Site-Specific Work Plan for:

HYDROGEOLOGIC INVESTIGATION AT THE HERKIMER VILLAGE DUMP NYSDEC REGION 6 - HERKIMER COUNTY VILLAGE OF HERKIMER, NEW YORK

Prepared For:

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Site Specific Work Plan For Hydrogeologic Investigation At Herkimer Village Dump Site

1.0 PROJECT BACKGROUND

This hydrogeologic investigation is part of the New York State Department of Environmental Conservation's (NYSDEC's) Inactive Landfills Initiative. The objective of the Initiative is to assess inactive landfills in New York State for potential impacts to drinking water sources and other potential receptors.

2.0 PROJECT OBJECTIVES

The objective of this hydrogeological investigation is to provide an initial assessment of the potential for impacts to groundwater in the immediate vicinity of the Herkimer Village Dump (Site # 622012) (**Figure 1**). This objective will be accomplished by installing a new downgradient well, replacing a damaged well, sampling up to six groundwater monitoring wells, sampling up to two seeps if observed and analyzing the samples for a suite of target organic and inorganic contaminants. The sample data will be evaluated to assess whether groundwater quality has been impacted by the landfill operations.

3.0 SITE SETTING

The landfill is located on the southern end of Kings Road, north of the Mohawk River and west of West Canada Creek in Herkimer, New York. The landfill consists of a relatively level area generally bordered by forested land and is in proximity to a known Bald Eagle nesting area.

According to a NYSDEC *Phase 1 Investigations* report by Wehran Engineering, P.C. dated May 1987, the Herkimer Village Dump was a municipal landfill that operated between the 1920s and 1972 and accepted commercial and industrial wastes from businesses located in the Village of Herkimer. After 1972 the NYSDEC *Phase 1 Investigations* report indicated the landfill was used in 1987 for demolition debris. According to the NYSDEC Reclassification Decision in 1996, the landfill size is identified as 32 acres. From 1972 to 1982, the site was used to dispose of an estimated 25,000 tons of sludge from the Herkimer Sewage Treatment Plant. Sludge tests completed in 1978, 1982, and 1983, found the sludge exceeded USEPA land spreading criteria for several metals. From 1951 to 1970 H.M. Quackenbush Co, a metal plating facility, disposed of waste at the dump. The total amount of waste was estimated at 28,500 pounds.

Based on Figure 1.2 (**Exhibit 1**) included in the NYSDEC Reclassification Decision in 1996, A network of 6 monitoring wells exists at the landfill. However, during January 2019 and March 2019 site visits, only 5 monitoring wells were located (GW-1, GW-2, GW-3, GW-5, GW-6). Of the five wells located, four monitoring wells were identified as suitable for sampling (GW-1, GW-2, GW-5, GW-6). GW-3 was located but observed without protective casing and with the PVC riser broken at grade. It was also noted that land clearing debris and construction and demolition debris are presently stored on top of the landfill.

3.1 GROUNDWATER AND SURFACE WATER OCCURRENCE AND FLOW

The Herkimer Village Dump is located at the confluence of the West Canada Creek and the Mohawk River within the Village limits of Herkimer, New York.

According to the *Phase 1 Investigations* report by Wehran Engineering, P.C. dated May 1987, the water table is within 3 to 4 feet below grade. According to a Groundwater Contour Map (Figure 4.3) presented in a *Phase II Investigation* dated

December 1992 by YEC, Inc. groundwater flow is to the south and east, towards the West Canada Creek and the Mohawk River (**Exhibit 2**). These rivers merge approximately 1,800 ft southeast of the site and then flow east, away from the landfill.

According to the surficial geology map of New York State (Hudson Mohawk Sheet) the landfill is underlain by mixed sand and gravel deposits. According to the bedrock geology map of New York State (Hudson Mohawk Sheet) the bedrock present beneath the landfill is the Utica Shale formation. The landfill is located within a 100-year floodplain where soil consists of fill and alluvial floodplain deposits of silt and trace clays.

