ILLINOIS POLLUTION CONTROL BOARD

Blake Leasing Company, LLC – Real Estate Series, as owner of Kirkland Quick Stop,	)	
Petitioner,	)	
	)	PCB No.
v.	)	
Illinois Environmental Protection Agency, Village of Kirkland, Illinois and Soo Line Railroad Company (d/b/a Canadian Pacific Railway and Canadian Pacific),	)	
Respondents.	)	

NOTICE OF FILING

To: See Attached Certificate of Service.

PLEASE TAKE NOTICE that on November 7, 2017, the Petitioner, Blake Leasing Company, LLC – Real Estate Series, as owner of Kirkland Quick Stop, filed the attached Petition for Water Well Setback Exception Pursuant to 415 ILCS 5/14.2(c), a copy of which is attached hereto and served upon you.

Dated: November 7, 2017

Respectfully submitted,

On behalf of Blake Leasing Company, LLC – Real Estate Series

/s/Charles F. Helsten
Charles F. Helsten
One of Its Attorneys

Charles F. Helsten
HINSHAW & CULBERTSON LLP
100 Park Avenue
P.O. Box 1389
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815-490-4900
chelsten@hinshawlaw.com

CERTIFICATE OF SERVICE

I, Charles F. Helsten, an attorney, certify that I have served the attached Petition for Water Well Setback Exception Pursuant to 415 ILCS 5/14.2(c) on the named parties below via certified mail, return receipt requested, by 5:00 p.m. on November 7, 2017.

Illinois Environmental Protection Agency
Division of Legal Counsel
Attn: John J. Kim
Stephanie Flowers
1021 N. Grand Avenue East
P.O. Box 19276
Springfield, IL 62794-9276

CT Corporation System, Registered Agent
Soo Line Railroad Company
208 South LaSalle Street, Suite 814
Chicago, IL 60604

Village of Kirkland
Attn: Ryan Block, Village President
511 W. Main Street
Kirkland, Illinois 60146

/s/Charles F. Helsten

ILLINOIS POLLUTION CONTROL BOARD

Blake Leasing Company, LLC – Real Estate Series, as owner of Kirkland Quick Stop,	)	
Petitioner,	)	
	)	PCB No.
v.	)	
Illinois Environmental Protection Agency, Village of Kirkland, Illinois and Soo Line Railroad Company (d/b/a Canadian Pacific Railway and Canadian Pacific),	)	
Respondents.	)	

PETITION FOR WATER WELL SETBACK EXCEPTION PURSUANT TO 415 ILCS 5/14.2(C)

NOW COMES Petitioner, Blake Leasing Company, LLC – Real Estate Series, as owner of Kirkland Quick Stop (the "KQS"), by and through its attorneys, Hinshaw & Culbertson, LLP, and pursuant to Section 14.2(c) of the Illinois Environmental Protection Act (the "Act") and Part 106 of the Illinois Pollution Control Board's procedural rules (35 Ill. Adm. Code Section 106.300, *et seq*.), hereby petitions this Honorable Board to grant the Petitioner an exception from the community water supply well setbacks included in Section 14.2 of the Act, and, in support thereof, states as follows:

BACKGROUND INFORMATION

1. Petitioner, Blake Leasing Company, LLC – Real Estate Series ("Petitioner"), is the owner of Kirkland Quick Stop (the "KQS") gas station property located at 411 West Main Street, Kirkland, DeKalb County, Illinois 60146 (the "Subject Property" and or the "Site").

2. The Petitioner initially presented a Petition ("First Petition") to this Honorable Board for a similar water well setback exception pursuant to Section 14.2(c) of the Act to further address the prior release of petroleum product (unleaded gasoline and diesel) from underground storage tanks formerly located at the Subject Property. In that regard, this Honorable Board

entered its Opinion and Order on August 17, 2017, granting that First Petition with conditions. (A copy of this Honorable Board's Opinion and Order in that matter is marked **Exhibit "A"** and attached hereto and incorporated herein by this reference).

3. During the course of its consideration of the First Petition filed by Petitioner before this Honorable Board, the Illinois Environmental Protection Agency (the "Agency") noted in its initial response of June 15, 2016, that the Underground Storage Tank ("UST") system currently operating at the KQS Site was installed on November 2, 1993, and as such, is considered by the Agency to be a "New Secondary Source" as defined by Section 3.355 of the Act, but the Agency had been unable to find a setback exception issued by this Honorable Board for installation and operation of the current UST system at the KQS Site. The Agency subsequently asserted that a Petition for an exception from the requirements of Section 14.2 of the Act be filed by Petitioner for the existing UST system since the existing system appeared to be within the minimum setback zone of Emergency Backup Well #1 for the Village of Kirkland, Illinois.

4. Accordingly, the Petitioner is submitting this Petition for a water well setback exception pursuant to Section to 14.2 of the Act for the installation and operation of the UST system now in existence/operation at the KQS Site which is within the setback of Village Emergency Backup Well #1. In support of this Petition, St. John Mittelhauser & Associates has prepared a Technical Report dated November 6, 2017, ("SM&A Technical Report"), which is marked **Exhibit "B"** and attached hereto and incorporated herein by this reference.

5. A review of water well records maintained by the Illinois State Geological Survey ("ISGS") and the Illinois State Water Survey ("ISWS") along with discussions with officials from the Village of Kirkland which were had in connection with the First Petition revealed that the existing UST system at the KQS Site is in fact located within the setback zone of one potable community water supply well maintained by the Village of Kirkland, that being IEPA Well

#11124 (also referred to as the Village of Kirkland's Emergency Backup Well #1) (the "Well"). Emergency Backup Well #1 is located 125 feet North-Northeast of the UST system at the KQS Site. The Well is owned by the Canadian National Railroad and is leased to the Village of Kirkland for emergency backup purposes. The Well was drilled in 1896, and no detailed geologic log is available for the Well. All that is known about this Well is that it has a seven inch diameter steel casing installed to a depth of 88 feet below ground surface ("BGS") in the bedrock. The Well is then completed as an open borehole to a depth of 737 feet BGS. Although the Well has not been actually utilized for potable community water supply well purposes for more than two decades, the Well is inspected and purged on an annual basis by the Village of Kirkland.

6. This Petition will demonstrate compliance with each of the following regulatory requirements:

COMPLIANCE WITH THE SETBACK REQUIREMENTS SET FORTH IN SECTION 14.2 OF THE ACT WOULD IMPOSE AN ARBITRARY AND UNREASONABLE HARDSHIP (35 IAS 106.310(A))

7. The KQS Site began operating as a retail petroleum service station sometime between the late 1920s and the early 1930s, and is currently the only retail service station within the Village of Kirkland. (See Page 1 of SM&A Technical Report). The Petitioner invested $420,000.00 in the original purchase of the KQS Site, and, consistent with the Petitioner's pride of ownership and operation, committed $834,787.00 to substantial renovation of the facility in 2003. (Id at Page 2). (The current existing convenience store and pump islands/canopy structures were constructed in 2003.) All investments made by the Petitioner in the KQS Site were made under the logical assumption that the KQS Site would be able to continue to operate as a petroleum service station and convenience store as it had for decades. As such, in the event this Honorable Board were to deny the present Petition, without the ability to operate as a service station, the parcel is worth only a fraction of its otherwise "highest and best" use as a retail

service station/convenience store, and the previous significant investments it made in the Site would become unrecoverable costs, in turn causing a substantial (and unnecessary) economic hardship to the Petitioner. Id at Page 19.

8. Moreover, as noted above, the KQS Site is the only retail service station site in the Village of Kirkland. It serves both the Village of Kirkland proper and residents in the surrounding area. The inability of the Petitioner to operate the KQS Site as a service station/convenience store would additionally result in harm to the Village of Kirkland, as the nearest petroleum service station/convenience store from the KQS Site is the Casey's General Store site located 5 miles to the East in Kingston, Illinois. The other closest gas service station/convenience store facilities are located (respectively) 15 miles North, 9 miles West and 13 miles South of the KQS Site. As such, the loss of the KQS gas service station/convenience store complex would negatively impact the residents of the Kirkland, Illinois community, as well as the surrounding areas, causing significant inconvenience and otherwise unnecessary trips to outlying gas station facilities. Id at Page 19.

9. Going further, sales tax figures from sales of gasoline and retail products at the KQS Site for the last five (5) years are as follows:

	Total	State	Village	County
2012	$189,311	$151,449	$30,290	$7,572
2013	194,484	155,588	31,117	7,779
2014	200,037	160,030	32,006	8,001
2015	176,459	141,168	28,233	7,058
2016	154,942	123,955	24,790	6,197

As such, discontinuation of the KQS Site as a retain gas service station/convenience store site would result in significant unnecessary losses of revenue to both local units of government as well as the State of Illinois, which would in turn result in financial hardship to all of these governmental entities.

THE PETITION UTILIZES THE BEST AVAILABLE CONTROL TECHNOLOGY ECONOMICALLY ACHIEVABLE TO MINIMIZE THE LIKELIHOOD OF CONTAMINATION OF THE POTABLE COMMUNITY WATER SUPPLY WELL IN QUESTION (35 IAC 106.310(B))

10. The existing UST system at the KQS Site has been designed, constructed and operated in such a manner as to utilize best available control technologies economically achievable to minimize the likelihood of contamination of Village Emergency Well #1. The current UST system consists of the USTs listed below:

USTs Currently Operated At KQS			
UST ID	**Size (gallons)**	**Contents**	**Construction**
11	10,000	Gasoline	Single Wall Fiberglass
12*	4,000	Gasoline	Single Wall Fiberglass
13	6,000	Diesel Fuel	Single Wall Fiberglass
14*	3,000	Gasoline	Single Wall Fiberglass

The current UST system was installed in October of 1993. At the time of the installation, the fill ports of each UST were fitted with a spill containment device and overflow protection. Piping between the UST and the dispensers consisted of single wall fiberglass lines fitted with pressure monitoring (leak detection) devices. The entire UST system is monitored by a Veeder-Root TLS system, which is fitted with a magnetostrictive probes to provide both reconciliation of product inventory and also monitor for the presence of any water within the USTs themselves. In 2002, the single wall fiberglass piping structure was replaced with flexible double wall piping (i.e., secondary containment). Id at Page 19. In addition to replacement of the fiberglass piping structure, in 2003, the Veeder-Root system was upgraded to provide pressure leak detection, in addition to the installation of risk management software for enhanced product inventory reconciliation. Id at Pages 15-16.

11. The current UST system is regularly inspected by the Office of Illinois State Fire Marshal ("OSFM"). A history of site inspections by OSFM is included below, and also included at Pages 16-17 of the SM&A Technical Report:

- July 29, 1998: A Certification Audit of the UST system noted the administrative file needed to be updated to reflect the 7,000 gallon UST being considered as two USTs, since it consisted of separate 4,000-gallon and 3,000-gallon compartments (An updated "Notification for Underground Storage Tanks" was submitted on September 14, 1998);

- October 22, 1998: The Certification Audit of UST system found no violations;

- May 10, 2001: The Certification Audit of UST system found no violations;

- January 2, 2003: Log of Attended Self-Service found no violations;

- February 17, 2004: The Certification Audit of UST system found no violations;

- September 17, 2007: The Certification Audit of UST system noted the last test of the product lines was June 1, 2004 and therefore the UST system was out of compliance (The product lines were tested on September 25, 2007);

- October 9, 2007: The Certification Audit indicated the UST system was re-inspected and noted the product line testing was completed on September 25, 2007 and the system was now in compliance;

- October 9, 2007: Log of both Attended and Unattended Self-Service found no violations;

- February 2009: The Certification Audit of UST system found no violations;

- February 18, 2009: Log of Self-Service found no violations;

- February 18, 2009: Log of Unattended Self-Service noted the annual inspection of the system had not been performed;

- February 27, 2009: Log of Unattended Self-Service noted the annual inspection had been completed and was now in compliance;

- May 31, 2011: The Certification Audit of UST system found no violations;

- March 19, 2015: The Certification Audit of UST system found no violations;

- March 23, 2017: Inspection of the system noted a violation for unattended self-service and a faded warning sign. However, at the time of the violation, the inspector mistook the entire station as being "unattended" self-service whereas only pumps 6, 7, and 8 (diesel fuel) are identified as "unattended" self-service. SMA understands that upon clarification that the entire site was not "unattended" self-service, the inspector dismissed all of the original violations.

- March 23, 2017: The OSFM inspector requested monthly Liquid Status Reports in addition to the line tests and constant leak detection monitoring and the

replacement of some whip hoses and breakaways which were showing wear. This was completed within a few days of the March 23, 2017 inspection.

- May 9, 2017: Re-inspection of the UST system indicated the facility is in full compliance.

In addition, KQS maintains an Inspections, Operation and Maintenance Plan ("IOMP") in accordance with 41 IAC 176.665. The IOMP includes the following:

- List of Emergency Contacts, including station owner/operator, fire, police, and emergency response contractor;
- Provides procedures and responses in the event that a release does occur;
- Provides a checklist for filling of the USTs;
- Provides a list of items to be inspected daily, weekly, monthly, quarterly, annually, three year, and five year intervals;
- Provides procedures related to the handling, storage and disposal of regulated wastes; (A copy of the KQS's Operation and Maintenance Plan is included as Attachment E to the SM&A Technical Report). Id at Page 17.

Moreover, to demonstrate ongoing compliance with the requirements of 41 IAC 175, tank tightness tests are conducted on a regular basis by an independent third party consultant to demonstrate system integrity. Since 2012, Tankology, Inc. has tested the UST and product lines at the KQS Site. A summary of tank tightness tests conducted since 2012 is included below, and also included at Page 18 of the SM&A Technical Report:

- November 7, 2012: Tightness testing was performed on the USTs and passed. The product line to the satellite dispenser was pressurized and passed. A product line tightness test was completed on the product lines and passed. The line leak detectors, impact value, and lead detection monitoring system passed inspection and testing.
- November 6, 2013: A product line tightness test was completed on the product lines and passed. The line leak detectors, impact value, and lead detection monitoring system passed inspection and testing.
- November 4, 2014: A product line tightness test was completed on the product lines and passed. The line leak detectors, impact value, and lead detection monitoring system passed inspection and testing.

- October 29, 2015: A product line tightness test was completed on the product lines and passed. The line leak detectors, impact value, and lead detection monitoring system passed inspection and testing.

- October 17, 2016: A product line tightness test was completed on the product lines and passed. The line leak detectors, impact value, and lead detection monitoring system passed inspection and testing.

- December 1, 2016: Tightness testing was performed on the USTs and passed. The product line to the satellite dispenser was pressurized and passed.

As the tank tightness testing summary indicates, the UST and product lines at the KQS Site have been routinely inspected and tested with no evidence that a release from the existing UST system has ever occurred.

12. In addition, a groundwater sample was collected from Emergency Backup Well #1 during the May, 2015 sampling event conducted by SM&A and analyzed for the presence of BTEX and PNAs. The analytical results of the May, 2015 sampling exercise indicated that no BTEX and PNA compounds were detected. (See Page 10, Section 5.2 of the SM&A Technical Report).

THE MAXIMUM FEASIBLE ALTERNATIVE SETBACK WOULD BE UTILIZED (35 IAC 106.310(C)

13. As noted above, the previous UST system located at the Site was discovered to be leaking in September, 1991, and was subsequently replaced by the current system, which was installed in October of 1993. As such, the current UST system was retrofitted and designed into the existing, long-standing gas station facility layout, and, by physical and operating necessity, its location constitutes the maximum feasible alternative setback from Emergency Well #1. Moving the existing UST system and reconfiguring the Site accordingly to add an additional few feet of setback would not make engineering and/or business logistic sense, or serve any environmental purpose. Moreover, moving the location of the existing UST system may (only arguably) make the system further away in distance from Emergency Well #1, but, in turn, serve to just may move it closer to another Village community water supply well.

THE LOCATION AND CONTINUED OPERATION OF THE EXISTING UST SYSTEM WILL NOT CONSTITUTE A SIGNIFICANT HAZARD TO THE POTABLE WATER SUPPLY WELL IN QUESTION (35 IAC 106.310(D)

14. The continued operation of the existing UST system will not create a potential source that is a significant hazard to the existing Emergency Backup Well. As noted above, the existing UST system is designed, operated and maintained in such a way as to prevent a significant hazard from arising.

15. Moreover, as noted in the attached Technical Report, the detailed groundwater impact analysis performed by SM&A in connection with the First Petition filed for this Site demonstrates that groundwater samples collected in and around Emergency Backup Well #1 in May of 2015 all tested "non-detect". This, in turn, confirms that the dense, dry silty clay layer which stands (laterally) between the existing UST system and the deeper bedrock aquifers that supply water to the Emergency Backup Well #1 is preventing migration of contamination within the shallow, alluvial water table aquifer downward into the deeper bedrock aquifers which feeds Emergency Backup Well #1. Because of all of the factors noted above, as well as certain unique geological/hydrogeological characteristics of the area in question, the continued operation of the existing UST system will not create a potential source that will constitute a significant hazard to Village Emergency Backup Well #1.

PROOF OF NOTICE TO EFFECTED POTABLE WELL SUPPLY OWNERS AND OPERATORS

16. As noted above, the only effected potable water supply well within the setback zone of the existing KQS UST system is Village of Kirkland Emergency Well #1. As also noted above, the Village of Kirkland leases this Well from the Canadian Pacific Railroad. As such, notice of this Petition will be delivered to:

Illinois Environmental Protection Agency
Division of Legal Counsel
Attn: John J. Kim
Stephanie Flowers
1021 N. Grand Avenue East
P.O. Box 19276
Springfield, IL 62794-9276

CT Corporation System, Registered Agent
Soo Line Railroad Company
208 South LaSalle Street, Suite 814
Chicago, IL 60604

Village of Kirkland
Attn: Ryan Block, Village President
511 W. Main Street
Kirkland, Illinois 60146

WHEREFORE, and for all the reasons set forth herein, the Petitioner respectfully requests that this Honorable Board grant a setback zone exception pursuant to Section 14.2 of the Act for the existing UST system, and for such other and further relief as this Board deems just and proper.

Dated: November 7, 2017

Respectfully submitted,

On behalf of Blake Leasing Company, LLC – Real Estate Series

/s/ Charles F. Helsten
Charles F. Helsten
One of Its Attorneys

Charles F. Helsten
HINSHAW & CULBERTSON LLP
100 Park Avenue
P.O. Box 1389
Rockford, IL 61105-1389
815-490-4900
chelsten@hinshawlaw.com

CERTIFICATE OF SERVICE

I, Charles F. Helsten, an attorney, certify that I have served the attached **Petition For Water Well Setback Exception Pursuant to 415 ILCS 5/14.2(c)** on the named parties below by certified mail, return receipt requested, by 5:00 p.m. on November 7, 2017.

Illinois Environmental Protection Agency
Division of Legal Counsel
Attn: John J. Kim
Stephanie Flowers
1021 N. Grand Avenue East
P.O. Box 19276
Springfield, IL 62794-9276

Village of Kirkland
Attn: Ryan Block, Village President
511 W. Main Street
Kirkland, Illinois 60146

CT Corporation System, Registered Agent
Soo Line Railroad Company
208 South LaSalle Street, Suite 814
Chicago, IL 60604

/s/Charles F. Helsten

ILLINOIS POLLUTION CONTROL BOARD
August 17, 2017

BLAKE LEASING COMPANY, LLC, Petitioner, v. ILLINOIS ENVIRONMENTAL PROTECTION AGENCY, VILLAGE OF KIRKLAND, and SOO LINE RAILROAD COMPANY, Respondent.	)	PCB 16-100 (Water Well Setback Exception)

CHARLES F. HELSTEN, HINSHAW & CULBERTSON, LLP, APPEARED ON BEHALF OF BLAKE LEASING COMPANY, LLC;

JOANNE M. OLSON, ASSISTANT COUNSEL, APPEARED ON BEHALF OF THE ILLINOIS ENVIRONMENTAL PROTECTION AGENCY; and

BRADFORD S. STEWART, ZUKOWSKI, ROGERS, FLOOD & MCARDLE, APPEARED ON BEHALF OF THE VILLAGE OF KIRKLAND.

OPINION AND ORDER OF THE BOARD (by C.K. Zalewski):

Blake Leasing Company, LLC (Blake) seeks an exception from the water well setback requirement in Section 14.2(d) of the Environmental Protection Act (Act) for its gas station in Kirkland, DeKalb County. *See* 415 ILCS 5/14.2(d) (2016). Blake seeks the exception to allow remediation of groundwater contamination within the setback zone for two of Kirkland's potable water supply wells.

Blake proposes air sparging as the remediation technology. Air sparging requires the installation of narrow wells to inject compressed air into the groundwater. Those wells constitute a new potential route through which contamination could reach the drinking water source for the Village of Kirkland. When a new potential route of contamination is created near a permitted community water supply well or other potable water supply well, the Act requires a minimum setback distance from the potable water well to the new potential route. 415 ILCS 5/14.2 (2016). Section 14.2(c) of the Act and Section 106.Subpart C of the Board's regulations provide an exception to the minimum setback requirement. 415 ILCS 5/14.2(c) (2016); 35 Ill. Adm. Code 106.SubpartC. The Act requires Blake to demonstrate four factors before it may be granted a water well setback exception:

(1) Compliance with the setback requirements of Section 14.2 . . . of the Act would pose an arbitrary and unreasonable hardship;

(2) The petitioner will utilize the best available control technology [BACT] economically achievable to minimize the likelihood of contamination of the potable water supply well;
(3) The maximum feasible alternative setback will be utilized; and
(4) The location of the potential route will not constitute a significant hazard to the potable water supply well. 35 Ill. Adm. Code 106.310; 415 ILCS 5/14.2(c) (2016).

Blake's petition addresses the four elements of Section 14.2(c) of the Act and Section 106.310 of the Board's regulations. 415 ILCS 5/14.2(c) (2016); 35 Ill. Adm. Code 106.310. This opinion and order describes the regulatory relief Blake seeks, the contamination at the Blake site and the air sparging remediation technology. Next, it explains how each element of Section 14.2 of the Act and 35 Ill. Adm. Code 106.310 has been satisfied by Blake's petition before granting Blake an exception to the minimum setback from the Village of Kirkland water supply wells.

BACKGROUND

Legal Background

Unless the Board grants an exception to the owner of a "new potential route," the Act prohibits locating a new potential route within the minimum "setback zone" of a community water supply well. 415 ILCS 5/14.2(a), (c), (d) (2016). A "potential route" includes "all injection wells" and a "new potential route" is one constructed after January 1, 1988. 415 ILCS 5/3.350 (2016). "Setback zone" means "a geographic area, designated pursuant to [the] Act, containing a potable water supply well . . . having a continuous boundary, and within which certain prohibitions or regulations are applicable in order to protect groundwaters." 415 ILCS 5/3.450 (2016); *see also* 415 ILCS 5/3.145, 3.365 (2016) (definitions of "community water supply" and "public water supply," respectively).

Generally, the minimum setback zone for a community water supply well is 200 feet, but it is extended to 400 feet if the community water supply well derives water from "an unconfined shallow fractured or highly permeable bedrock formation or from an unconsolidated and unconfined sand and gravel formation". 415 ILCS 5/14.2(a), (d) (2016). The Illinois Environmental Protection Agency's recommendation (Rec.) states that under Section 14.2(d) of the Act, the Village of Kirkland wells at issue have been assigned minimum setback zones of 400 feet. Rec. at 3.

The Blake Site Is Contaminated with Petroleum from Leaking Underground Storage Tanks

Blake owns the Kirkland Quick Stop gas station (site) located at 411 W. Main Street in the Village of Kirkland. Am. Pet. at 1. Blake has requested a water well setback exception to remediate petroleum contamination from ten underground storage tanks formerly located at the site. Pet. Exh. A at 5. The petroleum contamination must be addressed before Blake can obtain closure from the Illinois Environmental Protection Agency (Illinois EPA), indicating that

groundwater has been remediated to meet Class I potable resource groundwater standards. Am. Pet. at 1; 35 Ill. Adm. Code 620.210.

While the Village of Kirkland has three water supply wells, two are affected by Blake's petition: Well #1 (#11424) is Kirkland's emergency backup well; and Well #2 (#11425) is Kirkland's main water supply. Tech. Report at 1. According to Blake, Well #1 is located 75 feet east of the site and Well #2 is 422 feet north of the site—outside the area impacted by the contamination. Am. Pet. at 2; Tech. Report at 13. Blake has determined that the groundwater flow is in a north-northwest to northwest direction. No petroleum contamination, exceeding the groundwater remediation objectives, is migrating across the site's northern boundary. Tech. Report at 12, 13, Figure 5. The entire site falls within the minimum setback zone of Well #1 and part of the site falls within the minimum setback zone of Well #2. Am. Pet. at 3-4; Tech. Report at 1.

Petition, Amended Petitions, and Other Filings

Blake has worked with two consulting firms over the course of this case. First, GeoThink LLC prepared a Corrective Action Plan (CAP) including in-situ enhanced bioremediation as the remediation technology. Am. Pet. at 2. Illinois EPA conditionally approved this CAP for the site. On April 29, 2016, Blake filed its petition for water well setback exception for Well #1 (Pet.) to allow enhanced bioremediation. *Id*. In an August 11, 2016 order, the Board found Blake's original petition lacking on all four factors of Section 14.2(c) of the Act. The Board directed Blake to file an amended petition. Blake Leasing Company, LLC v. Illinois EPA and Village of Kirkland, PCB 16-100, slip op. at 3 (Aug. 11, 2016).

On January 6, 2017, Blake filed an amended petition (Am. Pet.) with technical support from St. John-Mittelhauser environmental consulting. St. John-Mittelhauser conducted additional groundwater sampling in August, November, and December 2016 that found a relationship between residual petroleum concentrations and low dissolved oxygen (DO) concentrations in the groundwater. This finding led to St. John-Mittelhauser's recommendation of air sparging as the BACT in its January 5, 2017[1] technical report (Tech. Report). Am. Pet. at 6-7. Air sparging accelerates the natural process of microorganisms breaking down contamination in the soil and groundwater by supplying those microorganisms with DO. Am. Pet. at 7; Air Sparge Memo. at 1. The amended petition requested a setback exception only for Kirkland's Well #1. Am. Pet. at 11.

On January 26, 2017, Illinois EPA filed its recommendation that the Board grant Blake's amended petition, contingent on Blake filing a map of the air sparging system. Rec. at 9. Blake responded with an additional technical memo on February 23, 2017 (Air Sparge Memo.) which supplied additional information about the air sparging technology and the requested map.

Also on February 23, 2017, the hearing officer directed Blake to answer a set of Board questions regarding the amended petition. Blake filed responses to the Board's questions on

[1] The copy of the St. John report filed with Blake's amended petition was erroneously dated January 5, 2016. Mar. Blake Res. at 2; Tr. at 44.

March 17, 2017 (Mar. Blake Res.) and on March 23, 2017, Illinois EPA responded (Mar. IEPA). Illinois EPA's response cited low DO concentrations in areas within the minimum setback zone for Kirkland's Well #2. Mar. IEPA at 2. Illinois EPA expressed support for Blake installing air sparging wells within the setback zone for both Well #1 (already subject of the petition at the time) and Well #2, stating "[t]he Agency is concerned that remedial goals may not be met for lack of including a small portion of the Well #2 setback zone in this petition and therefore limiting the ability to install injection wells in that small area." *Id.*; 2nd Am. Pet. at 4.

In response to Illinois EPA's statement regarding remediation within the setback for Well #2, Blake filed a supplemental technical memo on April 21, 2017 which included air sparging wells within the minimum setback zone for Well #2. On May 2, 2017, Blake filed a motion to file another amended petition (2nd Am. Pet.) requesting that the exception apply to *both* Well #1 and Well #2. 2nd Am. Pet. at 4. The Board grants the motion. On May 12, 2017, Blake filed an additional technical memo (May Tech. Memo) adjusting the maximum feasible alternative setbacks for both Well #1 and Well #2 and revising previously submitted figures to depict the updated air sparging system. The hearing in this case (Tr.) was held in Chicago on May 23, 2017. Blake filed its post-hearing brief (Brief) on June 29, 2017.

Blake Provided Notice of Its Exception Request to Well Owners

Section 14.2(c) of the Act provides, "[a] petition shall be accompanied by proof that the owner of each potable water supply well for which setback requirements would be affected by the requested exception has been notified and been provided with a copy of the petition." 415 ILCS 5/14.2(c) (2016); *see also* 35 Ill. Adm. Code 106.302(b). Blake's petition and two amended petitions were accompanied by proof of service on the Village of Kirkland, the owner of Well #2.

Soo Line Railroad Company (d/b/a Canadian Pacific Railway and Canadian Pacific) (Soo Line) owns Well #1. On May 18, 2017 Blake filed documentation that it sent on that date, by overnight mail, a notice letter and a copy of its first amended petition (Notice Letter) to CT Corporation System (CT Corporation), as the registered agent for Soo Line. In that notice, Blake stated that Well #1 "is leased by the Village of Kirkland from Canadian Pacific Railway and has been designated as a backup/emergency community water supply well by the Village." Notice Letter at 1. The letter also alerted Soo Line of the May 23, 2017 hearing, specified the hearing time and location and attached the hearing officer's notice of hearing. *Id.*

In its post-hearing brief, Blake stated that Soo Line and CT Corporation have had actual knowledge of Blake's petition for many months. Brief at 1-2. This statement is supported by affidavit. Brief Exh. A. Soo Line neither appeared at the hearing nor made any filings with the Board. Under these circumstances, the Board finds that Blake adequately notified Soo Line under Section 14.2(c). As its procedural rules require, the Board names Soo Line as a respondent in this case. 35 Ill. Adm. Code 106.300(b).

DISCUSSION

Blake's proposed air sparging wells would inject compressed air through a narrow well into the groundwater and therefore are a "new potential route" under the Act. 415 ILCS 5/3.350 (2016). It is uncontested that the 400-foot setback requirement of Section 14.2(d) of the Act applies to both Well #1 and Well #2. Without the Board granting an exception under Section 14.2(c) of the Act, the Act would bar Blake from installing the air sparging wells where the air sparging will remediate the groundwater most effectively. The Board now turns to the four factors of Section 14.2(c).

Blake Faces an Arbitrary and Unreasonable Hardship

Achieving the applicable groundwater remediation objectives at the site without creating a new potential route of contamination within the setback for Well #1 and Well #2 presents an arbitrary and unreasonable hardship for Blake. Blake states that "the lack of the requested setback for the use of air sparging would prevent [Blake] from having the ability to remediate the [site] of the low levels of contamination present." Am. Pet. at 10, 11. The Illinois EPA agrees. Rec. at 7. If Blake is prevented from remediating the petroleum contamination at the site, that contamination will remain at the site indefinitely and Blake would be prevented from achieving closure of the petroleum release. Am. Pet. at 1, 10. Therefore, the Board finds that without an exception, Blake faces an arbitrary and unreasonable hardship in properly remediating the site.

Air Sparging is the Best Available Control Technology for the Kirkland Site

Air sparging supplements the naturally-occurring dissolved oxygen in the groundwater at the site, facilitating aerobic biodegradation. Air sparging works "by injecting compressed air into the shallow groundwater below the site to increase the DO content of that groundwater and increase the natural biological degradation of the petroleum products impacting the groundwater." Air Sparge Memo at 1. As the compressed air mixes with and increases the DO level of the groundwater, the natural flow of that groundwater carries the DO down gradient from the sparging well. Air Sparge Memo at 1. St. John-Mittelhauser states:

> Analytical results of the groundwater samples collected at the [Blake] site in August and November 2016 indicated aerobic biodegradation of the contaminants of concern [is] being hindered by the depletion of DO within the area of petroleum impacts. Air Sparge Memo at 1.

Blake identified the contaminants at the site as the type that would be remediated with an adequate DO concentration in the groundwater. Am. Pet. at 4. Blake conducted additional groundwater testing at the site before filing its amended petition in order to insure air sparging is appropriate for all contaminants present. Am. Pet. at 4. For example, groundwater testing done in August 2016 "showed no detectable concentrations of either dissolved or total lead . . . indicating that lead detections previously reported at the site were the result of elevated turbidity levels" in the groundwater samples. *Id.*

Compared with other technologies, Blake found that air sparging is "[s]pecifically well-suited to the petroleum-based contaminants and the coarse-grained" soils that house the contaminants. Am. Pet. at 8. Blake considered at least 11 other treatment technologies as discussed in the amended petition. Am. Pet. at 8-10. Many of those technologies involve using chemicals (*e.g.*, in situ chemical oxidation, nutrient addition for enhanced in situ aerobic bioremediation, and surfactant enhanced aquifer remediation) or extracting groundwater (*e.g.*, pump and treat and two-phase extraction). *Id*. at 9-10. Air sparging, however, "[d]oes not require the injection of surfactants, bacteria, oxygen releasing compounds, or other non-naturally occurring constituents within the setback of the municipal wells." Am. Pet. at 8; Mar. Blake Res. at 6.

Blake proposed enhanced bioremediation as the BACT in its initial petition. Illinois EPA questioned this technology due to pH incompatibility along with the weak results of prior trials at the site. Blake explained why air sparging is better than enhanced bioremediation at the site in its March 17, 2017 response to the Board's question regarding the technology switch. Mar. Blake Res. at 4-6. Blake explained that low DO levels at the site may have been ignored by the prior environmental consultant. If supplied with proper levels of DO, "indigenous microorganisms have a distinct advantage over injected microorganisms [enhanced bioremediation] because they are well adapted to the physical and chemical conditions in the subsurface where they inherently reside." *Id*.

Blake concluded:

> Air sparging is a proven remediation technology to increase the dissolved oxygen in the groundwater at sites with relatively consistent, coarse-grained sediments, an aquifer thickness greater than 5 feet, and where the water table is greater than 5 feet below the ground surface. All of these characteristics are present at the site." Mar. Blake Res. at 5-6; *see also* Am. Pet. at 7.

In its recommendation, Illinois EPA agreed with Blake that air sparging is the BACT. Rec. at 7. Blake initially proposed a total of 12 to 15 air sparge wells for the site before expanding the exception to cover Well #2. Am. Pet. at 10; Air Sparge Memo at 1. Including Well #2, the total number of air sparging wells increased to 26. May Blake Resp. Fig. 1.

Blake has demonstrated that air sparging is effective at remediating the petroleum contaminants at the site and the safest way to do so within the setback zones of the Village of Kirkland's water supply wells. The Board therefore finds that air sparging is the BACT for the site.

Blake Will Use the Maximum Feasible Alternative Setback

Blake states in its March 17, 2017 response to Board questions that "[t]he maximum feasible alternative setback between the air sparging wells and . . . Well #1 is approximately 80 feet." Mar. Blake Res. at 4. At the time of that filing, Blake was not seeking an exception for Well #2. *Id*. After re-evaluating the need for remediation near Well #2, and filing its amended

petition, Blake provided an adjusted maximum feasible alternative setback of 30 ft. for Well #1 and 370 ft. for Well #2. May Tech. Memo.

The record supports placing air sparging wells as depicted in Blake's May Tech. Memo—at least 30 ft. from Well #1 and 370 ft. from Well #2. In addition, the air sparging technology, along with the hydrology of the site, ensure protection of the drinking water for the Village of Kirkland, as discussed below. Therefore, the Board finds that Blake's proposed setbacks are the maximum feasible alternative setbacks.

No Significant Hazard to the Village of Kirkland Water Supply Will Result from Air Sparging

Blake cited the benign nature of air sparging as one reason why it was chosen as the remediation technology over other technologies. Am. Pet. at 8; Tech. Report at 14; Mar. Blake Res. 4-6. In addition, St. John-Mittelhauser's geologic survey of the site found that the "shallow glacial drift aquifer is hydraulically isolated from the bedrock aquifer by glacial till material." Am. Pet. at 11. This aquitard prevents the petroleum contaminants in the shallow glacial drift from migrating vertically to the deeper, bedrock aquifer from which the Village of Kirkland extracts drinking water. *Id*.; Tech. Report at 12, 13. St. John-Mittelhauser also stated that it does not anticipate any change to the character of the groundwater supply for Kirkland as a result of air sparging. Mar. Blake Res. at 10. Compressed air does not present a hazard to the Village of Kirkland Water Supply. Combined with the protective nature of the site's hydrology, the Board finds that the location of the air sparging wells will not constitute a significant hazard to the Village of Kirkland's water supply wells.

Conclusion

The Board finds that Blake has met its burden of proof under Section 14.2(c) of the Act for an exception from the water-well setback requirement of Section 14(d) of the Act. The Board grants Blake an exception from the minimum water-well setback requirements for Village of Kirkland Well #1 and Well #2, subject to conditions. The exception will allow Blake to clean up petroleum contaminants at the site by placing air sparging wells within the 400-foot minimum setback zones of these two water supply wells.

This opinion constitutes the Board's findings of fact and conclusions of law.

ORDER

Under Section 14.2(c) of the Act, the Board grants Blake Leasing Company, LLC, (Blake) an exception from the setback requirements for the Village of Kirkland's community water supply Well #1 and Well #2. This water-well setback exception from Section 14.2(d) of the Act is solely for remediating petroleum contamination at the Blake site located at 411 W. Main Street, Kirkland, DeKalb County, and is subject to the following conditions:

1) Blake must maintain the maximum alternative setback of 30 ft. for the Village of Kirkland's emergency backup well, Well #1 (#11424), and 370 ft. for the Village of Kirkland's primary well, Well #2 (#11425);

2) Blake must demonstrate successful remediation and compliance with the Class I potable resource groundwater remediation objectives (35 Ill. Adm. Code 620.210) with four consecutive quarters of groundwater sampling before abandoning the air sparging wells;

3) Blake must properly abandon and seal the air sparging wells, under Section 920.120 of the Illinois Water Well Construction Code (77 Ill. Adm. Code 920.120), upon Blake's receipt of a No Further Remediation (NFR) letter from the Illinois Environmental Protection Agency regarding Leaking Underground Storage Tank/Illinois Emergency Management Agency Incident Number 891717; and

4) This water well setback exception terminates automatically on the date the Illinois Environmental Protection Agency issues the NFR letter referenced in Condition 3, above.

IT IS SO ORDERED.

If Blake accepts this exception subject to the above conditions, Blake must, within 45 days after the date of this opinion and order, file with the Board and serve on the Agency a certificate of acceptance and agreement to be bound by all the terms and conditions of the granted exception. Blake must forward the certificate to:

Joanne M. Olson
Division of Legal Counsel
Illinois Environmental Protection Agency
1021 North Grand Avenue East
PO Box 19276
Springfield IL 62794-9276

The certificate must be signed by a Blake officer authorized to bind Blake to all of the terms and conditions of the final Board order in this matter. The form of the certificate follows:

CERTIFICATE OF ACCEPTANCE

I (We), _____,
having read the opinion and order of the Illinois Pollution Control Board in docket PCB 16-100, dated August 17, 2017, understand and accept the opinion and order, realizing that this acceptance renders all terms and conditions of the water well setback exception set forth in that order binding and enforceable.

Petitioner: Blake Leasing

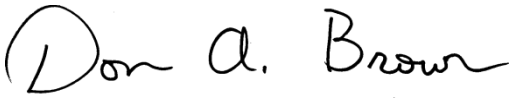
By: _____
Authorized Agent for Blake Leasing

Title: _____

Date: _____

Section 41(a) of the Environmental Protection Act provides that final Board orders may be appealed directly to the Illinois Appellate Court within 35 days after the Board serves the order. 415 ILCS 5/41(a) (2016); *see also* 35 Ill. Adm. Code 101.300(d)(2), 101.906, 102.706. Illinois Supreme Court Rule 335 establishes filing requirements that apply when the Illinois Appellate Court, by statute, directly reviews administrative orders. 172 Ill. 2d R. 335. The Board's procedural rules provide that motions for the Board to reconsider or modify its final orders may be filed with the Board within 35 days after the order is received. 35 Ill. Adm. Code 101.520; *see also* 35 Ill. Adm. Code 101.902, 102.700, 102.702.

I, Don A. Brown, Clerk of the Illinois Pollution Control Board, certify that the Board adopted the above opinion and order on August 17, 2017 by a vote of 5-0.



Don A. Brown, Clerk
Illinois Pollution Control Board

SM&A
ST. JOHN - MITTELHAUSER & ASSOCIATES

TECHNICAL REPORT

Support for the Petition Requesting an Exception to Operate Three Underground Storage Tanks Within the Water Well Setback Zone for Emergency Backup Well #1 Operated by the Village of Kirkland

Kirkland Quick Stop
411 Main Street
Kirkland, Illinois 60146

November 6, 2017

Prepared By:

St. John – Mittelhauser & Associates, Inc.
1401 Branding Avenue, Suite 315
Downers Grove, IL 60515

ST. JOHN - MITTELHAUSER & ASSOCIATES

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ST. JOHN - MITTELHAUSER & ASSOCIATES

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Tables

Appendices

1.0 INTRODUCTION

Blake Leasing, Company LLC – Real Estate Series (Blake Leasing) is requesting an exception to the minimum setback zone for a community supply well within the Village of Kirkland (Kirkland) for the installation and continued operation of three (3) underground storage tanks (USTs). The community supply well is owned by the Canadian Pacific Railroad and located immediately north of the Kirkland Quick Stop (KQS) site (the "Site"). The Village of Kirkland leases the community supply well from Canadian Pacific Railroad for emergency backup water supply purposes. This community supply well is generally known as Emergency Backup Well #1 or Well 11424 (five-digit IEPA identifier). It is one of three (3) community supply wells. The other two being primary production wells that are owned by the Village of Kirkland.

On March 21, 2016, Blake Leasing submitted a Petition to the Illinois Pollution Control Board (IPCB) for Water Well Setback Exception to allow the construction and operation of in-situ bioremediation injection wells within the setback zone of Emergency Backup Well #1. The Illinois Environmental Protection Agency (IEPA) noted in their initial response (June 15, 2016) that the USTs currently operating at the Site were installed on November 2, 1993, and are considered as "new secondary sources" as defined in Section 3.355 of the Act, but was unable to find an IPCB issued exception for the installation of the currently operating USTs at the Site. The IEPA therefore requested Blake Leasing to produce an IPCB Order for a setback exception for the USTs currently operating at the Site.

The IEPA noted that such a violation could be resolved if Blake Leasing is granted an exception by the IPCB for the installation of "new potential sources" (for the USTs installed on November 2, 1993 and currently operating at the site) within the minimum setback zone of the Emergency Backup Well #1. As a result, Blake Leasing is submitting this petition for a water well setback exception pursuant to Section 14.2(d) of the Environmental Protection Act for the installation and operation of the USTs within the setback of Emergency Backup Well #1. This petition will demonstrate the following:

- The Site began operating as a retail petroleum service station sometime between the late 1920's and early 1930's and currently is the only petroleum retail station within the Village of Kirkland;

- A review of water well records from the Illinois State Geological Survey (ISGS), Illinois State Water Survey (ISWS), and discussions with the Village of Kirkland indicate the UST system at the Site is located within the setback zone of one (1) potable water well. This well is identified as IEPA Well #11424, also referred to as the Village of Kirkland's Emergency Backup Well #1.

- The USTs are completed in the Kishwaukee alluvial surficial sand unit. Shallow groundwater is encountered within the alluvial surficial sand unit and flows north, towards the Kishwaukee River. Underlying the alluvial surficial sand unit is a dense, silty clay aquitard that impedes the vertical migration of groundwater within the alluvial sand and gravel unit to the groundwater occurring in the bedrock units below, in which the Emergency Backup Well #1 is completed at a depth of 737 feet;

- A pump test was performed on Municipal Well #2 to determine the competency of the 30-foot, sitly clay aquitard that separates the upper alluvial aquifer from the bedrock aquifers in the vicinity of the site. The lack of any observed response in MW-31, located 18 feet away from Well #2 and completed in the alluvial sand and gravel, indicates that the 30 feet of glacial till that separates the bedrock aquifers from the alluvial aquifer at the site is an effective aquitard, which significantly impedes the vertical migration of groundwater between the units and protects the bedrock aquifers in the vicinity of the site from routes of contaminant migration occurring within the alluvial aquifer;

- The current UST system, installed in 1993, features best available technology to prevent a release and detection of releases of fuel into the environment. These features include the use of secondary containment, sumps, and electronic monitoring and inventory controls;

- In September 1989, a release of petroleum was identified in the alluvial surficial sand unit below the Site (LUST Incident 891717). The release is associated with the previous UST system that existed at the Site prior to 1993 when the current UST system was installed. A review of the groundwater analytical data indicates that there is no evidence that a release from the current UST system has occurred;

- Groundwater samples collected from the Emergency Backup Well #1 and Municipal Well #2 in May 2015 were below the reporting limits of the laboratory equipment. As a result, there is no evidence that the historical release has impacted the community supply wells; and

- Blake Leasing has invested $420,000.00 in the original purchase of the Site and $834,787.00 in substantial renovations in 2003, including enhanced leak detection safeguards. The facility generates substantial sales tax revenue for various local units of government (most notably the Village of Kirkland), and affords safe and convenient retail gas station and convenience store service to Kirkland and the surrounding area. Denial of this petition would then result in financial hardship for the Petitioner, Blake Leasing, and the Village, and would negatively impact the quality of life of the residents of Kirkland.

2.0 SITE LOCATION

The Site is located in the SE ¼ of the NW ¼ of the NE ¼ of Section 14, Township 42N, Range 3E in DeKalb County, Illinois (Figure 1). The Site is zoned as "B-1: Commercial, General" and has been operated as a retail petroleum outlet and service station as early as 1928, and, most recently, has been operated by KQS.

Land use surrounding the Site currently consists of commercial and residential properties, Figure 2. The surrounding properties consist of:

- West: Kirkland IGA (permanently closed), beyond which is N. 5th Street and commercial establishments (Joey G's Pizzeria, Kirkland Family Restaurant, Kirkland Village Hall);
- North: Railroad Road immediately borders the Site on the north and separates the Site from the railroad property. Kirkland's Emergency Backup Well #1 is located on the Canadian National Railroad property immediately north of Railroad Road. North of the Canadian National Railroad is Kirkland Self Storage, Municipal Well #2, and single family residences;
- South: Main Street (Illinois Route 72), beyond which is DeBenedetto's Restaurant and single family residences; and
- East: Kirkland Carwash, Midnight Auto Repair, and Blake Oil Corporate Offices.

The nearest surface waterbody is the south branch of the Kishwaukee River, located approximately 1,200 feet north of the Site. An unnamed oxbow pond within the confines of Pioneer Park is located approximately 1,400 feet northeast of the Site. A storm water retention pond is located approximately 1,500 feet southwest of the Site.

The Site is the only retail petroleum service station within the Village of Kirkland. The next closest retail petroleum service station is located approximately 4.8 miles east of Kirkland in the Village of Kingston, Illinois (Casey's General Store).

3.0 POTABLE WATER WELLS

SMA contacted the Illinois State Geological Survey (ISGS) and the Illinois State Water Survey (ISWS) to obtain potable water well records for the Site and neighboring properties. The water

well record search identified the presence of two (2) potable water wells within 1,000 feet of the Site. These potable water wells are identified as the Emergency Backup Well #1 (IEPA No. 11424) and Municipal Well #2 (IEPA No. 11425). Both of these potable water wells are used by the Village of Kirkland and each have a 400-foot setback zone. Well construction details, based on the water well records, are provided below:

Emergency Backup Well #1 (IEPA No. 11424)

Emergency Backup Well #1 (IEPA No. 11424) is located 125 feet north-northeast of the UST system at the Site. The well is owned by the Canadian National Railroad and leased by the Village of Kirkland for emergency backup purposes. The well was drilled in 1896 and does not have a detailed geologic log available. All that is known about this well is that it has a 7-inch diameter steel casing installed to a depth of 88 feet below ground surface (bgs) into the bedrock. The well is completed as an open borehole to a depth of 737 feet bgs.

Municipal Well #2 (IEPA No. 11425)

Municipal Well #2 (IEPA No. 11425) is located approximately 470 feet north of the UST system at the Site. The well was drilled in 1950 and is owned by the Village of Kirkland. This well and Kirkland Well #3, located approximately one-mile west of town, supply all the water for the Village of Kirkland. The well log for Well #2 indicates that this well was constructed by first installing a 12-½ inch, steel surface casing from surface grade to 69 feet in depth, through all the glacial sediments and approximately nine feet into the upper surface of the Galena Dolomite. The well was then further advanced to 152 feet in depth into the Decorah Dolomite where an 8-inch, steel surface casing was installed inside the 12-½ inch surface casing. Below the 8-inch surface casing, the well is drilled and completed as an open hole to a total depth of 630 feet into the St. Peter Sandstone. The water produced from this well is collected from the lower Decorah Dolomite, the Platteville Dolomite and the St. Peter Sandstone (the Glenwood Shale is primarily an aquitard and is of low and/or inconsequential yield) between 152 and 630 feet in depth.

In addition, SMA contacted the Village of Kirkland Water Department[1] to identify any potable water wells not included in the ISGS and ISWS records. According to the Village of Kirkland Water Department, there are only three addresses within the Village of Kirkland that do not have a water meter installed, and are therefore not connected to the Village supplied water system. The closest of these three private water wells (each with a 200-foot setback zone), is located approximately 900 feet south-southeast of the Site, and is hydraulically upgradient in the upper, glaciofluvial aquifer.

[1] Personal Communication with Chris DeMunn, Kirkland Water Department, March 13, 2017.

Based on the potable water well records from the ISGS, ISWS, and information provided by the Village of Kirkland, the only potable water well that requires a water well setback exception pursuant to Section 14.2 of the Act is Emergency Backup Well #1. The Village of Kirkland leases the supply well from Canadian Pacific Railroad for emergency backup water supply purposes and it is not the primary source of water for the Village of Kirkland. The location of both the municipal and private potable water wells and their corresponding setback zones are shown on Figure 1. The location of the Emergency Backup Well #1 and the Municipal Well #2 with respect to the current UST system at the Site is shown on Figure 2. Copies of the potable water well records are provided in Attachment A.

4.0 GEOLOGY / HYDROGEOLOGY

4.1 REGIONAL GEOLOGY / HYDROGEOLOGY

Detailed analysis of the groundwater geology of the Kirkland area is available from several ISGS publications (R.C. Vaiden, et. al., 2004; David, G.L., 1970; Horberg, L., 1950; IEPA Bureau of Water, 2006), which indicate that the thickness of glacial sediments overlying bedrock in the vicinity of Kirkland is highly variable, and ranges from 300 feet west of town in the Troy Bedrock Valley to less than 20 feet north of the Kishwaukee River, immediately north of the site.

Several detailed well logs are available for wells penetrating the glacial and bedrock units in the vicinity of Kirkland, including the Kirkland community wells. Several boring logs for these wells are provided as Attachment A. These well logs are instructive, and have been used to form the basis for developing two semi-regional geological cross-sections in the vicinity of Kirkland. A third geological cross-section that depicts the geology in close proximity to the Site, and includes Emergency Backup Well #1 and Kirkland Municipal Well #2. The locations of these three cross-sections can be reviewed on Figure 3. These cross-sections are identified as follows:

Cross-section A-A’ (Figure 4) - This is an east to west cross-section from approximately ½ mile east of Kirkland to approximately one-mile west of Kirkland and passing through Kirkland Municipal Well #2 (11425). This cross-section illustrates the relatively consistent elevation of the bedrock surface and the general nature of the glacial sediments above bedrock in the areas south of the Kishwaukee River. The exception to the relatively uniform nature of the bedrock

surface occurs on the far west side of the cross-section where the buried Troy Bedrock Valley occurs. Kirkland Municipal Well #3 (01613) is located there and the log from that well provides the geologic data for cross-section A-A' in that area.

Cross-section B-B' (Figure 5) - This is a north to south geological cross-section from approximately 1/3-mile north of the Kishwaukee River to one-mile south of Kirkland and again, passes through Kirkland Municipal Well #2 (11425). This cross-section illustrates the thinning of the glacial sediments northward across the area and illustrates the occurrence of the Kishwaukee River alluvium that occurs from the river through areas south of the Site. (The sand occurrence associated with the Kishwaukee River alluvium will be discussed in greater detail in the next section discussing the site hydrogeology).

Cross-section C-C' (Figure 6) - This is a north-to-south cross-section from the Municipal Well #2 (11425) south through the Kirkland Emergency Backup Well #1 (11424) to the northern portion of the Site and was developed to provide a more detailed illustration of the geological unit occurrences in the vicinity of the Site.

4.2 SITE SPECIFIC GEOLOGY / HYDROGEOLOGY

4.2.1 Geology

Geological cross-section C-C' illustrates the occurrence and thickness of the glacial and bedrock units in close proximity to the Site. To verify the continuity and depth of occurrence of the glacial till that occurs below the Kishwaukee alluvial surficial sand unit in the immediate vicinity of the Site, SMA completed soil boring SB-38 adjacent to existing monitoring well MW-20 (immediately south of the water tower) and installed monitoring well MW-31 immediately outside of the well house for Municipal Well #2. During the installation of this boring and this well, soils were continuously sampled and logged by a geologist to determine the nature and thickness of the sand and the occurrence of the upper surface of the glacial till in the vicinity of the site.

At both of these locations, the soil samples collected from the upper portion of the glacial till were examined and determined to consist of a dense, dry, silty clay. This dense, dry, silty clay acts to impede the vertical migration of groundwater from the shallow, alluvial, water table aquifer to the

groundwater occurring within the bedrock units below. The location of soil borings SB-38 and MW-31 are shown on Figure 6 (Cross Section C – C'). The boring logs for SB-38 and MW-31 are provided in Attachment B.

