLINOIS**

<i>Sample Location</i>	<i>Date</i>	<i>Time</i>	<i>Pumping Rate (mL/min) <sup>(1)</sup></i>	<i>pH (Std. Units) <sup>(2)</sup></i>	<i>Temperature (°C) <sup>(3)</sup></i>	<i>Conductivity (µS/cm) <sup>(4)</sup></i>	<i>ORP <sup>(5)</sup> (mV) <sup>(6)</sup></i>	<i>DO <sup>(7)</sup> (mg/L) <sup>(8)</sup></i>	<i>Turbidity (NTU) <sup>(9)</sup></i>	<i>Volume Purged (gallons)</i>
MW-QC-116S	7/28/2006	6:35	400	6.91	13.3	0.309	90	7.98	22.8	3.2
		6:40	400	6.90	13.3	0.310	90	7.97	6.97	
		6:45	400	6.89	13.4	0.310	90	7.98	3.95	
MW-1	6/1/2006	9:05	460	6.15	15.6	13.66	112.8	6.07	7.45	3.0
		9:10	460	6.15	15.5	13.87	115.9	6.18	7.69	
		9:15	460	6.16	15.5	13.91	118.6	6.11	6.17	
MW-2	6/1/2006	10:05	440	6.51	17.1	8.598	112.5	1.76	12.7	3.0
		10:10	440	6.50	17.1	8.623	110.6	1.62	11.2	
		10:15	440	6.51	17.1	8.655	108.5	1.51	9.28	

## Notes:

- (1) mL/min - milliliters per minute
  - (2) Std. Units - standard units
  - (3) °C - degrees Celsius
  - (4) µS/cm - microSiemens per centimeter
  - (5) ORP - oxidation-reduction potential
  - (6) mV - millivolts
  - (7) DO - dissolved oxygen
  - (8) mg/L - milligrams per Liter
  - (9) NTU - nephelometric turbidity units
- The last three readings are provided in the table

TABLE 4.7

**SUMMARY OF EXISTING SUPPLY WELL PURGING PARAMETERS  
FLEETWIDE ASSESSMENT  
QUAD CITIES GENERATING STATION  
CORDOVA, ILLINOIS**

<i>Sample Location</i>	<i>Date</i>	<i>Time</i>	<i>pH (Std. Units)</i> <sup>(2)</sup>	<i>Temperature (°C)</i> <sup>(3)</sup>	<i>Conductivity (µS/cm)</i> <sup>(4)</sup>	<i>ORP (mV)</i> <sup>(5)</sup> <sup>(6)</sup>	<i>DO (mg/L)</i> <sup>(7)</sup> <sup>(8)</sup>	<i>Turbidity (NTU)</i> <sup>(9)</sup>
Fire Training Well	5/31/06	8:00	7.54	17.2	353	223.7	8.63	2.85
Fish House Well	5/31/06	9:10	7.87	22.0	402	266.8	5.10	2.67
Little Fish House	5/31/06	9:40	7.57	17.2	377	54.1	7.27	3.26
Dry Cask Storage Well	6/1/06	8:20	8.14	16.7	232	124	5.71	2.7
Big Fish Well	6/1/06	8:50	8.08	14.1	357	188.2	5.21	2.94
STP Sand Point Well	6/1/06	9:05	7.31	14.2	439	-26.2	5.70	2.23
Well #1	6/1/06	9:15	7.48	13.6	587	7.6	8.0	3.72
Well #5	6/1/06	9:30	7.26	14.3	1,131	82.5	8.12	3.00

## Notes:

- (1) mL/min - milliLiters per minute
- (2) Std. Units - standard units
- (3) °C - degrees Celsius
- (4) µS/cm - microSiemens per centimeter
- (5) ORP - oxidation-reduction potential
- (6) mV - millivolts
- (7) DO - dissolved oxygen
- (8) mg/L - milligrams per Liter
- (9) NTU - nephelometric turbidity units

TABLE 5.1

**SUMMARY OF CALCULATED VERTICAL GRADIENTS  
FLEETWIDE ASSESSMENT  
QUAD CITIES GENERATING STATION  
CORDOVA, ILLINOIS**

Sample Location	Top of Screen Elevation (ft AMSL) <sup>(1)</sup>	Bottom of Screen Elevation (ft AMSL)	Mid-Point of Screen Elevation (ft AMSL)	May 30, 2006		July 26, 2006	
				Water Level (ft AMSL)	Vertical Gradient (ft/ft) <sup>(2)</sup>	Water Level (ft AMSL)	Vertical Gradient (ft/ft) <sup>(2)</sup>
MW-QC-101S	576.52	566.52	571.52	573.85	0.001	572.10	0.001
MW-QC-101I	559.58	554.58	557.08	573.84		572.08	
MW-QC-102S	575.69	565.69	570.69	572.71	-0.003	571.79	-0.004
MW-QC-102I	550.76	545.76	548.26	572.77		571.87	
MW-QC-106S	576.79	566.79	571.79	573.82	0.003	571.74	0.003
MW-QC-106I	559.00	554.00	556.50	573.77		571.70	
MW-QC-108S	577.14	567.14	572.14	NI <sup>(3)</sup>	--	571.74	0.001
MW-QC-108I	550.41	545.41	547.91	NI	--	571.72	
MW-QC-109S	574.43	564.43	569.43	NI	--	571.73	0.006
MW-QC-109I	559.93	554.93	557.43	NI	--	571.66	

## Notes:

- (1) ft AMSL - feet above mean sea level
- (2) Positive value denotes downward vertical gradient; negative value denotes upward vertical gradient
- (3) NI - paired wells not installed

**ANALYTICAL RESULTS SUMMARY - TRITIUM IN GROUNDWATER AND SURFACE WATER  
FLEETWIDE ASSESSMENT  
QUAD CITIES GENERATING STATION  
CORDOVA, ILLINOIS**

<i>Sample Location</i>	<i>Sample Identification</i>	<i>QC Sample</i>	<i>Sample Date</i>	<i>Tritium (pCi/L)</i>	<i>Result Error</i>
Big Fish Well	WG-QC-MW-QC-BFW-060106-JH-007		6/1/2006	740	+/-152
Dry Cask Storage Well	WG-QC-MW-QC-DCS-060106-JH-006		6/1/2006	ND (200)	-
Fire Training Well	WG-QC-MW-QC-FTW-053106-JH-001		5/31/2006	ND (200)	-
Fish House Well	WG-QC-MW-QC-FHW-053106-JH-004		5/31/2006	ND (200)	-
Little Fish Well	WG-QC-MW-QC-LFW-053106-JH-005		5/31/2006	371	+/-134
MW-1	WG-QC-MW-1-060106-JH-022		6/1/2006	ND (200)	-
MW-2	WG-QC-MW-2-060106-JH-023		6/1/2006	250	+/-126
MW-QC-101I	WG-QC-MW-QC-101I-060106-JH-027		6/1/2006	ND (200)	-
MW-QC-101S	WG-QC-MW-QC-101S-060106-JH-026		6/1/2006	ND (200)	-
MW-QC-102D	WG-QC-MW-QC-102D-072806-NZ-015		7/28/2006	3930 J	+/-450
MW-QC-102I	WG-QC-MW-QC-102I-053106-JH-016		5/31/2006	32600	+/-977
MW-QC-102I	WG-QC-MW-QC-102I-053106-JH-017	Duplicate (016)	5/31/2006	31800	+/-972
MW-QC-102S	WG-QC-MW-QC-102S-053106-JH-018		5/31/2006	9410	+/-655
MW-QC-102S	WG-QC-MW-QC-102S-053106-JH-019	Duplicate (018)	5/31/2006	9640	+/-660
MW-QC-103I	WG-QC-MW-QC-103I-060106-JH-020		6/1/2006	ND (200)	-
MW-QC-103I	WG-QC-MW-QC-103I-060106-JH-021	Duplicate (020)	6/1/2006	ND (200)	-
MW-QC-104S	WG-QC-MW-QC-104S-060106-JH-025		6/1/2006	262	+/-130
MW-QC-105I	WG-QC-MW-QC-105I-060106-JH-024		6/1/2006	ND (200)	-
MW-QC-106I	WG-QC-MW-QC-106I-053106-JH-014		5/31/2006	ND (200)	-
MW-QC-106S	WG-QC-MW-QC-106S-053106-JH-015		5/31/2006	ND (200)	-
MW-QC-107I	WG-QC-MW-QC-107I-053106-JH-011		5/31/2006	ND (200)	-
MW-QC-108I	WG-QC-MW-QC-108I-072706-NZ-001		7/27/2006	1890 J	+/-252
MW-QC-108S	WG-QC-MW-QC-108S-053106-JH-012		5/31/2006	1460	+/-217
MW-QC-109I	WG-QC-MW-QC-109I-072806-NZ-012		7/28/2006	768 J	+/-156
MW-QC-109I	WG-QC-MW-QC-109I-072806-NZ-013	Duplicate (012)	7/28/2006	1140 J	+/-182
MW-QC-109S	WG-QC-MW-QC-109S-072806-NZ-010		7/28/2006	ND (200)	-
MW-QC-109S	WG-QC-MW-QC-109S-072806-NZ-011	Duplicate (010)	7/28/2006	ND (200)	-
MW-QC-110I	WG-QC-MW-QC-110I-072706-NZ-002		7/27/2006	ND (200)	-
MW-QC-111I	WG-QC-MW-QC-111I-072706-NZ-006		7/27/2006	420 J	+/-133
MW-QC-112I	WG-QC-MW-QC-112I-072706-NZ-005		7/27/2006	ND (200)	-
MW-QC-113I	WG-QC-MW-QC-113I-072706-NZ-004		7/27/2006	ND (200)	-
MW-QC-114I	WG-QC-MW-QC-114I-072706-NZ-003		7/27/2006	ND (200)	-
MW-QC-115S	WG-QC-MW-QC-115S-072806-NZ-009		7/28/2006	ND (200)	-
MW-QC-116S	WG-QC-MW-QC-116S-072806-NZ-008		7/28/2006	ND (200)	-
STP Sand Point Well	WG-QC-MW-QC-STP-060106-JH-008		6/1/2006	ND (200)	-
SW-QC-1	WS-QC-SW-QC-001-053106-JH-002		5/31/2006	550	+/-143
SW-QC-2	WS-QC-SW-QC-002-053106-JH-003		5/31/2006	497	+/-140
Well #1	WG-MW-QC-WELL#1-060106-JH-009		6/1/2006	ND (200)	-
Well #5	WG-MW-QC-WELL#5-060106-JH-010		6/1/2006	ND (200)	-

## Notes:

Samples analyzed by: Teledyne Brown Engineering, Inc.

QC - Quality Control

J - Estimated.

ND ( ) - Non-detect; value in parentheses is the LLD.

LLD - Lower limit of detection.

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



TABLE 5.3

ANALYTICAL RESULTS SUMMARY - RADIONUCLIDES IN GROUNDWATER AND SURFACE WATER  
FLEETWIDE ASSESSMENT  
QUAD CITIES GENERATING STATION  
CORDOVA, ILLINOIS

Sample Location:	Big Fish Well	Big Fish Well	Dry Cask Storage Well	Dry Cask Storage Well	Fire Training Well	Fire Training Well
Sample Identification:	WG-QC-MW-QC-BFW-060106-JH-007	Result	WG-QC-MW-QC-DCS-060106-JH-006	Result	WG-QC-MW-QC-FTW-053106-JH-001	Result
Sample Date:	6/1/2006	Error	6/1/2006	Error	5/31/2006	Error
	Units					
<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>(1)</sup></b>						
Actinium-228	pCi/L	RNI	-	RNI	-	RNI
Potassium-40	pCi/L	RNI	-	106.3	+/-33.68	RNI

Notes:

Samples analyzed by: Teledyne Brown

(1) - These non-targeted radionuclides are included in this table but excluded from the 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.

RNI- Radionuclide Not Identified during analysis.  
RNI- Radionuclide Not Identified during analysis.  
ND ( ) - Non-detect; 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 5.3

**ANALYTICAL RESULTS SUMMARY - RADIONUCLIDES IN GROUNDWATER AND SURFACE WATER  
FLEETWIDE ASSESSMENT  
QUAD CITIES GENERATING STATION  
CORDOVA, ILLINOIS**

<i>Sample Location:</i>	<i>Fish House Well</i>	<i>Fish House Well</i>	<i>Little Fish Well</i>	<i>Little Fish Well</i>	<i>MW-1</i>	<i>MW-1</i>
<i>Sample Identification:</i>	WG-QC-MW-QC-FHW-053106-JH-004	<i>Result</i>	WG-QC-MW-QC-LFW-053106-JH-005	<i>Result</i>	WG-QC-MW-1-060106-JH-022	<i>Result</i>
<i>Sample Date:</i>	5/31/2006	<i>Error</i>	5/31/2006	<i>Error</i>	6/1/2006	<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)	-	ND (10) U*	-	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 <sup>(1)</sup></i>						
Actinium-228	pCi/L	RNI	-	RNI	-	RNI
Potassium-40	pCi/L	RNI	-	RNI	-	RNI

Notes:

Samples analyzed by: Teledyne Brown

(1) - These non-targeted radionuclides are included in this table but excluded from the 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.

- RNI- Radionuclide Not Identified during analysis.
- RNI- Radionuclide Not Identified during analysis.
- ND ( ) - Non-detect; 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 5.3**  
**ANALYTICAL RESULTS SUMMARY - RADIONUCLIDES IN GROUNDWATER AND SURFACE WATER**  
**FLEETWIDE ASSESSMENT**  
**QUAD CITIES GENERATING STATION**  
**CORDOVA, ILLINOIS**

<i>Sample Location:</i>		<i>MW-2</i>	<i>MW-2</i>	<i>MW-QC-101I</i>	<i>MW-QC-101I</i>	<i>MW-QC-101S</i>	<i>MW-QC-101S</i>
<i>Sample Identification:</i>		<i>WG-QC-MW-2-060106-JH-023</i>	<i>Result</i>	<i>WG-QC-MW-QC-101I-060106-JH-027</i>	<i>Result</i>	<i>WG-QC-MW-QC-101S-060106-JH-026</i>	<i>Result</i>
<i>Sample Date:</i>		<i>6/1/2006</i>	<i>Error</i>	<i>6/1/2006</i>	<i>Error</i>	<i>6/1/2006</i>	<i>Error</i>
	<i>Units</i>						
<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>(1)</sup></b>							
Actinium-228	pCi/L	RNI	-	RNI	-	RNI	-
Potassium-40	pCi/L	144.8	+/-50.51	RNI	-	RNI	-

## Notes:

Samples analyzed by: Teledyne Brown

(1) - These non-targeted radionuclides are included in this table but excluded from the 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.

RNI- Radionuclide Not Identified during analysis.

RNI- Radionuclide Not Identified during analysis.

ND ( ) - Non-detect; 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 5.3

ANALYTICAL RESULTS SUMMARY - RADIONUCLIDES IN GROUNDWATER AND SURFACE WATER  
FLEETWIDE ASSESSMENT  
QUAD CITIES GENERATING STATION  
CORDOVA, ILLINOIS

Sample Location:	MW-QC-102D	MW-QC-102D	MW-QC-102I	MW-QC-102I	MW-QC-102I	MW-QC-102I
Sample Identification:	WG-QC-MW-QC-102D-072806-NZ-015	Result	WG-QC-MW-QC-102I-053106-JH-016	Result	WG-QC-MW-QC-102I-053106-JH-017	Result
Sample Date:	7/28/2006	Error	5/31/2006	Error	5/31/2006	Error
					Duplicate	
	Units					
<b>Target Radionuclides</b>						
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)	-	ND (30) U*	-	ND (30)
Zirconium-95	pCi/L	ND (10)	-	ND (10)	-	ND (10)
<b>Non-Target Radionuclides <sup>(1)</sup></b>						
Actinium-228	pCi/L	RNI	-	RNI	-	21.46
Potassium-40	pCi/L	RNI	-	RNI	-	84.48

## Notes:

Samples analyzed by: Teledyne Brown

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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 5.3**  
**ANALYTICAL RESULTS SUMMARY - RADIONUCLIDES IN GROUNDWATER AND SURFACE WATER**  
**FLEETWIDE ASSESSMENT**  
**QUAD CITIES GENERATING STATION**  
**CORDOVA, ILLINOIS**

<i>Sample Location:</i>		MW-QC-102S	MW-QC-102S	MW-QC-102S	MW-QC-102S	MW-QC-103I	MW-QC-103I
<i>Sample Identification:</i>		WG-QC-MW-QC-102S-053106-JH-018	<i>Result</i>	WG-QC-MW-QC-102S-053106-JH-019	<i>Result</i>	WG-QC-MW-QC-103I-060106-JH-020	<i>Result</i>
<i>Sample Date:</i>		5/31/2006	<i>Error</i>	5/31/2006	<i>Error</i>	6/1/2006	<i>Error</i>
	<i>Units</i>			<i>Duplicate</i>			
<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) U*	-	ND (30)	-
Zirconium-95	pCi/L	ND (10)	-	ND (10)	-	ND (10)	-
<b>Non-Target Radionuclides <sup>(1)</sup></b>							
Actinium-228	pCi/L	RNI	-	RNI	-	RNI	-
Potassium-40	pCi/L	RNI	-	RNI	-	RNI	-

**Notes:**

Samples analyzed by: Teledyne Brown

(1) - These non-targeted radionuclides are included in this table but excluded from the 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.

RNI- Radionuclide Not Identified during analysis.

RNI- Radionuclide Not Identified during analysis.

ND ( ) - Non-detect; 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 5.3**  
**ANALYTICAL RESULTS SUMMARY - RADIONUCLIDES IN GROUNDWATER AND SURFACE WATER**  
**FLEETWIDE ASSESSMENT**  
**QUAD CITIES GENERATING STATION**  
**CORDOVA, ILLINOIS**

<i>Sample Location:</i>		<i>MW-QC-103I</i>	<i>MW-QC-103I</i>	<i>MW-QC-104S</i>	<i>MW-QC-104S</i>	<i>MW-QC-105I</i>	<i>MW-QC-105I</i>
<i>Sample Identification:</i>		<i>WG-QC-MW-QC-103I-060106-JH-021</i>	<i>Result</i>	<i>WG-QC-MW-QC-104S-060106-JH-025</i>	<i>Result</i>	<i>WG-QC-MW-QC-105I-060106-JH-024</i>	<i>Result</i>
<i>Sample Date:</i>		<i>6/1/2006</i>	<i>Error</i>	<i>6/1/2006</i>	<i>Error</i>	<i>6/1/2006</i>	<i>Error</i>
	<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)	-	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>(1)</sup></i>							
Actinium-228	pCi/L	RNI	-	RNI	-	RNI	-
Potassium-40	pCi/L	RNI	-	RNI	-	RNI	-

Notes:

Samples analyzed by: Teledyne Brown

(1) - These non-targeted radionuclides are included in this table but excluded from the 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.

RNI- Radionuclide Not Identified during analysis.

RNI- Radionuclide Not Identified during analysis.

ND ( ) - Non-detect; 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 5.3**  
**ANALYTICAL RESULTS SUMMARY - RADIONUCLIDES IN GROUNDWATER AND SURFACE WATER**  
**FLEETWIDE ASSESSMENT**  
**QUAD CITIES GENERATING STATION**  
**CORDOVA, ILLINOIS**

<i>Sample Location:</i>		MW-QC-106I	MW-QC-106I	MW-QC-106S	MW-QC-106S	MW-QC-107I	MW-QC-107I
<i>Sample Identification:</i>		WG-QC-MW-QC-106I-053106-JH-014	Result	WG-QC-MW-QC-106S-053106-JH-015	Result	WG-QC-MW-QC-107I-053106-JH-011	Result
<i>Sample Date:</i>		5/31/2006	Error	5/31/2006	Error	5/31/2006	Error
	<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) 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)	-
Zirconium-95	pCi/L	ND (10)	-	ND (10)	-	ND (10)	-
<b>Non-Target Radionuclides <sup>(1)</sup></b>							
Actinium-228	pCi/L	RNI	-	RNI	-	RNI	-
Potassium-40	pCi/L	RNI	-	RNI	-	RNI	-

Notes:

Samples analyzed by: Teledyne Brown

(1) - These non-targeted radionuclides are included in this table but excluded from the 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.

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RNI- Radionuclide Not Identified during analysis.

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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 5.3**  
**ANALYTICAL RESULTS SUMMARY - RADIONUCLIDES IN GROUNDWATER AND SURFACE WATER**  
**FLEETWIDE ASSESSMENT**  
**QUAD CITIES GENERATING STATION**  
**CORDOVA, ILLINOIS**

<i>Sample Location:</i>		<i>MW-QC-1081</i>	<i>MW-QC-1081</i>	<i>MW-QC-1085</i>	<i>MW-QC-1085</i>	<i>MW-QC-1091</i>	<i>MW-QC-1091</i>
<i>Sample Identification:</i>		<i>WG-QC-MW-QC-1081-072706-NZ-001</i>	<i>Result</i>	<i>WG-QC-MW-QC-1085-053106-JH-012</i>	<i>Result</i>	<i>WG-QC-MW-QC-1091-072806-NZ-012</i>	<i>Result</i>
<i>Sample Date:</i>		<i>7/27/2006</i>	<i>Error</i>	<i>5/31/2006</i>	<i>Error</i>	<i>7/28/2006</i>	<i>Error</i>
	<i>Units</i>						
<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) U*	-
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>(1)</sup></b>							
Actinium-228	pCi/L	RNI	-	RNI	-	RNI	-
Potassium-40	pCi/L	RNI	-	162.9	+/-55.66	RNI	-

Notes:

Samples analyzed by: Teledyne Brown

(1) - These non-targeted radionuclides are included in this table but excluded from the 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.

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RNI- Radionuclide Not Identified during analysis.

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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 5.3**  
**ANALYTICAL RESULTS SUMMARY - RADIONUCLIDES IN GROUNDWATER AND SURFACE WATER**  
**FLEETWIDE ASSESSMENT**  
**QUAD CITIES GENERATING STATION**  
**CORDOVA, ILLINOIS**

<i>Sample Location:</i>		MW-QC-109I	MW-QC-109I	MW-QC-109S	MW-QC-109S	MW-QC-109S	MW-QC-109S
<i>Sample Identification:</i>		WG-QC-MW-QC-109I-072806-NZ-013	<i>Result</i>	WG-QC-MW-QC-109S-072806-NZ-010	<i>Result</i>	WG-QC-MW-QC-109S-072806-NZ-011	<i>Result</i>
<i>Sample Date:</i>		7/28/2006	<i>Error</i>	7/28/2006	<i>Error</i>	7/28/2006	<i>Error</i>
		<i>Duplicate</i>				<i>Duplicate</i>	
	<i>Units</i>						
<b>Target Radionuclides</b>							
Barium-140	pCi/L	ND (60)	-	ND (60)	-	ND (60)	-
Cesium-134	pCi/L	ND (10) U*	-	ND (10) U*	-	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) U*	-
Strontium-89/90 (Total)	pCi/L	ND (2)	-	ND (2)	-	ND (2)	-
Zinc-65	pCi/L	ND (30) U*	-	ND (30) U*	-	ND (30)	-
Zirconium-95	pCi/L	ND (10)	-	ND (10)	-	ND (10)	-
<b>Non-Target Radionuclides <sup>(1)</sup></b>							
Actinium-228	pCi/L	RNI	-	RNI	-	RNI	-
Potassium-40	pCi/L	RNI	-	RNI	-	RNI	-

**Notes:**

Samples analyzed by: Teledyne Brown

(1) - These non-targeted radionuclides are included in this table but excluded from the 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.

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- RNI- Radionuclide Not Identified during analysis.
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- 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 5.3**  
**ANALYTICAL RESULTS SUMMARY - RADIONUCLIDES IN GROUNDWATER AND SURFACE WATER**  
**FLEETWIDE ASSESSMENT**  
**QUAD CITIES GENERATING STATION**  
**CORDOVA, ILLINOIS**

<i>Sample Location:</i>		MW-QC-110I	MW-QC-110I	MW-QC-111I	MW-QC-111I	MW-QC-112I	MW-QC-112I
<i>Sample Identification:</i>		WG-QC-MW-QC-110I-072706-NZ-002	Result	WG-QC-MW-QC-111I-072706-NZ-006	Result	WG-QC-MW-QC-112I-072706-NZ-005	Result
<i>Sample Date:</i>		7/27/2006	Error	7/27/2006	Error	7/27/2006	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) 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) U*	-	ND (30) U*	-
Zirconium-95	pCi/L	ND (10)	-	ND (10)	-	ND (10)	-
<b>Non-Target Radionuclides <sup>(1)</sup></b>							
Actinium-228	pCi/L	RNI	-	RNI	-	RNI	-
Potassium-40	pCi/L	RNI	-	RNI	-	RNI	-

Notes:

Samples analyzed by: Teledyne Brown

(1) - These non-targeted radionuclides are included in this table but excluded from the 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.

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RNI- Radionuclide Not Identified during analysis.

ND ( ) - Non-detect; 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 5.3

ANALYTICAL RESULTS SUMMARY - RADIONUCLIDES IN GROUNDWATER AND SURFACE WATER  
FLEETWIDE ASSESSMENT  
QUAD CITIES GENERATING STATION  
CORDOVA, ILLINOIS

Sample Location:		MW-QC-113I	MW-QC-113I	MW-QC-114I	MW-QC-114I	MW-QC-115S	MW-QC-115S
Sample Identification:		WG-QC-MW-QC-113I-072706-NZ-004	Result	WG-QC-MW-QC-114I-072706-NZ-003	Result	WG-QC-MW-QC-115S-072806-NZ-009	Result
Sample Date:		7/27/2006	Error	7/27/2006	Error	7/28/2006	Error
	Units						
<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) U*	-	ND (30)	-	ND (30)	-
Zirconium-95	pCi/L	ND (10)	-	ND (10)	-	ND (10)	-
<b>Non-Target Radionuclides <sup>(1)</sup></b>							
Actinium-228	pCi/L	RNI	-	RNI	-	RNI	-
Potassium-40	pCi/L	RNI	-	RNI	-	RNI	-

## Notes:

Samples analyzed by: Teledyne Brown

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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 5.3

ANALYTICAL RESULTS SUMMARY - RADIONUCLIDES IN GROUNDWATER AND SURFACE WATER  
FLEETWIDE ASSESSMENT  
QUAD CITIES GENERATING STATION  
CORDOVA, ILLINOIS

Sample Location:	MW-QC-1165	MW-QC-1165	STP Sand Point Well	STP Sand Point Well	SW-QC-1	SW-QC-1
Sample Identification:	WG-QC-MW-QC-1165-072806-NZ-008	Result	WG-QC-MW-QC-STP-060106-JH-008	Result	WS-QC-SW-QC-001-053106-JH-002	Result
Sample Date:	7/28/2006	Error	6/1/2006	Error	5/31/2006	Error
	Units					
<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) 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)	-	ND (30)
Zirconium-95	pCi/L	ND (10)	-	ND (10)	-	ND (10)
<b>Non-Target Radionuclides <sup>(1)</sup></b>						
Actinium-228	pCi/L	RNI	-	RNI	-	RNI
Potassium-40	pCi/L	RNI	-	RNI	-	RNI

## Notes:

Samples analyzed by: Teledyne Brown

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Peak not identified, but forced activity concentration exceeds Minimum

Detectable Concentration and 3 sigma.

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

TABLE 5.3

ANALYTICAL RESULTS SUMMARY - RADIONUCLIDES IN GROUNDWATER AND SURFACE WATER  
FLEETWIDE ASSESSMENT  
QUAD CITIES GENERATING STATION  
CORDOVA, ILLINOIS

Sample Location:	SW-QC-2	SW-QC-2	Well #1	Well #1	Well #5	Well #5
Sample Identification:	WS-QC-SW-QC-002-053106-JH-003	Result	WG-MW-QC-WELL#1-060106-JH-009	Result	WG-MW-QC-WELL#5-060106-JH-010	Result
Sample Date:	5/31/2006	Error	6/1/2006	Error	6/1/2006	Error
	Units					
<b>Target Radionuclides</b>						
Barium-140	pCi/L	ND (60)	-	ND (60)	-	ND (60)
Cesium-134	pCi/L	ND (10)	-	ND (10) U*	-	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>(1)</sup></b>						
Actinium-228	pCi/L	RNI	-	RNI	-	RNI
Potassium-40	pCi/L	97.31	+/-44.6	RNI	-	RNI

## Notes:

Samples analyzed by: Teledyne Brown

(1) - These non-targeted radionuclides are included in this table but excluded from the 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.

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RNI- Radionuclide Not Identified during analysis.

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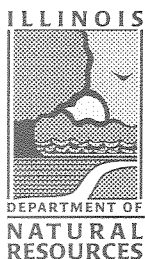
Peak not identified, but forced activity concentration exceeds Minimum

Detectable Concentration and 3 sigma.

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

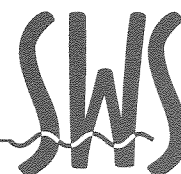
APPENDIX A

WATER SUPPLY WELL INFORMATION



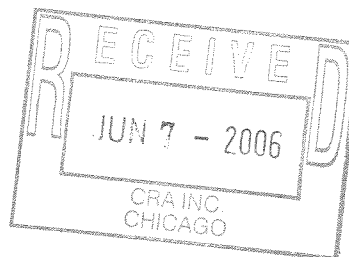
# Illinois State Water Survey

Main Office • 2204 Griffith Drive • Champaign, IL 61820-7495 • Tel (217) 333-2210 • Fax (217) 333-6540  
Peoria Office • P.O. Box 697 • Peoria, IL 61652-0697 • Tel (309) 671-3196 • Fax (309) 671-3106



6/1/2006

Ms. Patrica Klick  
CRA  
8615 W. Bryn Mawr  
Chicago, IL 60631



Dear Ms. Klick:

As you requested during our telephone conversation on June 01, 2006, we are enclosing printouts from our Private Well Database and Public, Industrial, Commercial Survey (PICS) Database for the following locations:

<u>COUNTY</u>	<u>TOWNSHIP</u>	<u>RANGE</u>	<u>SECTIONS</u>
ROCK ISLAND	20 NORTH	2 EAST	7, 8, 17-20

No available information is indicated on the printout by the statement "0 records were found for the specified locations." Also enclosed are explanations of the Illinois State Water Survey Private Well and PICS Databases.

The data included in the Private Well Database are those non-municipal wells which are known to the Illinois State Water Survey, and the PICS Database is an inventory of municipal well information and large industrial groundwater users. We may not have a copy of well records for these groundwater users.

The enclosed statement reflects the charges for this request which includes a \$35.00 query fee for PICS information, a \$35.00 query fee for Private well information, and a \$0.10 per page charge for 10 pages, plus a \$5.00 shipping and handling fee, totaling \$76.00.

If you have any questions or if I can be of further assistance, please call.

Sincerely,

Susie Dodd-Casey  
Associate Supportive Scientist  
Center for Groundwater Science  
Phone: (217) 333-9043

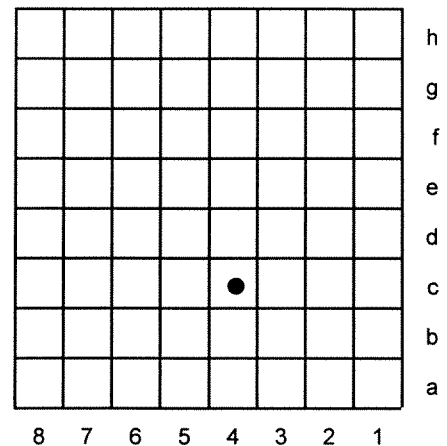
Enclosures as stated

## ISWS 10-ACRE PLOT LOCATION SYSTEM

The following is an explanation of the ISWS Private Well Database location system.

The location system uses Township, Range, and Section. The location consists of five parts: County abbreviation, Township, Range, Section, and coordinate within the section (subsection or 10-acre plot). Sections are divided into rows of  $\frac{1}{8}$ -mile squares. Each  $\frac{1}{8}$ -mile square contains 10 acres and corresponds to a quarter of a quarter of a quarter section. A normal section of 1 square mile contains 8 rows of  $\frac{1}{8}$ -mile squares; an odd-sized section contains more or fewer rows. Rows are numbered from east to west and lettered from south to north as shown in the diagram.

Example: St. Clair County, FIP No. 163  
T2N, R10W  
Section 23



The location of the well shown above is 163 2N10W-23.4c. The well point is located at the center of this 10-acre plot.



ILLINOIS STATE WATER SURVEY  
PRIVATE WELL DATABASE EXPLANATION

<b>WID</b>	Illinois State Water Survey Identification Number
<b>FIPS</b>	County Code Number
<b>TWN</b>	Civil Township
<b>RNG</b>	Range
<b>SEC</b>	Section
<b>PLOT</b>	10-acre Plot Location within the Section
<b>OWNER</b>	Well Owner
<b>DRILLER</b>	Well Drilling Contractor of Well
<b>DATE DRILLED</b>	Date Initially Drilled
<b>DEPTH</b>	Depth (well to nearest ft)
<b>RECORD TYPE</b>	Record Type (types of information on file)
	R - Construction Report
	G - Geology
	S - Sealed
	A - Affidavit
	C - Chemical Analysis
	I - Inventory
	X - Indicates Comment in Owners Field Something Unusual
	O - Any Other Type of Record
	P - Pump Installation
<b>USE</b>	Well Use (two-letter code indicating the usage of the well)
	CO - Conservation
	CS - Community Supply
	DO - Domestic
	DW - De-Watering
	IC - Industrial/Commercial
	IN - Injection Well
	IR - Irrigation
	MO - Monitoring
	NC - Non-Community
	NW - Non-Well Source
	OB - Observation
	PK - Park
	RC - Recovery Well
	RW - Relief Well
	SC - School
	ST - State

- USE** (Continued)
  - TB - Test Boring
  - TH - Test Hole
  - TW - Test Well
  - ~ - Unknown
  
- WELL TYPE** Well Type (two-letter code indicating the type of well)
  - BLANK - Assumed Drilled
  - BD - Bored
  - DL - Drilled
  - DU - Dug (Being Phased Out)
  - DR - Driven
  - NW - Non-Well
  - SP - Sand Point
  - SG - Spring
  - ~ - Assumed Drilled or Possibly Unknown
  
- AQUIFER TYPE** Aquifer Type (two-letter code indicating aquifer type)
  - BR - Bedrock
  - DH - Dry Hole
  - SW - Surface Water
  - UN - Unconsolidated
  - ~ - Unknown
  
- STAT LVL** Static Level - Reported non-pumping water level
- PUMP LVL** Pumping Level - Reported water level during initial pumping of the well
- PUMP GPM** Pumping GPM - Gallons per minute at time of well construction

THE DATA IN THE PRIVATE WELL DATABASE IS A LISTING OF THE NON-COMMUNITY WELLS WHICH ARE KNOWN TO THE ILLINOIS STATE WATER SURVEY (ISWS). THIS INFORMATION HAS BEEN ENTERED VERBATIM FROM WELL LOGS SUBMITTED BY THE DRILLER, FROM CHEMICAL ANALYSIS REPORTS, FROM WELL SEALING FORMS, OR WELL INVENTORY FORMS FROM THE 1930-34 WELL SURVEY AND OTHER SPECIAL PROJECTS. THE ACCURACY OF THIS DATA IS CONTROLLED BY THOSE WHO SUBMITTED THE FORM. INFORMATION IN THE PRIVATE WELL DATABASE HAS NOT BEEN VERIFIED.

**ILLINOIS STATE WATER SURVEY  
PICS DATABASE EXPLANATION**

<b>SWS ID</b>	ISWS Facility ID Number
<b>NAME</b>	Facility Name
<b>WELL #</b>	ISWS Point Source Well/Intake Number
<b>STATUS</b>	Point Source Status of Well/Intake A = Abandoned - no longer in existence, no affidavit on file, or do not know if it has been filled in C = Capped - cap attached to top D = Disconnected - disconnected from system E = Emergency - available for standby use I = In Use - produces major portion of water O = Observation - used for water level measurements S = Sealed - filled in U = Unused - exists but not used
<b>FIPS</b>	County Code Number
<b>TWN</b>	Civil Township
<b>RNG</b>	Range
<b>SEC</b>	Section
<b>PLOT</b>	10-acre Plot Location within the Section
<b>DEPTH</b>	Depth (well to nearest ft)
<b>TYPE LOG</b>	D = Driller's log O = Other X = Chemical C = Correlated log S = Sample study log - = Log not available
<b>YEAR</b>	Year Point Source Initially Constructed
<b>DRILLER</b>	Well Drilling Contractor of Well

# Illinois State Water Survey Private Well Database

Thursday, June 1, 2006

County: ROCK ISLAND

Township: 20N

Range: 02E

Sections: 07,08,17,18,19,20

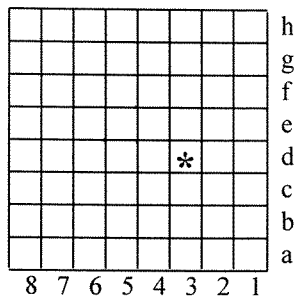
Records Found: 87

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

**Publication: Please cite the Illinois State Water Survey's Private Well Database in all publications based wholly or partially on this information.**

Note: The data in the Private Well Database is a listing of non-municipal wells which are known to the Illinois State Water Survey (ISWS). This information has been entered verbatim from well logs submitted by the driller, chemical analysis reports, well sealing forms, well inventory forms from the 1930-1934 well survey, and other special projects. The accuracy of this data is controlled by those submitting the forms. Information in the Private Well Database has not been 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'.

WID	FIPS	'N	RNG	SEC	PLOT	OWNER	DRILL	RECORD	WELL	AQ	STA	PUMP				
							DATE	DEPTH	TYPE	USE	TYPE	LVL	VL	GPM		
127628	161	40N	02E	07			00/00/1913	42	C		DR					
127629	161	20N	02E	07			UNKNOWN	00/00/1910	36	RG	DR					
127630	161	20N	02E	07			B BAUMGARTNER	00/00/1929	41	RG	DR					
127631	161	20N	02E	07			B JACOBSEN	00/00/1934	24	RG	DR					
127632	161	20N	02E	07			J SALLOWES	00/00/1914	34	RG	DR					
127633	161	20N	02E	07			A ROWLAND	00/00/1934	48	RG	DR					
127634	161	20N	02E	07			F M BAILEY	00/00/1909	20	RG	DU					
127635	161	20N	02E	07			M LAMB	00/00/1918	58	RG	DR					
127637	161	20N	02E	07			M J FENNO	03/06/1968	44	RG	DO					
249299	161	20N	02E	07	IC		LYONS	11/27/1989	48	RG	DO	DL	UN	19	40	
330143	161	20N	02E	07	IE		GLENN LYONS	09/21/1995	76	RG	DO	DL	UN	18	39	
358883	161	20N	02E	07	IF		LATTA WELL & PUMP/KIRK	08/28/2002	50	RG	DO	DL	UN	19	39	40
249300	161	20N	02E	07	IG		WINSLOW	07/31/1968	106	RG	DO	DL	UN	17	25	30
275580	161	20N	02E	07	2E		LYONS	08/09/1995	63	RG	DO	DL	UN	29	44	
297449	161	20N	02E	07	2E		GLENN LYONS	10/11/1996	51	RG	DO	DL	UN	29	46	

WID	FIPS	TWN	RNG	SEC	PLOT	OWNER	DRILLER	DRILL DATE	DEPTH	RECORD TYPE	WELL TYPE	AQ	STAT	PUMP LVL	PUMP LVL	PUMP LVL	PUMP LVL	PUMP LVL	PUMP LVL	
375638	161	20N	02E	07	2E	[REDACTED]	LATTA WELL & PUMP/KIRK	11/03/2005	50	RG	DO	DL	UN	18	39	50				
127640	161	20N	02E	07	2F	[REDACTED]	MJFENNO	06/01/1978	60	RG	DO	DL	UN	20	21	15				
240684	161	20N	02E	07	3B	[REDACTED]	LYONS	09/18/1992	45	RG	DO	--	UN	18	30					
311201	161	20N	02E	07	3B	[REDACTED]	LYONS DRILLING/HUBB	06/27/1997	50	RG	DO	DL	UN	29	34	18				
244019	161	20N	02E	07	3C	[REDACTED]	HOYLE WELL & PUMP	05/28/1993	12	RG	DO	DL	UN	16	23	20				
297451	161	20N	02E	07	3D	[REDACTED]	GLENN LYONS	09/26/1995	67	RG	DO	DL	UN	36	49					
318841	161	20N	02E	07	3D	[REDACTED]	LYONS DRILLING	06/25/1997	46	RG	DO	DL	UN	14	34	40				
355182	161	20N	02E	07	3D	[REDACTED]	LYONS WELL DRILLING/DALE HUBB	07/31/2003	53	RG	DO	DL	UN	18	34	25				
127636	161	20N	02E	07	3D	[REDACTED]	UNKNOWN	00/00/1934	60	RGC	--	DR	--	--	--	--				
127641	161	20N	02E	08		[REDACTED]	NEIDIG BROS	00/00/1941	73	RG	DO	--	--	--	--					
127642	161	20N	02E	08		[REDACTED]	E WILLIAMS	00/00/1918	54	RG	--	DR	--	--	--					
127643	161	20N	02E	08		[REDACTED]	C SALLOWES	00/00/1904	65	RG	--	DU	--	--	--					
127644	161	20N	02E	08		[REDACTED]	FLAGEL WELL DRLG	10/00/1958	45	RG	DO	--	--	--	--					
127645	161	20N	02E	08		[REDACTED]	FLAGEL WELL DRLG	10/00/1958	100	RGX	DO	--	--	--	--					
127646	161	20N	02E	08		[REDACTED]	FLAGEL WELL DRLG	10/00/1958	71	RGX	DO	--	--	--	--					

WID	FIPS	'N	RNG	SEC	PLOT	OWNER	DRII	DRILL DATE	DEPTH	RECORD TYPE	USE TYPE	WELL AQ STAT	PUMP	PUMP
127671	161	20N	02E	08	1H	MILWAUKEE R R	M J FENNA	09/16/1969	47	RG	SP			
340486	161	20N	02E	08	7G	[REDACTED]	GINGERICH WELL DRILLING	04/19/2001	205	RG	DO DL	BR		
127649	161	20N	02E	08	8G	[REDACTED]	GLYONS	10/23/1985	47	RG	DO			
249301	161	20N	02E	08	8H	[REDACTED]	LYONS	11/30/1989	47	RG	DO DL	UN	16	30
263201	161	20N	02E	08	8H	[REDACTED]	LYONS	11/24/1993	70	RG	DO DL	UN	33	50
358776	161	20N	02E	08	8H	[REDACTED]	LATTA WELL & PUMP	04/10/2002	72	RG	DO DL	UN	14	39
366145	161	20N	02E	08	8H	[REDACTED]	LYONS WELL DRILLING/DALE HUBB	09/23/2003	70	RG	DO DL	UN	15	39
127648	161	20N	02E	08	8H	[REDACTED]	GLYONS	05/24/1984	45	RG	DO			40
127666	161	20N	02E	17		[REDACTED]	HELLINGSHEAD	00/00/1873	62	RG	DO			
127667	161	20N	02E	17		[REDACTED]	UNKNOWN	00/00/1934	47	RG	DR			
355215	161	20N	02E	17	6G	EXELON GENERATION CO.LLC	JOHN KOPP	/ / 167		A	IC DL			
Sealed: 6/23/03														
127674	161	20N	02E	18	2A	[REDACTED]	E WILLIAMS	00/00/1920	60	RG	DR			
127675	161	20N	02E	18	2B	[REDACTED]	E WILLIAMS	00/00/1915	60	RG	DR			
127676	161	20N	02E	18	2C	[REDACTED]	OWNER	00/00/1909	60	RG	DU			
340848	161	20N	02E	18	2E	[REDACTED]	HOYLE WELL & PUMP/TIMMERMAN	01/12/2001	80	RG	DO DL	UN	23	38
20														

WID	FIPS	TWN	RNG	SEC	PLOT	OWNER	DRILLER	DRILL DATE	DEPTH	RECORD TYPE	WELL TYPE	AQ TYPE	STAT LVL	PUMP LVL	PUMP GPM	
127678	161	20N	02E	18	3G	[REDACTED]	M WILLIAMS	00/00/1927	54	RG	DR	---	---	---	---	
127680	161	20N	02E	19		[REDACTED]	BENSTER	00/00/1910	52	RG	DU	---	---	---	---	
127681	161	20N	02E	19		[REDACTED]	F L WILLIAMS	00/00/1933	60	RG	DR	---	---	---	---	
127682	161	20N	02E	19		[REDACTED]	J SALLOWES	00/00/1928	60	RG	DU	---	---	---	---	
127683	161	20N	02E	19		[REDACTED]	J JOHNSON	00/00/1929	60	RG	DR	---	---	---	---	
127684	161	20N	02E	19		[REDACTED]	UNKNOWN	00/00/1934	60	RG	DR	---	---	---	---	
127685	161	20N	02E	19		[REDACTED]	M J FENNO	10/30/1972	68	RG	DO	---	---	---	---	
127686	161	20N	02E	19	IA	[REDACTED]	M J FENNO	08/24/1974	90	RG	DO	---	---	---	---	
127687	161	20N	02E	19	ID	[REDACTED]	M J FENNO	08/07/1974	59	RG	SP	---	---	---	---	
127688	161	20N	02E	19	IG	[REDACTED]	M J FENNO	07/14/1972	75	RG	DO	---	---	---	---	
127689	161	20N	02E	19	IG	[REDACTED]	M J FENNOP	06/24/1977	62	RG	DO	---	---	---	---	
249302	161	20N	02E	19	IH	[REDACTED]	FENNO	06/09/1977	70	RG	DO	DL	UN	29	31	15
127690	161	20N	02E	19	2D	[REDACTED]	M J FENNO	10/24/1980	67	RG	DO	---	---	---	---	
127691	161	20N	02E	19	2E	[REDACTED]	M J FENNO	09/01/1973	71	RG	DO	---	---	---	---	
362267	161	20N	02E	19	2H	[REDACTED]	LATTA WELL & PUMP/KIRK	09/22/2003	70	RG	DO	DL	UN	24	39	50



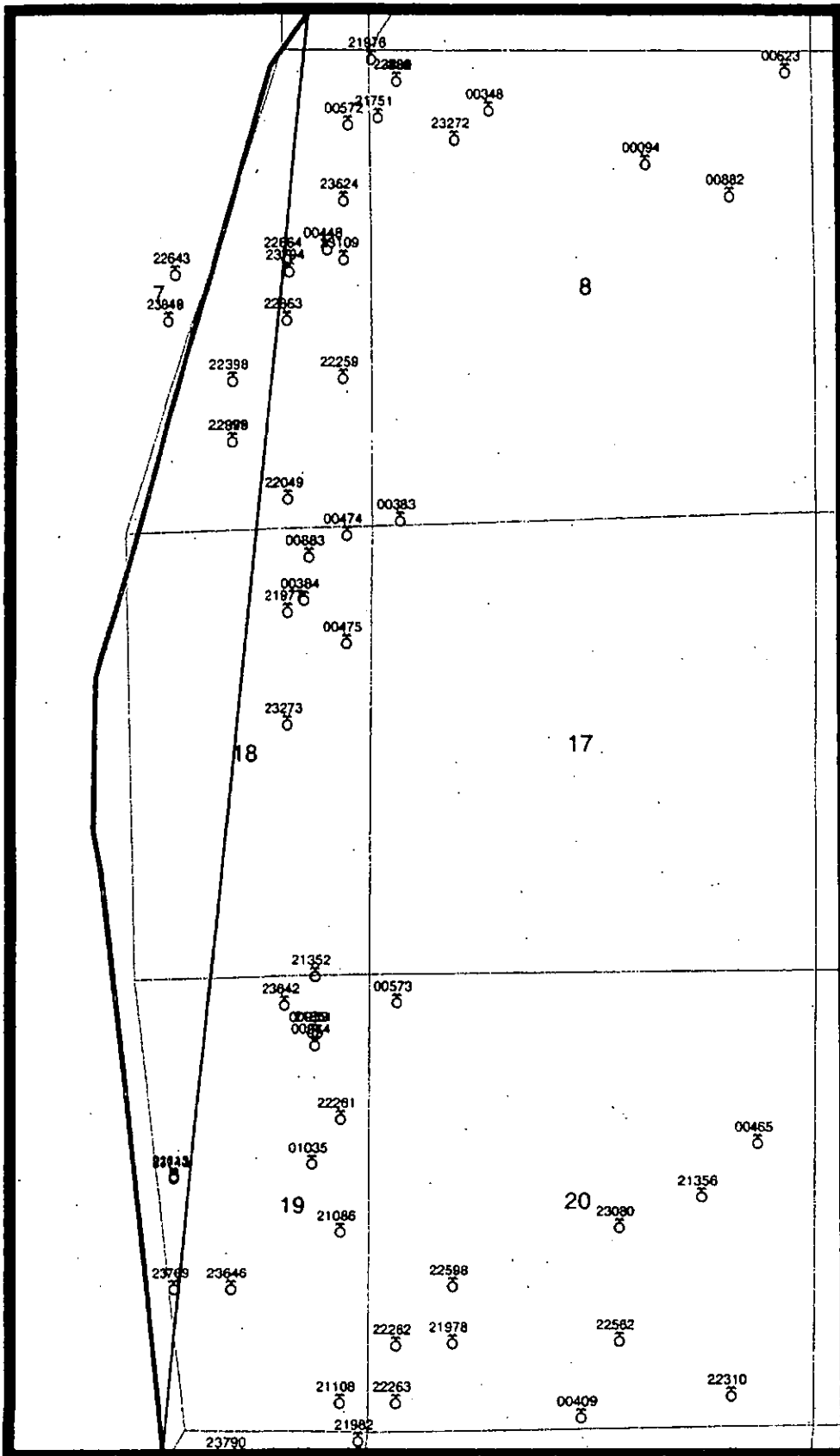
WID	FIPS	TWN	RNG	SEC	PLOT	OWNER	DRI	DRILL DATE	DEPTH	RECORD TYPE	WELL TYPE	AQ STA	PUMP LVL
361991	161	20N	02E	19	3C	[REDACTED]	HOYLE WELL & PUMP/CORWIN	03/08/2004	96	RG	DO DL BR		20
371586	161	20N	02E	19	3C	[REDACTED]	SELF	00/00/0000	70	A	DO SP		
371677	161	20N	02E	19	4C	[REDACTED]	GINGERICH WELL/CORWIN	10/21/2004	98	RG	DO DL UN	28	43 60
369108	161	20N	02E	19	4C	[REDACTED]	HOYLE WELL & PUMP/TOM	00/00/0000	44	A	DO SP		
369109	161	20N	02E	19	4C	[REDACTED]	HOYLE WELL & PUMP/TOM	00/00/0000	20	A	DO DU		
363143	161	20N	02E	19	4E	[REDACTED]	JOEL JOHNSON	00/00/0000	42	A	DO DR		
368552	161	20N	02E	19	4E	[REDACTED]	GINGERICH WELL /JOE06/24/2004	235	235	RG	DO DL BR	25	58 15
272141	161	20N	02E	19	4E	[REDACTED]	LYONS	06/20/1995	65	RG	DO DL UN	39	49
328274	161	20N	02E	19	6A	[REDACTED]	HOYLE WELL & PUMP	10/23/2000	80	RG	DO DL UN	33	48 20
324661	161	20N	02E	19	7D	[REDACTED]	HOYLE WELL & PUMP	05/20/2000	80	RG	DO DL UN	39	49 15
325280	161	20N	02E	19	8D	[REDACTED]	LYONS DRILLING	08/31/2000	70	RG	DO DL UN	36	49 60
127692	161	20N	02E	20		[REDACTED]	J SALLOWES	00/00/1924	45	RG	DU		
127693	161	20N	02E	20		[REDACTED]	J SALLOWES	00/00/1926	38	RG	DR		
127694	161	20N	02E	20		[REDACTED]	UNKNOWEN	00/00/1884	35	RG	SC		
127695	161	20N	02E	20		[REDACTED]	PREVIOUS OWNER	00/00/1921	37	RG	DR		

WID	FIPS	TWN	RNG	SEC	PLOT	OWNER	DRILLER	DRILL DATE	DEPTH	RECORD TYPE	WELL TYPE	AQ TYPE	STAT LVL	PUMP LVL	PUMP GPM
127696	161	20N	02E	20		[REDACTED]	M J FENNO	06/15/1967	60	RG	DO	UN			
127697	161	20N	02E	20		[REDACTED]	M J FENNO	06/06/1968	49	RG	DO	UN			
232166	161	20N	02E	20	2A	[REDACTED]	HOYLE WELL & PUMP CO	04/16/1991	80	RG	DO	UN	30	60	
127698	161	20N	02E	20	3E	[REDACTED]	S D ALBRECHT	00/00/1977	104	RG	IR	UN			
263202	161	20N	02E	20	4B	[REDACTED]	GROSCH IRRIGATION	03/17/1993	102	RG	DL	UN			
325276	161	20N	02E	20	4D	[REDACTED]	LYONS DRILLING			RG	DL	UN			
127699	161	20N	02E	20	6E	[REDACTED]	HOYLE WELL DRLG	08/02/1978	140	RG	DO	UN			
127700	161	20N	02E	20	7B	[REDACTED]	GROSCH IRRIG	03/13/1984	115	RG	IR	UN			
267574	161	20N	02E	20	7C	[REDACTED]	HOYLE WELL & PUMP	10/21/1993	61	RG	DO	UN	29	44	12
227309	161	20N	02E	20	8A	[REDACTED]	HOYLE WELL & PUMP	08/24/1990	59	RG	DO	UN	35	45	10
249303	161	20N	02E	20	8B	[REDACTED]	HOYLE WELL & PUMP	07/24/1989	60	RG	DO	BR	35	37	
127701	161	20N	02E	20	8H	[REDACTED]	WINSLOW WELL DRLG	04/29/1968	250	RG	DU	UN			



SWSID	FIPS	TWN	RNG	SEC	PLOT	NAME	DB ID	WELL #	DEPTH	STATUS	SEALED	TYPE	YEAR	DRILLER
16130340	161	20N	02E	07	2A	EXELON - QUAD CITIES STATION	12950	8	225	E	--	D	1987	ALBRECHT WELL DRLG
16130340	161	20N	02E	07	3A	EXELON - QUAD CITIES STATION	12948	6	58	I	--	O	1984	WINSLOW DRILLING COMPANY
16130340	161	20N	02E	08	6A	EXELON - QUAD CITIES STATION	12944	2	250	A	--	S	1966	WEHLING WELL WORKS
16130340	161	20N	02E	08	6A	EXELON - QUAD CITIES STATION	12952	2						U
16130340	161	20N	02E	18		EXELON - QUAD CITIES STATION		9	84	I		D	1966	WEHLING WELL DRILLING
16130340	161	20N	02E	18	1G	EXELON - QUAD CITIES STATION	12946	4	1798	A	--	D	1968	WEHLING WELL WORKS
16130340	161	20N	02E	18	1H	EXELON - QUAD CITIES STATION	12945	3	1800	A	--	D	1968	WEHLING WELL WORKS
16130340	161	20N	02E	18	2G	EXELON - QUAD CITIES STATION		11	250	I		D	1966	E.C. WEHLING
16130340	161	20N	02E	18	2G	EXELON - QUAD CITIES STATION		10	250	I		D	1966	E.C. WEHLING
16130340	161	20N	02E	18	2G	EXELON - QUAD CITIES STATION	12949	7	178	I	--	D	1984	GROSCH IRRIGATION CO
16130340	161	20N	02E	18	2H	EXELON - QUAD CITIES STATION	12947	5	264	I	--	D	1969	WEHLING WELL WORKS
16130340	161	20N	02E	18	2H	EXELON - QUAD CITIES STATION	12943	1	242	I	--	D	1966	WEHLING WELL WORKS
16130340	161	20N	02E	18	3G	EXELON - QUAD CITIES STATION	12951	1						

SWSID	FIPS	VN	RNG	SEC	PLOT	NAME	3 ID	WELL #	DEPTH	STATUS	SEALED	YEAR	DRI	R
16133578	161	20N	02E	19	1F	[REDACTED]	14211	3	100	I	--	1990	GROSCH	IRRIGATION CO
16133578	161	20N	02E	20	7B	[REDACTED]	14187	1	115	I	--	1984	GROSCH	IRRIGATION CO



Explanation		
● Oil	☀ Gas Injection	○ Junked
✱ Oil & Gas	⊕ Gas Storage	◊ Temporarily Abandoned
☀ Gas	⊖ Salt Water Disposal	⊗ Observation
⚡ D&A - Oil Show	⊗ Water Injection	⊗ Other Injection
☀ D&A - Gas Show	⊕ Water Supply	□ Confidential
⚡ D&A - Oil & Gas Show	○ Permit	⊗ Other Well Type
◊ D&A	○ Water	+ Status Unknown
/ through any symbol indicates well is currently plugged		

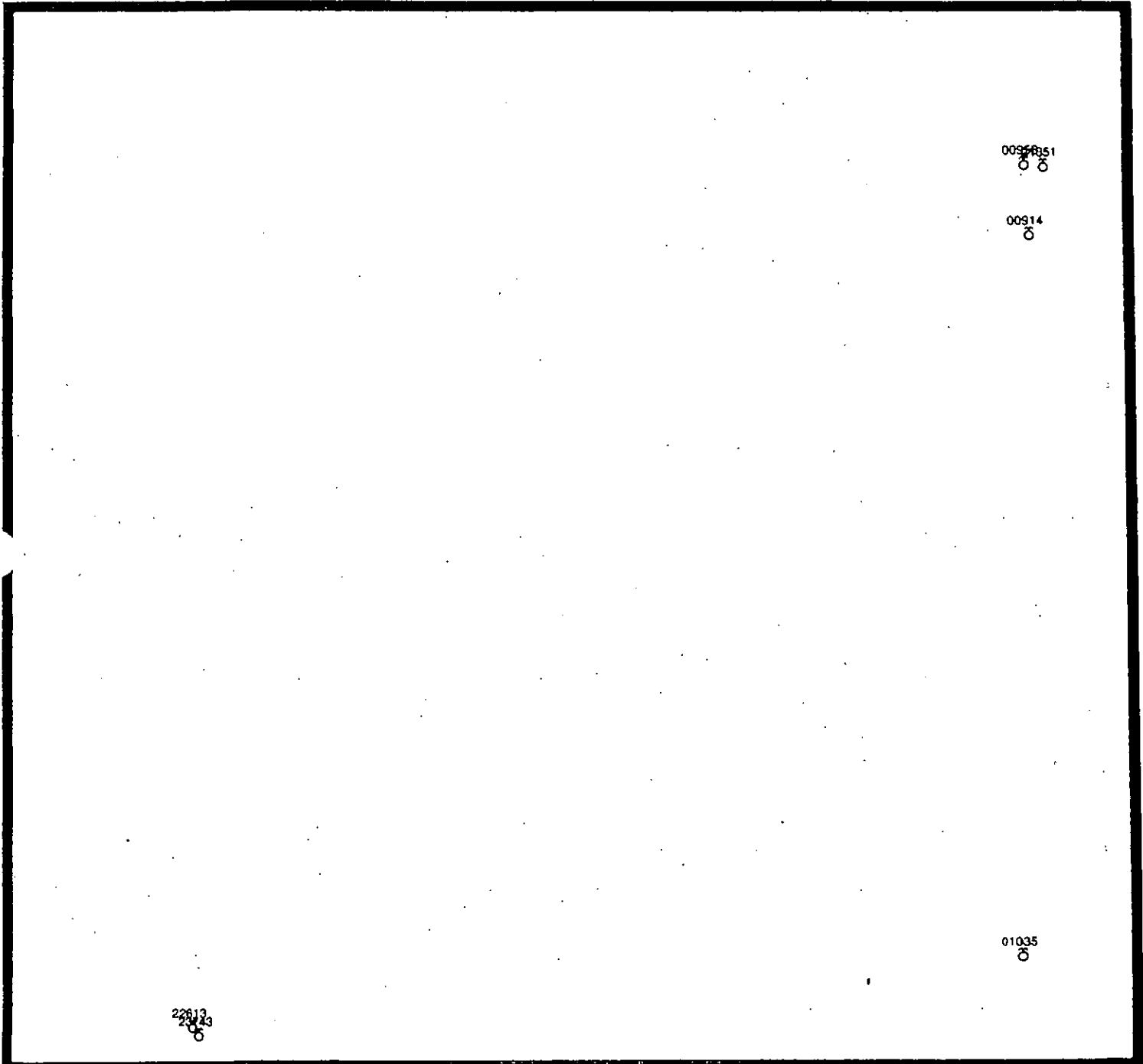


0 2000 4000 ft

Illinois State Geological Survey  
**QuESToR: Custom Map**  
 Date: 09-JUN-06 Scale: 1:24000

Displayed data is based upon information supplied to the Illinois State Geological Survey (ISGS) and are not field verified. The ISGS does not guarantee the validity, accuracy or completeness of these data.

Map Area: [REDACTED]



Explanation		
● Oil	☼ Gas Injection	⊗ Junk
* Oil & Gas	⊕ Gas Storage	⊖ Temp
☼ Gas	⊗ Salt Water Disposal	⊗ Obsc
⊕ D&A - Oil Show	⊗ Water Injection	⊗ Other
☼ D&A - Gas Show	⊕ Water Supply	□ Confl
⊕ D&A - Oil & Gas Show	○ Permit	⊗ Other
⊕ D&A	⊗ Water	+ Stati

— through any symbol indicates well is currently plugged

*Enlargement of congested area Sec. 19.*

0 296 592 ft

Illinois State Geological Survey

**QuESToR: Custom Map**

Date: 09-JUN-06 Scale: 1:3552

Displayed data is based upon information supplied to the Illinois State Geological Survey (ISGS) and are not field verified. The ISGS does not guarantee the validity, accuracy or completeness of these data.

## Non Oil and Gas - Wells

121612286300	[REDACTED]		7-20N- 2E
RockIsland		2	
Status: WATER		NW NE SE	Elev: 0
permit: 161WW76	permit date: 09/21/95		comp. date: 09/26/95
Lambert X: 2780131	Lambert Y: 3168546		td: 67
producing formation:	td formation:		
latitude: [REDACTED]	longitude: [REDACTED]		
121612225900	[REDACTED]		7-20N- 2E
RockIsland			
Status: WATER		SE NE SE	Elev: 0
permit: 015939	permit date: 11/16/89		comp. date: 11/27/89
Lambert X: 2780795	Lambert Y: 3167872		td: 48
producing formation:	td formation:		
latitude: [REDACTED]	longitude: [REDACTED]		
121612301900	[REDACTED]		7-20N- 2E
RockIsland		1	
Status: WATER		NW NW SE	Elev: 0
permit:	permit date: 06/20/97		comp. date: 06/25/97
Lambert X: 2778742	Lambert Y: 3168530		td: 46
producing formation:	td formation:		
latitude: [REDACTED]	longitude: [REDACTED]		
121612204900	Albrecht, Dean S.		7-20N- 2E
RockIsland	Commonwealth Edison		
Status: WATER		SW SE SE	Elev: 0
permit: 136904	permit date: 11/03/87		comp. date: 11/17/87
Lambert X: 2780143	Lambert Y: 3166493		td: 225
producing formation:	td formation:		
latitude: [REDACTED]	longitude: [REDACTED]		
121612379400	[REDACTED]		7-20N- 2E
RockIsland			
Status: WATER		SW SE NE	Elev: 0
permit:	permit date: 10/25/05		comp. date: 11/03/05
Lambert X: 2780133	Lambert Y: 3169108		td: 50
producing formation:	td formation:		
latitude: [REDACTED]	longitude: [REDACTED]		
121610057200	[REDACTED]		7-20N- 2E
RockIsland		0001	
Status: WATER		SE NE NE	Elev: 0
permit: 0	permit date:		comp. date: 07/01/68
Lambert X: 2780844	Lambert Y: 3170753		td: 106
producing formation:	td formation:		
latitude: [REDACTED]	longitude: [REDACTED]		
121610044800	[REDACTED]		7-20N- 2E
RockIsland		0001	
Status: WATER		NE	Elev: 0
permit: 0	permit date:		comp. date: 03/01/68
Lambert X: 2780596	Lambert Y: 3169352		td: 44
producing formation:	td formation:		
latitude: [REDACTED]	longitude: [REDACTED]		
121612334800	[REDACTED]		7-20N- 2E
RockIsland		1	



Status: WATER NW NW SE Elev: 0  
permit: permit date: 07/30/03 comp. date: 07/31/03  
Lambert X: 2778742 Lambert Y: 3168530 td: 53  
producing formation: td formation:  
latitude: longitude:

121612362400 7-20N- 2E  
RockIsland  
Status: WATER NE SE NE Elev: 0  
permit: permit date: 07/26/02 comp. date: 08/28/02  
Lambert X: 2780783 Lambert Y: 3169916 td: 50  
producing formation: td formation:  
latitude: longitude:

121612310900 7-20N- 2E  
RockIsland 2  
Status: WATER SE SE NE Elev: 0  
permit: permit date: 09/18/95 comp. date: 09/21/95  
Lambert X: 2780787 Lambert Y: 3169235 td: 76  
producing formation: td formation:  
latitude: longitude:

121612286400 7-20N- 2E  
RockIsland 1  
Status: WATER SW SE NE Elev: 0  
permit: 161WW61 permit date: 10/09/96 comp. date: 10/11/96  
Lambert X: 2780127 Lambert Y: 3169230 td: 51  
producing formation: td formation:  
latitude: longitude:

121612239800 7-20N- 2E  
RockIsland  
Status: WATER SE NW SE Elev: 0  
permit: permit date: 05/24/93 comp. date: 05/28/93  
Lambert X: 2779475 Lambert Y: 3167851 td: 50  
producing formation: td formation:  
latitude: longitude:

121612239900 7-20N- 2E  
RockIsland  
Status: WATER NE SW SE Elev: 0  
permit: permit date: 09/08/92 comp. date: 09/18/92  
Lambert X: 2779479 Lambert Y: 3167163 td: 45  
producing formation: td formation:  
latitude: longitude:

121612297500 7-20N- 2E  
RockIsland 1  
Status: WATER NE SW SE Elev: 0  
permit: 161 WW4 permit date: 06/16/97 comp. date: 06/27/97  
Lambert X: 2779479 Lambert Y: 3167163 td: 50  
producing formation: td formation:  
latitude: longitude:

121612264300 7-20N- 2E  
RockIsland  
Status: WATER SW SW NE Elev: 0  
permit: permit date: 08/07/95 comp. date: 08/09/95  
Lambert X: 2778809 Lambert Y: 3169084 td: 63  
producing formation: td formation:  
latitude: longitude:

121612197600 [REDACTED] 8-20N- 2E  
RockIsland  
Status: WATER 100 NL 20 WL Elev: 0  
permit: 112072 permit date: 04/27/84 comp. date: 05/21/84  
Lambert X: 2781123 Lambert Y: 3171516 td: 45  
producing formation: td formation:  
latitude: [REDACTED] longitude: [REDACTED]

121610088200 [REDACTED] 8-20N- 2E  
RockIsland  
Status: WATER NW SE NE Elev: 0  
permit: 0 permit date: comp. date: 01/01/41  
Lambert X: 2785435 Lambert Y: 3169970 td: 73  
producing formation: td formation:  
latitude: [REDACTED] longitude: [REDACTED]

121612256000 [REDACTED] 8-20N- 2E  
RockIsland  
Status: WATER NW NW NW Elev: 0  
permit: WW61'93 permit date: 11/18/93 comp. date: 11/24/93  
Lambert X: 2781437 Lambert Y: 3171277 td: 70  
producing formation: td formation:  
latitude: [REDACTED] longitude: [REDACTED]

121610038300 Wehling Well Works Inc. 8-20N- 2E  
RockIsland Comm Edison 2  
Status: WATER 50 SL 350 WL Elev: 0  
permit: 0 permit date: comp. date: 09/01/66  
Lambert X: 2781484 Lambert Y: 3166240 td: 255  
producing formation: td formation:  
latitude: 41.728662 longitude: 90.304030

121612226000 [REDACTED] 8-20N- 2E  
RockIsland  
Status: WATER NW NW NW Elev: 0  
permit: 016023 permit date: 11/21/89 comp. date: 11/30/89  
Lambert X: 2781437 Lambert Y: 3171277 td: 47  
producing formation: td formation:  
latitude: [REDACTED] longitude: [REDACTED]

121612370100 [REDACTED] 8-20N- 2E  
RockIsland 1  
Status: WATER NW NW NW Elev: 0  
permit: permit date: 09/12/03 comp. date: 09/23/03  
Lambert X: 2781437 Lambert Y: 3171277 td: 70  
producing formation: td formation:  
latitude: [REDACTED] longitude: [REDACTED]

121612175100 [REDACTED] 8-20N- 2E  
RockIsland  
Status: WATER 100 NL 100 WL SW NW NW Elev: 0  
permit: 120728 permit date: 10/03/85 comp. date: 10/23/85  
Lambert X: 2781207 Lambert Y: 3170837 td: 47  
producing formation: td formation:  
latitude: [REDACTED] longitude: [REDACTED]

121610009400 Flagel Drlg Co 8-20N- 2E  
RockIsland Mallory Lyle 0001  
Status: WATER 1300 NL 2000 EL Elev: 0  
permit: 0 permit date: comp. date: 10/01/58  
Lambert X: 2784430 Lambert Y: 3170327 td: 100  
producing formation: td formation:  
latitude: 41.739998 longitude: 90.293322

121610034800 Flagel Drlg Co 8-20N- 2E  
RockIsland 2  
Status: WATER Elev: 0  
permit: 0 permit date: comp. date: 10/01/58  
Lambert X: 2782526 Lambert Y: 3170920 td: 71  
producing formation: td formation:  
latitude: longitude:

121610062300 8-20N- 2E  
RockIsland Milwaukee Rl Rd 0001  
Status: WATER 250 NL 300 EL. Elev: 0  
permit: 0 permit date: comp. date: 09/01/69  
Lambert X: 2786122 Lambert Y: 3171382 td: 57  
producing formation: td formation:  
latitude: 41.742947 longitude: 90.287129

121612362200 8-20N- 2E  
RockIsland NW NW NW Elev: 0  
Status: WATER permit date: 04/05/02 comp. date: 04/10/02  
permit: Lambert X: 2781437 Lambert Y: 3171277 td: 72  
producing formation: td formation:  
latitude: longitude:

121612327200 8-20N- 2E  
RockIsland SE NW NW Elev: 0  
Status: WATER permit date: 04/17/01 comp. date: 04/19/01  
permit: Lambert X: 2782106 Lambert Y: 3170605 td: 205  
producing formation: td formation:  
latitude: longitude:

121610088300 Wehling Well Works Inc. 18-20N- 2E  
RockIsland Common W Edison 0001  
Status: WATER 350 NL 750 EL. Elev: 606GL  
permit: 0 permit date: comp. date: 09/01/66  
Lambert X: 2780383 Lambert Y: 3165807 td: 255  
producing formation: td formation:  
latitude: 41.727441 longitude: 90.308067

121612197700 McKinney, Ted 18-20N- 2E  
RockIsland Commonwealth Ed-SIU Fishery  
Status: WATER SW NE NE Elev: 0  
permit: 115930 permit date: 11/21/84 comp. date: 11/28/84  
Lambert X: 2780142 Lambert Y: 3165177 td: 178  
producing formation: td formation:  
latitude: 41.725743 longitude: 90.307303

121610038400 18-20N- 2E  
RockIsland Commonwealth Edison 1  
Status: WATER 840 NL 780 EL. Elev: 0  
permit: 0 permit date: comp. date: 09/01/66  
Lambert X: 2780352 Lambert Y: 3165316 td: 250  
producing formation: td formation:  
latitude: 41.726087 longitude: 90.308165

121610047400 Wehling Well Works Inc. 18-20N- 2E  
RockIsland Commonwealth Edison 3  
Status: WATER 100 NL 300 EL. Elev: 610GL  
permit: 0 permit date: comp. date: 08/01/68  
Lambert X: 2780834 Lambert Y: 3166070 td: 1800



permit: Lambert X: 2778821 producing formation: latitude: [REDACTED] permit date: 06/23/04 Lambert Y: 3158611 td formation: longitude: [REDACTED] comp. date: 06/24/05 td: 235

121610091400 RockIsland Status: WATER 800 NL 650 EL permit: 0 Lambert X: 2780470 producing formation: latitude: [REDACTED] [REDACTED] 19-20N- 2E 0001 Elev: 0 permit date: Lambert Y: 3160164 comp. date: 07/01/72 td: 75

121612135200 RockIsland Status: WATER 10 NL 640 EL permit: 0 Lambert X: 2780480 producing formation: latitude: [REDACTED] [REDACTED] 19-20N- 2E 1 Elev: 0 permit date: Lambert Y: 3160954 comp. date: 07/01/77 td: 70

121612261300 RockIsland Status: WATER SW SW NE permit: 0 Lambert X: 2778811 producing formation: latitude: [REDACTED] [REDACTED] 19-20N- 2E Elev: 0 permit date: 06/09/95 Lambert Y: 3158624 comp. date: 06/20/95 td: 65

121612108600 RockIsland Status: WATER NE NE SE permit: 0 Lambert X: 2780791 producing formation: latitude: [REDACTED] [REDACTED] 19-20N- 2E 1 Elev: 0 permit date: Lambert Y: 3157970 comp. date: 07/01/74 td: 59

121612226100 RockIsland Status: WATER NE SE NE permit: 017598 Lambert X: 2780790 producing formation: latitude: [REDACTED] [REDACTED] 19-20N- 2E Elev: 0 permit date: 04/19/90 Lambert Y: 3159303 comp. date: 04/25/90 td: 100

121612376900 RockIsland Status: WATER SW NW SE permit: 0 Lambert X: 2778822 producing formation: latitude: [REDACTED] [REDACTED] 19-20N- 2E Elev: 0 permit date: 10/19/04 Lambert Y: 3157297 comp. date: 10/21/04 td: 98

121612364600 RockIsland Status: WATER SE NW SE permit: 0 Lambert X: 2779471 producing formation: latitude: [REDACTED] [REDACTED] 19-20N- 2E Elev: 0 permit date: 03/03/04 Lambert Y: 3157304 comp. date: 03/08/04 td: 96

121610040900 [REDACTED] 20-20N- 2E

RockIsland [REDACTED] 0001  
 Status: WATER 120 SL 100 EL SW Elev: 0  
 permit: 0 permit date: comp. date: 06/01/67  
 Lambert X: 2783647 Lambert Y: 3155792 td: 60  
 producing formation: td formation:  
 latitude: [REDACTED] longitude: [REDACTED]

121612226200 [REDACTED] 20-20N- 2E  
 RockIsland  
 Status: WATER [REDACTED] NW SW SW Elev: 0  
 permit: 013116 permit date: 07/19/89 comp. date: 07/24/89  
 Lambert X: 2781450 Lambert Y: 3156641 td: 60  
 producing formation: td formation:  
 latitude: [REDACTED] longitude: [REDACTED]

121610057300 [REDACTED] 20-20N- 2E  
 RockIsland  
 Status: WATER [REDACTED] NW NW NW Elev: 0  
 permit: 0 permit date: comp. date: 04/01/68  
 Lambert X: 2781450 Lambert Y: 3160646 td: 250  
 producing formation: td formation:  
 latitude: [REDACTED] longitude: [REDACTED]

121612256200 [REDACTED] 20-20N- 2E  
 RockIsland  
 Status: WATER [REDACTED] NW SW SE Elev: 0  
 permit: WW05'93 permit date: 01/05/93 comp. date: 03/17/93  
 Lambert X: 2784079 Lambert Y: 3156679 td: 102  
 producing formation: td formation:  
 latitude: [REDACTED] longitude: [REDACTED]

121612231000 [REDACTED] 20-20N- 2E  
 RockIsland  
 Status: WATER [REDACTED] SW SE SE Elev: 0  
 permit: WW10'91 permit date: 04/04/91 comp. date: 04/16/91  
 Lambert X: 2785390 Lambert Y: 3156031 td: 80  
 producing formation: td formation:  
 latitude: [REDACTED] longitude: [REDACTED]

121612259800 [REDACTED] 20-20N- 2E  
 RockIsland  
 Status: WATER [REDACTED] SE NW SW Elev: 0  
 permit: permit date: 10/20/93 comp. date: 10/21/93  
 Lambert X: 2782108 Lambert Y: 3157318 td: 61  
 producing formation: td formation:  
 latitude: [REDACTED] longitude: [REDACTED]

121612135600 [REDACTED] 20-20N- 2E  
 RockIsland  
 Status: WATER 10 SL 10 EL SW NE 1823 Elev: 0  
 permit: 0 permit date: comp. date: 06/01/77  
 Lambert X: 2785064 Lambert Y: 3158370 td: 130  
 producing formation: td formation:  
 latitude: [REDACTED] longitude: [REDACTED]

121610046500 [REDACTED] 20-20N- 2E  
 RockIsland  
 Status: WATER 660 SL 660 EL NE 0001 Elev: 0  
 permit: 0 permit date: comp. date: 06/01/68  
 Lambert X: 2785736 Lambert Y: 3159030 td: 49  
 producing formation: td formation:  
 latitude: [REDACTED] longitude: [REDACTED]

121612308000 [REDACTED] 20-20N- 2E  
RockIsland  
Status: WATER [REDACTED] NW NW SE Elev: 1 0  
permit: permit date: 08/22/00 comp. date: 08/25/00  
Lambert X: 2784084 Lambert Y: 3158013 td: 70  
producing formation: td formation:  
latitude: [REDACTED] longitude: [REDACTED]

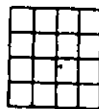
121612197800 [REDACTED] 20-20N- 2E  
RockIsland  
Status: WATER [REDACTED] NE SW SW Elev: 0  
permit: 111479 permit date: 03/08/84 comp. date: 03/13/84  
Lambert X: 2782107 Lambert Y: 3156650 td: 45  
producing formation: td formation:  
latitude: [REDACTED] longitude: [REDACTED]

121612226300 [REDACTED] 20-20N- 2E  
RockIsland  
Status: WATER [REDACTED] SW SW SW Elev: 0  
permit: 018841 permit date: 08/14/90 comp. date: 08/24/90  
Lambert X: 2781450 Lambert Y: 3155973 td: 59  
producing formation: td formation:  
latitude: [REDACTED] longitude: [REDACTED]

121612198200 [REDACTED] 30-20N- 2E  
RockIsland  
Status: WATER 125 NL 100 EL Elev: 0  
permit: 113659 permit date: 07/27/84 comp. date: 08/24/84  
Lambert X: 2781018 Lambert Y: 3155510 td: 52  
producing formation: td formation:  
latitude: [REDACTED] longitude: [REDACTED]

# GEOLOGICAL AND WATER SURVEYS WELL RECORD

Property owner [REDACTED] Well No. #1  
 Address [REDACTED]  
 Well address [REDACTED]  
 Lot        Subd         
 Driller Lyons, Larry License No. 102-2771  
 Permit No. 161-WW44-97 Date 06/20/1997  
 Water from gravel County Rock Island  
 at depth 23 to 46 ft.  
 Screen: Diam. 6 in. Sec. 7  
 Length: 5 ft. Slot 40 Rge. 2 E  
 Elev.       



**Casing and Liner Pipe**

Diam. (in.)	Kind and Weight	From (ft)	To (ft)
6	A53B	0	42

Size hole below casing:        in.  
 Static level 15 ft. below casing top which is 1 ft.  
 above ground level. Pumping level 35 ft. when pumping at 40  
 gpm for 4 hours.

Formations passed through	Thickness	Bottom
topsoil	1	1
red clay	2	3
red sandy clay	20	23
gravel	23	46

Household - Private

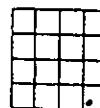
Rock Island [REDACTED]

7-20N-2E



## GEOLOGICAL AND WATER SURVEYS WELL RECORD

10. Property owner Commonwealth Edison Well No. \_\_\_\_\_  
 Address 22710-206 Ave. North Cordova IL  
 Driller Albrecht, Dean S. License No. 102-1203  
 11. Permit No. 136904 Date 11/03/87  
 12. Water from rock 13. County Rock Island  
 at depth 200 to 225 ft. Sec. 7  
 14. Screen: Diam. \_\_\_\_\_ in. Twp. 20 N  
 Length: \_\_\_\_\_ ft. Slot \_\_\_\_\_ Rge. 2 E  
 Elev. 6107



15. Casing and Liner Pipe SW SE SE

Diam. (in.)	Kind and Weight	From (ft)	To (ft)
8	STEEL	0	44

16. Size hole below casing: 8 in.  
 17. Static level 35 ft. below casing top which is 2 ft.  
 above ground level. Pumping level \_\_\_\_\_ ft. when pumping at 250  
 gpm for 4 hours.

18. Formations passed through	Thickness	Bottom
dirty sand	3	3
muscatine 60 slot	39	42
yellow limestone	92	134
badly fractured	3	137
yellow limestone	16	153
badly fractured	2	155
yellow limestone	8	163
hrd yl ls more wtr	22	185
yellow limestone	15	200

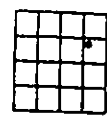
Rock Island [REDACTED]

07-20N-02E

18. Formations passed through (continued)	Thickness	Bottom
white limestone	25	225

# GEOLOGICAL AND WATER SURVEYS WELL RECORD

Property owner [REDACTED] Well No. \_\_\_\_\_  
 Address [REDACTED]  
 Well address [REDACTED]  
 Lot \_\_\_\_\_ Subd \_\_\_\_\_  
 Driller Latta, Kirk Stephen License No. 102-2755  
 Permit No. 161-W086-05 Date 10/25/2005  
 Water from sand County Rock Island  
 at depth 20 to 50 ft.  
 Screen: Diam. 5 in.  
 Length: 10 ft. Slot .014  
 Sec. 7  
 Twp. 20 N  
 Rge. 2 E  
 Elev. \_\_\_\_\_



**Casing and Liner Pipe**

Diam. (in.)	Kind and Weight	SW SE NE	
		From (ft)	To (ft)
5	PVC	-1	40
5	PVC SCREEN	40	50

Size hole below casing: \_\_\_\_\_ in.  
 Static level 19 ft. below casing top which is 1 ft.  
 above ground level. Pumping level 40 ft. when pumping at 50  
 gpm for 1 hours.

Formations passed through	Thickness	Bottom
gray medium sand	50	50

Private Water Well  
 Rock Island [REDACTED] 7-20N-2E

GEOLOGICAL WATER SURVEYS WATER WELL RECORD

Completed 7-31-68

10. Dept. Mines and Minerals permit No. 5272 Year 1968

11. Property owner [Redacted] Well No. 1

Address [Redacted]

Driller Sam W. [Redacted] License No. [Redacted]

12. Water from [Redacted] Formation [Redacted] 13. County [Redacted]

at depth 103 to 106 ft. Sec. 7

14. Screen: Diam. 4 in. Twp. 26 N

Length: 4 ft. Slot 3/32 Rng. 2 E

Elev. 600 M


15. Casing and Liner Pipe

Diam. (In.)	Kind and Weight	From (Ft.)	To (Ft.)
<u>5 1/2</u>	<u>Steel Pipe</u>	<u>0</u>	<u>103</u>

SHOW LOCATION IN SECTION PLAT

SE NE NE

16. Size Hole below casing: 5 in.

17. Static level 20 ft. below casing top which is 3 (permit) above ground level. Pumping level 25 ft. when pumping at 30 gpm for 4 hours.

18. FORMATIONS PASSED THROUGH	THICKNESS	DEPTH OF BOTTOM
<u>Soil</u>	<u>8</u>	<u>106</u>
<u>G</u>		
<u>4</u>		

(CONTINUE ON SEPARATE SHEET IF NECESSARY)

SIGNED [Signature] DATE 7/31/68

COUNTY No. 572

## GEOLOGICAL AND WATER SURVEYS WELL RECORD

Property owner [REDACTED] Well No. #1  
 Address [REDACTED]  
 Well address [REDACTED]  
 Lot            Subd           

Driller Lyons, Larry License No. 102-2771

Permit No. 161-WW46-03 Date 07/30/2003

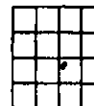
Water from sand & gravel mixed County Rock Island

at depth 30 to 53 ft. Sec. 7

Screen: Diam. 6 in. Twp. 20 N

Length: 5 ft. Slot 40 Rge. 2 E

Elev.           



**Casing and Liner Pipe** NW NW SE

Diam. (in.)	Kind and Weight	From (ft)	To (ft)
6	STEEL	0	49
6	STAINLESS STL SCREEN	48	53

Size hole below casing:            in.

Static level 19 ft. below casing top which is 1 ft.

above ground level. Pumping level 35 ft. when pumping at 25

gpm for 3 hours.

Formations passed through	Thickness	Bottom
sand	10	10
blue sandy clay	20	30
sand & gravel mixed	23	53

Private Water Well

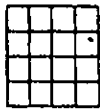
Rock Island [REDACTED] 7-20N-2E

**GEOLOGICAL AND WATER SURVEYS WELL RECORD**

Property owner [REDACTED] Well No. \_\_\_\_\_  
 Address [REDACTED]  
 Well address [REDACTED]  
 Lot 10 [REDACTED] Subd Skipper's [REDACTED]

Driller Latta, Kirk Stephen License No. 102-2755  
 Permit No. 161-W37-02 Date 07/26/2002  
 Water from sand County Rock Island

at depth 6 to 50 ft. Sec. 7  
 Screen: Diam. 5 in. Twp. 20 N  
 Length: 10 ft. Slot .014 Rge. 2 E  
 Elev. \_\_\_\_\_



Casing and Liner Pipe NE SE NE

Diam. (in.)	Kind and Weight	From (ft)	To (ft)
5	PVC	-1	40
5	PVC SCREEN	40	50

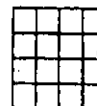
Size hole below casing: \_\_\_\_\_ in.  
 Static level 20 ft. below casing top which is 1 ft.  
 above ground level. Pumping level 40 ft. when pumping at 40  
 gpm for 1 hours.

Formations passed through	Thickness	Bottom
black topsoil	6	6
medium sand	44	50

Private Water Well  
 Rock Island [REDACTED] 7-20N-2E

# GEOLOGICAL AND WATER SURVEYS WELL RECORD

Property owner [REDACTED] Well No. #2  
 Address [REDACTED]  
 Well address [REDACTED]  
 Lot [REDACTED] Subd [REDACTED]  
 Driller Lyons, Glenn L License No. 092-0017  
 Permit No. 161 W74'95 Date 09/18/1995  
 Water from gravel County Rock Island  
 at depth 68 to 76 ft. Sec. 7  
 Screen: Diam. 6 in. Twp. 20 N  
 Length: 5 ft. Slot 40 Rge. 2 E  
 Elev. \_\_\_\_\_



### Casing and Liner Pipe

SE SE NE

Diam. (in.)	Kind and Weight	From (ft)	To (ft)
6	SCH 40 T&C 19.45#	0	71

Size hole below casing: 6 in.

Static level 19 ft. below casing top which is 1 ft.

above ground level. Pumping level 40 ft. when pumping at \_\_\_\_\_  
gpm for 2 hours.

Formations passed through	Thickness	Bottom
topsoil	1	1
sand	9	10
gravel	33	43
red & yellow clay	25	68
gravel	8	76

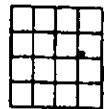
Household - Private

Rock Island [REDACTED]

7-20N-2E

# GEOLOGICAL AND WATER SURVEYS WELL RECORD

Property owner [REDACTED] Well No. #1  
 Address [REDACTED]  
 Well address [REDACTED]  
 Lot \_\_\_\_\_ Subd \_\_\_\_\_ ISWS P# \_\_\_\_\_  
 Driller Lyons, Glenn L License No. 092-0017  
 Permit No. 161MM61'96 Date 10/09/1996  
 Water from gravel County Rock Island  
 at depth 16 to 51 ft.  
 Screen: Diam. \_\_\_\_\_ in. Sec. 7 Irr  
 Length: \_\_\_\_\_ ft. Slot \_\_\_\_\_ Rge. 2 E  
 Elev. \_\_\_\_\_



**Casing and Liner Pipe**

SW SE NE

Diam. (in.)	Kind and Weight	From (ft)	To (ft)
6	SCH 40 T&C 19.45#	0	47

Size hole below casing: 6 in.  
 Static level 30 ft. below casing top which is 1 ft.  
 above ground level. Pumping level 47 ft. when pumping at \_\_\_\_\_  
 gpm for 2 hours.

Formations passed through	Thickness	Bottom
topsoil	1	1
sand	15	16
gravel	35	51

Household - Private

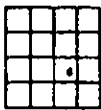
Rock Island [REDACTED]

7-20N-2E



**GEOLOGICAL AND WATER SURVEYS WELL RECORD**

10. Property owner [REDACTED] Well No. \_\_\_\_\_  
 Address [REDACTED]  
 Driller [REDACTED] License No. 102-1781  
 11. Permit No. W20 '93 Date 05/24/93  
 12. Water from sand & gravel 13. County Rock Island  
 at depth 46 to 50 ft. Sec. 7  
 14. Screen: Diam. \_\_\_\_\_ in. Twp. 20 N  
 Length: \_\_\_\_\_ ft. Slot \_\_\_\_\_ Rge. 2 E  
 Elev. \_\_\_\_\_



15. Casing and Liner Pipe SE NW SE

Diam. (in.)	Kind and Weight	From (ft)	To (ft)
5	PLASTIC	0	46

16. Size hole below casing: \_\_\_\_\_ in.  
 17. Static level 18 ft. below casing top which is 2 ft. above ground level. Pumping level 25 ft. when pumping at 20 gpm for 4 hours.

18. Formations passed through	Thickness	Bottom
sand & clay	12	12
sand & gravel	38	50

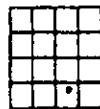
Household - Private

Rock Island [REDACTED]

07-20N-02E

**GEOLOGICAL AND WATER SURVEYS WELL RECORD**

10. Property owner [REDACTED] Well No. \_\_\_\_\_  
 Address [REDACTED]  
 Driller [REDACTED] License No. 092-0017  
 11. Permit No. W57 '92 Date 09/08/92  
 12. Water from gravel 13. County Rock Island  
 at depth 9 to 45 ft. Sec. 7  
 14. Screen: Diam. 6 in. Twp. 20 N  
 Length: 5 ft. Slot 40 Rge. 2 E  
 Elev. \_\_\_\_\_



15. Casing and Liner Pipe NE SW SE

Diam. (in.)	Kind and Weight	From (ft)	To (ft)
6	STEEL T&C 19.45	0	40

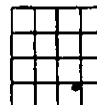
16. Size hole below casing: 6 in.  
 17. Static level 20 ft. below casing top which is 2 ft. above ground level. Pumping level 30 ft. when pumping at \_\_\_\_\_ gpm for 2 hours.

18. Formations passed through	Thickness	Bottom
sandy clay	9	9
gravel	36	45

Household - Private  
 Rock Island [REDACTED] **07-20N-02E**

## GEOLOGICAL AND WATER SURVEYS WELL RECORD

Property owner [REDACTED] Well No. #1  
 Address [REDACTED]  
 Well address [REDACTED]  
 Lot \_\_\_\_\_ Subd \_\_\_\_\_  
 Driller Lyons, Larry License No. 102-2771  
 Permit No. 161 WW4197 Date 06/16/1997  
 Water from gravel County Rock Island  
 at depth 8 to 50 ft. Sec. 7  
 Screen: Diam. 6 in. Twp. 20 N  
 Length: 5 ft. Slot 40 Rge. 2 E  
 Elev. \_\_\_\_\_



Casing and Liner Pipe NE SW SE

Diam. (in.)	Kind and Weight	From (ft)	To (ft)
6	A538	0	45

Size hole below casing: \_\_\_\_\_ in.  
 Static level 30 ft. below casing top which is 1 ft.  
 above ground level. Pumping level 35 ft. when pumping at 18  
 gpm for 4 hours.

Formations passed through	Thickness	Bottom
topsoil	1	1
sand	7	8
gravel	42	50

Household - Private

Rock Island [REDACTED] 7-20N-2E

### GEOLOGICAL AND WATER SURVEYS WELL RECORD

Completed 6-1-78

10. Property owner [REDACTED] Well No. 1  
 Address [REDACTED]  
 Driller MR. FORD License No. 102-134  
 11. Permit No. 74198 Date May. 11-78  
 12. Water from SAND Formation SAND 13. County Rock Island  
 at depth 45 to 50 ft. Sec. 7  
 14. Screen: Diam. 5 in. Twp. 20N  
 Length: 5 ft. Slot 20 Rge. 2E  
 Elev. 590M


15. Casing and Liner Pipe

Diam. (in.)	Kind and Weight	From (Ft.)	To (Ft.)
5"	A53 T&C	+1	21.5

SHOW LOCATION IN SECTION [REDACTED]  
 NE  
 (permit)

16. Size Hole below casing: 5 in.  
 17. Static level 21 ft. below casing top which is 1 ft. above ground level. Pumping level 22 ft. when pumping at 15 gpm for 6 hours.

18. FORMATIONS PASSED THROUGH	THICKNESS	DEPTH OF BOTTOM
Top Soil	1	1
Play Hard Pan	5	6
Clay + Sand	14	20
Sand + Gravel	32	52
Yellow Play	8	60
		60

(CONTINUE ON SEPARATE SHEET IF NECESSARY)

SIGNED Manning Perry DATE June-7-78

ROCK ISLAND

COUNTY No 21679

7-20N-2E

## GEOLOGICAL AND WATER SURVEYS WELL RECORD

10. Property owner [REDACTED] Well No. #1  
 Address [REDACTED]  
 Driller Lyons, Glenn L. License No. 092-0017  
 11. Permit No. 161 WW60 '95 Date 08/07/95  
 12. Water from gravel 13. County Rock Island  
 at depth 17 to 63 ft. Sec. 7  
 14. Screen: Diam. 6 in. Twp. 20 N  
 Length: 5 ft. Slot 40 Rge. 2 E  
 Elev. \_\_\_\_\_


15. Casing and Liner Pipe

Diam. (in.)	Kind and Weight	From (ft)	To (ft)
6	SCH 40 T&C 19.45#	0	59

16. Size hole below casing: 6 in.  
 17. Static level 30 ft. below casing top which is 1 ft. above ground level. Pumping level 45 ft. when pumping at \_\_\_\_\_ gpm for 3 hours.

18. Formations passed through	Thickness	Bottom
top soil	1	1
sand	16	17
gravel	46	63

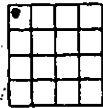
Household - Private

Rock Island [REDACTED]

07-20N-02E

**GEOLOGICAL AND WATER SURVEYS WELL RECORD**

10. Property owner [REDACTED] Well No. \_\_\_\_\_  
 Address [REDACTED]  
 Driller [REDACTED] License No. 092-0017  
 11. Permit No. 112072 Date 04/27/84  
 12. Water from gravel 13. County Rock Island  
 at depth \_\_\_\_\_ to \_\_\_\_\_ ft. Sec. 8  
 14. Screen: Diam. 6 in. Twp. 20 N  
 Length: 3 ft. Slot 100 Rge. 2 E  
 Elev. 592.7 177



15. Casing and Liner Pipe 100' S 20' E Nwc

Diam. (in.)	Kind and Weight	From (ft)	To (ft)
6	STEEL T&C 19.45	0	42

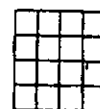
16. Size hole below casing: 6 in.  
 17. Static level 12 ft. below casing top which is 2 ft. above ground level. Pumping level 30 ft. when pumping at 60 gpm for 2 hours.

18. Formations passed through	Thickness	Bottom
top soil	1	1
red clay	10	11
sandy & gravel	34	45

Rock Island [REDACTED] 08-20N-02E

# GEOLOGICAL AND WATER SURVEYS WELL RECORD

Property owner [REDACTED] Well No. #2  
 Address [REDACTED]  
 Well address [REDACTED]  
 Lot \_\_\_\_\_ Subd \_\_\_\_\_ ISWS P# \_\_\_\_\_  
 Driller Lyons, Glenn L License No. 092-0017  
 Permit No. 161W76195 Date 09/21/1995  
 Water from gravel County Rock Island  
 at depth 8 to 67 ft.  
 Screen: Diam. 6 in. Sec. 7 Irr  
 Length: 5 ft. Slot \_\_\_\_\_ Twp. 20 N  
 Rge. 2 E  
 Elev. \_\_\_\_\_



### Casing and Liner Pipe

Diam. (in.)	Kind and Weight	NW NE SE	
		From (ft)	To (ft)
6	SCH 40 T&C 19.45#	0	64

Size hole below casing: 6 in.  
 Static level 37 ft. below casing top which is 1 ft.  
 above ground level. Pumping level 50 ft. when pumping at \_\_\_\_\_  
 gpm for 2 hours.

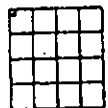
Formations passed through	Thickness	Bottom
topsoil	1	1
sand	7	8
gravel	59	67

Household - Private

Rock Island [REDACTED] 7-20N-2E

## GEOLOGICAL AND WATER SURVEYS WELL RECORD

10. Property owner [REDACTED] Well No. \_\_\_\_\_  
 Address [REDACTED]  
 Driller [REDACTED] License No. 092-0017  
 11. Permit No. W6193 Date 11/18/93  
 12. Water from gravel 13. County Rock Island  
 at depth 65 to 70 ft. Sec. 8  
 14. Screen: Diam. 6 in. Twp. 20 N  
 Length: 5 ft. Slot 40 Elev. 2 E



15. Casing and Liner Pipe NW NW NW

Diam. (in.)	Kind and Weight	From (ft)	To (ft)
6	SCH 40 T&C 19.45#	0	65

16. Size hole below casing: \_\_\_\_\_ in.  
 17. Static level 35 ft. below casing top which is 2 ft. above ground level. Pumping level 50 ft. when pumping at \_\_\_\_\_ gpm for 4 hours.

18. Formations passed through	Thickness	Bottom
sand	8	8
coarse sand	27	35
small gravel	35	70

Household - Private

Rock Island [REDACTED]

08-20N-02E





# GEOLOGICAL AND WATER SURVEYS WELL RECORD

10. Property owner [REDACTED] Well No. \_\_\_\_\_  
 Address [REDACTED]  
 Driller Lyons, Glenn L License No. 092-0017  
 11. Permit No. 016023 Date 11/21/89  
 12. Water from gravel 13. County Rock Island  
 at depth 14 to 47 ft. Sec. 8  
 14. Screen: Diam. 6 in. Twp. 20 N  
 Length: 5 ft. Slot 40 Rge. 2 E  
 Elev. \_\_\_\_\_



15. Casing and Liner Pipe NW NW NW

Diam. (in.)	Kind and Weight	From (ft)	To (ft)
6	STEEL T&C 19.45	0	42

16. Size hole below casing: \_\_\_\_\_ in.  
 17. Static level 18 ft. below casing top which is 2 ft. above ground level. Pumping level 30 ft. when pumping at \_\_\_\_\_ gpm for 2 hours.

18. Formations passed through	Thickness	Bottom
sand	14	14
gravel	33	47

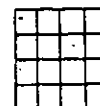
Household - Private

Rock Island [REDACTED]

08-20N-02E

## GEOLOGICAL AND WATER SURVEYS WELL RECORD

Property owner [REDACTED] Well No. #1  
 Address [REDACTED]  
 Well address [REDACTED]  
 Lot \_\_\_\_\_ Subd \_\_\_\_\_ ISWS P# 366145  
 Driller Lyons, Larry License No. 102-2771  
 Permit No. 161-MW63-03 Date 09/12/2003  
 Water from gravel County Rock Island  
 at depth 7 to 70 ft. Sec. 8  
 Screen: Diam. 6 in. Twp. 20 N  
 Length: 4 ft. Slot 40 Rge. 2 E  
 Elev. \_\_\_\_\_



### Casing and Liner Pipe

Diam. (in.)	Kind and Weight	From (ft)	To (ft)
6	STEEL	0	66
6	SS SCREEN	66	70

Size hole below casing: \_\_\_\_\_ in.  
 Static level 16 ft. below casing top which is 1 ft.  
 above ground level. Pumping level 40 ft. when pumping at 40  
 gpm for 3 hours.

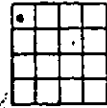
Formations passed through	Thickness	Bottom
topsoil	1	1
sandy clay	6	7
gravel	63	70

Private Water Well

Rock Island [REDACTED] 8-20N-2E

**GEOLOGICAL AND WATER SURVEYS WELL RECORD**

10. Property owner [REDACTED] Well No. \_\_\_\_\_  
 Address [REDACTED]  
 Driller Lyons, Glenn L. License No. 092-0017  
 11. Permit No. 120728 Date 10/03/85  
 12. Water from gravel 13. County Rock Island  
 at depth 38 to 47 ft. Sec. 8  
 14. Screen: Diam. 6 in. Twp. 20 N  
 Length: 5 ft. Slot 50 Rge. 2 E  
 Elev. 537.11 M



15. Casing and Liner Pipe [REDACTED]

Diam. (in.)	Kind and Weight	From (ft)	To (ft)
6	STEEL T&C 19.45	0	42

16. Size hole below casing: 6 in.  
 17. Static level 15 ft. below casing top which is 2 ft. above ground level. Pumping level 25 ft. when pumping at 20 gpm for 2 hours.

18. Formations passed through	Thickness	Bottom
top soil	1	1
red sandy clay	8	9
gravel	38	47

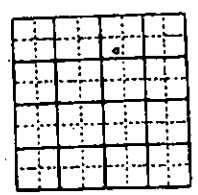
Rock Island [REDACTED]

08-20N-02E

ILLINOIS GEOLOGICAL SURVEY, URBANA

ST WELL	Thickness	Top	Bottom
p soil and fine sand ck and gravel iform small gravel (under 2") ck with a little gravel me rock		0 55 65 67½ 78	55 65 67½ 78 100
timated 150-300 gallons per minute. t enough for irrigation.			
te: It was difficult to catch a representative sample when the larger stone is coming out. A lot of the smaller aterial got away.			

COMPANY Flagel Drilling Co.  
 NO. 1  
 DRILLED October 29, 1958  
 COUNTY NO. 94  
 COMPANY  
 LOCATION  
 COUNTY ROCK ISLAND



8-20N-2E

ILLINOIS GEOLOGICAL SURVEY, URBANA

TEST WELL	Thickness	Top	Bottom
Top soil		0	2
Fine sand		2	18
Medium sand and large gravel		18	32
Good water bearing sand and gravel		32	71
Samples from Permanent Well			
3 samples		0	34
Hard gravel small stone			36
Sand and gravel			45
Size of well: 18" x 72' deep.			
Note: It was difficult to catch a representative sample when the larger stone was coming out. A lot of the small material got away.			
.S. # 31908			

COMPANY: **Flagel Drilling Co.**  
 NO. **2**  
 DATE DRILLED: **October 29, 1958** COUNTY NO. **348**  
 ADDRESS: **Company**  
**600 T.H. Ave.**  
**ROCK ISLAND**  
 STATE: **ILLINOIS**


**8-20N-2E**

# GEOLOGICAL AND WATER SURVEYS WELL RECORD

Property owner [REDACTED] Well No. \_\_\_\_\_  
 Address [REDACTED]  
 Well address [REDACTED]  
 Lot \_\_\_\_\_ Subd \_\_\_\_\_  
 Driller Latta, Kirk Stephen License No. 102-2755  
 Permit No. 161-LW14-02 Date 04/05/2002  
 Water from sand County Rock Island  
 Start depth 58 to 72 ft. Sec. 8  
 Screen: Diam. 5 in. Twp. 20 N  
 Length: 10 ft. Slot .014 Elev. \_\_\_\_\_ Rge. 2 E


### Casing and Liner Pipe

NW NW NW

Diam. (in.)	Kind and Weight	From (ft)	To (ft)
5	PVC	-1	62
5	PVC SCREEN	62	72

Size hole below casing: \_\_\_\_\_ in.  
 Static level 15 ft. below casing top which is 1 ft.  
 above ground level. Pumping level 40 ft. when pumping at 50  
 gpm for 1 hours.

Formations passed through	Thickness	Bottom
sand/yellow clay	15	15
medium gray sand	35	50
gray clay	8	58
medium to coarse gray sand	14	72

Private Water Well

Rock Island [REDACTED]

8-20N-2E

# GEOLOGICAL AND WATER SURVEYS WELL RECORD

Property owner [REDACTED] Well No. \_\_\_\_\_  
 Address [REDACTED]  
 Well address [REDACTED]  
 Lot \_\_\_\_\_ Subd Skippers \_\_\_\_\_  
 Driller Klint Gingerich License No. 092-8051  
 Permit No. 161W07'01 Date 04/17/2001  
 Water from \_\_\_\_\_ County Rock Island  
 Start depth \_\_\_\_\_ to \_\_\_\_\_ ft. Sec. 8  
 Screen: Diam. \_\_\_\_\_ in. Twp. 20 N  
 Length: \_\_\_\_\_ ft. Slot \_\_\_\_\_ Rge. 2 E  
 Elev. \_\_\_\_\_


**Casing and Liner Pipe**

SE NW NW

Diam. (in.)	Kind and Weight	From (ft)	To (ft)
6	SDR 21 PVC	0	140

Size hole below casing: \_\_\_\_\_ in.  
 Static level \_\_\_\_\_ ft. below casing top which is \_\_\_\_\_ ft.  
 above ground level. Pumping level \_\_\_\_\_ 0 ft. when pumping at \_\_\_\_\_  
 gpm for \_\_\_\_\_ hours.

Formations passed through	Thickness	Bottom
sand	60	60
clay	10	70
sand	36	106
clay limestone	99	205

Household - Private

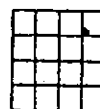
Rock Island [REDACTED]

8-20N-2E



## GEOLOGICAL AND WATER SURVEYS WELL RECORD

10. Property owner Commonwealth Ed-SIU fishery Well No. \_\_\_\_\_  
 Address Carbondale IL  
 Driller: McKinney, Ted R. License No. 102-2540  
 11. Permit No. 115930 Date 11/21/84  
 12. Water from \_\_\_\_\_ 13. County Rock Island  
 at depth \_\_\_\_\_ to \_\_\_\_\_ ft. Sec: 18  
 14. Screen: Diam. 18 in. Twp. 20 N  
 Length: 68 ft. Slot .05 Rge. 2 E  
 Elev. 610.74 <sub>81</sub>



15. Casing and Liner Pipe SW NE NE

Diam. (in.)	Kind and Weight	From (ft)	To (ft)
18	JOHNSON STEEL SCREEN	0	18
18	PLAIN STEEL	18	27
18	STEEL SCREEN	27	57

16. Size hole below casing: \_\_\_\_\_ in.  
 17. Static level 40 ft. below casing top which is 0 ft. above ground level. Pumping level 71 ft. when pumping at 3000 gpm for 24 hours.

18. Formations passed through	Thickness	Bottom
SS #65246 (0'-175')	0	0
top soil	2	2
med sand to med gvl	63	65
brown clay	3	68
med sand to med gvl	29	97
gray clay	24	121
crs sand to med gvl	30	151
gray clay	9	160
gry clay w/gvl layer	18	178

Rock Island 12-161-21977-00 18-20N-02E

Company verified 17-18-19-20-21-22-23-24-25-26-27-28-29-30-31-32-33-34-35-36-37-38-39-40-41-42-43-44-45-46-47-48-49-50-51-52-53-54-55-56-57-58-59-60-61-62-63-64-65-66-67-68-69-70-71-72-73-74-75-76-77-78-79-80-81-82-83-84-85-86-87-88-89-90-91-92-93-94-95-96-97-98-99-100

824

18. Formations passed through (continued)	Thickness	Bottom
limestone	0	178

ILLINOIS GEOLOGICAL SURVEY, URBANA

	Thickness	Top	Bottom
Summary Sample Study by M. R. McComas		11/66	
Pleistocene			
Sand, reddish, medium to coarse grained, mostly sub-angular to sub-round quartz	35		35
SILURIAN SYSTEM			
Niagaran Series			
Dolomite, yellow, fine crystalline, dense	120		155
Dolomite, yellow, fine crystalline, vugular and intercrystalline porosity, iron stained, some clay filling in vugs	50		205
Dolomite, yellow, dense	10		215
Dolomite, light gray, dense, coarsely crystalline with abundant dolomite euhedra	35		250

COMPANY: E. C. Wehling Well Works, Inc.  
 DRILLED BY: Commonwealth Edison  
 DATE: September 28, 1966  
 DRILLER: M. R. McComas  
 LOCATION: [REDACTED]  
 CITY: ROCK ISLAND S.S.#53601


18-20N-2E

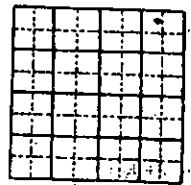


ILLINOIS GEOLOGICAL SURVEY, URBANA

Page 1

	Thickness	Top	Bottom
Sand		0	35
Gravel		35	58
Limestone		58	255 TD
Well record - 10" 0-125' 8" 125-255' (cemented)			
Casing record - 10" 0-61' 8" 0-125'			
Chief aquifer - dolomite from 58 to 255'			
Nonpumping level 35			
Pumping level 250' after pumping at 35 gallons per minute for 6 1/2 hours on September 22, 1966.			
Measuring point for above measurements top of casing, at land surface datum.			
ENVELOPE			

**COMPANY:** Wahling Well Works, Inc.  
**CLIENT:** Commonwealth Edison Co. NO. 1  
**DATE:** September 1966 COUNTY NO. 883  
**PROJECT:** State Water Survey  
**ELEVATION:** 606' Mean Sea Level  
**LOCATION:** 350' N line, 750' E line of NE.  
**CITY:** ROCK ISLAND



18-20N-2E



ILLINOIS GEOLOGICAL SURVEY, URBANA

# 2

	Thickness	Top	Bottom
Shale		1589	1593
lime		1593	1599
shale		1599	1604
and	T. G	1608*	1740
shale & Sand		1740	1800
			TD
<p> casing: 30" 0' - 37'</p> <p>          26" 0' - 495' cemented in place</p> <p>          16" 1474' - 1612'</p> <p>hole Size: 30" 0' - 37'</p> <p>          29" 37' - 495'</p> <p>          25" 495' - 930'</p> <p>          19" 930' - 1612'</p> <p>          16" 1612' - 1800'</p>			
<p>Wells #3 and #4 completed in Eau Claire            difference in yields probably due to amount            of dolomite cementation in Ironton-Gales-            ville. T.C. Buschbach August, 1968.</p>			
<p>uclear Log filed.            mperature Log filed.            iliper Log filed.            oduction Test filed.</p>			
<p>Shown on Drillers Log</p>			

Wahling Well Works, Inc. Commonwealth Edison Co. #3  
 ROCK ISLAND 18-20N-2E

ILLINOIS GEOLOGICAL SURVEY, URBANA

	Thickness	Top	Bottom
Soil and sand	20	0	20
Sand	17	20	37
Sand and gravel	27	37	60
Gravel	7	60	67
Lime	208	67	275
Shale	70	275	345
Shale and lime	21	345	366
Shale	24	366	390
Shale and limee	19	390	409
Lime	48	409	457
Lime and shale	33	457	490
Lime	337	490	827
Shale with sand	28	827	855
Sand	45	855	890
Sand, lime with shale	32	890	922
Lime	94	922	1016
Lime and sand	9	1016	1025
Sand	57	1025	1082
Sand and lime	20	1082	1102
Lime	13	1102	1115
Sand and lime	32	1115	1147
Lime	146	1147	1293
Sand	52	1293	1345
Lime	170	1345	1515
Shale and lime	95	1515	1610
Sand	10	1610	1620
Lime, shale, and sand	10	1620	1630
Sand	145	1630	1775
Shale	15	1775	1790
Sand	8	1790	1798
			TD

Using: 30" black pipe from 0' to 69'3"

DRILLED BY	Company	NO. 4	
DATE	July 24, 1968	COUNTY NO. 475	
LOCATION	610' G.L. - Nuclear log		
	1360' N line, 300' E line of NE		
	ROCK ISLAND		

16-20N-2E



	Thickness	Top	Bottom
Shale, as above; some dolomite, light olive gray (5Y 6/1) to greenish gray (5 GY 6/1), mottled and speckled dark gray (N3), fine grained, pyritic, fossiliferous (bryozoans, brachiopods)	315		330
Shale, as above; trace dolomite, as above, some very pyritic	330		350
Dolomite, as above, fossiliferous (bryozoans, crinoids), argillaceous; some shale, as above	350		365
Shale, as above, some dolomite, as above	365		380
Shale, as above; trace dolomite, light olive gray (5Y 6/1) to greenish gray (5 GY 6/1), very fine grained, slightly mottled dark gray (N3), silty, slightly fossiliferous (crinoids, bryozoans, gastropods)	380		390
As above, fossiliferous (gastropods), trace dark, rounded, phosphatic grains	390		395
Shale, light olive gray (5Y 6/1) to greenish gray (5 GY 6/1), weak, dolomitic; some dolomite, light olive gray (5Y 6/1) to olive gray (5Y 4/1), mottled and speckled dark gray (N3), very fine to fine grained, slightly fossiliferous (gastropods, bryozoans), silty, argillaceous	395		400
Dolomite, as above; some shale, as above	400		420
Dolomite, as above, grades to a dolomitic siltstone, argillaceous, same color; trace olive gray (5Y 4/1) shale, weak to moderately hard, dolomitic, slightly silty	420		450
Shale, as above; some dolomite, as above	450		455
Dolomite, olive gray (5Y 4/1), very fine grained, argillaceous, slightly speckled with dark gray (N3)	455		465

Wenling Well Works Commonwealth Edison Co. #4

NTV

ROCK ISLAND

SS# 55607

18-20N-2E



	Thickness	Top	Bottom
Dolomite, as above; trace shale, olive gray (5Y 4/1), weak, trace hard, dolomitic		465	470
Shale, olive gray (5Y 4/1), weak to hard, dolomitic, slightly silty		470	475
Shale, olive gray (5Y 4/1) to olive black (5Y 2/1), dolomitic, hard, pyritic; grades slightly to a dolomite, same color, very argillaceous, pyritic, trace phosphatic grains, trace depauperate fauna (crinoid, gastropod); shale is slightly lighter colored at the base (5Y 4/1)		475	483
Galena Group			
Dolomite, pale yellowish brown (10 YR 6/2), fine to medium grained, slightly mottled medium gray (N5), relatively pure, slightly pyritic		483	495

Wehling Well Works      Commonwealth Edison Co. #4  
ROCK ISLAND              SS# 55607 18-20N-2E

# GEOLOGICAL AND WATER SURVEYS WELL RECORD

Property owner [REDACTED] Well No. \_\_\_\_\_  
 Address [REDACTED]  
 Well address [REDACTED]  
 Lot 5068

Driller Timmerman, Tom License No. 102-1781

Permit No. 161WW01'01 Date 01/02/2001

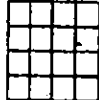
Water from sand & gravel County Rock Island

at depth 76 to 80 ft. Sec. 18

Screen: Diam. 5 in. Twp. 20 W

Length: 4 ft. Slot 20 Rge. 2 E

Elev. \_\_\_\_\_



**Casing and Liner Pipe**

SW SE NE

Diam. (in.)	Kind and Weight	From (ft)	To (ft)
5	PVC SDR 21	0	76

Size hole below casing: \_\_\_\_\_ in.

Static level 25 ft. below casing top which is 2 ft.

above ground level. Pumping level 40 ft. when pumping at 20 gpm for 4 hours.

Formations passed through	Thickness	Bottom
sand & gravel	80	80

Household - Private

Rock Island

18-20N-2E

**GEOLOGICAL AND WATER SURVEYS WELL RECORD**  
Completed 8-24-74

10. Property owner [REDACTED] Well No. 1  
 Address [REDACTED]  
 Driller [REDACTED] License No. 102-184  
 11. Permit No. 21400 Date 8-24-74  
 12. Water from [REDACTED] Formation [REDACTED] 13. County Rock Island  
 at depth 32 to 32 ft. Sec. 10  
 14. Screen: Diam. 5 in. Twp. 20N  
 Length: 1 ft. Slot 20 Rge. 2E  
 Elev. 2  
 600TH


15. Casing and Liner Pipe

Diam. (in.)	Kind and Weight	From (Ft.)	To (Ft.)
5	4.52 T&P	+	82

SHOW LOCATION IN SECTION PLAT

16. Size Hole below casing: 5 in.  
 17. Static level 42 ft. below casing top which is 1 (Permit) ft. above ground level. Pumping level 48 ft. when pumping at 30 gpm for 4 hours.

18. FORMATIONS PASSED THROUGH	THICKNESS	DEPTH OF BOTTOM
Gravelly clay	15	15
Sand	25	40
Dark loam	40	80
Coarse sand + gravel	10	90

(CONTINUE ON SEPARATE SHEET IF NECESSARY)

SIGNED Wassily J. [Signature] DATE Sept. 2 74

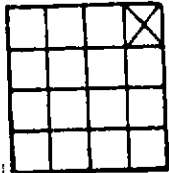
COUNTY No. 21108

ROCK ISLAND

GEOLOGICAL AND WATER SURVEYS WELL RECORD

Completed 10-30-72

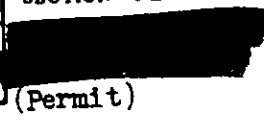
Property owner [REDACTED] Well No. 1  
 Address [REDACTED]  
 Driller [REDACTED] License No. 02-4122  
 Permit No. 11722 Date 09-05-72  
 Water from Sand Formation 13. County Rock Island  
 at depth 58 to 68 ft. Sec. 10  
 Screen: Diam. 4 in. Twp. 20N  
 Length: 10 ft. Slot 20 Elev. 13



Casing and Liner Pipe

Size (In.)	Kind and Weight	From (Ft.)	To (Ft.)
5"	552 TSP	1	58

SHOW LOCATION IN SECTION PLAT



2. Size Hole below casing: 4 in.  
 1. Static level 3.5 ft. below casing top which is 1 ft. above ground level. Pumping level 34 ft. when pumping at 20 gpm for 3 hours.

3. FORMATIONS PASSED THROUGH	THICKNESS	DEPTH OF BOTTOM
<u>Sand &amp; gravel</u>	<u>20</u>	<u>20</u>
<u>Sand &amp; gravel</u>	<u>48</u>	<u>68</u>

(CONTINUE ON SEPARATE SHEET IF NECESSARY)

SIGNED Marvin L. [Signature] DATE Oct 31 72  
 COUNTY No. 953

SEND AND MAIL ORIGINAL TO STATE  
 HEALTH PROTECTION, 535 WEST  
 NOT DETACH GEOLOGICAL/WATER  
 RECORD LOCATIONS

**GEOLOGICAL AND WATER SURVEYS WELL RECORD**  
 Completed 10-24-80

Property owner [REDACTED] Well No. \_\_\_\_\_  
 Address [REDACTED]  
 Driller \_\_\_\_\_ License No. \_\_\_\_\_  
 Permit No. 96353 Date 10-24-80  
 Water from Sand Formation \_\_\_\_\_ 13. County [REDACTED]  
 at depth 63 to 68 ft. Sec. 12  
 Screen: Diam. 5 in. Twp. 3N  
 Length: 5 ft. Slot 1.5 Rge. 2E  
 Elev. 600


**Casing and Liner Pipe**

in. (In.)	Kind and Weight	From (Pt.)	To (Pt.)
5"	153 TYP	+1	63

SHOW LOCATION IN SECTION PLAT

(permit)

Size Hole below casing: 5 in. Hansen's 2nd Add.  
 Static level 25 ft. below casing top which is 1 ft.  
 above ground level. Pumping level 36 ft. when pumping at 30  
 gpm for 2 hours.

FORMATIONS PASSED THROUGH	THICKNESS	DEPTH OF BOTTOM
<u>SAND &amp; GRAY SILT</u>	<u>6.7</u>	<u>67</u>

(CONTINUE ON SEPARATE SHEET IF NECESSARY)

SIGNED [Signature] DATE Oct. 27

ROCK ISLAND COUNTY No 21704

19-20N-2E

# GEOLOGICAL AND WATER SURVEYS WELL RECORD

Property owner [REDACTED] Well No. #1  
 Address [REDACTED]  
 Well address [REDACTED]  
 Lot [REDACTED] Subd [REDACTED]  
 Driller Lyons, Larry License No. 102-2771  
 Permit No. 161 MW57 00 Date 08/25/2000  
 Water from gravel County Rock Island  
 at depth 25 to 70 ft.  
 Screen: Diam. 6 in.  
 Length: 5 ft. Slot 40  
 Sec. 19  
 Twp. 20 N  
 Rge. 2 E  
 Elev.         



**Casing and Liner Pipe**

Diam. (in.)	Kind and Weight	NW NW SW	
		From (ft)	To (ft)
6	STEEL	0	65
6	STAINLESS STL SCREEN	65	70

Size hole below casing:          in.  
 Static level 37 ft. below casing top which is 1 ft.  
 above ground level. Pumping level 50 ft. when pumping at 60  
 gpm for 3 hours.

Formations passed through	Thickness	Bottom
topsoil	1	1
sand	24	25
gravel	45	70

Household - Private

Rock Island [REDACTED] 19-20N-2E

**GEOLOGICAL AND WATER SURVEYS WELL RECORD**  
 Completed 9-1-73

Property owner [REDACTED] Well No. 1  
 Address [REDACTED]  
 Driller [REDACTED] License No. 22-1112  
 Permit No. [REDACTED] Date [REDACTED]  
 Water from [REDACTED] 13. County [REDACTED]  
 Formation  
 at depth 66 to 70 ft. Sec. 12  
 Screen: Diam. 5 in. Twp. [REDACTED]  
 Length: 5 ft. Slot 2 Rge. [REDACTED]  
 Elev. 610.74


Casing and Liner Pipe

Len. (in.)	Kind and Weight	From (Ft.)	To (Ft.)
5	5/8" 10.9	0	70

SHOW  
 LOCATION IN  
 SECTION PLAT

[REDACTED]  
 (Permit)

Size Hole below casing: 5 in.  
 Static level 113 ft. below casing top which is 1 ft.  
 above ground level. Pumping level 114 ft. when pumping at 20  
 gpm for 2 hours.

FORMATIONS PASSED THROUGH	THICKNESS	DEPTH OF BOTTOM
Sand	2.5	3.5
Sand	2.6	7.1

(CONTINUE ON SEPARATE SHEET IF NECESSARY)

SIGNED [Signature] DATE Sept 1-73

ROCK ISLAND

COUNTY No. 1035

19-20N-2E

SEND MAIL ORIGINAL TO STATE GEOLOGICAL SURVEY OFFICE BUILDING, SPRINGFIELD, ILL. WATER SURVEYS SECTION. BE SURE TO

# GEOLOGICAL AND WATER SURVEYS WELL RECORD

Completed 6-24-77

Property owner [REDACTED] Well No. 1

Address [REDACTED]

Driller W. E. [REDACTED] License No. 102-130

Permit No. 60223 Date May 2-77

Water from Sand Formation 13. County Rock Island

at depth 57 to 62 ft. Sec. 10

Screen: Diam. 5 in. Twp. 20N

Length: 5 ft. Slot 20 Rge. 2E

Elev. 600TH


## Casing and Liner Pipe

Size (In.)	Kind and Weight	From (Ft.)	To (Ft.)
5"	253-T45	21	25

SHOW LOCATION IN SECTION PLAT

(permit) of section

1. Size Hole below casing: 5 in.  
 2. Static level 30 ft. below casing top which is 1 ft. above ground level. Pumping level 30.6 ft. when pumping at 15 gpm for 4 hours. Sub. pump set at 50'.

3. FORMATIONS PASSED THROUGH	THICKNESS	DEPTH OF BOTTOM
Clay & sand	5	5
Sand & gravel	57	62

(CONTINUE ON SEPARATE SHEET IF NECESSARY)

SIGNED Marvin [Signature] DATE 6-2-77

ROCK ISLAND

COUNTY No. 21351

19-20N-2E



# GEOLOGICAL AND WATER SURVEYS WELL RECORD

Property owner [REDACTED] Well No. \_\_\_\_\_  
 Address [REDACTED]  
 Well address [REDACTED]  
 Lot \_\_\_\_\_ Subd \_\_\_\_\_  
 Driller Latta, Kirk Stephen License No. 102-2755  
 Permit No. 161-WW065-03 Date 09/18/2003  
 Water from sand County Rock Island  
 Test depth 22 to 70 ft. Sec. 19  
 Screen: Diam. 6 in. Twp. 20 N  
 Length: 5 ft. Slot .014 Rge. 2 E  
 Elev. \_\_\_\_\_


### Casing and Liner Pipe

Diam. (in.)	Kind and Weight	From (ft)	To (ft)
6	PVC	-1	65
6	PVC SCREEN	65	70

Size hole below casing: \_\_\_\_\_ in.  
 Static level 25 ft. below casing top which is 1 ft.  
 above ground level. Pumping level 40 ft. when pumping at 50  
 gpm for 1 hours.

Formations passed through	Thickness	Bottom
fine sand	18	18
clay	4	22
medium to coarse red sand	48	70

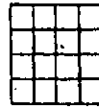
Private Water Well

Rock Island [REDACTED]

19-20N-2E

GEOLOGICAL AND WATER SURVEYS WELL RECORD

Property owner [REDACTED] Well No. \_\_\_\_\_  
 Address [REDACTED]  
 Well address [REDACTED]  
 Lot \_\_\_\_\_ Subd \_\_\_\_\_  
 Driller Joseph Allen License No. 092-8408  
 Permit No. 161-WW035-04 Date 06/23/2004  
 Water from limestone County Rock Island  
 Test depth 180 to 235 ft. Sec. 19  
 Screen: Diam. \_\_\_\_\_ in. Twp. 20 N  
 Length: \_\_\_\_\_ ft. Slot \_\_\_\_\_ Rge. 2 E  
 Elev. \_\_\_\_\_



Casing and Liner Pipe

Diam. (in.)	Kind and Weight	SW SW NE	
		From (ft)	To (ft)
6	PVC SDR 21	-1	175

Size hole below casing: \_\_\_\_\_ in.  
 Static level 27 ft. below casing top which is 2 ft.  
 above ground level. Pumping level 60 ft. when pumping at 15  
 gpm for 2 hours.

Formations passed through	Thickness	Bottom
sand	138	138
clay	13	151
sand	11	162
clay	10	172
yellow limestone	8	180
white limestone	55	235

Private Water Well

Rock Island [REDACTED] 19-20N-2E

# GEOLOGICAL AND WATER SURVEYS WELL RECORD

Property owner [REDACTED] Well No. \_\_\_\_\_

Address [REDACTED]

Well address [REDACTED]

Lot \_\_\_\_\_ Subd \_\_\_\_\_

Driller Jimmerman, Tom License No. 102-1781

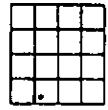
Permit No. 161 WW79'00 Date 10/25/2000

Water from sand & gravel County Rock Island

at depth 75 to 80 ft. Sec. 19

Screen: Diam. 5 in. Twp. 20 N

Length: 5 ft. Slot 20 Elev. \_\_\_\_\_



Casing and Liner Pipe SW SE SW

Diam. (in.)	Kind and Weight	From (ft)	To (ft)
5	PLASTIC	0	80

Size hole below casing: \_\_\_\_\_ in.  
 Static level 35 ft. below casing top which is 2 ft. above ground level. Pumping level 50 ft. when pumping at 20 gpm for 4 hours.

