Appendix J

Performance Monitoring Plan

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Performance Monitoring Plan

Dewey Loeffel Landfill Superfund Site
Nassau, New York

February 13, 2013
Last Revised December 18, 2014

Performance Monitoring Plan

Dewey Loeffel Landfill
Superfund Site
Nassau, New York

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February 13, 2013
Last Revised December 18, 2014

ARCADIS

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1. Introduction

This Performance Monitoring Plan has been prepared for the monitoring that will be performed to assess the effectiveness of the treatment system at the Dewey Loeffel Landfill Superfund Site located in the Town of Nassau, Rensselaer County, New York (site). The work described herein is being completed pursuant to the Administrative Settlement Agreement and Order on Consent for a Removal Action (CERCLA Index No. 02-2012-2005) (Consent Order) executed by the United States Environmental Protection Agency (USEPA), General Electric Company (GE), and SI Group, Inc. (SI Group). (GE and SI Group are referred to herein as Respondents.)

This Performance Monitoring Plan has been prepared to describe the following:

- Treatment system sampling and analysis, including tracking of contaminant mass removal; and
- Monitoring groundwater outside of the Dewey Loeffel Landfill (landfill), including residential wells without point of use (POU) treatment systems, residential wells with POU treatment systems, and the contaminant plume hydraulically downgradient of the landfill.

1.1 Location and Description

The landfill is located along the south side at 350 Mead Road between Nassau-Averill Park Road and Central Nassau Road. A map showing the location of the landfill and surrounding area is presented on Figure 1. Key features are presented on Figure 2.

The capped area of the landfill is roughly triangular in shape and situated in a low-lying area between two wooded hills. The landfill is bound to the north by Mead Road, and to the south, west and east by undeveloped forested land. The rural area surrounding the landfill is sparsely populated and contains few residential properties and a bowhunter's club lodge.

Topography in the area generally slopes downward from east to west. Surface water at the landfill mostly drains to the west toward the Valatie Kill via Tributary T11A. The Valatie Kill flows in a southwesterly direction to Nassau Lake, located approximately three miles downstream. Surface water from a portion of the landfill flows to the south into a small unnamed tributary which discharges into Valley Stream and ultimately Nassau Lake.

The hydraulic gradient of groundwater in overburden soils in the vicinity of the landfill is generally to the west and/or southwest. The hydraulic gradient of groundwater in the bedrock is similar. However, based on the distribution of volatile organic compounds (VOCs) in a groundwater contaminant plume

emanating from the landfill to the south, bedrock groundwater flows primarily to the south due to the influence of fractures within the bedrock.

1.2 History

As described in the Consent Order, from approximately 1952 to 1968, the landfill was owned and operated by several companies including the Loeffel Waste Oil and Removal Service Company (Loeffel Companies) as a waste disposal facility. During this time, the landfill consisted of two waste lagoons located in the western and central portions of the landfill, a 6-foot deep oil pit in the east central portion of the landfill, four 30,000 gallon aboveground storage tanks, and a drum disposal area located in the southeastern portion of the landfill.

Landfill disposal operations reportedly ceased in 1968 by order of the State of New York. Between 1970 and 1975, remedial actions undertaken by the Loeffel Companies included covering and grading the drum disposal area, oil pit and lagoons, and constructing a system of drainage ditches around the landfill. From 1974 to 1980, the Loeffel Companies reportedly also operated a waste oil transfer station utilizing the four 30,000 gallon aboveground storage tanks.

On September 23, 1980, GE entered into an agreement with the New York State Department of Environmental Conservation (NYSDEC) which required GE to perform field investigations, submit an engineering report which discussed the collected data, identify remedial alternatives, and recommend a remedial alternative. A remedy was subsequently selected by NYSDEC and involved the installation of soil-bentonite cutoff wall around the landfill, an overlying clay cap, and a landfill leachate collection system below the cap within the cutoff wall. The design of the remedy was performed by GE and approved by NYSDEC. The remedy was subsequently implemented by NYSDEC using funding provided by GE, Schenectady Chemicals, Inc. (now SI Group), and Bendix Corporation (now Honeywell International, Inc.). Beginning in 1983, NYSDEC and/or GE performed a variety of response actions at the site, some of which were performed in accordance with Records of Decision (RODs) issued by NYSDEC in January 2001 and January 2002. The response actions included, but were not limited to, the following:

- Installation and operation of a bedrock groundwater recovery well system involving three extraction wells located to the south of the landfill;
- Transportation of landfill leachate and groundwater for off-site treatment;
- Installation, operation, maintenance and monitoring of point-of-use treatment systems for five residential wells (located on four properties) to remove VOCs;

- Routine VOC monitoring of other residential wells located near the landfill; and
- Routine monitoring of many groundwater monitoring wells located outside the landfill's perimeter fence.

The current groundwater extraction system designed and constructed by NYSDEC is located along the approximate centerline of the VOC plume to the south of the landfill and includes three bedrock extraction wells (designated EW-1, EW-2 and EW-3, see Figure 2). Beginning in late March 2008 and through 2010, NYSDEC extracted groundwater from these three extraction wells on a seasonal basis, operating during the spring, summer, and fall months. Along with leachate from the landfill, extracted groundwater was transported for off-site treatment and disposal. NYSDEC transported landfill leachate for off-site treatment and disposal each year since 1991 with the exception of 1994. NYSDEC continued operation of the landfill leachate collection system through October 2011. Operation of the groundwater extraction system by NYSDEC did not resume after shutdown in the fall of 2010 until July 2011.

At the request of NYSDEC, USEPA proposed the site for inclusion on the National Priorities List (NPL) on March 4, 2010. The site was subsequently added to the NPL on March 10, 2011.

USEPA subsequently took over operation of the landfill leachate collection system and the groundwater extraction system to the south of the landfill on October 31, 2011. USEPA winterized the system, allowing groundwater extraction to continue during the winter months.

Pursuant to the Consent Order, GE and SI Group assumed responsibility from USEPA for continued operation and maintenance of the on-site leachate collection system and the off-site groundwater extraction system. The transition from USEPA to the Respondents occurred on August 1, 2012, and the first transportation of leachate and extracted groundwater by the Respondents occurred on August 2, 2012 and continued through December 2, 2013. Pursuant to the Consent Order, GE and SI Group designed and constructed a treatment system to treat landfill leachate and extracted groundwater. The treatment system was started up in December 2013.

2. Treatment System Monitoring

The purpose of the treatment system is to eliminate the need for the continued, year-round trucking of extracted groundwater and leachate from the site. The treatment system will also facilitate the extraction of additional groundwater (from five new extraction wells). The treatment system is primarily designed to address VOCs, semi-volatile organic compounds (SVOCs) and 1,4-dioxane in the extracted groundwater and landfill leachate prior to discharge to the Valatie Kill. Additional information on the treatment system is found in the Design Report/Implementation Plan (DR/IP).

The treatment system is designed to meet the substantive requirements established pursuant to the Consent Order (see Appendix B of the DR/IP). Effluent monitoring will be conducted to confirm that the discharge from the treatment system to surface water (i.e., Valatie Kill) meets the substantive requirements. Treatment system effluent samples will be collected from the discharge of pump P-820A/B as shown on the process flow diagram presented on Figure 3. The sampling frequency and analytical parameters specified in the substantive requirements are presented in Table 1. These include select field parameters (dissolved oxygen [DO] and pH), VOCs, select SVOCs, 1,4-dioxane, polychlorinated biphenyls (PCBs), select pesticides, select metals, and select water quality parameters. Additionally, the substantive requirements include quarterly whole effluent toxicity (WET) testing along with mercury and PCB minimization programs. Following the conclusion of the shakedown period, the routine discharge to the Valatie Kill will be monitored as described in this plan.

Treatment system influent samples will initially be collected monthly and analyzed for select field parameters, VOCs, SVOCs and 1,4-dioxane (See Table 1). Additional samples will be collected from the extraction wells, leachate collection tank, and specific locations between key process components within the treatment system. These samples will initially be analyzed for select field parameters (DO and pH), VOCs, and select SVOCs at the frequencies given in Table 1. Additionally, extraction well and leachate collection tank samples will also be analyzed for PCBs, 1,4-dioxane and Target Analyte List (TAL) metals (including mercury). Water samples from within the treatment system are anticipated to be collected from samples taps at the following locations shown on Figure 3:

- Treatment system influent – pump P-200A/B discharge;
- Fixed-film bioreactor and clarifier discharge - pump P-410A/B discharge;
- Air stripper discharge - pump P-500 A/B discharge;

- HiPOx® (advanced oxidation unit) discharge – pump P-610A/B; and

- Between liquid-phase granular activated carbon (GAC) units – lead liquid-phase GAC unit discharge.

Change outs of liquid-phase GAC will be scheduled based on the results of this sampling and analysis, in addition to evaluation of loading based on these data in conjunction with isotherm estimates in order to minimize the generation of hazardous waste while still meeting substantive requirements.

Extraction well samples will be collected from sample taps located in the vaults near each well. Similarly, samples of leachate will be collected from the vault near the leachate collection tank at the landfill. The locations, analytical parameters, and frequencies of the treatment system influent and process monitoring samples may be adjusted in the future based on operational experience.

As shown on Figure 3, the vapor-phase treatment will include three GAC units in series followed by two potassium permanganate impregnated zeolite (PPZ) units. To monitor operating efficiency, air samples will be collected from between the middle and the lag vapor-phase GAC units and at the discharge of the lead vapor-phase PPZ. Air samples will be collected using either a tedlar bag or summa canister and analyzed for VOCs. As presented in Table 1, air samples will be collected on a monthly basis for the first year of operation. Thereafter, based on operational experience, the sampling schedule may be reduced. Change outs of vapor-phase GAC and PPZ will be scheduled based on the results of this sampling and analysis, in addition to evaluation of loading based on these data in conjunction with isotherm estimates in order to minimize the generation of hazardous waste while still meeting substantive requirements.

The mass of VOCs and select SVOCs removed from each extraction well and the landfill leachate will be calculated each month. Mass removal of PCBs will not be tracked given the very low, sporadic detections. These calculations will use the monthly recorded volume of leachate and extracted groundwater pumped to the treatment system along with available analytical data. All detections (including those flagged as estimated [i.e., below the practical quantitation limit but above the method detection limit]) will be employed in these calculations; for the purpose of these mass removal calculations, non-detects will be represented by the reporting limit, one-half of the reporting limit and/or a zero.

3. Residential Well and Point of Use Treatment System Monitoring

The Residential Well Monitoring and Point of Use Treatment System Operation, Maintenance and Monitoring Plan is included as Attachment A of this Performance Monitoring Plan. In summary, a total of 22 residential wells without treatment systems and five residential wells with POU treatment systems are included in the monitoring program.

The residential wells without treatment systems included in the monitoring program consist of the 20 residential wells that are included in the current monitoring program approved by NYSDEC and two additional residential wells that were installed at new residences in 2012 and 2014. Eight residential wells without treatment systems, including one installed in 2012, are sampled semi-annually. Based on historical data, six residential wells without treatment systems plus one new well installed in 2014 are sampled annually while the remaining seven residential wells without treatment systems are sampled biennially. All of these residential well samples are analyzed for VOCs.

Four of the five POU treatment systems are currently in operation at four properties. These POU treatment systems are used to remove VOCs from the well water. Each POU treatment system consists of at least one particulate removal filter, two GAC units placed in series, and at least one ultraviolet (UV) light disinfection unit. UV light is used to kill bacteria, from the well water and/or from growth within the GAC units. Maintenance of these POU treatment systems includes periodic change outs of particulate filters, GAC units, and UV light bulbs.

The five residential wells with POU treatment systems will be sampled on a quarterly basis. If water from a POU treatment system is not being used for potable water, samples will not be collected until the water is needed. At that point, the POU treatment system will be placed back on the quarterly sampling schedule. One residential well with a POU treatment system is not currently operating; however, for sampling purposes, this well will be operated for a short time during each quarterly sampling event to collect samples. At each operating POU treatment system, samples are collected from the inlet (before particulate filter), between GAC units, and discharge (after UV unit). All samples will be analyzed for VOCs and the discharge samples will also be analyzed for total coliform. Additionally, on a semi-annual basis (i.e., during the second and fourth quarters), the inlet samples will be analyzed for 1,4-dioxane.

Bottled water is being provided and will continue to be provided to the four properties with POU treatment systems, to the inhabited properties with residential wells without POU treatment systems that are currently being sampled semi-annually, and to one inhabited property with a residential well without a POU treatment system that is currently being sampled annually. Each of these properties has a bottled water dispenser and the property owners are provided with full five-gallon bottles to place on the dispenser.

4. Groundwater Monitoring

The Groundwater Monitoring Plan (GWMP) is provided in Attachment B of this Performance Monitoring Plan. In summary, the monitoring program includes groundwater elevation measurements along with groundwater quality sampling and analysis. The basis of the GWMP is the existing off-site groundwater monitoring program which was previously approved by NYSDEC; however, the GWMP also includes the five open deep bedrock boreholes (designated as EPA-1 through EPA-5) installed by USEPA in 2011 for the Initial Supplemental Site Investigation (ISSI) as discussed in Appendix G of the DR/IP. Note that the extraction wells are not included in the GWMP; monitoring of those wells is covered under Section 2 of this Performance Monitoring Plan.

The first step of implementing the GWMP will be an inspection of all monitoring wells included in the program to determine the current condition of each well. The need for any repairs will then be evaluated and, if approved by USEPA, any such repairs will be implemented.