3.2 HISTORICAL INVESTIGATIONS

Monitoring wells were installed at the site and sampled along with surface water, sediment and soil during the *Phase II Investigation*. The Herkimer Village Dump was reclassified from a Class 2a to a Class 3 on the Hazardous Waste Registry in 1996 upon additional sampling at the site.

4.0 HYDROGEOLOGICAL INVESTIGATION AND SCOPE OF WORK

Field activities will be conducted in accordance with the Quality Assurance Project Plan (QAPP), Field Activities Plan (FAP), and Health and Safety Plan (HASP), which have been prepared and approved specifically for the NYSDEC Inactive Landfill Initiative program. Site-specific elements and specific job safety analyses for soil borings, and monitoring well installations will be added to the Health and Safety Plan specifically for the Herkimer Village Dump site.

A Community Air Monitoring Plan will be implemented for real-time monitoring for volatile organic compounds (VOCs) and particulates (i.e., dust) at the downwind perimeter of each designated work area during invasive activities on-site.

The specific field procedures to be used during this investigation are described in the FAP. That document describes the drilling methods, well installation and sampling methods, and handling of investigation-derived waste. The QAPP describes the analytical procedures to be used by the laboratory in analyzing the groundwater samples.

Two monitoring wells (GW-3 and GW-7) will be installed and a network of existing and newly installed wells will be sampled to evaluate general groundwater quality as described below. A new monitoring well (GW-7) will be installed between GW-3 and GW-5. Due to observed damage described in Section 3.0, monitoring well GW-3 will be replaced (designated as GW-3R). Existing well GW-3 will be abandoned according to NYSDEC Policy *CP-43 – Groundwater Monitoring Well Decommissioning Policy*. The well locations are shown in **Figure 1.** Wells will be sampled, as outlined in Section 4.3 below, to better evaluate general groundwater quality and verify the direction of groundwater flow described in Section 3.1.

It has been reported by NYSDEC that a potential bald eagle nest may be present in the vicinity of the site. At this time, it is uncertain if this is an active nest. Prior to conducting monitoring well installation and sampling at this site, the NYSDEC will be consulted regarding potential restrictions for these activities at the site; however, guidelines and restrictions set forth in the federal Bald and Golden Eagle Protection Act and the NYSDEC Conservation Plan for Bald Eagles in New York State will be followed as needed. In general, restrictions may include maintaining a certain distance from the nest, depending on the activity, during the bald eagle breeding season[1] and restrictions on the removal of overstory trees within a 330-foot buffer surrounding the nest tree, and larger potential perch trees, especially native pines and single trees in areas devoid of elevated perch sites, at any time of year at the site.

[1] The breeding season in New York State may begin as early as January 1 and conclude as late as September 30. The period of January 1 – September 30 therefore encompasses the entire breeding period and is used as a general guideline (Conservation Plan for Bald Eagles in New York State – NYSDEC, 2016).

4.1 SUBSURFACE UTILITY CLEARING

The local DIG SAFE service will be used to mark out subsurface utility lines near the proposed monitoring well locations. Monitoring well boring locations will be adjusted in the field as necessary to avoid subsurface obstructions and utilities. Each well boring location will also be hand-dug to 5 feet to ensure the location is clear of subsurface utilities. The proposed well locations are shown on **Figure 1**.

4.2 MONITORING WELL INSTALLATIONS

Following hand-clearing, the borings for the monitoring wells will be advanced through the overburden using hollow-stem augers and a soil sampler (**Figure 1**).

Acceptable drilling techniques are described in the FAP. Soil samples will be collected continuously at each boring location. Samples will be physically described in the field using both the Burmeister and USCS soil classification systems. A photoionization detector (PID) will be used to record the headspace readings of each soil sample.

The borings will be advanced to the first water-bearing zone that is considered acceptable for placing a monitoring well that will yield a volume of representative groundwater sufficient for sampling. In the event that shallow groundwater is encountered, wells will be screened at least 5 ft below grade to minimize mixing of the surface water with the groundwater in the well.