Formations passed through	Thickness	Bottom
sand & gravel	80	80

Household - Private

Rock Island [REDACTED] 19-20N-2E

**GEOLOGICAL AND WATER SURVEYS WELL RECORD**  
 Completed 7-14-72

Property owner [REDACTED] Well No. 1  
 Address [REDACTED]  
 Driller WAT FURMAN License No. 92-1112  
 Permit No. 150727 Date 7-14-72  
 Water from SAND Formation 13. County Rock Island  
 at depth 6.5 to 7.5 ft. Sec. 10  
 Screen: Diam. 4 in. Twp. 20N  
 Length: 10 ft. Slot 20 Rge. 2E  
 Elev. 41


**Casing and Liner Pipe**

Len. (in.)	Kind and Weight	From (Ft.)	To (Ft.)
5	4" 7.5	0	6.5

SHOW LOCATION IN SECTION PLAT

[REDACTED]  
 (Permit)

Size Hole below casing: 4 in.  
 Static level 40 ft. below casing top which is 1 ft. above ground level. Pumping level 41 ft. when pumping at 10 gpm for 2 hours.

FORMATIONS PASSED THROUGH	THICKNESS	DEPTH OF BOTTOM
<u>1/2" SAND</u>	<u>20</u>	<u>20</u>
<u>DRIVE PIPE</u>	<u>4.5</u>	<u>6.5</u>
<u>SAND &amp; GRAVEL</u>	<u>10</u>	<u>7.5</u>

CONTINUE ON SEPARATE SHEET IF NECESSARY

IGNED Walter A. Furman DATE July 14 72

COUNTY No. 914

ED AND MAIL ORIGINAL TO STATE DEPARTMENT OFFICE BUILDING, SPRINGFIELD, ILLINOIS WATER SURVEYS SECTION. BE SURE TO

# GEOLOGICAL AND WATER SURVEYS WELL RECORD

Completed 7-3-77

Property owner [REDACTED] Well No. \_\_\_\_\_  
 Address [REDACTED]  
 Driller [REDACTED] License No. [REDACTED]  
 Permit No. [REDACTED] Date [REDACTED]  
 Water from \_\_\_\_\_ 13. County \_\_\_\_\_  
 Formation \_\_\_\_\_  
 at depth \_\_\_\_\_ to \_\_\_\_\_ ft.  
 Screen: Diam. \_\_\_\_\_ in.  
 Length: \_\_\_\_\_ ft. Slot \_\_\_\_\_  
 Sec. \_\_\_\_\_  
 Twp. \_\_\_\_\_  
 Rge. \_\_\_\_\_  
 Elev. \_\_\_\_\_


### Casing and Liner Pipe

diam. (in.)	Kind and Weight	From (Ft.)	To (Ft.)
5	5/8" 10.95	0	6.5

SHOW LOCATION IN SECTION \_\_\_\_\_

(permit) NE

1. Size Hole below casing: \_\_\_\_\_ in.  
 2. Static level \_\_\_\_\_ ft. below casing top which is \_\_\_\_\_ ft. above ground level. Pumping level \_\_\_\_\_ ft. when pumping at \_\_\_\_\_ gpm for \_\_\_\_\_ hours.

3. FORMATIONS PASSED THROUGH	THICKNESS	DEPTH OF BOTTOM
Shale	5'	5'
Sandstone	4.5'	9.5'
Clay shale	1.4'	10.9'
Quartzite	6'	16.9'

(CONTINUE ON SEPARATE SHEET IF NECESSARY)

SIGNED [Signature] DATE July-5 77

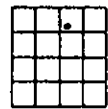
ROCK ISLAND

COUNTY No. 21352

19-20N-2E

**GEOLOGICAL AND WATER SURVEYS WELL RECORD**

10. Property owner [REDACTED] Well No. #1  
 Address [REDACTED]  
 Driller Lyons, Glenn L License No. 092-0017  
 11. Permit No. 161 W40 '95 Date 06/09/95  
 12. Water from gravel 13. County Rock Island  
 at depth 30 to 65 ft. Sec. 19  
 14. Screen: Diam. 6 in. Twp. 20 N  
 Length: 5 ft. Slot 40 Rge. 2 E  
 Elev. \_\_\_\_\_



15. Casing and Liner Pipe SW SW NE

Diam. (in.)	Kind and Weight	From (ft)	To (ft)
6	SCH 40 T&C 19.45#	0	60

16. Size hole below casing: 6 in.  
 17. Static level 40 ft. below casing top which is 1 ft. above ground level. Pumping level 50 ft. when pumping at \_\_\_\_\_ gpm for 2 hours.

18. Formations passed through	Thickness	Bottom
sand	9	9
coarse gravel	21	30
small gravel	35	65

Household - Private

Rock Island [REDACTED] 19-20N-02E

GEOLOGICAL AND WATER SURVEYS WELL RECORD  
 Completed 7-8-74

1. Property owner [REDACTED] Well No. 1  
 Address [REDACTED]  
 Driller Mike Evans License No. 102-134  
 1. Permit No. IV-21781 Date Nov-7-73  
 2. Water from Sand Formation 13. County Rock Island  
 at depth 55 to 59 ft. Sec. 19  
 1. Screen: Diam. 2 in. Twp. 20N  
 Length: 4 ft. Slot 10 Rge. 2E  
 Elev. 2


3. Casing and Liner Pipe

Diam. (In.)	Kind and Weight	From (Ft.)	To (Ft.)
<u>2</u>	<u>2" RD T&amp;P 25'</u>	<u>1</u>	<u>55</u>

SHOW LOCATION IN SECTION PLAT

[REDACTED]  
 (Permit)

6. Size Hole below casing: 2 in.  
 7. Static level 30 ft. below casing top which is 1 ft. above ground level. Pumping level 30 ft. when pumping at 10 gpm for 2 hours. Submersible pump set at 40'

8. FORMATIONS PASSED THROUGH	THICKNESS	DEPTH OF BOTTOM
<u>Sand Point</u>		<u>59'</u>
<u>Drain well</u>		

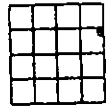
(CONTINUE ON SEPARATE SHEET IF NECESSARY)

SIGNED Marvin L. [Signature] DATE July 12-74

COUNTY No. 21086

## GEOLOGICAL AND WATER SURVEYS WELL RECORD

10. Property owner [REDACTED] Well No. \_\_\_\_\_  
 Address [REDACTED]  
 Driller Grosch, Wayne A. License No. 102-2557  
 11. Permit No. 017598 Date 04/19/90  
 12. Water from \_\_\_\_\_ 13. County Rock Island  
 at depth \_\_\_\_\_ to \_\_\_\_\_ ft. Sec. 19  
 14. Screen: Diam. 16 in. Twp. 20 N  
 Length: 20 ft. Slot .5 Rge. 2 E  
 Elev. \_\_\_\_\_



15. Casing and Liner Pipe NE SE NE

Diam. (in.)	Kind and Weight	From (ft)	To (ft)
16	PLAIN STEEL	0	80
16	STEEL SCREEN	80	100

16. Size hole below casing: \_\_\_\_\_ in.  
 17. Static level 30 ft. below casing top which is 0 ft.  
 above ground level. Pumping level 50 ft. when pumping at 1000  
 gpm for \_\_\_\_\_ hours.

18. Formations passed through	Thickness	Bottom
top soil	2	2
sand	33	35
medium sand	20	55
medium gravel	45	100
fine sand at	0	100

Irrigation

Rock Island [REDACTED]

19-20N-02E



**GEOLOGICAL AND WATER SURVEYS WELL RECORD**

Property owner [REDACTED] Well No. \_\_\_\_\_  
 Address [REDACTED]  
 Well address [REDACTED]  
 Lot \_\_\_\_\_ Subd \_\_\_\_\_

Driller Corwin Gingerich License No. 092-8374

Permit No. 161-MW61-04 Date 10/19/2004

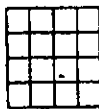
Water from sand County Rock Island

at depth 93 to 98 ft. Sec. 19

Screen: Diam. 4.5 in. Tap. 20 N

Length: 5 ft. Slot .02 Rge. 2 E

Elev. \_\_\_\_\_



**Casing and Liner Pipe**

SW NW SE

Diam. (in.)	Kind and Weight	From (ft)	To (ft)
6	PVC	-1	90
4.50	PVC	88	93
4.50	PVC SCREEN	93	98

Size hole below casing: \_\_\_\_\_ in.

Static level 30 ft. below casing top which is 2 ft.

above ground level. Pumping level 45 ft. when pumping at 60

gpm for 1 hours.

Formations passed through	Thickness	Bottom
sand	98	98

Private Water Well

Rock Island [REDACTED] 19-20N-2E



**GEOLOGICAL AND WATER SURVEYS WELL RECORD**

Property owner [REDACTED] Well No. \_\_\_\_\_  
 Address [REDACTED] ILL  
 Well address [REDACTED]  
 Lot \_\_\_\_\_ Subd \_\_\_\_\_  
 Driller Timmerman, Tom License No. 102-1781  
 Permit No. 161-LW25-00 Date 05/11/2000  
 Water from sand & gravel County Rock Island  
 at depth 75 to 80 ft. Sec. 19  
 Screen: Diam. 5 in. Twp. 20 N  
 Length: 5 ft. Slot 20 Rge. 2 E  
 Elev. \_\_\_\_\_


Casing and Liner Pipe NE NW SW

Diam. (in.)	Kind and Weight	From (ft)	To (ft)
5	PVC SDR 21	0	75

Size hole below casing: \_\_\_\_\_ in.  
 Static level 40 ft. below casing top which is 1 ft. above ground level.  
 Pumping level 50 ft. when pumping at 15 gpm for 4 hours.

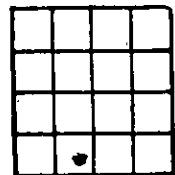
Formations passed through	Thickness	Bottom
sand & gravel	80	80

Household - Private  
 Rock Island: [REDACTED] 19-20N-2E

GEOLOGICAL WATER SURVEYS WATER WELL RECORD

Completed 6-15-67

1. Dept. Mines and Minerals permit No. NF 1753 Year 67  
 1. Property owner [REDACTED] Well No. 1  
 Address [REDACTED] RI  
 Driller W. J. Fennell License No. 92-442  
 2. Water from Sand 13. County Rock Island  
 Formation  
 at depth 30 to 60 ft. Sec. 20  
 4. Screen: Diam. 2 in. Twp. 20N  
 Length: 4 ft. Slot 10 Rng. 2E  
 Elev. 2



5. Casing and Liner Pipe

Diam. (in.)	Kind and Weight	From (Pt.)	To (Pt.)
2"	R&D Galv	5	58

SHOW LOCATION IN SECTION PLAT

SW (Permit)

6. Size Hole below casing: \_\_\_\_\_ in.  
 7. Static level 30 ft. below casing top which is 1 ft. above ground level. Pumping level \_\_\_\_\_ ft. when pumping at \_\_\_\_\_ gpm for \_\_\_\_\_ hours.

8. FORMATIONS PASSED THROUGH	THICKNESS	DEPTH OF BOTTOM
Sand	60	60

(CONTINUE ON SEPARATE SHEET IF NECESSARY)

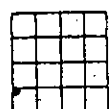
SIGNED W. J. Fennell DATE June-26-67  
Cowoda, Ill. COUNTY No. 409

ROCK ISLAND

20-20N-2E

## GEOLOGICAL AND WATER SURVEYS WELL RECORD

10. Property owner [REDACTED] Well No. \_\_\_\_\_  
 Address [REDACTED]  
 Driller Timmerman, Tom License No. 102-1781  
 11. Permit No. 013116 Date 07/19/89  
 12. Water from broken limestone 13. County Rock Island  
 at depth 55 to 59 ft. Sec. 20  
 14. Screen: Diam. 5 in. Twp. 20 N  
 Length: 5 ft. Slot 20 Elev. 2 E



15. Casing and Liner Pipe NW SW SW

Diam. (in.)	Kind and Weight	From (ft)	To (ft)
5	PLASTIC	0	50

16. Size hole below casing: 8 in.  
 17. Static level 37 ft. below casing top which is 2 ft. above ground level. Pumping level 37 ft. when pumping at \_\_\_\_\_ gpm for 10 hours.

18. Formations passed through	Thickness	Bottom
sand & gravel	60	60

Household - Private  
 Rock Island [REDACTED] 20-20N-02E

GEOLOGICAL WATER SURVEYS WATER WELL RECORD

Completed 4-29-68  
Dept. Mines and Minerals permit No. 4812 Year 1968

\*Property owner [REDACTED] Well No. \_\_\_\_\_

Address [REDACTED]  
Driller L.F. Winslow License No. 92-58

Water from Limestone 13. County Rock Island  
Formation

at depth 100 to 250 ft. Sec. 20  
1. Screen: Diam. \_\_\_\_\_ in. Twp. 20N  
Length: \_\_\_\_\_ ft. Slot \_\_\_\_\_ Rng. 2E  
Elev. 655.74


2. Casing and Liner Pipe

Diam. (in.)	Kind and Weight	From (Pt.)	To (Pt.)
<u>7.0 d.</u>	<u>25" seamless</u>	<u>0</u>	<u>187</u>

SHOW  
LOCATION IN  
SECTION PLAT  
[REDACTED]  
(permit)

6. Size Hole below casing: 6 1/4 in.  
7. Static level 35 ft. below casing top which is 1 ft.  
above ground level. Pumping level 74 ft. when pumping at 60  
gpm for 4 hours.

8. FORMATIONS PASSED THROUGH	THICKNESS	DEPTH OF BOTTOM
<u>Sand</u>	<u>0</u>	<u>175</u>
<u>Granite Rock</u>	<u>175</u>	<u>187</u>
<u>Limestone</u>	<u>187</u>	<u>250</u>

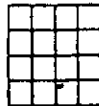
\* Industrial well  
(CONTINUE ON SEPARATE SHEET IF NECESSARY)

SIGNED L.F. Winslow DATE 5-1-68

COUNTY No. 573

## GEOLOGICAL AND WATER SURVEYS WELL RECORD

10. Property owner [REDACTED] Well No. \_\_\_\_\_  
 Address [REDACTED]  
 Driller Dirks, Michael J. License No. 092-7327  
 11. Permit No. WW05'93 Date 01/05/93  
 12. Water from \_\_\_\_\_ 13. County Rock Island  
 at depth \_\_\_\_\_ to \_\_\_\_\_ ft. Sec. 20  
 14. Screen: Diam. 12 in. Twp. 20 N  
 Length: 20 ft. Slot .05 Rge. 2 E  
 Elev. \_\_\_\_\_



15. Casing and Liner Pipe

NW SW SE

Diam. (in.)	Kind and Weight	From (ft)	To (ft)
14	PLAIN STEEL	0	82
12	SS SCREEN	82	102

16. Size hole below casing: \_\_\_\_\_ in.

17. Static level \_\_\_\_\_ ft. below casing top which is \_\_\_\_\_ ft. above ground level. Pumping level \_\_\_\_\_ ft. when pumping at \_\_\_\_\_ gpm for \_\_\_\_\_ hours.

18. Formations passed through	Thickness	Bottom
top soil	2	2
fine sand	35	37
medium to coarse sand	27	64
fine to medium gravel & rocks	38	102
shale at	0	102

Irrigation \_\_\_\_\_

Rock Island [REDACTED]

20-20N-02E

**GEOLOGICAL AND WATER SURVEYS WELL RECORD**

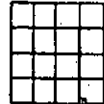
10. Property owner [REDACTED] Well No: \_\_\_\_\_  
 Address [REDACTED]

Driller Timmerman, Tom License No. 102-1781

11. Permit No. WJ10'91 Date 04/04/91

12. Water from sand & gravel 13. County Rock Island  
 at depth \_\_\_\_\_ to \_\_\_\_\_ ft.

14. Screen: Diam. \_\_\_\_\_ in. Sec. 20  
 Length: \_\_\_\_\_ ft. Slot \_\_\_\_\_ Rge. 2 E  
 Elev. \_\_\_\_\_



15. Casing and Liner Pipe SW SE SE

Diam. (in.)	Kind and Weight	From (ft)	To (ft)
5	PLASTIC	0	75

16. Size hole below casing: \_\_\_\_\_ in.  
 17. Static level 32 ft. below casing top which is 2 ft. above ground level. Pumping level 60 ft. when pumping at \_\_\_\_\_ gpm for 20 hours.

18. Formations passed through	Thickness	Bottom
dirt	10	10
sand & gravel	70	80

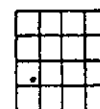
Household - Private

Rock Island [REDACTED] 20-20N-02E



## GEOLOGICAL AND WATER SURVEYS WELL RECORD

10. Property owner [REDACTED] Well No. \_\_\_\_\_  
 Address [REDACTED]  
 Driller Timmerman, Tom License No. 102-1781  
 11. Permit No. W72 '93 Date 10/20/93  
 12. Water from sand & gravel 13. County Rock Island  
 at depth 55 to 60 ft. Sec. 20  
 14. Screen: Diam. 5 in. Twp. 20 N  
 Length: 5 ft. Slot 20 Rge. 2 E  
 Elev. \_\_\_\_\_



15. Casing and Liner Pipe SE NW SW

Diam. (in.)	Kind and Weight	From (ft)	To (ft)
5	PVC SDR 21	0	55
	SCREEN	55	61

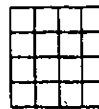
16. Size hole below casing: \_\_\_\_\_ in.  
 17. Static level 30 ft. below casing top which is 1 ft. above ground level. Pumping level 45 ft. when pumping at 12 gpm for 4 hours.

18. Formations passed through	Thickness	Bottom
sand & gravel	56	56
screen	5	61

Household - Private.  
 Rock Island [REDACTED] 20-20N-02E

GEOLOGICAL AND WATER SURVEYS WELL RECORD

Property owner [REDACTED] Well No. #1  
 Address [REDACTED]  
 Well address [REDACTED]  
 Lot \_\_\_\_\_ Subd \_\_\_\_\_  
 Driller Lyons, Larry License No. 102-2771  
 Permit No. 161 W55'00 Date 08/22/2000  
 Water from gravel County Rock Island  
 at depth 15 to 70 ft. Sec. 20  
 Screen: Diam. 6 in. Twp. 20 N  
 Length: 5 ft. Slot 40 Rge. 2 E  
 Elev. \_\_\_\_\_



Casing and Liner Pipe

NW NW SE

Diam. (in.)	Kind and Weight	From (ft)	To (ft)
6	STEEL	0	65
6	STAINLESS STL SCREEN	65	70

Size hole below casing: \_\_\_\_\_ in.  
 Static level 28 ft. below casing top which is 1 ft.  
 above ground level. Pumping level: 40 ft. when pumping at 60  
 gpm for 2 hours.

Formations passed through	Thickness	Bottom
topsoil	1	1
sand	14	15
gravel	55	70

Household - Private

Rock Island [REDACTED] 20-20N-2E

NOTED AND RECORDED TO STATE  
 ER HEALTH PROTECTION, 535 WEST  
 DO NOT DETACH GEOLOGICAL/WATER  
 OPER. WELL LOCATION

GEOLOGICAL AND WATER SURVEYS WELL RECORD

Property owner [REDACTED] Well No. 1823  
 Address [REDACTED]  
 Driller S.D. Albrecht License No. 102-120  
 Permit No. 58711 Date \_\_\_\_\_  
 Water from gravel & sand 13. County Rock Island  
 at depth 76 to 104 ft. Sec. 20  
 Screen: Diam. 12 in. Twp. 20N  
 Length: 32 ft. Slot 60 Rge. 2E  
 Elev. 627M

		x	

Casing and Liner Pipe

Size (In.)	Kind and Weight	From (Ft.)	To (Ft.)
15"	plastic	0	79

SHOW LOCATION IN SECTION PLAT

(permit)

Size Hole below casing: 15 in.  
 Static level 36 ft. below casing top which is \_\_\_\_\_ ft. above ground level. Pumping level \_\_\_\_\_ ft. when pumping at 1000 gpm for 1 1/2 hours.

FORMATIONS PASSED THROUGH	THICKNESS	DEPTH OF BOTTOM
sand	10	10
3/8" gravel	35	45
60 slot 20% 1/8" gravel	5	50
3/4" gravel	2	52
15 slot sand	4	56
3/8" gravel	8	64
20 slot sand	10	74
1/2" gravel	2	76
12 slot sand	28	104

(CONTINUE ON SEPARATE SHEET IF NECESSARY)

(over)

SIGNED S. Dean Albrecht DATE June 11, 1977

COUNTY No. 21356

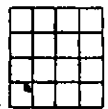
ROCK ISLAND

20-20N-2E



## GEOLOGICAL AND WATER SURVEYS WELL RECORD

10. Property owner [REDACTED] Well No. \_\_\_\_\_  
 Address [REDACTED]  
 Driller McKinney, Ted R. License No. 102-2540  
 11. Permit No. 111479 Date 03/08/84  
 12. Water from \_\_\_\_\_ 13. County Rock Island  
 at depth \_\_\_\_\_ to \_\_\_\_\_ ft. Sec. 20  
 14. Screen: Diam. 16 in. Twp. 20 N  
 Length: 20 ft. Slot .05 Rge. 2 E  
 Elev. 608.74



15. Casing and Liner Pipe NE SW SW

Diam. (in.)	Kind and Weight	From (ft)	To (ft)
16	STEEL PLAIN	0	95
16	STEEL SCREEN	95	115

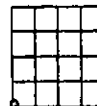
16. Size hole below casing: \_\_\_\_\_ in.  
 17. Static level 32 ft. below casing top which is 0 ft.  
 above ground level. Pumping level 72 ft. when pumping at 1250  
 gpm for \_\_\_\_\_ hours.

18. Formations passed through	Thickness	Bottom
SS #64408 (0'-115')	0	0
top soil	2	2
med sand to f gvl	32	34
crs sand to med gvl	72	106
fine sand to med gvl	9	115

Rock Island [REDACTED] 20-20N-02E

## GEOLOGICAL AND WATER SURVEYS WELL RECORD

10. Property owner [REDACTED] Well No. \_\_\_\_\_  
 Address [REDACTED]  
 Driller Timmerman, Tom License No. 102-1781  
 11. Permit No. 018841 Date 08/14/90  
 12. Water from sand & gravel 13. County Rock Island  
 at depth 54 to 59 ft. Sec. 20  
 14. Screen: Diam. 5 in. Twp. 20 N  
 Length: 5 ft. Slot 10 Rge. 2 E  
 Elev. \_\_\_\_\_



15. Casing and Liner Pipe SW SW SW

Diam. (in.)	Kind and Weight	From (ft)	To (ft)
5	PLASTIC	0	54

16. Size hole below casing: \_\_\_\_\_ in.  
 17. Static level 35 ft. below casing top which is 0 ft. above ground level. Pumping level 45 ft. when pumping at \_\_\_\_\_ gpm for 10 hours.

18. Formations passed through	Thickness	Bottom
dirt	4	4
sand & gravel	55	59

Household - Private  
 Rock Island [REDACTED] 20-20N-02E

REGISTERED AND PAID SURVEYORS TO STATE  
 PUBLIC HEALTH PROTECTION, 535 WEST  
 DO NOT DETACH GEOLOGICAL/WATER  
 PROPER WELL LOCATION.

**GEOLOGICAL AND WATER SURVEYS WELL RECORD**

Completed 8-2-78

10. Property owner [REDACTED] Well No. 7837  
 Address [REDACTED]  
 Driller House Well & Pump License No. 102-178  
 11. Permit No. 77605 Date 31 July 1978  
 12. Water from Broken Limestone 13. County Rock Island  
 at depth 63 to 140 ft. Sec. 20  
 14. Screen: Diam. \_\_\_\_\_ in. Twp. 20N  
 Length: \_\_\_\_\_ ft. Slot \_\_\_\_\_ Rge. 2E  
 Elev. 605.74


15. Casing and Liner Pipe

Dim. (In.)	Kind and Weight	From (Ft.)	To (Ft.)
6		0	63

SHOW LOCATION IN SECTION PLAT

(permit)

16. Size Hole below casing: 6 in.  
 17. Static level 70 ft. below casing top which is 1 ft. above ground level. Pumping level 80 ft. when pumping at 30 gpm for 3 1/2 hours.

18. FORMATIONS PASSED THROUGH	THICKNESS	DEPTH OF BOTTOM
<u>Brown Dirt &amp; Sand</u>	<u>39</u>	<u>39</u>
<u>Light Shale &amp; Sand</u>	<u>8</u>	<u>47</u>
<u>Red Clay</u>	<u>6</u>	<u>53</u>
<u>Limestone</u>	<u>87</u>	<u>140</u>

(CONTINUE ON SEPARATE SHEET IF NECESSARY)

SIGNED Tom timmerman DATE 7 August 1978

ROCK ISLAND

COUNTY No 21612

20-20N-2E



# Downhole Video Survey

Date: 10-10-03

Customer: Exelon - Quad Cities Station

Job Number: 169156N Well No: 1 S.W.L. 36'

Location: 3 Miles north of Cordova on west side of Route 84

County: Rock Island City: Cordova State: IL

Sec: 18 Twp: 2N Rge: 2E

Tape Made: Yes  No  Tape File No: \_\_\_\_\_

Was Well Backflushed? Yes  No

How Long Backflushed? Overnight

Tape Length in Minutes \_\_\_\_\_

Brief Well Description Originally constructed in September/October 1966. 10" casing is installed from the surface to 52'. A nominal 10" borehole was drilled from 52' to a total depth of 250'. Prior to this video survey the total depth was measured at 232' and then the well was bailed to its current total depth of 242'. Brown sand with shale was bailed from the well.

Depth		Description
+1'	52'	10" casing
52'	242'	9 7/8" drill hole
36'		Static water level
40'		Possible quarter sized hole in casing - nothing substantial
59'		Enlarged hole and fracture
71'		Enlarged hole and fracture
76'		Enlarged hole and fracture
80'		Enlarged hole and fracture
89'		Enlarged hole and fracture
98'		Enlarged hole and fracture
119'		Enlarged hole and fracture
129'		Enlarged hole and fracture
144'		Enlarged hole and substantial fracture
153'		Enlarged hole and substantial fracture
206'		Picture goes completely dark.
242'		Total depth.
250'		Original total depth

Technician: L. Malaker





WELL TEST DATA SHEET  
**Layne-Western**

a division of Layne Christensen Company

PROFESSIONAL SERVICES FOR WATER SYSTEMS

721 West Illinois Avenue, Aurora, Illinois 60506-2892 Telephone 630/897-6941  
229 West Indiana Avenue, Beecher, Illinois 60401 Telephone 708/946-2244

Location Exelon - Quad Cities Station Well No. 1 Date Tested 10-10-03  
 City Cordova, IL Tested By Senne/Kiefer  
 Diameter of Well 10" Driver 25HP Franklin 480V 3500 rpm  
 Depth of Well 242 Feet (orig. 250') Column and Shaft 3" T&C  
 Length of Airline 149 Feet Bowls 8 CHC - 4 stage  
 Non-Pumping Level 37 Feet Manufacturer Goulds/Christensen  
 Orifice Size 4 x 3 Serial No. 474465-Pump

Time	Piezometer Reading (in.)	G.P.M.	Air Gauge Reading (feet)	Pumping Level	Drawdown	Disch. Pressure		Amps	Remarks
						Lbs.	Pt.		
			112	37				33.5 FLA	
1:15	56	298	88	81	44	50	115.5	33.5-32	Clear
1:20	50	280	87	82	45	50	115.5	32	Clear
1:25	50	280	81	88	51	50	115.5	32	Trace of sand
1:30	50	280	61	88	51	50	115.5	32	Clear
1:35	48	277	61	88	51	50	115.5	32	Clear
			Open to 40 psi						
1:50	54	291	56	93	36	40	92.4	32	Clear, trace of sand
1:55	54	291	54	95	58	40	92.4	32	Clear, trace of sand
2:05	54	291	54	85	58	40	92.4	32	Clear, trace of sand
2:15	54	291	54	95	58	40	92.4	32	Clear, trace of sand
			Open to 30 psi						
2:20	61.5	310	50	99	62	30	69.3		Sp.Q = 5
2:30	61	309	49	100	63	30	69.3	32	
2:40	61	309	48	101	64	30	69.3		
2:50	61	309	48	101	64	30	69.3	32	Clear

Notes

- 1) Pumping assembly removed due to a low megohm reading
- 2) Pump and motor were replaced
- 3) Motor S/N 03J19-25-0167 Model No. 2366159020
- 4) Pump S/N 474465
- 5) Downhole video survey conducted
- 6) Layne project engineer: Nick Winkelmann



Driller's Log

<u>Depth (ft)</u>	<u>Formation</u>
0 - 40	sand
40 - 49	sand & gravel
49 - 142	limestone
142 - 148	lime & shale
148 - 250	limestone







INSTRUCTIONS TO DR.

FILL IN ALL PERTINENT INFORMATION REQUESTED AND MAIL ORIGINAL TO STATE DEPARTMENT OF PUBLIC HEALTH, CONSUMER HEALTH PROTECTION, 535 WEST JEFFERSON, SPRINGFIELD, ILLINOIS, 62761. DO NOT DETACH GEOLOGICAL/WATER SURVEYS SECTION. BE SURE TO PROVIDE PROPER WELL LOCATION.

Fire Tracing

ILLINOIS DEPARTMENT OF PUBLIC HEALTH  
WELL CONSTRUCTION REPORT

GEOLOGICAL AND WATER SURVEYS WELL RECORD

White Copy - Ill. Dept. of Public Health  
Yellow Copy - Well Contractor  
Blue Copy - Well Owner

1. Type of Well

- a. Dug  Bored  Hole Diam. 8 in. Depth 225 ft.  
Curb material  Buried Slab: Yes  No
- b. Driven  Drive Pipe Diam.  in. Depth  ft.
- c. Drilled  Finished in Drift  In Rock   
Tubular  Gravel Packed
- d. Grout:

(KIND)	FROM (Ft.)	TO (Ft.)
Puddled		
Clay	0	44

2. Distance to Nearest:

- Building  Ft. Seepage Tile Field
- Cess Pool  Sewer (non Cast iron)
- Privy  Sewer (Cast iron)
- Septic Tank  Barnyard
- Leaching Pit  Manure Pile

3. Well furnishes water for human consumption? Yes  No
4. Date well completed November 17, 1987
5. Permanent Pump Installed? Yes  Date  No   
Manufacturer Goulds Type subm Location in well  
Capacity 250 gpm. Depth of Setting 126 Ft.
6. Well Top Sealed? Yes  No  Type
7. Pitless Adapter Installed? Yes  No   
Manufacturer Baker Model Number   
How attached to casing? threaded
8. Well Disinfected? Yes  No
9. Pump and Equipment Disinfected? Yes  No
10. Pressure Tank Size 1000 gal. Type horizontal  
Location
11. Water Sample Submitted? Yes  No

REMARKS:

Co # 22049

10. Property owner Commonwealth Edison Well No. 3023  
Address 22710-206 Ave. N. Cordova, IL  
Driller S. Dean Albrecht License No. 102-120
11. Permit No. 136904 Date 11/3/87
12. Water from rock 13. County Rock Island  
at depth 200 to 225 ft. <sup>Formation</sup>
14. Screen: Diam.  in.  
Length:  ft. Slot
- Sec. 7.2a  
Twp. ZON  
Rge. 2E  
Elev. 605


15. Casing and Liner Pipe

Diam. (in.)	Kind and Weight	From (Ft.)	To (Ft.)
8	steel	0	44

SHOW LOCATION IN SECTION PLAT

SW SE SE

Leaching Protection Well

16. Size Hole below casing: 8 in.
17. Static level 35 ft. below casing top which is 1 1/2 ft. above ground level. Pumping level  ft. when pumping at 250 gpm for 4 hours.

18. FORMATIONS PASSED THROUGH	THICKNESS	DEPTH OF BOTTOM
dirty sand	3	3
muscatine 25+5% 60 slot	39	42
yellow limestone - no water to 60'	92	134
60-70 75 gpm; 70-90 +75-150 gpm		
badly fractured	3	137
yellow limestone	16	153
badly fractured	2	155
yellow limestone	8	163
harder yellow limestone more water	22	185
yellow limestone	15	200

(CONTINUE ON SEPARATE SHEET IF NECESSARY)

white limestone 25 225  
SIGNED Simon Luck DATE 11/25/88

Owner's Name: COMMONWEALTH EDISON

Address: 22710-206 Ave. North Cordova, IL

Location: The SW Quarter of the SE Quarter of the SE Quarter of Section 7 of Cordova[20N 2E]Twp. in Rock Island County.

Date: November 13-17, 1987

Well Log: Rough Ref.# 1762

**Well**

Diameter: 8"

Depth: 225'

Cased to: 44'

**Water levels**

Static: 35' est.

Pumping: \_\_\_\_\_

GPM: 250 est. w/air

Time: \_\_\_\_\_

**Screen**

Type of: ROCK WELL

Length: \_\_\_\_\_

Diameter: \_\_\_\_\_

Slot: \_\_\_\_\_

Seal: \_\_\_\_\_

**Pump**

Size: 20 HP

Type: 3Ø, 230v., Submersible Franklin Motor

Make: Goulds 225-H20-6

Setting: 126'x4" Steel

Pitless Unit: 8" Baker Threaded

Who did work: Jet, Bill, Tom  
Dennis, Harold,  
and Bryan

Permit No.: 136904

dirty sand 0-3

Muskatine 25+5% 60 slot 3-42

Yellow limestone 42-134

no water to 60'

60-70 75 gpm

70-90 +75-150 gpm

badly fractured 134-137

yellow limestone 137-153

badly fractured 153-155

yellow limestone 155-163

harder yellow limestone more H<sub>2</sub>O 163-185

yellow limestone 185-200

white limestone 200-225

**Additional Comments**

Furnas Starter & Mercoid Switch

135' Airline

2/3 Subm. Cable- 200'

1000 gal. horizontal pressure tank





WELL INFORMATION - ROCK WELLS

Layne®-Western

a division of Layne Christensen Company

PROFESSIONAL SERVICES FOR WATER SYSTEMS

721 West Illinois Avenue • Aurora, Illinois 60506-2892 • Phone 630/897-6941
229 West Indiana Avenue • Beecher, Illinois 60401 • Phone 708/946-2244

New Fish Hatchery well house

Name Of Job Exelon - Quad Cities Date 09/09/2004

City Cordova State ILLINOIS

Well No. Hatchery House #2 Drillers Swanberg and Lanan

Well Location 1320 ft. ( N ) and 330 ft. ( E ) of the SW corner of
the SW 1/4 of Section 7, Twp. 17 ( N ), Range 1 ( W ) Rock Island County

Otherwise located as Hatchery House Well #2

Work Began: 9/9/2004 Work Completed: 9/15/2004

Table with 5 columns: Casing Record Amount, Dia., Wt. or Thickness, Material, and joints from/to. Row 1: 73, 6", 0.280", Steel, with T&C joints from 71 to +2

Hole Record: 13 inch from 0 to 71'
5-1/2 inch from 71' to 135'

Cementing Record: Bentonite grout from 71' to 10'

Well Test Data: Static Level 32'; pumping level after hours pumping at g.p.m.

Length of test hrs. See Well Test Data Sheet Dated

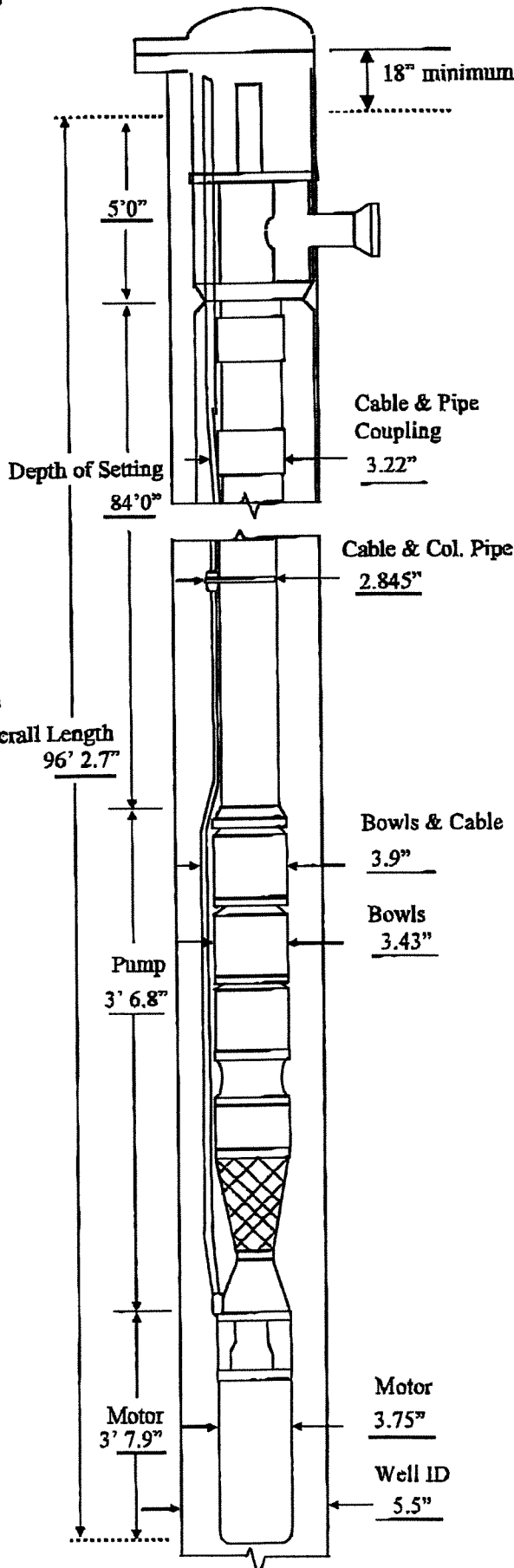
Performance test to be conducted when the permanent power is installed. Permit obtained from the Rock Island County Health Department.

Layne Job No. 169326N Well Permit No. 090904NW-1b





**SUBMERSIBLE OUTLINE  
PITLESS ADAPTER  
CONSTRUCTION**



DATE SEPTEMBER 9, 2004

CUSTOMER Exelon-Quad Cities Station Cordova, IL

WELL NO. Fish Hatchery Well #2

SERIAL NO. \_\_\_\_\_

LAYNE JOB NO. 16-9326N

PURCHASE ORDER NO. 16-8032-9326N

ADAPTER MANUFACTURER BAKER-MONITOR

MODEL NUMBER 6X5 Kwikconnect w/ Monitor 7WPSM Cap

2 " T&C GALVINIZED COLUMN PIPE

2 " THREADED DISCHARGE

BOWL ASSEMBLY GOULDS 80GS 75 / 14 STAGE

10 HP 3450 RPM FRANKLIN ELECTRIC  
SUBMERSIBLE MOTOR

4" SIZE 3 PH. 60 CYCLE 460 VOLT

100 GPM 185' TDH

CABLE SIZE #10 3c w/g VOLTAGE 600 LENGTH 100'

REMARKS 1. One (1) 2" bronze check valve located at the  
first joint above the bowl (21' above the bowl).

2. One (1) - 1/4" Toro plastic airline & gauge installed

3. Length of airline = 100'

4. Pump startup was on 12/3/04

**LAYNE-WESTERN**  
721 W. ILLINOIS AVENUE, AURORA ILLINOIS 60506  
TEL: 630/897-6941



ILLINOIS DEPARTMENT OF PUBLIC HEALTH

APPLICATION FOR PERMIT TO CONSTRUCT OR DEEPEN A WATER WELL

INSTRUCTIONS ON REVERSE SIDE

APPLICATIONS WILL BE RETURNED

Owner-Current Mailing Address

Exelon Nuclear

Address 22710 206th Avenue North

State/Zip Cordova, IL 61242-9240

Phone Number 309.227.3547

Site: County Rock Island

Address 22710 206th Avenue North

Well ID #

Location 17 Township 20 (N)(S) Range 2 (E)(W)

Directions to Site

2. Well Contractor License # 102 1003522

Name Layne-Western

Address 721 W. Illinois Avenue

City/State/Zip Aurora, IL 60506

Telephone Number 630.897.6941

Township

Lot #

Subdivision

1/4 of the 1/4 of the 1/4

more space is needed see reverse side or place on additional sheet.

Propose to [x] Construct or [ ] Deepen a [ ] Bored [ ] Driven [ ] Drilled

[x] Private Well B. [ ] Semi-Private Well C. [ ] Non-Community Public Well

Proposed Use: [ ] Irrigation [ ] Domestic [x] Commercial [ ] Livestock [ ] Other

Well Diameter 6 in. Estimated Depth 100 ft. Estimated Depth to Rock 50 ft.

Proposed Aquifer: [ ] Sand & Gravel [x] Limestone [ ] Sandstone [ ] Other

Proposed Casing: Type Steel Size 6 in. Estimated Amount 52 ft.

[ ] Check if anticipated yield is greater than 100,000 gallons per day.

Complete if B or C checked: Number of persons served Type of Facility (If C, an Application For Permit to Construct, Alter or Extend a Non-Community Public Water Supply must be completed)

I certify that the attached information is complete and correct and that the work will conform to the current Illinois Water Well Construction Code.

September 2, 2004 Date

Signature of Water Well Contractor

Pump Type Submersible

Pump Contractor Layne-Western

License # 102 1003522 Phone 630 / 897 / 6941

Address 721 W. Illinois Avenue City/State/Zip Aurora, IL 60506

I certify that the work will conform to the current Illinois Pump Installation Code.

September 2, 2004 Date

Signature of Pump Installation Contractor

ATTACH A SHEET WITH DIAGRAM OF WELL SITE SHOWING DIMENSIONS

If a septic system plot or draw the proposed construction site with dimensions showing the water well, distances to building and utility lines, sewer lines, septic tanks and other sources of contamination. Indicate distance to community water supply, if available. If there is an existing well on the property, indicate status.

FOR OFFICE USE ONLY

Approved By

Date

FIPS Code Number Year (Well Permit Number)

White Copy - Health  
 Ill. Dept. of Health  
 Yellow Copy - Contractor  
 Blue Copy - Well Owner

**INSTRUCTIONS**

FILL IN ALL PERTINENT INFORMATION REQUIRED AND MAIL ORIGINAL TO STATE DEPARTMENT OF PUBLIC HEALTH, CONSUMER HEALTH PROTECTION, 535 WEST JEFFERSON, SPRINGFIELD, ILLINOIS, 62761. DO NOT DETACH GEOLOGICAL/WATER SURVEYS SECTION. BE SURE TO PROVIDE PROPER WELL LOCATION.

**ILLINOIS DEPARTMENT OF PUBLIC HEALTH  
 WELL CONSTRUCTION REPORT**

**1. Type of Well**

- a. Dug  Bored  Hole Diam. 26 in. Depth 175 ft.  
 Curb material \_\_\_\_\_ Buried Slab: Yes  No
- b. Driven \_\_\_\_\_ Drive Pipe Diam. \_\_\_\_\_ in. Depth \_\_\_\_\_ ft.
- c. Drilled  Finished in Drift \_\_\_\_\_ In Rock \_\_\_\_\_  
 Tubular \_\_\_\_\_ Gravel Packed
- d. Grout:

(KIND)	FROM (FT.)	TO (FT.)
Grout	0	20

**2. Distance to Nearest:**

- Building \_\_\_\_\_ Ft. Seepage Tile Field \_\_\_\_\_  
 Cess Pool \_\_\_\_\_ Sewer (non Cast iron) \_\_\_\_\_  
 Privy \_\_\_\_\_ Sewer (Cast iron) \_\_\_\_\_  
 Septic Tank \_\_\_\_\_ Barnyard \_\_\_\_\_  
 Leaching Pit \_\_\_\_\_ Manure Pile \_\_\_\_\_

3. Well furnishes water for human consumption? Yes  No

4. Date well completed 11/28/84

5. Permanent Pump Installed? Yes  Date \_\_\_\_\_ No

Manufacturer \_\_\_\_\_ Type \_\_\_\_\_ Location \_\_\_\_\_  
 Capacity 3000 gpm. Depth of Setting \_\_\_\_\_ Ft.

6. Well Top Sealed? Yes  No  Type \_\_\_\_\_

7. Pitless Adapter Installed? Yes  No

Manufacturer \_\_\_\_\_ Model Number \_\_\_\_\_  
 How attached to casing? \_\_\_\_\_

8. Well Disinfected? Yes  No

9. Pump and Equipment Disinfected? Yes  No

10. Pressure Tank Size \_\_\_\_\_ gal. Type \_\_\_\_\_

Location \_\_\_\_\_

11. Water Sample Submitted? Yes  No

REMARKS:

*Big Fish leaning well*

**GEOLOGICAL AND WATER SURVEYS WELL RECORD**

10. Property owner Commonwealth Edison-SIU Fishery Research Project Well No. \_\_\_\_\_  
 Address Carbondale, Il.

Driller Grosch Irrigation License No. 102-002540

11. Permit No. 115930 Date 11/21/84

12. Water from \_\_\_\_\_ 13. County Rock Island

Formation \_\_\_\_\_ at depth \_\_\_\_\_ to \_\_\_\_\_ ft. Sec. 18.2g

14. Screen: Diam. 18 in. Twp. 20N

Length: 68 ft. Slot .050 Rge. 2E

Elev. \_\_\_\_\_

			<input checked="" type="checkbox"/>

**15. Casing and Liner Pipe**

Diam. (in.)	Kind and Weight	From (Ft.)	To (Ft.)
18	Johnson steel screen	0	18
18	Plain steel	18	27
18	Steel screen	27	57

SHOW LOCATION IN SECTION PLAT  
 18" Plain steel 57-  
 18" Steel screen 78-  
 18" Plain steel 98-  
 SW NE NE  
 Irrigation

16. Size Hole below casing: \_\_\_\_\_ in.

17. Static level 40 ft. below casing top which is \_\_\_\_\_ ft. above ground level. Pumping level 71 ft. when pumping at 3000 gpm for 24 hours.

18. FORMATIONS PASSED THROUGH	THICKNESS	DEPTH OF BOTTOM
Top soil	0	2
Medium sand to medium gravel	2	65
Brown clay	65	68
Medium sand to medium gravel	68	97
Gray clay	97	121
Coarse sand to medium gravel	121	151
Gray clay	151	160
Gray clay w/gravel layers	160	178
Limestone	178	--

(CONTINUE ON SEPARATE SHEET IF NECESSARY)

SIGNED Step R M Young DATE 3/7/85

# FACSIMILIE COVER SHEET

GROSCH IRRIGATION CO., INC.  
13590 N. SR 29  
Mason City, Il. 62684

217/482-5479 Phone no.  
E-Mail [suc-n-suc@abelink.com](mailto:suc-n-suc@abelink.com)  
217/482-3863 Fax no.

<b>SEND TO</b> Exclon Nuclear	<b>FROM</b> Sue
<b>PHONE NO.</b>	<b>DATE</b> 5/6/03
<b>FAX NO.</b> 309/227-2265	<b>PHONE NUMBER</b> 217/482-5479
<b>Attn: Mark Stuhlman</b>	

- Urgent/
  Reply ASAP/
  Please Comment/
  Please Review/
  For your information/

Total pages, including cover sheet: 2

### COMMENTS

**Well Information: 175 ft. Well - Listed top to bottom**

77 ft. of 18" Plain steel casing

20 ft. of 18" Stainless steel screen

21 ft. of 18" Plain steel casing

30 ft. of 18" Stainless steel screen

9 ft. of 18" Plain steel casing

18 ft. of 18" Stainless steel screen

Sue

# FACSIMILIE COVER SHEET

GROSCH IRRIGATION CO., INC.  
13590 N. SR 29  
Mason City, Il. 62664

217/482-5479 Phone no.  
E-Mail sue-n-sue@abclink.com  
217/482-3863 Fax no.

<b>SEND TO</b> Exelon Nuclear	<b>FROM</b> Sue
<b>PHONE NO.</b>	<b>DATE</b> 5/5/03
<b>FAX NO.</b> 309/227-2265	<b>PHONE NUMBER</b> 217/482-5479
<b>Attn: Mark Stahlman</b>	

Urgent/     Reply ASAP/     Please Comment/     Please Review/     For your information/

Total pages, including cover sheet: 1

**COMMENTS**

Mark:

Hope this is what you need.

**Test pump results:**

**Static water level 40 ft.**

**3000gpm @ 71 ft.**

**31 ft. drawdown**

**Pump set at 80 ft.**

If you need anything else, please give me a call. That's what I'm here for.

Sue





B SITE

23645-0008z



# Purchase Order

Southern Illinois University at Carbondale  
Carbondale, Illinois 62901

MARK ALL SHIPMENTS WITH THIS ORDER NUMBER - 23645-0008z	
BUYER	W. Stone
DATE	6-27-86
BID OPENING DATE	7/20/86
DELIVERY PROMISE	As Requested
SHIP VIA	
SHIP FROM	
TERMS	Net
FOB POINT	Job Site

Quad Cities Fisheries Investigations - Commonwealth of Illinois UNIV. ACCT. NO. 6-23645

US VERY	See Below	STAT	MS133	FUND	REST
Bettye Doerr 536-7761					

FEIN/SE RO	ZIP CODE	TYPE CODE
420959010	52773	01

VENDOR OR PAYEE

- Winlow Drilling Company
- RR #1
- Walcott, IA 52773

*the fish pump/well*

F.Y.	SOURCE OF FUNDS	MAJ. OBJ.	MIN. OBJ.	CUSAS CODE	OBIGATION NUMBER	LIQ.	APPROPRIATION ACCOUNT CODE NO.
86	00	26	05	1223			

QUANTITY	UNIT	DESCRIPTION	UNIT PRICE	AMOUNT
		Furnish and install a water well, test it, and install pump, at the Quad Cities Nuclear Power Station, Carbondale, Illinois, according to the following specifications. Test drilling has been completed at the site and the results are available. Design of the well:  50' 8" Plastic Cased Well  8" x 10' Johnson Stainless Steel Screen, 16 slot, 511 sq. in. open area  40' 2 1/2" Black Drop Pipe  50' Wire  150H05 Gould's Submersible Turbine TDH at 100' produces 150 GPM (specifications attached)  Seal and Permits  Installation, Water Supply, Drilling Fluid  Well, pump, and testing total		5,267.00

PASSED	OR ADJUSTMENT	BALANCE	PASSED	OR ADJUSTMENT	BALANCE	DATE PASSED	LIQUIDATION OR ADJUSTMENT	ENCUMBRANCE BALANCE

Estimate

CANDONA NUCLEAR PLANT  
PROJECT

Dry Cost Storage

**JOHNSON H<sub>2</sub>O EQUIPMENT**  
CERTIFIED PUMP INSTALLATION CONTRACTOR  
4350 Hopewell Avenue • Bettendorf, Iowa 52722  
Phone (563) 332-6820

Well Data

Date 4-13 2004  
Name VALLEY CONSTRUCTION Co Bill Wass  
Address \_\_\_\_\_  
Phone \_\_\_\_\_

Depth 74'  
Static Level 40'  
Pumping Level 43'  
Pump Setting 62'  
Casing Size 6"  
Casing Depth \_\_\_\_\_  
Driller \_\_\_\_\_

**Pump System**

Pump Model 5. HP. 60. GPM \$ 2,470.00  
Pump Control 5. HP. DELUXE 460.00  
Submersible Wire 75' #8-3 w/ Ground 168.75  
Drop Pipe 63' 2" GALVANIZED 570.15  
Pitless Adapter \_\_\_\_\_  
Well Seal Or Cap 6" 59.00

**Pressure System**

Pressure Tank \_\_\_\_\_  
Pressure Switch \_\_\_\_\_  
Pressure Gauge \_\_\_\_\_  
Air Release \_\_\_\_\_  
Check Valves (2) 2" BRASS - REQUIRED BY R.I. Co. HEALTH DEPT. 173.40  
Aerator \_\_\_\_\_

**Piping**

Well To Tank Pipe For Offset \_\_\_\_\_  
Valves, Fittings, Electrical And Miscellaneous items 150.00

**Other Items**

1/4" PRESSURE RELIEF VALVE 125.00  
WATER TIGHT ENCLOSURE / PUMP CONTROL 102.00

**TOTAL MATERIALS** \$ 4,278.30

Illinois Sales Tax \_\_\_\_\_

Labor \_\_\_\_\_ 564.00

Trenching or Backhoe \_\_\_\_\_

\* Rough Grade Finish, No Rock, Frost, Sand, Water, Debris.

Welding \_\_\_\_\_

Permits R.I. COUNTY PUMP INST. REPORT / PERMIT N/C

**SUB TOTAL** \$ 4,842.30

Iowa Sales Tax \_\_\_\_\_

**ESTIMATED TOTAL** \$ 4,842.30

**NOTES:**

- ① Some items may vary due to changes in well data, location, and materials used
- ② SALES TAX INVOICED, IF APPLY
- \* ③ RECOMMEND AIR LIFT DEBRIS FROM WELL PRIOR TO ABOVE INSTALL -
- ③ ADDITIONAL LABOR 8282.00, AIR COMPRESSOR PROVIDED BY CLIENT AT INVOICE RENTAL
- ④ \_\_\_\_\_

Proposals are for work done according to the original specifications. If, through a change in specifications by customer, additional work or equipment is required, such additions will be billed at current rates for work completed. All prices subject to change without notice.  
TERMS: Due In 10 days. Service Charge, 2% per Month, 24% Annually On Unpaid Balance.

APPENDIX B

MONITORING WELL LOGS



# STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: QUAD CITIES GENERATING STATION  
 PROJECT NUMBER: 45136-28  
 CLIENT: EXELON GENERATION COMPANY LLC  
 LOCATION: CORDOVA, ILLINOIS

HOLE DESIGNATION: MW-1  
 DATE COMPLETED: January 8, 2002  
 DRILLING METHOD: 4-1/2" HSA  
 FIELD PERSONNEL: J. HARGENS

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft AMSL	MONITORING WELL	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (PPM)
	GROUND SURFACE TOP OF RISER	594.10 593.44						
2	not sampled		<p style="font-size: small;">Concrete 8" Borehole Bentonite Chips 2" Ø PVC Well Casing 2" Ø PVC Well Screen Sand Pack</p>					
4								
6								
8								
10		584.10 583.60			1SS	X	>90	0
12	CL-CLAY, some fine sand, trace fine gravel, brown, dry							
14	SW-SAND, fine to medium grained, brown, dry							
16	- damp at 16.0ft BGS				2SS	X	88	0
18								
20								
22				3SS	X	74	1.4	
24								
26	- saturated at 25.0ft BGS			4SS	X	64	0	
28	END OF BOREHOLE @ 27.5ft BGS	566.60	<p style="font-size: small;"><u>WELL DETAILS</u>            Screened interval:            577.10 to 567.10ft AMSL            17.00 to 27.00ft BGS            Length: 10ft            Diameter: 2in            Slot Size: 10            Material: PVC            Sand Pack:            579.10 to 566.60ft AMSL            15.00 to 27.50ft BGS</p>					
30								
32								
34								
36								
38								
40								
42								
44								
46								
48								

**NOTES:** MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

OVERBURDEN LOG 45136-28.GPJ CRA\_CORP.GDT 6/7/06



# STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: QUAD CITIES GENERATING STATION  
 PROJECT NUMBER: 45136-28  
 CLIENT: EXELON GENERATION COMPANY LLC  
 LOCATION: CORDOVA, ILLINOIS

HOLE DESIGNATION: MW-2  
 DATE COMPLETED: January 9, 2002  
 DRILLING METHOD: 4-1/2" HSA  
 FIELD PERSONNEL: J. HARGENS

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft AMSL	MONITORING WELL	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (PPM)
	GROUND SURFACE TOP OF RISER	593.70 592.90						
2	asphalt and gravel not sampled	592.70	<p style="margin-left: 20px;">Concrete</p> <p style="margin-left: 20px;">8" Borehole</p> <p style="margin-left: 20px;">Bentonite Chips</p> <p style="margin-left: 20px;">2" Ø PVC Well Casing</p> <p style="margin-left: 20px;">2" Ø PVC Well Screen</p> <p style="margin-left: 20px;">Sand Pack</p>					
12	SW-SAND, trace fine gravel, fine to medium grained, brown, dry	581.70		1SS	X		88	0
20	- damp at 20.0ft BGS			2SS	X		>83	0
23	- gray, wet at 23.0ft BGS			3SS	X		>50	0
27.5	END OF BOREHOLE @ 27.5ft BGS	566.20						
				<p><u>WELL DETAILS</u></p> <p>Screened interval:            576.70 to 566.70ft AMSL            17.00 to 27.00ft BGS</p> <p>Length: 10ft            Diameter: 2in            Slot Size: 10            Material: PVC</p> <p>Sand Pack:            578.70 to 566.20ft AMSL            15.00 to 27.50ft BGS</p>				

**NOTES:** MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

OVERBURDEN LOG 45136-28.GPJ CRA\_CORP.GDT 6/7/06



# STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: QUAD CITIES GENERATING STATION  
 PROJECT NUMBER: 45136-28  
 CLIENT: EXELON GENERATION COMPANY LLC  
 LOCATION: CORDOVA, ILLINOIS

HOLE DESIGNATION: MW-3  
 DATE COMPLETED: January 9, 2002  
 DRILLING METHOD: 4-1/2" HSA  
 FIELD PERSONNEL: J. HARGENS

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft AMSL	MONITORING WELL	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (PPM)
	GROUND SURFACE TOP OF RISER	593.80 593.44						
2	gravel not sampled	592.80	<p style="font-size: small;">Concrete 8" Borehole Bentonite Chips 2" Ø PVC Well Casing 2" Ø PVC Well Screen Sand Pack</p>					
10	SW-SAND, fine to medium grained, brown, dry	583.80						
14				1SS	X		76	0.3
18	- trace fine rounded gravel at 18.0ft BGS							
20				2SS	X		63	0.7
22	- gray, saturated at 23.0ft BGS							
24				3SS	X		40	1.1
28	END OF BOREHOLE @ 27.5ft BGS	566.30						
30								
32								
34								
36								
38								
40								
42								
44								
46								
48								

**WELL DETAILS**  
 Screened interval:  
 576.80 to 566.80ft AMSL  
 17.00 to 27.00ft BGS  
 Length: 10ft  
 Diameter: 2in  
 Slot Size: 10  
 Material: PVC  
 Sand Pack:  
 578.80 to 566.30ft AMSL  
 15.00 to 27.50ft BGS

**NOTES:** MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

OVERBURDEN LOG 45136-28.GPJ CRA\_CORP.GDT 6/7/06



# STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: QUAD CITIES GENERATING STATION  
 PROJECT NUMBER: 45136-28  
 CLIENT: EXELON GENERATION COMPANY LLC  
 LOCATION: CORDOVA, ILLINOIS

HOLE DESIGNATION: MW-QC-1011  
 DATE COMPLETED: May 3, 2006  
 DRILLING METHOD: 4-1/2" HSA  
 FIELD PERSONNEL: P. KLICK

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft AMSL	MONITORING WELL	SAMPLE			
				NUMBER	INTERVAL	REC (%)	'N' VALUE
	TOP OF RISER GROUND SURFACE	597.10 594.58					
2	FILL-coarse gravel not sampled	594.28	Concrete				
4							
6							
8							
10	SP-SAND, fine grained, loose, brown, slightly moist	584.58	2" Ø PVC Well Casing	1SS	X	70	6
12				2SS	X	70	8
14				3SS	X	75	8
16			Bentonite Grout	4SS	X	60	11
18	- trace medium and coarse sand and fine gravel at 17.0ft BGS			5SS	X	75	9
20	- percent of medium and coarse grained sand and fine gravel decreases at 18.0ft BGS			6SS	X	65	7
22	- saturated at 22.0ft BGS		8" Borehole	7SS	X	65	9
24	- dense at 24.0ft BGS			8SS	X	25	40
26	- loose to compact at 26.0ft BGS			9SS	X	50	10
28				10SS	X	25	18
30				11SS	X	20	10
32			Bentonite Chips	12SS	X	35	18
34				13SS	X	45	9
36			2" Ø PVC Well Screen	14SS	X	40	14
38			Sand Pack	15SS	X	20	78
40	DOLOMITE, fractured, clayey, yellow-tan	555.78					
42	END OF BOREHOLE @ 40.0ft BGS	554.58					
44	Notes: Auger refusal at 40.0 ft BGS		<b>WELL DETAILS</b> Screened interval: 559.58 to 554.58ft AMSL 35.00 to 40.00ft BGS Length: 5ft Diameter: 2in Slot Size: 10 Material: PVC Sand Pack: 561.58 to 554.58ft AMSL 33.00 to 40.00ft BGS Material: 20/40 SAND				

**NOTES:** MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

OVERBURDEN LOG 45136-28.GPJ CRA\_CORP.GDT 6/7/06





# STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: QUAD CITIES GENERATING STATION  
 PROJECT NUMBER: 45136-28  
 CLIENT: EXELON GENERATION COMPANY LLC  
 LOCATION: CORDOVA, ILLINOIS

HOLE DESIGNATION: MW-QC-101S  
 DATE COMPLETED: May 3, 2006  
 DRILLING METHOD: 4-1/2" HSA  
 FIELD PERSONNEL: P. KLICK

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft AMSL	MONITORING WELL	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' VALUE	
	TOP OF RISER GROUND SURFACE	597.03 594.52						
2	FILL-coarse gravel not sampled	594.22		Concrete				
4								
6								
8			Bentonite Grout					
10		584.52	8" Borehole					
12	SP-SAND, fine grained, loose, brown, slightly moist		Bentonite Chips					
14			2" Ø PVC Well Casing					
16			2" Ø PVC Well Screen					
18	- trace medium and coarse sand and fine gravel at 17.0ft BGS		Sand Pack					
20	- percent of medium and coarse grained sand and fine gravel decreases at 18.0ft BGS							
22	- saturated at 22.0ft BGS							
24	- dense at 24.0ft BGS							
26	- loose to compact at 26.0ft BGS							
28								
30	END OF BOREHOLE @ 29.0ft BGS	565.52						
32			<u>WELL DETAILS</u> Screened interval: 576.52 to 566.52ft AMSL 18.00 to 28.00ft BGS Length: 10ft Diameter: 2in Slot Size: 10 Material: PVC Sand Pack: 579.02 to 565.52ft AMSL 15.50 to 29.00ft BGS Material: 20/40 SAND					
34								
36								
38								
40								
42								
44								
46								
48								

**NOTES:** MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

OVERBURDEN LOG 45136-28.GPJ CRA\_CORP.GDT 6/7/06



# STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: QUAD CITIES GENERATING STATION  
 PROJECT NUMBER: 45136-28  
 CLIENT: EXELON GENERATION COMPANY LLC  
 LOCATION: CORDOVA, ILLINOIS

HOLE DESIGNATION: MW-QC-102I  
 DATE COMPLETED: May 5, 2006  
 DRILLING METHOD: 4-1/2" HSA  
 FIELD PERSONNEL: T. PRANGER

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft AMSL	MONITORING WELL	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (PPM)
	TOP OF RISER GROUND SURFACE	597.14 594.76						
5	not sampled							
10	SP-SAND, trace gravel, fine to medium grained, dense, brown/tan, slightly moist - very dense, moist at 12.0ft BGS - trace clay at 14.0ft BGS	584.76		1SS	X	75	39	0.0
15	- very hard, some dolomite rock at 17.0ft BGS			2SS	X	100	59	0.0
20	- dense at 20.0ft BGS			3SS	X	80	55	0.0
25	- coarse sand with gravel, very dense, saturated at 22.0ft BGS - dense at 24.0ft BGS			4SS	X	50	>50	0.0
30	- fine to medium grained, compact at 26.0ft BGS			5SS	X	50	>50	0.0
35	- coarse sand with gravel at 32.0ft BGS			6SS	X	100	34	0.0
40	- no recovery from 36.0 to 38.0ft BGS - loose, no recovery from 38.0 to 40.0ft BGS			7SS	X	75	62	0.0
45	- compact at 40.0ft BGS			8SS	X	50	41	0.0
50	- dense, some large rock at 46.0ft BGS			9SS	X	50	16	0.0
55	END OF BOREHOLE @ 50.0ft BGS	544.76		10SS	X	50	11	0.0
60				11SS	X	25	10	0.0
				12SS	X	40	13	0.0
				13SS	X	40	12	0.0
				14SS	X	0	12	0.0
				15SS	X	0	8	0.0
				16SS	X	40	23	0.0
				17SS	X	60	29	0.0
				18SS	X	50	23	0.0
				19SS	X	25	40	0.0
				20SS	X	50	30	0.0

**WELL DETAILS**  
 Screened interval:  
 550.76 to 545.76ft AMSL  
 44.00 to 49.00ft BGS  
 Length: 5ft  
 Diameter: 2in  
 Slot Size: 10  
 Material: PVC  
 Sand Pack:  
 553.76 to 544.76ft AMSL  
 41.00 to 50.00ft BGS  
 Material: 20/40 SAND

**NOTES:** MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE  
 WATER FOUND ▼

OVERBURDEN LOG 45136-28.GPJ CRA\_CORP.GDT 6/7/06



# STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: QUAD CITIES GENERATING STATION  
 PROJECT NUMBER: 45136-28  
 CLIENT: EXELON GENERATION COMPANY LLC  
 LOCATION: CORDOVA, ILLINOIS

HOLE DESIGNATION: MW-QC-102S  
 DATE COMPLETED: May 8, 2006  
 DRILLING METHOD: 4-1/2" HSA  
 FIELD PERSONNEL: T. PRANGER

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft AMSL	MONITORING WELL	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' VALUE	
	TOP OF RISER GROUND SURFACE	596.83 594.69						
5	not sampled							
10	SP-SAND, trace gravel, fine to medium grained, dense, brown/tan, slightly moist - very dense, moist at 12.0ft BGS - trace clay at 14.0ft BGS - very hard, some dolomite rock at 17.0ft BGS - dense at 20.0ft BGS - coarse sand with gravel, very dense, saturated at 22.0ft BGS - dense at 24.0ft BGS - fine to medium grained, compact at 26.0ft BGS	584.69						
30	END OF BOREHOLE @ 30.0ft BGS	564.69	<p><u>WELL DETAILS</u>            Screened interval:            575.69 to 565.69ft AMSL            19.00 to 29.00ft BGS            Length: 10ft            Diameter: 2in            Slot Size: 10            Material: PVC            Sand Pack:            577.69 to 564.69ft AMSL            17.00 to 30.00ft BGS            Material: 20/40 SAND</p>					

**NOTES:** MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

OVERBURDEN LOG 45136-28.GPJ CRA\_CORP.GDT 6/7/06



# STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: QUAD CITIES GENERATING STATION  
 PROJECT NUMBER: 45136-28  
 CLIENT: EXELON GENERATION COMPANY LLC  
 LOCATION: CORDOVA, ILLINOIS

HOLE DESIGNATION: MW-QC-102D  
 DATE COMPLETED: June 20, 2006  
 DRILLING METHOD: 4-1/2" HSA  
 FIELD PERSONNEL: J. HARGENS

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft AMSL	MONITORING WELL	SAMPLE				
				NUMBER	INTERVAL	REC (%)	N' VALUE	PID (PPM)
	TOP OF RISER GROUND SURFACE	597.27 594.80						
2	not sampled							
4								
6								
8								
10		584.80						
12	SP-SAND, trace gravel, fine to medium grained, dense, brown/tan, slightly moist - very dense, moist at 12.0ft BGS							
14	- trace clay at 14.0ft BGS							
16								
18	- very hard, some dolomite rock at 17.0ft BGS							
20	- dense at 20.0ft BGS							
22	- coarse sand with gravel, very dense, saturated at 22.0ft BGS							
24	- dense at 24.0ft BGS							
26	- fine to medium grained, compact at 26.0ft BGS							
28								
30								
32	- coarse sand with gravel at 32.0ft BGS							
34								
36	- no recovery from 36.0 to 38.0ft BGS							
38	- loose, no recovery from 38.0 to 40.0ft BGS							

**NOTES:** MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

OVERBURDEN LOG 45136-28.GPJ CRA\_CORP.GDT 8/6/06






# STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: QUAD CITIES GENERATING STATION  
 PROJECT NUMBER: 45136-28  
 CLIENT: EXELON GENERATION COMPANY LLC  
 LOCATION: CORDOVA, ILLINOIS

HOLE DESIGNATION: MW-QC-103I  
 DATE COMPLETED: May 10, 2006  
 DRILLING METHOD: 4-1/2" HSA  
 FIELD PERSONNEL: N. ZIEGLER

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft AMSL	MONITORING WELL	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (PPM)
	TOP OF RISER GROUND SURFACE	596.44 594.39						
2	not sampled		Concrete					
4			8" Borehole					
6								
8								
10		584.39		1SS	X	50	16	0
12	SP-SAND, trace gravel, fine grained, compact, brown, damp		Bentonite Grout	2SS	X	50	12	0
14				3SS	X	50	14	0
16	- loose at 16.0ft BGS			4SS	X	50	8	0
18				5SS	X	50	8	0
20	- wet at 20.0ft BGS			6SS	X	66	13	0
22				7SS	X	42	7	0
24				8SS	X	50	3	0
26			Bentonite Pellets	9SS	X		11	0
28			2" Ø PVC Well Casing	10SS	X	50	4	0
30				11SS	X	50	6	0
32			2" Ø PVC Well Screen	12SS	X	50	5	0
34			Sand Pack	13SS	X			0
36	END OF BOREHOLE @ 35.0ft BGS	559.39						
				<p><u>WELL DETAILS</u>            Screened interval:            564.39 to 559.39ft AMSL            30.00 to 35.00ft BGS            Length: 5ft            Diameter: 2in            Slot Size: 10            Material: PVC            Sand Pack:            567.39 to 559.39ft AMSL            27.00 to 35.00ft BGS            Material: 20/40 SAND</p>				

**NOTES:** MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE


OVERBURDEN LOG 45136-28.GPJ CRA\_CORP.GDT 6/7/06



# STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: QUAD CITIES GENERATING STATION  
 PROJECT NUMBER: 45136-28  
 CLIENT: EXELON GENERATION COMPANY LLC  
 LOCATION: CORDOVA, ILLINOIS

HOLE DESIGNATION: MW-QC-104S  
 DATE COMPLETED: May 11, 2006  
 DRILLING METHOD: 4-1/2" HSA  
 FIELD PERSONNEL: N. ZIEGLER

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft AMSL	MONITORING WELL	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (PPM)
	TOP OF RISER GROUND SURFACE	596.08 594.07						
2	not sampled		Concrete					
4								
6								
8			Bentonite Grout					
10		584.07	8" Borehole	1SS	X	50	27	0
12	SW-SAND, trace fine gravel, medium to coarse grained sand, subangular to subrounded gravel, compact brown, damp			2SS	X	50	15	0
14				3SS	X	62	22	0
16			Bentonite Pellets	4SS	X	50	15	0
18			2" Ø PVC Well Casing	5SS	X	50	40	0
20	- wet at 20.0ft BGS			6SS	X	62	26	0
22			2" Ø PVC Well Screen	7SS	X	62	23	0
24				8SS	X	50	28	0
26	- very dense at 26.0ft BGS		Sand Pack	9SS	X	100	55	0
28				10SS	X	50	83	0
30	END OF BOREHOLE @ 30.0ft BGS	564.07						
32			<u>WELL DETAILS</u> Screened interval: 576.07 to 566.07ft AMSL 18.00 to 28.00ft BGS Length: 10ft Diameter: 2in Slot Size: 10 Material: PVC Sand Pack: 578.07 to 566.07ft AMSL 16.00 to 28.00ft BGS Material: 20/40 SAND					
34								
36								
38								
40								
42								
44								
46								
48								

**NOTES:** MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

OVERBURDEN LOG 45136-28.GPJ CRA\_CORP.GDT 7/11/06



# STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: QUAD CITIES GENERATING STATION  
 PROJECT NUMBER: 45136-28  
 CLIENT: EXELON GENERATION COMPANY LLC  
 LOCATION: CORDOVA, ILLINOIS

HOLE DESIGNATION: MW-QC-105I  
 DATE COMPLETED: May 9, 2006  
 DRILLING METHOD: 4-1/2" HSA  
 FIELD PERSONNEL: T. PRANGER

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft AMSL	MONITORING WELL	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (PPM)
	TOP OF RISER GROUND SURFACE	595.36 593.11						
5	not sampled		Concrete					
10	SP-SAND, fine to medium grained, some coarse grains, very loose to loose, brown/tan, moist	583.11		1SS	X	70	4	0.0
15				2SS	X	50	2	0.0
20			Bentonite Grout	3SS	X	50	2	0.0
25	- dense from 22.0 to 24.0ft BGS			4SS	X	70	8	0.0
30				5SS	X	60	3	0.0
35	- compact at 28.0ft BGS		8" Borehole	6SS	X	50	16	0.0
40				7SS	X	50	30	0.0
45	- no recovery from 40.0 to 42.0ft BGS		Bentonite Pellets	8SS	X	50	9	0.0
50	- large rock at 44.0ft BGS		2" Ø PVC Well Casing	9SS	X	40	1	0.0
55			2" Ø PVC Well Screen	10SS	X	40	11	0.0
60	END OF BOREHOLE @ 50.0ft BGS	543.11	Sand Pack	11SS	X	40	10	0.0
				12SS	X	25	10	0.0
				13SS	X	25	8	0.0
				14SS	X	20	12	0.0
				15SS	X	50	12	0.0
				16SS	X	0	8	0.0
				17SS	X	50	15	0.0
				18SS	X	8	12	0.0
				19SS	X	45	19	0.0
				20SS	X	40	14	0.0

**WELL DETAILS**  
 Screened interval:  
 548.11 to 543.11ft AMSL  
 45.00 to 50.00ft BGS  
 Length: 5ft  
 Diameter: 2in  
 Slot Size: 10  
 Material: PVC  
 Sand Pack:  
 551.11 to 543.11ft AMSL  
 42.00 to 50.00ft BGS  
 Material: 20/40 SAND

**NOTES:** MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

OVERBURDEN LOG 45136-28.GPJ CRA\_CORP.GDT 6/7/06





# STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: QUAD CITIES GENERATING STATION  
 PROJECT NUMBER: 45136-28  
 CLIENT: EXELON GENERATION COMPANY LLC  
 LOCATION: CORDOVA, ILLINOIS

HOLE DESIGNATION: MW-QC-106I  
 DATE COMPLETED: May 10, 2006  
 DRILLING METHOD: 4-1/2" HSA  
 FIELD PERSONNEL: T. PRANGER

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft AMSL	MONITORING WELL	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (PPM)
	TOP OF RISER GROUND SURFACE	596.19 594.00						
2	not sampled		Concrete					
4								
6								
8								
10		584.00	2" Ø PVC Well Casing	1SS	X	50	6	0.0
12	SP-SAND, very loose to loose, medium grained, fine to coarse grained, brown/tan, moist			2SS	X	50	12	0.0
14				3SS	X	75	8	0.0
16			Bentonite Grout	4SS	X	75	7	0.0
18				5SS	X	75	5	0.0
20	- saturated at 20.0ft BGS			6SS	X	75	4	0.0
22				7SS	X	40	3	0.0
24				8SS	X	40	5	0.0
26				9SS	X	40	6	0.0
28			8" Borehole	10SS	X	40	5	0.0
30	- loose to compact at 30.0ft BGS			11SS	X	35	11	0.0
32			Bentonite Pellets	12SS	X	25	6	0.0
34				13SS	X	30	15	0.0
36			2" Ø PVC Well Screen	14SS	X	30	21	0.0
38				15SS	X	100	>50	0.0
40	- large rock or bedrock at 39.0ft BGS		Sand Pack					
42	END OF BOREHOLE @ 40.0ft BGS	554.00						
44			<b>WELL DETAILS</b> Screened interval: 559.00 to 554.00ft AMSL 35.00 to 40.00ft BGS Length: 5ft Diameter: 2in Slot Size: 10 Material: PVC Sand Pack: 562.00 to 554.00ft AMSL 32.00 to 40.00ft BGS Material: 20/40 SAND					
46								
48								

**NOTES:** MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

OVERBURDEN LOG 45136-28.GPJ CRA\_CORP.GDT 6/7/06



# STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: QUAD CITIES GENERATING STATION  
 PROJECT NUMBER: 45136-28  
 CLIENT: EXELON GENERATION COMPANY LLC  
 LOCATION: CORDOVA, ILLINOIS

HOLE DESIGNATION: MW-QC-106S  
 DATE COMPLETED: May 10, 2006  
 DRILLING METHOD: 4-1/2" HSA  
 FIELD PERSONNEL: T. PRANGER

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft AMSL	MONITORING WELL	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' VALUE	
	TOP OF RISER GROUND SURFACE	596.24 593.79						
2	not sampled							
4								
6								
8								
10	SP-SAND, very loose to loose, medium grained, fine to coarse grained, brown/tan, moist	583.79						
12								
14								
16								
18								
20	- saturated at 20.0ft BGS							
22								
24								
26								
28	END OF BOREHOLE @ 27.0ft BGS	566.79	<p><u>WELL DETAILS</u>            Screened interval:            576.79 to 566.79ft AMSL            17.00 to 27.00ft BGS            Length: 10ft            Diameter: 2in            Slot Size: 10            Material: PVC            Sand Pack:            578.79 to 566.79ft AMSL            15.00 to 27.00ft BGS            Material: 20/40 SAND</p>					
30								
32								
34								
36								
38								
40								
42								
44								
46								
48								

**NOTES:** MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

OVERBURDEN LOG 45136-28.GPJ CRA\_CORP.GDT 6/7/06



# STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: QUAD CITIES GENERATING STATION  
 PROJECT NUMBER: 45136-28  
 CLIENT: EXELON GENERATION COMPANY LLC  
 LOCATION: CORDOVA, ILLINOIS

HOLE DESIGNATION: MW-QC-1071  
 DATE COMPLETED: May 2, 2006  
 DRILLING METHOD: 4-1/2" HSA  
 FIELD PERSONNEL: P. KLICK

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft AMSL	MONITORING WELL	SAMPLE			
				NUMBER	INTERVAL	REC (%)	'N' VALUE
	TOP OF RISER GROUND SURFACE	609.05 606.62					
2	grass and topsoil not sampled	606.12	Concrete				
4							
6							
8							
10			2" Ø PVC Well Casing				
12	SP-SAND, fine grained, loose, brown, slightly moist	595.62	Bentonite Grout	1SS	X	65	6
14				2SS	X	75	7
16				3SS	X	75	7
18			8" Borehole	4SS	X	60	11
20	SW-SAND, fine to medium grained, trace coarse grained, brown, moist	588.62		5SS	X	60	6
22	SP-SAND, fine grained, loose, brown, moist - wet at 20.0ft BGS	587.62		6SS	X	75	8
24	- compact at 23.0ft BGS			7SS	X	65	10
26			Bentonite Pellets	8SS	X	75	10
28	- trace coarse gravel at 27.0ft BGS			9SS	X	75	11
30				10SS	X	70	13
32	- saturated at 31.0ft BGS			11SS	X	85	18
34	- weathered dolomite, tan (2" layer) at 32.8ft BGS	573.62		12SS	X	70	69
36	SW-SAND, fine to coarse grained, brown, saturated	572.42	2" Ø PVC Well Screen	13SS	X	70	66
38	DOLOMITE, weathered, clayey, gray, saturated - tan at 34.6ft BGS		Sand Pack	14SS	X	25	28
40	END OF BOREHOLE @ 39.0ft BGS	567.62					
42	Notes: Auger refusal at 39.0 ft BGS						
44							
46							
48							

**WELL DETAILS**  
 Screened interval:  
 577.62 to 567.62ft AMSL  
 29.00 to 39.00ft BGS  
 Length: 10ft  
 Diameter: 2in  
 Slot Size: 10  
 Material: PVC  
 Sand Pack:  
 580.62 to 567.62ft AMSL  
 26.00 to 39.00ft BGS  
 Material: 20/40 SAND

**NOTES:** MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

OVERBURDEN LOG 45136-28.GPJ CRA\_CORP.GDT 6/7/06



# STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: QUAD CITIES GENERATING STATION  
 PROJECT NUMBER: 45136-28  
 CLIENT: EXELON GENERATION COMPANY LLC  
 LOCATION: CORDOVA, ILLINOIS

HOLE DESIGNATION: MW-QC-108S  
 DATE COMPLETED: May 15, 2006  
 DRILLING METHOD: 4-1/2" HSA  
 FIELD PERSONNEL: T. PRANGER

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft AMSL	MONITORING WELL	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (PPM)
	TOP OF RISER GROUND SURFACE	608.64 606.64						
2	not sampled							
4								
6								
8								
10		596.64						
12	SP-SAND, fine to medium grained, trace gravel, very loose, brown, dry			1SS	X	75	2	2.8
14				2SS	X	50	3	2.9
16	- loose, moist at 16.0ft BGS			3SS	X	60	1	5.5
18	- with coarse sand, compact at 18.0ft BGS			4SS	X	60	7	4.6
20	- no coarse sand, trace gravel at 20.0ft BGS			5SS	X	60	10	4.2
22	- fine grained at 22.0ft BGS			6SS	X	70	10	2.1
24	- loose at 24.0ft BGS			7SS	X	75	10	2.8
26	- compact at 26.0ft BGS			8SS	X	50	8	4.0
28	- trace gravel at 28.0ft BGS			9SS	X	50	14	4.2
30				10SS	X	50	23	3.2
32	- saturated at 32.0ft BGS			11SS	X	60	20	4.2
34	- gravel, coarse sand, loose at 34.0ft BGS			12SS	X	50	15	3.1
36				13SS	X	75	4	2.4
38				14SS	X	75	6	3.1
40		566.64		15SS	X	65	11	2.9
42	END OF BOREHOLE @ 40.0ft BGS		<b>WELL DETAILS</b> Screened interval: 577.14 to 567.14ft AMSL 29.50 to 39.50ft BGS Length: 10ft Diameter: 2in Slot Size: 10 Material: PVC Sand Pack: 579.14 to 566.64ft AMSL 27.50 to 40.00ft BGS Material: 20/40 SAND					

**NOTES:** MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

OVERBURDEN LOG 45136-28.GPJ CRA CORP.GDT 6/7/06



# STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: QUAD CITIES GENERATING STATION  
 PROJECT NUMBER: 45136-28  
 CLIENT: EXELON GENERATION COMPANY LLC  
 LOCATION: CORDOVA, ILLINOIS

HOLE DESIGNATION: MW-QC-108I  
 DATE COMPLETED: June 13, 2006  
 DRILLING METHOD: 4-1/2" HSA  
 FIELD PERSONNEL: J. HARGENS

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft AMSL	MONITORING WELL	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (PPM)
	TOP OF RISER GROUND SURFACE	608.54 606.41						
2	not sampled							
4								
6								
8								
10								
12	SP-SAND, fine to medium grained, trace gravel, very loose, brown, dry	596.41						
14								
16	- loose, moist at 16.0ft BGS							
18	- with coarse sand, compact at 18.0ft BGS							
20	- no coarse sand, trace gravel at 20.0ft BGS							
22	- fine grained at 22.0ft BGS							
24	- loose at 24.0ft BGS							
26	- compact at 26.0ft BGS							
28	- trace gravel at 28.0ft BGS							
30								
32	- saturated at 32.0ft BGS							
34	- gravel, coarse sand, loose at 34.0ft BGS							
36								

**NOTES:** MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

OVERBURDEN LOG 45136-28.GPJ CRA\_CORP.GDT 8/6/06



# STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: QUAD CITIES GENERATING STATION  
 PROJECT NUMBER: 45136-28  
 CLIENT: EXELON GENERATION COMPANY LLC  
 LOCATION: CORDOVA, ILLINOIS

HOLE DESIGNATION: MW-QC-108I  
 DATE COMPLETED: June 13, 2006  
 DRILLING METHOD: 4-1/2" HSA  
 FIELD PERSONNEL: J. HARGENS

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft AMSL	MONITORING WELL	SAMPLE					
				NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (PPM)	
40	SW-SAND, trace medium gravel, fine to coarse grained, brown, wet	566.41	<p style="font-size: small;">Bentonite Pellets Sand Pack 2" Ø PVC Well Screen</p>						
42									
44					1SS	X	0	12	NR
46									
48				2SS	X	80	15	0	
50									
52									
54				3SS	X	75	15	0	
56									
58									
60				4SS	X	100	17	0.2	
62	END OF BOREHOLE @ 62.0ft BGS	544.41							
64			<b>WELL DETAILS</b> Screened interval: 550.41 to 545.41ft AMSL 56.00 to 61.00ft BGS Length: 5ft Diameter: 2in Slot Size: 10 Material: PVC Sand Pack: 552.41 to 544.41ft AMSL 54.00 to 62.00ft BGS Material: NATURAL SAND						
66									
68									
70									
72									
74									

**NOTES:** MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

OVERBURDEN LOG 45136-28.GPJ CRA\_CORP.GDT 8/6/06



# STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: QUAD CITIES GENERATING STATION  
 PROJECT NUMBER: 45136-28  
 CLIENT: EXELON GENERATION COMPANY LLC  
 LOCATION: CORDOVA, ILLINOIS

HOLE DESIGNATION: MW-QC-109I  
 DATE COMPLETED: July 13, 2006  
 DRILLING METHOD: 4-1/2" HSA  
 FIELD PERSONNEL: N. ZIEGLER

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft AMSL	MONITORING WELL	SAMPLE					
				NUMBER	INTERVAL	REC (%)	N' VALUE		
	GROUND SURFACE TOP OF RISER	593.93 593.82							
2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38	not sampled		<p style="font-size: small;">Concrete</p> <p style="font-size: small;">8" Borehole</p> <p style="font-size: small;">2" Ø PVC Well Casing</p> <p style="font-size: small;">Bentonite Grout</p> <p style="font-size: small;">Bentonite Pellets</p> <p style="font-size: small;">2" Ø PVC Well Screen</p> <p style="font-size: small;">Sand Pack</p>						
	END OF BOREHOLE @ 39.0ft BGS	554.93							

**NOTES:** MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

OVERBURDEN LOG 45136-28.GPJ CRA\_CORP.GDT 8/6/06



# STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: QUAD CITIES GENERATING STATION  
 PROJECT NUMBER: 45136-28  
 CLIENT: EXELON GENERATION COMPANY LLC  
 LOCATION: CORDOVA, ILLINOIS

HOLE DESIGNATION: MW-QC-109I  
 DATE COMPLETED: July 13, 2006  
 DRILLING METHOD: 4-1/2" HSA  
 FIELD PERSONNEL: N. ZIEGLER

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft AMSL	MONITORING WELL	SAMPLE					
				NUMBER	INTERVAL	REC (%)	N' VALUE		
42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72 74 76 78			<u>WELL DETAILS</u> Screened interval: 559.93 to 554.93ft AMSL 34.00 to 39.00ft BGS Length: 5ft Diameter: 2in Slot Size: 10 Material: PVC Sand Pack: 561.93 to 554.93ft AMSL 32.00 to 39.00ft BGS Material: 20/40 SAND						

**NOTES:** MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

OVERBURDEN LOG 45136-28.GPJ CRA\_CORP.GDT 8/6/06





# STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: QUAD CITIES GENERATING STATION  
 PROJECT NUMBER: 45136-28  
 CLIENT: EXELON GENERATION COMPANY LLC  
 LOCATION: CORDOVA, ILLINOIS

HOLE DESIGNATION: MW-QC-109S  
 DATE COMPLETED: July 12, 2006  
 DRILLING METHOD: 4-1/2" HSA  
 FIELD PERSONNEL: N. ZIEGLER

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft AMSL	MONITORING WELL	SAMPLE				
				NUMBER	INTERVAL	REC (%)	N' VALUE	
	GROUND SURFACE TOP OF RISER	593.93 593.72						
2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38	not sampled		<p style="font-size: small;">Concrete 8" Borehole Bentonite Grout 2" Ø PVC Well Casing Bentonite Pellets Sand Pack 2" Ø PVC Well Screen</p>					
	END OF BOREHOLE @ 29.5ft BGS	564.43	<p style="font-size: small;"><u>WELL DETAILS</u>            Screened interval:                574.43 to 564.43ft AMSL                19.50 to 29.50ft BGS            Length: 10ft            Diameter: 2in            Slot Size: 10            Material: PVC            Sand Pack:                576.43 to 564.43ft AMSL                17.50 to 29.50ft BGS            Material: 20/40 SAND</p>					

OVERBURDEN LOG 45136-28.GPJ CRA\_CORP.GDT 8/10/06

**NOTES:** MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE



# STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: QUAD CITIES GENERATING STATION  
 PROJECT NUMBER: 45136-28  
 CLIENT: EXELON GENERATION COMPANY LLC  
 LOCATION: CORDOVA, ILLINOIS

HOLE DESIGNATION: MW-QC-110I  
 DATE COMPLETED: July 11, 2006  
 DRILLING METHOD: 4-1/2" HSA  
 FIELD PERSONNEL: N. ZIEGLER

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft AMSL	MONITORING WELL	SAMPLE					
				NUMBER	INTERVAL	REC (%)	N' VALUE	PID (PPM)	
	GROUND SURFACE TOP OF RISER	605.20 604.85							
2	not sampled		Concrete						
4			8" Borehole						
6			2" Ø PVC Well Casing						
8									
10									
12									
14		591.20							
16	SP-SAND, coarse grained, trace medium grained sand and fine subangular to subrounded gravel, brown, damp, loose			1SS	X	50	16	0	
18									
20			Bentonite Grout	2SS	X	50	8	0	
22									
24				3SS	X	75	20	0	
26									
28									
30				4SS	X	75	21	0	
32									
34	- wet at 33.0ft BGS			5SS	X	75	9	0	
36									

**NOTES:** MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

OVERBURDEN LOG 45136-28.GPJ CRA\_CORP.GDT 8/10/06

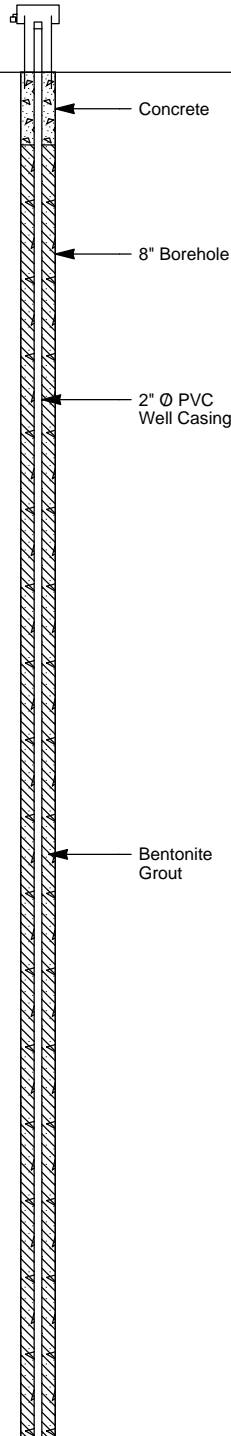




# STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: QUAD CITIES GENERATING STATION  
 PROJECT NUMBER: 45136-28  
 CLIENT: EXELON GENERATION COMPANY LLC  
 LOCATION: CORDOVA, ILLINOIS

HOLE DESIGNATION: MW-QC-1111  
 DATE COMPLETED: July 12, 2006  
 DRILLING METHOD: 4-1/2" HSA  
 FIELD PERSONNEL: J. Close

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft AMSL	MONITORING WELL	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (PPM)
	TOP OF RISER GROUND SURFACE	618.97 616.74						
2	not sampled		Concrete					
4			8" Borehole					
6			2" Ø PVC Well Casing					
8								
10								
12								
14	SW-SAND, medium-coarse sand, loose, well graded, medium-light brown, damp-moist	603.24		1SS	X	85	12	0
16	SP-SAND, medium grained, poorly graded, loose, light brown, dry	601.24						
18				2SS	X	85	9	0
20								
22			Bentonite Grout					
24				3SS	X	75	13	0
26	- coarse grained at 25.5ft BGS							
28	- wet at 28.0ft BGS			4SS	X	60	11	0
30								
32								
34				5SS	X	50	13	0
36								

**NOTES:** MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

OVERBURDEN LOG 45136-28.GPJ CRA\_CORP.GDT 8/10/06



# STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: QUAD CITIES GENERATING STATION  
 PROJECT NUMBER: 45136-28  
 CLIENT: EXELON GENERATION COMPANY LLC  
 LOCATION: CORDOVA, ILLINOIS

HOLE DESIGNATION: MW-QC-111I  
 DATE COMPLETED: July 12, 2006  
 DRILLING METHOD: 4-1/2" HSA  
 FIELD PERSONNEL: J. Close

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft AMSL	MONITORING WELL	SAMPLE				
				NUMBER	INTERVAL	REC (%)	N' VALUE	PID (PPM)
40	- trace fine gravel at 38.5ft BGS		<p style="font-size: small;">Bentonite Pellets Sand Pack 2" Ø PVC Well Screen</p>	6SS	X	55	17	0
42				7SS	X	50	17	0
44	- trace coarse gravel at 45.5ft BGS			8SS	X	15	8	0
46								
48								
50	END OF BOREHOLE @ 50.0ft BGS	566.74	<p><u>WELL DETAILS</u>            Screened interval:            571.74 to 566.74ft AMSL            45.00 to 50.00ft BGS            Length: 5ft            Diameter: 2in            Slot Size: 10            Material: PVC            Sand Pack:            573.74 to 566.74ft AMSL            43.00 to 50.00ft BGS            Material: #7 SAND</p>					
52								
54								
56								
58								
60								
62								
64								
66								
68								
70								
72								
74								

**NOTES:** MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

OVERBURDEN LOG 45136-28.GPJ CRA\_CORP.GDT 8/10/06



# STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: QUAD CITIES GENERATING STATION  
 PROJECT NUMBER: 45136-28  
 CLIENT: EXELON GENERATION COMPANY LLC  
 LOCATION: CORDOVA, ILLINOIS

HOLE DESIGNATION: MW-QC-112I  
 DATE COMPLETED: July 10, 2006  
 DRILLING METHOD: 4-1/2" HSA  
 FIELD PERSONNEL: J. Close

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft AMSL	MONITORING WELL	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (PPM)
	TOP OF RISER GROUND SURFACE	604.90 601.99						
2	not sampled		Concrete					
4			8" Borehole					
6			2" Ø PVC Well Casing					
8								
10								
12								
14	SP-SAND, loose, poorly graded, medium grained, slightly moist - some coarse sand at 15.0ft BGS	588.49		1SS	X	50	7	0
16								
18	- coarse grained at 18.5ft BGS			2SS	X	50	11	0
20			Bentonite Grout					
22								
24	- wet at 23.5ft BGS			3SS	X	65	8	0
26								
28								
30				4SS	X	70	12	0
32								
34				5SS	X	0	8	NR
36								

**NOTES:** MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

OVERBURDEN LOG 45136-28.GPJ CRA\_CORP.GDT 8/10/06





# STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: QUAD CITIES GENERATING STATION  
 PROJECT NUMBER: 45136-28  
 CLIENT: EXELON GENERATION COMPANY LLC  
 LOCATION: CORDOVA, ILLINOIS

HOLE DESIGNATION: MW-QC-113I  
 DATE COMPLETED: July 11, 2006  
 DRILLING METHOD: 4-1/2" HSA  
 FIELD PERSONNEL: J. Close

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft AMSL	MONITORING WELL	SAMPLE				
				NUMBER	INTERVAL	REC (%)	N' VALUE	PID (PPM)
	TOP OF RISER GROUND SURFACE	605.23 603.49						
2	not sampled							
14	SW-SAND, loose, medium-coarse grained, well graded, slightly moist	589.99		1SS	X	75	6	0
20	- 1/4" coarse sand layer at 20.0ft BGS			2SS	X	70	4	0
24	SP-SAND, trace medium sand and fine gravel, loose, coarse grained, poorly graded, moist	579.99		3SS	X	75	9	0
34	- increase in fine gravel, wet at 33.5ft BGS			4SS	X	65	11	0
36				5SS	X	35	7	0

**NOTES:** MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

OVERBURDEN LOG 45136-28.GPJ CRA\_CORP.GDT 8/10/06





# STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: QUAD CITIES GENERATING STATION  
 PROJECT NUMBER: 45136-28  
 CLIENT: EXELON GENERATION COMPANY LLC  
 LOCATION: CORDOVA, ILLINOIS

HOLE DESIGNATION: MW-QC-113I  
 DATE COMPLETED: July 11, 2006  
 DRILLING METHOD: 4-1/2" HSA  
 FIELD PERSONNEL: J. Close

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft AMSL	MONITORING WELL	SAMPLE				
				NUMBER	INTERVAL	REC (%)	N' VALUE	PID (PPM)
40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72 74	- layer of fine gravel at 45.5ft BGS  END OF BOREHOLE @ 50.0ft BGS	553.49	<p style="font-size: small;"> <b>WELL DETAILS</b>            Screened interval:            558.99 to 553.99ft AMSL            44.50 to 49.50ft BGS            Length: 5ft            Diameter: 2in            Slot Size: 10            Material: PVC            Sand Pack:            560.49 to 553.49ft AMSL            43.00 to 50.00ft BGS            Material: #7 SAND         </p>	6SS  7SS  8SS		35  50  0	6  7  13	0  0  NR

**NOTES:** MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

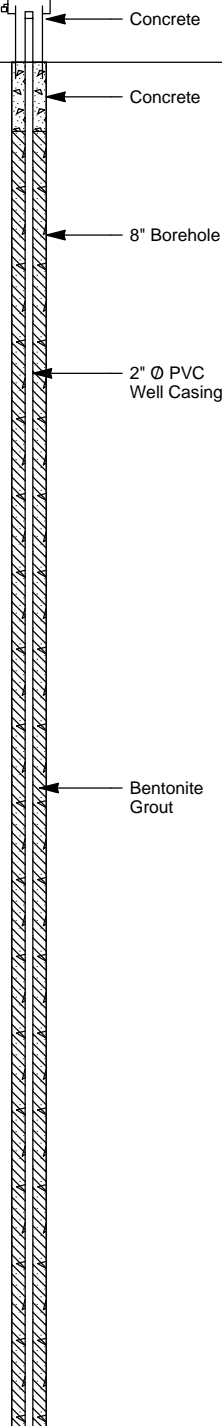
OVERBURDEN LOG 45136-28.GPJ CRA\_CORP.GDT 8/10/06



# STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: QUAD CITIES GENERATING STATION  
 PROJECT NUMBER: 45136-28  
 CLIENT: EXELON GENERATION COMPANY LLC  
 LOCATION: CORDOVA, ILLINOIS

HOLE DESIGNATION: MW-QC-114I  
 DATE COMPLETED: July 10, 2006  
 DRILLING METHOD: 4-1/2" HSA  
 FIELD PERSONNEL: N. ZIEGLER

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft AMSL	MONITORING WELL	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (PPM)
	TOP OF RISER GROUND SURFACE	607.30 604.22						
2	not sampled							
4								
6								
8								
10								
10	FILL, wood, sand, gravel, black coarse sand, loose, dry	594.22		1SS	X	40	8	0
12								
12	SP-SAND, coarse grained, loose, trace fine subangular-subrounded gravel, brown, damp	592.22		2SS	X	85	6	0
14								
16								
18								
20								
22								
22				3SS	X	75	9	0
24								
26				4SS	X	75	13	0
28								
30								
30				5SS	X	70	14	0
32	- wet at 32.0ft BGS							
34								
36				6SS	X	75	7	0
38								

**NOTES:** MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

OVERBURDEN LOG 45136-28.GPJ CRA\_CORP.GDT 8/10/06



# STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: QUAD CITIES GENERATING STATION  
 PROJECT NUMBER: 45136-28  
 CLIENT: EXELON GENERATION COMPANY LLC  
 LOCATION: CORDOVA, ILLINOIS

HOLE DESIGNATION: MW-QC-114I  
 DATE COMPLETED: July 10, 2006  
 DRILLING METHOD: 4-1/2" HSA  
 FIELD PERSONNEL: N. ZIEGLER

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft AMSL	MONITORING WELL	SAMPLE				
				NUMBER	INTERVAL	REC (%)	N' VALUE	PID (PPM)
42				7SS	X	75	8	0
44				8SS	X	75	5	0
46								
48								
50	END OF BOREHOLE @ 50.0ft BGS	554.22						
52								
54								
56								
58								
60								
62								
64								
66								
68								
70								
72								
74								
76								
78								

WELL DETAILS  
 Screened interval:  
 559.22 to 554.22ft AMSL  
 45.00 to 50.00ft BGS  
 Length: 5ft  
 Diameter: 2in  
 Slot Size: 10  
 Material: PVC  
 Sand Pack:  
 562.22 to 554.22ft AMSL  
 42.00 to 50.00ft BGS  
 Material: 20/40 SAND

**NOTES:** MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

OVERBURDEN LOG 45136-28.GPJ CRA\_CORP.GDT 8/10/06



# STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: QUAD CITIES GENERATING STATION  
 PROJECT NUMBER: 45136-28  
 CLIENT: EXELON GENERATION COMPANY LLC  
 LOCATION: CORDOVA, ILLINOIS

HOLE DESIGNATION: MW-QC-115S  
 DATE COMPLETED: July 13, 2006  
 DRILLING METHOD: 4-1/2" HSA  
 FIELD PERSONNEL: J. Close

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft AMSL	MONITORING WELL	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (PPM)
	TOP OF RISER GROUND SURFACE	609.89 607.23						
2	not sampled							
4								
6								
8								
10								
12								
14	SP-SAND, loose, medium grained, poorly graded, light brown, dry	593.73		1SS		90	9	0
16								
18								
20	- trace coarse sand at 20.2ft BGS			2SS		75	7	0
22								
24				3SS		80	7	0
26								
28								
30	SW-SAND, medium-coarse grained, loose, well graded, brown, dry	578.73		4SS		70	9	0

**NOTES:** MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

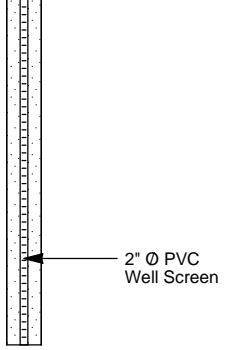
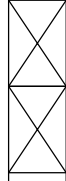
OVERBURDEN LOG 45136-28.GPJ CRA\_CORP.GDT 8/10/06



# STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: QUAD CITIES GENERATING STATION  
 PROJECT NUMBER: 45136-28  
 CLIENT: EXELON GENERATION COMPANY LLC  
 LOCATION: CORDOVA, ILLINOIS

HOLE DESIGNATION: MW-QC-115S  
 DATE COMPLETED: July 13, 2006  
 DRILLING METHOD: 4-1/2" HSA  
 FIELD PERSONNEL: J. Close

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft AMSL	MONITORING WELL	SAMPLE				
				NUMBER	INTERVAL	REC (%)	'N' VALUE	PID (PPM)
34  36  38  40  42  44  46  48  50  52  54  56  58  60  62	- moist at 33.5ft BGS  - wet at 35.0ft BGS  - thin layer of gravel at 37.0ft BGS  END OF BOREHOLE @ 40.0ft BGS	567.23	 <p style="text-align: center;">2" Ø PVC Well Screen</p> <p><u>WELL DETAILS</u>            Screened interval:            577.23 to 567.23ft AMSL            30.00 to 40.00ft BGS            Length: 10ft            Diameter: 2in            Slot Size: 10            Material: PVC            Sand Pack:            579.23 to 567.23ft AMSL            28.00 to 40.00ft BGS            Material: #7 SAND</p>	5SS  6SS		60  80	16  7	0  0

**NOTES:** MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

OVERBURDEN LOG 45136-28.GPJ CRA\_CORP.GDT 8/10/06



# STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: QUAD CITIES GENERATING STATION  
 PROJECT NUMBER: 45136-28  
 CLIENT: EXELON GENERATION COMPANY LLC  
 LOCATION: CORDOVA, ILLINOIS

HOLE DESIGNATION: MW-QC-116S  
 DATE COMPLETED: July 13, 2006  
 DRILLING METHOD: 4-1/2" HSA  
 FIELD PERSONNEL: J. Close

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft AMSL	MONITORING WELL	SAMPLE				
				NUMBER	INTERVAL	REC (%)	N' VALUE	PID (PPM)
	TOP OF RISER GROUND SURFACE	612.33 609.58						
2	not sampled		Concrete					
4			8" Borehole					
6			2" Ø PVC Well Casing					
8								
10								
12								
14	SP-SAND, medium grained, poorly graded, loose, brown, dry	596.08		1SS	X	80	5	0
16			Bentonite Grout					
18	- trace coarse sand at 18.5ft BGS							
20				2SS	X	90	10	0
22	SW-SAND, medium-coarse grained, loose, well graded, brown, dry	589.08						
24				3SS	X	75	6	0
26								
28				4SS	X	80	10	0
30			Bentonite Pellets					
32			Sand Pack	5SS	X	80	9	0
34	- trace fine gravel at 33.5ft BGS			6SS	X	90	14	0
36								
38	- wet at 38.0ft BGS		2" Ø PVC Well Screen	7SS	X	90	11	0

**NOTES:** MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

OVERBURDEN LOG 45136-28.GPJ CRA\_CORP.GDT 8/10/06



# STRATIGRAPHIC AND INSTRUMENTATION LOG (OVERBURDEN)

PROJECT NAME: QUAD CITIES GENERATING STATION  
 PROJECT NUMBER: 45136-28  
 CLIENT: EXELON GENERATION COMPANY LLC  
 LOCATION: CORDOVA, ILLINOIS

HOLE DESIGNATION: MW-QC-116S  
 DATE COMPLETED: July 13, 2006  
 DRILLING METHOD: 4-1/2" HSA  
 FIELD PERSONNEL: J. Close

DEPTH ft BGS	STRATIGRAPHIC DESCRIPTION & REMARKS	ELEV. ft AMSL	MONITORING WELL	SAMPLE				
				NUMBER	INTERVAL	REC (%)	N' VALUE	PID (PPM)
42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72 74 76 78	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin-left: auto; margin-right: auto;"> </div> <p style="text-align: center; margin-top: 10px;">END OF BOREHOLE @ 44.0ft BGS</p>	565.58	<div style="border: 1px solid black; padding: 5px; width: fit-content; margin-left: auto; margin-right: auto;"> </div> <p style="margin-top: 10px;"><u>WELL DETAILS</u>            Screened interval:                575.58 to 565.58ft AMSL                34.00 to 44.00ft BGS            Length: 10ft            Diameter: 2in            Slot Size: 10            Material: PVC            Sand Pack:                577.58 to 565.58ft AMSL                32.00 to 44.00ft BGS            Material: #7 SAND</p>					

**NOTES:** MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

OVERBURDEN LOG 45136-28.GPJ CRA\_CORP.GDT 8/10/06

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.

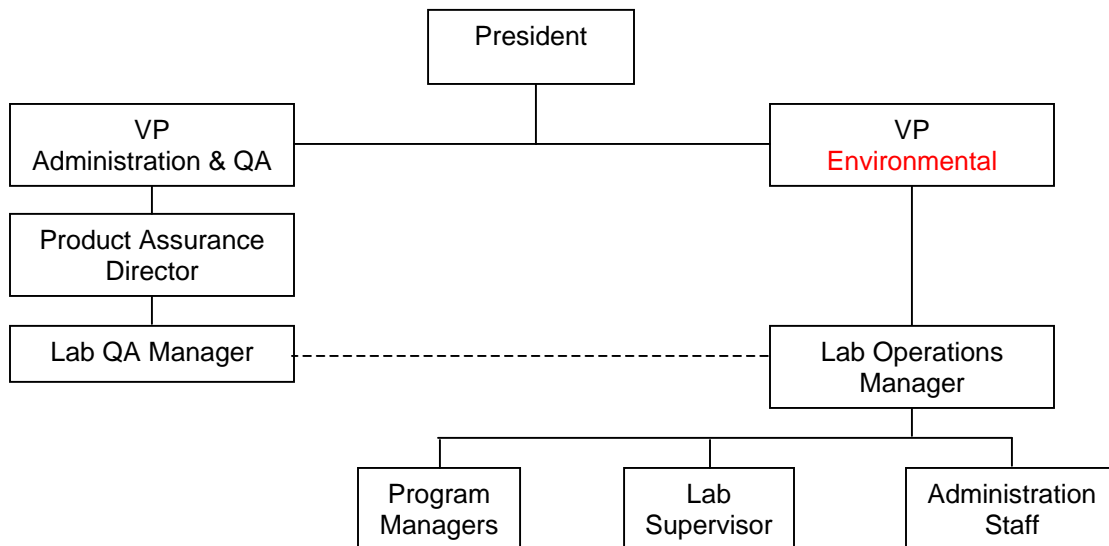
### 3.0 ORGANIZATION, AUTHORITY, AND RESPONSIBILITY

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 #: L28818**

**Exelon**

**June 12, 2006**



Kathy Shaw  
Conestoga-Rovers & Associates  
45 Farmington Valley Drive  
Plainville CT 06062

**Case Narrative - L28818  
EX001-3ESPQUAD-06**

06/12/2006 10:36

**Sample Receipt**

The following samples were received on June 2, 2006 in good condition, unless otherwise noted.

Tritium results were requested on a 2 day turn around. CRA revised the chain of custody on June 7 and the samples IDs were updated in the Teledyne database.

*Cross Reference Table*

Client ID	Laboratory ID	Station ID(if applicable)
WG-QC-MW-QC-102I-053106-JH-016	L28818-1	
WG-QC-MW-QC-102I-053106-JH-017	L28818-2	
WG-QC-MW-QC-102S-053106-JH-018	L28818-3	
WG-QC-MW-QC-102S-053106-JH-019	L28818-4	

*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 - L28818**  
**EX001-3ESPQUAD-06**

06/12/2006 10:36

**Gamma Spectroscopy**

**Quality Control**

Quality control samples were analyzed as WG4094.

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>
WS-LS-SW-LS-104- 052506-NK-008	L28801-1	WG4094-8

**H-3**

**Quality Control**

Quality control samples were analyzed as WG4080.

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-MWQC102I- 053106-JH-016	L28818-1	WG4080-3



**TELEDYNE**  
**BROWN ENGINEERING, INC.**

A Teledyne Technologies Company  
 2508 Quality Lane  
 Knoxville, TN 37931-3133

**Case Narrative - L28818**  
**EX001-3ESPQUAD-06**

06/12/2006 10:36

**TOTAL SR**

**Quality Control**

Quality control samples were analyzed as WG4133.

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-DN-DSP-121- 052606-JH-014	L28821-1	WG4133-4

**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

06/02/06 10:26

SR #: SR08688

Client: Exelon

Project #: EX001-3ESPQUAD-06

LIMS #: L28818

Initiated By: PMARSHALL

Init Date: 06/02/06      Receive Date: 06/02/06

**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	pH < 2
9 Other (Describe)			NA	

**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

L28818

REFERENCE NUMBER:  
45136-28

PROJECT NAME:

Quad Cities Power Plant

**CHAIN-OF-CUSTODY RECORD**

SAMPLER'S  
SIGNATURE:

*John Hargens*

PRINTED  
NAME:

John Hargens

No. OF  
CONTAINERS

PARAMETERS

tritium  
strontium  
gamma spec

REMARKS

SEQ. No.	DATE	TIME	SAMPLE IDENTIFICATION No.	SAMPLE MATRIX
1	5/31/06	11:00	WG-QC-MWQC-102I-053106-JH-016	water
2	5/31/06	11:10	WG-QC-MWQC-102I-053106-JH-017	water
3	5/31/06	11:15	WG-QC-MWQC-102S-053106-JH-018	water
4	5/31/06	11:40	WG-QC-MWQC-102S-053106-JH-019	water

2  
2  
2  
2

X X X  
X X X  
X X X  
X X X

TOTAL NUMBER OF CONTAINERS

8

RELINQUISHED BY:

①

*John Hargens*

DATE: 6/1/06  
TIME: 0819

RECEIVED BY:

②

*Paul Drummond*

DATE: 6-1-06  
TIME: 0820

RELINQUISHED BY:

②

*Paul Drummond*

DATE: 6/1/06  
TIME: 1039

RECEIVED BY:

③

*David Attie*

DATE: 6-1-06  
TIME: 1039

RELINQUISHED BY:

③

*David Attie*

DATE: 6-1-06  
TIME: 1255

RECEIVED BY:

④

*Don Smalley*

DATE: 6-1-06  
TIME: 12:55 pm

METHOD OF SHIPMENT:

DHL *Steven Stenberg*

AIR BILL No.

37342520843 + 37342520740

White -Fully Executed Copy  
Yellow -Receiving Laboratory Copy  
Pink -Shipper Copy  
Goldenrod -Sampler Copy

SAMPLE TEAM:

John Hargens  
Amanda Duchek  
Nate Ziegler

RECEIVED FOR LABORATORY BY:

*[Signature]*  
DATE: \_\_\_\_\_ TIME: 4:20

13714

*Pat Marshall*  
6/2/06



L 28818

RP-AA-600-1005

Revision 7

Page 8 of 16

**ATTACHMENT 2  
DOT Exempt Shipment Checklist  
Page 1 of 1**

Radioactive Material Shipment Number: QC-06-404 Date: 6-1-06

1. Describe the Shipment: WATER SAMPLES

2. Complete: Destination: TELEDYNE-BROWN ENCO.

Contact: SAMPLE CUSTODIAN.

3. Verify the Receiver can receive the quantity, type and form of radioactive material.

RP / 6-1-06

Initial

Date

4. Verify each completed document is retained by the station and distributed as follows:

DOCUMENT	PREPARER
PACKAGE CHARACTERIZATION DOCUMENTATION	RP
OPTIONAL DOCUMENTATION	RP

Shipment Preparer: Date: 6-1-06

TELEDYNE BROWN ENGINEERING  
2508 Quality Lane  
Knoxville, TN 37931-3133

6-2-06

ACKNOWLEDGEMENT  
This is not an invoice

Kathy Shaw  
Conestoga-Rovers & Associates  
45 Farmington Valley Drive  
Plainville, CT 06062

June 02, 2006

The following sample(s) were received at Teledyne Brown Engineering Knoxville laboratory on June 02, 2006. The sample(s) have been scheduled for the analyses listed below and the report is scheduled for completion by June 05, 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: EX001-3ESPQUAD-06  
P.O. #: 00411203  
Release #:  
Contract#: 00411203  
Kathy Shaw, FAX#:860-747-1900, larry.walton@exeloncorp.com

Client ID/ Station	Laboratory ID Analysis	Vol/Units Price	Start Collect Date/Time	End Collect Date/Time
WG-QC-MWQC102I-053106-JH-016	L28818-1		05/31/06:1600	
WG	GELI	108.00		
WG	H-3	162.00		
WG	SR-90 (FAST)	140.00		
WG-QC-MWQC102I-053106-JH-017	L28818-2		05/31/06:1610	
WG	GELI	108.00		
WG	H-3	162.00		
WG	SR-90 (FAST)	140.00		
WG-QC-MWQC102S-053106-JH-018	L28818-3		05/31/06:1615	
WG	GELI	108.00		
WG	H-3	162.00		
WG	SR-90 (FAST)	140.00		
WG-QC-MWQC102S-053106-JH-019	L28818-4		05/31/06:1640	
WG	GELI	108.00		
WG	H-3	162.00		
WG	SR-90 (FAST)	140.00		

**Charles, Rebecca**

---

**From:** Shaw, Kathy [kshaw@croworld.com]  
**Sent:** Wednesday, June 07, 2006 5:26 PM  
**To:** Charles, Rebecca  
**Cc:** Larry.Walton@exeloncorp.com  
**Subject:** 45136-28 Quad Cities

Hi Rebecca,

I have revised the COCs for the the Quad Cities samples. I have added dashes between the well IDs etc, nothing else was changed. Please update your database with these revised IDs.