In general, groundwater elevations will be measured on a semi-annual basis at 24 monitoring wells located outside the landfill perimeter fence and the five open deep bedrock boreholes installed by USEPA, which may be converted into monitoring wells as discussed in Appendix G of the DR/IP. However, groundwater elevations will also be measured monthly at these locations for a 12-month period beginning with the operation of the five new extraction wells.

In addition, during start-up of the five new extraction wells, near continuous hydraulic monitoring will be performed at each new extraction well and select monitoring wells to assess changes in groundwater elevations associated with pumping. Groundwater elevation measurements will be obtained using data loggers and associated pressure transducers using a 15-minute recording interval from the following 15 wells:

- Extraction wells EW-4, EW-5, EW-6, EW-7 and EW-8;
- Overburden monitoring wells DB-8S and PW-3;
- Shallow bedrock monitoring wells DB-8I, PB-2, OMW-201, OMW-202, OMW-204 (unless dry), OMW-205 and OMW-213; and
- Background shallow bedrock monitoring well OMW-206.

Near continuous hydraulic monitoring will be initiated one week prior to and will be performed throughout the start-up period for the five new extraction wells. Except in the new extraction wells, hydraulic monitoring will continue for approximately one month after all five new extraction wells are

in operation. Hydraulic monitoring for each new extraction well will continue until the extraction well is placed into routine operation, at which point the water level elevation will be controlled by the high and low level set points for the pump.

Groundwater quality monitoring will also be conducted at the 29 monitoring wells presented on Table 1 of Attachment B of this Performance Monitoring Plan primarily using passive diffusion bags (PDBs) placed at specified intervals within the wells. At wells that are too small (i.e., one-inch-diameter) and/or for parameters other than VOCs, low flow sampling procedures will be used for sample collection.

Consistent with the current program, eight monitoring wells will be sampled twice per year (spring and fall), 10 will be sampled annually in the fall, and six will be sampled biennially in the fall. All samples will be analyzed for VOCs. Select monitoring wells will also be analyzed for select phenolic compounds. Additionally, four monitoring wells will be sampled on a semi-annual basis for 1,4-dioxane and six wells will be sampled on a biennial basis for 1,4-dioxane. Field parameters (DO, pH, oxidation-reduction potential [ORP], specific conductance, and temperature) will be monitored when low-flow sampling procedures are used. The sampling technique at the five open deep bedrock boreholes may be influenced by the activities performed pursuant to Appendix G of the DR/IP.

Groundwater elevation measurements and laboratory analytical results will be provided to USEPA in the Monthly Progress Reports that are submitted pursuant to Paragraph 74 of the Consent Order. In addition, a Groundwater Monitoring Report (GWMR) will be prepared each year to document the monitoring performed under the GWMP. This annual GWMR will also include recommended modifications to the monitoring program for the subsequent year, if any.

5. Quality Assurance Project Plan

Additional information on sampling and associated procedures for the monitoring described in this Performance Monitoring Plan will be included in the revised Quality Assurance Project Plan (QAPP) that will be submitted to USEPA after this DR/IP. The QAPP will also cover analytical parameters and methods along with quality assurance/quality control (QA/QC) requirements.

6. Notification and Reporting

In accordance with Paragraph 59 of the Consent Order, Respondents will notify USEPA at least seven days prior to each sampling event. Respondents do not propose to provide USEPA with daily oral or weekly written reports for the ongoing activities described in this Performance Monitoring Plan. However, in addition to providing the laboratory data sheets, the activities performed under this plan will be summarized in the Monthly Progress Reports that are submitted to USEPA pursuant to the Consent Order. A summary table showing detections will also be developed for each sampling event. Additional details on specific additional reporting requirement are outlined in the plans included in Attachment A and B.

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Table

TABLE 1
DEWEY LOEFFEL LANDFILL SUPERFUND SITE
NASSAU, NEW YORK
TREATMENT SYSTEM MONITORING PLAN

Sampling Locations	Field Parameters[11]	VOCs	SVOCs[12]	Pesticides[12]	Metals[12]	Mercury	TAL Metals	PCBs	1,4-Dioxane	Water Quality[12]
Water Samples										
Extraction Wells (EW-1 through EW-8) [13, 18]	Q	Q	Q[17]	-	-	Q[17]	Q[17]	Q[17]	Q[17]	-
Leachate Underground Storage Tank[13, 18]	Q	Q	Q[17]	-	-	Q[17]	Q[17]	Q[17]	Q[17]	-
Pump P-200A/B (Equalization Tank Discharge/Treatment System Influent)[18]	M	M	M	-	-	-	-	-	M	-
Pump P-410A/B (Fixed-Film Bioreactor/Clarifier Discharge) [18]	M	M	M	-	-	-	-	-	-	M[15]
Pump P-500A/B Discharge (Air Stripper Discharge)[18]	M	M	-	-	-	-	-	-	W	-
Pump P-610A/B Discharge (HiPOx Discharge)[18]	M	M	-	-	-	-	-	-	W	-
Lead Liquid-Phase GAC Discharge (Between Liquid-Phase GAC Units) [18]	M	M	-	-	-	-	-	-	M	-
Pump P-820A/B Discharge (Treatment System Effluent)[16]	W	W	W	B	B	Q	-	B	W	B
Air Samples[14]										
Middle Vapor-Phase GAC Discharge (Between Middle and Lag Vapor-Phase GAC Units)	-	M	-	-	-	-	-	-	-	-
Lead Vapor Phase PPZ Discharge (Between Vapor-Phase PPZ Units)	-	M	-	-	-	-	-	-	-	-

Notes:

1. VOC = Volatile organic compounds
2. SVOCs = Semi-volatile organic compounds
3. PCBs = Polychlorinated biphenyls
4. TAL = Target Analyte List
5. GAC = Granular activated carbon
6. PPZ = Potassium permanganate impregnated zeolite
7. W = Weekly
8. B = Bi-weekly
9. M = Monthly
10. Q = Quarterly
11. Field parameters include dissolved oxygen (DO) and pH.
12. Includes analysis of select parameters. Additional information on select parameters and analytical methods is provided in the revised Quality Assurance Project Plan (QAPP).
13. Each operating extraction well and the leachate collection tank will be sampled monthly for the first three months after routine discharge to surface water beings and then quarterly thereafter.
14. Air samples will be collected monthly for the first twelve months after discharge to surface water begins and then quarterly thereafter.
15. Samples will be collected from the bioreactor/clarifier discharge and analyzed by the laboratory for ammonia and total phosphorus. Additionally, field testing for ammonia and total phosphorus will also be performed on the bioreactor/clarifier discharge at least weekly for operational purposes.
16. Treatment system effluent (discharge to the Valatie Kill) will be monitored in accordance with the substantive requirements.
17. Following two years of routine operations after discharge to surface water begins, this sampling will be performed semi-annually.
18. Based on operational experience, the locations, analytical parameters, and frequency of water and air samples may be reduced in the future.
19. The PCB and mercury minimization programs and whole effluent toxicity (WET) testing will be conducted quarterly.

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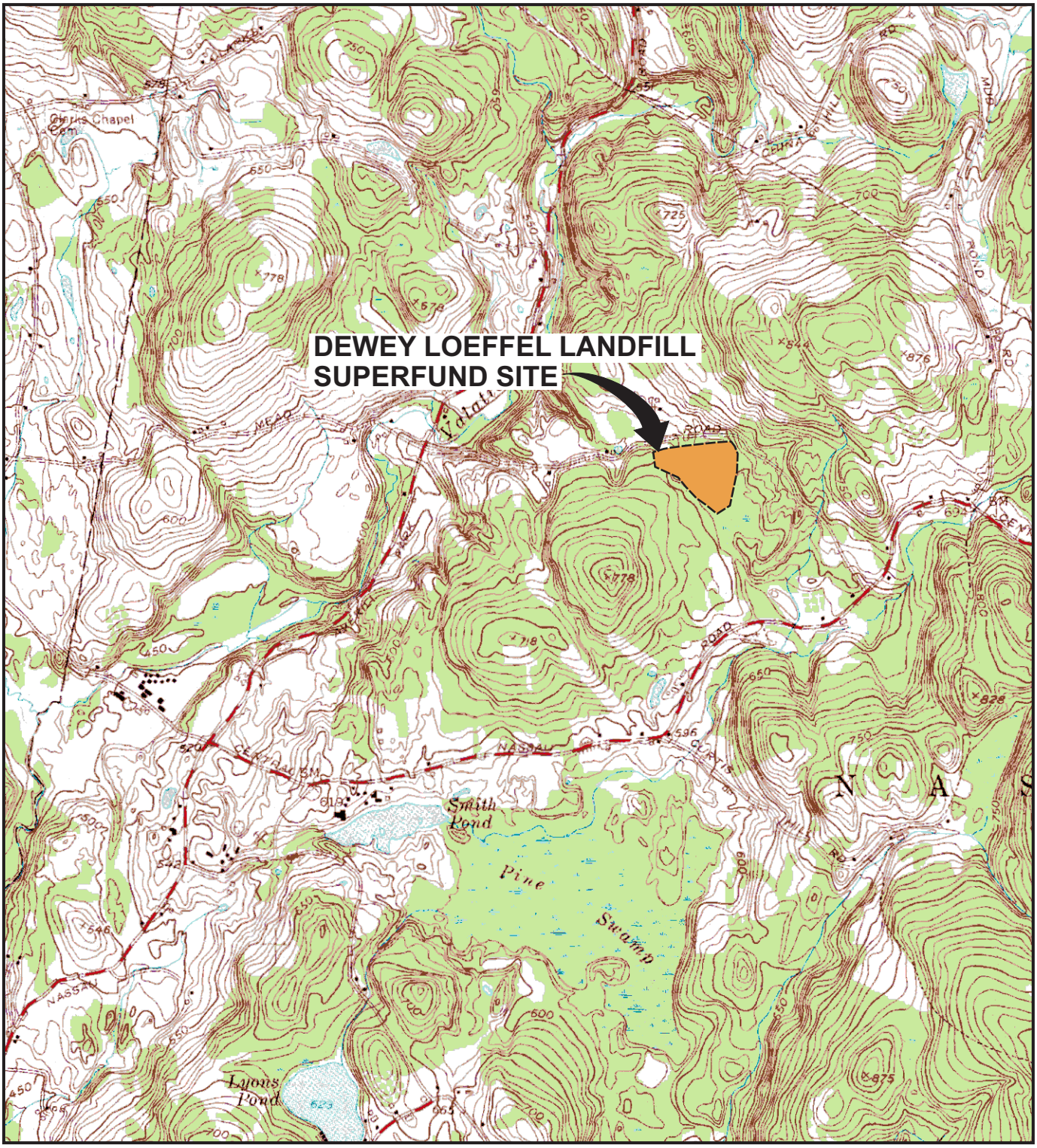
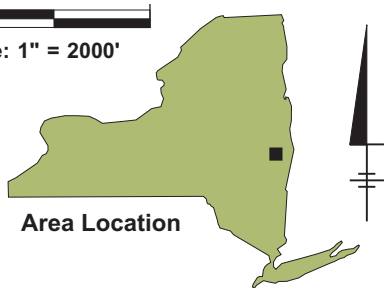
Figures



REFERENCE: BASE MAP USGS 7.5 MIN. QUAD., NASSAU, NY, 1953, PHOTOREVISED 1978.

2000' 0 2000'

Approximate Scale: 1" = 2000'



DEWEY LOEFFEL LANDFILL SUPERFUND SITE
NASSAU, NEW YORK

SITE LOCATION MAP

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FIGURE
1

04/116/2012 SYRACUSE, NY-ENV/CAD-141, DJHOWES
B0031174/0000/00001/CDR/31174N01.CDR

EXISTING UNDERGROUND GROUNDWATER TRANSFER PIPELINE AND CONTROL LINES (TO BE TAKEN OUT OF SERVICE AFTER TREATMENT SYSTEM START-UP)

EXISTING DOUBLE-WALLED FRAC TANKS WITHIN POLE BARN

NEW VALVE VAULT – TIE IN NEW 2"ø SDR 11 X 4"ø SDR 17 DUAL-CONTAINED HDPE FORCEMAINS INTO EXISTING 2" SDR 11 X 4" SDR 17 DUAL-CONTAINED FORCEMAIN

NEW UNDERGROUND ELECTRICAL AND INSTRUMENTATION CONDUIT

EXISTING ELECTRICAL SERVICE COMPOUND (TO BE TAKEN OUT OF SERVICE)

EXISTING SLURRY WALL

EXISTING LEACHATE UNDERGROUND STORAGE TANK

NEW 2"ø SDR 11 X 4"ø SDR 17 DUAL-CONTAINED FORCEMAIN FOR NEW EXTRACTION WELLS EW-4 THROUGH EW-8

NEW 2"ø SDR 11 X 4"ø SDR 17 DUAL-CONTAINED HDPE FORCEMAINS

NEW ELECTRIC SERVICE POLE, UTILITY TRANSFORMER, AND METER INSTALLED BY NATIONAL GRID (TYP. OF THREE)