It is possible that the first water-bearing zone will be encountered at the bedrock-overburden interface. If field observations verify this and bedrock drilling is required, shallow bedrock wells will be installed using a combination of hollow stem auguring and rotary (including air hammer) drilling methods. Initially, 6.25-inch inside diameter hollow stem augers will be advanced to the bedrock surface. During auger advancement, soil samples will be collected continuously from the ground surface to the top of bedrock. Upon reaching the top of bedrock, a nominal 6-inch diameter roller bit will be used to drill a socket approximately 6 inches into the bedrock. A 4-inch diameter temporary steel casing will be installed through the auger string as the auger string is retracted. A borehole will be advanced 5-feet into the bedrock using rotary drilling methods (including air hammer) to an estimated depth of 20-ft below grade. Rock chips will be collected to describe the bedrock and screen for evidence of staining or other chemically-related impacts. In addition, soil and rock chips will be screened with a photoionization detector (PID) to allow evaluation of the bulk volatile organic concentration.

In the event that groundwater is not encountered in overburden, bedrock drilling will be completed as outlined above.

Monitoring wells will be constructed of 2-inch inside-diameter polyvinyl chloride (PVC) casing with a 5 to 10-foot long, #10-slot screen and compatible sand pack material. In areas where there is no evidence of standing water, the well screen will be extended above the water table interface. The top of the screen will be no less than 5 ft below grade and may be deeper to isolate the well from standing surface water as previously described. Each well will be completed with a locking protective casing with approximately 3 feet of stick-up. Should shallow groundwater or other site conditions dictate, modifications to the well design will be made in the field by the supervising geologist.

If a bedrock well is required as a result of the first water-bearing zone being observed at the bedrock-overburden interface, PVC monitoring wells will be constructed with the same general construction as outlined above, however; the well screen will straddle the bedrock overburden interface.

If a bedrock well is required as a result of no groundwater encountered in overburden, open bedrock wells will be utilized if bedrock is competent enough that the hole will stay open. If the hole will not stay open, PVC monitoring wells will be completed in the bedrock boring consistent with the FAP.

Following installation, the new monitoring wells will be developed to remove material which may have settled in and around the well screen. Development will use methods described in the FAP. Following well development, the locations and elevations of the monitoring well PVC casings will be established relative to an arbitrary onsite datum using a Total Station surveying instrument.

Drilling equipment will be decontaminated by pressure washing between borings and before entering or leaving the site.

Drill cuttings from borings will be spread along the ground adjacent to the borehole. However, soils that contain visible wastes, free product, NAPL, or otherwise are grossly contaminated will be containerized for subsequent characterization and disposal. Water generated during the investigation will be discharged to an unpaved area of the site.

4.3 GROUNDWATER SEEP SAMPLING

The following monitoring wells will be sampled:

- GW-1 (MW-UNK-01 on NYSDEC Phase II Investigation Report)
- GW-2 (MW-UNK-02 on NYSDEC Phase II Investigation Report)
- GW-5 (MW-UNK-03 on NYSDEC Phase II Investigation Report)
- GW-3R (Replacement well near MW-UNK-04 on NYSDEC Phase II Investigation Report)
- GW-4 (missing, if located prior to sampling)
- GW-7 (Newly installed monitoring well)

In addition to development of newly installed wells, existing wells will be developed prior to sampling. Upon completion of development, a groundwater sample will be collected from each well utilizing FAP approved sampling techniques and analyzed as described in the FAP. If a well yield is insufficient to support low flow sampling, the sampling will be completed using another acceptable technique as outlined in the FAP. The wells will be purged prior to sampling, and all sampling equipment will be dedicated to that sampling location, or will be decontaminated between sampling locations using the methods provided in the FAP.

Additionally, up to two seep samples will be collected if seeps are observed.

The samples will be analyzed for modified baseline VOCs, polycyclic aromatic hydrocarbons, 1,4-dioxane, perfluorinated compounds, baseline leachate indicators, and modified baseline metals. A complete list of analytical parameters is provided in **Table 1**.