Thanks,

**Kathy Shaw - Chemist**

**Conestoga-Rovers & Associates**  
**45 Farmington Valley Drive**  
**Plainville, Connecticut 06062**  
**PH 860 747-1800**  
**Fax 860 747-1900**  
**CRAWORLD.COM**

REVISED

L28818

<b>CONESTOGA-ROVERS &amp; ASSOCIATES</b> 8615 W. Bryn Mawr Avenue Chicago, Illinois 60631 (773)380-9933 phone (773)380-6421 fax			SHIPPED TO (Laboratory Name): <b>Teledyne Brown</b>				
CHAIN-OF-CUSTODY RECORD			REFERENCE NUMBER: <b>45136-28</b>		PROJECT NAME: <b>Quad Cities Power Plant</b>		
SAMPLER'S SIGNATURE: <i>John Hargis</i>			PRINTED NAME: <b>John Hargis</b>		PARAMETERS: Yellow Strontium Gamma		
SEQ. No.	DATE	TIME	SAMPLE IDENTIFICATION No.	SAMPLE MATRIX	No. OF CONTAINERS	REMARKS	
1	5/31/06	1100	WG-QC-MW-QC-102I-053106-JH-016	Water	2		
2	5/31/06	1110	WG-QC-MW-QC-102I-053106-JH-017	Water	2		
3	5/31/06	1115	WG-QC-MW-QC-102S-053106-JH-018	Water	2		
4	5/31/06	1140	WG-QC-MW-QC-102S-053106-JH-019	Water	2		
(WG-QC-MW-QC-102I-053106-JH-016 WG-QC-MW-QC-102I-053106-JH-017 WG-QC-MW-QC-102S-053106-JH-018 WG-QC-MW-QC-102S-053106-JH-019)					LMS corrected 6/8/06 etc		
TOTAL NUMBER OF CONTAINERS					8		
RELINQUISHED BY: <i>John Hargis</i>		DATE: 6/1/06 TIME: 0819		RECEIVED BY: <i>Paul Diamond</i>		DATE: 6-1-06 TIME: 820	
RELINQUISHED BY:		DATE: TIME:		RECEIVED BY:		DATE: TIME:	
RELINQUISHED BY:		DATE: TIME:		RECEIVED BY:		DATE: TIME:	
METHOD OF SHIPMENT:				AIR BILL No.			
White -Fully Executed Copy Yellow -Receiving Laboratory Copy Pink -Shipper Copy Goldenrod -Sampler Copy			SAMPLE TEAM: <i>John Hargis</i> <i>Andrew Durbek</i> <i>Nate Ziegler</i>		RECEIVED FOR LABORATORY BY: _____ DATE: _____ TIME: _____		

# Internal Chain of Custody

\*\*\*\*\*

Sample # L28818-1                      Containernum    1

Prod                                      Analyst  
H-3                                        DW  
GELI                                        EJ  
SR-90 (FAST)                              LCB

Relinquish Date Relinquish By                                      Received By  
06/02/2006 00:00    099999                      Sample Custodian  
06/02/2006 12:34                      099999                      Sample Custodian                      030854                      Donna Webb  
06/02/2006 12:34                      030854                      Donna Webb                                      099999                      Sample Custodian

\*\*\*\*\*

Sample # L28818-1                      Containernum    2

Prod                                      Analyst  
H-3                                        DW  
GELI                                        EJ  
SR-90 (FAST)                              LCB

Relinquish Date Relinquish By                                      Received By  
06/02/2006 00:00    099999                      Sample Custodian

\*\*\*\*\*

Sample # L28818-2                      Containernum    1

Prod                                      Analyst  
H-3                                        DW  
GELI                                        EJ  
SR-90 (FAST)                              LCB

Relinquish Date Relinquish By                                      Received By  
06/02/2006 00:00    099999                      Sample Custodian  
06/02/2006 12:34                      099999                      Sample Custodian                      030854                      Donna Webb  
06/02/2006 12:34                      030854                      Donna Webb                                      099999                      Sample Custodian

\*\*\*\*\*

Sample # L28818-2                      Containernum    2

Prod                                      Analyst  
H-3                                        DW  
GELI                                        EJ  
SR-90 (FAST)                              LCB

Relinquish Date Relinquish By                                      Received By  
06/02/2006 00:00    099999                      Sample Custodian

\*\*\*\*\*

Sample # L28818-3                      Containernum    1

Prod                                      Analyst  
H-3                                        DW  
GELI                                        EJ  
SR-90 (FAST)                              LCB

Relinquish Date Relinquish By                                      Received By  
06/02/2006 00:00    099999                      Sample Custodian  
06/02/2006 12:34                      099999                      Sample Custodian                      030854                      Donna Webb  
06/02/2006 12:34                      030854                      Donna Webb                                      099999                      Sample Custodian

\*\*\*\*\*

Sample # L28818-3                      Containernum    2



06/12/06

Teledyne Brown Engineering  
Internal Chain of Custody  
Supplemental Sheet

L28818

\*\*\*\*\*

L28818-1      WG      WG-QC-MW-QC-102I-053106-JH-016				
<u>Process step</u>	<u>Prod</u>		<u>Analyst</u>	<u>Date</u>
Login			RCHARLES	06/02/06
Aliquot	H-3		DW	06/02/06
Aliquot	GELI		EJ	06/06/06
Aliquot	SR-90 (FAST)		LCB	06/09/06
Count Room	GELI		KPW	06/08/06
Count Room	H-3		KOJ	06/03/06
Count Room	SR-90 (FAST)		KOJ	06/12/06

\*\*\*\*\*

L28818-2      WG      WG-QC-MW-QC-102I-053106-JH-017				
<u>Process step</u>	<u>Prod</u>		<u>Analyst</u>	<u>Date</u>
Login			RCHARLES	06/02/06
Aliquot	H-3		DW	06/02/06
Aliquot	GELI		EJ	06/06/06
Aliquot	SR-90 (FAST)		LCB	06/09/06
Count Room	GELI		MVW	06/08/06
Count Room	H-3		KOJ	06/03/06
Count Room	SR-90 (FAST)		KOJ	06/12/06

\*\*\*\*\*

L28818-3      WG      WG-QC-MW-QC-102S-053106-JH-018				
<u>Process step</u>	<u>Prod</u>		<u>Analyst</u>	<u>Date</u>
Login			RCHARLES	06/02/06
Aliquot	H-3		DW	06/02/06
Aliquot	GELI		EJ	06/06/06
Aliquot	SR-90 (FAST)		LCB	06/09/06
Count Room	GELI		KPW	06/08/06
Count Room	H-3		KOJ	06/03/06
Count Room	SR-90 (FAST)		KOJ	06/12/06

\*\*\*\*\*

L28818-4      WG      WG-QC-MW-QC-102S-053106-JH-019				
<u>Process step</u>	<u>Prod</u>		<u>Analyst</u>	<u>Date</u>
Login			RCHARLES	06/02/06
Aliquot	H-3		DW	06/02/06
Aliquot	GELI		EJ	06/06/06
Aliquot	SR-90 (FAST)		LCB	06/09/06
Count Room	GELI		MVW	06/08/06
Count Room	H-3		KOJ	06/03/06
Count Room	SR-90 (FAST)		KOJ	06/12/06



# Analytical Results Summary

# Report of Analysis

06/12/06 09:58

## L28818

Conestoga-Rovers & Associates

EX001-3ESPQUAD-06

Kathy Shaw

Sample ID: <b>WG-QC-MW-QC-102I-053106-JH-016</b>	Collect Start: 05/31/2006 16:00	Matrix: Ground Water (WG)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 06/02/2006	% Moisture:
LIMS Number: L28818-1		

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	2010	<b>3.26E+04</b>	9.77E+02	7.64E+02	pCi/L		2	ml		06/03/06	135	M	+ High
TOTAL SR	2018	3.35E-01	4.54E-01	<b>7.25E-01</b>	pCi/L		450	ml	05/31/06 16:00	06/12/06	400	M	U
MN-54	2007	-1.14E-01	1.83E+00	<b>2.98E+00</b>	pCi/L		3486.6	ml	05/31/06 16:10	06/08/06	42147	Sec	U No
CO-58	2007	-5.76E-01	1.93E+00	<b>3.12E+00</b>	pCi/L		3486.6	ml	05/31/06 16:10	06/08/06	42147	Sec	U No
FE-59	2007	3.47E+00	3.83E+00	<b>6.49E+00</b>	pCi/L		3486.6	ml	05/31/06 16:10	06/08/06	42147	Sec	U No
CO-60	2007	1.88E-01	1.93E+00	<b>3.20E+00</b>	pCi/L		3486.6	ml	05/31/06 16:10	06/08/06	42147	Sec	U No
ZN-65	2007	7.42E+00	4.68E+00	<b>7.00E+00</b>	pCi/L		3486.6	ml	05/31/06 16:10	06/08/06	42147	Sec	U* No
NB-95	2007	9.54E-01	1.92E+00	<b>3.20E+00</b>	pCi/L		3486.6	ml	05/31/06 16:10	06/08/06	42147	Sec	U No
ZR-95	2007	-2.48E+00	3.43E+00	<b>5.50E+00</b>	pCi/L		3486.6	ml	05/31/06 16:10	06/08/06	42147	Sec	U No
CS-134	2007	6.86E+00	4.50E+00	<b>3.59E+00</b>	pCi/L		3486.6	ml	05/31/06 16:10	06/08/06	42147	Sec	U* No
CS-137	2007	1.04E+00	1.97E+00	<b>3.30E+00</b>	pCi/L		3486.6	ml	05/31/06 16:10	06/08/06	42147	Sec	U No
BA-140	2007	4.89E+00	1.01E+01	<b>1.67E+01</b>	pCi/L		3486.6	ml	05/31/06 16:10	06/08/06	42147	Sec	U No
LA-140	2007	2.07E+00	3.24E+00	<b>5.53E+00</b>	pCi/L		3486.6	ml	05/31/06 16:10	06/08/06	42147	Sec	U No

Comment: 1 ID corrected 6/8/06

### 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

06/12/06 09:58



**TELEDYNE**  
BROWN ENGINEERING, INC.  
A Teledyne Technologies Company

## L28818

Conestoga-Rovers & Associates

EX001-3ESPQUAD-06

Kathy Shaw

Sample ID: <b>WG-QC-MW-QC-102I-053106-JH-017</b>	Collect Start: 05/31/2006 16:10	Matrix: Ground Water (WG)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 06/02/2006	% Moisture:
LIMS Number: L28818-2		

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>3.18E+04</b>	9.72E+02	7.69E+02	pCi/L		2	ml		06/03/06	135	M	+ High
TOTAL SR	2018	-5.49E-02	5.35E-01	<b>8.86E-01</b>	pCi/L		450	ml	05/31/06 16:10	06/12/06	400	M	U
K-40	2007	<b>8.45E+01</b>	3.73E+01	3.59E+01	pCi/L		3307.52	ml	05/31/06 16:10	06/08/06	42029	Sec	+ Yes
MN-54	2007	3.51E-01	2.16E+00	<b>3.58E+00</b>	pCi/L		3307.52	ml	05/31/06 16:10	06/08/06	42029	Sec	U No
CO-58	2007	-8.97E-01	2.21E+00	<b>3.59E+00</b>	pCi/L		3307.52	ml	05/31/06 16:10	06/08/06	42029	Sec	U No
FE-59	2007	-1.24E-01	4.45E+00	<b>7.35E+00</b>	pCi/L		3307.52	ml	05/31/06 16:10	06/08/06	42029	Sec	U No
CO-60	2007	1.65E+00	2.24E+00	<b>3.79E+00</b>	pCi/L		3307.52	ml	05/31/06 16:10	06/08/06	42029	Sec	U No
ZN-65	2007	2.59E+00	4.65E+00	<b>7.88E+00</b>	pCi/L		3307.52	ml	05/31/06 16:10	06/08/06	42029	Sec	U No
NB-95	2007	2.59E+00	2.27E+00	<b>3.91E+00</b>	pCi/L		3307.52	ml	05/31/06 16:10	06/08/06	42029	Sec	U No
ZR-95	2007	-2.63E+00	3.91E+00	<b>6.31E+00</b>	pCi/L		3307.52	ml	05/31/06 16:10	06/08/06	42029	Sec	U* No
CS-134	2007	7.00E+00	3.64E+00	<b>3.82E+00</b>	pCi/L		3307.52	ml	05/31/06 16:10	06/08/06	42029	Sec	U No
CS-137	2007	2.35E+00	2.30E+00	<b>3.88E+00</b>	pCi/L		3307.52	ml	05/31/06 16:10	06/08/06	42029	Sec	U No
BA-140	2007	-2.26E+00	1.13E+01	<b>1.86E+01</b>	pCi/L		3307.52	ml	05/31/06 16:10	06/08/06	42029	Sec	U No
LA-140	2007	-8.74E-01	3.87E+00	<b>6.26E+00</b>	pCi/L		3307.52	ml	05/31/06 16:10	06/08/06	42029	Sec	U No
AC-228	2007	<b>2.15E+01</b>	7.75E+00	1.21E+01	pCi/L		3307.52	ml	05/31/06 16:10	06/08/06	42029	Sec	+ Yes

Comment: 1 ID corrected 6/8/06

**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

06/12/06 09:58

**L28818**

Conestoga-Rovers & Associates

EX001-3ESPQUAD-06



Kathy Shaw

Sample ID: <b>WG-QC-MW-QC-102S-053106-JH-018</b>	Collect Start: 05/31/2006 16:15	Matrix: Ground Water (WG)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 06/02/2006	% Moisture:
LIMS Number: L28818-3		

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	2010	<b>9.41E+03</b>	6.55E+02	7.64E+02	pCi/L		2	ml		06/03/06	135	M	+ High
TOTAL SR	2018	1.60E-01	4.01E-01	<b>6.50E-01</b>	pCi/L		450	ml	05/31/06 16:15	06/12/06	400	M	U
MN-54	2007	-3.68E-01	1.61E+00	<b>2.70E+00</b>	pCi/L		3232.84	ml	05/31/06 16:15	06/08/06	42013	Sec	U No
CO-58	2007	-2.51E+00	1.65E+00	<b>2.63E+00</b>	pCi/L		3232.84	ml	05/31/06 16:15	06/08/06	42013	Sec	U No
FE-59	2007	2.96E+00	3.22E+00	<b>5.74E+00</b>	pCi/L		3232.84	ml	05/31/06 16:15	06/08/06	42013	Sec	U No
CO-60	2007	1.18E+00	1.57E+00	<b>2.78E+00</b>	pCi/L		3232.84	ml	05/31/06 16:15	06/08/06	42013	Sec	U No
ZN-65	2007	4.03E+00	3.87E+00	<b>5.96E+00</b>	pCi/L		3232.84	ml	05/31/06 16:15	06/08/06	42013	Sec	U No
NB-95	2007	-1.60E-01	1.66E+00	<b>2.80E+00</b>	pCi/L		3232.84	ml	05/31/06 16:15	06/08/06	42013	Sec	U No
ZR-95	2007	-4.91E-01	2.93E+00	<b>4.94E+00</b>	pCi/L		3232.84	ml	05/31/06 16:15	06/08/06	42013	Sec	U No
CS-134	2007	3.34E+00	2.81E+00	<b>3.03E+00</b>	pCi/L		3232.84	ml	05/31/06 16:15	06/08/06	42013	Sec	U No
CS-137	2007	3.64E-01	1.70E+00	<b>2.91E+00</b>	pCi/L		3232.84	ml	05/31/06 16:15	06/08/06	42013	Sec	U No
BA-140	2007	6.82E+00	9.06E+00	<b>1.54E+01</b>	pCi/L		3232.84	ml	05/31/06 16:15	06/08/06	42013	Sec	U No
LA-140	2007	1.72E+00	2.74E+00	<b>4.91E+00</b>	pCi/L		3232.84	ml	05/31/06 16:15	06/08/06	42013	Sec	U No

Comment: 1 ID corrected 6/8/06

**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
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- H = High recovery

**Bolded text indicates reportable value.**

- No = Peak not identified in gamma spectrum
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- \*\*\*\* Results are reported on an as received basis unless otherwise noted

MDC - Minimum Detectable Concentration

# Report of Analysis

06/12/06 09:58

## L28818

Conestoga-Rovers & Associates

EX001-3ESPQUAD-06

Kathy Shaw

Sample ID: <b>WG-QC-MW-QC-102S-053106-JH-019</b>	Collect Start: 05/31/2006 16:40	Matrix: Ground Water	(WG)
Station:	Collect Stop:	Volume:	
Description:	Receive Date: 06/02/2006	% Moisture:	
LIMS Number: L28818-4			

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>9.64E+03</b>	6.60E+02	7.66E+02	pCi/L		2	ml		06/03/06	135	M	+ High
TOTAL SR	2018	4.04E-01	4.33E-01	<b>6.86E-01</b>	pCi/L		450	ml	05/31/06 16:40	06/12/06	400	M	U
MN-54	2007	3.56E-01	1.54E+00	<b>2.57E+00</b>	pCi/L		3066.07	ml	05/31/06 16:40	06/08/06	36388	Sec	U No
CO-58	2007	-3.22E-01	1.67E+00	<b>2.74E+00</b>	pCi/L		3066.07	ml	05/31/06 16:40	06/08/06	36388	Sec	U No
FE-59	2007	3.68E+00	3.19E+00	<b>5.53E+00</b>	pCi/L		3066.07	ml	05/31/06 16:40	06/08/06	36388	Sec	U No
CO-60	2007	1.05E+00	1.57E+00	<b>2.66E+00</b>	pCi/L		3066.07	ml	05/31/06 16:40	06/08/06	36388	Sec	U No
ZN-65	2007	5.86E+00	3.25E+00	<b>5.76E+00</b>	pCi/L		3066.07	ml	05/31/06 16:40	06/08/06	36388	Sec	U* No
NB-95	2007	1.01E+00	1.61E+00	<b>2.74E+00</b>	pCi/L		3066.07	ml	05/31/06 16:40	06/08/06	36388	Sec	U No
ZR-95	2007	-2.31E-01	2.97E+00	<b>4.82E+00</b>	pCi/L		3066.07	ml	05/31/06 16:40	06/08/06	36388	Sec	U No
CS-134	2007	2.69E+00	2.83E+00	<b>2.89E+00</b>	pCi/L		3066.07	ml	05/31/06 16:40	06/08/06	36388	Sec	U No
CS-137	2007	1.48E+00	1.66E+00	<b>2.80E+00</b>	pCi/L		3066.07	ml	05/31/06 16:40	06/08/06	36388	Sec	U No
BA-140	2007	1.26E+00	8.08E+00	<b>1.35E+01</b>	pCi/L		3066.07	ml	05/31/06 16:40	06/08/06	36388	Sec	U No
LA-140	2007	3.65E+00	2.61E+00	<b>4.62E+00</b>	pCi/L		3066.07	ml	05/31/06 16:40	06/08/06	36388	Sec	U No

Comment: 1 ID corrected 6/8/06

**Flag Values**

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- + = 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

L28818

**In Process**

<u>Sample#</u>	<u>Analysis</u>	<u>Matrix</u>	<u>Clientid</u>
*****			

**In Process QC**

<u>Sample #</u>	<u>Analysis</u>	<u>Matrix</u>	<u>Clientid</u>
*****			

**Missing gamma nuclides**

<u>Sample #</u>	<u>Nuclide</u>
*****	

**Spec/High Flags**

Sample#	Analysis	Flag
L28818-1	H-3	HIGH
L28818-2	H-3	HIGH
L28818-3	H-3	HIGH
L28818-4	H-3	HIGH

**QC Failures**

Qc Sample	Analysis	QC type	Passfail
*****			

**Recoveries**

Sample#	Analysis	Flag
*****		

**Comments**

Sample#	Analysis	Seq	Comments
---------	----------	-----	----------

# QC Results Summary

QC Summary Report

for L28818

6/12/2006

10:01:18AM



H-3

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>
WG4080-1	H-3	WO	06/03/2006 6:57	< 1.530E+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>
WG4080-2	H-3	WO	06/03/2006 9:16	5.05E+002	4.650E+02	pCi/Total	92.1	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>
WG4080-3 L28818-1	H-3	WG	06/03/2006 11:35	3.260E+04	3.220E+04	pCi/L	1.2	<30	+	P

- + 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 L28818

6/12/2006

10:01:18AM



L28818 H-3

Associated Samples for

WG4080

SAMPLENUM

CLIENTID

L28818-1

WG-QC-MW-QC-102I-053106-JH-016

L28818-2

WG-QC-MW-QC-102I-053106-JH-017

L28818-3

WG-QC-MW-QC-102S-053106-JH-018

L28818-4

WG-QC-MW-QC-102S-053106-JH-019

+ 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

Page: 2

L28818 24 OF 49

QC Summary Report

for L28818

6/12/2006

10:01:18AM



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>
WG4133-1	TOTAL SR	WO	06/12/2006 8:10	< 4.830E-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>
WG4133-2	TOTAL SR	WO	06/11/2006 23:28	5.84E+001	6.620E+01	pCi/Total	113.4	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>
WG4133-4 L28821-1	TOTAL SR	WG	06/12/2006 8:10	< 6.910E-01	1.110E+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

# QC Summary Report for L28818

6/12/2006 10:01:18AM



L28818 SR-90 (FAST)

Associated Samples for WG4133

SAMPLENUM

CLIENTID

L28818-1	WG-QC-MW-QC-102I-053106-JH-016
L28818-2	WG-QC-MW-QC-102I-053106-JH-017
L28818-3	WG-QC-MW-QC-102S-053106-JH-018
L28818-4	WG-QC-MW-QC-102S-053106-JH-019

+ 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

Raw Data Sheet (rawdata)  
 Jun 12 2006, 10:12 am

Work Order: L28818

Customer: Exelon

Nuclide: H-3

Project : EX001-3ESPQUAD-06

Sample ID	Run #	Analysis	Reference Date/time	Volume/ Aliquot	Scavenge Date/time	Milking Date/time	Mount Weight	Count Recovery	Count Date/time	Counter ID	Total counts	Sample dt (min)	Bkg counts	Bkg dt (min)	Eff. Factor	Decay & Ingrowth Factor	Analyst
L28818-1		H-3		2 ml			0		03-jun-06 13:53	LS5	6570	135	6.17	135	.294		DW
WG-QC-MW-QC-102I-05310																	
Activity: 3.26E+04 * Error: 9.77E+02				MDC: 7.64E+02													
L28818-2		H-3		2 ml			0		03-jun-06 16:12	LS5	6398	135	6.17	135	.292		DW
WG-QC-MW-QC-102I-05310																	
Activity: 3.18E+04 * Error: 9.72E+02				MDC: 7.69E+02													
L28818-3		H-3		2 ml			0		03-jun-06 18:31	LS5	2491	135	6.17	135	.294		DW
WG-QC-MW-QC-102S-05310																	
Activity: 9.41E+03 * Error: 6.55E+02				MDC: 7.64E+02													
L28818-4		H-3		2 ml			0		03-jun-06 20:49	LS5	2526	135	6.17	135	.293		DW
WG-QC-MW-QC-102S-05310																	
Activity: 9.64E+03 * Error: 6.6E+02				MDC: 7.66E+02													

Raw Data Sheet (rawdata)  
 Jun 12 2006, 10:12 am

Work Order: L28818

Customer: Exelon

Page: 2

Nuclide: SR-90 (FAST)

Project : EX001-3ESPQUAD-06

Sample ID	Run	Analysis	Reference	Volume/	Scavenge	Milking	Mount	Count	Counter	Total	Sample	Bkg	Bkg	Eff.	Decay & Ingrowth	Analyst
Client ID	#		Date/time	Aliquot	Date/time	Date/time	Weight	Recovery	ID	counts	dt (min)	counts	dt (min)	Factor		
L28818-1		TOTAL SR	31-may-06		11-jun-06		0		Y1B	315	400	279	400	.351	.999	LCB
WG-QC-MW-QC-102I-05310			16:00	450 ml	13:00			76.61		08:16						
Activity: 3.35E-01		Error: 4.54E-01		MDC: 7.25E-01		*										
L28818-2		TOTAL SR	31-may-06		11-jun-06		0		Y1C	295	400	300	400	.345	.999	LCB
WG-QC-MW-QC-102I-05310			16:10	450 ml	13:00			66.13		08:16						
Activity: -5.49E-02		Error: 5.35E-01		MDC: 8.86E-01		*										
L28818-3		TOTAL SR	31-may-06		11-jun-06		0		Y1D	325	400	305	400	.362	.999	LCB
WG-QC-MW-QC-102S-05310			16:15	450 ml	13:00			86.56		08:16						
Activity: 1.6E-01		Error: 4.01E-01		MDC: 6.5E-01		*										
L28818-4		TOTAL SR	31-may-06		11-jun-06		0		Y2A	326	400	280	400	.349	.999	LCB
WG-QC-MW-QC-102S-05310			16:40	450 ml	13:00			81.72		08:16						
Activity: 4.04E-01		Error: 4.33E-01		MDC: 6.86E-01		*										



## Summary of Nuclide Activity

Page : 2

Sample ID : 14L28818-1

Acquisition date : 8-JUN-2006 16:25:29

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 pCi/L	Decay Corr pCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	3.230E+01	3.230E+01	3.299E+01	102.15	
RA-226	1600.00Y	1.00	1.888E+01	1.888E+01	5.641E+01	298.75	
TH-228	1.91Y	1.01	8.674E-01	8.746E-01	39.52E-01	451.87	
U-235	7.04E+08Y	1.00	1.147E+00	1.147E+00	3.426E+00	298.75	K
			-----	-----			
	Total Activity :		5.320E+01	5.320E+01			

Grand Total Activity :	5.320E+01	5.320E+01
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Flags: "K" = Keyline not found  
 "E" = Manually edited

"M" = Manually accepted  
 "A" = Nuclide specific abn. limit



## Unidentified Energy Lines

Page : 3

Sample ID : 14L28818-1

Acquisition date : 8-JUN-2006 16:25:29

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
1	65.93	739	1810	2.75	132.85	126	11	1.75E-02	23.2	4.42E-01	
1	92.55	73	1160	1.30	186.23	183	8	1.73E-03	****	1.15E+00	
1	139.90	329	1318	1.35	281.17	277	9	7.81E-03	41.2	1.67E+00	
1	174.96	179	992	1.24	351.43	348	8	4.25E-03	62.8	1.67E+00	
1	198.70	308	1313	1.38	399.02	393	11	7.30E-03	51.4	1.60E+00	
1	295.52	276	790	1.78	592.91	588	11	6.54E-03	41.1	1.29E+00	
1	352.17	186	560	1.69	706.31	702	11	4.41E-03	65.0	1.14E+00	
1	582.38	142	395	3.06	1166.57	1160	14	3.37E-03	62.0	7.92E-01	T
1	595.88	230	361	2.33	1193.54	1186	14	5.45E-03	37.7	7.79E-01	
1	609.23	229	325	1.91	1220.19	1214	12	5.43E-03	43.0	7.66E-01	
1	1120.28	42	145	2.73	2238.69	2233	13	9.94E-04	****	4.81E-01	
1	1765.90	67	72	2.48	3519.49	3513	16	1.59E-03	81.9	3.44E-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	Wtd Mean	Decay Corr	2-Sigma	2-Sigma	%Error	Flags
			Uncorrected	Decay Corr					
K-40	1.28E+09Y	1.00	3.230E+01	3.230E+01	3.299E+01	102.15			
RA-226	1600.00Y	1.00	1.888E+01	1.888E+01	5.641E+01	298.75			
TH-228	1.91Y	1.01	8.674E-01	8.746E-01	39.52E-01	451.87			
Total Activity :			5.205E+01	5.206E+01					

Grand Total Activity : 5.205E+01 5.206E+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	3.230E+01	3.299E+01	2.804E+01	0.000E+00	1.152
RA-226	1.888E+01	5.641E+01	7.351E+01	0.000E+00	0.257
TH-228	8.746E-01	3.952E+00	5.507E+00	0.000E+00	0.159

Nuclide	Key-Line Activity (pCi/L)	K.L. Ided	Act error	MDA (pCi/L)	MDA error	Act/MDA
BE-7	1.781E+00		1.642E+01	2.714E+01	0.000E+00	0.066
NA-24	-1.808E-02		9.316E-03	Half-Life too short		
CR-51	-3.038E+01		1.912E+01	3.034E+01	0.000E+00	-1.001
MN-54	-1.143E-01		1.832E+00	2.981E+00	0.000E+00	-0.038
CO-57	-2.165E-01		1.887E+00	3.126E+00	0.000E+00	-0.069
CO-58	-5.764E-01		1.928E+00	3.118E+00	0.000E+00	-0.185
FE-59	3.465E+00		3.831E+00	6.492E+00	0.000E+00	0.534
CO-60	1.878E-01		1.932E+00	3.195E+00	0.000E+00	0.059
ZN-65	7.420E+00		4.679E+00	7.002E+00	0.000E+00	1.060
SE-75	-4.003E-01		2.520E+00	4.158E+00	0.000E+00	-0.096
SR-85	1.993E+01		2.265E+00	4.341E+00	0.000E+00	4.590
Y-88	-1.573E+00		2.122E+00	3.329E+00	0.000E+00	-0.473
NB-94	3.954E-01		1.743E+00	2.894E+00	0.000E+00	0.137
NB-95	9.537E-01		1.918E+00	3.196E+00	0.000E+00	0.298
ZR-95	-2.481E+00		3.433E+00	5.500E+00	0.000E+00	-0.451
MO-99	-1.003E+02		1.040E+02	1.654E+02	0.000E+00	-0.607
RU-103	1.412E+00		2.138E+00	3.572E+00	0.000E+00	0.395
RU-106	-1.489E+01		1.781E+01	2.815E+01	0.000E+00	-0.529
AG-110m	-1.118E-01		1.792E+00	2.962E+00	0.000E+00	-0.038
SN-113	1.990E+00		2.530E+00	4.178E+00	0.000E+00	0.476
SB-124	-2.472E-01		4.798E+00	3.274E+00	0.000E+00	-0.075
SB-125	8.344E-01		5.286E+00	8.794E+00	0.000E+00	0.095
TE-129M	3.095E+01		2.361E+01	4.024E+01	0.000E+00	0.769
I-131	-5.945E-01		3.813E+00	6.187E+00	0.000E+00	-0.096
BA-133	7.942E+00		3.086E+00	4.585E+00	0.000E+00	1.732
CS-134	6.855E+00		4.501E+00	3.589E+00	0.000E+00	1.910
CS-136	1.329E+00		2.739E+00	4.547E+00	0.000E+00	0.292
CS-137	1.038E+00		1.966E+00	3.304E+00	0.000E+00	0.314
CE-139	-1.295E+00		1.988E+00	3.115E+00	0.000E+00	-0.416
BA-140	4.886E+00		1.006E+01	1.668E+01	0.000E+00	0.293
LA-140	2.070E+00		3.240E+00	5.529E+00	0.000E+00	0.374
CE-141	4.843E+00		4.312E+00	6.185E+00	0.000E+00	0.783
CE-144	-5.791E+00		1.690E+01	2.359E+01	0.000E+00	-0.246
EU-152	-9.003E+00		7.148E+00	9.456E+00	0.000E+00	-0.952
EU-154	-2.139E-01		3.894E+00	6.455E+00	0.000E+00	-0.033
AC-228	3.827E+00		7.561E+00	1.158E+01	0.000E+00	0.331
TH-232	3.817E+00		7.541E+00	1.155E+01	0.000E+00	0.331
U-235	2.975E+01		1.697E+01	2.466E+01	0.000E+00	1.207
U-238	1.086E+02		1.928E+02	3.244E+02	0.000E+00	0.335
AM-241	-1.414E+01		2.904E+01	4.025E+01	0.000E+00	-0.351

A,14L28818-1 ,06/09/2006 04:08,05/31/2006 16:10, 3.487E+00,WG L28818-1 QU  
 B,14L28818-1 ,LIBD ,06/02/2006 08:23,1435L091304  
 C,K-40 ,YES, 3.230E+01, 3.299E+01, 2.804E+01,, 1.152  
 C,RA-226 ,YES, 1.888E+01, 5.641E+01, 7.351E+01,, 0.257  
 C,TH-228 ,YES, 8.746E-01, 3.952E+00, 5.507E+00,, 0.159  
 C,BE-7 ,NO , 1.781E+00, 1.642E+01, 2.714E+01,, 0.066  
 C,CR-51 ,NO , -3.038E+01, 1.912E+01, 3.034E+01,, -1.001  
 C,MN-54 ,NO , -1.143E-01, 1.832E+00, 2.981E+00,, -0.038  
 C,CO-57 ,NO , -2.165E-01, 1.887E+00, 3.126E+00,, -0.069  
 C,CO-58 ,NO , -5.764E-01, 1.928E+00, 3.118E+00,, -0.185  
 C,FE-59 ,NO , 3.465E+00, 3.831E+00, 6.492E+00,, 0.534  
 C,CO-60 ,NO , 1.878E-01, 1.932E+00, 3.195E+00,, 0.059  
 C,ZN-65 ,NO , 7.420E+00, 4.679E+00, 7.002E+00,, 1.060  
 C,SE-75 ,NO , -4.003E-01, 2.520E+00, 4.158E+00,, -0.096  
 C,SR-85 ,NO , 1.993E+01, 2.265E+00, 4.341E+00,, 4.590  
 C,Y-88 ,NO , -1.573E+00, 2.122E+00, 3.329E+00,, -0.473  
 C,NB-94 ,NO , 3.954E-01, 1.743E+00, 2.894E+00,, 0.137  
 C,NB-95 ,NO , 9.537E-01, 1.918E+00, 3.196E+00,, 0.298  
 C,ZR-95 ,NO , -2.481E+00, 3.433E+00, 5.500E+00,, -0.451  
 C,MO-99 ,NO , -1.003E+02, 1.040E+02, 1.654E+02,, -0.607  
 C,RU-103 ,NO , 1.412E+00, 2.138E+00, 3.572E+00,, 0.395  
 C,RU-106 ,NO , -1.489E+01, 1.781E+01, 2.815E+01,, -0.529  
 C,AG-110m ,NO , -1.118E-01, 1.792E+00, 2.962E+00,, -0.038  
 C,SN-113 ,NO , 1.990E+00, 2.530E+00, 4.178E+00,, 0.476  
 C,SB-124 ,NO , -2.472E-01, 4.798E+00, 3.274E+00,, -0.075  
 C,SB-125 ,NO , 8.344E-01, 5.286E+00, 8.794E+00,, 0.095  
 C,TE-129M ,NO , 3.095E+01, 2.361E+01, 4.024E+01,, 0.769  
 C,I-131 ,NO , -5.945E-01, 3.813E+00, 6.187E+00,, -0.096  
 C,BA-133 ,NO , 7.942E+00, 3.086E+00, 4.585E+00,, 1.732  
 C,CS-134 ,NO , 6.855E+00, 4.501E+00, 3.589E+00,, 1.910  
 C,CS-136 ,NO , 1.329E+00, 2.739E+00, 4.547E+00,, 0.292  
 C,CS-137 ,NO , 1.038E+00, 1.966E+00, 3.304E+00,, 0.314  
 C,CE-139 ,NO , -1.295E+00, 1.988E+00, 3.115E+00,, -0.416  
 C,BA-140 ,NO , 4.886E+00, 1.006E+01, 1.668E+01,, 0.293  
 C,LA-140 ,NO , 2.070E+00, 3.240E+00, 5.529E+00,, 0.374  
 C,CE-141 ,NO , 4.843E+00, 4.312E+00, 6.185E+00,, 0.783  
 C,CE-144 ,NO , -5.791E+00, 1.690E+01, 2.359E+01,, -0.246  
 C,EU-152 ,NO , -9.003E+00, 7.148E+00, 9.456E+00,, -0.952  
 C,EU-154 ,NO , -2.139E-01, 3.894E+00, 6.455E+00,, -0.033  
 C,AC-228 ,NO , 3.827E+00, 7.561E+00, 1.158E+01,, 0.331  
 C,TH-232 ,NO , 3.817E+00, 7.541E+00, 1.155E+01,, 0.331  
 C,U-235 ,NO , 2.975E+01, 1.697E+01, 2.466E+01,, 1.207  
 C,U-238 ,NO , 1.086E+02, 1.928E+02, 3.244E+02,, 0.335  
 C,AM-241 ,NO , -1.414E+01, 2.904E+01, 4.025E+01,, -0.351



Summary of Nuclide Activity  
 Sample ID : 15L28818-2

Page : 2  
 Acquisition date : 8-JUN-2006 16:27:44

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 pCi/L	Decay Corr pCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	8.448E+01	8.448E+01	3.732E+01	44.17	
AC-228	5.75Y	1.00	2.140E+01	2.146E+01	0.775E+01	36.11	
Total Activity :			1.059E+02	1.059E+02			

Grand Total Activity : 1.059E+02 1.059E+02

Flags: "K" = Keyline not found  
 "E" = Manually edited

"M" = Manually accepted  
 "A" = Nuclide specific abn. limit

Unidentified Energy Lines  
Sample ID : 15L28818-2

Page : 3  
Acquisition date : 8-JUN-2006 16:27:44

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
1	66.39	190	1091	1.21	120.25	117	7	4.52E-03	59.7	4.37E-01	
1	139.69	279	1030	1.20	267.66	264	8	6.64E-03	41.4	1.48E+00	
1	198.21	260	912	1.54	385.35	381	9	6.19E-03	43.4	1.37E+00	
1	294.11	103	650	1.85	578.19	574	10	2.46E-03	94.0	1.05E+00	
1	351.94	106	495	2.02	694.45	689	11	2.52E-03	98.5	9.16E-01	
1	595.25	143	224	2.10	1183.56	1179	12	3.41E-03	44.9	5.98E-01	
1	608.46	167	253	2.00	1210.10	1204	12	3.97E-03	41.4	5.87E-01	
1	1763.77	60	56	2.95	3530.31	3523	15	1.42E-03	60.3	2.54E-01	

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 Uncorrected pCi/L	Wtd Mean Decay Corr pCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	8.448E+01	8.448E+01	3.732E+01	44.17	
AC-228	5.75Y	1.00	2.140E+01	2.146E+01	0.775E+01	36.11	
Total Activity :			1.059E+02	1.059E+02			

Grand Total Activity : 1.059E+02      1.059E+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 (pCi/L)	Act error	MDA (pCi/L)	MDA error	Act/MDA
K-40	8.448E+01	3.732E+01	3.588E+01	0.000E+00	2.355
AC-228	2.146E+01	7.750E+00	1.212E+01	0.000E+00	1.771

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/L)	K.L. Ided	Act error	MDA (pCi/L)	MDA error	Act/MDA
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NA-24	-2.695E-02	1.110E-02	Half-Life too short		
CR-51	-1.251E+01	2.067E+01	3.371E+01	0.000E+00	-0.371
MN-54	3.506E-01	2.161E+00	3.582E+00	0.000E+00	0.098
CO-57	7.714E-02	2.156E+00	3.251E+00	0.000E+00	0.024
CO-58	-8.969E-01	2.213E+00	3.590E+00	0.000E+00	-0.250
FE-59	-1.238E-01	4.453E+00	7.351E+00	0.000E+00	-0.017
CO-60	1.650E+00	2.235E+00	3.794E+00	0.000E+00	0.435
ZN-65	2.587E+00	4.651E+00	7.875E+00	0.000E+00	0.329
SE-75	9.896E-01	2.850E+00	4.640E+00	0.000E+00	0.213
SR-85	1.657E+01	2.522E+00	4.802E+00	0.000E+00	3.452
Y-88	3.561E-01	2.428E+00	4.059E+00	0.000E+00	0.088
NB-94	-4.549E-01	2.198E+00	3.540E+00	0.000E+00	-0.129
NB-95	2.592E+00	2.265E+00	3.910E+00	0.000E+00	0.663
ZR-95	-2.632E+00	3.912E+00	6.314E+00	0.000E+00	-0.417
MO-99	-2.785E+01	1.267E+02	2.086E+02	0.000E+00	-0.133
RU-103	3.119E+00	2.386E+00	4.110E+00	0.000E+00	0.759
RU-106	-4.775E+00	1.980E+01	3.212E+01	0.000E+00	-0.149
AG-110m	7.546E-01	2.075E+00	3.430E+00	0.000E+00	0.220
SN-113	1.081E+00	2.777E+00	4.589E+00	0.000E+00	0.235
SB-124	3.132E+00	4.583E+00	3.674E+00	0.000E+00	0.852
SB-125	1.353E+00	5.996E+00	9.817E+00	0.000E+00	0.138
TE-129M	6.584E-01	2.796E+01	4.531E+01	0.000E+00	0.015
I-131	3.055E-01	4.119E+00	6.776E+00	0.000E+00	0.045
BA-133	1.541E+00	3.229E+00	4.589E+00	0.000E+00	0.336
CS-134	6.995E+00	3.643E+00	3.817E+00	0.000E+00	1.833
CS-136	1.219E-01	3.126E+00	5.163E+00	0.000E+00	0.024
CS-137	2.351E+00	2.296E+00	3.882E+00	0.000E+00	0.606
CE-139	8.536E-01	1.958E+00	3.262E+00	0.000E+00	0.262
BA-140	-2.259E+00	1.134E+01	1.860E+01	0.000E+00	-0.121
LA-140	-8.740E-01	3.866E+00	6.259E+00	0.000E+00	-0.140
CE-141	1.796E+00	4.378E+00	6.291E+00	0.000E+00	0.286
CE-144	-3.190E+00	1.702E+01	2.422E+01	0.000E+00	-0.132
EU-152	-2.851E+00	7.687E+00	1.060E+01	0.000E+00	-0.269
EU-154	1.963E+00	4.470E+00	6.789E+00	0.000E+00	0.289
RA-226	-4.989E+01	5.751E+01	8.183E+01	0.000E+00	-0.610
TH-228	-5.360E-01	4.366E+00	6.213E+00	0.000E+00	-0.086
TH-232	2.140E+01	7.729E+00	1.412E+01	0.000E+00	1.516
U-235	2.161E+01	1.683E+01	2.471E+01	0.000E+00	0.875
U-238	1.132E+02	2.376E+02	3.947E+02	0.000E+00	0.287
AM-241	-2.180E+01	2.479E+01	3.848E+01	0.000E+00	-0.567

A,15L28818-2	,06/09/2006	04:08,05/31/2006	16:10,	3.307E+00,WG	L28818-2	EX
B,15L28818-2	,LIBD	,06/06/2006	10:43,	1535L090104		
C,K-40	,YES,	8.448E+01,	3.732E+01,	3.588E+01,,	2.355	
C,AC-228	,YES,	2.146E+01,	7.750E+00,	1.212E+01,,	1.771	
C,BE-7	,NO,	4.598E-02,	1.904E+01,	3.168E+01,,	0.001	
C,CR-51	,NO,	-1.251E+01,	2.067E+01,	3.371E+01,,	-0.371	
C,MN-54	,NO,	3.506E-01,	2.161E+00,	3.582E+00,,	0.098	
C,CO-57	,NO,	7.714E-02,	2.156E+00,	3.251E+00,,	0.024	
C,CO-58	,NO,	-8.969E-01,	2.213E+00,	3.590E+00,,	-0.250	
C,FE-59	,NO,	-1.238E-01,	4.453E+00,	7.351E+00,,	-0.017	
C,CO-60	,NO,	1.650E+00,	2.235E+00,	3.794E+00,,	0.435	
C,ZN-65	,NO,	2.587E+00,	4.651E+00,	7.875E+00,,	0.329	
C,SE-75	,NO,	9.896E-01,	2.850E+00,	4.640E+00,,	0.213	
C,SR-85	,NO,	1.657E+01,	2.522E+00,	4.802E+00,,	3.452	
C,Y-88	,NO,	3.561E-01,	2.428E+00,	4.059E+00,,	0.088	
C,NB-94	,NO,	-4.549E-01,	2.198E+00,	3.540E+00,,	-0.129	
C,NB-95	,NO,	2.592E+00,	2.265E+00,	3.910E+00,,	0.663	
C,ZR-95	,NO,	-2.632E+00,	3.912E+00,	6.314E+00,,	-0.417	
C,MO-99	,NO,	-2.785E+01,	1.267E+02,	2.086E+02,,	-0.133	
C,RU-103	,NO,	3.119E+00,	2.386E+00,	4.110E+00,,	0.759	
C,RU-106	,NO,	-4.775E+00,	1.980E+01,	3.212E+01,,	-0.149	
C,AG-110m	,NO,	7.546E-01,	2.075E+00,	3.430E+00,,	0.220	
C,SN-113	,NO,	1.081E+00,	2.777E+00,	4.589E+00,,	0.235	
C,SB-124	,NO,	3.132E+00,	4.583E+00,	3.674E+00,,	0.852	
C,SB-125	,NO,	1.353E+00,	5.996E+00,	9.817E+00,,	0.138	
C,TE-129M	,NO,	6.584E-01,	2.796E+01,	4.531E+01,,	0.015	
C,I-131	,NO,	3.055E-01,	4.119E+00,	6.776E+00,,	0.045	
C,BA-133	,NO,	1.541E+00,	3.229E+00,	4.589E+00,,	0.336	
C,CS-134	,NO,	6.995E+00,	3.643E+00,	3.817E+00,,	1.833	
C,CS-136	,NO,	1.219E-01,	3.126E+00,	5.163E+00,,	0.024	
C,CS-137	,NO,	2.351E+00,	2.296E+00,	3.882E+00,,	0.606	
C,CE-139	,NO,	8.536E-01,	1.958E+00,	3.262E+00,,	0.262	
C,BA-140	,NO,	-2.259E+00,	1.134E+01,	1.860E+01,,	-0.121	
C,LA-140	,NO,	-8.740E-01,	3.866E+00,	6.259E+00,,	-0.140	
C,CE-141	,NO,	1.796E+00,	4.378E+00,	6.291E+00,,	0.286	
C,CE-144	,NO,	-3.190E+00,	1.702E+01,	2.422E+01,,	-0.132	
C,EU-152	,NO,	-2.851E+00,	7.687E+00,	1.060E+01,,	-0.269	
C,EU-154	,NO,	1.963E+00,	4.470E+00,	6.789E+00,,	0.289	
C,RA-226	,NO,	-4.989E+01,	5.751E+01,	8.183E+01,,	-0.610	
C,TH-228	,NO,	-5.360E-01,	4.366E+00,	6.213E+00,,	-0.086	
C,TH-232	,NO,	2.140E+01,	7.729E+00,	1.412E+01,,	1.516	
C,U-235	,NO,	2.161E+01,	1.683E+01,	2.471E+01,,	0.875	
C,U-238	,NO,	1.132E+02,	2.376E+02,	3.947E+02,,	0.287	
C,AM-241	,NO,	-2.180E+01,	2.479E+01,	3.848E+01,,	-0.567	





## Summary of Nuclide Activity

Page : 2

Sample ID : 23L28818-3

Acquisition date : 8-JUN-2006 16:27:45

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 pCi/L	Decay Corr pCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
AC-228	5.75Y	1.00	1.549E+00	1.554E+00	8.768E+00	564.42	
TH-228	1.91Y	1.01	3.203E-03	3.230E-03	3642.E-03	112767.99	
Total Activity :			1.552E+00	1.557E+00			

Grand Total Activity : 1.552E+00 1.557E+00

Flags: "K" = Keyline not found  
 "E" = Manually edited

"M" = Manually accepted  
 "A" = Nuclide specific abn. limit

Unidentified Energy Lines  
 Sample ID : 23L28818-3

Page : 3  
 Acquisition date : 8-JUN-2006 16:27:45

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
6	33.82	138	82	1.19	67.97	65	13	3.29E-03	51.7	9.44E-02	
0	63.08	56	1736	0.96	126.45	122	9	1.32E-03	****	9.34E-01	
0	66.17	170	1091	0.91	132.61	131	6	4.04E-03	63.7	1.03E+00	
0	140.14	179	1648	0.96	280.44	276	9	4.25E-03	93.6	2.05E+00	
0	198.14	66	1143	0.92	396.37	393	8	1.56E-03	****	1.90E+00	
0	595.51	133	288	1.54	1190.70	1186	10	3.16E-03	50.8	8.74E-01	
0	608.61	44	297	1.70	1216.90	1212	12	1.05E-03	****	8.60E-01	
0	1119.92	17	87	1.22	2239.35	2235	10	3.94E-04	****	5.53E-01	
0	1646.40	23	88	3.68	3292.59	3280	19	5.36E-04	****	4.22E-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 Uncorrected pCi/L	Wtd Mean Decay Corr pCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
AC-228	5.75Y	1.00	1.549E+00	1.554E+00	8.768E+00	564.42	
TH-228	1.91Y	1.01	3.203E-03	3.230E-03	3642.E-03	112767.99	
Total Activity :			1.552E+00	1.557E+00			

Grand Total Activity : 1.552E+00 1.557E+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
AC-228	1.554E+00	8.768E+00	9.384E+00	0.000E+00	0.166
TH-228	3.230E-03	3.642E+00	5.155E+00	0.000E+00	0.001

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/L)	K.L. Ided	Act error	MDA (pCi/L)	MDA error	Act/MDA
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BE-7	-4.902E+00	1.505E+01	2.492E+01	0.000E+00	-0.197
NA-24	-7.101E-03	7.611E-03	Half-Life	too short	
K-40	-1.178E+01	2.799E+01	4.809E+01	0.000E+00	-0.245
CR-51	-2.199E+01	1.716E+01	2.817E+01	0.000E+00	-0.781
MN-54	-3.678E-01	1.611E+00	2.699E+00	0.000E+00	-0.136
CO-57	-1.432E+00	1.852E+00	3.061E+00	0.000E+00	-0.468
CO-58	-2.506E+00	1.650E+00	2.631E+00	0.000E+00	-0.953
FE-59	2.959E+00	3.221E+00	5.737E+00	0.000E+00	0.516
CO-60	1.180E+00	1.565E+00	2.777E+00	0.000E+00	0.425
ZN-65	4.029E+00	3.874E+00	5.958E+00	0.000E+00	0.676
SE-75	-4.554E-01	2.380E+00	4.010E+00	0.000E+00	-0.114
SR-85	1.588E+01	1.983E+00	3.847E+00	0.000E+00	4.127
Y-88	-1.037E+00	1.682E+00	2.808E+00	0.000E+00	-0.369
NB-94	4.718E-01	1.567E+00	2.683E+00	0.000E+00	0.176
NB-95	-1.598E-01	1.661E+00	2.804E+00	0.000E+00	-0.057
ZR-95	-4.908E-01	2.927E+00	4.935E+00	0.000E+00	-0.099
MO-99	-4.948E+01	9.241E+01	1.538E+02	0.000E+00	-0.322
RU-103	-3.982E-01	1.911E+00	3.169E+00	0.000E+00	-0.126
RU-106	-7.791E-01	1.489E+01	2.533E+01	0.000E+00	-0.031
AG-110m	2.760E-01	1.532E+00	2.624E+00	0.000E+00	0.105
SN-113	-2.725E-01	2.183E+00	3.653E+00	0.000E+00	-0.075
SB-124	-2.899E-04	3.817E+00	2.799E+00	0.000E+00	0.000
SB-125	6.297E-01	4.670E+00	7.849E+00	0.000E+00	0.080
TE-129M	-3.466E+00	2.134E+01	3.552E+01	0.000E+00	-0.098
I-131	-4.963E-01	3.429E+00	5.743E+00	0.000E+00	-0.086
BA-133	-1.832E-01	2.334E+00	3.915E+00	0.000E+00	-0.047
CS-134	3.342E+00	2.812E+00	3.032E+00	0.000E+00	1.102
CS-136	-6.384E-01	2.295E+00	3.845E+00	0.000E+00	-0.166
CS-137	3.642E-01	1.701E+00	2.914E+00	0.000E+00	0.125
CE-139	-7.115E-01	1.876E+00	3.094E+00	0.000E+00	-0.230
BA-140	6.821E+00	9.064E+00	1.543E+01	0.000E+00	0.442
LA-140	1.717E+00	2.744E+00	4.910E+00	0.000E+00	0.350
CE-141	1.844E+00	4.300E+00	6.115E+00	0.000E+00	0.302
CE-144	-1.704E+01	1.693E+01	2.347E+01	0.000E+00	-0.726
EU-152	-1.449E+01	5.352E+00	8.489E+00	0.000E+00	-1.707
EU-154	-2.399E+00	3.817E+00	6.317E+00	0.000E+00	-0.380
RA-226	-1.767E+01	5.345E+01	7.565E+01	0.000E+00	-0.234
TH-232	1.549E+00	8.744E+00	1.100E+01	0.000E+00	0.141
U-235	1.036E+01	1.830E+01	2.419E+01	0.000E+00	0.428
U-238	1.753E+02	2.013E+02	3.179E+02	0.000E+00	0.552
AM-241	3.132E+01	1.136E+01	1.673E+01	0.000E+00	1.872

A,23L28818-3	,06/09/2006	04:08,05/31/2006	16:15,	3.233E+00,WG	L28818-3 EX
B,23L28818-3	,LIBD	,06/01/2006	10:14,	2335L090704	
C,AC-228	,YES,	1.554E+00,	8.768E+00,	9.384E+00,,	0.166
C,TH-228	,YES,	3.230E-03,	3.642E+00,	5.155E+00,,	0.001
C,BE-7	,NO,	-4.902E+00,	1.505E+01,	2.492E+01,,	-0.197
C,K-40	,NO,	-1.178E+01,	2.799E+01,	4.809E+01,,	-0.245
C,CR-51	,NO,	-2.199E+01,	1.716E+01,	2.817E+01,,	-0.781
C,MN-54	,NO,	-3.678E-01,	1.611E+00,	2.699E+00,,	-0.136
C,CO-57	,NO,	-1.432E+00,	1.852E+00,	3.061E+00,,	-0.468
C,CO-58	,NO,	-2.506E+00,	1.650E+00,	2.631E+00,,	-0.953
C,FE-59	,NO,	2.959E+00,	3.221E+00,	5.737E+00,,	0.516
C,CO-60	,NO,	1.180E+00,	1.565E+00,	2.777E+00,,	0.425
C,ZN-65	,NO,	4.029E+00,	3.874E+00,	5.958E+00,,	0.676
C,SE-75	,NO,	-4.554E-01,	2.380E+00,	4.010E+00,,	-0.114
C,SR-85	,NO,	1.588E+01,	1.983E+00,	3.847E+00,,	4.127
C,Y-88	,NO,	-1.037E+00,	1.682E+00,	2.808E+00,,	-0.369
C,NB-94	,NO,	4.718E-01,	1.567E+00,	2.683E+00,,	0.176
C,NB-95	,NO,	-1.598E-01,	1.661E+00,	2.804E+00,,	-0.057
C,ZR-95	,NO,	-4.908E-01,	2.927E+00,	4.935E+00,,	-0.099
C,MO-99	,NO,	-4.948E+01,	9.241E+01,	1.538E+02,,	-0.322
C,RU-103	,NO,	-3.982E-01,	1.911E+00,	3.169E+00,,	-0.126
C,RU-106	,NO,	-7.791E-01,	1.489E+01,	2.533E+01,,	-0.031
C,AG-110m	,NO,	2.760E-01,	1.532E+00,	2.624E+00,,	0.105
C,SN-113	,NO,	-2.725E-01,	2.183E+00,	3.653E+00,,	-0.075
C,SB-124	,NO,	-2.899E-04,	3.817E+00,	2.799E+00,,	0.000
C,SB-125	,NO,	6.297E-01,	4.670E+00,	7.849E+00,,	0.080
C,TE-129M	,NO,	-3.466E+00,	2.134E+01,	3.552E+01,,	-0.098
C,I-131	,NO,	-4.963E-01,	3.429E+00,	5.743E+00,,	-0.086
C,BA-133	,NO,	-1.832E-01,	2.334E+00,	3.915E+00,,	-0.047
C,CS-134	,NO,	3.342E+00,	2.812E+00,	3.032E+00,,	1.102
C,CS-136	,NO,	-6.384E-01,	2.295E+00,	3.845E+00,,	-0.166
C,CS-137	,NO,	3.642E-01,	1.701E+00,	2.914E+00,,	0.125
C,CE-139	,NO,	-7.115E-01,	1.876E+00,	3.094E+00,,	-0.230
C,BA-140	,NO,	6.821E+00,	9.064E+00,	1.543E+01,,	0.442
C,LA-140	,NO,	1.717E+00,	2.744E+00,	4.910E+00,,	0.350
C,CE-141	,NO,	1.844E+00,	4.300E+00,	6.115E+00,,	0.302
C,CE-144	,NO,	-1.704E+01,	1.693E+01,	2.347E+01,,	-0.726
C,EU-152	,NO,	-1.449E+01,	5.352E+00,	8.489E+00,,	-1.707
C,EU-154	,NO,	-2.399E+00,	3.817E+00,	6.317E+00,,	-0.380
C,RA-226	,NO,	-1.767E+01,	5.345E+01,	7.565E+01,,	-0.234
C,TH-232	,NO,	1.549E+00,	8.744E+00,	1.100E+01,,	0.141
C,U-235	,NO,	1.036E+01,	1.830E+01,	2.419E+01,,	0.428
C,U-238	,NO,	1.753E+02,	2.013E+02,	3.179E+02,,	0.552
C,AM-241	,NO,	3.132E+01,	1.136E+01,	1.673E+01,,	1.872



Summary of Nuclide Activity  
 Sample ID : 07L28818-4

Page : 2  
 Acquisition date : 8-JUN-2006 18:00:52

Total number of lines in spectrum	8	
Number of unidentified lines	7	
Number of lines tentatively identified by NID	1	12.50%

Nuclide Type : natural

Nuclide	Hlife	Decay	Uncorrected pCi/L	Decay Corr pCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	3.877E+01	3.877E+01	2.894E+01	74.64	
Total Activity :			3.877E+01	3.877E+01			

Grand Total Activity : 3.877E+01 3.877E+01

Flags: "K" = Keyline not found  
 "E" = Manually edited

"M" = Manually accepted  
 "A" = Nuclide specific abn. limit

## Unidentified Energy Lines

Page : 3

Sample ID : 07L28818-4

Acquisition date : 8-JUN-2006 18:00:52

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
1	66.49	350	1248	1.38	133.56	129	9	9.61E-03	40.7	8.12E-01	
1	139.96	283	1036	1.09	280.61	276	9	7.79E-03	47.9	2.36E+00	
1	198.61	319	905	1.58	397.98	393	10	8.76E-03	42.4	2.24E+00	
1	595.73	123	264	1.47	1192.63	1189	9	3.39E-03	50.2	1.10E+00	
1	609.18	119	345	1.88	1219.53	1213	13	3.28E-03	80.4	1.09E+00	
1	729.77	106	358	9.41	1460.78	1447	21	2.90E-03	91.7	9.54E-01	
1	1238.16	53	119	2.10	2477.49	2472	14	1.45E-03	93.0	6.55E-01	

Flags: "T" = Tentatively associated

## Summary of Nuclide Activity

Total number of lines in spectrum	8
Number of unidentified lines	7
Number of lines tentatively identified by NID	1          12.50%

Nuclide Type : natural

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/L	Wtd Mean Decay Corr pCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	3.877E+01	3.877E+01	2.894E+01	74.64	
Total Activity :			3.877E+01	3.877E+01			

Grand Total Activity : 3.877E+01      3.877E+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	3.877E+01	2.894E+01	2.399E+01	0.000E+00	1.616

## ---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/L)	K.L. Ided	Act error	MDA (pCi/L)	MDA error	Act/MDA
BE-7	9.648E+00		1.388E+01	2.307E+01	0.000E+00	0.418
NA-24	-2.237E-02		7.623E-03	Half-Life too short		
CR-51	-1.831E+01		1.560E+01	2.531E+01	0.000E+00	-0.723
MN-54	3.564E-01		1.541E+00	2.568E+00	0.000E+00	0.139



CO-57	-2.353E-01	1.500E+00	2.445E+00	0.000E+00	-0.096
CO-58	-3.218E-01	1.667E+00	2.741E+00	0.000E+00	-0.117
FE-59	3.678E+00	3.189E+00	5.530E+00	0.000E+00	0.665
CO-60	1.049E+00	1.574E+00	2.657E+00	0.000E+00	0.395
ZN-65	5.864E+00	3.246E+00	5.760E+00	0.000E+00	1.018
SE-75	-1.556E+00	2.100E+00	3.374E+00	0.000E+00	-0.461
SR-85	2.055E+01	2.070E+00	4.071E+00	0.000E+00	5.047
Y-88	3.826E-01	1.707E+00	2.863E+00	0.000E+00	0.134
NB-94	-6.263E-01	1.555E+00	2.505E+00	0.000E+00	-0.250
NB-95	1.013E+00	1.613E+00	2.738E+00	0.000E+00	0.370
ZR-95	-2.305E-01	2.974E+00	4.816E+00	0.000E+00	-0.048
MO-99	2.345E+01	1.062E+02	1.509E+02	0.000E+00	0.155
RU-103	8.691E-01	1.794E+00	2.955E+00	0.000E+00	0.294
RU-106	-1.190E+00	1.485E+01	2.404E+01	0.000E+00	-0.050
AG-110m	-1.256E-02	1.550E+00	2.540E+00	0.000E+00	-0.005
SN-113	5.375E-01	2.044E+00	3.390E+00	0.000E+00	0.159
SB-124	-2.792E+00	4.166E+00	2.692E+00	0.000E+00	-1.037
SB-125	-3.393E-01	4.319E+00	7.062E+00	0.000E+00	-0.048
TE-129M	1.032E+01	1.989E+01	3.294E+01	0.000E+00	0.313
I-131	-9.608E-01	2.995E+00	4.912E+00	0.000E+00	-0.196
BA-133	4.632E+00	2.118E+00	3.681E+00	0.000E+00	1.258
CS-134	2.691E+00	2.826E+00	2.892E+00	0.000E+00	0.930
CS-136	-2.478E-01	2.262E+00	3.727E+00	0.000E+00	-0.066
CS-137	1.484E+00	1.659E+00	2.799E+00	0.000E+00	0.530
CE-139	5.324E-01	1.471E+00	2.469E+00	0.000E+00	0.216
BA-140	1.256E+00	8.077E+00	1.347E+01	0.000E+00	0.093
LA-140	3.648E+00	2.613E+00	4.615E+00	0.000E+00	0.791
CE-141	3.298E+00	3.479E+00	4.918E+00	0.000E+00	0.671
CE-144	-9.907E+00	1.361E+01	1.850E+01	0.000E+00	-0.536
EU-152	-1.637E+01	4.984E+00	7.655E+00	0.000E+00	-2.138
EU-154	4.743E-01	3.100E+00	5.080E+00	0.000E+00	0.093
RA-226	-2.254E+01	4.087E+01	6.258E+01	0.000E+00	-0.360
AC-228	-1.514E+00	6.953E+00	1.000E+01	0.000E+00	-0.151
TH-228	4.178E+00	3.236E+00	5.029E+00	0.000E+00	0.831
TH-232	-1.510E+00	6.934E+00	9.973E+00	0.000E+00	-0.151
U-235	1.750E+01	1.365E+01	1.946E+01	0.000E+00	0.900
U-238	1.617E+02	1.672E+02	2.838E+02	0.000E+00	0.570
AM-241	-2.142E+01	1.630E+01	2.263E+01	0.000E+00	-0.947

A,07L28818-4 ,06/09/2006 04:07,05/31/2006 16:40, 3.066E+00,WG L28818-4 EX  
 B,07L28818-4 ,LIBD ,06/07/2006 09:32,073L082504

C,K-40	,YES,	3.877E+01,	2.894E+01,	2.399E+01,,	1.616
C,BE-7	,NO ,	9.648E+00,	1.388E+01,	2.307E+01,,	0.418
C,CR-51	,NO ,	-1.831E+01,	1.560E+01,	2.531E+01,,	-0.723
C,MN-54	,NO ,	3.564E-01,	1.541E+00,	2.568E+00,,	0.139
C,CO-57	,NO ,	-2.353E-01,	1.500E+00,	2.445E+00,,	-0.096
C,CO-58	,NO ,	-3.218E-01,	1.667E+00,	2.741E+00,,	-0.117
C,FE-59	,NO ,	3.678E+00,	3.189E+00,	5.530E+00,,	0.665
C,CO-60	,NO ,	1.049E+00,	1.574E+00,	2.657E+00,,	0.395
C,ZN-65	,NO ,	5.864E+00,	3.246E+00,	5.760E+00,,	1.018
C,SE-75	,NO ,	-1.556E+00,	2.100E+00,	3.374E+00,,	-0.461
C,SR-85	,NO ,	2.055E+01,	2.070E+00,	4.071E+00,,	5.047
C,Y-88	,NO ,	3.826E-01,	1.707E+00,	2.863E+00,,	0.134
C,NB-94	,NO ,	-6.263E-01,	1.555E+00,	2.505E+00,,	-0.250
C,NB-95	,NO ,	1.013E+00,	1.613E+00,	2.738E+00,,	0.370
C,ZR-95	,NO ,	-2.305E-01,	2.974E+00,	4.816E+00,,	-0.048
C,MO-99	,NO ,	2.345E+01,	1.062E+02,	1.509E+02,,	0.155
C,RU-103	,NO ,	8.691E-01,	1.794E+00,	2.955E+00,,	0.294
C,RU-106	,NO ,	-1.190E+00,	1.485E+01,	2.404E+01,,	-0.050
C,AG-110m	,NO ,	-1.256E-02,	1.550E+00,	2.540E+00,,	-0.005
C,SN-113	,NO ,	5.375E-01,	2.044E+00,	3.390E+00,,	0.159
C,SB-124	,NO ,	-2.792E+00,	4.166E+00,	2.692E+00,,	-1.037
C,SB-125	,NO ,	-3.393E-01,	4.319E+00,	7.062E+00,,	-0.048
C,TE-129M	,NO ,	1.032E+01,	1.989E+01,	3.294E+01,,	0.313
C,I-131	,NO ,	-9.608E-01,	2.995E+00,	4.912E+00,,	-0.196
C,BA-133	,NO ,	4.632E+00,	2.118E+00,	3.681E+00,,	1.258
C,CS-134	,NO ,	2.691E+00,	2.826E+00,	2.892E+00,,	0.930
C,CS-136	,NO ,	-2.478E-01,	2.262E+00,	3.727E+00,,	-0.066
C,CS-137	,NO ,	1.484E+00,	1.659E+00,	2.799E+00,,	0.530
C,CE-139	,NO ,	5.324E-01,	1.471E+00,	2.469E+00,,	0.216
C,BA-140	,NO ,	1.256E+00,	8.077E+00,	1.347E+01,,	0.093
C,LA-140	,NO ,	3.648E+00,	2.613E+00,	4.615E+00,,	0.791
C,CE-141	,NO ,	3.298E+00,	3.479E+00,	4.918E+00,,	0.671
C,CE-144	,NO ,	-9.907E+00,	1.361E+01,	1.850E+01,,	-0.536
C,EU-152	,NO ,	-1.637E+01,	4.984E+00,	7.655E+00,,	-2.138
C,EU-154	,NO ,	4.743E-01,	3.100E+00,	5.080E+00,,	0.093
C,RA-226	,NO ,	-2.254E+01,	4.087E+01,	6.258E+01,,	-0.360
C,AC-228	,NO ,	-1.514E+00,	6.953E+00,	1.000E+01,,	-0.151
C,TH-228	,NO ,	4.178E+00,	3.236E+00,	5.029E+00,,	0.831
C,TH-232	,NO ,	-1.510E+00,	6.934E+00,	9.973E+00,,	-0.151
C,U-235	,NO ,	1.750E+01,	1.365E+01,	1.946E+01,,	0.900
C,U-238	,NO ,	1.617E+02,	1.672E+02,	2.838E+02,,	0.570
C,AM-241	,NO ,	-2.142E+01,	1.630E+01,	2.263E+01,,	-0.947



2508 Quality Lane  
Knoxville, TN 37931  
865-690-6819 (Phone)

**Work Order #: L28834 R1**

**Exelon**

**June 23, 2006**



Kathy Shaw  
Conestoga-Rovers & Associates  
45 Farmington Valley Drive  
Plainville CT 06062

**Case Narrative - L28834  
EX001-3ESPQUAD-06**

06/23/2006 08:58

**Sample Receipt**

The following samples were received on June 5, 2006 in good condition, unless otherwise noted.

Only tritium was requested on the COC for WG-QC-MW-BFN-060106-JH-007, WG-QC-MW-STP-060106-JH-007, WG-QC-MW-101S-060106-JH-007. Gamma and Strontium were also analyzed per client request.

CRA supplied revised chain of custodies with revised client IDs.

Revision #1 - Strontium result for L28834-10 is being reported.

*Cross Reference Table*

Client ID	Laboratory ID	Station ID(if applicable)
WG-QC-MW-QC-BFW-060106-JH-007	L28834-1	
WG-QC-MW-QC-STP-060106-JH-008	L28834-2	
WG-QC-MW-QC-101S-060106-JH-026	L28834-3	
WG-QC-MW-QC-WELL #5-060106-JH-010	L28834-4	
WG-QC-MW-QC-WELL #1-060106-JH-009	L28834-5	
WG-QC-MW-QC-DCS-060106-JH-006	L28834-6	
WG-QC-MW-QC-FHW-053106-JH-004	L28834-7	
WS-QC-SW-QC-001-053106-JH-002	L28834-8	
WG-QC-MW-2-060106-JH-023	L28834-9	
WG-QC-MW-1-060106-JH-022	L28834-10	
WG-QC-MW-QC-103I-060106-JH-021	L28834-11	
WS-QC-SW-QC-002-053106-JH-003	L28834-12	
WG-QC-MW-QC-LFW-053106-JH-005	L28834-13	

*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 - L28834**  
**EX001-3ESPQUAD-06**

06/23/2006 08:58

**Gamma Spectroscopy**

**Quality Control**

Quality control samples were analyzed as WG4096, WG4097.

**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-ZN-MW-ZN-01U-052606-DS-05	L28833-13	WG4096-3
WG-QC-MW-QC-1071-053106-JH-011	L28837-2	WG4097-3

**H-3**

**Quality Control**

Quality control samples were analyzed as WG4089, WG4099.

**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-1031-060106-JH-021	L28834-11	WG4099-3
WG-QC-MW-QC-1031-060106-JH-020	L28837-3	WG4089-3



**Case Narrative - L28834  
EX001-3ESPQUAD-06**

06/23/2006 08:58

**TOTAL SR**

**Quality Control**

Quality control samples were analyzed as WG4138, WG4170.

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-BFW-060106-JH-007	L28834-1	WG4138-3
RB-TMI-RB7-061206-MMM-062	L28973-1	WG4170-3

**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





L 28834

**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:

45136-28

PROJECT NAME:

Exelon - Quad Cities

**CHAIN-OF-CUSTODY RECORD**

SAMPLER'S  
SIGNATURE:

*John Hargens*

PRINTED  
NAME:

John Hargens

PARAMETERS

No. OF  
CONTAINERS

REMARKS

SEQ. No.	DATE	TIME	SAMPLE IDENTIFICATION No.	SAMPLE MATRIX	No. OF CONTAINERS	PARAMETERS	REMARKS
1	6/11/06	0850	WG-QC-MW-QC-BFN-060106-JH-007	water	2	X	
2	6/11/06	0905	WG-QC-MW-QC-STP-060106-JH-008	water	2	X	
3	6/11/06	1420	WG-QC-MW-QC-IOIS-060106-JH-026	water	2	X	
TOTAL NUMBER OF CONTAINERS					6		

RELINQUISHED BY:

① *John Hargens*

DATE: 6/1/06  
TIME: 1600

RECEIVED BY:

② *Steven Harling*

DATE: 6/1/06  
TIME: 4:45 P.M.

RELINQUISHED BY:

② *Don Smeltzer*

DATE: 6-2-06  
TIME: 5:15 pm

RECEIVED BY:

③ *Carly J*

DATE: 6-2-06  
TIME: 5:15

RELINQUISHED BY:

③

DATE:  
TIME:

RECEIVED BY:

④ *R. Charles*

DATE:  
TIME:

METHOD OF SHIPMENT:

AIR BILL No.

White -Fully Executed Copy  
Yellow -Receiving Laboratory Copy  
Pink -Shipper Copy  
Goldenrod -Sampler Copy

SAMPLE TEAM:

RECEIVED FOR LABORATORY BY:

*R. Charles*  
DATE: 6/5/06 TIME: 09:30

12797

**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*

*L28834*

REFERENCE NUMBER:

*45136-28*

PROJECT NAME:

*Exelon-Quad Cities*

**CHAIN-OF-CUSTODY RECORD**

SAMPLER'S SIGNATURE:

*John Hargens*

PRINTED NAME:

*John Hargens*

No. OF CONTAINERS

PARAMETERS

*Initial  
Strontium  
GammaS PC*

REMARKS

SEQ. No.	DATE	TIME	SAMPLE IDENTIFICATION No.	SAMPLE MATRIX	No. OF CONTAINERS	PARAMETERS										REMARKS					
9	6/1/06	1018	WG-QC-MW2-060106-JH-023	Water	2	X	+	+													
10	6/1/06	0917	WG-QC-MW1-060106-JH-022	Water	2	X	+	+													
11	6/1/06	0830	WG-QC-MWQC103T-060106-JH-021	Water	2	X	+	+													
12	5/31/06	0850	NS-QC-SWF-QC-002-053106-JH-003	Water	1	X															
13	5/31/06	0940	WG-QC-MW-QC-LFW-053106-JH-005	Water	1	X															
<b>TOTAL NUMBER OF CONTAINERS</b>					<i>5</i>																

RELINQUISHED BY:

① *John Hargens*

DATE: *6/1/06*

TIME:

RECEIVED BY:

② *Steven Harburg*

DATE: *6/1/06*

TIME: *4:48 P.M.*

RELINQUISHED BY:

② *Dan Smith*

DATE: *6-2-06*

TIME: *5:15 pm*

RECEIVED BY:

③ *Carly*

DATE: *6-2-06*

TIME: *5:15*

RELINQUISHED BY:

③ \_\_\_\_\_

DATE:

TIME:

RECEIVED BY:

④ \_\_\_\_\_

DATE:

TIME:

**METHOD OF SHIPMENT:**

**AIR BILL No.**

White -Fully Executed Copy  
Yellow -Receiving Laboratory Copy  
Pink -Shipper Copy  
Goldenrod -Sampler Copy

**SAMPLE TEAM:**

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**RECEIVED FOR LABORATORY BY:**

*P. Charles*  
DATE: *6/5/06* TIME: *09:30*

*12799*

**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*

*L28834*

REFERENCE NUMBER:

*45136-28*

PROJECT NAME:

*Exelon-Quad Cities*

**CHAIN-OF-CUSTODY RECORD**

SAMPLER'S SIGNATURE:

*[Signature]*

PRINTED NAME:

*John Hargan*

PARAMETERS:

*ARITHM  
STOATIUS  
GAMMA SPECT*

REMARKS

SEQ. No.	DATE	TIME	SAMPLE IDENTIFICATION No.	SAMPLE MATRIX	No. OF CONTAINERS	PARAMETERS										REMARKS									
4	6/1/06	0930	WG-QC-MW-QC Well #5 060106-JH010	water	2	+	+	+																	
5	6/1/06	0915	WG-QC-MW-QC Well #1 060106-JH 009	water	2	X	X	X																	
6	6/1/06	0820	WG-QC-MW-QC-DCS-060106-JH-006	water	2	X	X	X																	
7	5/31/06	0910	WG-QC-MW-QC-FHW-053106-JH 004	water	1	X																			
8	5/31/06	0820	WS-QC-SW-QC-001-053106-JH-002	water	1	X																			
<b>TOTAL NUMBER OF CONTAINERS</b>					<i>8</i>																				

RELINQUISHED BY:

① *[Signature]*

DATE: *6/1/06*

TIME: *1600*

RECEIVED BY:

② *[Signature]*

DATE: *6/1/06*

TIME: *4:57 P.M.*

RELINQUISHED BY:

② *[Signature]*

DATE: *6-2-06*

TIME: *5:15 pm*

RECEIVED BY:

③ *[Signature]*

DATE: *6-2-06*

TIME: *5:15*

RELINQUISHED BY:

③ \_\_\_\_\_

DATE:

TIME:

RECEIVED BY:

④ \_\_\_\_\_

DATE:

TIME:

METHOD OF SHIPMENT:

AIR BILL No.

White -Fully Executed Copy  
Yellow -Receiving Laboratory Copy  
Pink -Shipper Copy  
Goldenrod -Sampler Copy

SAMPLE TEAM:

RECEIVED FOR LABORATORY BY:

*R. Charles* 12808  
DATE: *6/5/06* TIME: *09:30*









**Charles, Rebecca**

---

**From:** Shaw, Kathy [kshaw@croworld.com]  
**Sent:** Wednesday, June 07, 2006 5:26 PM  
**To:** Charles, Rebecca  
**Cc:** Larry.Walton@exeloncorp.com  
**Subject:** 45136-28 Quad Cities

Hi Rebecca,

I have revised the COCs for the the Quad Cities samples. I have added dashes between the well IDs etc, nothing else was changed. Please update your database with these revised IDs.

Thanks,

**Kathy Shaw - Chemist**

**Conestoga-Rovers & Associates**  
**45 Farmington Valley Drive**  
**Plainville, Connecticut 06062**  
**PH 860 747-1800**  
**Fax 860 747-1900**  
**CRAWORLD.COM**





REVISED

L28834

<b>CONESTOGA-ROVERS &amp; ASSOCIATES</b> 8615 W. Bryn Mawr Avenue Chicago, Illinois 60631 (773)380-9933 phone (773)380-6421 fax			SHIPPED TO (Laboratory Name): <i>TELLIUM - BROWN</i>			
CHAIN-OF-CUSTODY RECORD			REFERENCE NUMBER: <i>45136 2C</i>		PROJECT NAME: <i>EXELUN (SAND) CITIES</i>	
SAMPLER'S SIGNATURE: <i>John Hanger</i>		PRINTED NAME: <i>John Hanger</i>		PARAMETERS: <i>STYRENE, PHENOL, CHLORIDE, S/P</i>		
SEQ. No.	DATE	TIME	SAMPLE IDENTIFICATION No.	SAMPLE MATRIX	No. OF CONTAINERS	REMARKS
	<i>3/1/02</i>	<i>1110</i>	<del>WG-QC-MW-QC-FHW-053106-JH-004</del> <i>WG-QC-MW-QC-FHW-053106-JH-004</i>	<i>H<sub>2</sub>O</i>	<i>1</i>	<i>✓</i>
<b>TOTAL NUMBER OF CONTAINERS</b> <i>1</i>						
RELINQUISHED BY: <i>John Hanger</i>			DATE: <i>6/1/02</i> TIME: <i>1600</i>		RECEIVED BY: <i>Colleen</i>	
RELINQUISHED BY:			DATE: TIME:		RECEIVED BY:	
RELINQUISHED BY:			DATE: TIME:		RECEIVED BY:	
METHOD OF SHIPMENT: <i>IN PERSON</i>				AIR BILL No.		
White -Fully Executed Copy Yellow -Receiving Laboratory Copy Pink -Shipper Copy Goldenrod -Sampler Copy			SAMPLE TEAM: <i>N. Zogor</i>		RECEIVED FOR LABORATORY BY: <i>12.07</i> DATE: _____ TIME: _____	

REVISED

L28834

<b>CONESTOGA-ROVERS &amp; ASSOCIATES</b> 8615 W. Bryn Mawr Avenue Chicago, Illinois 60631 (773)380-9933 phone (773)380-6421 fax			<b>SHIPPED TO</b> (Laboratory Name):			
<b>CHAIN-OF-CUSTODY RECORD</b>			<b>REFERENCE NUMBER:</b>		<b>PROJECT NAME:</b>	
<b>SAMPLER'S SIGNATURE:</b> <i>John Hanger</i>		<b>PRINTED NAME:</b> <i>John Hanger</i>		<b>PARAMETERS:</b>		
SEQ. No.	DATE	TIME	SAMPLE IDENTIFICATION No.	SAMPLE MATRIX	No. OF CONTAINERS	REMARKS
			<del>WS-OC-SW-OC-002-053106-JH-003</del>		1 X X	
			WS-OC-SW-OC-002-053106-JH-003			
<b>TOTAL NUMBER OF CONTAINERS</b>					1	
<b>RELINQUISHED BY:</b> ① <i>John Hanger</i>		<b>DATE:</b> <i>4/1/01</i> <b>TIME:</b> <i>11:00</i>		<b>RECEIVED BY:</b> ② <i>[Signature]</i>		<b>DATE:</b> <i>4/1/01</i> <b>TIME:</b> <i>12:00</i>
<b>RELINQUISHED BY:</b> ②		<b>DATE:</b> <b>TIME:</b>		<b>RECEIVED BY:</b> ③		<b>DATE:</b> <b>TIME:</b>
<b>RELINQUISHED BY:</b> ③		<b>DATE:</b> <b>TIME:</b>		<b>RECEIVED BY:</b> ④		<b>DATE:</b> <b>TIME:</b>
<b>METHOD OF SHIPMENT:</b> <i>in 24 hr</i>				<b>AIR BILL No.</b>		
White -Fully Executed Copy Yellow -Receiving Laboratory Copy Pink -Shipper Copy Goldenrod -Sampler Copy			<b>SAMPLE TEAM:</b>		<b>RECEIVED FOR LABORATORY BY:</b> <i>12</i> <b>DATE:</b> _____ <b>TIME:</b> _____	

1001-00(SOURCE)GN-CO004

L28834

<b>CONESTOGA-ROVERS &amp; ASSOCIATES</b> 8615 W. Bryn Mawr Avenue Chicago, Illinois 60631 (773)380-9933 phone (773)380-6421 fax			<b>SHIPPED TO</b> (Laboratory Name): <i>TEREDYNE BROWN</i>			
<b>CHAIN-OF-CUSTODY RECORD</b>			<b>REFERENCE NUMBER:</b> <i>45136 2E</i>		<b>PROJECT NAME:</b> <i>FREEDOM QUAD CITIES</i>	
<b>SAMPLER'S SIGNATURE:</b> <i>John Hargens</i>		<b>PRINTED NAME:</b> <i>John Hargens</i>		<b>PARAMETERS</b> <i>Standard Chicago Sp</i>		
<b>SEQ. No.</b>	<b>DATE</b>	<b>TIME</b>	<b>SAMPLE IDENTIFICATION No.</b>	<b>SAMPLE MATRIX</b>	<b>No. OF CONTAINERS</b>	<b>REMARKS</b>
	<i>5/4/02</i>	<i>07:00</i>	<del><i>WS-QC-SW-QC-001-053106-JH-002</i></del> <i>WS-QC-SW-QC-001-053106-JH-002</i>	<i>120</i>	<i>1</i>	<i>X X</i>
<b>TOTAL NUMBER OF CONTAINERS</b> <i>1</i>						
<b>RELINQUISHED BY:</b> ① <i>John Hargens</i>		<b>DATE:</b> <i>5/1/02</i> <b>TIME:</b> <i>10:00</i>		<b>RECEIVED BY:</b> ② <i>Colleen</i>		<b>DATE:</b> <i>5/1/02</i> <b>TIME:</b> <i>11:00</i>
<b>RELINQUISHED BY:</b> ② _____		<b>DATE:</b> _____ <b>TIME:</b> _____		<b>RECEIVED BY:</b> ③ _____		<b>DATE:</b> _____ <b>TIME:</b> _____
<b>RELINQUISHED BY:</b> ③ _____		<b>DATE:</b> _____ <b>TIME:</b> _____		<b>RECEIVED BY:</b> ④ _____		<b>DATE:</b> _____ <b>TIME:</b> _____
<b>METHOD OF SHIPMENT:</b> <i>11. PERSN</i>				<b>AIR BILL No.</b>		
White -Fully Executed Copy Yellow -Receiving Laboratory Copy Pink -Shipper Copy Goldenrod -Sampler Copy		<b>SAMPLE TEAM:</b> <i>H. Taylor</i>		<b>RECEIVED FOR LABORATORY BY:</b> <i>H.</i>		
				<b>DATE:</b> _____ <b>TIME:</b> _____		

1001-00(SOURCE)GN-C0004

L28834 RI 18 OF 122



**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

L28834

REFERENCE NUMBER:

PROJECT NAME:

**CHAIN-OF-CUSTODY RECORD**

1521-28

Enclon-Quad Lines

SAMPLER'S SIGNATURE:

*John Hargen*

PRINTED NAME:

John Hargen

PARAMETERS

No. OF CONTAINERS

REMARKS

SEQ. No.	DATE	TIME	SAMPLE IDENTIFICATION No.	SAMPLE MATRIX	No. OF CONTAINERS	PARAMETERS	REMARKS
	11/10/06	11:00	<del>MW-QC-MW-QC-103I-060106-JH-021</del>	<del>water</del>	<del>1</del>	<del>+</del>	
	11/10/06	11:58	<del>MW-QC-MW-QC-104S-060106-JH-025</del>	<del>water</del>	<del>2</del>	<del>+</del>	
	11/10/06	11:57	<del>MW-QC-MW-QC-105I-060106-JH-024</del>	<del>water</del>	<del>2</del>	<del>+</del>	
	11/10/06	12:00	<del>MW-QC-MW-QC-FTW-053106-JH-001</del>	<del>water</del>	<del>1</del>	<del>+</del>	
			WG-QC-MW-QC-103I-060106-JH-021				
			WG-QC-MW-QC-104S-060106-JH-025				
			WG-QC-MW-QC-105I-060106-JH-024				
			WG-QC-MW-QC-FTW-053106-JH-001				

TOTAL NUMBER OF CONTAINERS

7

RELINQUISHED BY:

①

*John Hargen*

DATE: 6/16/06  
TIME:

RECEIVED BY:

②

*John Hargen*

DATE: 6/11/06  
TIME: 4:46 PM

RELINQUISHED BY:

②

DATE:  
TIME:

RECEIVED BY:

③

DATE:  
TIME:

RELINQUISHED BY:

③

DATE:  
TIME:

RECEIVED BY:

④

DATE:  
TIME:

METHOD OF SHIPMENT:

*in person*

AIR BILL No.

- White -Fully Executed Copy
- Yellow -Receiving Laboratory Copy
- Pink -Shipper Copy
- Goldenrod -Sampler Copy

SAMPLE TEAM:

RECEIVED FOR LABORATORY BY:

12798

DATE: TIME:





RECEIVED

28834

**CONESTOGA-ROVERS & ASSOCIATES**  
 8615 W. Bryn Mawr Avenue  
 Chicago, Illinois 60631  
 (773)380-9933 phone  
 (773)380-6421 fax

**SHIPPED TO**  
 (Laboratory Name): *McCormick & Co.*

**CHAIN-OF-CUSTODY RECORD**

REFERENCE NUMBER: *15136-28*

PROJECT NAME: *Exposure - Groundwater*

SAMPLER'S SIGNATURE: *John Hargen*

PRINTED NAME: *John Hargen*

PARAMETERS: *Strontium, Gamma*

SEQ. No.	DATE	TIME	SAMPLE IDENTIFICATION No.	SAMPLE MATRIX	No. OF CONTAINERS	REMARKS
	<i>6/1/06</i>		<del>WG-QC-MW-QC-BFW-060106-JH-007</del>	<del>Water</del>	<del>2</del>	
	<i>6/1/06</i>		<del>WG-QC-MW-QC-STP-060106-JH-008</del>	<del>Water</del>	<del>2</del>	
	<i>6/1/06</i>		<del>WG-QC-MW-QC-1015-060106-JH-026</del>	<del>Water</del>	<del>2</del>	
			<i>WG-QC-MW-QC-BFW-060106-JH-007</i>			<i>Add strontium and gamma spec to parameters.</i>
			<i>WG-QC-MW-QC-STP-060106-JH-008</i>			
			<i>WG-QC-MW-QC-1015-060106-JH-026</i>			

TOTAL NUMBER OF CONTAINERS: *6*

RELINQUISHED BY: <i>John Hargen</i>	DATE: <i>6/1/06</i>	RECEIVED BY: <i>Steve Halvick</i>	DATE: <i>6/1/06</i>
①	TIME: <i>1600</i>	②	TIME: <i>4:13 P.M.</i>
RELINQUISHED BY:	DATE:	RECEIVED BY:	DATE:
②	TIME:	③	TIME:
RELINQUISHED BY:	DATE:	RECEIVED BY:	DATE:
③	TIME:	④	TIME:

METHOD OF SHIPMENT: *AIR*

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SAMPLE TEAM:

RECEIVED FOR LABORATORY BY: *12797*

DATE: TIME:



**Charles, Rebecca**

---

**From:** Shaw, Kathy [kshaw@croworld.com]  
**Sent:** Tuesday, June 06, 2006 11:10 AM  
**To:** Charles, Rebecca; Larry.Walton@exeloncorp.com  
**Cc:** Reid, James; Klick, Pat  
**Subject:** RE: Rush tritium from Quad Cities

Hi Rebecca,

This is from the our station PM:

Please let the lab know for BFN, STP, and 101S that the samples should be run for strontium and gamma spec in addition to tritium.

Please let me know if you have any more questions.

Thanks,  
Kathy

---

**From:** Charles, Rebecca [mailto:Rebecca.Charles@tbe.com]  
**Sent:** Mon 6/5/2006 4:41 PM  
**To:** Larry.Walton@exeloncorp.com  
**Cc:** Shaw, Kathy  
**Subject:** RE: Rush tritium from Quad Cities

Larry,

I finally matched up all the COC information and SR, Gamma, and H-3 is requested for all of the Quad Cities samples except for BFN, STP and 101S. These samples are only being requested for tritium. We received both containers for these samples. Should we run all of the analyses?

Rebecca Charles  
Teledyne Brown Engineering  
Project Manager  
(865) 934-0379  
(865) 934-0396 (fax)

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-----Original Message-----

**From:** Larry.Walton@exeloncorp.com [mailto:Larry.Walton@exeloncorp.com]  
**Sent:** Monday, June 05, 2006 4:32 PM  
**To:** Charles, Rebecca  
**Subject:** RE: Rush tritium from Quad Cities

107S & 107I  
104S & 104I

6/6/2006

-----Original Message-----

**From:** Charles, Rebecca [mailto:Rebecca.Charles@tbe.com]

**Sent:** Monday, June 05, 2006 3:32 PM

**To:** Walton, Larry

**Cc:** Karpa, Zigmund A; Tomlinson, Joyce

**Subject:** Rush tritium from Quad Cities

Larry,

We cannot complete all of the tritiums by tomorrow. Do you have some that are higher priority than others? There are 23 samples for tritium.

There are also 4 samples that only request strontium and gamma and only the cubitainer was sent (not the glass tritium jar).

The Sr and gamma samples are:

- WG-QC-SW-QC-002-053106-JH-003,
- WG-QC-SW-QC-001-053106-JH-002,
- Wg-QC-MW-QC-LFH-053106-JH-005
- WG-QC-MW-QC-FHN-053106-JH-004

There are several samples that only request tritium and we only received the small glass jars

There are three samples which only request tritium and we received both the glass jars and the cubitainer.

- wG-QC-MW-QC-BFN-060106-JH-007
- WG-QC-MW-QC-STP-060106-JH-008
- WG-QC-MW-QC-101S-060106-JH-026

Rebecca Charles  
 Teledyne Brown Engineering  
 Project Manager  
 (865) 934-0379  
 (865) 934-0396 (fax)

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\*\*\*\*\*

6/6/06

TELEDYNE BROWN ENGINEERING  
2508 Quality Lane  
Knoxville, TN 37931-3133

## ACKNOWLEDGEMENT

This is not an invoice

Kathy Shaw  
Conestoga-Rovers & Associates  
45 Farmington Valley Drive  
Plainville, CT 06062

June 06, 2006

The following sample(s) were received at Teledyne Brown Engineering Knoxville laboratory on June 05, 2006. The sample(s) have been scheduled for the analyses listed below and the report is scheduled for completion by June 12, 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: EX001-3ESPQUAD-06  
P.O. #: 00411203  
Release #:  
Contract#: 00411203  
Kathy Shaw, FAX#:860-747-1900, larry.walton@exeloncorp.com

Rebecca

Client ID/ Station	Laboratory ID Analysis	Vol/Units Price	Start Collect Date/Time	End Collect Date/Time
WG-QC-MW-QC-BFW-060106-JH-00	L28834-1		06/01/06:0850	
WG	GELI	108.00		
WG	H-3	108.00		
WG	SR-90 (FAST)	210.00		
WG-QC-MW-QC-STP-060106-JH-00	L28834-2		06/01/06:0905	
WG	GELI	108.00		
WG	H-3	162.00		
WG	SR-90 (FAST)	140.00		
WG-QC-MW-QC-101S-060106-JH-0	L28834-3		06/01/06:1420	
WG	GELI	108.00		
WG	H-3	162.00		
WG	SR-90 (FAST)	140.00		
WG-QC-MW-QC-WELL #5-060106-J	L28834-4		06/01/06:0930	
WG	GELI	108.00		
WG	H-3	162.00		
WG	SR-90 (FAST)	140.00		
WG-QC-MW-QC-WELL #1-060106-J	L28834-5		06/01/06:0915	

Client ID/ Station	Laboratory ID Analysis	Vol/Units Price	Start Collect Date/Time	End Collect Date/Time
WG	GELI	108.00		
WG	H-3	162.00		
WG	SR-90 (FAST)	140.00		
WG-QC-MW-QC-DCS-060106-JH-00 L28834-6			06/01/06:0820	
WG	GELI	108.00		
WG	H-3	162.00		
WG	SR-90 (FAST)	140.00		
WG-QC-MW-QC-FHW-053106-JH-00 L28834-7			05/31/06:0910	
WG	GELI	108.00		
WG	H-3	162.00		
WG	SR-90 (FAST)	140.00		
WS-QC-SW-QC-001-053106-JH-00 L28834-8			05/31/06:0820	
WG	GELI	108.00		
WG	H-3	162.00		
WG	SR-90 (FAST)	140.00		
WG-QC-MW2-060106-JH-023 L28834-9			06/01/06:1018	
WG	GELI	108.00		
WG	H-3	162.00		
WG	SR-90 (FAST)	140.00		
WG-QC-MW1-060106-JH-022 L28834-10			06/01/06:0917	
WG	GELI	108.00		
WG	H-3	162.00		
WG	SR-90 (FAST)	140.00		
WG-QC-MW-QC-103I-060106-JH-0 L28834-11			06/01/06:0830	
WG	GELI	108.00		
WG	H-3	162.00		
WG	SR-90 (FAST)	140.00		
WS-QC-SW-QC-002-053106-JH-00 L28834-12			05/31/06:0850	
WG	GELI	108.00		
WG	H-3	162.00		
WG	SR-90	80.00		
WG-QC-MW-QC-LFW-053106-JH-00 L28834-13			05/31/06:0940	
WG	GELI	108.00		
WG	H-3	162.00		
WG	SR-90	80.00		

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End of document

# **Internal Chain of Custody**













06/23/06

Teledyne Brown Engineering  
Internal Chain of Custody  
Supplemental Sheet

L28834

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<b>L28834-1</b>			
<u>Process step</u>	<u>Prod</u>	<u>Analyst</u>	<u>Date</u>
<b>WG WG-QC-MW-QC-BFW-060106-JH-007</b>			
Login		RCHARLES	06/05/06
Aliquot	H-3	EJ	06/06/06
Aliquot	GELI	EJ	06/08/06
Aliquot	SR-90 (FAST)	LCB	06/09/06
Count Room	GELI	ILL	06/09/06
Count Room	H-3	KPW	06/07/06
Count Room	SR-90 (FAST)	KOJ	06/12/06

\*\*\*\*\*

<b>L28834-2</b>			
<u>Process step</u>	<u>Prod</u>	<u>Analyst</u>	<u>Date</u>
<b>WG WG-QC-MW-QC-STP-060106-JH-008</b>			
Login		RCHARLES	06/05/06
Aliquot	H-3	EJ	06/06/06
Aliquot	GELI	EJ	06/08/06
Aliquot	SR-90 (FAST)	LCB	06/09/06
Count Room	GELI	MVW	06/09/06
Count Room	H-3	KPW	06/07/06
Count Room	SR-90 (FAST)	KOJ	06/12/06

\*\*\*\*\*

<b>L28834-3</b>			
<u>Process step</u>	<u>Prod</u>	<u>Analyst</u>	<u>Date</u>
<b>WG WG-QC-MW-QC-101S-060106-JH-026</b>			
Login		RCHARLES	06/05/06
Aliquot	H-3	EJ	06/06/06
Aliquot	GELI	EJ	06/08/06
Aliquot	SR-90 (FAST)	LCB	06/09/06
Count Room	GELI	MVW	06/09/06
Count Room	H-3	KPW	06/07/06
Count Room	SR-90 (FAST)	KOJ	06/12/06

\*\*\*\*\*

<b>L28834-4</b>			
<u>Process step</u>	<u>Prod</u>	<u>Analyst</u>	<u>Date</u>
<b>WG WG-QC-MW-QC-WELL #5-060106-JH-010</b>			
Login		RCHARLES	06/05/06
Aliquot	H-3	EJ	06/06/06
Aliquot	GELI	EJ	06/08/06
Aliquot	SR-90 (FAST)	LCB	06/09/06
Count Room	GELI	MVW	06/09/06
Count Room	H-3	KPW	06/07/06
Count Room	SR-90 (FAST)	KOJ	06/12/06

\*\*\*\*\*

<b>L28834-5</b>			
<u>Process step</u>	<u>Prod</u>	<u>Analyst</u>	<u>Date</u>
<b>WG WG-QC-MW-QC-WELL #1-060106-JH-009</b>			
Login		RCHARLES	06/05/06
Aliquot	H-3	EJ	06/06/06
Aliquot	GELI	EJ	06/08/06
Aliquot	SR-90 (FAST)	LCB	06/09/06
Count Room	GELI	MVW	06/09/06



06/23/06

Teledyne Brown Engineering  
Internal Chain of Custody  
Supplemental Sheet

Page 3 of 3

L28834

L28834-10      WG      WG-QC-MW-1-060106-JH-022				
Aliquot	H-3		EJ	06/06/06
Aliquot	GELI		EJ	06/08/06
Aliquot	SR-90 (FAST)		CJF	06/21/06
Count Room	GELI		MVW	06/09/06
Count Room	H-3		KPW	06/07/06
Count Room	SR-90 (FAST)		KOJ	06/22/06

\*\*\*\*\*

L28834-11      WG      WG-QC-MW-QC-103I-060106-JH-021				
<u>Process step</u>	<u>Prod</u>		<u>Analyst</u>	<u>Date</u>
Login			RCHARLES	06/05/06
Aliquot	H-3		EJ	06/06/06
Aliquot	GELI		EJ	06/08/06
Aliquot	SR-90 (FAST)		LCB	06/09/06
Count Room	GELI		MVW	06/09/06
Count Room	H-3		KPW	06/07/06
Count Room	SR-90 (FAST)		KOJ	06/12/06

\*\*\*\*\*

L28834-12      WG      WS-QC-SW-QC-002-053106-JH-003				
<u>Process step</u>	<u>Prod</u>		<u>Analyst</u>	<u>Date</u>
Login			RCHARLES	06/05/06
Aliquot	H-3		EJ	06/06/06
Aliquot	GELI		EJ	06/08/06
Aliquot	SR-90 (FAST)		LCB	06/09/06
Count Room	GELI		MVW	06/09/06
Count Room	H-3		KPW	06/07/06
Count Room	SR-90 (FAST)		KOJ	06/12/06

\*\*\*\*\*

L28834-13      WG      WG-QC-MW-QC-LFW-053106-JH-005				
<u>Process step</u>	<u>Prod</u>		<u>Analyst</u>	<u>Date</u>
Login			RCHARLES	06/05/06
Aliquot	H-3		EJ	06/06/06
Aliquot	GELI		EJ	06/08/06
Aliquot	SR-90 (FAST)		LCB	06/09/06
Count Room	GELI		MVW	06/09/06
Count Room	H-3		KPW	06/07/06
Count Room	SR-90 (FAST)		KOJ	06/12/06

# Analytical Results Summary

# Report of Analysis

06/23/06 08:18



## L28834

Conestoga-Rovers & Associates

EX001-3ESPQUAD-06

Kathy Shaw

Sample ID: <b>WG-QC-MW-QC-BFW-060106-JH-007</b>	Collect Start: 06/01/2006 08:50	Matrix: Ground Water (WG)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 06/05/2006	% Moisture:
LIMS Number: L28834-1		

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	2010	<b>7.40E+02</b>	1.52E+02	1.86E+02	pCi/L		10	ml		06/07/06	60	M	+
TOTAL SR	2018	8.72E-01	7.18E-01	<b>1.26E+00</b>	pCi/L		450	ml	06/01/06 08:50	06/12/06	200	M	U
MN-54	2007	1.15E-01	2.90E+00	<b>4.78E+00</b>	pCi/L		3029.47	ml	06/01/06 08:50	06/09/06	12564	Sec	U No
CO-58	2007	3.08E+00	2.86E+00	<b>5.04E+00</b>	pCi/L		3029.47	ml	06/01/06 08:50	06/09/06	12564	Sec	U No
FE-59	2007	3.16E+00	6.18E+00	<b>1.05E+01</b>	pCi/L		3029.47	ml	06/01/06 08:50	06/09/06	12564	Sec	U No
CO-60	2007	4.10E-01	2.83E+00	<b>4.74E+00</b>	pCi/L		3029.47	ml	06/01/06 08:50	06/09/06	12564	Sec	U No
ZN-65	2007	3.15E+00	6.48E+00	<b>1.10E+01</b>	pCi/L		3029.47	ml	06/01/06 08:50	06/09/06	12564	Sec	U No
NB-95	2007	2.68E+00	2.89E+00	<b>5.06E+00</b>	pCi/L		3029.47	ml	06/01/06 08:50	06/09/06	12564	Sec	U No
ZR-95	2007	-4.24E+00	5.25E+00	<b>8.28E+00</b>	pCi/L		3029.47	ml	06/01/06 08:50	06/09/06	12564	Sec	U No
CS-134	2007	2.79E+00	4.93E+00	<b>5.26E+00</b>	pCi/L		3029.47	ml	06/01/06 08:50	06/09/06	12564	Sec	U No
CS-137	2007	-1.63E+00	3.24E+00	<b>4.99E+00</b>	pCi/L		3029.47	ml	06/01/06 08:50	06/09/06	12564	Sec	U No
BA-140	2007	-8.23E+00	1.45E+01	<b>2.35E+01</b>	pCi/L		3029.47	ml	06/01/06 08:50	06/09/06	12564	Sec	U No
LA-140	2007	-1.16E+00	5.20E+00	<b>8.45E+00</b>	pCi/L		3029.47	ml	06/01/06 08:50	06/09/06	12564	Sec	U No

**Flag Values**

- U = Compound/Analyte not detected or less than 3 sigma
- +
- 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.**

L28834 R1 38 OF 122



# Report of Analysis

06/23/06 08:18

**L28834**

Conestoga-Rovers & Associates

EX001-3ESPQUAD-06



Kathy Shaw

Sample ID: <b>WG-QC-MW-QC-STP-060106-JH-008</b>	Collect Start: 06/01/2006 09:05	Matrix: Ground Water (WG)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 06/05/2006	% Moisture:
LIMS Number: L28834-2		

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>1.81E+02</b>	1.17E+02	1.75E+02	pCi/L		10	ml		06/07/06	60	M	+
TOTAL SR	2018	1.67E-01	7.73E-01	<b>1.45E+00</b>	pCi/L		450	ml	06/01/06 09:05	06/12/06	200	M	U
MN-54	2007	-8.71E-01	3.05E+00	<b>4.87E+00</b>	pCi/L		3168.75	ml	06/01/06 09:05	06/09/06	11952	Sec	U No
CO-58	2007	-1.96E-01	3.47E+00	<b>5.67E+00</b>	pCi/L		3168.75	ml	06/01/06 09:05	06/09/06	11952	Sec	U No
FE-59	2007	6.95E+00	6.57E+00	<b>1.18E+01</b>	pCi/L		3168.75	ml	06/01/06 09:05	06/09/06	11952	Sec	U No
CO-60	2007	1.41E+00	3.32E+00	<b>5.68E+00</b>	pCi/L		3168.75	ml	06/01/06 09:05	06/09/06	11952	Sec	U No
ZN-65	2007	-6.90E+00	6.60E+00	<b>9.87E+00</b>	pCi/L		3168.75	ml	06/01/06 09:05	06/09/06	11952	Sec	U No
NB-95	2007	4.97E-01	3.22E+00	<b>5.35E+00</b>	pCi/L		3168.75	ml	06/01/06 09:05	06/09/06	11952	Sec	U No
ZR-95	2007	3.32E+00	5.83E+00	<b>9.97E+00</b>	pCi/L		3168.75	ml	06/01/06 09:05	06/09/06	11952	Sec	U No
CS-134	2007	-1.85E+00	4.34E+00	<b>5.89E+00</b>	pCi/L		3168.75	ml	06/01/06 09:05	06/09/06	11952	Sec	U No
CS-137	2007	9.85E-01	3.52E+00	<b>5.93E+00</b>	pCi/L		3168.75	ml	06/01/06 09:05	06/09/06	11952	Sec	U No
BA-140	2007	1.33E+01	1.70E+01	<b>2.89E+01</b>	pCi/L		3168.75	ml	06/01/06 09:05	06/09/06	11952	Sec	U No
LA-140	2007	3.35E+00	5.39E+00	<b>9.56E+00</b>	pCi/L		3168.75	ml	06/01/06 09:05	06/09/06	11952	Sec	U 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

- 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

06/23/06 08:18

**L28834**

Conestoga-Rovers & Associates

EX001-3ESPQUAD-06



Kathy Shaw

Sample ID: <b>WG-QC-MW-QC-101S-060106-JH-026</b>	Collect Start: 06/01/2006 14:20	Matrix: Ground Water (WG)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 06/05/2006	% Moisture:
LIMS Number: L28834-3		

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	2010	1.56E+02	1.22E+02	<b>1.85E+02</b>	pCi/L		10	ml		06/07/06	60	M	U	
TOTAL SR	2018	8.59E-01	7.13E-01	<b>1.25E+00</b>	pCi/L		450	ml	06/01/06 14:20	06/12/06	200	M	U	
MN-54	2007	-2.96E-01	2.76E+00	<b>4.50E+00</b>	pCi/L		3064.37	ml	06/01/06 14:20	06/09/06	12070	Sec	U	No
CO-58	2007	-6.30E-02	2.52E+00	<b>4.15E+00</b>	pCi/L		3064.37	ml	06/01/06 14:20	06/09/06	12070	Sec	U	No
FE-59	2007	3.18E+00	6.10E+00	<b>9.91E+00</b>	pCi/L		3064.37	ml	06/01/06 14:20	06/09/06	12070	Sec	U	No
CO-60	2007	2.23E+00	2.80E+00	<b>4.94E+00</b>	pCi/L		3064.37	ml	06/01/06 14:20	06/09/06	12070	Sec	U	No
ZN-65	2007	8.18E+00	6.11E+00	<b>1.00E+01</b>	pCi/L		3064.37	ml	06/01/06 14:20	06/09/06	12070	Sec	U	No
NB-95	2007	7.16E-01	2.76E+00	<b>4.65E+00</b>	pCi/L		3064.37	ml	06/01/06 14:20	06/09/06	12070	Sec	U	No
ZR-95	2007	-1.27E+00	5.06E+00	<b>8.25E+00</b>	pCi/L		3064.37	ml	06/01/06 14:20	06/09/06	12070	Sec	U	No
CS-134	2007	-2.23E+00	3.37E+00	<b>4.40E+00</b>	pCi/L		3064.37	ml	06/01/06 14:20	06/09/06	12070	Sec	U	No
CS-137	2007	-9.96E-02	2.74E+00	<b>4.45E+00</b>	pCi/L		3064.37	ml	06/01/06 14:20	06/09/06	12070	Sec	U	No
BA-140	2007	2.75E+00	1.33E+01	<b>2.22E+01</b>	pCi/L		3064.37	ml	06/01/06 14:20	06/09/06	12070	Sec	U	No
LA-140	2007	-4.42E+00	4.85E+00	<b>7.10E+00</b>	pCi/L		3064.37	ml	06/01/06 14:20	06/09/06	12070	Sec	U	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

# Report of Analysis

06/23/06 08:18

## L28834

Conestoga-Rovers & Associates

EX001-3ESPQUAD-06

Kathy Shaw

Sample ID: <b>WG-QC-MW-QC-WELL #5-060106-JH-010</b>	Collect Start: 06/01/2006 09:30	Matrix: Ground Water (WG)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 06/05/2006	% Moisture:
LIMS Number: L28834-4		

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	6.31E+01	1.19E+02	<b>1.89E+02</b>	pCi/L		10	ml		06/07/06	60	M	U
TOTAL SR	2018	4.70E-01	7.15E-01	<b>1.30E+00</b>	pCi/L		450	ml	06/01/06 09:30	06/12/06	200	M	U
MN-54	2007	1.49E+00	2.56E+00	<b>4.29E+00</b>	pCi/L		3033.93	ml	06/01/06 09:30	06/09/06	24000	Sec	U No
CO-58	2007	1.21E-01	2.58E+00	<b>4.22E+00</b>	pCi/L		3033.93	ml	06/01/06 09:30	06/09/06	24000	Sec	U No
FE-59	2007	3.15E+00	5.34E+00	<b>9.01E+00</b>	pCi/L		3033.93	ml	06/01/06 09:30	06/09/06	24000	Sec	U No
CO-60	2007	6.36E-01	2.45E+00	<b>4.10E+00</b>	pCi/L		3033.93	ml	06/01/06 09:30	06/09/06	24000	Sec	U No
ZN-65	2007	6.97E+00	5.47E+00	<b>9.52E+00</b>	pCi/L		3033.93	ml	06/01/06 09:30	06/09/06	24000	Sec	U No
NB-95	2007	-8.61E-01	2.70E+00	<b>4.37E+00</b>	pCi/L		3033.93	ml	06/01/06 09:30	06/09/06	24000	Sec	U No
ZR-95	2007	-1.47E+00	4.91E+00	<b>7.95E+00</b>	pCi/L		3033.93	ml	06/01/06 09:30	06/09/06	24000	Sec	U No
CS-134	2007	2.84E+00	4.87E+00	<b>4.79E+00</b>	pCi/L		3033.93	ml	06/01/06 09:30	06/09/06	24000	Sec	U No
CS-137	2007	1.78E+00	2.61E+00	<b>4.44E+00</b>	pCi/L		3033.93	ml	06/01/06 09:30	06/09/06	24000	Sec	U No
BA-140	2007	-7.35E+00	1.38E+01	<b>2.21E+01</b>	pCi/L		3033.93	ml	06/01/06 09:30	06/09/06	24000	Sec	U No
LA-140	2007	8.00E-02	4.17E+00	<b>6.91E+00</b>	pCi/L		3033.93	ml	06/01/06 09:30	06/09/06	24000	Sec	U 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
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- L = Low recovery
- H = High recovery

**Bolded text indicates reportable value.**

- No = Peak not identified in gamma spectrum
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- \*\*\*\* Results are reported on an as received basis unless otherwise noted

MDC - Minimum Detectable Concentration

# Report of Analysis

06/23/06 08:18

## L28834

Conestoga-Rovers & Associates

EX001-3ESPQUAD-06

Kathy Shaw

Sample ID: <b>WG-QC-MW-QC-WELL #1-060106-JH-009</b>	Collect Start: 06/01/2006 09:15	Matrix: Ground Water (WG)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 06/05/2006	% Moisture:
LIMS Number: L28834-5		

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	2010	1.32E+02	1.21E+02	<b>1.85E+02</b>	pCi/L		10	ml		06/07/06	60	M	U
TOTAL SR	2018	-1.19E-02	7.92E-01	<b>1.58E+00</b>	pCi/L		450	ml	06/01/06 09:15	06/13/06	150	M	U
MN-54	2007	-1.15E+00	2.81E+00	<b>4.52E+00</b>	pCi/L		3003.68	ml	06/01/06 09:15	06/09/06	18787	Sec	U No
CO-58	2007	-6.44E-01	2.79E+00	<b>4.55E+00</b>	pCi/L		3003.68	ml	06/01/06 09:15	06/09/06	18787	Sec	U No
FE-59	2007	4.96E-01	5.53E+00	<b>9.23E+00</b>	pCi/L		3003.68	ml	06/01/06 09:15	06/09/06	18787	Sec	U No
CO-60	2007	2.11E+00	2.88E+00	<b>4.99E+00</b>	pCi/L		3003.68	ml	06/01/06 09:15	06/09/06	18787	Sec	U No
ZN-65	2007	5.59E+00	5.78E+00	<b>1.02E+01</b>	pCi/L		3003.68	ml	06/01/06 09:15	06/09/06	18787	Sec	U No
NB-95	2007	1.64E+00	2.85E+00	<b>4.87E+00</b>	pCi/L		3003.68	ml	06/01/06 09:15	06/09/06	18787	Sec	U No
ZR-95	2007	-1.78E+00	4.90E+00	<b>7.96E+00</b>	pCi/L		3003.68	ml	06/01/06 09:15	06/09/06	18787	Sec	U* No
CS-134	2007	9.46E+00	5.45E+00	<b>5.13E+00</b>	pCi/L		3003.68	ml	06/01/06 09:15	06/09/06	18787	Sec	U No
CS-137	2007	3.19E+00	2.94E+00	<b>5.08E+00</b>	pCi/L		3003.68	ml	06/01/06 09:15	06/09/06	18787	Sec	U No
BA-140	2007	5.66E-01	1.51E+01	<b>2.49E+01</b>	pCi/L		3003.68	ml	06/01/06 09:15	06/09/06	18787	Sec	U No
LA-140	2007	1.07E-04	4.73E+00	<b>7.82E+00</b>	pCi/L		3003.68	ml	06/01/06 09:15	06/09/06	18787	Sec	U No

**Flag Values**

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- High = Activity concentration exceeds customer reporting value
- Spec = MDC exceeds customer technical specification
- L = Low recovery
- H = High recovery

**Bolded text indicates reportable value.**

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MDC - Minimum Detectable Concentration

# Report of Analysis

06/23/06 08:18



## L28834

Conestoga-Rovers & Associates

EX001-3ESPQUAD-06

Kathy Shaw

Sample ID: <b>WG-QC-MW-QC-DCS-060106-JH-006</b>	Collect Start: 06/01/2006 08:20	Matrix: Ground Water (WG)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 06/05/2006	% Moisture:
LIMS Number: L28834-6		

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	4.09E+01	1.16E+02	<b>1.87E+02</b>	pCi/L		10	ml		06/07/06	60	M	U
TOTAL SR	2018	1.15E-01	6.24E-01	<b>1.17E+00</b>	pCi/L		450	ml	06/01/06 08:20	06/12/06	200	M	U
K-40	2007	<b>1.06E+02</b>	3.37E+01	4.20E+01	pCi/L		3001.22	ml	06/01/06 08:20	06/09/06	17333	Sec	+ Yes
MN-54	2007	1.17E+00	2.68E+00	<b>4.32E+00</b>	pCi/L		3001.22	ml	06/01/06 08:20	06/09/06	17333	Sec	U No
CO-58	2007	-9.19E-01	2.73E+00	<b>4.37E+00</b>	pCi/L		3001.22	ml	06/01/06 08:20	06/09/06	17333	Sec	U No
FE-59	2007	4.09E+00	5.85E+00	<b>1.00E+01</b>	pCi/L		3001.22	ml	06/01/06 08:20	06/09/06	17333	Sec	U No
CO-60	2007	9.47E-01	3.00E+00	<b>5.15E+00</b>	pCi/L		3001.22	ml	06/01/06 08:20	06/09/06	17333	Sec	U Yes
ZN-65	2007	-2.59E+00	5.67E+00	<b>8.96E+00</b>	pCi/L		3001.22	ml	06/01/06 08:20	06/09/06	17333	Sec	U No
NB-95	2007	1.66E+00	2.67E+00	<b>4.54E+00</b>	pCi/L		3001.22	ml	06/01/06 08:20	06/09/06	17333	Sec	U No
ZR-95	2007	-5.86E+00	4.47E+00	<b>6.71E+00</b>	pCi/L		3001.22	ml	06/01/06 08:20	06/09/06	17333	Sec	U No
CS-134	2007	5.11E+00	5.24E+00	<b>4.54E+00</b>	pCi/L		3001.22	ml	06/01/06 08:20	06/09/06	17333	Sec	U No
CS-137	2007	9.83E-01	2.69E+00	<b>4.55E+00</b>	pCi/L		3001.22	ml	06/01/06 08:20	06/09/06	17333	Sec	U No
BA-140	2007	7.74E+00	1.34E+01	<b>2.26E+01</b>	pCi/L		3001.22	ml	06/01/06 08:20	06/09/06	17333	Sec	U No
LA-140	2007	2.58E+00	4.68E+00	<b>8.11E+00</b>	pCi/L		3001.22	ml	06/01/06 08:20	06/09/06	17333	Sec	U No

**Flag Values**

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- High = Activity concentration exceeds customer reporting value
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- H = High recovery

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MDC - Minimum Detectable Concentration

# Report of Analysis

06/23/06 08:18

## L28834

Conestoga-Rovers & Associates

EX001-3ESPQUAD-06

Kathy Shaw

Sample ID: <b>WG-QC-MW-QC-FHW-053106-JH-004</b>	Collect Start: 05/31/2006 09:10	Matrix: Ground Water (WG)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 06/05/2006	% Moisture:
LIMS Number: L28834-7		

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	1.70E+01	1.13E+02	<b>1.84E+02</b>	pCi/L		10	ml		06/07/06	60	M	U
TOTAL SR	2018	5.80E-01	6.47E-01	<b>1.16E+00</b>	pCi/L		450	ml	05/31/06 09:10	06/12/06	200	M	U
MN-54	2007	7.96E-01	2.23E+00	<b>3.75E+00</b>	pCi/L		3018.63	ml	05/31/06 09:10	06/09/06	17345	Sec	U No
CO-58	2007	-2.81E+00	2.42E+00	<b>3.76E+00</b>	pCi/L		3018.63	ml	05/31/06 09:10	06/09/06	17345	Sec	U No
FE-59	2007	4.43E+00	4.64E+00	<b>8.13E+00</b>	pCi/L		3018.63	ml	05/31/06 09:10	06/09/06	17345	Sec	U No
CO-60	2007	5.39E-01	2.30E+00	<b>3.81E+00</b>	pCi/L		3018.63	ml	05/31/06 09:10	06/09/06	17345	Sec	U No
ZN-65	2007	1.01E+01	5.89E+00	<b>9.38E+00</b>	pCi/L		3018.63	ml	05/31/06 09:10	06/09/06	17345	Sec	U* No
NB-95	2007	1.87E+00	2.39E+00	<b>4.13E+00</b>	pCi/L		3018.63	ml	05/31/06 09:10	06/09/06	17345	Sec	U No
ZR-95	2007	-2.56E+00	4.32E+00	<b>6.79E+00</b>	pCi/L		3018.63	ml	05/31/06 09:10	06/09/06	17345	Sec	U No
CS-134	2007	6.75E+00	4.69E+00	<b>4.67E+00</b>	pCi/L		3018.63	ml	05/31/06 09:10	06/09/06	17345	Sec	U No
CS-137	2007	1.20E+00	2.49E+00	<b>4.17E+00</b>	pCi/L		3018.63	ml	05/31/06 09:10	06/09/06	17345	Sec	U No
BA-140	2007	9.08E-01	1.26E+01	<b>2.09E+01</b>	pCi/L		3018.63	ml	05/31/06 09:10	06/09/06	17345	Sec	U No
LA-140	2007	2.07E+00	4.07E+00	<b>6.96E+00</b>	pCi/L		3018.63	ml	05/31/06 09:10	06/09/06	17345	Sec	U No

**Flag Values**

- U = Compound/Analyte not detected or less than 3 sigma
- + = Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)
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- High = Activity concentration exceeds customer reporting value
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MDC - Minimum Detectable Concentration

# Report of Analysis

06/23/06 08:18

**L28834**

Conestoga-Rovers & Associates

EX001-3ESPQUAD-06



Kathy Shaw

Sample ID: <b>WS-QC-SW-QC-001-053106-JH-002</b>	Collect Start: 05/31/2006 08:20	Matrix: Ground Water (WG)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 06/05/2006	% Moisture:
LIMS Number: L28834-8		

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>5.50E+02</b>	1.43E+02	1.85E+02	pCi/L		10	ml		06/07/06	60	M	+
TOTAL SR	2018	1.23E+00	7.75E-01	<b>1.33E+00</b>	pCi/L		450	ml	05/31/06 08:20	06/12/06	200	M	U
MN-54	2007	2.20E+00	2.35E+00	<b>4.06E+00</b>	pCi/L		3036.57	ml	05/31/06 08:20	06/09/06	17483	Sec	U No
CO-58	2007	1.87E-02	2.56E+00	<b>4.23E+00</b>	pCi/L		3036.57	ml	05/31/06 08:20	06/09/06	17483	Sec	U No
FE-59	2007	4.47E+00	5.29E+00	<b>9.15E+00</b>	pCi/L		3036.57	ml	05/31/06 08:20	06/09/06	17483	Sec	U No
CO-60	2007	8.13E-01	2.57E+00	<b>4.34E+00</b>	pCi/L		3036.57	ml	05/31/06 08:20	06/09/06	17483	Sec	U No
ZN-65	2007	3.12E+00	5.42E+00	<b>9.22E+00</b>	pCi/L		3036.57	ml	05/31/06 08:20	06/09/06	17483	Sec	U No
NB-95	2007	1.79E+00	2.52E+00	<b>4.32E+00</b>	pCi/L		3036.57	ml	05/31/06 08:20	06/09/06	17483	Sec	U No
ZR-95	2007	1.92E-01	4.48E+00	<b>7.46E+00</b>	pCi/L		3036.57	ml	05/31/06 08:20	06/09/06	17483	Sec	U No
CS-134	2007	6.75E+00	4.31E+00	<b>4.12E+00</b>	pCi/L		3036.57	ml	05/31/06 08:20	06/09/06	17483	Sec	U* No
CS-137	2007	-5.94E-01	2.70E+00	<b>4.17E+00</b>	pCi/L		3036.57	ml	05/31/06 08:20	06/09/06	17483	Sec	U No
BA-140	2007	2.09E+00	1.26E+01	<b>2.11E+01</b>	pCi/L		3036.57	ml	05/31/06 08:20	06/09/06	17483	Sec	U No
LA-140	2007	2.24E+00	4.61E+00	<b>7.92E+00</b>	pCi/L		3036.57	ml	05/31/06 08:20	06/09/06	17483	Sec	U No

Flag Values

- U = Compound/Analyte not detected or less than 3 sigma
- +
- U\* = Activity concentration exceeds MDC and 3 sigma; peak identified(gamma only)
- High = Compound/Analyte not detected. Peak not identified, but forced activity concentration exceeds MDC and 3 sigma
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- L = MDC exceeds customer technical specification
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- H = High recovery

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MDC - Minimum Detectable Concentration

**Bolded text indicates reportable value.**

L28834 R1 45 OF 122

# Report of Analysis

06/23/06 08:18

**L28834**

Conestoga-Rovers & Associates

EX001-3ESPQUAD-06



Kathy Shaw

Sample ID: <b>WG-QC-MW-2-060106-JH-023</b>	Collect Start: 06/01/2006 10:18	Matrix: Ground Water (WG)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 06/05/2006	% Moisture:
LIMS Number: L28834-9		

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>2.50E+02</b>	1.26E+02	1.82E+02	pCi/L		10	ml		06/07/06	60	M	+
TOTAL SR	2018	5.72E-01	4.78E-01	<b>8.45E-01</b>	pCi/L		450	ml	06/01/06 10:18	06/12/06	200	M	U
K-40	2007	<b>1.45E+02</b>	5.05E+01	4.09E+01	pCi/L		3014.88	ml	06/01/06 10:18	06/09/06	17533	Sec	+ Yes
MN-54	2007	2.86E+00	2.33E+00	<b>4.27E+00</b>	pCi/L		3014.88	ml	06/01/06 10:18	06/09/06	17533	Sec	U No
CO-58	2007	3.79E-01	2.61E+00	<b>4.52E+00</b>	pCi/L		3014.88	ml	06/01/06 10:18	06/09/06	17533	Sec	U No
FE-59	2007	3.39E+00	5.10E+00	<b>9.24E+00</b>	pCi/L		3014.88	ml	06/01/06 10:18	06/09/06	17533	Sec	U No
CO-60	2007	3.70E-01	2.42E+00	<b>4.28E+00</b>	pCi/L		3014.88	ml	06/01/06 10:18	06/09/06	17533	Sec	U No
ZN-65	2007	3.96E+00	5.22E+00	<b>9.50E+00</b>	pCi/L		3014.88	ml	06/01/06 10:18	06/09/06	17533	Sec	U No
NB-95	2007	1.62E+00	2.58E+00	<b>4.58E+00</b>	pCi/L		3014.88	ml	06/01/06 10:18	06/09/06	17533	Sec	U No
ZR-95	2007	-2.44E+00	4.49E+00	<b>7.50E+00</b>	pCi/L		3014.88	ml	06/01/06 10:18	06/09/06	17533	Sec	U No
CS-134	2007	1.21E+00	4.81E+00	<b>4.92E+00</b>	pCi/L		3014.88	ml	06/01/06 10:18	06/09/06	17533	Sec	U No
CS-137	2007	-1.26E-01	2.67E+00	<b>4.60E+00</b>	pCi/L		3014.88	ml	06/01/06 10:18	06/09/06	17533	Sec	U No
BA-140	2007	8.81E+00	1.37E+01	<b>2.38E+01</b>	pCi/L		3014.88	ml	06/01/06 10:18	06/09/06	17533	Sec	U No
LA-140	2007	2.31E+00	4.07E+00	<b>7.55E+00</b>	pCi/L		3014.88	ml	06/01/06 10:18	06/09/06	17533	Sec	U No

Comment: 1 ID corrected 6/8/06

**Flag Values**

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MDC - Minimum Detectable Concentration



# Report of Analysis

06/23/06 08:18



## L28834

Conestoga-Rovers & Associates

EX001-3ESPQUAD-06

Kathy Shaw

Sample ID: <b>WG-QC-MW-1-060106-JH-022</b>	Collect Start: 06/01/2006 09:17	Matrix: Ground Water (WG)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 06/05/2006	% Moisture:
LIMS Number: L28834-10		

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	1.75E+02	1.22E+02	<b>1.83E+02</b>	pCi/L		10	ml		06/07/06	60	M	U
TOTAL SR	2018	4.28E-01	5.17E-01	<b>9.79E-01</b>	pCi/L		450	ml	06/01/06 09:17	06/22/06	120	M	U
MN-54	2007	-1.46E+00	2.91E+00	<b>4.61E+00</b>	pCi/L		3020.14	ml	06/01/06 09:17	06/09/06	16626	Sec	U No
CO-58	2007	1.69E-01	3.14E+00	<b>5.17E+00</b>	pCi/L		3020.14	ml	06/01/06 09:17	06/09/06	16626	Sec	U No
FE-59	2007	3.71E+00	6.03E+00	<b>1.04E+01</b>	pCi/L		3020.14	ml	06/01/06 09:17	06/09/06	16626	Sec	U No
CO-60	2007	-2.06E+00	2.80E+00	<b>4.27E+00</b>	pCi/L		3020.14	ml	06/01/06 09:17	06/09/06	16626	Sec	U No
ZN-65	2007	5.77E+00	6.35E+00	<b>1.11E+01</b>	pCi/L		3020.14	ml	06/01/06 09:17	06/09/06	16626	Sec	U No
NB-95	2007	1.43E+00	3.02E+00	<b>5.10E+00</b>	pCi/L		3020.14	ml	06/01/06 09:17	06/09/06	16626	Sec	U No
ZR-95	2007	8.86E-01	5.46E+00	<b>9.06E+00</b>	pCi/L		3020.14	ml	06/01/06 09:17	06/09/06	16626	Sec	U No
CS-134	2007	2.25E+00	6.08E+00	<b>5.46E+00</b>	pCi/L		3020.14	ml	06/01/06 09:17	06/09/06	16626	Sec	U No
CS-137	2007	-1.94E+00	2.84E+00	<b>4.50E+00</b>	pCi/L		3020.14	ml	06/01/06 09:17	06/09/06	16626	Sec	U No
BA-140	2007	8.36E-01	1.52E+01	<b>2.47E+01</b>	pCi/L		3020.14	ml	06/01/06 09:17	06/09/06	16626	Sec	U No
LA-140	2007	-5.78E+00	5.54E+00	<b>8.34E+00</b>	pCi/L		3020.14	ml	06/01/06 09:17	06/09/06	16626	Sec	U No

Comment: 1 ID corrected 6/8/06

**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

06/23/06 08:18

## L28834

Conestoga-Rovers & Associates

EX001-3ESPQUAD-06

Kathy Shaw

Sample ID: <b>WG-QC-MW-QC-103I-060106-JH-021</b>	Collect Start: 06/01/2006 08:30	Matrix: Ground Water (WG)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 06/05/2006	% Moisture:
LIMS Number: L28834-11		

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>1.87E+02</b>	1.21E+02	1.81E+02	pCi/L		10	ml		06/07/06	60	M	+
TOTAL SR	2018	5.12E-02	6.39E-01	<b>1.21E+00</b>	pCi/L		450	ml	06/01/06 08:30	06/12/06	200	M	U
MN-54	2007	1.19E+00	2.14E+00	<b>3.65E+00</b>	pCi/L		3016.65	ml	06/01/06 08:30	06/09/06	16747	Sec	U No
CO-58	2007	-1.71E+00	2.44E+00	<b>3.85E+00</b>	pCi/L		3016.65	ml	06/01/06 08:30	06/09/06	16747	Sec	U No
FE-59	2007	4.03E+00	4.58E+00	<b>8.08E+00</b>	pCi/L		3016.65	ml	06/01/06 08:30	06/09/06	16747	Sec	U No
CO-60	2007	-1.62E+00	2.50E+00	<b>3.84E+00</b>	pCi/L		3016.65	ml	06/01/06 08:30	06/09/06	16747	Sec	U No
ZN-65	2007	3.74E+00	5.06E+00	<b>8.79E+00</b>	pCi/L		3016.65	ml	06/01/06 08:30	06/09/06	16747	Sec	U No
NB-95	2007	-1.73E+00	2.44E+00	<b>3.86E+00</b>	pCi/L		3016.65	ml	06/01/06 08:30	06/09/06	16747	Sec	U No
ZR-95	2007	-7.83E-01	4.30E+00	<b>7.05E+00</b>	pCi/L		3016.65	ml	06/01/06 08:30	06/09/06	16747	Sec	U No
CS-134	2007	-5.80E-01	2.85E+00	<b>3.89E+00</b>	pCi/L		3016.65	ml	06/01/06 08:30	06/09/06	16747	Sec	U No
CS-137	2007	8.80E-01	2.33E+00	<b>3.88E+00</b>	pCi/L		3016.65	ml	06/01/06 08:30	06/09/06	16747	Sec	U No
BA-140	2007	1.99E+00	1.15E+01	<b>1.92E+01</b>	pCi/L		3016.65	ml	06/01/06 08:30	06/09/06	16747	Sec	U No
LA-140	2007	2.36E+00	4.14E+00	<b>7.16E+00</b>	pCi/L		3016.65	ml	06/01/06 08:30	06/09/06	16747	Sec	U No

**Flag Values**

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- High = Activity concentration exceeds customer reporting value
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- 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

06/23/06 08:18

**L28834**

Conestoga-Rovers & Associates

EX001-3ESPQUAD-06



Kathy Shaw

Sample ID: <b>WS-QC-SW-QC-002-053106-JH-003</b>	Collect Start: 05/31/2006 08:50	Matrix: Ground Water (WG)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 06/05/2006	% Moisture:
LIMS Number: L28834-12		

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>4.97E+02</b>	1.40E+02	1.85E+02	pCi/L		10	ml		06/07/06	60	M	+
TOTAL SR	2018	6.33E-02	6.31E-01	<b>1.19E+00</b>	pCi/L		450	ml	05/31/06 08:50	06/12/06	200	M	U
K-40	2007	<b>9.73E+01</b>	4.46E+01	3.49E+01	pCi/L		3022.17	ml	05/31/06 08:50	06/09/06	24000	Sec	+ Yes
MN-54	2007	-9.36E-02	2.24E+00	<b>3.65E+00</b>	pCi/L		3022.17	ml	05/31/06 08:50	06/09/06	24000	Sec	U No
CO-58	2007	-7.72E-01	2.32E+00	<b>3.73E+00</b>	pCi/L		3022.17	ml	05/31/06 08:50	06/09/06	24000	Sec	U No
FE-59	2007	3.46E+00	4.91E+00	<b>8.36E+00</b>	pCi/L		3022.17	ml	05/31/06 08:50	06/09/06	24000	Sec	U No
CO-60	2007	1.66E-01	2.69E+00	<b>4.11E+00</b>	pCi/L		3022.17	ml	05/31/06 08:50	06/09/06	24000	Sec	U No
ZN-65	2007	2.50E+00	5.71E+00	<b>8.15E+00</b>	pCi/L		3022.17	ml	05/31/06 08:50	06/09/06	24000	Sec	U No
NB-95	2007	2.10E+00	2.31E+00	<b>3.97E+00</b>	pCi/L		3022.17	ml	05/31/06 08:50	06/09/06	24000	Sec	U No
ZR-95	2007	3.99E-01	4.29E+00	<b>7.09E+00</b>	pCi/L		3022.17	ml	05/31/06 08:50	06/09/06	24000	Sec	U No
CS-134	2007	2.90E+00	4.69E+00	<b>3.74E+00</b>	pCi/L		3022.17	ml	05/31/06 08:50	06/09/06	24000	Sec	U No
CS-137	2007	3.87E-01	2.27E+00	<b>3.79E+00</b>	pCi/L		3022.17	ml	05/31/06 08:50	06/09/06	24000	Sec	U No
BA-140	2007	-3.04E+00	1.22E+01	<b>1.97E+01</b>	pCi/L		3022.17	ml	05/31/06 08:50	06/09/06	24000	Sec	U No
LA-140	2007	7.05E-01	4.34E+00	<b>7.27E+00</b>	pCi/L		3022.17	ml	05/31/06 08:50	06/09/06	24000	Sec	U No

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- High = Activity concentration exceeds customer reporting value
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- 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

06/23/06 08:18



## L28834

Conestoga-Rovers & Associates

EX001-3ESPQUAD-06

Kathy Shaw

Sample ID: <b>WG-QC-MW-QC-LFW-053106-JH-005</b>	Collect Start: 05/31/2006 09:40	Matrix: Ground Water	(WG)
Station:	Collect Stop:	Volume:	
Description:	Receive Date: 06/05/2006	% Moisture:	
LIMS Number: L28834-13			

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>3.71E+02</b>	1.34E+02	1.85E+02	pCi/L		10	ml		06/07/06	60	M	+
TOTAL SR	2018	-1.34E-01	5.50E-01	<b>1.06E+00</b>	pCi/L		450	ml	05/31/06 09:40	06/12/06	200	M	U
MN-54	2007	1.60E+00	1.98E+00	<b>3.38E+00</b>	pCi/L		3006.35	ml	05/31/06 09:40	06/09/06	24000	Sec	U No
CO-58	2007	6.17E-01	2.06E+00	<b>3.45E+00</b>	pCi/L		3006.35	ml	05/31/06 09:40	06/09/06	24000	Sec	U No
FE-59	2007	6.19E+00	4.15E+00	<b>7.38E+00</b>	pCi/L		3006.35	ml	05/31/06 09:40	06/09/06	24000	Sec	U No
CO-60	2007	1.66E-01	1.88E+00	<b>3.09E+00</b>	pCi/L		3006.35	ml	05/31/06 09:40	06/09/06	24000	Sec	U No
ZN-65	2007	5.28E+00	4.01E+00	<b>7.08E+00</b>	pCi/L		3006.35	ml	05/31/06 09:40	06/09/06	24000	Sec	U No
NB-95	2007	-2.89E-01	2.11E+00	<b>3.48E+00</b>	pCi/L		3006.35	ml	05/31/06 09:40	06/09/06	24000	Sec	U No
ZR-95	2007	-2.48E+00	3.77E+00	<b>5.94E+00</b>	pCi/L		3006.35	ml	05/31/06 09:40	06/09/06	24000	Sec	U No
CS-134	2007	6.89E+00	4.09E+00	<b>3.62E+00</b>	pCi/L		3006.35	ml	05/31/06 09:40	06/09/06	24000	Sec	U* No
CS-137	2007	-1.67E-01	2.08E+00	<b>3.40E+00</b>	pCi/L		3006.35	ml	05/31/06 09:40	06/09/06	24000	Sec	U No
BA-140	2007	-6.84E-01	1.08E+01	<b>1.79E+01</b>	pCi/L		3006.35	ml	05/31/06 09:40	06/09/06	24000	Sec	U No
LA-140	2007	-7.42E-01	3.52E+00	<b>5.70E+00</b>	pCi/L		3006.35	ml	05/31/06 09:40	06/09/06	24000	Sec	U No

**Flag Values**

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- +
- + = 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
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- 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

H-3

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>
WG4089-1	H-3	WO	06/06/2006 4:08	< 1.900E+00	pCi/Total	U	P
WG4099-1		WO	06/06/2006 23:51	< 1.890E+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>
WG4089-2	H-3	WO	06/06/2006 5:12	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										
WG4099-2		WO	06/07/2006 0:55	5.05E+002	4.770E+02	pCi/Total	94.5	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>
WG4089-3 L28837-3	H-3	WG	06/06/2006 14:20	< 1.690E+02	< 1.780E+02	pCi/L		<30	**	NE
WG4099-3 L28834-11		WG	06/07/2006 1:14	1.870E+02	< 1.870E+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 L28834

6/23/2006

8:17:20AM



L28834 H-3

## Associated Samples for

### SAMPLENUM

L28834-1  
L28834-2  
L28834-3  
L28834-4  
L28834-5  
L28834-6  
L28834-7  
L28834-8  
L28834-9  
L28834-10

## WG4089

### CLIENTID

WG-QC-MW-QC-BFW-060106-JH-007  
WG-QC-MW-QC-STP-060106-JH-008  
WG-QC-MW-QC-101S-060106-JH-026  
WG-QC-MW-QC-WELL #5-060106-JH-010  
WG-QC-MW-QC-WELL #1-060106-JH-009  
WG-QC-MW-QC-DCS-060106-JH-006  
WG-QC-MW-QC-FHW-053106-JH-004  
WS-QC-SW-QC-001-053106-JH-002  
WG-QC-MW-2-060106-JH-023  
WG-QC-MW-1-060106-JH-022

## Associated Samples for

### SAMPLENUM

L28834-11  
L28834-12  
L28834-13

## WG4099

### CLIENTID

WG-QC-MW-QC-103I-060106-JH-021  
WS-QC-SW-QC-002-053106-JH-003  
WG-QC-MW-QC-LFW-053106-JH-005

- + 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

TOTAL SR

Method Blank Summary

TBE Sample ID	Radionuclide	Matrix	Count Date/Time	Blank Result	Units	Qualifier	P/F
WG4138-1	TOTAL SR	WO	06/12/2006 21:51	< 8.060E-01	pCi/Total	U	P
WG4170-1		WO	06/22/2006 16:17	< 6.870E-01	pCi/Total	U	P