4.2.2 Hydrogeology

SMA personnel surveyed the surface grade and top of casing of all the monitoring wells installed for Blake from a United States Geological Survey bench mark that was located immediately north of the site between Emergency Backup Well #1 (11424) and Municipal Well #2 (11425). This new survey data allows determinations across the site to be reported in vertical elevation compared to mean sea level (MSL) North American Vertical Datum 88.

Upon completing the new survey of the monitoring wells described above, SMA personnel measured the static water level occurrence in each monitoring well at the Site prior to sampling the well and computed the elevation of those static water levels compared to MSL. Static water level elevations were collected on a quarterly basis (August 9, 2016, November 2016, March 2017, and June 2017) and are provided on Table 1.

The static water level measurements were plotted in plan-view to create a potentiometric surface maps for the water table aquifer in the vicinity of the site during each of the four groundwater sampling events. The potentiometric surface map from the most recent groundwater sampling event on June 28, 2017 is provided as Figure 7. The potentiometric surface map indicates groundwater flow in the shallow, alluvial water bearing unit above the silty clay is generally to the north – northwest. The hydraulic gradient determined from this figure is 0.012 with a steepening of the gradient immediately north of the site in the vicinity of MW-20. The groundwater flow direction and gradient for the June 28, 2017 sampling event is consistent with previous potentiometric surface maps for the August 2016, November 14, 2016, and March 7, 2017 sampling events, provided in Attachment C.

A review of cross-section C-C' (Figure 6) indicates the occurrence of some fine-grained lithologies in the vicinity of MW-20 that are likely to cause the observed hydraulic gradient increase in this area and preserve the conservation of mass flow rate through the water table aquifer. A review of the surficial topography from the site to the Kishwaukee River indicates the

topographic gradient from the site to the pool elevation within the river is 0.012, the same as the hydraulic gradient determined for the site. Collectively, this data indicates that groundwater within the coarse-grained alluvial sediments associated with the Kishwaukee River form a water table aquifer saturating these sediments to a depth of approximately 30 feet where an underlying glacial till unit occurs, and the groundwater within this water table aquifer flows to the north-northwest to discharge to the Kishwaukee River under baseflow conditions.

In summary, the cross-sections, boring logs and water level measurements for the Site indicate that groundwater saturates the coarse-grained sand and gravel lithologies that occur to a depth of approximately 30 feet in the vicinity of the site above the glacial till unit to form a water table aquifer. This shallow groundwater occurrence within the Kishwaukee alluvial, coarse-grained, surficial sediments can be reviewed in cross-section on Figure 6.

4.2.3 Hydrogeologic Testing To Evaluate Routes of Exposure to Kirkland Community Wells

During the week of August 8, 2016, SMA did further testing at the site to evaluate the hydraulic connection between the shallow groundwater occurrence in the Kishwaukee River alluvium (shallow aquifer) and the deeper bedrock aquifers where Emergency Backup Well #1 (11424) and Municipal Well #2 (11425) are completed. To do this, SMA contacted Village of Kirkland officials to obtain permission to perform additional drilling and testing on the Village property located immediately north of the Site. As described in Section 4.2.1 of this report, one soil boring (SB-38) was completed at approximately the mid-point between the north property boundary of the Site and Municipal Well #2 (11425) at the location of monitoring well MW-20, and a monitoring well (MW-31) was installed directly adjacent to, and north of, Municipal Well #2 (11425). Monitoring well MW-31 and existing monitoring well MW-30D [located directly adjacent to Municipal Well #2 (11425) and Emergency Backup Well #1 (11424), respectively] were then used to collect static water level measurements in the alluvial aquifer while the Community wells were pumping to determine if a hydraulic connection between the alluvial aquifer and the lower bedrock aquifers exists.

The first hydraulic test was performed during the week of August 8, 2016 on Municipal Well #2 (11425) with monitoring well MW-31 as the shallow groundwater water level observation well.

Monitoring well MW-31 is located approximately 13 feet from Municipal Well #2 (11425). Per the discussion with Village officials, Municipal Well #3 (located over a mile west of town) was utilized for the Village water needs during the prior week to allow the water level in Well #2 (11425) to rebound and reach static equilibrium prior to the pump being performed. A 15 psi pressure transducer was installed in monitoring well MW-31 on the morning of August 9th to begin taking water level measurements in the well prior to performing the pump test and determine any antecedent trends in the water level data at the well. Municipal Well #2 (11425) was brought back on line on the morning of August 11th. Pumping at Municipal Well #2 (11425) was performed intermittently during the test period because it only operates on demand, based on the water level in the water tower.

Prior to Well #2 (11425) being brought back on line on the morning of August 11th, the static water level was measured in the well by airline method. Subsequent water level measurements taken by airline method while Well #2 was operating indicate that drawdown in the well was over nine feet in Well #2 (11425) during pumping. A plot of the water level data recorded in monitoring well MW-31 during the intermittent pumping of Well #2 (11425) is provided as Figure 8. Also supplied on Figure 8 is the relevant pumping data from Well #2 (11425) during the test period.

A review of Figure 8 provides the following observations related to the pump test at Municipal Well #2 (11425):

- A review of the antecedent trend period data in monitoring well MW-31 prior to pumping at Municipal Well #2 (11425) shows a diurnal fluctuation in the water levels of approximately 0.05 feet, which is likely to be caused by evapotranspiration. These diurnal effects were observed to continue throughout the performance of the pump test.
- During the pump test, Municipal Well #2 (11425) attained a flow rate between 275 gallons per minute (gpm) and 336 gpm when in operation over the four day period of the test.
- The water level measurements from monitoring well MW-31 during the pumping intervals of Municipal Well #2 (11425) indicate no observable change related to the pumping. This data indicates that the 30 feet of glacial till that separates the bedrock aquifers from the alluvial aquifer at the site is an effective aquitard, which significantly impedes the vertical migration of groundwater between the units and protects the bedrock aquifers in the vicinity of the site from routes of contaminant migration occurring within the alluvial aquifer.

After the pump test in Municipal Well #2 was completed, a similar short-term test of the backup Well #1 (11424) was attempted. This test was planned as a short term test because the water generated from the backup well is not routed to the water tower unless there is a need for it and as a result, the water had to be discharged to the local storm sewer system. Similar to the previous pump test, the pressure transducer was set in monitoring well MW-30D (located approximately 19 feet from backup Well #1 (11424) on August 15th to measure the antecedent trend water levels there for approximately one day prior to the pump test on August 16th. Figure 9 provides the water level data from monitoring MW-30D for the antecedent trend period and for the 17 minute test period during which the backup Well #1 (11424) was pumped at a rate of 370 gpm. A review of Figure 9 provides the following observations related to the pump test at Emergency Backup Well #1 (11424):

- Unlike the pump test at Well #2 (11425), the antecedent trend period did not indicate the occurrence of any diurnal effects. This is likely to be because monitoring well MW-30D is well away from any vegetation and trees on the north side of the Site, near the railroad tracks, and not subject to local evapotranspiration effects.

- The antecedent trend period exhibits at least three water level responses in monitoring well MW-30D that resulted in the water level going up between 0.03 and 0.12 feet and then rapidly declining to a level below the static level before returning to equilibrium. It is unclear what caused these observed responses. Train traffic on the adjacent railroad tracks does not appear to have been the cause, but the movement of heavy trucks in close proximity to MW-30D could have been.

- Upon initiation of pumping in backup Well #1 (11424), the water level in monitoring well MW-30D increased 0.05 feet and then declined through the 17 minute duration of the pumping to approximately a 0.05 foot decrease by the end of the pumping period. This water level response in MW-30D does not appear to have been a hydraulic response to pumping (it would be very difficult to explain the 0.05 feet water level increase at the beginning of the test otherwise), and appears rather to have been some form of mechanical response to the test (e.g., vibrational occurrence due to the well pumping and resulting water level response).

5.0 HISTORICAL UST OPERATIONS AT SITE

Since the installation of the first USTs at the Site, sometime in the 1930's to present, there has been a total of 16 USTs installed at the site. Currently, there are only three (3) physical UST's in operation at the site [one UST is partitioned and therefore considered to be two separate USTs by the Office of the State Fire Marshal (OSFM)]. The previously existing 12 USTs were removed in multiple stages over a period spanning approximately 5 years, beginning in 1988 and ending

in 1993. The current site features including USTs, dispensers, building footprint and monitoring wells, along with the historical location of the previous building, dispensers, and USTs is shown on Figure 10. SMA has compiled the events during the period into a brief timeline shown below. For a complete Site history see Attachment D.

- September, 1988: Two (2) 12,000 gallon fuel oil USTs (Tanks A and B) located at the northern end of the Site were removed. The installation date of these USTs is not well documented, but could be as early as 1938.

- September 7, 1989: Petroleum contamination was discovered at the Site during the installation of monitoring wells for the purpose of conforming to the leak detection phase of the UST regulations. The release was reported to the Illinois Emergency Management Agency (IEMA) on September 7, 1989, and incident #891717 was assigned to the site.

- September 19, 1989: A total of ten USTs were present at the Site. These include five "in service" USTs (Tanks #1 through #5) and five ""out of service" USTs (Tanks #6 through #10). A tank tightness test was performed on the "in service" USTs and each passed (not leaking). It is believed that the five "out of service" USTs were installed between 1940 and 1960 and the last known usage date for the "out of service" tanks was prior to November 1, 1978.

- November 2-3, 1989: The five "out-of-service" USTs (Tanks #6 through #10) were removed by Frink's Industrial Waste of Pecatonica, Illinois. Petroleum contaminated soils were apparent around the USTs located east-southeast of the former building.

- September 1991: PDC Technical Services, Inc. performed an initial investigation to determine the nature and extent of contaminants of concern in the soil and groundwater below the Site.

- April 1992: PDC Technical Services, Inc. investigation results were submitted to the IEPA. Following IEPA review of the report, the Agency requested that additional work be conducted.

- July 1993: Environmental Contractors of Illinois, Inc. was retained to complete a round of groundwater sampling at the Site to determine existing groundwater conditions. The analytical results of the groundwater samples verified the presence of petroleum impacts and determined that the five "in service" USTs (Tanks #1 through #5) may have been leaking. The tank removal and UST installation permits were submitted to the Office of the Illinois State Fire Marshal and an inspector was scheduled for the tank removals.

- October 6-7, 1993: The five "in-service" USTs (Tanks #1 through #5) were removed. Petroleum contamination (gasoline and diesel fuel) was apparent in the tank areas and along the diesel piping distribution lines. According to the OSFM Inspector Ken Oltman and site personnel, the release appeared to be a result of "general spillage and overfill and possibly a combination of leaking piping". These five USTs had been installed in November, 1978.

- October 8-15, 1993: The current USTs (Tanks #11 through #14) and dispensers were installed at the Site by Pyramid Petroleum.

- Spring 2003: Renovations occurred at the Site. Activities included demolishing the old convenience store building and the pump islands/canopy, which were installed in October 1993. The current USTs, installed in 1993, were left in place and utilized in the renovated Site configuration. The currently existing convenience store and pump islands/canopy were constructed at this time.

5.1 LUST INCIDENT NO. 891717

In September 1989, petroleum-impacted groundwater was identified at the Site during the installation of a UST monitoring well, and Incident #891717 was assigned to the Site. An initial subsurface investigation conducted in September 1991, consisting of six soil borings (AS-1 through AS-6) and three monitoring wells (MW-1 through MW-3), identified the presence of benzene, toluene, benzo(a)anthracene, chrysene, and naphthalene above the Class I GROs in the vicinity of the current UST system and dispensers. The highest concentration of benzene identified in the groundwater was 15 mg/l, directly east of the current UST system, from soil boring AS-1. The analytical results of the September 1991 groundwater samples are shown on Figure 11.

In August 2016, SMA commenced four quarters of groundwater sampling at the Site utilizing low-flow groundwater sampling techniques (August 2016; November/December 2016; March 2017; and June 2017). The low-flow sampling was facilitated through use of bladder pumps to achieve a minimal sustained drawdown with a maximum flow not to exceed 500 milliliters per minute. Flow through cells with general chemistry sensors for pH, temperature, specific conductance, dissolved oxygen, turbidity and oxidation/reduction potential were used to determine when parameter stabilization occurred. The samples obtained from the monitoring wells were submitted to First Environmental Laboratories, Inc. of Naperville, Illinois to undergo analysis for benzene, ethylbenzene, toluene and xylene (BTEX); polynuclear aromatic compounds (PNAs); total iron/lead; and dissolved iron/lead.

The analytical results of the groundwater samples are summarized on Table 2. The groundwater analytical results are shown on Figures 12 (August 2016); Figure 13 (November/December 2016); Figure 14 (March 2017) and Figure 15 (June 2017). The following observations are based on the analytical results of the groundwater samples collected by SMA:

- None of the wells sampled during the four quarterly groundwater sampling events had detectable concentrations of dissolved or total lead, indicating that lead detections previously reported at the site were the result of elevated turbidity levels in groundwater samples due to the sampling methods previously employed (bailer sampling).

- Nine wells on site exhibited organic constituents in excess of the GROs. These include:

    - Benzene was identified in MW-1 (August 2016 and November 2016); MW-3A (August 2016, November 2016, March 2017 and June 2017), and MW-15 August 2016, March 2017 and June 2017);

    - PNA exceedances were observed in MW-1 (November 2016 and March 2017), MW-3A (June 2017), MW-5 (March 2017), MW-6 (August 2016, November 2016, and June 2017), MW-7 (June 2017), and MW-14 (August 2016, November 2016, and June 2017).

    - PNAs were identified in MW-30S and MW-30D during the November 2016 sampling event. However the PNAs are associated with elevated turbidity levels during sample collection. MW-30S and MW-30D were resampled in December, 2017 for PNAs only. The result indicated all PNAs were below the reporting limits of the laboratory equipment.

- A review and comparison of the groundwater analytical data provided in Table 2 and summarized on Figures 12 through 15 indicate:

    - The elevated concentrations of dissolved iron in groundwater show a direct inverse relationship to dissolved oxygen concentrations in groundwater. That is, where dissolved oxygen concentrations are low (<0.5 mg/L) dissolved iron concentrations are elevated (>1.0 mg/L). From reviewing Table 2, the discrepancy between the dissolved and total iron concentration in some wells can be explained by the influence of turbidity in excess of 50 NTU.

    - The occurrence of the organic constituents (benzene and PNAs) exceeding the GROs at the site is directly related to areas in groundwater at the site where dissolved oxygen has been depleted (<0.5 mg/L). This observation indicates that significant natural attenuation of these compounds is taking place at the site under aerobic biodegradation conditions.

- The groundwater sampling data from the line of monitoring wells along the northern border of the site (MW-18, MW-19, MW-30S and MW-30D) indicate that no petroleum constituents are migrating north across the site property line in excess of the GROs. These wells exhibit higher concentrations of dissolved oxygen relative to other wells on the site. This aerobic environment is enabling the natural attenuation of the organic constituents, as mentioned above.

- The concentrations of benzene and PNAs that occur in select monitoring wells on the site are not significantly above the GROs. This fact, in conjunction with the apparent ability of the onsite groundwater system to supply sufficient dissolved oxygen to attenuate the

concentration of these constituents to below the GROs prior to them migrating off-site, suggests a weak residual contamination source associated with a capillary fringe smear zone.

The overall declining trend observed for many of the COCs at the site indicates that no additional releases of petroleum from the current UST system have occurred, and that the impacts to groundwater currently observed in MW-1, MW-5, MW-6, MW-3A, MW-14, and MW-15 are associated with the historical UST system at the Site prior to the installation of the current UST/dispensing system. The groundwater analytical results collected at the Site since 2001 are shown in Table 2.

The low level impacts of petroleum related hydrocarbons observed in the groundwater samples collected from monitoring wells immediately downgradient of the UST system (MW-5 and MW-17), are due to the former UST and dispensing system at the site, which was removed in 1993. The soil and groundwater results that have been obtained at the site indicate that, since 1993, source area remediation efforts (which include actual removal of the leaking former UST/dispensing system as well as contaminated soils) efforts have had a positive effect on the groundwater quality. The overall declining trend observed for many of the COCs at the site indicates that no releases of petroleum from the current UST system have occurred, and that the impacts to groundwater currently observed in MW-1, MW-5, MW-6, MW-3A, MW-14, and MW-15 are associated with the historical UST system at the Site prior to the installation of the current UST/dispensing system. The analytical results of the June 28, 2017 groundwater sampling event are shown on Figure 15. The groundwater analytical results collected at the Site since 2001 are shown in Table 2.

5.2 GROUNDWATER QUALITY: EMERGENCY BACKUP WELL #1

A groundwater sample was collected from the Emergency Backup Well #1 and Municipal Well #2 during the May 2015 sampling event and analyzed for the presence of BTEX and PNAs. The analytical results of the May 2015 grab samples indicated that no BTEX or PNA compounds were detected in the water samples. This confirms that the dense, dry, silty clay is preventing migration of BTEX and PNA compounds within the shallow, alluvial, water table aquifer

downward into the deeper bedrock aquifers which supply both the Emergency Backup Well #1 and Municipal Well #2. (The analytical results of the groundwater sample collected from Emergency Backup Well #1 and Municipal Well #2 are provided in Table 2).

6.0 UST SYSTEM WITHIN SETBACK OF EMERGENCY BACKUP WELL #1

As discussed in Section 5.0, the current UST system was installed in 1993, and used for the storage of gasoline and diesel products for retail sale. The USTs currently in operation at the site are identified in the table below:

USTs Currently Operated At KQS			
UST ID	**Size (gallons)**	**Contents**	**Construction**
11	10,000	Gasoline	Single Wall Fiberglass
12*	4,000	Gasoline	Single Wall Fiberglass
13	6,000	Diesel Fuel	Single Wall Fiberglass
14*	3,000	Gasoline	Single Wall Fiberglass

** UST #12 and #14 consist of a single UST with two separate compartments. The OSFM identifies each compartment as a separate UST*

6.1 INSTALLATION OF CURRENT UST SYSTEM

Again, the current UST system, consisting of the USTs listed in the table above, was installed in October 1993. At the time of the installation, the fill ports of each UST were fitted with a spill containment device and overfill protection. Piping between the USTs and the dispensers consisted of single wall fiberglass lines fitted with pressure monitoring (leak detection). The entire UST system is monitored by a Veeder Root TLS system, fitted with magnetostrictive probes to provide both reconciliation of product inventory and monitor for the presence of any water within the USTs.

In 2002, the single wall fiberglass piping was replaced with flexible double wall piping (secondary containment). In addition to the replacement of the fiberglass piping, the vent pipes, dispensers and canopy were upgraded. In 2003 the Veeder Root system was upgraded to provide pressure line leak detection, in addition to the installation of the Risk Management Software for product inventory reconciliation.

6.2 OSFM UST SYSTEM INSPECTIONS

The current UST system is inspected and regulated by the Office of the Illinois State Fire Marshal (OSFM). A review of the operating record for the current UST system does not identify a release. Moreover, as was discussed above (Section 5.0), the sub-surface impacts by fuel related constituents were likely due to "general spillage and overfill and possibly a combination of leaking piping" observed by the OSFM during the October 1993 tank removal that likely occurred prior to that time. A summary of the OSFM inspections for the Site is given in the following sections.

6.2.1 OSFM Certification Audits

The OSFM inspected the Site on multiple occasions since its installation.

- July 29, 1998: A Certification Audit of the UST system noted the administrative file needed to be updated to reflect the 7,000 gallon UST being considered as two USTs, since it consisted of separate 4,000-gallon and 3,000-gallon compartments (An updated "Notification for Underground Storage Tanks" was submitted on September 14, 1998);
- October 22, 1998: The Certification Audit of UST system found no violations;
- May 10, 2001: The Certification Audit of UST system found no violations;
- January 2, 2003: Log of Attended Self-Service found no violations;
- February 17, 2004: The Certification Audit of UST system found no violations;
- September 17, 2007: The Certification Audit of UST system noted the last test of the product lines was June 1, 2004 and therefore the UST system was out of compliance (The product lines were tested on September 25, 2007);
- October 9, 2007: The Certification Audit indicated the UST system was re-inspected and noted the product line testing was completed on September 25, 2007 and the system was now in compliance;
- October 9, 2007: Log of both Attended and Unattended Self-Service found no violations;
- February 2009: The Certification Audit of UST system found no violations;
- February 18, 2009: Log of Self-Service found no violations;

- February 18, 2009: Log of Unattended Self-Service noted the annual inspection of the system had not been performed;
- February 27, 2009: Log of Unattended Self-Service noted the annual inspection had been completed and was now in compliance;
- May 31, 2011: The Certification Audit of UST system found no violations;
- March 19, 2015: The Certification Audit of UST system found no violations;
- March 23, 2017: Inspection of the system noted a violation for unattended self-service and a faded warning sign. However, at the time of the violation, the inspector mistook the entire station as being "unattended" self-service whereas only pumps 6, 7, and 8 (diesel fuel) are identified as "unattended" self-service. SMA understands that upon clarification that the entire site was not "unattended" self-service, the inspector dismissed all of the original violations.
- March 23, 2017: The OSFM inspector requested monthly Liquid Status Reports in addition to the line tests and constant leak detection monitoring and the replacement of some whip hoses and breakaways which were showing wear. This was completed within a few days of the March 23, 2017 inspection.
- May 9, 2017: Re-inspection of the UST system indicated the facility is in full compliance.

6.2.2 KQS Inspections, Operations, and Maintenance Plan

KQS maintains an Inspections, Operation and Maintenance Plan (IOMP) in accordance with 41 IAC 176.655. The IOMP plan includes the following:

- List of Emergency Contacts, including station owner/operator, fire, police, and emergency response contractor;
- Provides procedures and responses in the event that a release does occur;
- Provides a checklist for filling of the USTs;
- Provides a list of items to be inspected daily, weekly, monthly, quarterly, annually, three year, and five year intervals;
- Provides procedures related to the handling, storage and disposal of regulated wastes;
- A copy of KQS's Operation and Maintenance Plan is provided in Attachment E.

6.2.3 UST System Testing

To demonstrate compliance with 41 IAC 175, a “Tank Tightness Test” is conducted on the USTs and product lines by a third party to demonstrate system integrity. Since 2012, Tankology, Inc. has tested the USTs and product lines at the Site. The USTs are tested by sealing the vent lines and placing a vacuum on the USTs. The system is then monitored for a period time to verify the system is holding a vacuum. The product lines are tightness tested by pressurizing the (drained) product lines. The pressure is then monitored for a period of time to verify the product lines are holding pressure. A loss of vacuum during the UST testing or pressure in the product line is an indication of a potential release. As the tank tightness summary below indicates, the USTs and product lines at the Site have been inspected and tested with no evidence that a release from the UST system has occurred.

November 7, 2012: Tightness testing was performed on the USTs and passed. The product line to the satellite dispenser was pressurized and passed. A product line tightness test was completed on the product lines and passed. The line leak detectors, impact value, and lead detection monitoring system passed inspection and testing.

November 6, 2013: A product line tightness test was completed on the product lines and passed. The line leak detectors, impact value, and lead detection monitoring system passed inspection and testing.

November 4, 2014: A product line tightness test was completed on the product lines and passed. The line leak detectors, impact value, and lead detection monitoring system passed inspection and testing.

October 29, 2015: A product line tightness test was completed on the product lines and passed. The line leak detectors, impact value, and lead detection monitoring system passed inspection and testing.

October 17, 2016: A product line tightness test was completed on the product lines and passed. The line leak detectors, impact value, and lead detection monitoring system passed inspection and testing.

December 1, 2016: Tightness testing was performed on the USTs and passed. The product line to the satellite dispenser was pressurized and passed.

7.0 ARBITRARY AND UNREASONABLE HARDSHIP

7.1 REMOVAL OF RISK AND VALUE TO THE SUBJECT PROPERTY AND OWNERS

Blake Leasing has invested $420,000.00 in the original purchase of the Site. This expenditure was followed by the substantial renovations and upgrades made to the Site in 2003, which amounted to $834,787.00. These investments were made under the assumption that the Site would be able to continue to operate as a petroleum service station and convenience store. Without the ability to operate as a service station, the parcel is worth only a fraction of its "Highest and Best" use as a "service station/convenience store", and the investments made in the property would become unrecoverable costs. This would cause substantial economic hardship to Blake Leasing.

7.2 REMOVAL OF RISK AND VALUE TO THE VILLAGE OF KIRKLAND

The Site serves the Village of Kirkland and the surrounding population. The inability of Blake Leasing to operate the Site as a service station would result in harm to the Village of Kirkland. The Site is the only petroleum service station and convenience store within the village limits. The nearest petroleum service station from the Site is the Casey's General Store, 5 miles to the east, in Kingston. The other closest service stations are 15 miles north, 9 miles west, and 13 miles south of the Site. Additionally, the KQS convenience store represents one of the only facilities of its kind within the municipality. The distances to other nearby convenience stores are the same as those for the fueling stations listed above. Continued operation of the convenience store without fuel sales is not an economically viable option for the petitioner, and subsequent closure of the convenience store would likely result if the water well setback exception is not approved. The loss of the KQS fueling station and convenience store would negatively impact the residents of the Kirkland community. In addition, the Village of Kirkland receives significant sales tax revenue from operation of the KQS facility sales tax revenues for the past five (5) years of operation of the KQS facility are included at Paragraph 9 of the Petition.

8.0 CONCLUSIONS

Blake is requesting the IPBC grant an exception to the minimum setback zone for a community supply well within the Village of Kirkland (Kirkland) for the installation and continued operation of three (3) USTs. The USTs are currently located within the setback of the Village of Kirkland's Emergency Backup Well #1 or Well 11424 (five-digit IEPA identifier), but not the Village's two primary production wells.

The geology below the Site consists of coarse-grained sand and gravel alluvial sediments that occur to a depth of approximately 30 feet in the vicinity of the site above the glacial till unit to form a water table aquifer. The groundwater within this water table aquifer flows to the north-northwest, and discharges to the Kishwaukee River under baseflow conditions. Underlying the coarse-grained sand and gravel alluvial sediments is a dense, dry, silty clay that, based on the testing described in this report performed by SMA, impedes the vertical migration of both groundwater and contaminants of concern from moving into the bedrock aquifers below where the Emergency Backup Well #1 is completed.

The site has operated as a petroleum retail service station since the late 1920's or early 1930's. According to the OSFM files, a total of 12 USTs have been removed from the Site. Five USTs, removed in 1993 are associated with a historic release of petroleum into the subsurface at the Site. The release was identified in September 1989 (Incident #891717) and is actively being addressed through the Illinois EPA LUST Section. Initial groundwater testing performed shortly after the releases were discovered showed concentrations of benzene as high as 15,000 ug/L in groundwater. The highest concentration of benzene in groundwater determined during the June 2017 sampling event was 133 ug/L.

A groundwater sample collected from Emergency Backup Well #1 in May 2015 indicated all BTEX and PNA compounds were below the detection limit of the laboratory equipment. This confirms that the dense, dry, silty clay is preventing migration of BTEX and PNA compounds within the shallow, alluvial, water table aquifer downward into the deeper bedrock aquifers which supply Emergency Backup Well #1.

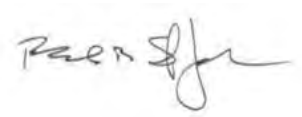
The current UST system was installed in 1993 and includes secondary containment, sumps, and electronic monitoring to prevent a release into the environment. A review of the analytical data indicates the historical releases of petroleum continue to attenuate and there is no evidence that a release from the current UST system has occurred and/or is contributing to the groundwater impacts observed at the site, or that any such releases are likely to occur in the future.

Blake Leasing has invested $420,000.00 in the original purchase and of the Site and $834,787.00 in renovations completed in 2003. These investments were made under the assumption that the Site would be able to continue to operate as a petroleum service station and convenience store. Without the ability to operate as a service station, the parcel is worth only a fraction of its comparable “service station value”, and the investments made in the property would become unrecoverable costs. Furthermore, the inability for Blake Leasing to operate the Site as a service station would result in harm to the Village of Kirkland. The Site is the only petroleum service station and convenience store within the village limits.

9.0 CERTIFICATION STATEMENT

I certify and attest to directing and overseeing all aspects of the work described in this report and believe that the data and conduct of the work described herein comply with good and standard practices related to the conduct of geologic and hydrogeologic investigations, reporting and analysis.

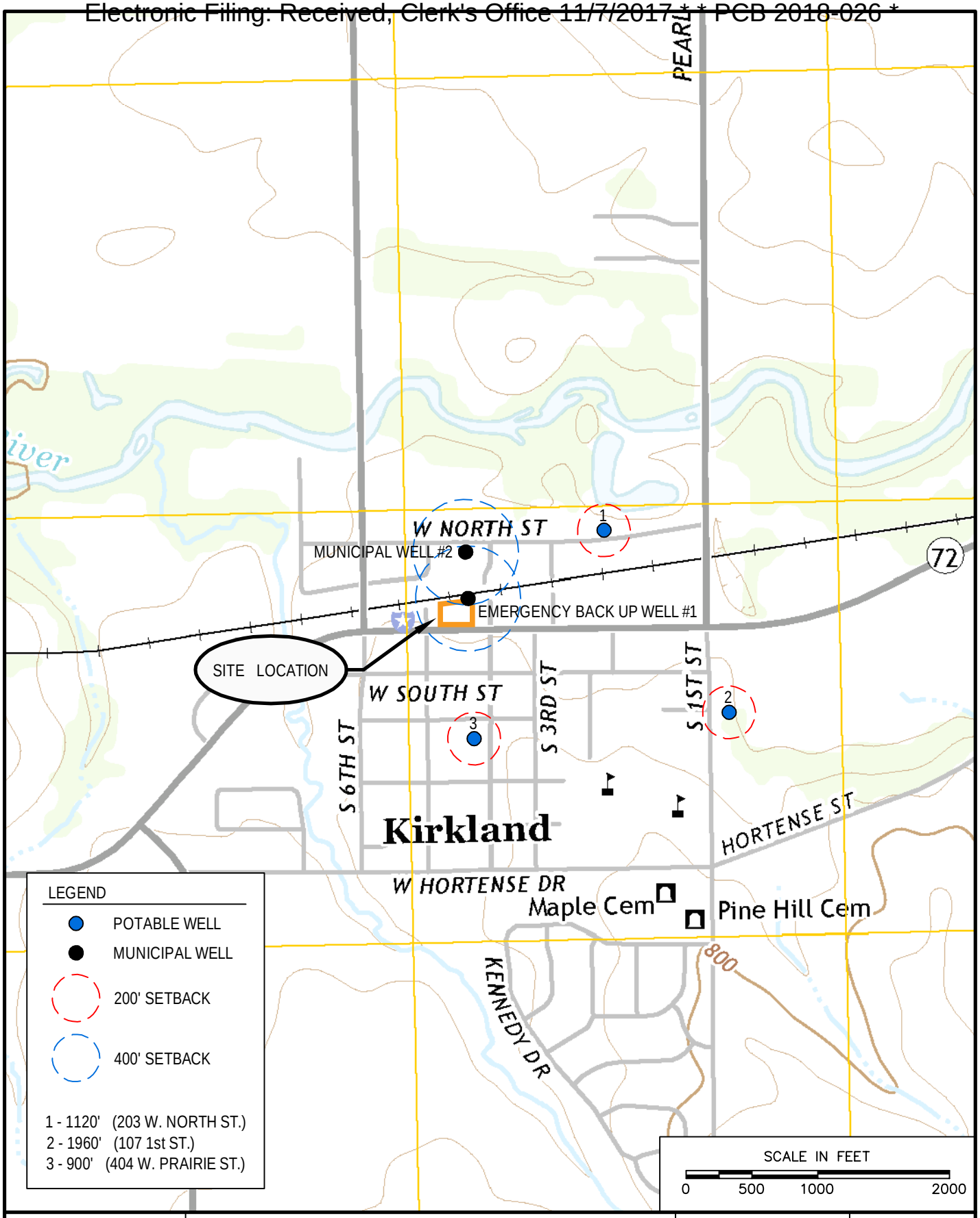
Signed:



Ronald B. St. John, PHG, CPG
Illinois Professional Geologist
St. John – Mittelhauser & Associates, Inc.
Certified Professional Hydrogeologist
American Institute of Hydrogeology

ST. JOHN - MITTELHAUSER & ASSOCIATES

FIGURES



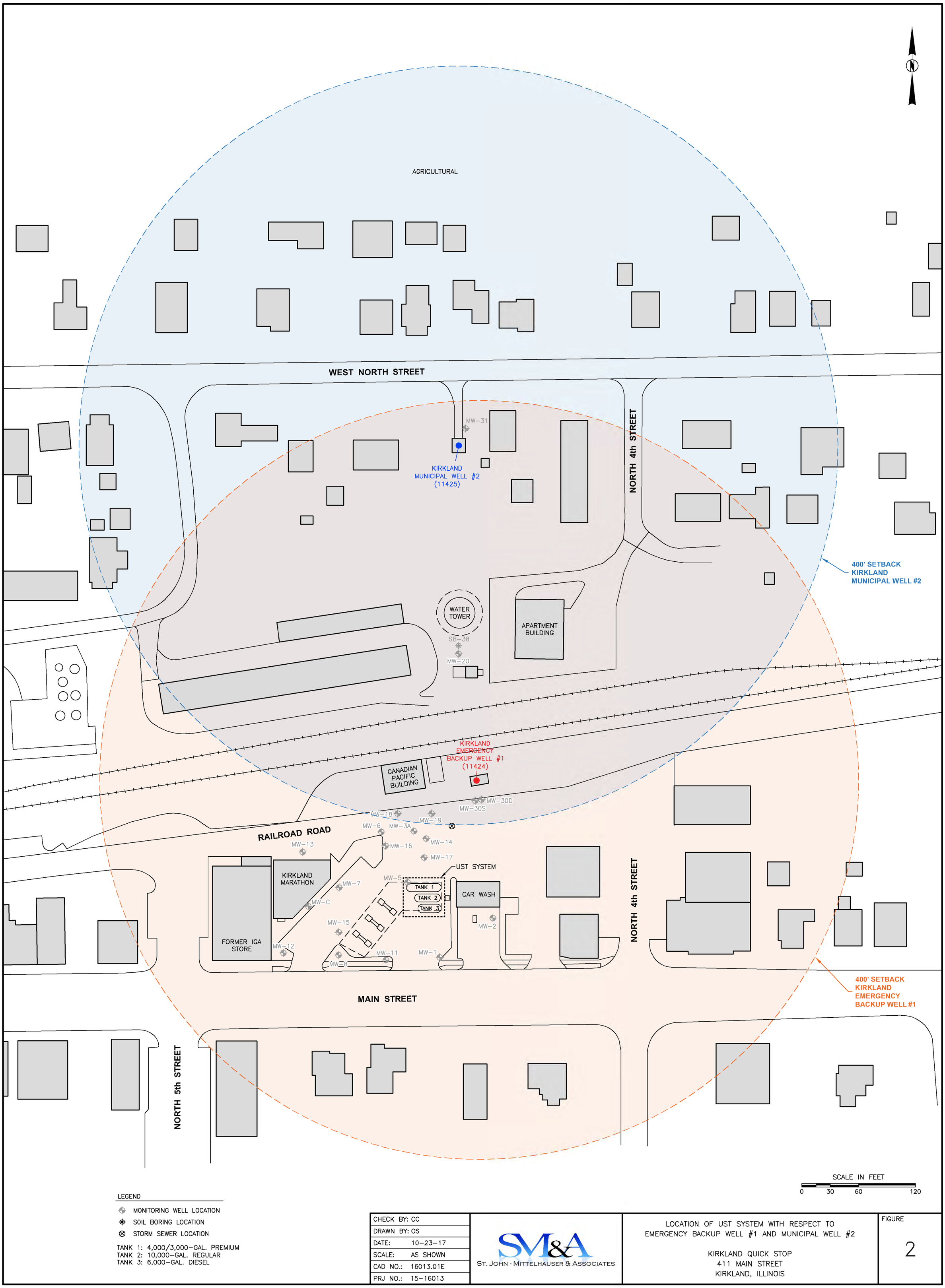
CHECK BY	SRS
DRAWN BY	OS
DATE	10–23–17
SCALE	N.T.S.
CAD NO.	16013.01N2
PRJ NO.	15–16013

SITE LOCATION MAP

KIRKLAND QUICK STOP
411 MAIN STREET
KIRKLAND, ILLINOIS

SM&A
St. John · Mittelhauser & Associates

FIGURE
1



LEGEND

- MONITORING WELL LOCATION
- SOIL BORING LOCATION
- STORM SEWER LOCATION

TANK 1: 4,000/3,000-GAL. PREMIUM
TANK 2: 10,000-GAL. REGULAR
TANK 3: 6,000-GAL. DIESEL

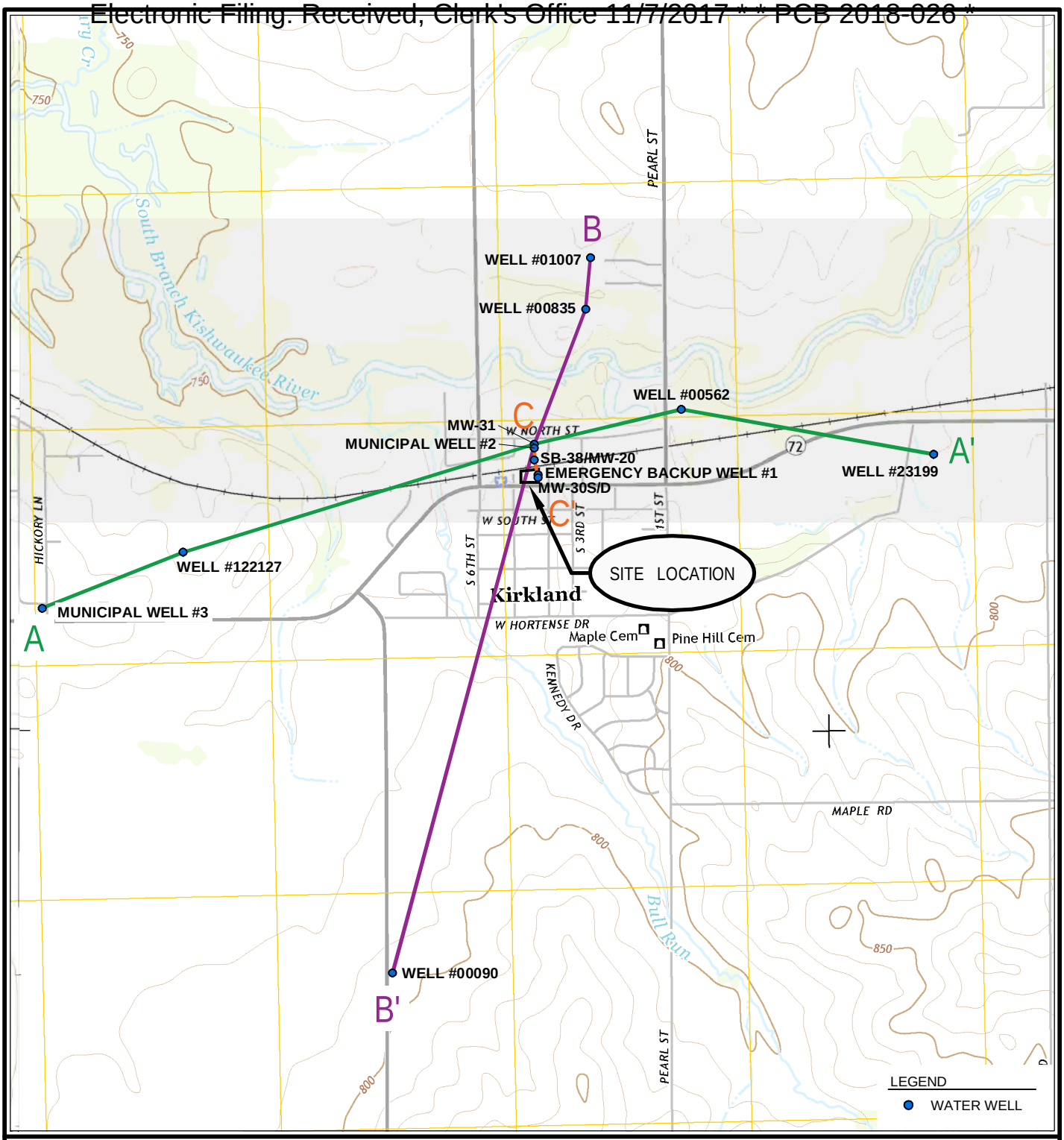
CHECK BY:	CC
DRAWN BY:	OS
DATE:	10-23-17
SCALE:	AS SHOWN
CAD NO.:	16013.01E
PRJ NO.:	15-16013

ST. JOHN - MITTELHAUSER & ASSOCIATES

LOCATION OF UST SYSTEM WITH RESPECT TO
EMERGENCY BACKUP WELL #1 AND MUNICIPAL WELL #2

KIRKLAND QUICK STOP
411 MAIN STREET
KIRKLAND, ILLINOIS

FIGURE
2



QUADRANGLE LOCATION

Scale 1:24000

0 1/2 1 MILE

1000 0 1000 2000 3000 FEET

(SOURCE OF MAP IS USGS 7.5 MINUTE QUADRANGLE MAP, KIRKLAND (2015), ILLINOIS)

CHECK BY	SRS
DRAWN BY	OS
DATE	10-23-17
SCALE	AS SHOWN
CAD NO.	16013.01D4
PRJ NO.	15-16013

CROSS SECTION REFERENCE MAP

KIRKLAND QUICK STOP
411 MAIN STREET
KIRKLAND, ILLINOIS

SM&A
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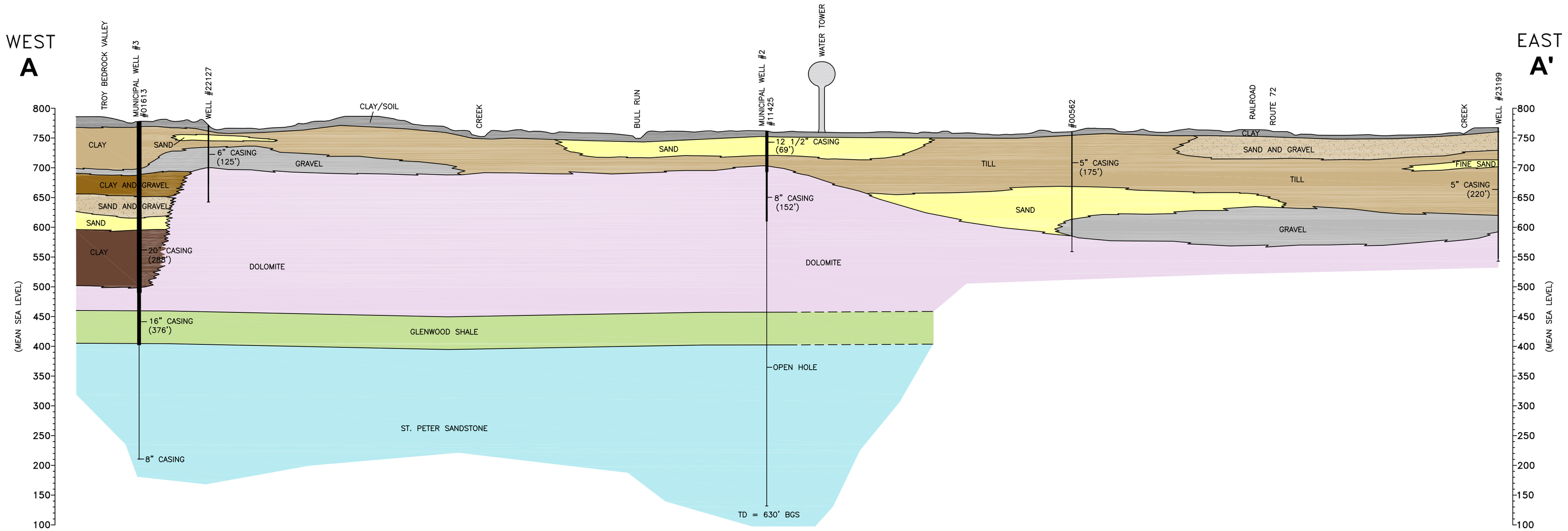
FIGURE
3



LEGEND

- WATER TABLE
- TOPSOIL
- SAND
- SAND & GRAVEL
- GRAVEL
- SILT/CLAY AND TILL
- SILT
- CLAY AND GRAVEL
- CLAY
- GALENA–PLATTEVILLE DOLOMITE
- GLENWOOD SHALE
- ST. PETER SANDTONE

HORIZONTAL SCALE IN FEET

0 300 600 1200

VERTICAL SCALE: 1"=120'

CHECK BY:	SRS
DRAWN BY:	OS
DATE:	8–8–16
SCALE:	AS SHOWN
CAD NO.:	16013.01C
PRJ NO.:	15–16013

SM&A
St. John - Mittelhauser & Associates

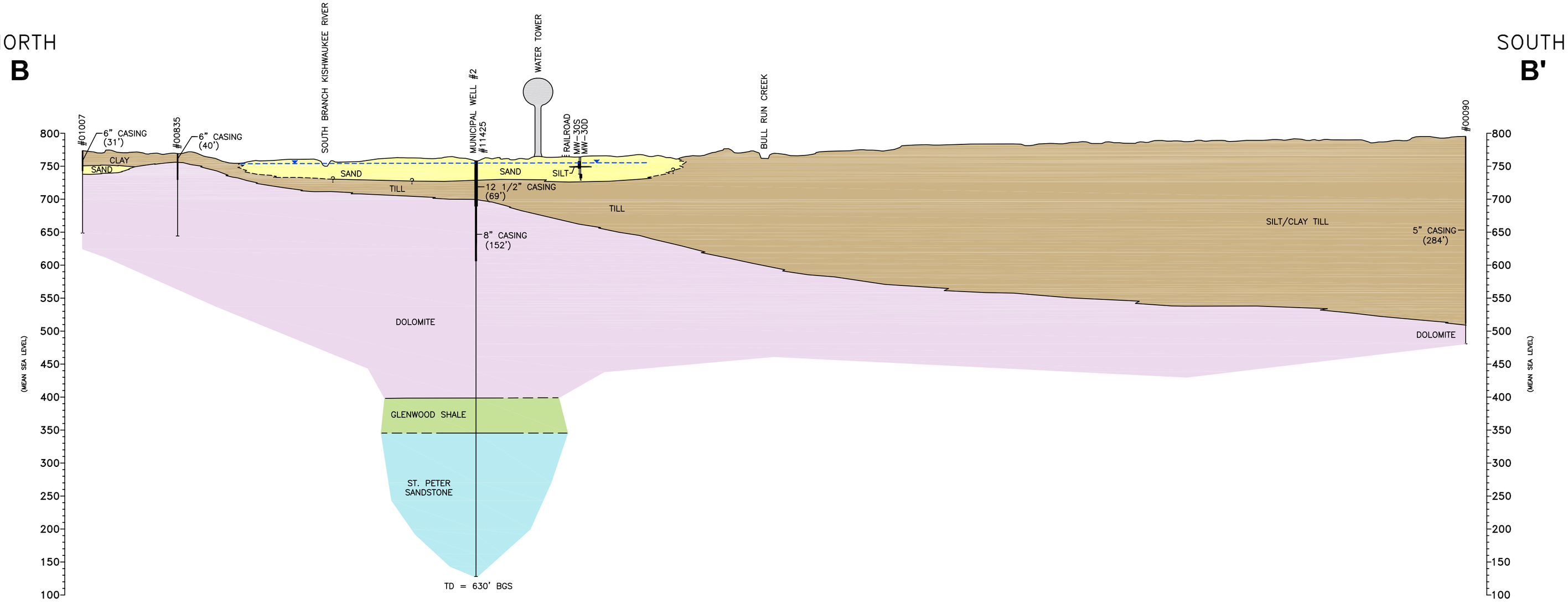
CROSS SECTION A–A'

411 MAIN STREET
KIRKLAND, ILLINOIS

FIGURE 4

NORTH
B

SOUTH
B'



LEGEND

- WATER TABLE
- SAND
- SAND & GRAVEL
- SILT/CLAY AND TILL
- SILT
- GALENA–PLATTEVILLE DOLOMITE
- GLENWOOD SHALE
- ST. PETER SANDTONE

HORIZONTAL SCALE IN FEET
0 300 600 1200

VERTICAL SCALE: 1"=120'

CHECK BY:	SRS
DRAWN BY:	OS
DATE:	8–8–16
SCALE:	AS SHOWN
CAD NO.:	16013.01C
PRJ NO.:	15–16013

SM&A
St. John - Mittelhauser & Associates

CROSS SECTION B–B'

411 MAIN STREET
KIRKLAND, ILLINOIS

FIGURE
5

NORTH
C

SOUTH
C'

MUNICIPAL WELL #2 (11425)
MW-31
WATER TOWER
SB-38/MW-20
RAILROAD
RAILROAD
EMERGENCY BACKUP WELL #1 (11424)
MW-30S
MW-30D

CLAY/SOIL
CLAYEY SILT
SAND/GRAVEL
12½" CASING
CLAY/TILL
CLAY/SOIL
CLAY
SILT AND CLAY
CLAY
SILT
CLAYEY SILT
SANDY CLAY
SAND/GRAVEL
FILL
SILT
7" CASING

GALENA DOLOMITE
8" CASING
DEOCORAH DOLOMITE
PLATTEVILLE DOLOMITE
GLENWOOD SHALE
OPEN HOLE
ST. PETER SANDSTONE
TOTAL DEPTH: 737'
TD = 630' BGS

(MEAN SEA LEVEL)

LEGEND

- WELL SCREEN
- WATER TABLE
- TOPSOIL
- SAND
- SAND & GRAVEL
- TILL/CLAY AND TILL
- SILT
- CLAY AND GRAVEL
- CLAY
- GLENWOOD SHALE
- ST. PETER SANDTONE
- DOLOMITE
- GRAVEL
- SANDY CLAY
- CLAYEY SILT
- FILL
- SILT AND CLAY

HORIZONTAL SCALE IN FEET
0 15 30 60

VERTICAL SCALE: 1"=30'

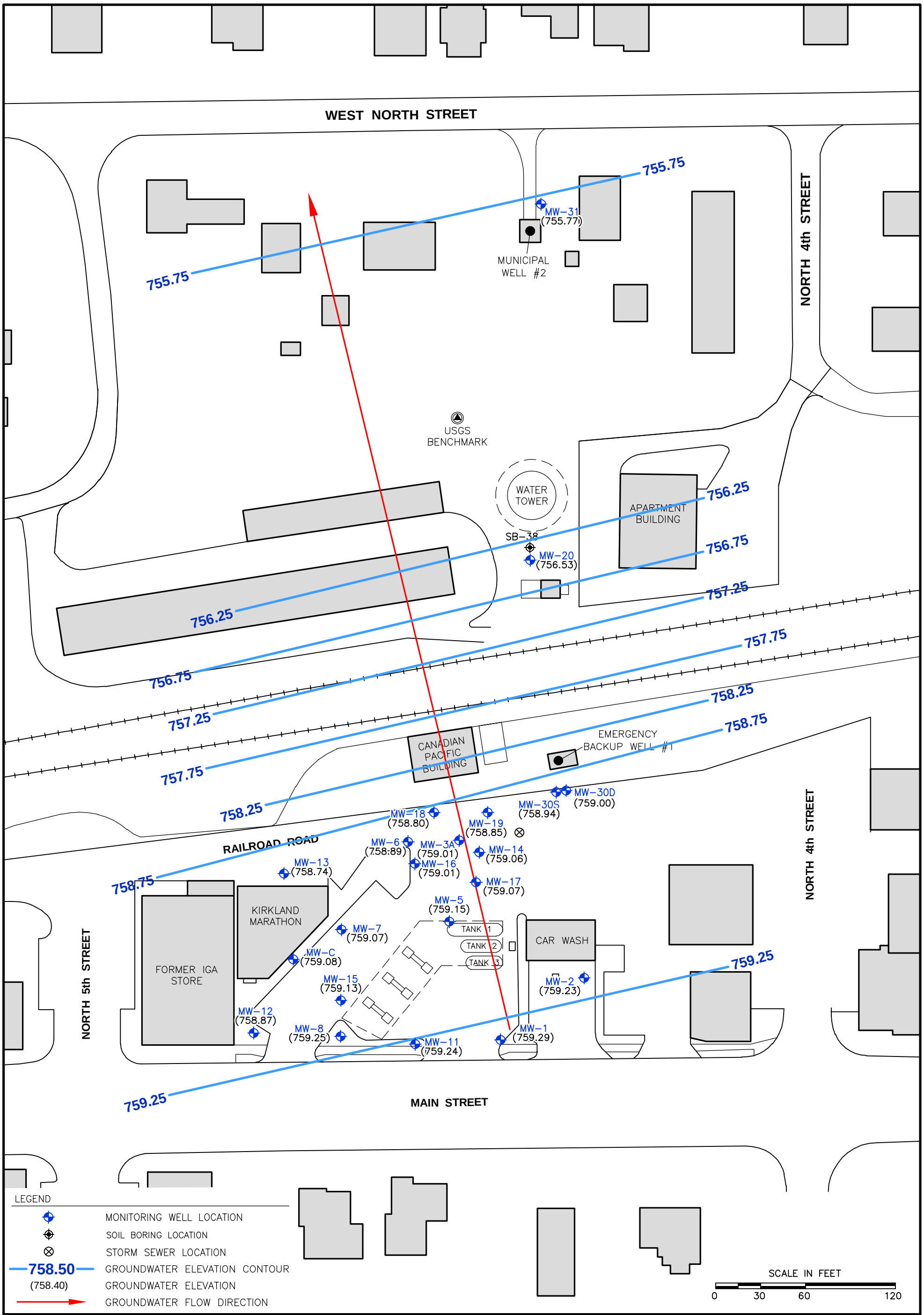
CHECK BY:	SRS
DRAWN BY:	OS
DATE:	10-23-17
SCALE:	AS SHOWN
CAD NO.:	16013.01C
PRJ NO.:	15-16013