5.0 INVESTIGATION REPORTING

Groundwater sampling logs, analytical data, and a site work summary will be provided at the completion of field activities for the site.

TABLE 1 – ANALYTICAL PARAMETERS

Parameter	Method	Parameter	Method
Leachate Indicators		**Inorganics**	
Ammonia	350.1 / SM20 4500NH3 B/D	Aluminum	SW6010C
Chemical Oxygen Demand	410.4	Antimony	SW6010C
Total Organic Carbon	EPA 9060 / SM20 5310B/C	Arsenic	SW6010C
Total Dissolved Solids	SM20 2540C	Barium	SW6010C
Sulfate	300	Boron	SW6010C
Alkalinity	SM20 2320B	Beryllium	SW6010C
Chloride	300	Cadmium	SW6010C
Bromide	300	Calcium	SW6010C
Total hardness as CaCO3	SM20 2340C	Chromium	SW6010C
		Cobalt	SW6010C
PAHs + 1,4-Dioxane		Copper	SW6010C
Acenaphthene	8270D SIM	Iron	SW6010C
Acenaphthylene	8270D SIM	Lead	SW6010C
Anthracene	8270D SIM	Magnesium	SW6010C
Benzo(a)anthracene	8270D SIM	Manganese	SW6010C
Benzo(a)pyrene	8270D SIM	Nickel	SW6010C
Benzo(b)fluoranthene	8270D SIM	Potassium	SW6010C
Benzo(g,h,i)perylene	8270D SIM	Selenium	SW6010C
Benzo(k)fluoranthene	8270D SIM	Silver	SW6010C
Chrysene	8270D SIM	Sodium	SW6010C
Dibenzo(a,h)anthracene	8270D SIM	Thallium	SW6010C
Fluoranthene	8270D SIM	Vanadium	SW6010C
Fluorene	8270D SIM	Zinc	SW6010C
Indeno(1,2,3-cd)pyrene	8270D SIM	Mercury	SW7470A
Naphthalene	8270D SIM	Mercury	E1631
Phenanthrene	8270D SIM	Dissolved Mercury	E1631
Pyrene	8270D SIM		
1-4-Dioxane	8270D SIM		

TABLE 1 – ANALYTICAL PARAMETERS
(Continued)

Parameter	Method	Parameter	Method
Volatiles			
Acetone	SW8260C	Ethylbenzene	SW8260C
Acrylonitrile	SW8260C	2-Hexanone	SW8260C
Benzene	SW8260C	Bromomethane	SW8260C
Bromochloromethane	SW8260C	Chloromethane (Methyl chloride)	SW8260C
Bromodichloromethane	SW8260C	Dibromomethane	SW8260C
Bromoform	SW8260C	Methylene chloride	SW8260C
Carbon disulfide	SW8260C	2-Butanone (Methyl ethyl ketone)	SW8260C
Carbon tetrachloride	SW8260C	Idomethane (Methyl iodide)	SW8260C
Chlorobenzene	SW8260C	4-Methyl-2-pentanone (Methyl isobutyl ketone)	SW8260C
Chloroethane	SW8260C	Styrene	SW8260C
Chloroform	SW8260C	1,1,1,2-Tetrachloroethane	SW8260C
Dibromochloromethane	SW8260C	1,1,2,2-Tetrachloroethane	SW8260C
1,2-Dibromo-3-chloropropane	SW8260C	Tetrachloroethene	SW8260C
1,2-Dibromoethane (Ethylene dibromide)	SW8260C	Toluene	SW8260C
1,2-Dichlorobenzene	SW8260C	1,1,1-Trichloroethane	SW8260C
1,4-Dichlorobenzene	SW8260C	1,1,2-Trichloroethane	SW8260C
trans-1,4-Dichloro-2-butene	SW8260C	Trichloroethene	SW8260C
1,1-Dichloroethane	SW8260C	Trichlorofluoromethane	SW8260C
1,2-Dichloroethane	SW8260C	1,2,3-Trichloropropane	SW8260C
1,1-Dichloroethene	SW8260C	Vinyl acetate	SW8260C
cis-1,2-Dichloroethene	SW8260C	Vinyl chloride	SW8260C
trans-1,2-Dichloroethene	SW8260C	o-Xylene	SW8260C
1,2-Dichloropropane	SW8260C	m,p-Xylene	SW8260C
cis-1,3-Dichlororpropene	SW8260C	Xylenes, Total	SW8260C
trans-1,3-Dichlororpropene	SW8260C		