LCS Sample Summary

TBE Sample ID	Radionuclide	Matrix	Count Date/Time	Spike Value	LCS Result	Units	Spike Recovery	Range	Qualifier	P/F
WG4138-2	TOTAL SR	WO	06/12/2006 21:51	5.84E+001	6.480E+01	pCi/Total	111.0	70-130	+	P
WG4170-2		WO	06/22/2006 16:17	5.84E+001	6.510E+01	pCi/Total	111.5	70-130	+	P

Spike ID: 90SR-011905  
Spike conc: 2.34E+002  
Spike Vol: 2.50E-001

Spike ID: 90SR-011905  
Spike conc: 2.34E+002  
Spike Vol: 2.50E-001

Duplicate Summary

TBE Sample ID	Radionuclide	Matrix	Count Date/Time	Original Result	DUP Result	Units	RPD	Range	Qualifier	P/F
WG4138-3 L28834-1	TOTAL SR	WG	06/12/2006 21:51	< 1.260E+00	< 1.180E+00	pCi/L		<30	**	NE
WG4170-3 L28973-1		WG	06/22/2006 16:17	< 1.570E+00	< 1.030E+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

Raw Data Sheet (rawdata)  
 Jun 23 2006, 08:33 am

Work Order: L28834

Customer: Exelon

Page: 1

Nuclide: H-3

Project: EX001-3ESPQUAD-06

Sample ID	Run	Analysis	Reference	Volume/	Scavenge	Milking	Mount	Count	Counter	Total	Sample	Bkg	Bkg	Decay &	Analyst
Client ID	#		Date/time	Aliquot	Date/time	Date/time	Weight	Recovery	ID	counts	dt (min)	counts	dt (min)	Eff. Ingrowth Factor	
L28834-1		H-3					0							.211	EJ
WG-QC-MW-QC-BFW-060106				10 ml						07-jun-06	60	2.08	60		
Activity: 7.4E+02		* Error: 1.52E+02		MDC: 1.86E+02						02:18					
L28834-2		H-3					0							.224	EJ
WG-QC-MW-QC-STP-060106				10 ml						07-jun-06	60	2.08	60		
Activity: 1.81E+02		* Error: 1.17E+02		MDC: 1.75E+02						04:25					
L28834-3		H-3					0							.211	EJ
WG-QC-MW-QC-101S-06010				10 ml						07-jun-06	60	2.08	60		
Activity: 1.56E+02		Error: 1.22E+02		MDC: 1.85E+02 *						09:44					
L28834-4		H-3					0							.207	EJ
WG-QC-MW-QC-WELL #5-06				10 ml						07-jun-06	60	2.08	60		
Activity: 6.31E+01		Error: 1.19E+02		MDC: 1.89E+02 *						10:47					
L28834-5		H-3					0							.211	EJ
WG-QC-MW-QC-WELL #1-06				10 ml						07-jun-06	60	2.08	60		
Activity: 1.32E+02		Error: 1.21E+02		MDC: 1.85E+02 *						11:51					
L28834-6		H-3					0							.209	EJ
WG-QC-MW-QC-DCS-060106				10 ml						07-jun-06	60	2.08	60		
Activity: 4.09E+01		Error: 1.16E+02		MDC: 1.87E+02 *						12:55					
L28834-7		H-3					0							.213	EJ
WG-QC-MW-QC-FHW-053106				10 ml						07-jun-06	60	2.08	60		
Activity: 1.7E+01		Error: 1.13E+02		MDC: 1.84E+02 *						13:59					
L28834-8		H-3					0							.212	EJ
WS-QC-SW-QC-001-053106				10 ml						07-jun-06	60	2.08	60		
Activity: 5.5E+02		* Error: 1.43E+02		MDC: 1.85E+02						06:32					
L28834-9		H-3					0							.214	EJ
WG-QC-MW-2-060106-JH-0				10 ml						07-jun-06	60	2.08	60		
Activity: 2.5E+02		* Error: 1.26E+02		MDC: 1.82E+02						08:40					
L28834-10		H-3					0							.214	EJ
WG-QC-MW-1-060106-JH-0				10 ml						07-jun-06	60	2.08	60		
Activity: 1.75E+02		Error: 1.22E+02		MDC: 1.83E+02 *						07:36					
L28834-11		H-3					0							.217	EJ
WG-QC-MW-QC-103I-06010				10 ml						07-jun-06	60	2.08	60		
Activity: 1.87E+02		* Error: 1.21E+02		MDC: 1.81E+02						03:22					
L28834-12		H-3					0							.211	EJ
WS-QC-SW-QC-002-053106				10 ml						07-jun-06	60	2.08	60		
Activity: 4.97E+02		* Error: 1.4E+02		MDC: 1.85E+02						05:29					
L28834-13		H-3					0							.212	EJ
WG-QC-MW-QC-LFW-053106				10 ml						07-jun-06	60	2.08	60		
Activity: 3.71E+02		* Error: 1.34E+02		MDC: 1.85E+02						15:03					

Raw Data Sheet (rawdata)  
 Jun 23 2006, 08:33 am

Work Order: L28834

Customer: Exelon

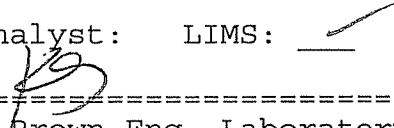
Page: 2

Nuclide: SR-90 (FAST)

Project: EX001-3ESPQUAD-06

Sample ID	Run	Analysis	Reference	Volume/	Scavenge	Milking	Mount	Count	Counter	Total	Sample	Bkg	Bkg	Decay &	Analyst
Client ID	#		Date/time	Aliquot	Date/time	Date/time	Weight	Recovery	ID	counts	dt (min)	counts	dt (min)	Eff. Ingrowth Factor	
L28834-1		TOTAL SR	01-jun-06		12-jun-06		0			194	200	308	400	.346 .999	LCB
WG-QC-MW-QC-BFW-060106			08:50	450 ml	15:00			66.40		21:46					
Activity: 8.72E-01		Error: 7.18E-01		MDC: 1.26E+00	*										
L28834-2		TOTAL SR	01-jun-06		12-jun-06		0			178	200	342	400	.343 .999	LCB
WG-QC-MW-QC-STP-060106			09:05	450 ml	15:00			61.29		21:46					
Activity: 1.67E-01		Error: 7.73E-01		MDC: 1.45E+00	*										
L28834-3		TOTAL SR	01-jun-06		12-jun-06		0			183	200	289	400	.354 .999	LCB
WG-QC-MW-QC-101S-06010			14:20	450 ml	15:00			63.44		21:46					
Activity: 8.59E-01		Error: 7.13E-01		MDC: 1.25E+00	*										
L28834-4		TOTAL SR	01-jun-06		12-jun-06		0			177	200	312	400	.344 .999	LCB
WG-QC-MW-QC-WELL #5-06			09:30	450 ml	15:00			65.05		21:46					
Activity: 4.7E-01		Error: 7.15E-01		MDC: 1.3E+00	*										
L28834-5		TOTAL SR	01-jun-06		12-jun-06		0			114	150	305	400	.362 .999	LCB
WG-QC-MW-QC-WELL #1-06			09:15	450 ml	15:00			58.33		01:17					
Activity: -1.19E-02		Error: 7.92E-01		MDC: 1.58E+00	*										
L28834-6		TOTAL SR	01-jun-06		12-jun-06		0			150	200	289	400	.345 .999	LCB
WG-QC-MW-QC-DCS-060106			08:20	450 ml	15:00			69.35		21:46					
Activity: 1.15E-01		Error: 6.24E-01		MDC: 1.17E+00	*										
L28834-7		TOTAL SR	31-may-06		12-jun-06		0			166	200	277	400	.344 .999	LCB
WG-QC-MW-QC-FHW-053106			09:10	450 ml	15:00			69.09		21:46					
Activity: 5.8E-01		Error: 6.47E-01		MDC: 1.16E+00	*										
L28834-8		TOTAL SR	31-may-06		12-jun-06		0			207	200	307	400	.343 .999	LCB
WS-QC-SW-QC-001-053106			08:20	450 ml	15:00			63.44		21:46					
Activity: 1.23E+00		Error: 7.75E-01		MDC: 1.33E+00	*										
L28834-9		TOTAL SR	01-jun-06		12-jun-06		0			224	200	363	400	.335 .999	LCB
WG-QC-MW-2-060106-JH-0			10:18	450 ml	15:00			111.02		21:46					
Activity: 5.72E-01		Error: 4.78E-01		MDC: 8.45E-01	*										
L28834-10		TOTAL SR	01-jun-06		22-jun-06		0			109	120	299	400	.35 .999	CJF
WG-QC-MW-1-060106-JH-0			09:17	450 ml	11:45			107.53		16:17					
Activity: 4.28E-01		Error: 5.17E-01		MDC: 9.79E-01	*										
L28834-11		TOTAL SR	01-jun-06		12-jun-06		0			163	200	321	400	.343 .999	LCB
WG-QC-MW-QC-103I-06010			08:30	450 ml	15:00			71.24		21:46					
Activity: 5.12E-02		Error: 6.39E-01		MDC: 1.21E+00	*										
L28834-12		TOTAL SR	31-may-06		12-jun-06		0			150	200	294	400	.345 .999	LCB
WS-QC-SW-QC-002-053106			08:50	450 ml	15:00			68.82		21:46					
Activity: 6.33E-02		Error: 6.31E-01		MDC: 1.19E+00	*										
L28834-13		TOTAL SR	31-may-06		12-jun-06		0			135	200	284	400	.358 .999	LCB
WG-QC-MW-QC-LFW-053106			09:40	450 ml	15:00			73.12		21:46					
Activity: -1.34E-01		Error: 5.5E-01		MDC: 1.06E+00	*										

L28834 R1 57 OF 122

Sec. Review: Analyst: LIMS: 

VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 12-JUN-2006 00:46:17.63  
 TBE13 P-10727B HpGe \*\*\*\*\* Aquisition Date/Time: 9-JUN-2006 13:23:22.33

LIMS No., Customer Name, Client ID: WG L28834-1 EXELON/QUAD

Sample ID : 13L28834-1 Smple Date: 1-JUN-2006 08:50:00.0  
 Sample Type : WG Geometry : 133L082404  
 Quantity : 3.02950E+00 L BKGFILE : 13BG060306MT  
 Start Channel : 25 Energy Tol : 1.50000 Real Time : 0 03:29:27.49  
 End Channel : 4090 Pk Srch Sens: 5.00000 Live time : 0 03:29:23.97  
 MDA Constant : 0.00 Library Used: LIBD

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	%Eff	Cts/Sec	%Err	Fit
1	1	46.26*	94	328	1.80	92.64	1.53E-01	7.51E-03	38.2	9.20E-01
2	1	66.65	103	295	1.07	133.39	8.41E-01	8.20E-03	28.2	2.81E+00
3	1	77.42*	15	302	0.94	154.91	1.26E+00	1.17E-03	214.6	3.02E+00
4	1	139.69*	109	503	1.97	279.37	2.27E+00	8.68E-03	42.5	1.19E+00
5	1	185.54*	53	315	1.28	371.02	2.18E+00	4.23E-03	70.2	2.41E+00
6	1	198.29*	92	369	1.03	396.50	2.12E+00	7.28E-03	42.6	6.55E-01
7	1	238.24*	25	184	1.23	476.37	1.94E+00	2.00E-03	109.3	5.98E+00
8	1	295.10*	17	242	1.33	590.03	1.70E+00	1.33E-03	188.5	1.25E+00
9	1	584.58	187	130	1.55	1168.83	1.04E+00	1.49E-02	14.5	8.05E+01
10	1	596.21	52	96	1.79	1192.09	1.02E+00	4.17E-03	38.7	1.61E+00
11	1	608.92*	59	93	1.66	1217.51	1.01E+00	4.66E-03	39.5	5.88E-01
12	1	911.83*	16	46	2.63	1823.39	7.36E-01	1.31E-03	104.3	2.01E+00
13	1	969.26*	23	45	1.57	1938.28	7.01E-01	1.82E-03	69.6	1.06E+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
RA-226	186.21	53	3.28*	2.180E+00	5.280E+01	5.280E+01	140.35
AC-228	835.50	-----	1.75	7.877E-01	-----	Line Not Found	-----
	911.07	16	27.70*	7.356E-01	5.714E+00	5.729E+00	208.64
TH-228	238.63	25	44.60*	1.940E+00	2.064E+00	2.081E+00	218.53
	240.98	-----	3.95	1.927E+00	-----	Line Not Found	-----
TH-232	583.14	187	30.25	1.038E+00	4.232E+01	4.232E+01	28.90
	911.07	16	27.70*	7.356E-01	5.714E+00	5.714E+00	208.64
	969.11	23	16.60	7.013E-01	1.394E+01	1.394E+01	139.21
U-235	143.76	-----	10.50*	2.278E+00	-----	Line Not Found	-----
	163.35	-----	4.70	2.256E+00	-----	Line Not Found	-----
	185.71	53	54.00	2.180E+00	3.207E+00	3.207E+00	140.35
	205.31	-----	4.70	2.093E+00	-----	Line Not Found	-----

Flag: "\*" = Keyline

Summary of Nuclide Activity  
 Sample ID : 13L28834-1

Page : 2  
 Acquisition date : 9-JUN-2006 13:23:22

Total number of lines in spectrum 13  
 Number of unidentified lines 8  
 Number of lines tentatively identified by NID 5 38.46%

Nuclide Type : natural

Nuclide	Hlife	Decay	Uncorrected pCi/L	Decay Corr pCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
RA-226	1600.00Y	1.00	5.280E+01	5.280E+01	7.411E+01	140.35	
AC-228	5.75Y	1.00	5.714E+00	5.729E+00	11.95E+00	208.64	
TH-228	1.91Y	1.01	2.064E+00	2.081E+00	4.547E+00	218.53	
TH-232	1.41E+10Y	1.00	5.714E+00	5.714E+00	11.92E+00	208.64	
U-235	7.04E+08Y	1.00	3.207E+00	3.207E+00	4.501E+00	140.35	K
Total Activity :			6.950E+01	6.953E+01			

Grand Total Activity : 6.950E+01 6.953E+01

Flags: "K" = Keyline not found  
 "E" = Manually edited

"M" = Manually accepted  
 "A" = Nuclide specific abn. limit

Unidentified Energy Lines  
Sample ID : 13L28834-1

Page : 3  
Acquisition date : 9-JUN-2006 13:23:22

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
1	46.26	94	328	1.80	92.64	89	9	7.51E-03	76.3	1.53E-01	
1	66.65	103	295	1.07	133.39	131	6	8.20E-03	56.4	8.41E-01	
1	77.42	15	302	0.94	154.91	147	12	1.17E-03	****	1.26E+00	
1	139.69	109	503	1.97	279.37	274	11	8.68E-03	85.1	2.27E+00	
1	198.29	92	369	1.03	396.50	392	10	7.28E-03	85.2	2.12E+00	
1	295.10	17	242	1.33	590.03	586	10	1.33E-03	****	1.70E+00	
1	596.21	52	96	1.79	1192.09	1186	11	4.17E-03	77.4	1.02E+00	
1	608.92	59	93	1.66	1217.51	1212	11	4.66E-03	79.0	1.01E+00	

Flags: "T" = Tentatively associated

### Summary of Nuclide Activity

Total number of lines in spectrum	13	
Number of unidentified lines	8	
Number of lines tentatively identified by NID	5	38.46%

Nuclide Type : natural

Nuclide	Hlife	Decay	Wtd Mean	Wtd Mean	Decay Corr	2-Sigma	Flags
			Uncorrected	Decay Corr	2-Sigma Error	%Error	
RA-226	1600.00Y	1.00	5.280E+01	5.280E+01	7.411E+01	140.35	
TH-228	1.91Y	1.01	2.064E+00	2.081E+00	4.547E+00	218.53	
TH-232	1.41E+10Y	1.00	7.968E+00	7.968E+00	10.16E+00	127.49	
Total Activity :			6.283E+01	6.285E+01			

Grand Total Activity : 6.283E+01 6.285E+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 ----

Nuclide	Activity (pCi/L)	Act error	MDA (pCi/L)	MDA error	Act/MDA
RA-226	5.280E+01	7.411E+01	1.011E+02	0.000E+00	0.522
TH-228	2.081E+00	4.547E+00	7.569E+00	0.000E+00	0.275
TH-232	7.968E+00	1.016E+01	1.711E+01	0.000E+00	0.466

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/L)	K.L. Ided	Act error	MDA (pCi/L)	MDA error	Act/MDA
BE-7	1.019E+01		2.522E+01	4.200E+01	0.000E+00	0.243
NA-24	1.619E-02		1.532E-02	Half-Life too short		
K-40	-2.458E+00		4.296E+01	8.012E+01	0.000E+00	-0.031
CR-51	-1.777E+01		2.833E+01	4.490E+01	0.000E+00	-0.396
MN-54	1.152E-01		2.895E+00	4.779E+00	0.000E+00	0.024
CO-57	-4.844E-01		2.507E+00	4.159E+00	0.000E+00	-0.116
CO-58	3.082E+00		2.857E+00	5.042E+00	0.000E+00	0.611
FE-59	3.155E+00		6.178E+00	1.054E+01	0.000E+00	0.299
CO-60	4.101E-01		2.834E+00	4.743E+00	0.000E+00	0.086
ZN-65	3.152E+00		6.479E+00	1.101E+01	0.000E+00	0.286
SE-75	-1.045E+00		3.764E+00	6.147E+00	0.000E+00	-0.170
SR-85	1.589E+01		3.640E+00	6.848E+00	0.000E+00	2.320
Y-88	-3.286E-01		3.411E+00	5.523E+00	0.000E+00	-0.059
NB-94	-4.010E+00		2.830E+00	4.211E+00	0.000E+00	-0.952
NB-95	2.683E+00		2.888E+00	5.059E+00	0.000E+00	0.530
ZR-95	-4.238E+00		5.248E+00	8.279E+00	0.000E+00	-0.512
MO-99	-1.288E+01		1.679E+02	2.781E+02	0.000E+00	-0.046
RU-103	9.761E-01		3.200E+00	5.286E+00	0.000E+00	0.185
RU-106	-1.487E+01		2.713E+01	4.327E+01	0.000E+00	-0.344
AG-110m	-4.433E-01		2.873E+00	4.661E+00	0.000E+00	-0.095
SN-113	-7.013E-01		3.655E+00	6.006E+00	0.000E+00	-0.117
SB-124	2.466E+00		6.324E+00	5.062E+00	0.000E+00	0.487
SB-125	1.483E+00		7.646E+00	1.270E+01	0.000E+00	0.117
TE-129M	1.736E+01		3.572E+01	5.987E+01	0.000E+00	0.290
I-131	-1.199E-01		5.456E+00	9.082E+00	0.000E+00	-0.013
BA-133	-7.983E-01		3.682E+00	6.091E+00	0.000E+00	-0.131
CS-134	2.792E+00		4.925E+00	5.257E+00	0.000E+00	0.531
CS-136	-2.680E+00		4.165E+00	6.576E+00	0.000E+00	-0.408
CS-137	-1.627E+00		3.235E+00	4.985E+00	0.000E+00	-0.326
CE-139	1.366E+00		2.650E+00	4.410E+00	0.000E+00	0.310
BA-140	-8.226E+00		1.453E+01	2.345E+01	0.000E+00	-0.351
LA-140	-1.161E+00		5.201E+00	8.445E+00	0.000E+00	-0.137
CE-141	2.243E+00		5.783E+00	8.348E+00	0.000E+00	0.269
CE-144	-2.510E+01		2.333E+01	3.178E+01	0.000E+00	-0.790
EU-152	-1.422E+01		8.970E+00	1.352E+01	0.000E+00	-1.052
EU-154	-1.201E-01		5.248E+00	8.746E+00	0.000E+00	-0.014
AC-228	5.729E+00		1.195E+01	1.894E+01	0.000E+00	0.302
U-235	2.304E+00		2.336E+01	3.294E+01	0.000E+00	0.070
U-238	6.420E+00		3.337E+02	5.360E+02	0.000E+00	0.012
AM-241	-3.646E+01		2.268E+01	3.570E+01	0.000E+00	-1.022

A,13L28834-1 ,06/12/2006 00:46,06/01/2006 08:50, 3.030E+00,WG L28834-1 EX  
 B,13L28834-1 ,LIBD ,08/05/2005 08:16,133L082404  
 C,RA-226 ,YES, 5.280E+01, 7.411E+01, 1.011E+02,, 0.522  
 C,TH-228 ,YES, 2.081E+00, 4.547E+00, 7.569E+00,, 0.275  
 C,TH-232 ,YES, 7.968E+00, 1.016E+01, 1.711E+01,, 0.466  
 C,BE-7 ,NO , 1.019E+01, 2.522E+01, 4.200E+01,, 0.243  
 C,K-40 ,NO , -2.458E+00, 4.296E+01, 8.012E+01,, -0.031  
 C,CR-51 ,NO , -1.777E+01, 2.833E+01, 4.490E+01,, -0.396  
 C,MN-54 ,NO , 1.152E-01, 2.895E+00, 4.779E+00,, 0.024  
 C,CO-57 ,NO , -4.844E-01, 2.507E+00, 4.159E+00,, -0.116  
 C,CO-58 ,NO , 3.082E+00, 2.857E+00, 5.042E+00,, 0.611  
 C,FE-59 ,NO , 3.155E+00, 6.178E+00, 1.054E+01,, 0.299  
 C,CO-60 ,NO , 4.101E-01, 2.834E+00, 4.743E+00,, 0.086  
 C,ZN-65 ,NO , 3.152E+00, 6.479E+00, 1.101E+01,, 0.286  
 C,SE-75 ,NO , -1.045E+00, 3.764E+00, 6.147E+00,, -0.170  
 C,SR-85 ,NO , 1.589E+01, 3.640E+00, 6.848E+00,, 2.320  
 C,Y-88 ,NO , -3.286E-01, 3.411E+00, 5.523E+00,, -0.059  
 C,NB-94 ,NO , -4.010E+00, 2.830E+00, 4.211E+00,, -0.952  
 C,NB-95 ,NO , 2.683E+00, 2.888E+00, 5.059E+00,, 0.530  
 C,ZR-95 ,NO , -4.238E+00, 5.248E+00, 8.279E+00,, -0.512  
 C,MO-99 ,NO , -1.288E+01, 1.679E+02, 2.781E+02,, -0.046  
 C,RU-103 ,NO , 9.761E-01, 3.200E+00, 5.286E+00,, 0.185  
 C,RU-106 ,NO , -1.487E+01, 2.713E+01, 4.327E+01,, -0.344  
 C,AG-110m ,NO , -4.433E-01, 2.873E+00, 4.661E+00,, -0.095  
 C,SN-113 ,NO , -7.013E-01, 3.655E+00, 6.006E+00,, -0.117  
 C,SB-124 ,NO , 2.466E+00, 6.324E+00, 5.062E+00,, 0.487  
 C,SB-125 ,NO , 1.483E+00, 7.646E+00, 1.270E+01,, 0.117  
 C,TE-129M ,NO , 1.736E+01, 3.572E+01, 5.987E+01,, 0.290  
 C,I-131 ,NO , -1.199E-01, 5.456E+00, 9.082E+00,, -0.013  
 C,BA-133 ,NO , -7.983E-01, 3.682E+00, 6.091E+00,, -0.131  
 C,CS-134 ,NO , 2.792E+00, 4.925E+00, 5.257E+00,, 0.531  
 C,CS-136 ,NO , -2.680E+00, 4.165E+00, 6.576E+00,, -0.408  
 C,CS-137 ,NO , -1.627E+00, 3.235E+00, 4.985E+00,, -0.326  
 C,CE-139 ,NO , 1.366E+00, 2.650E+00, 4.410E+00,, 0.310  
 C,BA-140 ,NO , -8.226E+00, 1.453E+01, 2.345E+01,, -0.351  
 C,LA-140 ,NO , -1.161E+00, 5.201E+00, 8.445E+00,, -0.137  
 C,CE-141 ,NO , 2.243E+00, 5.783E+00, 8.348E+00,, 0.269  
 C,CE-144 ,NO , -2.510E+01, 2.333E+01, 3.178E+01,, -0.790  
 C,EU-152 ,NO , -1.422E+01, 8.970E+00, 1.352E+01,, -1.052  
 C,EU-154 ,NO , -1.201E-01, 5.248E+00, 8.746E+00,, -0.014  
 C,AC-228 ,NO , 5.729E+00, 1.195E+01, 1.894E+01,, 0.302  
 C,U-235 ,NO , 2.304E+00, 2.336E+01, 3.294E+01,, 0.070  
 C,U-238 ,NO , 6.420E+00, 3.337E+02, 5.360E+02,, 0.012  
 C,AM-241 ,NO , -3.646E+01, 2.268E+01, 3.570E+01,, -1.022



Sec. Review: Analyst: LIMS: ✓

VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 9-JUN-2006 17:13:07.19  
 TBE11 P-20610B HpGe \*\*\*\*\* Aquisition Date/Time: 9-JUN-2006 13:53:42.81

LIMS No., Customer Name, Client ID: WG L28834-2 EXELON/QUAD

Sample ID : 11L28834-2 Smple Date: 1-JUN-2006 09:05:00.0  
 Sample Type : WG Geometry : 113L082304  
 Quantity : 3.16880E+00 L BKGFILE : 11BG060306MT  
 Start Channel : 40 Energy Tol : 1.00000 Real Time : 0 03:19:16.30  
 End Channel : 4090 Pk Srch Sens: 5.00000 Live time : 0 03:19:12.10  
 MDA Constant : 0.00 Library Used: LIBD

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	%Eff	Cts/Sec	%Err	Fit
1	0	66.31	126	623	1.76	131.63	6.87E-01	1.05E-02	35.5	
2	0	139.63*	92	368	1.94	278.69	1.90E+00	7.68E-03	43.4	
3	0	185.63*	69	290	1.36	370.94	1.80E+00	5.77E-03	55.7	
4	0	198.16	79	340	1.14	396.07	1.75E+00	6.59E-03	46.7	
5	0	351.87*	58	157	3.24	704.19	1.20E+00	4.86E-03	53.5	
6	0	609.31*	42	62	1.53	1219.88	7.90E-01	3.49E-03	45.3	
7	0	1460.79*	8	40	3.28	2922.09	3.92E-01	7.10E-04	203.4	
8	0	1728.39	9	10	1.43	3455.97	3.44E-01	7.79E-04	71.2	
9	0	1750.68	16	6	1.50	3500.42	3.41E-01	1.35E-03	36.4	

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*	3.919E-01	1.447E+01	1.447E+01	406.89
RA-226	186.21	69	3.28*	1.799E+00	8.341E+01	8.342E+01	111.31
U-235	143.76	-----	10.50*	1.906E+00	-----	Line Not Found	-----
	163.35	-----	4.70	1.876E+00	-----	Line Not Found	-----
	185.71	69	54.00	1.799E+00	5.067E+00	5.067E+00	111.31
	205.31	-----	4.70	1.718E+00	-----	Line Not Found	-----

Flag: "\*" = Keyline

Summary of Nuclide Activity  
 Sample ID : 11L28834-2

Page : 2  
 Acquisition date : 9-JUN-2006 13:53:42

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 pCi/L	Decay Corr pCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	1.447E+01	1.447E+01	5.889E+01	406.89	
RA-226	1600.00Y	1.00	8.341E+01	8.342E+01	9.285E+01	111.31	
U-235	7.04E+08Y	1.00	5.067E+00	5.067E+00	5.640E+00	111.31	K
			-----	-----			
		Total Activity :	1.030E+02	1.030E+02			

Grand Total Activity : 1.030E+02 1.030E+02

Flags: "K" = Keyline not found  
 "E" = Manually edited

"M" = Manually accepted  
 "A" = Nuclide specific abn. limit

Unidentified Energy Lines  
 Sample ID : 11L28834-2

Acquisition date : 9-JUN-2006 13:53:42

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	66.31	126	623	1.76	131.63	128	8	1.05E-02	71.0	6.87E-01	
0	139.63	92	368	1.94	278.69	274	11	7.68E-03	86.8	1.90E+00	
0	198.16	79	340	1.14	396.07	392	11	6.59E-03	93.3	1.75E+00	
0	351.87	58	157	3.24	704.19	696	16	4.86E-03	****	1.20E+00	
0	609.31	42	62	1.53	1219.88	1214	11	3.49E-03	90.6	7.90E-01	
0	1728.39	9	10	1.43	3455.97	3448	10	7.79E-04	****	3.44E-01	
0	1750.68	16	6	1.50	3500.42	3493	10	1.35E-03	72.8	3.41E-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 Uncorrected pCi/L	Wtd Mean Decay Corr pCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	1.447E+01	1.447E+01	5.889E+01	406.89	
RA-226	1600.00Y	1.00	8.341E+01	8.342E+01	9.285E+01	111.31	
Total Activity :			9.789E+01	9.789E+01			

Grand Total Activity : 9.789E+01 9.789E+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	1.447E+01	5.889E+01	4.899E+01	0.000E+00	0.295
RA-226	8.342E+01	9.285E+01	1.239E+02	0.000E+00	0.673

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/L)	K.L. Ided	Act error	MDA (pCi/L)	MDA error	Act/MDA
BE-7	-2.159E+00		2.895E+01	4.704E+01	0.000E+00	-0.046
NA-24	9.510E-03		1.694E-02	Half-Life too short		

CR-51	-5.284E+01	3.368E+01	5.210E+01	0.000E+00	-1.014
MN-54	-8.710E-01	3.046E+00	4.874E+00	0.000E+00	-0.179
CO-57	2.417E+00	3.160E+00	5.323E+00	0.000E+00	0.454
CO-58	-1.963E-01	3.469E+00	5.665E+00	0.000E+00	-0.035
FE-59	6.947E+00	6.569E+00	1.183E+01	0.000E+00	0.587
CO-60	1.411E+00	3.318E+00	5.675E+00	0.000E+00	0.249
ZN-65	-6.896E+00	6.598E+00	9.871E+00	0.000E+00	-0.699
SE-75	1.340E+00	4.431E+00	7.455E+00	0.000E+00	0.180
SR-85	1.419E+01	4.023E+00	7.516E+00	0.000E+00	1.887
Y-88	-1.927E-01	3.525E+00	5.764E+00	0.000E+00	-0.033
NB-94	-6.423E-01	3.067E+00	4.991E+00	0.000E+00	-0.129
NB-95	4.973E-01	3.217E+00	5.348E+00	0.000E+00	0.093
ZR-95	3.324E+00	5.828E+00	9.974E+00	0.000E+00	0.333
MO-99	-8.982E+01	1.833E+02	2.909E+02	0.000E+00	-0.309
RU-103	5.315E-01	3.861E+00	6.338E+00	0.000E+00	0.084
RU-106	-2.198E+01	2.953E+01	4.665E+01	0.000E+00	-0.471
AG-110m	6.658E-01	3.274E+00	5.485E+00	0.000E+00	0.121
SN-113	1.773E+00	4.049E+00	6.803E+00	0.000E+00	0.261
SB-124	-4.734E+00	4.395E+00	5.608E+00	0.000E+00	-0.844
SB-125	-8.574E+00	9.889E+00	1.551E+01	0.000E+00	-0.553
TE-129M	2.337E+01	4.191E+01	7.055E+01	0.000E+00	0.331
I-131	1.686E+00	6.475E+00	1.080E+01	0.000E+00	0.156
BA-133	8.937E-01	5.140E+00	7.254E+00	0.000E+00	0.123
CS-134	-1.847E+00	4.338E+00	5.887E+00	0.000E+00	-0.314
CS-136	-3.712E-01	4.864E+00	7.928E+00	0.000E+00	-0.047
CS-137	9.849E-01	3.524E+00	5.930E+00	0.000E+00	0.166
CE-139	3.118E-01	3.260E+00	5.352E+00	0.000E+00	0.058
BA-140	1.327E+01	1.696E+01	2.888E+01	0.000E+00	0.460
LA-140	3.352E+00	5.392E+00	9.564E+00	0.000E+00	0.351
CE-141	7.136E+00	7.069E+00	1.030E+01	0.000E+00	0.693
CE-144	-1.428E+01	2.758E+01	3.759E+01	0.000E+00	-0.380
EU-152	-5.464E-01	1.187E+01	1.653E+01	0.000E+00	-0.033
EU-154	6.839E+00	6.493E+00	1.102E+01	0.000E+00	0.620
AC-228	-1.450E+00	1.368E+01	2.127E+01	0.000E+00	-0.068
TH-228	3.636E+00	6.666E+00	1.074E+01	0.000E+00	0.339
TH-232	-1.447E+00	1.365E+01	2.121E+01	0.000E+00	-0.068
U-235	2.652E+01	2.848E+01	4.131E+01	0.000E+00	0.642
U-238	2.165E+02	3.353E+02	5.867E+02	0.000E+00	0.369
AM-241	3.563E+01	4.947E+01	6.943E+01	0.000E+00	0.513

A,11L28834-2	,06/09/2006 17:13,06/01/2006 09:05,	3.169E+00,WG L28834-2 EX
B,11L28834-2	,LIBD	,06/07/2006 09:40,113L082304
C,K-40	,YES,	1.447E+01, 5.889E+01, 4.899E+01,, 0.295
C,RA-226	,YES,	8.342E+01, 9.285E+01, 1.239E+02,, 0.673
C,BE-7	,NO ,	-2.159E+00, 2.895E+01, 4.704E+01,, -0.046
C,CR-51	,NO ,	-5.284E+01, 3.368E+01, 5.210E+01,, -1.014
C,MN-54	,NO ,	-8.710E-01, 3.046E+00, 4.874E+00,, -0.179
C,CO-57	,NO ,	2.417E+00, 3.160E+00, 5.323E+00,, 0.454
C,CO-58	,NO ,	-1.963E-01, 3.469E+00, 5.665E+00,, -0.035
C,FE-59	,NO ,	6.947E+00, 6.569E+00, 1.183E+01,, 0.587
C,CO-60	,NO ,	1.411E+00, 3.318E+00, 5.675E+00,, 0.249
C,ZN-65	,NO ,	-6.896E+00, 6.598E+00, 9.871E+00,, -0.699
C,SE-75	,NO ,	1.340E+00, 4.431E+00, 7.455E+00,, 0.180
C,SR-85	,NO ,	1.419E+01, 4.023E+00, 7.516E+00,, 1.887
C,Y-88	,NO ,	-1.927E-01, 3.525E+00, 5.764E+00,, -0.033
C,NB-94	,NO ,	-6.423E-01, 3.067E+00, 4.991E+00,, -0.129
C,NB-95	,NO ,	4.973E-01, 3.217E+00, 5.348E+00,, 0.093
C,ZR-95	,NO ,	3.324E+00, 5.828E+00, 9.974E+00,, 0.333
C,MO-99	,NO ,	-8.982E+01, 1.833E+02, 2.909E+02,, -0.309
C,RU-103	,NO ,	5.315E-01, 3.861E+00, 6.338E+00,, 0.084
C,RU-106	,NO ,	-2.198E+01, 2.953E+01, 4.665E+01,, -0.471
C,AG-110m	,NO ,	6.658E-01, 3.274E+00, 5.485E+00,, 0.121
C,SN-113	,NO ,	1.773E+00, 4.049E+00, 6.803E+00,, 0.261
C,SB-124	,NO ,	-4.734E+00, 4.395E+00, 5.608E+00,, -0.844
C,SB-125	,NO ,	-8.574E+00, 9.889E+00, 1.551E+01,, -0.553
C,TE-129M	,NO ,	2.337E+01, 4.191E+01, 7.055E+01,, 0.331
C,I-131	,NO ,	1.686E+00, 6.475E+00, 1.080E+01,, 0.156
C,BA-133	,NO ,	8.937E-01, 5.140E+00, 7.254E+00,, 0.123
C,CS-134	,NO ,	-1.847E+00, 4.338E+00, 5.887E+00,, -0.314
C,CS-136	,NO ,	-3.712E-01, 4.864E+00, 7.928E+00,, -0.047
C,CS-137	,NO ,	9.849E-01, 3.524E+00, 5.930E+00,, 0.166
C,CE-139	,NO ,	3.118E-01, 3.260E+00, 5.352E+00,, 0.058
C,BA-140	,NO ,	1.327E+01, 1.696E+01, 2.888E+01,, 0.460
C,LA-140	,NO ,	3.352E+00, 5.392E+00, 9.564E+00,, 0.351
C,CE-141	,NO ,	7.136E+00, 7.069E+00, 1.030E+01,, 0.693
C,CE-144	,NO ,	-1.428E+01, 2.758E+01, 3.759E+01,, -0.380
C,EU-152	,NO ,	-5.464E-01, 1.187E+01, 1.653E+01,, -0.033
C,EU-154	,NO ,	6.839E+00, 6.493E+00, 1.102E+01,, 0.620
C,AC-228	,NO ,	-1.450E+00, 1.368E+01, 2.127E+01,, -0.068
C,TH-228	,NO ,	3.636E+00, 6.666E+00, 1.074E+01,, 0.339
C,TH-232	,NO ,	-1.447E+00, 1.365E+01, 2.121E+01,, -0.068
C,U-235	,NO ,	2.652E+01, 2.848E+01, 4.131E+01,, 0.642
C,U-238	,NO ,	2.165E+02, 3.353E+02, 5.867E+02,, 0.369
C,AM-241	,NO ,	3.563E+01, 4.947E+01, 6.943E+01,, 0.513



Summary of Nuclide Activity  
 Sample ID : 15L28834-3

Page : 2  
 Acquisition date : 9-JUN-2006 13:53:50

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 pCi/L	Decay Corr pCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	3.431E+01	3.431E+01	3.379E+01	98.50	
			-----	-----			
		Total Activity :	3.431E+01	3.431E+01			

Grand Total Activity : 3.431E+01 3.431E+01

Flags: "K" = Keyline not found  
 "E" = Manually edited

"M" = Manually accepted  
 "A" = Nuclide specific abn. limit

Unidentified Energy Lines  
Sample ID : 15L28834-3

Page : 3  
Acquisition date : 9-JUN-2006 13:53:50

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
1	198.00	65	211	1.38	384.92	382	8	5.41E-03	80.4	2.44E+00	
1	608.67	41	73	2.15	1210.53	1207	9	3.39E-03	79.3	9.91E-01	
1	1112.06	24	24	2.29	2221.93	2214	13	1.95E-03	97.4	5.89E-01	
1	1763.75	28	18	3.19	3530.27	3522	15	2.34E-03	74.1	4.07E-01	

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 Uncorrected pCi/L	Wtd Mean Decay Corr pCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	3.431E+01	3.431E+01	3.379E+01	98.50	
Total Activity :			3.431E+01	3.431E+01			

Grand Total Activity : 3.431E+01      3.431E+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	3.431E+01	3.379E+01	4.296E+01	0.000E+00	0.799

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/L)	K.L. Ided	Act error	MDA (pCi/L)	MDA error	Act/MDA
BE-7	-2.996E-02		2.143E+01	3.565E+01	0.000E+00	-0.001
NA-24	-1.443E-02		1.016E-02	Half-Life too short		
CR-51	1.537E+01		2.304E+01	3.923E+01	0.000E+00	0.392
MN-54	-2.959E-01		2.755E+00	4.502E+00	0.000E+00	-0.066
CO-57	-1.203E+00		2.191E+00	3.415E+00	0.000E+00	-0.352
CO-58	-6.296E-02		2.519E+00	4.148E+00	0.000E+00	-0.015
FE-59	3.178E+00		6.100E+00	9.912E+00	0.000E+00	0.321



CO-60	2.230E+00	2.802E+00	4.938E+00	0.000E+00	0.452
ZN-65	8.178E+00	6.112E+00	1.003E+01	0.000E+00	0.815
SE-75	-1.060E+00	3.176E+00	5.056E+00	0.000E+00	-0.210
SR-85	9.468E+00	2.977E+00	5.601E+00	0.000E+00	1.690
Y-88	5.314E-01	3.038E+00	5.140E+00	0.000E+00	0.103
NB-94	1.380E+00	2.336E+00	3.956E+00	0.000E+00	0.349
NB-95	7.162E-01	2.755E+00	4.645E+00	0.000E+00	0.154
ZR-95	-1.265E+00	5.060E+00	8.247E+00	0.000E+00	-0.153
MO-99	-2.031E+01	1.371E+02	2.253E+02	0.000E+00	-0.090
RU-103	3.611E+00	2.750E+00	4.889E+00	0.000E+00	0.739
RU-106	1.580E+01	2.264E+01	3.882E+01	0.000E+00	0.407
AG-110m	-1.541E+00	2.550E+00	3.980E+00	0.000E+00	-0.387
SN-113	-1.520E+00	3.171E+00	5.053E+00	0.000E+00	-0.301
SB-124	-7.173E+00	3.674E+00	4.204E+00	0.000E+00	-1.706
SB-125	-4.803E+00	6.867E+00	1.072E+01	0.000E+00	-0.448
TE-129M	-6.639E+00	3.316E+01	5.308E+01	0.000E+00	-0.125
I-131	-3.243E+00	4.812E+00	7.636E+00	0.000E+00	-0.425
BA-133	-1.270E+00	3.361E+00	5.429E+00	0.000E+00	-0.234
CS-134	-2.233E+00	3.366E+00	4.399E+00	0.000E+00	-0.508
CS-136	-1.328E+00	3.668E+00	5.874E+00	0.000E+00	-0.226
CS-137	-9.963E-02	2.739E+00	4.451E+00	0.000E+00	-0.022
CE-139	-8.674E-01	2.125E+00	3.466E+00	0.000E+00	-0.250
BA-140	2.746E+00	1.325E+01	2.216E+01	0.000E+00	0.124
LA-140	-4.424E+00	4.851E+00	7.103E+00	0.000E+00	-0.623
CE-141	-3.393E+00	4.248E+00	6.894E+00	0.000E+00	-0.492
CE-144	-1.456E+01	1.670E+01	2.716E+01	0.000E+00	-0.536
EU-152	-1.032E+01	7.393E+00	1.137E+01	0.000E+00	-0.907
EU-154	-2.065E+00	4.502E+00	7.034E+00	0.000E+00	-0.294
RA-226	2.232E+01	5.709E+01	9.382E+01	0.000E+00	0.238
AC-228	3.458E+00	9.480E+00	1.597E+01	0.000E+00	0.217
TH-228	-2.211E-01	4.344E+00	6.861E+00	0.000E+00	-0.032
TH-232	3.449E+00	9.455E+00	1.593E+01	0.000E+00	0.217
U-235	-1.343E+01	1.662E+01	2.698E+01	0.000E+00	-0.498
U-238	3.984E+02	2.908E+02	5.270E+02	0.000E+00	0.756
AM-241	-1.674E+01	2.251E+01	3.635E+01	0.000E+00	-0.460

A, 15L28834-3	, 06/09/2006 17:15, 06/01/2006 14:20,	3.064E+00, WG L28834-3 EX
B, 15L28834-3	, LIBD	, 06/06/2006 10:43, 153L082604
C, K-40	, YES,	3.431E+01, 3.379E+01, 4.296E+01,, 0.799
C, BE-7	, NO ,	-2.996E-02, 2.143E+01, 3.565E+01,, -0.001
C, CR-51	, NO ,	1.537E+01, 2.304E+01, 3.923E+01,, 0.392
C, MN-54	, NO ,	-2.959E-01, 2.755E+00, 4.502E+00,, -0.066
C, CO-57	, NO ,	-1.203E+00, 2.191E+00, 3.415E+00,, -0.352
C, CO-58	, NO ,	-6.296E-02, 2.519E+00, 4.148E+00,, -0.015
C, FE-59	, NO ,	3.178E+00, 6.100E+00, 9.912E+00,, 0.321
C, CO-60	, NO ,	2.230E+00, 2.802E+00, 4.938E+00,, 0.452
C, ZN-65	, NO ,	8.178E+00, 6.112E+00, 1.003E+01,, 0.815
C, SE-75	, NO ,	-1.060E+00, 3.176E+00, 5.056E+00,, -0.210
C, SR-85	, NO ,	9.468E+00, 2.977E+00, 5.601E+00,, 1.690
C, Y-88	, NO ,	5.314E-01, 3.038E+00, 5.140E+00,, 0.103
C, NB-94	, NO ,	1.380E+00, 2.336E+00, 3.956E+00,, 0.349
C, NB-95	, NO ,	7.162E-01, 2.755E+00, 4.645E+00,, 0.154
C, ZR-95	, NO ,	-1.265E+00, 5.060E+00, 8.247E+00,, -0.153
C, MO-99	, NO ,	-2.031E+01, 1.371E+02, 2.253E+02,, -0.090
C, RU-103	, NO ,	3.611E+00, 2.750E+00, 4.889E+00,, 0.739
C, RU-106	, NO ,	1.580E+01, 2.264E+01, 3.882E+01,, 0.407
C, AG-110m	, NO ,	-1.541E+00, 2.550E+00, 3.980E+00,, -0.387
C, SN-113	, NO ,	-1.520E+00, 3.171E+00, 5.053E+00,, -0.301
C, SB-124	, NO ,	-7.173E+00, 3.674E+00, 4.204E+00,, -1.706
C, SB-125	, NO ,	-4.803E+00, 6.867E+00, 1.072E+01,, -0.448
C, TE-129M	, NO ,	-6.639E+00, 3.316E+01, 5.308E+01,, -0.125
C, I-131	, NO ,	-3.243E+00, 4.812E+00, 7.636E+00,, -0.425
C, BA-133	, NO ,	-1.270E+00, 3.361E+00, 5.429E+00,, -0.234
C, CS-134	, NO ,	-2.233E+00, 3.366E+00, 4.399E+00,, -0.508
C, CS-136	, NO ,	-1.328E+00, 3.668E+00, 5.874E+00,, -0.226
C, CS-137	, NO ,	-9.963E-02, 2.739E+00, 4.451E+00,, -0.022
C, CE-139	, NO ,	-8.674E-01, 2.125E+00, 3.466E+00,, -0.250
C, BA-140	, NO ,	2.746E+00, 1.325E+01, 2.216E+01,, 0.124
C, LA-140	, NO ,	-4.424E+00, 4.851E+00, 7.103E+00,, -0.623
C, CE-141	, NO ,	-3.393E+00, 4.248E+00, 6.894E+00,, -0.492
C, CE-144	, NO ,	-1.456E+01, 1.670E+01, 2.716E+01,, -0.536
C, EU-152	, NO ,	-1.032E+01, 7.393E+00, 1.137E+01,, -0.907
C, EU-154	, NO ,	-2.065E+00, 4.502E+00, 7.034E+00,, -0.294
C, RA-226	, NO ,	2.232E+01, 5.709E+01, 9.382E+01,, 0.238
C, AC-228	, NO ,	3.458E+00, 9.480E+00, 1.597E+01,, 0.217
C, TH-228	, NO ,	-2.211E-01, 4.344E+00, 6.861E+00,, -0.032
C, TH-232	, NO ,	3.449E+00, 9.455E+00, 1.593E+01,, 0.217
C, U-235	, NO ,	-1.343E+01, 1.662E+01, 2.698E+01,, -0.498
C, U-238	, NO ,	3.984E+02, 2.908E+02, 5.270E+02,, 0.756
C, AM-241	, NO ,	-1.674E+01, 2.251E+01, 3.635E+01,, -0.460



Summary of Nuclide Activity  
 Sample ID : 14L28834-4

Page : 2  
 Acquisition date : 9-JUN-2006 14:19:12

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 pCi/L	Decay Corr pCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	9.785E+00	9.785E+00	50.43E+00	515.41	
TH-228	1.91Y	1.01	7.037E-01	7.096E-01	52.76E-01	743.57	
Total Activity :			1.049E+01	1.049E+01			

Grand Total Activity : 1.049E+01 1.049E+01

Flags: "K" = Keyline not found  
 "E" = Manually edited

"M" = Manually accepted  
 "A" = Nuclide specific abn. limit

Unidentified Energy Lines  
 Sample ID : 14L28834-4

Page : 3  
 Acquisition date : 9-JUN-2006 14:19:12

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
1	66.31	348	1044	2.56	133.62	129	12	1.45E-02	38.8	5.11E-01	
1	92.39	98	854	2.34	185.92	181	11	4.09E-03	****	1.27E+00	
1	139.76	178	681	0.87	280.88	277	9	7.41E-03	54.7	1.89E+00	
1	198.54	206	647	1.74	398.68	393	11	8.58E-03	53.2	1.83E+00	
1	295.79	60	355	2.11	593.46	589	9	2.51E-03	****	1.45E+00	
1	351.90	57	341	1.65	705.78	701	11	2.37E-03	****	1.28E+00	
1	595.67	79	139	1.34	1193.12	1190	8	3.29E-03	55.4	8.48E-01	
1	609.34	28	263	1.86	1220.42	1215	14	1.15E-03	****	8.33E-01	
1	1765.91	24	41	3.32	3519.50	3513	18	9.84E-04	****	3.79E-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 Uncorrected pCi/L	Wtd Mean Decay Corr pCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	9.785E+00	9.785E+00	50.43E+00	515.41	
TH-228	1.91Y	1.01	7.037E-01	7.096E-01	52.76E-01	743.57	
Total Activity :			1.049E+01	1.049E+01			

Grand Total Activity : 1.049E+01 1.049E+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	9.785E+00	5.043E+01	3.746E+01	0.000E+00	0.261
TH-228	7.096E-01	5.276E+00	7.140E+00	0.000E+00	0.099

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/L)	K.L. Ided	Act error	MDA (pCi/L)	MDA error	Act/MDA
---------	---------------------------------	--------------	-----------	----------------	-----------	---------

3E-7	-2.741E+01	2.339E+01	3.699E+01	0.000E+00	-0.741
NA-24	-8.351E-03	1.340E-02	Half-Life	too short	
CR-51	3.154E-01	2.506E+01	4.109E+01	0.000E+00	0.008
VN-54	1.493E+00	2.562E+00	4.290E+00	0.000E+00	0.348
CO-57	2.801E+00	2.473E+00	4.194E+00	0.000E+00	0.668
CO-58	1.211E-01	2.577E+00	4.219E+00	0.000E+00	0.029
FE-59	3.151E+00	5.343E+00	9.011E+00	0.000E+00	0.350
CO-60	6.357E-01	2.450E+00	4.101E+00	0.000E+00	0.155
ZN-65	6.972E+00	5.469E+00	9.520E+00	0.000E+00	0.732
SE-75	-4.658E+00	3.282E+00	5.237E+00	0.000E+00	-0.889
SR-85	2.053E+01	3.102E+00	5.957E+00	0.000E+00	3.447
Y-88	-1.767E+00	2.824E+00	4.397E+00	0.000E+00	-0.402
NB-94	1.024E+00	2.367E+00	3.973E+00	0.000E+00	0.258
NB-95	-8.614E-01	2.701E+00	4.369E+00	0.000E+00	-0.197
ZR-95	-1.466E+00	4.905E+00	7.947E+00	0.000E+00	-0.184
MO-99	-2.979E+01	1.534E+02	2.500E+02	0.000E+00	-0.119
RU-103	2.144E+00	2.983E+00	5.019E+00	0.000E+00	0.427
RU-106	-2.445E+00	2.438E+01	3.769E+01	0.000E+00	-0.065
AG-110m	-2.819E-02	2.424E+00	4.012E+00	0.000E+00	-0.007
SN-113	-1.280E+00	3.312E+00	5.304E+00	0.000E+00	-0.241
SB-124	-3.714E+00	7.252E+00	4.598E+00	0.000E+00	-0.808
SB-125	2.546E+00	7.027E+00	1.178E+01	0.000E+00	0.216
TE-129M	-2.336E+01	3.358E+01	5.418E+01	0.000E+00	-0.431
I-131	-8.118E-01	5.122E+00	8.300E+00	0.000E+00	-0.098
BA-133	4.765E+00	4.113E+00	5.936E+00	0.000E+00	0.803
CS-134	2.837E+00	4.872E+00	4.788E+00	0.000E+00	0.592
CS-136	-2.130E+00	3.605E+00	5.713E+00	0.000E+00	-0.373
CS-137	1.779E+00	2.607E+00	4.436E+00	0.000E+00	0.401
CE-139	1.580E+00	2.431E+00	4.041E+00	0.000E+00	0.391
BA-140	-7.354E+00	1.380E+01	2.213E+01	0.000E+00	-0.332
LA-140	8.004E-02	4.170E+00	6.912E+00	0.000E+00	0.012
CE-141	-4.032E-01	5.627E+00	7.862E+00	0.000E+00	-0.051
CE-144	6.574E+00	2.180E+01	3.093E+01	0.000E+00	0.213
EU-152	-6.448E-02	9.256E+00	1.275E+01	0.000E+00	-0.005
EU-154	5.980E+00	5.138E+00	8.714E+00	0.000E+00	0.686
RA-226	-9.091E-01	6.505E+01	1.001E+02	0.000E+00	-0.009
AC-228	2.081E+00	1.017E+01	1.632E+01	0.000E+00	0.128
TH-232	2.076E+00	1.014E+01	1.627E+01	0.000E+00	0.128
U-235	1.699E+01	2.203E+01	3.156E+01	0.000E+00	0.538
U-238	3.264E+02	2.931E+02	5.075E+02	0.000E+00	0.643
AM-241	-1.217E+01	3.767E+01	5.225E+01	0.000E+00	-0.233

A,14L28834-4	,06/09/2006 20:59,06/01/2006 09:30,	3.034E+00,WG L28834-4 EX
B,14L28834-4	,LIBD	,06/02/2006 08:23,143L082304
C,K-40	,YES,	9.785E+00, 5.043E+01, 3.746E+01,, 0.261
C,TH-228	,YES,	7.096E-01, 5.276E+00, 7.140E+00,, 0.099
C,BE-7	,NO,	-2.741E+01, 2.339E+01, 3.699E+01,, -0.741
C,CR-51	,NO,	3.154E-01, 2.506E+01, 4.109E+01,, 0.008
C,MN-54	,NO,	1.493E+00, 2.562E+00, 4.290E+00,, 0.348
C,CO-57	,NO,	2.801E+00, 2.473E+00, 4.194E+00,, 0.668
C,CO-58	,NO,	1.211E-01, 2.577E+00, 4.219E+00,, 0.029
C,FE-59	,NO,	3.151E+00, 5.343E+00, 9.011E+00,, 0.350
C,CO-60	,NO,	6.357E-01, 2.450E+00, 4.101E+00,, 0.155
C,ZN-65	,NO,	6.972E+00, 5.469E+00, 9.520E+00,, 0.732
C,SE-75	,NO,	-4.658E+00, 3.282E+00, 5.237E+00,, -0.889
C,SR-85	,NO,	2.053E+01, 3.102E+00, 5.957E+00,, 3.447
C,Y-88	,NO,	-1.767E+00, 2.824E+00, 4.397E+00,, -0.402
C,NB-94	,NO,	1.024E+00, 2.367E+00, 3.973E+00,, 0.258
C,NB-95	,NO,	-8.614E-01, 2.701E+00, 4.369E+00,, -0.197
C,ZR-95	,NO,	-1.466E+00, 4.905E+00, 7.947E+00,, -0.184
C,MO-99	,NO,	-2.979E+01, 1.534E+02, 2.500E+02,, -0.119
C,RU-103	,NO,	2.144E+00, 2.983E+00, 5.019E+00,, 0.427
C,RU-106	,NO,	-2.445E+00, 2.438E+01, 3.769E+01,, -0.065
C,AG-110m	,NO,	-2.819E-02, 2.424E+00, 4.012E+00,, -0.007
C,SN-113	,NO,	-1.280E+00, 3.312E+00, 5.304E+00,, -0.241
C,SB-124	,NO,	-3.714E+00, 7.252E+00, 4.598E+00,, -0.808
C,SB-125	,NO,	2.546E+00, 7.027E+00, 1.178E+01,, 0.216
C,TE-129M	,NO,	-2.336E+01, 3.358E+01, 5.418E+01,, -0.431
C,I-131	,NO,	-8.118E-01, 5.122E+00, 8.300E+00,, -0.098
C,BA-133	,NO,	4.765E+00, 4.113E+00, 5.936E+00,, 0.803
C,CS-134	,NO,	2.837E+00, 4.872E+00, 4.788E+00,, 0.592
C,CS-136	,NO,	-2.130E+00, 3.605E+00, 5.713E+00,, -0.373
C,CS-137	,NO,	1.779E+00, 2.607E+00, 4.436E+00,, 0.401
C,CE-139	,NO,	1.580E+00, 2.431E+00, 4.041E+00,, 0.391
C,BA-140	,NO,	-7.354E+00, 1.380E+01, 2.213E+01,, -0.332
C,LA-140	,NO,	8.004E-02, 4.170E+00, 6.912E+00,, 0.012
C,CE-141	,NO,	-4.032E-01, 5.627E+00, 7.862E+00,, -0.051
C,CE-144	,NO,	6.574E+00, 2.180E+01, 3.093E+01,, 0.213
C,EU-152	,NO,	-6.448E-02, 9.256E+00, 1.275E+01,, -0.005
C,EU-154	,NO,	5.980E+00, 5.138E+00, 8.714E+00,, 0.686
C,RA-226	,NO,	-9.091E-01, 6.505E+01, 1.001E+02,, -0.009
C,AC-228	,NO,	2.081E+00, 1.017E+01, 1.632E+01,, 0.128
C,TH-232	,NO,	2.076E+00, 1.014E+01, 1.627E+01,, 0.128
C,U-235	,NO,	1.699E+01, 2.203E+01, 3.156E+01,, 0.538
C,U-238	,NO,	3.264E+02, 2.931E+02, 5.075E+02,, 0.643
C,AM-241	,NO,	-1.217E+01, 3.767E+01, 5.225E+01,, -0.233

Sec. Review: Analyst: *(Signature)* LIMS: ✓

VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 9-JUN-2006 21:57:15.11  
 TBE10 12892256 HpGe \*\*\*\*\* Aquisition Date/Time: 9-JUN-2006 16:43:59.06

LIMS No., Customer Name, Client ID: WG L28834-5 QUAD CITY

Sample ID : 10L28834-5 Smple Date: 1-JUN-2006 09:15:00.0  
 Sample Type : WG Geometry : 103L083004  
 Quantity : 3.00370E+00 L BKGFILE : 10BG060306MT  
 Start Channel : 80 Energy Tol : 1.00000 Real Time : 0 05:13:10.27  
 End Channel : 4090 Pk Srch Sens: 5.00000 Live time : 0 05:13:07.20  
 MDA Constant : 0.00 Library Used: LIBD

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	%Eff	Cts/Sec	%Err	Fit
1	1	66.67*	86	669	1.47	132.45	7.40E-01	4.59E-03	57.7	1.12E+00
2	1	139.88	165	699	1.27	278.93	1.91E+00	8.81E-03	33.1	1.26E+00
3	1	198.88	212	559	2.15	396.99	1.71E+00	1.13E-02	21.9	1.26E+01
4	1	238.59*	31	333	1.53	476.44	1.54E+00	1.64E-03	122.0	3.56E-01
5	1	352.03*	61	213	1.75	703.45	1.17E+00	3.25E-03	55.6	9.92E-01
6	1	596.17	69	130	1.98	1192.02	7.85E-01	3.70E-03	37.2	1.31E+00
7	1	609.69*	61	107	1.96	1219.08	7.72E-01	3.24E-03	41.7	1.45E+00
8	1	1848.53	16	6	1.89	3699.11	3.29E-01	8.57E-04	37.9	1.12E+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
TH-228	238.63	31	44.60*	1.538E+00	2.147E+00	2.165E+00	243.98
	240.98	-----	3.95	1.529E+00	-----	Line Not Found	-----

Flag: "\*" = Keyline



## Summary of Nuclide Activity

Page : 2

Sample ID : 10L28834-5

Acquisition date : 9-JUN-2006 16:43:59

Total number of lines in spectrum	8	
Number of unidentified lines	7	
Number of lines tentatively identified by NID	1	12.50%

Nuclide Type : natural

Nuclide	Hlife	Decay	Uncorrected pCi/L	Decay Corr pCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
TH-228	1.91Y	1.01	2.147E+00	2.165E+00	5.281E+00	243.98	
			-----	-----			
		Total Activity :	2.147E+00	2.165E+00			

Grand Total Activity : 2.147E+00 2.165E+00

Flags: "K" = Keyline not found  
 "E" = Manually edited

"M" = Manually accepted  
 "A" = Nuclide specific abn. limit

Unidentified Energy Lines  
Sample ID : 10L28834-5

Acquisition date : 9-JUN-2006 16:43:59

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
1	66.67	86	669	1.47	132.45	128	9	4.59E-03	****	7.40E-01	
1	139.88	165	699	1.27	278.93	273	12	8.81E-03	66.2	1.91E+00	
1	198.88	212	559	2.15	396.99	392	11	1.13E-02	43.8	1.71E+00	
1	352.03	61	213	1.75	703.45	698	12	3.25E-03	****	1.17E+00	
1	596.17	69	130	1.98	1192.02	1185	14	3.70E-03	74.4	7.85E-01	
1	609.69	61	107	1.96	1219.08	1213	12	3.24E-03	83.3	7.72E-01	
1	1848.53	16	6	1.89	3699.11	3695	9	8.57E-04	75.7	3.29E-01	

Flags: "T" = Tentatively associated

Summary of Nuclide Activity

Total number of lines in spectrum	8
Number of unidentified lines	7
Number of lines tentatively identified by NID	1 12.50%

Nuclide Type : natural

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/L	Wtd Mean Decay Corr pCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
TH-228	1.91Y	1.01	2.147E+00	2.165E+00	5.281E+00	243.98	
Total Activity :			2.147E+00	2.165E+00			
Grand Total Activity :			2.147E+00	2.165E+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
TH-228	2.165E+00	5.281E+00	8.371E+00	0.000E+00	0.259

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/L)	K.L. Ided	Act error	MDA (pCi/L)	MDA error	Act/MDA
BE-7	1.441E+00		2.515E+01	4.182E+01	0.000E+00	0.034
NA-24	1.674E-03		1.589E-02	Half-Life too short		
K-40	-2.703E+00		4.178E+01	7.466E+01	0.000E+00	-0.036
CR-51	-1.475E+01		2.877E+01	4.652E+01	0.000E+00	-0.317

VN-54	-1.148E+00	2.806E+00	4.522E+00	0.000E+00	-0.254
CO-57	-1.093E+00	2.763E+00	4.530E+00	0.000E+00	-0.241
CO-58	-6.437E-01	2.793E+00	4.553E+00	0.000E+00	-0.141
FE-59	4.959E-01	5.528E+00	9.230E+00	0.000E+00	0.054
CO-60	2.107E+00	2.880E+00	4.994E+00	0.000E+00	0.422
ZN-65	5.592E+00	5.781E+00	1.019E+01	0.000E+00	0.549
SE-75	4.452E-01	4.001E+00	6.655E+00	0.000E+00	0.067
SR-85	2.122E+01	3.601E+00	7.004E+00	0.000E+00	3.030
Y-88	2.255E+00	3.228E+00	5.344E+00	0.000E+00	0.422
NB-94	1.737E-01	2.689E+00	4.389E+00	0.000E+00	0.040
NB-95	1.638E+00	2.845E+00	4.865E+00	0.000E+00	0.337
ZR-95	-1.780E+00	4.901E+00	7.960E+00	0.000E+00	-0.224
MO-99	-5.329E+01	1.637E+02	2.671E+02	0.000E+00	-0.200
RU-103	-3.425E-01	3.271E+00	5.393E+00	0.000E+00	-0.064
RU-106	2.567E+01	2.620E+01	4.398E+01	0.000E+00	-0.064
AG-110m	9.875E-01	2.786E+00	4.631E+00	0.000E+00	0.584
SN-113	1.309E+00	3.903E+00	6.446E+00	0.000E+00	0.213
SB-124	9.001E-01	6.894E+00	4.937E+00	0.000E+00	0.182
SB-125	-1.665E+00	8.293E+00	1.336E+01	0.000E+00	-0.125
TE-129M	-1.600E+01	3.611E+01	5.892E+01	0.000E+00	-0.272
I-131	1.179E+00	5.974E+00	9.845E+00	0.000E+00	0.120
BA-133	8.814E+00	4.680E+00	7.097E+00	0.000E+00	1.242
CS-134	9.460E+00	5.449E+00	5.129E+00	0.000E+00	1.845
CS-136	-1.343E+00	4.121E+00	6.678E+00	0.000E+00	-0.201
CS-137	3.192E+00	2.942E+00	5.076E+00	0.000E+00	0.629
CE-139	-8.003E-01	2.953E+00	4.806E+00	0.000E+00	-0.167
BA-140	5.659E-01	1.507E+01	2.490E+01	0.000E+00	0.023
LA-140	1.071E-04	4.729E+00	7.817E+00	0.000E+00	0.000
CE-141	2.248E+00	6.438E+00	9.095E+00	0.000E+00	0.247
CE-144	1.026E+00	2.509E+01	3.519E+01	0.000E+00	0.029
EU-152	-1.092E+01	1.100E+01	1.446E+01	0.000E+00	-0.755
EU-154	-4.323E+00	5.708E+00	9.282E+00	0.000E+00	-0.466
RA-226	-4.013E+00	7.409E+01	1.160E+02	0.000E+00	-0.035
AC-228	-1.244E+00	1.104E+01	1.720E+01	0.000E+00	-0.072
TH-232	-1.241E+00	1.101E+01	1.715E+01	0.000E+00	-0.072
U-235	2.343E+01	2.534E+01	3.647E+01	0.000E+00	0.642
U-238	3.901E+02	3.006E+02	5.323E+02	0.000E+00	0.733
AM-241	-4.595E+01	2.799E+01	3.815E+01	0.000E+00	-1.204

A,10L28834-5 ,06/09/2006 21:57,06/01/2006 09:15, 3.004E+00,WG L28834-5 QU  
 B,10L28834-5 ,LIBD ,06/07/2006 09:32,103L083004  
 C,TH-228 ,YES, 2.165E+00, 5.281E+00, 8.371E+00,, 0.259  
 C,BE-7 ,NO , 1.441E+00, 2.515E+01, 4.182E+01,, 0.034  
 C,K-40 ,NO , -2.703E+00, 4.178E+01, 7.466E+01,, -0.036  
 C,CR-51 ,NO , -1.475E+01, 2.877E+01, 4.652E+01,, -0.317  
 C,MN-54 ,NO , -1.148E+00, 2.806E+00, 4.522E+00,, -0.254  
 C,CO-57 ,NO , -1.093E+00, 2.763E+00, 4.530E+00,, -0.241  
 C,CO-58 ,NO , -6.437E-01, 2.793E+00, 4.553E+00,, -0.141  
 C,FE-59 ,NO , 4.959E-01, 5.528E+00, 9.230E+00,, 0.054  
 C,CO-60 ,NO , 2.107E+00, 2.880E+00, 4.994E+00,, 0.422  
 C,ZN-65 ,NO , 5.592E+00, 5.781E+00, 1.019E+01,, 0.549  
 C,SE-75 ,NO , 4.452E-01, 4.001E+00, 6.655E+00,, 0.067  
 C,SR-85 ,NO , 2.122E+01, 3.601E+00, 7.004E+00,, 3.030  
 C,Y-88 ,NO , 2.255E+00, 3.228E+00, 5.344E+00,, 0.422  
 C,NB-94 ,NO , 1.737E-01, 2.689E+00, 4.389E+00,, 0.040  
 C,NB-95 ,NO , 1.638E+00, 2.845E+00, 4.865E+00,, 0.337  
 C,ZR-95 ,NO , -1.780E+00, 4.901E+00, 7.960E+00,, -0.224  
 C,MO-99 ,NO , -5.329E+01, 1.637E+02, 2.671E+02,, -0.200  
 C,RU-103 ,NO , -3.425E-01, 3.271E+00, 5.393E+00,, -0.064  
 C,RU-106 ,NO , 2.567E+01, 2.620E+01, 4.398E+01,, 0.584  
 C,AG-110m ,NO , 9.875E-01, 2.786E+00, 4.631E+00,, 0.213  
 C,SN-113 ,NO , 1.309E+00, 3.903E+00, 6.446E+00,, 0.203  
 C,SB-124 ,NO , 9.001E-01, 6.894E+00, 4.937E+00,, 0.182  
 C,SB-125 ,NO , -1.665E+00, 8.293E+00, 1.336E+01,, -0.125  
 C,TE-129M ,NO , -1.600E+01, 3.611E+01, 5.892E+01,, -0.272  
 C,I-131 ,NO , 1.179E+00, 5.974E+00, 9.845E+00,, 0.120  
 C,BA-133 ,NO , 8.814E+00, 4.680E+00, 7.097E+00,, 1.242  
 C,CS-134 ,NO , 9.460E+00, 5.449E+00, 5.129E+00,, 1.845  
 C,CS-136 ,NO , -1.343E+00, 4.121E+00, 6.678E+00,, -0.201  
 C,CS-137 ,NO , 3.192E+00, 2.942E+00, 5.076E+00,, 0.629  
 C,CE-139 ,NO , -8.003E-01, 2.953E+00, 4.806E+00,, -0.167  
 C,BA-140 ,NO , 5.659E-01, 1.507E+01, 2.490E+01,, 0.023  
 C,LA-140 ,NO , 1.071E-04, 4.729E+00, 7.817E+00,, 0.000  
 C,CE-141 ,NO , 2.248E+00, 6.438E+00, 9.095E+00,, 0.247  
 C,CE-144 ,NO , 1.026E+00, 2.509E+01, 3.519E+01,, 0.029  
 C,EU-152 ,NO , -1.092E+01, 1.100E+01, 1.446E+01,, -0.755  
 C,EU-154 ,NO , -4.323E+00, 5.708E+00, 9.282E+00,, -0.466  
 C,RA-226 ,NO , -4.013E+00, 7.409E+01, 1.160E+02,, -0.035  
 C,AC-228 ,NO , -1.244E+00, 1.104E+01, 1.720E+01,, -0.072  
 C,TH-232 ,NO , -1.241E+00, 1.101E+01, 1.715E+01,, -0.072  
 C,U-235 ,NO , 2.343E+01, 2.534E+01, 3.647E+01,, 0.642  
 C,U-238 ,NO , 3.901E+02, 3.006E+02, 5.323E+02,, 0.733  
 C,AM-241 ,NO , -4.595E+01, 2.799E+01, 3.815E+01,, -1.204

Sec. Review:      Analyst:      LIMS:       

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VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 9-JUN-2006 21:55:25.31  
 TBE04 P-40312B HpGe \*\*\*\*\* Aquisition Date/Time: 9-JUN-2006 17:06:18.94

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LIMS No., Customer Name, Client ID: WG L28834-6 QUAD CITY

Sample ID : 04L28834-6      Smple Date: 1-JUN-2006 08:20:00.0  
 Sample Type : WG      Geometry : 043L082004  
 Quantity : 3.00120E+00 L      BKGFILE : 04BG060306MT  
 Start Channel : 90      Energy Tol : 1.00000      Real Time : 0 04:48:55.91  
 End Channel : 4090      Pk Srch Sens: 5.00000      Live time : 0 04:48:53.00  
 MDA Constant : 0.00      Library Used: LIBD

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	%Eff	Cts/Sec	%Err	Fit
1	1	66.22*	113	449	1.46	132.91	6.60E-01	6.52E-03	35.3	2.51E+00
2	1	140.02	148	436	1.50	280.48	2.04E+00	8.54E-03	26.7	2.60E+00
3	1	198.69*	95	289	1.54	397.79	1.86E+00	5.50E-03	38.8	1.99E+00
4	1	238.91*	12	277	1.22	478.24	1.68E+00	6.66E-04	298.6	2.18E+00
5	1	351.81*	27	168	1.47	703.98	1.28E+00	1.57E-03	100.8	2.14E+00
6	1	596.63	61	102	1.78	1193.50	8.62E-01	3.53E-03	33.7	1.44E+00
7	1	609.85*	67	124	1.95	1219.92	8.48E-01	3.89E-03	43.9	1.13E+00
8	1	849.36	117	88	11.37	1698.76	6.56E-01	6.73E-03	24.0	1.59E+00
9	1	911.68*	14	55	1.94	1823.35	6.21E-01	8.12E-04	119.3	3.71E+00
10	1	922.01	39	13	1.77	1844.00	6.15E-01	2.25E-03	18.5	
11	1	1173.82*	9	33	2.66	2347.36	5.08E-01	5.33E-04	158.3	1.07E+00
12	1	1461.81	94	27	3.04	2922.98	4.29E-01	5.41E-03	15.8	2.14E+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	94	10.67*	4.294E-01	1.063E+02	1.063E+02	31.67
AC-228	835.50	-----	1.75	6.649E-01	-----	Line Not Found	-----
	911.07	14	27.70*	6.208E-01	4.251E+00	4.262E+00	238.56
TH-228	238.63	12	44.60*	1.678E+00	8.008E-01	8.075E-01	597.29
	240.98	-----	3.95	1.669E+00	-----	Line Not Found	-----

Nuclide Type: activation

Nuclide	Energy	Area	%Abn	%Eff	Uncorrected pCi/L	Decay Corr pCi/L	2-Sigma %Error
CO-60	1173.22	9	100.00	5.083E-01	9.441E-01	9.470E-01	316.63
	1332.49	-----	100.00*	4.604E-01	-----	Line Not Found	-----

Flag: "\*" = Keyline

## Summary of Nuclide Activity

Page : 2

Sample ID : 04L28834-6

Acquisition date : 9-JUN-2006 17:06:18

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 pCi/L	Decay Corr pCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	1.063E+02	1.063E+02	0.337E+02	31.67	
AC-228	5.75Y	1.00	4.251E+00	4.262E+00	10.17E+00	238.56	
TH-228	1.91Y	1.01	8.008E-01	8.075E-01	48.23E-01	597.29	
Total Activity :			1.114E+02	1.114E+02			

Nuclide Type : activation

Nuclide	Hlife	Decay	Uncorrected pCi/L	Decay Corr pCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
CO-60	5.27Y	1.00	9.441E-01	9.470E-01	29.98E-01	316.63	K
Total Activity :			9.441E-01	9.470E-01			

Grand Total Activity : 1.123E+02 1.123E+02

Flags: "K" = Keyline not found

"E" = Manually edited

"M" = Manually accepted

"A" = Nuclide specific abn. limit

Unidentified Energy Lines  
Sample ID : 04L28834-6

Page : 3  
Acquisition date : 9-JUN-2006 17:06:18

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
1	66.22	113	449	1.46	132.91	130	8	6.52E-03	70.6	6.60E-01	
1	140.02	148	436	1.50	280.48	276	9	8.54E-03	53.5	2.04E+00	
1	198.69	95	289	1.54	397.79	393	9	5.50E-03	77.6	1.86E+00	
1	351.81	27	168	1.47	703.98	700	9	1.57E-03	****	1.28E+00	
1	596.63	61	102	1.78	1193.50	1189	10	3.53E-03	67.5	8.62E-01	
1	609.85	67	124	1.95	1219.92	1215	16	3.89E-03	87.8	8.48E-01	
1	849.36	117	88	11.37	1698.76	1688	27	6.73E-03	48.0	6.56E-01	
1	922.01	39	13	1.77	1844.00	1817	30	2.25E-03	37.0	6.15E-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		Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
			Uncorrected pCi/L	Decay Corr pCi/L			
K-40	1.28E+09Y	1.00	1.063E+02	1.063E+02	0.337E+02	31.67	
AC-228	5.75Y	1.00	4.251E+00	4.262E+00	10.17E+00	238.56	
TH-228	1.91Y	1.01	8.008E-01	8.075E-01	48.23E-01	597.29	
Total Activity :			1.114E+02	1.114E+02			

Nuclide Type : activation

Nuclide	Hlife	Decay	Wtd Mean		Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
			Uncorrected pCi/L	Decay Corr pCi/L			
CO-60	5.27Y	1.00	9.441E-01	9.470E-01	29.98E-01	316.63	
Total Activity :			9.441E-01	9.470E-01			

Grand Total Activity : 1.123E+02 1.123E+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 (pCi/L)	Act error	MDA (pCi/L)	MDA error	Act/MDA
K-40	1.063E+02	3.368E+01	4.201E+01	0.000E+00	2.531

CO-60	9.470E-01	2.998E+00	5.151E+00	0.000E+00	0.184
AC-228	4.262E+00	1.017E+01	1.484E+01	0.000E+00	0.287
TH-228	8.075E-01	4.823E+00	7.535E+00	0.000E+00	0.107

## ---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/L)	K.L. Ided	Act error	MDA (pCi/L)	MDA error	Act/MDA
BE-7	1.158E+01		2.282E+01	3.860E+01	0.000E+00	0.300
NA-24	-1.781E-02		1.540E-02	Half-Life too short		
CR-51	-9.995E-01		2.554E+01	4.198E+01	0.000E+00	-0.024
MN-54	1.173E+00		2.678E+00	4.316E+00	0.000E+00	0.272
CO-57	2.209E+00		2.183E+00	3.753E+00	0.000E+00	0.589
CO-58	-9.194E-01		2.730E+00	4.370E+00	0.000E+00	-0.210
FE-59	4.089E+00		5.847E+00	1.001E+01	0.000E+00	0.408
ZN-65	-2.585E+00		5.671E+00	8.959E+00	0.000E+00	-0.289
SE-75	-1.355E+00		3.352E+00	5.503E+00	0.000E+00	-0.246
SR-85	2.076E+01		3.291E+00	6.528E+00	0.000E+00	3.180
Y-88	-1.786E+00		2.838E+00	4.314E+00	0.000E+00	-0.414
NB-94	-2.826E-01		2.367E+00	3.885E+00	0.000E+00	-0.073
NB-95	1.662E+00		2.666E+00	4.540E+00	0.000E+00	0.366
ZR-95	-5.864E+00		4.474E+00	6.707E+00	0.000E+00	-0.874
MO-99	-3.259E+01		1.586E+02	2.580E+02	0.000E+00	-0.126
RU-103	6.843E-01		2.994E+00	4.986E+00	0.000E+00	0.137
RU-106	-8.338E+00		2.798E+01	3.964E+01	0.000E+00	-0.210
AG-110m	-6.000E-01		2.452E+00	4.015E+00	0.000E+00	-0.149
SN-113	2.931E+00		3.248E+00	5.494E+00	0.000E+00	0.533
SB-124	4.040E+00		5.664E+00	4.702E+00	0.000E+00	0.859
SB-125	-1.080E+00		6.890E+00	1.139E+01	0.000E+00	-0.095
TE-129M	-7.561E+00		3.347E+01	5.491E+01	0.000E+00	-0.138
I-131	-2.123E+00		5.212E+00	8.365E+00	0.000E+00	-0.254
BA-133	5.042E+00		4.170E+00	6.180E+00	0.000E+00	0.816
CS-134	5.114E+00		5.244E+00	4.538E+00	0.000E+00	1.127
CS-136	1.156E+00		3.811E+00	6.348E+00	0.000E+00	0.182
CS-137	9.830E-01		2.689E+00	4.552E+00	0.000E+00	0.216
CE-139	6.376E-01		2.304E+00	3.833E+00	0.000E+00	0.166
BA-140	7.741E+00		1.339E+01	2.262E+01	0.000E+00	0.342
LA-140	2.583E+00		4.677E+00	8.110E+00	0.000E+00	0.319
CE-141	1.906E+00		5.175E+00	7.460E+00	0.000E+00	0.255
CE-144	2.434E+00		2.000E+01	2.869E+01	0.000E+00	0.085
EU-152	-1.128E+00		8.836E+00	1.260E+01	0.000E+00	-0.090
EU-154	5.059E+00		4.558E+00	7.849E+00	0.000E+00	0.645
RA-226	-3.588E+00		6.289E+01	9.888E+01	0.000E+00	-0.036
TH-232	4.251E+00	+	1.014E+01	1.644E+01	0.000E+00	0.259
U-235	1.656E+01		1.983E+01	2.914E+01	0.000E+00	0.568
U-238	2.666E+02		2.577E+02	4.566E+02	0.000E+00	0.584
AM-241	-1.588E+01		2.536E+01	3.934E+01	0.000E+00	-0.404



A,04L28834-6	,06/09/2006	21:55	,06/01/2006	08:20,	3.001E+00,WG L28834-6 QU
B,04L28834-6	,LIBD		,06/02/2006	09:04,	043L082004
C,K-40	,YES,	1.063E+02,	3.368E+01,	4.201E+01,,	2.531
C,CO-60	,YES,	9.470E-01,	2.998E+00,	5.151E+00,,	0.184
C,AC-228	,YES,	4.262E+00,	1.017E+01,	1.484E+01,,	0.287
C,TH-228	,YES,	8.075E-01,	4.823E+00,	7.535E+00,,	0.107
C,BE-7	,NO,	1.158E+01,	2.282E+01,	3.860E+01,,	0.300
C,CR-51	,NO,	-9.995E-01,	2.554E+01,	4.198E+01,,	-0.024
C,MN-54	,NO,	1.173E+00,	2.678E+00,	4.316E+00,,	0.272
C,CO-57	,NO,	2.209E+00,	2.183E+00,	3.753E+00,,	0.589
C,CO-58	,NO,	-9.194E-01,	2.730E+00,	4.370E+00,,	-0.210
C,FE-59	,NO,	4.089E+00,	5.847E+00,	1.001E+01,,	0.408
C,ZN-65	,NO,	-2.585E+00,	5.671E+00,	8.959E+00,,	-0.289
C,SE-75	,NO,	-1.355E+00,	3.352E+00,	5.503E+00,,	-0.246
C,SR-85	,NO,	2.076E+01,	3.291E+00,	6.528E+00,,	3.180
C,Y-88	,NO,	-1.786E+00,	2.838E+00,	4.314E+00,,	-0.414
C,NB-94	,NO,	-2.826E-01,	2.367E+00,	3.885E+00,,	-0.073
C,NB-95	,NO,	1.662E+00,	2.666E+00,	4.540E+00,,	0.366
C,ZR-95	,NO,	-5.864E+00,	4.474E+00,	6.707E+00,,	-0.874
C,MO-99	,NO,	-3.259E+01,	1.586E+02,	2.580E+02,,	-0.126
C,RU-103	,NO,	6.843E-01,	2.994E+00,	4.986E+00,,	0.137
C,RU-106	,NO,	-8.338E+00,	2.798E+01,	3.964E+01,,	-0.210
C,AG-110m	,NO,	-6.000E-01,	2.452E+00,	4.015E+00,,	-0.149
C,SN-113	,NO,	2.931E+00,	3.248E+00,	5.494E+00,,	0.533
C,SB-124	,NO,	4.040E+00,	5.664E+00,	4.702E+00,,	0.859
C,SB-125	,NO,	-1.080E+00,	6.890E+00,	1.139E+01,,	-0.095
C,TE-129M	,NO,	-7.561E+00,	3.347E+01,	5.491E+01,,	-0.138
C,I-131	,NO,	-2.123E+00,	5.212E+00,	8.365E+00,,	-0.254
C,BA-133	,NO,	5.042E+00,	4.170E+00,	6.180E+00,,	0.816
C,CS-134	,NO,	5.114E+00,	5.244E+00,	4.538E+00,,	1.127
C,CS-136	,NO,	1.156E+00,	3.811E+00,	6.348E+00,,	0.182
C,CS-137	,NO,	9.830E-01,	2.689E+00,	4.552E+00,,	0.216
C,CE-139	,NO,	6.376E-01,	2.304E+00,	3.833E+00,,	0.166
C,BA-140	,NO,	7.741E+00,	1.339E+01,	2.262E+01,,	0.342
C,LA-140	,NO,	2.583E+00,	4.677E+00,	8.110E+00,,	0.319
C,CE-141	,NO,	1.906E+00,	5.175E+00,	7.460E+00,,	0.255
C,CE-144	,NO,	2.434E+00,	2.000E+01,	2.869E+01,,	0.085
C,EU-152	,NO,	-1.128E+00,	8.836E+00,	1.260E+01,,	-0.090
C,EU-154	,NO,	5.059E+00,	4.558E+00,	7.849E+00,,	0.645
C,RA-226	,NO,	-3.588E+00,	6.289E+01,	9.888E+01,,	-0.036
C,TH-232	,NO,	4.251E+00,	1.014E+01,	1.644E+01,,	0.259
C,U-235	,NO,	1.656E+01,	1.983E+01,	2.914E+01,,	0.568
C,U-238	,NO,	2.666E+02,	2.577E+02,	4.566E+02,,	0.584
C,AM-241	,NO,	-1.588E+01,	2.536E+01,	3.934E+01,,	-0.404

Sec. Review: Analyst: LIMS: ✓

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VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 9-JUN-2006 21:55:38.58  
 TBE07 P-10768B HpGe \*\*\*\*\* Aquisition Date/Time: 9-JUN-2006 17:06:21.78

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LIMS No., Customer Name, Client ID: WG L28834-7 QUAD CITY

Sample ID : 07L28834-7 Smple Date: 31-MAY-2006 09:10:00.  
 Sample Type : WG Geometry : 073L082504  
 Quantity : 3.01860E+00 L BKGFILE : 07BG060306MT  
 Start Channel : 40 Energy Tol : 1.00000 Real Time : 0 04:49:08.36  
 End Channel : 4090 Pk Srch Sens: 5.00000 Live time : 0 04:49:04.95  
 MDA Constant : 0.00 Library Used: LIBD

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	%Eff	Cts/Sec	%Err	Fit
1	1	66.29*	144	450	1.44	133.16	8.04E-01	8.27E-03	28.8	1.03E+00
2	1	139.70*	117	422	1.43	280.09	2.36E+00	6.75E-03	34.8	4.90E+00
3	1	198.30*	122	362	1.42	397.36	2.25E+00	7.02E-03	32.9	1.92E+00
4	1	295.09*	145	336	3.26	591.08	1.81E+00	8.37E-03	28.5	1.83E+00
5	1	584.26*	214	139	1.47	1169.68	1.12E+00	1.23E-02	14.2	6.09E+01
6	1	596.04	111	135	1.86	1193.25	1.10E+00	6.40E-03	23.0	7.83E-01
7	1	609.30*	153	138	1.57	1219.78	1.09E+00	8.81E-03	19.2	8.90E-01
8	1	1120.42*	45	64	1.54	2242.07	7.03E-01	2.62E-03	42.4	4.13E-01
9	1	1730.35	23	16	1.53	3461.33	5.19E-01	1.35E-03	41.9	2.21E+00
10	1	1764.39*	55	13	4.51	3529.37	5.12E-01	3.16E-03	25.2	4.01E+00

Flag: "\*" = Peak area was modified by background subtraction

## Nuclide Line Activity Report

Flag: "\*" = Keyline

## Summary of Nuclide Activity

Page : 2

Sample ID : 07L28834-7

Acquisition date : 9-JUN-2006 17:06:21

Total number of lines in spectrum	10	
Number of unidentified lines	10	
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 : 07L28834-7

Page : 3  
Acquisition date : 9-JUN-2006 17:06:21

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
1	66.29	144	450	1.44	133.16	130	8	8.27E-03	57.5	8.04E-01	
1	139.70	117	422	1.43	280.09	277	8	6.75E-03	69.6	2.36E+00	
1	198.30	122	362	1.42	397.36	393	9	7.02E-03	65.8	2.25E+00	
1	295.09	145	336	3.26	591.08	586	13	8.37E-03	57.0	1.81E+00	
1	584.26	214	139	1.47	1169.68	1163	15	1.23E-02	28.4	1.12E+00	
1	596.04	111	135	1.86	1193.25	1187	12	6.40E-03	45.9	1.10E+00	
1	609.30	153	138	1.57	1219.78	1214	11	8.81E-03	38.4	1.09E+00	
1	1120.42	45	64	1.54	2242.07	2236	12	2.62E-03	84.8	7.03E-01	
1	1730.35	23	16	1.53	3461.33	3454	13	1.35E-03	83.8	5.19E-01	
1	1764.39	55	13	4.51	3529.37	3521	18	3.16E-03	50.4	5.12E-01	

Flags: "T" = Tentatively associated

### Summary of Nuclide Activity

Total number of lines in spectrum 10  
 Number of unidentified lines 10  
 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	8.202E+00		2.112E+01	3.496E+01	0.000E+00	0.235
NA-24	-6.866E-02		4.142E-02	Half-Life too short		
K-40	2.702E-01		3.253E+01	5.597E+01	0.000E+00	0.005
CR-51	-2.502E+01		2.363E+01	3.802E+01	0.000E+00	-0.658
MN-54	7.958E-01		2.227E+00	3.750E+00	0.000E+00	0.212
CO-57	-2.086E-01		2.168E+00	3.534E+00	0.000E+00	-0.059
CO-58	-2.809E+00		2.419E+00	3.757E+00	0.000E+00	-0.748
FE-59	4.431E+00		4.637E+00	8.125E+00	0.000E+00	0.545
CO-60	5.392E-01		2.295E+00	3.813E+00	0.000E+00	0.141
ZN-65	1.011E+01		5.894E+00	9.376E+00	0.000E+00	1.079
SE-75	3.393E-01		3.139E+00	5.142E+00	0.000E+00	0.066
SR-85	2.275E+01		2.998E+00	6.012E+00	0.000E+00	3.785
Y-88	-3.770E+00		2.606E+00	3.764E+00	0.000E+00	-1.002
NB-94	-9.473E-01		2.316E+00	3.706E+00	0.000E+00	-0.256
NB-95	1.865E+00		2.394E+00	4.130E+00	0.000E+00	0.452
ZR-95	-2.563E+00		4.320E+00	6.786E+00	0.000E+00	-0.378
MO-99	5.020E+01		1.791E+02	2.956E+02	0.000E+00	0.170
RU-103	3.186E+00		2.699E+00	4.597E+00	0.000E+00	0.693

RU-106	3.778E+00	2.237E+01	3.707E+01	0.000E+00	0.102
AG-110m	-8.635E-02	2.335E+00	3.820E+00	0.000E+00	-0.023
SN-113	1.307E+00	3.063E+00	5.123E+00	0.000E+00	0.255
SB-124	-4.572E-01	5.792E+00	4.020E+00	0.000E+00	-0.114
SB-125	3.683E-01	6.410E+00	1.053E+01	0.000E+00	0.035
TE-129M	4.803E+00	2.978E+01	4.893E+01	0.000E+00	0.098
I-131	-6.635E-01	4.987E+00	8.207E+00	0.000E+00	-0.081
BA-133	6.309E+00	3.238E+00	5.690E+00	0.000E+00	1.109
CS-134	6.746E+00	4.686E+00	4.669E+00	0.000E+00	1.445
CS-136	1.430E+00	3.457E+00	5.847E+00	0.000E+00	0.244
CS-137	1.198E+00	2.490E+00	4.173E+00	0.000E+00	0.287
CE-139	2.467E+00	2.239E+00	3.832E+00	0.000E+00	0.644
BA-140	9.078E-01	1.255E+01	2.090E+01	0.000E+00	0.043
LA-140	2.072E+00	4.068E+00	6.955E+00	0.000E+00	0.298
CE-141	1.718E+00	5.243E+00	7.321E+00	0.000E+00	0.235
CE-144	2.176E+00	1.973E+01	2.745E+01	0.000E+00	0.079
EU-152	-2.590E+01	7.534E+00	1.110E+01	0.000E+00	-2.333
EU-154	-1.533E+00	4.509E+00	7.302E+00	0.000E+00	-0.210
RA-226	-1.304E+01	5.743E+01	9.341E+01	0.000E+00	-0.140
AC-228	-8.561E-01	9.384E+00	1.478E+01	0.000E+00	-0.058
TH-228	7.828E+00	4.673E+00	7.882E+00	0.000E+00	0.993
TH-232	-8.534E-01	9.355E+00	1.473E+01	0.000E+00	-0.058
U-235	3.140E+01	1.994E+01	2.912E+01	0.000E+00	1.078
U-238	-1.873E+01	2.447E+02	3.973E+02	0.000E+00	-0.047
AM-241	-3.815E+01	2.336E+01	3.286E+01	0.000E+00	-1.161

A, 07L28834-7		, 06/09/2006 21:55, 05/31/2006 09:10,		3.019E+00, WG L28834-7 QU	
B, 07L28834-7		, LIBD		, 06/07/2006 09:32, 073L082504	
C, BE-7	, NO ,	8.202E+00,	2.112E+01,	3.496E+01,,	0.235
C, K-40	, NO ,	2.702E-01,	3.253E+01,	5.597E+01,,	0.005
C, CR-51	, NO ,	-2.502E+01,	2.363E+01,	3.802E+01,,	-0.658
C, MN-54	, NO ,	7.958E-01,	2.227E+00,	3.750E+00,,	0.212
C, CO-57	, NO ,	-2.086E-01,	2.168E+00,	3.534E+00,,	-0.059
C, CO-58	, NO ,	-2.809E+00,	2.419E+00,	3.757E+00,,	-0.748
C, FE-59	, NO ,	4.431E+00,	4.637E+00,	8.125E+00,,	0.545
C, CO-60	, NO ,	5.392E-01,	2.295E+00,	3.813E+00,,	0.141
C, ZN-65	, NO ,	1.011E+01,	5.894E+00,	9.376E+00,,	1.079
C, SE-75	, NO ,	3.393E-01,	3.139E+00,	5.142E+00,,	0.066
C, SR-85	, NO ,	2.275E+01,	2.998E+00,	6.012E+00,,	3.785
C, Y-88	, NO ,	-3.770E+00,	2.606E+00,	3.764E+00,,	-1.002
C, NB-94	, NO ,	-9.473E-01,	2.316E+00,	3.706E+00,,	-0.256
C, NB-95	, NO ,	1.865E+00,	2.394E+00,	4.130E+00,,	0.452
C, ZR-95	, NO ,	-2.563E+00,	4.320E+00,	6.786E+00,,	-0.378
C, MO-99	, NO ,	5.020E+01,	1.791E+02,	2.956E+02,,	0.170
C, RU-103	, NO ,	3.186E+00,	2.699E+00,	4.597E+00,,	0.693
C, RU-106	, NO ,	3.778E+00,	2.237E+01,	3.707E+01,,	0.102
C, AG-110m	, NO ,	-8.635E-02,	2.335E+00,	3.820E+00,,	-0.023
C, SN-113	, NO ,	1.307E+00,	3.063E+00,	5.123E+00,,	0.255
C, SB-124	, NO ,	-4.572E-01,	5.792E+00,	4.020E+00,,	-0.114
C, SB-125	, NO ,	3.683E-01,	6.410E+00,	1.053E+01,,	0.035
C, TE-129M	, NO ,	4.803E+00,	2.978E+01,	4.893E+01,,	0.098
C, I-131	, NO ,	-6.635E-01,	4.987E+00,	8.207E+00,,	-0.081
C, BA-133	, NO ,	6.309E+00,	3.238E+00,	5.690E+00,,	1.109
C, CS-134	, NO ,	6.746E+00,	4.686E+00,	4.669E+00,,	1.445
C, CS-136	, NO ,	1.430E+00,	3.457E+00,	5.847E+00,,	0.244
C, CS-137	, NO ,	1.198E+00,	2.490E+00,	4.173E+00,,	0.287
C, CE-139	, NO ,	2.467E+00,	2.239E+00,	3.832E+00,,	0.644
C, BA-140	, NO ,	9.078E-01,	1.255E+01,	2.090E+01,,	0.043
C, LA-140	, NO ,	2.072E+00,	4.068E+00,	6.955E+00,,	0.298
C, CE-141	, NO ,	1.718E+00,	5.243E+00,	7.321E+00,,	0.235
C, CE-144	, NO ,	2.176E+00,	1.973E+01,	2.745E+01,,	0.079
C, EU-152	, NO ,	-2.590E+01,	7.534E+00,	1.110E+01,,	-2.333
C, EU-154	, NO ,	-1.533E+00,	4.509E+00,	7.302E+00,,	-0.210
C, RA-226	, NO ,	-1.304E+01,	5.743E+01,	9.341E+01,,	-0.140
C, AC-228	, NO ,	-8.561E-01,	9.384E+00,	1.478E+01,,	-0.058
C, TH-228	, NO ,	7.828E+00,	4.673E+00,	7.882E+00,,	0.993
C, TH-232	, NO ,	-8.534E-01,	9.355E+00,	1.473E+01,,	-0.058
C, U-235	, NO ,	3.140E+01,	1.994E+01,	2.912E+01,,	1.078
C, U-238	, NO ,	-1.873E+01,	2.447E+02,	3.973E+02,,	-0.047
C, AM-241	, NO ,	-3.815E+01,	2.336E+01,	3.286E+01,,	-1.161



Summary of Nuclide Activity  
 Sample ID : 13L28834-8

Page : 2  
 Acquisition date : 9-JUN-2006 17:06:27

Total number of lines in spectrum 14  
 Number of unidentified lines 11  
 Number of lines tentatively identified by NID 3 21.43%

Nuclide Type : natural

Nuclide	Hlife	Decay	Uncorrected pCi/L	Decay Corr pCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	2.317E+01	2.317E+01	3.614E+01	156.01	
RA-226	1600.00Y	1.00	1.345E+01	1.345E+01	6.053E+01	450.04	
AC-228	5.75Y	1.00	8.185E+00	8.211E+00	10.32E+00	125.75	
U-235	7.04E+08Y	1.00	8.170E-01	8.170E-01	36.77E-01	450.04	K
Total Activity :			4.562E+01	4.564E+01			

Grand Total Activity : 4.562E+01 4.564E+01

Flags: "K" = Keyline not found  
 "E" = Manually edited

"M" = Manually accepted  
 "A" = Nuclide specific abn. limit



Unidentified Energy Lines  
Sample ID : 13L28834-8

Page : 3  
Acquisition date : 9-JUN-2006 17:06:27

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
1	65.53	76	374	0.91	131.16	123	14	4.36E-03	80.2	7.96E-01	
1	85.23	12	897	3.51	170.54	165	14	6.86E-04	****	1.52E+00	
1	92.65	52	767	1.42	185.37	180	12	2.95E-03	****	1.74E+00	
1	139.58	65	436	1.48	279.16	275	8	3.72E-03	****	2.27E+00	
1	198.02	117	379	1.29	395.96	392	8	6.67E-03	66.0	2.13E+00	
1	351.86	41	177	2.48	703.50	699	10	2.34E-03	****	1.51E+00	
1	595.88	135	124	1.94	1191.43	1184	15	7.75E-03	40.5	1.02E+00	
1	609.37	77	116	2.07	1218.41	1213	13	4.38E-03	73.6	1.01E+00	
1	1147.21	25	51	1.99	2294.34	2288	12	1.45E-03	****	6.15E-01	
1	1478.12	410	28	5.08	2956.66	2947	14	2.35E-02	6.0	5.10E-01	
1	2003.12	20	13	3.25	4008.00	4003	11	1.14E-03	79.9	4.26E-01	

Flags: "T" = Tentatively associated

### Summary of Nuclide Activity

Total number of lines in spectrum	14
Number of unidentified lines	11
Number of lines tentatively identified by NID	3
	21.43%

Nuclide Type : natural

Nuclide	Hlife	Decay	Wtd Mean	Wtd Mean	Decay Corr	2-Sigma	2-Sigma	%Error	Flags
			Uncorrected	Decay Corr					
K-40	1.28E+09Y	1.00	2.317E+01	2.317E+01	3.614E+01	156.01			
RA-226	1600.00Y	1.00	1.345E+01	1.345E+01	6.053E+01	450.04			
AC-228	5.75Y	1.00	8.185E+00	8.211E+00	10.32E+00	125.75			
Total Activity :			4.480E+01	4.483E+01					

Grand Total Activity : 4.480E+01 4.483E+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	2.317E+01	3.614E+01	3.812E+01	0.000E+00	0.608
RA-226	1.345E+01	6.053E+01	8.525E+01	0.000E+00	0.158
AC-228	8.211E+00	1.032E+01	1.434E+01	0.000E+00	0.573

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/L)	K.L. Ided	Act error	MDA (pCi/L)	MDA error	Act/MDA
BE-7	1.898E+01		2.141E+01	3.627E+01	0.000E+00	0.523
NA-24	5.586E-03		4.472E-02	Half-Life too short		
CR-51	-2.411E+01		2.438E+01	3.827E+01	0.000E+00	-0.630
MN-54	2.199E+00		2.347E+00	4.063E+00	0.000E+00	0.541
CO-57	-6.318E-01		2.138E+00	3.542E+00	0.000E+00	-0.178
CO-58	1.874E-02		2.561E+00	4.229E+00	0.000E+00	0.004
FE-59	4.474E+00		5.292E+00	9.153E+00	0.000E+00	0.489
CO-60	8.130E-01		2.570E+00	4.341E+00	0.000E+00	0.187
ZN-65	3.120E+00		5.422E+00	9.216E+00	0.000E+00	0.339
SE-75	1.177E+00		3.079E+00	5.141E+00	0.000E+00	0.229
SR-85	1.772E+01		3.126E+00	5.956E+00	0.000E+00	2.976
Y-88	-6.489E-01		2.802E+00	4.487E+00	0.000E+00	-0.145
NB-94	-4.055E-02		2.296E+00	3.734E+00	0.000E+00	-0.011
NB-95	1.787E+00		2.516E+00	4.324E+00	0.000E+00	0.413
ZR-95	1.918E-01		4.483E+00	7.462E+00	0.000E+00	0.026
MO-99	4.399E+01		1.829E+02	3.081E+02	0.000E+00	0.143
RU-103	-2.242E-01		2.783E+00	4.510E+00	0.000E+00	-0.050
RU-106	-6.357E+00		2.219E+01	3.545E+01	0.000E+00	-0.179
AG-110m	-6.709E-01		2.309E+00	3.723E+00	0.000E+00	-0.180
SN-113	6.689E-01		3.097E+00	5.173E+00	0.000E+00	0.129
SB-124	4.799E+00		4.672E+00	4.155E+00	0.000E+00	1.155
SB-125	7.300E+00		6.624E+00	1.137E+01	0.000E+00	0.642
TE-129M	-1.176E+01		3.179E+01	5.123E+01	0.000E+00	-0.230
I-131	1.593E+00		4.977E+00	8.388E+00	0.000E+00	0.190
BA-133	3.614E+00		3.452E+00	5.184E+00	0.000E+00	0.697
CS-134	6.748E+00		4.310E+00	4.119E+00	0.000E+00	1.638
CS-136	1.103E+00		3.653E+00	6.129E+00	0.000E+00	0.180
CS-137	-5.939E-01		2.702E+00	4.167E+00	0.000E+00	-0.143
CE-139	5.404E-01		2.145E+00	3.538E+00	0.000E+00	0.153
BA-140	2.086E+00		1.256E+01	2.107E+01	0.000E+00	0.099
LA-140	2.240E+00		4.608E+00	7.919E+00	0.000E+00	0.283
CE-141	5.013E+00		4.759E+00	7.289E+00	0.000E+00	0.688
CE-144	-1.607E+01		1.880E+01	2.598E+01	0.000E+00	-0.618
EU-152	-6.934E+00		8.473E+00	1.159E+01	0.000E+00	-0.598
EU-154	-5.768E-01		4.383E+00	7.285E+00	0.000E+00	-0.079
TH-228	-9.237E-01		4.694E+00	7.518E+00	0.000E+00	-0.123
TH-232	8.185E+00	+	1.029E+01	1.617E+01	0.000E+00	0.506
U-235	7.128E+00		1.930E+01	2.706E+01	0.000E+00	0.263
U-238	-3.920E+01		2.875E+02	4.475E+02	0.000E+00	-0.088
AM-241	4.461E+00		2.071E+01	3.001E+01	0.000E+00	0.149

A,13L28834-8 ,06/12/2006 00:50,05/31/2006 08:20, 3.037E+00,WG L28834-8 QU  
 B,13L28834-8 ,LIBD ,08/05/2005 08:16,133L082404  
 C,K-40 ,YES, 2.317E+01, 3.614E+01, 3.812E+01,, 0.608  
 C,RA-226 ,YES, 1.345E+01, 6.053E+01, 8.525E+01,, 0.158  
 C,AC-228 ,YES, 8.211E+00, 1.032E+01, 1.434E+01,, 0.573  
 C,BE-7 ,NO , 1.898E+01, 2.141E+01, 3.627E+01,, 0.523  
 C,CR-51 ,NO , -2.411E+01, 2.438E+01, 3.827E+01,, -0.630  
 C,MN-54 ,NO , 2.199E+00, 2.347E+00, 4.063E+00,, 0.541  
 C,CO-57 ,NO , -6.318E-01, 2.138E+00, 3.542E+00,, -0.178  
 C,CO-58 ,NO , 1.874E-02, 2.561E+00, 4.229E+00,, 0.004  
 C,FE-59 ,NO , 4.474E+00, 5.292E+00, 9.153E+00,, 0.489  
 C,CO-60 ,NO , 8.130E-01, 2.570E+00, 4.341E+00,, 0.187  
 C,ZN-65 ,NO , 3.120E+00, 5.422E+00, 9.216E+00,, 0.339  
 C,SE-75 ,NO , 1.177E+00, 3.079E+00, 5.141E+00,, 0.229  
 C,SR-85 ,NO , 1.772E+01, 3.126E+00, 5.956E+00,, 2.976  
 C,Y-88 ,NO , -6.489E-01, 2.802E+00, 4.487E+00,, -0.145  
 C,NB-94 ,NO , -4.055E-02, 2.296E+00, 3.734E+00,, -0.011  
 C,NB-95 ,NO , 1.787E+00, 2.516E+00, 4.324E+00,, 0.413  
 C,ZR-95 ,NO , 1.918E-01, 4.483E+00, 7.462E+00,, 0.026  
 C,MO-99 ,NO , 4.399E+01, 1.829E+02, 3.081E+02,, 0.143  
 C,RU-103 ,NO , -2.242E-01, 2.783E+00, 4.510E+00,, -0.050  
 C,RU-106 ,NO , -6.357E+00, 2.219E+01, 3.545E+01,, -0.179  
 C,AG-110m ,NO , -6.709E-01, 2.309E+00, 3.723E+00,, -0.180  
 C,SN-113 ,NO , 6.689E-01, 3.097E+00, 5.173E+00,, 0.129  
 C,SB-124 ,NO , 4.799E+00, 4.672E+00, 4.155E+00,, 1.155  
 C,SB-125 ,NO , 7.300E+00, 6.624E+00, 1.137E+01,, 0.642  
 C,TE-129M ,NO , -1.176E+01, 3.179E+01, 5.123E+01,, -0.230  
 C,I-131 ,NO , 1.593E+00, 4.977E+00, 8.388E+00,, 0.190  
 C,BA-133 ,NO , 3.614E+00, 3.452E+00, 5.184E+00,, 0.697  
 C,CS-134 ,NO , 6.748E+00, 4.310E+00, 4.119E+00,, 1.638  
 C,CS-136 ,NO , 1.103E+00, 3.653E+00, 6.129E+00,, 0.180  
 C,CS-137 ,NO , -5.939E-01, 2.702E+00, 4.167E+00,, -0.143  
 C,CE-139 ,NO , 5.404E-01, 2.145E+00, 3.538E+00,, 0.153  
 C,BA-140 ,NO , 2.086E+00, 1.256E+01, 2.107E+01,, 0.099  
 C,LA-140 ,NO , 2.240E+00, 4.608E+00, 7.919E+00,, 0.283  
 C,CE-141 ,NO , 5.013E+00, 4.759E+00, 7.289E+00,, 0.688  
 C,CE-144 ,NO , -1.607E+01, 1.880E+01, 2.598E+01,, -0.618  
 C,EU-152 ,NO , -6.934E+00, 8.473E+00, 1.159E+01,, -0.598  
 C,EU-154 ,NO , -5.768E-01, 4.383E+00, 7.285E+00,, -0.079  
 C,TH-228 ,NO , -9.237E-01, 4.694E+00, 7.518E+00,, -0.123  
 C,TH-232 ,NO , 8.185E+00, 1.029E+01, 1.617E+01,, 0.506  
 C,U-235 ,NO , 7.128E+00, 1.930E+01, 2.706E+01,, 0.263  
 C,U-238 ,NO , -3.920E+01, 2.875E+02, 4.475E+02,, -0.088  
 C,AM-241 ,NO , 4.461E+00, 2.071E+01, 3.001E+01,, 0.149

Sec. Review:      Analyst:      LIMS: ✓

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VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 9-JUN-2006 21:59:05.21  
 TBE23 03017322 HpGe \*\*\*\*\* Aquisition Date/Time: 9-JUN-2006 17:06:28.37

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LIMS No., Customer Name, Client ID: WG L28834-9 QUAD CITY

Sample ID : 23L28834-9      Smple Date: 1-JUN-2006 10:18:00.0  
 Sample Type : WG      Geometry : 233L082404  
 Quantity : 3.01490E+00 L      BKGFILE : 23BG060306MT  
 Start Channel : 50      Energy Tol : 1.50000      Real Time : 0 04:52:24.60  
 End Channel : 4090      Pk Srch Sens: 5.00000      Live time : 0 04:52:12.57  
 MDA Constant : 0.00      Library Used: LIBD

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	%Eff	Cts/Sec	%Err	Fit
1	4	33.72*	68	21	1.15	67.76	8.15E-02	3.87E-03	30.4	3.51E+00
2	4	35.21*	8	139	1.76	70.75	1.05E-01	4.64E-04	474.0	
3	5	63.02*	127	481	1.28	126.32	1.03E+00	7.22E-03	35.2	7.63E-01
4	5	66.03	171	626	1.67	132.33	1.15E+00	9.75E-03	28.9	
5	0	139.57*	99	595	1.05	279.31	2.32E+00	5.67E-03	46.8	
6	0	198.55*	73	482	1.29	397.20	2.11E+00	4.15E-03	59.9	
7	0	294.87*	120	373	2.47	589.71	1.64E+00	6.85E-03	36.3	
8	0	351.58*	12	267	1.18	703.07	1.44E+00	6.64E-04	301.6	
9	0	582.78*	31	88	1.88	1165.26	9.72E-01	1.75E-03	71.0	
10	0	595.51	42	128	1.55	1190.71	9.56E-01	2.40E-03	50.9	
11	0	608.92*	29	196	1.66	1217.52	9.41E-01	1.65E-03	122.3	
12	0	1460.61*	154	54	1.91	2920.87	5.10E-01	8.78E-03	17.4	

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	154	10.67*	5.096E-01	1.448E+02	1.448E+02	34.89

Flag: "\*" = Keyline

## Summary of Nuclide Activity

Page : 2

Sample ID : 23L28834-9

Acquisition date : 9-JUN-2006 17:06:28

Total number of lines in spectrum	12	
Number of unidentified lines	10	
Number of lines tentatively identified by NID	2	16.67%

Nuclide Type : natural

Nuclide	Hlife	Decay	Uncorrected pCi/L	Decay Corr pCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	1.448E+02	1.448E+02	0.505E+02	34.89	
Total Activity :			1.448E+02	1.448E+02			

Grand Total Activity :	1.448E+02	1.448E+02
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Flags: "K" = Keyline not found  
 "E" = Manually edited

"M" = Manually accepted  
 "A" = Nuclide specific abn. limit

Unidentified Energy Lines  
Sample ID : 23L28834-9

Page : 3  
Acquisition date : 9-JUN-2006 17:06:28

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
4	33.72	68	21	1.15	67.76	65	19	3.87E-03	60.8	8.15E-02	
4	35.21	8	139	1.76	70.75	65	19	4.64E-04	****	1.05E-01	
5	63.02	127	481	1.28	126.32	122	16	7.22E-03	70.4	1.03E+00	
5	66.03	171	626	1.67	132.33	122	16	9.75E-03	57.8	1.15E+00	
0	139.57	99	595	1.05	279.31	276	8	5.67E-03	93.6	2.32E+00	
0	198.55	73	482	1.29	397.20	393	9	4.15E-03	****	2.11E+00	
0	294.87	120	373	2.47	589.71	582	13	6.85E-03	72.5	1.64E+00	
0	351.58	12	267	1.18	703.07	697	11	6.64E-04	****	1.44E+00	
0	582.78	31	88	1.88	1165.26	1160	10	1.75E-03	****	9.72E-01	T
0	595.51	42	128	1.55	1190.71	1187	9	2.40E-03	****	9.56E-01	
0	608.92	29	196	1.66	1217.52	1210	17	1.65E-03	****	9.41E-01	

Flags: "T" = Tentatively associated

#### Summary of Nuclide Activity

Total number of lines in spectrum	12
Number of unidentified lines	10
Number of lines tentatively identified by NID	2
	16.67%

Nuclide Type : natural

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/L	Wtd Mean Decay Corr pCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	1.448E+02	1.448E+02	0.505E+02	34.89	
Total Activity :			1.448E+02	1.448E+02			

Grand Total Activity : 1.448E+02 1.448E+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 (pCi/L)	Act error	MDA (pCi/L)	MDA error	Act/MDA
K-40	1.448E+02	5.051E+01	4.093E+01	0.000E+00	3.537

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/L)	K.L. Ided	Act error	MDA (pCi/L)	MDA error	Act/MDA
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BE-7	1.402E+01	2.297E+01	3.981E+01	0.000E+00	0.352
NA-24	1.137E-02	1.319E-02	Half-Life too short		
CR-51	-4.934E+00	2.651E+01	4.479E+01	0.000E+00	-0.110
MN-54	2.859E+00	2.326E+00	4.272E+00	0.000E+00	0.669
CO-57	-1.251E-03	2.745E+00	4.604E+00	0.000E+00	0.000
CO-58	3.791E-01	2.614E+00	4.522E+00	0.000E+00	0.084
FE-59	3.385E+00	5.101E+00	9.243E+00	0.000E+00	0.366
CO-60	3.695E-01	2.422E+00	4.276E+00	0.000E+00	0.086
ZN-65	3.958E+00	5.222E+00	9.496E+00	0.000E+00	0.417
SE-75	6.259E-01	3.595E+00	6.155E+00	0.000E+00	0.102
SR-85	1.898E+01	3.132E+00	6.229E+00	0.000E+00	3.046
Y-88	-3.170E-01	2.415E+00	4.272E+00	0.000E+00	-0.074
NB-94	7.978E-01	2.299E+00	4.027E+00	0.000E+00	0.198
NB-95	1.623E+00	2.583E+00	4.581E+00	0.000E+00	0.354
ZR-95	-2.440E+00	4.486E+00	7.497E+00	0.000E+00	-0.325
MO-99	5.049E+00	1.478E+02	2.549E+02	0.000E+00	0.020
RU-103	9.005E-01	2.843E+00	4.866E+00	0.000E+00	0.185
RU-106	8.207E+00	2.431E+01	4.094E+01	0.000E+00	0.200
AG-110m	-3.102E-01	2.382E+00	4.086E+00	0.000E+00	-0.076
SN-113	1.071E-01	3.366E+00	5.715E+00	0.000E+00	0.019
SB-124	1.017E+00	6.248E+00	4.765E+00	0.000E+00	0.213
SB-125	-1.074E-01	7.218E+00	1.222E+01	0.000E+00	-0.009
TE-129M	4.997E+00	3.283E+01	5.588E+01	0.000E+00	0.089
I-131	1.483E-01	5.385E+00	9.141E+00	0.000E+00	0.016
BA-133	4.524E+00	4.200E+00	6.340E+00	0.000E+00	0.713
CS-134	1.209E+00	4.805E+00	4.922E+00	0.000E+00	0.246
CS-136	-1.566E+00	3.507E+00	5.880E+00	0.000E+00	-0.266
CS-137	-1.255E-01	2.672E+00	4.597E+00	0.000E+00	-0.027
CE-139	3.002E+00	2.782E+00	4.742E+00	0.000E+00	0.633
BA-140	8.806E+00	1.368E+01	2.376E+01	0.000E+00	0.371
LA-140	2.312E+00	4.069E+00	7.550E+00	0.000E+00	0.306
CE-141	4.624E+00	6.321E+00	9.162E+00	0.000E+00	0.505
CE-144	-2.028E+01	2.493E+01	3.459E+01	0.000E+00	-0.586
EU-152	3.004E-01	9.450E+00	1.360E+01	0.000E+00	0.022
EU-154	-8.406E-01	5.671E+00	9.485E+00	0.000E+00	-0.089
RA-226	-5.229E+01	7.227E+01	1.128E+02	0.000E+00	-0.464
AC-228	7.183E+00	9.821E+00	1.596E+01	0.000E+00	0.450
TH-228	4.729E-01	5.318E+00	8.426E+00	0.000E+00	0.056
TH-232	7.164E+00	9.794E+00	1.592E+01	0.000E+00	0.450
U-235	-1.930E+00	2.583E+01	3.566E+01	0.000E+00	-0.054
U-238	1.764E+02	2.909E+02	4.996E+02	0.000E+00	0.353
AM-241	3.077E+01	1.691E+01	2.511E+01	0.000E+00	1.225

A,23L28834-9 ,06/09/2006 21:59,06/01/2006 10:18, 3.015E+00,WG L28834-9 QU  
 B,23L28834-9 ,LIBD ,06/01/2006 10:14,233L082404  
 C,K-40 ,YES, 1.448E+02, 5.051E+01, 4.093E+01,, 3.537  
 C,BE-7 ,NO , 1.402E+01, 2.297E+01, 3.981E+01,, 0.352  
 C,CR-51 ,NO , -4.934E+00, 2.651E+01, 4.479E+01,, -0.110  
 C,MN-54 ,NO , 2.859E+00, 2.326E+00, 4.272E+00,, 0.669  
 C,CO-57 ,NO , -1.251E-03, 2.745E+00, 4.604E+00,, 0.000  
 C,CO-58 ,NO , 3.791E-01, 2.614E+00, 4.522E+00,, 0.084  
 C,FE-59 ,NO , 3.385E+00, 5.101E+00, 9.243E+00,, 0.366  
 C,CO-60 ,NO , 3.695E-01, 2.422E+00, 4.276E+00,, 0.086  
 C,ZN-65 ,NO , 3.958E+00, 5.222E+00, 9.496E+00,, 0.417  
 C,SE-75 ,NO , 6.259E-01, 3.595E+00, 6.155E+00,, 0.102  
 C,SR-85 ,NO , 1.898E+01, 3.132E+00, 6.229E+00,, 3.046  
 C,Y-88 ,NO , -3.170E-01, 2.415E+00, 4.272E+00,, -0.074  
 C,NB-94 ,NO , 7.978E-01, 2.299E+00, 4.027E+00,, 0.198  
 C,NB-95 ,NO , 1.623E+00, 2.583E+00, 4.581E+00,, 0.354  
 C,ZR-95 ,NO , -2.440E+00, 4.486E+00, 7.497E+00,, -0.325  
 C,MO-99 ,NO , 5.049E+00, 1.478E+02, 2.549E+02,, 0.020  
 C,RU-103 ,NO , 9.005E-01, 2.843E+00, 4.866E+00,, 0.185  
 C,RU-106 ,NO , 8.207E+00, 2.431E+01, 4.094E+01,, 0.200  
 C,AG-110m ,NO , -3.102E-01, 2.382E+00, 4.086E+00,, -0.076  
 C,SN-113 ,NO , 1.071E-01, 3.366E+00, 5.715E+00,, 0.019  
 C,SB-124 ,NO , 1.017E+00, 6.248E+00, 4.765E+00,, 0.213  
 C,SB-125 ,NO , -1.074E-01, 7.218E+00, 1.222E+01,, -0.009  
 C,TE-129M ,NO , 4.997E+00, 3.283E+01, 5.588E+01,, 0.089  
 C,I-131 ,NO , 1.483E-01, 5.385E+00, 9.141E+00,, 0.016  
 C,BA-133 ,NO , 4.524E+00, 4.200E+00, 6.340E+00,, 0.713  
 C,CS-134 ,NO , 1.209E+00, 4.805E+00, 4.922E+00,, 0.246  
 C,CS-136 ,NO , -1.566E+00, 3.507E+00, 5.880E+00,, -0.266  
 C,CS-137 ,NO , -1.255E-01, 2.672E+00, 4.597E+00,, -0.027  
 C,CE-139 ,NO , 3.002E+00, 2.782E+00, 4.742E+00,, 0.633  
 C,BA-140 ,NO , 8.806E+00, 1.368E+01, 2.376E+01,, 0.371  
 C,LA-140 ,NO , 2.312E+00, 4.069E+00, 7.550E+00,, 0.306  
 C,CE-141 ,NO , 4.624E+00, 6.321E+00, 9.162E+00,, 0.505  
 C,CE-144 ,NO , -2.028E+01, 2.493E+01, 3.459E+01,, -0.586  
 C,EU-152 ,NO , 3.004E-01, 9.450E+00, 1.360E+01,, 0.022  
 C,EU-154 ,NO , -8.406E-01, 5.671E+00, 9.485E+00,, -0.089  
 C,RA-226 ,NO , -5.229E+01, 7.227E+01, 1.128E+02,, -0.464  
 C,AC-228 ,NO , 7.183E+00, 9.821E+00, 1.596E+01,, 0.450  
 C,TH-228 ,NO , 4.729E-01, 5.318E+00, 8.426E+00,, 0.056  
 C,TH-232 ,NO , 7.164E+00, 9.794E+00, 1.592E+01,, 0.450  
 C,U-235 ,NO , -1.930E+00, 2.583E+01, 3.566E+01,, -0.054  
 C,U-238 ,NO , 1.764E+02, 2.909E+02, 4.996E+02,, 0.353  
 C,AM-241 ,NO , 3.077E+01, 1.691E+01, 2.511E+01,, 1.225





## Summary of Nuclide Activity

Page : 2

Sample ID : 11L28834-10

Acquisition date : 9-JUN-2006 17:19:29

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 pCi/L	Decay Corr pCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	4.581E+01	4.581E+01	5.263E+01	114.89	
TH-228	1.91Y	1.01	3.757E-01	3.788E-01	66.66E-01	1759.45	
			-----	-----			
		Total Activity :	4.618E+01	4.619E+01			

Grand Total Activity :	4.618E+01	4.619E+01
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Flags: "K" = Keyline not found

"M" = Manually accepted

"E" = Manually edited

"A" = Nuclide specific abn. limit

## Unidentified Energy Lines

Page : 3

Sample ID : 11L28834-10

Acquisition date : 9-JUN-2006 17:19:29

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	139.98	83	533	1.52	279.39	274	10	5.02E-03	****	1.90E+00	
0	198.82	65	432	1.03	397.40	392	9	3.89E-03	****	1.75E+00	
0	295.24	17	173	1.04	590.70	587	7	1.04E-03	****	1.37E+00	
0	352.36	32	267	1.00	705.18	699	12	1.90E-03	****	1.20E+00	
0	596.20	32	162	0.90	1193.63	1187	12	1.91E-03	****	8.03E-01	
0	609.24	87	138	1.44	1219.74	1212	16	5.24E-03	69.1	7.90E-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 Uncorrected pCi/L	Wtd Mean Decay Corr pCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	4.581E+01	4.581E+01	5.263E+01	114.89	
TH-228	1.91Y	1.01	3.757E-01	3.788E-01	66.66E-01	1759.45	
Total Activity :			4.618E+01	4.619E+01			

Grand Total Activity : 4.618E+01 4.619E+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	4.581E+01	5.263E+01	4.666E+01	0.000E+00	0.982
TH-228	3.788E-01	6.666E+00	8.587E+00	0.000E+00	0.044

## ---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/L)	K.L. Ided	Act error	MDA (pCi/L)	MDA error	Act/MDA
BE-7	6.547E+00		2.720E+01	4.487E+01	0.000E+00	0.146
NA-24	4.245E-03		1.784E-02	Half-Life too short		
CR-51	-1.217E+01		3.069E+01	5.010E+01	0.000E+00	-0.243

MN-54	-1.456E+00	2.905E+00	4.606E+00	0.000E+00	-0.316
CO-57	-8.411E-01	2.926E+00	4.790E+00	0.000E+00	-0.176
CO-58	1.693E-01	3.144E+00	5.171E+00	0.000E+00	0.033
FE-59	3.707E+00	6.026E+00	1.040E+01	0.000E+00	0.356
CO-60	-2.058E+00	2.803E+00	4.274E+00	0.000E+00	-0.482
ZN-65	5.773E+00	6.349E+00	1.114E+01	0.000E+00	0.518
SE-75	2.034E-01	4.041E+00	6.735E+00	0.000E+00	0.030
SR-85	2.010E+01	3.756E+00	7.208E+00	0.000E+00	2.788
Y-88	1.924E+00	3.549E+00	6.146E+00	0.000E+00	0.313
NB-94	1.049E+00	2.813E+00	4.732E+00	0.000E+00	0.222
NB-95	1.432E+00	3.018E+00	5.099E+00	0.000E+00	0.281
ZR-95	8.863E-01	5.459E+00	9.063E+00	0.000E+00	0.098
MO-99	-3.179E+01	1.758E+02	2.864E+02	0.000E+00	-0.111
RU-103	3.741E+00	3.404E+00	5.821E+00	0.000E+00	0.643
RU-106	2.860E+01	2.753E+01	4.641E+01	0.000E+00	0.616
AG-110m	-1.527E+00	2.678E+00	4.283E+00	0.000E+00	-0.356
SN-113	1.768E+00	3.845E+00	6.437E+00	0.000E+00	0.275
SB-124	-3.049E+00	7.927E+00	5.241E+00	0.000E+00	-0.582
SB-125	7.033E-01	8.539E+00	1.404E+01	0.000E+00	0.050
TE-129M	4.498E+00	3.900E+01	6.405E+01	0.000E+00	0.070
I-131	4.220E-01	5.847E+00	9.660E+00	0.000E+00	0.044
BA-133	7.975E+00	4.673E+00	7.127E+00	0.000E+00	1.119
CS-134	2.247E+00	6.075E+00	5.464E+00	0.000E+00	0.411
CS-136	-1.707E+00	4.405E+00	7.045E+00	0.000E+00	-0.242
CS-137	-1.944E+00	2.839E+00	4.503E+00	0.000E+00	-0.432
CE-139	-6.076E-01	3.057E+00	4.978E+00	0.000E+00	-0.122
BA-140	8.358E-01	1.519E+01	2.474E+01	0.000E+00	0.034
LA-140	-5.782E+00	5.539E+00	8.342E+00	0.000E+00	-0.693
CE-141	2.462E+00	6.774E+00	9.560E+00	0.000E+00	0.257
CE-144	-1.618E+01	2.634E+01	3.595E+01	0.000E+00	-0.450
EU-152	-1.569E+01	1.134E+01	1.466E+01	0.000E+00	-1.070
EU-154	2.918E+00	6.012E+00	1.002E+01	0.000E+00	0.291
RA-226	2.928E+01	7.738E+01	1.227E+02	0.000E+00	0.239
AC-228	-8.064E-01	1.339E+01	2.028E+01	0.000E+00	-0.040
TH-232	-8.041E-01	1.335E+01	2.022E+01	0.000E+00	-0.040
U-235	2.169E+01	2.685E+01	3.847E+01	0.000E+00	0.564
U-238	-8.392E+01	3.119E+02	5.091E+02	0.000E+00	-0.165
AM-241	-7.423E+01	3.921E+01	6.119E+01	0.000E+00	-1.213