NEW TREATMENT BUILDING

NEW GRAVEL PAD AND DRIVE

NEW 3"ø SDR 11 HDPE DISCHARGE LINE

TO VALATIE KILL

MEAD ROAD

THE COUNTY OF RENSSELAER (REPUTED OWNER) L. 1372 P. 557 TM 191-5-16.1

ALLAN M. SMITH (REPUTED OWNER) L. 1267 P. 1025 TM191-5-20

TRI-VILLAGE BOWHUNTERS L. 1696 P. 85 TM 191-5-16.2

TRI-VILLAGE BOWHUNTERS L. 1696 P.85 TM, NO. 2000-00013464 TM 191-5-16.2

ISIDORO MARRA AND GAIL A. MARRA (REPUTED OWNERS) L. 1259 P. 753 TM 191-5-21

ALLAN SMITH (REPUTED OWNER) L. 1351 P. 88 TM 191-5-14.2

LEGEND

- NEW FORCEMAIN
- NEW UNDERGROUND ELECTRIC SERVICE
- NEW CHAIN LINK FENCE
- PROPERTY LINES
- EXISTING ROADWAY
- EXISTING EXTRACTION WELL
- NEW EXTRACTION WELL
- EXISTING MONITORING WELL
- NEW ELECTRICAL SERVICE POLE

1"=100' 100' 0 100' 200'

DEWEY LOEFFEL LANDFILL SUPERFUND SITE
NASSAU, NEW YORK

SITE PLAN

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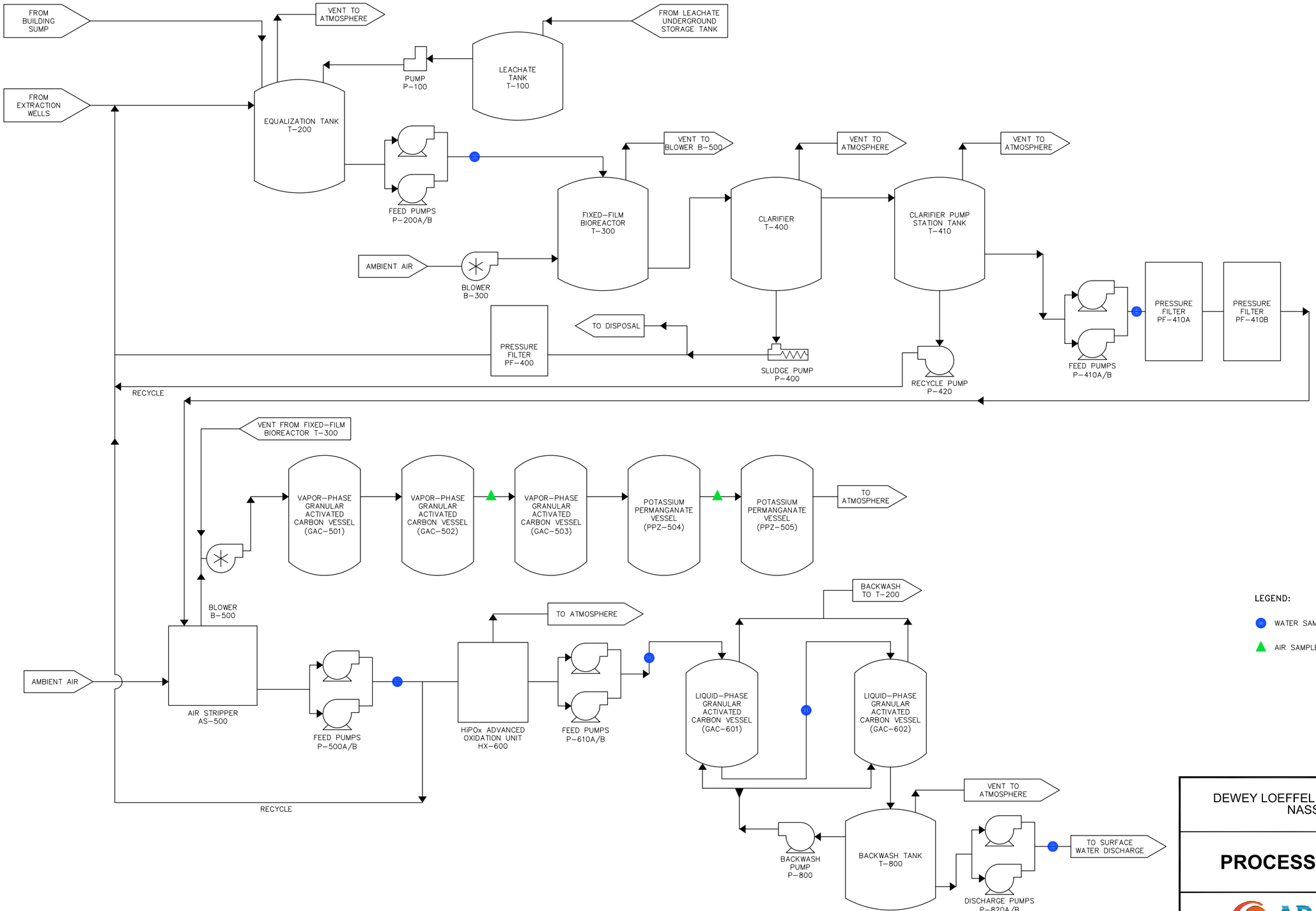
FIGURE 2



DEWEY LOEFFEL LANDFILL SUPERFUND SITE
NASSAU, NEW YORK

PROCESS FLOW DIAGRAM

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FIGURE
3

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Attachments

Attachment A

Residential Well Monitoring and Point of Use Treatment System Operation, Maintenance and Monitoring Plan

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Residential Well Monitoring and Point of Use Treatment System Operation, Maintenance and Monitoring Plan

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Nassau, New York

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Table 1 Residential Wells Included in Sampling Program

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Figure 1 Site Location Map

Figure 2 Location of Dwellings and Other Structures in the Vicinity of the Loeffel Site

1. Introduction

This plan has been prepared to describe the monitoring of select residential wells along with operation, maintenance and monitoring (OM&M) of point of use (POU) treatment systems near the Dewey Loeffel Landfill Superfund Site located in the Town of Nassau, Rensselaer County, New York (site). Routine monitoring of select residential wells by the General Electric Company (GE) began in 1998. However, the New York State Department of Health (NYSDOH) performed some residential well monitoring previously, and the first POU treatment systems were installed in 1993 based on that earlier monitoring. This plan describes continuation of the residential well monitoring and residential well POU treatment system OM&M programs that are already in place.

Upon approval or conditional approval of the Design Report/Implementation Plan (DR/IP) by the United States Environmental Protection Agency (USEPA), the work described herein will be performed pursuant to the Administrative Settlement Agreement and Order on Consent for a Removal Action (CERCLA Index No. 02-2012-2005) (Consent Order) executed by USEPA, GE, and SI Group, Inc. (SI Group). (GE and SI Group are referred to herein as Respondents.)

1.1 Location and Description

The Dewey Loeffel Landfill (landfill) is located along the south side at 350 Mead Road between Nassau-Averill Park Road and Central Nassau Road. A map showing the location of the landfill and surrounding area is presented on Figure 1.

The capped area of the landfill is roughly triangular in shape and situated in a low-lying area between two wooded hills. The landfill is bound to the north by Mead Road, and to the south, west and east by undeveloped forested land. The rural area surrounding the landfill is sparsely populated and contains few residential properties and a bowhunter's club lodge.

Topography in the area generally slopes downward from east to west. Surface water at the landfill mostly drains to the west toward the Valatie Kill via Tributary T11A. The Valatie Kill flows in a southwesterly direction to Nassau Lake, located approximately three miles downstream. Surface water from a portion of the landfill flows to the south into a small unnamed tributary which discharges into Valley Stream and ultimately Nassau Lake.

The hydraulic gradient of groundwater in overburden soils in the vicinity of the landfill is generally to the west and/or southwest. The hydraulic gradient of groundwater in the bedrock is similar. However, based on the distribution of volatile organic compounds (VOCs) in a groundwater contaminant plume emanating from the landfill to the south, bedrock groundwater flows primarily to the south due to the influence of fractures within the bedrock.

1.2 History

As described in the Consent Order, from approximately 1952 to 1968, the landfill was owned and operated by several companies including the Loeffel Waste Oil and Removal Service Company (Loeffel Companies) as a waste disposal facility. During this time, the landfill consisted of two waste lagoons located in the western and central portions of the landfill, a 6-foot deep oil pit in the east central portion of the landfill, four 30,000 gallon aboveground storage tanks, and a drum disposal area located in the southeastern portion of the landfill.

Landfill disposal operations reportedly ceased in 1968 by order of the State of New York. Between 1970 and 1975, remedial actions undertaken by the Loeffel Companies included covering and grading the drum disposal area, oil pit and lagoons, and constructing a system of drainage ditches around the landfill. From 1974 to 1980, the Loeffel Companies reportedly also operated a waste oil transfer station utilizing the four 30,000 gallon aboveground storage tanks.

On September 23, 1980, GE entered into an agreement with the New York State Department of Environmental Conservation (NYSDEC) which required GE to perform field investigations, submit an engineering report which discussed the collected data, identify remedial alternatives, and recommend a remedial alternative. A remedy was subsequently selected by NYSDEC and involved the installation of soil-bentonite cutoff wall around the landfill, an overlying clay cap, and a leachate collection system below the cap within the cutoff wall. The design of the remedy was performed by GE and approved by NYSDEC. The remedy was subsequently implemented by NYSDEC using funding provided by GE, Schenectady Chemicals, Inc. (now SI Group), and Bendix Corporation (now Honeywell International, Inc.). Beginning in 1983, NYSDEC and/or GE performed a variety of response actions at the site, some of which were performed in accordance with Records of Decision (RODs) issued by NYSDEC in January 2001 and January 2002. The response actions included, but were not limited to, the following:

- Installation and operation of a bedrock groundwater recovery well system involving three extraction wells located to the south of the landfill;
- Transportation of leachate and groundwater for off-site treatment;
- Installation, operation, maintenance and monitoring of point-of-use treatment systems for five residential wells (located on four properties) to remove VOCs;

- Routine VOC monitoring of other residential wells located near the landfill; and
- Routine monitoring of many groundwater monitoring wells located outside the landfill's perimeter fence.

The current off-site groundwater extraction system was designed and constructed by NYSDEC, and is located along the approximate centerline of the VOC plume to the south of the landfill and includes three bedrock extraction wells (designated EW-1, EW-2 and EW-3). Beginning in late March 2008 and through 2010, NYSDEC extracted groundwater from these three extraction wells on a seasonal basis, operating during the spring, summer, and fall months. Along with leachate from the landfill, extracted groundwater was transported for off-site treatment and disposal. NYSDEC transported leachate for off-site treatment and disposal each year since 1991 with the exception of 1994. NYSDEC continued operation of the on-site leachate collection system through October 2011. Operation of the off-site groundwater extraction system by NYSDEC did not resume after shutdown in the fall of 2010 until July 2011.

At the request of NYSDEC, USEPA proposed the site for inclusion on the National Priorities List (NPL) on March 4, 2010. The site was subsequently added to the NPL on March 10, 2011.

USEPA subsequently took over operation of the on-site leachate collection system at the landfill and the off-site groundwater extraction system to the south of the landfill on October 31, 2011. USEPA winterized the system, allowing groundwater extraction to continue during the winter months.

Pursuant to the Consent Order, GE and SI Group assumed responsibility from USEPA for continued operation and maintenance of the on-site leachate collection system and the off-site groundwater extraction system. The transition from USEPA to the Respondents occurred on August 1, 2012, and the first transportation of leachate and extracted groundwater by the Respondents occurred on August 2, 2012 and continued through December 2, 2013. Pursuant to the Consent Order, GE and SI Group designed and constructed a treatment system to treat landfill leachate and extracted groundwater. The treatment system was started up in December 2013.

2. Sampling Locations and Frequency

A total of 22 residential wells without treatment systems and five residential wells with treatment systems are included in the monitoring program. The residential wells without treatment systems included in the monitoring program consist of the 20 residential wells that were included in the current monitoring program approved by the New York State Department of Environmental Conservation (NYSDEC) (ARCADIS, 2008) and two additional residential wells that were installed at new residences in 2012 and 2014.

Descriptions of the residential wells to be sampled, including well type and depth are provided in Table 1. A map depicting the location of the residential wells is provided on Figure 2.

Nine residential wells without treatment systems, including one installed in 2012, are sampled semi-annually. Based on historical data, five residential wells without treatment systems plus one new well installed in 2014 are sampled annually while the remaining seven residential wells without treatment systems are sampled biennially.

The five residential wells with POU treatment systems will be sampled on a quarterly basis. If water from a POU treatment system is not being used for potable water, samples will not be collected until the water is needed. At that point, the POU treatment system will be placed back on the quarterly sampling schedule. NYSDOH Well #24S is not currently operating; however, for sampling purposes, this well will be operated for a short time during each quarterly sampling event to collect samples, as discussed in Section 5.

Every four years, a review of available data will be completed to determine if the scope of the residential well monitoring program can be reduced or needs to be increased, such as eliminating or adding one or more residential wells from the monitoring program or reducing or increasing the monitoring frequency at one or more of the residential wells. Changes to the program may also become necessary based on the data collected each year and/or the additional data that is generated during the Remedial Investigation for the Landfill and Groundwater components of the Site.

3. Property Owner and Agency Notifications

As part of the current residential well monitoring program, all property owners in the program received a letter describing the sampling schedule and general procedures. Additionally, access was obtained from each property owner to perform the monitoring. Participation by the property owners remains voluntary, and access could be rescinded at any time.

Prior to each sampling event, property owners are contacted with the schedule. Additionally, if sampling requires entrance into the residence, the necessary arrangements are made. In accordance with Paragraph 59 of the Consent Order, Respondents will notify USEPA at least seven days prior to each sampling event.

The POU treatment systems are located in separate enclosures, so OM&M activities do not require access to the residences. However, the property owners are still contacted prior to performing the OM&M activities.