TABLE 1 – ANALYTICAL PARAMETERS
(Continued)

Parameter	Method
Perfluorobutanoic acid (PFBA)	Modified 537
Perfluoropentanoic acid (PFPeA)	Modified 537
Perfluorohexanoic acid (PFHxA)	Modified 537
Perfluoroheptanoic acid (PFHpA)	Modified 537
Perfluorooctanoic acid (PFOA)	Modified 537
Perfluorononanoic acid (PFNA)	Modified 537
Perfluorodecanoic acid (PFDA)	Modified 537
Perfluoroundecanoic acid (PFUnA)	Modified 537
Perfluorododecanoic acid (PFDoA)	Modified 537
Perfluorotridecanoic Acid (PFTriA)	Modified 537
Perfluorotetradecanoic acid (PFTeA)	Modified 537
Perfluorobutanesulfonic acid (PFBS)	Modified 537
Perfluorohexanesulfonic acid (PFHxS)	Modified 537
Perfluoroheptanesulfonic Acid (PFHpS)	Modified 537
Perfluorooctanesulfonic acid (PFOS)	Modified 537
Perfluorodecanesulfonic acid (PFDS)	Modified 537
Perfluorooctane Sulfonamide (FOSA)	Modified 537
N-methyl perfluorooctane sulfonamidoacetic acid (NMeFOSAA)	Modified 537
N-ethyl perfluorooctane sulfonamidoacetic acid (NEtFOSAA)	Modified 537
6:2 Fluorotelomer sulfonate (6:2FTS)	Modified 537
8:2 Fluorotelomer sulfonate (8:2FTS)	Modified 537

FIGURE 1

6/3/2019 3:18:35 PM

I:\Parsons-Eng.8653\65982.Inactive-Landfil\Docs\DWG\MXD\Specific Sites\Region 6\Herkimer Village Dump\Site_Plan.mxd

N

LEGEND

- NOT LOCATED DURING 2019 INSPECTION
- PROPOSED MONITORING WELL
- WELL INSPECTION
- EXPOSED WASTE
- MISCELANEOUS FEATURES
- WATER FEATURE
- APPROXIMATE LANDFILL EXTENT

GW-1 - PHASE II INVESTIGATION REPORT ID
(MW-UNK-01) - SITE INSPECTION REPORT ID

NOTE:
PARCELS GEOREFERENCED FROM HERKIMER COUNTY GIS
SITE INSPECTION REPORT ID FROM INACTIVE LANDFILL INITIATIVE SITE INSPECTION REPORT.
FIGURE SOURCE: 1996 NYSDEC RECLASSIFICATION DECISION