SM&A
ST. JOHN - MITTELHAUSER & ASSOCIATES

CROSS SECTION C-C'

411 MAIN STREET
KIRKLAND, ILLINOIS

FIGURE
6



CHECK BY	SRS
DRAWN BY	OS
DATE	10–23–17
SCALE	AS SHOWN
CAD NO.	16013.01F3
PRJ NO.	15–16013

POTENTIOMETRIC SURFACE MAP
JUNE 28, 2017

411 MAIN STREET
KIRKLAND, ILLINOIS

SM&A
St. John · Mittelhauser & Associates

FIGURE
7

Figure 8
Water Level Data Recorded in MW-31

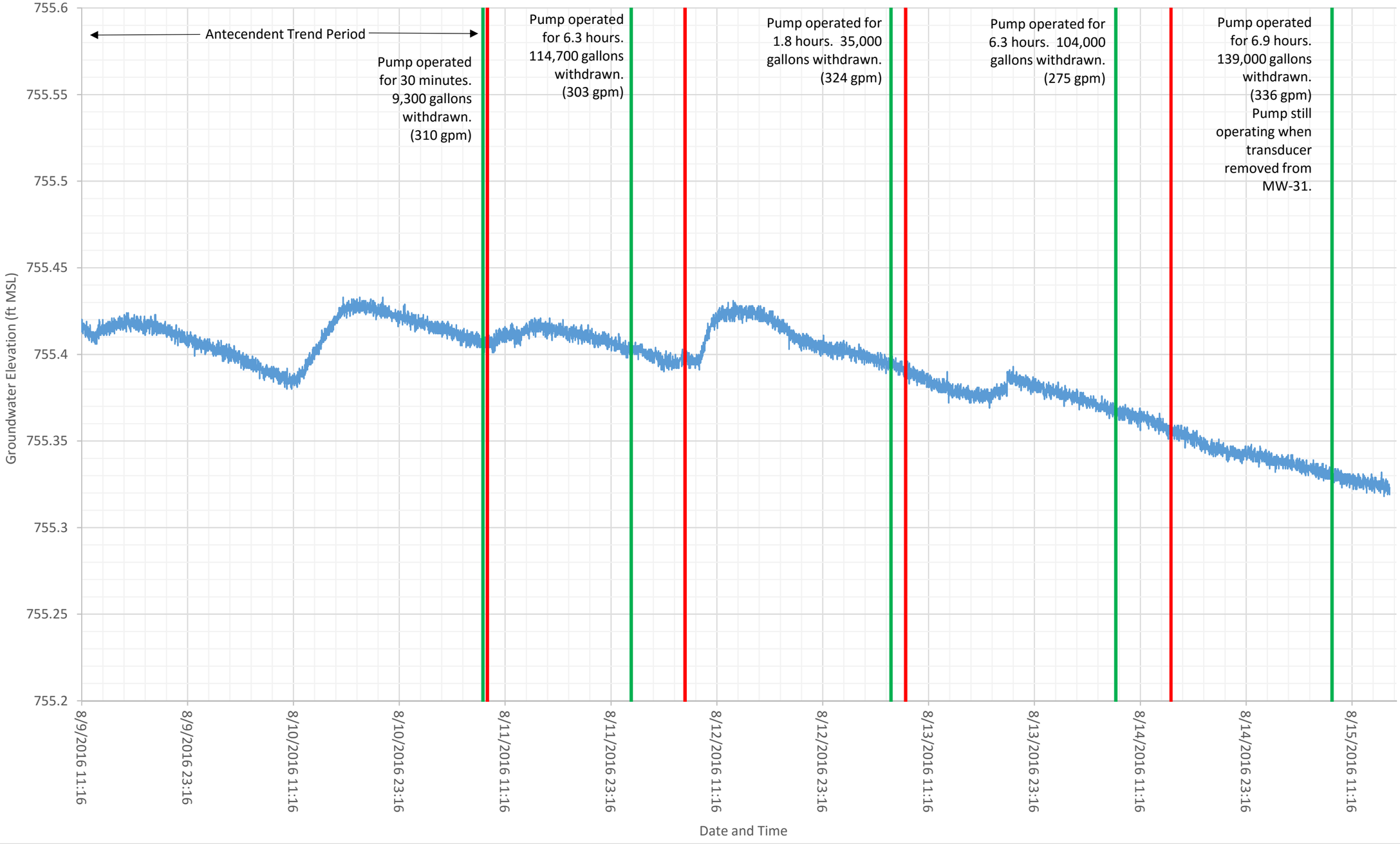
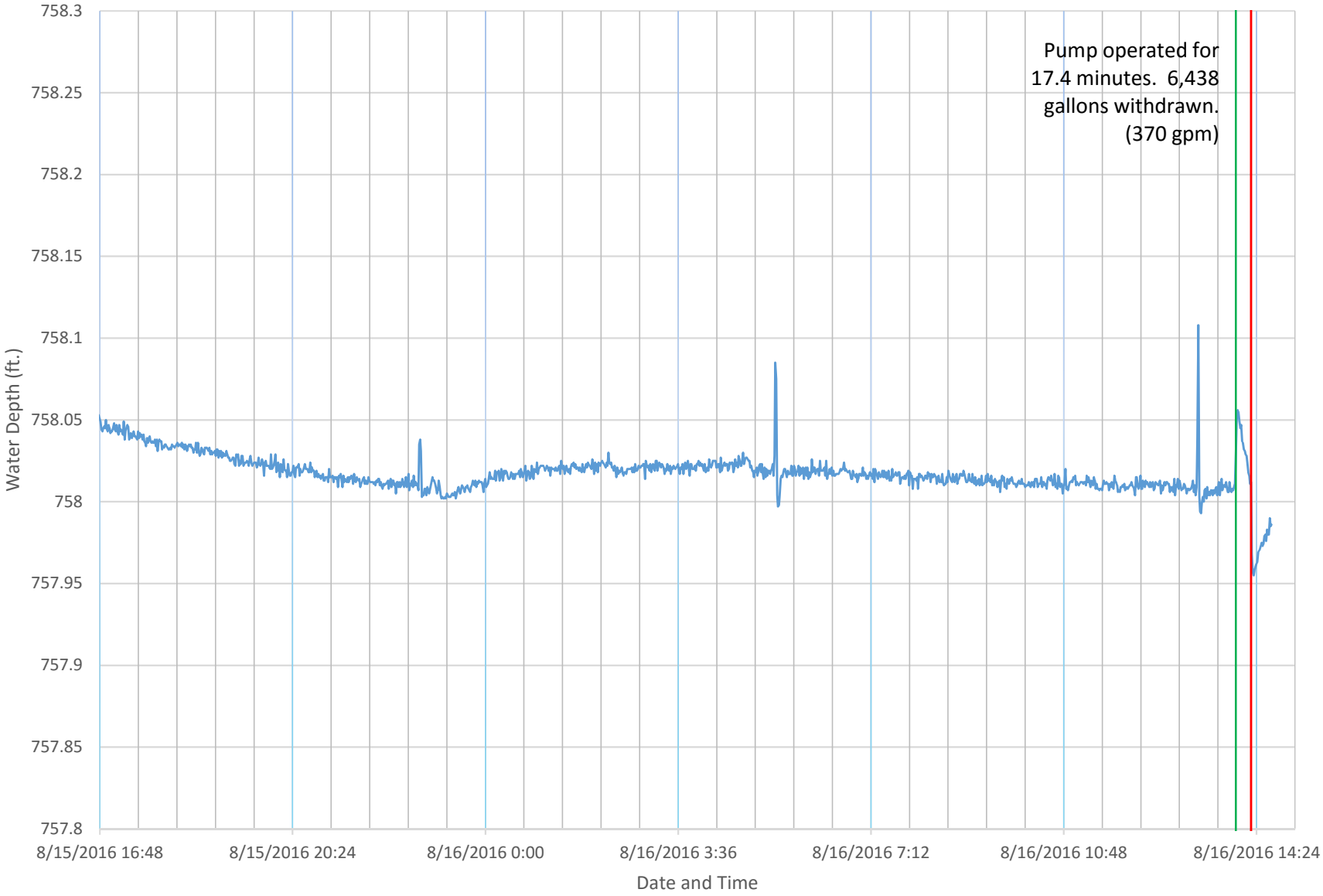


Figure 9
Water Level Data Recorded - MW-30D



MW-20

EMERGENCY BACKUP WELL #11424

CANADIAN PACIFIC BUILDING

MW-30S MW-30D

MW-18 MW-19

RAILROAD ROAD

MW-3 A-4 A MW-6 MW-3A A-2 MW-16 MW-14 MW-13 A-5 MW-17 B

FORMER KIRKLAND QUICK STOP (DEMOLISHED 2003)

MW-5 MW-3 11 12/14 13 2 3 1 4 5 A-1

KIRKLAND MARATHON

MW-7 MW-C A-3 A-6 MW-15

FORMER IGA STORE

(DEMOLISHED 2003)

FUEL ISLAND FUEL ISLAND

MW-12 MW-8 MW-11 MW-1 9 8 7 5

CAR WASH MW-2

NORTH 5th STREET

NORTH 4th STREET

MAIN STREET

LEGEND

- CURRENT MONITORING WELL LOCATION
- HISTORIC SOIL BORING/ MONITORING WELL LOCATION
- FORMER UST LOCATION
- CURRENT UST LOCATION

CHECK BY	SRS
DRAWN BY	OS
DATE	8-7-17
SCALE	AS SHOWN
CAD NO.	16013.01M8R
PRJ NO.	15-16013

KIRKLAND QUICK STOP
CURRENT FACILITY LAYOUT

411 MAIN STREET
KIRKLAND, ILLINOIS

SM&A
ST. JOHN · MITTELHAUSER & ASSOCIATES

FIGURE
10

Current and Former Underground Storage Tanks				
Tank #	Volume (gal)	Product	Install Date	Removal Date
A	12,000	Fuel Oil	As early as 1938	Sep-89
B	12,000	Fuel Oil	As early as 1938	Sep-89
1	2,000	Super Gasoline	Nov-78	Oct-93
2	1,000	Super Gasoline	Nov-78	Oct-93
3	1,000	Diesel Gasoline	Nov-78	Oct-93
4	5,000	Gasoline	Nov-78	Oct-93
5	5,000	Plus Gasoline	Nov-78	Oct-93
6	500	Gasoline	1940-1960	Nov-89
7	500	Gasoline	1940-1960	Nov-89
8	500	Gasoline	1940-1960	Nov-89
9	500	Waste Oil	1940-1960	Nov-89
10	300	Gasoline	1940-1960	Nov-89
11	10,000	Gasoline	Nov-93	In Use
12*	4,000	Gasoline	Nov-93	In Use
13	6,000	Diesel Fuel	Nov-93	In Use
14*	3,000	Gasoline	Nov-93	In Use

*Tanks 12 and 14 consist of a single UST with two separate compartments. The OSFM identifies each separate compartment as a UST.

Soil Boring A-5 (September 1991)		
Compound	Class I GRO (mg/l)	Analytical Result (mg/l)
Benzene	0.005	< 0.005
Ethylbenzene	0.7	< 0.005
Toluene	1	< 0.005
Xylenes	10	< 0.015

MW-2 (September 1991)		
Compound	Class I GRO (mg/l)	Analytical Result (mg/l)
Benzene	0.005	< 0.005
Ethylbenzene	0.7	< 0.005
Toluene	1	< 0.005
Xylenes	10	< 0.015
Fluoranthene	0.28	0.17
Fluorene	0.28	0.028
Phenanthrene	0.21	0.041

Soil Boring A-3 (September 1991)		
Compound	Class I GRO (mg/l)	Analytical Result (mg/l)
Benzene	0.005	< 0.005
Ethylbenzene	0.7	< 0.005
Toluene	1	< 0.005
Xylenes	10	< 0.015

Soil Boring A-4 (September 1991)		
Compound	Class I GRO (mg/l)	Analytical Result (mg/l)
Benzene	0.005	< 0.005
Ethylbenzene	0.7	< 0.005
Toluene	1	< 0.005
Xylenes	10	< 0.015

MW-3 (September 1991)		
Compound	Class I GRO (mg/l)	Analytical Result (mg/l)
Benzene	0.005	< 0.005
Ethylbenzene	0.7	< 0.005
Toluene	1	< 0.005
Xylenes	10	< 0.015
Anthracene	0.0021	0.00019
Benzo(a)anthracene	0.00013	0.00013
Chrysene	0.0015	0.00035
Fluoranthene	0.28	0.0074
Fluorene	0.28	0.0044
Phenanthrene	0.21	0.0047
Pyrene	0.21	0.0022

Soil Boring A-2 (September 1991)		
Compound	Class I GRO (mg/l)	Analytical Result (mg/l)
Benzene	0.005	5.4
Ethylbenzene	0.7	0.13
Toluene	1	0.12
Xylenes	10	0.082

Soil Boring A-1 (September 1991)		
Compound	Class I GRO (mg/l)	Analytical Result (mg/l)
Benzene	0.005	15.0
Ethylbenzene	0.7	0.33
Toluene	1	1.4
Xylenes	10	1.02

MW-1 (September 1991)		
Compound	Class I GRO (mg/l)	Analytical Result (mg/l)
Benzene	0.005	0.27
Ethylbenzene	0.7	0.16
Toluene	1	0.9
Xylenes	10	0.71
Anthracene	0.0021	0.0022
Benzo(a)anthracene	0.00013	0.0097
Chrysene	0.0015	0.027
Fluoranthene	0.28	0.17
Fluorene	0.28	0.028
Naphthalene	0.14	0.18
Phenanthrene	0.21	0.041
Pyrene	0.21	0.053

Soil Boring A-6 (September 1991)		
Compound	Class I GRO (mg/l)	Analytical Result (mg/l)
Benzene	0.005	1.1
Ethylbenzene	0.7	0.43
Toluene	1	0.09
Xylenes	10	1.46

MW-20
EMERGENCY BACKUP WELL #11424
CANADIAN PACIFIC BUILDING
MW-30S
MW-30D
MW-18
MW-19
A-4
MW-3
A
RAILROAD ROAD
A-5
MW-13
MW-6
MW-16
FORMER KIRKLAND QUICK STOP (DEMOLISHED 2003)
MW-3A
MW-14
B
MW-17
MW-5
A-2
KIRKLAND MARATHON
MW-7
MW-3
11
2 3
12/14
13
1
4 5
CAR WASH
A-1
MW-2
MW-2
MW-C
A-3
A-6
FORMER IGA STORE
RTH 5th STR
MW-15
10
MW-12
MW-8
MW-11
9 8
7 6
(DEMOLISHED 2003)
FUEL ISLAND
FUEL ISLAND
MW-1
NORTH 4th

LEGEND
- CURRENT MONITORING WELL LOCATION
- HISTORIC SOIL BORING/ MONITORING WELL LOCATION
- FORMER UST LOCATION
- CURRENT UST LOCATION

SCALE IN FEET
0 20 40 80

CHECK BY	SRS
DRAWN BY	CS
DATE	8-7-17
SCALE	AS SHOWN
CAD NO.	16013.01M9R
PRJ NO.	15-16013

HISTORICAL GROUNDWATER ANALYTICAL RESULTS
SEPTEMBER 1991

411 MAIN STREET
KIRKLAND, ILLINOIS

SM&A
ST. JOHN · MITTELHAUSER & ASSOCIATES

FIGURE
11

MW-6 (8/2/2016)		
Compound	Class I GRO (mg/l)	Analytical Result (mg/l)
BTEX	Various	All < Class I GRO
Benzo(a)anthracene	0.00013	0.00016
Benzo(a)pyrene	0.0002	0.00022
Benzo(k)fluoranthene	0.00017	0.00018
Diss. Iron	5.0	7.24
Lead	0.0075	<0.005
DO	--	0.04 mg/l

MW-16 (8/2/2016)		
Compound	Class I GRO (mg/l)	Analytical Result (mg/l)
BTEX	Various	All < Class I GRO
PNAs	Various	All < Class I GRO
Diss. Iron	5.0	0.10
Lead	0.0075	<0.005
DO	--	0.58 mg/l

MW-13 (8/2/2016)		
Compound	Class I GRO (mg/l)	Analytical Result (mg/l)
BTEX	Various	All < Class I GRO
PNAs	Various	All < Class I GRO
Diss. Iron	5.0	<0.05
Lead	0.0075	<0.005
DO	--	1.35 mg/l

MW-5 (8/3/2016)		
Compound	Class I GRO (mg/l)	Analytical Result (mg/l)
BTEX	Various	All < Class I GRO
PNAs	Various	All < Class I GRO
Diss. Iron	5.0	9.85
Lead	0.0075	<0.005
DO	--	0.04 mg/l

MW-7 (8/3/2016)		
Compound	Class I GRO (mg/l)	Analytical Result (mg/l)
BTEX	Various	All < Class I GRO
PNAs	Various	All < Class I GRO
Diss. Iron	5.0	<0.05
Lead	0.0075	<0.005
DO	--	0.47 mg/l

MW-C (8/3/2016)		
Compound	Class I GRO (mg/l)	Analytical Result (mg/l)
BTEX	Various	All < Class I GRO
PNAs	Various	All < Class I GRO
Diss. Iron	5.0	0.24
Lead	0.0075	<0.005
DO	--	0.10 mg/l

MW-12 (8/3/2016)		
Compound	Class I GRO (mg/l)	Analytical Result (mg/l)
BTEX	Various	All < Class I GRO
PNAs	Various	All < Class I GRO
Diss. Iron	5.0	<0.05
Lead	0.0075	<0.005
DO	--	2.36 mg/l

MW-15 (8/3/2016)		
Compound	Class I GRO (mg/l)	Analytical Result (mg/l)
Benzene	0.005	0.012
PNAs	Various	All < Class I GRO
Diss. Iron	5.0	12.70
Lead	0.0075	<0.005
DO	--	0.10 mg/l

MW-18 (8/2/2016)		
Compound	Class I GRO (mg/l)	Analytical Result (mg/l)
BTEX	Various	All < Class I GRO
PNAs	Various	All < Class I GRO
Diss. Iron	5.0	0.95
Lead	0.0075	<0.005
DO	--	1.75 mg/l

MW-20 (8/3/2016)		
Compound	Class I GRO (mg/l)	Analytical Result (mg/l)
BTEX	Various	All < Class I GRO
PNAs	Various	All < Class I GRO
Diss. Iron	5.0	<0.05
Lead	0.0075	<0.005
DO	--	0.59 mg/l

MW-19 (8/2/2016)		
Compound	Class I GRO (mg/l)	Analytical Result (mg/l)
BTEX	Various	All < Class I GRO
PNAs	Various	All < Class I GRO
Diss. Iron	5.0	0.34
Lead	0.0075	<0.005
DO	--	0.94 mg/l

MW-30S (8/3/2016)		
Compound	Class I GRO (mg/l)	Analytical Result (mg/l)
BTEX	Various	All < Class I GRO
PNAs	Various	All < Class I GRO
Diss. Iron	5.0	<0.05
Lead	0.0075	<0.005
DO	--	1.81 mg/l

MW-30D (8/3/2016)		
Compound	Class I GRO (mg/l)	Analytical Result (mg/l)
BTEX	Various	All < Class I GRO
PNAs	Various	All < Class I GRO
Diss. Iron	5.0	<0.05
Lead	0.0075	<0.005
DO	--	1.33 mg/l

MW-3 (8/3/2016)		
Compound	Class I GRO (mg/l)	Analytical Result (mg/l)
Benzene	0.005	0.0711
PNAs	Various	All < Class I GRO
Diss. Iron	5.0	11.70
Lead	0.0075	<0.005
DO	--	0.39 mg/l

MW-14 (8/3/2016)		
Compound	Class I GRO (mg/l)	Analytical Result (mg/l)
BTEX	Various	All < Class I GRO
Benzo(a)anthracene	0.00013	0.00164
Benzo(a)pyrene	0.0002	0.024
Benzo(b)fluoranthene	0.00017	0.00372
Benzo(k)fluoranthene	0.00018	0.00288
Chrysene	0.002	0.0034
Dibenzo(a,h)anthracene	0.0003	0.0005
Indeno(1,2,3-cd)pyrene	0.0004	0.0029
Diss. Iron	5.0	8.12
Lead	0.0075	<0.005
DO	--	0.02 mg/l

MW-17 (8/3/2016)		
Compound	Class I GRO (mg/l)	Analytical Result (mg/l)
BTEX	Various	All < Class I GRO
PNAs	Various	All < Class I GRO
Diss. Iron	5.0	<0.05
Lead	0.0075	<0.005
DO	--	2.96 mg/l

MW-2 (8/3/2016)		
Compound	Class I GRO (mg/l)	Analytical Result (mg/l)
BTEX	Various	All < Class I GRO
PNAs	Various	All < Class I GRO
Diss. Iron	5.0	0.11
Lead	0.0075	<0.005
DO	--	0.66 mg/l

MW-8 (8/3/2016)		
Compound	Class I GRO (mg/l)	Analytical Result (mg/l)
BTEX	Various	All < Class I GRO
PNAs	Various	All < Class I GRO
Diss. Iron	5.0	2.37
Lead	0.0075	<0.005
DO	--	0.19 mg/l

MW-11 (8/3/2016)		
Compound	Class I GRO (mg/l)	Analytical Result (mg/l)
BTEX	Various	All < Class I GRO
PNAs	Various	All < Class I GRO
Diss. Iron	5.0	0.09
Lead	0.0075	<0.005
DO	--	0.08 mg/l

MW-1 (8/3/2016)		
Compound	Class I GRO (mg/l)	Analytical Result (mg/l)
Benzene	0.005	0.0078
PNAs	Various	All < Class I GRO
Diss. Iron	5.0	4.80
Lead	0.0075	<0.005
DO	--	0.11 mg/l

400' SETBACK KIRKLAND EMERGENCY BACKUP WELL #1

400' SETBACK KIRKLAND MUNICIPAL WELL #2

KIRKLAND EMERGENCY BACKUP WELL #1 (11424)

WATER TOWER

APARTMENT BUILDING

CANADIAN PACIFIC BUILDING

KIRKLAND MARATHON

FORMER IGA STORE

CAR WASH

TANK 1

TANK 2

TANK 3

RAILROAD ROAD

MAIN STREET

NORTH 5th STREET

NORTH 4th STREET

SB-38

MW-1 MW-2 MW-3A MW-5 MW-6 MW-7 MW-8 MW-11 MW-12 MW-13 MW-14 MW-15 MW-16 MW-17 MW-18 MW-19 MW-20 MW-30D MW-30S MW-C

2.0 1.5 1.0 0.5

SCALE IN FEET

0 30 60 120

LEGEND

- MONITORING WELL LOCATION
- MONITORING WELL LOCATION THAT EXCEEDS GRO
- SOIL BORING LOCATION
- STORM SEWER LOCATION

GRO – GROUNDWATER REMEDIATION OBJECTIVE
DO – DISSOLVED OXYGEN
ALL RESULTS SHOWN IN mg/L

0.5 DISSOLVED OXYGEN ISOCONTOUR (DASHED WHERE INFERRED)

ANALYTICAL RESULT IN RED TEXT = GRO EXCEEDANCE

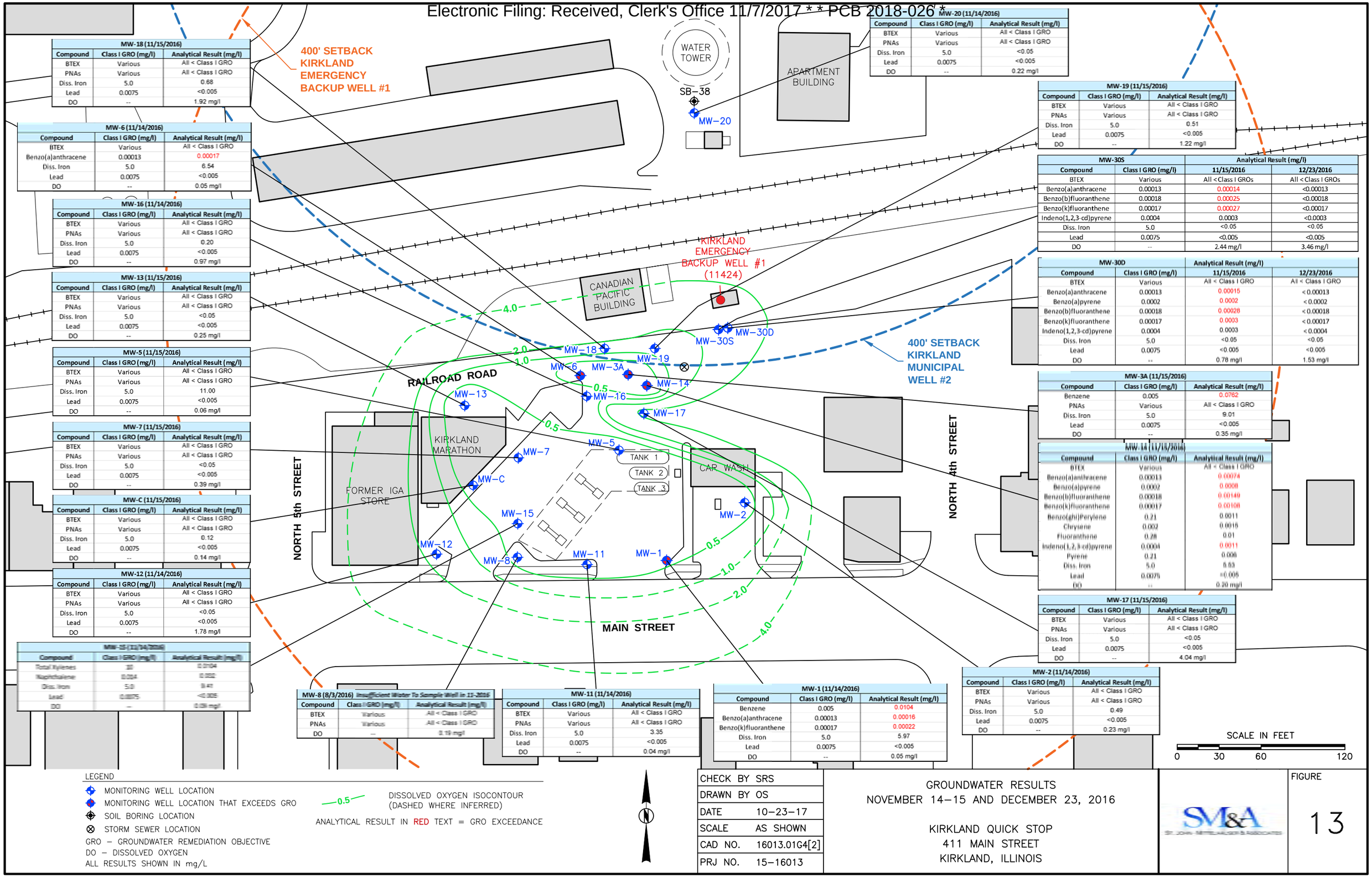
CHECK BY	SRS
DRAWN BY	OS
DATE	10-23-17
SCALE	AS SHOWN
CAD NO.	16013.01G6[2]
PRJ NO.	15-16013

GROUNDWATER RESULTS
AUGUST 2-3, 2016

KIRKLAND QUICK STOP
411 MAIN STREET
KIRKLAND, ILLINOIS

SM&A

FIGURE 12



MW-18 (11/15/2016)		
Compound	Class I GRO (mg/l)	Analytical Result (mg/l)
BTEX	Various	All < Class I GRO
PNAs	Various	All < Class I GRO
Diss. Iron	5.0	0.68
Lead	0.0075	<0.005
DO	--	1.92 mg/l

MW-6 (11/14/2016)		
Compound	Class I GRO (mg/l)	Analytical Result (mg/l)
BTEX	Various	All < Class I GRO
Benzo(a)anthracene	0.00013	0.00017
Diss. Iron	5.0	6.54
Lead	0.0075	<0.005
DO	--	0.05 mg/l

MW-16 (11/14/2016)		
Compound	Class I GRO (mg/l)	Analytical Result (mg/l)
BTEX	Various	All < Class I GRO
PNAs	Various	All < Class I GRO
Diss. Iron	5.0	0.20
Lead	0.0075	<0.005
DO	--	0.97 mg/l

MW-13 (11/15/2016)		
Compound	Class I GRO (mg/l)	Analytical Result (mg/l)
BTEX	Various	All < Class I GRO
PNAs	Various	All < Class I GRO
Diss. Iron	5.0	<0.05
Lead	0.0075	<0.005
DO	--	0.25 mg/l

MW-5 (11/15/2016)		
Compound	Class I GRO (mg/l)	Analytical Result (mg/l)
BTEX	Various	All < Class I GRO
PNAs	Various	All < Class I GRO
Diss. Iron	5.0	11.00
Lead	0.0075	<0.005
DO	--	0.06 mg/l

MW-7 (11/15/2016)		
Compound	Class I GRO (mg/l)	Analytical Result (mg/l)
BTEX	Various	All < Class I GRO
PNAs	Various	All < Class I GRO
Diss. Iron	5.0	<0.05
Lead	0.0075	<0.005
DO	--	0.39 mg/l

MW-C (11/15/2016)		
Compound	Class I GRO (mg/l)	Analytical Result (mg/l)
BTEX	Various	All < Class I GRO
PNAs	Various	All < Class I GRO
Diss. Iron	5.0	0.12
Lead	0.0075	<0.005
DO	--	0.14 mg/l

MW-12 (11/14/2016)		
Compound	Class I GRO (mg/l)	Analytical Result (mg/l)
BTEX	Various	All < Class I GRO
PNAs	Various	All < Class I GRO
Diss. Iron	5.0	<0.05
Lead	0.0075	<0.005
DO	--	1.78 mg/l

MW-15 (11/14/2016)		
Compound	Class I GRO (mg/l)	Analytical Result (mg/l)
Total Xylenes	10	0.0104
Naphthalene	0.014	0.052
Diss. Iron	5.0	9.41
Lead	0.0075	<0.005
DO	--	0.09 mg/l

MW-8 (8/3/2016) Insufficient Water To Sample Well in 11-2016		
Compound	Class I GRO (mg/l)	Analytical Result (mg/l)
BTEX	Various	All < Class I GRO
PNAs	Various	All < Class I GRO
DO	--	0.19 mg/l

MW-11 (11/14/2016)		
Compound	Class I GRO (mg/l)	Analytical Result (mg/l)
BTEX	Various	All < Class I GRO
PNAs	Various	All < Class I GRO
Diss. Iron	5.0	3.35
Lead	0.0075	<0.005
DO	--	0.04 mg/l

MW-1 (11/14/2016)		
Compound	Class I GRO (mg/l)	Analytical Result (mg/l)
Benzene	0.005	0.0104
Benzo(a)anthracene	0.00013	0.00016
Benzo(k)fluoranthene	0.00017	0.00022
Diss. Iron	5.0	5.97
Lead	0.0075	<0.005
DO	--	0.05 mg/l

MW-20 (11/14/2016)		
Compound	Class I GRO (mg/l)	Analytical Result (mg/l)
BTEX	Various	All < Class I GRO
PNAs	Various	All < Class I GRO
Diss. Iron	5.0	<0.05
Lead	0.0075	<0.005
DO	--	0.22 mg/l

MW-19 (11/15/2016)		
Compound	Class I GRO (mg/l)	Analytical Result (mg/l)
BTEX	Various	All < Class I GRO
PNAs	Various	All < Class I GRO
Diss. Iron	5.0	0.51
Lead	0.0075	<0.005
DO	--	1.22 mg/l

MW-30S		Analytical Result (mg/l)	
Compound	Class I GRO (mg/l)	11/15/2016	12/23/2016
BTEX	Various	All < Class I GROs	All < Class I GROs
Benzo(a)anthracene	0.00013	0.00014	<0.00013
Benzo(b)fluoranthene	0.00018	0.00025	<0.00018
Benzo(k)fluoranthene	0.00017	0.00027	<0.00017
Indeno(1,2,3-cd)pyrene	0.0004	0.0003	<0.0003
Diss. Iron	5.0	<0.05	<0.05
Lead	0.0075	<0.005	<0.005
DO	--	2.44 mg/l	3.46 mg/l

MW-30D		Analytical Result (mg/l)	
Compound	Class I GRO (mg/l)	11/15/2016	12/23/2016
BTEX	Various	All < Class I GRO	All < Class I GRO
Benzo(a)anthracene	0.00013	0.00015	< 0.00013
Benzo(a)pyrene	0.0002	0.0002	< 0.0002
Benzo(b)fluoranthene	0.00018	0.00028	< 0.00018
Benzo(k)fluoranthene	0.00017	0.0003	< 0.00017
Indeno(1,2,3-cd)pyrene	0.0004	0.0003	< 0.0004
Diss. Iron	5.0	<0.05	<0.05
Lead	0.0075	<0.005	<0.005
DO	--	0.78 mg/l	1.53 mg/l

MW-3A (11/15/2016)		
Compound	Class I GRO (mg/l)	Analytical Result (mg/l)
Benzene	0.005	0.0762
PNAs	Various	All < Class I GRO
Diss. Iron	5.0	9.01
Lead	0.0075	<0.005
DO	--	0.35 mg/l

MW-14 (11/15/2016)		
Compound	Class I GRO (mg/l)	Analytical Result (mg/l)
BTEX	Various	All < Class I GRO
Benzo(a)anthracene	0.00013	0.00074
Benzo(a)pyrene	0.0002	0.0008
Benzo(b)fluoranthene	0.00018	0.00149
Benzo(k)fluoranthene	0.00017	0.00108
Benzo(ghi)Perylene	0.21	0.0011
Chrysene	0.002	0.0016
Fluoranthene	0.28	0.01
Indeno(1,2,3-cd)pyrene	0.0004	0.0011
Pyrene	0.21	0.008
Diss. Iron	5.0	5.63
Lead	0.0075	<0.005
DO	--	0.20 mg/l

MW-17 (11/15/2016)		
Compound	Class I GRO (mg/l)	Analytical Result (mg/l)
BTEX	Various	All < Class I GRO
PNAs	Various	All < Class I GRO
Diss. Iron	5.0	<0.05
Lead	0.0075	<0.005
DO	--	4.04 mg/l

MW-2 (11/14/2016)		
Compound	Class I GRO (mg/l)	Analytical Result (mg/l)
BTEX	Various	All < Class I GRO
PNAs	Various	All < Class I GRO
Diss. Iron	5.0	0.49
Lead	0.0075	<0.005
DO	--	0.23 mg/l

LEGEND

- MONITORING WELL LOCATION
- MONITORING WELL LOCATION THAT EXCEEDS GRO
- SOIL BORING LOCATION
- STORM SEWER LOCATION

GRO – GROUNDWATER REMEDIATION OBJECTIVE
DO – DISSOLVED OXYGEN
ALL RESULTS SHOWN IN mg/L

0.5 DISSOLVED OXYGEN ISOCONTOUR (DASHED WHERE INFERRED)

ANALYTICAL RESULT IN RED TEXT = GRO EXCEEDANCE

CHECK BY	SRS
DRAWN BY	OS
DATE	10–23–17
SCALE	AS SHOWN
CAD NO.	16013.01G4[2]
PRJ NO.	15–16013

GROUNDWATER RESULTS
NOVEMBER 14–15 AND DECEMBER 23, 2016

KIRKLAND QUICK STOP
411 MAIN STREET
KIRKLAND, ILLINOIS

SM&A
ST. JOHN, MITTELAUER & ASSOCIATES

FIGURE
13

400' SETBACK KIRKLAND EMERGENCY BACKUP WELL #1

MW-16 (3/8/2017)		
Compound	Class I GRO (mg/l)	Analytical Result (mg/l)
BTEX	Various	All < Class I GRO
PNAs	Various	All < Class I GRO
Diss. Iron	5.0	0.14
Lead	0.0075	<0.005
DO	--	1.48 mg/l

MW-5 (3/8/2017)		
Compound	Class I GRO (mg/l)	Analytical Result (mg/l)
BTEX	Various	All < Class I GRO
Benzo(a)anthracene	0.00013	0.00016
Benzo(b)fluoranthene	0.00018	0.0002
Benzo(k)fluoranthene	0.00017	0.00024
Fluoranthene	0.28	0.0040
Diss. Iron	5.0	3.67
Lead	0.0075	<0.005
DO	--	0.41 mg/l

MW-13 (3/8/2017)		
Compound	Class I GRO (mg/l)	Analytical Result (mg/l)
BTEX	Various	All < Class I GRO
PNAs	Various	All < Class I GRO
Diss. Iron	5.0	<0.05
Lead	0.0075	<0.005
DO	--	1.34 mg/l

MW-7 (3/8/2017)		
Compound	Class I GRO (mg/l)	Analytical Result (mg/l)
BTEX	Various	All < Class I GRO
PNAs	Various	All < Class I GRO
Diss. Iron	5.0	<0.05
Lead	0.0075	<0.005
DO	--	1.32 mg/l

MW-C (3/8/2017)		
Compound	Class I GRO (mg/l)	Analytical Result (mg/l)
BTEX	Various	All < Class I GRO
PNAs	Various	All < Class I GRO
Diss. Iron	5.0	0.16
Lead	0.0075	<0.005
DO	--	1.56 mg/l

MW-12 (3/7/2017)		
Compound	Class I GRO (mg/l)	Analytical Result (mg/l)
BTEX	Various	All < Class I GRO
PNAs	Various	All < Class I GRO
Diss. Iron	5.0	<0.05
Lead	0.0075	<0.005
DO	--	6.77 mg/l

MW-15 (3/8/2017)		
Compound	Class I GRO (mg/l)	Analytical Result (mg/l)
Benzene	0.005	0.0072
Xylenes, Total	10.0	0.0162
Naphthalene	0.14	0.042
Diss. Iron	5.0	6.77
Lead	0.0075	<0.005
DO	--	0.40 mg/l

MW-6 (3/8/2017)		
Compound	Class I GRO (mg/l)	Analytical Result (mg/l)
BTEX	Various	All < Class I GRO
PNAs	0.00013	All < Class I GRO
Diss. Iron	5.0	5.81
Lead	0.0075	<0.005
DO	--	0.29 mg/l

MW-18 (3/7/2017)		
Compound	Class I GRO (mg/l)	Analytical Result (mg/l)
BTEX	Various	All < Class I GRO
PNAs	Various	All < Class I GRO
Diss. Iron	5.0	0.90
Lead	0.0075	<0.005
DO	--	2.17 mg/l

MW-20 (3/8/2017)		
Compound	Class I GRO (mg/l)	Analytical Result (mg/l)
BTEX	Various	All < Class I GRO
PNAs	Various	All < Class I GRO
Diss. Iron	5.0	<0.05
Lead	0.0075	<0.005
DO	--	1.40 mg/l

MW-19 (3/7/2017)		
Compound	Class I GRO (mg/l)	Analytical Result (mg/l)
BTEX	Various	All < Class I GRO
PNAs	Various	All < Class I GRO
Diss. Iron	5.0	0.33
Lead	0.0075	<0.005
DO	--	1.30 mg/l

MW-30S (3/7/2017)		
Compound	Class I GRO (mg/l)	Analytical Result (mg/l)
BTEX	Various	All < Class I GRO
PNAs	Various	All < Class I GRO
Diss. Iron	5.0	<0.05
Lead	0.0075	<0.005
DO	--	2.28 mg/l

MW-30D (3/7/2017)		
Compound	Class I GRO (mg/l)	Analytical Result (mg/l)
BTEX	Various	All < Class I GRO
PNAs	Various	All < Class I GRO
Diss. Iron	5.0	<0.05
Lead	0.0075	<0.005
DO	--	1.95 mg/l

MW-3A (3/8/2017)		
Compound	Class I GRO (mg/l)	Analytical Result (mg/l)
Benzene	0.005	0.132
Xylenes, Total	10.0	0.0057
Fluorene	0.28	0.004
Diss. Iron	5.0	10.70
Lead	0.0075	<0.005
DO	--	0.62 mg/l

MW-14 (3/8/2017)		
Compound	Class I GRO (mg/l)	Analytical Result (mg/l)
BTEX	Various	All < Class I GRO
PNAs	Various	All < Class I GRO
Diss. Iron	5.0	6.32
Lead	0.0075	<0.005
DO	--	0.45 mg/l

MW-17 (3/8/2017)		
Compound	Class I GRO (mg/l)	Analytical Result (mg/l)
BTEX	Various	All < Class I GRO
PNAs	Various	All < Class I GRO
Diss. Iron	5.0	<0.05
Lead	0.0075	<0.005
DO	--	4.74 mg/l

MW-2 (3/7/2017)		
Compound	Class I GRO (mg/l)	Analytical Result (mg/l)
BTEX	Various	All < Class I GRO
PNAs	Various	All < Class I GRO
Diss. Iron	5.0	<0.05
Lead	0.0075	<0.005
DO	--	0.73 mg/l

MW-8 (3/7/2017)		
Compound	Class I GRO (mg/l)	Analytical Result (mg/l)
Ethylbenzene	0.7	0.0077
PNAs	Various	All < Class I GRO
Diss. Iron	5.0	3.57
Lead	0.0075	<0.005
DO	--	0.35 mg/l

MW-11 / DUP-001 (3/7/2017)		
Compound	Class I GRO (mg/l)	Analytical Result (mg/l)
BTEX	Various	All < Class I GRO
PNAs	Various	All < Class I GRO
Diss. Iron	5.0	<0.05
Lead	0.0075	<0.005
DO	--	0.91 mg/l

MW-1 (3/7/2017)		
Compound	Class I GRO (mg/l)	Analytical Result (mg/l)
BTEX	Various	All < Class I GRO
Benzo(a)anthracene	0.00013	0.00018
Diss. Iron	5.0	0.99
Lead	0.0075	<0.005
DO	--	0.97 mg/l

WATER TOWER
APARTMENT BUILDING
SB-38
MW-20
KIRKLAND EMERGENCY BACKUP WELL #1 (11424)
CANADIAN PACIFIC BUILDING
400' SETBACK KIRKLAND MUNICIPAL WELL #2
MW-18
MW-30D
MW-30S
MW-19
MW-6
MW-3A
MW-14
RAILROAD ROAD
MW-13
MW-16
MW-17
KIRKLAND MARATHON
FORMER IGA STORE
MW-7
MW-5
TANK 1
TANK 2
TANK 3
CAR WASH
MW-C
MW-2
MW-15
MW-12
MW-8
MW-11
MW-1
NORTH 5th STREET
NORTH 4th STREET
MAIN STREET
2.0
1.5
1.0
0.5

SCALE IN FEET
0 30 60 120

LEGEND
- MONITORING WELL LOCATION
- MONITORING WELL LOCATION THAT EXCEEDS GRO
- SOIL BORING LOCATION
- STORM SEWER LOCATION

GRO – GROUNDWATER REMEDIATION OBJECTIVE
DO – DISSOLVED OXYGEN
ALL RESULTS SHOWN IN mg/L

0.5 DISSOLVED OXYGEN ISOCONTOUR (DASHED WHERE INFERRED)

ANALYTICAL RESULT IN RED TEXT = GRO EXCEEDANCE

CHECK BY	SRS
DRAWN BY	OS
DATE	10-23-17
SCALE	AS SHOWN
CAD NO.	16013.01G7[2]
PRJ NO.	15-16013

GROUNDWATER RESULTS
MARCH 7-8, 2017

KIRKLAND QUICK STOP
411 MAIN STREET
KIRKLAND, ILLINOIS

SM&A

FIGURE
14

400' SETBACK KIRKLAND EMERGENCY BACKUP WELL #1

400' SETBACK KIRKLAND MUNICIPAL WELL #2

KIRKLAND EMERGENCY BACKUP WELL #1 (11424)

WATER TOWER

APARTMENT BUILDING

CANADIAN PACIFIC BUILDING

KIRKLAND MARATHON

FORMER IGA STORE

CAR WASH

TANK 1

TANK 2

TANK 3

RAILROAD ROAD

NORTH 5th STREET

NORTH 4th STREET

MAIN STREET

SB-38

MW-1 MW-2 MW-3A MW-5 MW-6 MW-7 MW-8 MW-11 MW-12 MW-13 MW-14 MW-15 MW-16 MW-17 MW-18 MW-19 MW-20 MW-30D MW-30S MW-A MW-C

4.0 2.0 1.0 0.5

MW-18 (6/28/2017)

Compound	Class I GRO (mg/l)	Analytical Result (mg/l)
BTEX	Various	All Non-Detect
PNAs	Various	All Non-Detect
Diss. Iron	5.0	0.88
Lead	0.0075	<0.005
DO	--	1.19 mg/l

MW-6 (6/28/2017)

Compound	Class I GRO (mg/l)	Analytical Result (mg/l)
Benzo(a)anthracene	0.00013	0.00014
Benzo(b)fluoranthene	0.00017	0.00018
Diss. Iron	5.0	4.95
Lead	0.0075	<0.005
DO	--	0.00 mg/l

MW-20 (6/28/2017)

Compound	Class I GRO (mg/l)	Analytical Result (mg/l)
BTEX	Various	All Non-Detect
PNAs	Various	All Non-Detect
Diss. Iron	5.0	<0.05
Lead	0.0075	<0.005
DO	--	0.53 mg/l

MW-19 (6/28/2017)

Compound	Class I GRO (mg/l)	Analytical Result (mg/l)
BTEX	Various	All Non-Detect
PNAs	Various	All Non-Detect
Diss. Iron	5.0	0.31
Lead	0.0075	<0.005
DO	--	0.87 mg/l

MW-30S (6/28/2017)

Compound	Class I GRO (mg/l)	Analytical Result (mg/l)
BTEX	Various	All Non-Detect
PNAs	Various	All Non-Detect
Diss. Iron	5.0	<0.05
Lead	0.0075	<0.005
DO	--	5.37 mg/l

MW-30D (6/28/2017)

Compound	Class I GRO (mg/l)	Analytical Result (mg/l)
BTEX	Various	All Non-Detect
PNAs	Various	All Non-Detect
Diss. Iron	5.0	<0.05
Lead	0.0075	<0.005
DO	--	1.57 mg/l

MW-16 (6/28/2017)

Compound	Class I GRO (mg/l)	Analytical Result (mg/l)
BTEX	Various	All Non-Detect
PNAs	Various	All Non-Detect
Diss. Iron	5.0	0.44
Lead	0.0075	<0.005
DO	--	0.63 mg/l

MW-13 (6/28/2017)

Compound	Class I GRO (mg/l)	Analytical Result (mg/l)
BTEX	Various	All Non-Detect
PNAs	Various	All Non-Detect
Diss. Iron	5.0	<0.05
Lead	0.0075	<0.005
DO	--	1.80 mg/l

MW-3A (6/28/2017)

Compound	Class I GRO (mg/l)	Analytical Result (mg/l)
Benzene	0.005	0.133
Total Xylenes	10	0.0071
Benzo(a)anthracene	0.00013	0.00028
Flourene	0.28	0.005
Diss. Iron	5.0	6.1
Lead	0.0075	<0.005
DO	--	0.15 mg/l

MW-7 (6/28/2017)

Compound	Class I GRO (mg/l)	Analytical Result (mg/l)
BTEX	Various	All Non-Detect
Benzo(a)anthracene	0.00013	0.0048
Benzo(a)pyrene	0.0002	0.0006
Benzo(b)fluoranthene	0.00018	0.0007
Benzo(k)fluoranthene	0.00017	0.00082
Benzo(g,h,i)perylene	0.21	0.0006
Indeno(1,2,3-cd)pyrene	0.00043	0.0005
Diss. Iron	5.0	0.08
Lead	0.0075	<0.005
DO	--	1.2 mg/l

MW-14 (6/28/2017)

Compound	Class I GRO (mg/l)	Analytical Result (mg/l)
BTEX	Various	All Non-Detect
Benzo(a)anthracene	0.00013	0.00028
Benzo(a)pyrene	0.0002	0.0008
Benzo(b)fluoranthene	0.00018	0.00108
Benzo(k)fluoranthene	0.00017	0.00088
Benzo(g,h,i)perylene	0.21	0.0008
Fluoranthene	0.28	0.005
Indeno(1,2,3-cd)pyrene	0.00043	0.0008
Pyrene	0.21	0.003
Diss. Iron	5.0	9.75
Lead	0.0075	<0.005
DO	--	0.07 mg/l

MW-C (6/28/2017)

Compound	Class I GRO (mg/l)	Analytical Result (mg/l)
BTEX	Various	All Non-Detect
PNAs	Various	All Non-Detect
Diss. Iron	5.0	<0.05
Lead	0.0075	<0.005
DO	--	0.16 mg/l

MW-17 (6/28/2017)

Compound	Class I GRO (mg/l)	Analytical Result (mg/l)
BTEX	Various	All Non-Detect
PNAs	Various	All Non-Detect
Diss. Iron	5.0	<0.05
Lead	0.0075	<0.005
DO	--	3.67 mg/l

MW-15 (6/28/2017)

Compound	Class I GRO (mg/l)	Analytical Result (mg/l)
Benzene	0.005	0.0144
Total Xylenes	10	0.0148
Naphthalene	0.14	0.042
Diss. Iron	5.0	7.56
Lead	0.0075	<0.005
DO	--	0.11 mg/l

MW-5 (6/28/2017)

Compound	Class I GRO (mg/l)	Analytical Result (mg/l)
Ethylbenzene	0.7	0.0053
Flourene	0.28	0.002
Diss. Iron	5.0	6.74
Lead	0.0075	<0.005
DO	--	0.15 mg/l

MW-12 (6/28/2017)

Compound	Class I GRO (mg/l)	Analytical Result (mg/l)
BTEX	Various	All Non-Detect
PNAs	Various	All Non-Detect
Diss. Iron	5.0	<0.05
Lead	0.0075	<0.005
DO	--	2.68 mg/l

MW-2 (6/28/2017)

Compound	Class I GRO (mg/l)	Analytical Result (mg/l)
BTEX	Various	All < Class I GRO
PNAs	Various	All < Class I GRO
Diss. Iron	5.0	0.14
Lead	0.0075	<0.005
DO	--	0.83 mg/l

MW-8 (6/28/2017)

Compound	Class I GRO (mg/l)	Analytical Result (mg/l)
BTEX	Various	All Non-Detect
PNAs	Various	All Non-Detect
Diss. Iron	5.0	0.93
Lead	0.0075	<0.005
DO	--	0.3 mg/l

MW-1 (6/28/2017)

Compound	Class I GRO (mg/l)	Analytical Result (mg/l)
BTEX	Various	All Non-Detect
PNAs	Various	All Non-Detect
Diss. Iron	5.0	0.29
Lead	0.0075	<0.005
DO	--	0.73 mg/l

MW-11 (6/28/2017)

Compound	Class I GRO (mg/l)	Analytical Result (mg/l)
BTEX	Various	All Non-Detect
PNAs	Various	All Non-Detect
Diss. Iron	5.0	<0.05
Lead	0.0075	<0.005
DO	--	0.55 mg/l

SCALE IN FEET

0 30 60 120

LEGEND

- MONITORING WELL LOCATION
- MONITORING WELL LOCATION THAT EXCEEDS GRO
- SOIL BORING LOCATION
- STORM SEWER LOCATION

GRO – GROUNDWATER REMEDIATION OBJECTIVE
DO – DISSOLVED OXYGEN
ALL RESULTS SHOWN IN mg/L

0.5 DISSOLVED OXYGEN ISOCONTOUR (DASHED WHERE INFERRED)

ANALYTICAL RESULT IN RED TEXT = GRO EXCEEDANCE

CHECK BY	SRS
DRAWN BY	OS
DATE	10-23-17
SCALE	AS SHOWN
CAD NO.	16013.01G8[2]
PRJ NO.	15-16013

GROUNDWATER RESULTS
JUNE 28, 2017

KIRKLAND QUICK STOP
411 MAIN STREET
KIRKLAND, ILLINOIS

SM&A

FIGURE 15

TABLES

TABLE 1
Groundwater Level Measurements

0370305005 - DeKalb County / Kirkland, Illinois
Kirkland Quick Stop / Blake Leasing