4. Sample Collection at Properties without POU Treatment Systems

Information on sample collection and analytical procedures at properties without POU treatment systems is contained in the revised Quality Assurance Project Plan (QAPP) that will be submitted to USEPA after this DR/IP. However, key elements are summarized below.

Whenever possible, the cold water tap closest to the well will be used. The property owner's prerogative will also be taken into consideration when selecting the sample location. Samples will be collected prior to any property owner-installed conditioning systems such as carbon filters or water softeners.

Prior to sample collection, the water will be allowed to run until the well pump cycles on and the water temperature is cool to cold. This typically requires about five minutes.

Sample nomenclature will utilize the NYSDOH well identification number and the sample date (i.e., mmddyy). For example, "16-021313" is a sample collected from NYSDOH Well #16 on February 13, 2013.

Sample containers will be submitted for VOC analysis by USEPA Method 524.2. Quality assurance/quality control (QA/QC) samples will include trip blanks, blind duplicates and matrix spike/matrix spike duplicate (MS/MSD) samples. Trip blanks will be analyzed for VOCs at a frequency of one per cooler. The duplicates and MS/MSD samples will be collected at a frequency of one duplicate and one MS/MSD sample pair for every 20 samples collected. The sample identification nomenclature for the blind duplicate samples will be DUP-mmddyy. If there is more than one duplicate sample on the same day, they will be sequentially numbered (e.g., DUP1, DUP2).

Additionally, sample containers will also be submitted for 1,4-dioxane analysis by SW-846 Method 8270D. Residential wells without POU treatment systems that are provided bottled water and are sampled for VOCs semi-annually will also be sampled semi-annually for1,4-dioxane analysis. However, if there are four consecutive non-detect results for 1,4-dioxane in any given residential well, then the monitoring frequency at that residential well will move to annually. The remaining residential wells without POU treatment systems will not be sampled for 1,4-dioxane analysis as part of this residential well monitoring program. QA/QC samples for 1,4-dioxane analyses will include blind duplicates and MS/MSD sample pair, which will be collected at a frequency of one duplicate and one MS/MSD sample pair for every 20 samples collected.

5. Sample Collection at Properties with POU Treatment Systems

Additional information on sample collection and analytical procedures at properties with POU treatment systems is contained in the revised QAPP that will be submitted to USEPA after this DR/IP. However, key elements are summarized below.

Samples will be collected from the appropriate sample taps installed on the inlet, between granular activated carbon (GAC) units, and discharge of the POU treatment systems. Prior to sample collection, the water will be allowed to run (by opening a faucet after the treatment system) until the well pump cycles on and the water temperature is cool to cold. This typically requires about one minute, but may require longer at NYSDOH Well #24S because that well is not currently operating.

The sample collection sequence and sample identification nomenclature will be as follows:

- Collect POU treatment system discharge sample. For a discharge sample collected from NYSDOH Well #1 on February 13, 2013, sample nomenclature is 1-Disc-021313;

- Collect between carbon sample. For a between carbon sample collected from NYSDOH Well #1 on February 13, 2013, sample nomenclature is 1-BetCarb-021313; and

- Collect POU treatment system inlet sample. For an inlet sample collected from NYSDOH Well #1 on February 13, 2013, sample nomenclature is 1-Inlet-021313.

Sample containers will be submitted for VOC analysis by USEPA Method 524.2, and, on a semi-annual basis (i.e., during the second and fourth quarters), 1,4-dioxane on the inlet samples by SW-846 Method 8270D. Samples from the discharge of the POU treatment systems will also be collected and analyzed for total coliform by Standard Method (SM) 9222.

QA/QC samples will include trip blanks, blind field duplicates and MS/MSD samples. Trip blanks will be analyzed for VOCs at a frequency of one per cooler. The duplicate samples will be analyzed for VOCs and 1,4-dioxane. The MS/MSD sample pairs will be analyzed for 1,4-dioxane. Both the duplicate and MS/MSD samples will be collected at a frequency of one duplicate and one MS/MSD sample pair for every 20 samples collected. The sample identification nomenclature for the blind duplicate samples will be DUP-mmddyy. If there is more than one duplicate sample on the same day, they will be sequentially numbered (e.g., DUP1, DUP2).

6. Bottled Water

Bottled water is being provided and will continue to be provided to the four properties with operating POU treatment systems, and to the inhabited properties with residential wells without POU treatment systems that are currently being sampled semi-annually. Each of these properties has a bottled water dispenser that the property owner(s) selected for their particular needs (i.e., cold, hot and/or room temperature). Per current procedures, at least once per month the property owners will be provided with full five-gallon bottles to place on the dispenser and the empty bottles will be removed. The bottled water is currently provided by Culligan Troy, NY (Culligan).

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7. POU Treatment System OM&M Activities

Four of the five POU treatments systems are currently in operation at four properties. These POU treatment systems are used to remove VOCs from the well water. Each POU treatment system consists of at least one particulate removal filter, two GAC units placed in series, and at least one ultraviolet (UV) light disinfection unit. UV light is used to kill bacteria, from the well water and/or from growth within the GAC units.

Approximately every six weeks, the treatment systems will be inspected and maintained. During these visits the following activities will occur:

- Log sheets will be completed that note the totalized water flow, daily water use, operating pressures, electrical power use, and overall condition of each POU treatment system. Any samples that are collected and any maintenance completed will also be noted on the log sheet;
- Particulate filters will be changed out;
- UV light units will be inspected for proper operation; and
- GAC units will be inspected for leaks and correct valve positioning.

Approximately every six to eight weeks, the GAC units will be changed. If water from a POU treatment system is not being used for potable water, the GAC units will not be changed until the water is needed. At that point, the GAC units will be changed every six to eight weeks. On an annual basis, typically in May, the UV unit light bulbs will also be replaced. These items are currently being done by Culligan.

8. Reporting

This section describes the reporting to property owners and agencies as described below.

8.1 Reporting to Property Owners

Within 45 days of receipt of final laboratory analytical reports, a cover letter summarizing the results will be sent to each property owner. Additionally, the laboratory data sheets will be sent to each property owner unless the property owner has requested otherwise. USEPA will be contacted and provided with a draft letter for review whenever there is a significant change from previous results that requires explanation.

8.2 Reporting to Agencies

Copies of the letters and laboratory data sheets will be submitted to NYSDOH, USEPA and NYSDEC. The laboratory data sheets will also be included in the Monthly Progress Reports submitted to USEPA pursuant to the Consent Order. A summary table showing detections will be developed for each sampling event.

Level 4, Contract Laboratory Program (CLP) equivalent data packages for VOC and 1,4-dioxane analyses and Level 1 or Level 2 data packages for total coliform analysis will be obtained from the analytical laboratory and submitted to USEPA. Additionally, in accordance with Paragraph 57f of the Consent Order, Analytical Services Tracking System (ANSETS) forms will be submitted to USEPA for each sampling event. Data validation will not be performed on these data. However, data validation could be performed on the VOC or 1,4-dioxane data in the future if warranted based on the results of any particular sampling event.

Respondents do not propose to provide daily oral reports or submit Weekly Progress Reports to USEPA for the ongoing activities described in this plan. However, in addition to providing the lab data sheets, the activities performed under this plan will be summarized in the Monthly Progress Reports that are submitted to USEPA pursuant to the Consent Order.

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Table

TABLE 1
DEWEY LOEFFEL LANDFILL SUPERFUND SITE
NASSAU, NEW YORK
RESIDENTIAL WELLS INCLUDED IN SAMPLING PROGRAM

DOH Well #	Well ID	Analysis	Estimated Elevation of Well at Ground Surface (ft AMSL)	Pit/ Non-pit	Casing Diameter Material	Well Casing Stickup (ft)	Total Depth (ft TOC)	Pump Type	Well Yield (gpm)	Driller	Date of Installation
Semi-Annual Sampling of Residential Wells Without Treatment Systems											
3	191-05-17	VOCs, 1,4-Dioxane	610.00	Non-pit	6" ID, Steel	2.00	200.10	Submersible	NA	NA	Pre-1980
16	191-05-28	VOCs, 1,4-Dioxane	608.20	Non-pit	6" ID, Steel	2.08	123.60	Submersible	NA	NA	NA
17	191-05-27	VOCs, 1,4-Dioxane	600.00	Non-pit	6" ID, Steel	2.00	78.00	Submersible	5.5	Kris	NA
18	191-05-20	VOCs, 1,4-Dioxane	600.11	Non-pit	6" ID, Steel	1.00	154.00+	Submersible	NA	NA	NA
19	191-05-26	VOCs, 1,4-Dioxane	609.86	Non-pit	6" ID, Steel	1.70	179.20	Submersible	2	Goold	1971
20	191-05-24	VOCs, 1,4-Dioxane	590.86	Non-pit	6" ID, Steel	2.25	215.50	Submersible	NA	NA	NA
21	191-05-22	VOCs, 1,4-Dioxane	589.07	Non-pit	6" ID, Steel	1.40	200.00	Submersible	15	Hacker	1960
22	191-05-25	VOCs, 1,4-Dioxane	599.33	Non-pit	6" ID, Steel	0.78	173.00	Submersible	6	Goold	1978
32	191-05-22.123	VOCs, 1,4-Dioxane	NA	Pit	6" ID, Steel	2.00	240	Submersible	6-7	Smith	2012
Annual Sampling of Residential Wells Without Treatment Systems											
26	192-01-2	VOCs	625.00	Non-pit	6" ID, Steel	0.80	262.50	Submersible	20+	Goold	Pre-1980
27	192-01-3A	VOCs	650.50	Non-pit	6" ID, Steel	0.50	94.50	Jet pump	NA	NA	1948
28	192-01-4	VOCs	655.00	Covered	NA	NA	NA	NA	NA	NA	NA
29	192-01-59	VOCs	635.00	Dug well	3' Concrete	1.00	10.20	Shallow pump	NA	NA	NA
30	192-01-6	VOCs	NA	Non-pit	6" ID, Steel	2.00	270	NA	NA	Goold	2006
33	192-01-6.2	VOCs	NA	Non-pit	6" ID, Steel	3.17	460	Submersible	6	Goold	2014

TABLE 1
DEWEY LOEFFEL LANDFILL SUPERFUND SITE
NASSAU, NEW YORK
RESIDENTIAL WELLS INCLUDED IN SAMPLING PROGRAM

DOH Well #	Well ID	Analysis	Estimated Elevation of Well at Ground Surface (ft AMSL)	Pit/ Non-pit	Casing Diameter Material	Well Casing Stickup (ft)	Total Depth (ft TOC)	Pump Type	Well Yield (gpm)	Driller	Date of Installation
Biennial Sampling of Residential Wells Without Treatment Systems											
6	191-05-13.1	VOCs	520.00	NA	NA	NA	NA	Jet pump	NA	NA	NA
7	191-04-35.2	VOCs	495.00	Non-pit	6" ID, Steel	0.85	267.50	Submersible	NA	Goold	NA
9	191-05-9.1	VOCs	515.00	Non-pit	6" ID, Steel	1.20	174.70	Submersible	NA	NA	NA
10	191-05-18.11	VOCs	495.00	NA	NA	NA	NA	Submersible?	NA	NA	NA
11	191-05-18.2	VOCs	501.00	Non-pit	6" ID, Steel	3.85	222.40	Submersible	NA	NA	1980
12	191-05-8.1	VOCs	490.00	Non-pit	NA	NA	99.00	NA	NA	NA	NA
13	191-05-82	VOCs	470.00	Non-pit	6" ID, Steel	1.75	123.00	Jet pump	40	NA	1994
Quarterly Sampling of Residential Wells With Treatment Systems											
1	191-05-15	VOCs, TC, 1,4-Dioxane	640.00	Non-pit	NA	NA	NA	Submersible	NA	NA	1985
23	191-05-22.1	VOCs, TC, 1,4-Dioxane	600.01	Non-pit	6" ID, Steel	0.91	205.85	Submersible	NA	Hacker	1981
24D	191-05-21A	VOCs, TC, 1,4-Dioxane	619.00	Non-pit	NA	NA	NA	Submersible	NA	NA	1989
24S	191-05-21B	VOCs, TC, 1,4-Dioxane	613.50	Non-pit	Open Hole	1.92	213	Submersible	NA	NA	NA
25	192-01-3B	VOCs, TC, 1,4-Dioxane	640.50	Non-pit	NA	NA	NA	Submersible	NA	NA	NA

TABLE 1
DEWEY LOEFFEL LANDFILL SUPERFUND SITE
NASSAU, NEW YORK
RESIDENTIAL WELLS INCLUDED IN SAMPLING PROGRAM

Notes:

1. AMSL = Above Mean Sea Level
2. TOC = Top of Casing
3. ft = feet
4. gpm = gallons per minute
5. NA = Not Available
6. VOC = Volatile Organic Compounds
7. TC = Total Coliform
8. Nine residential wells without treatment systems, as designated above, will be analyzed for 1,4-dioxane semi-annually. However, if there are four consecutive non-detect results for 1,4-dioxane in any given residential well, then the monitoring frequency at that residential well will move to annually. The remaining residential wells without POU treatment systems will not be sampled for 1,4-dioxane analysis as part of this residential well monitoring program.
9. Samples from treatment systems are collected from the inlet, between carbon units, and discharge with analysis for VOCs at each location and analysis for TC at the discharge only. Additionally, samples are collected from the inlet with analysis for 1,4-dioxane semi-annually (i.e., during the second and fourth quarters). If NYSDOH Well #24S is not in routine operation, then, for sampling purposes, this well will be operated for a short time during each quarterly monitoring event to collect an inlet sample.
10. Information believed accurate as of December 2014.