A,11L28834-10	,06/10/2006 14:02,06/01/2006 09:17,	3.020E+00,WG L28834-10 E
B,11L28834-10	,LIBD	,06/07/2006 09:40,113L082304
C,K-40	,YES,	4.581E+01, 5.263E+01, 4.666E+01,, 0.982
C,TH-228	,YES,	3.788E-01, 6.666E+00, 8.587E+00,, 0.044
C,BE-7	,NO,	6.547E+00, 2.720E+01, 4.487E+01,, 0.146
C,CR-51	,NO,	-1.217E+01, 3.069E+01, 5.010E+01,, -0.243
C,MN-54	,NO,	-1.456E+00, 2.905E+00, 4.606E+00,, -0.316
C,CO-57	,NO,	-8.411E-01, 2.926E+00, 4.790E+00,, -0.176
C,CO-58	,NO,	1.693E-01, 3.144E+00, 5.171E+00,, 0.033
C,FE-59	,NO,	3.707E+00, 6.026E+00, 1.040E+01,, 0.356
C,CO-60	,NO,	-2.058E+00, 2.803E+00, 4.274E+00,, -0.482
C,ZN-65	,NO,	5.773E+00, 6.349E+00, 1.114E+01,, 0.518
C,SE-75	,NO,	2.034E-01, 4.041E+00, 6.735E+00,, 0.030
C,SR-85	,NO,	2.010E+01, 3.756E+00, 7.208E+00,, 2.788
C,Y-88	,NO,	1.924E+00, 3.549E+00, 6.146E+00,, 0.313
C,NB-94	,NO,	1.049E+00, 2.813E+00, 4.732E+00,, 0.222
C,NB-95	,NO,	1.432E+00, 3.018E+00, 5.099E+00,, 0.281
C,ZR-95	,NO,	8.863E-01, 5.459E+00, 9.063E+00,, 0.098
C,MO-99	,NO,	-3.179E+01, 1.758E+02, 2.864E+02,, -0.111
C,RU-103	,NO,	3.741E+00, 3.404E+00, 5.821E+00,, 0.643
C,RU-106	,NO,	2.860E+01, 2.753E+01, 4.641E+01,, 0.616
C,AG-110m	,NO,	-1.527E+00, 2.678E+00, 4.283E+00,, -0.356
C,SN-113	,NO,	1.768E+00, 3.845E+00, 6.437E+00,, 0.275
C,SB-124	,NO,	-3.049E+00, 7.927E+00, 5.241E+00,, -0.582
C,SB-125	,NO,	7.033E-01, 8.539E+00, 1.404E+01,, 0.050
C,TE-129M	,NO,	4.498E+00, 3.900E+01, 6.405E+01,, 0.070
C,I-131	,NO,	4.220E-01, 5.847E+00, 9.660E+00,, 0.044
C,BA-133	,NO,	7.975E+00, 4.673E+00, 7.127E+00,, 1.119
C,CS-134	,NO,	2.247E+00, 6.075E+00, 5.464E+00,, 0.411
C,CS-136	,NO,	-1.707E+00, 4.405E+00, 7.045E+00,, -0.242
C,CS-137	,NO,	-1.944E+00, 2.839E+00, 4.503E+00,, -0.432
C,CE-139	,NO,	-6.076E-01, 3.057E+00, 4.978E+00,, -0.122
C,BA-140	,NO,	8.358E-01, 1.519E+01, 2.474E+01,, 0.034
C,LA-140	,NO,	-5.782E+00, 5.539E+00, 8.342E+00,, -0.693
C,CE-141	,NO,	2.462E+00, 6.774E+00, 9.560E+00,, 0.257
C,CE-144	,NO,	-1.618E+01, 2.634E+01, 3.595E+01,, -0.450
C,EU-152	,NO,	-1.569E+01, 1.134E+01, 1.466E+01,, -1.070
C,EU-154	,NO,	2.918E+00, 6.012E+00, 1.002E+01,, 0.291
C,RA-226	,NO,	2.928E+01, 7.738E+01, 1.227E+02,, 0.239
C,AC-228	,NO,	-8.064E-01, 1.339E+01, 2.028E+01,, -0.040
C,TH-232	,NO,	-8.041E-01, 1.335E+01, 2.022E+01,, -0.040
C,U-235	,NO,	2.169E+01, 2.685E+01, 3.847E+01,, 0.564
C,U-238	,NO,	-8.392E+01, 3.119E+02, 5.091E+02,, -0.165
C,AM-241	,NO,	-7.423E+01, 3.921E+01, 6.119E+01,, -1.213

Sec. Review: Analyst: LIMS: ✓

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VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 9-JUN-2006 21:58:49.48  
 TBE15 P-10635B HpGe \*\*\*\*\* Aquisition Date/Time: 9-JUN-2006 17:19:33.63

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LIMS No., Customer Name, Client ID: WG L28834-11 QUAD CITY

Sample ID : 15L28834-11 Smple Date: 1-JUN-2006 08:30:00.0  
 Sample Type : WG Geometry : 153L082604  
 Quantity : 3.01660E+00 L BKGFILE : 15BG060306MT  
 Start Channel : 40 Energy Tol : 1.50000 Real Time : 0 04:39:09.04  
 End Channel : 4090 Pk Srch Sens: 5.00000 Live time : 0 04:39:07.37  
 MDA Constant : 0.00 Library Used: LIBD

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	%Eff	Cts/Sec	%Err	Fit
1	1	139.36	78	548	2.22	266.99	2.70E+00	4.65E-03	59.6	3.15E+00
2	1	198.08	135	329	1.75	385.09	2.44E+00	8.07E-03	25.7	1.18E+00
3	1	351.93*	73	170	1.68	694.43	1.59E+00	4.37E-03	39.0	2.07E+00
4	1	608.57	93	82	2.23	1210.33	9.91E-01	5.53E-03	22.3	1.27E+00
5	1	1460.38*	51	27	3.40	2921.35	4.69E-01	3.02E-03	34.5	1.12E+00
6	1	1764.15	19	19	1.51	3531.07	4.07E-01	1.15E-03	49.1	8.86E-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	51	10.67*	4.695E-01	5.401E+01	5.401E+01	69.05

Flag: "\*" = Keyline

Summary of Nuclide Activity  
 Sample ID : 15L28834-11

Page : 2  
 Acquisition date : 9-JUN-2006 17:19:33

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 pCi/L	Decay Corr pCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	5.401E+01	5.401E+01	3.729E+01	69.05	
Total Activity :			5.401E+01	5.401E+01			

Grand Total Activity : 5.401E+01 5.401E+01

Flags: "K" = Keyline not found  
 "E" = Manually edited

"M" = Manually accepted  
 "A" = Nuclide specific abn. limit

Unidentified Energy Lines  
Sample ID : 15L28834-11

Page : 3  
Acquisition date : 9-JUN-2006 17:19:33

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
1	139.36	78	548	2.22	266.99	263	11	4.65E-03	****	2.70E+00	
1	198.08	135	329	1.75	385.09	381	9	8.07E-03	51.3	2.44E+00	
1	351.93	73	170	1.68	694.43	691	10	4.37E-03	77.9	1.59E+00	
1	608.57	93	82	2.23	1210.33	1205	12	5.53E-03	44.5	9.91E-01	
1	1764.15	19	19	1.51	3531.07	3527	10	1.15E-03	98.1	4.07E-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	Wtd Mean	Decay Corr 2-Sigma Error	2-Sigma	Flags
			Uncorrected pCi/L	Decay Corr pCi/L			
K-40	1.28E+09Y	1.00	5.401E+01	5.401E+01	3.729E+01	69.05	
Total Activity :			5.401E+01	5.401E+01			

Grand Total Activity : 5.401E+01      5.401E+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	5.401E+01	3.729E+01	3.990E+01	0.000E+00	1.354

#### ---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/L)	K.L. Ided	Act error	MDA (pCi/L)	MDA error	Act/MDA
BE-7	1.465E+01		1.922E+01	3.310E+01	0.000E+00	0.443
NA-24	-1.587E-02		1.510E-02	Half-Life too short		
CR-51	-2.671E+01		2.037E+01	3.200E+01	0.000E+00	-0.835
MN-54	1.189E+00		2.137E+00	3.648E+00	0.000E+00	0.326
CO-57	-2.472E-01		1.910E+00	2.995E+00	0.000E+00	-0.083
CO-58	-1.711E+00		2.442E+00	3.854E+00	0.000E+00	-0.444



FE-59	4.032E+00	4.584E+00	8.078E+00	0.000E+00	0.499
CO-60	-1.615E+00	2.500E+00	3.835E+00	0.000E+00	-0.421
ZN-65	3.740E+00	5.062E+00	8.788E+00	0.000E+00	0.426
SE-75	2.230E+00	2.699E+00	4.492E+00	0.000E+00	0.496
SR-85	1.082E+01	2.537E+00	4.857E+00	0.000E+00	2.228
Y-88	-1.184E+00	2.661E+00	4.195E+00	0.000E+00	-0.282
NB-94	-9.762E-01	2.100E+00	3.309E+00	0.000E+00	-0.295
NB-95	-1.733E+00	2.435E+00	3.864E+00	0.000E+00	-0.448
ZR-95	-7.826E-01	4.300E+00	7.053E+00	0.000E+00	-0.111
MO-99	-9.146E+01	1.335E+02	2.123E+02	0.000E+00	-0.431
RU-103	9.739E-01	2.381E+00	4.028E+00	0.000E+00	0.242
RU-106	5.525E+00	2.112E+01	3.505E+01	0.000E+00	0.158
AG-110m	-1.142E+00	2.169E+00	3.424E+00	0.000E+00	-0.333
SN-113	5.854E-01	2.909E+00	4.796E+00	0.000E+00	0.122
SB-124	-5.988E+00	3.097E+00	3.655E+00	0.000E+00	-1.638
SB-125	6.398E+00	6.036E+00	1.030E+01	0.000E+00	0.621
TE-129M	1.544E+01	2.906E+01	4.824E+01	0.000E+00	0.320
I-131	3.623E+00	4.147E+00	7.060E+00	0.000E+00	0.513
BA-133	5.670E-01	3.338E+00	4.705E+00	0.000E+00	0.121
CS-134	-5.795E-01	2.853E+00	3.893E+00	0.000E+00	-0.149
CS-136	6.420E-01	3.225E+00	5.389E+00	0.000E+00	0.119
CS-137	8.799E-01	2.328E+00	3.879E+00	0.000E+00	0.227
CE-139	4.457E-01	1.848E+00	3.076E+00	0.000E+00	0.145
BA-140	1.989E+00	1.152E+01	1.920E+01	0.000E+00	0.104
LA-140	2.359E+00	4.138E+00	7.164E+00	0.000E+00	0.329
CE-141	6.981E-01	4.018E+00	5.756E+00	0.000E+00	0.121
CE-144	2.317E+00	1.660E+01	2.384E+01	0.000E+00	0.097
EU-152	-8.736E+00	7.041E+00	9.784E+00	0.000E+00	-0.893
EU-154	-2.549E+00	3.975E+00	6.140E+00	0.000E+00	-0.415
RA-226	3.403E+00	5.060E+01	8.069E+01	0.000E+00	0.042
AC-228	3.578E+00	8.069E+00	1.361E+01	0.000E+00	0.263
TH-228	6.438E-01	3.820E+00	5.965E+00	0.000E+00	0.108
TH-232	3.568E+00	8.046E+00	1.357E+01	0.000E+00	0.263
U-235	7.424E+00	1.546E+01	2.244E+01	0.000E+00	0.331
U-238	8.031E+01	2.435E+02	4.058E+02	0.000E+00	0.198
AM-241	-3.650E+01	1.999E+01	3.147E+01	0.000E+00	-1.160

A, 15L28834-11	, 06/09/2006 21:58, 06/01/2006 08:30,	3.017E+00, WG	L28834-11 Q
B, 15L28834-11	, LIBD	, 06/06/2006 10:43,	153L082604
C, K-40	, YES,	5.401E+01,	3.729E+01,
		3.990E+01,,	1.354
C, BE-7	, NO,	1.465E+01,	1.922E+01,
		3.310E+01,,	0.443
C, CR-51	, NO,	-2.671E+01,	2.037E+01,
		3.200E+01,,	-0.835
C, MN-54	, NO,	1.189E+00,	2.137E+00,
		3.648E+00,,	0.326
C, CO-57	, NO,	-2.472E-01,	1.910E+00,
		2.995E+00,,	-0.083
C, CO-58	, NO,	-1.711E+00,	2.442E+00,
		3.854E+00,,	-0.444
C, FE-59	, NO,	4.032E+00,	4.584E+00,
		8.078E+00,,	0.499
C, CO-60	, NO,	-1.615E+00,	2.500E+00,
		3.835E+00,,	-0.421
C, ZN-65	, NO,	3.740E+00,	5.062E+00,
		8.788E+00,,	0.426
C, SE-75	, NO,	2.230E+00,	2.699E+00,
		4.492E+00,,	0.496
C, SR-85	, NO,	1.082E+01,	2.537E+00,
		4.857E+00,,	2.228
C, Y-88	, NO,	-1.184E+00,	2.661E+00,
		4.195E+00,,	-0.282
C, NB-94	, NO,	-9.762E-01,	2.100E+00,
		3.309E+00,,	-0.295
C, NB-95	, NO,	-1.733E+00,	2.435E+00,
		3.864E+00,,	-0.448
C, ZR-95	, NO,	-7.826E-01,	4.300E+00,
		7.053E+00,,	-0.111
C, MO-99	, NO,	-9.146E+01,	1.335E+02,
		2.123E+02,,	-0.431
C, RU-103	, NO,	9.739E-01,	2.381E+00,
		4.028E+00,,	0.242
C, RU-106	, NO,	5.525E+00,	2.112E+01,
		3.505E+01,,	0.158
C, AG-110m	, NO,	-1.142E+00,	2.169E+00,
		3.424E+00,,	-0.333
C, SN-113	, NO,	5.854E-01,	2.909E+00,
		4.796E+00,,	0.122
C, SB-124	, NO,	-5.988E+00,	3.097E+00,
		3.655E+00,,	-1.638
C, SB-125	, NO,	6.398E+00,	6.036E+00,
		1.030E+01,,	0.621
C, TE-129M	, NO,	1.544E+01,	2.906E+01,
		4.824E+01,,	0.320
C, I-131	, NO,	3.623E+00,	4.147E+00,
		7.060E+00,,	0.513
C, BA-133	, NO,	5.670E-01,	3.338E+00,
		4.705E+00,,	0.121
C, CS-134	, NO,	-5.795E-01,	2.853E+00,
		3.893E+00,,	-0.149
C, CS-136	, NO,	6.420E-01,	3.225E+00,
		5.389E+00,,	0.119
C, CS-137	, NO,	8.799E-01,	2.328E+00,
		3.879E+00,,	0.227
C, CE-139	, NO,	4.457E-01,	1.848E+00,
		3.076E+00,,	0.145
C, BA-140	, NO,	1.989E+00,	1.152E+01,
		1.920E+01,,	0.104
C, LA-140	, NO,	2.359E+00,	4.138E+00,
		7.164E+00,,	0.329
C, CE-141	, NO,	6.981E-01,	4.018E+00,
		5.756E+00,,	0.121
C, CE-144	, NO,	2.317E+00,	1.660E+01,
		2.384E+01,,	0.097
C, EU-152	, NO,	-8.736E+00,	7.041E+00,
		9.784E+00,,	-0.893
C, EU-154	, NO,	-2.549E+00,	3.975E+00,
		6.140E+00,,	-0.415
C, RA-226	, NO,	3.403E+00,	5.060E+01,
		8.069E+01,,	0.042
C, AC-228	, NO,	3.578E+00,	8.069E+00,
		1.361E+01,,	0.263
C, TH-228	, NO,	6.438E-01,	3.820E+00,
		5.965E+00,,	0.108
C, TH-232	, NO,	3.568E+00,	8.046E+00,
		1.357E+01,,	0.263
C, U-235	, NO,	7.424E+00,	1.546E+01,
		2.244E+01,,	0.331
C, U-238	, NO,	8.031E+01,	2.435E+02,
		4.058E+02,,	0.198
C, AM-241	, NO,	-3.650E+01,	1.999E+01,
		3.147E+01,,	-1.160

Sec. Review: Analyst: LIMS: *✓*

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VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 10-JUN-2006 11:32:29.47  
 TBE04 P-40312B HpGe \*\*\*\*\* Aquisition Date/Time: 9-JUN-2006 22:10:47.99

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LIMS No., Customer Name, Client ID: WG L28834-12 QUAD CITY

Sample ID : 04L28834-12                      Smple Date: 31-MAY-2006 08:50:00.  
 Sample Type : WG                              Geometry : 043L082004  
 Quantity : 3.02220E+00 L                      BKGFILE : 04BG060306MT  
 Start Channel : 90                      Energy Tol : 1.00000                      Real Time : 0 06:40:04.08  
 End Channel : 4090                      Pk Srch Sens: 5.00000                      Live time : 0 06:40:00.00  
 MDA Constant : 0.00                      Library Used: LIBD

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	%Eff	Cts/Sec	%Err	Fit
1	1	66.36*	236	679	1.30	133.19	6.65E-01	9.84E-03	22.0	1.47E+00
2	1	139.89	218	628	1.14	280.21	2.04E+00	9.08E-03	21.7	1.63E+00
3	1	198.49*	55	492	1.24	397.41	1.86E+00	2.27E-03	86.6	2.80E+00
4	1	295.23	73	342	1.34	590.84	1.45E+00	3.03E-03	47.3	1.49E+00
5	1	351.94*	116	299	1.56	704.25	1.28E+00	4.84E-03	35.5	7.54E-01
6	1	583.74*	41	150	1.21	1167.72	8.77E-01	1.69E-03	69.0	2.13E+00
7	1	596.16	115	148	1.91	1192.54	8.63E-01	4.80E-03	23.1	5.50E-01
8	1	609.80*	149	149	1.62	1219.81	8.48E-01	6.20E-03	22.5	9.63E-01
9	1	911.70*	9	84	1.69	1823.38	6.21E-01	3.74E-04	246.1	1.16E+00
10	1	1120.97	55	78	2.30	2241.71	5.27E-01	2.29E-03	35.4	2.30E+00
11	1	1174.40	40	47	2.22	2348.52	5.08E-01	1.66E-03	36.0	1.14E+00
12	1	1461.64	120	95	3.08	2922.65	4.29E-01	4.99E-03	22.9	3.06E+00
13	1	1765.98	32	48	0.83	3530.88	3.77E-01	1.35E-03	49.6	5.26E+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	120	10.67*	4.294E-01	9.731E+01	9.731E+01	45.84
AC-228	835.50	-----	1.75	6.649E-01	-----	Line Not Found	-----
	911.07	9	27.70*	6.208E-01	1.947E+00	1.953E+00	492.26
TH-232	583.14	41	30.25	8.766E-01	5.707E+00	5.707E+00	138.00
	911.07	9	27.70*	6.208E-01	1.947E+00	1.947E+00	492.26
	969.11	-----	16.60	5.916E-01	-----	Line Not Found	-----

Flag: "\*" = Keyline

## Summary of Nuclide Activity

Page : 2

Sample ID : 04L28834-12

Acquisition date : 9-JUN-2006 22:10:47

Total number of lines in spectrum	13	
Number of unidentified lines	10	
Number of lines tentatively identified by NID	3	23.08%

Nuclide Type : natural

Nuclide	Hlife	Decay	Uncorrected pCi/L	Decay Corr pCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	9.731E+01	9.731E+01	4.460E+01	45.84	
AC-228	5.75Y	1.00	1.947E+00	1.953E+00	9.615E+00	492.26	
TH-232	1.41E+10Y	1.00	1.947E+00	1.947E+00	9.584E+00	492.26	
			-----	-----			
		Total Activity :	1.012E+02	1.012E+02			

Grand Total Activity : 1.012E+02 1.012E+02

Flags: "K" = Keyline not found  
 "E" = Manually edited

"M" = Manually accepted  
 "A" = Nuclide specific abn. limit

Unidentified Energy Lines  
Sample ID : 04L28834-12

Page : 3  
Acquisition date : 9-JUN-2006 22:10:47

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
1	66.36	236	679	1.30	133.19	130	9	9.84E-03	43.9	6.65E-01	
1	139.89	218	628	1.14	280.21	276	9	9.08E-03	43.4	2.04E+00	
1	198.49	55	492	1.24	397.41	393	9	2.27E-03	****	1.86E+00	
1	295.23	73	342	1.34	590.84	587	9	3.03E-03	94.6	1.45E+00	
1	351.94	116	299	1.56	704.25	698	13	4.84E-03	70.9	1.28E+00	
1	596.16	115	148	1.91	1192.54	1187	12	4.80E-03	46.1	8.63E-01	
1	609.80	149	149	1.62	1219.81	1213	13	6.20E-03	45.0	8.48E-01	
1	1120.97	55	78	2.30	2241.71	2235	13	2.29E-03	70.9	5.27E-01	
1	1174.40	40	47	2.22	2348.52	2344	10	1.66E-03	72.0	5.08E-01	
1	1765.98	32	48	0.83	3530.88	3521	15	1.35E-03	99.2	3.77E-01	

Flags: "T" = Tentatively associated

#### Summary of Nuclide Activity

Total number of lines in spectrum	13
Number of unidentified lines	10
Number of lines tentatively identified by NID	3                    23.08%

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	9.731E+01	9.731E+01	4.460E+01	45.84			
TH-232	1.41E+10Y	1.00	4.191E+00	4.191E+00	6.085E+00	145.17			
Total Activity :			1.015E+02	1.015E+02					

Grand Total Activity : 1.015E+02      1.015E+02

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 ----

Nuclide	Activity (pCi/L)	Act error	MDA (pCi/L)	MDA error	Act/MDA
K-40	9.731E+01	4.460E+01	3.488E+01	0.000E+00	2.790
TH-232	4.191E+00	6.085E+00	1.257E+01	0.000E+00	0.333

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/L)	K.L. Ided	Act error	MDA (pCi/L)	MDA error	Act/MDA
BE-7	-1.239E+01		1.925E+01	3.098E+01	0.000E+00	-0.400
NA-24	-1.211E-02		5.674E-02	Half-Life too short		
CR-51	-1.524E+01		2.270E+01	3.659E+01	0.000E+00	-0.416
MN-54	-9.363E-02		2.242E+00	3.649E+00	0.000E+00	-0.026
CO-57	-2.493E-02		1.927E+00	3.225E+00	0.000E+00	-0.008
CO-58	-7.716E-01		2.321E+00	3.727E+00	0.000E+00	-0.207
FE-59	3.455E+00		4.910E+00	8.363E+00	0.000E+00	0.413
CO-60	1.655E-01		2.689E+00	4.112E+00	0.000E+00	0.040
ZN-65	2.501E+00		5.714E+00	8.146E+00	0.000E+00	0.307
SE-75	-2.370E+00		2.791E+00	4.531E+00	0.000E+00	-0.523
SR-85	2.039E+01		2.781E+00	5.516E+00	0.000E+00	3.697
Y-88	-1.886E+00		2.469E+00	3.749E+00	0.000E+00	-0.503
NB-94	-5.347E-01		2.146E+00	3.506E+00	0.000E+00	-0.152
NB-95	2.098E+00		2.314E+00	3.971E+00	0.000E+00	0.528
ZR-95	3.988E-01		4.293E+00	7.088E+00	0.000E+00	0.056
MO-99	-2.447E+00		1.823E+02	2.999E+02	0.000E+00	-0.008
RU-103	2.174E+00		2.486E+00	4.239E+00	0.000E+00	0.513
RU-106	7.334E+00		2.132E+01	3.465E+01	0.000E+00	0.212
AG-110m	-9.160E-01		2.112E+00	3.436E+00	0.000E+00	-0.267
SN-113	1.807E+00		2.965E+00	4.926E+00	0.000E+00	0.367
SB-124	5.759E-01		5.114E+00	3.765E+00	0.000E+00	0.153
SB-125	-5.518E-01		6.019E+00	9.987E+00	0.000E+00	-0.055
TE-129M	1.932E+01		2.841E+01	4.830E+01	0.000E+00	0.400
I-131	-6.537E+00		5.021E+00	7.820E+00	0.000E+00	-0.836
BA-133	9.020E+00		3.424E+00	5.354E+00	0.000E+00	1.685
CS-134	2.900E+00		4.689E+00	3.741E+00	0.000E+00	0.775
CS-136	1.676E+00		3.520E+00	5.897E+00	0.000E+00	0.284
CS-137	3.869E-01		2.266E+00	3.791E+00	0.000E+00	0.102
CE-139	5.673E-01		2.056E+00	3.415E+00	0.000E+00	0.166
BA-140	-3.038E+00		1.215E+01	1.971E+01	0.000E+00	-0.154
LA-140	7.048E-01		4.339E+00	7.265E+00	0.000E+00	0.097
CE-141	2.663E+00		4.804E+00	6.945E+00	0.000E+00	0.383
CE-144	-8.218E+00		1.753E+01	2.464E+01	0.000E+00	-0.334
EU-152	-2.438E+00		7.809E+00	1.068E+01	0.000E+00	-0.228
EU-154	2.182E-01		3.984E+00	6.676E+00	0.000E+00	0.033
RA-226	3.418E+01		5.415E+01	8.432E+01	0.000E+00	0.405
AC-228	1.953E+00		9.615E+00	1.476E+01	0.000E+00	0.132
TH-228	6.674E+00		4.561E+00	7.431E+00	0.000E+00	0.898
U-235	1.863E+00		1.812E+01	2.584E+01	0.000E+00	0.072
U-238	-5.593E+01		2.447E+02	3.980E+02	0.000E+00	-0.141
AM-241	-9.829E+00		2.151E+01	3.364E+01	0.000E+00	-0.292

A,04L28834-12 ,06/10/2006 11:32,05/31/2006 08:50, 3.022E+00,WG L28834-12 Q  
 B,04L28834-12 ,LIBD ,06/02/2006 09:04,043L082004  
 C,K-40 ,YES, 9.731E+01, 4.460E+01, 3.488E+01,, 2.790  
 C,TH-232 ,YES, 4.191E+00, 6.085E+00, 1.257E+01,, 0.333  
 C,BE-7 ,NO , -1.239E+01, 1.925E+01, 3.098E+01,, -0.400  
 C,CR-51 ,NO , -1.524E+01, 2.270E+01, 3.659E+01,, -0.416  
 C,MN-54 ,NO , -9.363E-02, 2.242E+00, 3.649E+00,, -0.026  
 C,CO-57 ,NO , -2.493E-02, 1.927E+00, 3.225E+00,, -0.008  
 C,CO-58 ,NO , -7.716E-01, 2.321E+00, 3.727E+00,, -0.207  
 C,FE-59 ,NO , 3.455E+00, 4.910E+00, 8.363E+00,, 0.413  
 C,CO-60 ,NO , 1.655E-01, 2.689E+00, 4.112E+00,, 0.040  
 C,ZN-65 ,NO , 2.501E+00, 5.714E+00, 8.146E+00,, 0.307  
 C,SE-75 ,NO , -2.370E+00, 2.791E+00, 4.531E+00,, -0.523  
 C,SR-85 ,NO , 2.039E+01, 2.781E+00, 5.516E+00,, 3.697  
 C,Y-88 ,NO , -1.886E+00, 2.469E+00, 3.749E+00,, -0.503  
 C,NB-94 ,NO , -5.347E-01, 2.146E+00, 3.506E+00,, -0.152  
 C,NB-95 ,NO , 2.098E+00, 2.314E+00, 3.971E+00,, 0.528  
 C,ZR-95 ,NO , 3.988E-01, 4.293E+00, 7.088E+00,, 0.056  
 C,MO-99 ,NO , -2.447E+00, 1.823E+02, 2.999E+02,, -0.008  
 C,RU-103 ,NO , 2.174E+00, 2.486E+00, 4.239E+00,, 0.513  
 C,RU-106 ,NO , 7.334E+00, 2.132E+01, 3.465E+01,, 0.212  
 C,AG-110m ,NO , -9.160E-01, 2.112E+00, 3.436E+00,, -0.267  
 C,SN-113 ,NO , 1.807E+00, 2.965E+00, 4.926E+00,, 0.367  
 C,SB-124 ,NO , 5.759E-01, 5.114E+00, 3.765E+00,, 0.153  
 C,SB-125 ,NO , -5.518E-01, 6.019E+00, 9.987E+00,, -0.055  
 C,TE-129M ,NO , 1.932E+01, 2.841E+01, 4.830E+01,, 0.400  
 C,I-131 ,NO , -6.537E+00, 5.021E+00, 7.820E+00,, -0.836  
 C,BA-133 ,NO , 9.020E+00, 3.424E+00, 5.354E+00,, 1.685  
 C,CS-134 ,NO , 2.900E+00, 4.689E+00, 3.741E+00,, 0.775  
 C,CS-136 ,NO , 1.676E+00, 3.520E+00, 5.897E+00,, 0.284  
 C,CS-137 ,NO , 3.869E-01, 2.266E+00, 3.791E+00,, 0.102  
 C,CE-139 ,NO , 5.673E-01, 2.056E+00, 3.415E+00,, 0.166  
 C,BA-140 ,NO , -3.038E+00, 1.215E+01, 1.971E+01,, -0.154  
 C,LA-140 ,NO , 7.048E-01, 4.339E+00, 7.265E+00,, 0.097  
 C,CE-141 ,NO , 2.663E+00, 4.804E+00, 6.945E+00,, 0.383  
 C,CE-144 ,NO , -8.218E+00, 1.753E+01, 2.464E+01,, -0.334  
 C,EU-152 ,NO , -2.438E+00, 7.809E+00, 1.068E+01,, -0.228  
 C,EU-154 ,NO , 2.182E-01, 3.984E+00, 6.676E+00,, 0.033  
 C,RA-226 ,NO , 3.418E+01, 5.415E+01, 8.432E+01,, 0.405  
 C,AC-228 ,NO , 1.953E+00, 9.615E+00, 1.476E+01,, 0.132  
 C,TH-228 ,NO , 6.674E+00, 4.561E+00, 7.431E+00,, 0.898  
 C,U-235 ,NO , 1.863E+00, 1.812E+01, 2.584E+01,, 0.072  
 C,U-238 ,NO , -5.593E+01, 2.447E+02, 3.980E+02,, -0.141  
 C,AM-241 ,NO , -9.829E+00, 2.151E+01, 3.364E+01,, -0.292





Summary of Nuclide Activity  
Sample ID : 07L28834-13

Page : 2  
Acquisition date : 9-JUN-2006 22:10:58

Total number of lines in spectrum	6	
Number of unidentified lines	6	
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 : 07L28834-13

Acquisition date : 9-JUN-2006 22:10:58

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
4	66.39	250	643	1.34	133.36	124	14	1.04E-02	39.4	8.08E-01	
1	139.94	205	621	1.07	280.57	276	9	8.53E-03	50.6	2.36E+00	
1	295.81	127	494	2.68	592.52	586	13	5.30E-03	78.9	1.81E+00	
1	596.03	144	188	2.69	1193.23	1189	13	6.00E-03	42.8	1.10E+00	
1	609.43	79	193	1.54	1220.03	1215	11	3.31E-03	85.3	1.09E+00	
1	1764.49	36	45	3.27	3529.56	3523	17	1.50E-03	****	5.12E-01	

Flags: "T" = Tentatively associated

## Summary of Nuclide Activity

Total number of lines in spectrum	6
Number of unidentified lines	6
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	4.590E+00		1.783E+01	2.930E+01	0.000E+00	0.157
NA-24	-4.453E-02		4.360E-02	Half-Life too short		
K-40	2.075E+01		2.881E+01	4.893E+01	0.000E+00	0.424
CR-51	-3.236E+01		1.958E+01	3.109E+01	0.000E+00	-1.041
MN-54	1.595E+00		1.979E+00	3.383E+00	0.000E+00	0.472
CO-57	-1.302E+00		1.859E+00	2.991E+00	0.000E+00	-0.435
CO-58	6.172E-01		2.057E+00	3.451E+00	0.000E+00	0.179
FE-59	6.186E+00		4.153E+00	7.378E+00	0.000E+00	0.838
CO-60	1.662E-01		1.882E+00	3.091E+00	0.000E+00	0.054
ZN-65	5.280E+00		4.010E+00	7.077E+00	0.000E+00	0.746
SE-75	3.782E-01		2.624E+00	4.301E+00	0.000E+00	0.088
SR-85	2.143E+01		2.548E+00	5.068E+00	0.000E+00	4.228
Y-88	-1.573E-01		2.206E+00	3.634E+00	0.000E+00	-0.043
NB-94	-1.178E+00		1.856E+00	2.946E+00	0.000E+00	-0.400
NB-95	-2.894E-01		2.106E+00	3.480E+00	0.000E+00	-0.083
ZR-95	-2.477E+00		3.774E+00	5.944E+00	0.000E+00	-0.417
MO-99	-6.492E+01		1.658E+02	2.649E+02	0.000E+00	-0.245
RU-103	3.215E+00		2.316E+00	3.945E+00	0.000E+00	0.815
RU-106	2.484E+00		1.902E+01	3.104E+01	0.000E+00	0.080
AG-110m	-1.002E+00		1.916E+00	3.070E+00	0.000E+00	-0.326
SN-113	1.295E+00		2.540E+00	4.251E+00	0.000E+00	0.305
SB-124	3.016E+00		4.428E+00	3.470E+00	0.000E+00	0.869

SB-125	1.290E+00	5.490E+00	9.068E+00	0.000E+00	0.142
TE-129M	2.243E+00	2.578E+01	4.219E+01	0.000E+00	0.053
I-131	6.514E-01	4.247E+00	7.056E+00	0.000E+00	0.092
BA-133	1.833E+00	2.631E+00	4.442E+00	0.000E+00	0.413
CS-134	6.888E+00	4.093E+00	3.620E+00	0.000E+00	1.903
CS-136	-1.220E+00	2.992E+00	4.856E+00	0.000E+00	-0.251
CS-137	-1.667E-01	2.083E+00	3.402E+00	0.000E+00	-0.049
CE-139	-5.214E-01	1.834E+00	3.041E+00	0.000E+00	-0.171
BA-140	-6.843E-01	1.081E+01	1.789E+01	0.000E+00	-0.038
LA-140	-7.423E-01	3.522E+00	5.704E+00	0.000E+00	-0.130
CE-141	6.270E+00	4.331E+00	6.261E+00	0.000E+00	1.001
CE-144	-4.833E+00	1.694E+01	2.325E+01	0.000E+00	-0.208
EU-152	-1.455E+01	6.154E+00	9.528E+00	0.000E+00	-1.527
EU-154	-1.731E+00	3.837E+00	6.207E+00	0.000E+00	-0.279
RA-226	1.233E+01	4.933E+01	7.942E+01	0.000E+00	0.155
AC-228	-1.469E+00	8.265E+00	1.256E+01	0.000E+00	-0.117
TH-228	-3.434E-01	3.828E+00	6.026E+00	0.000E+00	-0.057
TH-232	-1.464E+00	8.238E+00	1.252E+01	0.000E+00	-0.117
U-235	3.160E+01	1.669E+01	2.443E+01	0.000E+00	1.293
U-238	2.168E+02	2.145E+02	3.678E+02	0.000E+00	0.590
AM-241	2.125E+00	1.996E+01	2.757E+01	0.000E+00	0.077

A, 07L28834-13		, 06/10/2006 11:33, 05/31/2006 09:40,		3.006E+00, WG L28834-13 Q	
B, 07L28834-13		, LIBD		, 06/07/2006 09:32, 073L082504	
C, BE-7	, NO ,	4.590E+00,	1.783E+01,	2.930E+01,,	0.157
C, K-40	, NO ,	2.075E+01,	2.881E+01,	4.893E+01,,	0.424
C, CR-51	, NO ,	-3.236E+01,	1.958E+01,	3.109E+01,,	-1.041
C, MN-54	, NO ,	1.595E+00,	1.979E+00,	3.383E+00,,	0.472
C, CO-57	, NO ,	-1.302E+00,	1.859E+00,	2.991E+00,,	-0.435
C, CO-58	, NO ,	6.172E-01,	2.057E+00,	3.451E+00,,	0.179
C, FE-59	, NO ,	6.186E+00,	4.153E+00,	7.378E+00,,	0.838
C, CO-60	, NO ,	1.662E-01,	1.882E+00,	3.091E+00,,	0.054
C, ZN-65	, NO ,	5.280E+00,	4.010E+00,	7.077E+00,,	0.746
C, SE-75	, NO ,	3.782E-01,	2.624E+00,	4.301E+00,,	0.088
C, SR-85	, NO ,	2.143E+01,	2.548E+00,	5.068E+00,,	4.228
C, Y-88	, NO ,	-1.573E-01,	2.206E+00,	3.634E+00,,	-0.043
C, NB-94	, NO ,	-1.178E+00,	1.856E+00,	2.946E+00,,	-0.400
C, NB-95	, NO ,	-2.894E-01,	2.106E+00,	3.480E+00,,	-0.083
C, ZR-95	, NO ,	-2.477E+00,	3.774E+00,	5.944E+00,,	-0.417
C, MO-99	, NO ,	-6.492E+01,	1.658E+02,	2.649E+02,,	-0.245
C, RU-103	, NO ,	3.215E+00,	2.316E+00,	3.945E+00,,	0.815
C, RU-106	, NO ,	2.484E+00,	1.902E+01,	3.104E+01,,	0.080
C, AG-110m	, NO ,	-1.002E+00,	1.916E+00,	3.070E+00,,	-0.326
C, SN-113	, NO ,	1.295E+00,	2.540E+00,	4.251E+00,,	0.305
C, SB-124	, NO ,	3.016E+00,	4.428E+00,	3.470E+00,,	0.869
C, SB-125	, NO ,	1.290E+00,	5.490E+00,	9.068E+00,,	0.142
C, TE-129M	, NO ,	2.243E+00,	2.578E+01,	4.219E+01,,	0.053
C, I-131	, NO ,	6.514E-01,	4.247E+00,	7.056E+00,,	0.092
C, BA-133	, NO ,	1.833E+00,	2.631E+00,	4.442E+00,,	0.413
C, CS-134	, NO ,	6.888E+00,	4.093E+00,	3.620E+00,,	1.903
C, CS-136	, NO ,	-1.220E+00,	2.992E+00,	4.856E+00,,	-0.251
C, CS-137	, NO ,	-1.667E-01,	2.083E+00,	3.402E+00,,	-0.049
C, CE-139	, NO ,	-5.214E-01,	1.834E+00,	3.041E+00,,	-0.171
C, BA-140	, NO ,	-6.843E-01,	1.081E+01,	1.789E+01,,	-0.038
C, LA-140	, NO ,	-7.423E-01,	3.522E+00,	5.704E+00,,	-0.130
C, CE-141	, NO ,	6.270E+00,	4.331E+00,	6.261E+00,,	1.001
C, CE-144	, NO ,	-4.833E+00,	1.694E+01,	2.325E+01,,	-0.208
C, EU-152	, NO ,	-1.455E+01,	6.154E+00,	9.528E+00,,	-1.527
C, EU-154	, NO ,	-1.731E+00,	3.837E+00,	6.207E+00,,	-0.279
C, RA-226	, NO ,	1.233E+01,	4.933E+01,	7.942E+01,,	0.155
C, AC-228	, NO ,	-1.469E+00,	8.265E+00,	1.256E+01,,	-0.117
C, TH-228	, NO ,	-3.434E-01,	3.828E+00,	6.026E+00,,	-0.057
C, TH-232	, NO ,	-1.464E+00,	8.238E+00,	1.252E+01,,	-0.117
C, U-235	, NO ,	3.160E+01,	1.669E+01,	2.443E+01,,	1.293
C, U-238	, NO ,	2.168E+02,	2.145E+02,	3.678E+02,,	0.590
C, AM-241	, NO ,	2.125E+00,	1.996E+01,	2.757E+01,,	0.077



2508 Quality Lane  
Knoxville, TN 37931  
865-690-6819 (Phone)

**Work Order #: L28837**

**Exelon Quad Cities**

**June 13, 2006**



Kathy Shaw  
Conestoga-Rovers & Associates  
45 Farmington Valley Drive  
Plainville CT 06062

**Case Narrative - L28837  
EX001-3ESPQUAD-06**

06/13/2006 15:06

**Sample Receipt**

The following samples were received on June 5, 2006 in good condition, unless otherwise noted.

CRA supplied revised chain of custodies with corrected client IDs.

*Cross Reference Table*

Client ID	Laboratory ID	Station ID(if applicable)
WG-QC-MW-QC-108S-053106-JH-012	L28837-1	
WG-QC-MW-QC-107I-053106-JH-011	L28837-2	
WG-QC-MW-QC-103I-060106-JH-020	L28837-3	
WG-QC-MW-QC-106S-053106-JH-015	L28837-4	
RB-QC-MW-QC-108S-053106-JH-013	L28837-5	
WG-QC-MW-QC-106I-053106-JH-014	L28837-6	
WG-QC-MW-QC-101I-060106-JH-027	L28837-7	
WG-QC-MW-QC-104S-060106-JH-025	L28837-8	
WG-QC-MW-QC-105I-060106-JH-024	L28837-9	
WG-QC-MW-QC-FTW-053106-JH-001	L28837-10	

*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 - L28837**  
**EX001-3ESPQUAD-06**

06/13/2006 15:06

**Gamma Spectroscopy**

**Quality Control**

Quality control samples were analyzed as WG4097.

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-107I- 053106-JH-011	L28837-2	WG4097-3

**H-3**

**Quality Control**

Quality control samples were analyzed as WG4089.

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-103I- 060106-JH-020	L28837-3	WG4089-3



**TELEDYNE  
BROWN ENGINEERING, INC.**

A Teledyne Technologies Company  
2508 Quality Lane  
Knoxville, TN 37931-3133

**Case Narrative - L28837  
EX001-3ESPQUAD-06**

06/13/2006 15:06

**TOTAL SR**

**Quality Control**

Quality control samples were analyzed as WG4135.

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.

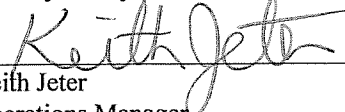
<u>Client ID</u>	<u>Laboratory ID</u>	<u>QC Sample #</u>
WG-TMI-MS-7-053106- JAS-015	L28846-1	WG4135-3

**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


**TELEDYNE  
BROWN ENGINEERING, INC.**

A Teledyne Technologies Company  
2508 Quality Lane  
Knoxville, TN 37931-3133

Kathy Shaw  
Conestoga-Rovers & Associates  
45 Farmington Valley Drive  
Plainville CT 06062

LIMS #: L28837

Project ID#: EX001-3ESPQUAD-06

Received: 06/05/2006

Delivery Date: 06/12/2006

P.O. #: 00411203

Release #:

SDG #:

*Cross Reference Table*

Client ID	Laboratory ID	Station ID(if applicable)
WG-QC-MW-QC-108S-053106-JH-012	L28837-1	
WG-QC-MW-QC-107I-053106-JH-011	L28837-2	
WG-QC-MW-QC-103I-060106-JH-020	L28837-3	
WG-QC-MW-QC-106S-053106-JH-015	L28837-4	
RB-QC-MW-QC-108S-053106-JH-013	L28837-5	
WG-QC-MW-QC-106I-053106-JH-014	L28837-6	
WG-QC-MW-QC-101I-060106-JH-027	L28837-7	
WG-QC-MW-QC-104S-060106-JH-025	L28837-8	
WG-QC-MW-QC-105I-060106-JH-024	L28837-9	
WG-QC-MW-QC-FTW-053106-JH-001	L28837-10	

06/13/06 13:40

**Teledyne Brown Engineering**  
**Sample Receipt Verification/Variance Report**

SR #: SR08709

Client: Exelon

Project #: EX001-3ESPQUAD-06

LIMS #: L28837

Initiated By: RCHARLES

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)			NA	PH < 2
9 Other (Describe)			NA	



L 2883

**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:**  
*45136-28*

**PROJECT NAME:**  
*Exelon - Quad Cities*

**CHAIN-OF-CUSTODY RECORD**

**SAMPLER'S SIGNATURE:** *John Hargens* **PRINTED NAME:** *John Hargens*

SEQ. No.	DATE	TIME	SAMPLE IDENTIFICATION No.	SAMPLE MATRIX	No. OF CONTAINERS	PARAMETERS				REMARKS
						Tritium	Strontium	Gamma Spec		
	<i>5/31/06</i>	<i>1437</i>	<i>WG-QC-MWQC106S-053106-JH-015</i>	<i>water</i>	<i>2</i>	<i>x</i>	<i>x</i>	<i>x</i>		
	<i>05/31/06</i>	<i>1100</i>	<i>RB-QC-MWQC108S-053106-JH-013</i>	<i>water</i>	<i>2</i>	<i>x</i>	<i>x</i>	<i>x</i>		
	<i>05/31/06</i>	<i>1445</i>	<i>WG-QC-MWQC106I-053106-JH-014</i>	<i>water</i>	<i>2</i>	<i>x</i>	<i>x</i>	<i>x</i>		
<b>TOTAL NUMBER OF CONTAINERS</b>					<i>6</i>					

<b>RELINQUISHED BY:</b> ① <i>John Hargens</i>	<b>DATE:</b> <i>6/1/06</i> <b>TIME:</b> <i>1600</i>	<b>RECEIVED BY:</b> ② <i>Steven Halverson</i>	<b>DATE:</b> <i>6/1/06</i> <b>TIME:</b> <i>4:52 P.M.</i>
<b>RELINQUISHED BY:</b> ② <i>Dan Smeltz</i>	<b>DATE:</b> <i>6-2-06</i> <b>TIME:</b> <i>5:15 pm</i>	<b>RECEIVED BY:</b> ③ <i>ES RJ</i>	<b>DATE:</b> <i>6-2-06</i> <b>TIME:</b> <i>5:15</i>
<b>RELINQUISHED BY:</b> ③	<b>DATE:</b> <b>TIME:</b>	<b>RECEIVED BY:</b> ④	<b>DATE:</b> <b>TIME:</b>

**METHOD OF SHIPMENT:** *in person* **AIR BILL No.**

White -Fully Executed Copy Yellow -Receiving Laboratory Copy Pink -Shipper Copy Goldenrod -Sampler Copy	<b>SAMPLE TEAM:</b>	<b>RECEIVED FOR LABORATORY BY:</b> <i>R. Charles</i> <b>12801</b>
		<b>DATE:</b> <i>6/5/06</i> <b>TIME:</b> <i>09:30</i>

L28837

**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:

45136-28

PROJECT NAME:

Exelon-Quad Cities

**CHAIN-OF-CUSTODY RECORD**

SAMPLER'S  
SIGNATURE:

*John Hargens*

PRINTED  
NAME:

John Hargens

No. OF  
CONTAINERS

PARAMETERS

*TRIBU  
SILICA  
GUMMUS*

REMARKS

SEQ. No.	DATE	TIME	SAMPLE IDENTIFICATION No.	SAMPLE MATRIX	No. OF CONTAINERS	PARAMETERS				REMARKS
	6/1/06	1410	WG-QC-MWQC101I-060106-JH-027	water	2	x	x	x		
	6/1/06	1258	WG-QC-MWQC104S-060106-JH-025	water	2	x	x	x		
	6/1/06	1118	WG-QC-MWQC105I-060106-JH-024	water	2	x	x	x		
	5/31/06	0800	WG-QC-MW-QC-FTW-053106-JH 001	water	1	x				

TOTAL NUMBER OF CONTAINERS

7

RELINQUISHED BY:

①

*John Hargens*

DATE: 6/6/06

TIME:

RECEIVED BY:

②

*Steven Maden*

DATE: 6/1/06

TIME: 4:46 P.M.

RELINQUISHED BY:

②

*Sam...*

DATE: 6-2-06

TIME: 5:15 pm

RECEIVED BY:

③

*A. R. J.*

DATE: 6-2-06

TIME: 5:15

RELINQUISHED BY:

③

DATE:

TIME:

RECEIVED BY:

④

DATE:

TIME:

METHOD OF SHIPMENT:

*in person*

AIR BILL No.

White -Fully Executed Copy  
 Yellow -Receiving Laboratory Copy  
 Pink -Shipper Copy  
 Goldenrod -Sampler Copy

SAMPLE TEAM:

RECEIVED FOR LABORATORY BY:

*R. Charles*

12798

DATE: 6/5/06 TIME: 09:30

**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

L28837

REFERENCE NUMBER:

45136-28

PROJECT NAME:

Exelon-Quad Cities

**CHAIN-OF-CUSTODY RECORD**

SAMPLER'S  
SIGNATURE:

*John Hargen*

PRINTED  
NAME:

John Hargen

PARAMETERS

*tritium  
strontium  
gammabro*

REMARKS

SEQ. No.	DATE	TIME	SAMPLE IDENTIFICATION No.	SAMPLE MATRIX	No. OF CONTAINERS	PARAMETERS				REMARKS
	053106	030	WG-QC-MW-QC108S-053106-JH012	water	2	X	+	+		
	053106	0910	WG-QC-MWQC107I-053106-JH-011	water	2	X	+	+		
	6/1/06	0748	WG-QC-MWQC103I-060106-JH020	water	2	X	+	+		
<b>TOTAL NUMBER OF CONTAINERS</b>					6					

RELINQUISHED BY:

①

*John Hargen*

DATE:

6/1/06

TIME:

1:00

RECEIVED BY:

②

*Henry Hargen*

DATE:

6/1/06

TIME:

4:51 P.M.

RELINQUISHED BY:

②

*Dan Smeltzer*

DATE:

5.15 pm

TIME:

6-2-06

RECEIVED BY:

③

*Ray Hargen*

DATE:

6.2.06

TIME:

RELINQUISHED BY:

③

DATE:

TIME:

RECEIVED BY:

④

DATE:

TIME:

METHOD OF SHIPMENT:

*1 person*

AIR BILL No.

White -Fully Executed Copy  
Yellow -Receiving Laboratory Copy  
Pink -Shipper Copy  
Goldenrod -Sampler Copy

SAMPLE TEAM:

RECEIVED FOR LABORATORY BY:

*R Charles*

12800

DATE: 6/5/06 TIME: 09:30

**Charles, Rebecca**

---

**From:** Shaw, Kathy [kshaw@croworld.com]  
**Sent:** Wednesday, June 07, 2006 5:26 PM  
**To:** Charles, Rebecca  
**Cc:** Larry.Walton@exeloncorp.com  
**Subject:** 45136-28 Quad Cities

Hi Rebecca,

I have revised the COCs for the the Quad Cities samples. I have added dashes between the well IDs etc, nothing else was changed. Please update your database with these revised IDs.

Thanks,

**Kathy Shaw - Chemist**

**Conestoga-Rovers & Associates**  
**45 Farmington Valley Drive**  
**Plainville, Connecticut 06062**  
**PH 860 747-1800**  
**Fax 860 747-1900**  
**CRAWORLD.COM**

6/8/2006



REVIS

L28837

**CONESTOGA-ROVERS & ASSOCIATES**

8615 W. Bryn Mawr Avenue  
Chicago, Illinois 60631  
(773)380-9933 phone  
(773)380-6421 fax



SHIPPED TO  
(Laboratory Name):

Tekdyne Brown

REFERENCE NUMBER:

45136-28

PROJECT NAME:

Exelon-Quad Cities

**CHAIN-OF-CUSTODY RECORD**

SAMPLER'S  
SIGNATURE:

*John Hargan*

PRINTED  
NAME:

John Hargan

NO. OF  
CONTAINERS

PARAMETERS

*TRITIA  
DEUTERIUM  
AMMONIA*

REMARKS

SEQ. No.	DATE	TIME	SAMPLE IDENTIFICATION No.	SAMPLE MATRIX	NO. OF CONTAINERS	PARAMETERS										REMARKS					
	5/3/00	1433	<del>WG-QC-MW-QC-106I-053106-JH-015</del>	WALCA	2	x	x	x													
	5/3/00	1100	<del>RB-QC-MW-QC-108S-053106-JH-013</del>	WALCA	2	x	x	x													
	5/3/00	1100	<del>WG-QC-MW-QC-106I-053106-JH-014</del>	WALCA	2	x	x	x													
			WG-QC-MW-QC-106S-053106-JH-015																		
			RB-QC-MW-QC-108S-053106-JH-013																		
			WG-QC-MW-QC-106I-053106-JH-014																		

TOTAL NUMBER OF CONTAINERS

6

RELINQUISHED BY: ① <i>John Hargan</i>	DATE: 6/1/00 TIME: 11:00	RECEIVED BY: ② <i>Steven Halverson</i>	DATE: 6/1/00 TIME: 4:52 P.M.
RELINQUISHED BY: ②	DATE: TIME:	RECEIVED BY: ③	DATE: TIME:
RELINQUISHED BY: ③	DATE: TIME:	RECEIVED BY: ④	DATE: TIME:

METHOD OF SHIPMENT: *LA PERSON* AIR BILL No.

White -Fully Executed Copy Yellow -Receiving Laboratory Copy Pink -Shipper Copy Goldenrod -Sampler Copy	SAMPLE TEAM:	RECEIVED FOR LABORATORY BY: <b>12801</b>
		DATE: TIME:

REVISED

L28837

<b>CONESTOGA-ROVERS &amp; ASSOCIATES</b> 8615 W. Bryn Mawr Avenue Chicago, Illinois 60631 (773)380-9933 phone (773)380-6421 fax			<b>SHIPPED TO</b> (Laboratory Name): <i>Telechem Brown</i>			
<b>CHAIN-OF-CUSTODY RECORD</b>			<b>REFERENCE NUMBER:</b> <i>45136-26</i>		<b>PROJECT NAME:</b> <i>Exelon</i>	
<b>SAMPLER'S SIGNATURE:</b> <i>John Hargan</i>		<b>PRINTED NAME:</b> <i>John Hargan</i>		<b>No. OF CONTAINERS</b> <i>1</i>	<b>PARAMETERS</b> <i>SILICA FIBRIL P/L</i>	<b>REMARKS</b>
<b>SEQ. No.</b>	<b>DATE</b>	<b>TIME</b>	<b>SAMPLE IDENTIFICATION No.</b>			
	<i>5/3/00</i>	<i>0800</i>	<del>W6-QC-MW-QC-FTW-053106-JH-001</del> <i>W6-QC-MW-QC-FTW-053106-JH-001</i>	<i>H2O</i>	<i>1</i>	<i>Y</i>
<b>TOTAL NUMBER OF CONTAINERS</b>						
<b>RELINQUISHED BY:</b> ① <i>John Hargan</i>		<b>DATE:</b> <i>5/1/00</i> <b>TIME:</b> <i>1600</i>		<b>RECEIVED BY:</b> ② <i>[Signature]</i>		<b>DATE:</b> <i>5/1/00</i>
<b>RELINQUISHED BY:</b> ② _____		<b>DATE:</b> _____ <b>TIME:</b> _____		<b>RECEIVED BY:</b> ③ _____		<b>DATE:</b> _____
<b>RELINQUISHED BY:</b> ③ _____		<b>DATE:</b> _____ <b>TIME:</b> _____		<b>RECEIVED BY:</b> ④ _____		<b>DATE:</b> _____
<b>METHOD OF SHIPMENT:</b> <i>IN PERSON</i>				<b>AIR BILL No.</b>		
White -Fully Executed Copy Yellow -Receiving Laboratory Copy Pink -Shipper Copy Goldenrod -Sampler Copy		<b>SAMPLE TEAM:</b> <i>N. Ziegler</i>		<b>RECEIVED FOR LABORATORY BY:</b> _____ <b>DATE:</b> _____ <b>TIME:</b> _____		

1001-00(SOURCE)GN-CO004

REVISED

L 28837

**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:** *45136-28*

**PROJECT NAME:** *Exxon Road Lines*

**CHAIN-OF-CUSTODY RECORD**

SAMPLER'S SIGNATURE: *John Hanger* PRINTED NAME: *John Hanger*

SEQ. No.	DATE	TIME	SAMPLE IDENTIFICATION No.	SAMPLE MATRIX	No. OF CONTAINERS	PARAMETERS	REMARKS
<i>053106</i>	<i>030</i>		<del><i>WG-QC-MW-QC 1085-053106-JH-012</i></del>	<i>Water</i>	<i>2</i>	<i>X</i>	
<i>053106</i>	<i>040</i>		<del><i>WG-QC-MW-QC 107I-053106-JH-011</i></del>	<i>Water</i>	<i>2</i>	<i>X</i>	
<i>060106</i>	<i>0748</i>		<del><i>WG-QC-MW-QC 103I-060106-JH-020</i></del>	<i>Water</i>	<i>2</i>	<i>X</i>	
			<i>WG-QC-MW-QC-1085-053106-JH-012</i>				
			<i>WG-QC-MW-QC-107I-053106-JH-011</i>				
			<i>WG-QC-MW-QC-103I-060106-JH-020</i>				

*WG-QC-MW-QC-1085-053106-JH-012*  
*WG-QC-MW-QC-107I-053106-JH-011*  
*WG-QC-MW-QC-103I-060106-JH-020*

TOTAL NUMBER OF CONTAINERS: *6*

RELINQUISHED BY: <i>John Hanger</i>	DATE: <i>6/1/06</i>	RECEIVED BY: <i>Andrew Maloney</i>	DATE: <i>6/1/06</i>
①	TIME: <i>1:00</i>	②	TIME: <i>1:51 P.M.</i>
RELINQUISHED BY:	DATE:	RECEIVED BY:	DATE:
②	TIME:	③	TIME:
RELINQUISHED BY:	DATE:	RECEIVED BY:	DATE:
③	TIME:	④	TIME:

METHOD OF SHIPMENT: *LA P.P.S.A* AIR BILL No. \_\_\_\_\_

White -Fully Executed Copy	SAMPLE TEAM:	RECEIVED FOR LABORATORY BY: <i>12500</i>
Yellow -Receiving Laboratory Copy		DATE: _____ TIME: _____
Pink -Shipper Copy		
Goldenrod -Sampler Copy		

6/6/06

TELEDYNE BROWN ENGINEERING  
2508 Quality Lane  
Knoxville, TN 37931-3133

## ACKNOWLEDGEMENT

This is not an invoice

June 06, 2006

Kathy Shaw  
Conestoga-Rovers & Associates  
45 Farmington Valley Drive  
Plainville, CT 06062

The following sample(s) were received at Teledyne Brown Engineering Knoxville laboratory on June 05, 2006. The sample(s) have been scheduled for the analyses listed below and the report is scheduled for completion by June 12, 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: EX001-3ESPQUAD-06  
P.O. #: 00411203  
Release #:  
Contract#: 00411203  
Kathy Shaw, FAX#:860-747-1900, larry.walton@exeloncorp.com

Rebecca

Client ID/ Station	Laboratory ID Analysis	Vol/Units Price	Start Collect Date/Time	End Collect Date/Time
WG-QC-MW-QC-108S-053106-JH-0 L28837-1			05/31/06:1030	
WG	GELI	108.00		
WG	H-3	162.00		
WG	SR-90 (FAST)	140.00		
WG-QC-MW-QC-107I-053106-JH-0 L28837-2			05/31/06:0910	
WG	GELI	108.00		
WG	H-3	162.00		
WG	SR-90 (FAST)	140.00		
WG-QC-MW-QC-103I-060106-JH-0 L28837-3			06/01/06:0748	
WG	GELI	108.00		
WG	H-3	162.00		
WG	SR-90 (FAST)	140.00		
WG-QC-MW-QC-106S-053106-JH-0 L28837-4			05/31/06:1437	
WG	GELI	108.00		
WG	H-3	162.00		
WG	SR-90 (FAST)	140.00		
RB-QC-MW-QC-108S-053106-JH-0 L28837-5			05/31/06:1100	

Client ID/ Station	Laboratory ID Analysis	Vol/Units Price	Start Collect Date/Time	End Collect Date/Time
WG	GELI	108.00		
WG	H-3	162.00		
WG	SR-90 (FAST)	140.00		
WG-QC-MW-QC-106I-053106-JH-0 L28837-6			05/31/06:1445	
WG	GELI	108.00		
WG	H-3	162.00		
WG	SR-90 (FAST)	140.00		
WG-QC-MW-QC-101I-060106-JH-0 L28837-7			06/01/06:1410	
WG	GELI	108.00		
WG	H-3	162.00		
WG	SR-90 (FAST)	140.00		
WG-QC-MW-QC-104S-060106-JH-0 L28837-8			06/01/06:1258	
WG	GELI	108.00		
WG	H-3	162.00		
WG	SR-90 (FAST)	140.00		
WG-QC-MW-QC-105I-060106-JH-0 L28837-9			06/01/06:1118	
WG	GELI	108.00		
WG	H-3	162.00		
WG	SR-90 (FAST)	140.00		
WG-QC-MW-QC-FTW-053106-JH-0 L28837-10			05/31/06:0800	
WG	GELI	108.00		
WG	H-3	162.00		
WG	SR-90 (FAST)	140.00		

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End of document

# **Internal Chain of Custody**







06/13/06 15:06

Teledyne Brown Engineering

Internal Chain of Custody

\*\*\*\*\*  
Sample # L28837-7 Containernum 1

Prod Analyst  
GELI EJ  
H-3 SO  
SR-90 (FAST) LCB

Relinquish Date Relinquish By Received By  
06/05/2006 00:00 099999 Sample Custodian

\*\*\*\*\*  
Sample # L28837-7 Containernum 2

Prod Analyst  
GELI EJ  
H-3 SO  
SR-90 (FAST) LCB

Relinquish Date Relinquish By Received By  
06/05/2006 00:00 099999 Sample Custodian

\*\*\*\*\*  
Sample # L28837-8 Containernum 1

Prod Analyst  
GELI EJ  
H-3 EJ  
SR-90 (FAST) LCB

Relinquish Date Relinquish By Received By  
06/05/2006 00:00 099999 Sample Custodian

\*\*\*\*\*  
Sample # L28837-8 Containernum 2

Prod Analyst  
GELI EJ  
H-3 EJ  
SR-90 (FAST) LCB

Relinquish Date Relinquish By Received By  
06/05/2006 00:00 099999 Sample Custodian

\*\*\*\*\*  
Sample # L28837-9 Containernum 1

Prod Analyst  
GELI EJ  
H-3 SO  
SR-90 (FAST) LCB

Relinquish Date Relinquish By Received By  
06/05/2006 00:00 099999 Sample Custodian

\*\*\*\*\*  
Sample # L28837-9 Containernum 2

Prod Analyst  
GELI EJ  
H-3 SO  
SR-90 (FAST) LCB

Relinquish Date Relinquish By Received By  
06/05/2006 00:00 099999 Sample Custodian

\*\*\*\*\*



06/13/06

Teledyne Brown Engineering  
Internal Chain of Custody  
Supplemental Sheet

L28837

\*\*\*\*\*

L28837-1      WG      WG-QC-MW-QC-108S-053106-JH-012

<u>Process step</u>	<u>Prod</u>	<u>Analyst</u>	<u>Date</u>
Login		RCHARLES	06/05/06
Aliquot	H-3	EJ	06/05/06
Aliquot	GELI	EJ	06/08/06
Aliquot	SR-90 (FAST)	LCB	06/09/06
Count Room	GELI	MVW	06/09/06
Count Room	H-3	KOJ	06/06/06
Count Room	SR-90 (FAST)	KOJ	06/12/06

\*\*\*\*\*

L28837-2      WG      WG-QC-MW-QC-107I-053106-JH-011

<u>Process step</u>	<u>Prod</u>	<u>Analyst</u>	<u>Date</u>
Login		RCHARLES	06/05/06
Aliquot	H-3	EJ	06/05/06
Aliquot	GELI	EJ	06/08/06
Aliquot	SR-90 (FAST)	LCB	06/09/06
Count Room	GELI	MVW	06/09/06
Count Room	H-3	KOJ	06/06/06
Count Room	SR-90 (FAST)	KOJ	06/12/06

\*\*\*\*\*

L28837-3      WG      WG-QC-MW-QC-103I-060106-JH-020

<u>Process step</u>	<u>Prod</u>	<u>Analyst</u>	<u>Date</u>
Login		RCHARLES	06/05/06
Aliquot	H-3	SO	06/06/06
Aliquot	GELI	EJ	06/08/06
Aliquot	SR-90 (FAST)	LCB	06/09/06
Count Room	GELI	KPW	06/09/06
Count Room	H-3	KPW	06/06/06
Count Room	SR-90 (FAST)	KOJ	06/12/06

\*\*\*\*\*

L28837-4      WG      WG-QC-MW-QC-106S-053106-JH-015

<u>Process step</u>	<u>Prod</u>	<u>Analyst</u>	<u>Date</u>
Login		RCHARLES	06/05/06
Aliquot	H-3	SO	06/06/06
Aliquot	GELI	EJ	06/08/06
Aliquot	SR-90 (FAST)	LCB	06/09/06
Count Room	GELI	MVW	06/09/06
Count Room	H-3	KPW	06/06/06
Count Room	SR-90 (FAST)	KOJ	06/12/06

\*\*\*\*\*

L28837-5      WG      RB-QC-MW-QC-108S-053106-JH-013

<u>Process step</u>	<u>Prod</u>	<u>Analyst</u>	<u>Date</u>
Login		RCHARLES	06/05/06
Aliquot	H-3	SO	06/06/06
Aliquot	GELI	EJ	06/08/06
Aliquot	SR-90 (FAST)	LCB	06/09/06
Count Room	GELI	MVW	06/09/06



06/13/06

Teledyne Brown Engineering  
Internal Chain of Custody  
Supplemental Sheet

Page 3 of 3

L28837

L28837-10	WG	WG-QC-MW-QC-FTW-053106-JH-001		
Aliquot	H-3		SO	06/06/06
Aliquot	GELI		EJ	06/08/06
Aliquot	SR-90 (FAST)		LCB	06/09/06
Count Room	GELI		MVW	06/10/06
Count Room	H-3		KPW	06/06/06
Count Room	SR-90 (FAST)		KOJ	06/12/06

# Analytical Results Summary

# Report of Analysis

06/13/06 15:04

## L28837

Conestoga-Rovers & Associates

EX001-3ESPQUAD-06

Kathy Shaw

Sample ID: **WG-QC-MW-QC-108S-053106-JH-012**

Collect Start: 05/31/2006 10:30

Matrix: Ground Water

(WG)

Station:

Collect Stop:

Volume:

Description:

Receive Date: 06/05/2006

% Moisture:

LIMS Number: L28837-1

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	2010	<b>1.46E+03</b>	2.17E+02	2.30E+02	pCi/L		10	ml		06/06/06	42.5	M	+
TOTAL SR	2018	1.36E+00	9.47E-01	<b>1.64E+00</b>	pCi/L		450	ml	05/31/06 10:30	06/12/06	200	M	U
K-40	2007	<b>1.63E+02</b>	5.57E+01	4.73E+01	pCi/L		2714.41	ml	05/31/06 10:30	06/09/06	24000	Sec	+ Yes
MN-54	2007	1.20E+00	2.74E+00	<b>4.62E+00</b>	pCi/L		2714.41	ml	05/31/06 10:30	06/09/06	24000	Sec	U No
CO-58	2007	-1.17E-01	2.79E+00	<b>4.60E+00</b>	pCi/L		2714.41	ml	05/31/06 10:30	06/09/06	24000	Sec	U No
FE-59	2007	1.92E+00	5.68E+00	<b>9.62E+00</b>	pCi/L		2714.41	ml	05/31/06 10:30	06/09/06	24000	Sec	U No
CO-60	2007	-5.26E-01	2.78E+00	<b>4.49E+00</b>	pCi/L		2714.41	ml	05/31/06 10:30	06/09/06	24000	Sec	U No
ZN-65	2007	7.33E+00	6.68E+00	<b>1.02E+01</b>	pCi/L		2714.41	ml	05/31/06 10:30	06/09/06	24000	Sec	U No
NB-95	2007	1.52E+00	2.79E+00	<b>4.75E+00</b>	pCi/L		2714.41	ml	05/31/06 10:30	06/09/06	24000	Sec	U No
ZR-95	2007	-2.47E+00	4.91E+00	<b>7.93E+00</b>	pCi/L		2714.41	ml	05/31/06 10:30	06/09/06	24000	Sec	U No
CS-134	2007	6.61E+00	6.20E+00	<b>5.09E+00</b>	pCi/L		2714.41	ml	05/31/06 10:30	06/09/06	24000	Sec	U No
CS-137	2007	-1.61E+00	2.90E+00	<b>4.61E+00</b>	pCi/L		2714.41	ml	05/31/06 10:30	06/09/06	24000	Sec	U No
BA-140	2007	3.36E-02	1.56E+01	<b>2.57E+01</b>	pCi/L		2714.41	ml	05/31/06 10:30	06/09/06	24000	Sec	U No
LA-140	2007	-6.48E-01	5.08E+00	<b>8.32E+00</b>	pCi/L		2714.41	ml	05/31/06 10:30	06/09/06	24000	Sec	U 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

- 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

06/13/06 15:04

## L28837

Conestoga-Rovers & Associates

EX001-3ESPQUAD-06

Kathy Shaw

Sample ID: <b>WG-QC-MW-QC-1071-053106-JH-011</b>	Collect Start: 05/31/2006 09:10	Matrix: Ground Water (WG)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 06/05/2006	% Moisture:
LIMS Number: L28837-2		

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+02	1.22E+02	<b>1.91E+02</b>	pCi/L		10	ml		06/06/06	60	M	U
TOTAL SR	2018	1.09E+00	9.13E-01	<b>1.61E+00</b>	pCi/L		450	ml	05/31/06 09:10	06/12/06	200	M	U
MN-54	2007	6.45E-01	2.33E+00	<b>3.87E+00</b>	pCi/L		3004.21	ml	05/31/06 09:10	06/09/06	24000	Sec	U No
CO-58	2007	1.08E+00	2.49E+00	<b>4.17E+00</b>	pCi/L		3004.21	ml	05/31/06 09:10	06/09/06	24000	Sec	U No
FE-59	2007	1.60E+00	4.96E+00	<b>8.37E+00</b>	pCi/L		3004.21	ml	05/31/06 09:10	06/09/06	24000	Sec	U No
CO-60	2007	2.11E+00	2.41E+00	<b>4.20E+00</b>	pCi/L		3004.21	ml	05/31/06 09:10	06/09/06	24000	Sec	U No
ZN-65	2007	6.37E+00	5.26E+00	<b>9.29E+00</b>	pCi/L		3004.21	ml	05/31/06 09:10	06/09/06	24000	Sec	U No
NB-95	2007	1.19E+00	2.47E+00	<b>4.15E+00</b>	pCi/L		3004.21	ml	05/31/06 09:10	06/09/06	24000	Sec	U No
ZR-95	2007	2.53E-01	4.32E+00	<b>7.13E+00</b>	pCi/L		3004.21	ml	05/31/06 09:10	06/09/06	24000	Sec	U* No
CS-134	2007	7.21E+00	4.21E+00	<b>4.41E+00</b>	pCi/L		3004.21	ml	05/31/06 09:10	06/09/06	24000	Sec	U No
CS-137	2007	1.79E+00	2.50E+00	<b>4.28E+00</b>	pCi/L		3004.21	ml	05/31/06 09:10	06/09/06	24000	Sec	U No
BA-140	2007	4.66E+00	1.38E+01	<b>2.28E+01</b>	pCi/L		3004.21	ml	05/31/06 09:10	06/09/06	24000	Sec	U No
LA-140	2007	-1.94E+00	4.82E+00	<b>7.77E+00</b>	pCi/L		3004.21	ml	05/31/06 09:10	06/09/06	24000	Sec	U 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
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- 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

06/13/06 15:04

## L28837

Conestoga-Rovers & Associates

EX001-3ESPQUAD-06

Kathy Shaw

Sample ID: <b>WG-QC-MW-QC-103I-060106-JH-020</b>	Collect Start: 06/01/2006 07:48	Matrix: Ground Water (WG)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 06/05/2006	% Moisture:
LIMS Number: L28837-3		

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	2010	5.47E+01	1.06E+02	<b>1.69E+02</b>	pCi/L		10	ml		06/06/06	60	M	U
TOTAL SR	2018	1.15E+00	7.20E-01	<b>1.23E+00</b>	pCi/L		450	ml	06/01/06 07:48	06/12/06	200	M	U
MN-54	2007	6.20E-01	2.07E+00	<b>3.46E+00</b>	pCi/L		3011.4	ml	06/01/06 07:48	06/09/06	24000	Sec	U
CO-58	2007	-1.70E+00	2.19E+00	<b>3.48E+00</b>	pCi/L		3011.4	ml	06/01/06 07:48	06/09/06	24000	Sec	U
FE-59	2007	3.79E+00	4.54E+00	<b>7.78E+00</b>	pCi/L		3011.4	ml	06/01/06 07:48	06/09/06	24000	Sec	U
CO-60	2007	-2.32E+00	2.20E+00	<b>3.39E+00</b>	pCi/L		3011.4	ml	06/01/06 07:48	06/09/06	24000	Sec	U
ZN-65	2007	5.90E+00	5.38E+00	<b>8.07E+00</b>	pCi/L		3011.4	ml	06/01/06 07:48	06/09/06	24000	Sec	U
NB-95	2007	1.76E+00	2.28E+00	<b>3.90E+00</b>	pCi/L		3011.4	ml	06/01/06 07:48	06/09/06	24000	Sec	U
ZR-95	2007	-1.79E+00	3.96E+00	<b>6.45E+00</b>	pCi/L		3011.4	ml	06/01/06 07:48	06/09/06	24000	Sec	U
CS-134	2007	-2.15E+00	2.73E+00	<b>3.66E+00</b>	pCi/L		3011.4	ml	06/01/06 07:48	06/09/06	24000	Sec	U
CS-137	2007	4.20E-01	2.44E+00	<b>3.78E+00</b>	pCi/L		3011.4	ml	06/01/06 07:48	06/09/06	24000	Sec	U
BA-140	2007	6.51E-01	1.12E+01	<b>1.87E+01</b>	pCi/L		3011.4	ml	06/01/06 07:48	06/09/06	24000	Sec	U
LA-140	2007	3.15E+00	3.97E+00	<b>6.91E+00</b>	pCi/L		3011.4	ml	06/01/06 07:48	06/09/06	24000	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
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- 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

06/13/06 15:04



## L28837

Conestoga-Rovers & Associates

EX001-3ESPQUAD-06

Kathy Shaw

Sample ID: <b>WG-QC-MW-QC-106S-053106-JH-015</b>	Collect Start: 05/31/2006 14:37	Matrix: Ground Water	(WG)
Station:	Collect Stop:	Volume:	
Description:	Receive Date: 06/05/2006	% Moisture:	
LIMS Number: L28837-4			

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	2.60E+01	1.12E+02	<b>1.81E+02</b>	pCi/L		10	ml		06/06/06	60	M	U
TOTAL SR	2018	1.12E+00	1.05E+00	<b>1.86E+00</b>	pCi/L		450	ml	05/31/06 14:37	06/12/06	200	M	U
MN-54	2007	5.31E-01	2.62E+00	<b>4.32E+00</b>	pCi/L		3014.23	ml	05/31/06 14:37	06/09/06	24000	Sec	U
CO-58	2007	1.28E+00	2.75E+00	<b>4.59E+00</b>	pCi/L		3014.23	ml	05/31/06 14:37	06/09/06	24000	Sec	U
FE-59	2007	1.27E+00	5.26E+00	<b>8.72E+00</b>	pCi/L		3014.23	ml	05/31/06 14:37	06/09/06	24000	Sec	U
CO-60	2007	-2.10E+00	2.56E+00	<b>3.99E+00</b>	pCi/L		3014.23	ml	05/31/06 14:37	06/09/06	24000	Sec	U
ZN-65	2007	5.08E+00	5.82E+00	<b>9.92E+00</b>	pCi/L		3014.23	ml	05/31/06 14:37	06/09/06	24000	Sec	U
NB-95	2007	3.49E-01	2.68E+00	<b>4.42E+00</b>	pCi/L		3014.23	ml	05/31/06 14:37	06/09/06	24000	Sec	U
ZR-95	2007	-3.93E-01	4.88E+00	<b>7.98E+00</b>	pCi/L		3014.23	ml	05/31/06 14:37	06/09/06	24000	Sec	U
CS-134	2007	5.21E+00	6.14E+00	<b>4.74E+00</b>	pCi/L		3014.23	ml	05/31/06 14:37	06/09/06	24000	Sec	U
CS-137	2007	1.55E-01	2.67E+00	<b>4.44E+00</b>	pCi/L		3014.23	ml	05/31/06 14:37	06/09/06	24000	Sec	U
BA-140	2007	7.05E+00	1.50E+01	<b>2.50E+01</b>	pCi/L		3014.23	ml	05/31/06 14:37	06/09/06	24000	Sec	U
LA-140	2007	4.30E+00	4.36E+00	<b>7.71E+00</b>	pCi/L		3014.23	ml	05/31/06 14:37	06/09/06	24000	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.**

L28837 30 OF 94

# Report of Analysis

06/13/06 15:04

**L28837**

Conestoga-Rovers & Associates

EX001-3ESPQUAD-06



Kathy Shaw

Sample ID: **RB-QC-MW-QC-108S-053106-JH-013**

Collect Start: 05/31/2006 11:00

Matrix: Ground Water

(WG)

Station:

Collect Stop:

Volume:

Description:

Receive Date: 06/05/2006

% Moisture:

LIMS Number: L28837-5

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	2010	1.50E+02	1.15E+02	<b>1.74E+02</b>	pCi/L		10	ml		06/06/06	60	M U	
TOTAL SR	2018	4.73E-01	8.64E-01	<b>1.58E+00</b>	pCi/L		450	ml	05/31/06 11:00	06/12/06	200	M U	
MN-54	2007	5.56E-01	1.82E+00	<b>3.04E+00</b>	pCi/L		3014.24	ml	05/31/06 11:00	06/09/06	24000	Sec U	No
CO-58	2007	-2.79E-01	1.95E+00	<b>3.19E+00</b>	pCi/L		3014.24	ml	05/31/06 11:00	06/09/06	24000	Sec U	No
FE-59	2007	1.28E+00	3.70E+00	<b>6.25E+00</b>	pCi/L		3014.24	ml	05/31/06 11:00	06/09/06	24000	Sec U	No
CO-60	2007	-1.08E-01	1.99E+00	<b>3.23E+00</b>	pCi/L		3014.24	ml	05/31/06 11:00	06/09/06	24000	Sec U	No
ZN-65	2007	6.06E+00	3.87E+00	<b>7.02E+00</b>	pCi/L		3014.24	ml	05/31/06 11:00	06/09/06	24000	Sec U	No
NB-95	2007	1.80E-01	1.90E+00	<b>3.16E+00</b>	pCi/L		3014.24	ml	05/31/06 11:00	06/09/06	24000	Sec U	No
ZR-95	2007	-2.86E+00	3.50E+00	<b>5.56E+00</b>	pCi/L		3014.24	ml	05/31/06 11:00	06/09/06	24000	Sec U	No
CS-134	2007	2.81E+00	2.65E+00	<b>3.17E+00</b>	pCi/L		3014.24	ml	05/31/06 11:00	06/09/06	24000	Sec U	No
CS-137	2007	-6.10E-01	1.99E+00	<b>3.19E+00</b>	pCi/L		3014.24	ml	05/31/06 11:00	06/09/06	24000	Sec U	No
BA-140	2007	1.56E+00	1.03E+01	<b>1.71E+01</b>	pCi/L		3014.24	ml	05/31/06 11:00	06/09/06	24000	Sec U	No
LA-140	2007	-1.23E+00	3.50E+00	<b>5.56E+00</b>	pCi/L		3014.24	ml	05/31/06 11:00	06/09/06	24000	Sec U	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

- 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.**

L28837 31 OF 94

# Report of Analysis

06/13/06 15:04

## L28837

Conestoga-Rovers & Associates

EX001-3ESPQUAD-06

Kathy Shaw

Sample ID: <b>WG-QC-MW-QC-106I-053106-JH-014</b>	Collect Start: 05/31/2006 14:45	Matrix: Ground Water (WG)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 06/05/2006	% Moisture:
LIMS Number: L28837-6		

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	-5.14E+01	1.05E+02	<b>1.79E+02</b>	pCi/L		10	ml		06/06/06	60	M	U
TOTAL SR	2018	1.02E+00	7.89E-01	<b>1.38E+00</b>	pCi/L		450	ml	05/31/06 14:45	06/12/06	200	M	U
MN-54	2007	-1.42E+00	2.04E+00	<b>3.36E+00</b>	pCi/L		3000.84	ml	05/31/06 14:45	06/09/06	24000	Sec	U No
CO-58	2007	4.32E-01	2.16E+00	<b>3.73E+00</b>	pCi/L		3000.84	ml	05/31/06 14:45	06/09/06	24000	Sec	U No
FE-59	2007	2.40E+00	4.19E+00	<b>7.50E+00</b>	pCi/L		3000.84	ml	05/31/06 14:45	06/09/06	24000	Sec	U No
CO-60	2007	1.65E+00	2.20E+00	<b>3.96E+00</b>	pCi/L		3000.84	ml	05/31/06 14:45	06/09/06	24000	Sec	U No
ZN-65	2007	4.83E+00	4.32E+00	<b>7.91E+00</b>	pCi/L		3000.84	ml	05/31/06 14:45	06/09/06	24000	Sec	U No
NB-95	2007	1.60E+00	2.22E+00	<b>3.92E+00</b>	pCi/L		3000.84	ml	05/31/06 14:45	06/09/06	24000	Sec	U No
ZR-95	2007	5.07E-01	3.82E+00	<b>6.58E+00</b>	pCi/L		3000.84	ml	05/31/06 14:45	06/09/06	24000	Sec	U No
CS-134	2007	5.50E+00	4.62E+00	<b>4.03E+00</b>	pCi/L		3000.84	ml	05/31/06 14:45	06/09/06	24000	Sec	U No
CS-137	2007	2.58E+00	2.22E+00	<b>3.99E+00</b>	pCi/L		3000.84	ml	05/31/06 14:45	06/09/06	24000	Sec	U No
BA-140	2007	6.69E+00	1.20E+01	<b>2.06E+01</b>	pCi/L		3000.84	ml	05/31/06 14:45	06/09/06	24000	Sec	U No
LA-140	2007	2.20E+00	3.81E+00	<b>6.95E+00</b>	pCi/L		3000.84	ml	05/31/06 14:45	06/09/06	24000	Sec	U 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

# Report of Analysis

06/13/06 15:04



## L28837

Conestoga-Rovers & Associates

EX001-3ESPQUAD-06

Kathy Shaw

Sample ID: <b>WG-QC-MW-QC-101I-060106-JH-027</b>	Collect Start: 06/01/2006 14:10	Matrix: Ground Water (WG)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 06/05/2006	% Moisture:
LIMS Number: L28837-7		

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	3.30E+01	9.52E+01	<b>1.53E+02</b>	pCi/L		10	ml		06/06/06	60	M U	
TOTAL SR	2018	1.13E+00	6.79E-01	<b>1.16E+00</b>	pCi/L		450	ml	06/01/06 14:10	06/12/06	200	M U	
MN-54	2007	1.91E+00	3.29E+00	<b>5.61E+00</b>	pCi/L		3022.6	ml	06/01/06 14:10	06/10/06	11273	Sec U	No
CO-58	2007	8.96E-01	3.63E+00	<b>6.04E+00</b>	pCi/L		3022.6	ml	06/01/06 14:10	06/10/06	11273	Sec U	No
FE-59	2007	3.21E+00	6.88E+00	<b>1.17E+01</b>	pCi/L		3022.6	ml	06/01/06 14:10	06/10/06	11273	Sec U	No
CO-60	2007	2.91E+00	3.64E+00	<b>6.37E+00</b>	pCi/L		3022.6	ml	06/01/06 14:10	06/10/06	11273	Sec U	No
ZN-65	2007	7.00E+00	7.41E+00	<b>1.30E+01</b>	pCi/L		3022.6	ml	06/01/06 14:10	06/10/06	11273	Sec U	No
NB-95	2007	2.86E+00	3.38E+00	<b>5.88E+00</b>	pCi/L		3022.6	ml	06/01/06 14:10	06/10/06	11273	Sec U	No
ZR-95	2007	-3.11E+00	6.07E+00	<b>9.60E+00</b>	pCi/L		3022.6	ml	06/01/06 14:10	06/10/06	11273	Sec U	No
CS-134	2007	7.47E+00	6.52E+00	<b>6.01E+00</b>	pCi/L		3022.6	ml	06/01/06 14:10	06/10/06	11273	Sec U	No
CS-137	2007	3.61E+00	3.38E+00	<b>6.00E+00</b>	pCi/L		3022.6	ml	06/01/06 14:10	06/10/06	11273	Sec U	No
BA-140	2007	-1.09E+01	1.88E+01	<b>2.98E+01</b>	pCi/L		3022.6	ml	06/01/06 14:10	06/10/06	11273	Sec U	No
LA-140	2007	1.01E+00	5.85E+00	<b>9.87E+00</b>	pCi/L		3022.6	ml	06/01/06 14:10	06/10/06	11273	Sec U	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

- 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.**

L28837 33 OF 94

# Report of Analysis

06/13/06 15:04

**L28837**

Conestoga-Rovers & Associates

EX001-3ESPQUAD-06



**TELEDYNE  
BROWN ENGINEERING, INC.**  
A Teledyne Technologies Company

Kathy Shaw

Sample ID: <b>WG-QC-MW-QC-104S-060106-JH-025</b>	Collect Start: 06/01/2006 12:58	Matrix: Ground Water	(WG)
Station:	Collect Stop:	Volume:	
Description:	Receive Date: 06/05/2006	% Moisture:	
LIMS Number: L28837-8			

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>2.62E+02</b>	1.30E+02	1.88E+02	pCi/L		10	ml		06/06/06	60	M	+
TOTAL SR	2018	<b>1.19E+00</b>	6.09E-01	1.04E+00	pCi/L		450	ml	06/01/06 12:58	06/13/06	150	M	+
MN-54	2007	2.00E-01	2.77E+00	<b>4.60E+00</b>	pCi/L		3020.63	ml	06/01/06 12:58	06/10/06	11367	Sec	U
CO-58	2007	-2.09E+00	3.00E+00	<b>4.74E+00</b>	pCi/L		3020.63	ml	06/01/06 12:58	06/10/06	11367	Sec	U
FE-59	2007	1.10E+00	5.89E+00	<b>9.89E+00</b>	pCi/L		3020.63	ml	06/01/06 12:58	06/10/06	11367	Sec	U
CO-60	2007	1.82E+00	3.09E+00	<b>5.29E+00</b>	pCi/L		3020.63	ml	06/01/06 12:58	06/10/06	11367	Sec	U
ZN-65	2007	7.13E+00	7.67E+00	<b>1.17E+01</b>	pCi/L		3020.63	ml	06/01/06 12:58	06/10/06	11367	Sec	U
NB-95	2007	4.41E+00	2.92E+00	<b>5.29E+00</b>	pCi/L		3020.63	ml	06/01/06 12:58	06/10/06	11367	Sec	U
ZR-95	2007	-3.62E+00	5.54E+00	<b>8.61E+00</b>	pCi/L		3020.63	ml	06/01/06 12:58	06/10/06	11367	Sec	U
CS-134	2007	7.92E+00	6.57E+00	<b>5.74E+00</b>	pCi/L		3020.63	ml	06/01/06 12:58	06/10/06	11367	Sec	U
CS-137	2007	1.74E+00	2.89E+00	<b>4.92E+00</b>	pCi/L		3020.63	ml	06/01/06 12:58	06/10/06	11367	Sec	U
BA-140	2007	1.34E+01	1.53E+01	<b>2.66E+01</b>	pCi/L		3020.63	ml	06/01/06 12:58	06/10/06	11367	Sec	U
LA-140	2007	-1.44E+00	4.97E+00	<b>7.93E+00</b>	pCi/L		3020.63	ml	06/01/06 12:58	06/10/06	11367	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

06/13/06 15:04

## L28837

Conestoga-Rovers & Associates

EX001-3ESPQUAD-06

Kathy Shaw

Sample ID: **WG-QC-MW-QC-105I-060106-JH-024**

Collect Start: 06/01/2006 11:18

Matrix: Ground Water

(WG)

Station:

Collect Stop:

Volume:

Description:

Receive Date: 06/05/2006

% Moisture:

LIMS Number: L28837-9

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	6.46E+00	1.10E+02	<b>1.80E+02</b>	pCi/L		10	ml		06/06/06	60	M U	
TOTAL SR	2018	7.38E-01	9.30E-01	<b>1.69E+00</b>	pCi/L		450	ml	06/01/06 11:18	06/12/06	200	M U	
MN-54	2007	1.40E-01	2.93E+00	<b>4.53E+00</b>	pCi/L		3000.54	ml	06/01/06 11:18	06/10/06	19000	Sec U	No
CO-58	2007	-6.00E-01	3.02E+00	<b>4.94E+00</b>	pCi/L		3000.54	ml	06/01/06 11:18	06/10/06	19000	Sec U	No
FE-59	2007	3.79E+00	6.34E+00	<b>1.09E+01</b>	pCi/L		3000.54	ml	06/01/06 11:18	06/10/06	19000	Sec U	No
CO-60	2007	1.70E+00	2.93E+00	<b>5.02E+00</b>	pCi/L		3000.54	ml	06/01/06 11:18	06/10/06	19000	Sec U	No
ZN-65	2007	8.72E+00	7.49E+00	<b>1.15E+01</b>	pCi/L		3000.54	ml	06/01/06 11:18	06/10/06	19000	Sec U	No
NB-95	2007	2.88E+00	3.00E+00	<b>5.22E+00</b>	pCi/L		3000.54	ml	06/01/06 11:18	06/10/06	19000	Sec U	No
ZR-95	2007	-2.01E+00	5.43E+00	<b>8.84E+00</b>	pCi/L		3000.54	ml	06/01/06 11:18	06/10/06	19000	Sec U	No
CS-134	2007	5.12E+00	7.03E+00	<b>5.52E+00</b>	pCi/L		3000.54	ml	06/01/06 11:18	06/10/06	19000	Sec U	No
CS-137	2007	-1.42E+00	3.08E+00	<b>4.91E+00</b>	pCi/L		3000.54	ml	06/01/06 11:18	06/10/06	19000	Sec U	No
BA-140	2007	-2.75E+00	1.60E+01	<b>2.62E+01</b>	pCi/L		3000.54	ml	06/01/06 11:18	06/10/06	19000	Sec U	No
LA-140	2007	-3.08E+00	4.99E+00	<b>7.79E+00</b>	pCi/L		3000.54	ml	06/01/06 11:18	06/10/06	19000	Sec U	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

# Report of Analysis

06/13/06 15:04

**L28837**

Conestoga-Rovers & Associates

EX001-3ESPQUAD-06



Kathy Shaw

Sample ID: <b>WG-QC-MW-QC-FTW-053106-JH-001</b>	Collect Start: 05/31/2006 08:00	Matrix: Ground Water (WG)
Station:	Collect Stop:	Volume:
Description:	Receive Date: 06/05/2006	% Moisture:
LIMS Number: L28837-10		

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	1.10E+02	<b>1.79E+02</b>	pCi/L		10	ml		06/06/06	60	M U	
TOTAL SR	2018	1.27E-02	7.88E-01	<b>1.50E+00</b>	pCi/L		450	ml	05/31/06 08:00	06/12/06	200	M U	
MN-54	2007	9.83E-01	2.72E+00	<b>4.54E+00</b>	pCi/L		3000.74	ml	05/31/06 08:00	06/10/06	19500	Sec U	No
CO-58	2007	-2.70E-01	2.91E+00	<b>4.75E+00</b>	pCi/L		3000.74	ml	05/31/06 08:00	06/10/06	19500	Sec U	No
FE-59	2007	7.83E+00	5.87E+00	<b>1.05E+01</b>	pCi/L		3000.74	ml	05/31/06 08:00	06/10/06	19500	Sec U	No
CO-60	2007	1.26E+00	2.83E+00	<b>4.80E+00</b>	pCi/L		3000.74	ml	05/31/06 08:00	06/10/06	19500	Sec U	No
ZN-65	2007	4.66E+00	6.75E+00	<b>1.00E+01</b>	pCi/L		3000.74	ml	05/31/06 08:00	06/10/06	19500	Sec U	No
NB-95	2007	2.29E+00	2.82E+00	<b>4.84E+00</b>	pCi/L		3000.74	ml	05/31/06 08:00	06/10/06	19500	Sec U	No
ZR-95	2007	-5.90E+00	5.13E+00	<b>7.89E+00</b>	pCi/L		3000.74	ml	05/31/06 08:00	06/10/06	19500	Sec U	No
CS-134	2007	6.44E+00	6.08E+00	<b>5.14E+00</b>	pCi/L		3000.74	ml	05/31/06 08:00	06/10/06	19500	Sec U	No
CS-137	2007	5.03E-01	2.93E+00	<b>4.89E+00</b>	pCi/L		3000.74	ml	05/31/06 08:00	06/10/06	19500	Sec U	No
BA-140	2007	2.74E+00	1.64E+01	<b>2.69E+01</b>	pCi/L		3000.74	ml	05/31/06 08:00	06/10/06	19500	Sec U	No
LA-140	2007	-7.23E-01	5.18E+00	<b>8.50E+00</b>	pCi/L		3000.74	ml	05/31/06 08:00	06/10/06	19500	Sec U	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

- 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.**

L28837 36 OF 94



# QC Results Summary

# QC Summary Report

for L28837

6/13/2006

3:10:49PM



H-3

## 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>
WG4089-1	H-3	WO	06/06/2006 4:08	< 1.900E+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>
WG4089-2	H-3	WO	06/06/2006 5:12	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>	<u>P/F</u>
WG4089-3 L28837-3	H-3	WG	06/06/2006 14:20	< 1.690E+02	< 1.780E+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 L28837

6/13/2006

3:10:49PM



L28837

H-3

## Associated Samples for

## WG4089

### SAMPLENUM

### CLIENTID

L28837-1	WG-QC-MW-QC-108S-053106-JH-012
L28837-2	WG-QC-MW-QC-107I-053106-JH-011
L28837-3	WG-QC-MW-QC-103I-060106-JH-020
L28837-4	WG-QC-MW-QC-106S-053106-JH-015
L28837-5	RB-QC-MW-QC-108S-053106-JH-013
L28837-6	WG-QC-MW-QC-106I-053106-JH-014
L28837-7	WG-QC-MW-QC-101I-060106-JH-027
L28837-8	WG-QC-MW-QC-104S-060106-JH-025
L28837-9	WG-QC-MW-QC-105I-060106-JH-024
L28837-10	WG-QC-MW-QC-FTW-053106-JH-001

+ 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

Page: 2

L28837 39 OF 94

# QC Summary Report

for L28837

6/13/2006

3:10:49PM



## 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>
WG4135-1	TOTAL SR	WO	06/12/2006 17:54	< 6.410E-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>
WG4135-2	TOTAL SR	WO	06/12/2006 17:54	5.84E+001	6.350E+01	pCi/Total	108.8	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>
WG4135-3 L28846-1	TOTAL SR	WG	06/12/2006 17:54	< 1.510E+00	< 1.820E+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

L28837 SR-90 (FAST)

Associated Samples for WG4135

<u>SAMPLENUM</u>	<u>CLIENTID</u>
L28837-1	WG-QC-MW-QC-108S-053106-JH-012
L28837-2	WG-QC-MW-QC-107I-053106-JH-011
L28837-3	WG-QC-MW-QC-103I-060106-JH-020
L28837-4	WG-QC-MW-QC-106S-053106-JH-015
L28837-5	RB-QC-MW-QC-108S-053106-JH-013
L28837-6	WG-QC-MW-QC-106I-053106-JH-014
L28837-7	WG-QC-MW-QC-101I-060106-JH-027
L28837-8	WG-QC-MW-QC-104S-060106-JH-025
L28837-9	WG-QC-MW-QC-105I-060106-JH-024
L28837-10	WG-QC-MW-QC-FTW-053106-JH-001

- + 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

Raw Data Sheet (rawdata)  
 Jun 13 2006, 03:19 pm

Work Order: L28837

Customer: Exelon

Nuclide: H-3

Project: EX001-3ESPQUAD-06

Sample ID Client 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	Analyst
L28837-1		H-3		10 ml			0		06-jun-06 05:30	LS7	373	42.5	2.13	60	.205		EJ
WG-QC-MW-QC-108S-05310																	
Activity: 1.46E+03 * Error: 2.17E+02				MDC: 2.3E+02				0	06-jun-06 06:16	LS7	158	60	2.13	60	.208		EJ
L28837-2		H-3		10 ml			0		06-jun-06 15:24	LS7	132	60	1.93	60	.223		SO
WG-QC-MW-QC-107I-05310																	
Activity: 1.09E+02 Error: 1.22E+02				MDC: 1.91E+02 *				0	06-jun-06 16:28	LS7	123	60	1.93	60	.208		SO
L28837-3		H-3		10 ml			0		06-jun-06 17:31	LS7	159	60	1.93	60	.216		SO
WG-QC-MW-QC-103I-06010																	
Activity: 5.47E+01 Error: 1.06E+02				MDC: 1.69E+02 *				0	06-jun-06 18:35	LS7	101	60	1.93	60	.211		SO
L28837-4		H-3		10 ml			0		06-jun-06 19:38	LS7	127	60	1.93	60	.246		SO
WG-QC-MW-QC-106S-05310																	
Activity: 2.6E+01 Error: 1.12E+02				MDC: 1.81E+02 *				0	06-jun-06 07:20	LS7	118	60	1.93	60	.21		SO
L28837-5		H-3		10 ml			0		06-jun-06 20:41	LS7	122	60	1.93	60	.21		SO
RB-QC-MW-QC-108S-05310																	
Activity: 1.5E+02 Error: 1.15E+02				MDC: 1.74E+02 *				0	06-jun-06 21:45	LS7	122	60	1.93	60	.21		SO
L28837-6		H-3		10 ml			0										
WG-QC-MW-QC-106I-05310																	
Activity: -5.14E+01 Error: 1.05E+02				MDC: 1.79E+02 *				0									
L28837-7		H-3		10 ml			0										
WG-QC-MW-QC-101I-06010																	
Activity: 3.3E+01 Error: 9.52E+01				MDC: 1.53E+02 *				0									
L28837-8		H-3		10 ml			0										
WG-QC-MW-QC-104S-06010																	
Activity: 2.62E+02 * Error: 1.3E+02				MDC: 1.88E+02				0									
L28837-9		H-3		10 ml			0										
WG-QC-MW-QC-105I-06010																	
Activity: 6.46E+00 Error: 1.1E+02				MDC: 1.8E+02 *				0									
L28837-10		H-3		10 ml			0										
WG-QC-MW-QC-FTW-053106																	
Activity: 2.36E+01 Error: 1.1E+02				MDC: 1.79E+02 *				0									

Raw Data Sheet (rawdata)  
Jun 13 2006, 03:19 pm

Work Order: L28837

Customer: Exelon

Nuclide: SR-90 (FAST)

Project : EX001-3ESPQUAD-06

Sample ID	Run	Analysis	Reference	Volume/	Scavenge	Milking	Mount	Count	Counter	Total	Sample	Bkg	Bkg	Decay &	Analyst	
Client ID	#		Date/time	Aliquot	Date/time	Date/time	Weight	Recovery	ID	counts	dt(min)	counts	dt(min)	Eff. Factor		
L28837-1		TOTAL SR	31-may-06		12-jun-06		0		X1A	202	200	308	400	.346	.999	LCB
WG-QC-MW-QC-108S-05310			10:30	450 ml	11:00			51.08								
Activity:	1.36E+00	Error:	9.47E-01	MDC:	1.64E+00 *											
L28837-2		TOTAL SR	31-may-06		12-jun-06		0		X1B	212	200	342	400	.343	.999	LCB
WG-QC-MW-QC-107I-05310			09:10	450 ml	11:00			55.11								
Activity:	1.09E+00	Error:	9.13E-01	MDC:	1.61E+00 *											
L28837-3		TOTAL SR	01-jun-06		12-jun-06		0		X1C	197	200	289	400	.354	.999	LCB
WG-QC-MW-QC-103I-06010			07:48	450 ml	11:00			64.52								
Activity:	1.15E+00	Error:	7.2E-01	MDC:	1.23E+00 *											
L28837-4		TOTAL SR	31-may-06		12-jun-06		0		X1D	191	200	312	400	.344	.999	LCB
WG-QC-MW-QC-106S-05310			14:37	450 ml	11:00			45.43								
Activity:	1.12E+00	Error:	1.05E+00	MDC:	1.86E+00 *											
L28837-5		TOTAL SR	31-may-06		12-jun-06		0		X2A	148	200	264	400	.354	.999	LCB
RB-QC-MW-QC-108S-05310			11:00	450 ml	11:00			47.85								
Activity:	4.73E-01	Error:	8.64E-01	MDC:	1.58E+00 *											
L28837-6		TOTAL SR	31-may-06		12-jun-06		0		X2B	186	200	289	400	.345	.999	LCB
WG-QC-MW-QC-106I-05310			14:45	450 ml	11:00			59.14								
Activity:	1.02E+00	Error:	7.89E-01	MDC:	1.38E+00 *											
L28837-7		TOTAL SR	01-jun-06		12-jun-06		0		X4C	205	200	299	400	.35	.999	LCB
WG-QC-MW-QC-101I-06010			14:10	450 ml	11:00			70.43								
Activity:	1.13E+00	Error:	6.79E-01	MDC:	1.16E+00 *											
L28837-8		TOTAL SR	01-jun-06		12-jun-06		0		Y2B	176	150	315	400	.356	.999	LCB
WG-QC-MW-QC-104S-06010			12:58	450 ml	11:00			91.40								
Activity:	1.19E+00 *	Error:	6.09E-01	MDC:	1.04E+00											
L28837-9		TOTAL SR	01-jun-06		12-jun-06		0		X3A	209	200	363	400	.335	.999	LCB
WG-QC-MW-QC-105I-06010			11:18	450 ml	11:00			55.65								
Activity:	7.38E-01	Error:	9.3E-01	MDC:	1.69E+00 *											
L28837-10		TOTAL SR	31-may-06		12-jun-06		0		X3B	161	200	321	400	.343	.999	LCB
WG-QC-MW-QC-FTW-053106			08:00	450 ml	11:00			57.53								
Activity:	1.27E-02	Error:	7.88E-01	MDC:	1.5E+00 *											



Sec. Review: Analyst: LIMS: ✓

VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 10-JUN-2006 11:40:15.90  
 TBE10 12892256 HpGe \*\*\*\*\* Aquisition Date/Time: 9-JUN-2006 22:11:07.83

LIMS No., Customer Name, Client ID: WG L28837-1 QUAD CITY

Sample ID : 10L28837-1 Smple Date: 31-MAY-2006 10:30:00.  
 Sample Type : WG Geometry : 103L083004  
 Quantity : 2.71440E+00 L BKGFILE : 10BG060306MT  
 Start Channel : 80 Energy Tol : 1.00000 Real Time : 0 06:40:03.88  
 End Channel : 4090 Pk Srch Sens: 5.00000 Live time : 0 06:40:00.00  
 MDA Constant : 0.00 Library Used: LIBD

Pk It	Energy	Area	Bkgnd	FWHM	Channel	%Eff	Cts/Sec	%Err	Fit
1 1	66.47*	133	742	1.14	132.05	7.32E-01	5.55E-03	38.5	1.69E+00
2 1	92.66*	0	650	1.35	184.46	1.52E+00	9.99E-06	*****	1.57E+00
3 1	139.72	202	714	1.44	278.61	1.91E+00	8.43E-03	24.6	1.45E+00
4 1	185.76*	55	641	2.58	370.74	1.77E+00	2.28E-03	101.3	3.28E+00
5 1	198.21*	180	586	2.32	395.65	1.72E+00	7.51E-03	29.7	4.10E+00
6 1	238.50*	8	426	1.69	476.27	1.54E+00	3.33E-04	539.4	1.29E+00
7 1	294.99	56	274	1.54	589.30	1.33E+00	2.32E-03	49.4	6.84E+00
8 1	351.73*	45	316	1.75	702.84	1.17E+00	1.89E-03	92.4	3.44E+00
9 1	596.03	103	152	2.07	1191.73	7.85E-01	4.28E-03	28.4	1.48E+00
10 1	609.53*	60	154	1.73	1218.76	7.72E-01	2.49E-03	51.4	1.91E+00
11 1	1120.61*	18	77	1.65	2241.71	4.79E-01	7.53E-04	119.6	7.05E-01
12 1	1461.75	163	86	2.84	2924.65	3.88E-01	6.78E-03	17.1	3.26E+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	163	10.67*	3.884E-01	1.629E+02	1.629E+02	34.16
RA-226	186.21	55	3.28*	1.771E+00	3.901E+01	3.901E+01	202.51
TH-228	238.63	8	44.60*	1.539E+00	4.834E-01	4.880E-01	1078.72
	240.98	-----	3.95	1.529E+00	-----	Line Not Found	-----
U-235	143.76	-----	10.50*	1.905E+00	-----	Line Not Found	-----
	163.35	-----	4.70	1.860E+00	-----	Line Not Found	-----
	185.71	55	54.00	1.771E+00	2.369E+00	2.369E+00	202.51
	205.31	-----	4.70	1.684E+00	-----	Line Not Found	-----

Flag: "\*" = Keyline

Summary of Nuclide Activity  
 Sample ID : 10L28837-1

Acquisition date : 9-JUN-2006 22:11:07

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 pCi/L	Decay Corr pCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	1.629E+02	1.629E+02	0.557E+02	34.16	
RA-226	1600.00Y	1.00	3.901E+01	3.901E+01	7.899E+01	202.51	
TH-228	1.91Y	1.01	4.834E-01	4.880E-01	52.64E-01	1078.72	
U-235	7.04E+08Y	1.00	2.369E+00	2.369E+00	4.798E+00	202.51	K
Total Activity :			2.048E+02	2.048E+02			

Grand Total Activity : 2.048E+02 2.048E+02

Flags: "K" = Keyline not found  
 "E" = Manually edited

"M" = Manually accepted  
 "A" = Nuclide specific abn. limit

Unidentified Energy Lines  
Sample ID : 10L28837-1

Page : 3  
Acquisition date : 9-JUN-2006 22:11:07

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
1	66.47	133	742	1.14	132.05	129	8	5.55E-03	77.0	7.32E-01	
1	92.66	0	650	1.35	184.46	180	8	9.99E-06	****	1.52E+00	
1	139.72	202	714	1.44	278.61	275	9	8.43E-03	49.3	1.91E+00	
1	198.21	180	586	2.32	395.65	390	11	7.51E-03	59.5	1.72E+00	
1	294.99	56	274	1.54	589.30	586	7	2.32E-03	98.8	1.33E+00	
1	351.73	45	316	1.75	702.84	696	13	1.89E-03	****	1.17E+00	
1	596.03	103	152	2.07	1191.73	1186	15	4.28E-03	56.7	7.85E-01	
1	609.53	60	154	1.73	1218.76	1214	12	2.49E-03	****	7.72E-01	
1	1120.61	18	77	1.65	2241.71	2238	14	7.53E-04	****	4.79E-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	Flags
			Uncorrected	Decay Corr					
K-40	1.28E+09Y	1.00	1.629E+02	1.629E+02	0.557E+02	34.16			
RA-226	1600.00Y	1.00	3.901E+01	3.901E+01	7.899E+01	202.51			
TH-228	1.91Y	1.01	4.834E-01	4.880E-01	52.64E-01	1078.72			
Total Activity :			2.024E+02	2.024E+02					

Grand Total Activity : 2.024E+02            2.024E+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 (pCi/L)	Act error	MDA (pCi/L)	MDA error	Act/MDA
K-40	1.629E+02	5.566E+01	4.725E+01	0.000E+00	3.448
RA-226	3.901E+01	7.899E+01	1.132E+02	0.000E+00	0.344
TH-228	4.880E-01	5.264E+00	8.262E+00	0.000E+00	0.059

---- Non-Identified Nuclides ----

Key-Line Activity	K.L.	Act error	MDA	MDA error	Act/MDA
----------------------	------	-----------	-----	-----------	---------

Nuclide	(pCi/L)	Ided	(pCi/L)		
BE-7	2.382E+01	2.562E+01	4.393E+01	0.000E+00	0.542
NA-24	-1.263E-01	6.109E-02	Half-Life	too short	
CR-51	-3.289E+01	3.020E+01	4.814E+01	0.000E+00	-0.683
MN-54	1.203E+00	2.742E+00	4.623E+00	0.000E+00	0.260
CO-57	-1.679E+00	2.719E+00	4.444E+00	0.000E+00	-0.378
CO-58	-1.166E-01	2.790E+00	4.602E+00	0.000E+00	-0.025
FE-59	1.918E+00	5.682E+00	9.616E+00	0.000E+00	0.199
CO-60	-5.260E-01	2.778E+00	4.492E+00	0.000E+00	-0.117
ZN-65	7.328E+00	6.680E+00	1.022E+01	0.000E+00	0.717
SE-75	8.052E-03	3.875E+00	6.426E+00	0.000E+00	0.001
SR-85	2.192E+01	3.563E+00	6.860E+00	0.000E+00	3.196
Y-88	2.601E+00	3.044E+00	5.354E+00	0.000E+00	0.486
NB-94	-7.048E-01	2.674E+00	4.295E+00	0.000E+00	-0.164
NB-95	1.520E+00	2.793E+00	4.754E+00	0.000E+00	0.320
ZR-95	-2.469E+00	4.905E+00	7.930E+00	0.000E+00	-0.311
MO-99	6.729E+01	2.247E+02	3.785E+02	0.000E+00	0.178
RU-103	1.215E+00	3.315E+00	5.561E+00	0.000E+00	0.218
RU-106	1.139E+01	2.666E+01	4.274E+01	0.000E+00	0.267
AG-110m	-8.946E-01	2.692E+00	4.325E+00	0.000E+00	-0.207
SN-113	-7.891E-01	3.754E+00	6.077E+00	0.000E+00	-0.130
SB-124	3.597E-01	6.697E+00	4.719E+00	0.000E+00	0.076
SB-125	-5.069E+00	7.882E+00	1.249E+01	0.000E+00	-0.406
TE-129M	-1.534E+01	3.675E+01	6.016E+01	0.000E+00	-0.255
I-131	-4.200E+00	6.428E+00	1.029E+01	0.000E+00	-0.408
BA-133	6.701E+00	4.640E+00	6.839E+00	0.000E+00	0.980
CS-134	6.612E+00	6.197E+00	5.086E+00	0.000E+00	1.300
CS-136	-1.570E+00	4.190E+00	6.784E+00	0.000E+00	-0.231
CS-137	-1.606E+00	2.902E+00	4.608E+00	0.000E+00	-0.349
CE-139	2.020E+00	2.869E+00	4.767E+00	0.000E+00	0.424
BA-140	3.355E-02	1.558E+01	2.570E+01	0.000E+00	0.001
LA-140	-6.484E-01	5.080E+00	8.315E+00	0.000E+00	-0.078
CE-141	-4.827E+00	6.485E+00	8.848E+00	0.000E+00	-0.546
CE-144	9.203E+00	2.455E+01	3.478E+01	0.000E+00	0.265
EU-152	3.718E-02	1.031E+01	1.428E+01	0.000E+00	0.003
EU-154	-3.478E+00	5.617E+00	9.178E+00	0.000E+00	-0.379
AC-228	-3.028E+00	1.139E+01	1.729E+01	0.000E+00	-0.175
TH-232	-3.018E+00	1.136E+01	1.724E+01	0.000E+00	-0.175
U-235	2.566E+01	2.453E+01	3.532E+01	0.000E+00	0.726
U-238	1.479E+02	2.984E+02	5.013E+02	0.000E+00	0.295
AM-241	-3.524E+01	2.591E+01	3.709E+01	0.000E+00	-0.950

		,06/10/2006	11:40,05/31/2006	10:30,	2.714E+00,WG	L28837-1	QU
A,10L28837-1		,06/10/2006	11:40,05/31/2006	10:30,	2.714E+00,WG	L28837-1	QU
B,10L28837-1		,LIBD		,06/07/2006	09:32,103L083004		
C,K-40	,YES,	1.629E+02,	5.566E+01,	4.725E+01,,			3.448
C,RA-226	,YES,	3.901E+01,	7.899E+01,	1.132E+02,,			0.344
C,TH-228	,YES,	4.880E-01,	5.264E+00,	8.262E+00,,			0.059
C,BE-7	,NO,	2.382E+01,	2.562E+01,	4.393E+01,,			0.542
C,CR-51	,NO,	-3.289E+01,	3.020E+01,	4.814E+01,,			-0.683
C,MN-54	,NO,	1.203E+00,	2.742E+00,	4.623E+00,,			0.260
C,CO-57	,NO,	-1.679E+00,	2.719E+00,	4.444E+00,,			-0.378
C,CO-58	,NO,	-1.166E-01,	2.790E+00,	4.602E+00,,			-0.025
C,FE-59	,NO,	1.918E+00,	5.682E+00,	9.616E+00,,			0.199
C,CO-60	,NO,	-5.260E-01,	2.778E+00,	4.492E+00,,			-0.117
C,ZN-65	,NO,	7.328E+00,	6.680E+00,	1.022E+01,,			0.717
C,SE-75	,NO,	8.052E-03,	3.875E+00,	6.426E+00,,			0.001
C,SR-85	,NO,	2.192E+01,	3.563E+00,	6.860E+00,,			3.196
C,Y-88	,NO,	2.601E+00,	3.044E+00,	5.354E+00,,			0.486
C,NB-94	,NO,	-7.048E-01,	2.674E+00,	4.295E+00,,			-0.164
C,NB-95	,NO,	1.520E+00,	2.793E+00,	4.754E+00,,			0.320
C,ZR-95	,NO,	-2.469E+00,	4.905E+00,	7.930E+00,,			-0.311
C,MO-99	,NO,	6.729E+01,	2.247E+02,	3.785E+02,,			0.178
C,RU-103	,NO,	1.215E+00,	3.315E+00,	5.561E+00,,			0.218
C,RU-106	,NO,	1.139E+01,	2.666E+01,	4.274E+01,,			0.267
C,AG-110m	,NO,	-8.946E-01,	2.692E+00,	4.325E+00,,			-0.207
C,SN-113	,NO,	-7.891E-01,	3.754E+00,	6.077E+00,,			-0.130
C,SB-124	,NO,	3.597E-01,	6.697E+00,	4.719E+00,,			0.076
C,SB-125	,NO,	-5.069E+00,	7.882E+00,	1.249E+01,,			-0.406
C,TE-129M	,NO,	-1.534E+01,	3.675E+01,	6.016E+01,,			-0.255
C,I-131	,NO,	-4.200E+00,	6.428E+00,	1.029E+01,,			-0.408
C,BA-133	,NO,	6.701E+00,	4.640E+00,	6.839E+00,,			0.980
C,CS-134	,NO,	6.612E+00,	6.197E+00,	5.086E+00,,			1.300
C,CS-136	,NO,	-1.570E+00,	4.190E+00,	6.784E+00,,			-0.231
C,CS-137	,NO,	-1.606E+00,	2.902E+00,	4.608E+00,,			-0.349
C,CE-139	,NO,	2.020E+00,	2.869E+00,	4.767E+00,,			0.424
C,BA-140	,NO,	3.355E-02,	1.558E+01,	2.570E+01,,			0.001
C,LA-140	,NO,	-6.484E-01,	5.080E+00,	8.315E+00,,			-0.078
C,CE-141	,NO,	-4.827E+00,	6.485E+00,	8.848E+00,,			-0.546
C,CE-144	,NO,	9.203E+00,	2.455E+01,	3.478E+01,,			0.265
C,EU-152	,NO,	3.718E-02,	1.031E+01,	1.428E+01,,			0.003
C,EU-154	,NO,	-3.478E+00,	5.617E+00,	9.178E+00,,			-0.379
C,AC-228	,NO,	-3.028E+00,	1.139E+01,	1.729E+01,,			-0.175
C,TH-232	,NO,	-3.018E+00,	1.136E+01,	1.724E+01,,			-0.175
C,U-235	,NO,	2.566E+01,	2.453E+01,	3.532E+01,,			0.726
C,U-238	,NO,	1.479E+02,	2.984E+02,	5.013E+02,,			0.295
C,AM-241	,NO,	-3.524E+01,	2.591E+01,	3.709E+01,,			-0.950



Summary of Nuclide Activity  
 Sample ID : 11L28837-2

Page : 2  
 Acquisition date : 9-JUN-2006 22:11:16

Total number of lines in spectrum 8  
 Number of unidentified lines 7  
 Number of lines tentatively identified by NID 1 12.50%

Nuclide Type : natural

Nuclide	Hlife	Decay	Uncorrected pCi/L	Decay Corr pCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
AC-228	5.75Y	1.00	2.171E-01	2.178E-01	111.2E-01	5104.48	
Total Activity :			2.171E-01	2.178E-01			

Grand Total Activity : 2.171E-01 2.178E-01

Flags: "K" = Keyline not found  
 "E" = Manually edited

"M" = Manually accepted  
 "A" = Nuclide specific abn. limit

## Unidentified Energy Lines

Sample ID : 11L28837-2

Acquisition date : 9-JUN-2006 22:11:16

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	66.39	203	1271	1.71	131.78	128	8	8.47E-03	62.4	6.89E-01	
0	139.97	109	665	1.11	279.37	274	10	4.56E-03	98.0	1.90E+00	
0	198.74	205	493	1.09	397.23	393	10	8.53E-03	43.0	1.75E+00	
0	351.96	122	284	1.69	704.37	699	12	5.10E-03	66.5	1.20E+00	
0	595.96	122	126	1.82	1193.15	1188	11	5.08E-03	40.0	8.03E-01	
0	608.67	106	149	1.74	1218.59	1212	13	4.42E-03	58.4	7.90E-01	
0	1762.44	27	49	2.24	3523.86	3512	22	1.12E-03	****	3.39E-01	

Flags: "T" = Tentatively associated

## Summary of Nuclide Activity

Total number of lines in spectrum 8  
 Number of unidentified lines 7  
 Number of lines tentatively identified by NID 1 12.50%

Nuclide Type : natural

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/L	Wtd Mean Decay Corr pCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
AC-228	5.75Y	1.00	2.171E-01	2.178E-01	111.2E-01	5104.48	
Total Activity :			2.171E-01	2.178E-01			

Grand Total Activity : 2.171E-01 2.178E-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
AC-228	2.178E-01	1.112E+01	1.376E+01	0.000E+00	0.016

## ---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/L)	K.L. Ided	Act error	MDA (pCi/L)	MDA error	Act/MDA
BE-7	-8.198E+00		2.199E+01	3.534E+01	0.000E+00	-0.232
NA-24	-8.104E-02		6.401E-02	Half-Life too short		
K-40	1.694E+01		3.605E+01	6.114E+01	0.000E+00	0.277
CR-51	1.271E+01		2.521E+01	4.231E+01	0.000E+00	0.300



MN-54	6.447E-01	2.327E+00	3.867E+00	0.000E+00	0.167
CO-57	-6.691E-01	2.356E+00	3.861E+00	0.000E+00	-0.173
CO-58	1.084E+00	2.487E+00	4.171E+00	0.000E+00	0.260
FE-59	1.604E+00	4.959E+00	8.371E+00	0.000E+00	0.192
CO-60	2.114E+00	2.406E+00	4.197E+00	0.000E+00	0.504
ZN-65	6.372E+00	5.261E+00	9.292E+00	0.000E+00	0.686
SE-75	-7.869E-01	3.254E+00	5.380E+00	0.000E+00	-0.146
SR-85	1.757E+01	3.108E+00	5.881E+00	0.000E+00	2.988
Y-88	6.209E-01	2.674E+00	4.496E+00	0.000E+00	0.138
NB-94	-4.312E-01	2.290E+00	3.745E+00	0.000E+00	-0.115
NB-95	1.187E+00	2.467E+00	4.154E+00	0.000E+00	0.286
ZR-95	2.526E-01	4.319E+00	7.125E+00	0.000E+00	0.035
MO-99	1.187E+01	1.977E+02	3.265E+02	0.000E+00	0.036
RU-103	1.306E+00	2.905E+00	4.814E+00	0.000E+00	0.271
RU-106	-7.919E+00	2.230E+01	3.640E+01	0.000E+00	-0.218
AG-110m	-1.839E-01	2.349E+00	3.872E+00	0.000E+00	-0.048
SN-113	4.282E+00	3.243E+00	5.564E+00	0.000E+00	0.770
SB-124	4.661E+00	4.837E+00	4.102E+00	0.000E+00	1.136
SB-125	-6.122E-01	7.173E+00	1.172E+01	0.000E+00	-0.052
TE-129M	3.271E+01	3.229E+01	5.478E+01	0.000E+00	0.597
I-131	-3.586E+00	5.503E+00	8.871E+00	0.000E+00	-0.404
BA-133	5.644E+00	3.940E+00	5.856E+00	0.000E+00	0.964
CS-134	7.206E+00	4.205E+00	4.413E+00	0.000E+00	1.633
CS-136	-7.333E-01	3.748E+00	6.078E+00	0.000E+00	-0.121
CS-137	1.790E+00	2.504E+00	4.277E+00	0.000E+00	0.418
CE-139	-1.126E+00	2.501E+00	4.054E+00	0.000E+00	-0.278
BA-140	4.664E+00	1.382E+01	2.278E+01	0.000E+00	0.205
LA-140	-1.937E+00	4.821E+00	7.765E+00	0.000E+00	-0.249
CE-141	1.765E+00	5.440E+00	7.656E+00	0.000E+00	0.231
CE-144	-4.420E-01	2.164E+01	3.019E+01	0.000E+00	-0.015
EU-152	-5.343E+00	8.873E+00	1.204E+01	0.000E+00	-0.444
EU-154	-5.569E-02	4.863E+00	8.013E+00	0.000E+00	-0.007
RA-226	-3.339E+01	6.503E+01	9.805E+01	0.000E+00	-0.341
TH-228	1.232E+00	5.172E+00	7.742E+00	0.000E+00	0.159
TH-232	2.171E-01	1.108E+01	1.527E+01	0.000E+00	0.014
U-235	1.507E+01	2.102E+01	2.994E+01	0.000E+00	0.503
U-238	-1.669E+01	2.602E+02	4.311E+02	0.000E+00	-0.039
AM-241	-8.285E+00	3.656E+01	4.988E+01	0.000E+00	-0.166

A,11L28837-2	,06/10/2006	11:42,05/31/2006	09:10,	3.004E+00,WG	L28837-2	QU
B,11L28837-2	,LIBD	,06/07/2006	09:40,	113L082304		
C,AC-228	,YES,	2.178E-01,	1.112E+01,	1.376E+01,,	0.016	
C,BE-7	,NO,	-8.198E+00,	2.199E+01,	3.534E+01,,	-0.232	
C,K-40	,NO,	1.694E+01,	3.605E+01,	6.114E+01,,	0.277	
C,CR-51	,NO,	1.271E+01,	2.521E+01,	4.231E+01,,	0.300	
C,MN-54	,NO,	6.447E-01,	2.327E+00,	3.867E+00,,	0.167	
C,CO-57	,NO,	-6.691E-01,	2.356E+00,	3.861E+00,,	-0.173	
C,CO-58	,NO,	1.084E+00,	2.487E+00,	4.171E+00,,	0.260	
C,FE-59	,NO,	1.604E+00,	4.959E+00,	8.371E+00,,	0.192	
C,CO-60	,NO,	2.114E+00,	2.406E+00,	4.197E+00,,	0.504	
C,ZN-65	,NO,	6.372E+00,	5.261E+00,	9.292E+00,,	0.686	
C,SE-75	,NO,	-7.869E-01,	3.254E+00,	5.380E+00,,	-0.146	
C,SR-85	,NO,	1.757E+01,	3.108E+00,	5.881E+00,,	2.988	
C,Y-88	,NO,	6.209E-01,	2.674E+00,	4.496E+00,,	0.138	
C,NB-94	,NO,	-4.312E-01,	2.290E+00,	3.745E+00,,	-0.115	
C,NB-95	,NO,	1.187E+00,	2.467E+00,	4.154E+00,,	0.286	
C,ZR-95	,NO,	2.526E-01,	4.319E+00,	7.125E+00,,	0.035	
C,MO-99	,NO,	1.187E+01,	1.977E+02,	3.265E+02,,	0.036	
C,RU-103	,NO,	1.306E+00,	2.905E+00,	4.814E+00,,	0.271	
C,RU-106	,NO,	-7.919E+00,	2.230E+01,	3.640E+01,,	-0.218	
C,AG-110m	,NO,	-1.839E-01,	2.349E+00,	3.872E+00,,	-0.048	
C,SN-113	,NO,	4.282E+00,	3.243E+00,	5.564E+00,,	0.770	
C,SB-124	,NO,	4.661E+00,	4.837E+00,	4.102E+00,,	1.136	
C,SB-125	,NO,	-6.122E-01,	7.173E+00,	1.172E+01,,	-0.052	
C,TE-129M	,NO,	3.271E+01,	3.229E+01,	5.478E+01,,	0.597	
C,I-131	,NO,	-3.586E+00,	5.503E+00,	8.871E+00,,	-0.404	
C,BA-133	,NO,	5.644E+00,	3.940E+00,	5.856E+00,,	0.964	
C,CS-134	,NO,	7.206E+00,	4.205E+00,	4.413E+00,,	1.633	
C,CS-136	,NO,	-7.333E-01,	3.748E+00,	6.078E+00,,	-0.121	
C,CS-137	,NO,	1.790E+00,	2.504E+00,	4.277E+00,,	0.418	
C,CE-139	,NO,	-1.126E+00,	2.501E+00,	4.054E+00,,	-0.278	
C,BA-140	,NO,	4.664E+00,	1.382E+01,	2.278E+01,,	0.205	
C,LA-140	,NO,	-1.937E+00,	4.821E+00,	7.765E+00,,	-0.249	
C,CE-141	,NO,	1.765E+00,	5.440E+00,	7.656E+00,,	0.231	
C,CE-144	,NO,	-4.420E-01,	2.164E+01,	3.019E+01,,	-0.015	
C,EU-152	,NO,	-5.343E+00,	8.873E+00,	1.204E+01,,	-0.444	
C,EU-154	,NO,	-5.569E-02,	4.863E+00,	8.013E+00,,	-0.007	
C,RA-226	,NO,	-3.339E+01,	6.503E+01,	9.805E+01,,	-0.341	
C,TH-228	,NO,	1.232E+00,	5.172E+00,	7.742E+00,,	0.159	
C,TH-232	,NO,	2.171E-01,	1.108E+01,	1.527E+01,,	0.014	
C,U-235	,NO,	1.507E+01,	2.102E+01,	2.994E+01,,	0.503	
C,U-238	,NO,	-1.669E+01,	2.602E+02,	4.311E+02,,	-0.039	
C,AM-241	,NO,	-8.285E+00,	3.656E+01,	4.988E+01,,	-0.166	



Summary of Nuclide Activity  
 Sample ID : 13L28837-3

Page : 2  
 Acquisition date : 9-JUN-2006 22:11:27

Total number of lines in spectrum 19  
 Number of unidentified lines 13  
 Number of lines tentatively identified by NID 6 31.58%

Nuclide Type : natural

Nuclide	Hlife	Decay	Uncorrected pCi/L	Decay Corr pCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	1.634E+01	1.634E+01	4.356E+01	266.62	
RA-226	1600.00Y	1.00	3.612E+00	3.612E+00	59.02E+00	1633.89	
TH-232	1.41E+10Y	1.00	2.323E-01	2.323E-01	84.37E-01	3632.74	K
U-235	7.04E+08Y	1.00	2.194E-01	2.194E-01	35.85E-01	1633.89	K
Total Activity :			2.040E+01	2.040E+01			

Grand Total Activity : 2.040E+01 2.040E+01

Flags: "K" = Keyline not found "M" = Manually accepted  
 "E" = Manually edited "A" = Nuclide specific abn. limit