Well ID	TOC [1] (MSL)	August 9, 2016		November 14, 2016		March 7, 2017		June 28, 2017	
		Depth to Water [2]	Static Water Elevation (MSL)	Depth to Water [2]	Static Water Elevation (MSL)	Depth to Water [2]	Static Water Elevation (MSL)	Depth to Water [2]	Static Water Elevation (MSL)
MW-1	767.28	8.83	758.45	9.41	757.87	8.30	758.98	7.99	759.29
MW-2	767.66	9.22	758.44	9.80	757.86	8.69	758.97	8.43	750.01
MW-3A	766.94	8.69	758.25	9.20	757.74	8.15	758.79	7.93	750.32
MW-5	767.44	9.07	758.37	9.63	757.81	8.50	758.94	8.29	750.08
MW-6	767.00	8.84	758.16	9.42	757.58	8.30	758.70	8.11	750.05
MW-7	768.44	10.14	758.30	10.70	757.74	9.06	759.38	9.37	748.93
MW-8	769.13	10.68	758.45	11.27	757.86	10.24	758.89	9.88	748.57
MW-11	767.93	9.46	758.47	10.04	757.89	9.01	758.92	8.69	749.78
MW-12	768.78	10.39	758.39	10.95	757.83	9.98	758.80	9.91	748.48
MW-13	768.26	10.25	758.01	10.81	757.45	9.73	758.53	9.52	748.49
MW-14	766.46	8.16	758.30	8.69	757.77	7.64	758.82	7.40	750.90
MW-15	768.11	9.71	758.40	10.28	757.83	9.29	758.82	8.98	749.42
MW-16	767.04	8.79	758.25	9.35	757.69	8.24	758.80	8.03	750.22
MW-17	766.82	8.45	758.37	9.06	757.76	7.99	758.83	7.75	750.62
MW-18	766.72	8.66	758.06	9.18	757.54	8.10	758.62	7.92	750.14
MW-19	766.20	8.10	758.10	8.62	757.58	7.54	758.66	7.35	750.75
MW-20	763.38	7.55	755.83	7.75	755.63	6.74	756.64	6.85	748.98
MW-30D	765.35	7.10	758.25	7.63	757.72	6.60	758.75	6.35	751.90
MW-30S	765.50	7.31	758.19	7.83	757.67	6.78	758.72	6.56	751.63
MW-31	766.88	11.79	755.09	11.90	754.98	10.95	755.93	11.11	743.98
MW-C	769.35	11.05	758.30	11.61	757.74	10.58	758.77	10.27	748.03

NOTES:
[1] Survey Date: May 9, 2016: USGS Marker S-130 Located 42 05 38 (N), 88 50 53 (W) 763.68 feet MSL
[2] Measured from Top of Riser
ft = feet
MSL = Mean Sea Level
TOC = Top of Casing

TABLE 2
Historic Groundwater Analytical Results (2001 - 2017)

0370305005 - DeKalb County / Kirkland, Illinois
Kirkland Quick Stop / Blake Leasing

Contaminant of Concern	Class I Groundwater Remediation Objective [1]	MW-C						MW-1					MW-2	
		Nov-12	Jun-14	May-15	Aug-16	Nov-16	Mar-17	Aug-01	May-15	Aug-16	Nov-16	Mar-17	Aug-01	May-15
BTEX (mg/l)														
Benzene	0.005	<	<0001	<0001	<0.005	<0.005	<0.005	<0.005	**0.0072**	**0.0078**	**0.0104**	<0.005	<0.005	<0001
Ethylbenzene	0.7	<	<0.001	<0.001	<0.005	<0.005	<0.005	<0.005	<0.001	<0.005	<0.005	<0.005	<0.005	<0.001
Toluene	1	<	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Xylene, Total	10	<	<0.003	<0.003	<0.005	<0.005	<0.005	<0.005	<0.003	<0.005	<0.005	<0.005	<0.005	<0.003
PNAs (mg/l)														
Acenaphthene	0.42	NA	<0.00005	<0.00005	<0.01	<0.01	<0.01	<0.01	**0.00034**	<0.01	<0.01	<0.01	<0.01	<0.00005
Acenaphthylene	0.21	NA	<0.00005	<0.00005	<0.01	<0.01	<0.01	<0.01	<0.00005	<0.01	<0.01	<0.01	<0.01	<0.00005
Anthracene	2.1	NA	<0.00005	<0.00005	<0.005	<0.005	<0.005	<0.005	**0.000056**	<0.005	<0.005	<0.005	<0.005	<0.00005
Benzo(a)anthracene	0.00013	NA	<0.00005	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013	<0.00005	<0.00013	**0.00016**	**0.00018**	<0.00013	<0.00005
Benzo(a)pyrene	0.0002	NA	<0.00005	<0.00005	<0.0002	<0.0002	<0.0002	<0.0002	<0.00005	<0.0002	<0.0002	<0.0002	<0.0002	<0.00005
Benzo(b)fluoranthene	0.00018	NA	<0.00005	<0.00005	<0.00018	<0.00018	<0.00018	<0.00018	<0.00005	<0.00018	<0.00018	<0.00018	<0.00018	<0.00005
Benzo(k)fluoranthene	0.00017	NA	<0.00005	<0.00005	<0.00017	<0.00017	<0.00017	<0.00017	<0.00005	<0.00017	**0.00022**	<0.00017	<0.00017	<0.00005
Benzo(ghi)perylene	0.21	NA	<0.00005	<0.00005	<0.0004	<0.0004	<0.0004	<0.0004	<0.00005	<0.0004	<0.0004	<0.0004	<0.0004	<0.00005
Chrysene	0.0015	NA	<0.00005	<0.00005	<0.0015	<0.0015	<0.0015	<0.0015	<0.00005	<0.0015	<0.0015	<0.0015	<0.0015	<0.00005
Dibenzo(a,h)anthracene	0.0003	NA	<0.00005	<0.00005	<0.0003	<0.0003	<0.0003	<0.0003	<0.00005	<0.0003	<0.0003	<0.0003	<0.0003	<0.00005
Fluoranthene	0.28	NA	<0.00005	<0.00005	<0.002	<0.002	<0.002	<0.002	**0.00011**	<0.002	<0.002	<0.002	<0.002	<0.00005
Fluorene	0.28	NA	<0.00005	<0.00005	<0.002	<0.002	<0.002	<0.002	**0.00041**	<0.002	<0.002	<0.002	<0.002	<0.00005
Indeno(1,2,3-cd)pyrene	0.00043	NA	<0.00005	<0.00005	<0.0003	<0.0003	<0.0003	<0.0003	<0.00005	<0.0003	<0.0003	<0.0003	<0.0003	<0.00005
Naphthalene	0.14	NA	<0.00025	0.00094	<0.01	<0.01	<0.01	<0.01	**0.0003**	<0.01	<0.01	<0.01	<0.01	<0.00025
Phenanthrene	0.21	NA	<0.00005	<0.00005	<0.005	<0.005	<0.005	<0.005	**0.00018**	<0.005	<0.005	<0.005	<0.005	<0.00005
Pyrene	0.21	NA	<0.00005	<0.00005	<0.002	<0.002	<0.002	<0.002	**0.00011**	<0.002	<0.002	<0.002	<0.002	<0.00005
Total Metals (6010C)														
Iron		NA	NA	10	3.57	1.52	6.75	NA	6.6	5.97	6.81	1.22	NA	1.7
Lead	0.0075	NA	<	<	<0.005	<0.005	<0.005	NA	<	<0.005	<0.005	<0.005	NA	<
Dissolved Metals (6010C)														
Iron, diss.		NA	NA	NA	0.24	0.12	0.16	NA	NA	4.80	5.97	0.99	NA	NA
Lead, diss.	0.0075	NA	NA	NA	<0.005	<0.005	<0.005	NA	NA	<0.005	<0.005	<0.005	NA	NA
Field Parameters														
pH	6.5 - 9	NA	7.30	NA	6.78	7.05	7.08	NA	7.40	6.60	6.74	6.57	NA	6.80
Temperature (^{o}C)	--	NA	NA	NA	17.43	17.79	13.17	NA	NA	16.96	17.64	11.34	NA	NA
Specific Conductivity (µS/cm)	--	NA	NA	NA	2,139.9	2,785.2	1,778.7	NA	NA	1,178.9	1,230.7	1,260.1	NA	NA
Dissolved Oxygen (mg/l)	--	NA	NA	NA	0.10	0.14	1.56	NA	NA	0.11	0.05	0.97	NA	NA
Turbidity (NTU)	--	NA	NA	NA	75.80	36.26	127.70	NA	NA	18.32	224.91	3.99	NA	NA
ORP (mV)	--	NA	NA	NA	60.2	199.7	158.0	NA	NA	-69.3	-91.4	63.0	NA	NA

Notes:
[1] 35 IAC 620
"<" = Historic analytical table indicated constituent not detected above laboratory reporting limits.
NS = Not Sampled, Insufficient Water
NA = Not Analyzed
BOLD Identified above laboratory detection limits
BOLD Exceeds Class I GRO
Results reported in milligrams per liter (mg/l) or parts per million.

TABLE 2
Historic Groundwater Analytical Results (2001 - 2017)

0370305005 - DeKalb County / Kirkland, Illinois
Kirkland Quick Stop / Blake Leasing

Contaminant of Concern	Class I Groundwater Remediation Objective [1]	MW-2			MW-3A									
		Aug-16	Nov-16	Mar-17	Aug-01	May-02	Apr-03	Dec-03	Apr-04	Jun-05	Apr-06	Jul-06	Mar-07	Mar-08
BTEX (mg/l)														
Benzene	0.005	<0.005	<0.005	<0.005	0.0382	<0.005	**0.408**	**0.586**	**0.172**	**0.0242**	**0.0231**	**0.0204**	**0.0109**	<0.005
Ethylbenzene	0.7	<0.005	<0.005	<0.005	<0.005	<0.005	**0.0195**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Toluene	1	<0.005	<0.005	<0.005	<0.005	<0.005	**0.0099**	**0.0224**	**0.012**	<0.005	**0.0238**	<0.005	<0.005	<0.005
Xylene, Total	10	<0.005	<0.005	<0.005	**0.0059**	<0.005	**0.0232**	**0.0416**	**0.0236**	<0.005	<0.005	**0.0051**	<0.005	<0.005
PNAs (mg/l)														
Acenaphthene	0.42	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Acenaphthylene	0.21	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Anthracene	2.1	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Benzo(a)anthracene	0.00013	<0.00013	<0.00013	<0.00013	<0.00013	<0.00013	<0.00013	<0.00013	<0.00013	<0.00013	0.00015	<0.00013	<0.00013	**0.00022**
Benzo(a)pyrene	0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Benzo(b)fluoranthene	0.00018	<0.00018	<0.00018	<0.00018	<0.00018	<0.00018	<0.00018	<0.00018	<0.00018	<0.00018	<0.00018	<0.00018	<0.00018	<0.00018
Benzo(k)fluoranthene	0.00017	<0.00017	<0.00017	<0.00017	<0.00017	<0.00017	<0.00017	<0.00017	<0.00017	<0.00017	<0.00017	<0.00017	<0.00017	**0.00021**
Benzo(ghi)perylene	0.21	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004
Chrysene	0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015
Dibenzo(a,h)anthracene	0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Fluoranthene	0.28	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Fluorene	0.28	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Indeno(1,2,3-cd)pyrene	0.00043	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Naphthalene	0.14	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Phenanthrene	0.21	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Pyrene	0.21	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Total Metals (6010C)														
Iron		0.24	0.44	0.37	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	0.0075	<0.005	<0.005	<0.005	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dissolved Metals (6010C)														
Iron, diss.		0.11	0.49	<0.05	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead, diss.	0.0075	<0.005	<0.005	<0.005	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Field Parameters														
pH	6.5 - 9	6.59	6.77	6.46	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Temperature (°C)	--	17.50	17.36	11.12	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Specific Conductivity (µS/cm)	--	2,325.2	1,520.4	2,056.4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dissolved Oxygen (mg/l)	--	0.66	0.23	0.73	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Turbidity (NTU)	--	48.64	113.04	41.64	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ORP (mV)	--	131.2	149.8	208.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
[1] 35 IAC 620
"<" = Historic analytical table indicated constituent not detected above laboratory reporting limits.
NS = Not Sampled, Insufficient Water
NA = Not Analyzed
BOLD Identified above laboratory detection limits
BOLD Exceeds Class I GRO
Results reported in milligrams per liter (mg/l) or parts per million.

TABLE 2
Historic Groundwater Analytical Results (2001 - 2017)

0370305005 - DeKalb County / Kirkland, Illinois
Kirkland Quick Stop / Blake Leasing

Contaminant of Concern	Class I Groundwater Remediation Objective [1]	MW-3A								MW-4	MW-5			
		Feb-09	Nov-12	Jun-14	Aug-14	May-15	Aug-16	Nov-16	Mar-17	Aug-01	Aug-01	May-02	Apr-03	Dec-03
BTEX (mg/l)														
Benzene	0.005	<0.005	**0.03**	**0.031**	**0.063**	<0.001	**0.0711**	**0.0762**	**0.132**	<0.005	**0.235**	**0.192**	**0.0744**	**0.0299**
Ethylbenzene	0.7	<0.005	<	<0.001	<0.001	<0001	<0.005	<0.005	<0.005	<0.005	**0.301**	**0.165**	**0.0324**	**0.0272**
Toluene	1	<0.005	<	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	**0.0135**	**0.0128**	**0.0053**	<0.005
Xylene, Total	10	<0.005	<	**0.0036**	**0.013**	<0.003	<0.005	<0.005	**0.0057**	**0.0057**	**0.661**	**0.214**	**0.190**	**0.0808**
PNAs (mg/l)														
Acenaphthene	0.42	<0.01	NA	**0.0014**	**0.0013**	**0.0017**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Acenaphthylene	0.21	<0.01	NA	**0.00012**	**0.0002**	**0.00022**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Anthracene	2.1	<0.005	NA	**0.00024**	**0.0002**	**0.00018**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Benzo(a)anthracene	0.00013	**0.00037**	NA	**0.0001**	**0.000016**	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013	<0.00013	<0.00013	<0.00013	<0.00013
Benzo(a)pyrene	0.0002	**0.0004**	NA	**0.00016**	<0.00005	<0.00005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Benzo(b)fluoranthene	0.00018	**0.00036**	NA	**0.0003**	<0.00005	<0.00005	<0.00018	<0.00018	<0.00018	<0.00018	<0.00018	<0.00018	<0.00018	<0.00018
Benzo(k)fluoranthene	0.00017	**0.00046**	NA	**0.00023**	<0.00005	<0.00005	<0.00017	<0.00017	<0.00017	<0.00017	<0.00017	<0.00017	<0.00017	<0.00017
Benzo(ghi)perylene	0.21	<0.004	NA	**0.000083**	<0.00005	<0.00005	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004
Chrysene	0.0015	<0.0015	NA	**0.00018**	**0.000026**	<0.00005	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015
Dibenzo(a,h)anthracene	0.0003	<0.0003	NA	<0.00005	<0.00005	<0.00005	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Fluoranthene	0.28	**0.003**	NA	**0.00066**	**0.00012**	**0.000057**	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Fluorene	0.28	<0.002	NA	**0.0017**	**0.0016**	**0.0021**	**0.003**	**0.004**	**0.004**	<0.002	<0.002	<0.002	<0.002	<0.002
Indeno(1,2,3-cd)pyrene	0.00043	**0.0003**	NA	**0.00017**	<0.00005	<0.00005	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Naphthalene	0.14	<0.01	NA	**0.0011**	**0.0014**	**0.0032**	<0.01	<0.01	<0.01	<0.01	**0.051**	**0.016**	<0.01	**0.012**
Phenanthrene	0.21	<0.005	NA	**0.00073**	**0.0012**	**0.0013**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Pyrene	0.21	<0.002	NA	**0.00052**	**0.00012**	0.000071	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Total Metals (6010C)														
Iron		NA	NA	NA	NA	7	11.8	8.98	12.3	NA	NA	NA	NA	NA
Lead	0.0075	NA	NA	NA	NA	<	<0.005	<0.005	<0.005	NA	NA	NA	NA	NA
Dissolved Metals (6010C)														
Iron, diss.		NA	NA	NA	NA	NA	11.7	9.01	10.7	NA	NA	NA	NA	NA
Lead, diss.	0.0075	NA	NA	NA	NA	NA	<0.005	<0.005	<0.005	NA	NA	NA	NA	NA
Field Parameters														
pH	6.5 - 9	NA	NA	NA	NA	6.90	6.79	6.89	6.98	NA	NA	NA	NA	NA
Temperature (^{o}C)	--	NA	NA	NA	NA	NA	18.44	17.16	10.01	NA	NA	NA	NA	NA
Specific Conductivity (µS/cm)	--	NA	NA	NA	NA	NA	1,639.7	1,760.6	1,714.2	NA	NA	NA	NA	NA
Dissolved Oxygen (mg/l)	--	NA	NA	NA	NA	NA	0.39	0.35	0.62	NA	NA	NA	NA	NA
Turbidity (NTU)	--	NA	NA	NA	NA	NA	8.87	0.00	0.77	NA	NA	NA	NA	NA
ORP (mV)	--	NA	NA	NA	NA	NA	-81.1	-117.7	-58.4	NA	NA	NA	NA	NA

Notes:
[1] 35 IAC 620
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BOLD Identified above laboratory detection limits
BOLD Exceeds Class I GRO
Results reported in milligrams per liter (mg/l) or parts per million.

TABLE 2
Historic Groundwater Analytical Results (2001 - 2017)

0370305005 - DeKalb County / Kirkland, Illinois
Kirkland Quick Stop / Blake Leasing

Contaminant of Concern	Class I Groundwater Remediation Objective [1]	MW-5												
		Apr-04	Jun-05	Apr-06	Jul-06	Mar-07	Mar-08	Feb-09	Apr-13	May-12	Jun-14	Aug-16	Nov-16	Mar-17
BTEX (mg/l)														
Benzene	0.005	**0.065**	**0.0534**	**0.018**	**0.0292**	**0.0392**	**0.0184**	**0.0122**	**0.0744**	**0.192**	**0.0034**	<0.005	<0.005	<0.005
Ethylbenzene	0.7	**0.0284**	**0.129**	**0.0154**	**0.0273**	**0.0148**	**0.0639**	**0.057**	**0.324**	**0.165**	**0.0065**	**0.0057**	<0.005	<0.005
Toluene	1	<0.005	**0.0059**	<0.005	<0.005	<0.005	<0.005	<0.005	**0.0053**	**0.0128**	<0.005	<0.005	<0.005	<0.005
Xylene, Total	10	**0.148**	**0.148**	**0.0203**	**0.0444**	**0.0274**	**0.0179**	**0.149**	**0.19**	**0.214**	<0.003	<0.005	<0.005	<0.005
PNAs (mg/l)														
Acenaphthene	0.42	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.000005	<0.01	<0.01	<0.01
Acenaphthylene	0.21	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.000005	<0.01	<0.01	<0.01
Anthracene	2.1	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	**0.00011**	<0.005	<0.005	<0.005
Benzo(a)anthracene	0.00013	<0.00013	<0.00013	<0.00013	<0.00013	<0.00013	**0.00032**	<0.00013	<0.00013	<0.00013	**0.0002**	<0.00013	<0.00013	**0.00016**
Benzo(a)pyrene	0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	**0.0004**	<0.0002	<0.0002	<0.0002	**0.00054**	<0.0002	<0.0002	<0.0002
Benzo(b)fluoranthene	0.00018	<0.00018	<0.00018	<0.00018	<0.00018	<0.00018	**0.00035**	<0.00018	<0.00018	<0.00018	**0.001**	<0.00018	<0.00018	**0.0002**
Benzo(k)fluoranthene	0.00017	<0.00017	<0.00017	<0.00017	<0.00017	<0.00017	**0.00021**	<0.00017	<0.00017	<0.00017	**0.00091**	<0.00017	<0.00017	**0.00024**
Benzo(ghi)perylene	0.21	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	**0.00034**	<0.0004	<0.0004	<0.0004
Chrysene	0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	**0.0003**	<0.0015	<0.0015	<0.0015
Dibenzo(a,h)anthracene	0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.000005	<0.0003	<0.0003	<0.0003
Fluoranthene	0.28	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	**0.00063**	<0.002	<0.002	**0.004**
Fluorene	0.28	<0.002	<0.002	**0.003**	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.000005	**0.002**	<0.002	<0.002
Indeno(1,2,3-cd)pyrene	0.00043	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	**0.00055**	<0.0003	<0.0003	<0.0003
Naphthalene	0.14	<0.01	**0.018**	**0.331**	<0.01	<0.01	<0.01	**0.03**	**0.051**	**0.016**	**0.00052**	<0.01	<0.01	<0.01
Phenanthrene	0.21	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	**0.00022**	<0.005	<0.005	<0.005
Pyrene	0.21	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	**0.00092**	<0.002	<0.002	<0.002
Total Metals (6010C)														
Iron		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	9.75	10.4	3.69
Lead	0.0075	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.005	<0.005	<0.005
Dissolved Metals (6010C)														
Iron, diss.		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	9.85	11.0	3.67
Lead, diss.	0.0075	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.005	<0.005	<0.005
Field Parameters														
pH	6.5 - 9	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	6.70	6.83	7.06
Temperature (^{o}C)	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	17.59	16.33	9.25
Specific Conductivity (µS/cm)	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1,655.4	2,071.7	1,657.5
Dissolved Oxygen (mg/l)	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.04	0.06	0.41
Turbidity (NTU)	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	23.46	4.15	10.58
ORP (mV)	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	-105.1	-100.5	7.8

Notes:
[1] 35 IAC 620
"<" = Historic analytical table indicated constituent not detected above laboratory reporting limits.
NS = Not Sampled, Insufficient Water
NA = Not Analyzed
BOLD Identified above laboratory detection limits
BOLD Exceeds Class I GRO
Results reported in milligrams per liter (mg/l) or parts per million.

TABLE 2
Historic Groundwater Analytical Results (2001 - 2017)

0370305005 - DeKalb County / Kirkland, Illinois
Kirkland Quick Stop / Blake Leasing

Contaminant of Concern	Class I Groundwater Remediation Objective [1]	MW-6												
		Aug-01	May-02	Apr-03	Dec-03	May-04	Jun-05	Apr-06	Jul-06	Mar-07	Mar-08	Feb-09	May-12	Jun-14
BTEX (mg/l)														
Benzene	0.005	**0.013**	<0.005	<0.005	**0.0124**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.001
Ethylbenzene	0.7	<0.005	<0.005	<0.005	**0.0058**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.001
Toluene	1	<0.005	<0.005	<0.005	**0.021**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Xylene, Total	10	<0.005	<0.005	<0.005	**0.0251**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.003
PNAs (mg/l)														
Acenaphthene	0.42	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**0.00073**
Acenaphthylene	0.21	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.00005
Anthracene	2.1	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	**0.00047**
Benzo(a)anthracene	0.00013	<0.00013	<0.00013	<0.00013	**0.0042**	**0.00168**	**0.0009**	**0.0004**	0.0004	<0.00013	**0.00669**	**0.001**	<0.00013	**0.0025**
Benzo(a)pyrene	0.0002	<0.0002	<0.0002	<0.0002	**0.0064**	**0.0016**	**0.0015**	**0.0006**	0.0006	<0.002	**0.0098**	**0.0032**	<0.0002	**0.0032**
Benzo(b)fluoranthene	0.00018	<0.00018	<0.00018	<0.00018	**0.006**	**0.0017**	**0.0032**	**0.00075**	0.00075	0.00021	**0.0122**	**0.00349**	<0.00018	**0.0056**
Benzo(k)fluoranthene	0.00017	<0.00017	<0.00017	<0.00017	**0.0055**	**0.00199**	**0.00166**	**0.00046**	0.00046	0.0002	**0.00889**	**0.00312**	<0.00017	**0.0036**
Benzo(ghi)perylene	0.21	<0.0004	<0.0004	<0.0004	**0.0049**	**0.0014**	**0.0024**	**0.0006**	0.0006	<0.0004	**0.0097**	**0.0035**	<0.0004	**0.0016**
Chrysene	0.0015	<0.0015	<0.0015	<0.0015	**0.006**	**0.0026**	**0.0023**	<0.0015	<0.0015	<0.0015	**0.0151**	**0.0028**	<0.0015	**0.00322**
Dibenzo(a,h)anthracene	0.0003	<0.0003	<0.0003	<0.0003	**0.001**	**0.0005**	**0.0008**	<0.0003	<0.0003	<0.0003	**0.0019**	**0.0007**	<0.0003	**0.000092**
Fluoranthene	0.28	<0.002	<0.002	<0.002	**0.018**	**0.011**	**0.003**	**0.002**	<0.002	<0.002	**0.033**	**0.006**	<0.002	**0.0086**
Fluorene	0.28	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.002	<0.002	<0.002	<0.002	<0.002	**0.00059**
Indeno(1,2,3-cd)pyrene	0.00043	<0.0003	<0.0003	<0.0003	**0.0052**	**0.0016**	**0.0024**	**0.0006**	<0.0003	<0.0003	**0.0098**	**0.0033**	<0.0003	**0.0028**
Naphthalene	0.14	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.0006	<0.01	<0.01	<0.01	<0.01	<0.00025
Phenanthrene	0.21	<0.005	<0.005	<0.005	**0.02**	<0.005	<0.005	<0.005	<0.005	<0.005	**0.008**	<0.005	<0.005	**0.00077**
Pyrene	0.21	<0.002	<0.002	<0.002	**0.013**	**0.007**	**0.002**	<0.002	<0.002	<0.002	**0.022**	**0.003**	<0.002	**0.005**
Total Metals (6010C)														
Iron		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead	0.0075	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dissolved Metals (6010C)														
Iron, diss.		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Lead, diss.	0.0075	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Field Parameters														
pH	6.5 - 9	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Temperature (^{o}C)	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Specific Conductivity (µS/cm)	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Dissolved Oxygen (mg/l)	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Turbidity (NTU)	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ORP (mV)	--	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:
[1] 35 IAC 620
"<" = Historic analytical table indicated constituent not detected above laboratory reporting limits.
NS = Not Sampled, Insufficient Water
NA = Not Analyzed
BOLD Identified above laboratory detection limits
BOLD Exceeds Class I GRO
Results reported in milligrams per liter (mg/l) or parts per million.

TABLE 2
Historic Groundwater Analytical Results (2001 - 2017)

0370305005 - DeKalb County / Kirkland, Illinois
Kirkland Quick Stop / Blake Leasing

Contaminant of Concern	Class I Groundwater Remediation Objective [1]	MW-6						MW-7						
		Aug-14	May-15	Jul-15	Aug-16	Nov-16	Mar-17	Aug-01	May-02	Apr-03	Dec-03	Apr-04	Jun-05	Apr-06
BTEX (mg/l)														
Benzene	0.005	<0.001	<0.001	<0.001	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	**0.0145**	<0.005	<0.005	<0.005
Ethylbenzene	0.7	<0.0001	<0001	<0001	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	**0.0054**	<0.005	<0.005	<0.005
Toluene	1	**0.0078**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	**0.0101**	<0.005	<0.005	<0.005
Xylene, Total	10	<0.003	<0.003	<0.003	<0.005	<0.005	<0.005	**0.0056**	<0.005	<0.005	**0.0225**	<0.005	<0.005	<0.0005
PNAs (mg/l)														
Acenaphthene	0.42	**0.00054**	**0.00006**	**0.000073**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Acenaphthylene	0.21	<0.00005	<0.00005	**0.000082**	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Anthracene	2.1	<0.00005	0.00008	**0.00024**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005	<0.005	<0.005
Benzo(a)anthracene	0.00013	**0.00086**	**0.000058**	**0.0015**	**0.00016**	**0.00017**	<0.00013	**0.00015**	<0.00013	<0.00013	<0.005	<0.00013	<0.00013	<0.00013
Benzo(a)pyrene	0.0002	**0.00093**	**0.000079**	**0.0029**	<0.0002	<0.0002	<0.0002	**0.0004**	<0.0002	<0.0002	<0.00013	<0.0002	<0.0002	<0.0002
Benzo(b)fluoranthene	0.00018	**0.0017**	**0.00013**	**0.0057**	**0.00022**	<0.00018	<0.00018	**0.00072**	<0.00018	<0.00018	**0.00023**	<0.00018	<0.00018	<0.00018
Benzo(k)fluoranthene	0.00017	**0.00096**	<0.00005	**0.0013**	**0.00018**	<0.00017	<0.00017	**0.00056**	<0.00017	<0.00017	**0.00023**	<0.00017	<0.00017	<0.00017
Benzo(ghi)perylene	0.21	**0.00055**	**0.00012**	**0.0041**	<0.0004	<0.0004	<0.0004	**0.0005**	<0.0004	<0.0004	<0.00017	<0.0004	<0.0004	<0.0004
Chrysene	0.0015	**0.0015**	**0.0001**	**0.0025**	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0004	<0.0015	<0.0015	<0.0015
Dibenzo(a,h)anthracene	0.0003	<0.00005	<0.00005	**0.00012**	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0015	<0.0003	<0.0003	<0.0003
Fluoranthene	0.28	**0.0046**	**0.00064**	**0.0052**	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.0003	<0.002	<0.002	<0.002
Fluorene	0.28	**0.00083**	**0.0001**	**0.00011**	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Indeno(1,2,3-cd)pyrene	0.00043	**0.00074**	**0.000093**	**0.003**	<0.0003	<0.0003	<0.0003	0.0004	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
Naphthalene	0.14	<0.00025	<0.00025	<0.00025	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Phenanthrene	0.21	**0.0027**	**0.000074**	**0.0007**	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Pyrene	0.21	**0.003**	**0.00038**	**0.004**	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Total Metals (6010C)														
Iron		NA	2.2	NA	7.14	5.91	5.34	NA	NA	NA	NA	NA	NA	NA
Lead	0.0075	NA	<	NA	<0.005	<0.005	<0.005	NA	NA	NA	NA	NA	NA	NA
Dissolved Metals (6010C)														
Iron, diss.		NA	NA	NA	7.24	6.54	5.81	NA	NA	NA	NA	NA	NA	NA
Lead, diss.	0.0075	NA	NA	NA	<0.005	<0.005	<0.005	NA	NA	NA	NA	NA	NA	NA
Field Parameters														
pH	6.5 - 9	NA	6.70	NA	6.82	7.02	6.90	NA	NA	NA	NA	NA	NA	NA
Temperature (^{o}C)	--	NA	NA	NA	19.28	17.05	9.72	NA	NA	NA	NA	NA	NA	NA
Specific Conductivity (µS/cm)	--	NA	NA	NA	1,097.0	897.43	2,440.70	NA	NA	NA	NA	NA	NA	NA
Dissolved Oxygen (mg/l)	--	NA	NA	NA	0.07	0.05	0.29	NA	NA	NA	NA	NA	NA	NA
Turbidity (NTU)	--	NA	NA	NA	3.77	0.02	4.87	NA	NA	NA	NA	NA	NA	NA
ORP (mV)	--	NA	NA	NA	-96.6	-191.1	-14.4	NA	NA	NA	NA	NA	NA	NA

Notes:
[1] 35 IAC 620
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BOLD Exceeds Class I GRO
Results reported in milligrams per liter (mg/l) or parts per million.

TABLE 2
Historic Groundwater Analytical Results (2001 - 2017)

0370305005 - DeKalb County / Kirkland, Illinois
Kirkland Quick Stop / Blake Leasing

Contaminant of Concern	Class I Groundwater Remediation Objective [1]	MW-7							MW-8					
		Jul-06	Mar-07	Mar-08	Feb-09	Aug-16	Nov-16	Mar-17	Aug-01	May-02	Apr-03	Dec-03	Apr-04	Jun-05
BTEX (mg/l)														
Benzene	0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	**0.166**	**0.075**	**0.106**	**0.236**	**0.127**	**0.059**
Ethylbenzene	0.7	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	**0.0429**	**0.0472**	**0.0744**	**3.17**	**0.538**	**0.619**
Toluene	1	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	**0.0185**	**0.0095**	**0.0164**	**0.073**	**0.0198**	**1.09**
Xylene, Total	10	<0.0005	<0.0005	<0.0005	<0.0005	<0.005	<0.005	<0.005	**0.0354**	**0.023**	**0.057**	**8.53**	**1.41**	**0.912**
PNAs (mg/l)														
Acenaphthene	0.42	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**0.642**	<0.01	<0.01
Acenaphthylene	0.21	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.030	<0.01	<0.01
Anthracene	2.1	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	**0.102**	<0.005	<0.005
Benzo(a)anthracene	0.00013	<0.00013	<0.00013	<0.00013	<0.00013	<0.00013	<0.00013	<0.00013	<0.00013	<0.00013	<0.00013	<0.030	<0.00013	<0.00013
Benzo(a)pyrene	0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.030	<0.0002	<0.0002
Benzo(b)fluoranthene	0.00018	<0.00018	<0.00018	<0.00018	<0.00018	<0.00018	<0.00018	<0.00018	<0.00018	<0.00018	<0.00018	<0.030	<0.00018	<0.00018
Benzo(k)fluoranthene	0.00017	<0.00017	<0.00017	<0.00017	<0.00017	<0.00017	<0.00017	<0.00017	<0.00017	<0.00017	<0.00017	<0.030	<0.00017	<0.00017
Benzo(ghi)perylene	0.21	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.030	<0.0004	<0.0004
Chrysene	0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.030	<0.0015	<0.0015
Dibenzo(a,h)anthracene	0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.030	<0.0003	<0.0003
Fluoranthene	0.28	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	**0.042**	<0.002	<0.002
Fluorene	0.28	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	**0.002**	<0.002	<0.002	**1.58**	**0.006**	**0.002**
Indeno(1,2,3-cd)pyrene	0.00043	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.030	<0.0003	<0.0003
Naphthalene	0.14	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	**0.018**	**0.01**	**0.042**	**31.5**	**0.42**	**0.356**
Phenanthrene	0.21	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	**1.44**	<0.005	<0.005
Pyrene	0.21	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	**0.15**	<0.002	<0.002
Total Metals (6010C)														
Iron		NA	NA	NA	NA	0.15	0.50	0.58	NA	NA	NA	NA	NA	NA
Lead	0.0075	NA	NA	NA	NA	<0.005	<0.005	<0.005	NA	NA	NA	NA	NA	NA
Dissolved Metals (6010C)														
Iron, diss.		NA	NA	NA	NA	<0.05	<0.05	<0.05	NA	NA	NA	NA	NA	NA
Lead, diss.	0.0075	NA	NA	NA	NA	<0.005	<0.005	<0.005	NA	NA	NA	NA	NA	NA
Field Parameters														
pH	6.5 - 9	NA	NA	NA	NA	6.99	6.96	7.14	NA	NA	NA	NA	NA	NA
Temperature (^{o}C)	--	NA	NA	NA	NA	17.99	17.02	11.63	NA	NA	NA	NA	NA	NA
Specific Conductivity (µS/cm)	--	NA	NA	NA	NA	2,636.7	2,530.8	2,414.9	NA	NA	NA	NA	NA	NA
Dissolved Oxygen (mg/l)	--	NA	NA	NA	NA	0.47	0.39	1.32	NA	NA	NA	NA	NA	NA
Turbidity (NTU)	--	NA	NA	NA	NA	18.53	101.13	6.71	NA	NA	NA	NA	NA	NA
ORP (mV)	--	NA	NA	NA	NA	42.8	243.8	163.9	NA	NA	NA	NA	NA	NA

Notes:
[1] 35 IAC 620
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BOLD Identified above laboratory detection limits
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TABLE 2
Historic Groundwater Analytical Results (2001 - 2017)

0370305005 - DeKalb County / Kirkland, Illinois
Kirkland Quick Stop / Blake Leasing

Contaminant of Concern	Class I Groundwater Remediation Objective [1]	MW-8											MW-9	MW-10
		Apr-06	Jul-06	Mar-07	Mar-08	Feb-09	Nov-12	Jun-14	May-15	Aug-16	Nov-16	Mar-17	Aug-01	Aug-01
BTEX (mg/l)														
Benzene	0.005	**0.0188**	**0.0124**	**0.0064**	<0.005	<0.005	<	<0.001	<0.001	<0.005	NS	<0.005	<0.005	<0.005
Ethylbenzene	0.7	**0.569**	**0.452**	**0.374**	**0.197**	**0.515**	<	**0.046**	**0.059**	<0.005	NS	**0.0077**	<0.005	<0.005
Toluene	1	**0.012**	**0.0088**	**0.0101**	<0.005	<0.005	<	<0.005	<0.005	<0.005	NS	<0.005	<0.005	<0.005
Xylene, Total	10	**1.07**	**0.83**	**0.438**	**0.112**	**0.178**	<	<0.003	**0.015**	<0.005	NS	<0.005	<0.005	<0.005
PNAs (mg/l)														
Acenaphthene	0.42	<0.01	<0.01	<0.01	<0.01	**0.029**	NA	<0.00005	<0.00005	<0.01	NS	<0.01	<0.01	<0.01
Acenaphthylene	0.21	<0.01	<0.01	<0.01	<0.01	<0.01	NA	<0.00005	<0.00005	<0.01	NS	<0.01	<0.01	<0.01
Anthracene	2.1	<0.005	<0.005	<0.005	<0.005	<0.005	NA	<0.00005	<0.00005	<0.005	NS	<0.005	<0.005	<0.005
Benzo(a)anthracene	0.00013	<0.00013	<0.00013	<0.00013	<0.00013	**0.00032**	NA	<0.00005	<0.00005	<0.00013	NS	<0.00013	<0.00013	<0.00013
Benzo(a)pyrene	0.0002	<0.0002	<0.0002	<0.0002	<0.0002	**0.0002**	NA	<0.00005	<0.00005	<0.0002	NS	<0.0002	<0.0002	<0.0002
Benzo(b)fluoranthene	0.00018	<0.00018	<0.00018	<0.00018	<0.00018	<0.00018	NA	<0.00005	<0.00005	<0.00018	NS	<0.00018	<0.00018	<0.00018
Benzo(k)fluoranthene	0.00017	<0.00017	<0.00017	<0.00017	<0.00017	**0.00023**	NA	<0.00005	<0.00005	<0.00017	NS	<0.00017	<0.00017	<0.00017
Benzo(ghi)perylene	0.21	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	NA	<0.00005	<0.00005	<0.0004	NS	<0.0004	<0.0004	<0.0004
Chrysene	0.0015	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	NA	<0.00005	<0.00005	<0.0015	NS	<0.0015	<0.0015	<0.0015
Dibenzo(a,h)anthracene	0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	NA	<0.00005	<0.00005	<0.0003	NS	<0.0003	<0.0003	<0.0003
Fluoranthene	0.28	<0.002	<0.002	<0.002	<0.002	<0.002	NA	<0.00005	<0.00005	<0.002	NS	<0.002	<0.002	<0.002
Fluorene	0.28	<0.002	**0.004**	<0.002	<0.002	**0.032**	NA	<0.00005	<0.00005	<0.002	NS	<0.002	<0.002	<0.002
Indeno(1,2,3-cd)pyrene	0.00043	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	NA	<0.00005	<0.00005	<0.0003	NS	<0.0003	<0.0003	<0.0003
Naphthalene	0.14	<0.01	**0.426**	**0.274**	**0.091**	**0.475**	NA	<0.00025	<0.00025	<0.01	NS	<0.01	<0.01	<0.01
Phenanthrene	0.21	<0.005	<0.005	<0.005	<0.005	**0.03**	NA	**0.00021**	**0.086**	<0.005	NS	<0.005	<0.005	<0.005
Pyrene	0.21	<0.002	<0.002	<0.002	<0.002	**0.003**	NA	<0.00005	**0.000072**	<0.002	NS	<0.002	<0.002	<0.002
Total Metals (6010C)														
Iron		NA	NA	NA	NA	NA	NA	NA	18	2.32	NS	2.96	NA	NA
Lead	0.0075	NA	NA	NA	NA	NA	NA	NA	0.0094	<0.005	NS	<0.005	NA	NA
Dissolved Metals (6010C)														
Iron, diss.		NA	NA	NA	NA	NA	NA	NA	NA	2.37	NS	3.57	NA	NA
Lead, diss.	0.0075	NA	NA	NA	NA	NA	NA	NA	NA	<0.005	NS	<0.005	NA	NA
Field Parameters														
pH	6.5 - 9	NA	NA	NA	NA	NA	NA	NA	6.80	6.40	NS	6.58	NA	NA
Temperature (^{o}C)	--	NA	NA	NA	NA	NA	NA	NA	NA	18.93	NS	11.25	NA	NA
Specific Conductivity (µS/cm)	--	NA	NA	NA	NA	NA	NA	NA	NA	1,142.3	NS	1494.4	NA	NA
Dissolved Oxygen (mg/l)	--	NA	NA	NA	NA	NA	NA	NA	NA	0.19	NS	0.35	NA	NA
Turbidity (NTU)	--	NA	NA	NA	NA	NA	NA	NA	NA	33.74	NS	1.53	NA	NA
ORP (mV)	--	NA	NA	NA	NA	NA	NA	NA	NA	-106.5	NS	-122.1	NA	NA

Notes:
[1] 35 IAC 620
"<" = Historic analytical table indicated constituent not detected above laboratory reporting limits.
NS = Not Sampled, Insufficient Water
NA = Not Analyzed
BOLD Identified above laboratory detection limits
BOLD Exceeds Class I GRO
Results reported in milligrams per liter (mg/l) or parts per million.

TABLE 2
Historic Groundwater Analytical Results (2001 - 2017)

0370305005 - DeKalb County / Kirkland, Illinois
Kirkland Quick Stop / Blake Leasing

Contaminant of Concern	Class I Groundwater Remediation Objective [1]	MW-11									MW-12			
		Aug-09	Feb-10	Mar-11	Sep-12	Nov-12	May-15	Aug-16	Nov-16	Mar-17	Aug-09	Feb-10	Mar-11	Sep-12
BTEX (mg/l)														
Benzene	0.005	<0.005	<0.005	<0.005	<0.005	<	<0.001	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Ethylbenzene	0.7	**0.0671**	**0.0681**	<0.005	<0.005	<	<0.001	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Toluene	1	<0.005	<0.005	<0.005	<0.005	<	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Xylene, Total	10	**0.296**	**0.286**	<0.005	<0.005	<	<0.003	<0.005	<0.005	<0.005	**0.008**	<0.005	<0.005	<0.005
PNAs (mg/l)														
Acenaphthene	0.42	<0.01	<0.01	NA	NA	NA	<0.00005	<0.01	<0.01	<0.01	<0.01	<0.01	NA	NA
Acenaphthylene	0.21	<0.01	<0.01	NA	NA	NA	<0.00005	<0.01	<0.01	<0.01	<0.01	<0.01	NA	NA
Anthracene	2.1	<0.005	<0.005	NA	NA	NA	<0.00005	<0.005	<0.005	<0.005	<0.005	<0.005	NA	NA
Benzo(a)anthracene	0.00013	<0.00013	<0.00013	NA	NA	NA	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013	<0.00013	NA	NA
Benzo(a)pyrene	0.0002	<0.0002	<0.0002	NA	NA	NA	<0.00005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	NA	NA
Benzo(b)fluoranthene	0.00018	<0.00018	<0.00018	NA	NA	NA	<0.00005	<0.00018	<0.00018	<0.00018	<0.00018	<0.00018	NA	NA
Benzo(k)fluoranthene	0.00017	<0.00017	<0.00017	NA	NA	NA	<0.00005	<0.00017	<0.00017	<0.00017	<0.00017	<0.00017	NA	NA
Benzo(ghi)perylene	0.21	<0.0004	<0.0004	NA	NA	NA	<0.00005	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	NA	NA
Chrysene	0.0015	<0.0015	<0.0015	NA	NA	NA	<0.00005	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	NA	NA
Dibenzo(a,h)anthracene	0.0003	<0.0003	<0.0003	NA	NA	NA	<0.00005	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	NA	NA
Fluoranthene	0.28	<0.002	<0.002	NA	NA	NA	<0.00005	<0.002	<0.002	<0.002	<0.002	<0.002	NA	NA
Fluorene	0.28	<0.002	<0.002	NA	NA	NA	<0.00005	<0.002	<0.002	<0.002	<0.002	<0.002	NA	NA
Indeno(1,2,3-cd)pyrene	0.00043	<0.0003	<0.0003	NA	NA	NA	<0.00005	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	NA	NA
Naphthalene	0.14	**0.017**	**0.031**	NA	NA	NA	<0.00025	<0.01	<0.01	<0.01	<0.01	<0.01	NA	NA
Phenanthrene	0.21	<0.005	<0.005	NA	NA	NA	<0.00005	<0.005	<0.005	<0.005	<0.005	<0.005	NA	NA
Pyrene	0.21	<0.002	<0.002	NA	NA	NA	<0.00005	<0.002	<0.002	<0.002	<0.002	<0.002	NA	NA
Total Metals (6010C)														
Iron		NA	NA	NA	NA	NA	0.35	0.12	3.22	<0.05	NA	NA	NA	NA
Lead	0.0075	NA	NA	NA	NA	NA	<	<0.005	<0.005	<0.005	NA	NA	NA	NA
Dissolved Metals (6010C)														
Iron, diss.		NA	NA	NA	NA	NA	NA	0.09	3.35	<0.05	NA	NA	NA	NA
Lead, diss.	0.0075	NA	NA	NA	NA	NA	NA	<0.005	<0.005	<0.005	NA	NA	NA	NA
Field Parameters														
pH	6.5 - 9	NA	NA	NA	NA	NA	7.10	6.43	6.80	6.53	NA	NA	NA	NA
Temperature (^{o}C)	--	NA	NA	NA	NA	NA	NA	21.38	18.60	10.67	NA	NA	NA	NA
Specific Conductivity (µS/cm)	--	NA	NA	NA	NA	NA	NA	856.29	1,033.2	1,171.8	NA	NA	NA	NA
Dissolved Oxygen (mg/l)	--	NA	NA	NA	NA	NA	NA	0.08	0.04	0.91	NA	NA	NA	NA
Turbidity (NTU)	--	NA	NA	NA	NA	NA	NA	61.28	43.05	3.91	NA	NA	NA	NA
ORP (mV)	--	NA	NA	NA	NA	NA	NA	69.8	-85.4	282.1	NA	NA	NA	NA

Notes:
[1] 35 IAC 620
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BOLD Identified above laboratory detection limits
BOLD Exceeds Class I GRO
Results reported in milligrams per liter (mg/l) or parts per million.

TABLE 2
Historic Groundwater Analytical Results (2001 - 2017)

0370305005 - DeKalb County / Kirkland, Illinois
Kirkland Quick Stop / Blake Leasing

Contaminant of Concern	Class I Groundwater Remediation Objective [1]	MW-12				MW-13								
		May-15	Aug-16	Nov-16	Mar-17	Aug-09	Feb-10	Mar-11	Sep-12	Nov-12	Aug-14	May-15	Aug-16	Nov-16
BTEX (mg/l)														
Benzene	0.005	<0.001	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<	<0.001	<0.001	<0.005	<0.005
Ethylbenzene	0.7	<0.001	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<	<0.001	<0.001	<0.005	<0.005
Toluene	1	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<	<0.005	<0.005	<0.005	<0.005
Xylene, Total	10	<0.003	<0.005	<0.005	<0.005	**0.0086**	<0.005	<0.005	<0.005	<	<0.003	<0.003	<0.005	<0.005
PNAs (mg/l)														
Acenaphthene	0.42	<0.00005	<0.01	<0.01	<0.01	<0.01	<0.01	NA	NA	NA	<0.00005	<0.00005	<0.01	<0.01
Acenaphthylene	0.21	<0.00005	<0.01	<0.01	<0.01	<0.01	<0.01	NA	NA	NA	<0.00005	<0.00005	<0.01	<0.01
Anthracene	2.1	<0.00005	<0.005	<0.005	<0.005	<0.005	<0.005	NA	NA	NA	<0.00005	<0.00005	<0.005	<0.005
Benzo(a)anthracene	0.00013	<0.00005	<0.00013	<0.00013	<0.00013	<0.00013	<0.00013	NA	NA	NA	<0.00005	<0.00005	<0.00013	<0.00013
Benzo(a)pyrene	0.0002	<0.00005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	NA	NA	NA	<0.00005	<0.00005	<0.0002	<0.0002
Benzo(b)fluoranthene	0.00018	<0.00005	<0.00018	<0.00018	<0.00018	<0.00018	<0.00018	NA	NA	NA	<0.00005	<0.00005	<0.00018	<0.00018
Benzo(k)fluoranthene	0.00017	<0.00005	<0.00017	<0.00017	<0.00017	<0.00017	<0.00017	NA	NA	NA	<0.00005	<0.00005	<0.00017	<0.00017
Benzo(ghi)perylene	0.21	<0.00005	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	NA	NA	NA	<0.00005	<0.00005	<0.0004	<0.0004
Chrysene	0.0015	<0.00005	<0.0015	<0.0015	<0.0015	<0.0015	<0.0015	NA	NA	NA	<0.00005	<0.00005	<0.0015	<0.0015
Dibenzo(a,h)anthracene	0.0003	<0.00005	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	NA	NA	NA	<0.00005	<0.00005	<0.0003	<0.0003
Fluoranthene	0.28	<0.00005	<0.002	<0.002	<0.002	<0.002	<0.002	NA	NA	NA	<0.00005	<0.00005	<0.002	<0.002
Fluorene	0.28	<0.00005	<0.002	<0.002	<0.002	<0.002	<0.002	NA	NA	NA	<0.00005	<0.00005	<0.002	<0.002
Indeno(1,2,3-cd)pyrene	0.00043	<0.00005	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	NA	NA	NA	<0.00005	<0.00005	<0.0003	<0.0003
Naphthalene	0.14	**0.00069**	<0.01	<0.01	<0.01	<0.01	<0.01	NA	NA	NA	<0.00025	<0.00025	<0.01	<0.01
Phenanthrene	0.21	<0.00005	<0.005	<0.005	<0.005	<0.005	<0.005	NA	NA	NA	<0.00005	<0.00005	<0.005	<0.005
Pyrene	0.21	<0.00005	<0.002	<0.002	<0.002	<0.002	<0.002	NA	NA	NA	<0.00005	<0.00005	<0.002	<0.002
Total Metals (6010C)														
Iron		<	0.12	0.13	<0.05	NA	NA	NA	NA	NA	NA	3	1.26	<0.05
Lead	0.0075	<	<0.005	<0.005	<0.005	NA	NA	NA	NA	NA	NA	0.0076	<0.005	<0.005
Dissolved Metals (6010C)														
Iron, diss.		NA	<0.05	<0.05	<0.05	NA	NA	NA	NA	NA	NA	NA	<0.05	<0.05
Lead, diss.	0.0075	NA	<0.005	<0.005	<0.005	NA	NA	NA	NA	NA	NA	NA	<0.005	<0.005
Field Parameters														
pH	6.5 - 9	7.80	6.77	7.13	6.70	NA	NA	NA	NA	NA	NA	7.40	6.73	6.96
Temperature (^{o}C)	--	NA	17.86	17.76	10.69	NA	NA	NA	NA	NA	NA	NA	20.89	14.43
Specific Conductivity (µS/cm)	--	NA	2,628.2	2,441.6	1,870.2	NA	NA	NA	NA	NA	NA	NA	4,338.2	3,119.8
Dissolved Oxygen (mg/l)	--	NA	2.36	1.78	6.77	NA	NA	NA	NA	NA	NA	NA	1.35	0.25
Turbidity (NTU)	--	NA	20.30	25.58	3.50	NA	NA	NA	NA	NA	NA	NA	155.19	10.01
ORP (mV)	--	NA	64.0	83.4	299.1	NA	NA	NA	NA	NA	NA	NA	167.7	233.2

Notes:
[1] 35 IAC 620
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Results reported in milligrams per liter (mg/l) or parts per million.