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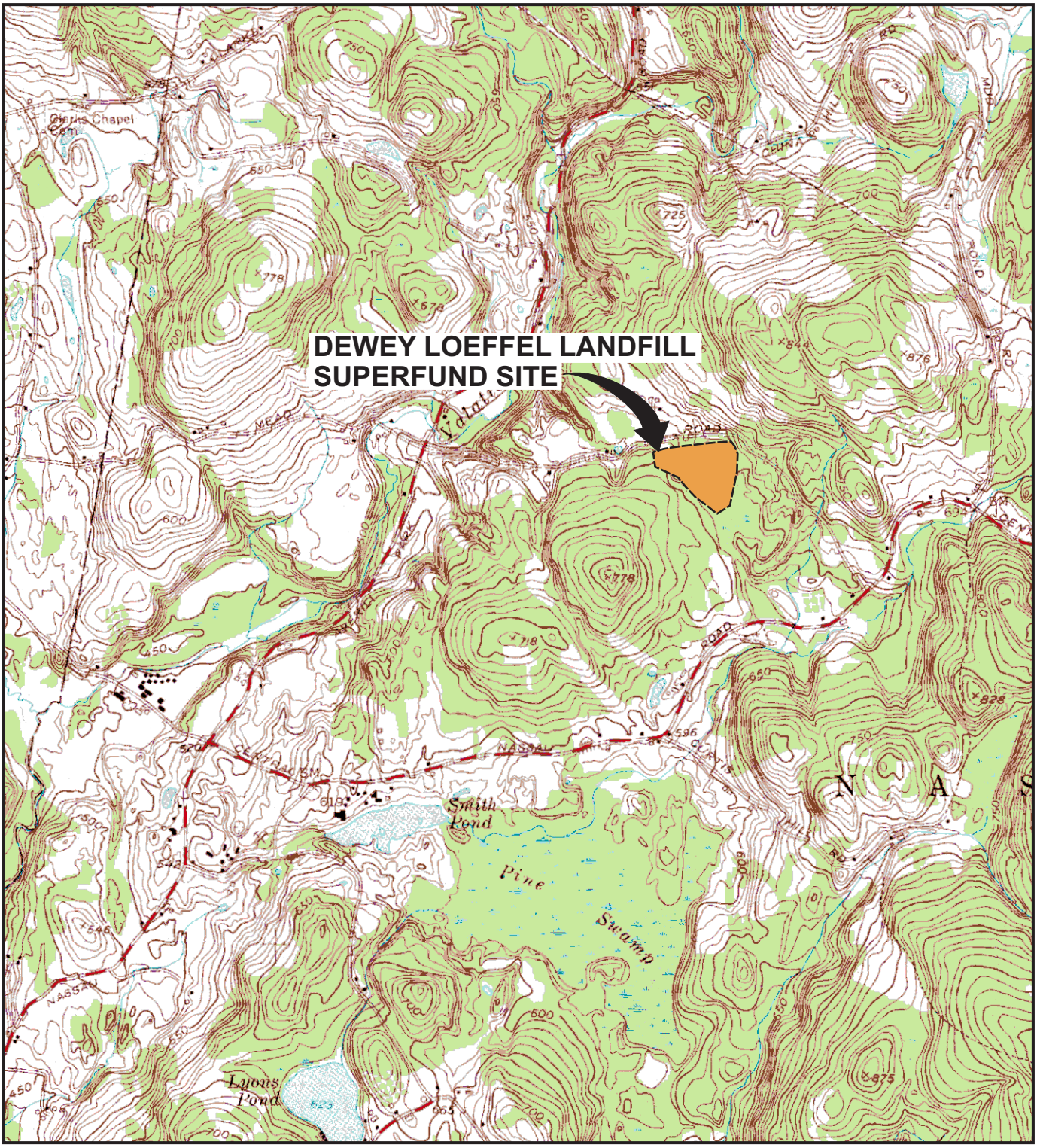
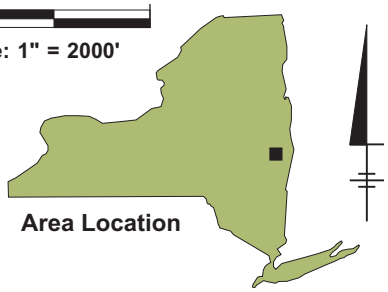
Figures



REFERENCE: BASE MAP USGS 7.5 MIN. QUAD., NASSAU, NY, 1953, PHOTOREVISED 1978.

2000' 0 2000'

Approximate Scale: 1" = 2000'



DEWEY LOEFFEL LANDFILL SUPERFUND SITE
NASSAU, NEW YORK

SITE LOCATION MAP

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FIGURE
1

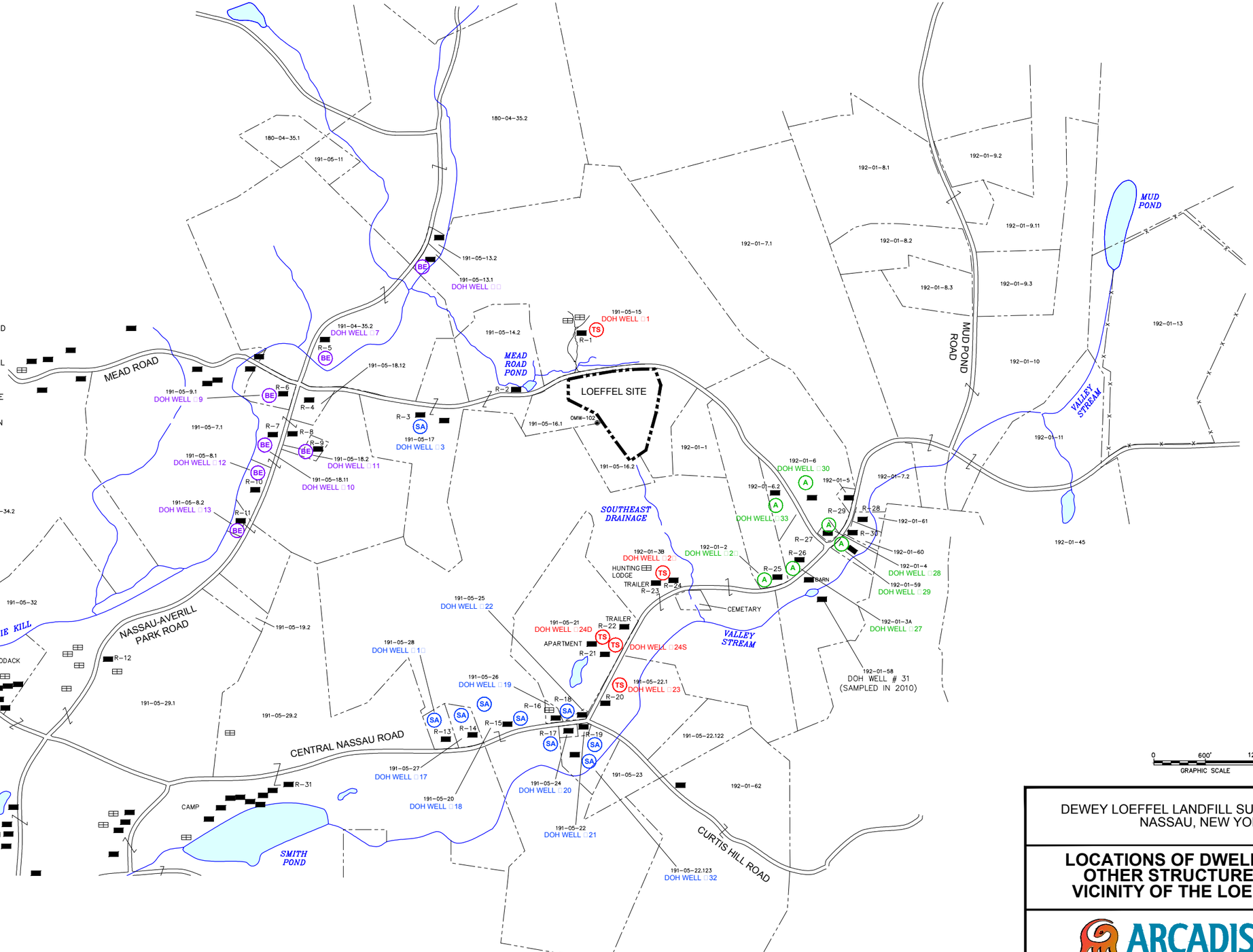
04/116/2012 SYRACUSE, NY-ENV/CAD-141, DJHOWES
B0031174/0000/00001/CDR/31174N01.CDR

LEGEND:

- 191-05-7.1 — SAMPLE ID NUMBER
- PROPERTY LINE
- FENCE
- DWELLING (HOUSE, TRAILER, APARTMENT, CABIN)
- R-6 — DWELLING REFERENCE NUMBER
- OTHER STRUCTURE (GARAGE, SHED, LODGE, OUTBUILDING)
- TS — RESIDENTIAL WELL WITH TREATMENT SYSTEM SAMPLED QUARTERLY
- SA — RESIDENTIAL WELL WITHOUT TREATMENT SYSTEM SAMPLED SEMI-ANNUALLY
- A — RESIDENTIAL WELL WITHOUT TREATMENT SYSTEM SAMPLED ANNUALLY
- BE — RESIDENTIAL WELL WITHOUT TREATMENT SYSTEM SAMPLED BIENNIALLY

NOTES:

1. BASEMAP PREPARED FROM UNITED STATES GEOLOGICAL SURVEY TOPOGRAPHIC MAP, NASSAU, NEW YORK, QUADRANGLE (1953) AND TOWN OF NASSAU PROPERTY TAX MAPS.
2. LOCATIONS OF PROPERTY LINES, DWELLINGS, AND OTHER STRUCTURES ARE APPROXIMATE.
3. DWELLINGS AND OTHER STRUCTURES WERE LOCATED ALONG MEAD ROAD BETWEEN AVERILL PARK ROAD AND CENTRAL NASSAU ROAD, CENTRAL NASSAU ROAD BETWEEN MEAD ROAD AND AVERILL PARK ROAD, AND AVERILL PARK ROAD BETWEEN CENTRAL NASSAU ROAD AND MEAD ROAD BY FIELD IDENTIFICATION AND REVIEW OF AERIAL PHOTOGRAPHS. LOCATIONS FOR OTHER DWELLINGS AND STRUCTURES BASED ON REVIEW OF AVAILABLE AERIAL PHOTOGRAPHS. DWELLINGS AND STRUCTURES ALONG MUD POND ROAD AND CENTRAL NASSAU ROAD EAST OF OF INTERSECTION WITH MEAD ROAD NOT IDENTIFIED.



DEWEY LOEFFEL LANDFILL SUPERFUND SITE
NASSAU, NEW YORK

LOCATIONS OF DWELLINGS AND OTHER STRUCTURES IN THE VICINITY OF THE LOEFFEL SITE

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FIGURE 2

Attachment B

Groundwater Monitoring Plan

Attachment B

Groundwater Monitoring Plan

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Infrastructure · Water · Environment · Buildings

Imagine the result

Groundwater Monitoring Plan

Dewey Loeffel Landfill Superfund site
Nassau, New York

February 13, 2013
Last Revised December 18, 2014

Groundwater Monitoring Plan

Dewey Loeffel Landfill
Superfund Site
Nassau, New York

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Our Ref.:
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Date:
February 13, 2013
Last Revised December 18, 2014

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Tables

Table 1 Well Construction Details

Table 2 Groundwater Quality Monitoring Program

Figures

Figure 1 Site Location Map

Figure 2 Site Plan

Figure 3 Groundwater Quality Monitoring Locations

1. Introduction

This Groundwater Monitoring Plan (GWMP) has been prepared to describe the groundwater monitoring activities to be performed at the Dewey Loeffel Landfill Superfund Site located in the Town of Nassau, Rensselaer County, New York (site). Specifically, groundwater elevation and quality data will be collected to monitor the contaminant plume hydraulically downgradient of the Dewey Loeffel Landfill (landfill). The work described herein is being completed pursuant to the Administrative Settlement Agreement and Order on Consent for a Removal Action (CERCLA Index No. 02-2012-2005)(Consent Order) executed by the United States Environmental Protection Agency (USEPA), General Electric Company (GE), and SI Group, Inc. (SI Group). (GE and SI Group are referred to herein as Respondents).

This GWMP has been prepared to provide descriptions of the following:

- Groundwater elevation monitoring;
- Groundwater quality monitoring;
- Sample collection procedures;
- Management of investigation-derived materials (IDM); and
- Notifications and reporting, including preparation of an annual Groundwater Monitoring Report (GWMR).

1.1 Site Location and Description

The landfill is located along the south side at 350 Mead Road between Nassau-Averill Park Road and Central Nassau Road. A map showing the location of the landfill and surrounding area is presented on Figure 1. Key features are presented on Figure 2.

The capped area of the landfill is roughly triangular in shape and situated in a low-lying area between two wooded hills. The landfill is bounded to the north by Mead Road, and to the south, west and east by undeveloped forested land. The rural area surrounding the landfill is sparsely populated and contains few residential properties and a bowhunter's club lodge.

Topography in the area generally slopes downward from east to west. Surface water at the landfill mostly drains to the west toward the Valatie Kill via Tributary T11A. The Valatie Kill flows in a southwesterly direction to Nassau Lake, located approximately three miles downstream. Surface

water from a portion of the landfill flows to the south into a small unnamed tributary which discharges into Valley Stream and ultimately Nassau Lake.