NEW YORK STATE
DEPARTMENT OF CONSERVATION
HERKIMER VILLAGE DUMP
HERKIMER, NEW YORK
REGION 6 HERKIMER COUNTY

SITE PLAN

0 75 150 300
Feet

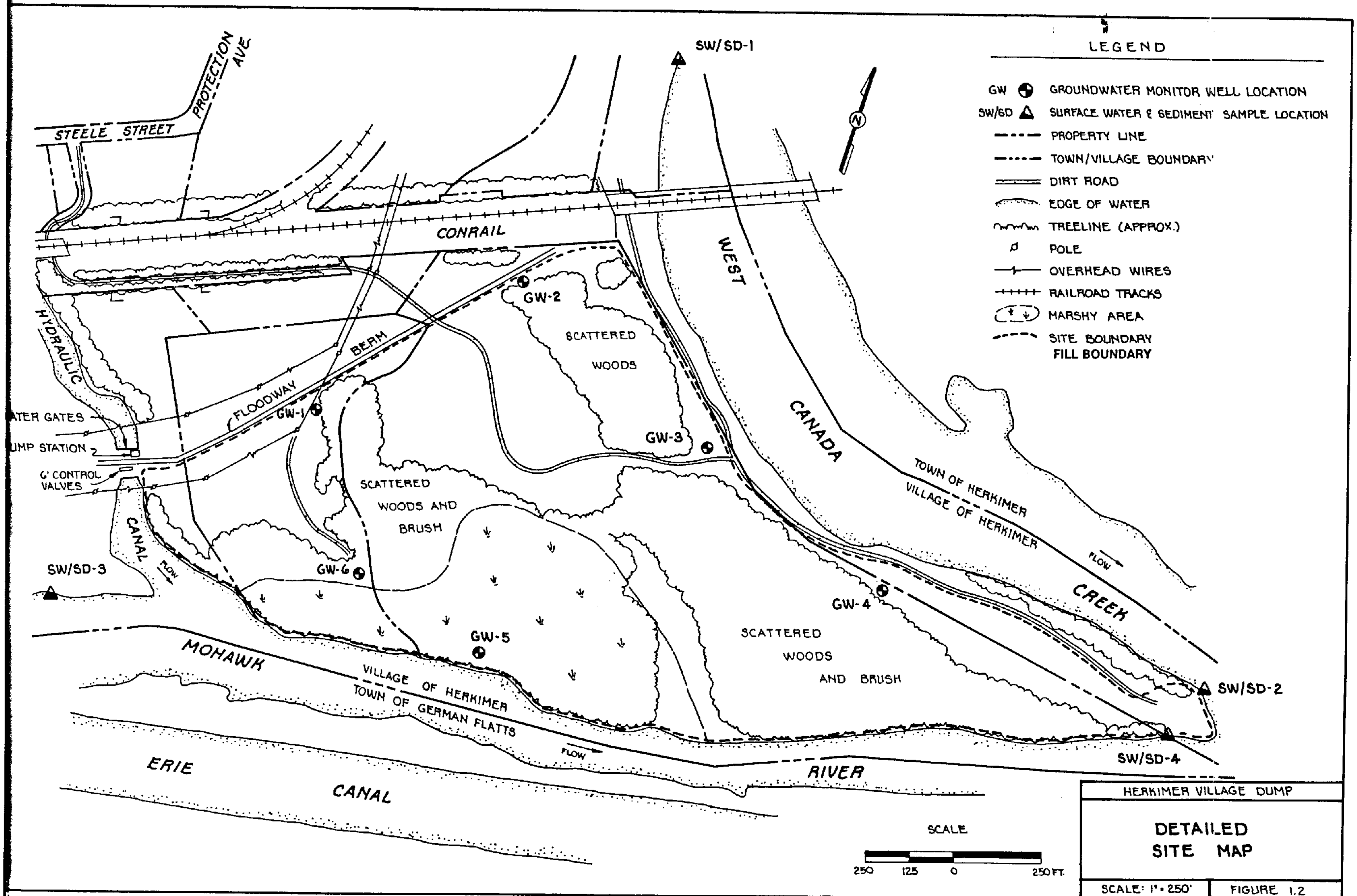
8653.65982
JUNE 2019

O'BRIEN & GERE ENGINEERS, INC.

Exhibit 1

Detailed Site Map

(Source Not Identified)