TABLE 2
Historic Groundwater Analytical Results (2001 - 2017)

0370305005 - DeKalb County / Kirkland, Illinois
Kirkland Quick Stop / Blake Leasing

Contaminant of Concern	Class I Groundwater Remediation Objective [1]	MW-13	MW-14										
		Mar-17	Aug-09	Feb-10	Jan-11	Mar-11	Sep-12	Nov-12	Jun-14	Aug-14	May-15	Jul-15	Aug-16	Nov-16
BTEX (mg/l)														
Benzene	0.005	<0.005	**0.0337**	**0.122**	**0.0595**	**0.0304**	<0.005	**0.0076**	**0.0017**	**0.0055**	<0.001	**0.012**	<0.005	<0.005
Ethylbenzene	0.7	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<	<0.001	<0.001	<0.001	<0.001	<0.005	<0.005
Toluene	1	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Xylene, Total	10	<0.005	**0.0087**	<0.005	<0.005	<0.005	<0.005	<	<0.003	**0.003**	<0.003	<0.003	<0.005	<0.005
PNAs (mg/l)														
Acenaphthene	0.42	<0.01	<0.01	<0.01	NA	NA	NA	NA	**0.0018**	**0.001**	**0.00022**	**0.00037**	<0.01	<0.01
Acenaphthylene	0.21	<0.01	<0.01	<0.01	NA	NA	NA	NA	**0.00085**	<0.00005	<0.00005	<0.00005	<0.01	<0.01
Anthracene	2.1	<0.005	<0.005	<0.005	NA	NA	NA	NA	**0.0034**	**0.0017**	**0.00041**	**0.00067**	<0.005	<0.005
Benzo(a)anthracene	0.00013	<0.00013	<0.00013	<0.00013	NA	NA	NA	NA	**0.028**	**0.006**	**0.00017**	**0.0018**	**0.00164**	**0.00074**
Benzo(a)pyrene	0.0002	<0.0002	<0.0002	<0.0002	NA	NA	NA	NA	**0.041**	**0.0088**	**0.00014**	**0.0037**	**0.024**	**0.0008**
Benzo(b)fluoranthene	0.00018	<0.00018	<0.00018	<0.00018	NA	NA	NA	NA	**0.086**	**0.018**	**0.00026**	**0.0066**	**0.00372**	**0.00149**
Benzo(k)fluoranthene	0.00017	<0.00017	<0.00017	<0.00017	NA	NA	NA	NA	**0.045**	**0.0096**	**0.000079**	**0.0022**	**0.00288**	**0.00108**
Benzo(ghi)perylene	0.21	<0.0004	<0.0004	<0.0004	NA	NA	NA	NA	**0.022**	**0.0056**	**0.00014**	**0.0041**	**0.0028**	**0.0011**
Chrysene	0.0015	<0.0015	<0.0015	<0.0015	NA	NA	NA	NA	**0.048**	**0.016**	**0.00032**	**0.0037**	**0.0034**	**0.0015**
Dibenzo(a,h)anthracene	0.0003	<0.0003	<0.0003	<0.0003	NA	NA	NA	NA	**0.0011**	<0.00005	<0.00005	**0.00012**	**0.0005**	<0.0003
Fluoranthene	0.28	<0.002	<0.002	<0.002	NA	NA	NA	NA	**0.12**	**0.0028**	**0.0058**	**0.014**	**0.01**	**0.01**
Fluorene	0.28	<0.002	<0.002	<0.002	NA	NA	NA	NA	**0.0026**	**0.0079**	**0.00079**	**0.00096**	<0.002	<0.002
Indeno(1,2,3-cd)pyrene	0.00043	<0.0003	<0.0003	<0.0003	NA	NA	NA	NA	**0.038**	<0.00005	**0.00011**	**0.0033**	**0.0029**	**0.0011**
Naphthalene	0.14	<0.01	<0.01	<0.01	NA	NA	NA	NA	<0.0012	**0.015**	<0.00025	<0.00025	<0.01	<0.01
Phenanthrene	0.21	<0.005	<0.005	<0.005	NA	NA	NA	NA	**0.012**	<0.00005	**0.0049**	**0.0027**	<0.005	<0.005
Pyrene	0.21	<0.002	<0.002	<0.002	NA	NA	NA	NA	**0.078**	**0.024**	**0.0033**	**0.0081**	**0.007**	**0.006**
Total Metals (6010C)														
Iron		0.16	NA	NA	NA	NA	NA	NA	NA	NA	10	11	9.81	5.17
Lead	0.0075	<0.005	NA	NA	NA	NA	NA	NA	NA	NA	<	0.0089	<0.005	<0.005
Dissolved Metals (6010C)														
Iron, diss.		<0.05	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	8.12	5.53
Lead, diss.	0.0075	<0.005	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	<0.005	<0.005
Field Parameters														
pH	6.5 - 9	6.90	NA	NA	NA	NA	NA	NA	NA	NA	7.30	6.95	6.85	7.01
Temperature (^{o}C)	--	11.02	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	18.76	17.02
Specific Conductivity (µS/cm)	--	4,083.2	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1,920.9	1,757.6
Dissolved Oxygen (mg/l)	--	1.34	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.02	0.20
Turbidity (NTU)	--	8.17	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	35.17	4.80
ORP (mV)	--	219.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	-85.4	-132.2

Notes:
[1] 35 IAC 620
"<" = Historic analytical table indicated constituent not detected above laboratory reporting limits.
NS = Not Sampled, Insufficient Water
NA = Not Analyzed
BOLD Identified above laboratory detection limits
BOLD Exceeds Class I GRO
Results reported in milligrams per liter (mg/l) or parts per million.

TABLE 2
Historic Groundwater Analytical Results (2001 - 2017)

0370305005 - DeKalb County / Kirkland, Illinois
Kirkland Quick Stop / Blake Leasing

Contaminant of Concern	Class I Groundwater Remediation Objective [1]	MW-14	MW-15				MW-16				MW-17			
		Mar-17	May-15	Aug-16	Nov-16	Mar-17	May-15	Aug-16	Nov-16	Mar-17	May-15	Aug-16	Nov-16	Mar-17
BTEX (mg/l)														
Benzene	0.005	<0.005	<0.001	**0.012**	<0.005	**0.0072**	<0.001	<0.005	<0.005	<0.005	<0.001	<0.005	<0.005	<0.005
Ethylbenzene	0.7	<0.005	<0.001	**0.0068**	<0.005	<0.005	<0.001	<0.005	<0.005	<0.005	<0.001	<0.005	<0.005	<0.005
Toluene	1	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Xylene, Total	10	<0.005	<0.003	**0.0164**	**0.0104**	**0.0162**	<0.003	<0.005	<0.005	<0.005	<0.003	<0.005	<0.005	<0.005
PNAs (mg/l)														
Acenaphthene	0.42	<0.01	**0.00064**	<0.01	<0.01	<0.01	<0.00005	<0.01	<0.01	<0.01	<0.00005	<0.01	<0.01	<0.01
Acenaphthylene	0.21	<0.01	**0.00017**	<0.01	<0.01	<0.01	<0.00005	<0.01	<0.01	<0.01	<0.00005	<0.01	<0.01	<0.01
Anthracene	2.1	<0.005	**0.00008**	<0.005	<0.005	<0.005	<0.00005	<0.005	<0.005	<0.005	<0.00005	<0.005	<0.005	<0.005
Benzo(a)anthracene	0.00013	<0.00013	<0.00005	<0.00013	<0.00013	<0.00013	<0.00005	<0.00013	<0.00013	<0.00013	<0.00005	<0.00013	<0.00013	<0.00013
Benzo(a)pyrene	0.0002	<0.0002	<0.00005	<0.0002	<0.0002	<0.0002	<0.00005	<0.0002	<0.0002	<0.0002	<0.00005	<0.0002	<0.0002	<0.0002
Benzo(b)fluoranthene	0.00018	<0.00018	<0.00005	<0.00018	<0.00018	<0.00018	<0.00005	<0.00018	<0.00018	<0.00018	<0.00005	<0.00018	<0.00018	<0.00018
Benzo(k)fluoranthene	0.00017	<0.00017	<0.00005	<0.00017	<0.00017	<0.00017	<0.00005	<0.00017	<0.00017	<0.00017	<0.00005	<0.00017	<0.00017	<0.00017
Benzo(ghi)perylene	0.21	<0.0004	<0.00005	<0.0004	<0.0004	<0.0004	<0.00005	<0.0004	<0.0004	<0.0004	<0.00005	<0.0004	<0.0004	<0.0004
Chrysene	0.0015	<0.0015	<0.00005	<0.0015	<0.0015	<0.0015	<0.00005	<0.0015	<0.0015	<0.0015	<0.00005	<0.0015	<0.0015	<0.0015
Dibenzo(a,h)anthracene	0.0003	<0.0003	<0.00005	<0.0003	<0.0003	<0.0003	<0.00005	<0.0003	<0.0003	<0.0003	<0.00005	<0.0003	<0.0003	<0.0003
Fluoranthene	0.28	<0.002	**0.00095**	<0.002	<0.002	<0.002	<0.00005	<0.002	<0.002	<0.002	<0.00005	<0.002	<0.002	<0.002
Fluorene	0.28	<0.002	<0.00005	<0.002	<0.002	<0.002	<0.00005	<0.002	<0.002	<0.002	<0.00005	<0.002	<0.002	<0.002
Indeno(1,2,3-cd)pyrene	0.00043	<0.0003	<0.00005	<0.0003	<0.0003	<0.0003	<0.00005	<0.0003	<0.0003	<0.0003	<0.00005	<0.0003	<0.0003	<0.0003
Naphthalene	0.14	<0.01	**0.2**	**0.058**	**0.032**	**0.042**	<0.00025	<0.01	<0.01	<0.01	<0.00025	<0.01	<0.01	<0.01
Phenanthrene	0.21	<0.005	**0.00052**	<0.005	<0.005	<0.005	<0.00005	<0.005	<0.005	<0.005	<0.00005	<0.005	<0.005	<0.005
Pyrene	0.21	<0.002	<0.00005	<0.002	<0.002	<0.002	<0.00005	<0.002	<0.002	<0.002	<0.00005	<0.002	<0.002	<0.002
Total Metals (6010C)														
Iron		6.13	12	14.4	8.96	6.23	12	1.22	0.40	0.27	31	1.1	0.38	0.43
Lead	0.0075	<0.005	0.011	<0.005	<0.005	<0.005	<	<0.005	<0.005	<0.005	0.034	<0.005	<0.005	<0.005
Dissolved Metals (6010C)														
Iron, diss.		6.32	NA	12.7	9.41	6.77	NA	0.10	0.20	0.14	NA	<0.05	<0.05	<0.05
Lead, diss.	0.0075	<0.005	NA	<0.005	<0.005	<0.005	NA	<0.005	<0.005	<0.005	NA	<0.005	<0.005	<0.005
Field Parameters														
pH	6.5 - 9	7.09	7.30	6.64	6.97	7.01	7.80	6.49	6.92	7.17	7.20	6.75	6.82	7.19
Temperature (^{o}C)	--	9.94	NA	18.93	17.77	11.35	NA	17.20	16.82	10.01	NA	17.54	15.62	10.85
Specific Conductivity (µS/cm)	--	1,708.4	NA	1,704.7	1,805.1	1,779.6	NA	1,251.3	1,389.3	1,345.6	NA	1,103.0	1,244.9	1,301.1
Dissolved Oxygen (mg/l)	--	0.45	NA	0.10	0.09	0.40	NA	0.58	0.97	1.48	NA	2.96	4.04	4.74
Turbidity (NTU)	--	5.76	NA	24.71	35.09	5.87	NA	264.09	6.06	7.26	NA	154.30	21.39	19.83
ORP (mV)	--	-16.3	NA	-73.2	-45.5	0.0	NA	107.2	85.8	209.2	NA	123.2	208.8	204.2

Notes:
[1] 35 IAC 620
"<" = Historic analytical table indicated constituent not detected above laboratory reporting limits.
NS = Not Sampled, Insufficient Water
NA = Not Analyzed
BOLD Identified above laboratory detection limits
BOLD Exceeds Class I GRO
Results reported in milligrams per liter (mg/l) or parts per million.

TABLE 2
Historic Groundwater Analytical Results (2001 - 2017)

0370305005 - DeKalb County / Kirkland, Illinois
Kirkland Quick Stop / Blake Leasing

Contaminant of Concern	Class I Groundwater Remediation Objective [1]	MW-18		MW-18		MW-19				MW-20			
		May-15	Aug-16	Nov-16	Mar-17	May-15	Aug-16	Nov-16	Mar-17	May-15	Aug-16	Nov-16	Mar-17
BTEX (mg/l)													
Benzene	0.005	<0.001	<0.005	<0.005	<0.005	<0.001	<0.005	<0.005	<0.005	<0.001	<0.005	<0.005	<0.005
Ethylbenzene	0.7	<0.001	<0.005	<0.005	<0.005	<0.001	<0.005	<0.005	<0.005	<0.001	<0.005	<0.005	<0.005
Toluene	1	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Xylene, Total	10	<0.003	<0.005	<0.005	<0.005	<0.003	<0.005	<0.005	<0.005	<0.003	<0.005	<0.005	<0.005
PNAs (mg/l)													
Acenaphthene	0.42	<0.00005	<0.01	<0.01	<0.01	<0.00005	<0.01	<0.01	<0.01	<0.00005	<0.01	<0.01	<0.01
Acenaphthylene	0.21	<0.00005	<0.01	<0.01	<0.01	<0.00005	<0.01	<0.01	<0.01	<0.00005	<0.01	<0.01	<0.01
Anthracene	2.1	<0.00005	<0.005	<0.005	<0.005	<0.00005	<0.005	<0.005	<0.005	<0.00005	<0.005	<0.005	<0.005
Benzo(a)anthracene	0.00013	<0.00005	<0.00013	<0.00013	<0.00013	<0.00005	<0.00013	<0.00013	<0.00013	<0.00005	<0.00013	<0.00013	<0.00013
Benzo(a)pyrene	0.0002	<0.00005	<0.0002	<0.0002	<0.0002	<0.00005	<0.0002	<0.0002	<0.0002	<0.00005	<0.0002	<0.0002	<0.0002
Benzo(b)fluoranthene	0.00018	<0.00005	<0.00018	<0.00018	<0.00018	<0.00005	<0.00018	<0.00018	<0.00018	<0.00005	<0.00018	<0.00018	<0.00018
Benzo(k)fluoranthene	0.00017	<0.00005	<0.00017	<0.00017	<0.00017	<0.00005	<0.00017	<0.00017	<0.00017	<0.00005	<0.00017	<0.00017	<0.00017
Benzo(ghi)perylene	0.21	<0.00005	<0.0004	<0.0004	<0.0004	<0.00005	<0.0004	<0.0004	<0.0004	<0.00005	<0.0004	<0.0004	<0.0004
Chrysene	0.0015	<0.00005	<0.0015	<0.0015	<0.0015	<0.00005	<0.0015	<0.0015	<0.0015	<0.00005	<0.0015	<0.0015	<0.0015
Dibenzo(a,h)anthracene	0.0003	<0.00005	<0.0003	<0.0003	<0.0003	<0.00005	<0.0003	<0.0003	<0.0003	<0.00005	<0.0003	<0.0003	<0.0003
Fluoranthene	0.28	<0.00005	<0.002	<0.002	<0.002	<0.00005	<0.002	<0.002	<0.002	<0.00005	<0.002	<0.002	<0.002
Fluorene	0.28	<0.00005	<0.002	<0.002	<0.002	<0.00005	<0.002	<0.002	<0.002	<0.00005	<0.002	<0.002	<0.002
Indeno(1,2,3-cd)pyrene	0.00043	<0.00005	<0.0003	<0.0003	<0.0003	<0.00005	<0.0003	<0.0003	<0.0003	<0.00005	<0.0003	<0.0003	<0.0003
Naphthalene	0.14	<0.00025	<0.01	<0.01	<0.01	<0.00025	<0.01	<0.01	<0.01	<0.00025	<0.01	<0.01	<0.01
Phenanthrene	0.21	<0.00005	<0.005	<0.005	<0.005	<0.00005	<0.005	<0.005	<0.005	<0.00005	<0.005	<0.005	<0.005
Pyrene	0.21	<0.00005	<0.002	<0.002	<0.002	<0.00005	<0.002	<0.002	<0.002	<0.00005	<0.002	<0.002	<0.002
Total Metals (6010C)													
Iron		2.8	4.96	0.88	5.48	0.13	1.53	2.84	13.8	5.8	0.11	0.05	1.22
Lead	0.0075	<	<0.005	<0.005	<0.005	<	<0.005	<0.005	<0.005	0.012	<0.005	<0.005	<0.005
Dissolved Metals (6010C)													
Iron, diss.		NA	0.95	0.68	0.90	NA	0.34	0.51	0.33	NA	<0.05	<0.05	<0.05
Lead, diss.	0.0075	NA	<0.005	<0.005	<0.005	NA	<0.005	<0.005	<0.005	NA	<0.005	<0.005	<0.005
Field Parameters													
pH	6.5 - 9	6.90	7.00	7.07	6.66	6.90	6.98	7.07	6.72	7.14	7.05	6.70	6.67
Temperature (^{o}C)	--	NA	19.09	16.85	10.50	NA	19.07	17.25	10.14	NA	17.58	14.73	9.18
Specific Conductivity (µS/cm)	--	NA	1304.3	1,373.3	1,553.3	NA	1,729.6	1,755.8	2,012.1	NA	1,025.4	1,073.14	1,140.30
Dissolved Oxygen (mg/l)	--	NA	1.75	1.92	2.17	NA	0.94	1.22	1.30	NA	0.59	0.22	1.40
Turbidity (NTU)	--	NA	104.33	4.24	56.16	NA	86.92	143.99	78.02	NA	136.78	2.20	78.39
ORP (mV)	--	NA	6.0	49.9	98.8	NA	15.6	65.2	85.2	NA	-3.5	152.19	238.2

Notes:
[1] 35 IAC 620
"<" = Historic analytical table indicated constituent not detected above laboratory reporting limits.
NS = Not Sampled, Insufficient Water
NA = Not Analyzed
BOLD Identified above laboratory detection limits
BOLD Exceeds Class I GRO
Results reported in milligrams per liter (mg/l) or parts per million.

TABLE 2
Historic Groundwater Analytical Results (2001 - 2017)

0370305005 - DeKalb County / Kirkland, Illinois
Kirkland Quick Stop / Blake Leasing

Contaminant of Concern	Class I Groundwater Remediation Objective [1]	MW-30S						MW-30D						Emergency Backup Well #1	Municipal Well #2
		May-15	Jul-15	Aug-16	Nov-16	Dec-16	Mar-17	May-15	Jul-15	Aug-16	Nov-16	Dec-16	Mar-17	May-15	May-15
BTEX (mg/l)															
Benzene	0.005	<0.001	<	<0.005	<0.005	<0.005	<0.005	<0.001	<	<0.005	<0.005	<0.005	<0.005	<0.001	<0.001
Ethylbenzene	0.7	<0.001	<	<0.005	<0.005	<0.005	<0.005	<0.001	<	<0.005	<0.005	<0.005	<0.005	<0.001	<0.001
Toluene	1	<0.005	<	<0.005	<0.005	<0.005	<0.005	<0.005	<	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Xylene, Total	10	<0.003	<	<0.005	<0.005	<0.005	<0.005	<0.003	<	<0.005	<0.005	<0.005	<0.005	<0.003	<0.003
PNAs (mg/l)															
Acenaphthene	0.42	<0.00005	<	<0.01	<0.01	<0.01	<0.01	<0.00005	<	<0.01	<0.01	<0.01	<0.01	<0.00005	<0.00005
Acenaphthylene	0.21	<0.00005	<	<0.01	<0.01	<0.01	<0.01	<0.00005	<	<0.01	<0.01	<0.01	<0.01	<0.00005	<0.00005
Anthracene	2.1	<0.00005	<	<0.005	<0.005	<0.005	<0.005	**0.000063**	<	<0.005	<0.005	<0.005	<0.005	<0.00005	<0.00005
Benzo(a)anthracene	0.00013	<0.00005	<	<0.00013	**0.00014**	<0.00013	<0.00013	**0.0003**	<	<0.00013	**0.00015**	<0.00013	<0.00013	<0.00005	<0.00005
Benzo(a)pyrene	0.0002	<0.00005	<	<0.0002	<0.0002	<0.0002	<0.0002	**0.00049**	<	<0.0002	**0.0002**	<0.0002	<0.0002	<0.00005	<0.00005
Benzo(b)fluoranthene	0.00018	<0.00005	<	<0.00018	**0.00025**	<0.00018	<0.00018	**0.0011**	<	<0.00018	**0.00028**	<0.00018	<0.00018	<0.00005	<0.00005
Benzo(k)fluoranthene	0.00017	<0.00005	<	<0.00017	**0.00027**	<0.00017	<0.00017	**0.00032**	<	<0.00017	**0.0003**	<0.00017	<0.00017	<0.00005	<0.00005
Benzo(ghi)perylene	0.21	<0.00005	<	<0.0004	<0.0004	<0.0004	<0.0004	**0.00072**	<	<0.0004	<0.0004	<0.0004	<0.0004	<0.00005	<0.00005
Chrysene	0.0015	<0.00005	<	<0.0015	<0.0015	<0.0015	<0.0015	**0.00084**	<	<0.0015	<0.0015	<0.0015	<0.0015	<0.00005	<0.00005
Dibenzo(a,h)anthracene	0.0003	<0.00005	<	<0.0003	<0.0003	<0.0003	<0.0003	**0.00012**	<	<0.0003	<0.0003	<0.0003	<0.0003	<0.00005	<0.00005
Fluoranthene	0.28	<0.00005	<	<0.002	<0.002	<0.002	<0.002	**0.0012**	**0.000076**	<0.002	<0.002	<0.002	<0.002	<0.00005	<0.00005
Fluorene	0.28	<0.00005	<	<0.002	<0.002	<0.002	<0.002	<0.00005	<	<0.002	<0.002	<0.002	<0.002	<0.00005	<0.00005
Indeno(1,2,3-cd)pyrene	0.00043	<0.00005	<	<0.0003	**0.0003**	<0.0003	<0.0003	**0.00057**	<	<0.0003	**0.0003**	<0.0003	<0.0003	<0.00005	<0.00005
Naphthalene	0.14	<0.00025	<	<0.01	<0.01	<0.01	<0.01	<0.00025	<	<0.01	<0.01	<0.01	<0.01	<0.00025	<0.00025
Phenanthrene	0.21	<0.00005	<	<0.005	<0.005	<0.005	<0.005	**0.000526**	<	<0.005	<0.005	<0.005	<0.005	<0.00005	<0.00005
Pyrene	0.21	<0.00005	<	<0.002	<0.002	<0.002	<0.002	**0.00096**	**0.000072**	<0.002	<0.002	<0.002	<0.002	<0.00005	<0.00005
Total Metals (6010C)															
Iron		4.8	14	0.99	1.28	<0.05	0.14	1.1	1.8	0.56	0.36	0.11	0.14	0.45	0.6
Lead	0.0075	0.0058	0.0082	<0.005	<0.005	<0.005	<0.005	0.011	<	<0.005	<0.005	<0.005	<0.005	<	<
Dissolved Metals (6010C)															
Iron, diss.		NA	NA	<0.05	<0.05	<0.05	<0.05	NA	NA	<0.05	<0.05	<0.05	<0.05	NA	NA
Lead, diss.	0.0075	NA	NA	<0.005	<0.005	<0.005	<0.005	NA	NA	<0.005	<0.005	<0.005	<0.005	NA	NA
Field Parameters															
pH	6.5 - 9	7.00	6.98	6.64	6.92	6.97	6.42	7.70	7.04	6.90	6.02	7.12	7.07	7.13	7.14
Temperature (°C)	--	NA	NA	17.89	17.87	13.93	10.40	NA	NA	15.55	15.41	13.42	12.72	NA	NA
Specific Conductivity (µS/cm)	--	NA	NA	268.16	1,766.1	1,810.7	1,734.9	NA	NA	1,444.4	1,626.5	1,522.8	1,631.3	NA	NA
Dissolved Oxygen (mg/l)	--	NA	NA	1.81	2.44	3.46	2.28	NA	NA	1.33	0.78	1.53	1.95	NA	NA
Turbidity (NTU)	--	NA	NA	113.75	502.26	5.53	8.36	NA	NA	55.79	110.88	8.39	8.31	NA	NA
ORP (mV)	--	NA	NA	199.0	227.8	183.8	110.4	NA	NA	181.7	247.2	166.9	117.9	NA	NA

Notes:
[1] 35 IAC 620
"<" = Historic analytical table indicated constituent not detected above laboratory reporting limits.
NS = Not Sampled, Insufficient Water
NA = Not Analyzed
BOLD Identified above laboratory detection limits
BOLD Exceeds Class I GRO
Results reported in milligrams per liter (mg/l) or parts per million.

APPENDIX A

POTABLE WATER WELL RECORDS

Water Well	Top	Bottom
drift	0	284
limestone	284	311
Total Depth		**311**

Casing: 5" from 0' to 284'

Size hole below casing: 5"

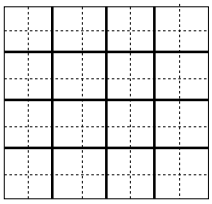
Water from limestone at 284' to 311'.
Static level 32' below casing top which is 0' above GL
Pumping level 32' when pumping at 30 gpm for 0 hours

Driller's Log filed

Owner Address: ,
Location source: Platbook verified

Permit Date: **Permit #:**

COMPANY owner
FARM Roberts, Mr.
DATE DRILLED January 1, 1955 **NO.**
ELEVATION 795GL **COUNTY NO.** 00090
LOCATION S2 NW
LATITUDE 42.074957 **LONGITUDE** -88.856029
COUNTY DeKalb **API 120370009000** **35 - 42N - 3E**



Water Well	Top	Bottom
top soil	0	2
clay	2	12
hard pan	12	90
clay	90	95
quick sand	95	143
gravel	143	175
yellow lime rock	175	198
Total Depth		**198**

Casing: 5" GALV. STEEL CASING from 0' to 175'

Size hole below casing: 5"

Water from yellow lime at 175' to 198'.
Static level 6' below casing top which is 0' above GL
Pumping level 16' when pumping at 10 gpm for 2 hours

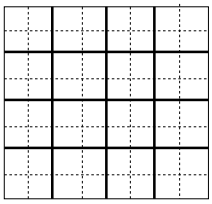
Remarks: 1st farm on left East of Kirkland Rt 72

Driller's Log filed

Owner Address: ,
Location source: Platbook verified

Permit Date: **Permit #:**

COMPANY owner
FARM Ault, Fred
DATE DRILLED January 1, 1961 **NO.** 1
ELEVATION 778TM **COUNTY NO.** 00562
LOCATION 75'S line, 420'E line of SW SW SW
LATITUDE 42.095255 **LONGITUDE** -88.840864
COUNTY DeKalb **API 120370056200** **24 - 42N - 3E**



Water Well	Top	Bottom
clay	0	16
limestone	16	125
Total Depth		**125**

Casing: 6" 19# BLK STEEL from 0' to 40'

Size hole below casing: 6"

Water from rock at 0' to 125'.
Pumping level 16' when pumping at 17 gpm for 2 hours

Driller's Log filed

Owner Address: Kirkland, IL

Location source: Platbook verified

Permit Date: January 1, 1968 **Permit #:** 4548

COMPANY Rosenquist K W

FARM Lawrence & Decker

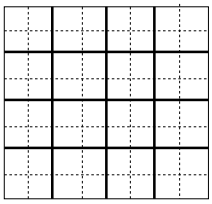
DATE DRILLED April 22, 1968 **NO.**

ELEVATION 0 **COUNTY NO.** 00835

LOCATION SW NE SE

LATITUDE 42.099526 **LONGITUDE** -88.845448

COUNTY DeKalb **API 120370083500** **23 - 42N - 3E**



Water Well	Top	Bottom
clay	0	5
sand	5	10
clay	10	24
sand & clay	24	38
gravel, stones & sand	38	74
soft limestone	74	83
white & yellow then red limestone	83	125
Total Depth		**125**

Casing: 6" from 0' to 0'

Size hole below casing: 6"

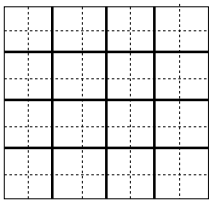
Water from rock at 0' to 0'.
Static level 10' below casing top which is 1' above GL

Driller's Log filed

Owner Address: 6336 Calumet Ave. Munster, IN
Location source: Platbook verified

Permit Date: February 13, 1974 **Permit #:** 27609

COMPANY Stone H I & Son
FARM Calumet Council B.S.A.
DATE DRILLED March 20, 1974 **NO.** 1
ELEVATION 750TM **COUNTY NO.** 21227
LOCATION 2380'N line, 1100'E line of SW SE SE
LATITUDE 42.090035 **LONGITUDE** -88.867642
COUNTY DeKalb **API 120372122700** **22 - 42N - 3E**



Private Water Well	Top	Bottom
clay	0	10
sand & gravel	10	30
sand, clay & gravel	30	40
clay & stones	40	60
fine sand	60	70
clay	70	80
sandy clay	80	130
fine sand	130	145
sand & gravel	145	170
limestone	170	220
Total Depth		**220**

Casing: 5" IL APPROVED STEEL from -1' to 220'

Grout: BENTONITE from 0 to 0.

Size hole below casing: 5"

Water from rock at 0' to 0'.

Pumping level 15' when pumping at 15 gpm for 0 hours

Permanent pump installed at 40'
on July 7, 1999, with a capacity of 10 gpm

Owner Address: 31957 Ault Road Kingston, IL

Address of well: same as above

Location source: Location from permit

Permit Date: June 16, 1999 **Permit #:**

COMPANY Stone, Guy D.

FARM Busse, Daryl & Connie

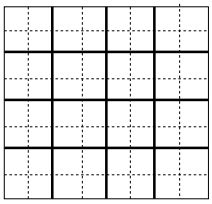
DATE DRILLED June 21, 1999 **NO.**

ELEVATION 0 **COUNTY NO.** 23199

LOCATION NE NE NE

LATITUDE 42.094289 **LONGITUDE** -88.823394

COUNTY DeKalb **API 120372319900** **25 - 42N - 3E**



Water Well	Top	Bottom
clay	0	25
sand	25	31
limestone	31	125
Total Depth		**125**

Casing: 6" BLK. STEEL 19.45# from 0' to 31'

Size hole below casing: 6"

Water from limestone at 31' to 125'.
Static level 6' below casing top which is 1' above GL
Pumping level 13' when pumping at 15 gpm for 2 hours

Driller's Log filed

Owner Address: Box 97 Kirkland, IL

Location source: Location from permit

Permit Date: June 27, 1972 **Permit #:** 18481

COMPANY Rosenquist, Gerald Wilbur

FARM Begun, John

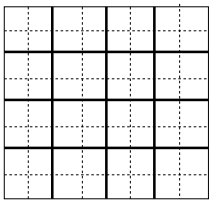
DATE DRILLED July 6, 1972 **NO.**

ELEVATION 767TM **COUNTY NO.** 01007

LOCATION NW NE SE

LATITUDE 42.101333 **LONGITUDE** -88.845464

COUNTY DeKalb **API 120370100700** **23 - 42N - 3E**



Municipal Well #1 #11424

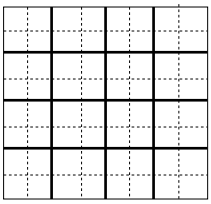
Municipal Water Supply	Top	Bottom
no record	0	737
Total Depth		**737**

Casing: 7" CASING from 0' to 88'

Static level 6' below casing top which is 0' above GL
Pumping level 8' when pumping at 200 gpm for 1 hour

Permit Date: **Permit #:**

COMPANY
FARM Kirkland, Village of
DATE DRILLED January 1, 1896 **NO.**
ELEVATION 775 **COUNTY NO.** 23132
LOCATION 650'S 1850'W NE/c
LATITUDE 42.093177 **LONGITUDE** -88.848557
COUNTY DeKalb **API 120372313200** **26 - 42N - 3E**



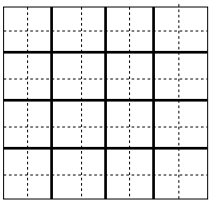
ILLINOIS STATE GEOLOGICAL SURVEY

Municipal Well #2
 # 11425

Municipal Water Supply	Top	Bottom
soil, silty, dark brown;silt,ylsh orange	0	5
gvl(1/2"), sand,calc,clayey,ylsh orn/gry	5	30
till,calc,sy,sty,ylsh orn / gry orange	30	50
till,calc,sty,gry orange to olive green	50	60
dol,ylsh orn / lgt ylsh gry, f / coarse	60	130
dolomite, cherty, ylsh orn, fine /coarse	130	147
dol,slgtly sy, yl gry,f/crs,few dk spks	147	165
dol, sy, ylsh gry, f / crs, dk speckled	165	175
dol,gry yl,f / crs,ptly dk spkld,f / crs	175	180
dol,gray yl /ylsh gray, fine to medium	180	205
dol,ylsh gry / pale ylsh brn,f / medium	205	215
dol,ylsh orn,f/med;dol,gry,f,slgtly fosf	215	225
dol,lgt ylsh brn / gray, fine to medium	225	245
dol,ylsh gry/gry,f/med,scttrd orn&dk spk	245	260
dol,ptly argil,gry/ylsh gry,f,dark spks	260	270
dol,ylsh gry/orn,f/med,scttrd dk&orn spk	270	290
dol,ptly argil,ylsh orn, fine to medium	290	295
dol,sy,ylsh gry to yellowish orange,fine	295	300
sh,dolc,grn/gry grn,fr;ss,gry,crs,incoh	300	305
dol,sy,argil,yl/grn-gry,vy f,ss,f/crs	305	310
sandstone,gray,fine & coarse,incoherent	310	315
dol,sy,argil,yl/grn-gry,very fine	315	340
ss,partly dol,gry, vy f / crs,incoherent	340	350
ss,gray,fine / crs, incoh,silty, at base	350	420

Permit Date: **Permit #:**

COMPANY owner
FARM Kirkland, Village Of
DATE DRILLED October 1, 1950 **NO.** 1
ELEVATION 775TM **COUNTY NO.** 00792
LOCATION 2219'S line, 1818'E line of SE
LATITUDE 42.086613 **LONGITUDE** -88.848295
COUNTY **DeKalb** **API** **120370079200** **26 - 42N - 3E**



sandstone,silty,light gray,f / crs,incoh	420	430
sandstone,light gry,fine to coarse,incoh	430	495
ss,lgt ylsh gry,fine / medium,incoherent	495	550
ss,sty,lgt ylsh gray, fine to crs,incoh	550	590
ss,light yellow,fine / medium,incoherent	590	600
ss,lgt gry, pnksh tint, fine to coarse	600	620
cht,yl,pnk,ss,yl-gry,f/crs;ss,silic,yl	620	630
Knox	350	
St Peter	350	
Total Depth		**630**

Casing: 13" I.D. from 0' to 69'
8" I.D. from -2' to 152'

Static level 15' below casing top which is 0' above GL
Pumping level 24' when pumping at 200 gpm for 0 hours

Driller's Log filed
Strip Log filed
Survey Sample Study filed
Sample set # 20714 (0' - 630') Received: January 1, 1950

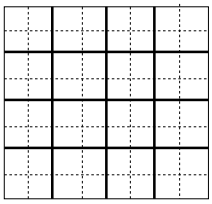
Owner Address: ,
Location source: Platbook verified

Municipal Well #3
 # 01613

Municipal Water Supply	Top	Bottom
brown clay	0	10
yellow clay	10	15
brown clay	15	40
sandy & clay	40	50
sandy clay	50	70
fine gravel	70	80
clay	80	90
clay & fine gravel	90	120
fine gravel	120	125
clay	125	140
sand & fine gravel (caving)	140	160
fine gravel	160	180
clay & fine gravel	180	190
clay	190	205
clay & sand	205	281
soft brown limestone	281	283
shale	283	284
hard limestone	284	287
tan limestone	287	370
sandstone	370	376
tan sandstone	376	430
brown sandstone	430	440
tan sandstone	440	530
brown lime & sand	530	554

Permit Date: **Permit #:**

COMPANY Meadow Equipment
FARM Kirkland
DATE DRILLED March 25, 2005 **NO.** 3
ELEVATION 0 **COUNTY NO.** 23580
LOCATION SW SE NW
LATITUDE 42.088375 **LONGITUDE** -88.874446
COUNTY DeKalb **API 120372358000** **27 - 42N - 3E**



red shale	554	560
Total Depth		**560**

Casing: 20" A53 STEEL from 0' to 288'
16" A53 STEEL from 288' to 376'

Grout: PRESSURIZED from 0 to 288.

Grout: NEAT CEMENT from 0 to 376.

Water from sandstone at 376' to 560'.
Static level 69' below casing top which is 2' above GL

Remarks: PICS 03790300 #3, Est Yield 600 gpm

Owner Address: ,
Address of well: W of Malta Rd, N of Rt 72
Kirkland, IL
Add'l loc. info: Subdivision: Hickory Ridge

Location source: Location from the driller

Water Well	Top	Bottom
clay	0	5
sand	5	10
clay	10	24
sand & clay	24	38
gravel, stones & sand	38	74
soft limestone	74	83
white & yellow then red limestone	83	125
Total Depth		**125**

Casing: 6" from 0' to 0'

Size hole below casing: 6"

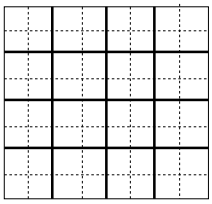
Water from rock at 0' to 0'.
Static level 10' below casing top which is 1' above GL

Driller's Log filed

Owner Address: 6336 Calumet Ave. Munster, IN
Location source: Platbook verified

Permit Date: February 13, 1974 **Permit #:** 27609

COMPANY Stone H I & Son
FARM Calumet Council B.S.A.
DATE DRILLED March 20, 1974 **NO.** 1
ELEVATION 750TM **COUNTY NO.** 21227
LOCATION 2380'N line, 1100'E line of SW SE SE
LATITUDE 42.090035 **LONGITUDE** -88.867642
COUNTY DeKalb **API 120372122700** **22 - 42N - 3E**



APPENDIX B

SOIL BORING / MONITORING WELL COMPLETION REPORTS

PDC TECHNICAL SERVICES, INC.
LOG OF BORING

Project KIRKLAND QUICK STOP — Sheet 1 of 1
Project Location KIRKLAND, ILLINOIS — Job No. 91C-139
Boring Designation MW-1 — Boring Type HSA
Date Started 9-5-91 — Date Completed 9-5-91 — Elev. ____ — Total Depth 18.0'
Drilling Contractor TESTING ENGINEERING, INC. — Logged By M. MELTON
Driller PAT HAMMOND & STEVE WADE — Rig No. 17 — Backfilled (Y/N) N
Surface Conditions ASPHALT PAVEMENT — INSTALLED WELL MW-1

SAMPLE NUMBER	SAMPLE TYPE	RECOVERED (INCHES)	SET 6"	2ND 6"	3RD 6"	"N" VALUE	OP (TSF)	DEPTH (FEET)	SAMPLE TYPE	LOG	DESCRIPTION OF MATERIAL	REMARKS
											ASPHALT	
											SANDY GRAVEL [FILL]	
1	SS	18	3	3	3	6	1.0	2			SILTY CLAY (CL): Dark brown, soft, moist	TIP read 0.0 PPM
								4			grades brown @ 3.7'	
2	SS	20	2	4	3	7	0.8	6			grades mottled greenish-greyish brown @ 5.7'	TIP read 34.5 PPM
3	SS	19	7	13	16	29	–	8			SANDY GRAVEL (GM); Dark greenish grey, medium dense, wet, w/ silt	TIP read 1745.0 PPM
4	SS	16	12	18	16	34	–	10			grades saturated @ 11.2'	TIP read 2348.0 PPM Collected sample MW-1
5	SS	16	17	18	24	42	–	12				
								14			SAND (SW); Brown, loose, saturated	TIP read 2.4 PPM
								16				
								18			End of boring @ 18.0'	

PDC TECHNICAL SERVICES, INC.
LOG OF BORING

Sheet 1 of 1

Project KIRKLAND QUICK STOP — Job No. 91C-139

Project Location KIRKLAND, ILLINOIS — Boring Type HSA

Boring Designation MW-2 — Elev. _____ Total Depth 18.0'

Date Started 9-4-91 Date Completed 9-4-91 Logged By M. MELTON

Drilling Contractor TESTING ENGINEERING, INC.

Driller PAT HAMMOND & STEVE WADE Rig No. 17 Backfilled (Y/N) N

Surface Conditions ASPHALT PAVEMENT — INSTALLED WELL MW-2

SAMPLE NUMBER	SAMPLE TYPE	RECOVERED (INCHES)	1ST 6"	2ND 6"	3RD 6"	"N" VALUE	QP (TSF)	DEPTH (FEET)	SAMPLE TYPE	LOG	DESCRIPTION OF MATERIAL	REMARKS
											ASPHALT	
											SANDY GRAVEL [Fill]	
1	SS	12	3	3	3	6	1.1	2			SILTY CLAY (CL); Dark brown, soft, molst	TIP read 0.0 PPM
								4				
2	SS	16	3	3	4	7	1.5	6			grade w/sand @ 6.0'	TIP read 0.0 PPM
											1" sand seam @ 6.8'	
3	SS	21	16	19	21	40	-	8			SANDY GRAVEL (GM); Brown, dense, moist	TIP read 0.0 PPM
								10			grades wet @ 9.4'	
4	SS	18	21	25	26	N/A	-					TIP read 0.0 PPM
								12			grades saturated @ 11.5'	
5	SS	19	19	28	21	49	-					TIP read 0.0 PPM
								14			SAND (SW); Brown, loose, saturated	
6	SS	14	10	16	10	26	-	16			grades oxide stains @ 16.5'	TIP read 0.0 PPM
								18			End of boring @ 18.0'	

Illinois Environmental Protection Agency — LUST Well Completion Report

Incident No.: 89-1717 — Well No.: MW-3A

Site Name: KIRKLAND QUICK STOP — Date Drilling Start: 11/14/94

Drilling Contractor: FISCHE ENTERPRISES INC. — Date Completed: 11/14/94

Driller: J. Reimer — Geologist: A. HAAK/DAHL

Drilling Method: HOLLOW STEM AUGER — Drilling Fluids (type) NO FLUIDS USED

Annular Space Details

Type of Surface Seal: Portland cement

Type of Annual Sealant: Portland cement

Type of Bentonite Seal (Granular, Pellet): 1/4" pellets

Type of Sand Pack: #5 Silica

Well Construction Materals

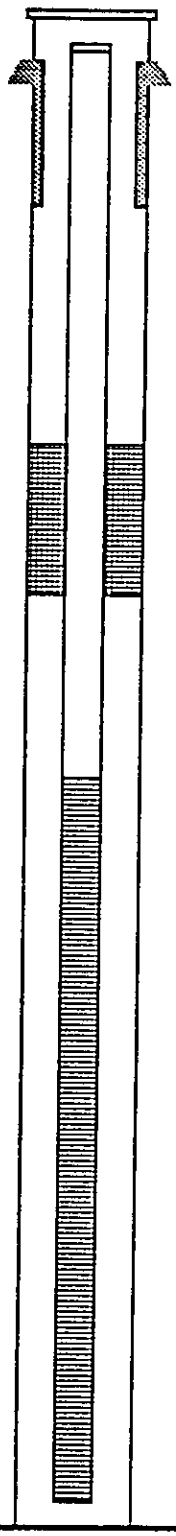
	Sstainless Steel SpecifyType	PVC Specify Type	Other SpecifyType
Riser coupling joint			
Riser pipe above w.t.		Sched 40	
Riser pipe below w.t.			
Screen	304		
Coupling joint screen to riser	Threaded	Threaded	
Protective casing			Manhole Cover

Measurements

to .01 ft (where applicable)

Riser pipe length	3' 2"
Screen length	10'
Screen slot size	.01
Protective casing length	
Depth to water	7.95
Elevation of water	89.63
Free Product thickness	
Gallons removed (develop)	
Gallons removed (purge)	2.82
Other	

Completed by: A. Haak



Elevations - .01 ft.

97.92 Top of Protective Casing

97.58 Top of Riser Pipe

97.92 Ground Surface

97.42 Top of Annular Sealant

.16 Casing Stickup

97.26 Top of Seal

2' Total Seal Interval

95.26 Top of Sand

94.26 Top of Screen

10 Total Screen Interval

84.26 Bottom of Screen

83.93 Bottom of Borehole

For Groundwater Monitoring Wells installed due to a release of petroleum subject to 35 Ill. Adm. Code Section 731, Subpart F.

Illinois Environmental Protection Agency — LUST Well Completion Report

Incident No.: 89-1717 — Well No.: MW-4

Site Name: KIRKLAND QUICK STOP — Date Drilling Start: 11/14/94

Drilling Contractor: FISCHE ENTERPRISES INC. — Date Completed: 11/14/94

Driller: J. REIMER — Geologist: A. HAAK/DAHL

Drilling Method: HOLLOW STEM AUGER — Drilling Fluids (type) NO FLUIDS USED

Annular Space Details

Type of Surface Seal: Portland cement

Type of Annual Sealant: Portland cement

Type of Bentonite Seal (Granular, Pellet): 1/4" pellets

Type of Sand Pack: #5 Silica

Well Construction Materals

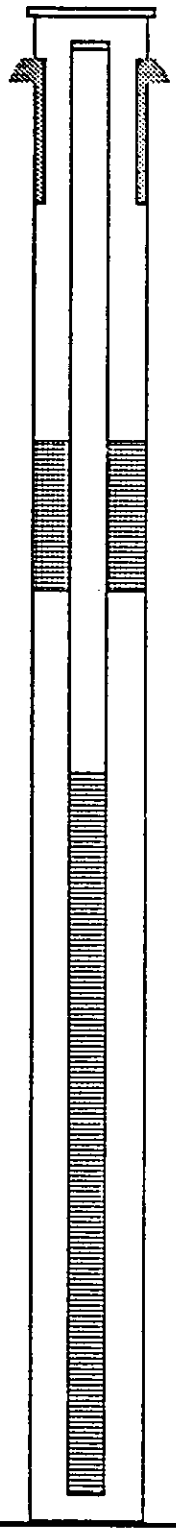
	Sstainless Steel SpecifyType	PVC Specify Type	Other SpecifyType
Riser coupling joint			
Riser pipe above w.t.		Sched 40	
Riser pipe below w.t.			
Screen	304		
Coupling joint screen to riser	Threaded	Threaded	
Protective casing			Manhole Cover

Measurements

to .01 ft (where applicable)

Riser pipe length	3' 2"
Screen length	10
Screen slot size	.01
Protective casing length	
Depth to water	8.68
Elevation of water	89.84
Free Product thickness	N/A
Gallons removed (develop)	
Gallons removed (purge)	2.07
Other	

Completed by: A. Haak



Elevations - .01 ft.

98.88 Top of Protective Casing

98.52 Top of Riser Pipe

98.88 Ground Surface

98.36 Top of Annular Sealant

.16 Casing Stickup

98.22 Top of Seal

2' Total Seal Interval

96.22 Top of Sand

95.22 Top of Screen

10 Total Screen Interval

85.22 Bottom of Screen

84.88 Bottom of Borehole

For Groundwater Monitoring Wells installed due to a release of petroleum subject to 35 Ill. Adm. Code Section 731, Subpart F.

Illinois Environmental Protection Agency — LUST Well Completion Report

Incident No.: 89-1717 — Well No.: MW-5

Site Name: KIRKLAND QUICK STOP — Date Drilling Start: 11/14/94

Drilling Contractor: FISCHE ENTERPRISES INC. — Date Completed: 11/14/94

Driller: J. REIMER — Geologist: A. HAAK/DAHL

Drilling Method: HOLLOW STEM AUGER — Drilling Fluids (type) NO FLUIDS USED

Annular Space Details

Type of Surface Seal: Portland cement

Type of Annual Sealant: Portland cement

Type of Bentonite Seal (Granular, Pellet): 1/4" pellets

Type of Sand Pack: #5 Silica

Well Construction Materals

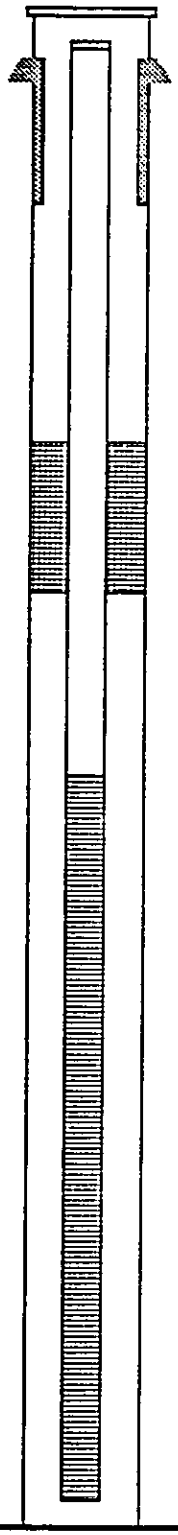
	Sstainless Steel SpecifYType	PVC Specify Type	Other SpecifyType
Riser coupling joint			
Riser pipe above w.t.		Sched 40	
Riser pipe below w.t.			
Screen	304		
Coupling joint screen to riser	Threaded	Threaded	
Protective casing			Manhole Cover

Measurements

to .01 ft (where applicable)

Riser pipe length	3' 2"
Screen length	10'
Screen slot size	.01
Protective casing length	
Depth to water	9.21
Elevation of water	89.73
Free Product thickness	
Gallons removed (develop)	
Gallons removed (purge)	2.21
Other	

Completed by: A. Haak



Elevations - .01 ft.

99.26 Top of Protective Casing

98.94 Top of Riser Pipe

99.26 Ground Surface

98.78 Top of Annular Sealant

.16 Casing Stickup

98.60 Top of Seal

2 Total Seal Interval

96.60 Top of Sand

95.60 Top of Screen

10 Total Screen Interval

88.60 Bottom of Screen

86.27 Bottom of Borehole

For Groundwater Monitoring Wells installed due to a release of petroleum subject to 35 Ill. Adm. Code Section 731, Subpart F.

Illinois Environmental Protection Agency — LUST Well Completion Report

Incident No.: 89-1717 — Well No.: MW-6

Site Name: KIRKLAND QUICK STOP — Date Drilling Start: 11/14/94

Drilling Contractor: FISCHE ENTERPRISES — Date Completed: 11/14/94

Driller: J. REIMER — Geologist: A. HAAK/DAHL

Drilling Method: HOLLOW STEM AUGER — Drilling Fluids (type) NO FLUIDS USED

Annular Space Details

Type of Surface Seal: Portland cement

Type of Annual Sealant: Portland cement

Type of Bentonite Seal (Granular, Pellet): 1/4" pellets

Type of Sand Pack: #5 Silica

Well Construction Materals

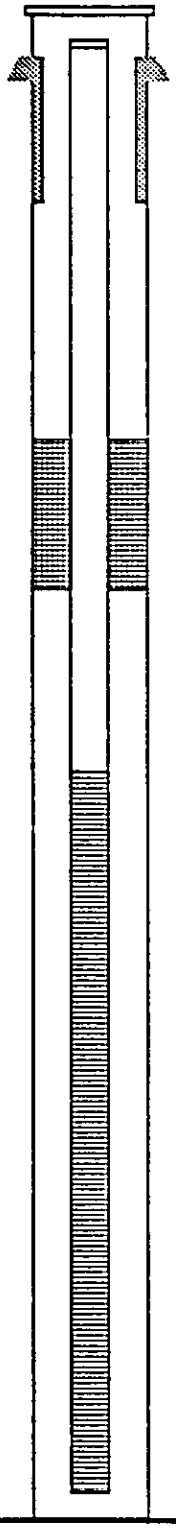
	Sstainless Steel SpecifyType	PVC Specify Type	Other SpecifyType
Riser coupling joint			
Riser pipe above w.t.		Sched. 40	
Riser pipe below w.t.			
Screen	304		
Coupling joint screen to riser	Threaded	Threaded	
Protective casing			Manhole Cover

Measurements

to .01 ft (where applicable)

Riser pipe length	3' 2"
Screen length	10'
Screen slot size	.01
Protective casing length	
Depth to water	8.62
Elevation of water	89.48
Free Product thickness	
Gallons removed (develop)	
Gallons removed (purge)	2.52
Other	

Completed by: A. Haak



Elevations - .01 ft.

98.44 Top of Protective Casing

98.10 Top of Riser Pipe

98.44 Ground Surface

97.94 Top of Annular Sealant

.16' Casing Stickup

97.78 Top of Seal

2 Total Seal Interval

95.78 Top of Sand

94.78 Top of Screen

10 Total Screen Interval

84.78 Bottom of Screen

84.45 Bottom of Borehole

For Groundwater Monitoring Wells installed due to a release of petroleum subject to 35 Ill. Adm. Code Section 731, Subpart F.

DAHL & ASSOCIATES, INC. / BETTENDORF, IOWA

Illinois Environmental Protection Agency — LUST Well Completion Report

Incident No.: 89-1717 — Well No.: MW-7

Site Name: KIRKLAND QUICK STOP — Date Drilling Start: 11/15/94

Drilling Contractor: FISCHE ENTERPRISES INC. — Date Completed: 11/15/94

Driller: J. REIMER — Geologist: A. HAAK/DAHL

Drilling Method: HOLLOW STEM AUGER — Drilling Fluids (type) NO FLUIDS USED

Annular Space Details

Type of Surface Seal: Portland cement

Type of Annual Sealant: Portland cement

Type of Bentonite Seal (Granular, Pellet): 1/4" pellets

Type of Sand Pack: #5 Silica

Well Construction Materals

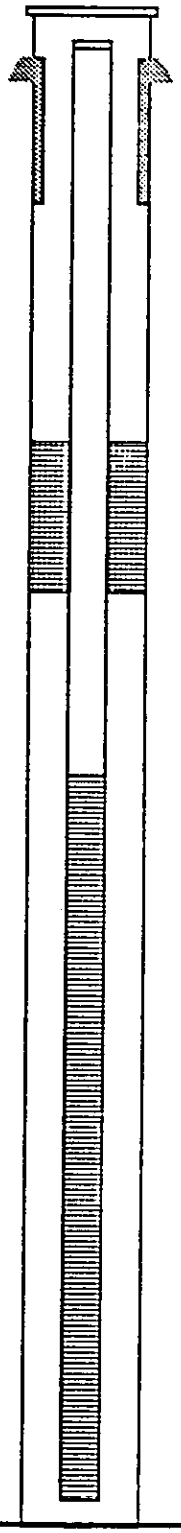
	Sstainless Steel SpecifyType	PVC Specify Type	Other SpecifyType
Riser coupling joint			
Riser pipe above w.t.		Sched 40	
Riser pipe below w.t.			
Screen	304		
Coupling joint screen to riser	Threaded	Threaded	
Protective casing			Manhole Cover

Measurements

to .01 ft (where applicable)

Riser pipe length	3' 2"
Screen length	10'
Screen slot size	.01
Protective casing length	
Depth to water	9.07
Elevation of water	89.58
Free Product thickness	
Gallons removed (develop)	
Gallons removed (purge)	2.27
Other	

Completed by: A. Haak



Elevations - .01 ft.