The hydraulic gradient of groundwater in overburden soils in the vicinity of the landfill is generally to the west and/or southwest. The hydraulic gradient of groundwater in the bedrock is similar. However, based on the distribution of volatile organic compounds (VOCs) in a groundwater contaminant plume emanating from the landfill to the south, bedrock groundwater flows primarily to the south and is influenced by the presence of fractures within the bedrock.

1.2 History

As described in the Consent Order, from approximately 1952 to 1968, the landfill was owned and operated by several companies, including the Loeffel Waste Oil and Removal Service Company (Loeffel Companies) as a waste disposal facility. During this time, the landfill consisted of two waste lagoons located in the western and central portions of the landfill, a 6-foot deep oil pit in the east central portion of the landfill, four 30,000-gallon aboveground storage tanks, and a drum disposal area located in the southeastern portion of the landfill.

Landfill disposal operations reportedly ceased in 1968 by order of the State of New York. Between 1970 and 1975, remedial actions undertaken by the Loeffel Companies included covering and grading the drum disposal area, oil pit and lagoons and constructing a system of drainage ditches around the landfill. From 1974 to 1980, the Loeffel Companies reportedly also operated a waste oil transfer station utilizing the four 30,000-gallon aboveground storage tanks.

On September 23, 1980, GE entered into an agreement with the New York State Department of Environmental Conservation (NYSDEC) which required GE to perform field investigations, submit an engineering report which discussed the collected data, identify remedial alternatives, and recommend a remedial alternative. A remedy was subsequently selected by NYSDEC and involved the installation of soil-bentonite cutoff wall around the landfill, an overlying clay cap, and a landfill leachate collection system below the cap within the cutoff wall. The design of the remedy was performed by GE and approved by NYSDEC. The remedy was subsequently implemented by NYSDEC using funding provided by GE, Schenectady Chemicals, Inc. (now SI Group), and Bendix Corporation (now Honeywell International, Inc.). Beginning in 1983, NYSDEC and/or GE performed a variety of response actions at the site, some of which were performed in accordance with Records of Decision (RODs) issued by NYSDEC in January 2001 and January 2002. The response actions included, but were not limited to, the following:

- Installation and operation of a bedrock groundwater recovery well system involving three extraction wells located to the south of the landfill;

- Transportation of landfill leachate and groundwater for off-site treatment;
- Installation, operation, maintenance and monitoring of point-of-use treatment systems for five residential wells (located on four properties) to remove VOCs;
- Routine VOC monitoring of other residential wells located near the landfill; and
- Routine monitoring of many groundwater monitoring wells located outside the landfill's perimeter fence.

The current groundwater extraction system was designed and constructed by NYSDEC is located along the approximate centerline of the VOC plume to the south of the landfill and includes three bedrock extraction wells (designated EW-1, EW-2 and EW-3, see Figure 2). Beginning in late March 2008 and through 2010, NYSDEC extracted groundwater from these three extraction wells on a seasonal basis, operating during the spring, summer, and fall months. Along with leachate from the landfill, extracted groundwater was transported for off-site treatment and disposal. NYSDEC transported landfill leachate for off-site treatment and disposal each year since 1991 with the exception of 1994. NYSDEC continued operation of the landfill leachate collection system through October 2011. Operation of the groundwater extraction system by NYSDEC did not resume after shutdown in the fall of 2010 until July 2011.

At the request of NYSDEC, USEPA proposed the site for inclusion on the National Priorities List (NPL) on March 4, 2010. The site was subsequently added to the NPL on March 10, 2011.

USEPA subsequently took over operation of the landfill leachate collection system and the groundwater extraction system to the south of the landfill on October 31, 2011. USEPA winterized the system, allowing groundwater extraction to continue during the winter months.

Pursuant to the Consent Order, GE and SI Group assumed responsibility from USEPA for continued operation and maintenance of the on-site leachate collection system and the off-site groundwater extraction system. The transition from USEPA to the Respondents occurred on August 1, 2012, and the first transportation of leachate and extracted groundwater by the Respondents occurred on August 2, 2012. The leachate and extracted groundwater will continue to be transported for off-site treatment and disposal until such time as an off-site treatment system is designed, constructed and approved for operation. Pursuant to the Consent Order, GE and SI Group will design and construct the treatment system to treat landfill leachate and extracted groundwater. Upon USEPA approval that the treatment system discharge meets the effluent discharge limits set under the Consent Order, routine transportation of leachate and extracted groundwater for off-site treatment will cease.

2. Groundwater Monitoring

Semi-annual groundwater monitoring has been conducted at the site since 1998. There are 24 monitoring wells located outside the landfill perimeter fence and one residential well that are included in the current monitoring program approved by NYSDEC (GeoTrans, Inc., 2006, amended 2009). An evaluation of the data collected under the groundwater monitoring program has resulted in the following modifications that are reflected in this GWMP:

- Adding the five open deep bedrock boreholes (designated as EPA-1 through EPA-5), which were installed by USEPA in 2011 for the Initial Supplemental Site Investigation (ISSI), to the GWMP. These open deep bedrock boreholes may be converted to monitoring wells as discussed in Appendix G of the Design Report/Implementation Plan (DR/IP).

- Removing New York State Department of Health (NYSDOH) Well #24S, a residential well equipped with a point of use (POU) treatment system, from the GWMP. This residential well was included in the semi-annual groundwater monitoring program when its operation was discontinued, and the nearby NYSDOH Well #24D was used as the source of water at this property. For sampling purposes in the future, NYSDOH Well #24S will be operated for a short time on a quarterly basis to collect samples under the Residential Well Monitoring and Point of Use Treatment System Operation, Maintenance and Monitoring Plan, which is Attachment A of the Performance Monitoring Plan (Appendix J of the DR/IP);

- Modifying the current three-tiered approach as discussed in Section 2.2;

- Removing sampling and analysis for polychlorinated biphenyls (PCBs) at select monitoring wells. However, as described in the Performance Monitoring Plan (Appendix J of the DR/IP), routine analysis of PCBs will be conducted on samples from the three existing extraction wells and the five new extraction wells;

- Removing sampling and analysis for semi-volatile organic compounds (SVOCs) at select monitoring wells. However, sampling and analysis at select monitoring wells for phenolic compounds is still included in this GWMP;

- Collection of groundwater samples from select wells for laboratory analysis of 1,4-dioxane using low flow sampling procedures;

- Using passive diffusion bags (PDBs) placed at specified depths within the monitoring wells for the majority of the wells that are being sampled and analyzed for VOCs only (i.e., not phenolic compounds and not 1,4-dioxane); and

- Continuing to use low-flow sampling procedures at monitoring wells that are too small (i.e., one-inch-diameter) to use PDBs, or for 1,4-dioxane and phenolic compounds in addition to VOCs.

The first task under this GWMP will be an inspection of all monitoring wells included in the program to determine the current condition of each well. The need for any repairs will then be evaluated and, if approved by USEPA, any such repairs will be implemented.

The GWMP includes groundwater elevation measurements along with groundwater quality sampling and analysis. The details for each of these data collection activities are described below.

2.1 Groundwater Elevation Monitoring

In general, groundwater elevations will be measured on a semi-annual basis at 24 monitoring wells located outside of the perimeter fence and five open deep bedrock boreholes (which may be converted into monitoring wells as discussed in Appendix G of the DR/IP). However, groundwater elevations will also be measured monthly at these locations for a 12-month period beginning with the operation of the five new extraction wells. Well construction details for the 24 existing monitoring wells are presented in Table 1 and the groundwater elevation monitoring locations are shown on Figure 2. Information on procedures for measuring water levels is contained in the revised Quality Assurance Project Plan (QAPP) that will be submitted to USEPA after this DR/IP. Key elements are summarized below.

During start-up of the five new extraction wells, near continuous hydraulic monitoring will be performed at each new extraction well and select monitoring wells to assess changes in groundwater elevations associated with pumping. Groundwater elevation measurements will be obtained using data loggers and associated pressure transducers using a 15-minute recording interval from the following 15 wells:

- Extraction wells EW-4, EW-5, EW-6, EW-7 and EW-8;
- Overburden monitoring wells DB-8S and PW-3;
- Shallow bedrock monitoring wells DB-8I, PB-2, OMW-201, OMW-202, OMW-204 (unless dry), OMW-205 and OMW-213; and
- Background shallow bedrock monitoring well OMW-206.

Near continuous hydraulic monitoring will be initiated one week prior to and will be performed throughout the start-up period for the five new extraction wells. Except in the new extraction wells,

hydraulic monitoring will continue for approximately one month after all five new extraction wells are in operation. Hydraulic monitoring for each new extraction well will continue until the extraction well is placed into routine operation, at which point the water level elevation will be controlled by the high and low level set points for the pump.

Groundwater elevations at monitoring wells and/or open deep bedrock boreholes will be determined using a water level meter. Depth to groundwater measurements will be recorded to the nearest 0.01 foot and converted to elevations using the surveyed reference point (i.e., top of casing or top of riser). The results of the groundwater elevation monitoring will be included in Monthly Progress Reports submitted to USEPA under the Consent Order, and will also be included in the annual GWMRs.

2.2 Groundwater Quality Monitoring

A total of 24 monitoring wells located outside the landfill perimeter fence and the five open deep bedrock boreholes installed by USEPA (which may be converted into monitoring wells as discussed in Appendix G of the DR/IP) will be included in the groundwater quality monitoring program. Based on a review of historical groundwater analytical results obtained since the inception of the semi-annual groundwater monitoring program in 1998, the sampling program is divided into three tiers, with each tier representing a different sampling frequency. The results of the groundwater quality monitoring will be reviewed each year and proposed modifications, if any, included in the annual GWMR.

The sampling locations for the 24 existing monitoring wells and the five open deep bedrock boreholes (which might be converted into monitoring wells in accordance with Appendix G of the DR/IP) included in the program along with the associated sampling frequency are presented in Table 2 and shown on Figure 3. A description of each sampling tier is provided below.

Tier 1: Eight monitoring wells (OMW-102, MW-201, OMW-204, OMW-205, OMW-211, OMW-213, OMW-215, and OMW-219) will be included in Tier 1 of the monitoring program. These monitoring wells are located near the south/southwestern perimeter of the landfill in the vicinity of five proposed extraction wells being installed in conjunction with the new treatment system. The five open deep bedrock boreholes installed by USEPA (which might be converted into monitoring wells in accordance with Appendix G of the DR/IP) will also initially be included in Tier 1 of the monitoring program. Groundwater will be sampled from the Tier 1 monitoring wells twice per year, in the spring (April and/or May) and fall (October and/or November). Tier 1 monitoring wells and/or open deep bedrock boreholes are designated with a red triangle on Figure 3.

Tier 2: Ten monitoring wells (OMW-101, MW-103, OMW-202, OMW-212, OMW-214, OMW-216, OMW-218, OMW-221, OMW-222, and OMW-223) will be included in Tier 2 of the monitoring program. These monitoring wells are generally located south/southwest of the landfill and farther away from the

landfill perimeter than the monitoring wells included in Tier 1. Three of these monitoring wells are located about 2,000 to 3,500 feet south from the landfill perimeter. Groundwater will be sampled from the Tier 2 monitoring wells once per year, in the fall (October and/or November). Tier 2 monitoring wells are designated with a green circle on Figure 3.

Tier 3: Six monitoring wells (OMW-107, OMW-108, OMW-206, OMW-220, OPZ-207, and OPZ-217) will be included in Tier 3 of the monitoring program. These monitoring wells are generally located west or north of the landfill and outside the VOC plume to the south of the landfill. Groundwater will be sampled from the Tier 3 monitoring wells biennially, in the fall (October and/or November). Tier 3 monitoring wells are designated with a blue square on Figure 3.

Samples from all monitoring wells and open deep bedrock boreholes (if not converted into monitoring wells in accordance with Appendix G of the DR/IP) included the program will be analyzed for VOCs. Based on historical results, samples from five monitoring wells (OMW-102, OMW-201, OMW-204, OMW-215, and OMW-219) will be analyzed for phenolic compounds. These five locations, which are all included in Tier 1 of the monitoring program, are presented in Table 2 and shown on Figure 3. Samples from these five monitoring wells will be analyzed for phenolic compounds biennially.

In addition, 13 wells will be sampled for 1,4-dioxane analysis, as shown on Table 2. Four monitoring wells (OMW-102, OMW-201, OMW-205 and OMW-215) will be sampled on a semi-annual basis. Three wells (OMW-214, OMW-216 and OMW-219) will be sampled on an annual basis, and six wells (OMW-107, OMW-108, OMW-206, OMW-221, OMW-222 and OPZ-207) will be sampled on a biennial basis.

2.2.1 Sample Collection

Groundwater samples will be collected at the majority of the monitoring wells using PDBs placed at specified depths within the monitoring wells. At some wells that are too small (i.e., one-inch-diameter at OMW-215, OMW-218 and OMW-219) to use PDBs, or for wells to be sampled for 1,4-dioxane and/or phenolic compounds in addition to VOCs (i.e., the biennial sampling for phenols at OMW-102, OMW-201, OMW-204, OMW-215, and OMW-219 and any well that is being sampled for 1,4-dioxane), low-flow sampling procedures will be used for sample collection. Key elements are summarized below.

For each monitoring event under this GWMP, PDBs will be installed in the appropriate monitoring wells at least two weeks prior to sampling. The PDBs will be installed in monitoring wells at the approximate mid-point of the saturated portion of the well screen or open hole (see Table 2), which is consistent with the historical sampling depths.

Field parameters (DO, pH, oxidation-reduction potential [ORP], specific conductance, and temperature) will be monitored when low-flow sampling procedures are used. These parameters will be measured using a flow-through cell.