Unidentified Energy Lines  
 Sample ID : 13L28837-3

Acquisition date : 9-JUN-2006 22:11:27

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
1	46.06	95	666	1.66	92.24	88	9	3.96E-03	****	1.49E-01	
5	63.36	120	685	1.18	126.82	123	15	5.01E-03	89.1	7.09E-01	
5	65.95	178	845	1.33	131.99	123	15	7.42E-03	59.0	8.13E-01	
1	87.43	28	436	0.86	174.93	173	5	1.17E-03	****	1.59E+00	
1	92.57	32	770	1.11	185.19	181	8	1.33E-03	****	1.73E+00	
1	139.69	119	751	0.96	279.39	276	8	4.97E-03	88.8	2.27E+00	
1	198.33	242	599	1.37	396.60	392	9	1.01E-02	42.2	2.12E+00	
1	241.70	88	559	1.67	483.29	481	10	3.68E-03	****	1.92E+00	T
1	295.33	72	387	1.28	590.50	587	8	3.01E-03	****	1.70E+00	
1	351.96	134	368	1.08	703.71	699	10	5.58E-03	64.7	1.51E+00	
1	609.19	181	192	1.32	1218.04	1213	12	7.56E-03	39.9	1.01E+00	
1	707.67	56	116	1.50	1415.00	1411	9	2.32E-03	74.3	8.96E-01	T
1	1121.12	27	102	2.36	2242.13	2236	15	1.10E-03	****	6.26E-01	
1	1237.74	52	122	5.36	2475.51	2471	20	2.16E-03	****	5.81E-01	
1	1765.38	73	54	2.36	3531.83	3523	18	3.05E-03	60.7	4.55E-01	

Flags: "T" = Tentatively associated

Summary of Nuclide Activity

Total number of lines in spectrum	19	
Number of unidentified lines	13	
Number of lines tentatively identified by NID	6	31.58%

Nuclide Type : natural

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/L	Wtd Mean Decay Corr pCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	1.634E+01	1.634E+01	4.356E+01	266.62	
RA-226	1600.00Y	1.00	3.612E+00	3.612E+00	59.02E+00	1633.89	
TH-232	1.41E+10Y	1.00	1.250E+00	1.250E+00	7.619E+00	609.41	
Total Activity :			2.120E+01	2.120E+01			

Grand Total Activity : 2.120E+01 2.120E+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	1.634E+01	4.356E+01	3.096E+01	0.000E+00	0.528
RA-226	3.612E+00	5.902E+01	7.522E+01	0.000E+00	0.048

TH-232	1.250E+00	7.619E+00	1.407E+01	0.000E+00	0.089
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---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/L)	K.L. Ided	Act error	MDA (pCi/L)	MDA error	Act/MDA
BE-7	5.730E+00		1.872E+01	3.089E+01	0.000E+00	0.186
NA-24	-3.270E-02		1.797E-02	Half-Life too short		
CR-51	-2.542E+00		2.097E+01	3.400E+01	0.000E+00	-0.075
MN-54	6.199E-01		2.072E+00	3.458E+00	0.000E+00	0.179
CO-57	-2.652E-01		1.876E+00	3.121E+00	0.000E+00	-0.085
CO-58	-1.701E+00		2.189E+00	3.483E+00	0.000E+00	-0.488
FE-59	3.791E+00		4.535E+00	7.784E+00	0.000E+00	0.487
CO-60	-2.315E+00		2.197E+00	3.390E+00	0.000E+00	-0.683
ZN-65	5.895E+00		5.384E+00	8.073E+00	0.000E+00	0.730
SE-75	-1.654E+00		2.780E+00	4.516E+00	0.000E+00	-0.366
SR-85	1.733E+01		2.692E+00	5.101E+00	0.000E+00	3.397
Y-88	2.153E-01		2.346E+00	3.863E+00	0.000E+00	0.056
NB-94	1.108E+00		2.395E+00	3.383E+00	0.000E+00	0.328
NB-95	1.758E+00		2.281E+00	3.904E+00	0.000E+00	0.450
ZR-95	-1.786E+00		3.961E+00	6.451E+00	0.000E+00	-0.277
MO-99	-2.019E+01		1.405E+02	2.324E+02	0.000E+00	-0.087
RU-103	1.947E+00		2.438E+00	4.077E+00	0.000E+00	0.478
RU-106	-5.576E+00		1.979E+01	3.219E+01	0.000E+00	-0.173
AG-110m	-2.039E+00		2.068E+00	3.242E+00	0.000E+00	-0.629
SN-113	-1.422E+00		2.709E+00	4.414E+00	0.000E+00	-0.322
SB-124	-6.074E+00		2.837E+00	3.486E+00	0.000E+00	-1.742
SB-125	-2.204E-01		5.594E+00	9.194E+00	0.000E+00	-0.024
TE-129M	-8.811E+00		2.791E+01	4.518E+01	0.000E+00	-0.195
I-131	2.612E+00		4.181E+00	7.095E+00	0.000E+00	0.368
BA-133	-1.213E+00		3.272E+00	4.579E+00	0.000E+00	-0.265
CS-134	-2.147E+00		2.733E+00	3.659E+00	0.000E+00	-0.587
CS-136	-9.217E-01		3.171E+00	5.160E+00	0.000E+00	-0.179
CS-137	4.200E-01		2.444E+00	3.779E+00	0.000E+00	0.111
CE-139	4.570E-01		1.980E+00	3.259E+00	0.000E+00	0.140
BA-140	6.508E-01		1.122E+01	1.872E+01	0.000E+00	0.035
LA-140	3.153E+00		3.972E+00	6.905E+00	0.000E+00	0.457
CE-141	5.358E-01		4.379E+00	6.238E+00	0.000E+00	0.086
CE-144	-4.458E+00		1.613E+01	2.380E+01	0.000E+00	-0.187
EU-152	-1.198E+01		7.590E+00	1.012E+01	0.000E+00	-1.184
EU-154	-8.441E-01		3.876E+00	6.434E+00	0.000E+00	-0.131
AC-228	1.041E+00		9.459E+00	1.411E+01	0.000E+00	0.074
TH-228	3.171E+00		4.631E+00	6.595E+00	0.000E+00	0.481
U-235	-3.330E-01		1.771E+01	2.413E+01	0.000E+00	-0.014
U-238	-1.344E+02		2.529E+02	3.749E+02	0.000E+00	-0.358
AM-241	1.718E+01		1.721E+01	2.557E+01	0.000E+00	0.672

A,13L28837-3 ,06/12/2006 00:29,06/01/2006 07:48, 3.011E+00,WG L28837-3 QU  
 B,13L28837-3 ,LIBD ,08/05/2005 08:16,133L082404

C,K-40	,YES,	1.634E+01,	4.356E+01,	3.096E+01,,	0.528
C,RA-226	,YES,	3.612E+00,	5.902E+01,	7.522E+01,,	0.048
C,TH-232	,YES,	1.250E+00,	7.619E+00,	1.407E+01,,	0.089
C,BE-7	,NO ,	5.730E+00,	1.872E+01,	3.089E+01,,	0.186
C,CR-51	,NO ,	-2.542E+00,	2.097E+01,	3.400E+01,,	-0.075
C,MN-54	,NO ,	6.199E-01,	2.072E+00,	3.458E+00,,	0.179
C,CO-57	,NO ,	-2.652E-01,	1.876E+00,	3.121E+00,,	-0.085
C,CO-58	,NO ,	-1.701E+00,	2.189E+00,	3.483E+00,,	-0.488
C,FE-59	,NO ,	3.791E+00,	4.535E+00,	7.784E+00,,	0.487
C,CO-60	,NO ,	-2.315E+00,	2.197E+00,	3.390E+00,,	-0.683
C,ZN-65	,NO ,	5.895E+00,	5.384E+00,	8.073E+00,,	0.730
C,SE-75	,NO ,	-1.654E+00,	2.780E+00,	4.516E+00,,	-0.366
C,SR-85	,NO ,	1.733E+01,	2.692E+00,	5.101E+00,,	3.397
C,Y-88	,NO ,	2.153E-01,	2.346E+00,	3.863E+00,,	0.056
C,NB-94	,NO ,	1.108E+00,	2.395E+00,	3.383E+00,,	0.328
C,NB-95	,NO ,	1.758E+00,	2.281E+00,	3.904E+00,,	0.450
C,ZR-95	,NO ,	-1.786E+00,	3.961E+00,	6.451E+00,,	-0.277
C,MO-99	,NO ,	-2.019E+01,	1.405E+02,	2.324E+02,,	-0.087
C,RU-103	,NO ,	1.947E+00,	2.438E+00,	4.077E+00,,	0.478
C,RU-106	,NO ,	-5.576E+00,	1.979E+01,	3.219E+01,,	-0.173
C,AG-110m	,NO ,	-2.039E+00,	2.068E+00,	3.242E+00,,	-0.629
C,SN-113	,NO ,	-1.422E+00,	2.709E+00,	4.414E+00,,	-0.322
C,SB-124	,NO ,	-6.074E+00,	2.837E+00,	3.486E+00,,	-1.742
C,SB-125	,NO ,	-2.204E-01,	5.594E+00,	9.194E+00,,	-0.024
C,TE-129M	,NO ,	-8.811E+00,	2.791E+01,	4.518E+01,,	-0.195
C,I-131	,NO ,	2.612E+00,	4.181E+00,	7.095E+00,,	0.368
C,BA-133	,NO ,	-1.213E+00,	3.272E+00,	4.579E+00,,	-0.265
C,CS-134	,NO ,	-2.147E+00,	2.733E+00,	3.659E+00,,	-0.587
C,CS-136	,NO ,	-9.217E-01,	3.171E+00,	5.160E+00,,	-0.179
C,CS-137	,NO ,	4.200E-01,	2.444E+00,	3.779E+00,,	0.111
C,CE-139	,NO ,	4.570E-01,	1.980E+00,	3.259E+00,,	0.140
C,BA-140	,NO ,	6.508E-01,	1.122E+01,	1.872E+01,,	0.035
C,LA-140	,NO ,	3.153E+00,	3.972E+00,	6.905E+00,,	0.457
C,CE-141	,NO ,	5.358E-01,	4.379E+00,	6.238E+00,,	0.086
C,CE-144	,NO ,	-4.458E+00,	1.613E+01,	2.380E+01,,	-0.187
C,EU-152	,NO ,	-1.198E+01,	7.590E+00,	1.012E+01,,	-1.184
C,EU-154	,NO ,	-8.441E-01,	3.876E+00,	6.434E+00,,	-0.131
C,AC-228	,NO ,	1.041E+00,	9.459E+00,	1.411E+01,,	0.074
C,TH-228	,NO ,	3.171E+00,	4.631E+00,	6.595E+00,,	0.481
C,U-235	,NO ,	-3.330E-01,	1.771E+01,	2.413E+01,,	-0.014
C,U-238	,NO ,	-1.344E+02,	2.529E+02,	3.749E+02,,	-0.358
C,AM-241	,NO ,	1.718E+01,	1.721E+01,	2.557E+01,,	0.672





Summary of Nuclide Activity  
Sample ID : 14L28837-4

Page : 2  
Acquisition date : 9-JUN-2006 22:11:37

Total number of lines in spectrum	10	
Number of unidentified lines	10	
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 : 14L28837-4

Page : 3  
Acquisition date : 9-JUN-2006 22:11:37

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
1	66.27	248	875	1.47	133.52	129	9	1.03E-02	44.8	5.10E-01	
1	92.57	19	798	1.64	186.27	182	9	8.07E-04	****	1.28E+00	
1	139.76	181	750	1.11	280.89	276	10	7.56E-03	58.4	1.89E+00	
1	198.52	106	576	1.55	398.65	395	9	4.42E-03	91.3	1.83E+00	
1	242.25	120	349	1.64	486.26	483	8	5.01E-03	57.2	1.66E+00	
1	295.79	118	319	1.75	593.47	590	8	4.93E-03	55.6	1.45E+00	
1	351.84	114	338	2.97	705.66	700	13	4.74E-03	79.1	1.28E+00	
1	596.15	109	189	2.10	1194.08	1187	13	4.56E-03	55.5	8.48E-01	
1	609.58	77	214	2.00	1220.89	1213	14	3.22E-03	96.1	8.33E-01	
1	1767.32	109	86	1.35	3522.29	3513	22	4.55E-03	45.2	3.79E-01	

Flags: "T" = Tentatively associated

### Summary of Nuclide Activity

Total number of lines in spectrum 10  
 Number of unidentified lines 10  
 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	1.089E+01		2.306E+01	3.861E+01	0.000E+00	0.282
NA-24	-4.619E-02		4.571E-02	Half-Life too short		
K-40	3.919E-01		3.738E+01	6.554E+01	0.000E+00	0.006
CR-51	-1.420E+01		2.608E+01	4.212E+01	0.000E+00	-0.337
MN-54	5.305E-01		2.623E+00	4.317E+00	0.000E+00	0.123
CO-57	2.397E+00		2.509E+00	4.240E+00	0.000E+00	0.565
CO-58	1.276E+00		2.750E+00	4.588E+00	0.000E+00	0.278
FE-59	1.265E+00		5.258E+00	8.717E+00	0.000E+00	0.145
CO-60	-2.096E+00		2.556E+00	3.988E+00	0.000E+00	-0.526
ZN-65	5.077E+00		5.822E+00	9.923E+00	0.000E+00	0.512
SE-75	1.823E+00		3.407E+00	5.710E+00	0.000E+00	0.319
SR-85	2.364E+01		3.186E+00	6.210E+00	0.000E+00	3.807
Y-88	4.631E-01		3.061E+00	5.068E+00	0.000E+00	0.091
NB-94	-1.711E+00		2.452E+00	3.928E+00	0.000E+00	-0.436
NB-95	3.489E-01		2.680E+00	4.421E+00	0.000E+00	0.079
ZR-95	-3.925E-01		4.879E+00	7.980E+00	0.000E+00	-0.049
MO-99	-1.054E+02		2.005E+02	3.218E+02	0.000E+00	-0.327
RU-103	4.792E-02		2.937E+00	4.831E+00	0.000E+00	0.010

RU-106	-2.134E+01	2.422E+01	3.725E+01	0.000E+00	-0.573
AG-110m	8.247E-02	2.461E+00	4.079E+00	0.000E+00	0.020
SN-113	-5.559E-01	3.341E+00	5.389E+00	0.000E+00	-0.103
SB-124	9.687E-02	6.660E+00	4.583E+00	0.000E+00	0.021
SB-125	-8.802E-01	7.141E+00	1.179E+01	0.000E+00	-0.075
TE-129M	1.298E+01	3.457E+01	5.776E+01	0.000E+00	0.225
I-131	2.064E-01	5.619E+00	9.161E+00	0.000E+00	0.023
BA-133	4.665E+00	4.125E+00	5.948E+00	0.000E+00	0.784
CS-134	5.206E+00	6.139E+00	4.742E+00	0.000E+00	1.098
CS-136	-9.256E-02	4.076E+00	6.649E+00	0.000E+00	-0.014
CS-137	1.549E-01	2.674E+00	4.436E+00	0.000E+00	0.035
CE-139	1.084E+00	2.512E+00	4.156E+00	0.000E+00	0.261
BA-140	7.053E+00	1.500E+01	2.496E+01	0.000E+00	0.283
LA-140	4.299E+00	4.364E+00	7.713E+00	0.000E+00	0.557
CE-141	2.146E+00	5.900E+00	8.349E+00	0.000E+00	0.257
CE-144	1.031E+01	2.184E+01	3.114E+01	0.000E+00	0.331
EU-152	-7.691E+00	9.287E+00	1.233E+01	0.000E+00	-0.624
EU-154	3.393E+00	5.173E+00	8.691E+00	0.000E+00	0.390
RA-226	-8.555E+00	6.562E+01	1.007E+02	0.000E+00	-0.085
AC-228	4.907E+00	1.016E+01	1.650E+01	0.000E+00	0.297
TH-228	4.642E+00	5.506E+00	7.752E+00	0.000E+00	0.599
TH-232	4.891E+00	1.013E+01	1.645E+01	0.000E+00	0.297
U-235	1.735E+01	2.264E+01	3.242E+01	0.000E+00	0.535
U-238	8.653E+01	2.711E+02	4.537E+02	0.000E+00	0.191
AM-241	-1.187E+01	3.857E+01	5.355E+01	0.000E+00	-0.222

A,14L28837-4 ,06/10/2006 11:47,05/31/2006 14:37, 3.014E+00,WG L28837-4 QU  
 B,14L28837-4 ,LIBD ,06/02/2006 08:23,143L082304  
 C,BE-7 ,NO , 1.089E+01, 2.306E+01, 3.861E+01,, 0.282  
 C,K-40 ,NO , 3.919E-01, 3.738E+01, 6.554E+01,, 0.006  
 C,CR-51 ,NO , -1.420E+01, 2.608E+01, 4.212E+01,, -0.337  
 C,MN-54 ,NO , 5.305E-01, 2.623E+00, 4.317E+00,, 0.123  
 C,CO-57 ,NO , 2.397E+00, 2.509E+00, 4.240E+00,, 0.565  
 C,CO-58 ,NO , 1.276E+00, 2.750E+00, 4.588E+00,, 0.278  
 C,FE-59 ,NO , 1.265E+00, 5.258E+00, 8.717E+00,, 0.145  
 C,CO-60 ,NO , -2.096E+00, 2.556E+00, 3.988E+00,, -0.526  
 C,ZN-65 ,NO , 5.077E+00, 5.822E+00, 9.923E+00,, 0.512  
 C,SE-75 ,NO , 1.823E+00, 3.407E+00, 5.710E+00,, 0.319  
 C,SR-85 ,NO , 2.364E+01, 3.186E+00, 6.210E+00,, 3.807  
 C,Y-88 ,NO , 4.631E-01, 3.061E+00, 5.068E+00,, 0.091  
 C,NB-94 ,NO , -1.711E+00, 2.452E+00, 3.928E+00,, -0.436  
 C,NB-95 ,NO , 3.489E-01, 2.680E+00, 4.421E+00,, 0.079  
 C,ZR-95 ,NO , -3.925E-01, 4.879E+00, 7.980E+00,, -0.049  
 C,MO-99 ,NO , -1.054E+02, 2.005E+02, 3.218E+02,, -0.327  
 C,RU-103 ,NO , 4.792E-02, 2.937E+00, 4.831E+00,, 0.010  
 C,RU-106 ,NO , -2.134E+01, 2.422E+01, 3.725E+01,, -0.573  
 C,AG-110m ,NO , 8.247E-02, 2.461E+00, 4.079E+00,, 0.020  
 C,SN-113 ,NO , -5.559E-01, 3.341E+00, 5.389E+00,, -0.103  
 C,SB-124 ,NO , 9.687E-02, 6.660E+00, 4.583E+00,, 0.021  
 C,SB-125 ,NO , -8.802E-01, 7.141E+00, 1.179E+01,, -0.075  
 C,TE-129M ,NO , 1.298E+01, 3.457E+01, 5.776E+01,, 0.225  
 C,I-131 ,NO , 2.064E-01, 5.619E+00, 9.161E+00,, 0.023  
 C,BA-133 ,NO , 4.665E+00, 4.125E+00, 5.948E+00,, 0.784  
 C,CS-134 ,NO , 5.206E+00, 6.139E+00, 4.742E+00,, 1.098  
 C,CS-136 ,NO , -9.256E-02, 4.076E+00, 6.649E+00,, -0.014  
 C,CS-137 ,NO , 1.549E-01, 2.674E+00, 4.436E+00,, 0.035  
 C,CE-139 ,NO , 1.084E+00, 2.512E+00, 4.156E+00,, 0.261  
 C,BA-140 ,NO , 7.053E+00, 1.500E+01, 2.496E+01,, 0.283  
 C,LA-140 ,NO , 4.299E+00, 4.364E+00, 7.713E+00,, 0.557  
 C,CE-141 ,NO , 2.146E+00, 5.900E+00, 8.349E+00,, 0.257  
 C,CE-144 ,NO , 1.031E+01, 2.184E+01, 3.114E+01,, 0.331  
 C,EU-152 ,NO , -7.691E+00, 9.287E+00, 1.233E+01,, -0.624  
 C,EU-154 ,NO , 3.393E+00, 5.173E+00, 8.691E+00,, 0.390  
 C,RA-226 ,NO , -8.555E+00, 6.562E+01, 1.007E+02,, -0.085  
 C,AC-228 ,NO , 4.907E+00, 1.016E+01, 1.650E+01,, 0.297  
 C,TH-228 ,NO , 4.642E+00, 5.506E+00, 7.752E+00,, 0.599  
 C,TH-232 ,NO , 4.891E+00, 1.013E+01, 1.645E+01,, 0.297  
 C,U-235 ,NO , 1.735E+01, 2.264E+01, 3.242E+01,, 0.535  
 C,U-238 ,NO , 8.653E+01, 2.711E+02, 4.537E+02,, 0.191  
 C,AM-241 ,NO , -1.187E+01, 3.857E+01, 5.355E+01,, -0.222



## Summary of Nuclide Activity

Page : 2

Sample ID : 15L28837-5

Acquisition date : 9-JUN-2006 22:11:48

Total number of lines in spectrum	4	
Number of unidentified lines	3	
Number of lines tentatively identified by NID	1	25.00%

Nuclide Type : natural

Nuclide	Hlife	Decay	Uncorrected pCi/L	Decay Corr pCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	3.608E+01	3.608E+01	3.271E+01	90.65	
Total Activity :			3.608E+01	3.608E+01			

Grand Total Activity :	3.608E+01	3.608E+01
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Flags: "K" = Keyline not found  
 "E" = Manually edited

"M" = Manually accepted  
 "A" = Nuclide specific abn. limit

Unidentified Energy Lines  
Sample ID : 15L28837-5

Page : 3  
Acquisition date : 9-JUN-2006 22:11:48

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
1	198.13	107	477	1.53	385.18	381	9	4.44E-03	77.2	2.44E+00	
1	595.26	58	144	1.74	1183.58	1179	10	2.41E-03	81.8	1.01E+00	
1	608.55	132	137	2.62	1210.28	1203	14	5.49E-03	41.7	9.91E-01	

Flags: "T" = Tentatively associated

### Summary of Nuclide Activity

Total number of lines in spectrum	4
Number of unidentified lines	3
Number of lines tentatively identified by NID	1      25.00%

Nuclide Type : natural

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/L	Wtd Mean Decay Corr pCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	3.608E+01	3.608E+01	3.271E+01	90.65	
Total Activity :			3.608E+01	3.608E+01			

Grand Total Activity : 3.608E+01      3.608E+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	3.608E+01	3.271E+01	3.087E+01	0.000E+00	1.169

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/L)	K.L. Ided	Act error	MDA (pCi/L)	MDA error	Act/MDA
BE-7	-1.711E+00		1.582E+01	2.620E+01	0.000E+00	-0.065
NA-24	-2.225E-02		4.282E-02	Half-Life too short		
CR-51	2.076E+00		1.753E+01	2.909E+01	0.000E+00	0.071
MN-54	5.557E-01		1.816E+00	3.041E+00	0.000E+00	0.183
CO-57	-7.526E-01		1.634E+00	2.511E+00	0.000E+00	-0.300
CO-58	-2.786E-01		1.949E+00	3.191E+00	0.000E+00	-0.087
FE-59	1.276E+00		3.696E+00	6.252E+00	0.000E+00	0.204
CO-60	-1.077E-01		1.989E+00	3.227E+00	0.000E+00	-0.033

ZN-65	6.060E+00	3.872E+00	7.018E+00	0.000E+00	0.864
SE-75	-1.096E-01	2.337E+00	3.770E+00	0.000E+00	-0.029
SR-85	8.500E+00	2.162E+00	4.015E+00	0.000E+00	2.117
Y-88	4.997E-01	2.087E+00	3.533E+00	0.000E+00	0.141
NB-94	1.542E+00	1.760E+00	2.981E+00	0.000E+00	0.517
NB-95	1.804E-01	1.900E+00	3.163E+00	0.000E+00	0.057
ZR-95	-2.863E+00	3.502E+00	5.562E+00	0.000E+00	-0.515
MO-99	4.087E+01	1.405E+02	2.369E+02	0.000E+00	0.173
RU-103	-4.872E-01	2.074E+00	3.410E+00	0.000E+00	-0.143
RU-106	-9.095E+00	1.666E+01	2.653E+01	0.000E+00	-0.343
AG-110m	-2.949E-01	1.848E+00	2.988E+00	0.000E+00	-0.099
SN-113	-5.376E-01	2.311E+00	3.746E+00	0.000E+00	-0.144
SB-124	1.639E+00	3.872E+00	3.064E+00	0.000E+00	0.535
SB-125	5.755E+00	4.974E+00	8.456E+00	0.000E+00	0.681
TE-129M	-7.355E-01	2.418E+01	3.910E+01	0.000E+00	-0.019
I-131	-6.406E-01	4.011E+00	6.549E+00	0.000E+00	-0.098
BA-133	-5.813E-01	2.436E+00	3.974E+00	0.000E+00	-0.146
CS-134	2.807E+00	2.652E+00	3.168E+00	0.000E+00	0.886
CS-136	-1.114E-01	2.865E+00	4.715E+00	0.000E+00	-0.024
CS-137	-6.097E-01	1.985E+00	3.185E+00	0.000E+00	-0.191
CE-139	-1.040E-01	1.566E+00	2.585E+00	0.000E+00	-0.040
BA-140	1.562E+00	1.030E+01	1.712E+01	0.000E+00	0.091
LA-140	-1.228E+00	3.496E+00	5.562E+00	0.000E+00	-0.221
CE-141	-2.716E+00	3.097E+00	5.051E+00	0.000E+00	-0.538
CE-144	-1.020E+01	1.182E+01	1.937E+01	0.000E+00	-0.527
EU-152	-8.735E+00	5.367E+00	8.363E+00	0.000E+00	-1.044
EU-154	1.707E-01	3.356E+00	5.216E+00	0.000E+00	0.033
RA-226	-1.918E+01	4.211E+01	6.406E+01	0.000E+00	-0.299
AC-228	4.394E+00	6.884E+00	1.167E+01	0.000E+00	0.376
TH-228	1.817E+00	3.398E+00	5.231E+00	0.000E+00	0.347
TH-232	4.380E+00	6.862E+00	1.163E+01	0.000E+00	0.376
U-235	6.508E-01	1.176E+01	1.959E+01	0.000E+00	0.033
U-238	3.391E+01	2.145E+02	3.521E+02	0.000E+00	0.096
AM-241	-1.648E+01	1.639E+01	2.650E+01	0.000E+00	-0.622



A,15L28837-5 ,06/10/2006 11:48,05/31/2006 11:00, 3.014E+00,WG L28837-5 QU  
 B,15L28837-5 ,LIBD ,06/06/2006 10:43,153L082604  
 C,K-40 ,YES, 3.608E+01, 3.271E+01, 3.087E+01,, 1.169  
 C,BE-7 ,NO , -1.711E+00, 1.582E+01, 2.620E+01,, -0.065  
 C,CR-51 ,NO , 2.076E+00, 1.753E+01, 2.909E+01,, 0.071  
 C,MN-54 ,NO , 5.557E-01, 1.816E+00, 3.041E+00,, 0.183  
 C,CO-57 ,NO , -7.526E-01, 1.634E+00, 2.511E+00,, -0.300  
 C,CO-58 ,NO , -2.786E-01, 1.949E+00, 3.191E+00,, -0.087  
 C,FE-59 ,NO , 1.276E+00, 3.696E+00, 6.252E+00,, 0.204  
 C,CO-60 ,NO , -1.077E-01, 1.989E+00, 3.227E+00,, -0.033  
 C,ZN-65 ,NO , 6.060E+00, 3.872E+00, 7.018E+00,, 0.864  
 C,SE-75 ,NO , -1.096E-01, 2.337E+00, 3.770E+00,, -0.029  
 C,SR-85 ,NO , 8.500E+00, 2.162E+00, 4.015E+00,, 2.117  
 C,Y-88 ,NO , 4.997E-01, 2.087E+00, 3.533E+00,, 0.141  
 C,NB-94 ,NO , 1.542E+00, 1.760E+00, 2.981E+00,, 0.517  
 C,NB-95 ,NO , 1.804E-01, 1.900E+00, 3.163E+00,, 0.057  
 C,ZR-95 ,NO , -2.863E+00, 3.502E+00, 5.562E+00,, -0.515  
 C,MO-99 ,NO , 4.087E+01, 1.405E+02, 2.369E+02,, 0.173  
 C,RU-103 ,NO , -4.872E-01, 2.074E+00, 3.410E+00,, -0.143  
 C,RU-106 ,NO , -9.095E+00, 1.666E+01, 2.653E+01,, -0.343  
 C,AG-110m ,NO , -2.949E-01, 1.848E+00, 2.988E+00,, -0.099  
 C,SN-113 ,NO , -5.376E-01, 2.311E+00, 3.746E+00,, -0.144  
 C,SB-124 ,NO , 1.639E+00, 3.872E+00, 3.064E+00,, 0.535  
 C,SB-125 ,NO , 5.755E+00, 4.974E+00, 8.456E+00,, 0.681  
 C,TE-129M ,NO , -7.355E-01, 2.418E+01, 3.910E+01,, -0.019  
 C,I-131 ,NO , -6.406E-01, 4.011E+00, 6.549E+00,, -0.098  
 C,BA-133 ,NO , -5.813E-01, 2.436E+00, 3.974E+00,, -0.146  
 C,CS-134 ,NO , 2.807E+00, 2.652E+00, 3.168E+00,, 0.886  
 C,CS-136 ,NO , -1.114E-01, 2.865E+00, 4.715E+00,, -0.024  
 C,CS-137 ,NO , -6.097E-01, 1.985E+00, 3.185E+00,, -0.191  
 C,CE-139 ,NO , -1.040E-01, 1.566E+00, 2.585E+00,, -0.040  
 C,BA-140 ,NO , 1.562E+00, 1.030E+01, 1.712E+01,, 0.091  
 C,LA-140 ,NO , -1.228E+00, 3.496E+00, 5.562E+00,, -0.221  
 C,CE-141 ,NO , -2.716E+00, 3.097E+00, 5.051E+00,, -0.538  
 C,CE-144 ,NO , -1.020E+01, 1.182E+01, 1.937E+01,, -0.527  
 C,EU-152 ,NO , -8.735E+00, 5.367E+00, 8.363E+00,, -1.044  
 C,EU-154 ,NO , 1.707E-01, 3.356E+00, 5.216E+00,, 0.033  
 C,RA-226 ,NO , -1.918E+01, 4.211E+01, 6.406E+01,, -0.299  
 C,AC-228 ,NO , 4.394E+00, 6.884E+00, 1.167E+01,, 0.376  
 C,TH-228 ,NO , 1.817E+00, 3.398E+00, 5.231E+00,, 0.347  
 C,TH-232 ,NO , 4.380E+00, 6.862E+00, 1.163E+01,, 0.376  
 C,U-235 ,NO , 6.508E-01, 1.176E+01, 1.959E+01,, 0.033  
 C,U-238 ,NO , 3.391E+01, 2.145E+02, 3.521E+02,, 0.096  
 C,AM-241 ,NO , -1.648E+01, 1.639E+01, 2.650E+01,, -0.622



Summary of Nuclide Activity  
 Sample ID : 23L28837-6

Page : 2  
 Acquisition date : 9-JUN-2006 22:11:59

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 pCi/L	Decay Corr pCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
RA-226	1600.00Y	1.00	1.162E+01	1.162E+01	6.451E+01	555.30	
TH-228	1.91Y	1.01	7.364E-01	7.433E-01	44.19E-01	594.48	
Total Activity :			1.235E+01	1.236E+01			

Grand Total Activity : 1.235E+01 1.236E+01

Flags: "K" = Keyline not found  
 "E" = Manually edited

"M" = Manually accepted  
 "A" = Nuclide specific abn. limit

Unidentified Energy Lines  
 Sample ID : 23L28837-6

Page : 3  
 Acquisition date : 9-JUN-2006 22:11:59

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
5	33.80	45	143	1.13	67.92	65	10	1.88E-03	****	8.26E-02	
0	64.28	250	1494	1.72	128.84	121	16	1.04E-02	73.4	1.08E+00	
0	92.47	90	1104	1.39	185.18	181	10	3.75E-03	****	1.93E+00	
0	139.76	85	837	1.02	279.69	276	8	3.53E-03	****	2.32E+00	
0	197.95	103	807	1.14	395.99	391	10	4.30E-03	****	2.11E+00	
0	351.26	109	463	1.63	702.43	695	16	4.56E-03	96.9	1.44E+00	
0	583.14	9	122	0.99	1165.98	1162	9	3.90E-04	****	9.71E-01	T
0	595.67	102	149	1.51	1191.02	1187	11	4.24E-03	50.5	9.56E-01	
0	608.76	38	165	1.41	1217.20	1213	11	1.57E-03	****	9.41E-01	
0	727.11	27	65	1.01	1453.82	1448	8	1.11E-03	****	8.28E-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 Uncorrected pCi/L	Wtd Mean Decay Corr pCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
RA-226	1600.00Y	1.00	1.162E+01	1.162E+01	6.451E+01	555.30	
TH-228	1.91Y	1.01	7.364E-01	7.433E-01	44.19E-01	594.48	
Total Activity :			1.235E+01	1.236E+01			

Grand Total Activity : 1.235E+01 1.236E+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	1.162E+01	6.451E+01	9.415E+01	0.000E+00	0.123
TH-228	7.433E-01	4.419E+00	6.763E+00	0.000E+00	0.110

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/L)	K.L. Ided	Act error	MDA (pCi/L)	MDA error	Act/MDA
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BE-7	2.098E+00	1.986E+01	3.354E+01	0.000E+00	0.063
NA-24	-2.110E-03	3.509E-02	Half-Life too short		
K-40	-4.696E+01	3.192E+01	5.807E+01	0.000E+00	-0.809
CR-51	-1.568E+01	2.251E+01	3.743E+01	0.000E+00	-0.419
MN-54	-1.421E+00	2.039E+00	3.359E+00	0.000E+00	-0.423
CO-57	-6.001E-01	2.322E+00	3.871E+00	0.000E+00	-0.155
CO-58	4.317E-01	2.159E+00	3.725E+00	0.000E+00	0.116
FE-59	2.398E+00	4.191E+00	7.499E+00	0.000E+00	0.320
CO-60	1.652E+00	2.195E+00	3.956E+00	0.000E+00	0.418
ZN-65	4.828E+00	4.316E+00	7.908E+00	0.000E+00	0.611
SE-75	1.991E+00	3.157E+00	5.435E+00	0.000E+00	0.366
SR-85	1.333E+01	2.657E+00	5.054E+00	0.000E+00	2.637
Y-88	-1.891E+00	2.263E+00	3.717E+00	0.000E+00	-0.509
NB-94	-1.980E+00	2.044E+00	3.353E+00	0.000E+00	-0.591
NB-95	1.600E+00	2.220E+00	3.915E+00	0.000E+00	0.409
ZR-95	5.069E-01	3.820E+00	6.581E+00	0.000E+00	0.077
MO-99	-2.385E+01	1.596E+02	2.716E+02	0.000E+00	-0.088
RU-103	3.496E+00	2.408E+00	4.266E+00	0.000E+00	0.820
RU-106	-7.036E+00	1.960E+01	3.318E+01	0.000E+00	-0.212
AG-110m	5.094E-01	2.039E+00	3.537E+00	0.000E+00	0.144
SN-113	-1.217E+00	2.956E+00	4.925E+00	0.000E+00	-0.247
SB-124	5.667E-01	4.981E+00	3.753E+00	0.000E+00	0.151
SB-125	-1.361E+00	6.275E+00	1.050E+01	0.000E+00	-0.130
TE-129M	1.389E+01	2.899E+01	4.961E+01	0.000E+00	0.280
I-131	6.457E+00	4.876E+00	8.560E+00	0.000E+00	0.754
BA-133	1.114E+00	3.548E+00	5.142E+00	0.000E+00	0.217
CS-134	5.501E+00	4.622E+00	4.027E+00	0.000E+00	1.366
CS-136	-7.633E-01	3.165E+00	5.347E+00	0.000E+00	-0.143
CS-137	2.578E+00	2.216E+00	3.986E+00	0.000E+00	0.647
CE-139	7.466E-01	2.385E+00	3.990E+00	0.000E+00	0.187
BA-140	6.687E+00	1.197E+01	2.057E+01	0.000E+00	0.325
LA-140	2.196E+00	3.811E+00	6.950E+00	0.000E+00	0.316
CE-141	-1.270E+00	5.463E+00	7.686E+00	0.000E+00	-0.165
CE-144	-3.258E+00	2.142E+01	3.026E+01	0.000E+00	-0.108
EU-152	-6.865E+00	7.916E+00	1.091E+01	0.000E+00	-0.629
EU-154	5.058E-01	4.813E+00	8.069E+00	0.000E+00	0.063
AC-228	1.914E+00	8.805E+00	1.325E+01	0.000E+00	0.145
TH-232	1.908E+00	8.777E+00	1.321E+01	0.000E+00	0.145
U-235	-2.590E+00	2.194E+01	2.973E+01	0.000E+00	-0.087
U-238	2.193E+02	2.457E+02	4.159E+02	0.000E+00	0.527
AM-241	1.508E+01	1.469E+01	2.111E+01	0.000E+00	0.714

A,23L28837-6 ,06/10/2006 11:49,05/31/2006 14:45, 3.001E+00,WG L28937-6 QU  
 B,23L28837-6 ,LIBD ,06/01/2006 10:14,233L082404  
 C,RA-226 ,YES, 1.162E+01, 6.451E+01, 9.415E+01,, 0.123  
 C,TH-228 ,YES, 7.433E-01, 4.419E+00, 6.763E+00,, 0.110  
 C,BE-7 ,NO , 2.098E+00, 1.986E+01, 3.354E+01,, 0.063  
 C,K-40 ,NO , -4.696E+01, 3.192E+01, 5.807E+01,, -0.809  
 C,CR-51 ,NO , -1.568E+01, 2.251E+01, 3.743E+01,, -0.419  
 C,MN-54 ,NO , -1.421E+00, 2.039E+00, 3.359E+00,, -0.423  
 C,CO-57 ,NO , -6.001E-01, 2.322E+00, 3.871E+00,, -0.155  
 C,CO-58 ,NO , 4.317E-01, 2.159E+00, 3.725E+00,, 0.116  
 C,FE-59 ,NO , 2.398E+00, 4.191E+00, 7.499E+00,, 0.320  
 C,CO-60 ,NO , 1.652E+00, 2.195E+00, 3.956E+00,, 0.418  
 C,ZN-65 ,NO , 4.828E+00, 4.316E+00, 7.908E+00,, 0.611  
 C,SE-75 ,NO , 1.991E+00, 3.157E+00, 5.435E+00,, 0.366  
 C,SR-85 ,NO , 1.333E+01, 2.657E+00, 5.054E+00,, 2.637  
 C,Y-88 ,NO , -1.891E+00, 2.263E+00, 3.717E+00,, -0.509  
 C,NB-94 ,NO , -1.980E+00, 2.044E+00, 3.353E+00,, -0.591  
 C,NB-95 ,NO , 1.600E+00, 2.220E+00, 3.915E+00,, 0.409  
 C,ZR-95 ,NO , 5.069E-01, 3.820E+00, 6.581E+00,, 0.077  
 C,MO-99 ,NO , -2.385E+01, 1.596E+02, 2.716E+02,, -0.088  
 C,RU-103 ,NO , 3.496E+00, 2.408E+00, 4.266E+00,, 0.820  
 C,RU-106 ,NO , -7.036E+00, 1.960E+01, 3.318E+01,, -0.212  
 C,AG-110m ,NO , 5.094E-01, 2.039E+00, 3.537E+00,, 0.144  
 C,SN-113 ,NO , -1.217E+00, 2.956E+00, 4.925E+00,, -0.247  
 C,SB-124 ,NO , 5.667E-01, 4.981E+00, 3.753E+00,, 0.151  
 C,SB-125 ,NO , -1.361E+00, 6.275E+00, 1.050E+01,, -0.130  
 C,TE-129M ,NO , 1.389E+01, 2.899E+01, 4.961E+01,, 0.280  
 C,I-131 ,NO , 6.457E+00, 4.876E+00, 8.560E+00,, 0.754  
 C,BA-133 ,NO , 1.114E+00, 3.548E+00, 5.142E+00,, 0.217  
 C,CS-134 ,NO , 5.501E+00, 4.622E+00, 4.027E+00,, 1.366  
 C,CS-136 ,NO , -7.633E-01, 3.165E+00, 5.347E+00,, -0.143  
 C,CS-137 ,NO , 2.578E+00, 2.216E+00, 3.986E+00,, 0.647  
 C,CE-139 ,NO , 7.466E-01, 2.385E+00, 3.990E+00,, 0.187  
 C,BA-140 ,NO , 6.687E+00, 1.197E+01, 2.057E+01,, 0.325  
 C,LA-140 ,NO , 2.196E+00, 3.811E+00, 6.950E+00,, 0.316  
 C,CE-141 ,NO , -1.270E+00, 5.463E+00, 7.686E+00,, -0.165  
 C,CE-144 ,NO , -3.258E+00, 2.142E+01, 3.026E+01,, -0.108  
 C,EU-152 ,NO , -6.865E+00, 7.916E+00, 1.091E+01,, -0.629  
 C,EU-154 ,NO , 5.058E-01, 4.813E+00, 8.069E+00,, 0.063  
 C,AC-228 ,NO , 1.914E+00, 8.805E+00, 1.325E+01,, 0.145  
 C,TH-232 ,NO , 1.908E+00, 8.777E+00, 1.321E+01,, 0.145  
 C,U-235 ,NO , -2.590E+00, 2.194E+01, 2.973E+01,, -0.087  
 C,U-238 ,NO , 2.193E+02, 2.457E+02, 4.159E+02,, 0.527  
 C,AM-241 ,NO , 1.508E+01, 1.469E+01, 2.111E+01,, 0.714

Sec. Review: Analyst: LIMS: ✓

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VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 10-JUN-2006 15:21:15.54  
 TBE04 P-40312B HpGe \*\*\*\*\* Aquisition Date/Time: 10-JUN-2006 12:13:10.51

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LIMS No., Customer Name, Client ID: WG L28837-7 EXELON QUAD

Sample ID : 04L28837-7 Smple Date: 1-JUN-2006 14:10:00.0  
 Sample Type : WG Geometry : 043L082004  
 Quantity : 3.02260E+00 L BKGFILE : 04BG060306MT  
 Start Channel : 90 Energy Tol : 1.00000 Real Time : 0 03:07:55.21  
 End Channel : 4090 Pk Srch Sens: 5.00000 Live time : 0 03:07:53.21  
 MDA Constant : 0.00 Library Used: LIBD

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	%Eff	Cts/Sec	%Err	Fit
1	1	66.24*	100	260	1.30	132.94	6.61E-01	8.85E-03	29.7	6.75E-01
2	1	77.31	98	208	1.24	155.08	1.07E+00	8.72E-03	25.6	2.22E-01
3	1	85.62*	24	385	2.20	171.68	1.34E+00	2.12E-03	169.3	6.31E-01
4	1	140.08	147	320	1.73	280.60	2.04E+00	1.30E-02	26.5	2.90E+00
5	1	198.82*	20	209	1.68	398.06	1.86E+00	1.74E-03	144.0	1.88E+00
6	1	238.51*	94	255	1.16	477.42	1.68E+00	8.36E-03	35.6	5.80E+00
7	1	295.52	71	132	1.84	591.43	1.45E+00	6.29E-03	32.6	3.77E-01
8	1	351.89*	107	128	1.58	704.14	1.28E+00	9.51E-03	24.4	9.41E-01
9	1	583.48*	31	55	1.84	1167.19	8.77E-01	2.71E-03	53.5	3.02E+00
10	1	596.88	79	45	2.60	1194.00	8.62E-01	6.97E-03	20.2	1.72E+00
11	1	609.51*	115	51	1.31	1219.24	8.48E-01	1.02E-02	17.1	1.02E+00
12	1	1155.59	18	14	1.81	2310.91	5.15E-01	1.62E-03	45.5	1.45E+00
13	1	1461.45*	14	24	4.20	2922.27	4.29E-01	1.28E-03	105.9	1.59E+00
14	1	1764.90*	33	8	3.14	3528.72	3.77E-01	2.92E-03	29.9	1.37E+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	14	10.67*	4.294E-01	2.507E+01	2.507E+01	211.89
TH-228	238.63	94	44.60*	1.680E+00	9.979E+00	1.007E+01	71.23
	240.98	-----	3.95	1.669E+00	-----	Line Not Found	-----

Flag: "\*" = Keyline

Summary of Nuclide Activity  
 Sample ID : 04L28837-7

Page : 2  
 Acquisition date : 10-JUN-2006 12:13:10

Total number of lines in spectrum	14	
Number of unidentified lines	11	
Number of lines tentatively identified by NID	3	21.43%

Nuclide Type : natural

Nuclide	Hlife	Decay	Uncorrected pCi/L	Decay Corr pCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	2.507E+01	2.507E+01	5.311E+01	211.89	
TH-228	1.91Y	1.01	9.979E+00	1.007E+01	0.717E+01	71.23	
Total Activity :			3.505E+01	3.514E+01			

Grand Total Activity : 3.505E+01 3.514E+01

Flags: "K" = Keyline not found  
 "E" = Manually edited

"M" = Manually accepted  
 "A" = Nuclide specific abn. limit



Unidentified Energy Lines  
Sample ID : 04L28837-7

Page : 3  
Acquisition date : 10-JUN-2006 12:13:10

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
1	66.24	100	260	1.30	132.94	130	7	8.85E-03	59.5	6.61E-01	
1	77.31	98	208	1.24	155.08	153	6	8.72E-03	51.2	1.07E+00	
1	85.62	24	385	2.20	171.68	167	11	2.12E-03	****	1.34E+00	
1	140.08	147	320	1.73	280.60	275	12	1.30E-02	53.1	2.04E+00	
1	198.82	20	209	1.68	398.06	395	8	1.74E-03	****	1.86E+00	
1	295.52	71	132	1.84	591.43	587	10	6.29E-03	65.2	1.45E+00	
1	351.89	107	128	1.58	704.14	699	11	9.51E-03	48.8	1.28E+00	
1	583.48	31	55	1.84	1167.19	1163	9	2.71E-03	****	8.77E-01	T
1	596.88	79	45	2.60	1194.00	1189	11	6.97E-03	40.4	8.62E-01	
1	609.51	115	51	1.31	1219.24	1215	10	1.02E-02	34.1	8.48E-01	
1	1155.59	18	14	1.81	2310.91	2304	11	1.62E-03	91.0	5.15E-01	
1	1764.90	33	8	3.14	3528.72	3523	13	2.92E-03	59.8	3.77E-01	

Flags: "T" = Tentatively associated

#### Summary of Nuclide Activity

Total number of lines in spectrum	14	
Number of unidentified lines	11	
Number of lines tentatively identified by NID	3	21.43%

Nuclide Type : natural

Nuclide	Hlife	Decay	Wtd Mean	Wtd Mean	Decay Corr	2-Sigma	2-Sigma	%Error	Flags
			Uncorrected	Decay Corr					
K-40	1.28E+09Y	1.00	2.507E+01	2.507E+01	5.311E+01	211.89			
TH-228	1.91Y	1.01	9.979E+00	1.007E+01	0.717E+01	71.23			
Total Activity :			3.505E+01	3.514E+01					

Grand Total Activity : 3.505E+01 3.514E+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	2.507E+01	5.311E+01	5.702E+01	0.000E+00	0.440
TH-228	1.007E+01	7.172E+00	9.415E+00	0.000E+00	1.069

---- Non-Identified Nuclides ----

Key-Line

Nuclide	Activity (pCi/L)	K.L. Ided	Act error	MDA (pCi/L)	MDA error	Act/MDA
BE-7	1.290E+00		2.986E+01	4.947E+01	0.000E+00	0.026
NA-24	-2.256E-02		3.427E-02	Half-Life too short		
CR-51	2.945E+00		3.344E+01	5.525E+01	0.000E+00	0.053
MN-54	1.913E+00		3.292E+00	5.605E+00	0.000E+00	0.341
CO-57	-1.764E+00		2.901E+00	4.766E+00	0.000E+00	-0.370
CO-58	8.961E-01		3.631E+00	6.042E+00	0.000E+00	0.148
FE-59	3.213E+00		6.878E+00	1.171E+01	0.000E+00	0.274
CO-60	2.906E+00		3.641E+00	6.372E+00	0.000E+00	0.456
ZN-65	7.000E+00		7.412E+00	1.303E+01	0.000E+00	0.537
SE-75	2.578E+00		4.418E+00	7.516E+00	0.000E+00	0.343
SR-85	2.376E+01		4.258E+00	8.511E+00	0.000E+00	2.792
Y-88	-1.593E+00		4.267E+00	6.684E+00	0.000E+00	-0.238
NB-94	7.578E-01		3.165E+00	5.310E+00	0.000E+00	0.143
NB-95	2.858E+00		3.378E+00	5.881E+00	0.000E+00	0.486
ZR-95	-3.112E+00		6.070E+00	9.598E+00	0.000E+00	-0.324
MO-99	1.005E+01		2.137E+02	3.531E+02	0.000E+00	0.028
RU-103	-8.068E-02		3.582E+00	5.898E+00	0.000E+00	-0.014
RU-106	7.535E+00		3.294E+01	5.424E+01	0.000E+00	0.139
AG-110m	-8.669E-01		3.201E+00	5.220E+00	0.000E+00	-0.166
SN-113	2.407E+00		4.469E+00	7.461E+00	0.000E+00	0.323
SB-124	-1.540E+00		7.715E+00	5.276E+00	0.000E+00	-0.292
SB-125	-4.749E+00		8.940E+00	1.446E+01	0.000E+00	-0.328
TE-129M	-1.076E+01		4.292E+01	7.017E+01	0.000E+00	-0.153
I-131	-1.287E+00		6.987E+00	1.130E+01	0.000E+00	-0.114
BA-133	5.931E+00		5.580E+00	8.270E+00	0.000E+00	0.717
CS-134	7.471E+00		6.515E+00	6.008E+00	0.000E+00	1.243
CS-136	-4.196E+00		5.230E+00	8.022E+00	0.000E+00	-0.523
CS-137	3.608E+00		3.380E+00	5.995E+00	0.000E+00	0.602
CE-139	-2.099E+00		3.084E+00	4.974E+00	0.000E+00	-0.422
BA-140	-1.092E+01		1.880E+01	2.975E+01	0.000E+00	-0.367
LA-140	1.005E+00		5.852E+00	9.867E+00	0.000E+00	0.102
CE-141	-2.806E+00		6.775E+00	9.430E+00	0.000E+00	-0.298
CE-144	-6.027E+00		2.658E+01	3.754E+01	0.000E+00	-0.161
EU-152	-6.217E+00		1.204E+01	1.612E+01	0.000E+00	-0.386
EU-154	-3.066E+00		5.978E+00	9.845E+00	0.000E+00	-0.311
RA-226	1.726E+01		7.851E+01	1.278E+02	0.000E+00	0.135
AC-228	-8.576E+00		1.297E+01	2.046E+01	0.000E+00	-0.419
TH-232	-8.551E+00		1.293E+01	2.040E+01	0.000E+00	-0.419
U-235	-3.468E+00		2.565E+01	3.623E+01	0.000E+00	-0.096
U-238	2.262E+01		3.482E+02	5.769E+02	0.000E+00	0.039
AM-241	-2.271E+01		3.145E+01	4.838E+01	0.000E+00	-0.469

A, 04L28837-7		, 06/10/2006 15:21,	06/01/2006 14:10,	3.023E+00,	WG L28837-7 EX
B, 04L28837-7		, LIBD	, 06/02/2006 09:04,	043L082004	
C, K-40	, YES,	2.507E+01,	5.311E+01,	5.702E+01,,	0.440
C, TH-228	, YES,	1.007E+01,	7.172E+00,	9.415E+00,,	1.069
C, BE-7	, NO ,	1.290E+00,	2.986E+01,	4.947E+01,,	0.026
C, CR-51	, NO ,	2.945E+00,	3.344E+01,	5.525E+01,,	0.053
C, MN-54	, NO ,	1.913E+00,	3.292E+00,	5.605E+00,,	0.341
C, CO-57	, NO ,	-1.764E+00,	2.901E+00,	4.766E+00,,	-0.370
C, CO-58	, NO ,	8.961E-01,	3.631E+00,	6.042E+00,,	0.148
C, FE-59	, NO ,	3.213E+00,	6.878E+00,	1.171E+01,,	0.274
C, CO-60	, NO ,	2.906E+00,	3.641E+00,	6.372E+00,,	0.456
C, ZN-65	, NO ,	7.000E+00,	7.412E+00,	1.303E+01,,	0.537
C, SE-75	, NO ,	2.578E+00,	4.418E+00,	7.516E+00,,	0.343
C, SR-85	, NO ,	2.376E+01,	4.258E+00,	8.511E+00,,	2.792
C, Y-88	, NO ,	-1.593E+00,	4.267E+00,	6.684E+00,,	-0.238
C, NB-94	, NO ,	7.578E-01,	3.165E+00,	5.310E+00,,	0.143
C, NB-95	, NO ,	2.858E+00,	3.378E+00,	5.881E+00,,	0.486
C, ZR-95	, NO ,	-3.112E+00,	6.070E+00,	9.598E+00,,	-0.324
C, MO-99	, NO ,	1.005E+01,	2.137E+02,	3.531E+02,,	0.028
C, RU-103	, NO ,	-8.068E-02,	3.582E+00,	5.898E+00,,	-0.014
C, RU-106	, NO ,	7.535E+00,	3.294E+01,	5.424E+01,,	0.139
C, AG-110m	, NO ,	-8.669E-01,	3.201E+00,	5.220E+00,,	-0.166
C, SN-113	, NO ,	2.407E+00,	4.469E+00,	7.461E+00,,	0.323
C, SB-124	, NO ,	-1.540E+00,	7.715E+00,	5.276E+00,,	-0.292
C, SB-125	, NO ,	-4.749E+00,	8.940E+00,	1.446E+01,,	-0.328
C, TE-129M	, NO ,	-1.076E+01,	4.292E+01,	7.017E+01,,	-0.153
C, I-131	, NO ,	-1.287E+00,	6.987E+00,	1.130E+01,,	-0.114
C, BA-133	, NO ,	5.931E+00,	5.580E+00,	8.270E+00,,	0.717
C, CS-134	, NO ,	7.471E+00,	6.515E+00,	6.008E+00,,	1.243
C, CS-136	, NO ,	-4.196E+00,	5.230E+00,	8.022E+00,,	-0.523
C, CS-137	, NO ,	3.608E+00,	3.380E+00,	5.995E+00,,	0.602
C, CE-139	, NO ,	-2.099E+00,	3.084E+00,	4.974E+00,,	-0.422
C, BA-140	, NO ,	-1.092E+01,	1.880E+01,	2.975E+01,,	-0.367
C, LA-140	, NO ,	1.005E+00,	5.852E+00,	9.867E+00,,	0.102
C, CE-141	, NO ,	-2.806E+00,	6.775E+00,	9.430E+00,,	-0.298
C, CE-144	, NO ,	-6.027E+00,	2.658E+01,	3.754E+01,,	-0.161
C, EU-152	, NO ,	-6.217E+00,	1.204E+01,	1.612E+01,,	-0.386
C, EU-154	, NO ,	-3.066E+00,	5.978E+00,	9.845E+00,,	-0.311
C, RA-226	, NO ,	1.726E+01,	7.851E+01,	1.278E+02,,	0.135
C, AC-228	, NO ,	-8.576E+00,	1.297E+01,	2.046E+01,,	-0.419
C, TH-232	, NO ,	-8.551E+00,	1.293E+01,	2.040E+01,,	-0.419
C, U-235	, NO ,	-3.468E+00,	2.565E+01,	3.623E+01,,	-0.096
C, U-238	, NO ,	2.262E+01,	3.482E+02,	5.769E+02,,	0.039
C, AM-241	, NO ,	-2.271E+01,	3.145E+01,	4.838E+01,,	-0.469



Summary of Nuclide Activity  
Sample ID : 07L28837-8

Acquisition date : 10-JUN-2006 12:13:12

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  
"E" = Manually edited

"M" = Manually accepted  
"A" = Nuclide specific abn. limit

Unidentified Energy Lines  
Sample ID : 07L28837-8

Page : 3  
Acquisition date : 10-JUN-2006 12:13:12

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
1	66.19	105	283	1.29	132.94	130	7	9.25E-03	59.1	8.00E-01	
1	139.75	82	265	1.43	280.18	276	8	7.21E-03	77.4	2.36E+00	
1	198.38	66	233	1.06	397.53	393	8	5.83E-03	90.8	2.25E+00	
2	242.09	56	194	1.31	485.00	474	16	4.89E-03	92.3	2.04E+00	
1	352.04	82	143	1.25	705.03	700	10	7.21E-03	65.9	1.61E+00	
1	596.08	53	71	1.81	1193.33	1163	41	4.66E-03	71.9	1.10E+00	
1	609.28	87	150	1.56	1219.74	1213	14	7.64E-03	67.4	1.09E+00	
1	1120.40	34	25	2.44	2242.03	2236	12	2.99E-03	77.8	7.03E-01	
1	1764.49	40	11	3.39	3529.57	3525	12	3.49E-03	51.9	5.12E-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	-4.576E+00		2.620E+01	4.226E+01	0.000E+00	-0.108
NA-24	-7.167E-02		3.396E-02	Half-Life too short		
K-40	2.532E+01		3.983E+01	7.336E+01	0.000E+00	0.345
CR-51	-3.264E+01		2.791E+01	4.426E+01	0.000E+00	-0.738
MN-54	2.001E-01		2.770E+00	4.599E+00	0.000E+00	0.044
CO-57	-1.168E+00		2.715E+00	4.377E+00	0.000E+00	-0.267
CO-58	-2.089E+00		3.001E+00	4.744E+00	0.000E+00	-0.440
FE-59	1.103E+00		5.888E+00	9.887E+00	0.000E+00	0.112
CO-60	1.819E+00		3.086E+00	5.285E+00	0.000E+00	0.344
ZN-65	7.125E+00		7.665E+00	1.165E+01	0.000E+00	0.611
SE-75	-5.086E-02		3.939E+00	6.428E+00	0.000E+00	-0.008
SR-85	2.296E+01		3.736E+00	7.476E+00	0.000E+00	3.071
Y-88	-2.816E+00		3.068E+00	4.555E+00	0.000E+00	-0.618
NB-94	1.415E+00		2.894E+00	4.854E+00	0.000E+00	0.291
NB-95	4.409E+00		2.922E+00	5.289E+00	0.000E+00	0.834
ZR-95	-3.617E+00		5.540E+00	8.612E+00	0.000E+00	-0.420
MO-99	1.751E+00		2.128E+02	3.463E+02	0.000E+00	0.005
RU-103	3.380E+00		3.220E+00	5.517E+00	0.000E+00	0.613
RU-106	1.150E+01		2.728E+01	4.480E+01	0.000E+00	0.257

AG-110m	-2.182E+00	2.703E+00	4.202E+00	0.000E+00	-0.519
SN-113	-1.881E+00	3.705E+00	5.957E+00	0.000E+00	-0.316
SB-124	-2.592E-01	6.981E+00	4.874E+00	0.000E+00	-0.053
SB-125	1.269E+00	8.379E+00	1.383E+01	0.000E+00	0.092
TE-129M	1.204E+01	3.695E+01	6.130E+01	0.000E+00	0.196
I-131	7.064E-01	6.138E+00	1.020E+01	0.000E+00	0.069
BA-133	7.482E+00	4.671E+00	7.168E+00	0.000E+00	1.044
CS-134	7.917E+00	6.569E+00	5.742E+00	0.000E+00	1.379
CS-136	2.440E+00	4.316E+00	7.399E+00	0.000E+00	0.330
CS-137	1.735E+00	2.893E+00	4.917E+00	0.000E+00	0.353
CE-139	-1.174E+00	2.716E+00	4.473E+00	0.000E+00	-0.263
BA-140	1.344E+01	1.533E+01	2.663E+01	0.000E+00	0.505
LA-140	-1.440E+00	4.968E+00	7.926E+00	0.000E+00	-0.182
CE-141	3.215E+00	6.417E+00	9.059E+00	0.000E+00	0.355
CE-144	5.806E+00	2.426E+01	3.398E+01	0.000E+00	0.171
EU-152	-9.501E+00	1.090E+01	1.452E+01	0.000E+00	-0.654
EU-154	9.406E-01	5.519E+00	9.066E+00	0.000E+00	0.104
RA-226	-3.496E+01	6.839E+01	1.122E+02	0.000E+00	-0.312
AC-228	7.942E-01	1.079E+01	1.768E+01	0.000E+00	0.045
TH-228	-2.070E+00	6.685E+00	9.459E+00	0.000E+00	-0.219
TH-232	7.919E-01	1.076E+01	1.762E+01	0.000E+00	0.045
U-235	1.152E+01	2.529E+01	3.563E+01	0.000E+00	0.323
U-238	1.972E+02	3.124E+02	5.331E+02	0.000E+00	0.370
AM-241	-3.310E+01	2.902E+01	4.116E+01	0.000E+00	-0.804

A,07L28837-8 ,06/10/2006 15:22,06/01/2006 12:58, 3.021E+00,WG L28837-8 EX  
 B,07L28837-8 ,LIBD ,06/07/2006 09:32,073L082504

C, BE-7	,NO ,	-4.576E+00,	2.620E+01,	4.226E+01,,	-0.108
C, K-40	,NO ,	2.532E+01,	3.983E+01,	7.336E+01,,	0.345
C, CR-51	,NO ,	-3.264E+01,	2.791E+01,	4.426E+01,,	-0.738
C, MN-54	,NO ,	2.001E-01,	2.770E+00,	4.599E+00,,	0.044
C, CO-57	,NO ,	-1.168E+00,	2.715E+00,	4.377E+00,,	-0.267
C, CO-58	,NO ,	-2.089E+00,	3.001E+00,	4.744E+00,,	-0.440
C, FE-59	,NO ,	1.103E+00,	5.888E+00,	9.887E+00,,	0.112
C, CO-60	,NO ,	1.819E+00,	3.086E+00,	5.285E+00,,	0.344
C, ZN-65	,NO ,	7.125E+00,	7.665E+00,	1.165E+01,,	0.611
C, SE-75	,NO ,	-5.086E-02,	3.939E+00,	6.428E+00,,	-0.008
C, SR-85	,NO ,	2.296E+01,	3.736E+00,	7.476E+00,,	3.071
C, Y-88	,NO ,	-2.816E+00,	3.068E+00,	4.555E+00,,	-0.618
C, NB-94	,NO ,	1.415E+00,	2.894E+00,	4.854E+00,,	0.291
C, NB-95	,NO ,	4.409E+00,	2.922E+00,	5.289E+00,,	0.834
C, ZR-95	,NO ,	-3.617E+00,	5.540E+00,	8.612E+00,,	-0.420
C, MO-99	,NO ,	1.751E+00,	2.128E+02,	3.463E+02,,	0.005
C, RU-103	,NO ,	3.380E+00,	3.220E+00,	5.517E+00,,	0.613
C, RU-106	,NO ,	1.150E+01,	2.728E+01,	4.480E+01,,	0.257
C, AG-110m	,NO ,	-2.182E+00,	2.703E+00,	4.202E+00,,	-0.519
C, SN-113	,NO ,	-1.881E+00,	3.705E+00,	5.957E+00,,	-0.316
C, SB-124	,NO ,	-2.592E-01,	6.981E+00,	4.874E+00,,	-0.053
C, SB-125	,NO ,	1.269E+00,	8.379E+00,	1.383E+01,,	0.092
C, TE-129M	,NO ,	1.204E+01,	3.695E+01,	6.130E+01,,	0.196
C, I-131	,NO ,	7.064E-01,	6.138E+00,	1.020E+01,,	0.069
C, BA-133	,NO ,	7.482E+00,	4.671E+00,	7.168E+00,,	1.044
C, CS-134	,NO ,	7.917E+00,	6.569E+00,	5.742E+00,,	1.379
C, CS-136	,NO ,	2.440E+00,	4.316E+00,	7.399E+00,,	0.330
C, CS-137	,NO ,	1.735E+00,	2.893E+00,	4.917E+00,,	0.353
C, CE-139	,NO ,	-1.174E+00,	2.716E+00,	4.473E+00,,	-0.263
C, BA-140	,NO ,	1.344E+01,	1.533E+01,	2.663E+01,,	0.505
C, LA-140	,NO ,	-1.440E+00,	4.968E+00,	7.926E+00,,	-0.182
C, CE-141	,NO ,	3.215E+00,	6.417E+00,	9.059E+00,,	0.355
C, CE-144	,NO ,	5.806E+00,	2.426E+01,	3.398E+01,,	0.171
C, EU-152	,NO ,	-9.501E+00,	1.090E+01,	1.452E+01,,	-0.654
C, EU-154	,NO ,	9.406E-01,	5.519E+00,	9.066E+00,,	0.104
C, RA-226	,NO ,	-3.496E+01,	6.839E+01,	1.122E+02,,	-0.312
C, AC-228	,NO ,	7.942E-01,	1.079E+01,	1.768E+01,,	0.045
C, TH-228	,NO ,	-2.070E+00,	6.685E+00,	9.459E+00,,	-0.219
C, TH-232	,NO ,	7.919E-01,	1.076E+01,	1.762E+01,,	0.045
C, U-235	,NO ,	1.152E+01,	2.529E+01,	3.563E+01,,	0.323
C, U-238	,NO ,	1.972E+02,	3.124E+02,	5.331E+02,,	0.370
C, AM-241	,NO ,	-3.310E+01,	2.902E+01,	4.116E+01,,	-0.804



Sec. Review: Analyst: LIMS:           

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VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 10-JUN-2006 18:07:34.41  
 TBE10 12892256 HpGe \*\*\*\*\* Aquisition Date/Time: 10-JUN-2006 12:39:34.67

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LIMS No., Customer Name, Client ID: WG L28837-9 EXELON QUAD

Sample ID	: 10L28837-9	Smple Date:	1-JUN-2006 11:18:00.0
Sample Type	: WG	Geometry	: 103L083004
Quantity	: 3.00050E+00 L	BKGFILE	: 10BG060306MT
Start Channel	: 80	Energy Tol	: 1.00000
End Channel	: 4090	Pk Srch Sens:	5.00000
MDA Constant	: 0.00	Library Used:	LIBD
		Real Time	: 0 05:16:43.21
		Live time	: 0 05:16:40.00

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	%Eff	Cts/Sec	%Err	Fit
1	1	66.24*	146	614	1.54	131.59	7.24E-01	7.67E-03	33.3	2.06E+00
2	1	139.91	148	593	1.78	278.99	1.91E+00	7.78E-03	30.8	1.39E+00
3	1	185.97*	26	391	1.26	371.17	1.77E+00	1.34E-03	155.8	4.54E-01
4	1	198.40*	102	499	1.75	396.02	1.71E+00	5.37E-03	45.9	1.27E+00
5	1	352.11*	71	249	1.18	703.61	1.17E+00	3.74E-03	48.2	1.30E+00
6	1	583.67*	9	129	1.63	1167.00	7.98E-01	4.73E-04	302.9	1.43E+00
7	1	596.29	79	170	1.71	1192.25	7.85E-01	4.14E-03	36.8	1.26E+00
8	1	609.59*	152	133	1.42	1218.88	7.72E-01	8.02E-03	19.4	1.11E+00
9	1	847.35*	25	81	2.95	1694.73	5.98E-01	1.32E-03	89.5	1.73E+00
10	1	1120.80*	16	62	1.69	2242.10	4.79E-01	8.31E-04	115.2	1.01E+00
11	1	1461.53*	34	26	2.54	2924.21	3.88E-01	1.79E-03	58.7	2.04E+00
12	1	1764.99*	10	35	2.07	3531.83	3.39E-01	5.29E-04	140.5	1.71E+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	34	10.67*	3.885E-01	3.895E+01	3.895E+01	117.33
RA-226	186.21	26	3.28*	1.770E+00	2.084E+01	2.084E+01	311.53
U-235	143.76	-----	10.50*	1.905E+00	-----	Line Not Found	-----
	163.35	-----	4.70	1.860E+00	-----	Line Not Found	-----
	185.71	26	54.00	1.770E+00	1.266E+00	1.266E+00	311.53
	205.31	-----	4.70	1.684E+00	-----	Line Not Found	-----

Flag: "\*" = Keyline

Summary of Nuclide Activity  
 Sample ID : 10L28837-9

Page : 2  
 Acquisition date : 10-JUN-2006 12:39:34

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 pCi/L	Decay Corr pCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	3.895E+01	3.895E+01	4.570E+01	117.33	
RA-226	1600.00Y	1.00	2.084E+01	2.084E+01	6.492E+01	311.53	
U-235	7.04E+08Y	1.00	1.266E+00	1.266E+00	3.943E+00	311.53	K
Total Activity :			6.106E+01	6.106E+01			

Grand Total Activity : 6.106E+01 6.106E+01

Flags: "K" = Keyline not found  
 "E" = Manually edited

"M" = Manually accepted  
 "A" = Nuclide specific abn. limit

Unidentified Energy Lines  
 Sample ID : 10L28837-9

Acquisition date : 10-JUN-2006 12:39:34

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
1	66.24	146	614	1.54	131.59	128	9	7.67E-03	66.6	7.24E-01	
1	139.91	148	593	1.78	278.99	275	9	7.78E-03	61.6	1.91E+00	
1	198.40	102	499	1.75	396.02	391	10	5.37E-03	91.9	1.71E+00	
1	352.11	71	249	1.18	703.61	699	10	3.74E-03	96.4	1.17E+00	
1	583.67	9	129	1.63	1167.00	1157	14	4.73E-04	****	7.98E-01	T
1	596.29	79	170	1.71	1192.25	1186	14	4.14E-03	73.6	7.85E-01	
1	609.59	152	133	1.42	1218.88	1212	13	8.02E-03	38.7	7.72E-01	
1	847.35	25	81	2.95	1694.73	1688	14	1.32E-03	****	5.98E-01	
1	1120.80	16	62	1.69	2242.10	2235	12	8.31E-04	****	4.79E-01	
1	1764.99	10	35	2.07	3531.83	3523	13	5.29E-04	****	3.39E-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 Uncorrected pCi/L	Wtd Mean Decay Corr pCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	3.895E+01	3.895E+01	4.570E+01	117.33	
RA-226	1600.00Y	1.00	2.084E+01	2.084E+01	6.492E+01	311.53	
Total Activity :			5.979E+01	5.979E+01			

Grand Total Activity : 5.979E+01 5.979E+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	3.895E+01	4.570E+01	4.119E+01	0.000E+00	0.946
RA-226	2.084E+01	6.492E+01	1.175E+02	0.000E+00	0.177

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/L)	K.L. Ided	Act error	MDA (pCi/L)	MDA error	Act/MDA
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BE-7	-1.248E+01	2.584E+01	4.201E+01	0.000E+00	-0.297
NA-24	-8.298E-02	3.846E-02	Half-Life	too short	
CR-51	5.630E+00	2.978E+01	4.930E+01	0.000E+00	0.114
MN-54	1.396E-01	2.929E+00	4.529E+00	0.000E+00	0.031
CO-57	1.324E-01	2.891E+00	4.785E+00	0.000E+00	0.028
CO-58	-5.997E-01	3.024E+00	4.944E+00	0.000E+00	-0.121
FE-59	3.787E+00	6.336E+00	1.089E+01	0.000E+00	0.348
CO-60	1.704E+00	2.931E+00	5.021E+00	0.000E+00	0.339
ZN-65	8.718E+00	7.485E+00	1.153E+01	0.000E+00	0.756
SE-75	7.455E-01	4.012E+00	6.687E+00	0.000E+00	0.111
SR-85	2.103E+01	3.529E+00	6.893E+00	0.000E+00	3.050
Y-88	-1.081E+00	3.151E+00	4.983E+00	0.000E+00	-0.217
NB-94	1.827E+00	2.738E+00	4.606E+00	0.000E+00	0.397
NB-95	2.881E+00	3.002E+00	5.222E+00	0.000E+00	0.552
ZR-95	-2.008E+00	5.431E+00	8.839E+00	0.000E+00	-0.227
MO-99	-1.007E+02	2.012E+02	3.252E+02	0.000E+00	-0.310
RU-103	2.599E+00	3.315E+00	5.662E+00	0.000E+00	0.459
RU-106	-1.554E+01	2.716E+01	4.192E+01	0.000E+00	-0.371
AG-110m	-9.713E-01	2.791E+00	4.473E+00	0.000E+00	-0.217
SN-113	1.887E+00	3.914E+00	6.498E+00	0.000E+00	0.290
SB-124	-3.622E+00	7.538E+00	4.770E+00	0.000E+00	-0.759
SB-125	-9.930E-01	8.440E+00	1.364E+01	0.000E+00	-0.073
TE-129M	-1.242E+01	3.810E+01	6.251E+01	0.000E+00	-0.199
I-131	-5.538E+00	6.470E+00	1.026E+01	0.000E+00	-0.540
BA-133	1.291E+01	4.855E+00	7.576E+00	0.000E+00	1.704
CS-134	5.123E+00	7.034E+00	5.517E+00	0.000E+00	0.928
CS-136	1.816E+00	4.344E+00	7.344E+00	0.000E+00	0.247
CS-137	-1.421E+00	3.081E+00	4.907E+00	0.000E+00	-0.290
CE-139	-2.383E+00	3.043E+00	4.897E+00	0.000E+00	-0.487
BA-140	-2.750E+00	1.601E+01	2.620E+01	0.000E+00	-0.105
LA-140	-3.076E+00	4.989E+00	7.787E+00	0.000E+00	-0.395
CE-141	1.250E+00	6.695E+00	9.405E+00	0.000E+00	0.133
CE-144	-1.890E+01	2.607E+01	3.567E+01	0.000E+00	-0.530
EU-152	-3.405E+00	1.101E+01	1.502E+01	0.000E+00	-0.227
EU-154	3.002E+00	5.926E+00	9.901E+00	0.000E+00	0.303
AC-228	3.779E-01	1.163E+01	1.836E+01	0.000E+00	0.021
TH-228	3.382E+00	5.679E+00	9.249E+00	0.000E+00	0.366
TH-232	3.767E-01	1.160E+01	1.831E+01	0.000E+00	0.021
U-235	2.737E+01	2.590E+01	3.739E+01	0.000E+00	0.732
U-238	-3.158E+01	3.129E+02	5.075E+02	0.000E+00	-0.062
AM-241	-5.927E+00	2.777E+01	3.970E+01	0.000E+00	-0.149

A,10L28837-9 ,06/10/2006 18:07,06/01/2006 11:18, 3.000E+00,WG L28837-9 EX  
 B,10L28837-9 ,LIBD ,06/07/2006 09:32,103L083004

C,K-40	,YES,	3.895E+01,	4.570E+01,	4.119E+01,,	0.946
C,RA-226	,YES,	2.084E+01,	6.492E+01,	1.175E+02,,	0.177
C,BE-7	,NO ,	-1.248E+01,	2.584E+01,	4.201E+01,,	-0.297
C,CR-51	,NO ,	5.630E+00,	2.978E+01,	4.930E+01,,	0.114
C,MN-54	,NO ,	1.396E-01,	2.929E+00,	4.529E+00,,	0.031
C,CO-57	,NO ,	1.324E-01,	2.891E+00,	4.785E+00,,	0.028
C,CO-58	,NO ,	-5.997E-01,	3.024E+00,	4.944E+00,,	-0.121
C,FE-59	,NO ,	3.787E+00,	6.336E+00,	1.089E+01,,	0.348
C,CO-60	,NO ,	1.704E+00,	2.931E+00,	5.021E+00,,	0.339
C,ZN-65	,NO ,	8.718E+00,	7.485E+00,	1.153E+01,,	0.756
C,SE-75	,NO ,	7.455E-01,	4.012E+00,	6.687E+00,,	0.111
C,SR-85	,NO ,	2.103E+01,	3.529E+00,	6.893E+00,,	3.050
C,Y-88	,NO ,	-1.081E+00,	3.151E+00,	4.983E+00,,	-0.217
C,NB-94	,NO ,	1.827E+00,	2.738E+00,	4.606E+00,,	0.397
C,NB-95	,NO ,	2.881E+00,	3.002E+00,	5.222E+00,,	0.552
C,ZR-95	,NO ,	-2.008E+00,	5.431E+00,	8.839E+00,,	-0.227
C,MO-99	,NO ,	-1.007E+02,	2.012E+02,	3.252E+02,,	-0.310
C,RU-103	,NO ,	2.599E+00,	3.315E+00,	5.662E+00,,	0.459
C,RU-106	,NO ,	-1.554E+01,	2.716E+01,	4.192E+01,,	-0.371
C,AG-110m	,NO ,	-9.713E-01,	2.791E+00,	4.473E+00,,	-0.217
C,SN-113	,NO ,	1.887E+00,	3.914E+00,	6.498E+00,,	0.290
C,SB-124	,NO ,	-3.622E+00,	7.538E+00,	4.770E+00,,	-0.759
C,SB-125	,NO ,	-9.930E-01,	8.440E+00,	1.364E+01,,	-0.073
C,TE-129M	,NO ,	-1.242E+01,	3.810E+01,	6.251E+01,,	-0.199
C,I-131	,NO ,	-5.538E+00,	6.470E+00,	1.026E+01,,	-0.540
C,BA-133	,NO ,	1.291E+01,	4.855E+00,	7.576E+00,,	1.704
C,CS-134	,NO ,	5.123E+00,	7.034E+00,	5.517E+00,,	0.928
C,CS-136	,NO ,	1.816E+00,	4.344E+00,	7.344E+00,,	0.247
C,CS-137	,NO ,	-1.421E+00,	3.081E+00,	4.907E+00,,	-0.290
C,CE-139	,NO ,	-2.383E+00,	3.043E+00,	4.897E+00,,	-0.487
C,BA-140	,NO ,	-2.750E+00,	1.601E+01,	2.620E+01,,	-0.105
C,LA-140	,NO ,	-3.076E+00,	4.989E+00,	7.787E+00,,	-0.395
C,CE-141	,NO ,	1.250E+00,	6.695E+00,	9.405E+00,,	0.133
C,CE-144	,NO ,	-1.890E+01,	2.607E+01,	3.567E+01,,	-0.530
C,EU-152	,NO ,	-3.405E+00,	1.101E+01,	1.502E+01,,	-0.227
C,EU-154	,NO ,	3.002E+00,	5.926E+00,	9.901E+00,,	0.303
C,AC-228	,NO ,	3.779E-01,	1.163E+01,	1.836E+01,,	0.021
C,TH-228	,NO ,	3.382E+00,	5.679E+00,	9.249E+00,,	0.366
C,TH-232	,NO ,	3.767E-01,	1.160E+01,	1.831E+01,,	0.021
C,U-235	,NO ,	2.737E+01,	2.590E+01,	3.739E+01,,	0.732
C,U-238	,NO ,	-3.158E+01,	3.129E+02,	5.075E+02,,	-0.062
C,AM-241	,NO ,	-5.927E+00,	2.777E+01,	3.970E+01,,	-0.149

Sec. Review:      Analyst:      LIMS:

=====

VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 10-JUN-2006 18:13:48.42  
 TBE11 P-20610B HpGe \*\*\*\*\* Aquisition Date/Time: 10-JUN-2006 12:39:37.57

-----

LIMS No., Customer Name, Client ID: WG L28837-10 EXELON QUAD

Sample ID : 11L28837-10      Smple Date: 31-MAY-2006 08:00:00.  
 Sample Type : WG      Geometry : 113L082304  
 Quantity : 3.00070E+00 L      BKGFILE : 11BG060306MT  
 Start Channel : 40      Energy Tol : 1.00000      Real Time : 0 05:25:06.95  
 End Channel : 4090      Pk Srch Sens: 5.00000      Live time : 0 05:25:00.00  
 MDA Constant : 0.00      Library Used: LIBD

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	%Eff	Cts/Sec	%Err	Fit
1	0	139.71*	71	484	1.11	278.85	1.90E+00	3.63E-03	60.1	
2	0	198.48	159	347	1.75	396.71	1.75E+00	8.16E-03	21.1	
3	0	295.14*	108	328	1.77	590.50	1.37E+00	5.55E-03	37.9	
4	0	351.75*	71	293	1.82	703.97	1.20E+00	3.65E-03	55.8	
5	0	596.30	85	134	1.50	1193.84	8.03E-01	4.38E-03	29.9	
6	0	608.91*	91	140	1.40	1219.09	7.90E-01	4.67E-03	31.8	
7	0	1120.28*	39	24	1.81	2241.99	4.86E-01	2.00E-03	34.7	
8	0	1460.16*	0	36	2.38	2920.83	3.92E-01	1.50E-05*****		

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	0	10.67*	3.920E-01	3.219E-01	3.219E-01	11953.61

Flag: "\*" = Keyline

Summary of Nuclide Activity  
 Sample ID : 11L28837-10

Page : 2  
 Acquisition date : 10-JUN-2006 12:39:37

Total number of lines in spectrum	8	
Number of unidentified lines	7	
Number of lines tentatively identified by NID	1	12.50%

Nuclide Type : natural

Nuclide	Hlife	Decay	Uncorrected pCi/L	Decay Corr pCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	3.219E-01	3.219E-01	384.8E-01	11953.61	
Total Activity :			3.219E-01	3.219E-01			

Grand Total Activity : 3.219E-01 3.219E-01

Flags: "K" = Keyline not found  
 "E" = Manually edited

"M" = Manually accepted  
 "A" = Nuclide specific abn. limit

Unidentified Energy Lines  
 Sample ID : 11L28837-10

Acquisition date : 10-JUN-2006 12:39:37

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	139.71	71	484	1.11	278.85	275	8	3.63E-03	****	1.90E+00	
0	198.48	159	347	1.75	396.71	393	7	8.16E-03	42.1	1.75E+00	
0	295.14	108	328	1.77	590.50	585	13	5.55E-03	75.8	1.37E+00	
0	351.75	71	293	1.82	703.97	696	13	3.65E-03	****	1.20E+00	
0	596.30	85	134	1.50	1193.84	1188	13	4.38E-03	59.7	8.03E-01	
0	608.91	91	140	1.40	1219.09	1212	13	4.67E-03	63.6	7.90E-01	
0	1120.28	39	24	1.81	2241.99	2236	12	2.00E-03	69.4	4.86E-01	

Flags: "T" = Tentatively associated

Summary of Nuclide Activity

Total number of lines in spectrum 8  
 Number of unidentified lines 7  
 Number of lines tentatively identified by NID 1 12.50%

Nuclide Type : natural

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/L	Wtd Mean Decay Corr pCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	3.219E-01	3.219E-01	384.8E-01	11953.61	
Total Activity :			3.219E-01	3.219E-01			

Grand Total Activity : 3.219E-01 3.219E-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	3.219E-01	3.848E+01	4.330E+01	0.000E+00	0.007

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/L)	K.L. Ided	Act error	MDA (pCi/L)	MDA error	Act/MDA
BE-7	1.125E+01		2.426E+01	4.040E+01	0.000E+00	0.278
NA-24	-2.990E-01		1.386E-01	Half-Life too short		
CR-51	-1.119E+01		2.925E+01	4.780E+01	0.000E+00	-0.234
MN-54	9.831E-01		2.718E+00	4.542E+00	0.000E+00	0.216



CO-57	-4.533E-01	2.664E+00	4.375E+00	0.000E+00	-0.104
CO-58	-2.704E-01	2.914E+00	4.753E+00	0.000E+00	-0.057
FE-59	7.831E+00	5.873E+00	1.053E+01	0.000E+00	0.744
CO-60	1.257E+00	2.830E+00	4.799E+00	0.000E+00	0.262
ZN-65	4.659E+00	6.748E+00	1.004E+01	0.000E+00	0.464
SE-75	-1.567E+00	3.719E+00	6.114E+00	0.000E+00	-0.256
SR-85	1.604E+01	3.454E+00	6.464E+00	0.000E+00	2.482
Y-88	7.941E-01	3.085E+00	5.206E+00	0.000E+00	0.153
NB-94	-6.886E-01	2.668E+00	4.346E+00	0.000E+00	-0.158
NB-95	2.285E+00	2.819E+00	4.839E+00	0.000E+00	0.472
ZR-95	-5.899E+00	5.130E+00	7.891E+00	0.000E+00	-0.747
MO-99	9.113E+00	2.619E+02	4.320E+02	0.000E+00	0.021
RU-103	1.093E+00	3.247E+00	5.366E+00	0.000E+00	0.204
RU-106	-5.233E+00	2.455E+01	4.028E+01	0.000E+00	-0.130
AG-110m	7.568E-02	2.720E+00	4.506E+00	0.000E+00	0.017
SN-113	-1.817E+00	3.680E+00	5.937E+00	0.000E+00	-0.306
SB-124	7.460E-01	6.478E+00	4.728E+00	0.000E+00	0.158
SB-125	4.897E-01	7.835E+00	1.287E+01	0.000E+00	0.038
TE-129M	6.214E+00	3.693E+01	6.076E+01	0.000E+00	0.102
I-131	1.133E+00	6.620E+00	1.097E+01	0.000E+00	0.103
BA-133	4.068E+00	4.637E+00	6.742E+00	0.000E+00	0.603
CS-134	6.437E+00	6.082E+00	5.140E+00	0.000E+00	1.252
CS-136	4.136E-01	4.490E+00	7.399E+00	0.000E+00	0.056
CS-137	5.034E-01	2.934E+00	4.893E+00	0.000E+00	0.103
CE-139	-1.655E+00	2.805E+00	4.526E+00	0.000E+00	-0.366
BA-140	2.742E+00	1.644E+01	2.691E+01	0.000E+00	0.102
LA-140	-7.233E-01	5.181E+00	8.495E+00	0.000E+00	-0.085
CE-141	2.190E+00	6.507E+00	9.166E+00	0.000E+00	0.239
CE-144	-2.011E+01	2.452E+01	3.329E+01	0.000E+00	-0.604
EU-152	-1.204E+01	1.024E+01	1.344E+01	0.000E+00	-0.896
EU-154	1.715E+00	5.454E+00	9.052E+00	0.000E+00	0.189
RA-226	-1.096E+00	7.241E+01	1.125E+02	0.000E+00	-0.010
AC-228	-1.150E+01	1.187E+01	1.634E+01	0.000E+00	-0.704
TH-228	7.117E+00	5.773E+00	9.100E+00	0.000E+00	0.782
TH-232	-1.146E+01	1.183E+01	1.628E+01	0.000E+00	-0.704
U-235	3.228E+01	2.446E+01	3.557E+01	0.000E+00	0.908
U-238	2.622E+02	2.891E+02	5.071E+02	0.000E+00	0.517
AM-241	-8.765E+01	3.655E+01	5.670E+01	0.000E+00	-1.546

A,11L28837-10 ,06/10/2006 18:13,05/31/2006 08:00, 3.001E+00,WG L28837-10 E  
 B,11L28837-10 ,LIBD ,06/07/2006 09:40,113L082304  
 C,K-40 ,YES, 3.219E-01, 3.848E+01, 4.330E+01,, 0.007  
 C,BE-7 ,NO , 1.125E+01, 2.426E+01, 4.040E+01,, 0.278  
 C,CR-51 ,NO , -1.119E+01, 2.925E+01, 4.780E+01,, -0.234  
 C,MN-54 ,NO , 9.831E-01, 2.718E+00, 4.542E+00,, 0.216  
 C,CO-57 ,NO , -4.533E-01, 2.664E+00, 4.375E+00,, -0.104  
 C,CO-58 ,NO , -2.704E-01, 2.914E+00, 4.753E+00,, -0.057  
 C,FE-59 ,NO , 7.831E+00, 5.873E+00, 1.053E+01,, 0.744  
 C,CO-60 ,NO , 1.257E+00, 2.830E+00, 4.799E+00,, 0.262  
 C,ZN-65 ,NO , 4.659E+00, 6.748E+00, 1.004E+01,, 0.464  
 C,SE-75 ,NO , -1.567E+00, 3.719E+00, 6.114E+00,, -0.256  
 C,SR-85 ,NO , 1.604E+01, 3.454E+00, 6.464E+00,, 2.482  
 C,Y-88 ,NO , 7.941E-01, 3.085E+00, 5.206E+00,, 0.153  
 C,NB-94 ,NO , -6.886E-01, 2.668E+00, 4.346E+00,, -0.158  
 C,NB-95 ,NO , 2.285E+00, 2.819E+00, 4.839E+00,, 0.472  
 C,ZR-95 ,NO , -5.899E+00, 5.130E+00, 7.891E+00,, -0.747  
 C,MO-99 ,NO , 9.113E+00, 2.619E+02, 4.320E+02,, 0.021  
 C,RU-103 ,NO , 1.093E+00, 3.247E+00, 5.366E+00,, 0.204  
 C,RU-106 ,NO , -5.233E+00, 2.455E+01, 4.028E+01,, -0.130  
 C,AG-110m ,NO , 7.568E-02, 2.720E+00, 4.506E+00,, 0.017  
 C,SN-113 ,NO , -1.817E+00, 3.680E+00, 5.937E+00,, -0.306  
 C,SB-124 ,NO , 7.460E-01, 6.478E+00, 4.728E+00,, 0.158  
 C,SB-125 ,NO , 4.897E-01, 7.835E+00, 1.287E+01,, 0.038  
 C,TE-129M ,NO , 6.214E+00, 3.693E+01, 6.076E+01,, 0.102  
 C,I-131 ,NO , 1.133E+00, 6.620E+00, 1.097E+01,, 0.103  
 C,BA-133 ,NO , 4.068E+00, 4.637E+00, 6.742E+00,, 0.603  
 C,CS-134 ,NO , 6.437E+00, 6.082E+00, 5.140E+00,, 1.252  
 C,CS-136 ,NO , 4.136E-01, 4.490E+00, 7.399E+00,, 0.056  
 C,CS-137 ,NO , 5.034E-01, 2.934E+00, 4.893E+00,, 0.103  
 C,CE-139 ,NO , -1.655E+00, 2.805E+00, 4.526E+00,, -0.366  
 C,BA-140 ,NO , 2.742E+00, 1.644E+01, 2.691E+01,, 0.102  
 C,LA-140 ,NO , -7.233E-01, 5.181E+00, 8.495E+00,, -0.085  
 C,CE-141 ,NO , 2.190E+00, 6.507E+00, 9.166E+00,, 0.239  
 C,CE-144 ,NO , -2.011E+01, 2.452E+01, 3.329E+01,, -0.604  
 C,EU-152 ,NO , -1.204E+01, 1.024E+01, 1.344E+01,, -0.896  
 C,EU-154 ,NO , 1.715E+00, 5.454E+00, 9.052E+00,, 0.189  
 C,RA-226 ,NO , -1.096E+00, 7.241E+01, 1.125E+02,, -0.010  
 C,AC-228 ,NO , -1.150E+01, 1.187E+01, 1.634E+01,, -0.704  
 C,TH-228 ,NO , 7.117E+00, 5.773E+00, 9.100E+00,, 0.782  
 C,TH-232 ,NO , -1.146E+01, 1.183E+01, 1.628E+01,, -0.704  
 C,U-235 ,NO , 3.228E+01, 2.446E+01, 3.557E+01,, 0.908  
 C,U-238 ,NO , 2.622E+02, 2.891E+02, 5.071E+02,, 0.517  
 C,AM-241 ,NO , -8.765E+01, 3.655E+01, 5.670E+01,, -1.546



2508 Quality Lane  
Knoxville, TN 37931  
865-690-6819 (Phone)

**Work Order #: L29107**

**Exelon**

**July 6, 2006**



Kathy Shaw  
 Conestoga-Rovers & Associates  
 45 Farmington Valley Drive  
 Plainville CT 06062

**Case Narrative - L29107**  
**EX001-3ESPQUAD-06**

07/06/2006 15:26

**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)
WG-QC-MW-QC-102D-062806KR-001	L29107-1	
WG-QC-MW-QC-108I-062806KR-002	L29107-2	

*Analytical Method Cross Reference Table*

Radiological Parameter	TBE Knoxville Method	Reference Method
H-3 (DIST)	TBE-2010	



**Case Narrative - L29107**  
**EX001-3ESPQUAD-06**

07/06/2006 15:26

**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.

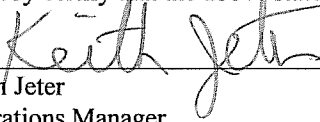
<u>Client ID</u>	<u>Laboratory ID</u>	<u>QC Sample #</u>
GW-062806-PG-01	L29109-1	WG4198-3

**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

06/30/06 10:39

**Teledyne Brown Engineering**  
**Sample Receipt Verification/Variance Report**

SR #: SR09162

Client: Exelon

Project #: EX001-3ESPQUAD-06

LIMS #: L29107

Initiated By: PMARSHALL

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 WG-QC-MW-QC-102D-062806KR-001 WG-QC-MW-QC-108I-062806KR-002			N	Container:WG-QC-MW-QC-102D-062806KR-002 Container:WG-QC-MW-QC-108I-062806KR-001
8 Sample(s) properly preserved and in appropriate container(s)			NA	
9 Other (Describe)			NA	

**Charles, Rebecca**

---

**From:** Charles, Rebecca

**Sent:** Monday, July 03, 2006 2:51 PM

**To:** Ziggy Karpa (zigmund.karpa@exeloncorp.com); Joyce Tomlinson (joyce.tomlinson@exeloncorp.com); Julie Czech (jczech@croworld.com); Larry.Walton@exeloncorp.com; Rick Maldonado (Rick.maldonado@exeloncorp.com); Scott Sklenar (Scott.sklenar@exeloncorp.com); Shaw, Kathy

**Subject:** Acknowledgements

Acknowledgements for Limerick L29133, Zion L29109 and Quad Cities L29107. The Quad cities acknowledgement has a variance report attached.

The sample IDs on the bottle did not match the sample IDs on the paperwork.

Rebecca Charles  
Teledyne Brown Engineering  
Project Manager  
(865) 934-0379  
(865) 934-0396 (fax)

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# Internal Chain of Custody



L29107

\*\*\*\*\*

L29107-1      WG      WG-QC-MW-QC-102D-062806KR-001				
<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

\*\*\*\*\*

L29107-2      WG      WG-QC-MW-QC-108I-062806KR-002				
<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 15:25  
**L29107**

Conestoga-Rovers & Associates  
 EX001-3ESPQUAD-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	3.66E+03	4.22E+02	3.14E+02	pCi/L	10	10	ml	07/05/06	07/05/06	20.62	M	+ High
Sample ID: <b>WG-QC-MW-QC-102D-062806KR-001</b> Matrix: Ground Water (WG) Station: Collect Start: 06/28/2006 13:20 Volume: Description: Collect Stop: Receive Date: 06/30/2006 % Moisture: LIMS Number: L29107-1													
-3 (DIST)	2010	1.94E+03	2.56E+02	2.43E+02	pCi/L	10	10	ml	07/05/06	07/05/06	34.85	M	+ High
Sample ID: <b>WG-QC-MW-QC-1081-062806KR-002</b> Matrix: Ground Water (WG) Station: Collect Start: 06/28/2006 12:25 Volume: Description: Collect Stop: Receive Date: 06/30/2006 % Moisture: LIMS Number: L29107-2													

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  
 ligh = Activity concentration exceeds customer reporting value  
 pec = MDC exceeds customer technical specification  
 = Low recovery  
 = High recovery

**folded 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 L29107

7/6/2006 3:31:06PM



H-3

## Method Blank Summary

BE Sample ID	Radionuclide	Matrix	Count Date/Time	Blank Result	Units	Qualifier	P/F
/G4198-1	H-3	WO	07/05/2006 12:32	< 1.730E+00	pCi/Total	U	P

## LCS Sample Summary

BE Sample ID	Radionuclide	Matrix	Count Date/Time	Spike Value	LCS Result	Units	Spike Recovery	Range	Qualifier	P/F
/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

L29107 H-3

Associated Samples for WG4198

### SAMPLENUM

L29107-1 WG-QC-MW-QC-102D-062806KR-001  
 L29107-2 WG-QC-MW-QC-108I-062806KR-002

### CLIENTID

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 L29107

7/6/2006 3:31:06PM



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 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  
E Not evaluated

# Raw Data

ork Order: L29107 Customer: Exelon

uclide: H-3 (DIST) Project: EX001-3ESPQUAD-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
L29107-1	H-3 DIST		10 ml			0		05-jul-06 18:07	LS7	389	20.62	1.99	60	.208		EJ
WG-QC-MW-QC-102D-062806KR-001 ctivity: 3.66E+03 * Error: 4.22E+02 MDC: 3.14E+02																
L29107-2	H-3 DIST		10 ml			0		05-jul-06 18:31	LS7	380	34.85	1.99	60	.207		EJ
WG-QC-MW-QC-108I-062806KR-002 ctivity: 1.94E+03 * Error: 2.56E+02 MDC: 2.43E+02																



2508 Quality Lane  
Knoxville, TN 37931  
865-690-6819 (Phone)

**Work Order #: L29389**

**Exelon**

**August 1, 2006**



Kathy Shaw  
Conestoga-Rovers & Associates  
45 Farmington Valley Drive  
Plainville CT 06062

**Case Narrative - L29389**  
**EX001-3ESPQUAD-06**

08/01/2006 09:14

**Sample Receipt**

The following samples were received on July 28, 2006 in good condition, unless otherwise noted.

*Cross Reference Table*

Client ID	Laboratory ID	Station ID(if applicable)
WG-QC-MW-QC-108I-072706-NZ-001	L29389-1	
WG-QC-MW-QC-110I-072706-NZ-002	L29389-2	
WG-QC-MW-QC-114I-072706-NZ-003	L29389-3	
WG-QC-MW-QC-113I-072706-NZ-004	L29389-4	
WG-QC-MW-QC-112I-072706-NZ-005	L29389-5	
WG-QC-MW-QC-111I-072706-NZ-006	L29389-6	
RB-QC-MW-QC-115S-072706-NZ-007	L29389-7	

*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 - L29389  
EX001-3ESPQUAD-06**

08/01/2006 09:14

**Gamma Spectroscopy**

**Quality Control**

Quality control samples were analyzed as WG4270.

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-QC108I-072706-NZ-001	L29389-1	WG4270-1

**H-3 (DIST)**

**Quality Control**

Quality control samples were analyzed as WG4269.

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-111I-072706-NZ-006	L29389-6	WG4269-3



**TELEDYNE  
BROWN ENGINEERING, INC.**  
A Teledyne Technologies Company  
2508 Quality Lane  
Knoxville, TN 37931-3133

**Case Narrative - L29389  
EX001-3ESPQUAD-06**

08/01/2006 09:14

**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.

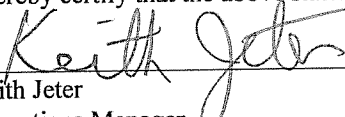
<u>Client ID</u>	<u>Laboratory ID</u>	<u>QC Sample #</u>
WG-QC-MW-QC-1111-072706-NZ-006	L29389-6	WG4278-3

**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.

  
 \_\_\_\_\_  
 Keith Jeter  
 Operations Manager

# Sample Receipt Summary



07/28/06 10:02

**Teledyne Brown Engineering**  
**Sample Receipt Verification/Variance Report**

SR #: SR09606

Client: Exelon

Project #: EX001-3ESPQUAD-06

LIMS #: L29389

Initiated By: PMARSHALL

Init Date: 07/28/06      Receive Date: 07/28/06

**Notification of Variance**

Person Notified: *Stotts*Contacted By: *R. Charles*Notify Date: *7/28/06*Notify Method: *Phone*Notify Comment: *should be what ID*

**Client Response**

Person Responding: *Stotts*Response Date: *7/28/06*Response Method: *Phone*Response Comment: *108I is correct ID***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)		N	Approx 4mL of nitric added to each Gamma container to bring pH to </= 2
9	Other (Describe) WG-QC-MW-QC-102I-072706-MZ-001		N	Was not sure if the id should read 102I or 108I.



SHIPPED TO  
(Laboratory Name): **TELEDYNE - BROWN Engineering L 29389**

**CONESTOGA-ROVERS & ASSOCIATES**  
9033 Meridian Way  
West Chester, Ohio 45069  
513-942-4750 phone  
513-942-8585 fax

REFERENCE NUMBER:  
**A5136-2E**

PROJECT NAME:  
**EYELW QUAD CITES**

**CHAIN-OF-CUSTODY RECORD**

SAMPLER'S SIGNATURE: *Mate Zugler* PRINTED NAME: **MATE ZUGLER**

SEQ. No.	DATE	TIME	SAMPLE IDENTIFICATION No.	SAMPLE MATRIX	No. Of CONTAINERS	PARAMETERS	REMARKS
1	7/27/06	0835	W9-02-MW-02-108I 79-108I 072706-N2-001	H <sub>2</sub> O	2	V X	
2	↓	0920	↓	↓	2	V X	
3	↓	1010	110I ↓ 002 114I ↓ 003	↓	2	V X	
4	↓	1100	113I ↓ 004	↓	2	V X	
<b>TOTAL NUMBER OF CONTAINERS</b>							
<b>8</b>							

RELINQUISHED BY: *Mate Zugler* DATE: 7/27/06 TIME: 1450  
 RECEIVED BY: *[Signature]* DATE: 7/27/06 TIME: 1450  
 RELINQUISHED BY: *[Signature]* DATE: 7/27/06 TIME: 4:34  
 RECEIVED BY: *[Signature]* DATE: 7/27/06 TIME: 4:33  
 RELINQUISHED BY: \_\_\_\_\_ DATE: \_\_\_\_\_ TIME: \_\_\_\_\_  
 RECEIVED BY: \_\_\_\_\_ DATE: \_\_\_\_\_ TIME: \_\_\_\_\_

METHOD OF SHIPMENT: **HAND DELIVER TO EYELW** AIR BILL No. **N/A**

SAMPLE TEAM:  
 -Fully Executed Copy *N. Zugler*  
 -Receiving Laboratory Copy *G. Lewis*  
 -Shipper Copy  
 -Sampler Copy

RECEIVED FOR LABORATORY BY: *[Signature]* 004284  
 DATE: 7/28/06 TIME: 1100

TELEDYNE BROWN ENGINEERING  
2508 Quality Lane  
Knoxville, TN 37931-3133

JUL 28 2006

**ACKNOWLEDGEMENT**

This is not an invoice

July 28, 2006

Kathy Shaw  
Conestoga-Rovers & Associates  
45 Farmington Valley Drive  
Plainville, CT 06062

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: EX001-3ESPQUAD-06  
P.O. #: 00411203  
Release #:  
Contract#: 00411203  
Kathy Shaw, FAX#: 860-747-1900, larry.walton@exeloncorp.com

Client ID/ Station	Laboratory ID Analysis	Vol/Units Price	Start Collect Date/Time	End Collect Date/Time
WG-QC-MW-QC-108I-072706-NZ-0	L29389-1		07/27/06:0835	
WG	GELI	135.00		
WG	H-3 (DIST)	135.00		
WG	SR-90 (FAST)	175.00		
WG-QC-MW-QC-110I-072706-NZ-0	L29389-2		07/27/06:0920	
WG	GELI	135.00		
WG	H-3 (DIST)	135.00		
WG	SR-90 (FAST)	175.00		
WG-QC-MW-QC-114I-072706-NZ-0	L29389-3		07/27/06:1010	
WG	GELI	135.00		
WG	H-3 (DIST)	135.00		
WG	SR-90 (FAST)	175.00		
WG-QC-MW-QC-113I-072706-NZ-0	L29389-4		07/27/06:1100	
WG	GELI	135.00		
WG	H-3 (DIST)	135.00		
WG	SR-90 (FAST)	175.00		
WG-QC-MW-QC-112I-072706-NZ-0	L29389-5		07/27/06:1315	

Client ID/ Station	Laboratory ID Analysis	Vol/Units Price	Start Collect Date/Time	End Collect Date/Time
WG	GELI	135.00		
WG	H-3 (DIST)	135.00		
WG	SR-90 (FAST)	175.00		
WG-QC-MW-QC-111I-072706-NZ-0 L29389-6			07/27/06:1405	
WG	GELI	135.00		
WG	H-3 (DIST)	135.00		
WG	SR-90 (FAST)	175.00		
RB-QC-MW-QC-115S-072706-NZ-0 L29389-7			07/27/06:1415	
WG	GELI	135.00		
WG	H-3 (DIST)	135.00		
WG	SR-90 (FAST)	175.00		

---

End of document

**Charles, Rebecca**

---

**From:** Charles, Rebecca  
**Sent:** Monday, July 31, 2006 12:39 PM  
**To:** 'Wayne.Stotts@exeloncorp.com'; 'Larry.Walton@exeloncorp.com'  
**Subject:** preliminary data

All,

Attached are the tritium results (and some gamma) from the Quad Cities samples received on Friday. Three of the tritiums were above 200 pCi/L and one is fairly high. Thought you might want to see the results sooner than Tuesday.

Rebecca Charles  
Teledyne Brown Engineering  
Project Manager  
(865) 934-0379  
(865) 934-0396 (fax)

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7/31/2006

# Internal Chain of Custody











08/01/06

Teledyne Brown Engineering  
Internal Chain of Custody  
Supplemental Sheet

L29389

\*\*\*\*\*

L29389-1      WG      WG-QC-MW-QC-108I-072706-NZ-001

<u>Process step</u>	<u>Prod</u>	<u>Analyst</u>	<u>Date</u>
Login		KTHURMAN	07/28/06
Aliquot	GELI	DW	07/28/06
Aliquot	H-3 (DIST)	EJ	07/28/06
Aliquot	SR-90 (FAST)	LCB	07/29/06
Count Room	GELI	ILL	07/28/06
Count Room	H-3 (DIST)	KOJ	07/31/06
Count Room	SR-90 (FAST)	KOJ	07/31/06

\*\*\*\*\*

L29389-2      WG      WG-QC-MW-QC-110I-072706-NZ-002

<u>Process step</u>	<u>Prod</u>	<u>Analyst</u>	<u>Date</u>
Login		KTHURMAN	07/28/06
Aliquot	GELI	DW	07/28/06
Aliquot	H-3 (DIST)	EJ	07/28/06
Aliquot	SR-90 (FAST)	LCB	07/29/06
Count Room	GELI	ILL	07/28/06
Count Room	H-3 (DIST)	KOJ	07/31/06
Count Room	SR-90 (FAST)	KOJ	07/31/06

\*\*\*\*\*

L29389-3      WG      WG-QC-MW-QC-114I-072706-NZ-003

<u>Process step</u>	<u>Prod</u>	<u>Analyst</u>	<u>Date</u>
Login		KTHURMAN	07/28/06
Aliquot	GELI	DW	07/28/06
Aliquot	H-3 (DIST)	EJ	07/28/06
Aliquot	SR-90 (FAST)	LCB	07/29/06
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

\*\*\*\*\*

L29389-4      WG      WG-QC-MW-QC-113I-072706-NZ-004

<u>Process step</u>	<u>Prod</u>	<u>Analyst</u>	<u>Date</u>
Login		KTHURMAN	07/28/06
Aliquot	GELI	DW	07/28/06
Aliquot	H-3 (DIST)	EJ	07/28/06
Aliquot	SR-90 (FAST)	LCB	07/29/06
Count Room	GELI	ILL	07/28/06
Count Room	H-3 (DIST)	KOJ	07/31/06
Count Room	SR-90 (FAST)	KOJ	07/31/06

\*\*\*\*\*

L29389-5      WG      WG-QC-MW-QC-112I-072706-NZ-005

<u>Process step</u>	<u>Prod</u>	<u>Analyst</u>	<u>Date</u>
Login		KTHURMAN	07/28/06
Aliquot	GELI	DW	07/28/06
Aliquot	H-3 (DIST)	EJ	07/28/06
Aliquot	SR-90 (FAST)	LCB	07/29/06
Count Room	GELI	ILL	07/28/06

08/01/06

Teledyne Brown Engineering  
Internal Chain of Custody  
Supplemental Sheet

L29389

L29389-5      WG      WG-QC-MW-QC-112I-072706-NZ-005

Count Room	H-3 (DIST)	KOJ	07/31/06
Count Room	SR-90 (FAST)	KOJ	07/31/06

\*\*\*\*\*

L29389-6      WG      WG-QC-MW-QC-111I-072706-NZ-006

<u>Process step</u>	<u>Prod</u>	<u>Analyst</u>	<u>Date</u>
Login		KTHURMAN	07/28/06
Aliquot	GELI	DW	07/28/06
Aliquot	H-3 (DIST)	EJ	07/28/06
Aliquot	SR-90 (FAST)	LCB	07/29/06
Count Room	GELI	ILL	07/28/06
Count Room	H-3 (DIST)	KOJ	07/31/06
Count Room	SR-90 (FAST)	KOJ	07/31/06

\*\*\*\*\*

L29389-7      WG      RB-QC-MW-QC-115S-072706-NZ-007

<u>Process step</u>	<u>Prod</u>	<u>Analyst</u>	<u>Date</u>
Login		KTHURMAN	07/28/06
Aliquot	GELI	DW	07/28/06
Aliquot	H-3 (DIST)	EJ	07/28/06
Aliquot	SR-90 (FAST)	LCB	07/29/06
Count Room	GELI	ILL	07/28/06
Count Room	H-3 (DIST)	KOJ	07/31/06
Count Room	SR-90 (FAST)	KOJ	07/31/06

# Analytical Results Summary

# Report of Analysis

08/01/06 09:31

**L29389**

Conestoga-Rovers & Associates

EX001-3ESPQUAD-06

Kathy Shaw

Sample ID: **WG-QC-MW-QC-1081-072706-NZ-001** Matrix: Ground Water (WG)  
 Station: Collect Start: 07/27/2006 08:35  
 Description: Collect Stop: Volume:  
 LIMS Number: L29389-1 Receive Date: 07/28/2006 % 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 (DIST)	2010	<b>1.89E+03</b>	2.52E+02	2.40E+02	pCi/L		10	ml	07/27/06 08:35	07/31/06	34.56	M	+
TOTAL SR	2018	1.02E-01	6.94E-01	<b>1.45E+00</b>	pCi/L		450	ml	07/27/06 08:35	07/31/06	80	M	U
MN-54	2007	-3.96E-01	3.30E+00	<b>5.37E+00</b>	pCi/L		3122.7	ml	07/27/06 08:35	07/28/06	10531	Sec	U
CO-58	2007	-2.33E+00	3.40E+00	<b>5.29E+00</b>	pCi/L		3122.7	ml	07/27/06 08:35	07/28/06	10531	Sec	U
FE-59	2007	1.20E+00	6.32E+00	<b>1.07E+01</b>	pCi/L		3122.7	ml	07/27/06 08:35	07/28/06	10531	Sec	U
CO-60	2007	-3.42E+00	3.41E+00	<b>4.94E+00</b>	pCi/L		3122.7	ml	07/27/06 08:35	07/28/06	10531	Sec	U
ZN-65	2007	9.24E+00	8.60E+00	<b>1.38E+01</b>	pCi/L		3122.7	ml	07/27/06 08:35	07/28/06	10531	Sec	U
NB-95	2007	6.35E+00	4.11E+00	<b>6.64E+00</b>	pCi/L		3122.7	ml	07/27/06 08:35	07/28/06	10531	Sec	U
ZR-95	2007	2.55E+00	5.72E+00	<b>9.48E+00</b>	pCi/L		3122.7	ml	07/27/06 08:35	07/28/06	10531	Sec	U
CS-134	2007	8.56E+00	4.40E+00	<b>7.16E+00</b>	pCi/L		3122.7	ml	07/27/06 08:35	07/28/06	10531	Sec	U*
CS-137	2007	2.10E+00	3.43E+00	<b>5.94E+00</b>	pCi/L		3122.7	ml	07/27/06 08:35	07/28/06	10531	Sec	U
BA-140	2007	3.79E-01	1.30E+01	<b>2.10E+01</b>	pCi/L		3122.7	ml	07/27/06 08:35	07/28/06	10531	Sec	U
LA-140	2007	1.13E+00	4.55E+00	<b>7.64E+00</b>	pCi/L		3122.7	ml	07/27/06 08:35	07/28/06	10531	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

08/01/06 09:31

**L29389**

Conestoga-Rovers & Associates

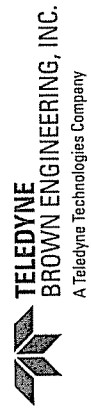
EX001-3ESPQUAD-06

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
Station: <b>WG-QC-MW-QC-1101-072706-NZ-002</b> Matrix: Ground Water (WG) Description: L29389-2 Collect Start: 07/27/2006 09:20 Collect Stop: Volume: LIMS Number: L29389-2 Receive Date: 07/28/2006 % Moisture:													
H-3 (DIST)	2010	2.31E+01	1.10E+02	<b>1.79E+02</b>	pCi/L		10	ml		07/31/06	60	M	U
TOTAL SR	2018	1.01E+00	8.38E-01	<b>1.53E+00</b>	pCi/L		450	ml	07/27/06 09:20	07/31/06	80	M	U
MN-54	2007	3.56E+00	3.44E+00	<b>6.01E+00</b>	pCi/L		3260.4	ml	07/27/06 09:20	07/28/06	13825	Sec	U
CO-58	2007	-1.94E+00	3.57E+00	<b>5.67E+00</b>	pCi/L		3260.4	ml	07/27/06 09:20	07/28/06	13825	Sec	U
FE-59	2007	-4.93E+00	6.42E+00	<b>1.00E+01</b>	pCi/L		3260.4	ml	07/27/06 09:20	07/28/06	13825	Sec	U
CO-60	2007	-9.01E-01	3.44E+00	<b>5.51E+00</b>	pCi/L		3260.4	ml	07/27/06 09:20	07/28/06	13825	Sec	U
ZN-65	2007	1.59E+01	1.01E+01	<b>1.61E+01</b>	pCi/L		3260.4	ml	07/27/06 09:20	07/28/06	13825	Sec	U
NB-95	2007	3.70E+00	3.67E+00	<b>6.39E+00</b>	pCi/L		3260.4	ml	07/27/06 09:20	07/28/06	13825	Sec	U
ZR-95	2007	-2.09E+00	6.31E+00	<b>9.57E+00</b>	pCi/L		3260.4	ml	07/27/06 09:20	07/28/06	13825	Sec	U
CS-134	2007	2.25E+01	5.28E+00	<b>9.06E+00</b>	pCi/L		3260.4	ml	07/27/06 09:20	07/28/06	13825	Sec	U*
CS-137	2007	5.47E+00	3.77E+00	<b>6.73E+00</b>	pCi/L		3260.4	ml	07/27/06 09:20	07/28/06	13825	Sec	U
BA-140	2007	2.60E+00	1.28E+01	<b>2.11E+01</b>	pCi/L		3260.4	ml	07/27/06 09:20	07/28/06	13825	Sec	U
LA-140	2007	-5.02E-01	3.78E+00	<b>6.07E+00</b>	pCi/L		3260.4	ml	07/27/06 09:20	07/28/06	13825	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

08/01/06 09:31

**L29389**

Conestoga-Rovers & Associates

EX001-3ESPQUAD-06

Kathy Shaw

Sample ID: **WG-QC-MW-QC-1141-072706-NZ-003**

Station:

Description:

LIMS Number: L29389-3

Collect Start: 07/27/2006 10:10

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	-3.98E+01	1.05E+02	<b>1.78E+02</b>	pCi/L		10	ml		07/31/06	60	M	U
TOTAL SR	2018	5.67E-01	8.40E-01	<b>1.65E+00</b>	pCi/L		450	ml	07/27/06 10:10	07/31/06	80	M	U
MN-54	2007	-9.26E-01	2.55E+00	<b>4.46E+00</b>	pCi/L		3273	ml	07/27/06 10:10	07/30/06	9712	Sec	U
CO-58	2007	-2.53E+00	2.86E+00	<b>4.54E+00</b>	pCi/L		3273	ml	07/27/06 10:10	07/30/06	9712	Sec	U
FE-59	2007	3.95E-02	5.10E+00	<b>9.15E+00</b>	pCi/L		3273	ml	07/27/06 10:10	07/30/06	9712	Sec	U
CO-60	2007	-1.08E+00	2.92E+00	<b>4.97E+00</b>	pCi/L		3273	ml	07/27/06 10:10	07/30/06	9712	Sec	U
ZN-65	2007	-5.61E+00	7.54E+00	<b>1.02E+01</b>	pCi/L		3273	ml	07/27/06 10:10	07/30/06	9712	Sec	U
NB-95	2007	5.46E+00	2.88E+00	<b>5.73E+00</b>	pCi/L		3273	ml	07/27/06 10:10	07/30/06	9712	Sec	U
ZR-95	2007	1.17E+00	4.85E+00	<b>8.63E+00</b>	pCi/L		3273	ml	07/27/06 10:10	07/30/06	9712	Sec	U
CS-134	2007	2.02E+00	2.93E+00	<b>4.74E+00</b>	pCi/L		3273	ml	07/27/06 10:10	07/30/06	9712	Sec	U
CS-137	2007	-1.10E+00	2.82E+00	<b>4.78E+00</b>	pCi/L		3273	ml	07/27/06 10:10	07/30/06	9712	Sec	U
BA-140	2007	-1.09E+01	1.14E+01	<b>1.86E+01</b>	pCi/L		3273	ml	07/27/06 10:10	07/30/06	9712	Sec	U
LA-140	2007	-7.20E-01	3.66E+00	<b>6.55E+00</b>	pCi/L		3273	ml	07/27/06 10:10	07/30/06	9712	Sec	U

### Flag Values

- = Compound/Analyte not detected or less than 3 sigma
- U = 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



TELEDYNE  
BROWN ENGINEERING, INC.  
A Teledyne Technologies Company

**Report of Analysis**  
 08/01/06 09:31  
**L29389**

Conestoga-Rovers & Associates  
 EX001-3ESPQUAD-06

Kathy Shaw

Station:	Matrix:	Ground Water	(WG)										
Description:	Volume:												
LIMS Number:	% Moisture:												
Sample ID: <b>WG-QC-MW-QC-1131-072706-NZ-004</b>	Collect Start: 07/27/2006 11:00												
Collect Stop:													
Receive Date: 07/28/2006													
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 (DIST)	2010	3.69E+01	1.14E+02	<b>1.84E+02</b>	pCi/L		10	ml		07/31/06	60	M	U
TOTAL SR	2018	6.53E-01	8.06E-01	<b>1.55E+00</b>	pCi/L		450	ml	07/27/06 11:00	07/31/06	80	M	U
MN-54	2007	2.08E+00	3.21E+00	<b>5.47E+00</b>	pCi/L		3041.7	ml	07/27/06 11:00	07/28/06	9121	Sec	U
CO-58	2007	-3.16E+00	3.48E+00	<b>5.32E+00</b>	pCi/L		3041.7	ml	07/27/06 11:00	07/28/06	9121	Sec	U
FE-59	2007	3.62E+00	5.88E+00	<b>1.01E+01</b>	pCi/L		3041.7	ml	07/27/06 11:00	07/28/06	9121	Sec	U
CO-60	2007	2.74E+00	3.53E+00	<b>6.18E+00</b>	pCi/L		3041.7	ml	07/27/06 11:00	07/28/06	9121	Sec	U
ZN-65	2007	2.71E+01	9.24E+00	<b>1.63E+01</b>	pCi/L		3041.7	ml	07/27/06 11:00	07/28/06	9121	Sec	U*
NB-95	2007	3.80E+00	3.85E+00	<b>5.82E+00</b>	pCi/L		3041.7	ml	07/27/06 11:00	07/28/06	9121	Sec	U
ZR-95	2007	3.90E+00	6.01E+00	<b>9.11E+00</b>	pCi/L		3041.7	ml	07/27/06 11:00	07/28/06	9121	Sec	U
CS-134	2007	2.64E+01	7.24E+00	<b>8.62E+00</b>	pCi/L		3041.7	ml	07/27/06 11:00	07/28/06	9121	Sec	U*
CS-137	2007	1.71E+00	3.42E+00	<b>5.85E+00</b>	pCi/L		3041.7	ml	07/27/06 11:00	07/28/06	9121	Sec	U
BA-140	2007	6.12E+00	1.16E+01	<b>1.95E+01</b>	pCi/L		3041.7	ml	07/27/06 11:00	07/28/06	9121	Sec	U
LA-140	2007	-1.51E+00	4.09E+00	<b>6.50E+00</b>	pCi/L		3041.7	ml	07/27/06 11:00	07/28/06	9121	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**  
 08/01/06 09:31

**L29389**

Conestoga-Rovers & Associates

EX001-3ESPQUAD-06

Kathy Shaw

Sample ID: **WG-QC-MW-QC-1121-072706-NZ-005** Matrix: Ground Water (WG)  
 Station: Collect Start: 07/27/2006 13:15  
 Description: Collect Stop: Volume: % Moisture:  
 LIMS Number: L29389-5 Receive Date: 07/28/2006

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 (DIST)	2010	4.73E+01	1.14E+02	<b>1.83E+02</b>	pCi/L		10	ml	07/27/06 13:15	07/31/06	60	M	U
TOTAL SR	2018	4.09E-01	8.63E-01	<b>1.74E+00</b>	pCi/L		450	ml	07/27/06 13:15	07/31/06	80	M	U
MN-54	2007	-3.44E+00	3.92E+00	<b>5.91E+00</b>	pCi/L		2993	ml	07/27/06 13:15	07/28/06	8821	Sec	U
CO-58	2007	-5.43E+00	3.69E+00	<b>5.21E+00</b>	pCi/L		2993	ml	07/27/06 13:15	07/28/06	8821	Sec	U
FE-59	2007	8.66E+00	6.87E+00	<b>1.26E+01</b>	pCi/L		2993	ml	07/27/06 13:15	07/28/06	8821	Sec	U
CO-60	2007	1.10E+00	3.99E+00	<b>6.95E+00</b>	pCi/L		2993	ml	07/27/06 13:15	07/28/06	8821	Sec	U*
ZN-65	2007	2.10E+01	1.03E+01	<b>1.78E+01</b>	pCi/L		2993	ml	07/27/06 13:15	07/28/06	8821	Sec	U
NB-95	2007	5.60E+00	4.41E+00	<b>7.00E+00</b>	pCi/L		2993	ml	07/27/06 13:15	07/28/06	8821	Sec	U
ZR-95	2007	-2.45E+00	5.89E+00	<b>9.31E+00</b>	pCi/L		2993	ml	07/27/06 13:15	07/28/06	8821	Sec	U
CS-134	2007	1.21E+01	6.09E+00	<b>7.21E+00</b>	pCi/L		2993	ml	07/27/06 13:15	07/28/06	8821	Sec	U*
CS-137	2007	2.96E-01	3.93E+00	<b>6.54E+00</b>	pCi/L		2993	ml	07/27/06 13:15	07/28/06	8821	Sec	U
BA-140	2007	-7.99E-01	1.32E+01	<b>2.14E+01</b>	pCi/L		2993	ml	07/27/06 13:15	07/28/06	8821	Sec	U
LA-140	2007	1.14E+00	4.79E+00	<b>8.05E+00</b>	pCi/L		2993	ml	07/27/06 13:15	07/28/06	8821	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**  
 08/01/06 09:31

**L29389**

Conestoga-Rovers & Associates

EX001-3ESPQUAD-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-QC-MW-QC-1111-072706-NZ-006</b> Matrix: Ground Water (WG) Station: Collect Start: 07/27/2006 14:05 Description: Collect Stop: Volume: LIMS Number: L29389-6 Receive Date: 07/28/2006 % Moisture:													
H-3 (DIST)	2010	4.20E+02	1.33E+02	1.79E+02	pCi/L		10	ml		07/31/06	60	M	+
TOTAL SR	2018	-1.72E-01	8.72E-01	1.89E+00	pCi/L		450	ml	07/27/06 14:05	07/31/06	80	M	U
MN-54	2007	-1.81E-01	3.11E+00	5.43E+00	pCi/L		2929.5	ml	07/27/06 14:05	07/28/06	10871	Sec	U
CO-58	2007	-2.54E+00	3.21E+00	5.33E+00	pCi/L		2929.5	ml	07/27/06 14:05	07/28/06	10871	Sec	U
FE-59	2007	-1.29E-01	5.95E+00	1.05E+01	pCi/L		2929.5	ml	07/27/06 14:05	07/28/06	10871	Sec	U
CO-60	2007	-2.38E+00	3.23E+00	5.31E+00	pCi/L		2929.5	ml	07/27/06 14:05	07/28/06	10871	Sec	U
ZN-65	2007	2.17E+01	9.55E+00	1.68E+01	pCi/L		2929.5	ml	07/27/06 14:05	07/28/06	10871	Sec	U*
NB-95	2007	5.85E+00	4.23E+00	6.93E+00	pCi/L		2929.5	ml	07/27/06 14:05	07/28/06	10871	Sec	U
ZR-95	2007	-2.18E+00	6.34E+00	9.84E+00	pCi/L		2929.5	ml	07/27/06 14:05	07/28/06	10871	Sec	U
CS-134	2007	1.91E+01	5.23E+00	9.05E+00	pCi/L		2929.5	ml	07/27/06 14:05	07/28/06	10871	Sec	U*
CS-137	2007	-1.43E-01	3.56E+00	6.11E+00	pCi/L		2929.5	ml	07/27/06 14:05	07/28/06	10871	Sec	U
BA-140	2007	-1.25E+00	1.24E+01	2.14E+01	pCi/L		2929.5	ml	07/27/06 14:05	07/28/06	10871	Sec	U
LA-140	2007	3.22E-01	3.65E+00	6.62E+00	pCi/L		2929.5	ml	07/27/06 14:05	07/28/06	10871	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 09:31

**L29389**

Conestoga-Rovers & Associates

EX001-3ESPQUAD-06

Kathy Shaw

Sample ID: **RB-QC-MW-QC-115S-072706-NZ-007**

Station:

Description:

LIMS Number: L29389-7

Collect Start: 07/27/2006 14:15

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	<b>2.82E+02</b>	1.24E+02	1.76E+02	pCi/L		10	ml		07/31/06	60	M	+
TOTAL SR	2018	-3.31E-01	6.70E-01	<b>1.51E+00</b>	pCi/L		450	ml	07/27/06 14:15	07/31/06	80	M	U
MN-54	2007	-3.11E+00	3.52E+00	<b>5.51E+00</b>	pCi/L		3087.9	ml	07/27/06 14:15	07/28/06	11431	Sec	U
CO-58	2007	-2.85E+00	3.62E+00	<b>5.57E+00</b>	pCi/L		3087.9	ml	07/27/06 14:15	07/28/06	11431	Sec	U
FE-59	2007	2.44E-01	6.65E+00	<b>1.09E+01</b>	pCi/L		3087.9	ml	07/27/06 14:15	07/28/06	11431	Sec	U
CO-60	2007	-2.85E+00	3.60E+00	<b>5.40E+00</b>	pCi/L		3087.9	ml	07/27/06 14:15	07/28/06	11431	Sec	U
ZN-65	2007	7.71E+00	7.70E+00	<b>1.35E+01</b>	pCi/L		3087.9	ml	07/27/06 14:15	07/28/06	11431	Sec	U
NB-95	2007	3.01E+00	3.37E+00	<b>5.81E+00</b>	pCi/L		3087.9	ml	07/27/06 14:15	07/28/06	11431	Sec	U
ZR-95	2007	-3.26E+00	6.29E+00	<b>9.90E+00</b>	pCi/L		3087.9	ml	07/27/06 14:15	07/28/06	11431	Sec	U
CS-134	2007	3.12E+00	4.93E+00	<b>7.11E+00</b>	pCi/L		3087.9	ml	07/27/06 14:15	07/28/06	11431	Sec	U
CS-137	2007	-9.61E-01	3.88E+00	<b>6.27E+00</b>	pCi/L		3087.9	ml	07/27/06 14:15	07/28/06	11431	Sec	U
BA-140	2007	-1.16E+00	1.32E+01	<b>2.17E+01</b>	pCi/L		3087.9	ml	07/27/06 14:15	07/28/06	11431	Sec	U
LA-140	2007	5.29E+00	4.04E+00	<b>7.49E+00</b>	pCi/L		3087.9	ml	07/27/06 14:15	07/28/06	11431	Sec	U