99.03 Top of Protective Casing

98.65 Top of Riser Pipe

99.03 Ground Surface

98.49 Top of Annular Sealant

.16' Casing Stickup

98.37 Top of Seal

2 Total Seal Interval

96.37 Top of Sand

95.37 Top of Screen

10 Total Screen Interval

85.37 Bottom of Screen

85.04 Bottom of Borehole

For Groundwater Monitoring Wells installed due to a release of petroleum subject to 35 Ill. Adm. Code Section 731, Subpart F.

Illinois Environmental Protection Agency — LUST Well Completion Report

Incident No.: 89-1717 — Well No.: MW-8

Site Name: KIRKLAND QUICK STOP — Date Drilling Start: 11/15/94

Drilling Contractor: FISCHE ENTERPRISES INC. — Date Completed: 11/15/94

Driller: J. REIMER — Geologist: A. HAAK/DAHL

Drilling Method: HOLLOW STEM AUGER — Drilling Fluids (type) NO FLUIDS USED

Annular Space Details

Type of Surface Seal: Portland cement

Type of Annual Sealant: Portland cement

Type of Bentonite Seal (Granular, Pellet): 1/4" pellets

Type of Sand Pack: #5 Silica

Well Construction Materals

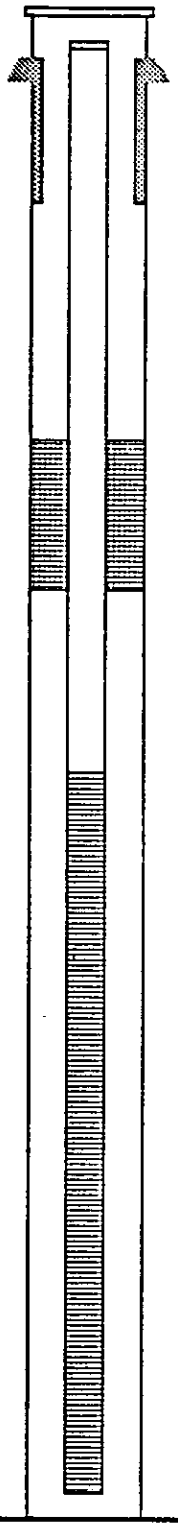
	Sstainless Steel SpecifiyType	PVC Specify Type	Other SpecifyType
Riser coupling joint			
Riser pipe above w.t.		Sched. 40	
Riser pipe below w.t.			
Screen	304		
Coupling joint screen to riser	Threaded	Threaded	
Protective casing			Manhole Cover

Measurements

to .01 ft (where applicable)

Riser pipe length	3' 2"
Screen length	10'
Screen slot size	.01
Protective casing length	
Depth to water	9.27
Elevation of water	89.63
Free Product thickness	
Gallons removed (develop)	
Gallons removed (purge)	2.17
Other	

Completed by: A. Haak



Elevations - .01 ft.

99.23 Top of Protective Casing

98.90 Top of Riser Pipe

99.23 Ground Surface

98.74 Top of Annular Sealant

.16' Casing Stickup

98.57 Top of Seal

2 Total Seal Interval

96.57 Top of Sand

95.57 Top of Screen

10 Total Screen Interval

85.57 Bottom of Screen

85.24 Bottom of Borehole

For Groundwater Monitoring Wells installed due to a release of petroleum subject to 35 Ill. Adm. Code Section 731, Subpart F.

Illinois Environmental Protection Agency — LUST Well Completion Report

Incident No.: 89-1717 — Well No.: MW-9

Site Name: KIRKLAND QUICK STOP — Date Drilling Start: 1/5/95

Drilling Contractor: FISCHE ENTERPRISES INC. — Date Completed: 1/5/95

Driller: S. SAUNDERS — Geologist: E. STEWART/DAHL

Drilling Method: HOLLOW STEM AUGER — Drilling Fluids (type) NO FLUIDS USED

Annular Space Details

Type of Surface Seal: Portland cement

Type of Annual Sealant: Potland cement

Type of Bentonite Seal (Granular, Pellet): 1/4" pellets

Type of Sand Pack: #5 Silica

Well Construction Materals

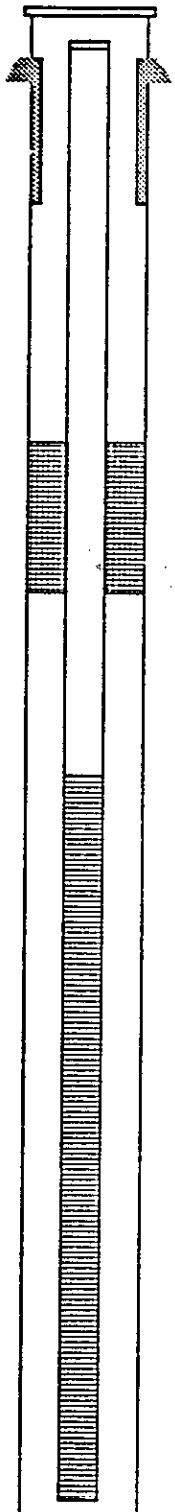
	Sstainless Steel SpecifYType	PVC Specify Type	Other SpecifyType
Riser coupling joint			
Riser pipe above w.t.		Sched. 40	
Riser pipe below w.t.			
Screen	304		
Coupling joint screen to riser	Threaded	Threaded	
Protective casing			Manhole Cover

Measurements

to .01 ft (where applicable)

Riser pipe length	3'
Screen length	10.00
Screen slot size	.01
Protective casing length	
Depth to water	8.76
Elevation of water	89.66
Free Product thickness	
Gallons removed (develop)	
Gallons removed (purge)	2.33 gallons
Other	

Completed by: A. Haak



Elevations - .01 ft.

--- Top of Protective Casing

98.42 Top of Riser Pipe

98.68 Ground Surface

97.57 Top of Annular Sealant

.85 Casing Stickup

96.91 Top of Seal

1' Total Seal Interval

95.91 Top of Sand

94.91 Top of Screen

10 Total Screen Interval

84.91 Bottom of Screen

85.16 Bottom of Borehole

For Groundwater Monitoring Wells installed due to a release of petroleum subject to 35 Ill. Adm. Code Section 731, Subpart F.

Illinois Environmental Protection Agency — LUST Well Completion Report

Incident No.: 89-1717 — Well No.: MW-10

Site Name: KIRKLAND QUICK STOP — Date Drilling Start: 1/5/95

Drilling Contractor: FISCHE ENTERPRISES INC. — Date Completed: 1/5/95

Driller: S. SAUNDERS — Geologist: E. STEWART/DAHL

Drilling Method: HOLLOW STEM AUGER — Drilling Fluids (type) NO FLUIDS USED

Annular Space Details

Type of Surface Seal: Portland cement

Type of Annual Sealant: Portland cement

Type of Bentonite Seal (Granular, Pellet): 1/4" pellets

Type of Sand Pack: #5 Silica

Well Construction Materals

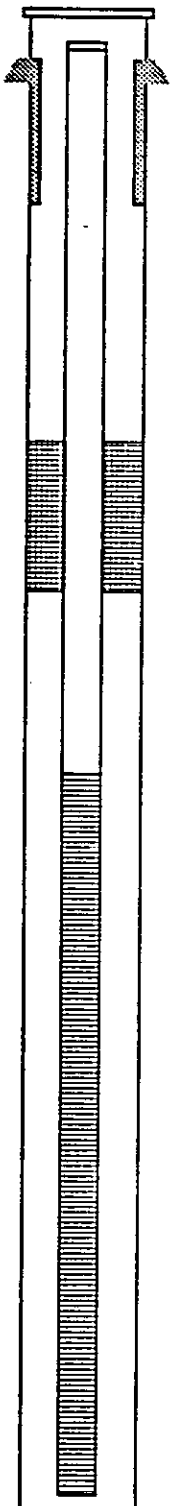
	Sstainless Steel SpecifyType	PVC Specify Type	Other SpecifyType
Riser coupling joint			
Riser pipe above w.t.		Sched. 40	
Riser pipe below w.t.			
Screen	304		
Coupling joint screen to riser	Threaded	Threaded	
Protective casing			Manhole Cover

Measurements

to .01 ft (where applicable)

Riser pipe length	3'
Screen length	10'
Screen slot size	.01
Protective casing length	---
Depth to water	8.10
Elevation of water	89.68
Free Product thickness	
Gallons removed (develop)	
Gallons removed (purge)	2.67 gallons
Other	

Completed by: A. Haak



Elevations - .01 ft.

--- Top of Protective Casing

97.78 Top of Riser Pipe

98.10 Ground Surface

96.88 Top of Annular Sealant

.90 Casing Stickup

96.22 Top of Seal

1' Total Seal Interval

95.22 Top of Sand

94.22 Top of Screen

10 Total Screen Interval

84.22 Bottom of Screen

84.47 Bottom of Borehole

For Groundwater Monitoring Wells installed due to a release of petroleum subject to 35 Ill. Adm. Code Section 731, Subpart F.

Illinois Environmental Protection Agency — **LUST Well Completion Report**

Incident No.: 891717
Site Name: Kirkland Quick Stop
Drilling Contractor: Trans Environmental
Driller: Cabeno Environmental Field Services
Drilling Method: Hollow Stem Auger-Geoprobe

Well No.: MW-11
Date Drilled Start: 26-Aug-09
Date Completed: 26-Aug-09
Geologist: Matt Warneke
Drilling Fluids (Type): None

The Agency is authorized to require this information under 415 ILCS 5/4 and 21. Disclosure of this information is required. Failure to do so may result in a civil penalty up to $25,000.00 for each day failure continues, a fine up to $50,000.00 and imprisonment up to five years. This form has been approved by the Forms Management Center.

Annular Space Details

Type of Surface Seal: Concrete
Type of Annular Sealant: Bentonite Chips
Type of Bentonite Seal (Granular, Pellet): Bartoid Bentonite (Hole Plug) - Chips
Type of Sand Pack: Silica Sand - #5

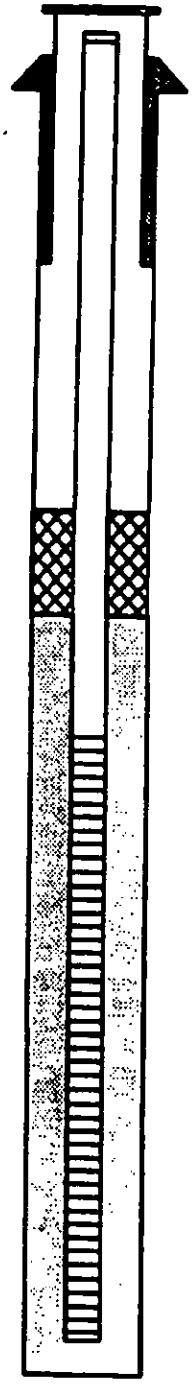
Well Construction Materials

	Stainless Steel Specify Type	PVC Specify Type	Other Specify Type
Riser coupling joint		x	
Riser pipe above w.t.		✓	
Riser Pipe below w.t.		✓	
Screen		✓	
Coupling joint screen to riser		x	
Protective casing			

Measurements to .01 ft (where applicable)

Riser Pipe Length	4.00
Screen Length	10.00
Screen Slot Size	
Protective casing length	8"
Depth to water	11.00
Elevation of water	
Free Product thickness	
Gallons removed (develop)	5
Gallons removed (purge)	
Other	

Completed by: Matt Warneke



Elevations - .01 ft.

_____ Top of Protective Casing
_____ Top of Riser Pipe
_____ Ground Surface
_____ Top of Annular sealant
_____ Casing Stickup

_____ Top of Seal
_____ Total Seal Interval
_____ Top of Sand

4' Top of Screen

_____ Total Screen Interval

14' Bottom of Screen
15' Bottom of Borehole

IL 532-2274
LPC 500 Dec-96

Illinois Environmental Protection Agency

LUST Well Completion Report

Incident No.: 891717
Site Name: Kirkland Quick Stop
Drilling Contractor: Trans Environmental
Driller: Cabeno Environmental Field Services
Drilling Method: Hollow Stem Auger-Geoprobe

Well No.: MW-12
Date Drilled Start: 26-Aug-09
Date Completed: 26-Aug-09
Geologist: Matt Warneke
Drilling Fluids (Type): None

Annular Space Details

Type of Surface Seal: Concrete
Type of Annular Sealant: Bentonite Chips
Type of Bentonite Seal (Granular, Pellet): _____
Bartoid Bentonite (Hole Plug) - Chips
Type of Sand Pack: Silica Sand - #5

Well Construction Materials

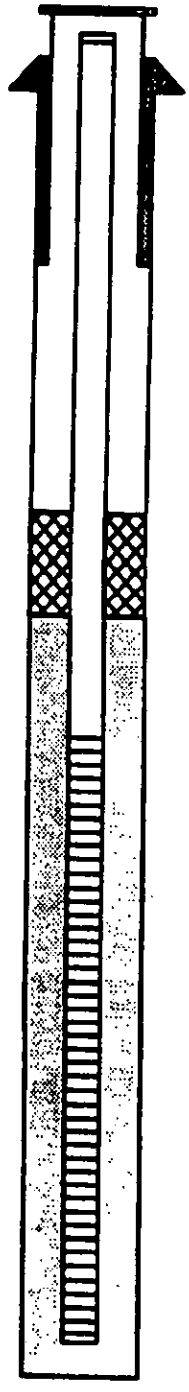
	Stainless Steel Specify Type	PVC Specify Type	Other Specify Type
Riser coupling joint			
Riser pipe above w.t.		✓	
Riser Pipe below w.t.		✓	
Screen		✓	
Coupling joint screen to riser		X	
Protective casing			

Measurements

to .01 ft (where applicable)

Riser Pipe Length	3.50
Screen Length	10.00
Screen Slot Size	
Protective casing length	8"
Depth to water	11.00
Elevation of water	
Free Product thickness	
Gallons removed (develop)	3
Gallons removed (purge)	
Other	

Completed by: Matt Warneke



Elevations - .01 ft.

_____ Top of Protective Casing
_____ Top of Riser Pipe
_____ Ground Surface
_____ Top of Annular sealant
_____ Casing Stickup

_____ Top of Seal
_____ Total Seal Interval
_____ Top of Sand
3.5' Top of Screen
10' Total Screen Interval
13.5' Bottom of Screen
14' Bottom of Borehole

The Agency is authorized to require this information under 415 ILCS 5/4 and 21. Disclosure of this information is required. Failure to do so may result in a civil penalty up to $25,000.00 for each day failure continues, a fine up to $50,000.00 and imprisonment up to five years. This form has been approved by the Forms Management Center.

IL 532-2274
LPC 500 Dec-96

Illinois Environmental Protection Agency

LUST Well Completion Report

Incident No.: 891717
Site Name: Kirkland Quick Stop
Drilling Contractor: Trans Environmental
Driller: Cabeno Environmental Field Services
Drilling Method: Hollow Stem Auger-Geoprobe

Well No.: MW-13
Date Drilled Start: 26-Aug-09
Date Completed: 26-Aug-09
Geologist: Matt Warneke
Drilling Fluids (Type): None

Annular Space Details

Type of Surface Seal: Concrete
Type of Annular Sealant: Bentonite Chips
Type of Bentonite Seal (Granular, Pellet): Bartoid Bentonite (Hole Plug) - Chips
Type of Sand Pack: Silica Sand - #5

Well Construction Materials

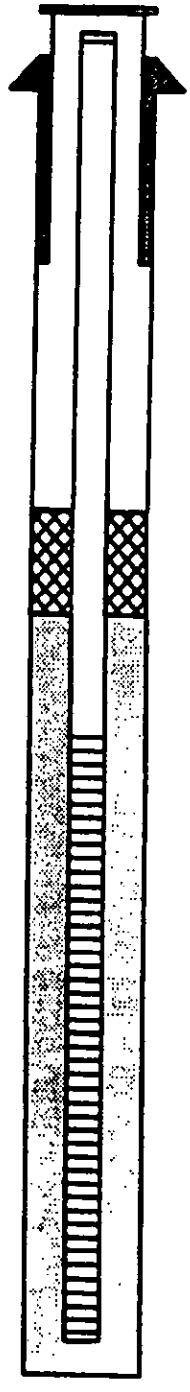
	Stainless Steel Specify Type	PVC Specify Type	Other Specify Type
Riser coupling joint		X	
Riser pipe above w.t.		✓	
Riser Pipe below w.t.		✓	
Screen		✓	
Coupling joint screen to riser		X	
Protective casing			

Measurements

to .01 ft (where applicable)

Riser Pipe Length	4.00
Screen Length	10.00
Screen Slot Size	
Protective casing length	8"
Depth to water	11.00
Elevation of water	
Free Product thickness	
Gallons removed (develop)	5
Gallons removed (purge)	
Other	

Completed by: Matt Warneke



Elevations - .01 ft.

_____ Top of Protective Casing
_____ Top of Riser Pipe
_____ Ground Surface
_____ Top of Annular sealant
_____ Casing Stickup

_____ Top of Seal
_____ Total Seal Interval
_____ Top of Sand

4' Top of Screen

10' Total Screen Interval

14' Bottom of Screen
15' Bottom of Borehole

The Agency is authorized to require this information under 415 ILCS 5/4 and 21. Disclosure of this information is required. Failure to do so may result in a civil penalty up to $25,000.00 for each day failure continues, a fine up to $50,000.00 and imprisonment up to five years. This form has been approved by the Forms Management Center.

IL 532-2274
LPC 500 Dec-96

Illinois Environmental Protection Agency

LUST Well Completion Report

Incident No.: 891717
Site Name: Kirkland Quick Stop
Drilling Contractor: Trans Environmental
Driller: Cabeno Environmental Field Services
Drilling Method: Hollow Stem Auger-Geoprobe

Well No.: MW-14
Date Drilled Start: 26-Aug-09
Date Completed: 26-Aug-09
Geologist: Matt Warneke
Drilling Fluids (Type): None

Annular Space Details

Type of Surface Seal: Concrete
Type of Annular Sealant: Bentonite Chips
Type of Bentonite Seal (Granular, Pellet): _____
Bartoid Bentonite (Hole Plug) - Chips
Type of Sand Pack: Silica Sand - #5

Well Construction Materials

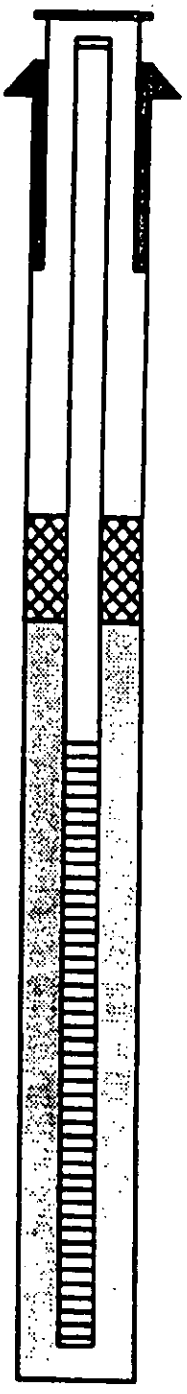
	Stainless Steel Specify Type	PVC Specify Type	Other Specify Type
Riser coupling joint		x	
Riser pipe above w.t.		✓	
Riser Pipe below w.t.		✓	
Screen		✓	
Coupling joint screen to riser		x	
Protective casing			

Measurements

to .01 ft (where applicable)

Riser Pipe Length	3.00
Screen Length	10.00
Screen Slot Size	
Protective casing length	8"
Depth to water	9.00
Elevation of water	
Free Product thickness	
Gallons removed (develop)	5
Gallons removed (purge)	
Other	

Completed by: Matt Warneke



Elevations - .01 ft.

_____ Top of Protective Casing
_____ Top of Riser Pipe
_____ Ground Surface
_____ Top of Annular sealant
_____ Casing Stickup

_____ Top of Seal
_____ Total Seal Interval
_____ Top of Sand

3' Top of Screen

10' Total Screen Interval

13' Bottom of Screen
14' Bottom of Borehole

The Agency is authorized to require this information under 415 ILCS 5/4 and 21. Disclosure of this information is required. Failure to do so may result in a civil penalty up to $25,000.00 for each day failure continues, a fine up to $50,000.00 and imprisonment up to five years. This form has been approved by the Forms Management Center.

IL 532-2274
LPC 500 Dec-96

STAGE 2

Illinois Environmental Protection Agency

LUST Well Completion Report

Incident No.: 891717
Site Name: Kirkland Quick Stop
Drilling Contractor: C & S Drilling
Driller: Mark and Bart
Drilling Method: 4 1/4" ID HSA

Well No.: SB-21/MW-15
Date Drilled Start: 04/20/15
Date Completed: 04/20/15
Geologist: Tom Mangan/Al Stone
Drilling Fluids (Type): None

Annular Space Details

Type of Surface Seal: Concrete
Type of Annular Sealant: Bentonite
Type of Bentonite Seal (Granular, Pellet): Pellet
Type of Sand Pack: #5 quartz filter sand

Well Construction Materials

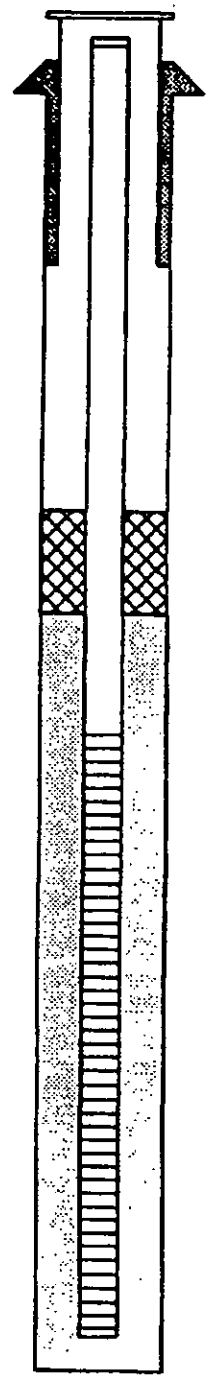
	Stainless Steel Specify Type	PVC Specify Type	Other Specify Type
Riser coupling joint		threaded	
Riser pipe above w.t.		2" sc. 40	
Riser Pipe below w.t.		2" sc. 40	
Screen		#10 slot	
Coupling joint screen to riser		threaded	
Protective casing	steel		

Measurements

to .01 ft (where applicable)

Riser Pipe Length	7.60
Screen Length	10.00
Screen Slot Size	0.00
Protective casing length	0.80
Depth to water	8.82
Elevation of water	760.33
Free Product thickness	0.00
Gallons removed (develop)	12.00
Gallons removed (purge)	5.00
Other	

Completed by: Alan Stone



Elevations - .01 ft.

769.55 Top of Protective Casing
769.15 Top of Riser Pipe
769.55 Ground Surface
768.55 Top of Annular sealant
-0.40 Casing Stickup

-1.00 Top of Seal
5.00 Total Seal Interval
-6.00 Top of Sand

-8.00 Top of Screen

10.00 Total Screen Interval

-18.00 Bottom of Screen
-20.00 Bottom of Borehole

STAGE 2

Illinois Environmental Protection Agency

LUST Well Completion Report

Incident No.: 891717
Site Name: Kirkland Quick Stop
Drilling Contractor: C & S Drilling
Driller: Mark and Bart
Drilling Method: 4 1/4" ID HSA

Well No.: SB-23/MW-16
Date Drilled Start: 04/22/15
Date Completed: 04/22/15
Geologist: Tom Mangan/Al Stone
Drilling Fluids (Type): None

Annular Space Details

Type of Surface Seal: Concrete
Type of Annular Sealant: Bentonite
Type of Bentonite Seal (Granular, Pellet): Pellet
Type of Sand Pack: #5 quartz filter sand

Well Construction Materials

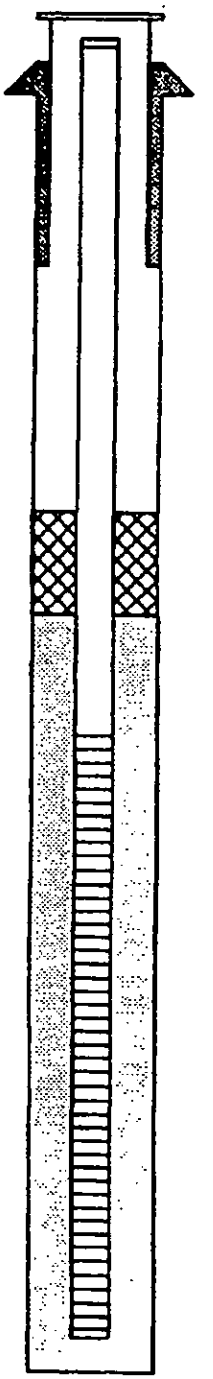
	Stainless Steel Specify Type	PVC Specify Type	Other Specify Type
Riser coupling joint		threaded	
Riser pipe above w.t.		2" sc. 40	
Riser Pipe below w.t.		2" sc. 40	
Screen		#10 slot	
Coupling joint screen to riser		threaded	
Protective casing	steel		

Measurements

to .01 ft (where applicable)

Riser Pipe Length	5.61
Screen Length	10.00
Screen Slot Size	0.00
Protective casing length	0.80
Depth to water	7.90
Elevation of water	760.28
Free Product thickness	0.00
Gallons removed (develop)	8.00
Gallons removed (purge)	5.00
Other	

Completed by: Alan Stone



Elevations - .01 ft.

768.57 Top of Protective Casing
768.18 Top of Riser Pipe
768.57 Ground Surface
767.57 Top of Annular sealant
-0.40 Casing Stickup

-1.00 Top of Seal
3.00 Total Seal Interval
-4.00 Top of Sand

-6.00 Top of Screen

10.00 Total Screen Interval

-16.00 Bottom of Screen
-20.00 Bottom of Borehole

STAGE 2a

Illinois Environmental Protection Agency

LUST Well Completion Report

Incident No.: 891717
Site Name: Kirkland Quick Stop
Drilling Contractor: C & S Drilling
Driller: Mark and Bart
Drilling Method: 4 1/4" ID HSA

Well No.: SB-24/MW-17
Date Drilled Start: 04/22/15
Date Completed: 04/22/15
Geologist: Tom Mangan/Al Stone
Drilling Fluids (Type): None

Annular Space Details

Type of Surface Seal: Concrete
Type of Annular Sealant: Bentonite
Type of Bentonite Seal (Granular, Pellet): Pellet

Type of Sand Pack: #5 quartz filter sand

Well Construction Materials

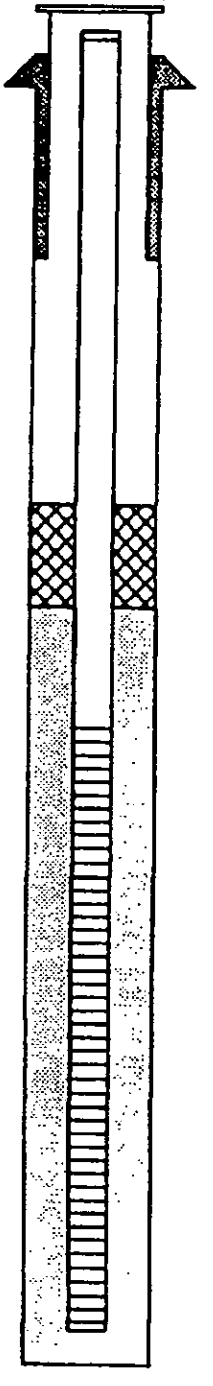
	Stainless Steel Specify Type	PVC Specify Type	Other Specify Type
Riser coupling joint		threaded	
Riser pipe above w.t.		2" sc. 40	
Riser Pipe below w.t.		2" sc. 40	
Screen		#10 slot	
Coupling joint screen to riser		threaded	
Protective casing	steel		

Measurements

to .01 ft (where applicable)

Riser Pipe Length	5.99
Screen Length	10.00
Screen Slot Size	0.00
Protective casing length	0.80
Depth to water	7.58
Elevation of water	760.33
Free Product thickness	0.00
Gallons removed (develop)	8.00
Gallons removed (purge)	5.00
Other	

Completed by: Alan Stone



Elevations - .01 ft.

768.92 Top of Protective Casing
767.91 Top of Riser Pipe
768.92 Ground Surface
767.92 Top of Annular sealant
-1.01 Casing Stickup

-1.00 Top of Seal
4.00 Total Seal Interval
-5.00 Top of Sand

-7.00 Top of Screen

10.00 Total Screen Interval

-17.00 Bottom of Screen
-20.00 Bottom of Borehole

STAGE 3

Illinois Environmental Protection Agency

LUST Well Completion Report

Incident No.: 891717
Site Name: Kirkland Quick Stop
Drilling Contractor: C & S Drilling
Driller: Mark and Bart
Drilling Method: 4 1/4" ID HSA

Well No.: SB-32MW-18
Date Drilled Start: 04/20/15
Date Completed: 04/20/15
Geologist: Tom Mangan/Al Stone
Drilling Fluids (Type): None

Annular Space Details

Type of Surface Seal: Concrete
Type of Annular Sealant: Bentonite
Type of Bentonite Seal (Granular, Pellet): Pellet

Type of Sand Pack: #5 quartz filter sand

Well Construction Materials

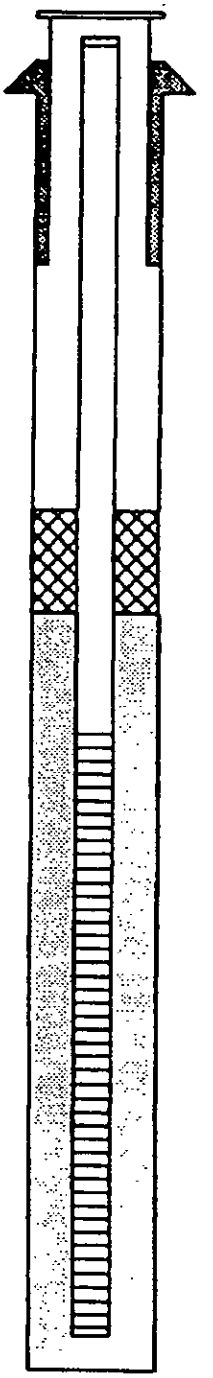
	Stainless Steel Specify Type	PVC Specify Type	Other Specify Type
Riser coupling joint		threaded	
Riser pipe above w.t.		2" sc. 40	
Riser Pipe below w.t.		2" sc. 40	
Screen		#10 slot	
Coupling joint screen to riser		threaded	
Protective casing	steel		

Measurements

to .01 ft (where applicable)

Riser Pipe Length	6.60
Screen Length	10.00
Screen Slot Size	0.00
Protective casing length	0.80
Depth to water	7.71
Elevation of water	760.13
Free Product thickness	0.00
Gallons removed (develop)	8.00
Gallons removed (purge)	5.00
Other	

Completed by: Alan Stone



Elevations - .01 ft.

768.24 Top of Protective Casing
767.84 Top of Riser Pipe
768.24 Ground Surface
767.24 Top of Annular sealant
-0.40 Casing Stickup

-1.00 Top of Seal
4.00 Total Seal Interval
-5.00 Top of Sand

-7.00 Top of Screen

10.00 Total Screen Interval

-17.00 Bottom of Screen
-18.00 Bottom of Borehole

STAGE 3

Illinois Environmental Protection Agency

LUST Well Completion Report

Incident No.: 891717
Site Name: Kirkland Quick Stop
Drilling Contractor: C & S Drilling
Driller: Mark and Dan
Drilling Method: 4 1/4" ID HSA

Well No.: SB-34/MW-19
Date Drilled Start: 04/23/15
Date Completed: 04/23/15
Geologist: Tom Mangan/Al Stone
Drilling Fluids (Type): None

Annular Space Details

Type of Surface Seal: Concrete
Type of Annular Sealant: Bentonite
Type of Bentonite Seal (Granular, Pellet): Pellet

Type of Sand Pack: #5 quartz filter sand

Well Construction Materials

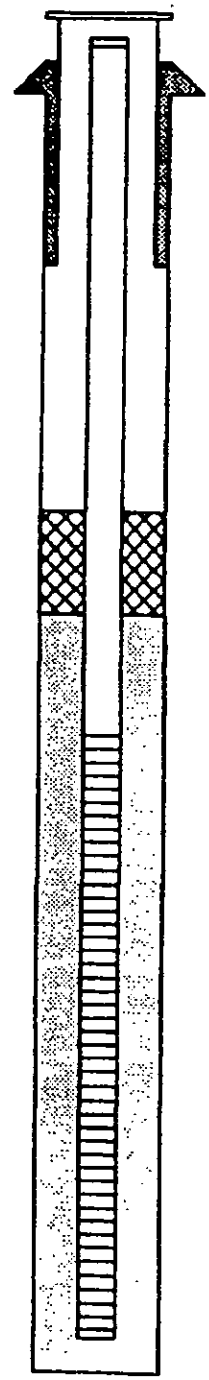
	Stainless Steel Specify Type	PVC Specify Type	Other Specify Type
Riser coupling joint		threaded	
Riser pipe above w.t.		2" sc. 40	
Riser Pipe below w.t.		2" sc. 40	
Screen		#10 slot	
Coupling joint screen to riser		threaded	
Protective casing	steel		

Measurements

to .01 ft (where applicable)

Riser Pipe Length	6.54
Screen Length	10.00
Screen Slot Size	0.00
Protective casing length	0.80
Depth to water	7.17
Elevation of water	760.16
Free Product thickness	0.00
Gallons removed (develop)	8.00
Gallons removed (purge)	5.00
Other	

Completed by: Alan Stone



Elevations - .01 ft.

767.79 Top of Protective Casing
767.33 Top of Riser Pipe
767.79 Ground Surface
766.79 Top of Annular sealant
-0.46 Casing Stickup

-1.00 Top of Seal
3.00 Total Seal Interval
-4.00 Top of Sand

-6.00 Top of Screen

10.00 Total Screen Interval

-16.00 Bottom of Screen
-19.00 Bottom of Borehole

STAGE 3

Illinois Environmental Protection Agency

LUST Well Completion Report

Incident No.: 891717
Site Name: Kirkland Quick Stop
Drilling Contractor: C & S Drilling
Driller: Mark and Dan
Drilling Method: 4 1/4" ID HSA

Well No.: SB-38/MW-20
Date Drilled Start: 04/23/15
Date Completed: 04/23/15
Geologist: Tom Mangan/Al Stone
Drilling Fluids (Type): None

Annular Space Details

Type of Surface Seal: Concrete
Type of Annular Sealant: Bentonite
Type of Bentonite Seal (Granular, Pellet): Pellet

Type of Sand Pack: #5 quartz filter sand

Well Construction Materials

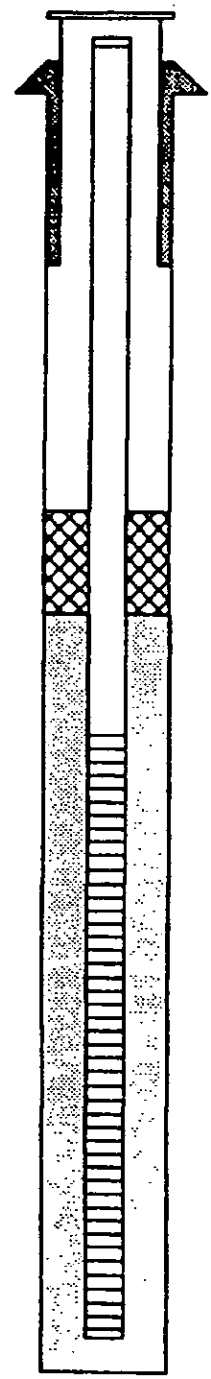
	Stainless Steel Specify Type	PVC Specify Type	Other Specify Type
Riser coupling joint		threaded	
Riser pipe above w.t.		2" sc. 40	
Riser Pipe below w.t.		2" sc. 40	
Screen		#10 slot	
Coupling joint screen to riser		threaded	
Protective casing	steel		

Measurements

to .01 ft (where applicable)

Riser Pipe Length	5.73
Screen Length	10.00
Screen Slot Size	0.00
Protective casing length	0.80
Depth to water	6.80
Elevation of water	757.83
Free Product thickness	0.00
Gallons removed (develop)	5.00
Gallons removed (purge)	5.00
Other	

Completed by: Alan Stone



Elevations - .01 ft.

764.90 Top of Protective Casing
764.63 Top of Riser Pipe
764.90 Ground Surface
763.90 Top of Annular sealant
-0.27 Casing Stickup

-1.00 Top of Seal
3.00 Total Seal Interval
-4.00 Top of Sand

-6.00 Top of Screen

10.00 Total Screen Interval

-16.00 Bottom of Screen
-20.00 Bottom of Borehole

STAGE 3

Illinois Environmental Protection Agency

LUST Well Completion Report

Incident No.: 891717
Site Name: Kirkland Quick Stop
Drilling Contractor: C & S Drilling
Driller: Mark and Bart
Drilling Method: 4 1/4" ID HSA

Well No.: SB-30D/MW-30D
Date Drilled Start: 04/21/15
Date Completed: 04/21/15
Geologist: Tom Mangan/Al Stone
Drilling Fluids (Type): None

Annular Space Details

Type of Surface Seal: Concrete
Type of Annular Sealant: Bentonite, grout
Type of Bentonite Seal (Granular, Pellet): Pellet

Type of Sand Pack: #5 quartz filter sand

Well Construction Materials

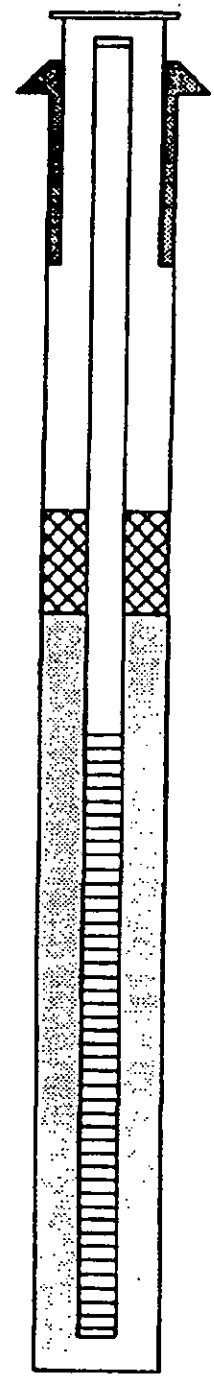
	Stainless Steel Specify Type	PVC Specify Type	Other Specify Type
Riser coupling joint		threaded	
Riser pipe above w.t.		2" sc. 40	
Riser Pipe below w.t.		2" sc. 40	
Screen		#10 slot	
Coupling joint screen to riser		threaded	
Protective casing	steel		

Measurements

to .01 ft (where applicable)

Riser Pipe Length	25.55
Screen Length	5.00
Screen Slot Size	0.00
Protective casing length	0.80
Depth to water	6.20
Elevation of water	760.30
Free Product thickness	0.00
Gallons removed (develop)	47.50
Gallons removed (purge)	5.00
Other	

Completed by: Alan Stone



Elevations - .01 ft.

766.95 Top of Protective Casing
766.50 Top of Riser Pipe
766.95 Ground Surface
765.95 Top of Annular sealant
-0.45 Casing Stickup

-1.00 Top of Seal
23.70 Total Seal Interval
-24.70 Top of Sand

-26.00 Top of Screen

5.00 Total Screen Interval

-31.00 Bottom of Screen
-35.00 Bottom of Borehole

STAGE 3

Illinois Environmental Protection Agency

LUST Well Completion Report

Incident No.: 891717
Site Name: Kirkland Quick Stop
Drilling Contractor: C & S Drilling
Driller: Mark and Bart
Drilling Method: 4 1/4" ID HSA

Well No.: SB-30S/MW-30S
Date Drilled Start: 04/20/15
Date Completed: 04/20/15
Geologist: Tom Mangan/Al Stone
Drilling Fluids (Type): None

Annular Space Details

Type of Surface Seal: Concrete
Type of Annular Sealant: Bentonite
Type of Bentonite Seal (Granular, Pellet): Pellet

Type of Sand Pack: #5 quartz filter sand

Well Construction Materials

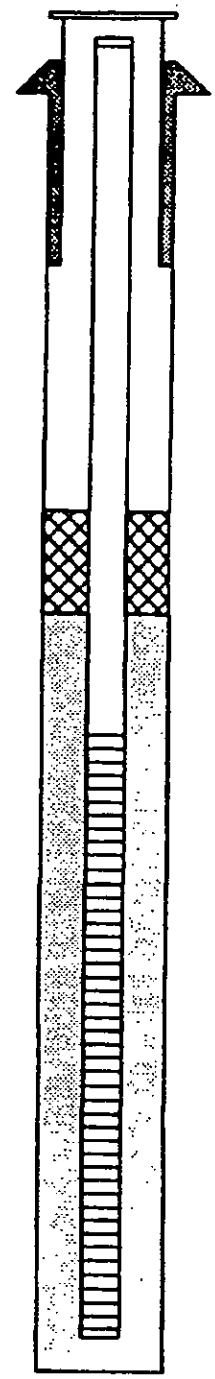
	Stainless Steel Specify Type	PVC Specify Type	Other Specify Type
Riser coupling joint		threaded	
Riser pipe above w.t.		2" sc. 40	
Riser Pipe below w.t.		2" sc. 40	
Screen		#10 slot	
Coupling joint screen to riser		threaded	
Protective casing	steel		

Measurements

to .01 ft (where applicable)

Riser Pipe Length	6.64
Screen Length	10.00
Screen Slot Size	0.00
Protective casing length	0.80
Depth to water	6.35
Elevation of water	760.29
Free Product thickness	0.00
Gallons removed (develop)	47.50
Gallons removed (purge)	5.00
Other	

Completed by: Alan Stone



Elevations - .01 ft.

767.00 Top of Protective Casing
766.64 Top of Riser Pipe
767.00 Ground Surface
766.00 Top of Annular sealant
-0.45 Casing Stickup

-1.00 Top of Seal
3.90 Total Seal Interval
-4.90 Top of Sand

-7.00 Top of Screen

10.00 Total Screen Interval

-17.00 Bottom of Screen
-26.00 Bottom of Borehole

ST. JOHN - MITTELHAUSER & ASSOCIATES

BORING NO.: MW-31	**WELL NO.:** MW-31	**PROJECT NO.:** 15-16013	**PROJECT NAME:** Kirkland
SITE ID. NO.:	**FEDERAL ID. NO.:**		**SITE LOCATION:** Kirkland, IL
COORDINATES:		**LATITUDE:** °	**LONGITUDE:** °
DRILLING CO.: C.S Drilling	**QUAD.:** Kirkland **SEC.:** 26 **T:** T42 N **R:** R3 E		**G.S. ELEVATION:** 763.90 MSL
DRILLER: M. Natali	**DRILLING EQUIP.:** Diedrich D-120		**BOREHOLE DIA.:** 6.75"
START DATE: 8/8/16 **START TIME (hours):** 0900	**FINISH DATE:** 8/8/16 **FINISH TIME (hours):** 1045		**LOGGED BY:** M. Lyter **CHECKED BY:** C. Clark
STICKUP: 2.98 ft AGS	**TOP of CASING ELEVATION:** 766.88 ft MSL		**SCREEN INTERVAL:** 2.0'-26.8'
RISER DIA./MTL./LGTH.: 2"/PVC/4.98'		**SCREEN MTL./SLOT:** PVC/0.010"	

DEPTH (ft)	DESCRIPTION	GRAPHIC	ELEVATION	WELL	SAMPLES NUMBER	SAMPLES RECOVERY (ft)	SAMPLES METHOD	SAMPLES MOISTURE	SAMPLES BLOW CNT (6")	PID (ppm) SCAN	PID (ppm) HEADSPACE	REMARKS
-4												
-2												
0			763.90									
	TOPSOIL (0.0'-1.6') Black, moist, stiff, organics, medium to high plasticity				A	3.9/4	HSA	M	--	0.2	--	
			762.3									
2	**SILTY CLAY (1.6'-6.5') CL** Tan, moist, stiff, high plasticity											
	Grades hard at 2.4'				B		HSA	M	--	0.1	--	
4					C	3/4	HSA	M	--	0.1	--	
6	Grades with fine grained sand at 6.1'											
			757.4									
	SANDY CLAY (6.5'-7.4') SC Brown, moist, stiff, low plasticity				D		HSA	M	--	0.2	--	
			756.5									
8	**SAND (7.4'-10.3') SW** Brown, moist, fine grained, dense, with fine and coarse gravel, some medium grained sand, trace coarse grained sand				E	3.4/4	HSA	M	--	0.4	--	
	Saturated at 9.2'											
10			753.6									
	SAND (10.3'-11.0') SP Brown, saturated, fine grained, medium dense		752.9		F		HSA	M/S	--	--	--	
	SAND (11.0'-19.8') SW Brown, saturated, fine to coarse grained, some fine and coarse gravel											
12					G	3/4	HSA	S	--	--	--	
	Sand seam; Fine grained from 12.8'-13.3'											
	Sand seam; Coarse grained 13.3'-13.5'											
14	With fine gravel at 13.7'				H		HSA	S	--	--	--	
16												

ST. JOHN - MITTELHAUSER & ASSOCIATES

BORING NO.: MW-31 | **WELL NO.:** MW-31 | **PROJECT NO.:** 15-16013 | **PROJECT NAME:** Kirkland

DEPTH (ft)	DESCRIPTION	GRAPHIC	ELEVATION	WELL	SAMPLES NUMBER	RECOVERY (ft)	METHOD	MOISTURE	BLOW CNT (6")	PID (ppm) SCAN	PID (ppm) HEADSPACE	REMARKS
	Sand seam; Fine grained from 16.6'-16.9'				I	1.7/2	HSA	S	--	--	--	
18					J	2.8/4	HSA	S	--	--	--	
			744.1									
20	**CLAYEY SILT (19.8'-21.4') ML** Tan, saturated, some fine grained sand, medium plasticity											
	Gravel seam; Fine and coarse gravel from 21.0'-21.1'		742.5		K		HSA	S	--	--	--	
22	**SAND (21.4'-24.4') SP** Tan, saturated, fine grained, dense				L	2.8/4	HSA	S	--	--	--	
24	Grades to trace clay at 23.9'		739.5									
	SANDY GRAVEL (24.4'-26.0') GC Dark gray to black, saturated, fine to medium grained sand, fine and coarse gravel				M		HSA	S	--	--	--	
26	Silty clay seam; Dark gray, very hard, trace fine gravel from 24.8'-25.3' Grades gray at 25.3'		737.9									
	SAND (26.0'-26.7') SP Gray, saturated, fine grained, dense		737.2		N	2/2	HSA	S/M	--	--	--	
	SAND (26.7'-27.3') SW Gray, saturated, fine to coarse grained sand, dense		736.6									
28	**SILTY CLAY (27.3'-28.0') CL** Gray, moist, very hard, high plasticity, trace fine gravel		735.9									
	End of Boring at 28.0'											
30												
32												
34												
36												
38												
40												

PDC TECHNICAL SERVICES, INC.
LOG OF BORING

Sheet 1 of 1

Project KIRKLAND QUICK STOP — Job No. 91C-139
Project Location KIRKLAND, ILLINOIS — Boring Type HSA
Boring Designation A-1 — Elev. ____ Total Depth 17.0'
Date Started 9-3-91 Date Completed 9-3-91 Logged By M. MELTON
Drilling Contractor TESTING ENGINEERING, INC.
Driller PAT HAMMOND & STEVE WADE Rig No. 17 Backfilled (Y/N) Y
Surface Conditions ASPHALT PAVEMENT

SAMPLE NUMBER	SAMPLE TYPE	RECOVERED (INCHES)	SET 6"	2ND 6"	3RD 6"	"N" VALUE	QP (TSF)	DEPTH (FEET)	SAMPLE TYPE	LOG	DESCRIPTION OF MATERIAL	REMARKS
											ASPHALT	
								2			SANDY GRAVEL [Fill] Dark brown, loose, moist, w/brick and cement fragments	TIP read 3.9 PPM
1	SS	19	3	3	2	5						
								4				TIP read 19.7 PPM
							1.2				SILTY CLAY (CL) Brown, soft, moist	
2	SS	22	3	3	3	6	1.3	6				TIP read 4.3 PPM
3	SS	14	2	5	3	8	0.9	8			grades @ 8.7', greenish-grey, wet, trace sand	TIP read 573.0 PPM
								10			GRAVELLY SAND (GM) Dark brown, loose, wet, trace silt	TIP read 1093.0 PPM
4	SS	15	5	6	7	13	-					
								12			grades saturated @ 11.25'	TIP read 3824.0 PPM Collected sample A-1
5	SS	12	6	7	5	12	-					
								14				TIP read 2045.0 PPM
6	SS	18	7	6	4	10	-					
								16			grades light brown @ 16.0'	TIP read 127.0 PPM
												TIP read 9.3 PPM
								18			End of boring @ 17.0'	

PDC TECHNICAL SERVICES, INC.
LOG OF BORING

Sheet 1 of 1

Project KIRKLAND QUICK STOP — Job No. 91C-139

Project Location KIRKLAND, ILLINOIS — Boring Type HSA

Boring Designation A-2 — Elev. ____ — Total Depth 14.5'

Date Started 9-4-91 — Date Completed 9-4-91 — Logged By M. MELTON

Drilling Contractor TESTING ENGINEERING, INC.

Driller PAT HAMMOND & STEVE WADE — Rig No. 17 — Backfilled (Y/N) Y

Surface Conditions ASPHALT PAVEMENT

SAMPLE NUMBER	SAMPLE TYPE	RECOVERED (INCHES)	SET 6"	2ND 6"	3RD 6"	"N" VALUE	QP (TSF)	DEPTH (FEET)	SAMPLE TYPE	LOG	DESCRIPTION OF MATERIAL	REMARKS
											ASPHALT	
											SANDY GRAVEL [FILL]	
1	SS	15	3	3	3	6	1.1	2			SILTY CLAY (CL); Dark brown, soft, moist	TIP read 78.0 PPM
								4			grades mottled greenish brown @ 4.0'	
2	SS	12	4	5	6	11	1.25	6			grades trace sand & gravel, wet @ 6.8'	TIP read 83.5 PPM
3	SS	13	42	51	53	N/A	-	8			SANDY GRAVEL (GM); Light brownish grey, loose, damp, trace silt	TIP read 168.0 PPM
4	SS	17	19	21	19	40	-	10			Sand (SW); Light brownish grey, wet, loose, w/gravel grades saturated @ 10.7'	TIP read 125.0 PPM Collected Sample A-2
5	SS	19	13	16	15	31	-	12				
								14			grades brown @ 13.8'	TIP read 38.4 PPM
											End of boring @ 14.5'	TIP read 1.4 PPM
								16				
								18				

LUST Incident #: 89171 | Boring #: TB-1 MW-3 | Page 1 of 1

DAHL Project #: 1494 1347 | Boring Location: REPLACE MW-3

Site Name: KIRKLAND QUICK | Date: 11/14/94

Address: KIRKLAND, IL | Start 12:00 p.m. Finish 12:40 pm

Sample #	Sample Type	Sample Recovery	Depth (feet)	Detailed Soil and Rock Description	Natural Moisture Content P.L. % 0 20 40 60 LL.% Scale:	Penetrometer(TSF)	OVA/PID/FID	Remarks
1	SS	3"	1	Dark brown silty clay w/some organics. (CL)			15	Slight petrol. odor.
2	SS	6"	3	Grades to gray.			60	
3	SS	F	5	Gray sandy silt. (ML)			70	Moist, strong odor.
4	SS	F	7	@7.5' gray silty sand w/large gravel (GM)			90	Water @ ~9'. Lab sample collected, strong odor.
5	SS	12"	9	Gravel amount & size decreasing, very loose.			85	Sheen on spoon, odor.
6	SS	12"	11	Brown, well sorted sands. (SW)			30	Slight odor, wet.
7	SS	20"	13				1	
			15	EOB @ 15'. (Lots of blow-up in hole)				

Note: Stratification lines are approximate; in-situ transition between soil types may be gradual.

Groundwater Data

▼ Depth While Drilling 9'

▽ Depth After Drilling 7.95

Auger Depth 14' Rig Type B-57 Mobile Drill

Rotary Depth 15'

Driller J. Reimer Geologist A. Haak

Note: Boring backfilled unless otherwise noted.

Illinois Environmental Protection Agency

P = Partial Recovery F = Full Recovery

DAHL & ASSOCIATES, INC. / BETTENDORF, IOWA

IL 532 2275
LPC 501 Oct-93

LUST Incident #: 89177
DAHL Project #: 1494 1347
Site Name: KIRKLAND QUICK
Address: KIRKLAND, IL

Boring #: B-1
Boring Location: SE CORNER OF CAR WASH

Page: 1 of 1
Date: 11/14/94
Start 8:15 a.m. Finish 9:10 a.m.

Sample #	Sample Type	Sample Recovery	Depth (feet)	Detailed Soil and Rock Description	Natural Moisture Content P.L. % 0 20 40 60 LL.% Scale:	Penetrometer(TSF)	OVA/PID/FID	Remarks
1	SS	12"	1	Silty clay, dark brown. (CL)			0	
			2					
2	SS	F	3	Grades to medium brown.			0	
			4					
3	SS	F	5	Brown, sandy silt. (ML)			0	
			6					
4	SS	6"	7	Brown silt w/sand & large gravel, very loose (GM)			0	
			8					Wet @ 8'.
5	SS	14"	9				0	Wet. Lab sample collected.
			10					
6	SS	12"	11				0.5	Gravel decrease in size. Wet.
			12					
7	SS	F	13					
			14					
			15	EOB @ 15'.				

Note: Stratification lines are approximate; in-situ transition between soil types may be gradual.

Groundwater Data
▼ Depth While Drilling 8'
▽ Depth After Drilling 8.66

Auger Depth 14' Rig Type B-57 Mobile Drill
Rotary Depth 15'
Driller J. Reimer Geologist A. Haak
Note: Boring backfilled unless otherwise noted.