Sample nomenclature will utilize the monitoring well or open deep bedrock borehole identification (ID) number and the sample date (i.e., mmddyy). For example, “OMW-101-021313” is a sample collected from monitoring well OMW-101 on February 13, 2013, and "EPA-1-021313" is a sample collected from open deep bedrock borehole EPA-1 on February 13, 2013. When samples are collected using PDBs, the abbreviation “PB” will be added to the sample ID (e.g., OMW-101-PB-021313).

Sample containers will be submitted for VOC analysis by USEPA Method 8260 and phenolic compound analysis by USEPA Method 8270. In addition, samples collected for low level 1,4-dioxane will be analyzed by USEPA Method 8270D. Quality assurance/quality control (QA/QC) samples will include trip blanks, blind duplicates, and matrix spike/matrix spike duplicates (MS/MSDs). Trip blanks will be analyzed for VOCs at a frequency of one per cooler. Blind duplicate and MS/MSD samples will be collected at a frequency of one for every 20 samples collected. The sample ID nomenclature for the blind duplicate samples will be DUP-mmddyy. If there is more than one duplicate sample on the same day, they will be sequentially numbered (e.g., DUP1, DUP2).

2.2.2 Management of IDM

IDM that will be generated during groundwater monitoring may include purge water (when using low-flow sampling), decontamination fluids, used personal protective equipment (PPE), and disposable equipment. The management of these materials is discussed below.

Any purge water produced during groundwater sampling will be containerized in polyethylene storage tanks and/or 55-gallon drums, and transported to be treated on-site using the new treatment system. Prior to that time, the purge water will be transported to the landfill where it will be transferred to one of the two on-site frac tanks located in the pole barn. This groundwater will then be transferred into tanker trucks for off-site transport, treatment, and disposal in accordance with the Transportation and Disposal Plan (T&D Plan) conditionally approved by USEPA.

Any decontamination fluids containing non-indigenous materials (i.e., alconox solution) generated during performance of the groundwater sampling will be containerized in 55-gallon drums. These drums will be either stored in the pole barn on the landfill or the new treatment building. Depending on the content of the decontamination fluids, this material may be treated on-site using the new treatment system. Alternatively, these materials may be characterized as necessary for profile approval, and then transported off-site for disposal at a permitted facility in accordance with the T&D Plan conditionally approved by USEPA.

Used PPE, disposable equipment, and other debris (e.g., plastic, tubing, etc.) will be containerized in 55-gallon drums. These drums will be either stored in the pole barn on the landfill or the new treatment building. These materials will be characterized as necessary for profile approval, and then transported off-site for disposal at a permitted facility in accordance with the T&D Plan conditionally approved by USEPA.

3. Notification and Reporting

As part of the current groundwater monitoring program, access was obtained from required property owners. Prior to each monitoring event, property owners that require notice are contacted with the schedule. In accordance with Paragraph 59 of the Consent Order, Respondents will also notify USEPA at least seven days prior to each groundwater monitoring event.

Respondents do not propose to provide USEPA with daily oral or weekly written reports for the ongoing activities described in this GWMP. However, in addition to providing the groundwater elevation data and laboratory data sheets in the Monthly Progress Reports that are submitted to USEPA pursuant to the Consent Order, analytical summary tables showing the detections for each sampling event will also be provided in the Monthly Progress Reports.

Level 4, Contract Laboratory Program (CLP) equivalent data packages for VOC, phenolic compound and 1,4-dioxane analyses will be obtained from the analytical laboratory and submitted to USEPA. Additionally, in accordance with Paragraph 57f of the Consent Order, Analytical Services Tracking System (ANSETS) forms will be submitted to USEPA for each sampling event. Data validation will not be performed on these data. However, data validation could be performed in the future if warranted based on the results of any particular sampling event.

The results of the groundwater monitoring program will be presented in an annual GWMR. These reports will include, at a minimum, the following:

- Discussion of the groundwater elevation and quality monitoring activities and any deviations from the methods discussed in this GWMP or the QAPP;
- Tabulated summary of groundwater elevation data;
- Tabulated summary of field parameter (if any), detected VOCs, detected phenolic compounds and 1,4-dioxane;
- Figure showing sampling locations;
- Figures showing concentration trends for key VOCs (e.g., trichloroethene [TCE] and benzene) at select monitoring wells;
- Recommendations for modifications to the monitoring program (if any);
- Tabulated summary of recent and historical analytical data;

- Sampling forms and COCs; and
- Laboratory analytical reports.

The annual GWMR will be submitted to USEPA within 60 days of receipt of the final laboratory analytical reports.

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Tables

TABLE 1
DEWEY LOEFFEL LANDFILL SUPERFUND SITE
NASSAU, NEW YORK
WELL CONSTRUCTION DETAILS

Monitoring Well/ Piezometer/Open Borehole ID	Ground Surface Elevation (ft, MSL)	Elevation of Reference Point (ft, MSL)	Geologic Description Screened Interval	Depth to Bottom of Borehole (ft, bgs)	Well Diameter (in)	Depth to Top of Sand Pack (ft, bgs)	Depth to Top of Bentonite Seal (ft, bgs)	Depth to Top of Screened Interval (ft, bgs)	Depth to Bottom of Screened Interval (ft, bgs)	Open Borehole Interval (ft, bgs)	Monitoring Interval Elevation (ft, MSL)
OMW-101	638.2	640.6	Overburden (Till)	60	2	47	45	50	59	-	579.0 - 588.6
OMW-102	637.5	639.9	Bedrock	76	4	-	-	-	-	65.5 - 75.6	561.9 - 572.0
OMW-103	642.9	644.8	Bedrock	20	2	4	2	10	19	-	623.6 - 633.2
OMW-107	624.1	626.4	Overburden (Sand)	17	2	6	4	7	16	-	607.7 - 617.3
OMW-108	625.0	626.0	Bedrock	62	4	-	-	-	-	51.5 - 61.5	563.5 - 573.5
OMW-201	637.9	640.2	Bedrock	106	4	-	-	-	-	86 - 106	531.9 - 551.9
OMW-202	655.6	657.0	Bedrock	113	4	-	-	-	-	91 - 113	542.6 - 564.6
OMW-204	648.5	650.3	Bedrock	69	4	-	-	-	-	49 - 69	579.5 - 599.5
OMW-205	650.1	652.0	Bedrock	54	4	-	-	-	-	33.5 - 53.5	596.6 - 616.6
OMW-206	616.7	619.0	Bedrock	121	4	-	-	-	-	101 - 121	495.7 - 515.7
OMW-211	649.1	651.7	Overburden (Silt)	50	2	35	32	38	48	-	601.1 - 611.1
OMW-212	653.6	655.9	Bedrock	124	4	-	-	-	-	104 - 124	529.6 - 549.6
OMW-213	667.1	669.0	Bedrock	83	4	-	-	-	-	61 - 83.4	583.7 - 606.1
OMW-214	655.5	657.8	Bedrock	108	4	-	-	-	-	89 - 108	547.5 - 566.5
OMW-215	656.2	657.9	Deep Bedrock	-	1	196	172	203	244	-	412.7 - 453.2
OMW-216	657.6	659.2	Deep Bedrock	170	4	-	-	-	-	108 - 170	487.6 - 549.6
OMW-218	652.6	655.1	Deep Bedrock	254	1	206	191	213	253	-	399.2 - 439.6
OMW-219	665.6	667.6	Deep Bedrock	266	1	219	203	225	265	-	400.4 - 440.4
OMW-220	635.5	637.3	Deep Bedrock	-	4	-	-	-	-	150.2 - 190.2	445.3 - 485.3
OMW-221	592.0	593.2	Deep Bedrock	142	2	92	-	102	142	-	460.0 - 500.0
OMW-222	598.6	601.5	Deep Bedrock	213	2	154	-	165	205	-	393.6 - 433.6
OMW-223	593.9	596.2	Deep Bedrock	179	2	119	-	130	170	-	423.9 - 463.9
OPZ-207	648.3	649.6	Bedrock	100	4	-	-	-	-	80 - 100	548.3 - 568.3
OPZ-217	664.7	666.5	Deep Bedrock	157	4	-	-	-	-	117 - 157	507.7 - 547.7
EPA-1*	667.6	669.6	Deep Bedrock	260	4	-	-	-	-	101 - 260	566.6 - 409.6
EPA-2*	618.7	621.1	Deep Bedrock	315	4	-	-	-	-	81 - 315	537.7 - 306.1
EPA-3*	685.8	688.6	Deep Bedrock	295	4	-	-	-	-	115 - 295	570.8 - 393.6
EPA-4*	688.2	690.4	Deep Bedrock	290	4	-	-	-	-	111 - 290	577.2 - 400.4
EPA-5*	625.4	628.6	Deep Bedrock	221	4	-	-	-	-	35 - 221	590.4 - 407.6

Notes:

1. in = inches
2. ft = feet
3. bgs = below ground surface
4. OH = open hole
5. MSL = Mean sea level
6. - = No data available
7. * indicates borehole depth, length, and intervals are in feet as measured along the length of the borehole

TABLE 2
DEWEY LOEFFEL LANDFILL SUPERFUND SITE
NASSAU, NEW YORK
GROUNDWATER QUALITY MONITORING PROGRAM

Sampling Tier[1]	Sampling Tier/Frequency[1] for 1,4-Dioxane	Monitoring Well/ Piezometer/Open Borehole ID	Unit	Screened/Open Interval (ft, AMSL)	Diameter (inches)
2	None	OMW-101	Overburden	579.6 - 588.6	2
1+phenols	1 / Semi-annual	OMW-102	Bedrock	561.9 - 572.0	4
2	None	OMW-103	Bedrock	623.6 - 633.2	2
3	3 / Biennial	OMW-107	Overburden	607.7 - 617.3	2
3	3 / Biennial	OMW-108	Bedrock	563.3 - 573.5	4
1+phenols	1 / Semi-annual	OMW-201	Bedrock	531.9 - 551.9	4
2	None	OMW-202	Bedrock	542.6 - 564.6	4
1+phenols	TBD	OMW-204	Bedrock	579.5 - 599.5	4
1	1 / Semi-annual	OMW-205	Bedrock	596.6 - 616.6	4
3	3 / Biennial	OMW-206	Bedrock	495.7 - 515.7	4
1	None	OMW-211	Overburden	601.1 - 611.1	2
2	None	OMW-212	Bedrock	529.6 - 549.9	4
1	None	OMW-213	Bedrock	583.7 - 606.1	4
2	2 / Annual	OMW-214	Bedrock	547.5 - 566.5	4
1 +phenols	1 / Semi-annual	OMW-215	Deep bedrock	412.7 - 453.2	1
2	2 / Annual	OMW-216	Deep bedrock	487.6 - 549.6	4
2	None	OMW-218	Deep bedrock	399.2 - 439.6	1
1 +phenols	2 / Annual	OMW-219	Deep bedrock	400.4 - 440.4	1
3	None	OMW-220	Deep bedrock	445.3 - 485.3	4
2	3 / Biennial	OMW-221	Deep bedrock	460.0 - 500.0	2
2	3 / Biennial	OMW-222	Deep bedrock	393.6 - 433.6	2
2	None	OMW-223	Deep bedrock	423.9 - 463.9	2
3	3 / Biennial	OPZ-207	Bedrock	548.3 - 568.3	4
3	None	OPZ-217	Deep bedrock	507.7 - 547.7	4

Notes:

1. Sampling Tiers:
   Tier 1: Semi-annual monitoring location
   Tier 2: Annual monitoring location
   Tier 3: Biennial monitoring location
2. +phenols = Monitoring well will also be sampled for phenolic compounds biennially
3. All monitoring well samples will be analyzed for volatile organic compounds (VOCs)
4. ft = feet
5. AMSL = above mean sea level
6. TBD = to be determined