**Flag Values**

- = Compound/Analyte not detected or less than 3 sigma
- U = 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
- U\* = Activity concentration exceeds customer reporting value
- High = MDC exceeds customer technical specification
- Spec = Low recovery
- L = High recovery
- H =

**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 L29389

8/1/2006 9:33:28AM



H-3 (DIST)

## Method Blank Summary

TBE Sample ID	Radionuclide	Matrix	Count Date/Time	Blank Result	Units	Qualifier	P/F
WG4269-1	H-3 (DIST)	WO	07/31/2006 0:08	< 1.750E+00	pCi/Total	U	P

## LCS Sample Summary

TBE Sample ID	Radionuclide	Matrix	Count Date/Time	Spike Value	LCS Result	Units	Spike Recovery	Range	Qualifier	P/F
WG4269-2	H-3 (DIST)	WO	07/31/2006 1:12	5.05E+002	4.960E+02	pCi/Total	98.3	70-130	+	P

Spike ID: 3H-041706-1  
Spike conc: 5.05E+002  
Spike Vol: 1.00E+000

## Duplicate Summary

TBE Sample ID	Radionuclide	Matrix	Count Date/Time	Original Result	DUP Result	Units	RPD	Range	Qualifier	P/F
WG4269-3 L29389-6	H-3 (DIST)	WG	07/31/2006 1:30	4.200E+02	5.110E+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 L29389

8/1/2006 9:33:28AM



## 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>
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>	<u>P/F</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>	<u>P/F</u>
WG4278-3 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

Raw Data Sheet (rawdata)  
 Aug 01 2006, 09:46 am

Page: 1

Work Order: L29389	Customer: Exelon	Project: EX001-3ESPQVAD-06	Decay & Ingrowth Analyst							
Nuclide: H-3 (DIST)	Reference Date/time	Volume/ Aliquot	Mount Weight	Recovery	Count Date/time	Counter ID	Total counts	Sample dt (min)	Bkg counts	Eff. Factor
L29389-1	H-3 DIST	10 ml	0	02:33	LS7	375	34.56	2	60	.21
WG-QC-MW-QC-108I-072706-NZ-001	Activity: 1.89E+03 * Error: 2.52E+02	MDC: 2.4E+02	0	31-jul-06 03:11	LS7	127	60	2	60	.214
L29389-2	H-3 DIST	10 ml	0							
WG-QC-MW-QC-110I-072706-NZ-002	Activity: 2.31E+01 Error: 1.1E+02	MDC: 1.79E+02 *	0	31-jul-06 04:14	LS7	109	60	2	60	.215
L29389-3	H-3 DIST	10 ml	0							
WG-QC-MW-QC-114I-072706-NZ-003	Activity: -3.98E+01 Error: 1.05E+02	MDC: 1.78E+02 *	0	31-jul-06 05:18	LS7	130	60	2	60	.208
L29389-4	H-3 DIST	10 ml	0							
WG-QC-MW-QC-113I-072706-NZ-004	Activity: 3.69E+01 Error: 1.14E+02	MDC: 1.84E+02 *	0	31-jul-06 06:21	LS7	133	60	2	60	.21
L29389-5	H-3 DIST	10 ml	0							
WG-QC-MW-QC-112I-072706-NZ-005	Activity: 4.73E+01 Error: 1.14E+02	MDC: 1.83E+02 *	0	31-jul-06 07:25	LS7	240	60	2	60	.215
L29389-6	H-3 DIST	10 ml	0							
WG-QC-MW-QC-111I-072706-NZ-006	Activity: 4.2E+02 * Error: 1.33E+02	MDC: 1.79E+02	0	31-jul-06 08:28	LS7	202	60	2	60	.218
L29389-7	H-3 DIST	10 ml	0							
RB-QC-MW-QC-115S-072706-NZ-007	Activity: 2.82E+02 * Error: 1.24E+02	MDC: 1.76E+02	0							

Work Order: L29389	Customer: ExeIon															
Nuclide: SR-90 (FAST)	Project: EX001-3ESFQUAD-06															
Sample ID	Run Analysis	Reference Date/time	Volume/ Aliquot	Scavenger Date/time	Milking Date/time	Mount Weight	Recovery Date/time	Count Date/time	Counter ID	Total counts	Sample dt (min)	Bkg counts dt (min)	Bkg Eff. Factor	Decay & Ingrowth Factor	Analyst	
L29389-1	TOTAL SR	27-jul-06 08:35	450 ml	31-jul-06 12:30		0	31-jul-06 17:05	31-jul-06 17:05	X1D	65	80	312	400	.344	1	LCB
WG-QC-MW-QC-108I-072706-NZ-001																
Activity: 1.02E+00 Error: 6.94E-01 MDC: 1.45E+00 *																
L29389-2	TOTAL SR	27-jul-06 09:20	450 ml	31-jul-06 12:30		0	31-jul-06 17:05	31-jul-06 17:05	X2A	75	80	264	400	.354	1	LCB
WG-QC-MW-QC-110I-072706-NZ-002																
Activity: 1.01E+00 Error: 8.38E-01 MDC: 1.53E+00 *																
L29389-3	TOTAL SR	27-jul-06 10:10	450 ml	31-jul-06 12:30		0	31-jul-06 17:05	31-jul-06 17:05	X2B	70	80	289	400	.345	1	LCB
WG-QC-MW-QC-114I-072706-NZ-003																
Activity: 5.67E-01 Error: 8.4E-01 MDC: 1.65E+00 *																
L29389-4	TOTAL SR	27-jul-06 11:00	450 ml	31-jul-06 12:30		0	31-jul-06 17:05	31-jul-06 17:05	X2C	70	80	277	400	.344	1	LCB
WG-QC-MW-QC-113I-072706-NZ-004																
Activity: 6.53E-01 Error: 8.06E-01 MDC: 1.55E+00 *																
L29389-5	TOTAL SR	27-jul-06 13:15	450 ml	31-jul-06 12:30		0	31-jul-06 17:05	31-jul-06 17:05	X2D	70	80	307	400	.343	1	LCB
WG-QC-MW-QC-112I-072706-NZ-005																
Activity: 4.09E-01 Error: 8.63E-01 MDC: 1.74E+00 *																
L29389-6	TOTAL SR	27-jul-06 14:05	450 ml	31-jul-06 12:30		0	31-jul-06 17:05	31-jul-06 17:05	X3A	69	80	363	400	.335	1	LCB
WG-QC-MW-QC-111I-072706-NZ-006																
Activity: -1.72E-01 Error: 8.72E-01 MDC: 1.89E+00 *																
L29389-7	TOTAL SR	27-jul-06 14:15	450 ml	31-jul-06 12:30		0	31-jul-06 17:05	31-jul-06 17:05	X3B	56	80	321	400	.343	1	LCB
RB-QC-MW-QC-115S-072706-NZ-007																
Activity: -3.31E-01 Error: 6.7E-01 MDC: 1.51E+00 *																

Sec. Review: Analyst: LIMS: ✓

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VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 1-AUG-2006 00:07:12.97  
 TBE11 P-20610B HpGe \*\*\*\*\* Aquisition Date/Time: 28-JUL-2006 13:20:22.09

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LIMS No., Customer Name, Client ID: L29389-1 WG EX/QUAD

Sample ID : 11L29389-1 Smple Date: 27-JUL-2006 08:35:00.  
 Sample Type : WG Geometry : 113L082304  
 Quantity : 3.12270E+00 L BKGFILE : 11BG070106MT  
 Start Channel : 40 Energy Tol : 1.00000 Real Time : 0 02:55:35.61  
 End Channel : 4090 Pk Srch Sens: 5.00000 Live time : 0 02:55:31.28  
 MDA Constant : 0.00 Library Used: LIBD

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	%Eff	Cts/Sec	%Err	Fit
1	0	197.81	132	320	1.42	395.75	1.75E+00	1.26E-02	26.7	
2	1	238.42*	54	231	1.45	477.20	1.58E+00	5.13E-03	57.1	1.90E+00
3	1	241.90	175	181	1.18	484.18	1.56E+00	1.66E-02	14.6	
4	0	295.37*	353	230	1.31	591.40	1.37E+00	3.36E-02	10.5	
5	0	351.65*	510	241	1.40	704.23	1.20E+00	4.85E-02	8.2	
6	0	609.15*	410	72	1.68	1220.14	7.90E-01	3.90E-02	6.9	
7	0	767.82	77	59	4.32	1537.79	6.59E-01	7.31E-03	26.0	
8	0	1120.16*	109	20	1.87	2242.46	4.86E-01	1.04E-02	13.9	
9	0	1237.49	58	13	1.67	2476.89	4.48E-01	5.52E-03	18.3	
10	0	1407.13	20	12	0.99	2815.69	4.04E-01	1.91E-03	39.5	
11	0	1460.70*	21	13	2.82	2922.63	3.92E-01	1.96E-03	62.2	
12	0	1728.59	23	14	1.41	3457.05	3.44E-01	2.15E-03	40.0	
13	0	1762.59*	77	12	2.05	3524.85	3.39E-01	7.30E-03	17.3	

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	21	10.67*	3.919E-01	4.057E+01	4.057E+01	124.45
TH-228	238.63	54	44.60*	1.578E+00	6.311E+00	6.319E+00	114.17
	240.98	175	3.95	1.563E+00	2.327E+02	2.330E+02	29.15

Flag: "\*" = Keyline

Summary of Nuclide Activity  
 Sample ID : 11L29389-1

Page : 2  
 Acquisition date : 28-JUL-2006 13:20:22

Total number of lines in spectrum 13  
 Number of unidentified lines 9  
 Number of lines tentatively identified by NID 4 30.77%

Nuclide Type : natural

Nuclide	Hlife	Decay	Uncorrected pCi/L	Decay Corr pCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	4.057E+01	4.057E+01	5.049E+01	124.45	
TH-228	1.91Y	1.00	6.311E+00	6.319E+00	7.214E+00	114.17	
Total Activity :			4.688E+01	4.689E+01			

Grand Total Activity : 4.688E+01 4.689E+01

Flags: "K" = Keyline not found "M" = Manually accepted  
 "E" = Manually edited "A" = Nuclide specific abn. limit

Unidentified Energy Lines

Sample ID : 11L29389-1

Acquisition date : 28-JUL-2006 13:20:22

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	197.81	132	320	1.42	395.75	391	10	1.26E-02	53.4	1.75E+00	
0	295.37	353	230	1.31	591.40	586	12	3.36E-02	21.0	1.37E+00	
0	351.65	510	241	1.40	704.23	697	15	4.85E-02	16.4	1.20E+00	
0	609.15	410	72	1.68	1220.14	1215	14	3.90E-02	13.9	7.90E-01	
0	767.82	77	59	4.32	1537.79	1530	18	7.31E-03	51.9	6.59E-01	
0	1120.16	109	20	1.87	2242.46	2234	16	1.04E-02	27.7	4.86E-01	
0	1237.49	58	13	1.67	2476.89	2470	13	5.52E-03	36.6	4.48E-01	
0	1407.13	20	12	0.99	2815.69	2810	10	1.91E-03	79.1	4.04E-01	T
0	1728.59	23	14	1.41	3457.05	3450	12	2.15E-03	80.0	3.44E-01	
0	1762.59	77	12	2.05	3524.85	3516	17	7.30E-03	34.7	3.39E-01	

Flags: "T" = Tentatively associated

Summary of Nuclide Activity

Total number of lines in spectrum 13  
 Number of unidentified lines 9  
 Number of lines tentatively identified by NID 4 30.77%

Nuclide Type : natural

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/L	Wtd Mean Decay Corr pCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	4.057E+01	4.057E+01	5.049E+01	124.45	
TH-228	1.91Y	1.00	6.311E+00	6.319E+00	7.214E+00	114.17	
Total Activity :			4.688E+01	4.689E+01			

Grand Total Activity : 4.688E+01 4.689E+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	4.057E+01	5.049E+01	6.012E+01	0.000E+00	0.675
TH-228	6.319E+00	7.214E+00	1.061E+01	0.000E+00	0.595

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/L)	K.L. Ided	Act error	MDA (pCi/L)	MDA error	Act/MDA
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BE-7	-1.488E+01	2.844E+01	4.477E+01	0.000E+00	-0.332
NA-24	-2.492E+01	1.537E+01	2.062E+01	0.000E+00	-1.209
CR-51	-1.353E+01	3.115E+01	5.053E+01	0.000E+00	-0.268
MN-54	-3.961E-01	3.303E+00	5.369E+00	0.000E+00	-0.074
CO-57	2.191E+00	3.525E+00	5.875E+00	0.000E+00	0.373
CO-58	-2.333E+00	3.404E+00	5.288E+00	0.000E+00	-0.441
FE-59	1.199E+00	6.324E+00	1.072E+01	0.000E+00	0.112
CO-60	-3.421E+00	3.406E+00	4.942E+00	0.000E+00	-0.692
ZN-65	9.243E+00	8.598E+00	1.377E+01	0.000E+00	0.671
SE-75	-7.743E+00	4.492E+00	6.938E+00	0.000E+00	-1.116
SR-85	9.461E+00	4.163E+00	7.443E+00	0.000E+00	1.271
Y-88	-3.105E+00	3.825E+00	5.668E+00	0.000E+00	-0.548
NB-94	-6.428E-01	3.291E+00	5.373E+00	0.000E+00	-0.120
NB-95	6.350E+00	4.108E+00	6.643E+00	0.000E+00	0.956
ZR-95	2.554E+00	5.723E+00	9.478E+00	0.000E+00	0.270
MO-99	-1.614E+01	3.299E+01	5.236E+01	0.000E+00	-0.308
RU-103	7.196E-01	3.568E+00	5.867E+00	0.000E+00	0.123
RU-106	5.265E+00	2.899E+01	4.886E+01	0.000E+00	0.108
AG-110m	-1.081E+00	3.124E+00	5.054E+00	0.000E+00	-0.214
SN-113	9.591E-01	4.574E+00	7.583E+00	0.000E+00	0.126
SB-124	-5.129E+00	4.348E+00	5.535E+00	0.000E+00	-0.927
SB-125	-6.242E-01	1.008E+01	1.642E+01	0.000E+00	-0.038
TE-129M	4.807E+00	3.911E+01	6.421E+01	0.000E+00	0.075
I-131	-1.489E+00	3.850E+00	6.208E+00	0.000E+00	-0.240
BA-133	1.117E+01	5.732E+00	9.080E+00	0.000E+00	1.231
CS-134	8.560E+00	4.396E+00	7.158E+00	0.000E+00	1.196
CS-136	2.326E+00	3.411E+00	5.913E+00	0.000E+00	0.393
CS-137	2.101E+00	3.430E+00	5.942E+00	0.000E+00	0.354
CE-139	-8.446E-01	3.569E+00	5.748E+00	0.000E+00	-0.147
BA-140	3.794E-01	1.296E+01	2.103E+01	0.000E+00	0.018
LA-140	1.127E+00	4.553E+00	7.642E+00	0.000E+00	0.147
CE-141	-2.799E+00	6.241E+00	1.003E+01	0.000E+00	-0.279
CE-144	-2.429E+01	2.687E+01	4.261E+01	0.000E+00	-0.570
EU-152	-1.183E+01	1.293E+01	1.702E+01	0.000E+00	-0.695
EU-154	2.344E+00	7.394E+00	1.221E+01	0.000E+00	0.192
RA-226	-7.558E+01	9.219E+01	1.450E+02	0.000E+00	-0.521
AC-228	-6.366E+00	1.413E+01	2.251E+01	0.000E+00	-0.283
TH-232	-6.363E+00	1.413E+01	2.250E+01	0.000E+00	-0.283
U-235	-2.560E+01	2.828E+01	4.480E+01	0.000E+00	-0.571
U-238	-1.491E+02	3.883E+02	6.093E+02	0.000E+00	-0.245
AM-241	-2.608E+01	4.104E+01	6.715E+01	0.000E+00	-0.388

A,11L29389-1	,08/01/2006	00:07,07/27/2006	08:35,	3.123E+00,L29389-1	WG EX
B,11L29389-1	,LIBD	,07/28/2006	09:50,	113L082304	
C,K-40	,YES,	4.057E+01,	5.049E+01,	6.012E+01,,	0.675
C,TH-228	,YES,	6.319E+00,	7.214E+00,	1.061E+01,,	0.595
C,BE-7	,NO,	-1.488E+01,	2.844E+01,	4.477E+01,,	-0.332
C,NA-24	,NO,	-2.492E+01,	1.537E+01,	2.062E+01,,	-1.209
C,CR-51	,NO,	-1.353E+01,	3.115E+01,	5.053E+01,,	-0.268
C,MN-54	,NO,	-3.961E-01,	3.303E+00,	5.369E+00,,	-0.074
C,CO-57	,NO,	2.191E+00,	3.525E+00,	5.875E+00,,	0.373
C,CO-58	,NO,	-2.333E+00,	3.404E+00,	5.288E+00,,	-0.441
C,FE-59	,NO,	1.199E+00,	6.324E+00,	1.072E+01,,	0.112
C,CO-60	,NO,	-3.421E+00,	3.406E+00,	4.942E+00,,	-0.692
C,ZN-65	,NO,	9.243E+00,	8.598E+00,	1.377E+01,,	0.671
C,SE-75	,NO,	-7.743E+00,	4.492E+00,	6.938E+00,,	-1.116
C,SR-85	,NO,	9.461E+00,	4.163E+00,	7.443E+00,,	1.271
C,Y-88	,NO,	-3.105E+00,	3.825E+00,	5.668E+00,,	-0.548
C,NB-94	,NO,	-6.428E-01,	3.291E+00,	5.373E+00,,	-0.120
C,NB-95	,NO,	6.350E+00,	4.108E+00,	6.643E+00,,	0.956
C,ZR-95	,NO,	2.554E+00,	5.723E+00,	9.478E+00,,	0.270
C,MO-99	,NO,	-1.614E+01,	3.299E+01,	5.236E+01,,	-0.308
C,RU-103	,NO,	7.196E-01,	3.568E+00,	5.867E+00,,	0.123
C,RU-106	,NO,	5.265E+00,	2.899E+01,	4.886E+01,,	0.108
C,AG-110m	,NO,	-1.081E+00,	3.124E+00,	5.054E+00,,	-0.214
C,SN-113	,NO,	9.591E-01,	4.574E+00,	7.583E+00,,	0.126
C,SB-124	,NO,	-5.129E+00,	4.348E+00,	5.535E+00,,	-0.927
C,SB-125	,NO,	-6.242E-01,	1.008E+01,	1.642E+01,,	-0.038
C,TE-129M	,NO,	4.807E+00,	3.911E+01,	6.421E+01,,	0.075
C,I-131	,NO,	-1.489E+00,	3.850E+00,	6.208E+00,,	-0.240
C,BA-133	,NO,	1.117E+01,	5.732E+00,	9.080E+00,,	1.231
C,CS-134	,NO,	8.560E+00,	4.396E+00,	7.158E+00,,	1.196
C,CS-136	,NO,	2.326E+00,	3.411E+00,	5.913E+00,,	0.393
C,CS-137	,NO,	2.101E+00,	3.430E+00,	5.942E+00,,	0.354
C,CE-139	,NO,	-8.446E-01,	3.569E+00,	5.748E+00,,	-0.147
C,BA-140	,NO,	3.794E-01,	1.296E+01,	2.103E+01,,	0.018
C,LA-140	,NO,	1.127E+00,	4.553E+00,	7.642E+00,,	0.147
C,CE-141	,NO,	-2.799E+00,	6.241E+00,	1.003E+01,,	-0.279
C,CE-144	,NO,	-2.429E+01,	2.687E+01,	4.261E+01,,	-0.570
C,EU-152	,NO,	-1.183E+01,	1.293E+01,	1.702E+01,,	-0.695
C,EU-154	,NO,	2.344E+00,	7.394E+00,	1.221E+01,,	0.192
C,RA-226	,NO,	-7.558E+01,	9.219E+01,	1.450E+02,,	-0.521
C,AC-228	,NO,	-6.366E+00,	1.413E+01,	2.251E+01,,	-0.283
C,TH-232	,NO,	-6.363E+00,	1.413E+01,	2.250E+01,,	-0.283
C,U-235	,NO,	-2.560E+01,	2.828E+01,	4.480E+01,,	-0.571
C,U-238	,NO,	-1.491E+02,	3.883E+02,	6.093E+02,,	-0.245
C,AM-241	,NO,	-2.608E+01,	4.104E+01,	6.715E+01,,	-0.388



Sec. Review: Analyst: LIMS: 

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VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 28-JUL-2006 17:11:00.52  
 TBE10 12892256 HpGe \*\*\*\*\* Aquisition Date/Time: 28-JUL-2006 13:20:21.07

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LIMS No., Customer Name, Client ID: L29389-2 WG EX/QUAD

Sample ID : 10L29389-2                      Smple Date: 27-JUL-2006 09:20:00.  
 Sample Type : WG                              Geometry : 1035L091004  
 Quantity : 3.26040E+00 L                      BKGFILE : 10BG070106MT  
 Start Channel : 80                      Energy Tol : 1.00000                      Real Time : 0 03:50:27.57  
 End Channel : 4090                      Pk Srch Sens: 5.00000                      Live time : 0 03:50:24.98  
 MDA Constant : 0.00                      Library Used: LIBD

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	%Eff	Cts/Sec	%Err	Fit
1	1	66.14	121	633	1.44	131.72	6.29E-01	8.72E-03	38.7	9.06E-01
2	1	74.75*	8	509	1.39	148.94	8.79E-01	5.53E-04	574.2	1.75E+00
3	1	77.17	187	487	1.33	153.79	9.45E-01	1.36E-02	22.2	
4	1	198.14*	78	449	1.66	395.94	1.55E+00	5.63E-03	54.5	5.97E-01
5	1	238.49*	94	277	1.54	476.72	1.40E+00	6.77E-03	35.4	2.55E+00
6	1	242.21	172	264	1.55	484.17	1.39E+00	1.25E-02	18.9	
7	1	295.23*	193	280	1.62	590.31	1.21E+00	1.40E-02	20.1	4.85E+00
8	1	351.80*	391	248	1.28	703.55	1.07E+00	2.83E-02	10.0	7.35E-01
9	1	609.24*	409	98	1.60	1218.91	6.94E-01	2.95E-02	7.5	7.02E-01
10	1	768.10	36	66	1.03	1536.93	5.79E-01	2.57E-03	49.9	9.06E-01
11	1	1120.29*	83	59	1.82	2241.99	4.33E-01	5.97E-03	25.3	7.21E-01
12	1	1238.54*	37	48	2.99	2478.72	4.01E-01	2.68E-03	47.1	1.60E+00
13	1	1377.75	46	22	2.66	2757.41	3.71E-01	3.32E-03	24.4	3.62E+00
14	1	1460.88*	15	37	2.40	2923.83	3.56E-01	1.10E-03	111.0	8.51E-01
15	1	1730.26	32	20	4.50	3463.14	3.17E-01	2.30E-03	35.2	1.15E+00
16	1	1764.73*	65	29	2.15	3532.15	3.13E-01	4.71E-03	23.6	1.25E+00
17	1	1847.53	15	16	1.24	3697.92	3.05E-01	1.10E-03	61.0	5.56E-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	15	10.67*	3.559E-01	2.408E+01	2.408E+01	222.00
TH-228	238.63	94	44.60*	1.401E+00	8.977E+00	8.988E+00	70.84
	240.98	-----	3.95	1.392E+00	-----	Line Not Found	-----

Flag: "\*" = Keyline

Summary of Nuclide Activity  
 Sample ID : 10L29389-2

Acquisition date : 28-JUL-2006 13:20:21

Total number of lines in spectrum 17  
 Number of unidentified lines 15  
 Number of lines tentatively identified by NID 2 11.76%

Nuclide Type : natural

Nuclide	Hlife	Decay	Uncorrected pCi/L	Decay Corr pCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	2.408E+01	2.408E+01	5.347E+01	222.00	
TH-228	1.91Y	1.00	8.977E+00	8.988E+00	6.367E+00	70.84	
Total Activity :			3.306E+01	3.307E+01			

Grand Total Activity : 3.306E+01 3.307E+01

Flags: "K" = Keyline not found  
 "E" = Manually edited

"M" = Manually accepted  
 "A" = Nuclide specific abn. limit

Unidentified Energy Lines  
Sample ID : 10L29389-2

Acquisition date : 28-JUL-2006 13:20:21

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
1	66.14	121	633	1.44	131.72	128	9	8.72E-03	77.5	6.29E-01	
1	74.75	8	509	1.39	148.94	141	18	5.53E-04	****	8.79E-01	
1	77.17	187	487	1.33	153.79	141	18	1.36E-02	44.4	9.45E-01	
1	198.14	78	449	1.66	395.94	391	10	5.63E-03	****	1.55E+00	
1	242.21	172	264	1.55	484.17	472	18	1.25E-02	37.8	1.39E+00	
1	295.23	193	280	1.62	590.31	586	12	1.40E-02	40.1	1.21E+00	
1	351.80	391	248	1.28	703.55	698	12	2.83E-02	20.1	1.07E+00	
1	609.24	409	98	1.60	1218.91	1212	13	2.95E-02	15.1	6.94E-01	
1	768.10	36	66	1.03	1536.93	1531	12	2.57E-03	99.9	5.79E-01	
1	1120.29	83	59	1.82	2241.99	2234	17	5.97E-03	50.7	4.33E-01	
1	1238.54	37	48	2.99	2478.72	2474	15	2.68E-03	94.2	4.01E-01	
1	1377.75	46	22	2.66	2757.41	2751	11	3.32E-03	48.8	3.71E-01	
1	1730.26	32	20	4.50	3463.14	3454	16	2.30E-03	70.3	3.17E-01	
1	1764.73	65	29	2.15	3532.15	3526	16	4.71E-03	47.3	3.13E-01	
1	1847.53	15	16	1.24	3697.92	3691	13	1.10E-03	****	3.05E-01	

Flags: "T" = Tentatively associated

#### Summary of Nuclide Activity

Total number of lines in spectrum	17	
Number of unidentified lines	15	
Number of lines tentatively identified by NID	2	11.76%

Nuclide Type : natural

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/L	Wtd Mean Decay Corr pCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	2.408E+01	2.408E+01	5.347E+01	222.00	
TH-228	1.91Y	1.00	8.977E+00	8.988E+00	6.367E+00	70.84	
Total Activity :			3.306E+01	3.307E+01			

Grand Total Activity : 3.306E+01 3.307E+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	2.408E+01	5.347E+01	5.600E+01	0.000E+00	0.430
TH-228	8.988E+00	6.367E+00	1.073E+01	0.000E+00	0.838

## ---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/L)	K.L. Ided	Act error	MDA (pCi/L)	MDA error	Act/MDA
BE-7	2.346E+00		3.009E+01	4.936E+01	0.000E+00	0.048
NA-24	1.968E+00		1.750E+01	2.449E+01	0.000E+00	0.080
CR-51	-2.731E+01		3.086E+01	4.953E+01	0.000E+00	-0.551
MN-54	3.562E+00		3.439E+00	6.011E+00	0.000E+00	0.593
CO-57	-1.505E+00		3.808E+00	6.227E+00	0.000E+00	-0.242
CO-58	-1.938E+00		3.572E+00	5.669E+00	0.000E+00	-0.342
FE-59	-4.927E+00		6.415E+00	1.002E+01	0.000E+00	-0.492
CO-60	-9.014E-01		3.436E+00	5.508E+00	0.000E+00	-0.164
ZN-65	1.585E+01		1.012E+01	1.611E+01	0.000E+00	0.984
SE-75	2.152E+00		4.882E+00	8.240E+00	0.000E+00	0.261
SR-85	1.587E+01		4.035E+00	7.531E+00	0.000E+00	2.107
Y-88	3.440E+00		3.514E+00	5.915E+00	0.000E+00	0.581
NB-94	5.523E-01		3.432E+00	5.723E+00	0.000E+00	0.096
NB-95	3.702E+00		3.674E+00	6.387E+00	0.000E+00	0.580
ZR-95	-2.086E+00		6.312E+00	9.566E+00	0.000E+00	-0.218
MO-99	-4.146E+00		3.356E+01	5.491E+01	0.000E+00	-0.076
RU-103	8.061E-01		3.582E+00	5.908E+00	0.000E+00	0.136
RU-106	1.482E+00		3.074E+01	5.120E+01	0.000E+00	0.029
AG-110m	-2.854E-02		3.418E+00	5.662E+00	0.000E+00	-0.005
SN-113	3.308E+00		4.558E+00	7.724E+00	0.000E+00	0.428
SB-124	-2.630E+00		4.252E+00	5.703E+00	0.000E+00	-0.461
SB-125	3.599E+00		1.027E+01	1.710E+01	0.000E+00	0.210
TE-129M	2.692E+01		3.906E+01	6.602E+01	0.000E+00	0.408
I-131	1.433E+00		3.901E+00	6.530E+00	0.000E+00	0.219
BA-133	3.139E+01		6.433E+00	1.104E+01	0.000E+00	2.844
CS-134	2.247E+01		5.276E+00	9.064E+00	0.000E+00	2.480
CS-136	-5.181E-01		3.419E+00	5.556E+00	0.000E+00	-0.093
CS-137	5.466E+00		3.766E+00	6.726E+00	0.000E+00	0.813
CE-139	-2.959E-01		3.803E+00	6.219E+00	0.000E+00	-0.048
BA-140	2.596E+00		1.280E+01	2.106E+01	0.000E+00	0.123
LA-140	-5.023E-01		3.782E+00	6.066E+00	0.000E+00	-0.083
CE-141	-1.352E+01		6.894E+00	1.083E+01	0.000E+00	-1.248
CE-144	-5.042E+01		3.033E+01	4.811E+01	0.000E+00	-1.048
EU-152	-1.362E+01		1.362E+01	1.800E+01	0.000E+00	-0.756
EU-154	-3.997E+00		7.989E+00	1.303E+01	0.000E+00	-0.307
RA-226	1.206E+01		9.696E+01	1.580E+02	0.000E+00	0.076
AC-228	-8.681E-01		1.306E+01	2.143E+01	0.000E+00	-0.040
TH-232	-8.678E-01		1.306E+01	2.143E+01	0.000E+00	-0.040
U-235	-9.877E+00		3.069E+01	5.009E+01	0.000E+00	-0.197
U-238	4.030E+02		3.819E+02	6.690E+02	0.000E+00	0.602
AM-241	-3.103E+01		4.018E+01	5.362E+01	0.000E+00	-0.579

A,10L29389-2	,07/28/2006	17:11,07/27/2006	09:20,	3.260E+00,L29389-2	WG EX
B,10L29389-2	,LIBD		,07/28/2006	09:50,1035L091004	
C,K-40	,YES,	2.408E+01,	5.347E+01,	5.600E+01,,	0.430
C,TH-228	,YES,	8.988E+00,	6.367E+00,	1.073E+01,,	0.838
C,BE-7	,NO,	2.346E+00,	3.009E+01,	4.936E+01,,	0.048
C,NA-24	,NO,	1.968E+00,	1.750E+01,	2.449E+01,,	0.080
C,CR-51	,NO,	-2.731E+01,	3.086E+01,	4.953E+01,,	-0.551
C,MN-54	,NO,	3.562E+00,	3.439E+00,	6.011E+00,,	0.593
C,CO-57	,NO,	-1.505E+00,	3.808E+00,	6.227E+00,,	-0.242
C,CO-58	,NO,	-1.938E+00,	3.572E+00,	5.669E+00,,	-0.342
C,FE-59	,NO,	-4.927E+00,	6.415E+00,	1.002E+01,,	-0.492
C,CO-60	,NO,	-9.014E-01,	3.436E+00,	5.508E+00,,	-0.164
C,ZN-65	,NO,	1.585E+01,	1.012E+01,	1.611E+01,,	0.984
C,SE-75	,NO,	2.152E+00,	4.882E+00,	8.240E+00,,	0.261
C,SR-85	,NO,	1.587E+01,	4.035E+00,	7.531E+00,,	2.107
C,Y-88	,NO,	3.440E+00,	3.514E+00,	5.915E+00,,	0.581
C,NB-94	,NO,	5.523E-01,	3.432E+00,	5.723E+00,,	0.096
C,NB-95	,NO,	3.702E+00,	3.674E+00,	6.387E+00,,	0.580
C,ZR-95	,NO,	-2.086E+00,	6.312E+00,	9.566E+00,,	-0.218
C,MO-99	,NO,	-4.146E+00,	3.356E+01,	5.491E+01,,	-0.076
C,RU-103	,NO,	8.061E-01,	3.582E+00,	5.908E+00,,	0.136
C,RU-106	,NO,	1.482E+00,	3.074E+01,	5.120E+01,,	0.029
C,AG-110m	,NO,	-2.854E-02,	3.418E+00,	5.662E+00,,	-0.005
C,SN-113	,NO,	3.308E+00,	4.558E+00,	7.724E+00,,	0.428
C,SB-124	,NO,	-2.630E+00,	4.252E+00,	5.703E+00,,	-0.461
C,SB-125	,NO,	3.599E+00,	1.027E+01,	1.710E+01,,	0.210
C,TE-129M	,NO,	2.692E+01,	3.906E+01,	6.602E+01,,	0.408
C,I-131	,NO,	1.433E+00,	3.901E+00,	6.530E+00,,	0.219
C,BA-133	,NO,	3.139E+01,	6.433E+00,	1.104E+01,,	2.844
C,CS-134	,NO,	2.247E+01,	5.276E+00,	9.064E+00,,	2.480
C,CS-136	,NO,	-5.181E-01,	3.419E+00,	5.556E+00,,	-0.093
C,CS-137	,NO,	5.466E+00,	3.766E+00,	6.726E+00,,	0.813
C,CE-139	,NO,	-2.959E-01,	3.803E+00,	6.219E+00,,	-0.048
C,BA-140	,NO,	2.596E+00,	1.280E+01,	2.106E+01,,	0.123
C,LA-140	,NO,	-5.023E-01,	3.782E+00,	6.066E+00,,	-0.083
C,CE-141	,NO,	-1.352E+01,	6.894E+00,	1.083E+01,,	-1.248
C,CE-144	,NO,	-5.042E+01,	3.033E+01,	4.811E+01,,	-1.048
C,EU-152	,NO,	-1.362E+01,	1.362E+01,	1.800E+01,,	-0.756
C,EU-154	,NO,	-3.997E+00,	7.989E+00,	1.303E+01,,	-0.307
C,RA-226	,NO,	1.206E+01,	9.696E+01,	1.580E+02,,	0.076
C,AC-228	,NO,	-8.681E-01,	1.306E+01,	2.143E+01,,	-0.040
C,TH-232	,NO,	-8.678E-01,	1.306E+01,	2.143E+01,,	-0.040
C,U-235	,NO,	-9.877E+00,	3.069E+01,	5.009E+01,,	-0.197
C,U-238	,NO,	4.030E+02,	3.819E+02,	6.690E+02,,	0.602
C,AM-241	,NO,	-3.103E+01,	4.018E+01,	5.362E+01,,	-0.579



Summary of Nuclide Activity  
 Sample ID : 23L29389-3

Page : 2  
 Acquisition date : 30-JUL-2006 21:04:06

Total number of lines in spectrum 14  
 Number of unidentified lines 11  
 Number of lines tentatively identified by NID 3 21.43%

Nuclide Type : natural

Nuclide	Hlife	Decay	Uncorrected pCi/L	Decay Corr pCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	2.056E+00	2.056E+00	48.36E+00	2352.21	
TH-228	1.91Y	1.00	6.487E+00	6.509E+00	6.490E+00	99.70	
Total Activity :			8.542E+00	8.565E+00			

Grand Total Activity : 8.542E+00 8.565E+00

Flags: "K" = Keyline not found  
 "E" = Manually edited

"M" = Manually accepted  
 "A" = Nuclide specific abn. limit

Unidentified Energy Lines  
Sample ID : 23L29389-3

Page : 3  
Acquisition date : 30-JUL-2006 21:04:06

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	33.57	0	100	1.00	67.47	65	6	6.69E-06	****	9.06E-02	
0	41.51	46	277	3.26	83.32	79	9	4.69E-03	****	2.50E-01	
0	77.28	100	375	1.05	154.77	152	7	1.03E-02	68.1	1.36E+00	
0	92.67	52	449	1.37	185.53	182	9	5.33E-03	****	1.69E+00	
0	139.46	23	438	0.56	279.02	276	8	2.41E-03	****	2.05E+00	
0	295.15	153	197	1.30	590.12	586	9	1.58E-02	37.4	1.50E+00	
0	351.73	255	208	1.35	703.22	698	13	2.63E-02	27.1	1.32E+00	
0	609.19	283	70	1.33	1217.96	1211	14	2.91E-02	18.1	8.59E-01	
0	1120.92	60	47	1.64	2241.90	2234	17	6.18E-03	62.1	5.52E-01	
0	1728.94	28	7	0.89	3459.85	3452	14	2.89E-03	54.9	4.07E-01	
0	1764.28	61	3	2.61	3530.69	3525	14	6.26E-03	32.0	4.00E-01	

Flags: "T" = Tentatively associated

#### Summary of Nuclide Activity

Total number of lines in spectrum	14	
Number of unidentified lines	11	
Number of lines tentatively identified by NID	3	21.43%

Nuclide Type : natural

Nuclide	Hlife	Decay	Wtd Mean	Wtd Mean	Decay Corr	2-Sigma	2-Sigma	%Error	Flags
			Uncorrected	Decay Corr					
K-40	1.28E+09Y	1.00	2.056E+00	2.056E+00	48.36E+00	2352.21			
TH-228	1.91Y	1.00	6.487E+00	6.509E+00	6.490E+00	99.70			
Total Activity :			8.542E+00	8.565E+00					

Grand Total Activity : 8.542E+00 8.565E+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
K-40	2.056E+00	4.836E+01	3.720E+01	0.000E+00	0.055
TH-228	6.509E+00	6.490E+00	8.809E+00	0.000E+00	0.739

---- Non-Identified Nuclides ----

Key-Line Activity	K.L.	Act error	MDA	MDA error	Act/MDA
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Nuclide	(pCi/L)	Ided	(pCi/L)		
BE-7	2.148E+01	2.365E+01	4.398E+01	0.000E+00	0.488
NA-24	1.009E+02	1.271E+02	2.514E+02	0.000E+00	0.401
CR-51	1.485E+01	2.575E+01	4.508E+01	0.000E+00	0.330
MN-54	-9.260E-01	2.548E+00	4.462E+00	0.000E+00	-0.208
CO-57	-1.425E-01	3.172E+00	5.241E+00	0.000E+00	-0.027
CO-58	-2.534E+00	2.855E+00	4.542E+00	0.000E+00	-0.558
FE-59	3.948E-02	5.098E+00	9.147E+00	0.000E+00	0.004
CO-60	-1.082E+00	2.917E+00	4.965E+00	0.000E+00	-0.218
ZN-65	-5.608E+00	7.538E+00	1.018E+01	0.000E+00	-0.551
SE-75	-2.260E+00	4.070E+00	6.783E+00	0.000E+00	-0.333
SR-85	-1.346E+00	3.617E+00	6.148E+00	0.000E+00	-0.219
Y-88	1.787E-01	2.631E+00	4.956E+00	0.000E+00	0.036
NB-94	2.879E+00	2.589E+00	4.913E+00	0.000E+00	0.586
NB-95	5.461E+00	2.878E+00	5.732E+00	0.000E+00	0.953
ZR-95	1.172E+00	4.846E+00	8.628E+00	0.000E+00	0.136
MO-99	-2.652E+01	4.937E+01	8.197E+01	0.000E+00	-0.324
RU-103	-2.859E+00	2.892E+00	4.761E+00	0.000E+00	-0.600
RU-106	-8.852E+00	2.743E+01	4.674E+01	0.000E+00	-0.189
AG-110m	-1.328E+00	2.492E+00	4.177E+00	0.000E+00	-0.318
SN-113	2.347E+00	3.623E+00	6.385E+00	0.000E+00	0.368
SB-124	-1.548E-01	3.132E+00	4.684E+00	0.000E+00	-0.033
SB-125	-9.821E+00	8.271E+00	1.284E+01	0.000E+00	-0.765
TE-129M	-1.040E+01	3.272E+01	5.661E+01	0.000E+00	-0.184
I-131	1.833E+00	3.845E+00	6.705E+00	0.000E+00	0.273
BA-133	4.189E+00	4.434E+00	6.985E+00	0.000E+00	0.600
CS-134	2.024E+00	2.930E+00	4.737E+00	0.000E+00	0.427
CS-136	1.349E+00	3.704E+00	6.561E+00	0.000E+00	0.206
CS-137	-1.095E+00	2.815E+00	4.776E+00	0.000E+00	-0.229
CE-139	3.101E-01	3.011E+00	5.228E+00	0.000E+00	0.059
BA-140	-1.091E+01	1.136E+01	1.862E+01	0.000E+00	-0.586
LA-140	-7.200E-01	3.657E+00	6.553E+00	0.000E+00	-0.110
CE-141	3.568E+00	6.116E+00	9.898E+00	0.000E+00	0.360
CE-144	-6.547E-01	2.413E+01	3.839E+01	0.000E+00	-0.017
EU-152	-9.194E-01	9.154E+00	1.456E+01	0.000E+00	-0.063
EU-154	-3.513E+00	6.629E+00	1.077E+01	0.000E+00	-0.326
RA-226	1.603E+01	7.937E+01	1.406E+02	0.000E+00	0.114
AC-228	-4.872E+00	1.032E+01	1.833E+01	0.000E+00	-0.266
TH-232	-4.866E+00	1.030E+01	1.830E+01	0.000E+00	-0.266
U-235	-1.068E+01	2.971E+01	4.189E+01	0.000E+00	-0.255
U-238	6.224E+01	3.181E+02	5.877E+02	0.000E+00	0.106
AM-241	-9.464E+00	1.625E+01	2.710E+01	0.000E+00	-0.349

A, 23L29389-3 , 07/30/2006 23:46, 07/27/2006 10:10, 3.273E+00, WG L29389-3 EX  
 B, 23L29389-3 , LIBD , 07/28/2006 10:10, 2335L090704  
 C, K-40 , YES, 2.056E+00, 4.836E+01, 3.720E+01,, 0.055  
 C, TH-228 , YES, 6.509E+00, 6.490E+00, 8.809E+00,, 0.739  
 C, BE-7 , NO , 2.148E+01, 2.365E+01, 4.398E+01,, 0.488  
 C, NA-24 , NO , 1.009E+02, 1.271E+02, 2.514E+02,, 0.401  
 C, CR-51 , NO , 1.485E+01, 2.575E+01, 4.508E+01,, 0.330  
 C, MN-54 , NO , -9.260E-01, 2.548E+00, 4.462E+00,, -0.208  
 C, CO-57 , NO , -1.425E-01, 3.172E+00, 5.241E+00,, -0.027  
 C, CO-58 , NO , -2.534E+00, 2.855E+00, 4.542E+00,, -0.558  
 C, FE-59 , NO , 3.948E-02, 5.098E+00, 9.147E+00,, 0.004  
 C, CO-60 , NO , -1.082E+00, 2.917E+00, 4.965E+00,, -0.218  
 C, ZN-65 , NO , -5.608E+00, 7.538E+00, 1.018E+01,, -0.551  
 C, SE-75 , NO , -2.260E+00, 4.070E+00, 6.783E+00,, -0.333  
 C, SR-85 , NO , -1.346E+00, 3.617E+00, 6.148E+00,, -0.219  
 C, Y-88 , NO , 1.787E-01, 2.631E+00, 4.956E+00,, 0.036  
 C, NB-94 , NO , 2.879E+00, 2.589E+00, 4.913E+00,, 0.586  
 C, NB-95 , NO , 5.461E+00, 2.878E+00, 5.732E+00,, 0.953  
 C, ZR-95 , NO , 1.172E+00, 4.846E+00, 8.628E+00,, 0.136  
 C, MO-99 , NO , -2.652E+01, 4.937E+01, 8.197E+01,, -0.324  
 C, RU-103 , NO , -2.859E+00, 2.892E+00, 4.761E+00,, -0.600  
 C, RU-106 , NO , -8.852E+00, 2.743E+01, 4.674E+01,, -0.189  
 C, AG-110m , NO , -1.328E+00, 2.492E+00, 4.177E+00,, -0.318  
 C, SN-113 , NO , 2.347E+00, 3.623E+00, 6.385E+00,, 0.368  
 C, SB-124 , NO , -1.548E-01, 3.132E+00, 4.684E+00,, -0.033  
 C, SB-125 , NO , -9.821E+00, 8.271E+00, 1.284E+01,, -0.765  
 C, TE-129M , NO , -1.040E+01, 3.272E+01, 5.661E+01,, -0.184  
 C, I-131 , NO , 1.833E+00, 3.845E+00, 6.705E+00,, 0.273  
 C, BA-133 , NO , 4.189E+00, 4.434E+00, 6.985E+00,, 0.600  
 C, CS-134 , NO , 2.024E+00, 2.930E+00, 4.737E+00,, 0.427  
 C, CS-136 , NO , 1.349E+00, 3.704E+00, 6.561E+00,, 0.206  
 C, CS-137 , NO , -1.095E+00, 2.815E+00, 4.776E+00,, -0.229  
 C, CE-139 , NO , 3.101E-01, 3.011E+00, 5.228E+00,, 0.059  
 C, BA-140 , NO , -1.091E+01, 1.136E+01, 1.862E+01,, -0.586  
 C, LA-140 , NO , -7.200E-01, 3.657E+00, 6.553E+00,, -0.110  
 C, CE-141 , NO , 3.568E+00, 6.116E+00, 9.898E+00,, 0.360  
 C, CE-144 , NO , -6.547E-01, 2.413E+01, 3.839E+01,, -0.017  
 C, EU-152 , NO , -9.194E-01, 9.154E+00, 1.456E+01,, -0.063  
 C, EU-154 , NO , -3.513E+00, 6.629E+00, 1.077E+01,, -0.326  
 C, RA-226 , NO , 1.603E+01, 7.937E+01, 1.406E+02,, 0.114  
 C, AC-228 , NO , -4.872E+00, 1.032E+01, 1.833E+01,, -0.266  
 C, TH-232 , NO , -4.866E+00, 1.030E+01, 1.830E+01,, -0.266  
 C, U-235 , NO , -1.068E+01, 2.971E+01, 4.189E+01,, -0.255  
 C, U-238 , NO , 6.224E+01, 3.181E+02, 5.877E+02,, 0.106  
 C, AM-241 , NO , -9.464E+00, 1.625E+01, 2.710E+01,, -0.349

Sec. Review: *Kes* Analyst: *M* LIMS:

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VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 28-JUL-2006 15:52:30.79  
 TBE07 P-10768B HpGe \*\*\*\*\* Aquisition Date/Time: 28-JUL-2006 13:20:19.12

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LIMS No., Customer Name, Client ID: L29389-4 WG EX/QUAD

Sample ID : 07L29389-4 Smple Date: 27-JUL-2006 11:00:00.  
 Sample Type : WG Geometry : 073L082504  
 Quantity : 3.04170E+00 L BKGFILE : 07BG070106MT  
 Start Channel : 40 Energy Tol : 1.00000 Real Time : 0 02:32:02.94  
 End Channel : 4090 Pk Srch Sens: 5.00000 Live time : 0 02:32:00.95  
 MDA Constant : 0.00 Library Used: LIBD

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	%Eff	Cts/Sec	%Err	Fit
1	1	65.98*	98	316	1.59	132.83	7.92E-01	1.07E-02	33.9	1.57E+00
2	1	77.22*	78	283	1.02	155.33	1.23E+00	8.55E-03	39.6	1.71E+00
3	1	140.05*	97	334	1.43	281.17	2.36E+00	1.06E-02	37.6	1.34E+00
4	1	198.34*	70	285	1.24	397.89	2.25E+00	7.67E-03	48.5	1.40E+00
5	1	241.93*	163	141	1.20	485.17	2.04E+00	1.79E-02	15.4	9.32E-01
6	1	295.27*	273	166	1.65	591.97	1.81E+00	2.99E-02	12.2	3.03E+00
7	1	351.70*	413	171	1.18	704.95	1.61E+00	4.52E-02	8.4	2.81E+00
8	1	595.82	49	76	1.49	1193.63	1.10E+00	5.37E-03	37.4	1.76E+00
9	1	609.13*	396	76	1.59	1220.28	1.09E+00	4.34E-02	7.3	1.19E+00
10	1	767.84	44	68	1.87	1537.89	9.20E-01	4.78E-03	46.6	7.96E-01
11	1	1120.11*	86	50	2.26	2242.72	7.03E-01	9.40E-03	23.0	1.05E+00
12	1	1155.17	22	34	1.64	2312.85	6.88E-01	2.39E-03	62.8	6.12E-01
13	1	1239.76	32	57	2.42	2482.06	6.54E-01	3.54E-03	65.6	5.40E+00
14	1	1378.57	16	23	1.19	2759.67	6.07E-01	1.73E-03	76.6	2.54E+00
15	1	1730.33	54	15	5.58	3463.01	5.19E-01	5.93E-03	20.6	2.97E+00
16	1	1764.36*	57	12	2.43	3531.04	5.12E-01	6.23E-03	21.2	1.13E+00

Flag: "\*" = Peak area was modified by background subtraction

#### Nuclide Line Activity Report

Flag: "\*" = Keyline

Summary of Nuclide Activity  
Sample ID : 07L29389-4

Acquisition date : 28-JUL-2006 13:20:19

Total number of lines in spectrum	16	
Number of unidentified lines	15	
Number of lines tentatively identified by NID	1	6.25%

\*\*\*\* 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 : 07L29389-4

Page : 3  
Acquisition date : 28-JUL-2006 13:20:19

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
1	65.98	98	316	1.59	132.83	129	8	1.07E-02	67.9	7.92E-01	
1	77.22	78	283	1.02	155.33	153	7	8.55E-03	79.1	1.23E+00	
1	140.05	97	334	1.43	281.17	276	10	1.06E-02	75.2	2.36E+00	
1	198.34	70	285	1.24	397.89	393	10	7.67E-03	97.0	2.25E+00	
1	241.93	163	141	1.20	485.17	482	8	1.79E-02	30.9	2.04E+00	T
1	295.27	273	166	1.65	591.97	586	13	2.99E-02	24.4	1.81E+00	
1	351.70	413	171	1.18	704.95	699	12	4.52E-02	16.8	1.61E+00	
1	595.82	49	76	1.49	1193.63	1190	11	5.37E-03	74.8	1.10E+00	
1	609.13	396	76	1.59	1220.28	1212	14	4.34E-02	14.7	1.09E+00	
1	767.84	44	68	1.87	1537.89	1529	17	4.78E-03	93.1	9.20E-01	
1	1120.11	86	50	2.26	2242.72	2235	18	9.40E-03	46.0	7.03E-01	
1	1155.17	22	34	1.64	2312.85	2306	15	2.39E-03	****	6.88E-01	
1	1239.76	32	57	2.42	2482.06	2469	25	3.54E-03	****	6.54E-01	
1	1378.57	16	23	1.19	2759.67	2754	15	1.73E-03	****	6.07E-01	
1	1730.33	54	15	5.58	3463.01	3453	19	5.93E-03	41.3	5.19E-01	
1	1764.36	57	12	2.43	3531.04	3524	15	6.23E-03	42.4	5.12E-01	

Flags: "T" = Tentatively associated

#### Summary of Nuclide Activity

Total number of lines in spectrum 16  
 Number of unidentified lines 15  
 Number of lines tentatively identified by NID 1 6.25%  
 \*\*\*\* 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	2.044E+01		2.594E+01	4.471E+01	0.000E+00	0.457
NA-24	9.198E+00		1.299E+01	1.979E+01	0.000E+00	0.465
K-40	-3.441E+01		4.298E+01	7.782E+01	0.000E+00	-0.442
CR-51	-1.554E+01		2.891E+01	4.659E+01	0.000E+00	-0.334
MN-54	2.080E+00		3.207E+00	5.465E+00	0.000E+00	0.381
CO-57	2.231E+00		3.167E+00	5.244E+00	0.000E+00	0.425
CO-58	-3.164E+00		3.476E+00	5.321E+00	0.000E+00	-0.595
FE-59	3.616E+00		5.875E+00	1.008E+01	0.000E+00	0.359
CO-60	2.736E+00		3.526E+00	6.177E+00	0.000E+00	0.443
ZN-65	2.710E+01		9.240E+00	1.625E+01	0.000E+00	1.668
SE-75	-4.395E+00		4.153E+00	6.635E+00	0.000E+00	-0.662

Y-88	-3.457E+00	3.809E+00	5.564E+00	0.000E+00	-0.621
NB-94	2.469E-01	3.159E+00	5.238E+00	0.000E+00	0.047
NB-95	3.797E+00	3.848E+00	5.824E+00	0.000E+00	0.652
ZR-95	3.895E+00	6.006E+00	9.107E+00	0.000E+00	0.428
MO-99	8.266E+00	3.146E+01	5.264E+01	0.000E+00	0.157
RU-103	2.279E+00	3.290E+00	5.621E+00	0.000E+00	0.406
RU-106	-8.654E+00	2.937E+01	4.668E+01	0.000E+00	-0.185
AG-110m	-1.958E+00	3.130E+00	4.985E+00	0.000E+00	-0.393
SN-113	-3.304E-01	4.234E+00	6.860E+00	0.000E+00	-0.048
SB-124	7.508E-01	6.599E+00	4.896E+00	0.000E+00	0.153
SB-125	6.237E-01	9.218E+00	1.540E+01	0.000E+00	0.040
TE-129M	-3.477E+00	3.601E+01	5.937E+01	0.000E+00	-0.059
I-131	2.452E+00	3.558E+00	6.006E+00	0.000E+00	0.408
BA-133	1.698E+01	5.932E+00	9.582E+00	0.000E+00	1.773
CS-134	2.635E+01	7.238E+00	8.622E+00	0.000E+00	3.057
CS-136	1.007E+00	3.403E+00	5.668E+00	0.000E+00	0.178
CS-137	1.709E+00	3.422E+00	5.849E+00	0.000E+00	0.292
CE-139	5.860E-01	3.181E+00	5.297E+00	0.000E+00	0.111
BA-140	6.116E+00	1.155E+01	1.954E+01	0.000E+00	0.313
LA-140	-1.509E+00	4.086E+00	6.495E+00	0.000E+00	-0.232
CE-141	1.842E+00	6.420E+00	9.277E+00	0.000E+00	0.199
CE-144	1.592E+00	2.764E+01	3.975E+01	0.000E+00	0.040
EU-152	-6.061E+00	1.209E+01	1.624E+01	0.000E+00	-0.373
EU-154	-1.523E+00	6.723E+00	1.079E+01	0.000E+00	-0.141
RA-226	2.752E+01	8.261E+01	1.384E+02	0.000E+00	0.199
AC-228	-1.920E+00	1.288E+01	2.126E+01	0.000E+00	-0.090
TH-228	1.230E+01	7.509E+00	1.162E+01	0.000E+00	1.058
TH-232	-1.919E+00	1.288E+01	2.125E+01	0.000E+00	-0.090
U-235	1.665E+01	2.894E+01	4.241E+01	0.000E+00	0.393
U-238	1.668E+02	3.381E+02	5.780E+02	0.000E+00	0.289
AM-241	-3.413E+01	3.323E+01	4.752E+01	0.000E+00	-0.718

A, 07L29389-4	,07/28/2006	15:52,	07/27/2006	11:00,	3.042E+00,	L29389-4 WG EX
B, 07L29389-4	,LIBD					
						07/28/2006 09:50,073L082504
C, BE-7	,NO ,	2.044E+01,	2.594E+01,	4.471E+01,,	0.457	
C, NA-24	,NO ,	9.198E+00,	1.299E+01,	1.979E+01,,	0.465	
C, K-40	,NO ,	-3.441E+01,	4.298E+01,	7.782E+01,,	-0.442	
C, CR-51	,NO ,	-1.554E+01,	2.891E+01,	4.659E+01,,	-0.334	
C, MN-54	,NO ,	2.080E+00,	3.207E+00,	5.465E+00,,	0.381	
C, CO-57	,NO ,	2.231E+00,	3.167E+00,	5.244E+00,,	0.425	
C, CO-58	,NO ,	-3.164E+00,	3.476E+00,	5.321E+00,,	-0.595	
C, FE-59	,NO ,	3.616E+00,	5.875E+00,	1.008E+01,,	0.359	
C, CO-60	,NO ,	2.736E+00,	3.526E+00,	6.177E+00,,	0.443	
C, ZN-65	,NO ,	2.710E+01,	9.240E+00,	1.625E+01,,	1.668	
C, SE-75	,NO ,	-4.395E+00,	4.153E+00,	6.635E+00,,	-0.662	
C, SR-85	,NO ,	1.677E+01,	3.800E+00,	7.330E+00,,	2.288	
C, Y-88	,NO ,	-3.457E+00,	3.809E+00,	5.564E+00,,	-0.621	
C, NB-94	,NO ,	2.469E-01,	3.159E+00,	5.238E+00,,	0.047	
C, NB-95	,NO ,	3.797E+00,	3.848E+00,	5.824E+00,,	0.652	
C, ZR-95	,NO ,	3.895E+00,	6.006E+00,	9.107E+00,,	0.428	
C, MO-99	,NO ,	8.266E+00,	3.146E+01,	5.264E+01,,	0.157	
C, RU-103	,NO ,	2.279E+00,	3.290E+00,	5.621E+00,,	0.406	
C, RU-106	,NO ,	-8.654E+00,	2.937E+01,	4.668E+01,,	-0.185	
C, AG-110m	,NO ,	-1.958E+00,	3.130E+00,	4.985E+00,,	-0.393	
C, SN-113	,NO ,	-3.304E-01,	4.234E+00,	6.860E+00,,	-0.048	
C, SB-124	,NO ,	7.508E-01,	6.599E+00,	4.896E+00,,	0.153	
C, SB-125	,NO ,	6.237E-01,	9.218E+00,	1.540E+01,,	0.040	
C, TE-129M	,NO ,	-3.477E+00,	3.601E+01,	5.937E+01,,	-0.059	
C, I-131	,NO ,	2.452E+00,	3.558E+00,	6.006E+00,,	0.408	
C, BA-133	,NO ,	1.698E+01,	5.932E+00,	9.582E+00,,	1.773	
C, CS-134	,NO ,	2.635E+01,	7.238E+00,	8.622E+00,,	3.057	
C, CS-136	,NO ,	1.007E+00,	3.403E+00,	5.668E+00,,	0.178	
C, CS-137	,NO ,	1.709E+00,	3.422E+00,	5.849E+00,,	0.292	
C, CE-139	,NO ,	5.860E-01,	3.181E+00,	5.297E+00,,	0.111	
C, BA-140	,NO ,	6.116E+00,	1.155E+01,	1.954E+01,,	0.313	
C, LA-140	,NO ,	-1.509E+00,	4.086E+00,	6.495E+00,,	-0.232	
C, CE-141	,NO ,	1.842E+00,	6.420E+00,	9.277E+00,,	0.199	
C, CE-144	,NO ,	1.592E+00,	2.764E+01,	3.975E+01,,	0.040	
C, EU-152	,NO ,	-6.061E+00,	1.209E+01,	1.624E+01,,	-0.373	
C, EU-154	,NO ,	-1.523E+00,	6.723E+00,	1.079E+01,,	-0.141	
C, RA-226	,NO ,	2.752E+01,	8.261E+01,	1.384E+02,,	0.199	
C, AC-228	,NO ,	-1.920E+00,	1.288E+01,	2.126E+01,,	-0.090	
C, TH-228	,NO ,	1.230E+01,	7.509E+00,	1.162E+01,,	1.058	
C, TH-232	,NO ,	-1.919E+00,	1.288E+01,	2.125E+01,,	-0.090	
C, U-235	,NO ,	1.665E+01,	2.894E+01,	4.241E+01,,	0.393	
C, U-238	,NO ,	1.668E+02,	3.381E+02,	5.780E+02,,	0.289	
C, AM-241	,NO ,	-3.413E+01,	3.323E+01,	4.752E+01,,	-0.718	





Summary of Nuclide Activity  
 Sample ID : 04L29389-5

Page : 2  
 Acquisition date : 28-JUL-2006 13:20:17

Total number of lines in spectrum 13  
 Number of unidentified lines 11  
 Number of lines tentatively identified by NID 2 15.38%

Nuclide Type : natural

Nuclide	Hlife	Decay	Uncorrected pCi/L	Decay Corr pCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	1.192E+01	1.192E+01	5.425E+01	455.05	
Total Activity :			1.192E+01	1.192E+01			

Grand Total Activity : 1.192E+01 1.192E+01

Flags: "K" = Keyline not found  
 "E" = Manually edited

"M" = Manually accepted  
 "A" = Nuclide specific abn. limit

Unidentified Energy Lines  
Sample ID : 04L29389-5

Page : 3  
Acquisition date : 28-JUL-2006 13:20:17

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
1	66.68	39	375	1.20	134.25	130	8	4.43E-03	****	6.77E-01	
1	77.25	143	292	1.22	155.42	153	7	1.62E-02	43.4	1.07E+00	
1	198.16	73	210	1.60	397.37	394	8	8.27E-03	75.1	1.87E+00	
1	240.67	38	249	1.04	482.42	476	12	4.32E-03	****	1.67E+00	T
1	295.13	288	166	1.27	591.39	586	13	3.26E-02	22.7	1.46E+00	
1	351.92	435	166	1.18	705.01	698	14	4.93E-02	16.6	1.28E+00	
1	597.60	97	87	6.91	1196.49	1185	22	1.10E-02	54.1	8.61E-01	
1	609.01	395	42	1.44	1219.33	1213	11	4.48E-02	12.7	8.49E-01	
1	767.96	47	23	2.42	1537.23	1532	11	5.31E-03	50.9	7.10E-01	
1	1119.94	101	23	2.53	2241.07	2233	18	1.15E-02	31.6	5.27E-01	
1	1237.61	44	20	2.12	2476.32	2468	16	4.98E-03	55.6	4.88E-01	
1	1764.13	70	17	2.57	3528.61	3521	13	7.90E-03	35.8	3.77E-01	

Flags: "T" = Tentatively associated

#### Summary of Nuclide Activity

Total number of lines in spectrum	13
Number of unidentified lines	11
Number of lines tentatively identified by NID	2                      15.38%

Nuclide Type : natural

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/L	Wtd Mean Decay Corr pCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	1.192E+01	1.192E+01	5.425E+01	455.05	
Total Activity :			1.192E+01	1.192E+01			

Grand Total Activity : 1.192E+01      1.192E+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	1.192E+01	5.425E+01	6.205E+01	0.000E+00	0.192

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/L)	K.L. Ided	Act error	MDA (pCi/L)	MDA error	Act/MDA
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BE-7	1.682E+01	2.907E+01	4.954E+01	0.000E+00	0.340
NA-24	-3.035E+01	1.460E+01	1.868E+01	0.000E+00	-1.625
CR-51	-6.929E+00	3.190E+01	5.108E+01	0.000E+00	-0.136
MN-54	-3.438E+00	3.916E+00	5.907E+00	0.000E+00	-0.582
CO-57	3.985E-01	3.420E+00	5.600E+00	0.000E+00	0.071
CO-58	-5.431E+00	3.687E+00	5.212E+00	0.000E+00	-1.042
FE-59	8.661E+00	6.865E+00	1.263E+01	0.000E+00	0.686
CO-60	1.099E+00	3.991E+00	6.951E+00	0.000E+00	0.158
ZN-65	2.104E+01	1.034E+01	1.781E+01	0.000E+00	1.181
SE-75	-4.970E+00	4.731E+00	7.360E+00	0.000E+00	-0.675
SR-85	8.356E+00	4.470E+00	7.946E+00	0.000E+00	1.052
Y-88	9.610E-01	3.651E+00	6.275E+00	0.000E+00	0.153
NB-94	-1.800E+00	3.647E+00	5.802E+00	0.000E+00	-0.310
NB-95	5.599E+00	4.410E+00	6.998E+00	0.000E+00	0.800
ZR-95	-2.453E+00	5.891E+00	9.307E+00	0.000E+00	-0.264
MO-99	1.425E+01	3.373E+01	5.742E+01	0.000E+00	0.248
RU-103	-7.511E-01	3.479E+00	5.606E+00	0.000E+00	-0.134
RU-106	-7.163E+00	3.303E+01	5.414E+01	0.000E+00	-0.132
AG-110m	-4.154E-01	3.264E+00	5.358E+00	0.000E+00	-0.078
SN-113	-3.370E+00	4.694E+00	7.491E+00	0.000E+00	-0.450
SB-124	3.100E+00	5.743E+00	5.314E+00	0.000E+00	0.583
SB-125	-6.995E-01	1.038E+01	1.709E+01	0.000E+00	-0.041
TE-129M	-1.100E+01	4.226E+01	6.840E+01	0.000E+00	-0.161
I-131	1.542E+00	3.784E+00	6.458E+00	0.000E+00	0.239
BA-133	3.859E+00	5.337E+00	8.088E+00	0.000E+00	0.477
CS-134	1.212E+01	6.091E+00	7.208E+00	0.000E+00	1.681
CS-136	3.503E+00	3.728E+00	6.571E+00	0.000E+00	0.533
CS-137	2.957E-01	3.928E+00	6.544E+00	0.000E+00	0.045
CE-139	1.105E+00	3.624E+00	5.886E+00	0.000E+00	0.188
BA-140	-7.990E-01	1.321E+01	2.141E+01	0.000E+00	-0.037
LA-140	1.144E+00	4.788E+00	8.051E+00	0.000E+00	0.142
CE-141	1.489E+00	6.093E+00	9.938E+00	0.000E+00	0.150
CE-144	9.228E+00	2.711E+01	4.454E+01	0.000E+00	0.207
EU-152	-1.765E+00	1.349E+01	1.838E+01	0.000E+00	-0.096
EU-154	-8.953E-01	7.249E+00	1.176E+01	0.000E+00	-0.076
RA-226	9.282E+01	8.788E+01	1.535E+02	0.000E+00	0.605
AC-228	3.325E-01	1.355E+01	2.314E+01	0.000E+00	0.014
TH-228	1.376E+00	8.213E+00	1.225E+01	0.000E+00	0.112
TH-232	3.324E-01	1.355E+01	2.314E+01	0.000E+00	0.014
U-235	-2.054E+01	2.799E+01	4.405E+01	0.000E+00	-0.466
U-238	2.834E+02	3.694E+02	6.573E+02	0.000E+00	0.431
AM-241	-1.627E+01	3.727E+01	5.999E+01	0.000E+00	-0.271

A,04L29389-5	,07/28/2006 15:47,07/27/2006 13:15,	2.993E+00,L29389-5 WG EX
B,04L29389-5	,LIBD	,07/28/2006 09:49,043L082004
C,K-40	,YES,	1.192E+01, 5.425E+01, 6.205E+01,, 0.192
C,BE-7	,NO ,	1.682E+01, 2.907E+01, 4.954E+01,, 0.340
C,NA-24	,NO ,	-3.035E+01, 1.460E+01, 1.868E+01,, -1.625
C,CR-51	,NO ,	-6.929E+00, 3.190E+01, 5.108E+01,, -0.136
C,MN-54	,NO ,	-3.438E+00, 3.916E+00, 5.907E+00,, -0.582
C,CO-57	,NO ,	3.985E-01, 3.420E+00, 5.600E+00,, 0.071
C,CO-58	,NO ,	-5.431E+00, 3.687E+00, 5.212E+00,, -1.042
C,FE-59	,NO ,	8.661E+00, 6.865E+00, 1.263E+01,, 0.686
C,CO-60	,NO ,	1.099E+00, 3.991E+00, 6.951E+00,, 0.158
C,ZN-65	,NO ,	2.104E+01, 1.034E+01, 1.781E+01,, 1.181
C,SE-75	,NO ,	-4.970E+00, 4.731E+00, 7.360E+00,, -0.675
C,SR-85	,NO ,	8.356E+00, 4.470E+00, 7.946E+00,, 1.052
C,Y-88	,NO ,	9.610E-01, 3.651E+00, 6.275E+00,, 0.153
C,NB-94	,NO ,	-1.800E+00, 3.647E+00, 5.802E+00,, -0.310
C,NB-95	,NO ,	5.599E+00, 4.410E+00, 6.998E+00,, 0.800
C,ZR-95	,NO ,	-2.453E+00, 5.891E+00, 9.307E+00,, -0.264
C,MO-99	,NO ,	1.425E+01, 3.373E+01, 5.742E+01,, 0.248
C,RU-103	,NO ,	-7.511E-01, 3.479E+00, 5.606E+00,, -0.134
C,RU-106	,NO ,	-7.163E+00, 3.303E+01, 5.414E+01,, -0.132
C,AG-110m	,NO ,	-4.154E-01, 3.264E+00, 5.358E+00,, -0.078
C,SN-113	,NO ,	-3.370E+00, 4.694E+00, 7.491E+00,, -0.450
C,SB-124	,NO ,	3.100E+00, 5.743E+00, 5.314E+00,, 0.583
C,SB-125	,NO ,	-6.995E-01, 1.038E+01, 1.709E+01,, -0.041
C,TE-129M	,NO ,	-1.100E+01, 4.226E+01, 6.840E+01,, -0.161
C,I-131	,NO ,	1.542E+00, 3.784E+00, 6.458E+00,, 0.239
C,BA-133	,NO ,	3.859E+00, 5.337E+00, 8.088E+00,, 0.477
C,CS-134	,NO ,	1.212E+01, 6.091E+00, 7.208E+00,, 1.681
C,CS-136	,NO ,	3.503E+00, 3.728E+00, 6.571E+00,, 0.533
C,CS-137	,NO ,	2.957E-01, 3.928E+00, 6.544E+00,, 0.045
C,CE-139	,NO ,	1.105E+00, 3.624E+00, 5.886E+00,, 0.188
C,BA-140	,NO ,	-7.990E-01, 1.321E+01, 2.141E+01,, -0.037
C,LA-140	,NO ,	1.144E+00, 4.788E+00, 8.051E+00,, 0.142
C,CE-141	,NO ,	1.489E+00, 6.093E+00, 9.938E+00,, 0.150
C,CE-144	,NO ,	9.228E+00, 2.711E+01, 4.454E+01,, 0.207
C,EU-152	,NO ,	-1.765E+00, 1.349E+01, 1.838E+01,, -0.096
C,EU-154	,NO ,	-8.953E-01, 7.249E+00, 1.176E+01,, -0.076
C,RA-226	,NO ,	9.282E+01, 8.788E+01, 1.535E+02,, 0.605
C,AC-228	,NO ,	3.325E-01, 1.355E+01, 2.314E+01,, 0.014
C,TH-228	,NO ,	1.376E+00, 8.213E+00, 1.225E+01,, 0.112
C,TH-232	,NO ,	3.324E-01, 1.355E+01, 2.314E+01,, 0.014
C,U-235	,NO ,	-2.054E+01, 2.799E+01, 4.405E+01,, -0.466
C,U-238	,NO ,	2.834E+02, 3.694E+02, 6.573E+02,, 0.431
C,AM-241	,NO ,	-1.627E+01, 3.727E+01, 5.999E+01,, -0.271

Sec. Review: Analyst: LIMS: 

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VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 28-JUL-2006 16:21:53.60  
 TBE23 03017322 HpGe \*\*\*\*\* Aquisition Date/Time: 28-JUL-2006 13:20:26.10

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LIMS No., Customer Name, Client ID: L29389-6 WG EX/QUAD

Sample ID : 23L29389-6                      Smple Date: 27-JUL-2006 14:05:00.  
 Sample Type : WG                              Geometry : 233L082404  
 Quantity : 2.92950E+00 L                      BKGFILE : 23BG070106MT  
 Start Channel : 50                      Energy Tol : 1.00000                      Real Time : 0 03:01:18.73  
 End Channel : 4090                      Pk Srch Sens: 5.00000                      Live time : 0 03:01:11.33  
 MDA Constant : 0.00                      Library Used: LIBD

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	%Eff	Cts/Sec	%Err	Fit
1	0	77.01*	100	518	1.27	154.25	1.53E+00	9.24E-03	40.3	0.00E+00
2	0	139.44	109	406	1.20	278.97	2.32E+00	9.99E-03	32.2	
3	0	185.25*	23	475	1.32	370.50	2.18E+00	2.11E-03	187.8	
4	0	198.31	82	344	0.99	396.61	2.11E+00	7.58E-03	40.6	
5	1	238.63*	21	284	1.34	477.17	1.90E+00	1.92E-03	146.1	1.30E+00
6	1	241.99	166	256	1.34	483.88	1.88E+00	1.53E-02	18.5	
7	0	295.11*	409	264	1.28	590.04	1.64E+00	3.77E-02	9.8	
8	0	351.76*	559	214	1.34	703.28	1.43E+00	5.14E-02	7.3	
9	0	609.04*	476	74	1.64	1217.66	9.41E-01	4.38E-02	6.1	
10	0	768.31	94	60	1.46	1536.24	7.96E-01	8.67E-03	21.5	
11	0	1120.40*	111	40	1.69	2240.86	6.16E-01	1.02E-02	17.2	
12	0	1239.97	49	51	1.05	2480.26	5.74E-01	4.47E-03	38.4	
13	0	1379.86	46	40	8.89	2760.41	5.32E-01	4.26E-03	38.6	
14	0	1460.66*	28	25	1.56	2922.26	5.10E-01	2.54E-03	60.2	
15	0	1729.69	30	7	1.30	3461.37	4.45E-01	2.80E-03	25.8	
16	0	1763.90*	82	11	0.91	3529.94	4.38E-01	7.53E-03	16.1	

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	28	10.67*	5.096E-01	4.317E+01	4.317E+01	120.35
RA-226	186.21	23	3.28*	2.177E+00	2.727E+01	2.727E+01	375.68
TH-228	238.63	21	44.60*	1.900E+00	2.094E+00	2.096E+00	292.20
	240.98	-----	3.95	1.888E+00	-----	Line Not Found	-----

Flag: "\*" = Keyline

Summary of Nuclide Activity  
 Sample ID : 23L29389-6

Page : 2  
 Acquisition date : 28-JUL-2006 13:20:26

Total number of lines in spectrum 16  
 Number of unidentified lines 13  
 Number of lines tentatively identified by NID 3 18.75%

Nuclide Type : natural

Nuclide	Hlife	Decay	Uncorrected pCi/L	Decay Corr pCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	4.317E+01	4.317E+01	5.195E+01	120.35	
RA-226	1600.00Y	1.00	2.727E+01	2.727E+01	10.24E+01	375.68	
TH-228	1.91Y	1.00	2.094E+00	2.096E+00	6.124E+00	292.20	
Total Activity :			7.253E+01	7.253E+01			

Grand Total Activity : 7.253E+01 7.253E+01

Flags: "K" = Keyline not found  
 "E" = Manually edited

"M" = Manually accepted  
 "A" = Nuclide specific abn. limit

Unidentified Energy Lines  
Sample ID : 23L29389-6

Page : 3  
Acquisition date : 28-JUL-2006 13:20:26

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	77.01	100	518	1.27	154.25	151	7	9.24E-03	80.5	1.53E+00	
0	139.44	109	406	1.20	278.97	276	7	9.99E-03	64.4	2.32E+00	
0	198.31	82	344	0.99	396.61	393	8	7.58E-03	81.1	2.11E+00	
1	241.99	166	256	1.34	483.88	473	17	1.53E-02	37.0	1.88E+00	
0	295.11	409	264	1.28	590.04	584	13	3.77E-02	19.6	1.64E+00	
0	351.76	559	214	1.34	703.28	696	15	5.14E-02	14.7	1.43E+00	
0	609.04	476	74	1.64	1217.66	1211	12	4.38E-02	12.3	9.41E-01	
0	768.31	94	60	1.46	1536.24	1528	16	8.67E-03	43.0	7.96E-01	
0	1120.40	111	40	1.69	2240.86	2232	18	1.02E-02	34.5	6.16E-01	
0	1239.97	49	51	1.05	2480.26	2471	19	4.47E-03	76.9	5.74E-01	
0	1379.86	46	40	8.89	2760.41	2750	25	4.26E-03	77.3	5.32E-01	
0	1729.69	30	7	1.30	3461.37	3454	14	2.80E-03	51.6	4.45E-01	
0	1763.90	82	11	0.91	3529.94	3522	16	7.53E-03	32.2	4.38E-01	

Flags: "T" = Tentatively associated

### Summary of Nuclide Activity

Total number of lines in spectrum	16	
Number of unidentified lines	13	
Number of lines tentatively identified by NID	3	18.75%

Nuclide Type : natural

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/L	Wtd Mean Decay Corr pCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	4.317E+01	4.317E+01	5.195E+01	120.35	
RA-226	1600.00Y	1.00	2.727E+01	2.727E+01	10.24E+01	375.68	
TH-228	1.91Y	1.00	2.094E+00	2.096E+00	6.124E+00	292.20	
Total Activity :			7.253E+01	7.253E+01			

Grand Total Activity : 7.253E+01 7.253E+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	4.317E+01	5.195E+01	5.393E+01	0.000E+00	0.800
RA-226	2.727E+01	1.024E+02	1.454E+02	0.000E+00	0.188
TH-228	2.096E+00	6.124E+00	1.087E+01	0.000E+00	0.193


## ---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/L)	K.L. Ided	Act error	MDA (pCi/L)	MDA error	Act/MDA
BE-7	7.746E-01		2.895E+01	4.896E+01	0.000E+00	0.016
NA-24	5.132E+00		1.130E+01	1.797E+01	0.000E+00	0.286
CR-51	-3.361E+01		2.938E+01	4.811E+01	0.000E+00	-0.699
MN-54	-1.814E-01		3.113E+00	5.434E+00	0.000E+00	-0.033
CO-57	1.466E-01		3.521E+00	5.800E+00	0.000E+00	0.025
CO-58	-2.542E+00		3.211E+00	5.333E+00	0.000E+00	-0.477
FE-59	-1.286E-01		5.948E+00	1.053E+01	0.000E+00	-0.012
CO-60	-2.381E+00		3.225E+00	5.307E+00	0.000E+00	-0.449
ZN-65	2.165E+01		9.548E+00	1.684E+01	0.000E+00	1.286
SE-75	-1.073E+00		4.553E+00	7.524E+00	0.000E+00	-0.143
SR-85	9.687E+00		3.639E+00	6.916E+00	0.000E+00	1.401
Y-88	-1.456E+00		3.024E+00	5.149E+00	0.000E+00	-0.283
NB-94	-1.962E+00		3.270E+00	5.393E+00	0.000E+00	-0.364
NB-95	5.849E+00		4.232E+00	6.929E+00	0.000E+00	0.844
ZR-95	-2.183E+00		6.339E+00	9.844E+00	0.000E+00	-0.222
MO-99	-1.727E+00		3.163E+01	5.402E+01	0.000E+00	-0.032
RU-103	-4.362E-01		3.395E+00	5.856E+00	0.000E+00	-0.074
RU-106	-4.016E+00		3.061E+01	5.241E+01	0.000E+00	-0.077
AG-110m	1.572E-01		3.252E+00	5.612E+00	0.000E+00	0.028
SN-113	1.423E+00		4.522E+00	7.788E+00	0.000E+00	0.183
SB-124	-6.782E+00		4.370E+00	5.566E+00	0.000E+00	-1.219
SB-125	6.247E+00		9.880E+00	1.725E+01	0.000E+00	0.362
TE-129M	7.046E+00		3.981E+01	6.787E+01	0.000E+00	0.104
I-131	-2.443E+00		3.724E+00	6.173E+00	0.000E+00	-0.396
BA-133	2.345E+01		5.956E+00	1.035E+01	0.000E+00	2.265
CS-134	1.908E+01		5.234E+00	9.046E+00	0.000E+00	2.109
CS-136	1.937E+00		3.205E+00	5.852E+00	0.000E+00	0.331
CS-137	-1.433E-01		3.560E+00	6.114E+00	0.000E+00	-0.023
CE-139	1.004E+00		3.558E+00	6.059E+00	0.000E+00	0.166
BA-140	-1.249E+00		1.240E+01	2.138E+01	0.000E+00	-0.058
LA-140	3.224E-01		3.651E+00	6.620E+00	0.000E+00	0.049
CE-141	2.135E+00		7.124E+00	1.046E+01	0.000E+00	0.204
CE-144	1.791E+00		3.130E+01	4.578E+01	0.000E+00	0.039
EU-152	-5.546E-01		1.233E+01	1.784E+01	0.000E+00	-0.031
EU-154	-1.871E+00		7.469E+00	1.221E+01	0.000E+00	-0.153
AC-228	6.579E+00		1.223E+01	2.218E+01	0.000E+00	0.297
TH-232	6.576E+00		1.223E+01	2.218E+01	0.000E+00	0.297
U-235	1.702E+01		3.218E+01	4.745E+01	0.000E+00	0.359
U-238	-3.873E+02		3.881E+02	6.294E+02	0.000E+00	-0.615
AM-241	-9.501E+00		1.952E+01	3.256E+01	0.000E+00	-0.292



A, 23L29389-6 ,07/28/2006 16:21,07/27/2006 14:05, 2.930E+00,L29389-6 WG EX  
 B, 23L29389-6 ,LIBD ,07/28/2006 10:10,233L082404

C, K-40	, YES,	4.317E+01,	5.195E+01,	5.393E+01,,	0.800
C, RA-226	, YES,	2.727E+01,	1.024E+02,	1.454E+02,,	0.188
C, TH-228	, YES,	2.096E+00,	6.124E+00,	1.087E+01,,	0.193
C, BE-7	, NO ,	7.746E-01,	2.895E+01,	4.896E+01,,	0.016
C, NA-24	, NO ,	5.132E+00,	1.130E+01,	1.797E+01,,	0.286
C, CR-51	, NO ,	-3.361E+01,	2.938E+01,	4.811E+01,,	-0.699
C, MN-54	, NO ,	-1.814E-01,	3.113E+00,	5.434E+00,,	-0.033
C, CO-57	, NO ,	1.466E-01,	3.521E+00,	5.800E+00,,	0.025
C, CO-58	, NO ,	-2.542E+00,	3.211E+00,	5.333E+00,,	-0.477
C, FE-59	, NO ,	-1.286E-01,	5.948E+00,	1.053E+01,,	-0.012
C, CO-60	, NO ,	-2.381E+00,	3.225E+00,	5.307E+00,,	-0.449
C, ZN-65	, NO ,	2.165E+01,	9.548E+00,	1.684E+01,,	1.286
C, SE-75	, NO ,	-1.073E+00,	4.553E+00,	7.524E+00,,	-0.143
C, SR-85	, NO ,	9.687E+00,	3.639E+00,	6.916E+00,,	1.401
C, Y-88	, NO ,	-1.456E+00,	3.024E+00,	5.149E+00,,	-0.283
C, NB-94	, NO ,	-1.962E+00,	3.270E+00,	5.393E+00,,	-0.364
C, NB-95	, NO ,	5.849E+00,	4.232E+00,	6.929E+00,,	0.844
C, ZR-95	, NO ,	-2.183E+00,	6.339E+00,	9.844E+00,,	-0.222
C, MO-99	, NO ,	-1.727E+00,	3.163E+01,	5.402E+01,,	-0.032
C, RU-103	, NO ,	-4.362E-01,	3.395E+00,	5.856E+00,,	-0.074
C, RU-106	, NO ,	-4.016E+00,	3.061E+01,	5.241E+01,,	-0.077
C, AG-110m	, NO ,	1.572E-01,	3.252E+00,	5.612E+00,,	0.028
C, SN-113	, NO ,	1.423E+00,	4.522E+00,	7.788E+00,,	0.183
C, SB-124	, NO ,	-6.782E+00,	4.370E+00,	5.566E+00,,	-1.219
C, SB-125	, NO ,	6.247E+00,	9.880E+00,	1.725E+01,,	0.362
C, TE-129M	, NO ,	7.046E+00,	3.981E+01,	6.787E+01,,	0.104
C, I-131	, NO ,	-2.443E+00,	3.724E+00,	6.173E+00,,	-0.396
C, BA-133	, NO ,	2.345E+01,	5.956E+00,	1.035E+01,,	2.265
C, CS-134	, NO ,	1.908E+01,	5.234E+00,	9.046E+00,,	2.109
C, CS-136	, NO ,	1.937E+00,	3.205E+00,	5.852E+00,,	0.331
C, CS-137	, NO ,	-1.433E-01,	3.560E+00,	6.114E+00,,	-0.023
C, CE-139	, NO ,	1.004E+00,	3.558E+00,	6.059E+00,,	0.166
C, BA-140	, NO ,	-1.249E+00,	1.240E+01,	2.138E+01,,	-0.058
C, LA-140	, NO ,	3.224E-01,	3.651E+00,	6.620E+00,,	0.049
C, CE-141	, NO ,	2.135E+00,	7.124E+00,	1.046E+01,,	0.204
C, CE-144	, NO ,	1.791E+00,	3.130E+01,	4.578E+01,,	0.039
C, EU-152	, NO ,	-5.546E-01,	1.233E+01,	1.784E+01,,	-0.031
C, EU-154	, NO ,	-1.871E+00,	7.469E+00,	1.221E+01,,	-0.153
C, AC-228	, NO ,	6.579E+00,	1.223E+01,	2.218E+01,,	0.297
C, TH-232	, NO ,	6.576E+00,	1.223E+01,	2.218E+01,,	0.297
C, U-235	, NO ,	1.702E+01,	3.218E+01,	4.745E+01,,	0.359
C, U-238	, NO ,	-3.873E+02,	3.881E+02,	6.294E+02,,	-0.615
C, AM-241	, NO ,	-9.501E+00,	1.952E+01,	3.256E+01,,	-0.292

Sec. Review: Analyst: LIMS: 

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VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 28-JUL-2006 16:31:09.23  
 TBE14 P-10933A HpGe \*\*\*\*\* Aquisition Date/Time: 28-JUL-2006 13:20:25.47

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LIMS No., Customer Name, Client ID: L29389-7 WG EX/QUAD

Sample ID : 14L29389-7                      Smple Date: 27-JUL-2006 14:15:00.  
 Sample Type : WG                              Geometry : 143L082304  
 Quantity : 3.08790E+00 L                      BKGFILE : 14BG070106MT  
 Start Channel : 90                      Energy Tol : 1.00000                      Real Time : 0 03:10:32.49  
 End Channel : 4090                      Pk Srch Sens: 5.00000                      Live time : 0 03:10:30.60  
 MDA Constant : 0.00                      Library Used: LIBD

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	%Eff	Cts/Sec	%Err	Fit
1	1	92.13*	22	355	1.47	185.82	1.26E+00	1.94E-03	164.7	2.62E+00
2	1	185.47*	57	310	2.24	373.28	1.88E+00	4.96E-03	62.3	8.82E-01
3	1	295.65*	33	260	2.26	594.42	1.46E+00	2.92E-03	106.1	2.06E+00
4	1	352.06*	87	128	2.42	707.56	1.28E+00	7.59E-03	31.0	1.07E+00
5	1	609.39*	70	90	1.99	1223.05	8.33E-01	6.15E-03	32.8	1.11E+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
RA-226	186.21	57	3.28*	1.878E+00	7.049E+01	7.049E+01	124.60
U-235	143.76	-----	10.50*	1.907E+00	-----	Line Not Found	-----
	163.35	-----	4.70	1.923E+00	-----	Line Not Found	-----
	185.71	57	54.00	1.878E+00	4.282E+00	4.282E+00	124.60
	205.31	-----	4.70	1.809E+00	-----	Line Not Found	-----

Flag: "\*" = Keyline

## Summary of Nuclide Activity

Page : 2

Sample ID : 14L29389-7

Acquisition date : 28-JUL-2006 13:20:25

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 pCi/L	Decay Corr pCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
RA-226	1600.00Y	1.00	7.049E+01	7.049E+01	8.784E+01	124.60	
U-235	7.04E+08Y	1.00	4.282E+00	4.282E+00	5.335E+00	124.60	K
Total Activity :			7.478E+01	7.478E+01			

Grand Total Activity : 7.478E+01 7.478E+01

Flags: "K" = Keyline not found  
 "E" = Manually edited

"M" = Manually accepted  
 "A" = Nuclide specific abn. limit

## Unidentified Energy Lines

Page : 3

Sample ID : 14L29389-7

Acquisition date : 28-JUL-2006 13:20:25

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
1	92.13	22	355	1.47	185.82	183	9	1.94E-03	****	1.26E+00	
1	295.65	33	260	2.26	594.42	587	13	2.92E-03	****	1.46E+00	
1	352.06	87	128	2.42	707.56	702	12	7.59E-03	62.0	1.28E+00	
1	609.39	70	90	1.99	1223.05	1215	13	6.15E-03	65.5	8.33E-01	

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 Uncorrected pCi/L	Wtd Mean Decay Corr pCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
RA-226	1600.00Y	1.00	7.049E+01	7.049E+01	8.784E+01	124.60	
Total Activity :			7.049E+01	7.049E+01			

Grand Total Activity : 7.049E+01      7.049E+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	7.049E+01	8.784E+01	1.496E+02	0.000E+00	0.471

## ---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/L)	K.L. Ided	Act error	MDA (pCi/L)	MDA error	Act/MDA
BE-7	-8.615E+00		3.144E+01	5.144E+01	0.000E+00	-0.167
NA-24	-1.140E+01		1.233E+01	1.885E+01	0.000E+00	-0.605
K-40	1.908E+02		4.502E+01	9.433E+01	0.000E+00	2.023
CR-51	-2.176E+01		3.205E+01	5.114E+01	0.000E+00	-0.425
MN-54	-3.111E+00		3.523E+00	5.511E+00	0.000E+00	-0.565
CO-57	-9.682E-01		3.964E+00	6.416E+00	0.000E+00	-0.151
CO-58	-2.853E+00		3.617E+00	5.565E+00	0.000E+00	-0.513

FE-59	2.438E-01	6.645E+00	1.094E+01	0.000E+00	0.022
CO-60	-2.850E+00	3.600E+00	5.404E+00	0.000E+00	-0.527
ZN-65	7.714E+00	7.695E+00	1.354E+01	0.000E+00	0.570
SE-75	2.310E+00	5.082E+00	8.482E+00	0.000E+00	0.272
SR-85	1.806E+01	4.237E+00	8.056E+00	0.000E+00	2.242
Y-88	1.981E+00	3.502E+00	6.114E+00	0.000E+00	0.324
NB-94	1.572E-01	3.428E+00	5.621E+00	0.000E+00	0.028
NB-95	3.010E+00	3.366E+00	5.811E+00	0.000E+00	0.518
ZR-95	-3.256E+00	6.286E+00	9.901E+00	0.000E+00	-0.329
MO-99	-2.185E+01	3.580E+01	5.618E+01	0.000E+00	-0.389
RU-103	-2.172E+00	3.844E+00	6.195E+00	0.000E+00	-0.351
RU-106	-1.494E+01	3.541E+01	5.681E+01	0.000E+00	-0.263
AG-110m	1.578E+00	3.602E+00	6.053E+00	0.000E+00	0.261
SN-113	3.925E+00	4.931E+00	8.294E+00	0.000E+00	0.473
SB-124	-3.819E+00	4.566E+00	5.895E+00	0.000E+00	-0.648
SB-125	4.122E+00	1.095E+01	1.849E+01	0.000E+00	0.223
TE-129M	3.021E+01	4.159E+01	7.122E+01	0.000E+00	0.424
I-131	-3.663E+00	4.173E+00	6.352E+00	0.000E+00	-0.577
BA-133	1.231E+01	6.101E+00	9.357E+00	0.000E+00	1.315
CS-134	3.120E+00	4.931E+00	7.105E+00	0.000E+00	0.439
CS-136	-2.468E+00	3.700E+00	5.734E+00	0.000E+00	-0.431
CS-137	-9.605E-01	3.881E+00	6.266E+00	0.000E+00	-0.153
CE-139	-3.271E+00	3.699E+00	6.008E+00	0.000E+00	-0.544
BA-140	-1.157E+00	1.323E+01	2.174E+01	0.000E+00	-0.053
LA-140	5.288E+00	4.037E+00	7.486E+00	0.000E+00	0.706
CE-141	-6.823E+00	6.705E+00	1.059E+01	0.000E+00	-0.644
CE-144	-2.241E+01	3.053E+01	4.870E+01	0.000E+00	-0.460
EU-152	1.970E+00	1.403E+01	1.944E+01	0.000E+00	0.101
EU-154	-2.454E+00	8.294E+00	1.341E+01	0.000E+00	-0.183
AC-228	-6.859E-01	1.372E+01	2.287E+01	0.000E+00	-0.030
TH-228	2.843E+00	6.950E+00	1.159E+01	0.000E+00	0.245
TH-232	-6.856E-01	1.372E+01	2.286E+01	0.000E+00	-0.030
U-235	1.725E+01	3.046E+01	5.021E+01	0.000E+00	0.344
U-238	1.552E+02	4.087E+02	6.914E+02	0.000E+00	0.225
AM-241	-3.380E+01	5.340E+01	8.662E+01	0.000E+00	-0.390

A,14L29389-7	,07/28/2006 16:31,07/27/2006 14:15,	3.088E+00,L29389-7 WG EX
B,14L29389-7	,LIBD	,07/27/2006 14:28,143L082304
C,RA-226	,YES,	7.049E+01, 8.784E+01, 1.496E+02,, 0.471
C,BE-7	,NO ,	-8.615E+00, 3.144E+01, 5.144E+01,, -0.167
C,NA-24	,NO ,	-1.140E+01, 1.233E+01, 1.885E+01,, -0.605
C,K-40	,NO ,	1.908E+02, 4.502E+01, 9.433E+01,, 2.023
C,CR-51	,NO ,	-2.176E+01, 3.205E+01, 5.114E+01,, -0.425
C,MN-54	,NO ,	-3.111E+00, 3.523E+00, 5.511E+00,, -0.565
C,CO-57	,NO ,	-9.682E-01, 3.964E+00, 6.416E+00,, -0.151
C,CO-58	,NO ,	-2.853E+00, 3.617E+00, 5.565E+00,, -0.513
C,FE-59	,NO ,	2.438E-01, 6.645E+00, 1.094E+01,, 0.022
C,CO-60	,NO ,	-2.850E+00, 3.600E+00, 5.404E+00,, -0.527
C,ZN-65	,NO ,	7.714E+00, 7.695E+00, 1.354E+01,, 0.570
C,SE-75	,NO ,	2.310E+00, 5.082E+00, 8.482E+00,, 0.272
C,SR-85	,NO ,	1.806E+01, 4.237E+00, 8.056E+00,, 2.242
C,Y-88	,NO ,	1.981E+00, 3.502E+00, 6.114E+00,, 0.324
C,NB-94	,NO ,	1.572E-01, 3.428E+00, 5.621E+00,, 0.028
C,NB-95	,NO ,	3.010E+00, 3.366E+00, 5.811E+00,, 0.518
C,ZR-95	,NO ,	-3.256E+00, 6.286E+00, 9.901E+00,, -0.329
C,MO-99	,NO ,	-2.185E+01, 3.580E+01, 5.618E+01,, -0.389
C,RU-103	,NO ,	-2.172E+00, 3.844E+00, 6.195E+00,, -0.351
C,RU-106	,NO ,	-1.494E+01, 3.541E+01, 5.681E+01,, -0.263
C,AG-110m	,NO ,	1.578E+00, 3.602E+00, 6.053E+00,, 0.261
C,SN-113	,NO ,	3.925E+00, 4.931E+00, 8.294E+00,, 0.473
C,SB-124	,NO ,	-3.819E+00, 4.566E+00, 5.895E+00,, -0.648
C,SB-125	,NO ,	4.122E+00, 1.095E+01, 1.849E+01,, 0.223
C,TE-129M	,NO ,	3.021E+01, 4.159E+01, 7.122E+01,, 0.424
C,I-131	,NO ,	-3.663E+00, 4.173E+00, 6.352E+00,, -0.577
C,BA-133	,NO ,	1.231E+01, 6.101E+00, 9.357E+00,, 1.315
C,CS-134	,NO ,	3.120E+00, 4.931E+00, 7.105E+00,, 0.439
C,CS-136	,NO ,	-2.468E+00, 3.700E+00, 5.734E+00,, -0.431
C,CS-137	,NO ,	-9.605E-01, 3.881E+00, 6.266E+00,, -0.153
C,CE-139	,NO ,	-3.271E+00, 3.699E+00, 6.008E+00,, -0.544
C,BA-140	,NO ,	-1.157E+00, 1.323E+01, 2.174E+01,, -0.053
C,LA-140	,NO ,	5.288E+00, 4.037E+00, 7.486E+00,, 0.706
C,CE-141	,NO ,	-6.823E+00, 6.705E+00, 1.059E+01,, -0.644
C,CE-144	,NO ,	-2.241E+01, 3.053E+01, 4.870E+01,, -0.460
C,EU-152	,NO ,	1.970E+00, 1.403E+01, 1.944E+01,, 0.101
C,EU-154	,NO ,	-2.454E+00, 8.294E+00, 1.341E+01,, -0.183
C,AC-228	,NO ,	-6.859E-01, 1.372E+01, 2.287E+01,, -0.030
C,TH-228	,NO ,	2.843E+00, 6.950E+00, 1.159E+01,, 0.245
C,TH-232	,NO ,	-6.856E-01, 1.372E+01, 2.286E+01,, -0.030
C,U-235	,NO ,	1.725E+01, 3.046E+01, 5.021E+01,, 0.344
C,U-238	,NO ,	1.552E+02, 4.087E+02, 6.914E+02,, 0.225
C,AM-241	,NO ,	-3.380E+01, 5.340E+01, 8.662E+01,, -0.390



Summary of Nuclide Activity  
Sample ID : 07WG4270-1

Page : 2  
Acquisition date : 30-JUL-2006 21:04:00

Total number of lines in spectrum	12	
Number of unidentified lines	10	
Number of lines tentatively identified by NID	2	16.67%

\*\*\*\* 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 : 07WG4270-1

Page : 3  
 Acquisition date : 30-JUL-2006 21:04:00

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
5	66.33	83	217	1.23	133.52	123	14	9.85E-03	65.1	8.06E-01	
1	139.63	54	187	1.34	280.33	277	7	6.49E-03	92.3	2.36E+00	
1	241.97	100	141	1.35	485.25	474	16	1.19E-02	47.9	2.04E+00	T
1	295.32	154	174	1.48	592.06	587	11	1.83E-02	38.1	1.81E+00	
1	351.88	263	141	1.06	705.30	700	11	3.13E-02	21.9	1.61E+00	
1	583.21	31	46	2.91	1168.38	1164	11	3.72E-03	98.7	1.12E+00	T
1	609.39	263	59	1.56	1220.79	1214	14	3.13E-02	18.8	1.09E+00	
1	1120.41	53	38	2.25	2243.32	2237	12	6.31E-03	54.9	7.03E-01	
1	1238.31	36	26	2.68	2479.15	2470	15	4.23E-03	71.8	6.55E-01	
1	1707.72	12	5	2.16	3417.80	3410	12	1.47E-03	91.7	5.23E-01	
3	1765.08	47	18	2.95	3532.47	3522	24	5.62E-03	55.6	5.12E-01	
3	1769.97	18	8	2.31	3542.26	3522	24	2.13E-03	62.2	5.11E-01	

Flags: "T" = Tentatively associated

#### Summary of Nuclide Activity

Total number of lines in spectrum 12  
 Number of unidentified lines 10  
 Number of lines tentatively identified by NID 2 16.67%  
 \*\*\*\* 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	-3.214E+01		2.750E+01	4.231E+01	0.000E+00	-0.760
NA-24	-3.360E+02		2.076E+02	2.885E+02	0.000E+00	-1.165
K-40	2.799E+01		4.040E+01	8.112E+01	0.000E+00	0.345
CR-51	-1.217E+01		2.936E+01	4.747E+01	0.000E+00	-0.256
MN-54	2.546E-01		3.251E+00	5.327E+00	0.000E+00	0.048
CO-57	-1.395E+00		3.216E+00	5.121E+00	0.000E+00	-0.272
CO-58	-1.682E+00		3.385E+00	5.320E+00	0.000E+00	-0.316
FE-59	2.544E+00		6.614E+00	1.114E+01	0.000E+00	0.228
CO-60	5.320E-01		3.354E+00	5.592E+00	0.000E+00	0.095
ZN-65	1.430E+01		9.443E+00	1.501E+01	0.000E+00	0.953
SE-75	-3.848E-01		4.316E+00	7.170E+00	0.000E+00	-0.054
SR-85	1.803E+01		3.925E+00	7.667E+00	0.000E+00	2.351
Y-88	-2.216E+00		3.505E+00	5.234E+00	0.000E+00	-0.423
NB-94	1.559E+00		3.048E+00	5.202E+00	0.000E+00	0.300
NB-95	6.265E+00		3.376E+00	6.210E+00	0.000E+00	1.009
ZR-95	-1.610E+00		5.497E+00	8.819E+00	0.000E+00	-0.183

MO-99	-1.817E+01	5.910E+01	9.503E+01	0.000E+00	-0.191
RU-103	6.061E-01	3.505E+00	5.833E+00	0.000E+00	0.104
RU-106	3.488E+00	3.110E+01	5.010E+01	0.000E+00	0.070
AG-110m	-2.413E+00	3.108E+00	4.881E+00	0.000E+00	-0.494
SN-113	-2.004E+00	4.292E+00	6.806E+00	0.000E+00	-0.294
SB-124	-6.782E+00	4.491E+00	5.314E+00	0.000E+00	-1.276
SB-125	3.859E+00	9.371E+00	1.593E+01	0.000E+00	0.242
TE-129M	5.317E+01	4.065E+01	7.178E+01	0.000E+00	0.741
I-131	-2.695E+00	4.277E+00	6.754E+00	0.000E+00	-0.399
BA-133	1.702E+01	5.521E+00	9.177E+00	0.000E+00	1.855
CS-134	9.057E+00	4.958E+00	7.648E+00	0.000E+00	1.184
CS-136	1.995E+00	3.758E+00	6.379E+00	0.000E+00	0.313
CS-137	4.646E+00	3.354E+00	6.063E+00	0.000E+00	0.766
CE-139	-1.125E+00	3.160E+00	5.168E+00	0.000E+00	-0.218
BA-140	-4.515E+00	1.319E+01	2.114E+01	0.000E+00	-0.214
LA-140	1.698E+00	4.523E+00	7.745E+00	0.000E+00	0.219
CE-141	1.758E+00	6.602E+00	9.540E+00	0.000E+00	0.184
CE-144	-4.330E-01	2.840E+01	4.070E+01	0.000E+00	-0.011
EU-152	-1.035E+01	1.269E+01	1.665E+01	0.000E+00	-0.621
EU-154	2.312E-01	6.695E+00	1.084E+01	0.000E+00	0.021
RA-226	-1.281E+01	7.800E+01	1.310E+02	0.000E+00	-0.098
AC-228	-1.814E+00	1.261E+01	2.168E+01	0.000E+00	-0.084
TH-228	1.229E+01	7.364E+00	1.146E+01	0.000E+00	1.073
TH-232	-1.812E+00	1.260E+01	2.166E+01	0.000E+00	-0.084
U-235	-2.256E+01	2.867E+01	3.950E+01	0.000E+00	-0.571
U-238	3.034E+00	3.569E+02	5.840E+02	0.000E+00	0.005
AM-241	1.039E+01	3.179E+01	4.650E+01	0.000E+00	0.223

A,07WG4270-1 ,07/30/2006 23:24,07/27/2006 08:35, 3.123E+00,WG WG4270-1 EX  
 B,07WG4270-1 ,LIBD ,07/28/2006 09:50,073L082504  
 C,BE-7 ,NO , -3.214E+01, 2.750E+01, 4.231E+01,, -0.760  
 C,NA-24 ,NO , -3.360E+02, 2.076E+02, 2.885E+02,, -1.165  
 C,K-40 ,NO , 2.799E+01, 4.040E+01, 8.112E+01,, 0.345  
 C,CR-51 ,NO , -1.217E+01, 2.936E+01, 4.747E+01,, -0.256  
 C,MN-54 ,NO , 2.546E-01, 3.251E+00, 5.327E+00,, 0.048  
 C,CO-57 ,NO , -1.395E+00, 3.216E+00, 5.121E+00,, -0.272  
 C,CO-58 ,NO , -1.682E+00, 3.385E+00, 5.320E+00,, -0.316  
 C,FE-59 ,NO , 2.544E+00, 6.614E+00, 1.114E+01,, 0.228  
 C,CO-60 ,NO , 5.320E-01, 3.354E+00, 5.592E+00,, 0.095  
 C,ZN-65 ,NO , 1.430E+01, 9.443E+00, 1.501E+01,, 0.953  
 C,SE-75 ,NO , -3.848E-01, 4.316E+00, 7.170E+00,, -0.054  
 C,SR-85 ,NO , 1.803E+01, 3.925E+00, 7.667E+00,, 2.351  
 C,Y-88 ,NO , -2.216E+00, 3.505E+00, 5.234E+00,, -0.423  
 C,NB-94 ,NO , 1.559E+00, 3.048E+00, 5.202E+00,, 0.300  
 C,NB-95 ,NO , 6.265E+00, 3.376E+00, 6.210E+00,, 1.009  
 C,ZR-95 ,NO , -1.610E+00, 5.497E+00, 8.819E+00,, -0.183  
 C,MO-99 ,NO , -1.817E+01, 5.910E+01, 9.503E+01,, -0.191  
 C,RU-103 ,NO , 6.061E-01, 3.505E+00, 5.833E+00,, 0.104  
 C,RU-106 ,NO , 3.488E+00, 3.110E+01, 5.010E+01,, 0.070  
 C,AG-110m ,NO , -2.413E+00, 3.108E+00, 4.881E+00,, -0.494  
 C,SN-113 ,NO , -2.004E+00, 4.292E+00, 6.806E+00,, -0.294  
 C,SB-124 ,NO , -6.782E+00, 4.491E+00, 5.314E+00,, -1.276  
 C,SB-125 ,NO , 3.859E+00, 9.371E+00, 1.593E+01,, 0.242  
 C,TE-129M ,NO , 5.317E+01, 4.065E+01, 7.178E+01,, 0.741  
 C,I-131 ,NO , -2.695E+00, 4.277E+00, 6.754E+00,, -0.399  
 C,BA-133 ,NO , 1.702E+01, 5.521E+00, 9.177E+00,, 1.855  
 C,CS-134 ,NO , 9.057E+00, 4.958E+00, 7.648E+00,, 1.184  
 C,CS-136 ,NO , 1.995E+00, 3.758E+00, 6.379E+00,, 0.313  
 C,CS-137 ,NO , 4.646E+00, 3.354E+00, 6.063E+00,, 0.766  
 C,CE-139 ,NO , -1.125E+00, 3.160E+00, 5.168E+00,, -0.218  
 C,BA-140 ,NO , -4.515E+00, 1.319E+01, 2.114E+01,, -0.214  
 C,LA-140 ,NO , 1.698E+00, 4.523E+00, 7.745E+00,, 0.219  
 C,CE-141 ,NO , 1.758E+00, 6.602E+00, 9.540E+00,, 0.184  
 C,CE-144 ,NO , -4.330E-01, 2.840E+01, 4.070E+01,, -0.011  
 C,EU-152 ,NO , -1.035E+01, 1.269E+01, 1.665E+01,, -0.621  
 C,EU-154 ,NO , 2.312E-01, 6.695E+00, 1.084E+01,, 0.021  
 C,RA-226 ,NO , -1.281E+01, 7.800E+01, 1.310E+02,, -0.098  
 C,AC-228 ,NO , -1.814E+00, 1.261E+01, 2.168E+01,, -0.084  
 C,TH-228 ,NO , 1.229E+01, 7.364E+00, 1.146E+01,, 1.073  
 C,TH-232 ,NO , -1.812E+00, 1.260E+01, 2.166E+01,, -0.084  
 C,U-235 ,NO , -2.256E+01, 2.867E+01, 3.950E+01,, -0.571  
 C,U-238 ,NO , 3.034E+00, 3.569E+02, 5.840E+02,, 0.005  
 C,AM-241 ,NO , 1.039E+01, 3.179E+01, 4.650E+01,, 0.223



2508 Quality Lane  
Knoxville, TN 37931  
865-690-6819 (Phone)

**Work Order #: L29403**

**Exelon**

**August 1, 2006**



Kathy Shaw  
Conestoga-Rovers & Associates  
45 Farmington Valley Drive  
Plainville CT 06062

**Case Narrative - L29403**  
**EX001-3ESPQUAD-06**

08/01/2006 09:57

**Sample Receipt**

The following samples were received on July 28, 2006 in good condition, unless otherwise noted.