Illinois Environmental Protection Agency

P = Partial Recovery F = Full Recovery

DAHL & ASSOCIATES, INC. / BETTENDORF, IOWA

IL 532 2275
LPC 501 Oct-93

LUST Incident #: 891717
DAHL Project #: 1494 1347
Site Name: KIRKLAND QUICK
Address: KIRKLAND, IL

Boring #: SB-3
Boring Location: EAST SIDE OF STATION BUILDING

Date: 11/14/94
Start: 10:10 a.m. Finish: 10:20 am

Sample #	Sample Type	Sample Recovery	Depth (feet)	Detailed Soil and Rock Description	Natural Moisture Content P.L. % 0 20 40 60 LL% Scale:	Penetrometer(TSF)	OVA/PID/FID	Remarks
			1	New fill material consistency of pea gravel.				
			2					
			3	No samples collected.				
			4					
			5					
			6					
			7					
			8					
			9				30	Wet @ ~9-10'. Petroleum odor.
			10					
			11					
			12					
			13	Brown sand w/silt & fine gravel, very loose (GM)				
			14				110	Lab sample from ~14'. Wet.
			15	EOB @ 15'.				

Note: Stratification lines are approximate; in-situ transition between soil types may be gradual.

Groundwater Data
Depth While Drilling ▼ 9'
Depth After Drilling ▽ 9.21

Auger Depth 14 Rig Type B-57 Mobile Drill
Rotary Depth 15
Driller J. Reimer Geologist A. Haak
Note: Boring backfilled unless otherwise noted.

Illinois Environmental Protection Agency

P = Partial Recovery F = Full Recovery

DAHL & ASSOCIATES, INC. / BETTENDORF, IOWA

IL 532 2275
LPC 501 Oct-93

LUST Incident #: 891717
DAHL Project #: 1494 1347
Site Name: KIRLAND QUICK
Address: KIRKLAND, IL

Boring #:
Boring Location: NORTH SIDE OF STATION.

Page 1 of 1
Date: 11/14/94
Start 1:20 p.m. Finish 2:05 p.m.

Sample #	Sample Type	Sample Recovery	Depth (feet)	Detailed Soil and Rock Description	Natural Moisture Content (P.L. % — L.L. %; Scale: 0, 20, 40, 60)	Penetro-meter (TSF)	OVA/PID/FID	Remarks
				Fill - Hit old RR tie, bricks.			1	Smells like creosote
1	SS	6"	1					
			2					
2	SS	F	3	Dark brown silty clay, some organics. (CL)			0	
			4					
3	SS	NR	5	Grades to medium brown.				
			6					
4	SS	18"	7	Brown silt & sand w/large gravel, very loose (GM)			0.5	Moist.
			8					
5	SS	12"	9	Grades to gray.			2	Water @ 9'. 'ab sample
			10					Wet
6	SS	F	11	Grades to light brown.			5	Slight petrol. odor, wet.
			12					
7	SS	F	13	Brown, med. grained sand & gravel. (GP)			1	Wet.
			14					
			15	EOB @ 15'.				

Note: Stratification lines are approximate; in-situ transition between soil types may be gradual.

Groundwater Data
Depth While Drilling 9'
Depth After Drilling 8.6'

Auger Depth 14'
Rotary Depth 15'
Driller J. Reimer
Rig Type B-57 Mobile Drill
Geologist A. Haak
Note: Boring backfilled unless otherwise noted.

Illinois Environmental Protection Agency

P = Partial Recovery F = Full Recovery

DAHL & ASSOCIATES, INC. / BETTENDORF, IOWA

IL 532 2275
LPC 501 Oct-93

LUST Incident #: 891717 | Boring #: TB-5 MW
DAHL Project #: 1494.1347 | Boring Location: WEST SIDE OF BUILDING
Site Name: KIRKLAND QUICK | Page: 1 of 1
Address: KIRKLAND, IL | Date: 11/15/94
Start 8:15 a.m. Finish 9:20 a.m.

Sample #	Sample Type	Sample Recovery	Depth (feet)	Detailed Soil and Rock Description	Natural Moisture Content P.L. % 0 20 40 60 L.L. % Scale:	Penetrometer (TSF)	OVA/PID/FID	Remarks
1	SS	F	1-2	Silty clay w/some organics, trace small gravel, dark brown. (CL)			0	
2	SS	12"	3-4				0	
3	SS	18"	5-6	Grades to medium brown.			0	
4	SS	20"	7-8	Brown sandy silt. (ML)			0.5	
5	SS	F	9-10	Brown sandy silt w/gravel. (GM)			1	Water @ ~9.5'. Lab sample collected.
6	SS	16"	11-12	Brown, well sorted sand, medium grained. (SW)			0	Saturated.
7	SS		13-14	Brown, silty sand w/gravel. (GM)			0	Saturated.
			15	EOB @ 15'.				

Note: Stratification lines are approximate; in-situ transition between soil types may be gradual.

Groundwater Data
Depth While Drilling ▼ 9.5'
Depth After Drilling ▽ 9.07

Auger Depth 14' Rig Type B-57 Mobile Drill
Rotary Depth 15'
Driller J. Reimer Geologist A. Haak
Note: Boring backfilled unless otherwise noted.

Illinois Environmental Protection Agency

P = Partial Recovery F = Full Recovery

DAHL & ASSOCIATES, INC. / BETTENDORF, IOWA

IL 532 2275
LPC 501 Oct-93

LUST Incident #: 89117 | Boring #: TB-6/MW-6 | Page: 1 of 1

DAHL Project #: 1494.1347

Site Name: KIRKLAND QUICK

Address: KIRLAND, IL

Boring Location: SOUTHWEST CORNER OF STATION.

Date: 11/15/94

Start: 9:55 a.m. Finish: 11:05 am

Sample #	Sample Type	Sample Recovery	Depth (feet)	Detailed Soil and Rock Description	Natural Moisture Content (P.L. % / L.L. % Scale: 0 20 40 60)	Penetrometer(TSF)	OVA/PID/FID	Remarks
1	SS	20"	1-2	Dark brown w/organics, silty clay. (CL)			1	
2	SS	18"	3-4	Grades to med. brown w/Fe mottles.			2	
3	SS	F	5-6	Dark brown sandy silt w/Fe stains, petrol. staining. (ML)			5	Petroleum odor.
							50	Petroleum odor.
4	SS	F	7-8	Gray sand & silt w/gravel. (GM)				
5	SS	F	9-10	Gray, well sorted med. grained sand. (SW)			190	Water @ 9'. Lab sample collected. Petroleum odor.
6	SS	F	11-12	Gray sand & silt w/gravel, petrol. staining. (GM)			170	Wet, odor.
7	SS	F	13-14	Brown, well sorted med. grained sand, grades to coarse grained.			150	Saturated, strong petroleum odor.
							60	
8	SS		15-16	Sand & silt w/gravel. (GM)			70	Slight petroleum odor.
			17	EOB @ 17'.				
			18-19					

Note: Stratification lines are approximate; in-situ transition between soil types may be gradual.

Groundwater Data

Depth While Drilling ▼ 9'

Depth After Drilling ▽ 9.27

Auger Depth 14' Rig Type B-57 Mobile Drill

Rotary Depth 17'

Driller J. Reimer Geologist A. Haak

Note: Boring backfilled unless otherwise noted.

Illinois Environmental Protection Agency

P = Partial Recovery F = Full Recovery

DAHL & ASSOCIATES, INC. / BETTENDORF, IOWA

IL 532 2275
LPC 501 Oct-93

LUST Incident #: 891717 Boring #: MW-9 Page 1 of 1

DAHL Project #: 1494 1347 Boring Location: IN PARKING LANE ON SOUTH SIDE OF HWY. 73 WEST OF QUICK STOP

Site Name: KIRKLAND QUICK Date: 1/5/95

Address: 411 W. MAIN STREET Start 9:00 a.m. Finish

Sample #	Sample Type	Sample Recovery	Depth (feet)	Detailed Soil and Rock Description	Natural Moisture Content P.L. % 0 20 40 60 L.L.% Scale:	Penetrometer(TSF)	OVA/PID/FID	Remarks
			1	Asphalt & concrete.				
			2	Brown/black clayey silt.				Slightly moist.
			3					
1	SS	1/4	4	Gravel & sand fill.			8	Plastic.
			5					
2	SS	1/2	6	Sand & small limestone chips			7	Dry
			7					
3	SS	3/4	8	Coarse sand & pebbles			6	Wet. Lab sample collected.
			9					
			10	Mixed grain sand.				
			11					
4	SS	3/4	12				11	Wet.
			13					
5	SS	3/4	14				8	
			15	EOB @ 15'. MW-9 set @ 15'.				
			16					
			17					
			18					
			19					

Note: Stratification lines are approximate; in-situ transition between soil types may be gradual.

Groundwater Data

Depth While Drilling ▼ 7 1/2'

Depth After Drilling ▽ 8.75'

Auger Depth 15' Rig Type B-57 Mobile Drill

Rotary Depth

Driller Fische Ent. Geologist E. Stewart

Note: Boring backfilled unless otherwise noted.

Illinois Environmental Protection Agency

P = Partial Recovery F = Full Recovery

DAHL & ASSOCIATES, INC. / BETTENDORF, IOWA

IL 532 2275
LPC 501 Oct-93

LUST Incident #: 89707
DAHL Project #: 1494 1347
Site Name: KIRKLAND QUICK
Address: 411 W. MAIN STREET

Boring #: B-8 / MW-10
Boring Location: IN PARKING LANE SOUTH SIDE OF HWY. 72 SOUTH OF SOUTH CORNER OF QUICK STOP

Page: 1 of 1
Date: 1/5/95
Start 10:45 a.m. Finish 12:00 p.m

Sample #	Sample Type	Sample Recovery	Depth (feet)	Detailed Soil and Rock Description	Natural Moisture Content P.L. % 0 20 40 60 L.L.% Scale:	Penetrometer(TSF)	OVA/PID/FID	Remarks
			1	Asphalt & concrete.				
			2	Brown/black silty, clay, plastic.				Slightly moist.
			3	1' Gray sandy clay, non-plastic, compressed. 6" Gray clay mixed w/sand &				Dry.
1	SS	1/2	4	gravel. 6" Gravel & sand.			1	Dry
2	SS	1/2	5	Gravel & find sand.			1	Dry
			6					
3	SS	3/4	7	Mixed grain sand.			4	Wet @ 7'. Lab sample collected.
			8					
			9	Mixed grain sand & gravel.			3	Wet.
			10					
4	SS	3/4	11					
			12					
5	SS	3/4	13				1	
			14					
6	SS	3/4	15	EOB @ 15'. MW-10 set @ 10'.			1	
			16					
			17					
			18					
			19					

Note: Stratification lines are approximate; in-situ transition between soil types may be gradual.

Groundwater Data
Depth While Drilling ▼ 8'
Depth After Drilling ▽ 8.10'

Auger Depth 14' Rig Type B-57 Mobile Drill
Rotary Depth
Driller Steve/Fische Drilling Geologist E. Stewart
Note: Boring backfilled unless otherwise noted.

Illinois Environmental Protection Agency

P = Partial Recovery F = Full Recovery

DAHL & ASSOCIATES, INC. / BETTENDORF, IOWA

IL 532 2275
LPC 501 Oct-93

GEO-THINK, LLC

611 Stevens Street
Geneva, Il. 60134

Proj. No.	Kirkland Quick Stop	**Soil Boring No.**	SB-21/MW-15
Site Name:	Kirkland Quick Stop	**Driller:**	C&S Drilling
Location:	411 W Main St.	**Dril Name**	Mark and Bart
	Kirkland, IL	**Sampling Depth:**	20
MW Diameter:	2"	**Total Depth:**	20
Field Staff:	Tom Mangan and Al Stone	**Date:**	4/20/2015
Sampler Length:	4' macrocore	**GW Level:**	approx. 9.5' bgs

GROUND ELEVATION (ft. NGVD):

BELOW BELOW GRND SURFACE	STRAT			SAMPLE DESCRIPTION	MW DIA	SMP ID No.	Rec. (%)	SAMPLE DATA PID (ppm)	Penetrm Reading	Moisture Content
1.0	FILL	0	4.5'	ASPHALT (0 - 3") FILL. Light tan silty sand and gravel base (3" - 14") FILL. Brown clay, black sand, mixed with coal and silty sand. Moist. No odor.			63%	0.9 (0' - 4')		
2.0										
3.0										
4.0										
5.0	CL	4.5	5.9	CLAY, with silt, some fine to coarse sand, trace gravel. Brown, medium consistency, medium plasticity, moist. No odor. May be fill or reworked.		4' - 6' to lab	63%	0.8 (4' - 8')		
6.0										
7.0	SW	5.9	10	SAND, fine to medium grained, with coarse sand, some gravel. Light brown, loose, slightly moist. Mild odor starting at 8'. May be fill or reworked material.						
8.0										
9.0				Becoming wet at 9.5'.			63%	166.0 (8' - 12')		
10.0										
11.0	SW	10	16.5	SAND, fine to medium grained, with coarse sand, some gravel. Gray, loose, slightly moist. Very strong petroleum odor.		10' - 11' to lab				
12.0										
13.0				Gray fine sand between 12.75' and 13.5'.			65%	179.0 (12' - 16')		
14.0				Color changes to light brown with reddish lenses, slight odor at 13.5'.						
15.0										
16.0										
17.0	SP	16.5	18	SAND, fine grained. Brown, loose, wet. No odor.			63%	9.5 (16' - 20')		
18.0										
19.0	SW	18	18.5	SAND, fine to medium grained, with coarse sand, some gravel. Brown, loose, sl. moist. No odor. Brown clay plug between 18.4' - 18.5'. No sample recovery from 18.5' to 20'. Fell out of sampler.						
20.0										

NOTES: End of drilling at 16'. End of sampling at 20'.
Drilled w/ 4 1/4" ID Hollow Stem Auger.

Telephone No. (630) 208-5050

Monitoring Well Construction

8	-	18	ft bgs	2" ID #10-slot PVC screen
0.25	-	8	ft bgs	2" ID sch. 40 PVC casing
6	-	18	ft bgs	filter sand
1	-	6	ft bgs	bentonite
0	-	1	ft bgs	flush mount pro casing, concreted in place

GEO-THINK, LLC

611 Stevens Street
Geneva, Il. 60134

Proj. No.	Kirkland Quick Stop	**Soil Boring No.**	SB-21/MW-15
Site Name:	Kirkland Quick Stop	**Driller:**	C&S Drilling
Location:	411 W Main St.	**Dril Name**	Mark and Bart
	Kirkland, IL	**Sampling Depth:**	20
MW Diameter:	2"	**Total Depth:**	20
Field Staff:	Tom Mangan and Al Stone	**Date:**	4/20/2015
Sampler Length:	4' macrocore	**GW Level:**	approx. 9.5' bgs

GROUND ELEVATION (ft. NGVD):

BELOW BELOW GRND SURFACE	STRAT			SAMPLE DESCRIPTION	MW DIA	SMP ID No.	Rec. (%)	SAMPLE DATA PID (ppm)	Penetrm Reading	Moisture Content
1.0	FILL	0	4.5'	ASPHALT (0 - 3") FILL. Light tan silty sand and gravel base (3" - 14") FILL. Brown clay, black sand, mixed with coal and silty sand. Moist. No odor.			63%	0.9 (0' - 4')		
2.0										
3.0										
4.0										
5.0	CL	4.5	5.9	CLAY, with silt, some fine to coarse sand, trace gravel. Brown, medium consistency, medium plasticity, moist. No odor. May be fill or reworked.		4' - 6' to lab	63%	0.8 (4' - 8')		
6.0										
7.0	SW	5.9	10	SAND, fine to medium grained, with coarse sand, some gravel. Light brown, loose, slightly moist. Mild odor starting at 8'. May be fill or reworked material.						
8.0										
9.0				Becoming wet at 9.5'.			63%	166.0 (8' - 12')		
10.0										
11.0	SW	10	16.5	SAND, fine to medium grained, with coarse sand, some gravel. Gray, loose, slightly moist. Very strong petroleum odor.		10' - 11' to lab				
12.0										
13.0				Gray fine sand between 12.75' and 13.5'.			65%	179.0 (12' - 16')		
14.0				Color changes to light brown with reddish lenses, slight odor at 13.5'.						
15.0										
16.0										
17.0	SP	16.5	18	SAND, fine grained. Brown, loose, wet. No odor.			63%	9.5 (16' - 20')		
18.0										
19.0	SW	18	18.5	SAND, fine to medium grained, with coarse sand, some gravel. Brown, loose, sl. moist. No odor. Brown clay plug between 18.4' - 18.5'. No sample recovery from 18.5' to 20'. Fell out of sampler.						
20.0										

NOTES: End of drilling at 16'. End of sampling at 20'.
Drilled w/ 4 1/4" ID Hollow Stem Auger.

Telephone No. (630) 208-5050

Monitoring Well Construction

8	-	18	ft bgs	2" ID #10-slot PVC screen
0.25	-	8	ft bgs	2" ID sch. 40 PVC casing
6	-	18	ft bgs	filter sand
1	-	6	ft bgs	bentonite
0	-	1	ft bgs	flush mount pro casing, concreted in place

GEO-THINK, LLC

611 Stevens Street
Geneva, Il. 60134

Proj. No.	Kirkland Quick Stop	Soil Boring No.	SB-23/MW-16
Site Name:	Kirkland Quick Stop	Driller:	C&S Drilling
Location:	411 W Main St.	Dril Name	Mark and Bart
	Kirkland, IL	Sampling Depth:	20
MW Diameter:	2"	Total Depth:	20
Field Staff:	Tom Mangan and Al Stone	Date:	4/22/2015
Sampler Length:	4' macrocore	GW Level:	approx. 8' bgs

BELOW BELOW GRND SURFACE	STRAT			SAMPLE DESCRIPTION	MW DIA	SMP ID No.	Rec. (%)	PID (ppm)	Penetrm Reading	Moisture Content
	GROUND ELEVATION (ft. NGVD):							SAMPLE DATA		
	FILL	0	4.5'	ASPHALT (0 - 3")						
1.0				FILL. Light tan silty sand and gravel base (3" - 15")						
				FILL. Brown clay, black sand, mixed with coal			54%	0.0		
2.0				(15" - 26")				(2' - 3')		
3.0										
				Empty sample tune from 26" - 48".						
4.0										
	CL	4	8	CLAY, with silt and little fine to coarse sand. Brown						
5.0				with many small distinct reddish brown and brownish		4' - 6'	58%	0.0		
				gray mottles, some small black (pyrolusite)		to lab		(4' - 7')		
6.0				nodules. Medium consistency, medium plasticity,						
				very moist. No odor.		6' - 8'				
7.0						to lab				
8.0										
	SM	8	10	SILTY SAND, fine to medium grained, with trace						
9.0				coarse sand and little gravel. Brown, medium			73%	0.0		
				dense, wet. No odor.				(8' - 10')		
10.0										
	SP/	10	12	SAND, fine to medium grained, with silt, trace						
11.0	SM			coarse sand and little gravel. Brown, medium				0.7		
				dense, wet. No odor.				(10' - 12')		
12.0										
	SP	12	14.5	SAND, fine to medium grained, with some silt,						
13.0				trace coarse sand and little gravel. Brownish			67%	0.2		
				gray, medium, dense, wet. Very slight odor.				(12' - 14')		
14.0				Becoming brown at 14'.						
								0.0		
15.0	SM	14.5	16	SILTY SAND, fine grained, with trace gravel, coarse				(14' - 16')		
				sand, and little medium sand. Brown,						
16.0				medium dense, wet. No odor.						
17.0	SP	16	18	SAND, medium grained, with trace gravel, trace			50%	0.0		
				fine sand, and trace coarse sand. Brown,				(16' - 20')		
18.0				medium dense, no odor.						
				Becoming more gravelly with depth, then no						
19.0				gravel between 19' - 20'.						
20.0										

NOTES: End of drilling at 16'. End of sampling at 20'.
Drilled w/ 4 1/4" ID Hollow Stem Auger.

Telephone No. (630) 208-5050

Monitoring Well Construction

6	-	16	ft bgs	2" ID #10-slot PVC screen
0.25	-	6	ft bgs	2" ID sch. 40 PVC casing
4	-	16	ft bgs	filter sand
1	-	4	ft bgs	bentonite
0	-	1	ft bgs	flush mount pro casing, concreted in place

GEO-THINK, LLC
611 Stevens Street
Geneva, Il. 60134

Proj. No.	Kirkland Quick Stop	Soil Boring No.	SB-24/MW-17
Site Name:	Kirkland Quick Stop	Driller:	C&S Drilling
Location:	411 W Main St.	Dril Name	Mark and Bart
	Kirkland, IL	Sampling Depth:	20
MW Diameter:	2"	Total Depth:	20
Field Staff:	Tom Mangan and Al Stone	Date:	4/22/2015
Sampler Length:	4' macrocore	GW Level:	approx. 8' bgs

BELOW BELOW GRND SURFACE	GROUND ELEVATION (ft. NGVD): STRAT			SAMPLE DESCRIPTION	MW DIA	SMP ID No.	Rec. (%)	SAMPLE DATA PID (ppm)	Penetrm Reading	Moisture Content
	FILL	0	2	ASPHALT (0 - 3")						
1.0				FILL. Light tan silty sand and gravel base (3" - 14")						
				FILL. Brown clay, black sand, mixed with coal			90%	0.4		
2.0				(14" - 24")				(0' - 4')		
	CL	2	6	CLAY, with silt. Dark brown, soft, medium						
3.0				plasticity, very moist. No odor.						
4.0				Becoming brown with reddish-brown and grayish-brown mottles at 3.5'.						
5.0				Tan, medium consistency to stiff atarting at 5'.		4' - 6'	65%	0.0		
				Little gravel starting at 5'.		to lab		(4' - 6')		
6.0										
	SP	6	8	SAND, fine to medium grained, with little coarse				0.2		
7.0				sand, some gravel, and trace silt. Tan, medium				(6' - 8')		
				dense, moist. No odor.						
8.0										
	SP	8	10	SAND, medium grained, with some fine and coarse						
9.0				sand, some gravel, and trace silt. Brown, medium			85%	1.2		
				dense, wet. No odor.				(8' - 10')		
10.0				More fine sand starting at 9.3'.						
	SP	10	15.5	SAND, medium grained, with little to some gravel,						
11.0				and some fine and coarse sand. Gray, medium		10' - 12'		7.9		
				dense to dense, wet. Mild odor.		to lab		(10' - 12')		
12.0										
13.0							88%	3.0		
								(12' - 14')		
14.0										
				Black from 14' - 15'.				3.6		
15.0								(14' - 15')		
				Brown from 15' - 15.5'.				1.1		
16.0	CL	15.5	20	CLAY, with silt and fine to medium sand, and trace				(15' - 16')		
				gravel. Light brown, medium consistency, medium						
17.0				plasticity, wet. No odor.			94%	2.1		
								(16' - 20')		
18.0										
19.0										
				Thin (1") layer of gravelly clay at 19'.						
20.0										

NOTES: End of drilling at 17'. End of sampling at 20'.
Drilled w/ 4 1/4" ID Hollow Stem Auger.

Telephone No. (630) 208-5050

Monitoring Well Construction

7	-	17	ft bgs	2" ID #10-slot PVC screen
0.25	-	7	ft bgs	2" ID sch. 40 PVC casing
5	-	17	ft bgs	filter sand
1	-	5	ft bgs	bentonite
0	-	1	ft bgs	flush mount pro casing, concreted in place

GEO-THINK, LLC

611 Stevens Street
Geneva, Il. 60134

Proj. No.	Kirkland Quick Stop	Soil Boring No.	SB-32/MW-18
Site Name:	Kirkland Quick Stop	Driller:	C&S Drilling
Location:	411 W Main St.	Dril Name	Mark and Bart
	Kirkland, IL	Sampling Depth:	18
MW Diameter:	2"	Total Depth:	18
Field Staff:	Tom Mangan and Al Stone	Date:	4/20/2015
Sampler Length:	4' macrocore	GW Level:	approx. 8' bgs

BELOW BELOW GRND SURFACE	GROUND ELEVATION (ft. NGVD): STRAT			SAMPLE DESCRIPTION	MW DIA	SMP ID No.	Rec. (%)	SAMPLE DATA PID (ppm)	Penetrm Reading	Moisture Content
	FILL	0	4	ASPHALT (0 - 3")						
1.0				FILL. Black sand with coal (3" - 6")						
				FILL. Black/greenish gray clay. Mild odor. (6"-1.5')			75%	3.5		
2.0				FILL. Black and brown sand. Moist. (1.5' - 4')		1' - 3'		(1' - 3')		
						to lab				
3.0								0.7		
								(3' - 4')		
4.0										
5.0	OL	4	4.5	TOPSOIL. Clay w/ silt. Moist. No odor.			83%	0.6		
	CL	4.5	7.5	CLAY, with silt and trace fine sand. Brown,				(4.5' - 7')		
6.0				medium consistency, medium plasticity,						
				very moist to wet.		6' - 8'				
7.0				Yellow-brown and gray mottles, black (pyrolusite)		to lab				
				nodules starting at 5'. Gravel at 7'.						
8.0	SP	7.5	11.5	SAND, medium grained, with some fine and coarse						
				sand, some gravel, trace silt. Light brown to reddish						
9.0				brown, dense, wet. No odor.			92%	0.8		
								(8' - 10')		
10.0										
				Becoming grayish brown with mild odor at 10'.				0.9		
11.0								(10' - 12')		
12.0	SM	11.5	12	SILTY SAND, fine grained. Dense, wet. No odor.						
	SP	12	14	SAND, fine to medium grained. Light brown,						
13.0				medium dense, wet. No odor.			77%	0.6		
								(12' - 16')		
14.0										
	CL	14	14.75	SANDY CLAY, fine grained, with silt. Brown,						
15.0				medium consistency, medium plasticity, wet.						
	SP	14.75	15.5	SAND, medium to coarse grained. Brown,						
16.0	CL	15.5	18	SANDY CLAY, fine grained, with silt. Brown, wet.						
				medium consistency, medium plasticity, wet.						
17.0							58%	0.4		
				4" seam of brown fine to medium sand at 16'9"				(16' - 18')		
18.0										
				1" softer and silter seam at 17'6"						
19.0										
20.0										

NOTES: End of drilling at 16'. End of sampling at 18'. Telephone No. (630) 208-5050
Drilled w/ 4 1/4" ID Hollow Stem Auger. 18' - 20' interval fell out of sampler in hole.

Monitoring Well Construction

7	-	17	ft bgs	2" ID #10-slot PVC screen
0.25	-	7	ft bgs	2" ID sch. 40 PVC casing
5	-	17	ft bgs	filter sand
1	-	5	ft bgs	bentonite
0	-	1	ft bgs	flush mount pro casing, concreted in place

GEO-THINK, LLC

611 Stevens Street
Geneva, Il. 60134

Proj. No.	Kirkland Quick Stop	Soil Boring No.	SB-34/MW-19
Site Name:	Kirkland Quick Stop	Driller:	C&S Drilling
Location:	411 W Main St.	Dril Name	Mark and Bart
	Kirkland, IL	Sampling Depth:	19'
MW Diameter:	2"	Total Depth:	19'
Field Staff:	Tom Mangan and Al Stone	Date:	4/23/2015
Sampler Length:	4' macrocore	GW Level:	approx. 8' bgs

BELOW BELOW GRND SURFACE	STRAT			SAMPLE DESCRIPTION	MW DIA	SMP ID No.	Rec. (%)	PID (ppm)	Penetrm Reading	Moisture Content
	GROUND ELEVATION (ft. NGVD):							SAMPLE DATA		
	FILL	0	4.5	ASPHALT (0" - 3")						
1.0				FILL. Light tan silty sand and gravel base (3" - 5").						
				FILL. Clay, wiuth silt, sand, and gravel. Brown,			90%	1.6		
2.0				moist. Layers of black slag and cinders observed.				(0' - 4')		
3.0										
				Layer (6") of yellow-brown medium sand with						
4.0				little gravel at 3' - 3.5'.						
5.0	CL	4.5	6.5	SILTY SANDY CLAY, fine grained, with trace medium			69%	0.6		
				sand. Brown, medium consistency, medium				(4' - 6')		
6.0				plasticity, moist. No odor.		5' - 7'				
				Thin (1/4") seams of brown sand @ 5.5' and 5.7'.		to lab		0.1		
7.0	SP	6.5	12	SAND, fine to medium grained, with little gravel				(6' - 7')		
				and trace silt. Reddish-brown, loose, moist.						
8.0				No odor.						
				becoming wet @ 8'.						
9.0				Thin (3') seam of fine sand @ 8.5'.			92%	0.5		
				Color is brownish-gray @ 9.5' - 10'.				(8' - 10')		
10.0				Thin (1') seam of reddish-brown fine sand @ 10'.						
				Color changes to brownish-gray at 10'.				0.6		
11.0				Thin (1") seam of silty fine sand @ 10.5'.				(10' - 12')		
12.0										
	SP	12	13	SAND, medium grained. Brown, medium dense,						
13.0				wet. No odor.			92%	0.7		
	SP	13	14	SAND, fine grained, with trace to little silt.				(12' - 14')		
14.0				Reddish-brown, med. Dense, wet. No odor.						
				Becoming brown and medium/coarse at 14'.						
15.0	SP	14	15	SAND, med/coarse grained, w/ little gravel. Brown						
				to gray, medium dense, wet. No odor. Silty at 14.5'.				0.5		
16.0	CL	15	15.8	SILTY SANDY CLAY, fine grained. Brown, wet.				(14' - 16')		
	SP	15.8	16.5	SAND, fine/med grained. Brown, wet. No odor.						
17.0	SP	16.5	19	SAND, medium to coarse grained, with gravel.			71%	2.0		
				Brown, medium dense, wet. No odor.		16' - 18'		(16' - 18')		
18.0				Becoming siltier @ 17.25'.		to lab				
								0.7		
19.0				More gravel and cobbles @ 18.5'.				(18' - 19')		
20.0				No recovery from 19' - 20'.						

NOTES: End of drilling at 16'. End of sampling at 19' (bottom 1' fell out of sampler). Drilled w/ 4 1/4" ID Hollow Stem Auger.

Telephone No. (630) 208-5050

Monitoring Well Construction

6	-	16	ft bgs	2" ID #10-slot PVC screen
0.25	-	6	ft bgs	2" ID sch. 40 PVC casing
4	-	16	ft bgs	filter sand
1	-	4	ft bgs	bentonite
0	-	1	ft bgs	flush mount pro casing, concreted in place

GEO-THINK, LLC
611 Stevens Street
Geneva, Il. 60134

Proj. No.	Kirkland Quick Stop	Soil Boring No.	SB-38/MW-20
Site Name:	Kirkland Quick Stop	Driller:	C&S Drilling
Location:	411 W Main St.	Dril Name	Mark and Bart
	Kirkland, IL	Sampling Depth:	18'
MW Diameter:	2"	Total Depth:	18'
Field Staff:	Tom Mangan and Al Stone	Date:	4/23/2015
Sampler Length:	4' macrocore	GW Level:	approx. 8' bgs

BELOW BELOW GRND SURFACE	STRAT			SAMPLE DESCRIPTION	MW DIA	SMP ID No.	Rec. (%)	PID (ppm)	Penetrm Reading	Moisture Content
	GROUND ELEVATION (ft. NGVD):							SAMPLE DATA		
	FILL	0	6.5	FILL. Clay, with silt, trace to little fine to coarse sand, trace gravel. Brown with reddish-brown and grayish-brown mottles, medium consistency to stiff, medium plasticity, moist to very moist. No odor. Thin (1") seams of slag and coal throughout.			94%	0.3 (0' - 2') 0.0 (2' - 4')		
1.0										
2.0										
3.0										
4.0										
5.0				Note: Bottom 3' of 0' - 4' sample appeared to have fallen out of sampler while in hole.			25%	0.0 (5' - 6')		
6.0										
7.0	SM	6.5	9	SILTY SAND, fine to medium grained, with coarse sand and trace gravel. Brown, loose (soupy), wet. No odor.						
8.0										
9.0						8' - 10' to lab	52%	0.3 (8' - 10')		
	SP	9	9.5	SAND, fine /med. grained. Brown, wet, loose.						
10.0	SP	9.5	12.5	SAND, medium to coarse grained, with some gravel. Brown, wet, loose. No odor.						
11.0										
12.0										
13.0	CL	12.5	16	SILTY SANDY CLAY, fine grained, with trace to little gravel, and trace coarse sand. Brown, stiff, medium plasticity, wet. No odor. Thin (4") seam of fine to medium grained sand at 14'. Wet, no odor.			77%	0.3 (12' - 14') 0.1 (14' - 16')		
14.0										
15.0										
16.0										
	ML	16	16.5	SILT, w/little f/m sand. Brown, no plast., stiff, wet.						
17.0	CL	16.5	17.5	SILTY SANDY CLAY, fine grained, with trace gravel and tr med/c sand. Brown, stiff, med plast., moist.		17' - 18' to lab	56%	0.0 (16' - 17') 0.1 (17' - 18')		
18.0	ML	17.5	18	SILT. Brown, medium consistency to stiff, no plasticity, wet. No odor.						
19.0										
20.0										

NOTES: End of drilling at 16'. End of sampling at 18' (bottom 2' fell out of sampler). Drilled w/ 4 1/4" ID Hollow Stem Auger.

Telephone No. (630) 208-5050

Monitoring Well Construction

6	-	16	ft bgs	2" ID #10-slot PVC screen
0.25	-	6	ft bgs	2" ID sch. 40 PVC casing
4	-	16	ft bgs	filter sand
1	-	4	ft bgs	bentonite
0	-	1	ft bgs	flush mount pro casing, concreted in place

GEO-THINK, LLC

611 Stevens Street
Geneva, Il. 60134

Proj. No.	Kirkland Quick Stop	Soil Boring No.	SB-30D/MW-30D
Site Name:	Kirkland Quick Stop	Driller:	C&S Drilling
Location:	411 W Main St.	Dril Name	Mark and Bart
	Kirkland, IL	Sampling Depth:	35
MW Diameter:	2"	Total Depth:	35
Field Staff:	Tom Mangan and Al Stone	Date:	4/21/2015
Sampler Length:	4' macrocore, 2' split barrel	GW Level:	approx. 7' bgs

BELOW BELOW GRND SURFACE	GROUND ELEVATION (ft. NGVD): STRAT			SAMPLE DESCRIPTION	MW DIA	SMP ID No.	Rec. (%)	SAMPLE DATA PID (ppm)	Penetrm Reading	Moisture Content
1.0	FILL	1	4	ASPHALT (0" - 3") FILL (black sand, gravel, clay, and coal) (3" - 3') No odor. Bottom 2' of sample missing. Believed to be fill.			44%	0.0 (0' - 4')		
2.0										
3.0										
4.0										
5.0	FILL	4	5.5	FILL, brown clay with silt and sand. Moist. No odor.			81%	0.5 (4' - 6')		
6.0	SP	5.5	8	SAND, medium to coarse grained, with some gravel. Light brown, medium dense, moist to very moist. No odor. Thin silty sand seams at 6' and 7'.		6' - 8' to lab		0.5 (6' - 8')		
7.0										
8.0										
9.0		8	26	Blind drilled. See log for SB30S.						
10.0										
11.0										
12.0										
13.0										
14.0										
15.0										
16.0										
17.0										
18.0										
19.0										
20.0										

GEO-THINK, LLC 611 Stevens Street Geneva, Il. 60134	Proj. No.	Kirkland Quick Stop	Soil Boring No.	SB-30D/MW-30D	
	Site Name:	Kirkland Quick Stop	Driller:	C&S Drilling	
	Location:	411 W Main St.	Dril Name	Mark and Bart	
		Kirkland, IL	Sampling Depth:	35	
	MW Diameter:	2"	Total Depth:	35	
	Field Staff:	Tom Mangan and Al Stone	Date:	4/21/2015	
	Sampler Length:	4' macrocore, 2' split barrel	GW Level:	approx. 7' bgs	

BELOW BELOW GRND SURFACE	GROUND ELEVATION (ft. NGVD): STRAT			SAMPLE DESCRIPTION	MW DIA	SMP ID No.	Rec. (%)	SAMPLE DATA PID (ppm)	Penetrm Reading	Moisture Content
21.0										
22.0										
23.0										
24.0										
25.0										
26.0										
27.0	SP	26	28	SAND, fine grained, with some medium sand and little to some fine gravel. Brown, medium dense, wet. No odor.			33%	0.5 (26' - 28')		
28.0										
29.0	SP	28	30	SAND, medium grained, with fine to coarse gravel, little fine and coarse sand. Brown, dense, wet. No odor. 2" seam of brown sandy silt at 29.8', wet.			63%	0.8 (28' - 30')		
30.0										
31.0	CL	30	35	SANDY CLAY (till) (fine grained sand), with silt, little medium to coarse sand, some fine to coarse gravel and cobbles. Gray, very hard, moist (actually saturated), medium plasticity. No odor.			38%	0.7 (30' - 32')		
32.0										
33.0							0%	--		
34.0							83%	--		
35.0										

NOTES: End of drilling at 33'. End of sampling at 35'. Drilled w/ 4 1/4" ID Hollow Stem Auger.

Telephone No. (630) 208-5050

Monitoring Well Construction

26	-	31	ft bgs	2" ID #10-slot PVC screen
0.25	-	26	ft bgs	2" ID sch. 40 PVC casing
31	-	35	ft bgs	natural collapse
24.7	-	31	ft bgs	filter sand
22.4	-	24.7	ft bgs	bentonite
5	-	22.4	ft bgs	cement/bentonite grout
1	-	5	ft bgs	bentonite
0	-	1	ft bgs	flush mount pro casing, concreted in place

GEO-THINK, LLC
611 Stevens Street
Geneva, Il. 60134

Proj. No.	Kirkland Quick Stop	Soil Boring No.	SB-30S/MW-30S
Site Name:	Kirkland Quick Stop	Driller:	C&S Drilling
Location:	411 W Main St.	Dril Name	Mark and Bart
	Kirkland, IL	Sampling Depth:	26'
MW Diameter:	2"	Total Depth:	26'
Field Staff:	Tom Mangan and Al Stone	Date:	4/20/2015
Sampler Length:	4' macrocore, 2' split barrel	GW Level:	approx. 7' bgs

BELOW BELOW GRND SURFACE	GROUND ELEVATION (ft. NGVD): STRAT			SAMPLE DESCRIPTION	MW DIA	SMP ID No.	Rec. (%)	SAMPLE DATA PID (ppm)	Penetrm Reading	Moisture Content
				ASPHALT (0" - 3")						
1.0	FILL	1	3	FILL (black sand, gravel, clay, and coal) (3" - 3') No odor.			71%			
2.0										
3.0								0.2 (3' - 4')		
4.0	CL	3	4	CLAY, with silt, trace fine sand. Brown, medium consistency, medium plasticity, very moist. No odor.						
5.0	CL	4	6	Same, but thin seams of fine sand and trace gravel starting at 4'. Few brownish-gray and many reddish brown mottles, some black (pyrolusite) nodules, wet starting at 4'. No odor.		4'-6' to lab	92%	0.0 (4' - 6')		
6.0										
	SM	6	6.5	SILTY SAND, fine grained, with trace gravel, wet.						
7.0	SW	6.5	8	SAND, fine to coarse grained, with little silt. Brown, medium dense, very moist. No odor.				0.1 (6' - 8')		
8.0										
	SP	8	14	SAND, medium grained, with fine and coarse sand, little gravel, trace silt. Brown, medium dense, wet. No odor.						
9.0							71%	0.1 (8' - 12')		
10.0				6" layer of light brown sand at 7' (SP).		10'-11' to lab				
11.0										
12.0										
13.0							58%	0.1 (12' - 16')		
14.0										
15.0	ML	14	15	SILT, with trace fine sand. Brown, stiff, no plasticity, wet. No odor.						
16.0	SM	15	16	SILTY SAND, fine grained, with little clay and some gravel. Brown, loose, wet. No odor.						
17.0	SP	16	20	SAND, fine to medium grained, with trace silt. Brown, medium dense, wet. No odor.			50%	0.0 (16' - 20')		
18.0										
19.0										
20.0										

GEO-THINK, LLC

611 Stevens Street
Geneva, Il. 60134

Proj. No.	Kirkland Quick Stop	Soil Boring No.	SB-30S/MW-30S
Site Name:	Kirkland Quick Stop	Driller:	C&S Drilling
Location:	411 W Main St.	Dril Name	Mark and Bart
	Kirkland, IL	Sampling Depth:	26'
MW Diameter:	2"	Total Depth:	26'
Field Staff:	Tom Mangan and Al Stone	Date:	4/20/2015
Sampler Length:	4' macrocore, 2' split barrel	GW Level:	approx. 7' bgs

BELOW BELOW GRND SURFACE	GROUND ELEVATION (ft. NGVD): STRAT			SAMPLE DESCRIPTION	MW DIA	SMP ID No.	Rec. (%)	SAMPLE DATA PID (ppm)	Penetrm Reading	Moisture Content
	SP	20	25.5	SAND, medium grained, with trace to little fine and coarse sand, trace silt. Brown, loose to medium dense, wet. No odor.			88%	0.3 (20' - 24')		
21.0										
22.0				1" seam of gravelly sand at 22'.						
23.0										
24.0										
25.0							50%	0.0 (24' - 26')		
26.0	SW	25.5	26	SAND, fine to coarse grained, w/ gravel and cobbles. Brown, w/ lenses of brown silty/sandy clay.						

NOTES: End of drilling at 33'. End of sampling at 35'. Drilled w/ 4 1/4" ID Hollow Stem Auger.

Telephone No. (630) 208-5050

Monitoring Well Construction

7	-	17	ft bgs	2" ID #10-slot PVC screen
0.25	-	7	ft bgs	2" ID sch. 40 PVC casing
17	-	26	ft bgs	natural collapse
4.9	-	17	ft bgs	filter sand
1	-	4.9	ft bgs	bentonite
0	-	1	ft bgs	flush mount pro casing, concreted in place

ST. JOHN - MITTELHAUSER & ASSOCIATES

BORING NO.: MW-31	**WELL NO.:** MW-31	**PROJECT NO.:** 15-16013	**PROJECT NAME:** Kirkland
SITE ID. NO.:	**FEDERAL ID. NO.:**		**SITE LOCATION:** Kirkland, IL
COORDINATES:		**LATITUDE:** °	**LONGITUDE:** °
DRILLING CO.: C.S Drilling	**QUAD.:** Kirkland **SEC.:** 26 **T:** T42 N **R:** R3 E		**G.S. ELEVATION:** 763.90 MSL
DRILLER: M. Natali	**DRILLING EQUIP.:** Diedrich D-120		**BOREHOLE DIA.:** 6.75"
START DATE: 8/8/16 **START TIME (hours):** 0900	**FINISH DATE:** 8/8/16 **FINISH TIME (hours):** 1045		**LOGGED BY:** M. Lyter **CHECKED BY:** C. Clark
STICKUP: 2.98 ft AGS	**TOP of CASING ELEVATION:** 766.88 ft MSL		**SCREEN INTERVAL:** 2.0'-26.8'
RISER DIA./MTL./LGTH.: 2"/PVC/4.98'		**SCREEN MTL./SLOT:** PVC/0.010"	

DEPTH (ft)	DESCRIPTION	GRAPHIC	ELEVATION	WELL	SAMPLES NUMBER	SAMPLES RECOVERY (ft)	SAMPLES METHOD	SAMPLES MOISTURE	SAMPLES BLOW CNT (6")	PID (ppm) SCAN	PID (ppm) HEADSPACE	REMARKS
-4												
-2												
0			763.90									
	TOPSOIL (0.0'-1.6') Black, moist, stiff, organics, medium to high plasticity				A	3.9/4	HSA	M	--	0.2	--	
			762.3									
2	**SILTY CLAY (1.6'-6.5') CL** Tan, moist, stiff, high plasticity											
	Grades hard at 2.4'				B		HSA	M	--	0.1	--	
4					C	3/4	HSA	M	--	0.1	--	
6	Grades with fine grained sand at 6.1'											
			757.4									
	SANDY CLAY (6.5'-7.4') SC Brown, moist, stiff, low plasticity				D		HSA	M	--	0.2	--	
			756.5									
8	**SAND (7.4'-10.3') SW** Brown, moist, fine grained, dense, with fine and coarse gravel, some medium grained sand, trace coarse grained sand				E	3.4/4	HSA	M	--	0.4	--	
	Saturated at 9.2'											
10			753.6									
	SAND (10.3'-11.0') SP Brown, saturated, fine grained, medium dense		752.9		F		HSA	M/S	--	--	--	
	SAND (11.0'-19.8') SW Brown, saturated, fine to coarse grained, some fine and coarse gravel											
12					G	3/4	HSA	S	--	--	--	
	Sand seam; Fine grained from 12.8'-13.3'											
	Sand seam; Coarse grained 13.3'-13.5'											
14	With fine gravel at 13.7'				H		HSA	S	--	--	--	
16												

ST. JOHN - MITTELHAUSER & ASSOCIATES

BORING NO.: MW-31 | **WELL NO.:** MW-31 | **PROJECT NO.:** 15-16013 | **PROJECT NAME:** Kirkland

DEPTH (ft)	DESCRIPTION	GRAPHIC	ELEVATION	WELL	SAMPLES NUMBER	RECOVERY (ft)	METHOD	MOISTURE	BLOW CNT (6")	PID (ppm) SCAN	PID (ppm) HEADSPACE	REMARKS
	Sand seam; Fine grained from 16.6'-16.9'				I	1.7/2	HSA	S	--	--	--	
18					J	2.8/4	HSA	S	--	--	--	
			744.1									
20	**CLAYEY SILT (19.8'-21.4') ML** Tan, saturated, some fine grained sand, medium plasticity											
	Gravel seam; Fine and coarse gravel from 21.0'-21.1'		742.5		K		HSA	S	--	--	--	
22	**SAND (21.4'-24.4') SP** Tan, saturated, fine grained, dense				L	2.8/4	HSA	S	--	--	--	
24	Grades to trace clay at 23.9'		739.5									
	SANDY GRAVEL (24.4'-26.0') GC Dark gray to black, saturated, fine to medium grained sand, fine and coarse gravel				M		HSA	S	--	--	--	
26	Silty clay seam; Dark gray, very hard, trace fine gravel from 24.8'-25.3' Grades gray at 25.3'		737.9									
	SAND (26.0'-26.7') SP Gray, saturated, fine grained, dense		737.2		N	2/2	HSA	S/M	--	--	--	
	SAND (26.7'-27.3') SW Gray, saturated, fine to coarse grained sand, dense		736.6									
28	**SILTY CLAY (27.3'-28.0') CL** Gray, moist, very hard, high plasticity, trace fine gravel		735.9									
	End of Boring at 28.0'											
30												
32												
34												
36												
38												
40												

ST. JOHN - MITTELHAUSER & ASSOCIATES

BORING NO.: SB-20B	**PROJECT NO.:** 15-16013		**PROJECT NAME:** Kirkland
SITE ID. NO.:	**FEDERAL ID. NO.:**		**SITE LOCATION:** Kirkland, IL
COORDINATES:		**LATITUDE:** °	**LONGITUDE:** °
DRILLING CO.: C.S Drilling	**QUAD.:** Kirkland **SEC.:** 26 **T.:** T42 N **R.:** R3 E		**G.S. ELEVATION:** 763.72 MSL
DRILLER: M. Natali	**DRILLING EQUIP.:** Diedrich D-120		**BOREHOLE DIA.:** 6.75"
START DATE: 8/8/16 **START TIME (hours):** 1250	**FINISH DATE:** 8/8/16 **FINISH TIME (hours):** 1405		**LOGGED BY:** M. Lyter **CHECKED BY:** C. Clark

DEPTH (ft)	DESCRIPTION	GRAPHIC	ELEVATION	SAMPLES NUMBER	SAMPLES RECOVERY (ft)	SAMPLES METHOD	SAMPLES MOISTURE	SAMPLES BLOW CNT (6")	PID (ppm) SCAN	PID (ppm) HEADSPACE	REMARKS
0	**BLIND DRILL (0.0'-16.0')**		763.72								
8				A	--	HSA	--	--	--	--	
16			747.7								
16	**SAND (16.0'-19.6') SP** Brown, saturated, fine grained, some medium and coarse gravel Trace coarse gravel at 16.4'			B	2/2	HSA	S	--	--	--	
18				C	3.4/4	HSA	S	--	--	--	
20			744.1								
20	**SILTY CLAY (19.6'-20.0') CL** Tan, saturated, stiff, high plasticity		743.7								

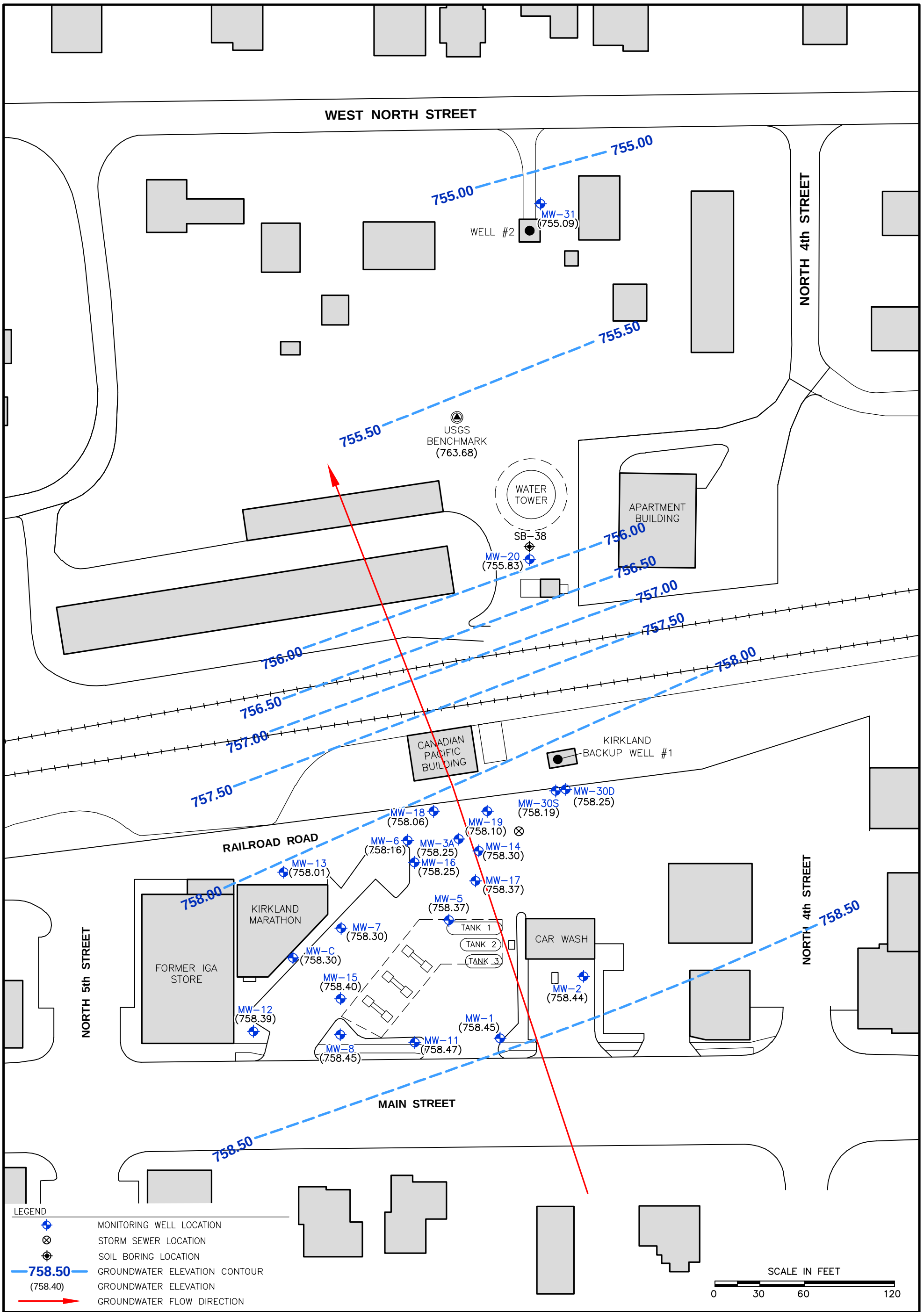
ST. JOHN - MITTELHAUSER & ASSOCIATES

BORING NO.: SB-20B | **PROJECT NO.:** 15-16013 | **PROJECT NAME:** Kirkland

DEPTH (ft)	DESCRIPTION	GRAPHIC	ELEVATION	SAMPLES NUMBER	SAMPLES RECOVERY (ft)	SAMPLES METHOD	SAMPLES MOISTURE	SAMPLES BLOW CNT (6")	PID (ppm) SCAN	PID (ppm) HEADSPACE	REMARKS
22	**CLAYEY SILT (20.0'-24.2') ML** Tan, saturated, soft, trace fine grained sand Red rust mottles from 20.3'-20.4' Grades gray at 20.9'			D		HSA	S	--	--	--	
24				E	3.6/4	HSA	S/W	--	--	--	
			739.5								
	SANDY CLAY (24.2'-25.1') GC Gray, saturated to wet, fine grained sand, stiff, medium plasticity, with fine and coarse gravel, with silt, some coarse grained sand		738.6	F		HSA	W/S	--	--	--	
26	**SILTY CLAY (25.1'-26.0') CL** Gray, moist, very stiff, trace fine gravel		737.7								
	End of Boring at 26.0'										
28											
30											
32											
34											
36											
38											
40											
42											