HERKIMER VILLAGE DUMP

DETAILED SITE MAP

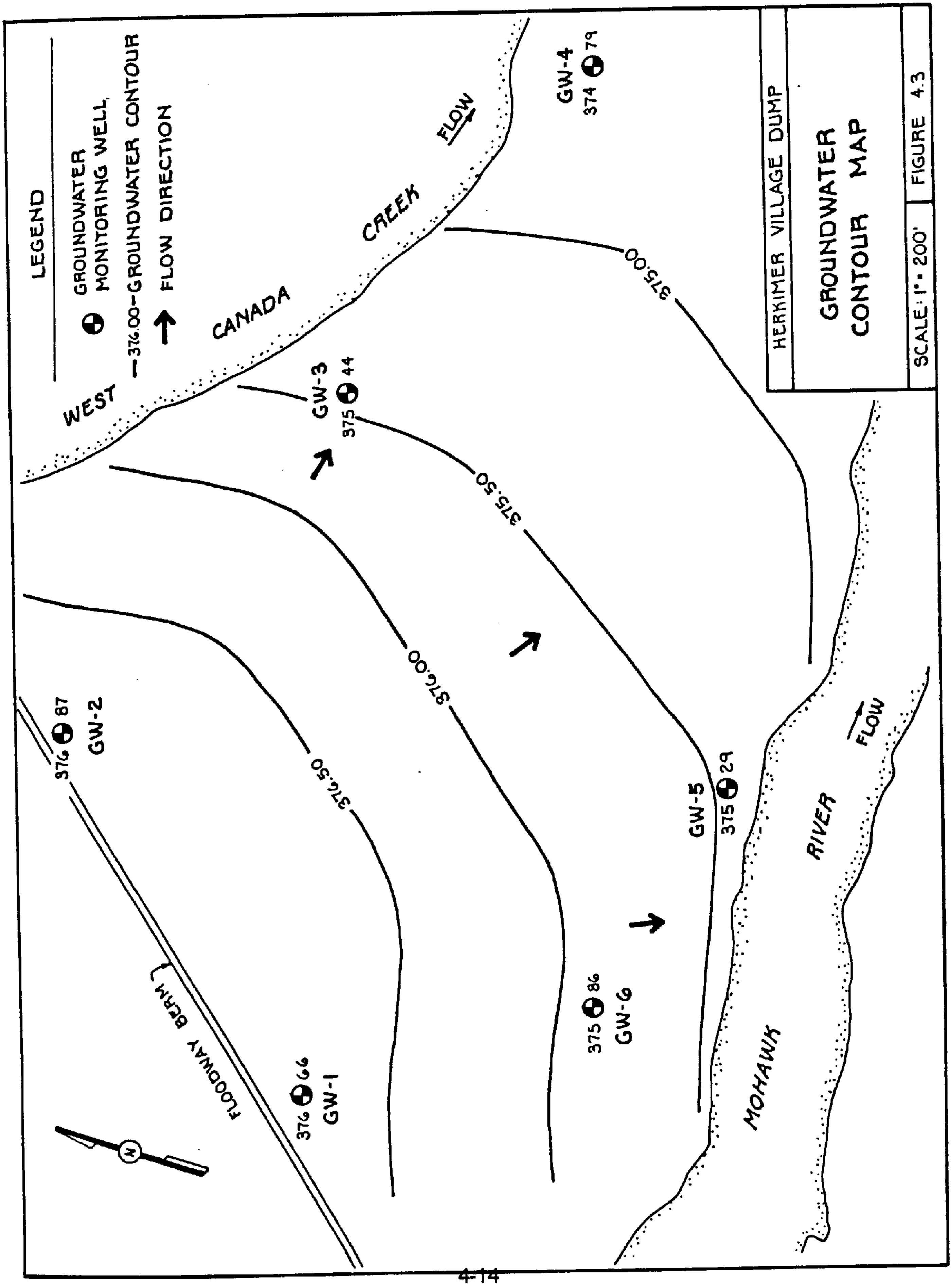
SCALE: 1" = 250'

FIGURE 1.2

Exhibit 2

Groundwater Contour Map

(YEC, Inc.)


LEGEND
GROUNDWATER MONITORING WELL
—376.00—GROUNDWATER CONTOUR
FLOW DIRECTION
WEST CANADA CREEK
FLOW
GW-4
374 79
GW-3
375 44
375.00
375.50
376.00
376.50
GW-2
376 87
GW-5
375 29
GW-6
375 86
GW-1
376 66
FLOODWAY BERM
N
MOHAWK RIVER
FLOW
HERKIMER VILLAGE DUMP
GROUNDWATER CONTOUR MAP
SCALE: 1" = 200'
FIGURE 4.3