*Cross Reference Table*

Client ID	Laboratory ID	Station ID(if applicable)
WG-QC-MW-QC-116S-072806-NZ-008	L29403-1	
WG-QC-MW-QC-115S-072806-NZ-009	L29403-2	
WG-QC-MW-QC-109S-072806-NZ-010	L29403-3	
WG-QC-MW-QC-109S-072806-NZ-011	L29403-4	
WG-QC-MW-QC-109I-072806-NZ-012	L29403-5	
WG-QC-MW-QC-109I-072806-NZ-013	L29403-6	
RB-QC-MW-QC-102D-072806-NZ-014	L29403-7	
WG-QC-MW-QC-102D-072806-NZ-015	L29403-8	

*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 - L29403**  
**EX001-3ESPQUAD-06**

08/01/2006 09:57

**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 - L29403**  
**EX001-3ESPQUAD-06**

08/01/2006 09:57

**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



**Teledyne Brown Engineering**  
**Sample Receipt Verification/Variance Report**

07/31/06 08:37

SR #: SR09618

Client: Exelon

Project #: EX001-3ESPQUAD-06

LIMS #: L29403

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	

**CONESTOGA-ROVERS & ASSOCIATES**  
 9033 Meridian Way  
 West Chester, Ohio 45069  
 513-942-4750 phone  
 513-942-8585 fax



SHIPPED TO  
 (Laboratory Name): **TELEDYNE BROWN**

REFERENCE NUMBER:  
**45736-28**

PROJECT NAME:  
**EXELON DUAN CITIES**

**CHAIN-OF-CUSTODY RECORD**

SAMPLER'S SIGNATURE: *Rob Ziegler* PRINTED NAME: **Rob Ziegler**

PARAMETERS	REMARKS
TRIM	
STATION SPEC	

SEQ. No.	DATE	TIME	SAMPLE IDENTIFICATION No.	SAMPLE MATRIX	No. OF CONTAINERS	PARAMETERS		REMARKS
						X	Y	
5	7/28/06	1110	W4-QC-MW-QC-109I-072E06-N2-012	H <sub>2</sub> O	2	X	X	
6	7/28/06	1115	W6-QC-MW-QC-109I-072E06-N2-013	↓	2	X	X	CRA CONTACT
7	7/28/06	1120	KB-QC-MW-QC-102D-072E06-N2-014	↓	2	X	X	KATHY SHAW
8	7/28/06	1225	W6-QC-MW-QC-102D-072E06-N2-015		2	X	X	

TOTAL NUMBER OF CONTAINERS **(8)**

RELINQUISHED BY: <i>Rob Ziegler</i>	DATE: 7/28/06	RECEIVED BY: <i>Brown Hunter</i>	DATE: 7-28-06
TIME: 1345	TIME: 16:39	TIME: 13:47	TIME: 9:28
RELINQUISHED BY: <i>Rob Ziegler</i>	DATE: 7-28-06	RECEIVED BY: <i>Rob Ziegler</i>	DATE: 7-28
TIME: 16:39	TIME: 16:39	TIME: 16:39	TIME: 16:39
RELINQUISHED BY: <i>Rob Ziegler</i>	DATE: 7-28-06	RECEIVED BY: <i>Rob Ziegler</i>	DATE: 7-28-06
TIME: 16:39	TIME: 16:39	TIME: 16:39	TIME: 16:39

METHOD OF SHIPMENT: **HAND DELIVERED TO EXELON** AIR BILL No. \_\_\_\_\_

SAMPLE TEAM:  
*N. Ziegler*  
*Ang Lewis*

RECEIVED FOR LABORATORY BY: \_\_\_\_\_  
 DATE: *7/29/06* TIME: *12:15*

004287

**CONESTOGA-ROVERS & ASSOCIATES**  
 9033 Meridian Way  
 West Chester, Ohio 45069  
 513-942-4750 phone  
 513-942-8585 fax



SHIPPED TO  
 (Laboratory Name): **TELEPHONE BROWN**

REFERENCE NUMBER:  
**45136-2E**

PROJECT NAME:  
**EXELON QUART CITIES**

**CHAIN-OF-CUSTODY RECORD**

SAMPLER'S SIGNATURE: *[Signature]* PRINTED NAME: **Nate Ziegler**

PARAMETERS	CONTAINERS	REMARKS
TRIM		
STRAIN		
SPES		

SEQ. No.	DATE	TIME	SAMPLE IDENTIFICATION No.	SAMPLE MATRIX	No. OF CONTAINERS	PARAMETERS	REMARKS
1	7/28/06	0650	W4-02-MW-02-1165-012E06-NZ-008	H <sub>2</sub> O	2	X X	CRA CONTACT
2	7/28/06	0750	1155 ↓	↓	2	X X	KATHY SHAW
3	1000	↓	1095 ↓	↓	2	X X	
4	1005	↓	1095 ↓	↓	2	X X	

TOTAL NUMBER OF CONTAINERS: **8**

RELINQUISHED BY: <i>[Signature]</i>	DATE: 7/28/06	RECEIVED BY: <i>[Signature]</i>	DATE: 7-28-06
TIME: 1545	TIME: 13:48		
RELINQUISHED BY: <i>[Signature]</i>	DATE: 7-28-06	RECEIVED BY: <i>[Signature]</i>	DATE: 7-28
TIME: 16:37	TIME: 16:39		
RELINQUISHED BY:	DATE:	RECEIVED BY:	DATE:
TIME:	TIME:		

METHOD OF SHIPMENT: **HAND DELIVER TO *[Signature]* EXELON AIR BILL No. N/A**

White	-Fully Executed Copy	RECEIVED FOR LABORATORY BY: <i>[Signature]</i>	004286
Yellow	-Receiving Laboratory Copy		
Pink	-Shipper Copy		
Goldenrod	-Sampler Copy		

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 Drive  
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: EX001-3ESPQUAD-06  
P.O. #: 00411203  
Release #:  
Contract#: 00411203  
Kathy Shaw, FAX#: 860-747-1900, larry.walton@exeloncorp.com

Client ID/ Station	Laboratory ID Analysis	Vol/Units Price	Start Collect Date/Time	End Collect Date/Time
WG-QC-MW-QC-116S-072806-NZ-0	L29403-1		07/28/06:0650	
WG	GELI	162.00		
WG	H-3 (DIST)	162.00		
WG	SR-90 (FAST)	210.00		
WG-QC-MW-QC-115S-072806-NZ-0	L29403-2		07/28/06:0750	
WG	GELI	162.00		
WG	H-3 (DIST)	162.00		
WG	SR-90 (FAST)	210.00		
WG-QC-MW-QC-109S-072806-NZ-0	L29403-3		07/28/06:1000	
WG	GELI	162.00		
WG	H-3 (DIST)	162.00		
WG	SR-90 (FAST)	210.00		
WG-QC-MW-QC-109S-072806-NZ-0	L29403-4		07/28/06:1005	
WG	GELI	162.00		
WG	H-3 (DIST)	162.00		
WG	SR-90 (FAST)	210.00		
WG-QC-MW-QC-109I-072806-NZ-0	L29403-5		07/28/06:1110	

Client ID/ Station	Laboratory ID Analysis	Vol/Units Price	Start Collect Date/Time	End Collect Date/Time
WG	GELI	162.00		
WG	H-3 (DIST)	162.00		
WG	SR-90 (FAST)	210.00		
WG-QC-MW-QC-109I-072806-NZ-0 L29403-6			07/28/06:1115	
WG	GELI	162.00		
WG	H-3 (DIST)	162.00		
WG	SR-90 (FAST)	210.00		
RB-QC-MW-QC-102D-072806-NZ-0 L29403-7			07/28/06:1120	
WG	GELI	162.00		
WG	H-3 (DIST)	162.00		
WG	SR-90 (FAST)	210.00		
WG-QC-MW-QC-102D-072806-NZ-0 L29403-8			07/28/06:1225	
WG	GELI	162.00		
WG	H-3 (DIST)	162.00		
WG	SR-90 (FAST)	210.00		

---

End of document

# Internal Chain of Custody











08/01/06

Teledyne Brown Engineering  
Internal Chain of Custody  
Supplemental Sheet

L29403

\*\*\*\*\*

L29403-1      WG      WG-QC-MW-QC-116S-072806-NZ-008

<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	08/01/06
Count Room	SR-90 (FAST)	KOJ	07/31/06

\*\*\*\*\*

L29403-2      WG      WG-QC-MW-QC-115S-072806-NZ-009

<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	08/01/06
Count Room	SR-90 (FAST)	KOJ	07/31/06

\*\*\*\*\*

L29403-3      WG      WG-QC-MW-QC-109S-072806-NZ-010

<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	ILL	07/31/06
Count Room	H-3 (DIST)	KOJ	08/01/06
Count Room	SR-90 (FAST)	KOJ	07/31/06

\*\*\*\*\*

L29403-4      WG      WG-QC-MW-QC-109S-072806-NZ-011

<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	ILL	07/31/06
Count Room	H-3 (DIST)	KOJ	08/01/06
Count Room	SR-90 (FAST)	KOJ	07/31/06

\*\*\*\*\*

L29403-5      WG      WG-QC-MW-QC-109I-072806-NZ-012

<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	ILL	07/31/06



# Analytical Results Summary

**Report of Analysis**  
 08/01/06 09:59

**L29403**

Conestoga-Rovers & Associates

EX001-3ESPQUAD-06

Kathy Shaw

Sample ID: **WG-QC-MW-QC-116S-072806-NZ-008** Matrix: Ground Water (WG)  
 Station: Volume:   
 Description: % Moisture:   
 LIMS Number: L29403-1 Collect Start: 07/28/2006 06:50  
 Collect Stop:   
 Receive Date: 07/28/2006

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 (DIST)	2010	1.71E+02	1.22E+02	<b>1.83E+02</b>	pCi/L		10	ml		08/01/06	60	M	U
TOTAL SR	2018	-6.21E-01	8.65E-01	<b>1.88E+00</b>	pCi/L		450	ml	07/28/06 06:50	07/31/06	120	M	U
MN-54	2007	-9.27E-01	2.39E+00	<b>3.78E+00</b>	pCi/L		3139.72	ml	07/28/06 06:50	07/30/06	14400	Sec	U
CO-58	2007	1.46E+00	2.65E+00	<b>4.50E+00</b>	pCi/L		3139.72	ml	07/28/06 06:50	07/30/06	14400	Sec	U
FE-59	2007	1.05E+00	5.02E+00	<b>8.38E+00</b>	pCi/L		3139.72	ml	07/28/06 06:50	07/30/06	14400	Sec	U
CO-60	2007	8.13E-01	2.73E+00	<b>4.89E+00</b>	pCi/L		3139.72	ml	07/28/06 06:50	07/30/06	14400	Sec	U
ZN-65	2007	1.26E+01	5.83E+00	<b>1.02E+01</b>	pCi/L		3139.72	ml	07/28/06 06:50	07/30/06	14400	Sec	U*
NB-95	2007	2.04E+00	2.66E+00	<b>4.57E+00</b>	pCi/L		3139.72	ml	07/28/06 06:50	07/30/06	14400	Sec	U
ZR-95	2007	1.97E+00	4.43E+00	<b>7.50E+00</b>	pCi/L		3139.72	ml	07/28/06 06:50	07/30/06	14400	Sec	U
CS-134	2007	9.00E+00	3.34E+00	<b>4.87E+00</b>	pCi/L		3139.72	ml	07/28/06 06:50	07/30/06	14400	Sec	U*
CS-137	2007	1.23E+00	2.74E+00	<b>4.67E+00</b>	pCi/L		3139.72	ml	07/28/06 06:50	07/30/06	14400	Sec	U
BA-140	2007	-1.38E+00	1.03E+01	<b>1.67E+01</b>	pCi/L		3139.72	ml	07/28/06 06:50	07/30/06	14400	Sec	U
LA-140	2007	2.70E+00	3.34E+00	<b>5.92E+00</b>	pCi/L		3139.72	ml	07/28/06 06:50	07/30/06	14400	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**  
 08/01/06 09:59

**L29403**

Conestoga-Rovers & Associates

EX001-3ESPQUAD-06

Kathy Shaw

Sample ID: **WG-QC-MW-QC-115S-072806-NZ-009** Matrix: Ground Water (WG)  
 Station: Collect Start: 07/28/2006 07:50  
 Description: Collect Stop: Volume:  
 LIMS Number: L29403-2 Receive Date: 07/28/2006 % 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 (DIST)	2010	-1.51E+01	1.11E+02	<b>1.85E+02</b>	pCi/L		10	ml		08/01/06	60	M	U
TOTAL SR	2018	-9.81E-01	7.45E-01	<b>1.72E+00</b>	pCi/L		450	ml	07/28/06 07:50	07/31/06	120	M	U
MN-54	2007	-1.13E+00	2.16E+00	<b>3.71E+00</b>	pCi/L		3427.13	ml	07/28/06 07:50	07/30/06	14400	Sec	U
CO-58	2007	-1.32E-02	2.19E+00	<b>3.76E+00</b>	pCi/L		3427.13	ml	07/28/06 07:50	07/30/06	14400	Sec	U
FE-59	2007	2.07E-01	4.49E+00	<b>7.88E+00</b>	pCi/L		3427.13	ml	07/28/06 07:50	07/30/06	14400	Sec	U
CO-60	2007	1.02E-01	2.00E+00	<b>3.56E+00</b>	pCi/L		3427.13	ml	07/28/06 07:50	07/30/06	14400	Sec	U
ZN-65	2007	3.63E+00	4.73E+00	<b>7.85E+00</b>	pCi/L		3427.13	ml	07/28/06 07:50	07/30/06	14400	Sec	U
NB-95	2007	2.79E+00	2.45E+00	<b>4.47E+00</b>	pCi/L		3427.13	ml	07/28/06 07:50	07/30/06	14400	Sec	U
ZR-95	2007	-1.34E+00	3.63E+00	<b>6.08E+00</b>	pCi/L		3427.13	ml	07/28/06 07:50	07/30/06	14400	Sec	U
CS-134	2007	1.78E+00	2.75E+00	<b>3.65E+00</b>	pCi/L		3427.13	ml	07/28/06 07:50	07/30/06	14400	Sec	U
CS-137	2007	-9.73E-02	2.38E+00	<b>4.10E+00</b>	pCi/L		3427.13	ml	07/28/06 07:50	07/30/06	14400	Sec	U
BA-140	2007	-8.13E-02	8.45E+00	<b>1.47E+01</b>	pCi/L		3427.13	ml	07/28/06 07:50	07/30/06	14400	Sec	U
LA-140	2007	1.77E+00	2.65E+00	<b>5.12E+00</b>	pCi/L		3427.13	ml	07/28/06 07:50	07/30/06	14400	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

08/01/06 09:59

**L29403**

Conestoga-Rovers & Associates

EX001-3ESPQUAD-06

Kathy Shaw

Sample ID: **WG-QC-MW-QC-109S-072806-NZ-010**

Station:

Description:

LIMS Number: L29403-3

Collect Start: 07/28/2006 10:00

Collect Stop:

Receive Date: 07/28/2006

Matrix: Ground Water (WG)

Volume:

% 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	1.54E+02	1.19E+02	1.81E+02	pCi/L		10	ml	07/28/06 10:00	08/01/06	60	M	U
TOTAL SR	2018	2.33E-01	4.71E-01	9.21E-01	pCi/L		450	ml	07/28/06 10:00	07/31/06	120	M	U
MN-54	2007	2.79E+00	3.24E+00	5.60E+00	pCi/L		3191.67	ml	07/28/06 10:00	07/31/06	8581	Sec	U
CO-58	2007	-4.18E-01	3.26E+00	5.27E+00	pCi/L		3191.67	ml	07/28/06 10:00	07/31/06	8581	Sec	U
FE-59	2007	7.02E+00	6.53E+00	1.15E+01	pCi/L		3191.67	ml	07/28/06 10:00	07/31/06	8581	Sec	U
CO-60	2007	8.32E-01	3.08E+00	5.20E+00	pCi/L		3191.67	ml	07/28/06 10:00	07/31/06	8581	Sec	U*
ZN-65	2007	1.70E+01	8.37E+00	1.41E+01	pCi/L		3191.67	ml	07/28/06 10:00	07/31/06	8581	Sec	U
NB-95	2007	1.68E+00	3.31E+00	5.61E+00	pCi/L		3191.67	ml	07/28/06 10:00	07/31/06	8581	Sec	U
ZR-95	2007	-3.38E+00	5.69E+00	8.50E+00	pCi/L		3191.67	ml	07/28/06 10:00	07/31/06	8581	Sec	U
CS-134	2007	1.32E+01	6.42E+00	7.32E+00	pCi/L		3191.67	ml	07/28/06 10:00	07/31/06	8581	Sec	U*
CS-137	2007	-1.61E+00	3.45E+00	5.54E+00	pCi/L		3191.67	ml	07/28/06 10:00	07/31/06	8581	Sec	U
BA-140	2007	-6.29E+00	1.29E+01	2.05E+01	pCi/L		3191.67	ml	07/28/06 10:00	07/31/06	8581	Sec	U
LA-140	2007	3.13E+00	4.19E+00	7.44E+00	pCi/L		3191.67	ml	07/28/06 10:00	07/31/06	8581	Sec	U

**Flag Values**

- = 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



TELEDYNE  
BROWN ENGINEERING, INC.  
A Teledyne Technologies Company



**Report of Analysis**  
08/01/06 09:59  
**L29403**

Conestoga-Rovers & Associates  
EX001-3ESPQUAD-06

Kathy Shaw

Station:	WG-QC-MW-QC-109S-072806-NZ-011	Matrix:	Ground Water	(WG)							
Description:		Volume:									
LIMS Number:	L29403-4	% Moisture:									
Collect Start:	07/28/2006 10:05	Reference Date									
Collect Stop:		Count Date									
Receive Date:	07/28/2006	Count Time									
Run #	Units	Aliquot Volume	Aliquot Units	Count Units							
Activity Conc	Uncertainty 2 Sigma	MDC	Run #	Units							
SOP#	Activity Conc	Uncertainty 2 Sigma	MDC	Units							
Radionuclide	SOP#	Activity Conc	Uncertainty 2 Sigma	MDC							
H-3 (DIST)	2010	6.42E+01	1.08E+02	1.72E+02	pCi/L	10	ml	08/01/06	60	M	U
TOTAL SR	2018	4.03E-01	7.34E-01	1.49E+00	pCi/L	450	ml	07/28/06 10:05	50	M	U
MN-54	2007	-8.01E-01	2.91E+00	5.07E+00	pCi/L	3333.82	ml	07/28/06 10:05	10861	Sec	No
CO-58	2007	-1.33E+00	2.79E+00	4.61E+00	pCi/L	3333.82	ml	07/28/06 10:05	10861	Sec	No
FE-59	2007	-3.72E+00	5.29E+00	8.76E+00	pCi/L	3333.82	ml	07/28/06 10:05	10861	Sec	No
CO-60	2007	1.38E+00	2.79E+00	5.18E+00	pCi/L	3333.82	ml	07/28/06 10:05	10861	Sec	No
ZN-65	2007	-5.72E-01	7.45E+00	1.10E+01	pCi/L	3333.82	ml	07/28/06 10:05	10861	Sec	No
NB-95	2007	6.91E+00	3.49E+00	6.08E+00	pCi/L	3333.82	ml	07/28/06 10:05	10861	Sec	U*
ZR-95	2007	2.95E+00	4.97E+00	8.94E+00	pCi/L	3333.82	ml	07/28/06 10:05	10861	Sec	U
CS-134	2007	2.31E+00	3.11E+00	4.93E+00	pCi/L	3333.82	ml	07/28/06 10:05	10861	Sec	U
CS-137	2007	-2.60E+00	3.14E+00	5.12E+00	pCi/L	3333.82	ml	07/28/06 10:05	10861	Sec	U
BA-140	2007	-1.16E+00	1.16E+01	2.00E+01	pCi/L	3333.82	ml	07/28/06 10:05	10861	Sec	U
LA-140	2007	6.07E-01	3.61E+00	6.65E+00	pCi/L	3333.82	ml	07/28/06 10:05	10861	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  
08/01/06 09:59

L29403

Conestoga-Rovers & Associates

EX001-3ESPQUAD-06

Kathy Shaw

Sample ID: **WG-QC-MW-QC-1091-072806-NZ-012** Matrix: Ground Water (WG)  
 Station: **WG-QC-MW-QC-1091-072806-NZ-012**  
 Description: **WG-QC-MW-QC-1091-072806-NZ-012**  
 LIMS Number: L29403-5  
 Collect Start: 07/28/2006 11:10  
 Collect Stop:   
 Receive Date: 07/28/2006  
 Volume:   
 % Moisture:   
 Matrix: Ground Water (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	7.68E+02	1.56E+02	1.88E+02	pCi/L		10	ml	07/28/06 11:10	08/01/06	60	M	+
TOTAL SR	2018	9.97E-01	6.26E-01	1.10E+00	pCi/L		450	ml	07/28/06 11:10	07/31/06	120	M	U
MN-54	2007	6.82E-01	3.02E+00	4.99E+00	pCi/L		3280.36	ml	07/28/06 11:10	07/31/06	13261	Sec	U
CO-58	2007	-3.36E+00	2.75E+00	4.05E+00	pCi/L		3280.36	ml	07/28/06 11:10	07/31/06	13261	Sec	U
FE-59	2007	2.10E-02	5.32E+00	8.74E+00	pCi/L		3280.36	ml	07/28/06 11:10	07/31/06	13261	Sec	U
CO-60	2007	-2.20E+00	3.34E+00	5.49E+00	pCi/L		3280.36	ml	07/28/06 11:10	07/31/06	13261	Sec	U
ZN-65	2007	1.22E+01	7.44E+00	1.23E+01	pCi/L		3280.36	ml	07/28/06 11:10	07/31/06	13261	Sec	U
NB-95	2007	6.24E+00	3.40E+00	5.57E+00	pCi/L		3280.36	ml	07/28/06 11:10	07/31/06	13261	Sec	U*
ZR-95	2007	1.96E+00	5.37E+00	9.03E+00	pCi/L		3280.36	ml	07/28/06 11:10	07/31/06	13261	Sec	U
CS-134	2007	6.16E+00	4.47E+00	5.59E+00	pCi/L		3280.36	ml	07/28/06 11:10	07/31/06	13261	Sec	U
CS-137	2007	-3.50E-01	3.25E+00	5.35E+00	pCi/L		3280.36	ml	07/28/06 11:10	07/31/06	13261	Sec	U
BA-140	2007	2.48E+00	1.19E+01	1.97E+01	pCi/L		3280.36	ml	07/28/06 11:10	07/31/06	13261	Sec	U
LA-140	2007	1.09E+00	4.18E+00	7.01E+00	pCi/L		3280.36	ml	07/28/06 11:10	07/31/06	13261	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.**

**L29403**

Conestoga-Rovers & Associates

EX001-3ESPQUAD-06

Kathy Shaw

Sample ID: **WG-QC-MW-QC-1091-072806-NZ-013** Matrix: Ground Water (WG)  
 Station: Collect Start: 07/28/2006 11:15 Volume:  
 Description: Collect Stop: Receive Date: 07/28/2006 % Moisture:  
 LIMS Number: L29403-6

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	1.14E+03	1.82E+02	2.01E+02	pCi/L		10	ml	07/28/06 11:15	08/01/06	49.35	M	+
TOTAL SR	2018	4.12E-01	6.54E-01	1.26E+00	pCi/L		450	ml	07/28/06 11:15	07/31/06	120	M	U
MN-54	2007	-1.62E-01	3.07E+00	4.98E+00	pCi/L		3379.89	ml	07/28/06 11:15	07/31/06	11671	Sec	U
CO-58	2007	2.07E+00	3.09E+00	5.25E+00	pCi/L		3379.89	ml	07/28/06 11:15	07/31/06	11671	Sec	U
FE-59	2007	6.10E+00	5.64E+00	9.91E+00	pCi/L		3379.89	ml	07/28/06 11:15	07/31/06	11671	Sec	U
CO-60	2007	-7.57E-01	2.96E+00	4.76E+00	pCi/L		3379.89	ml	07/28/06 11:15	07/31/06	11671	Sec	U
ZN-65	2007	2.83E+01	8.80E+00	1.52E+01	pCi/L		3379.89	ml	07/28/06 11:15	07/31/06	11671	Sec	U*
NB-95	2007	4.29E+00	3.30E+00	5.77E+00	pCi/L		3379.89	ml	07/28/06 11:15	07/31/06	11671	Sec	U
ZR-95	2007	2.82E+00	5.45E+00	9.20E+00	pCi/L		3379.89	ml	07/28/06 11:15	07/31/06	11671	Sec	U
CS-134	2007	2.31E+01	8.40E+00	8.30E+00	pCi/L		3379.89	ml	07/28/06 11:15	07/31/06	11671	Sec	U*
CS-137	2007	7.17E-01	3.15E+00	5.28E+00	pCi/L		3379.89	ml	07/28/06 11:15	07/31/06	11671	Sec	U
BA-140	2007	3.11E+00	1.22E+01	2.02E+01	pCi/L		3379.89	ml	07/28/06 11:15	07/31/06	11671	Sec	U
LA-140	2007	2.69E+00	4.08E+00	7.09E+00	pCi/L		3379.89	ml	07/28/06 11:15	07/31/06	11671	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**  
 08/01/06 09:59

**L29403**

Conestoga-Rovers & Associates

EX001-3ESPQUAD-06

Kathy Shaw

Sample ID: **RB-QC-MW-QC-102D-072806-NZ-014** Matrix: Ground Water (WG)  
 Station: Collect Start: 07/28/2006 11:20  
 Description: Collect Stop: Volume:  
 LIMS Number: L29403-7 Receive Date: 07/28/2006 % 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 (DIST)	2010	<b>3.65E+02</b>	1.32E+02	<b>1.83E+02</b>	pCi/L		10	ml		08/01/06	60	M	+
TOTAL SR	2018	-6.88E-01	5.58E-01	<b>1.28E+00</b>	pCi/L		450	ml	07/28/06 11:20	07/31/06	120	M	U
MN-54	2007	-3.13E+00	2.42E+00	<b>3.84E+00</b>	pCi/L		3268.73	ml	07/28/06 11:20	07/31/06	9481	Sec	U
CO-58	2007	-4.24E-01	2.84E+00	<b>4.85E+00</b>	pCi/L		3268.73	ml	07/28/06 11:20	07/31/06	9481	Sec	U
FE-59	2007	-3.31E-01	4.97E+00	<b>8.87E+00</b>	pCi/L		3268.73	ml	07/28/06 11:20	07/31/06	9481	Sec	U
CO-60	2007	-1.96E+00	2.59E+00	<b>4.17E+00</b>	pCi/L		3268.73	ml	07/28/06 11:20	07/31/06	9481	Sec	U
ZN-65	2007	3.02E+00	5.70E+00	<b>9.60E+00</b>	pCi/L		3268.73	ml	07/28/06 11:20	07/31/06	9481	Sec	U
NB-95	2007	1.16E+00	2.65E+00	<b>4.81E+00</b>	pCi/L		3268.73	ml	07/28/06 11:20	07/31/06	9481	Sec	U
ZR-95	2007	-3.31E-01	4.50E+00	<b>7.84E+00</b>	pCi/L		3268.73	ml	07/28/06 11:20	07/31/06	9481	Sec	U
CS-134	2007	1.42E+00	2.84E+00	<b>4.52E+00</b>	pCi/L		3268.73	ml	07/28/06 11:20	07/31/06	9481	Sec	U
CS-137	2007	1.94E-01	2.90E+00	<b>5.11E+00</b>	pCi/L		3268.73	ml	07/28/06 11:20	07/31/06	9481	Sec	U
BA-140	2007	1.08E+01	1.18E+01	<b>2.19E+01</b>	pCi/L		3268.73	ml	07/28/06 11:20	07/31/06	9481	Sec	U
LA-140	2007	-1.89E+00	3.65E+00	<b>6.27E+00</b>	pCi/L		3268.73	ml	07/28/06 11:20	07/31/06	9481	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**  
 08/01/06 09:59

**L29403**

Conestoga-Rovers & Associates

EX001-3ESPQUAD-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 (DIST)	2010	3.93E+03	4.50E+02	3.25E+02	pCi/L		10	ml		08/01/06	18.85	M	+ High
TOTAL SR	2018	-3.47E-02	9.15E-01	1.87E+00	pCi/L		450	ml	07/28/06 12:25	07/31/06	120	M	U
MN-54	2007	1.05E+00	3.75E+00	6.26E+00	pCi/L		3358.53	ml	07/28/06 12:25	07/31/06	7756	Sec	U
CO-58	2007	1.10E-01	3.95E+00	6.47E+00	pCi/L		3358.53	ml	07/28/06 12:25	07/31/06	7756	Sec	U
FE-59	2007	3.34E-01	7.71E+00	1.27E+01	pCi/L		3358.53	ml	07/28/06 12:25	07/31/06	7756	Sec	U
CO-60	2007	8.21E-01	4.61E+00	8.18E+00	pCi/L		3358.53	ml	07/28/06 12:25	07/31/06	7756	Sec	U
ZN-65	2007	1.43E+01	1.12E+01	1.81E+01	pCi/L		3358.53	ml	07/28/06 12:25	07/31/06	7756	Sec	U
NB-95	2007	7.22E+00	4.34E+00	7.98E+00	pCi/L		3358.53	ml	07/28/06 12:25	07/31/06	7756	Sec	U
ZR-95	2007	-1.69E+00	6.03E+00	9.62E+00	pCi/L		3358.53	ml	07/28/06 12:25	07/31/06	7756	Sec	U
CS-134	2007	9.94E+00	4.61E+00	7.84E+00	pCi/L		3358.53	ml	07/28/06 12:25	07/31/06	7756	Sec	U*
CS-137	2007	7.66E+00	4.17E+00	7.84E+00	pCi/L		3358.53	ml	07/28/06 12:25	07/31/06	7756	Sec	U
BA-140	2007	-1.53E+01	1.66E+01	2.52E+01	pCi/L		3358.53	ml	07/28/06 12:25	07/31/06	7756	Sec	U
LA-140	2007	4.33E+00	4.93E+00	9.03E+00	pCi/L		3358.53	ml	07/28/06 12:25	07/31/06	7756	Sec	U

Matrix: Ground Water  
 Volume:  
 % Moisture:

Collect Start: 07/28/2006 12:25  
 Collect Stop:  
 Receive Date: 07/28/2006

Sample ID: **WG-QC-MW-QC-102D-072806-NZ-015**  
 Station:  
 Description:  
 LIMS Number: L29403-8

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 **L29403**

8/1/2006 9:58:25AM



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>
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>
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>
WG4273-3 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 L29403

8/1/2006 9:58:25AM



## 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>
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>	<u>P/F</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>	<u>P/F</u>
WG4278-3 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

Work Order: L29403 Customer: Exelon

Nuclide: H-3 (DIST) Project: EX001-3ESPQUAD-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
L29403-1	H-3 DIST		10 ml			0		01-aug-06 02:27	LS7	170	60	2.03	60	.211	EJ
WG-QC-MW-QC-116S-072806-NZ-008															
Activity: 1.71E+02 Error: 1.22E+02 MDC: 1.83E+02 *															
L29403-2	H-3 DIST		10 ml			0		01-aug-06 03:31	LS7	118	60	2.03	60	.209	EJ
WG-QC-MW-QC-115S-072806-NZ-009															
Activity: -1.51E+01 Error: 1.11E+02 MDC: 1.85E+02 *															
L29403-3	H-3 DIST		10 ml			0		01-aug-06 04:34	LS7	166	60	2.03	60	.213	EJ
WG-QC-MW-QC-109S-072806-NZ-010															
Activity: 1.54E+02 Error: 1.19E+02 MDC: 1.81E+02 *															
L29403-4	H-3 DIST		10 ml			0		01-aug-06 05:38	LS7	141	60	2.03	60	.225	EJ
WG-QC-MW-QC-109S-072806-NZ-011															
Activity: 6.42E+01 Error: 1.08E+02 MDC: 1.72E+02 *															
L29403-5	H-3 DIST		10 ml			0		01-aug-06 06:42	LS7	332	60	2.03	60	.205	EJ
WG-QC-MW-QC-109I-072806-NZ-012															
Activity: 7.68E+02 * Error: 1.56E+02 MDC: 1.88E+02															
L29403-6	H-3 DIST		10 ml			0		01-aug-06 07:45	LS7	365	49.35	2.03	60	.212	EJ
WG-QC-MW-QC-109I-072806-NZ-013															
Activity: 1.14E+03 * Error: 1.82E+02 MDC: 2.01E+02															
L29403-7	H-3 DIST		10 ml			0		01-aug-06 08:38	LS7	224	60	2.03	60	.211	EJ
RB-QC-MW-QC-102D-072806-NZ-014															
Activity: 3.65E+02 * Error: 1.32E+02 MDC: 1.83E+02															
L29403-8	H-3 DIST		10 ml			0		01-aug-06 09:42	LS7	387	18.85	2.03	60	.212	EJ
WG-QC-MW-QC-102D-072806-NZ-015															
Activity: 3.93E+03 * Error: 4.5E+02 MDC: 3.25E+02															



Sec. Review: *EW* Analyst: *W* LIMS: 

=====

VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 31-JUL-2006 03:53:25.68  
 TBE04 P-40312B HpGe \*\*\*\*\* Aquisition Date/Time: 30-JUL-2006 23:53:16.81

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LIMS No., Customer Name, Client ID: WG L29403-1 EX QUAD

Sample ID : 04L29403-1 Smple Date: 28-JUL-2006 06:50:00.  
 Sample Type : WG Geometry : 043L082004  
 Quantity : 3.13970E+00 L BKGFILE : 04BG072806MT  
 Start Channel : 90 Energy Tol : 1.50000 Real Time : 0 04:00:02.72  
 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	4	63.17*	71	379	1.35	127.23	5.49E-01	4.92E-03	51.7	1.69E+00
2	4	66.39*	100	418	1.36	133.68	6.66E-01	6.95E-03	38.6	
3	1	77.05*	65	389	0.80	155.01	1.06E+00	4.51E-03	52.5	1.27E+00
4	1	87.16*	36	300	1.07	175.24	1.39E+00	2.50E-03	82.6	3.80E+00
5	1	139.69*	59	447	1.10	280.37	2.04E+00	4.09E-03	67.9	2.93E+00
6	1	185.62*	10	361	1.25	372.27	1.92E+00	6.66E-04	363.9	1.48E+00
7	1	198.16*	74	362	1.15	397.37	1.87E+00	5.15E-03	49.1	1.77E+00
8	1	241.11	182	553	5.10	483.30	1.67E+00	1.27E-02	32.6	7.91E+00
9	1	294.86*	212	247	1.23	590.86	1.46E+00	1.47E-02	16.6	4.18E+00
10	1	351.84*	386	199	1.24	704.85	1.28E+00	2.68E-02	9.1	1.42E+00
11	1	595.98	43	92	1.41	1193.25	8.63E-01	2.96E-03	44.0	2.40E+00
12	1	609.05*	357	101	1.45	1219.39	8.49E-01	2.48E-02	8.6	1.76E+00
13	1	1120.27*	105	25	2.64	2241.72	5.27E-01	7.32E-03	16.2	3.41E+00
14	1	1237.91*	29	58	2.04	2476.91	4.87E-01	2.03E-03	65.7	1.89E+00
15	1	1377.74	37	27	1.90	2756.43	4.49E-01	2.57E-03	33.0	1.34E+00
16	1	1460.41*	11	21	2.66	2921.67	4.30E-01	7.69E-04	134.2	9.71E-01
17	1	1764.56*	76	26	2.69	3529.48	3.77E-01	5.29E-03	19.8	8.15E-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	11	10.67*	4.297E-01	1.444E+01	1.444E+01	268.42
RA-226	186.21	10	3.28*	1.923E+00	9.090E+00	9.090E+00	727.89
U-235	143.76	-----	10.50*	2.041E+00	-----	Line Not Found	-----
	163.35	-----	4.70	2.007E+00	-----	Line Not Found	-----
	185.71	10	54.00	1.923E+00	5.521E-01	5.521E-01	727.89
	205.31	-----	4.70	1.833E+00	-----	Line Not Found	-----

Flag: "\*" = Keyline

Summary of Nuclide Activity  
 Sample ID : 04L29403-1

Page : 2  
 Acquisition date : 30-JUL-2006 23:53:16

Total number of lines in spectrum 17  
 Number of unidentified lines 14  
 Number of lines tentatively identified by NID 3 17.65%

Nuclide Type : natural

Nuclide	Hlife	Decay	Uncorrected pCi/L	Decay Corr pCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	1.444E+01	1.444E+01	3.876E+01	268.42	
RA-226	1600.00Y	1.00	9.090E+00	9.090E+00	66.16E+00	727.89	
U-235	7.04E+08Y	1.00	5.521E-01	5.521E-01	40.19E-01	727.89	K
Total Activity :			2.408E+01	2.408E+01			

Grand Total Activity : 2.408E+01 2.408E+01

Flags: "K" = Keyline not found  
 "E" = Manually edited

"M" = Manually accepted  
 "A" = Nuclide specific abn. limit

Unidentified Energy Lines  
Sample ID : 04L29403-1

Page : 3  
Acquisition date : 30-JUL-2006 23:53:16

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
4	63.17	71	379	1.35	127.23	123	18	4.92E-03	****	5.49E-01	
4	66.39	100	418	1.36	133.68	123	18	6.95E-03	77.1	6.66E-01	
1	77.05	65	389	0.80	155.01	153	6	4.51E-03	****	1.06E+00	
1	87.16	36	300	1.07	175.24	173	6	2.50E-03	****	1.39E+00	
1	139.69	59	447	1.10	280.37	276	9	4.09E-03	****	2.04E+00	
1	198.16	74	362	1.15	397.37	393	9	5.15E-03	98.2	1.87E+00	
1	241.11	182	553	5.10	483.30	474	19	1.27E-02	65.2	1.67E+00	T
1	294.86	212	247	1.23	590.86	585	11	1.47E-02	33.2	1.46E+00	
1	351.84	386	199	1.24	704.85	700	11	2.68E-02	18.2	1.28E+00	
1	595.98	43	92	1.41	1193.25	1191	9	2.96E-03	87.9	8.63E-01	
1	609.05	357	101	1.45	1219.39	1212	14	2.48E-02	17.1	8.49E-01	
1	1120.27	105	25	2.64	2241.72	2235	18	7.32E-03	32.4	5.27E-01	
1	1237.91	29	58	2.04	2476.91	2470	18	2.03E-03	****	4.87E-01	
1	1377.74	37	27	1.90	2756.43	2751	12	2.57E-03	66.0	4.49E-01	
1	1764.56	76	26	2.69	3529.48	3521	15	5.29E-03	39.6	3.77E-01	

Flags: "T" = Tentatively associated

#### Summary of Nuclide Activity

Total number of lines in spectrum	17
Number of unidentified lines	14
Number of lines tentatively identified by NID	3
	17.65%

Nuclide Type : natural

Nuclide	Hlife	Decay	Wtd Mean Uncorrected pCi/L	Wtd Mean Decay Corr pCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	1.444E+01	1.444E+01	3.876E+01	268.42	
RA-226	1600.00Y	1.00	9.090E+00	9.090E+00	66.16E+00	727.89	
Total Activity :			2.353E+01	2.353E+01			

Grand Total Activity : 2.353E+01 2.353E+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	1.444E+01	3.876E+01	4.140E+01	0.000E+00	0.349
RA-226	9.090E+00	6.616E+01	9.919E+01	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	-4.158E+00		2.211E+01	3.591E+01	0.000E+00	-0.116
NA-24	-8.604E+00		6.751E+01	9.528E+01	0.000E+00	-0.090
CR-51	4.727E+00		2.310E+01	3.775E+01	0.000E+00	0.125
MN-54	-9.267E-01		2.394E+00	3.782E+00	0.000E+00	-0.245
CO-57	-1.526E+00		2.352E+00	3.757E+00	0.000E+00	-0.406
CO-58	1.459E+00		2.654E+00	4.499E+00	0.000E+00	0.324
FE-59	1.045E+00		5.018E+00	8.384E+00	0.000E+00	0.125
CO-60	8.132E-01		2.730E+00	4.885E+00	0.000E+00	0.166
ZN-65	1.262E+01		5.827E+00	1.023E+01	0.000E+00	1.233
SE-75	1.724E+00		3.440E+00	5.743E+00	0.000E+00	0.300
SR-85	6.811E+00		3.128E+00	5.557E+00	0.000E+00	1.226
Y-88	-1.671E+00		2.840E+00	4.372E+00	0.000E+00	-0.382
NB-94	-3.263E+00		2.557E+00	3.882E+00	0.000E+00	-0.840
NB-95	2.035E+00		2.655E+00	4.570E+00	0.000E+00	0.445
ZR-95	1.972E+00		4.434E+00	7.503E+00	0.000E+00	0.263
MO-99	-3.094E+01		3.703E+01	5.724E+01	0.000E+00	-0.541
RU-103	5.436E-01		2.664E+00	4.407E+00	0.000E+00	0.123
RU-106	-1.034E+01		2.289E+01	3.706E+01	0.000E+00	-0.279
AG-110m	-1.547E+00		2.477E+00	3.946E+00	0.000E+00	-0.392
SN-113	1.335E+00		3.242E+00	5.491E+00	0.000E+00	0.243
SB-124	2.083E+00		4.642E+00	4.073E+00	0.000E+00	0.511
SB-125	1.419E+00		7.558E+00	1.260E+01	0.000E+00	0.113
TE-129M	1.225E+01		2.974E+01	4.997E+01	0.000E+00	0.245
I-131	2.111E+00		3.101E+00	5.335E+00	0.000E+00	0.396
BA-133	2.422E+00		3.841E+00	5.730E+00	0.000E+00	0.423
CS-134	9.003E+00		3.338E+00	4.869E+00	0.000E+00	1.849
CS-136	-2.468E+00		2.935E+00	4.490E+00	0.000E+00	-0.550
CS-137	1.225E+00		2.743E+00	4.672E+00	0.000E+00	0.262
CE-139	-1.447E+00		2.541E+00	4.002E+00	0.000E+00	-0.361
BA-140	-1.380E+00		1.031E+01	1.665E+01	0.000E+00	-0.083
LA-140	2.695E+00		3.336E+00	5.922E+00	0.000E+00	0.455
CE-141	-1.335E+00		4.859E+00	7.028E+00	0.000E+00	-0.190
CE-144	1.283E+01		2.058E+01	3.100E+01	0.000E+00	0.414
EU-152	-8.228E+00		9.178E+00	1.298E+01	0.000E+00	-0.634
EU-154	-2.263E+00		4.922E+00	7.904E+00	0.000E+00	-0.286
AC-228	1.808E+00		1.046E+01	1.760E+01	0.000E+00	0.103
TH-228	-1.384E+00		6.017E+00	8.783E+00	0.000E+00	-0.158
TH-232	1.806E+00		1.045E+01	1.759E+01	0.000E+00	0.103
U-235	5.776E+00		2.169E+01	3.063E+01	0.000E+00	0.189
U-238	1.888E+02		2.960E+02	5.125E+02	0.000E+00	0.368
AM-241	-1.045E+01		2.697E+01	3.874E+01	0.000E+00	-0.270

A, 04L29403-1 , 07/31/2006 03:53, 07/28/2006 06:50, 3.140E+00, WG L29403-1 EX  
 B, 04L29403-1 , LIBD , 07/28/2006 09:49, 043L082004  
 C, K-40 , YES, 1.444E+01, 3.876E+01, 4.140E+01,, 0.349  
 C, RA-226 , YES, 9.090E+00, 6.616E+01, 9.919E+01,, 0.092  
 C, BE-7 , NO , -4.158E+00, 2.211E+01, 3.591E+01,, -0.116  
 C, NA-24 , NO , -8.604E+00, 6.751E+01, 9.528E+01,, -0.090  
 C, CR-51 , NO , 4.727E+00, 2.310E+01, 3.775E+01,, 0.125  
 C, MN-54 , NO , -9.267E-01, 2.394E+00, 3.782E+00,, -0.245  
 C, CO-57 , NO , -1.526E+00, 2.352E+00, 3.757E+00,, -0.406  
 C, CO-58 , NO , 1.459E+00, 2.654E+00, 4.499E+00,, 0.324  
 C, FE-59 , NO , 1.045E+00, 5.018E+00, 8.384E+00,, 0.125  
 C, CO-60 , NO , 8.132E-01, 2.730E+00, 4.885E+00,, 0.166  
 C, ZN-65 , NO , 1.262E+01, 5.827E+00, 1.023E+01,, 1.233  
 C, SE-75 , NO , 1.724E+00, 3.440E+00, 5.743E+00,, 0.300  
 C, SR-85 , NO , 6.811E+00, 3.128E+00, 5.557E+00,, 1.226  
 C, Y-88 , NO , -1.671E+00, 2.840E+00, 4.372E+00,, -0.382  
 C, NB-94 , NO , -3.263E+00, 2.557E+00, 3.882E+00,, -0.840  
 C, NB-95 , NO , 2.035E+00, 2.655E+00, 4.570E+00,, 0.445  
 C, ZR-95 , NO , 1.972E+00, 4.434E+00, 7.503E+00,, 0.263  
 C, MO-99 , NO , -3.094E+01, 3.703E+01, 5.724E+01,, -0.541  
 C, RU-103 , NO , 5.436E-01, 2.664E+00, 4.407E+00,, 0.123  
 C, RU-106 , NO , -1.034E+01, 2.289E+01, 3.706E+01,, -0.279  
 C, AG-110m , NO , -1.547E+00, 2.477E+00, 3.946E+00,, -0.392  
 C, SN-113 , NO , 1.335E+00, 3.242E+00, 5.491E+00,, 0.243  
 C, SB-124 , NO , 2.083E+00, 4.642E+00, 4.073E+00,, 0.511  
 C, SB-125 , NO , 1.419E+00, 7.558E+00, 1.260E+01,, 0.113  
 C, TE-129M , NO , 1.225E+01, 2.974E+01, 4.997E+01,, 0.245  
 C, I-131 , NO , 2.111E+00, 3.101E+00, 5.335E+00,, 0.396  
 C, BA-133 , NO , 2.422E+00, 3.841E+00, 5.730E+00,, 0.423  
 C, CS-134 , NO , 9.003E+00, 3.338E+00, 4.869E+00,, 1.849  
 C, CS-136 , NO , -2.468E+00, 2.935E+00, 4.490E+00,, -0.550  
 C, CS-137 , NO , 1.225E+00, 2.743E+00, 4.672E+00,, 0.262  
 C, CE-139 , NO , -1.447E+00, 2.541E+00, 4.002E+00,, -0.361  
 C, BA-140 , NO , -1.380E+00, 1.031E+01, 1.665E+01,, -0.083  
 C, LA-140 , NO , 2.695E+00, 3.336E+00, 5.922E+00,, 0.455  
 C, CE-141 , NO , -1.335E+00, 4.859E+00, 7.028E+00,, -0.190  
 C, CE-144 , NO , 1.283E+01, 2.058E+01, 3.100E+01,, 0.414  
 C, EU-152 , NO , -8.228E+00, 9.178E+00, 1.298E+01,, -0.634  
 C, EU-154 , NO , -2.263E+00, 4.922E+00, 7.904E+00,, -0.286  
 C, AC-228 , NO , 1.808E+00, 1.046E+01, 1.760E+01,, 0.103  
 C, TH-228 , NO , -1.384E+00, 6.017E+00, 8.783E+00,, -0.158  
 C, TH-232 , NO , 1.806E+00, 1.045E+01, 1.759E+01,, 0.103  
 C, U-235 , NO , 5.776E+00, 2.169E+01, 3.063E+01,, 0.189  
 C, U-238 , NO , 1.888E+02, 2.960E+02, 5.125E+02,, 0.368  
 C, AM-241 , NO , -1.045E+01, 2.697E+01, 3.874E+01,, -0.270



Sec. Review: Analyst: LIMS: ✓

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VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 31-JUL-2006 03:53:48.37  
 TBE23 03017322 HpGe \*\*\*\*\* Aquisition Date/Time: 30-JUL-2006 23:53:29.39

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LIMS No., Customer Name, Client ID: WG L29403-2 EX QUAD

Sample ID : 23L29403-2                      Smple Date: 28-JUL-2006 07:50:00.  
 Sample Type : WG                              Geometry : 2335L090704  
 Quantity : 3.42710E+00 L                      BKGFILE : 23BG072806MT  
 Start Channel : 50                      Energy Tol : 1.00000                      Real Time : 0 04:00:09.98  
 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	7	33.69*	56	9	1.08	67.71	9.24E-02	3.87E-03	29.0	2.77E+00
2	7	35.16*	59	110	1.80	70.63	1.16E-01	4.10E-03	63.2	
3	7	37.45*	117	235	1.81	75.21	1.58E-01	8.15E-03	32.4	
4	7	39.51	73	213	1.14	79.34	2.02E-01	5.04E-03	36.5	
5	7	40.72	51	312	1.50	81.75	2.31E-01	3.51E-03	62.1	
6	7	42.99*	23	352	1.75	86.28	2.88E-01	1.61E-03	124.5	
7	0	77.16*	87	584	1.25	154.55	1.36E+00	6.08E-03	48.1	
8	0	92.57*	18	504	1.35	185.34	1.69E+00	1.28E-03	227.1	
9	0	139.91*	190	638	1.34	279.91	2.05E+00	1.32E-02	26.2	
10	0	198.16	98	399	1.04	396.30	1.90E+00	6.79E-03	36.7	
11	0	238.57*	72	263	0.94	477.06	1.72E+00	5.00E-03	42.1	
12	0	241.81	119	321	1.21	483.53	1.71E+00	8.30E-03	27.5	
13	0	294.77*	306	328	1.07	589.37	1.50E+00	2.13E-02	13.1	
14	0	351.91*	408	255	1.19	703.57	1.32E+00	2.84E-02	9.6	
15	0	596.61	48	127	0.83	1192.81	8.73E-01	3.34E-03	50.9	
16	0	609.20*	426	119	1.69	1218.00	8.59E-01	2.96E-02	7.6	
17	0	934.56	36	48	1.45	1868.88	6.27E-01	2.50E-03	39.6	
18	0	1120.35*	93	44	1.38	2240.75	5.52E-01	6.47E-03	19.0	
19	0	1238.91	43	39	1.48	2478.14	5.15E-01	2.99E-03	33.6	
20	0	1378.69	32	35	1.44	2758.06	4.78E-01	2.24E-03	40.9	
21	0	1461.45*	14	40	2.39	2923.85	4.59E-01	9.62E-04	157.3	
22	0	1730.65	17	23	2.31	3463.30	4.06E-01	1.19E-03	65.5	
23	0	1764.18*	63	15	2.00	3530.50	4.01E-01	4.36E-03	19.8	

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	14	10.67*	4.593E-01	1.549E+01	1.549E+01	314.53
TH-228	238.63	72	44.60*	1.725E+00	5.125E+00	5.139E+00	84.17
	240.98	119	3.95	1.711E+00	9.683E+01	9.709E+01	54.91

Flag: "\*" = Keyline

## Summary of Nuclide Activity

Page : 2

Sample ID : 23L29403-2

Acquisition date : 30-JUL-2006 23:53:29

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 pCi/L	Decay Corr pCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	1.549E+01	1.549E+01	4.871E+01	314.53	
TH-228	1.91Y	1.00	5.125E+00	5.139E+00	4.325E+00	84.17	
Total Activity :			2.061E+01	2.063E+01			

Grand Total Activity :	2.061E+01	2.063E+01
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Flags: "K" = Keyline not found  
 "E" = Manually edited

"M" = Manually accepted  
 "A" = Nuclide specific abn. limit

Unidentified Energy Lines  
Sample ID : 23L29403-2

Page : 3  
Acquisition date : 30-JUL-2006 23:53:29

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
7	33.69	56	9	1.08	67.71	65	25	3.87E-03	58.1	9.24E-02	
7	35.16	59	110	1.80	70.63	65	25	4.10E-03	****	1.16E-01	
7	37.45	117	235	1.81	75.21	65	25	8.15E-03	64.8	1.58E-01	
7	39.51	73	213	1.14	79.34	65	25	5.04E-03	73.1	2.02E-01	
7	40.72	51	312	1.50	81.75	65	25	3.51E-03	****	2.31E-01	
7	42.99	23	352	1.75	86.28	65	25	1.61E-03	****	2.88E-01	
0	77.16	87	584	1.25	154.55	152	7	6.08E-03	96.2	1.36E+00	
0	92.57	18	504	1.35	185.34	182	7	1.28E-03	****	1.69E+00	
0	139.91	190	638	1.34	279.91	276	10	1.32E-02	52.4	2.05E+00	
0	198.16	98	399	1.04	396.30	393	8	6.79E-03	73.4	1.90E+00	
0	294.77	306	328	1.07	589.37	584	11	2.13E-02	26.1	1.50E+00	
0	351.91	408	255	1.19	703.57	697	12	2.84E-02	19.2	1.32E+00	
0	596.61	48	127	0.83	1192.81	1187	13	3.34E-03	****	8.73E-01	
0	609.20	426	119	1.69	1218.00	1211	14	2.96E-02	15.3	8.59E-01	
0	934.56	36	48	1.45	1868.88	1864	10	2.50E-03	79.2	6.27E-01	
0	1120.35	93	44	1.38	2240.75	2236	13	6.47E-03	38.0	5.52E-01	
0	1238.91	43	39	1.48	2478.14	2473	13	2.99E-03	67.2	5.15E-01	
0	1378.69	32	35	1.44	2758.06	2751	12	2.24E-03	81.9	4.78E-01	
0	1730.65	17	23	2.31	3463.30	3453	14	1.19E-03	****	4.06E-01	
0	1764.18	63	15	2.00	3530.50	3524	12	4.36E-03	39.5	4.01E-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 Uncorrected pCi/L	Wtd Mean Decay Corr pCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	1.549E+01	1.549E+01	4.871E+01	314.53	
TH-228	1.91Y	1.00	5.125E+00	5.139E+00	4.325E+00	84.17	
Total Activity :			2.061E+01	2.063E+01			

Grand Total Activity : 2.061E+01 2.063E+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 ----

Activity	Act error	MDA	MDA error	Act/MDA
----------	-----------	-----	-----------	---------

Nuclide	(pCi/L)		(pCi/L)		
K-40	1.549E+01	4.871E+01	3.478E+01	0.000E+00	0.445
TH-228	5.139E+00	4.325E+00	6.953E+00	0.000E+00	0.739

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/L)	K.L. Ided	Act error	MDA (pCi/L)	MDA error	Act/MDA
BE-7	-1.491E+01		1.806E+01	3.017E+01	0.000E+00	-0.494
NA-24	3.563E+01		5.057E+01	9.122E+01	0.000E+00	0.391
CR-51	-4.559E+00		2.006E+01	3.353E+01	0.000E+00	-0.136
MN-54	-1.131E+00		2.164E+00	3.707E+00	0.000E+00	-0.305
CO-57	1.944E-01		2.458E+00	4.058E+00	0.000E+00	0.048
CO-58	-1.321E-02		2.192E+00	3.757E+00	0.000E+00	-0.004
FE-59	2.066E-01		4.486E+00	7.883E+00	0.000E+00	0.026
CO-60	1.016E-01		1.999E+00	3.558E+00	0.000E+00	0.029
ZN-65	3.633E+00		4.732E+00	7.854E+00	0.000E+00	0.463
SE-75	5.244E-01		3.042E+00	5.200E+00	0.000E+00	0.101
SR-85	-4.455E+00		2.645E+00	4.231E+00	0.000E+00	-1.053
Y-88	-1.264E-02		2.203E+00	3.985E+00	0.000E+00	-0.003
NB-94	7.572E-01		2.163E+00	3.801E+00	0.000E+00	0.199
NB-95	2.794E+00		2.447E+00	4.471E+00	0.000E+00	0.625
ZR-95	-1.336E+00		3.629E+00	6.083E+00	0.000E+00	-0.220
MO-99	-4.014E+00		3.126E+01	5.337E+01	0.000E+00	-0.075
RU-103	1.382E-01		2.305E+00	4.024E+00	0.000E+00	0.034
RU-106	-8.741E+00		2.006E+01	3.379E+01	0.000E+00	-0.259
AG-110m	4.104E-02		2.077E+00	3.599E+00	0.000E+00	0.011
SN-113	2.999E+00		2.962E+00	5.212E+00	0.000E+00	0.576
SB-124	2.264E+00		3.423E+00	3.627E+00	0.000E+00	0.624
SB-125	-3.020E+00		6.626E+00	1.081E+01	0.000E+00	-0.279
TE-129M	3.570E+00		2.503E+01	4.408E+01	0.000E+00	0.081
I-131	-2.587E+00		2.789E+00	4.479E+00	0.000E+00	-0.578
BA-133	-1.321E+00		3.580E+00	5.071E+00	0.000E+00	-0.260
CS-134	1.776E+00		2.746E+00	3.653E+00	0.000E+00	0.486
CS-136	5.160E-01		2.413E+00	4.208E+00	0.000E+00	0.123
CS-137	-9.725E-02		2.383E+00	4.104E+00	0.000E+00	-0.024
CE-139	-5.302E-01		2.356E+00	4.035E+00	0.000E+00	-0.131
BA-140	-8.130E-02		8.446E+00	1.472E+01	0.000E+00	-0.006
LA-140	1.766E+00		2.652E+00	5.118E+00	0.000E+00	0.345
CE-141	-1.278E+00		4.967E+00	7.013E+00	0.000E+00	-0.182
CE-144	1.357E+01		1.912E+01	3.098E+01	0.000E+00	0.438
EU-152	2.672E+00		7.768E+00	1.208E+01	0.000E+00	0.221
EU-154	1.569E+00		5.088E+00	8.455E+00	0.000E+00	0.186
RA-226	-2.096E+01		6.306E+01	1.080E+02	0.000E+00	-0.194
AC-228	1.337E-01		8.504E+00	1.527E+01	0.000E+00	0.009
TH-232	1.336E-01		8.496E+00	1.525E+01	0.000E+00	0.009
U-235	6.054E+00		2.174E+01	3.122E+01	0.000E+00	0.194
U-238	1.341E+02		2.434E+02	4.500E+02	0.000E+00	0.298
AM-241	-1.478E+01		1.264E+01	2.069E+01	0.000E+00	-0.715

A,23L29403-2 ,07/31/2006 03:53,07/28/2006 07:50, 3.427E+00,WG L29403-2 EX  
 B,23L29403-2 ,LIBD ,07/28/2006 10:10,2335L090704  
 C,K-40 ,YES, 1.549E+01, 4.871E+01, 3.478E+01,, 0.445  
 C,TH-228 ,YES, 5.139E+00, 4.325E+00, 6.953E+00,, 0.739  
 C,BE-7 ,NO , -1.491E+01, 1.806E+01, 3.017E+01,, -0.494  
 C,NA-24 ,NO , 3.563E+01, 5.057E+01, 9.122E+01,, 0.391  
 C,CR-51 ,NO , -4.559E+00, 2.006E+01, 3.353E+01,, -0.136  
 C,MN-54 ,NO , -1.131E+00, 2.164E+00, 3.707E+00,, -0.305  
 C,CO-57 ,NO , 1.944E-01, 2.458E+00, 4.058E+00,, 0.048  
 C,CO-58 ,NO , -1.321E-02, 2.192E+00, 3.757E+00,, -0.004  
 C,FE-59 ,NO , 2.066E-01, 4.486E+00, 7.883E+00,, 0.026  
 C,CO-60 ,NO , 1.016E-01, 1.999E+00, 3.558E+00,, 0.029  
 C,ZN-65 ,NO , 3.633E+00, 4.732E+00, 7.854E+00,, 0.463  
 C,SE-75 ,NO , 5.244E-01, 3.042E+00, 5.200E+00,, 0.101  
 C,SR-85 ,NO , -4.455E+00, 2.645E+00, 4.231E+00,, -1.053  
 C,Y-88 ,NO , -1.264E-02, 2.203E+00, 3.985E+00,, -0.003  
 C,NB-94 ,NO , 7.572E-01, 2.163E+00, 3.801E+00,, 0.199  
 C,NB-95 ,NO , 2.794E+00, 2.447E+00, 4.471E+00,, 0.625  
 C,ZR-95 ,NO , -1.336E+00, 3.629E+00, 6.083E+00,, -0.220  
 C,MO-99 ,NO , -4.014E+00, 3.126E+01, 5.337E+01,, -0.075  
 C,RU-103 ,NO , 1.382E-01, 2.305E+00, 4.024E+00,, 0.034  
 C,RU-106 ,NO , -8.741E+00, 2.006E+01, 3.379E+01,, -0.259  
 C,AG-110m ,NO , 4.104E-02, 2.077E+00, 3.599E+00,, 0.011  
 C,SN-113 ,NO , 2.999E+00, 2.962E+00, 5.212E+00,, 0.576  
 C,SB-124 ,NO , 2.264E+00, 3.423E+00, 3.627E+00,, 0.624  
 C,SB-125 ,NO , -3.020E+00, 6.626E+00, 1.081E+01,, -0.279  
 C,TE-129M ,NO , 3.570E+00, 2.503E+01, 4.408E+01,, 0.081  
 C,I-131 ,NO , -2.587E+00, 2.789E+00, 4.479E+00,, -0.578  
 C,BA-133 ,NO , -1.321E+00, 3.580E+00, 5.071E+00,, -0.260  
 C,CS-134 ,NO , 1.776E+00, 2.746E+00, 3.653E+00,, 0.486  
 C,CS-136 ,NO , 5.160E-01, 2.413E+00, 4.208E+00,, 0.123  
 C,CS-137 ,NO , -9.725E-02, 2.383E+00, 4.104E+00,, -0.024  
 C,CE-139 ,NO , -5.302E-01, 2.356E+00, 4.035E+00,, -0.131  
 C,BA-140 ,NO , -8.130E-02, 8.446E+00, 1.472E+01,, -0.006  
 C,LA-140 ,NO , 1.766E+00, 2.652E+00, 5.118E+00,, 0.345  
 C,CE-141 ,NO , -1.278E+00, 4.967E+00, 7.013E+00,, -0.182  
 C,CE-144 ,NO , 1.357E+01, 1.912E+01, 3.098E+01,, 0.438  
 C,EU-152 ,NO , 2.672E+00, 7.768E+00, 1.208E+01,, 0.221  
 C,EU-154 ,NO , 1.569E+00, 5.088E+00, 8.455E+00,, 0.186  
 C,RA-226 ,NO , -2.096E+01, 6.306E+01, 1.080E+02,, -0.194  
 C,AC-228 ,NO , 1.337E-01, 8.504E+00, 1.527E+01,, 0.009  
 C,TH-232 ,NO , 1.336E-01, 8.496E+00, 1.525E+01,, 0.009  
 C,U-235 ,NO , 6.054E+00, 2.174E+01, 3.122E+01,, 0.194  
 C,U-238 ,NO , 1.341E+02, 2.434E+02, 4.500E+02,, 0.298  
 C,AM-241 ,NO , -1.478E+01, 1.264E+01, 2.069E+01,, -0.715



## Summary of Nuclide Activity

Page : 2

Sample ID : 07L29403-3

Acquisition date : 31-JUL-2006 10:11:49

Total number of lines in spectrum	15	
Number of unidentified lines	15	
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 : 07L29403-3

Page : 3  
Acquisition date : 31-JUL-2006 10:11:49

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
1	66.09	61	330	1.25	133.06	130	8	7.16E-03	****	7.96E-01	
4	76.94	75	189	1.03	154.78	148	10	8.71E-03	70.2	1.22E+00	
1	198.03	151	234	2.43	397.26	392	13	1.75E-02	46.2	2.25E+00	
1	242.04	80	152	1.45	485.40	482	8	9.34E-03	59.2	2.04E+00	
1	295.27	134	198	1.50	591.97	585	14	1.56E-02	49.5	1.81E+00	
1	351.78	226	98	1.36	705.11	701	9	2.63E-02	21.8	1.61E+00	
1	584.21	133	81	1.48	1170.39	1163	17	1.55E-02	33.4	1.12E+00	
1	595.94	48	84	1.95	1193.86	1186	14	5.55E-03	86.3	1.10E+00	
1	609.15	228	50	1.54	1220.32	1215	11	2.66E-02	19.2	1.09E+00	
1	768.15	43	26	2.45	1538.52	1534	9	5.03E-03	52.8	9.20E-01	
1	1083.33	17	22	1.22	2169.14	2161	11	2.02E-03	****	7.20E-01	
1	1120.46	64	36	2.13	2243.42	2234	18	7.45E-03	52.9	7.03E-01	
1	1238.51	28	32	2.13	2479.55	2472	16	3.23E-03	****	6.55E-01	
1	1765.08	44	17	2.36	3532.48	3525	13	5.16E-03	51.6	5.12E-01	
1	1849.29	44	11	1.72	3700.81	3695	14	5.10E-03	35.9	4.96E-01	

Flags: "T" = Tentatively associated

#### Summary of Nuclide Activity

Total number of lines in spectrum 15  
 Number of unidentified lines 15  
 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	5.546E+00		2.533E+01	4.241E+01	0.000E+00	0.131
NA-24	-3.359E+01		1.034E+02	1.640E+02	0.000E+00	-0.205
K-40	2.913E+01		4.148E+01	8.186E+01	0.000E+00	0.356
CR-51	-1.935E+01		2.831E+01	4.522E+01	0.000E+00	-0.428
MN-54	2.789E+00		3.242E+00	5.603E+00	0.000E+00	0.498
CO-57	4.821E-01		3.019E+00	4.911E+00	0.000E+00	0.098
CO-58	-4.175E-01		3.259E+00	5.270E+00	0.000E+00	-0.079
FE-59	7.020E+00		6.525E+00	1.154E+01	0.000E+00	0.608
CO-60	8.322E-01		3.083E+00	5.200E+00	0.000E+00	0.160
ZN-65	1.703E+01		8.366E+00	1.406E+01	0.000E+00	1.211
SE-75	1.265E+00		4.008E+00	6.767E+00	0.000E+00	0.187
SR-85	1.760E+01		3.765E+00	7.367E+00	0.000E+00	2.389
Y-88	-9.461E-01		3.504E+00	4.998E+00	0.000E+00	-0.189



NB-94	6.870E-01	3.024E+00	5.065E+00	0.000E+00	0.136
NB-95	1.682E+00	3.307E+00	5.606E+00	0.000E+00	0.300
ZR-95	-3.382E+00	5.688E+00	8.497E+00	0.000E+00	-0.398
MO-99	-2.401E+01	4.940E+01	7.835E+01	0.000E+00	-0.306
RU-103	-1.490E-01	3.307E+00	5.437E+00	0.000E+00	-0.027
RU-106	-1.112E+01	2.931E+01	4.630E+01	0.000E+00	-0.240
AG-110m	-3.979E-01	3.127E+00	5.144E+00	0.000E+00	-0.077
SN-113	4.756E-01	4.095E+00	6.702E+00	0.000E+00	0.071
SB-124	-1.078E+00	7.289E+00	5.058E+00	0.000E+00	-0.213
SB-125	-6.900E-01	8.659E+00	1.436E+01	0.000E+00	-0.048
TE-129M	-7.749E-01	3.659E+01	6.057E+01	0.000E+00	-0.013
I-131	-1.078E+00	3.905E+00	6.289E+00	0.000E+00	-0.171
BA-133	1.034E+01	5.280E+00	8.278E+00	0.000E+00	1.249
CS-134	1.324E+01	6.418E+00	7.317E+00	0.000E+00	1.810
CS-136	-3.899E-01	3.543E+00	5.730E+00	0.000E+00	-0.068
CS-137	-1.607E+00	3.446E+00	5.540E+00	0.000E+00	-0.290
CE-139	1.120E+00	2.913E+00	4.888E+00	0.000E+00	0.229
BA-140	-6.286E+00	1.290E+01	2.051E+01	0.000E+00	-0.306
LA-140	3.129E+00	4.193E+00	7.435E+00	0.000E+00	0.421
CE-141	-5.123E+00	5.500E+00	8.892E+00	0.000E+00	-0.576
CE-144	-7.639E+00	2.376E+01	3.936E+01	0.000E+00	-0.194
EU-152	-8.637E+00	1.118E+01	1.524E+01	0.000E+00	-0.567
EU-154	-4.244E-01	6.374E+00	1.028E+01	0.000E+00	-0.041
RA-226	-6.390E+01	7.576E+01	1.243E+02	0.000E+00	-0.514
AC-228	-4.238E+00	1.168E+01	1.984E+01	0.000E+00	-0.214
TH-228	4.413E+00	7.193E+00	1.064E+01	0.000E+00	0.415
TH-232	-4.234E+00	1.166E+01	1.982E+01	0.000E+00	-0.214
U-235	-3.904E+01	2.376E+01	3.742E+01	0.000E+00	-1.043
U-238	1.576E+01	3.524E+02	5.782E+02	0.000E+00	0.027
AM-241	-5.275E+01	3.070E+01	4.401E+01	0.000E+00	-1.199

A,07L29403-3 ,07/31/2006 12:34,07/28/2006 10:00, 3.192E+00,L29403-3 WG EX  
 B,07L29403-3 ,LIBD ,07/28/2006 09:50,073L082504  
 C,BE-7 ,NO , 5.546E+00, 2.533E+01, 4.241E+01,, 0.131  
 C,NA-24 ,NO , -3.359E+01, 1.034E+02, 1.640E+02,, -0.205  
 C,K-40 ,NO , 2.913E+01, 4.148E+01, 8.186E+01,, 0.356  
 C,CR-51 ,NO , -1.935E+01, 2.831E+01, 4.522E+01,, -0.428  
 C,MN-54 ,NO , 2.789E+00, 3.242E+00, 5.603E+00,, 0.498  
 C,CO-57 ,NO , 4.821E-01, 3.019E+00, 4.911E+00,, 0.098  
 C,CO-58 ,NO , -4.175E-01, 3.259E+00, 5.270E+00,, -0.079  
 C,FE-59 ,NO , 7.020E+00, 6.525E+00, 1.154E+01,, 0.608  
 C,CO-60 ,NO , 8.322E-01, 3.083E+00, 5.200E+00,, 0.160  
 C,ZN-65 ,NO , 1.703E+01, 8.366E+00, 1.406E+01,, 1.211  
 C,SE-75 ,NO , 1.265E+00, 4.008E+00, 6.767E+00,, 0.187  
 C,SR-85 ,NO , 1.760E+01, 3.765E+00, 7.367E+00,, 2.389  
 C,Y-88 ,NO , -9.461E-01, 3.504E+00, 4.998E+00,, -0.189  
 C,NB-94 ,NO , 6.870E-01, 3.024E+00, 5.065E+00,, 0.136  
 C,NB-95 ,NO , 1.682E+00, 3.307E+00, 5.606E+00,, 0.300  
 C,ZR-95 ,NO , -3.382E+00, 5.688E+00, 8.497E+00,, -0.398  
 C,MO-99 ,NO , -2.401E+01, 4.940E+01, 7.835E+01,, -0.306  
 C,RU-103 ,NO , -1.490E-01, 3.307E+00, 5.437E+00,, -0.027  
 C,RU-106 ,NO , -1.112E+01, 2.931E+01, 4.630E+01,, -0.240  
 C,AG-110m ,NO , -3.979E-01, 3.127E+00, 5.144E+00,, -0.077  
 C,SN-113 ,NO , 4.756E-01, 4.095E+00, 6.702E+00,, 0.071  
 C,SB-124 ,NO , -1.078E+00, 7.289E+00, 5.058E+00,, -0.213  
 C,SB-125 ,NO , -6.900E-01, 8.659E+00, 1.436E+01,, -0.048  
 C,TE-129M ,NO , -7.749E-01, 3.659E+01, 6.057E+01,, -0.013  
 C,I-131 ,NO , -1.078E+00, 3.905E+00, 6.289E+00,, -0.171  
 C,BA-133 ,NO , 1.034E+01, 5.280E+00, 8.278E+00,, 1.249  
 C,CS-134 ,NO , 1.324E+01, 6.418E+00, 7.317E+00,, 1.810  
 C,CS-136 ,NO , -3.899E-01, 3.543E+00, 5.730E+00,, -0.068  
 C,CS-137 ,NO , -1.607E+00, 3.446E+00, 5.540E+00,, -0.290  
 C,CE-139 ,NO , 1.120E+00, 2.913E+00, 4.888E+00,, 0.229  
 C,BA-140 ,NO , -6.286E+00, 1.290E+01, 2.051E+01,, -0.306  
 C,LA-140 ,NO , 3.129E+00, 4.193E+00, 7.435E+00,, 0.421  
 C,CE-141 ,NO , -5.123E+00, 5.500E+00, 8.892E+00,, -0.576  
 C,CE-144 ,NO , -7.639E+00, 2.376E+01, 3.936E+01,, -0.194  
 C,EU-152 ,NO , -8.637E+00, 1.118E+01, 1.524E+01,, -0.567  
 C,EU-154 ,NO , -4.244E-01, 6.374E+00, 1.028E+01,, -0.041  
 C,RA-226 ,NO , -6.390E+01, 7.576E+01, 1.243E+02,, -0.514  
 C,AC-228 ,NO , -4.238E+00, 1.168E+01, 1.984E+01,, -0.214  
 C,TH-228 ,NO , 4.413E+00, 7.193E+00, 1.064E+01,, 0.415  
 C,TH-232 ,NO , -4.234E+00, 1.166E+01, 1.982E+01,, -0.214  
 C,U-235 ,NO , -3.904E+01, 2.376E+01, 3.742E+01,, -1.043  
 C,U-238 ,NO , 1.576E+01, 3.524E+02, 5.782E+02,, 0.027  
 C,AM-241 ,NO , -5.275E+01, 3.070E+01, 4.401E+01,, -1.199



## Summary of Nuclide Activity

Page : 2

Sample ID : 23L29403-4

Acquisition date : 31-JUL-2006 10:11:54

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 pCi/L	Decay Corr pCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	3.141E+01	3.141E+01	4.762E+01	151.62	
RA-226	1600.00Y	1.00	5.933E+01	5.933E+01	11.02E+01	185.76	
Total Activity :			9.074E+01	9.074E+01			

Grand Total Activity :	9.074E+01	9.074E+01
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Flags: "K" = Keyline not found  
 "E" = Manually edited

"M" = Manually accepted  
 "A" = Nuclide specific abn. limit

## Unidentified Energy Lines

Page : 3

Sample ID : 23L29403-4

Acquisition date : 31-JUL-2006 10:11:54

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
6	33.67	49	14	1.11	67.75	65	19	4.48E-03	67.9	9.20E-02	
6	35.24	54	101	1.68	70.89	65	19	4.98E-03	****	1.17E-01	
6	36.85	37	131	1.40	74.11	65	19	3.45E-03	****	1.46E-01	
6	38.84	96	230	1.42	78.08	65	19	8.81E-03	57.1	1.87E-01	
0	63.56	35	373	1.02	127.46	125	6	3.21E-03	****	9.50E-01	
2	74.62	178	448	1.17	149.57	144	14	1.64E-02	42.8	1.29E+00	
2	77.02	263	411	0.95	154.36	144	14	2.42E-02	27.3	1.35E+00	
0	87.00	148	427	0.98	174.29	171	7	1.36E-02	49.3	1.59E+00	
0	139.92	84	505	1.54	280.03	277	8	7.69E-03	97.3	2.05E+00	
0	240.73	290	469	1.29	481.47	474	14	2.67E-02	33.8	1.72E+00	T
0	295.02	415	270	1.34	589.97	584	10	3.82E-02	18.0	1.50E+00	
0	351.78	666	230	1.45	703.43	698	12	6.13E-02	12.2	1.32E+00	
0	609.18	758	109	1.51	1218.06	1212	15	6.98E-02	9.7	8.59E-01	
0	768.28	73	81	1.48	1536.27	1529	14	6.75E-03	56.9	7.22E-01	
0	934.31	42	52	1.60	1868.45	1860	13	3.87E-03	77.2	6.27E-01	
0	1120.32	155	36	1.84	2240.74	2234	13	1.43E-02	23.6	5.52E-01	
0	1238.29	80	26	2.18	2476.90	2471	10	7.39E-03	32.3	5.16E-01	
0	1377.45	56	28	1.17	2755.56	2749	14	5.16E-03	48.1	4.79E-01	
0	1729.28	45	14	1.95	3460.40	3450	17	4.18E-03	46.9	4.07E-01	
0	1764.18	150	11	2.31	3530.33	3522	15	1.38E-02	20.0	4.01E-01	
0	1847.94	22	28	1.66	3698.22	3689	16	2.04E-03	****	3.87E-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 Uncorrected pCi/L	Wtd Mean Decay Corr pCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	3.141E+01	3.141E+01	4.762E+01	151.62	
RA-226	1600.00Y	1.00	5.933E+01	5.933E+01	11.02E+01	185.76	
Total Activity :			9.074E+01	9.074E+01			

Grand Total Activity : 9.074E+01 9.074E+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	3.141E+01	4.762E+01	4.448E+01	0.000E+00	0.706
RA-226	5.933E+01	1.102E+02	1.275E+02	0.000E+00	0.465

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/L)	K.L. Ided	Act error	MDA (pCi/L)	MDA error	Act/MDA
BE-7	-3.435E+00		2.435E+01	4.217E+01	0.000E+00	-0.081
NA-24	-5.135E+01		8.939E+01	1.362E+02	0.000E+00	-0.377
CR-51	1.868E+00		2.643E+01	4.468E+01	0.000E+00	0.042
MN-54	-8.007E-01		2.913E+00	5.073E+00	0.000E+00	-0.158
CO-57	-2.539E+00		3.078E+00	4.924E+00	0.000E+00	-0.516
CO-58	-1.326E+00		2.793E+00	4.614E+00	0.000E+00	-0.287
FE-59	-3.723E+00		5.289E+00	8.755E+00	0.000E+00	-0.425
CO-60	1.375E+00		2.789E+00	5.178E+00	0.000E+00	0.266
ZN-65	-5.719E-01		7.452E+00	1.104E+01	0.000E+00	-0.052
SE-75	-8.699E-01		3.916E+00	6.583E+00	0.000E+00	-0.132
SR-85	-2.789E+00		3.443E+00	5.714E+00	0.000E+00	-0.488
Y-88	6.858E-01		3.601E+00	6.245E+00	0.000E+00	0.110
NB-94	-1.973E+00		2.759E+00	4.509E+00	0.000E+00	-0.438
NB-95	6.906E+00		3.485E+00	6.080E+00	0.000E+00	1.136
ZR-95	2.950E+00		4.966E+00	8.939E+00	0.000E+00	0.330
MO-99	3.901E+01		4.610E+01	8.414E+01	0.000E+00	0.464
RU-103	1.369E-01		2.819E+00	4.936E+00	0.000E+00	0.028
RU-106	-8.385E+00		2.627E+01	4.455E+01	0.000E+00	-0.188
AG-110m	5.348E-01		2.708E+00	4.755E+00	0.000E+00	0.112
SN-113	9.001E-02		3.882E+00	6.512E+00	0.000E+00	0.014
SB-124	1.278E+00		3.205E+00	4.939E+00	0.000E+00	0.259
SB-125	-5.652E+00		8.226E+00	1.390E+01	0.000E+00	-0.407
TE-129M	-2.186E+01		3.357E+01	5.661E+01	0.000E+00	-0.386
I-131	-2.750E+00		3.896E+00	6.311E+00	0.000E+00	-0.436
BA-133	1.556E+00		4.591E+00	6.818E+00	0.000E+00	0.228
CS-134	2.313E+00		3.111E+00	4.934E+00	0.000E+00	0.469
CS-136	1.835E+00		3.095E+00	5.757E+00	0.000E+00	0.319
CS-137	-2.596E+00		3.144E+00	5.119E+00	0.000E+00	-0.507
CE-139	4.679E-01		3.007E+00	5.188E+00	0.000E+00	0.090
BA-140	-1.164E+00		1.158E+01	2.004E+01	0.000E+00	-0.058
LA-140	6.066E-01		3.606E+00	6.649E+00	0.000E+00	0.091
CE-141	3.493E+00		5.839E+00	9.369E+00	0.000E+00	0.373
CE-144	-1.513E+01		2.433E+01	3.903E+01	0.000E+00	-0.388
EU-152	-3.151E-01		9.472E+00	1.498E+01	0.000E+00	-0.021
EU-154	-1.882E+00		6.317E+00	1.028E+01	0.000E+00	-0.183
AC-228	-5.199E+00		1.048E+01	1.835E+01	0.000E+00	-0.283
TH-228	-2.331E+00		6.575E+00	9.667E+00	0.000E+00	-0.241
TH-232	-5.194E+00		1.047E+01	1.833E+01	0.000E+00	-0.283
U-235	2.366E+00		2.695E+01	4.055E+01	0.000E+00	0.058
U-238	-1.247E+02		3.100E+02	5.391E+02	0.000E+00	-0.231
AM-241	2.955E+00		1.843E+01	2.743E+01	0.000E+00	0.108

A,23L29403-4 ,07/31/2006 13:13,07/28/2006 10:05, 3.334E+00,L29403-4 WG EX  
 B,23L29403-4 ,LIBD ,07/31/2006 10:02,2335L090704  
 C,K-40 ,YES, 3.141E+01, 4.762E+01, 4.448E+01,, 0.706  
 C,RA-226 ,YES, 5.933E+01, 1.102E+02, 1.275E+02,, 0.465  
 C,BE-7 ,NO , -3.435E+00, 2.435E+01, 4.217E+01,, -0.081  
 C,NA-24 ,NO , -5.135E+01, 8.939E+01, 1.362E+02,, -0.377  
 C,CR-51 ,NO , 1.868E+00, 2.643E+01, 4.468E+01,, 0.042  
 C,MN-54 ,NO , -8.007E-01, 2.913E+00, 5.073E+00,, -0.158  
 C,CO-57 ,NO , -2.539E+00, 3.078E+00, 4.924E+00,, -0.516  
 C,CO-58 ,NO , -1.326E+00, 2.793E+00, 4.614E+00,, -0.287  
 C,FE-59 ,NO , -3.723E+00, 5.289E+00, 8.755E+00,, -0.425  
 C,CO-60 ,NO , 1.375E+00, 2.789E+00, 5.178E+00,, 0.266  
 C,ZN-65 ,NO , -5.719E-01, 7.452E+00, 1.104E+01,, -0.052  
 C,SE-75 ,NO , -8.699E-01, 3.916E+00, 6.583E+00,, -0.132  
 C,SR-85 ,NO , -2.789E+00, 3.443E+00, 5.714E+00,, -0.488  
 C,Y-88 ,NO , 6.858E-01, 3.601E+00, 6.245E+00,, 0.110  
 C,NB-94 ,NO , -1.973E+00, 2.759E+00, 4.509E+00,, -0.438  
 C,NB-95 ,NO , 6.906E+00, 3.485E+00, 6.080E+00,, 1.136  
 C,ZR-95 ,NO , 2.950E+00, 4.966E+00, 8.939E+00,, 0.330  
 C,MO-99 ,NO , 3.901E+01, 4.610E+01, 8.414E+01,, 0.464  
 C,RU-103 ,NO , 1.369E-01, 2.819E+00, 4.936E+00,, 0.028  
 C,RU-106 ,NO , -8.385E+00, 2.627E+01, 4.455E+01,, -0.188  
 C,AG-110m ,NO , 5.348E-01, 2.708E+00, 4.755E+00,, 0.112  
 C,SN-113 ,NO , 9.001E-02, 3.882E+00, 6.512E+00,, 0.014  
 C,SB-124 ,NO , 1.278E+00, 3.205E+00, 4.939E+00,, 0.259  
 C,SB-125 ,NO , -5.652E+00, 8.226E+00, 1.390E+01,, -0.407  
 C,TE-129M ,NO , -2.186E+01, 3.357E+01, 5.661E+01,, -0.386  
 C,I-131 ,NO , -2.750E+00, 3.896E+00, 6.311E+00,, -0.436  
 C,BA-133 ,NO , 1.556E+00, 4.591E+00, 6.818E+00,, 0.228  
 C,CS-134 ,NO , 2.313E+00, 3.111E+00, 4.934E+00,, 0.469  
 C,CS-136 ,NO , 1.835E+00, 3.095E+00, 5.757E+00,, 0.319  
 C,CS-137 ,NO , -2.596E+00, 3.144E+00, 5.119E+00,, -0.507  
 C,CE-139 ,NO , 4.679E-01, 3.007E+00, 5.188E+00,, 0.090  
 C,BA-140 ,NO , -1.164E+00, 1.158E+01, 2.004E+01,, -0.058  
 C,LA-140 ,NO , 6.066E-01, 3.606E+00, 6.649E+00,, 0.091  
 C,CE-141 ,NO , 3.493E+00, 5.839E+00, 9.369E+00,, 0.373  
 C,CE-144 ,NO , -1.513E+01, 2.433E+01, 3.903E+01,, -0.388  
 C,EU-152 ,NO , -3.151E-01, 9.472E+00, 1.498E+01,, -0.021  
 C,EU-154 ,NO , -1.882E+00, 6.317E+00, 1.028E+01,, -0.183  
 C,AC-228 ,NO , -5.199E+00, 1.048E+01, 1.835E+01,, -0.283  
 C,TH-228 ,NO , -2.331E+00, 6.575E+00, 9.667E+00,, -0.241  
 C,TH-232 ,NO , -5.194E+00, 1.047E+01, 1.833E+01,, -0.283  
 C,U-235 ,NO , 2.366E+00, 2.695E+01, 4.055E+01,, 0.058  
 C,U-238 ,NO , -1.247E+02, 3.100E+02, 5.391E+02,, -0.231  
 C,AM-241 ,NO , 2.955E+00, 1.843E+01, 2.743E+01,, 0.108





Flag: "\*" = Keyline

## Summary of Nuclide Activity

Page : 2

Sample ID : 04L29403-5

Acquisition date : 31-JUL-2006 10:11:51

Total number of lines in spectrum 20  
 Number of unidentified lines 15  
 Number of lines tentatively identified by NID 5 25.00%

Nuclide Type : natural

Nuclide	Hlife	Decay	Uncorrected pCi/L	Decay Corr pCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	2.236E+01	2.236E+01	4.892E+01	218.85	
RA-226	1600.00Y	1.00	9.170E+01	9.170E+01	8.509E+01	92.79	
AC-228	5.75Y	1.00	2.968E+00	2.971E+00	10.54E+00	354.63	
TH-228	1.91Y	1.00	4.723E+00	4.737E+00	4.559E+00	96.25	
U-235	7.04E+08Y	1.00	5.570E+00	5.570E+00	5.168E+00	92.79	K
Total Activity :			1.273E+02	1.273E+02			

Grand Total Activity : 1.273E+02 1.273E+02

Flags: "K" = Keyline not found  
 "E" = Manually edited

"M" = Manually accepted  
 "A" = Nuclide specific abn. limit

Unidentified Energy Lines  
Sample ID : 04L29403-5

Page : 3  
Acquisition date : 31-JUL-2006 10:11:51

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
1	65.71	102	540	2.03	132.30	129	9	7.72E-03	85.9	6.27E-01	
1	77.05	114	368	0.77	155.01	153	6	8.59E-03	59.4	9.89E-01	
1	139.90	42	530	1.92	280.77	276	10	3.20E-03	****	1.82E+00	
1	198.67	80	275	1.14	398.38	394	8	6.03E-03	77.9	1.68E+00	
1	295.07	226	241	1.13	591.28	587	10	1.70E-02	30.1	1.32E+00	
1	351.92	501	185	1.14	705.01	700	10	3.78E-02	14.0	1.17E+00	
1	595.65	66	100	1.66	1192.59	1189	11	5.01E-03	62.9	7.86E-01	
1	609.16	469	97	1.41	1219.62	1213	14	3.54E-02	13.4	7.73E-01	
1	768.59	56	56	2.88	1538.50	1533	12	4.21E-03	60.5	6.46E-01	
1	785.00	40	38	2.50	1571.32	1567	10	3.03E-03	65.1	6.36E-01	
1	1120.08	98	39	2.02	2241.35	2236	13	7.40E-03	34.3	4.81E-01	
1	1237.69	61	45	3.81	2476.46	2470	18	4.58E-03	58.7	4.45E-01	
1	1377.62	37	37	2.63	2756.18	2752	12	2.77E-03	71.9	4.10E-01	
1	1729.42	30	17	3.99	3459.25	3454	16	2.24E-03	75.7	3.48E-01	
1	1764.50	69	17	2.58	3529.35	3519	22	5.23E-03	42.5	3.43E-01	

Flags: "T" = Tentatively associated

#### Summary of Nuclide Activity

Total number of lines in spectrum	20
Number of unidentified lines	15
Number of lines tentatively identified by NID	5                      25.00%

Nuclide Type : natural

Nuclide	Hlife	Decay	Wtd Mean	Wtd Mean	Decay Corr	2-Sigma	2-Sigma	%Error	Flags
			Uncorrected	Decay Corr					
K-40	1.28E+09Y	1.00	2.236E+01	2.236E+01	4.892E+01	218.85			
RA-226	1600.00Y	1.00	9.170E+01	9.170E+01	8.509E+01	92.79			
AC-228	5.75Y	1.00	2.968E+00	2.971E+00	10.54E+00	354.63			
TH-228	1.91Y	1.00	4.723E+00	4.737E+00	4.559E+00	96.25			
Total Activity :			1.217E+02	1.218E+02					

Grand Total Activity : 1.217E+02                      1.218E+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 (pCi/L)	Act error	MDA (pCi/L)	MDA error	Act/MDA
K-40	2.236E+01	4.892E+01	4.403E+01	0.000E+00	0.508

RA-226	9.170E+01	8.509E+01	1.089E+02	0.000E+00	0.842
AC-228	2.971E+00	1.054E+01	1.731E+01	0.000E+00	0.172
TH-228	4.737E+00	4.559E+00	8.514E+00	0.000E+00	0.556

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/L)	K.L. Ided	Act error	MDA (pCi/L)	MDA error	Act/MDA
BE-7	9.259E+00		2.421E+01	4.056E+01	0.000E+00	0.228
NA-24	3.906E+01		8.986E+01	1.404E+02	0.000E+00	0.278
CR-51	-1.817E+01		2.693E+01	4.233E+01	0.000E+00	-0.429
MN-54	6.820E-01		3.016E+00	4.993E+00	0.000E+00	0.137
CO-57	1.601E-01		2.705E+00	4.418E+00	0.000E+00	0.036
CO-58	-3.363E+00		2.754E+00	4.050E+00	0.000E+00	-0.831
FE-59	2.099E-02		5.317E+00	8.738E+00	0.000E+00	0.002
CO-60	-2.201E+00		3.338E+00	5.486E+00	0.000E+00	-0.401
ZN-65	1.224E+01		7.440E+00	1.225E+01	0.000E+00	0.999
SE-75	-1.977E+00		3.881E+00	6.232E+00	0.000E+00	-0.317
SR-85	7.060E+00		3.475E+00	6.154E+00	0.000E+00	1.147
Y-88	-1.993E+00		3.284E+00	5.047E+00	0.000E+00	-0.395
NB-94	-3.563E-01		2.878E+00	4.715E+00	0.000E+00	-0.076
NB-95	6.238E+00		3.401E+00	5.565E+00	0.000E+00	1.121
ZR-95	1.957E+00		5.370E+00	9.028E+00	0.000E+00	0.217
MO-99	4.593E+00		4.187E+01	6.943E+01	0.000E+00	0.066
RU-103	5.476E-01		3.028E+00	5.003E+00	0.000E+00	0.109
RU-106	9.192E+00		2.517E+01	4.287E+01	0.000E+00	0.214
AG-110m	5.123E-02		2.834E+00	4.706E+00	0.000E+00	0.011
SN-113	2.268E+00		3.785E+00	6.461E+00	0.000E+00	0.351
SB-124	9.224E-01		5.761E+00	4.746E+00	0.000E+00	0.194
SB-125	1.295E+00		8.171E+00	1.361E+01	0.000E+00	0.095
TE-129M	1.165E+01		3.432E+01	5.744E+01	0.000E+00	0.203
I-131	1.375E+00		3.430E+00	5.836E+00	0.000E+00	0.236
BA-133	4.439E+00		4.176E+00	6.413E+00	0.000E+00	0.692
CS-134	6.164E+00		4.466E+00	5.591E+00	0.000E+00	1.102
CS-136	-4.986E-01		3.278E+00	5.288E+00	0.000E+00	-0.094
CS-137	-3.497E-01		3.249E+00	5.352E+00	0.000E+00	-0.065
CE-139	-6.079E-01		2.832E+00	4.514E+00	0.000E+00	-0.135
BA-140	2.484E+00		1.194E+01	1.967E+01	0.000E+00	0.126
LA-140	1.088E+00		4.179E+00	7.012E+00	0.000E+00	0.155
CE-141	4.572E-01		5.943E+00	8.314E+00	0.000E+00	0.055
CE-144	-6.424E-01		2.351E+01	3.452E+01	0.000E+00	-0.019
EU-152	-1.054E+01		9.912E+00	1.382E+01	0.000E+00	-0.763
EU-154	-1.156E+00		5.610E+00	9.082E+00	0.000E+00	-0.127
TH-232	2.968E+00	+	1.053E+01	1.980E+01	0.000E+00	0.150
U-235	-1.531E+01		2.624E+01	3.565E+01	0.000E+00	-0.430
U-238	1.829E+02		3.176E+02	5.490E+02	0.000E+00	0.333
AM-241	-4.584E-01		2.648E+01	4.200E+01	0.000E+00	-0.011

A, 04L29403-5		, 07/31/2006	13:53, 07/28/2006	11:10,	3.280E+00, L29403-5	WG EX
B, 04L29403-5		, LIBD		, 07/28/2006	09:49, 0435L090804	
C, K-40	, YES,	2.236E+01,	4.892E+01,	4.403E+01,,	0.508	
C, RA-226	, YES,	9.170E+01,	8.509E+01,	1.089E+02,,	0.842	
C, AC-228	, YES,	2.971E+00,	1.054E+01,	1.731E+01,,	0.172	
C, TH-228	, YES,	4.737E+00,	4.559E+00,	8.514E+00,,	0.556	
C, BE-7	, NO,	9.259E+00,	2.421E+01,	4.056E+01,,	0.228	
C, NA-24	, NO,	3.906E+01,	8.986E+01,	1.404E+02,,	0.278	
C, CR-51	, NO,	-1.817E+01,	2.693E+01,	4.233E+01,,	-0.429	
C, MN-54	, NO,	6.820E-01,	3.016E+00,	4.993E+00,,	0.137	
C, CO-57	, NO,	1.601E-01,	2.705E+00,	4.418E+00,,	0.036	
C, CO-58	, NO,	-3.363E+00,	2.754E+00,	4.050E+00,,	-0.831	
C, FE-59	, NO,	2.099E-02,	5.317E+00,	8.738E+00,,	0.002	
C, CO-60	, NO,	-2.201E+00,	3.338E+00,	5.486E+00,,	-0.401	
C, ZN-65	, NO,	1.224E+01,	7.440E+00,	1.225E+01,,	0.999	
C, SE-75	, NO,	-1.977E+00,	3.881E+00,	6.232E+00,,	-0.317	
C, SR-85	, NO,	7.060E+00,	3.475E+00,	6.154E+00,,	1.147	
C, Y-88	, NO,	-1.993E+00,	3.284E+00,	5.047E+00,,	-0.395	
C, NB-94	, NO,	-3.563E-01,	2.878E+00,	4.715E+00,,	-0.076	
C, NB-95	, NO,	6.238E+00,	3.401E+00,	5.565E+00,,	1.121	
C, ZR-95	, NO,	1.957E+00,	5.370E+00,	9.028E+00,,	0.217	
C, MO-99	, NO,	4.593E+00,	4.187E+01,	6.943E+01,,	0.066	
C, RU-103	, NO,	5.476E-01,	3.028E+00,	5.003E+00,,	0.109	
C, RU-106	, NO,	9.192E+00,	2.517E+01,	4.287E+01,,	0.214	
C, AG-110m	, NO,	5.123E-02,	2.834E+00,	4.706E+00,,	0.011	
C, SN-113	, NO,	2.268E+00,	3.785E+00,	6.461E+00,,	0.351	
C, SB-124	, NO,	9.224E-01,	5.761E+00,	4.746E+00,,	0.194	
C, SB-125	, NO,	1.295E+00,	8.171E+00,	1.361E+01,,	0.095	
C, TE-129M	, NO,	1.165E+01,	3.432E+01,	5.744E+01,,	0.203	
C, I-131	, NO,	1.375E+00,	3.430E+00,	5.836E+00,,	0.236	
C, BA-133	, NO,	4.439E+00,	4.176E+00,	6.413E+00,,	0.692	
C, CS-134	, NO,	6.164E+00,	4.466E+00,	5.591E+00,,	1.102	
C, CS-136	, NO,	-4.986E-01,	3.278E+00,	5.288E+00,,	-0.094	
C, CS-137	, NO,	-3.497E-01,	3.249E+00,	5.352E+00,,	-0.065	
C, CE-139	, NO,	-6.079E-01,	2.832E+00,	4.514E+00,,	-0.135	
C, BA-140	, NO,	2.484E+00,	1.194E+01,	1.967E+01,,	0.126	
C, LA-140	, NO,	1.088E+00,	4.179E+00,	7.012E+00,,	0.155	
C, CE-141	, NO,	4.572E-01,	5.943E+00,	8.314E+00,,	0.055	
C, CE-144	, NO,	-6.424E-01,	2.351E+01,	3.452E+01,,	-0.019	
C, EU-152	, NO,	-1.054E+01,	9.912E+00,	1.382E+01,,	-0.763	
C, EU-154	, NO,	-1.156E+00,	5.610E+00,	9.082E+00,,	-0.127	
C, TH-232	, NO,	2.968E+00,	1.053E+01,	1.980E+01,,	0.150	
C, U-235	, NO,	-1.531E+01,	2.624E+01,	3.565E+01,,	-0.430	
C, U-238	, NO,	1.829E+02,	3.176E+02,	5.490E+02,,	0.333	
C, AM-241	, NO,	-4.584E-01,	2.648E+01,	4.200E+01,,	-0.011	

Sec. Review: *ROD* Analyst: *JM* LIMS:

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VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 31-JUL-2006 15:53:45.83  
 TBE07 P-10768B HpGe \*\*\*\*\* Aquisition Date/Time: 31-JUL-2006 12:39:04.39

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LIMS No., Customer Name, Client ID: L29403-6 WG EX/QUAD

Sample ID : 07L29403-6                      Smple Date: 28-JUL-2006 11:15:00.  
 Sample Type : WG                              Geometry : 0735L090904  
 Quantity : 3.37990E+00 L                      BKGFILE : 07BG072806MT  
 Start Channel : 40                      Energy Tol : 1.00000                      Real Time : 0 03:14:33.47  
 End Channel : 4090                      Pk Srch Sens: 5.00000                      Live time : 0 03:14:30.80  
 MDA Constant : 0.00                      Library Used: LIBD

Pk	It	Energy	Area	Bkgnd	FWHM	Channel	%Eff	Cts/Sec	%Err	Fit
1	1	77.13*	98	470	0.88	155.16	1.11E+00	8.42E-03	41.3	1.09E+00
2	1	198.37*	71	362	1.47	397.95	1.98E+00	6.10E-03	51.5	2.54E+00
3	5	241.95*	253	311	1.61	485.22	1.80E+00	2.16E-02	14.7	1.97E+00
4	1	295.15*	338	235	1.35	591.74	1.61E+00	2.90E-02	10.7	1.57E+00
5	1	351.79*	626	213	1.25	705.14	1.43E+00	5.37E-02	6.3	1.26E+00
6	1	595.96	51	147	1.77	1193.91	9.96E-01	4.39E-03	52.6	1.27E+00
7	1	609.20*	616	154	1.38	1220.40	9.81E-01	5.28E-02	6.2	9.23E-01
8	1	934.08	32	61	2.38	1870.54	7.17E-01	2.73E-03	50.6	9.96E-01
9	1	1120.22*	109	49	1.73	2242.95	6.26E-01	9.37E-03	16.5	1.36E+00
10	1	1237.95*	77	37	2.54	2478.43	5.81E-01	6.56E-03	19.2	2.29E+00
11	1	1378.18*	52	26	2.32	2758.90	5.37E-01	4.46E-03	26.7	1.58E+00
12	1	1764.75*	142	24	2.72	3531.82	4.54E-01	1.21E-02	11.8	5.20E-01

Flag: "\*" = Peak area was modified by background subtraction

#### Nuclide Line Activity Report

Flag: "\*" = Keyline

Summary of Nuclide Activity  
Sample ID : 07L29403-6

Page : 2  
Acquisition date : 31-JUL-2006 12:39:04

Total number of lines in spectrum	12	
Number of unidentified lines	11	
Number of lines tentatively identified by NID	1	8.33%

\*\*\*\* 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 : 07L29403-6

Page : 3  
Acquisition date : 31-JUL-2006 12:39:04

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
1	77.13	98	470	0.88	155.16	153	8	8.42E-03	82.5	1.11E+00	
1	198.37	71	362	1.47	397.95	394	9	6.10E-03	****	1.98E+00	
5	241.95	253	311	1.61	485.22	475	22	2.16E-02	29.5	1.80E+00	T
1	295.15	338	235	1.35	591.74	587	11	2.90E-02	21.4	1.61E+00	
1	351.79	626	213	1.25	705.14	699	12	5.37E-02	12.6	1.43E+00	
1	595.96	51	147	1.77	1193.91	1188	14	4.39E-03	****	9.96E-01	
1	609.20	616	154	1.38	1220.40	1214	15	5.28E-02	12.3	9.81E-01	
1	934.08	32	61	2.38	1870.54	1865	11	2.73E-03	****	7.17E-01	
1	1120.22	109	49	1.73	2242.95	2237	11	9.37E-03	33.1	6.26E-01	
1	1237.95	77	37	2.54	2478.43	2472	12	6.56E-03	38.4	5.81E-01	
1	1378.18	52	26	2.32	2758.90	2750	15	4.46E-03	53.4	5.37E-01	
1	1764.75	142	24	2.72	3531.82	3526	14	1.21E-02	23.5	4.54E-01	

Flags: "T" = Tentatively associated

#### Summary of Nuclide Activity

Total number of lines in spectrum	12
Number of unidentified lines	11
Number of lines tentatively identified by NID	1 8.33%

\*\*\*\* 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	-6.685E+00		2.427E+01	3.960E+01	0.000E+00	-0.169
NA-24	9.916E+00		1.214E+02	1.682E+02	0.000E+00	0.059
K-40	4.799E+01		4.066E+01	7.965E+01	0.000E+00	0.602
CR-51	8.283E+00		2.696E+01	4.492E+01	0.000E+00	0.184
MN-54	-1.618E-01		3.069E+00	4.984E+00	0.000E+00	-0.032
CO-57	2.536E+00		3.003E+00	4.973E+00	0.000E+00	0.510
CO-58	2.070E+00		3.094E+00	5.247E+00	0.000E+00	0.394
FE-59	6.102E+00		5.639E+00	9.905E+00	0.000E+00	0.616
CO-60	-7.566E-01		2.963E+00	4.758E+00	0.000E+00	-0.159
ZN-65	2.834E+01		8.797E+00	1.521E+01	0.000E+00	1.863
SE-75	-3.871E-01		3.967E+00	6.592E+00	0.000E+00	-0.059
SR-85	2.059E+01		3.482E+00	6.866E+00	0.000E+00	2.999
Y-88	-4.533E+00		3.376E+00	4.723E+00	0.000E+00	-0.960
NB-94	-5.232E-01		2.868E+00	4.688E+00	0.000E+00	-0.112
NB-95	4.291E+00		3.303E+00	5.772E+00	0.000E+00	0.744
ZR-95	2.823E+00		5.450E+00	9.202E+00	0.000E+00	0.307



MO-99	4.354E+01	4.951E+01	8.529E+01	0.000E+00	0.510
RU-103	3.795E-01	3.260E+00	5.401E+00	0.000E+00	0.070
RU-106	-1.929E+00	2.744E+01	4.296E+01	0.000E+00	-0.045
AG-110m	-3.807E+00	2.921E+00	4.505E+00	0.000E+00	-0.845
SN-113	2.579E+00	3.889E+00	6.504E+00	0.000E+00	0.397
SB-124	3.078E+00	6.239E+00	4.963E+00	0.000E+00	0.620
SB-125	3.357E+00	8.341E+00	1.412E+01	0.000E+00	0.238
TE-129M	2.050E+01	3.460E+01	5.884E+01	0.000E+00	0.348
I-131	-1.388E+00	3.889E+00	6.261E+00	0.000E+00	-0.222
BA-133	2.136E+01	5.225E+00	8.742E+00	0.000E+00	2.443
CS-134	2.309E+01	8.404E+00	8.299E+00	0.000E+00	2.782
CS-136	-3.262E+00	3.430E+00	5.257E+00	0.000E+00	-0.620
CS-137	7.171E-01	3.145E+00	5.277E+00	0.000E+00	0.136
CE-139	-2.666E+00	2.959E+00	4.776E+00	0.000E+00	-0.558
BA-140	3.105E+00	1.219E+01	2.023E+01	0.000E+00	0.153
LA-140	2.690E+00	4.079E+00	7.093E+00	0.000E+00	0.379
CE-141	-5.496E+00	5.481E+00	8.903E+00	0.000E+00	-0.617
CE-144	-3.794E+01	2.282E+01	3.656E+01	0.000E+00	-1.038
EU-152	-5.820E+00	1.110E+01	1.497E+01	0.000E+00	-0.389
EU-154	4.909E+00	6.292E+00	1.040E+01	0.000E+00	0.472
RA-226	-1.743E+01	7.603E+01	1.264E+02	0.000E+00	-0.138
AC-228	4.935E+00	1.181E+01	2.067E+01	0.000E+00	0.239
TH-228	1.508E+01	7.300E+00	1.121E+01	0.000E+00	1.345
TH-232	4.930E+00	1.180E+01	2.065E+01	0.000E+00	0.239
U-235	-1.822E+01	2.391E+01	3.891E+01	0.000E+00	-0.468
U-238	1.458E+01	3.333E+02	5.428E+02	0.000E+00	0.027
AM-241	-3.778E+01	2.692E+01	4.314E+01	0.000E+00	-0.876

A,07L29403-6 ,07/31/2006 15:53,07/28/2006 11:15, 3.380E+00,L29403-6 WG EX  
 B,07L29403-6 ,LIBD ,07/28/2006 09:50,0735L090904  
 C,BE-7 ,NO , -6.685E+00, 2.427E+01, 3.960E+01,, -0.169  
 C,NA-24 ,NO , 9.916E+00, 1.214E+02, 1.682E+02,, 0.059  
 C,K-40 ,NO , 4.799E+01, 4.066E+01, 7.965E+01,, 0.602  
 C,CR-51 ,NO , 8.283E+00, 2.696E+01, 4.492E+01,, 0.184  
 C,MN-54 ,NO , -1.618E-01, 3.069E+00, 4.984E+00,, -0.032  
 C,CO-57 ,NO , 2.536E+00, 3.003E+00, 4.973E+00,, 0.510  
 C,CO-58 ,NO , 2.070E+00, 3.094E+00, 5.247E+00,, 0.394  
 C,FE-59 ,NO , 6.102E+00, 5.639E+00, 9.905E+00,, 0.616  
 C,CO-60 ,NO , -7.566E-01, 2.963E+00, 4.758E+00,, -0.159  
 C,ZN-65 ,NO , 2.834E+01, 8.797E+00, 1.521E+01,, 1.863  
 C,SE-75 ,NO , -3.871E-01, 3.967E+00, 6.592E+00,, -0.059  
 C,SR-85 ,NO , 2.059E+01, 3.482E+00, 6.866E+00,, 2.999  
 C,Y-88 ,NO , -4.533E+00, 3.376E+00, 4.723E+00,, -0.960  
 C,NB-94 ,NO , -5.232E-01, 2.868E+00, 4.688E+00,, -0.112  
 C,NB-95 ,NO , 4.291E+00, 3.303E+00, 5.772E+00,, 0.744  
 C,ZR-95 ,NO , 2.823E+00, 5.450E+00, 9.202E+00,, 0.307  
 C,MO-99 ,NO , 4.354E+01, 4.951E+01, 8.529E+01,, 0.510  
 C,RU-103 ,NO , 3.795E-01, 3.260E+00, 5.401E+00,, 0.070  
 C,RU-106 ,NO , -1.929E+00, 2.744E+01, 4.296E+01,, -0.045  
 C,AG-110m ,NO , -3.807E+00, 2.921E+00, 4.505E+00,, -0.845  
 C,SN-113 ,NO , 2.579E+00, 3.889E+00, 6.504E+00,, 0.397  
 C,SB-124 ,NO , 3.078E+00, 6.239E+00, 4.963E+00,, 0.620  
 C,SB-125 ,NO , 3.357E+00, 8.341E+00, 1.412E+01,, 0.238  
 C,TE-129M ,NO , 2.050E+01, 3.460E+01, 5.884E+01,, 0.348  
 C,I-131 ,NO , -1.388E+00, 3.889E+00, 6.261E+00,, -0.222  
 C,BA-133 ,NO , 2.136E+01, 5.225E+00, 8.742E+00,, 2.443  
 C,CS-134 ,NO , 2.309E+01, 8.404E+00, 8.299E+00,, 2.782  
 C,CS-136 ,NO , -3.262E+00, 3.430E+00, 5.257E+00,, -0.620  
 C,CS-137 ,NO , 7.171E-01, 3.145E+00, 5.277E+00,, 0.136  
 C,CE-139 ,NO , -2.666E+00, 2.959E+00, 4.776E+00,, -0.558  
 C,BA-140 ,NO , 3.105E+00, 1.219E+01, 2.023E+01,, 0.153  
 C,LA-140 ,NO , 2.690E+00, 4.079E+00, 7.093E+00,, 0.379  
 C,CE-141 ,NO , -5.496E+00, 5.481E+00, 8.903E+00,, -0.617  
 C,CE-144 ,NO , -3.794E+01, 2.282E+01, 3.656E+01,, -1.038  
 C,EU-152 ,NO , -5.820E+00, 1.110E+01, 1.497E+01,, -0.389  
 C,EU-154 ,NO , 4.909E+00, 6.292E+00, 1.040E+01,, 0.472  
 C,RA-226 ,NO , -1.743E+01, 7.603E+01, 1.264E+02,, -0.138  
 C,AC-228 ,NO , 4.935E+00, 1.181E+01, 2.067E+01,, 0.239  
 C,TH-228 ,NO , 1.508E+01, 7.300E+00, 1.121E+01,, 1.345  
 C,TH-232 ,NO , 4.930E+00, 1.180E+01, 2.065E+01,, 0.239  
 C,U-235 ,NO , -1.822E+01, 2.391E+01, 3.891E+01,, -0.468  
 C,U-238 ,NO , 1.458E+01, 3.333E+02, 5.428E+02,, 0.027  
 C,AM-241 ,NO , -3.778E+01, 2.692E+01, 4.314E+01,, -0.876

Sec. Review: *KS* Analyst: *M* LIMS:

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VAX/VMS Teledyne Brown Eng. Laboratory Gamma Report: 31-JUL-2006 15:55:02.76  
 TBE23 03017322 HpGe \*\*\*\*\* Aquisition Date/Time: 31-JUL-2006 13:16:47.13

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LIMS No., Customer Name, Client ID: L29403-7 WG EX/QUAD

Sample ID : 23L29403-7                      Smple Date: 28-JUL-2006 11:20:00.  
 Sample Type : WG                              Geometry : 2335L090704  
 Quantity : 3.26870E+00 L                      BKGFILE : 23BG072806MT  
 Start Channel : 50                      Energy Tol : 1.00000                      Real Time : 0 02:38:07.54  
 End Channel : 4090                      Pk Srch Sens: 5.00000                      Live time : 0 02:38:00.99  
 MDA Constant : 0.00                      Library Used: LIBD

Pk It	Energy	Area	Bkgnd	FWHM	Channel	%Eff	Cts/Sec	%Err	Fit
1 0	39.22	17	183	2.34	78.85	1.96E-01	1.81E-03	132.8	0.00E+00
2 0	63.08*	30	326	0.94	126.50	9.34E-01	3.18E-03	110.1	
3 0	92.60*	28	379	1.10	185.48	1.69E+00	2.93E-03	138.7	
4 0	351.55*	20	107	1.30	702.96	1.32E+00	2.06E-03	98.2	
5 0	583.65*	21	53	0.91	1166.99	8.88E-01	2.20E-03	76.6	
6 0	595.64	64	42	0.94	1190.99	8.74E-01	6.77E-03	23.1	
7 0	609.21*	60	90	1.56	1218.13	8.59E-01	6.35E-03	38.6	
8 0	1121.30	48	24	0.99	2242.70	5.52E-01	5.05E-03	29.1	
9 0	1460.80*	4	25	1.28	2922.49	4.59E-01	4.55E-04	345.6	
10 0	1764.33*	32	13	2.78	3530.64	4.00E-01	3.41E-03	32.6	

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	4	10.67*	4.595E-01	7.676E+00	7.676E+00	691.10

Flag: "\*" = Keyline

Summary of Nuclide Activity  
 Sample ID : 23L29403-7

Page : 2  
 Acquisition date : 31-JUL-2006 13:16:47

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 pCi/L	Decay Corr pCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	7.676E+00	7.676E+00	53.05E+00	691.10	
Total Activity :			7.676E+00	7.676E+00			

Grand Total Activity : 7.676E+00 7.676E+00

Flags: "K" = Keyline not found  
 "E" = Manually edited

"M" = Manually accepted  
 "A" = Nuclide specific abn. limit

Unidentified Energy Lines  
 Sample ID : 23L29403-7

Page : 3  
 Acquisition date : 31-JUL-2006 13:16:47

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
0	39.22	17	183	2.34	78.85	77	7	1.81E-03	****	1.96E-01	
0	63.08	30	326	0.94	126.50	123	8	3.18E-03	****	9.34E-01	
0	92.60	28	379	1.10	185.48	182	9	2.93E-03	****	1.69E+00	
0	351.55	20	107	1.30	702.96	699	7	2.06E-03	****	1.32E+00	
0	583.65	21	53	0.91	1166.99	1161	11	2.20E-03	****	8.88E-01	T
0	595.64	64	42	0.94	1190.99	1186	11	6.77E-03	46.1	8.74E-01	
0	609.21	60	90	1.56	1218.13	1209	15	6.35E-03	77.2	8.59E-01	
0	1121.30	48	24	0.99	2242.70	2234	18	5.05E-03	58.2	5.52E-01	
0	1764.33	32	13	2.78	3530.64	3524	16	3.41E-03	65.2	4.00E-01	

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 Uncorrected pCi/L	Wtd Mean Decay Corr pCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	7.676E+00	7.676E+00	53.05E+00	691.10	
Total Activity :			7.676E+00	7.676E+00			

Grand Total Activity : 7.676E+00 7.676E+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
K-40	7.676E+00	5.305E+01	4.911E+01	0.000E+00	0.156

---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/L)	K.L. Ided	Act error	MDA (pCi/L)	MDA error	Act/MDA
BE-7	-1.518E+01		2.310E+01	3.894E+01	0.000E+00	-0.390
NA-24	-2.137E+01		8.068E+01	1.457E+02	0.000E+00	-0.147

CR-51	9.639E+00	2.489E+01	4.318E+01	0.000E+00	0.223
MN-54	-3.133E+00	2.421E+00	3.837E+00	0.000E+00	-0.816
CO-57	1.879E+00	2.999E+00	5.060E+00	0.000E+00	0.371
CO-58	-4.237E-01	2.835E+00	4.853E+00	0.000E+00	-0.087
FE-59	-3.306E-01	4.966E+00	8.870E+00	0.000E+00	-0.037
CO-60	-1.956E+00	2.585E+00	4.174E+00	0.000E+00	-0.469
ZN-65	3.024E+00	5.704E+00	9.599E+00	0.000E+00	0.315
SE-75	1.534E-01	3.709E+00	6.348E+00	0.000E+00	0.024
SR-85	3.963E-03	3.446E+00	5.965E+00	0.000E+00	0.001
Y-88	8.579E-02	2.753E+00	5.145E+00	0.000E+00	0.017
NB-94	-8.700E-01	2.627E+00	4.451E+00	0.000E+00	-0.195
NB-95	1.160E+00	2.652E+00	4.814E+00	0.000E+00	0.241
ZR-95	-3.306E-01	4.503E+00	7.838E+00	0.000E+00	-0.042
MO-99	3.839E+01	4.758E+01	8.803E+01	0.000E+00	0.436
RU-103	-7.739E-01	2.819E+00	4.872E+00	0.000E+00	-0.159
RU-106	-1.033E+01	2.582E+01	4.377E+01	0.000E+00	-0.236
AG-110m	1.694E-01	2.761E+00	4.845E+00	0.000E+00	0.035
SN-113	6.471E-01	3.892E+00	6.630E+00	0.000E+00	0.098
SB-124	-6.844E-01	4.135E+00	4.433E+00	0.000E+00	-0.154
SB-125	2.714E+00	7.916E+00	1.425E+01	0.000E+00	0.190
TE-129M	3.546E+00	3.063E+01	5.457E+01	0.000E+00	0.065
I-131	-3.732E-01	3.547E+00	5.984E+00	0.000E+00	-0.062
BA-133	7.672E-01	4.683E+00	6.921E+00	0.000E+00	0.111
CS-134	1.420E+00	2.837E+00	4.523E+00	0.000E+00	0.314
CS-136	5.468E-01	2.891E+00	5.332E+00	0.000E+00	0.103
CS-137	1.942E-01	2.902E+00	5.112E+00	0.000E+00	0.038
CE-139	-2.661E+00	2.876E+00	4.807E+00	0.000E+00	-0.553
BA-140	1.075E+01	1.175E+01	2.186E+01	0.000E+00	0.492
LA-140	-1.886E+00	3.648E+00	6.267E+00	0.000E+00	-0.301
CE-141	4.971E+00	5.268E+00	9.393E+00	0.000E+00	0.529
CE-144	-1.376E+01	2.404E+01	3.867E+01	0.000E+00	-0.356
EU-152	-5.485E+00	8.707E+00	1.379E+01	0.000E+00	-0.398
EU-154	2.521E+00	6.328E+00	1.059E+01	0.000E+00	0.238
RA-226	-4.713E+01	7.654E+01	1.324E+02	0.000E+00	-0.356
AC-228	-4.078E-01	9.770E+00	1.814E+01	0.000E+00	-0.022
TH-228	3.570E+00	5.647E+00	9.946E+00	0.000E+00	0.359
TH-232	-4.074E-01	9.759E+00	1.813E+01	0.000E+00	-0.022
U-235	-1.533E+01	2.405E+01	4.048E+01	0.000E+00	-0.379
U-238	9.144E+01	2.842E+02	5.406E+02	0.000E+00	0.169
AM-241	3.137E+00	1.676E+01	2.521E+01	0.000E+00	0.124

A, 23L29403-7		, 07/31/2006 15:55, 07/28/2006 11:20,		3.269E+00, L29403-7 WG EX	
B, 23L29403-7		, LIBD		, 07/31/2006 10:02, 2335L090704	
C, K-40	, YES,	7.676E+00,	5.305E+01,	4.911E+01,,	0.156
C, BE-7	, NO,	-1.518E+01,	2.310E+01,	3.894E+01,,	-0.390
C, NA-24	, NO,	-2.137E+01,	8.068E+01,	1.457E+02,,	-0.147
C, CR-51	, NO,	9.639E+00,	2.489E+01,	4.318E+01,,	0.223
C, MN-54	, NO,	-3.133E+00,	2.421E+00,	3.837E+00,,	-0.816
C, CO-57	, NO,	1.879E+00,	2.999E+00,	5.060E+00,,	0.371
C, CO-58	, NO,	-4.237E-01,	2.835E+00,	4.853E+00,,	-0.087
C, FE-59	, NO,	-3.306E-01,	4.966E+00,	8.870E+00,,	-0.037
C, CO-60	, NO,	-1.956E+00,	2.585E+00,	4.174E+00,,	-0.469
C, ZN-65	, NO,	3.024E+00,	5.704E+00,	9.599E+00,,	0.315
C, SE-75	, NO,	1.534E-01,	3.709E+00,	6.348E+00,,	0.024
C, SR-85	, NO,	3.963E-03,	3.446E+00,	5.965E+00,,	0.001
C, Y-88	, NO,	8.579E-02,	2.753E+00,	5.145E+00,,	0.017
C, NB-94	, NO,	-8.700E-01,	2.627E+00,	4.451E+00,,	-0.195
C, NB-95	, NO,	1.160E+00,	2.652E+00,	4.814E+00,,	0.241
C, ZR-95	, NO,	-3.306E-01,	4.503E+00,	7.838E+00,,	-0.042
C, MO-99	, NO,	3.839E+01,	4.758E+01,	8.803E+01,,	0.436
C, RU-103	, NO,	-7.739E-01,	2.819E+00,	4.872E+00,,	-0.159
C, RU-106	, NO,	-1.033E+01,	2.582E+01,	4.377E+01,,	-0.236
C, AG-110m	, NO,	1.694E-01,	2.761E+00,	4.845E+00,,	0.035
C, SN-113	, NO,	6.471E-01,	3.892E+00,	6.630E+00,,	0.098
C, SB-124	, NO,	-6.844E-01,	4.135E+00,	4.433E+00,,	-0.154
C, SB-125	, NO,	2.714E+00,	7.916E+00,	1.425E+01,,	0.190
C, TE-129M	, NO,	3.546E+00,	3.063E+01,	5.457E+01,,	0.065
C, I-131	, NO,	-3.732E-01,	3.547E+00,	5.984E+00,,	-0.062
C, BA-133	, NO,	7.672E-01,	4.683E+00,	6.921E+00,,	0.111
C, CS-134	, NO,	1.420E+00,	2.837E+00,	4.523E+00,,	0.314
C, CS-136	, NO,	5.468E-01,	2.891E+00,	5.332E+00,,	0.103
C, CS-137	, NO,	1.942E-01,	2.902E+00,	5.112E+00,,	0.038
C, CE-139	, NO,	-2.661E+00,	2.876E+00,	4.807E+00,,	-0.553
C, BA-140	, NO,	1.075E+01,	1.175E+01,	2.186E+01,,	0.492
C, LA-140	, NO,	-1.886E+00,	3.648E+00,	6.267E+00,,	-0.301
C, CE-141	, NO,	4.971E+00,	5.268E+00,	9.393E+00,,	0.529
C, CE-144	, NO,	-1.376E+01,	2.404E+01,	3.867E+01,,	-0.356
C, EU-152	, NO,	-5.485E+00,	8.707E+00,	1.379E+01,,	-0.398
C, EU-154	, NO,	2.521E+00,	6.328E+00,	1.059E+01,,	0.238
C, RA-226	, NO,	-4.713E+01,	7.654E+01,	1.324E+02,,	-0.356
C, AC-228	, NO,	-4.078E-01,	9.770E+00,	1.814E+01,,	-0.022
C, TH-228	, NO,	3.570E+00,	5.647E+00,	9.946E+00,,	0.359
C, TH-232	, NO,	-4.074E-01,	9.759E+00,	1.813E+01,,	-0.022
C, U-235	, NO,	-1.533E+01,	2.405E+01,	4.048E+01,,	-0.379
C, U-238	, NO,	9.144E+01,	2.842E+02,	5.406E+02,,	0.169
C, AM-241	, NO,	3.137E+00,	1.676E+01,	2.521E+01,,	0.124





Summary of Nuclide Activity  
 Sample ID : 04L29403-8

Page : 2  
 Acquisition date : 31-JUL-2006 13:55:42

Total number of lines in spectrum 18  
 Number of unidentified lines 13  
 Number of lines tentatively identified by NID 5 27.78%

Nuclide Type : natural

Nuclide	Hlife	Decay	Uncorrected pCi/L	Decay Corr pCi/L	Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
K-40	1.28E+09Y	1.00	8.525E+00	8.525E+00	41.57E+00	487.65	
RA-226	1600.00Y	1.00	1.332E+02	1.332E+02	1.258E+02	94.43	
TH-228	1.91Y	1.00	9.220E+00	9.249E+00	7.411E+00	80.12	
U-235	7.04E+08Y	1.00	8.090E+00	8.090E+00	7.640E+00	94.43	K
Total Activity :			1.590E+02	1.591E+02			

Grand Total Activity : 1.590E+02 1.591E+02

Flags: "K" = Keyline not found  
 "E" = Manually edited

"M" = Manually accepted  
 "A" = Nuclide specific abn. limit

Unidentified Energy Lines  
Sample ID : 04L29403-8

Page : 3  
Acquisition date : 31-JUL-2006 13:55:42

It	Energy	Area	Bkgnd	FWHM	Channel	Left	Pw	Cts/Sec	%Err	%Eff	Flags
1	66.14	66	309	1.26	133.18	130	8	8.51E-03	96.9	6.42E-01	
3	74.75	73	267	1.10	150.40	144	20	9.39E-03	83.9	9.18E-01	
3	77.08	122	180	0.91	155.07	144	20	1.58E-02	39.5	9.90E-01	
1	198.45	36	287	1.64	397.94	392	11	4.58E-03	****	1.68E+00	
1	295.13	276	189	0.93	591.39	587	10	3.56E-02	22.4	1.32E+00	
1	351.87	506	174	1.08	704.92	699	13	6.52E-02	14.1	1.17E+00	
1	583.08	15	44	2.21	1167.46	1164	10	1.92E-03	****	7.99E-01	T
1	609.18	447	65	1.28	1219.66	1213	11	5.76E-02	12.0	7.73E-01	
1	768.19	56	34	1.62	1537.70	1533	9	7.21E-03	45.8	6.46E-01	
1	1120.49	100	22	2.17	2242.17	2235	16	1.29E-02	30.3	4.81E-01	
1	1266.70	19	4	1.94	2534.47	2531	7	2.47E-03	53.4	4.37E-01	
1	1372.41	17	2	2.32	2745.77	2742	7	2.20E-03	52.6	4.11E-01	
1	1377.76	36	15	2.77	2756.47	2751	12	4.62E-03	53.0	4.10E-01	
1	1764.30	71	11	2.61	3528.96	3521	15	9.20E-03	32.6	3.43E-01	

Flags: "T" = Tentatively associated

#### Summary of Nuclide Activity

Total number of lines in spectrum	18
Number of unidentified lines	13
Number of lines tentatively identified by NID	5
	27.78%

Nuclide Type : natural

Nuclide	Hlife	Decay	Wtd Mean		Decay Corr 2-Sigma Error	2-Sigma %Error	Flags
			Uncorrected pCi/L	Decay Corr pCi/L			
K-40	1.28E+09Y	1.00	8.525E+00	8.525E+00	41.57E+00	487.65	
RA-226	1600.00Y	1.00	1.332E+02	1.332E+02	1.258E+02	94.43	
TH-228	1.91Y	1.00	9.220E+00	9.249E+00	7.411E+00	80.12	
Total Activity :			1.509E+02	1.510E+02			

Grand Total Activity : 1.509E+02 1.510E+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 (pCi/L)	Act error	MDA (pCi/L)	MDA error	Act/MDA
K-40	8.525E+00	4.157E+01	7.079E+01	0.000E+00	0.120
RA-226	1.332E+02	1.258E+02	1.430E+02	0.000E+00	0.932
TH-228	9.249E+00	7.411E+00	1.070E+01	0.000E+00	0.865

## ---- Non-Identified Nuclides ----

Nuclide	Key-Line Activity (pCi/L)	K.L. Ided	Act error	MDA (pCi/L)	MDA error	Act/MDA
BE-7	1.392E+00		3.149E+01	5.183E+01	0.000E+00	0.027
NA-24	6.803E+01		1.561E+02	2.399E+02	0.000E+00	0.284
CR-51	-1.754E+01		3.394E+01	5.332E+01	0.000E+00	-0.329
MN-54	1.054E+00		3.745E+00	6.264E+00	0.000E+00	0.168
CO-57	-1.371E+00		3.700E+00	5.945E+00	0.000E+00	-0.231
CO-58	1.096E-01		3.953E+00	6.472E+00	0.000E+00	0.017
FE-59	3.339E-01		7.710E+00	1.272E+01	0.000E+00	0.026
CO-60	8.210E-01		4.611E+00	8.177E+00	0.000E+00	0.100
ZN-65	1.430E+01		1.119E+01	1.805E+01	0.000E+00	0.792
SE-75	-3.983E+00		5.174E+00	8.154E+00	0.000E+00	-0.488
SR-85	8.673E+00		4.428E+00	7.996E+00	0.000E+00	1.085
Y-88	3.144E-01		4.098E+00	6.859E+00	0.000E+00	0.046
NB-94	4.907E-01		3.711E+00	6.191E+00	0.000E+00	0.079
NB-95	7.220E+00		4.342E+00	7.983E+00	0.000E+00	0.904
ZR-95	-1.687E+00		6.028E+00	9.618E+00	0.000E+00	-0.175
MO-99	-2.917E+01		5.952E+01	9.350E+01	0.000E+00	-0.312
RU-103	3.056E+00		3.892E+00	6.717E+00	0.000E+00	0.455
RU-106	-4.604E+00		3.324E+01	5.474E+01	0.000E+00	-0.084
AG-110m	2.455E-02		3.855E+00	6.398E+00	0.000E+00	0.004
SN-113	5.159E+00		5.029E+00	8.838E+00	0.000E+00	0.584
SB-124	-4.174E+00		4.708E+00	6.072E+00	0.000E+00	-0.687
SB-125	-1.219E+00		1.185E+01	1.947E+01	0.000E+00	-0.063
TE-129M	4.364E+00		4.783E+01	7.913E+01	0.000E+00	0.055
I-131	-3.081E+00		5.034E+00	8.119E+00	0.000E+00	-0.380
BA-133	5.555E+00		5.737E+00	8.872E+00	0.000E+00	0.626
CS-134	9.940E+00		4.613E+00	7.840E+00	0.000E+00	1.268
CS-136	-1.534E+00		4.473E+00	7.067E+00	0.000E+00	-0.217
CS-137	7.662E+00		4.169E+00	7.840E+00	0.000E+00	0.977
CE-139	-2.402E+00		3.919E+00	6.131E+00	0.000E+00	-0.392
BA-140	-1.528E+01		1.662E+01	2.519E+01	0.000E+00	-0.607
LA-140	4.333E+00		4.926E+00	9.025E+00	0.000E+00	0.480
CE-141	-6.606E+00		6.755E+00	1.049E+01	0.000E+00	-0.630
CE-144	1.019E+00		2.964E+01	4.818E+01	0.000E+00	0.021
EU-152	-1.016E+01		1.379E+01	1.864E+01	0.000E+00	-0.545
EU-154	-2.099E+00		7.719E+00	1.245E+01	0.000E+00	-0.169
AC-228	1.533E+01		1.491E+01	2.758E+01	0.000E+00	0.556
TH-232	1.531E+01		1.489E+01	2.755E+01	0.000E+00	0.556
U-235	-3.978E+01		2.999E+01	4.596E+01	0.000E+00	-0.865
U-238	2.935E+01		4.322E+02	7.199E+02	0.000E+00	0.041
AM-241	-4.245E+01		3.501E+01	5.451E+01	0.000E+00	-0.779

A, 04L29403-8 ,07/31/2006 16:07,07/28/2006 12:25, 3.359E+00,L29403-8 WG EX  
 B, 04L29403-8 ,LIBD ,07/28/2006 09:49,0435L090804

C, K-40	, YES,	8.525E+00,	4.157E+01,	7.079E+01,,	0.120
C, RA-226	, YES,	1.332E+02,	1.258E+02,	1.430E+02,,	0.932
C, TH-228	, YES,	9.249E+00,	7.411E+00,	1.070E+01,,	0.865
C, BE-7	, NO,	1.392E+00,	3.149E+01,	5.183E+01,,	0.027
C, NA-24	, NO,	6.803E+01,	1.561E+02,	2.399E+02,,	0.284
C, CR-51	, NO,	-1.754E+01,	3.394E+01,	5.332E+01,,	-0.329
C, MN-54	, NO,	1.054E+00,	3.745E+00,	6.264E+00,,	0.168
C, CO-57	, NO,	-1.371E+00,	3.700E+00,	5.945E+00,,	-0.231
C, CO-58	, NO,	1.096E-01,	3.953E+00,	6.472E+00,,	0.017
C, FE-59	, NO,	3.339E-01,	7.710E+00,	1.272E+01,,	0.026
C, CO-60	, NO,	8.210E-01,	4.611E+00,	8.177E+00,,	0.100
C, ZN-65	, NO,	1.430E+01,	1.119E+01,	1.805E+01,,	0.792
C, SE-75	, NO,	-3.983E+00,	5.174E+00,	8.154E+00,,	-0.488
C, SR-85	, NO,	8.673E+00,	4.428E+00,	7.996E+00,,	1.085
C, Y-88	, NO,	3.144E-01,	4.098E+00,	6.859E+00,,	0.046
C, NB-94	, NO,	4.907E-01,	3.711E+00,	6.191E+00,,	0.079
C, NB-95	, NO,	7.220E+00,	4.342E+00,	7.983E+00,,	0.904
C, ZR-95	, NO,	-1.687E+00,	6.028E+00,	9.618E+00,,	-0.175
C, MO-99	, NO,	-2.917E+01,	5.952E+01,	9.350E+01,,	-0.312
C, RU-103	, NO,	3.056E+00,	3.892E+00,	6.717E+00,,	0.455
C, RU-106	, NO,	-4.604E+00,	3.324E+01,	5.474E+01,,	-0.084
C, AG-110m	, NO,	2.455E-02,	3.855E+00,	6.398E+00,,	0.004
C, SN-113	, NO,	5.159E+00,	5.029E+00,	8.838E+00,,	0.584
C, SB-124	, NO,	-4.174E+00,	4.708E+00,	6.072E+00,,	-0.687
C, SB-125	, NO,	-1.219E+00,	1.185E+01,	1.947E+01,,	-0.063
C, TE-129M	, NO,	4.364E+00,	4.783E+01,	7.913E+01,,	0.055
C, I-131	, NO,	-3.081E+00,	5.034E+00,	8.119E+00,,	-0.380
C, BA-133	, NO,	5.555E+00,	5.737E+00,	8.872E+00,,	0.626
C, CS-134	, NO,	9.940E+00,	4.613E+00,	7.840E+00,,	1.268
C, CS-136	, NO,	-1.534E+00,	4.473E+00,	7.067E+00,,	-0.217
C, CS-137	, NO,	7.662E+00,	4.169E+00,	7.840E+00,,	0.977
C, CE-139	, NO,	-2.402E+00,	3.919E+00,	6.131E+00,,	-0.392
C, BA-140	, NO,	-1.528E+01,	1.662E+01,	2.519E+01,,	-0.607
C, LA-140	, NO,	4.333E+00,	4.926E+00,	9.025E+00,,	0.480
C, CE-141	, NO,	-6.606E+00,	6.755E+00,	1.049E+01,,	-0.630
C, CE-144	, NO,	1.019E+00,	2.964E+01,	4.818E+01,,	0.021
C, EU-152	, NO,	-1.016E+01,	1.379E+01,	1.864E+01,,	-0.545
C, EU-154	, NO,	-2.099E+00,	7.719E+00,	1.245E+01,,	-0.169
C, AC-228	, NO,	1.533E+01,	1.491E+01,	2.758E+01,,	0.556
C, TH-232	, NO,	1.531E+01,	1.489E+01,	2.755E+01,,	0.556
C, U-235	, NO,	-3.978E+01,	2.999E+01,	4.596E+01,,	-0.865
C, U-238	, NO,	2.935E+01,	4.322E+02,	7.199E+02,,	0.041
C, AM-241	, NO,	-4.245E+01,	3.501E+01,	5.451E+01,,	-0.779

APPENDIX E

DATA VALIDATION MEMORANDUM



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## MEMORANDUM

TO: Steve Quigley  
FROM: Kathy Shaw/ks/6/CT *[Signature]*  
REF. NO.: 45136-28  
DATE: June 22, 2006  
Revision Date: August 23, 2006  
RE: Data Quality Assessment and Verification  
Fleetwide Assessment - Hydrogeologic Investigation  
Quad Cities Generating Station - Cordova, Illinois

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This memorandum details a data verification of the radiochemical data resulting from the collection of 32 groundwater, two (2) surface water and eight (8) quality control samples from the Quad Cities Generating Station in Cordova, 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 five (5) field duplicate sample sets and three (3) rinsate blank samples.

To assess the efficiency of field decontamination procedures and cleanliness of sample containers, the rinsate samples identified in Table 1 were collected and analyzed. The samples that should be qualified due to rinsate blank contamination are summarized in Table 3. No additional target radionuclides were reported as detected in the rinsate samples.

Overall precision for the sampling event and laboratory procedures were monitored using the results of the field duplicate sample sets. Table 4 summarizes the results of the detected analytes in the field duplicate sample set. The data indicate that an adequate level of precision was achieved for the sampling event.

### 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  
QUAD CITIES GENERATING STATION  
CORDOVA, ILLINOIS**

Sample Location	Sample Identification	QC Sample	Sample Date	Matrix	Analysis
MW-QC-102I	WG-QC-MW-QC-102I-053106-JH-016		5/31/2006	Groundwater	Tritium/Strontium/Gamma Spectrum
MW-QC-102I	WG-QC-MW-QC-102I-053106-JH-017	Duplicate (016)	5/31/2006	Groundwater	Tritium/Strontium/Gamma Spectrum
MW-QC-102S	WG-QC-MW-QC-102S-053106-JH-018		5/31/2006	Groundwater	Tritium/Strontium/Gamma Spectrum
MW-QC-102S	WG-QC-MW-QC-102S-053106-JH-019	Duplicate (018)	5/31/2006	Groundwater	Tritium/Strontium/Gamma Spectrum
Fish House Well	WG-QC-MW-QC-FHW-053106-JH-004		5/31/2006	Groundwater	Tritium/Strontium/Gamma Spectrum
Little Fish Well	WG-QC-MW-QC-LFW-053106-JH-005		5/31/2006	Groundwater	Tritium/Strontium/Gamma Spectrum
SW-QC-1	WS-QC-SW-QC-001-053106-JH-002		5/31/2006	Surface Water	Tritium/Strontium/Gamma Spectrum
SW-QC-2	WS-QC-SW-QC-002-053106-JH-003		5/31/2006	Surface Water	Tritium/Strontium/Gamma Spectrum
Rinsate	RB-QC-MW-QC-108S-053106-JH-013	Rinsate	5/31/2006	Water	Tritium/Strontium/Gamma Spectrum
MW-QC-106I	WG-QC-MW-QC-106I-053106-JH-014		5/31/2006	Groundwater	Tritium/Strontium/Gamma Spectrum
MW-QC-106S	WG-QC-MW-QC-106S-053106-JH-015		5/31/2006	Groundwater	Tritium/Strontium/Gamma Spectrum
MW-QC-107I	WG-QC-MW-QC-107I-053106-JH-011		5/31/2006	Groundwater	Tritium/Strontium/Gamma Spectrum
MW-QC-108S	WG-QC-MW-QC-108S-053106-JH-012		5/31/2006	Groundwater	Tritium/Strontium/Gamma Spectrum
Fire Training Well	WG-QC-MW-QC-FTW-053106-JH-001		5/31/2006	Groundwater	Tritium/Strontium/Gamma Spectrum
WELL #1	WG-QC-MW-QC-WELL#1-060106-JH-009		6/1/2006	Groundwater	Tritium/Strontium/Gamma Spectrum
WELL #5	WG-QC-MW-QC-WELL#5-060106-JH-010		6/1/2006	Groundwater	Tritium/Strontium/Gamma Spectrum
MW-1	WG-QC-MW-1-060106-JH-022		6/1/2006	Groundwater	Tritium/Strontium/Gamma Spectrum
MW-2	WG-QC-MW-2-060106-JH-023		6/1/2006	Groundwater	Tritium/Strontium/Gamma Spectrum
MW-QC-101S	WG-QC-MW-QC-101S-060106-JH-026		6/1/2006	Groundwater	Tritium/Strontium/Gamma Spectrum
Big Fish Well	WG-QC-MW-QC-BFW-060106-JH-007		6/1/2006	Groundwater	Tritium/Strontium/Gamma Spectrum
Dry Cask Storage Well	WG-QC-MW-QC-DCS-060106-JH-006		6/1/2006	Groundwater	Tritium/Strontium/Gamma Spectrum
STP Sand Point Well	WG-QC-MW-QC-STP-060106-JH-008		6/1/2006	Groundwater	Tritium/Strontium/Gamma Spectrum
MW-QC-101I	WG-QC-MW-QC-101I-060106-JH-027		6/1/2006	Groundwater	Tritium/Strontium/Gamma Spectrum
MW-QC-103I	WG-QC-MW-QC-103I-060106-JH-020		6/1/2006	Groundwater	Tritium/Strontium/Gamma Spectrum
MW-QC-103I	WG-QC-MW-QC-103I-060106-JH-021	Duplicate (020)	6/1/2006	Groundwater	Tritium/Strontium/Gamma Spectrum
MW-QC-104S	WG-QC-MW-QC-104S-060106-JH-025		6/1/2006	Groundwater	Tritium/Strontium/Gamma Spectrum
MW-QC-105I	WG-QC-MW-QC-105I-060106-JH-024		6/1/2006	Groundwater	Tritium/Strontium/Gamma Spectrum
MW-QC-108I	WG-QC-MW-QC-108I-072706-NZ-001		7/27/2006	Groundwater	Tritium/Strontium/Gamma Spectrum
MW-QC-110I	WG-QC-MW-QC-110I-072706-NZ-002		7/27/2006	Groundwater	Tritium/Strontium/Gamma Spectrum
MW-QC-114I	WG-QC-MW-QC-114I-072706-NZ-003		7/27/2006	Groundwater	Tritium/Strontium/Gamma Spectrum
MW-QC-113I	WG-QC-MW-QC-113I-072706-NZ-004		7/27/2006	Groundwater	Tritium/Strontium/Gamma Spectrum
MW-QC-112I	WG-QC-MW-QC-112I-072706-NZ-005		7/27/2006	Groundwater	Tritium/Strontium/Gamma Spectrum
MW-QC-111I	WG-QC-MW-QC-111I-072706-NZ-006		7/27/2006	Groundwater	Tritium/Strontium/Gamma Spectrum



SAMPLE KEY  
FLEETWIDE ASSESSMENT  
QUAD CITIES GENERATING STATION  
CORDOVA, ILLINOIS

Sample Location	Sample Identification	QC Sample	Sample Date	Matrix	Analysis
MW-QC-115S	RB-QC-MW-QC-115S-072706-NZ-007	Rinsate	7/27/2006	Water	Tritium/Strontium/Gamma Spectrum
MW-QC-116S	WG-QC-MW-QC-116S-072806-NZ-008		7/28/2006	Groundwater	Tritium/Strontium/Gamma Spectrum
MW-QC-115S	WG-QC-MW-QC-115S-072806-NZ-009		7/28/2006	Groundwater	Tritium/Strontium/Gamma Spectrum
MW-QC-109S	WG-QC-MW-QC-109S-072806-NZ-010		7/28/2006	Groundwater	Tritium/Strontium/Gamma Spectrum
MW-QC-109S	WG-QC-MW-QC-109S-072806-NZ-011	Duplicate (010)	7/28/2006	Groundwater	Tritium/Strontium/Gamma Spectrum
MW-QC-109I	WG-QC-MW-QC-109I-072806-NZ-012		7/28/2006	Groundwater	Tritium/Strontium/Gamma Spectrum
MW-QC-109I	WG-QC-MW-QC-109I-072806-NZ-013	Duplicate (012)	7/28/2006	Groundwater	Tritium/Strontium/Gamma Spectrum
MW-QC-102D	RB-QC-MW-QC-102D-072806-NZ-014	Rinsate	7/28/2006	Water	Tritium/Strontium/Gamma Spectrum
MW-QC-102D	WG-QC-MW-QC-102D-072806-NZ-015		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  
QUAD CITIES GENERATING STATION  
CORDOVA, 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	HNO <sub>3</sub> to pH<2
Gamma Spectrum	EPA 901.1	Water	- 6 months	HNO <sub>3</sub> 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"

TABLE 3

SUMMARY OF QUALIFIED SAMPLE DATA DUE TO RINSATE BLANK CONTAMINATION  
FLEETWIDE ASSESSMENT  
QUAD CITIES GENERATING STATION  
CORDOVA, ILLINOIS

<i>Rinse Blank Date</i>	<i>Analyte</i>	<i>Blank Result</i>	<i>Sample ID</i>	<i>Sample Result</i>	<i>Uncertainty @ 2 sigma</i>	<i>Qualified Sample Result</i>	<i>Units</i>
7/27/06	Tritium	282	WG-QC-MW-QC-108I-072706-NZ-001	597	+/- 140	597 J	pCi/L
			WG-QC-MW-QC-111I-072706-NZ-006	390	+/-127	390 J	pCi/L
7/28/07	Tritium	365	WG-QC-MW-QC-109I-072806-NZ-012	768	+/- 234	768 J	pCi/L
			WG-QC-MW-QC-109I-072806-NZ-013	1140	+/- 273	1140 J	pCi/L
			WG-QC-MW-QC-102D-072806-NZ-015	3930	+/- 675	3930 J	pCi/L

Notes:

J - The associated numerical value is an estimated quantity

TABLE 4

SUMMARY OF DETECTED ANALYTES IN FIELD DUPLICATE SAMPLE SET  
 FLEETWIDE ASSESSMENT  
 QUAD CITIES GENERATING STATION  
 CORDOVA, ILLINOIS

<i>Analyte</i>	<i>Original Sample ID</i>	<i>Original Result</i>	<i>Uncertainty @ 2 sigma</i>	<i>Duplicate Sample ID</i>	<i>Duplicate Result</i>	<i>Uncertainty @ 2 sigma</i>	<i>RPD</i>	<i>Units</i>
Tritium	WG-QC-MW-QC-109I-072806-NZ-012	768 J	+/- 156	WG-QC-MW-QC-109I-072806-NZ-013	1140 J	+/- 182	39	pCi/L

Notes:

RPD Relative Percent Difference