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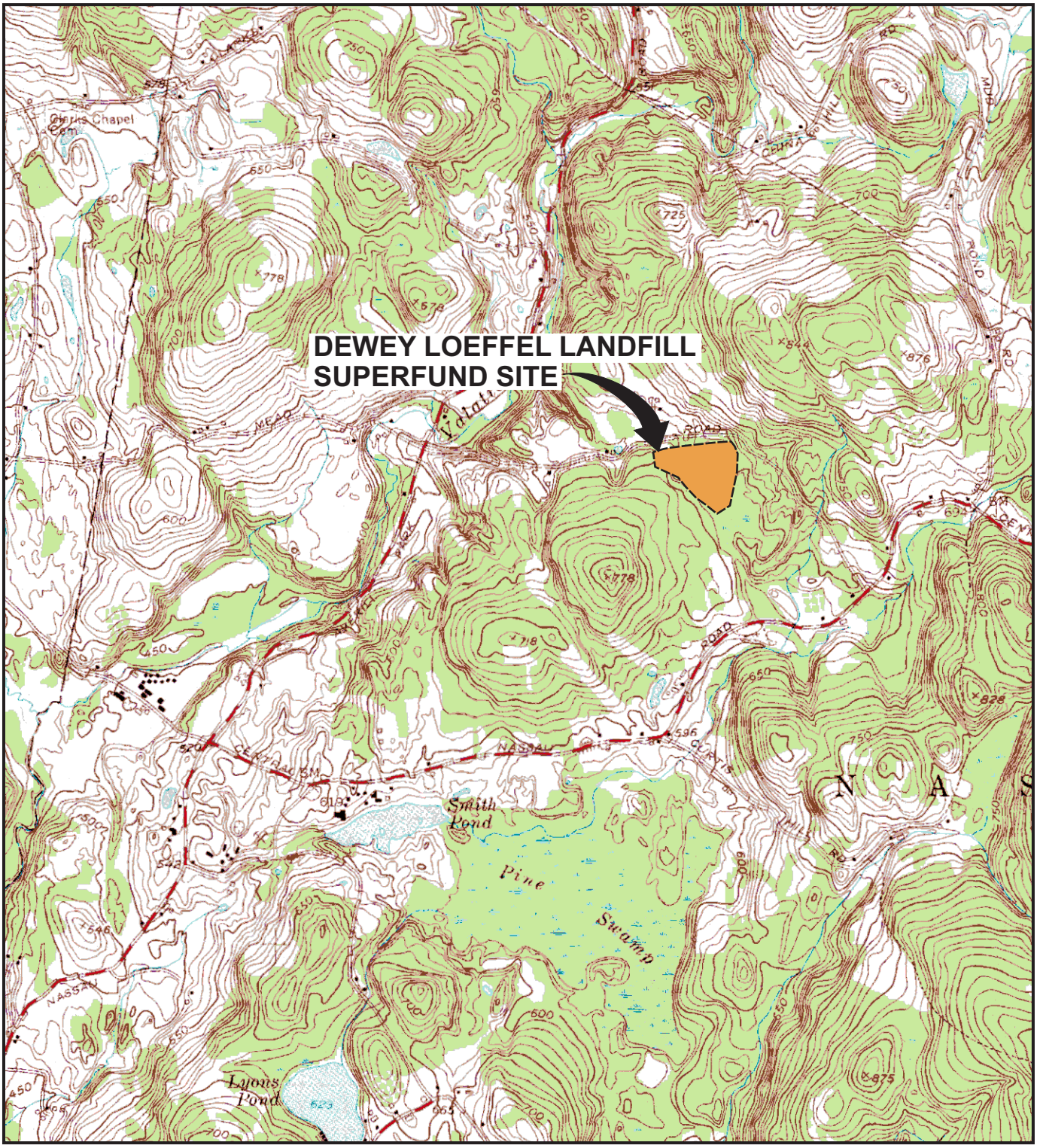
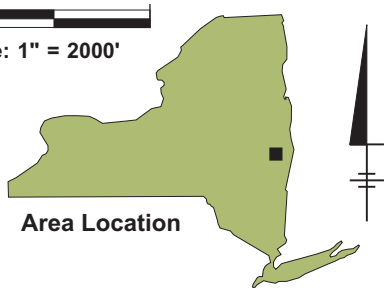
Figures



REFERENCE: BASE MAP USGS 7.5 MIN. QUAD., NASSAU, NY, 1953, PHOTOREVISED 1978.

2000' 0 2000'

Approximate Scale: 1" = 2000'



DEWEY LOEFFEL LANDFILL SUPERFUND SITE
NASSAU, NEW YORK

SITE LOCATION MAP

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FIGURE
1

04/116/2012 SYRACUSE, NY-ENV/CAD-141, DJHOWES
B0031174/0000/00001/CDR/31174N01.CDR

CITY:SYRACUSE, NY DIV/GROUP: ENV/CADD DB: K.SARTORI PIC: P.FARR PM:/TM: D. SAUDA LYR:(O□)ON=*;OFF=*REF*
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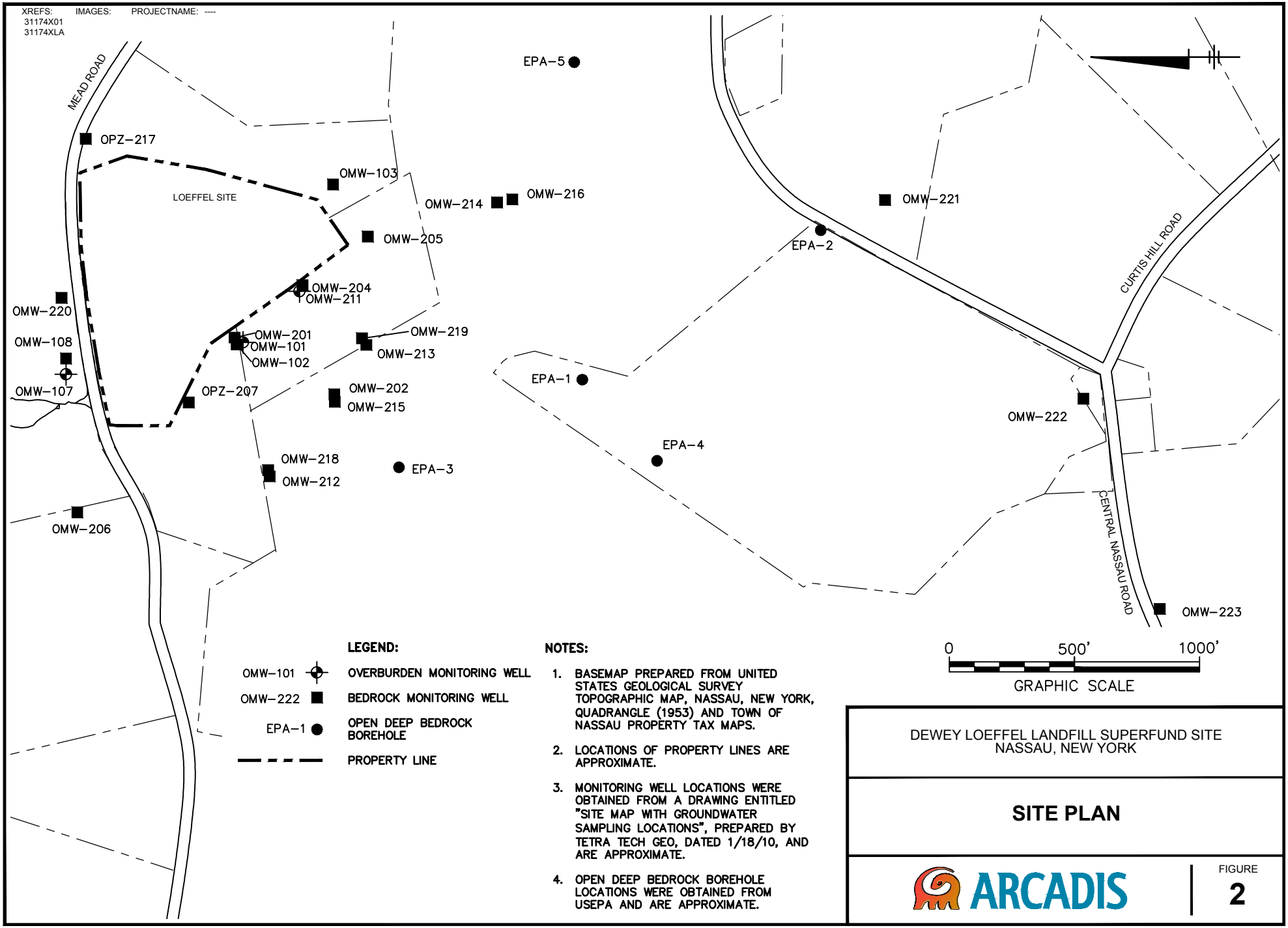
31174XLA



LEGEND:

- OMW-101 — OVERBURDEN MONITORING WELL
- OMW-222 — BEDROCK MONITORING WELL
- EPA-1 — OPEN DEEP BEDROCK BOREHOLE
- PROPERTY LINE

NOTES:

1. BASEMAP PREPARED FROM UNITED STATES GEOLOGICAL SURVEY TOPOGRAPHIC MAP, NASSAU, NEW YORK, QUADRANGLE (1953) AND TOWN OF NASSAU PROPERTY TAX MAPS.
2. LOCATIONS OF PROPERTY LINES ARE APPROXIMATE.
3. MONITORING WELL LOCATIONS WERE OBTAINED FROM A DRAWING ENTITLED "SITE MAP WITH GROUNDWATER SAMPLING LOCATIONS", PREPARED BY TETRA TECH GEO, DATED 1/18/10, AND ARE APPROXIMATE.
4. OPEN DEEP BEDROCK BOREHOLE LOCATIONS WERE OBTAINED FROM USEPA AND ARE APPROXIMATE.

DEWEY LOEFFEL LANDFILL SUPERFUND SITE
NASSAU, NEW YORK

SITE PLAN

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FIGURE
2

CITY:SYRACUSE, NY DIV/GROUP: ENV/CADD DB: K.SARTORI PIC: P.FARR PM:/TM: D. SAUDA LYR:(O□)ON=*;OFF=*REF*
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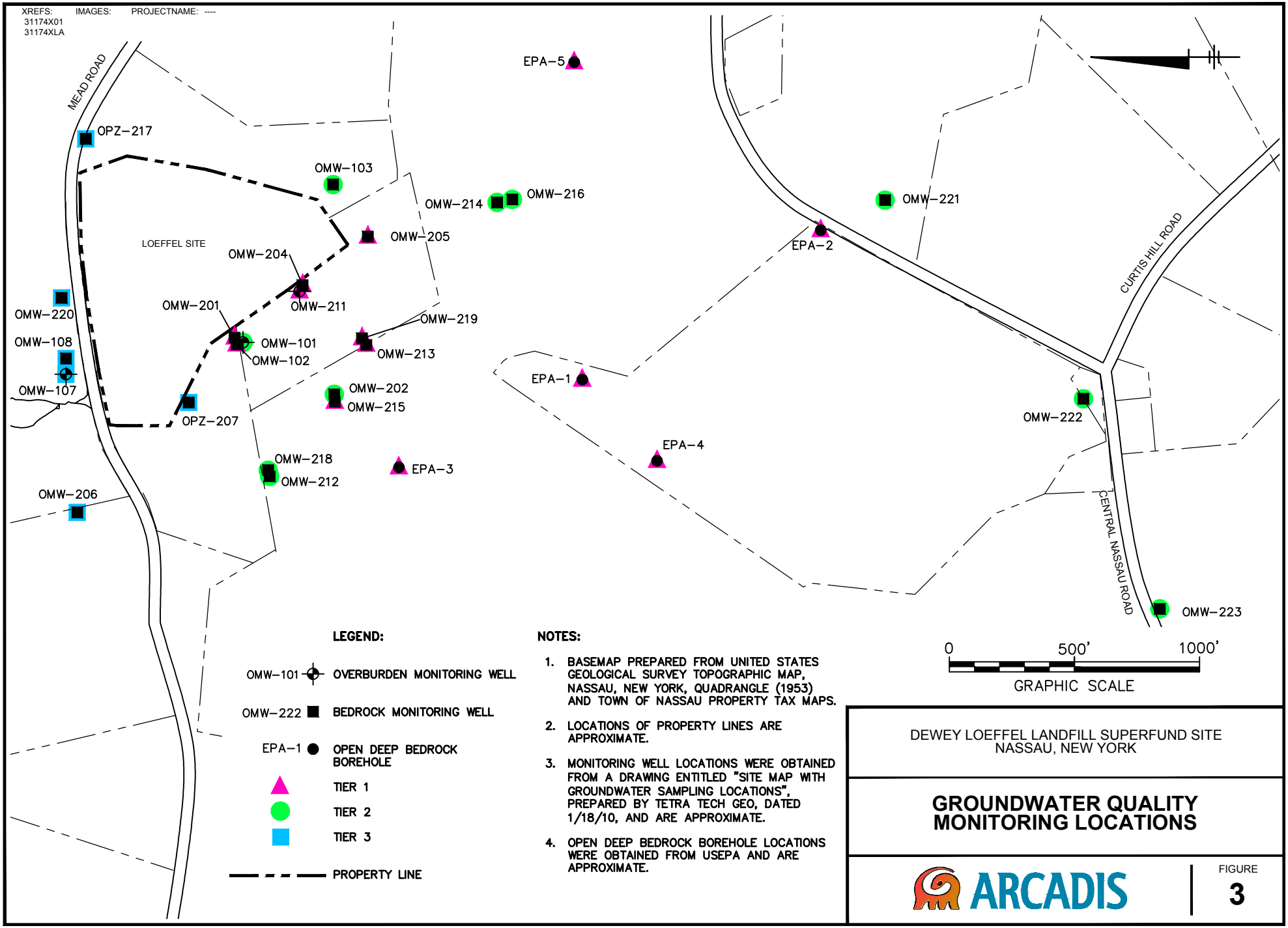
31174XLA



LEGEND:

- OMW-101 — OVERBURDEN MONITORING WELL
- OMW-222 — BEDROCK MONITORING WELL
- EPA-1 — OPEN DEEP BEDROCK BOREHOLE
- TIER 1
- TIER 2
- TIER 3
- PROPERTY LINE

NOTES:

1. BASEMAP PREPARED FROM UNITED STATES GEOLOGICAL SURVEY TOPOGRAPHIC MAP, NASSAU, NEW YORK, QUADRANGLE (1953) AND TOWN OF NASSAU PROPERTY TAX MAPS.
2. LOCATIONS OF PROPERTY LINES ARE APPROXIMATE.
3. MONITORING WELL LOCATIONS WERE OBTAINED FROM A DRAWING ENTITLED "SITE MAP WITH GROUNDWATER SAMPLING LOCATIONS", PREPARED BY TETRA TECH GEO, DATED 1/18/10, AND ARE APPROXIMATE.
4. OPEN DEEP BEDROCK BOREHOLE LOCATIONS WERE OBTAINED FROM USEPA AND ARE APPROXIMATE.

DEWEY LOEFFEL LANDFILL SUPERFUND SITE
NASSAU, NEW YORK

GROUNDWATER QUALITY MONITORING LOCATIONS

ARCADIS

FIGURE
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