APPENDIX C

POTENTIOMETRIC SURFACE MAPS



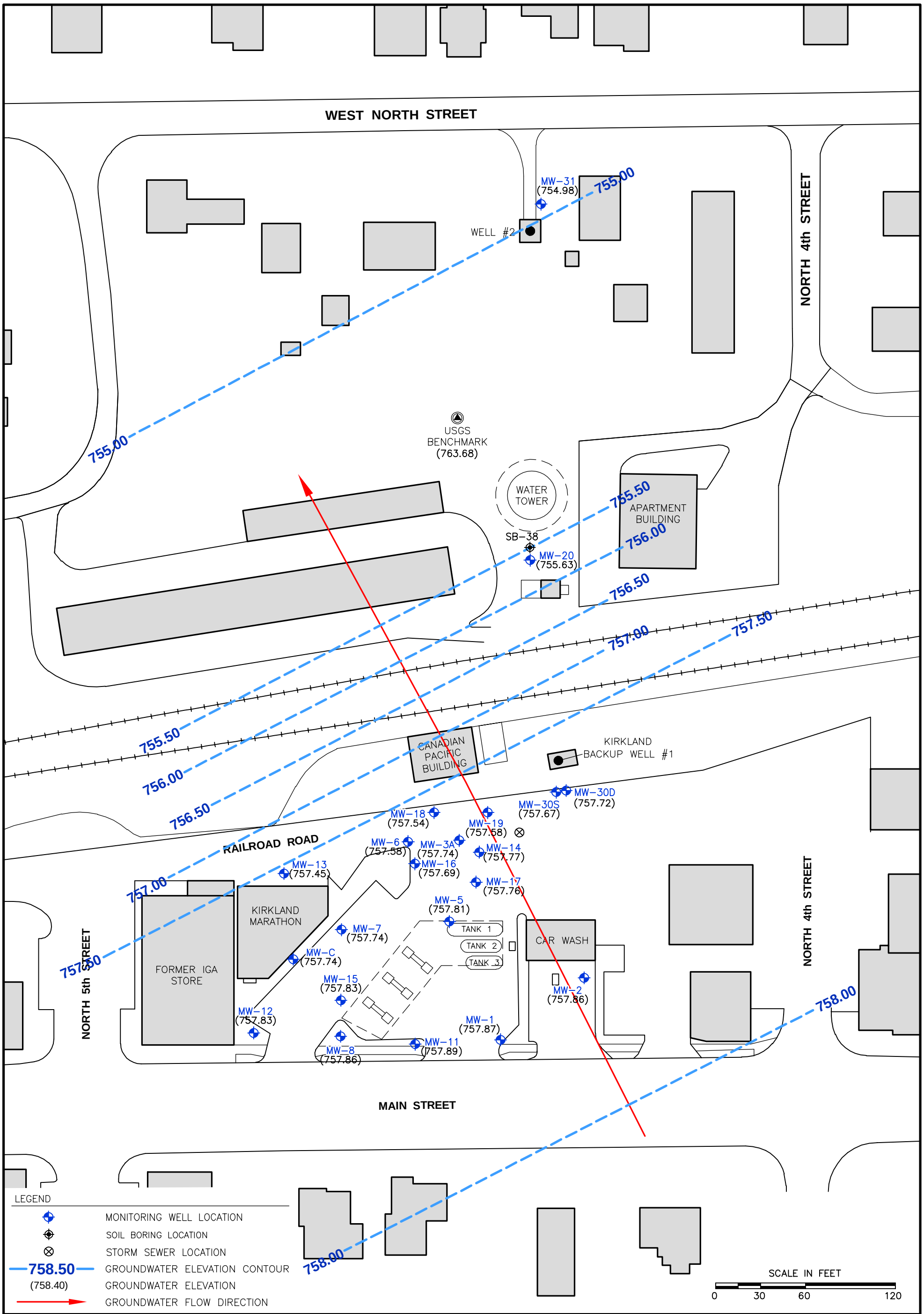
CHECK BY	MM
DRAWN BY	OS
DATE	8-19-16
SCALE	AS SHOWN
CAD NO.	16013.01F
PRJ NO.	15-16013

POTENTIOMETRIC SURFACE MAP
AUGUST 9, 2016

411 MAIN STREET
KIRKLAND, ILLINOIS

SM&A
ST. JOHN · MITTELHAUSER & ASSOCIATES

FIGURE
C-1



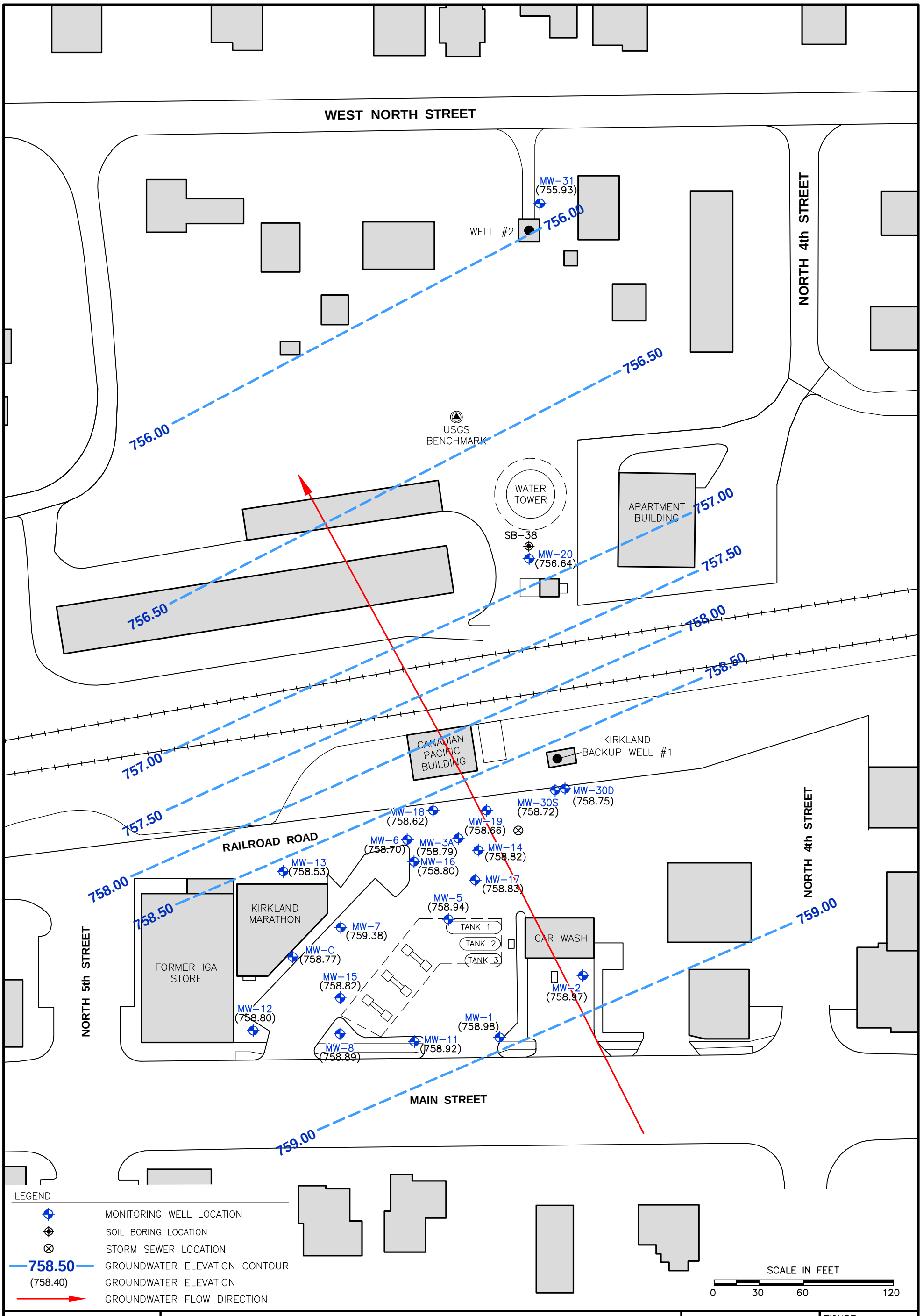
CHECK BY	MM
DRAWN BY	OS
DATE	8-19-16
SCALE	AS SHOWN
CAD NO.	16013.01F1
PRJ NO.	15-16013

POTENTIOMETRIC SURFACE MAP
NOVEMBER 14, 2016

411 MAIN STREET
KIRKLAND, ILLINOIS

SM&A
ST. JOHN · MITTELHAUSER & ASSOCIATES

FIGURE
C-2



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DATE	6-5-17
SCALE	AS SHOWN
CAD NO.	16013.01F2
PRJ NO.	15-16013

POTENTIOMETRIC SURFACE MAP
MARCH 7, 2017

411 MAIN STREET
KIRKLAND, ILLINOIS

SM&A
ST. JOHN · MITTELHAUSER & ASSOCIATES

FIGURE
C-3

APPENDIX D

KIRKLAND QUICK STOP SITE HISTORY

Site History – Blake Leasing / Kirkland Quick Stop

September 7, 1989 – Petroleum contamination was discovered at the Kirkland Quick Stop gasoline station site during monitoring well installation. On behalf of Kirkland Quick Stop, the release was reported to the Illinois Emergency Management Agency (IEMA or IESDA at the time) on September 7, 1989, and incident number 891717 was assigned to the site.

September 19, 1989 – At this time, there were five tanks or USTs "in service" and five tanks "out of service". A tank tightness test was performed, and the five in service tanks passed (as not leaking).

November 2-3, 1989 – The five "out-of-service" tanks were removed by F.I.W. Petroleum contaminated soils were apparent around some of the USTs located east-southeast of the former building.

September 1991 – PDC Technical Services, Inc. performed an investigation.

April 1992 – PDC Technical Services, Inc. investigation results were submitted to the IEPA. Following IEPA review of the report, the Agency requested that additional work be conducted.

July 1993, Environmental Contractors of Illinois, Inc. (ECI) was contracted to provide consulting and contracting services. The monitoring wells on site were surveyed and sampled to determine existing groundwater conditions. Petroleum contamination was apparent. It was determined that the site may be impacted by the USTs in service. From the data obtained from the well survey, it was determined that a shallow groundwater table was present (approximately 7 feet) in the tank area. In an effort to remediate the site, it was decided to remove the tanks that were in service. The station was still operating and the owners/operators wanted to continue to operate the gas station. Therefore, plans and designs for new double-walled fiberglass tanks were implemented for installation immediately following the UST removals. Limited downtime was required between the removal of the existing USTs and the installation of the new USTs as well as the remediation operations to address the release and LUST# 891717. ECI, along with the installation contractor, determined that the excavation would require dewatering during the tank removals and prior to installations due to the high water table. In addition, contaminated soil would be heavily saturated and may not pass a paint filter test for disposal at a special waste landfill. Arrangements were made to run a 3-inch propane powered water pump during tank removal activities and prior to new tank installations. Previous test results showed the groundwater to contain levels of contamination within the limits for disposal at a special waste treatment facility. However, areas of free product were expected and provision had to be made for high hydrocarbon levels. An air stripper was rented and available to serve as a pretreatment system in the event hydrocarbon concentrations encountered in the water exceeded special waste disposal limits. The tank removal and UST installation permits were submitted to the Office of the Illinois State Fire Marshal and an inspector was scheduled for the tank removals.

October 1-5, 1993 – A containment cell was constructed for placement of the contaminated soil. The containment cell was constructed of sand, a PVC liner, and concrete barrier walls. The ground surface was prepared with ag-lime (sand) to provide a level surface and prevent damage to the liner base from sharp rocks or foreign objects. The base liner consisted of a one piece 30 mil PVC liner. The edges were draped over 4 foot high concrete barrier walls and anchored with ag-lime (sand). The base of the containment cell was 40 feet by 80 feet by 4 feet in depth. The contaminated soil was placed in the cell and covered with a 15 mil PVC liner.

October 6-7, 1993 – The five in-service USTs were removed. Petroleum contamination (gasoline and diesel fuel) was apparent in the tank areas and along the diesel piping distribution lines. According to the OSFM Inspector Ken Oltman and site personnel, the release appeared to be a result of general spillage and overfill and possibly a combination of leaking piping. The tanks were cleaned and disposed of. The contaminated soil was excavated (approximately 700 cubic yards), loaded and stockpiled in the containment cell. Over the course of the tank removal and UST installation project, contaminated groundwater was pumped and placed in a temporary storage tank and hauled to Interstate Pollution Control (IPC) for wastewater treatment. A total of 30, 500 gallons of contaminated groundwater was pumped and disposed of as special waste.

October 8, 1993 – The installation process for three new USTs began in the same location as the former USTs and canopy are (east of the building) following the tanks removals and the excavation of the petroleum contaminated soils (PCS). The excavation area was approximately 45 feet wide by 55 feet long and 12 feet deep. The new tanks were installed by Pyramid Petroleum Company. Pyramid Petroleum set the tanks and then continued the installation project by installing the new piping and dispenser pumps over the next week.

October 11, 1993 – Piping and pump islands were uncovered and removed. Additional PCS was stockpiled in the containment cell.

October 12, 1993 – Additional PCS was removed from the piping/pump island excavation and stockpiled in the containment cell. The stockpile was covered with a PVC liner.

October 13, 1993 – Additional PCS was removed from the piping/pump island and stockpiled in the containment cell. The stockpile was covered with a PVC liner. Closure samples were collected from the piping trench excavation areas and under the former dispenser pumps.

May 31, 1994 – ECI completed a 45 Day Report and submitted it to IEPA.

July 29, 1994 – Through the process of evaporation, the PCS in the stockpile on site had dried to the point where representative samples passed a paint filter test so that the special waste could be disposed at a licensed subtitle D landfill. Heavy equipment was used to load the PCS onto licensed special waste hauler semi dump trucks and the PCS was transported and disposed at Winnebago Reclamation Landfill located in New Milford, Illinois. Approximately 700 cubic yards of PCS was removed as part of the remediation operations to address the release and LUST# 891717.

March 21, 1995 – Dahl & Associates completed a Corrective Action Plan/Report and submitted it to the IEPA.

August 24, 2001 – Trans Environmental conducted groundwater sampling at the Kirkland Quick Stop. Benzene was detected above TACO Cleanup Objectives in the northern monitoring wells (MW-03, MW-05, MW-06) and in the monitoring well located along the west side of the building near the southern property line (MW-08). In addition, several PNA compounds were detected slightly above TACO Cleanup Objectives in the monitoring wells MW-05 and MW-07.

February 15, 2002 – Trans Environmental injected 6 to 7 gallons of Hydrocarbon bacterial agent for bioremediation into wells MW-3A, MW-05, MW-08, and MW-06.

May 23, 2002 – Trans Environmental conducted groundwater sampling. Benzene, toluene, ethyl benzene, and xylene (BTEX) compounds were detected in wells MW-05 and MW-08. One PNA compound (naphthalene) was also detected in MW-05 and MW-08. However, only benzene was detected above the TACO Cleanup Objectives. Wells MW-3A, MW-06, and MW-07 had no detection of BTEX or PNA compounds.

April 3, 2003 – Trans Environmental conducted groundwater sampling on the site. The five groundwater monitoring wells (MW-3A, MW-05, MW-06, MW-07, and MW-08) were sampled. A general increase in BTEX levels had occurred, especially in MW-3A and MW-08. Part of the increase may have been due to construction activities for the new Marathon station (the old building and canopy were demolished, and a new building and canopy were constructed on the west side of the property), and a low water table which resulted in poor well purging (sedimentation in water samples).

December 1, 2003 – Trans Environmental conducted groundwater sampling which included monitoring wells MW-3A, MW-05, MW-06, MW-07, and MW-08. This sampling event showed a significant increase in the levels of both BTEX and PNA compounds, of which all five samples exceeded the TACO Tier 1 GROs. Sample MW-3A had the highest concentration of benzene at 0.586 ppm, whereas sample MW-08 had the highest concentration of PNAs with naphthalene detected at 31.5 ppm. Samples MW-06 and MW-07 also had hits of PNAs exceeding the TACO Tier 1 GROs. Benzene was the only indicator compound that exceeded the Tier 1 GROs in MW-05.

April 27, 2004 – Trans Environmental conducted groundwater sampling. The sampling showed a downward trend at the site with petroleum contaminants in the wells MW-3A, MW-06, MW-07, and MW-08 showing lower concentrations. MW-05 was the only well that showed an upward trend with the concentration of benzene going up from 0.0299 ppm to 0.065 ppm. Benzene was the only indicator compound that exceeded the Tier 1 GROs in MW-3a, MW-05, and MW-08. Samples MW-06 and MW-08 had hits of PNAs (naphthalene) exceeding the Tier 1 GROs.
2005-2006 – A series of in situ bio-remedial corrective actions were conducted on site in an attempt to assist in degrading the residual compounds of petroleum hydrocarbons remaining in the groundwater. These corrective actions included pumping impacted groundwater from existing monitoring wells and installation of bioremediation solutions into un-used monitoring wells.

June 8, 2005 – Trans Environmental conducted groundwater sampling. The wells MW-3A, MW-05, MW-07 and MW-08 sampled exceeded the TACO Tier 1 GROs for BTEX compounds, and wells MW-06 and MW-08 exceeded the TACO Tier 1 GROs for PNA compounds. Some well maintenance actions were conducted on MW-3A and MW-06, which consisted of replacing the flush mount cover on MW-06 and fixing the cover on MW-3A (the covers were worn and partially damaged from age along with all the construction operations on site, and some poor storm water drainage on site created puddles/swales on the asphalt surface around some monitoring wells).

April and July 2006 – Trans Environmental conducted groundwater sampling. The sampling events showed overall downward trend at the site with the petroleum contaminants in the majority of the wells showing lower concentrations (MW-3A, MW-05, and MW-07). MW-06 was the only well that showed an upward trend along with reappearance of naphthalene in MW-08. Nevertheless, all the wells sampled exceeded TACO Tier 1 GROs with the exception of MW-07. Monitoring wells MW-03, MW-05, and MW-08 exceeded the GROs for BTWEX compounds, and MW-06 and MW-08 exceeded the GROs for PNA compounds.

The wells were surveyed to determine the current groundwater flow, and Tier II modeling was completed to see if the levels were below the TACO Tier I GROs at the property boundaries or by the time they cross under Main Street to the south, Based on the mathematical modeling and using the highest concentration of benzene in MW-08 in the April & July 2006 sampling periods, the groundwater plume diluted out under the TACO Tier I GROs 30 feet southwest of MW-08, far before contamination reached to the neighboring properties to the south. It appeared that the low levels of petroleum contaminants in all of the monitoring wells would meet the TACO Tier 1 GROs through modeling before that would migrate off-site.

March 2007-2008 – Additional groundwater sampling was conducted. The sampling events showed another overall downward trend at the site with the petroleum contaminants in the majority of the wells showing lower concentrations. This was especially true with respect to BTEX compounds with the exception or MW-08, which had a resurgence of all four BTEX compounds in the 2007 sampling event. The only well that continued to exceed the TACO Tier 1 GROs was MW-05 for benzene, which was down to its lowest level of benzene at 0.0184 mg/L. Although the BTEX compounds had remained low, there was a significant resurgence in PNAs during the 2008 sampling period, especially for MW-3A, MW-05 and MW-06. The resurgence of PNAs in these three monitoring wells was at levels exceeding TACO Tier 1 GROs. The other two monitoring wells (MW-07 and MW-08), were non-detect with the exception of naphthalene in MW-08, but both samples were below the Tier 1 GROs.

November 2008 – Trans Environmental installed Regenesis oxygen release compound (ORC) 2-inch socks in the wells to assist in degrading the residual compounds of petroleum hydrocarbons remaining in the groundwater.

February 2009 – Trans Environmental conducted groundwater sampling. The only well that continued to exceed the TACO Tier 1 GROs was MW-05 for benzene, which was down to its lowest level of benzene at 0.0122 mg/L, but three of the wells (MW-3A, MW-06, and MW-08) remained above the GROs for PNAs.

August 26, 2009 – Trans Environmental installed four new monitoring wells (MW-11, MW-12, MW-13, and MW-14) on the subject property (Marathon Gas Station). The old wells remained in place in case future needs for ORC injections were needed or until the IEPA issues an NFR letter.

September 2009 – New Regenesis oxygen release compound (ORC) 2-inch socks were installed in the old wells to assist in degrading the residual compounds of petroleum hydrocarbons remaining in the groundwater.

August 27 and November 27, 2009 – Trans Environmental conducted groundwater sampling. The only monitoring well that continued to exceed the TACO Tier 1 GROs was MW-14 (northeast corner along alleyway) for benzene, which was down to its lowest level of benzene at 0.067 mg/L and 0.0337 mg/L. The August sampling event had low levels of xylenes in all four monitoring wells, but no xylenes were detected in the November sampling event and no PNAs were detected in either sampling event.

February 16, 2010 – Trans Environmental conducted groundwater sampling. An increase was noted in benzene concentrations in MW-14, which is located on the north end of the property and low hits of ethyl benzene, xylenes and naphthalene in MW-11 located on the southern portion of the property. The only wells that continued to exceed the TACO Tier 1 GROs was MW-14 (northeast corner along alleyway) for benzene, which increased from the last sampling

event from 0.067 mg/L to 0.122 mg/L. Both monitoring wells on the western portion of the property (MW-12 and MW-13) were clean or non-detect for all BTEX and PNA compounds.

January, March & September 2011 – Trans Environmental conducted additional groundwater sampling especially focusing on the benzene levels in MW-14. A decrease was noted in benzene concentrations in MW-14, from 0.0595 mg/L to 0.0304 mg/L to finally less than 0.005 mg/L. The September groundwater sampling even had no BTEX compounds above the TACO Tier 1 GROs. The sample results were relayed to the IEPA project manager and he requested a status report in the form of a CACR in order to evaluate the site conditions and determine if any further monitoring or remedial actions would be required.

May 2012 – Trans Environmental submitted a Corrective Action Completion Report (CACR) to IEPA requesting closure for the Site and IEMA incident #891717.

July 2012 – IEPA responded to the Trans Environmental CACR and site closure request. The request is denied on the basis that 1) Groundwater contamination remains within the setback zone of the Illinois State Geological Survey (ISGS) and community water supply well, 2) Off-site groundwater monitoring at monitoring well MW-06 has not been adequately addressed, and 3) The CACR signature page does not have the seal/approval of a Licensed Professional Engineer (LPE) or the signatures of the LPE, UST owner/operator or consultant.

November 2012 – GEOTHINK conducted groundwater sampling. Drought conditions prevented the sampling of all wells (including MW-06, which had shown prior BTEX and PNA levels exceeding Class I GROs). However, six (6) monitoring wells were sampled (MW-3A, MW-14, MW-11, MW-08, MW-C, and MW-13).Monitoring Wells MW-3A and MW-14 showed Class I GRO exceedances for benzene.

August 2013 – Trans Environmental responds to the IEPA response/denial letter (July 2012) to the CACR submitted on May 31, 2012. TE also submits another CAP and budget in this response, which includes a remediation plan utilizing a full-scale air sparging system, as well as continued groundwater monitoring.

September 2013 – IEPA rejects the August 2013 CAP and budget on the grounds that there had been no pilot study to define the radius of influence for the proposed treatment system, and no documentation provided to support air-sparging as the Best Available Technology (BAT).

February 2014 – GEOTHINK submits Corrective Action Plan and work budget to IEPA. At that time, a pilot scale air sparging remediation system was proposed, in conjunction with groundwater monitoring and groundwater testing.

May and June 2014 – GEOTHINK conducted groundwater monitoring at the site. MW-06, MW-3A, MW-14, MW-C, MW-08 and MW-05 were sampled for BTEX, MTBE , and PNAs. No BTEX or MTBE detection were observed at MW-06, but the detections for PNAs did exceed the Class I GROs. MW-3A exceeded the Class I GROs for benzene and a single PNA (benzo(b)flouranthene). Class I exceedances for multiple PNAs (7 compounds) were observed at MW-14. MW-5 also had Class I GRO exceedances for five (5) different PNAs. Neither MW-C nor MW-08 showed detections for any BTEX, MTBE, or PNA constituent.

July 2014 – The IEPA rejects the CAP and budget submitted by GEOTHINK in February of 2014 due to the off-site contamination present at MW-06. The presence of off-site

contamination required that a Stage 3 Investigation be conducted to delineate the extent of the off-site contamination within the set-back zone of the municipal back-up well.

August 2014 – GEOTHINK conducted groundwater monitoring at the site. MW-3A and MW-14 had Class I GRO exceedances for benzene and PNAs, while well MW-06 had an exceedance for only PNAs.

November 2014 – GEOTHINK submits Stage 2 and Stage 3 investigation and budget plans to IEPA.

December 2014 – GEOTHINK submits amended CAP and budget to include soil and groundwater testing costs that were not included with the previous plan.

February 2015 – GEOTHINK submits request to withdraw amended CAP and budget plan submitted in December 2014.

March 2015 – GEOTHINK submits the "Final Revised Replacement Budgets for the Stage 2 and Stage 3 Investigations".

March 2015 – The IEPA approves the Stage 2/3 investigation plans with conditions.
April - August 2015 – GEOTHINK completes Stage 2/3 Investigation and submits report. MW-2, MW-3A, MW-18, MW-19, MW-30S, and MW-20 were below Class I GROs for BTEX, MTBE, PNAs, total mercury and total lead (excluding MW-30S and MW-20 which had only total lead exceedances). MW-1 and MW-14 showed exceedances for benzene. MW-6, MW-14, MW-15, and MW-30D exceeded Class I GROs for PNAs.

August 2015 – The IEPA approved the Site Investigation Completion Report (SICR) submitted in August 2015.

September 2015 – GEOTHINK submitted a CAP and budget plan for the implementation of enhanced bioremediation at the site, to include injection wells within the set-back zone of the municipal well.

November 2015 – IEPA approved the CAP and budget submitted September 2015 (pending approval of the petition for variance due to the set-back zone issue).
December 2015 – GEOTHINK submitted petition for variance waiver to allow for injection of bioremediation ingredients within the set-back zones of the municipal wells for the Village of Kirkland.

March 21, 2016 – Blake Leasing electronically files a petition to the Illinois Pollution Control Board (IPCB) for a variance to operate bioremediation injection wells within the setback zone of a municipal well.

April 21, 2016 – IPCB agrees to accept petition for hearing and directs the IEPA to respond.

April 28, 2016 – IEPA Motion to dismiss petition based on the "[in]correct address for the Agency" on the petitioner's documents.

April 29, 2016 – Blake Leasing corrects the service error (address) and the petition is properly served to the IEPA.

May 19, 2016 – IPCB denies the IEPA motion (based on the service error) to dismiss the petition.

June 15, 2016 – IEPA recommends that the IPCB deny the petition variance to operate bioremediation injection wells within the setback zone of a municipal well requested by Blake Leasing.

July 19, 2016 – Blake Leasing files motion for extension on IPCB decision.

January 6, 2017 – Blake Leasing files an Amended Petition for a Water Well Setback Zone. The Amended Petition outlines the use of air sparging to remediate the residual petroleum hydrocarbons below the Site.

January 23, 2017 – IEPA requests a figure identifying the location of the proposed air sparging wells.

February 23, 2017 – Blake Leasing submits a Technical Memorandum identifying the location of the air sparging wells and additional information regarding the conceptual approach.

February 23, 2017 – IPCB directs Blake Leasing to respond to written questions regarding the Amended Petition dated January 6, 2017.

March 17, 2017 – Blake Leasing provides a Technical Memorandum written responses to IPCB questions dated February 23, 2017.

March 23, 2017 - IEPA responds to Blake Leasing's technical memorandum dated March 17, 2017 and requests Blake Leasing include air sparging points within the setback zone of Municipal Well #2.

April 21, 2017 – Blake Leasing submits a Technical Memorandum outlining the addition of air sparging points within the setback zone of Municipal Well #2.

May 2, 2017 – Blake Leasing files and Amended Petition to include additional air sparging wells within the setback zone of Municipal Well #2.

May 23, 2017 – Hearing is held regarding the motion of Blake Leasing Company, LLC vs. the Illinois Environmental Protection Agency and the Village of Kirkland.

August 18, 2017 – The IPCB grants Blake Leasing an exception from the water well setback requirements.

APPENDIX E

KIRKLAND QUICK STOP OPERATION AND MAINTENANCE PLAN

KIRKLAND QUICK STOP EMERGENCY CONTACT LIST

Class A/B Operator (Manager)	Loretta Scholle	815-997-2046
Class A/B Operator (Owner)	John Blake	815-693-2850
Class A/B Operator (H. Lee & Sons)	Dan Leisch	815-332-4966
Emergency Response Contractor	Trans Environmental	815-885-4840
Police		911
Kirkland Fire Department		815-522-4414
Illinois Emergency Response Center		800-762-7860

6/30/17

Emergency Response Procedures

Facility #: 1014986

(1) FACILITY - name and address where tanks are located:

Name: Kirkland Quick Stop

Street Address: 411 W Main St

City: Kirkland County: DeKalb

A. Emergency contacts and information for a leak, spill, release, or when a alarm occurs:

A/B Operator Kari Atchison 815-761-1688 John Blake 815-693-2850

Emergency Response Contractor Trans Environmental 815-885-4840

Police 911

Fire Department 815-522-4414

B. Procedures for overfill protection during delivery of regulated substances:

Ensure Delivery will Fit and all alarms are functioning Properly

Delivery Personnel are to remain in area and observe the entire fuel delivery

C. Operation of emergency shut-off systems:

Large Spills

Dispenser Hit and Knocked Loose

In Case of Fire

D. Appropriate responses to all alarms:

Write Down Information in The Alarm Log and Call An A/B Operator

E. Reporting of leaks, spills and releases:

Report All Leaks or Spills To An A/B Operator

F. Site-specific emergency procedures, if any:

Protect All Storm Sewers in Case of A Spill With the Spill Kit

Kirkland Quick Stop C Operator Instructions

1. Insure all fueling customers
    A. Turn off Vehicle
    B. Stay at nozzle, do not re-enter vehicle
    C. NO SMOKING

2. Record all warning alarms (Yellow) in the alarm log and monitor alarm

3. Emergency alarms (Red)
    A. Silence Alarm
    B. Write down the alarm Information in the alarm log
    C. Contact an A/B Operator

4. Report all Spills to A/B Operator
    A. Small Spills (Less than 25 Gallons)
        1. Turn pumps off at effected lanes
        2. Bag nozzles and place cones in lanes
        3. Use spill kit to clean up
        4. Place used clean up materials in the onsite hazardous waste container
    B. Large spills
        1. Press in E Stop
        2. Call 911
        3. Call A/B Operator
        4. Clear all people
        5. Use spill kit to protect storm sewers
            A. Storm sewer at NE corner of lot
            B. Storm sewers located at curbs on south side of lot

5. Dispenser hit and knocked loose
    A. Press in E Stop
    B. Call 911
    C. Call A/B Operator
    D. Block off Lanes
    E. Clean up any Spills

6. In Case of Fire
    A. Press in E Stop
    B. Call 911
    C. Locate fire extinguisher and use PASS system on fire
    D. Clear all people
    E. Call A/B Operator

Dated 4-19-2017

PASS
PRACTICAL AMERICAN SAFETY SOLUTIONS

✔ Correct Filling Checklist

What To Do Before Your USTs Are Filled	❑ Post clear signs that alert delivery persons to the overfill devices and alarms in use at your facility. ❑ Make and record accurate readings for product and water in the tank before fuel delivery. ❑ Order only the quantity of fuel that will fit into 90% of the tank. **Remember, the formula for determining the maximum amount of gasoline to order is:** (Tank capacity in gallons X 90%) — Product currently in tank = Maximum amount of fuel to order **Example:** (10,000 gal X 0.9) — 2,000 gal = 7,000 gal maximum amount to order ❑ Ensure fuel delivery personnel know the type of overfill device present at the tank and what actions to perform if it activates. For example, use sample sign on page 27 of this chapter. ❑ Review and understand the spill response procedures. ❑ Verify that your spill bucket is empty, clean, and will contain spills.
What To Do While Your USTs Are Being Filled	❑ Keep fill ports locked until the fuel delivery person requests access. ❑ Have an accurate tank capacity chart available for the fuel delivery person. ❑ The fuel delivery person makes all hook-ups. The person responsible for monitoring the delivery should remain attentive and observe the entire fuel delivery, be prepared to stop the flow of fuel from the truck to the UST at any time, and respond to any unusual condition, leak, or spill which may occur during delivery. ❑ Have response supplies readily available for use in case a spill or overfill occurs (see Section 3). ❑ Provide safety barriers around the fueling zone. ❑ Make sure there is adequate lighting around the fueling zone.
What To Do After Your USTs Are Filled	❑ Following complete delivery, the fuel delivery person is responsible for disconnecting all hook-ups. ❑ Return spill response kit and safety barriers to proper storage locations. ❑ Make and record accurate readings for product and water in the tank after fuel delivery. ❑ Verify the amount of fuel received. ❑ Make sure fill ports are properly secured. ❑ Ensure the spill bucket is free of product and clean up any small spills.

UNDERGROUND STORAGE TANK
OPERATIONS AND MAINTENANCE PLAN TEMPLATE

Plan Purpose & Signatures Page:

The purpose of an Operations & Maintenance Plan (O&M Plan) is to assist owners and employees operate and maintain a facility with an Underground Storage Tank (UST) by providing a document which incorporates the following 3 components:

1. An outline for all inspections, testing & maintenance that shall be performed at the facility, **specific to the facility's operations,** with the defined intervals at which the activities shall be performed.
2. Directions on how to control and clean up routine releases or spills of regulated product at a facility, including:
   a. instructions for handling and collecting spilled or released product,
   b. where and how contaminated debris will be safely stored,
   c. how contaminated debris will be properly disposed of.

   These directions should include what equipment is to be used, where the equipment is stored, how equipment is replaced, and who the environmental contractor is, with their contact information.
3. Emergency Response Procedures, as defined in our regulations.

All operations, maintenance and inspections activities shall comply with the Illinois Office of the State Fire Marshal (OSFM) Division of Petroleum & Chemical Safety (P&CS) rules and regulations. General information about OSFM UST requirements can be found at the OSFM website: www.sfm.illinois.gov.

Specifics of the regulations as they apply to the O&M Plan can be found at:
41 Illinois Administrative Code, Part 176.655(b)(2)(A-C)

Specifics on Part 3 of the O&M Plan, the Emergency Response Procedures, are at:
41 Illinois Administrative Code, Part 176.645(b)(1)(A-E)

SIGNATURE of OWNER: _____ **DATE:** 8 / 8 /20 14

SIGNATURE of A/B OPERATOR: _____ **DATE:** 8 / 8 /20 14

UNDERGROUND STORAGE TANK
OPERATIONS AND MAINTENANCE PLAN TEMPLATE

Facility General Information Page:

Facility Number: 1014986

Facility Address: 411 W Main St

Kirkland, Illinois 60146

Facility Phone Number: 815-522-3510

Class A/B Operator List:

Name: John D Blake Emergency contact # 815-693-2850

Name: Kari Atchison Emergency contact # 815-761-1688

Owner Contact Information: Blake Leasing Co. LLC John D Blake 815-693-2850

UST Contractors Contact Information:

- OSFM Licensed UST Contractor: Trans Environmental
- Contact #: 815-885-4840
- OSFM Licensed UST Contractor: _____
- Contact #: _____

Other Contacts as needed:

- Illinois Emergency Response Center 800-762-7860
- _____
- _____
- _____

Local Emergency Contact Numbers:

- Fire (local number if 911 service not available): 815-522-4414
- EMS (local number if 911 service not available): _____
- Police (local number if 911 service not available): _____

Emergency Stop Switch Locations:

- Sales Counter beneath POS system
- Northwest corner of carwash

UNDERGROUND STORAGE TANK
OPERATIONS AND MAINTENANCE PLAN TEMPLATE

OPERATIONS & MAINTENANCE PLAN, Part 1:

Inspection and Maintenance with Required Intervals:

Equipment at this facility needs to be inspected, checked, tested and maintained, often at defined intervals. Below are sections for daily, weekly, monthly, quarterly, annual and other inspections/tests/maintenance. **Common examples are given, but those specific to this facility must be listed under each time interval section.** More information can be obtained from your UST contractor.

Daily:

On a daily basis the manager or assigned employee will check the automatic tank gauge (ATG) to ensure power is on, and check for any alarms pertaining to the monitoring of the UST. Follow up on any ATG alarm & report the Unusual Condition to the A/B Operator. Check fire extinguishers for pressure and expiration dates. If it applies, check speaker system operation. Inspect spill buckets for damage, debris or liquids; electrical boxes; sump lid(s) for damage.

Daily Items to be checked at this facility:

1. **ATG Power On**
2. **Alarms Checked & Unusual Conditions Noted**
3. Check Spill Buckets For Liquid & Keep Clean
4. Check Drive Area For Spills
5. Check Hoses, Breakaways, Swivels & Nozzles
6. Check All Manhole Lids
7. Check Electrical Box & Ensure It Is Not Blocked
8. _____
9. _____

UNDERGROUND STORAGE TANK
OPERATIONS AND MAINTENANCE PLAN TEMPLATE

Weekly:

Weekly UST inspections will be completed and may cover items such as inspections of dispensers, nozzles, sumps and ATG Monitoring Equipment.

Weekly Items to be checked at this facility:

1. All Daily Items
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____

Monthly:

Monthly UST inspections will be completed and may also cover items such as Spill Kits and Emergency Shut Offs. If it applies, Vapor/Groundwater Monitoring Wells will be checked and the Monthly Log completed. If it applies, operation of the Impressed Current rectifier will be checked, and the monthly log report completed and saved in the facility folder. Interstitial Sensors must be checked, and the box initialed in the correct month on the Quarterly Equipment Inspection Checklist Report. A "PASSING" tank test from the ATG must be printed and saved, which will include, if it applies, "tank test" and "all sensors normal" status.

Monthly items to be checked at this facility:

1. **ATG "PASS" test printed and saved**
2. Check And Maintain 30 Daily Inspections
3. Check Spill Kit For Completeness
4. Check Fire Extinguishers
5. Check For Water In Tanks

UNDERGROUND STORAGE TANK
OPERATIONS AND MAINTENANCE PLAN TEMPLATE

Quarterly:

A quarterly inspection **must be conducted personally by the designated A/B operator assigned to this site**, and the Quarterly Equipment Inspection Checklist Report must be completed and signed by that same individual. This report will be kept for two years along with other facility records, and must be available for the OSFM inspector to inspect upon request or within 30 minutes.

Quarterly items to be checked at this facility:

1. **Quarterly Equipment Inspection Checklist Report completed.**
2. _____

Annual:

Annual testing*(see p. 6) may include but not be limited to: Tank/Line Precision Test; Line Leak Detection Test; Tank/Line Interstitial Sensors Test; Impressed Current Test, as applies to the facility. Sacrificial Anodes if last test was <-875 mV & >-850 mV. Emergency Shut Offs will be tested, Shear Valves inspected, and the signed annual Financial Responsibility Statement must be mailed to the OSFM.

OSFM licensed UST contractor who will conduct annual Tank/Line tests:
Tanknology Inc. 800-800-4633 Tests Due: 10/27/2017.

OSFM licensed CP contractor who will conduct annual Impressed Current test:
N/A Test Due: ____/____/20____.

Annual items to be checked at this facility:

1. **Emergency Shut Off Switches tested & report completed & saved.**
2. **Shear Valves inspected and checked to insure secure mounting.**
3. **OSFM Financial Responsibility Form must be mailed to the office.**
4. Security Alarm Inspection & Testing Report
5. Review 5 Year Tank Tightness Test
6. Maintain 2 Years of Quarterly Reports
7. _____

UNDERGROUND STORAGE TANK
OPERATIONS AND MAINTENANCE PLAN TEMPLATE

Three Years:

Vapor Monitoring Device Test, if it applies*; Sacrificial Anode Test, if it applies.* Sacrificial Anodes will be tested every three years if they show a reading of -875 millivolts or better, where "better" means a larger negative value. NOTE: In the event that a reading of -875 mV or lesser negative value is recorded with testing being conducted above the structure, on any type of corrosion protection system, then **annual testing** will be required thereafter as long as the system does not fall below -850 mV. Readings below -850 mV constitute a FAILED Test. OSFM must be notified, and your CP contractor must be contacted for repairs/replacement.

Vapor Monitoring Device Test, if it applies: Test Due: ____/____/20____.

Triennial Sacrificial Anode Test, if it applies: Test Due: ____/____/20____.

***Note:** Report any FAILED test to OSFM within 3 working days. Print and complete the form at our website for most annual tests: Failed Test Results Report [PDF, 1.4MB], and mail it to P&CS at the OSFM. This applies to: Tank/Line Precision Test, Cathodic Protection Test, Line Leak Detection Test, & Interstitial Monitoring Sensor Test.

All equipment testing must be performed by an OSFM licensed contractor, licensed in the module appropriate for the test being performed. **Emergency Stop Switch test and documentation is the exception, and may be done by the facility owner/operator.**

Five Years:

Internal Lining inspections, if it applies. Lining inspections for tanks will be five years after the tanks were lined, and the tanks will be inspected every five years thereafter. Results & data from a PASS lining inspection shall be submitted to OSFM within 10 days of the lining inspection.

Tanks failing to pass the lining inspection criteria will not be allowed to be touched up, repaired, totally relined or put back in use and shall be decommissioned immediately and removed within 60 days after the lining inspection. Results & data from a FAIL lining inspection shall be submitted to OSFM within 3 days of the lining inspection.

5 Year Internal Lining Inspection, if it applies: Test Due: ____/____/20____.

UNDERGROUND STORAGE TANK
OPERATIONS AND MAINTENANCE PLAN TEMPLATE

OPERATIONS & MAINTENANCE PLAN, Part 2:

Handling, Storage and Disposal of Regulated Waste Generated at Facility:

Your facility should be equipped with a fuel spill kit. The kit may include:

- Personal Protective Equipment (PPE) including: eye/face protection, chemical-resistant nitrile gloves, clothing/shoe protection.
- Warning equipment to isolate a spill area or equipment, such as traffic cones, safety tape, nozzle bags.
- Clean absorbent materials in bags or cans, such as oil dry compound.
- Absorbent pads to soak up spills, and absorbent booms to control/contain fuel, especially if it is flowing toward an environmentally sensitive receptor.
- Safe non-sparking tools, such as a plastic dust pan or plastic scoop shovel, whisk broom, push broom, a hand pump for evacuating liquid from a sump. Do not use energized equipment in the vicinity of a fuel spill.
- Containers to hold the debris until it can be disposed of properly: chemical resistant cans/pails/buckets/barrels with lids, chemical resistant polyethylene bags with ties or zip-lock plastic bags.

Location of facility Spill Kit equipment: Northeast Corner of Building

This Facility's Procedure for Controlling and Cleaning Small Spills:
If safe to do so, Turn Pumps Off At Effected Lanes, Bag Nozzles and Place Cones in Lanes, Use Spill Kit To Clean Up Spill, Place Used Clean Up Materials In The On Site Hazardous Waste Container Located in Trash Area

Large Spills - Push E Stop, Call 911, Call A/B Operator, Clear All People, Use Spill Kit To Protect Storm Sewers Located at NE Corner of Lot and Along South Curbs of Lot

This Facility's Procedure/Location for safe storage of regulated waste from spills:
Hazardous Waste Drum Located in Waste Container Area Call Trans Environmental for Removal 815-885-4840

UNDERGROUND STORAGE TANK
OPERATIONS AND MAINTENANCE PLAN TEMPLATE

Contact for proper disposal of regulated waste:

- Environmental Contractor: Trans Environmental
- Phone Number: 815-885-4840

Vendor to contact for replacement supplies:

- Name of vendor: Blake Oil Co
- Phone Number: 815-522-3521

General Safety Procedures for Small Spills:

1. Always wear proper PPE before handling any regulated products. Always protect your skin and eyes.
2. If product is still flowing or the spill is 25 gallons or more, immediately push the Emergency Stop Switch, call Fire Department, contact the A/B Operator.
3. Do not allow customers to start their vehicles near the spilled product and turn off any other potential ignition sources.
4. Move customers and employees away from the spill vicinity to a safe area.
5. Isolate/Barricade spill area with traffic cones and/or caution tape.
6. In the event of a small spill, if safe to do so, bring the spill kit to the spill area:
    a. Put on approved protective equipment. Avoid contact of spilled liquids with skin while working. Protect eyes/face from splashing liquids.
    b. Contain spill with oil absorbent compound & pads.
    c. Isolate/protect sensitive receptors (storm water drains, sewers, UST manways or the public right-of-way) with booms/dikes.
    d. Follow Facility Procedure for Controlling & Cleaning Small Spills.
    e. Report all spills and other incidents to your Class A/B Operator.

OPERATIONS & MAINTENANCE PLAN, Part 3:

Emergency Response Procedures (ERP):

Complete this third & final section of the Operations & Maintenance Plan by completing the Emergency Response Procedures Form [PDF, 1Mb] at our website.

Add a copy of the ERP to Parts 1 & 2 of your Operations & Maintenance Plan.

Post a second copy of the ERP where it can be easily seen by employees.

Kirkland Quick Stop Daily Inspection Date_____

☐ Check fills and vapor spill buckets for liquid and keep clean

☐ Check hoses, breakaways, swivels and nozzles for defects

☐ Check drive area for spills

☐ Check Veeder-Root for any warnings or alarms

☐ Check electrical circuit box and ensure it is not blocked

REMARKS SAMPLE

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Signature (C Operator or A/B Operator)

Kirkland Quick Stop Monthly Inspection Date_____

- ☐ Check fills and vapor spill buckets for liquid and keep clean
- ☐ Check hoses, breakaways, swivels and nozzles for defects
- ☐ Check drive area for spills
- ☐ Check Veeder Root for any warnings or alarms
- ☐ Check electrical circuit box and ensure it is not blocked
- ☐ Check spill kit for completeness
- ☐ Check all fire extinguishers
- ☐ Check and report any water in tanks
- ☐ Check and maintain two passing tank test reports
- ☐ Check and maintain Liquid Status Reprot
- ☐ Check and maintain one month of daily inspections

REMARKS

Sample

_____

Signature (A/B Operator)

SAMPLE

Office of the Illinois State Fire Marshal
Underground Storage Tank Equipment Inspection Checklist/Operations & Maintenance Guidelines
For UST System Inspections

Facility Name: KIRKLAND QUICK STOP Facility ID: 1014986

THIS QUARTERLY INSPECTION IS IN ADDITION TO ALL OTHER MONTHLY RELEASE DETECTION AND TESTING REQUIREMENTS

UST Quarterly Inspection Equipment Items (place check mark in last column if unusual conditions (UC) exist)				
		CHECKED	N/A	UC
Section A.	**Tank Leak Detection Records (Circle applicable number)**			
1. Automatic Tank Gauge	Monthly passing print out tape			
2. Interstitial Sensors	Monthly status record of normal or equivalent - Annual functional test Last tested:_____ Test due:_____			
3. S.I.R. (Includes Warren Rogers)	Monthly status report normal or equivalent			
4. Manual Tank Gauging < 600 gal.	Weekly stick measurements with monthly reconciliation		X	
5. Manual Tank Gauging 601-2000 gallons	Weekly stick measurements with monthly reconciliation - Annual precision test Last tested:_____ Test due:_____		X	
6. Vapor/Groundwater Monitoring	Monthly log with date, results and inspectors initials		X	
7. Water in Tank	Monitor ATG for water alarm or check tank utilizing gauge stick and water paste		X	
Section B.	**Tank Component Inspection**			
1. Tank Monitoring System	Ensure system has power and is in a normal status with no alarms (daily)			
2. Submersible Sump Covers	Ensure all covers are present, in good condition and seated firmly			
3. Submersible Sump	Ensure no water is in submersible sump that contains interstitial sensors If piping is single wall and corrosion prevention is installed, water is allowed			
4. Electrical	Ensure junction boxes are intact and no obvious wire breaks are visible			
Section C.	**Piping Leak Detection Records (Circle applicable number)**			
1. Interstitial Sensors	Monthly status record of normal or equivalent - Annual functional test Last tested:_____ Test due:_____		X	
2. Mechanical Line Leak Detector	Annual precision test of lines and functionality test of leak detector Last tested:_____ Test due:_____		X	
3. Electronic Line Leak Detector	If proof of annual 0.1 gph system leak test is performed, a functionality test of the leak detector is required only - If proof is not available a precision line test will also have to be performed Last tested:_____ Test due:_____			
Section D.	**Piping Component Inspection (Circle applicable number)**			
1. Pressurized piping components	Ensure line leak detector is in place, if interstitial sensors are used, ensure they are positioned at the lowest portion of the submersible and dispenser sump			
2. American Suction	Ensure monthly monitoring is in place		X	
3. Product Piping	Inspect for obvious leaks, deformations, cracks or other abnormalities		X	
Section E.	**Corrosion Protection Records (Circle applicable number)**			
1. Impressed Current System	Monthly log with date, initials of inspector, hour, volt, amp and power on verification - Annual system test: Last tested:_____ Test due:_____		X	
2. Sacrificial Anode System	System must be tested every 3 years: Last tested:_____ Test due:_____		X	
3. Internal Lining	Must be inspected every 5 years: Last tested:_____ Test due:_____		X	
Section F.	**Corrosion Component Inspection (Circle applicable number)**			
1. Impressed Current System	Ensure rectifier has power and power light functions, observe and record volt, amp and hour meter readings		X	
2. Sacrificial Anodes	If anodes and connections are visible in submersible or dispenser sumps, observe for obvious connection breaks of wiring from steel components		X	
Section G.	**Spill Protection**			
1. Spill Protection Equipment	Ensure spill containment is in place, clean, dry & no obvious cracks/tears (daily)			
Section H.	**Overfill**			
1. Automatic Shutoff	Ensure device is in place and free of restrictive items			
2. Overfill Alarm	Ensure device is in place and test function operates properly			
Section I.	**Dispensers and Emergency Shut-Offs**			
1. Hose and Nozzle Components	Observe for obvious leaks, cracks & deformations. Ensure breakaway is installed			
2. Under dispenser	Ensure shear valve is in place and properly anchored. Observe for obvious leaks			
	Ensure interstitial sensors if installed are positioned at the lowest portion			
	Observe for obvious open electrical junction boxes or broken wiring			
Section J.	**Emergency Shut-Off**			
1. Emergency Shut-Off	Ensure emergency shut-offs are accessible and have no obvious damage Last tested:_____ Test due:_____			
Section K.	**Emergency Actions**			
1. System Alarms	Ensure any alarms have been reported as required by facility operations plan			
2. Spills, Leaks or Release	Ensure any release has been reported as required by facility operations plan			

Remarks needed if unusual conditions exists (also incude the date owner was notified and actions taken):

Verify that each monthly recordkeeping requirement on the 1st page has been accomplished by initialing in the blanks below. (Initial all that are applicable)

Tank Leak Detection/Interstitial Monitoring

Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec

Line Interstitial Monitoring/Automatic Line Leak Detectors

Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec

Impressed Current System

Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec

Additional Daily, Monthly, Quarterly, and Annual Inspection Items (indicate how often):

Daily:	
Monthly:	
Quarterly:	
Annually:	**Submit annual Financial Responsibility Report from www.sfm.illinois.gov at Applications & Forms.**

Identify the manner in which facility owners/operators will properly dispose of regulated substances spilled at the facility:

A/B Operators must conduct the quarterly inspections personally. Sign & date the form when inspection is done.

If using this form as part of your Operations & Maintenance Plan, attach the list of your class A/B & C Operators & your facility's Emergency Response Procedures form. The facility Owner must sign the O&M Plan with the A/B Operator, but only the A/B Operator is required to sign the Quarterly Inspection report.

SAMPLE

Signature of Owner

Signature of A/B Operator

Date of Inspection

Kirkland Quick Stop Yearly Inspection Date_____

- ☐ Check fills and vapor spill buckets for liquid and keep clean
- ☐ Check hoses, breakaways, swivels and nozzles for defects
- ☐ Check drive area for spills
- ☐ Check Veeder Root for any warnings or alarms
- ☐ Check electrical circuit box and ensure it is not blocked
- ☐ Check spill kit for completeness
- ☐ Check all fire extinguishers, insure they are up to date
- ☐ Check and report any water in tanks
- ☐ Check and maintain two passing tank test reports for each month (Maintain 2 Years)
- ☐ Check and maintain monthly passing Liquid Status Report (Maintain 2 Years)
- ☐ Check and ensure tank test are current (Passed test every 5 years)
- ☐ Check and ensure that line leak tests are current (Passed test each year)
- ☐ Check E-Stops (Passed test each year)
- ☐ Check and ensure line leak detectors test are current (passed test each year)
- ☐ Check and ensure that security system test are current (passed test each year)
- ☐ Check Quarterly Reports and attach monthly reports (Maintain 2 years)

REMARKS Sample

_____

_____

_____
Signature (A/B Operator)

ALARM LOG

JAMPLE

DATE:	TIME:	C OPERATOR NAME	TYPE OF ALARM:	RESULT OF ALARM: