TOWN OF ISLIP
ISLIP RESOURCE RECOVERY AGENCY

Report to NYSDEC for Landfill Gas Condensate Management

SONIA ROAD LANDFILL
TOWN OF ISLIP, NEW YORK
NYSDEC SITE NO. 152013

AUGUST 2001

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A DIVISION OF WILLIAM F. COSULICH ASSOCIATES, P.C.

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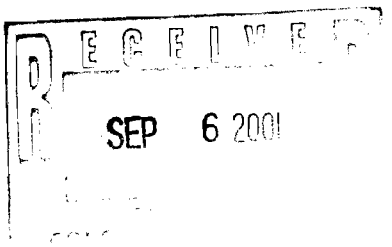
TOWN OF ISLIP
ISLIP RESOURCE RECOVERY AGENCY

SONIA ROAD LANDFILL
SITE REMEDIATION
NYSDEC SITE NO. 152013

REPORT TO NYSDEC FOR
LANDFILL GAS
CONDENSATE MANAGEMENT

DVIRKA AND BARTILUCCI
CONSULTING ENGINEERS



AUGUST 2001

TOWN OF ISLIP
ISLIP RESOURCE RECOVERY AGENCY

SONIA ROAD LANDFILL
REPORT TO NYSDEC FOR
LANDFILL GAS CONDENSATE MANAGEMENT

TABLE OF CONTENTS

List of Appendices

List of Figures

List of Tables

Section 1

1.0 STATEMENT OF PURPOSE

This report has been prepared on behalf of the Town of Islip as the Owner of the Sonia Road Landfill, NYSDEC Site No. 152013. The report is intended to address the issue of landfill gas condensate management for the Sonia Road Landfill site, including condensate generation, on-site management and disposal options.

The report is for submittal to the New York State Department of Environmental Conservation (NYSDEC) for consideration and in response to their correspondence dated January 19, 1999 (Appendix A). As noted in paragraph 4 of the January 19, 1999 correspondence, the Town of Islip must confirm that the landfill gas condensate, which is generated by the landfill gas management system, may or may not be disposed of in the condensate drain system.

The purpose of the report is to discuss the sources of landfill gas condensate, its rate of generation, its characteristics and the available options for its disposal.

Section 2

2.0 EXISTING CONDITIONS

The Sonia Road Landfill is an inactive municipal solid waste landfill owned and operated by the Town of Islip. The landfill is located in the western portion of the Town of Islip in the hamlet of Brentwood and is in close proximity to the western town boundary between the Towns of Islip and Babylon. The location of the Sonia Road Landfill is depicted on Figure 2-1.

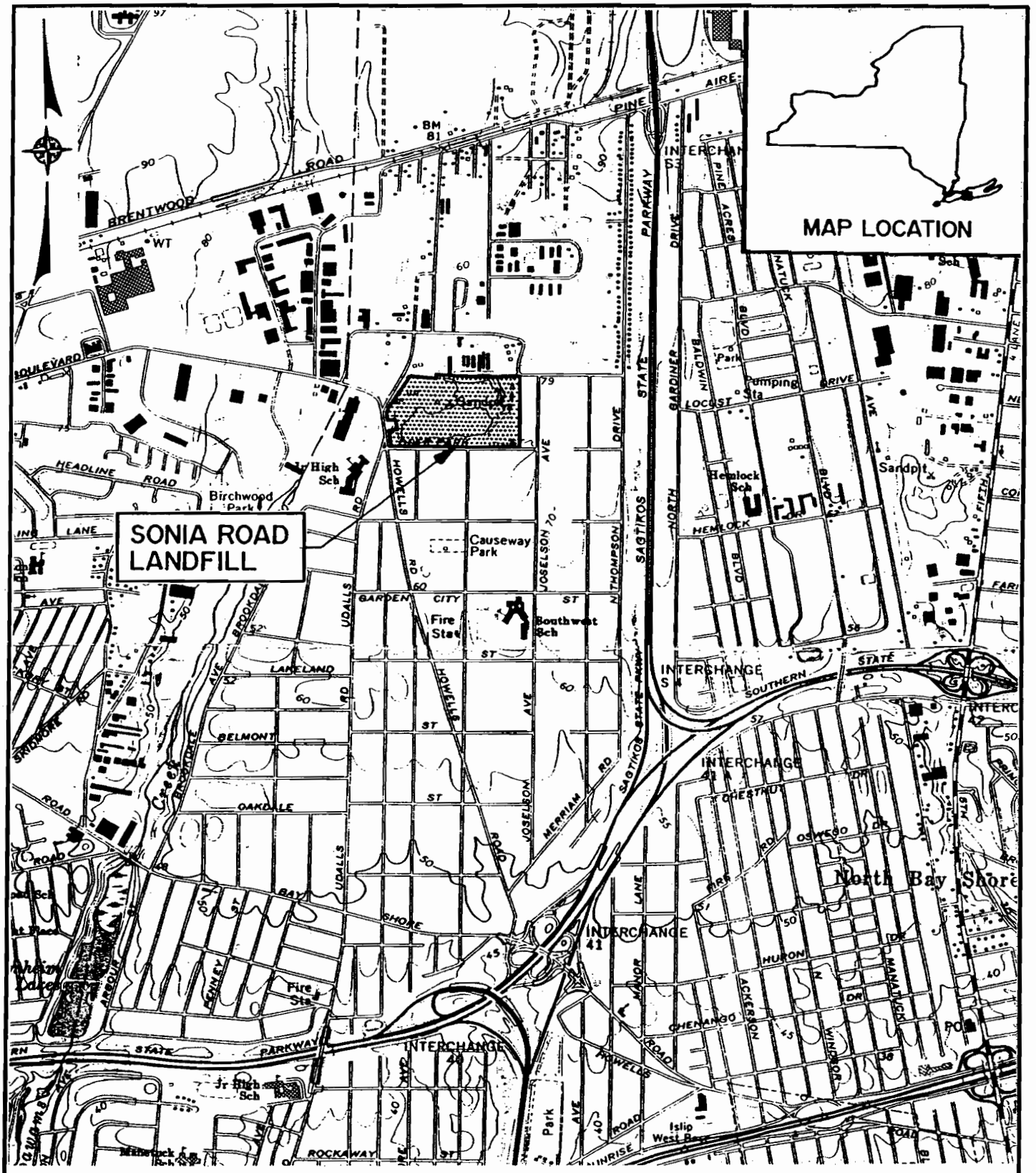
The landfill property is approximately 42.7 acres in area and is generally rectangular in shape. The landfill is bounded to the north by industrial properties, to the east by residential properties, to the south by Deer Park Street with residential properties beyond, and to the west by Howell's Road, Secatogue Road and Corbin Avenue with industrial properties beyond. In the vicinity of the southwest corner of the property is one residential parcel (Tax Map No. 221-2-1) which projects into the landfill property but is privately owned and is not part of the site.

The footprint of the MSW waste mass covers an area of approximately 40 acres and is approximately equivalent to the boundaries of the property. There are limited areas along the western property boundary where landfilling did not occur.

The Sonia Road Landfill has been identified by the NYSDEC as an inactive hazardous waste disposal site, Site No. 152013. The site has been the subject of Phase I and Remedial Investigation/Feasibility Study (RI/FS) investigations and was categorized as a Class 2 site. A Final Closure Plan (Draft – April 1998, Final – January 1999) was prepared for the site as a Presumptive Remedy. The Presumptive Remedy was identified as the construction of a landfill capping system in accordance with the appropriate portions of 6 NYCRR Part 360.

The capping system for the Sonia Road Landfill was identified as a layered configuration of soils and geosynthetics as follows (from the bottom up):

- Contour grading material as required to achieve prepared subgrade.
- 12 inches of Gas Venting Layer
- 60 mil textured HDPE geomembrane



SONIA ROAD LANDFILL

SITE LOCATION MAP

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FIGURE 2-1

- Geocomposite Drainage Layer
- 12 inches of Barrier Protection Layer Type I
- 12 inches of Barrier Protection Layer Type II
- 6 inches of Fabricated Topsoil
- Vegetation

The Final Closure Plan addressed the issue of landfill gas management and migration control by recommending the installation of a landfill gas migration control system as part of the landfill cap construction. Historic site monitoring data had suggested that landfill gas migration was not pronounced, but indicated that an issue could exist in the northeast corner of the property and, to a lesser extent, in the southeast corner. This historic data was supplemented by a soil vapor/explosive gas survey performed as part of the RI/FS. The data from the soil vapor/explosive gas survey documented that landfill gas was present at select locations of the site, though given the age of the waste of 20+ years, it was unclear whether gas was being actively produced or was reflective of landfill gas stored in the void volume of the waste mass.

The Final Closure Plan further noted that the installation of the proposed landfill capping system may tend to promote lateral migration of the landfill gas by mitigating the surface venting of the gas. The lateral migration of landfill gas presents a health and safety issue due to the fact that methane is explosive in the range of 5 to 15 percent by volume. Given the extent to which the waste mass covers the majority of the property and the proximity of residential and commercial structures to the property, it was deemed prudent to incorporate a landfill gas management system into the design of the landfill gas capping system.

The design of the landfill gas management system was intended to address several issues. A typical 6 NYCRR Part 360 landfill cap would provide for passive landfill gas vents spaced at a frequency of one per acre to provide for passive release of gases which tend to accumulate below the geomembrane hydraulic barrier. These passive vents serve to relieve gas pressure from beneath the cap and may discharge gases which could have concentrations of methane at or in excess of the explosive limits. Recognizing that the Sonia Road site is an inactive, unmanned

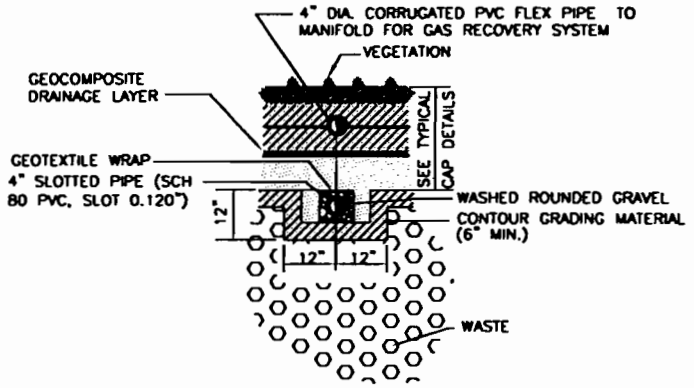
site which experienced unauthorized and unsanctioned access by persons engaged in the use of off-road vehicles, the potential for damage or vandalism to passive relief vents was considered high. In light of these conditions, a total of 37 landfill gas recovery wells were proposed in lieu of the relief vents. The recovery wells would be spaced at approximately one per acre and would provide for active withdrawal of landfill gas from the waste mass. The details for the recovery wells would provide for wellheads which were below grade, and therefore, less prone to tampering or vandalism.

In addition to the 37 landfill gas recovery wells, a total of 16 landfill gas collection wells are included in the landfill gas management system to address the potential for off-site migration. The landfill gas collection wells are spaced at or in close proximity to the site property boundaries. These collection wells are intended to intercept the movement of landfill gas towards the property boundaries and mitigate the potential for off-site migration.

In order to monitor the effectiveness of the landfill gas management system, a total of 17 landfill gas monitoring wells are spaced at intervals approximately equidistant to the landfill gas collection wells in order to monitor the effectiveness of the system at the site boundaries. The details for the landfill gas recovery wells, landfill gas collection wells and landfill gas monitoring wells are presented on Figures 2-2 through 2-4, respectively.

The landfill gas recovery wells and the landfill gas collection wells comprise the active portions of the landfill gas management system. The landfill gas recovery wells are grouped into a total of eight piping manifolds. Each 4-inch diameter HDPE manifold services from three to seven landfill gas recovery wells and is connected to a perimeter landfill gas collection header by means of a 4-inch diameter butterfly valve suitable for throttling purposes.

The 16 landfill gas collection wells are individually connected to the perimeter collection header. Each collection well is fitted with a butterfly valve to allow throttling of the extracted gas. The perimeter collection header forms a continuous loop around the landfill property and terminates at the landfill gas management compound located along the western property boundary, adjacent to the main entrance gate. The ends of the perimeter collection header



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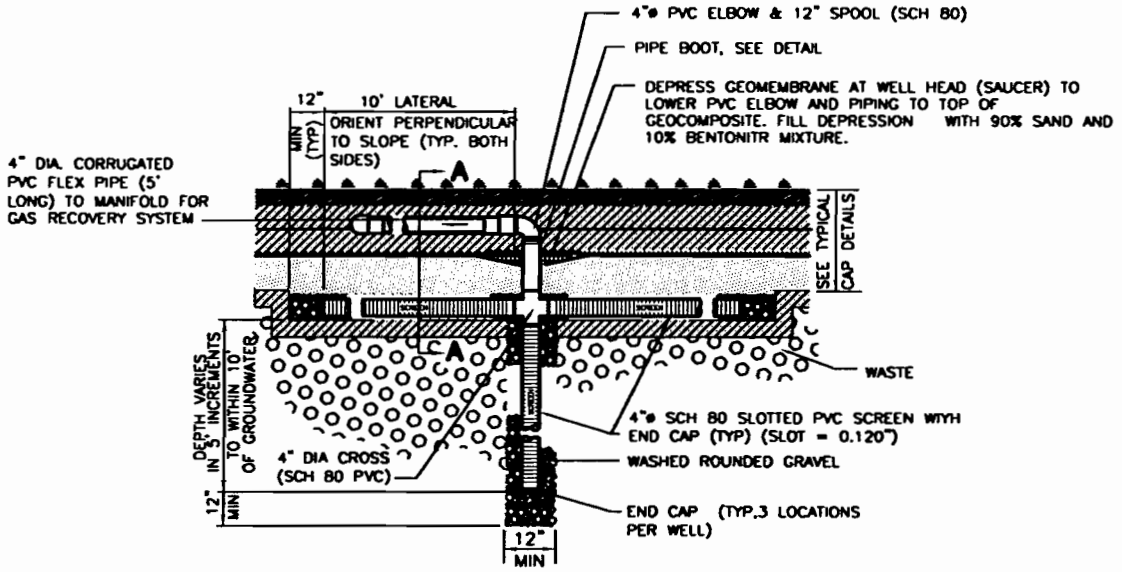

ELEVATION

N.T.S.

TOWN OF ISLIP
SONIA ROAD LANDFILL
LANDFILL GAS CONDENSATE MANAGEMENT

LANDFILL GAS RECOVERY WELL

FIGURE 2-2

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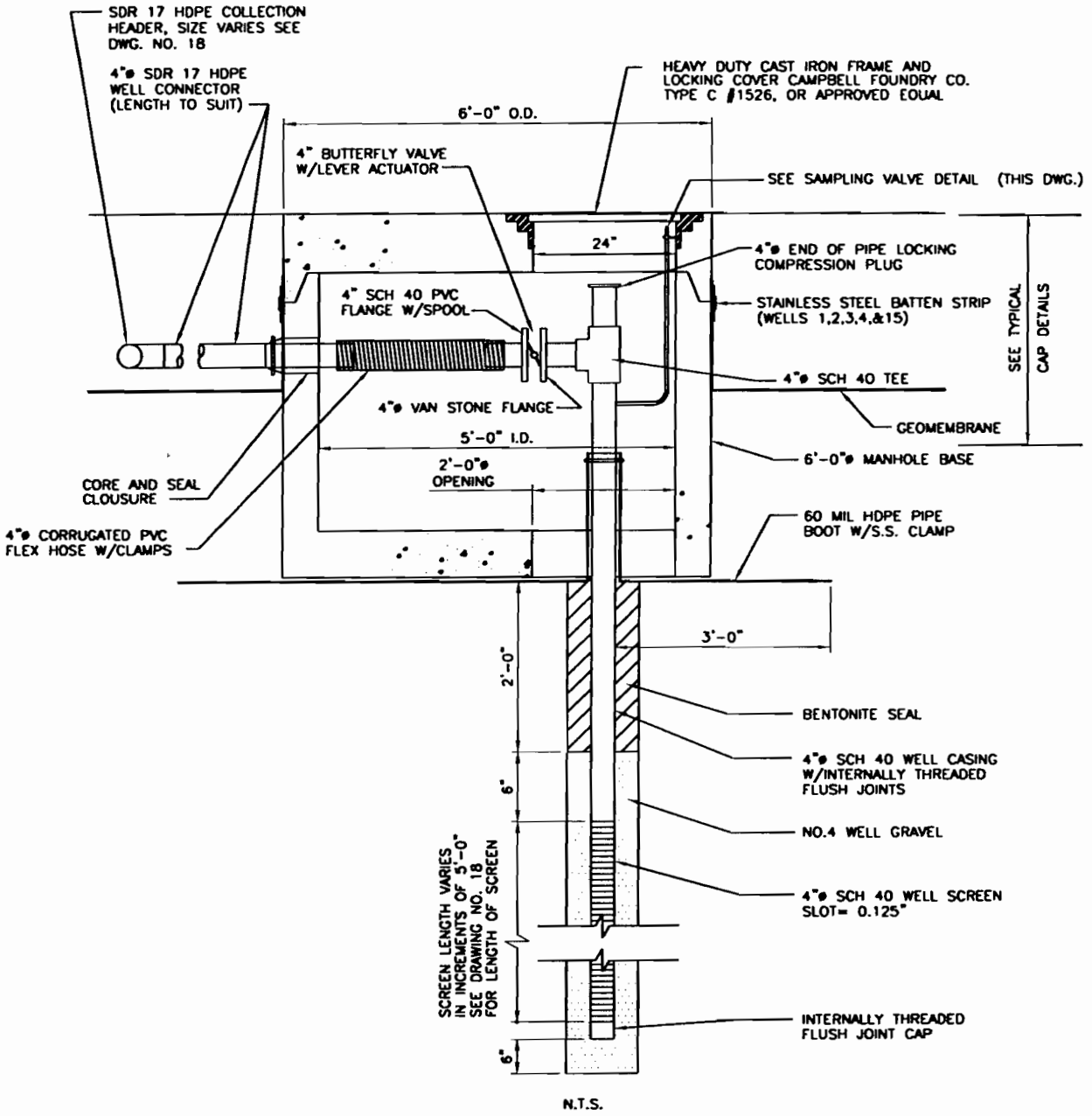
TUE, AUG 07, 2001 02:58 P AWK F:\1594\1594-L.F.G FIG. 2-2.DWG



TOWN OF ISLIP
SONIA ROAD LANDFILL
LANDFILL GAS CONDENSATE MANAGEMENT

LANDFILL GAS COLLECTION WELL

FIGURE 2-3

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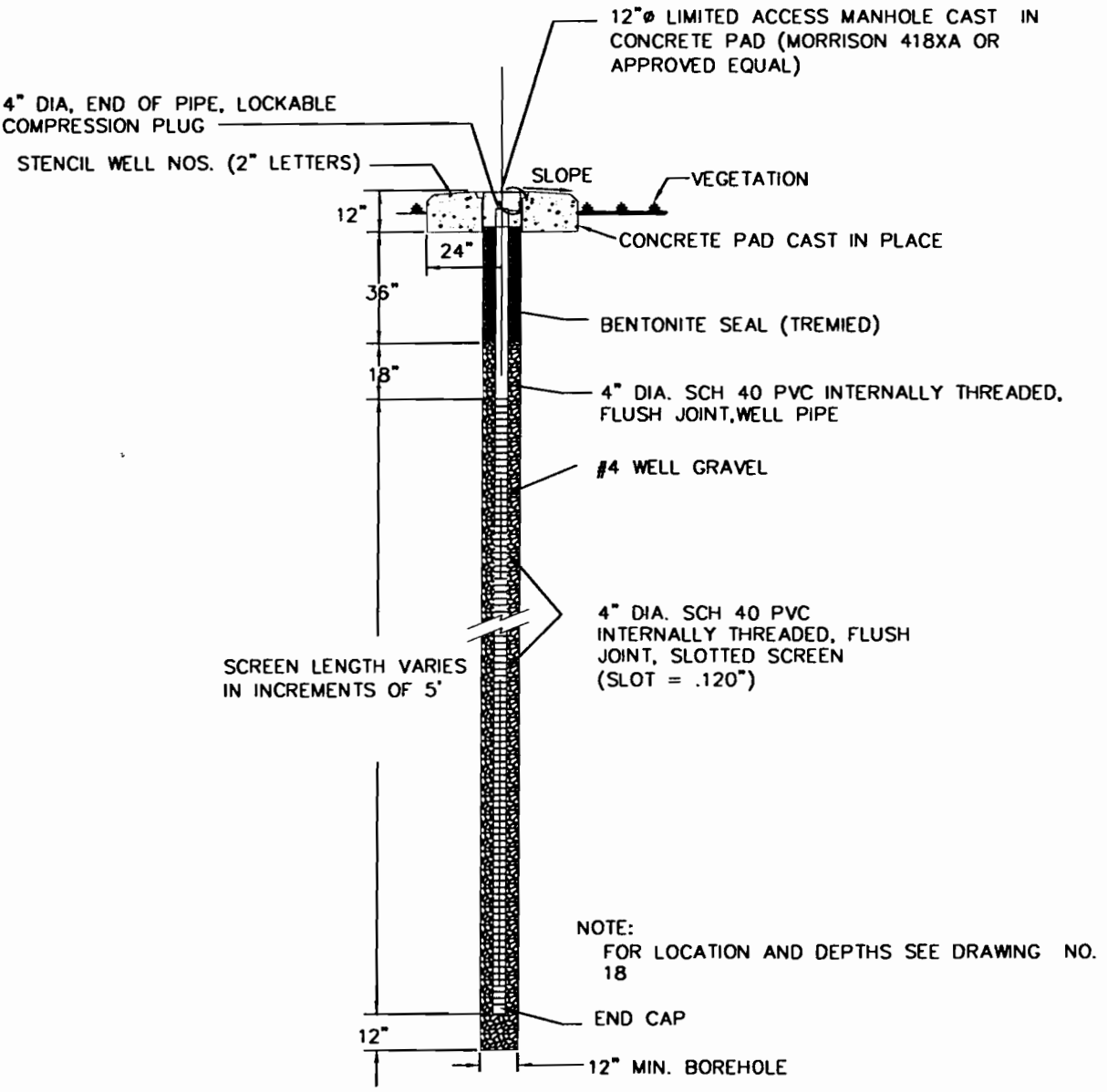
TUE, AUG 07, 2001 03:00 P AWK F:\1594\1594-L.F.G FIG. 2-3.DWG



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TOWN OF ISLIP
SONIA ROAD LANDFILL

LANDFILL GAS MONITORING WELL

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FIGURE 2-4

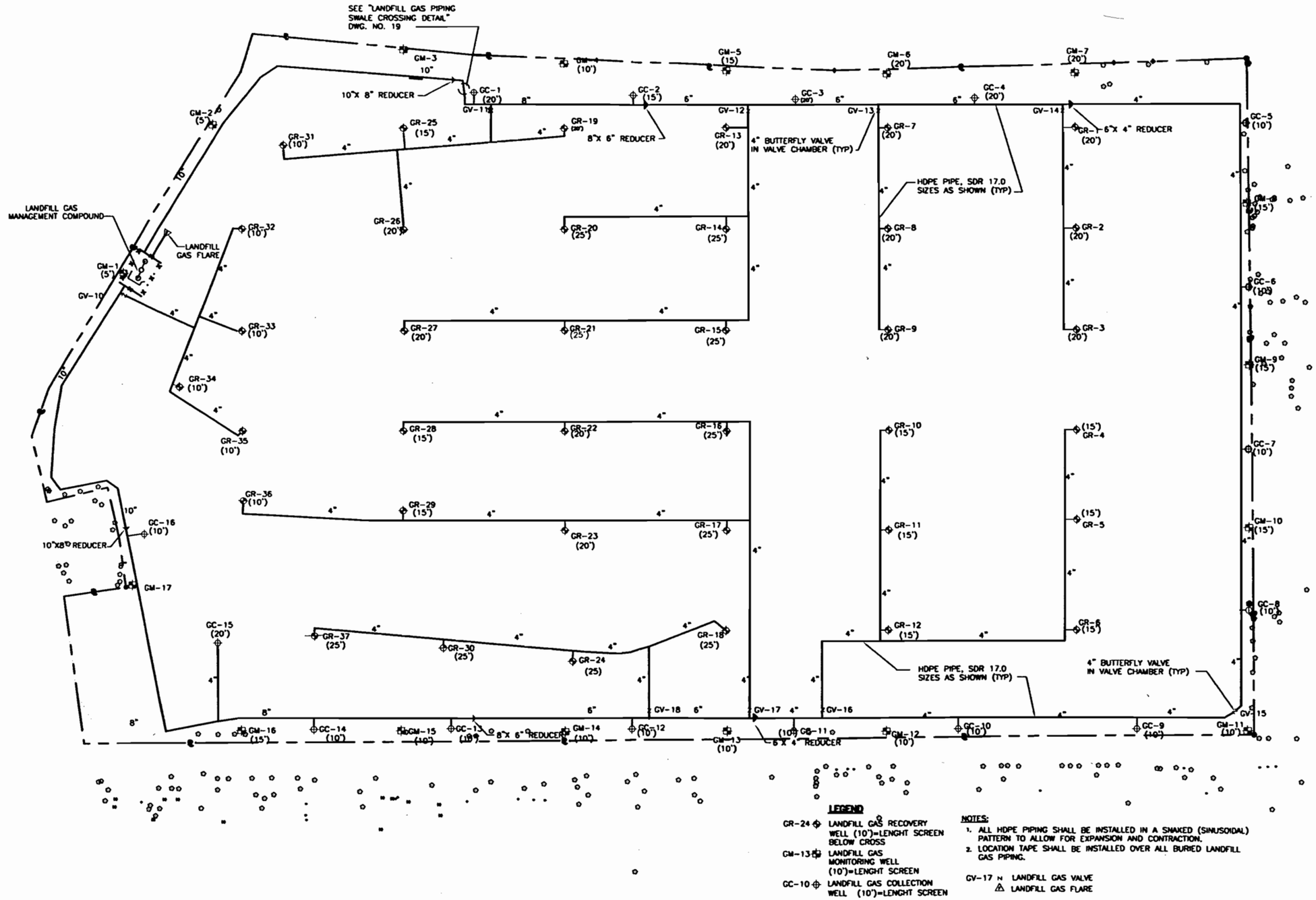
TUE, AUG 07, 2001 03:02 P AWK F:\1594\1594-L.F.G FIG. 2-4.DWG

connect to a blower skid. One end of the collection header is identified as the "Northern Landfill Gas Collection Header" and the other end is identified as the "Southern Landfill Gas Collection Header." The perimeter collection header varies in size from 4-inch HDPE at the southeast corner of the property, where a 4-inch butterfly valve separates the northern and southern halves, and increase in size up to 10-inch HDPE piping as the header approaches the landfill gas management compound. The layout of the recovery wells, collection wells, monitoring wells and collection headers is shown on Figure 2-5.

The landfill gas management compound consists of a blower skid, an elevated (utility) flare and associated electrical controls and appurtenances. The blower skid is a prefabricated skid consisting of two water separators, two rotary lobe positive displacement blowers, discharge silencers and related piping, valves, fittings and appurtenances. The discharge from the blower skid is directed to the elevated flare for flaring or venting, as conditions may warrant. The landfill gas management compound is shown on Figure 2-6.

The two blowers operate as vacuum blowers and induce the extraction of landfill gas from the landfill gas recovery wells (manifolds) and the landfill gas collection wells. The blower associated with the North Collection System is rated at 1,250 inlet cubic feet per minute (ICFM). The blower associated with the South Collection System is rated at 1,020 ICFM. The blower skid piping and valving allows for each blower to be dedicated to one half (north or south) of the collection system, or for either blower to operate both halves of the collection system simultaneously. Each blower is fitted with bypass piping and a 4-inch butterfly, throttling valve to allow for adjustment of the induced flow and vacuum imparted by the blower.

The suction side of each blower is fitted with a centrifugal water separator to remove free liquid from the gas stream prior to entering the blower. This liquid originates as water vapor or free liquid entrained in the landfill gas at the point of extraction (wellheads). For the purpose of this discussion, the landfill gas is considered to be saturated with water vapor and may include some free liquid (water droplets) as it is withdrawn from the waste mass or surrounding buffer zones. As the gas is transported through the collection headers, the water vapor may condense to form free liquid which is entrained in the gas stream. This condensed free liquid is termed



LEGEND

GR-24 ⊕ LANDFILL GAS RECOVERY WELL (10')=LENGHT SCREEN BELOW CROSS

GM-13 ⊕ LANDFILL GAS MONITORING WELL (10')=LENGHT SCREEN

GC-10 ⊕ LANDFILL GAS COLLECTION WELL (10')=LENGHT SCREEN

NOTES:

1. ALL HDPE PIPING SHALL BE INSTALLED IN A SNAKED (SINUSOIDAL) PATTERN TO ALLOW FOR EXPANSION AND CONTRACTION.
2. LOCATION TAPE SHALL BE INSTALLED OVER ALL BURIED LANDFILL GAS PIPING.

GV-17 ⋈ LANDFILL GAS VALVE

⚠ LANDFILL GAS FLARE

TUE, AUG 07, 2001 02:48 P AWK F:\1594ii\1594-LFG-FIG. 2-5.DWG X-REFS. 1594-19.DWG

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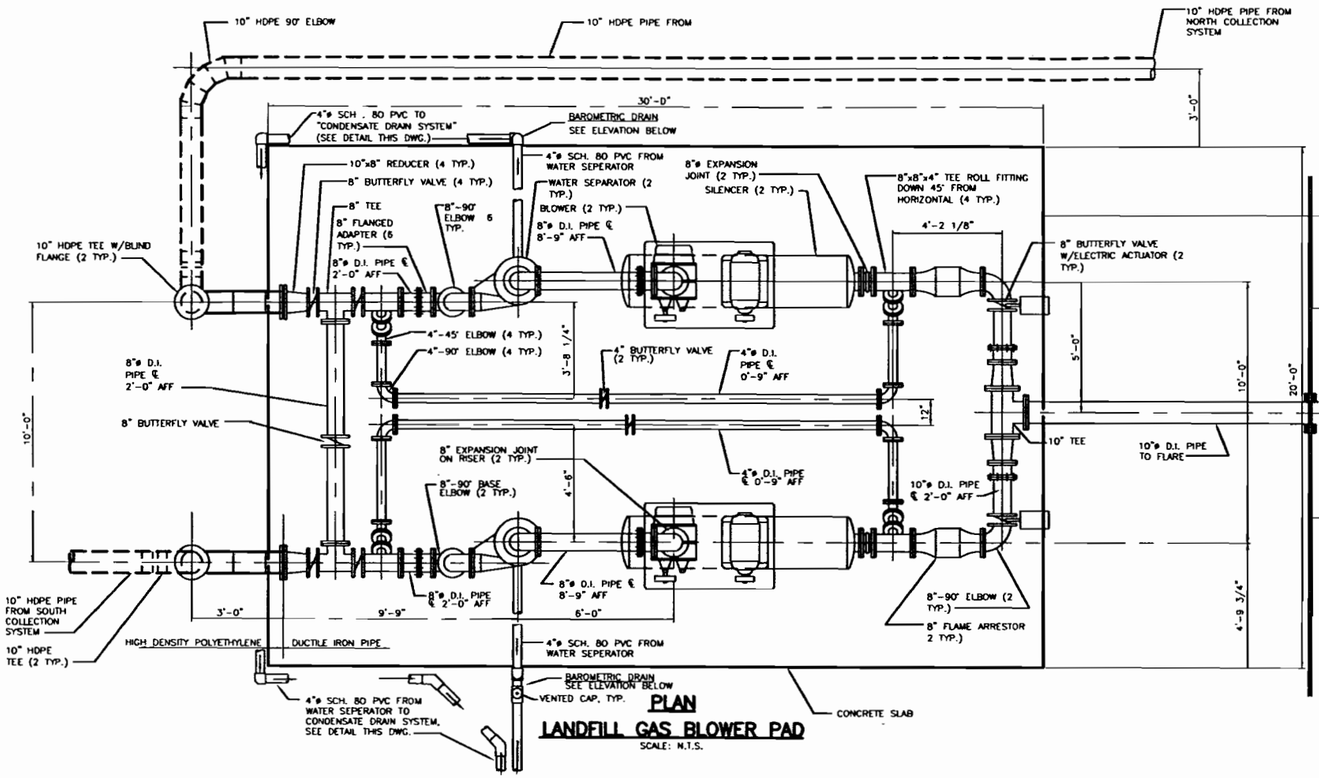
TOWN OF ISLIP
SONIA ROAD LANDFILL

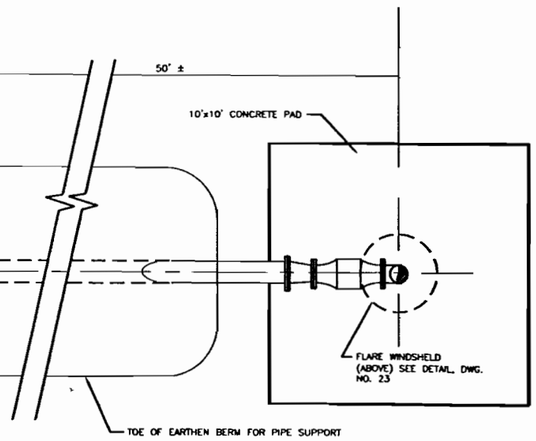
LANDFILL GAS CONDENSATE MANAGEMENT
LANDFILL GAS COLLECTION SYSTEM

FIGURE 2-5

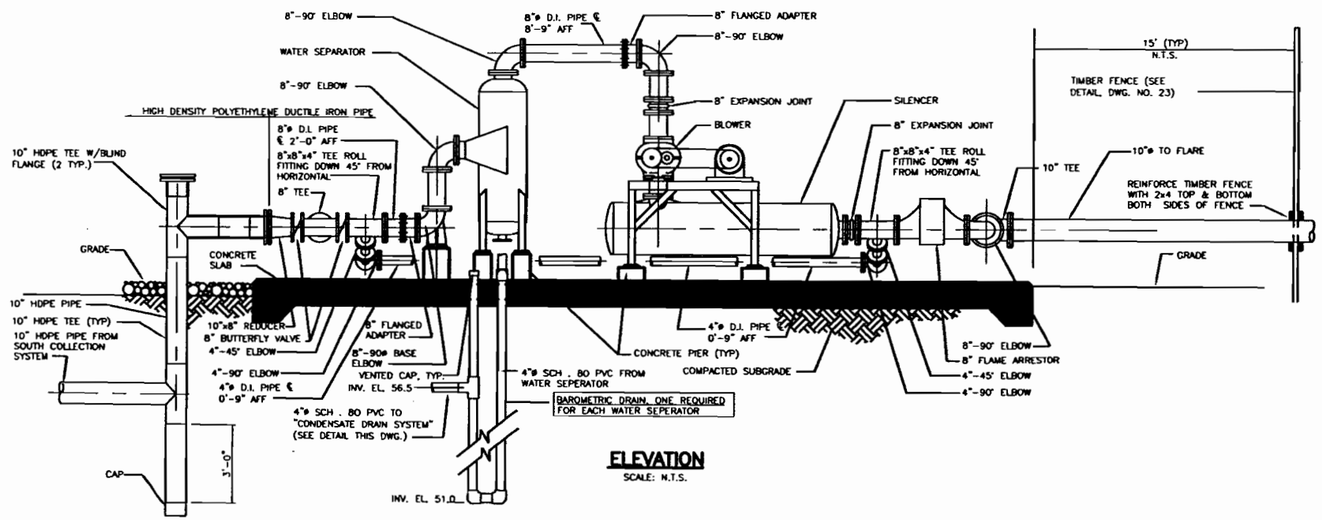


PLAN
LANDFILL GAS BLOWER PAD
SCALE: N.T.S.

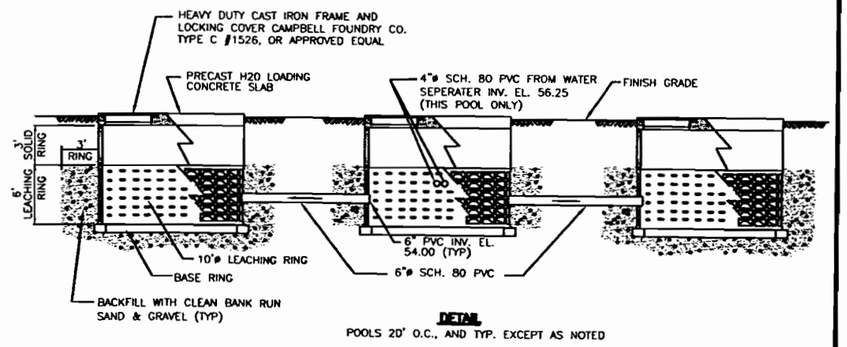
NOTE : BLOWERS, PIPING, VALVES AND APPURTENANCES ARE SKID MOUNTED. DIMENSIONS VARY FROM THOSE SHOWN



PLAN
LANDFILL GAS FLARE PAD
SCALE: N.T.S.



ELEVATION
SCALE: N.T.S.



DETAIL
POOLS 20' O.C., AND TYP. EXCEPT AS NOTED

CONDENSATE DRAIN SYSTEM
N.T.S.

TUE, AUG 07, 2001 03:06 P AWK F:\1594\1594-FIG-2-6.DWG

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TOWN OF ISLIP
SONIA ROAD LANDFILL
LAUNDNDFILL GAS CONDENSATE MANAGEMENT
LANDFILL GAS MANAGEMENT COMPOUND

FIGURE 2-6

landfill gas condensate. The function of the water separator is to remove the free liquid from the gas stream to avoid introducing it to the blower.

The installed water separators function as centrifugal separators. Inlet gas enters the vertical cylinder on a tangent causing the gas to swirl around the cylinder. The free liquid in the gas coalesces on the interior of the shell and drains down to the water outlet fitting. Dewatered gas exits the vessel from the top and feeds the blower section.

The liquid which is captured by each water separator passes through a barometric drain. The barometric drain serves as a break between the vacuum conditions which prevail in the landfill gas piping system and atmospheric pressure. The barometric drain is arranged in the form of a U tube manometer with system vacuum conditions on the leg connected to the water separator and atmospheric conditions on the remaining leg. The atmospheric leg of the assembly allows condensate to drain by gravity to a series of three 10-foot diameter leaching rings.

The three leaching rings were originally intended to be installed in the waste mass to allow the condensate to be discharged to the waste mass. During the construction of the landfill capping system and the landfill gas management system, the leaching rings were relocated and installed within the confines of the landfill gas management compound. The installed location of the leaching rings places them on the periphery of the waste mass. Landfill gas condensate is the only material which discharges to these leaching rings.

The suitability of the continued discharge of the landfill gas condensate to the leaching rings is the subject of this report.

It should be noted that, during the construction of the landfill capping system and landfill gas management system, a design change was implemented in the area of Recharge Basin No. 2 which necessitated the installation of an additional barometric drain and leaching ring assembly. The design drawings depicted the alignment of the site perimeter road and landfill gas collection header to occur on the outboard side of Recharge Basin No. 2. During construction, a design change was initiated to realign the perimeter road and landfill gas collection header to the

inboard side of the recharge basin. This realignment resulted in the formation of a low point in the landfill gas collection header in the vicinity of the southeast corner of the recharge basin. In order to address the potential for condensate to accumulate in the low point and possibly block the internal diameter of the pipe, a drain connection was installed. This drain connection consists of a tee fitting in the collection header pipeline and allows accumulated condensate to drain to a barometric drain and associated leaching ring. This drain connection is strictly intended to address an operational issue and no mechanism, such as a water separator, is in place to precipitate the capture and disposal of condensate at this location. This drain connection is intended as a safeguard to facilitate the operation of the system and any discharge of condensate should be minimal. This drain connection is not the subject of this report.

As noted previously, NYSDEC has requested that the landfill gas condensate generated at the landfill gas management compound be considered for its suitability for on-site discharge. In order to make this assessment, the quantity and quality of the landfill gas condensate must be established.

Section 3

3.0 LANDFILL GAS CONDENSATE GENERATION

As noted in Section 2, landfill gas condensate is generated as a product of the withdrawal of landfill gas from the waste mass and the surrounding buffer zones. Landfill gas, by its nature, is considered a wet gas saturated with water vapor and may also include free liquid in the form of droplets. Landfill gas condensate is only generated when active withdrawal of landfill gas is occurring (i.e., when the blowers are operating). In general terms, the condensate originates as water contained within the waste mass due to the initial water content of the waste, precipitation and water generated as a byproduct from the decomposition of the waste. Given the age of the waste mass (20+ years), the initial water content of the waste should have little bearing at this time. In addition, the completed installation of the landfill capping system should preclude the introduction of additional precipitation to the waste mass. Therefore, over time, the waste mass will tend to become less wet and produce diminishing quantities of landfill gas condensate. However, it is difficult to quantify when and how much of a reduction in condensate generation will be realized.

The Sonia Road Landfill Gas Management System was placed in operation in the Summer of 2000. The operating history of this facility indicates that methane is still being produced by portions of the landfill but not in sufficient quantity to sustain a flame on a continuous basis. At the time of startup, it appeared that a steady supply of methane existed and the flare could be operated for several hours. However, as time progressed, the ability to sustain a flame diminished. Through the Fall of 2000, the system was operated on a time clock basis whereby the system would attempt to automatically operate for 2 hours out of every 24-hour day. Over time, this method of operation became more difficult as the concentrations of methane extracted from the landfill continued to decline to levels which could not reliably support combustion for the intended hours of operation. In the automatic mode, the system will interrupt its operation if a flame cannot be detected or sustained. These conditions resulted in abbreviated operating events less than that intended. In the case where initial ignition could not be realized, the net effect was that there was no operation of the system on that day, and therefore, no extraction of landfill gas.

With the onset of winter conditions, the system was placed in manual, continuous operation with venting of the landfill gas. This approach was necessary to: overcome the abbreviated operating events in automatic operation; adequately address the off-site migration of landfill gas; and prevent freezing of the system equipment.

The operating history of the landfill gas management system indicates that the system must be operated in order to control the off-site migration of landfill gas. If the system is not operated, landfill gas will migrate in sufficient concentrations to create an issue at the property boundaries. However, the active withdrawal of landfill gas necessary to control off-site migration yields a composition of landfill gas which is either marginally combustible or insufficient to support combustion. The net result is that the system must be operated in order to protect the safety and welfare of the public either with or without the presence of a flame. The hours of operation may vary from a few hours per day to continuous, round the clock operation as conditions may dictate. The quantity of landfill gas condensate to be managed is directly related to the hours of operation of the system.

In an effort to quantify the volume of landfill gas condensate which is generated by the landfill gas management system, a series of field tests were conducted in March and April 2001. These tests involved the installation of a temporary tank into one of the leaching rings in the existing condensate disposal system. Temporary piping was installed to direct the discharge from the two barometric drains into the tank rather than the leaching ring. The details of this temporary arrangement are provided in Appendix B. The temporary tank served as a closed vessel to allow the volume of condensate generated to be measured against time.

Testing was performed from March 8 through April 23 and involved the operation of both landfill gas blowers on a 24-hour per day, 7 days per week basis. At the start of testing, the bypass valves for each blower were partially open. This partial recirculation of flow from the blower discharge to the blower suction equated to a throttling of the flow and vacuum imposed on the system. In order to demonstrate worst case conditions, the bypass valves were closed on March 19, 2001, to create the maximum landfill gas extraction rates.

During the performance of the test, the accumulated depth of condensate in the tank was measured with a graduated rod and an equivalent volume was calculated. The date and time of each measurement was also recorded to allow for calculation of the elapsed time. The tank contents were emptied as necessary to allow the testing to proceed. The calculation of the landfill gas condensate generation rates is presented in Appendix C.

The results of this testing indicate that a relatively steady state of condensate generation was observed under the temperature conditions prevailing at the time of the test. In general, the average landfill gas condensate generation rate was calculated to be 3.3 gallons per hour (gph) with variations as high as 12.5 gph and as low as 1.9 gph.

Over the course of a year, the rate of landfill gas condensate generation should vary in response to ambient temperatures and precipitation patterns. During the colder months, the disparity in the temperature of the extracted landfill gas and the ambient temperature will be greatest, resulting in the greatest degree of cooling in the pipelines, and therefore, the greatest degree of liquid formation due to condensation of the water vapor. In the case of the Sonia Road landfill, the temperature of the extracted landfill gas has been measured at approximately 70°F, substantially lower than landfills which are more active producers of methane, and presents lower extremes for condensation due to cooling.

In light of the installation of the landfill capping system, the Sonia Road landfill should be less susceptible to variations in condensate generation rates due to precipitation than an uncapped facility would be. All 37 landfill gas recovery wells are well within the footprint of the capping system and should not be significantly influenced by precipitation. The 16 landfill gas collection wells are closer to the perimeter of the capping system and are more susceptible to variations in the soil moisture content of areas beyond the capping system (on-site and off-site) where precipitation may percolate into the soils. This percolated precipitation may be drawn into the wells as part of the extraction of soil gases and contribute to the quantity of condensate generated.

For the purpose of this discussion, the calculated generation rate of 3.3 gph should be considered as a benchmark rate of generation. Extrapolating this rate over an entire year of round the clock operation would yield approximately 29,000 gallons of condensate. As discussed previously, round the clock operation of both blowers is not necessary to address the migration of landfill gas from the site, and consequently, the actual quantity of condensate should be less than this calculated quantity. The rate of condensate generation will vary seasonally.

Section 4

4.0 LANDFILL GAS CONDENSATE CHARACTERISTICS

Landfill gas condensate is predominantly condensed water vapor inherent to the extracted landfill gas or entrained free liquid which is transported through the landfill gas management system by the velocity of the gas stream. Since the origin of the landfill gas is the waste mass, the landfill gas and the condensate generated from it may contain contaminants.

In order to assess the characteristics of the landfill gas condensate, a sampling protocol was prepared to address the collection of samples from each of the two barometric drains and the required analyses of the samples. A copy of the sampling protocol is on file with the NYSDEC and a copy is attached as Appendix D.

The proposed sampling protocol provided for four rounds of sampling to gauge the variability of the landfill gas condensate. Two rounds of sampling have been performed with the first occurring on December 4, 2000, and the second round occurring on February 8, 2001. At the time of each sampling, the landfill gas management system was operating on a round-the-clock basis. After the performance of the first two rounds of sampling, it was determined that a third and fourth round of sampling would be redundant and a decision was made to forego these two sampling events.

Each sampling event involved the collection of baled samples from the barometric drain associated with the North Landfill Gas Collection System and the barometric drain associated with the South Landfill Gas Collection System. At the time of sampling, the 4-inch butterfly valve (GV-15) located in the southeast corner of the landfill was in the closed position allowing the north and south collection systems to operate independent of each other.

Each sample was analyzed for the Expanded Parameters list of analytes as defined by 6 NYCRR Part 360-2.11. The Expanded Parameters list was selected in order to provide a reasonable level of comparison of analytes to the requirements of 6 NYCRR Part 703.6 - Groundwater Effluent Limitations for Discharges to Class GA Waters. The regulations of

6 NYCRR Part 703.6 are considered the most appropriate for this application given that the current method of disposal (leaching rings) results in a discharge to the groundwater system.

The results from the two rounds of sampling are presented in Appendix E. A summary of the exceedances of the Class GA Groundwater Standards and/or 6 NYCRR Part 703.6 is presented in Table 4-1.

A review of the analytical results indicates that the landfill gas condensate exceeds the Effluent Limitations for Discharge to Class GA Groundwaters for select volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), pesticides, metals and leachate indicators. On the basis of these exceedances, the landfill gas condensate is not suitable for the continued discharge to the groundwater system via the leaching rings.

Table 4 - 1

ISLIP RESOURCE RECOVERY AGENCY
SONIA ROAD LANDFILL
LANDFILL GAS CONDENSATE
CONDENSATE EXCEEDANCES OF CLASS GA STANDARDS AND/OR
6NYCRR PART 703.6 EFFLUENT LIMITATIONS TO CLASS GA WATERS

CONSTITUENT	CLASS GA GROUND-WATER EFFLUENT LIMITATIONS *	UNITS	NORTH COLLECTION SYSTEM 12/04/2000	NORTH COLLECTION SYSTEM 02/08/2001	SOUTH COLLECTION SYSTEM 12/04/2000	SOUTH COLLECTION SYSTEM 02/08/2001
LEACHATE PARAMETERS:						
Phenols, total	0.002	(mg/l)	0.1	0.012	1.4	0.16
Total Kjeldahl Nitrogen (as N)	10**	(mg/l)	2.6	13.6	16	21.4
VOLATILE ORGANIC COMPOUNDS:						
Chloroethane	5	(ug/l)	17	13	5 U	5 U
Methylene chloride	5	(ug/l)	5 U	5 U	5 U	19 B
1,1-Dichloroethane	5	(ug/l)	7	11	5 U	5 U
Benzene	1.0	(ug/l)	3 J	1.6 J	3 J	5 U
4-Methyl-2-pentanone	5	(ug/l)	8	5 U	6	5 U
Chlorobenzene	5	(ug/l)	7	5.3 J	5 U	5 U
Xylene (total)	5	(ug/l)	23	5 U	6	6
SEMI-VOLATILE ORGANIC COMPOUNDS:						
Phenol	1	(ug/l)	18	10 U	240 D	30 J
2-Methylphenol	1	(ug/l)	10 U	10 U	4 J	100 U
4-Methylphenol	1	(ug/l)	3 J	10 U	1	200 U
Naphthalene	10	(ug/l)	11	10 U	10	88 J
Acenaphthene	20	(ug/l)	16	10 U	29	220
Fluorene	50	(ug/l)	19	10 U	32	270
Phenanthrene	50	(ug/l)	79	2.5 J	98 JD	780
Anthracene	50	(ug/l)	18	10 U	24	360
Fluoranthene	50	(ug/l)	67	17	47	660
Pyrene	50	(ug/l)	44	13	36	600
Benzo(a)anthracene	0.002	(ug/l)	25	8.8 J	11	530
Chrysene	0.002	(ug/l)	24	7.2 J	11	430
Bis(2-ethylhexyl)phthalate	5	(ug/l)	10 U	3.5 J	10 U	46 J
Benzo(b)fluoranthene	0.002	(ug/l)	16	3.9 J	6 J	250
Benzo(k)fluoranthene	0.002	(ug/l)	12	5.5 J	5 J	300
Benzo(a)pyrene	0	(ug/l)	18	4.8 J	8 J	210
Indeno(1,2,3-cd)pyrene	0.002	(ug/l)	11	3.1 J	4 J	210

Table 4 - 1

ISLIP RESOURCE RECOVERY AGENCY
SONIA ROAD LANDFILL
LANDFILL GAS CONDENSATE
CONDENSATE EXCEEDANCES OF CLASS GA STANDARDS AND/OR
6NYCRR PART 703.6 EFFLUENT LIMITATIONS TO CLASS GA WATERS

CONSTITUENT	CLASS GA GROUND-WATER EFFLUENT LIMITATIONS *	UNITS	NORTH COLLECTION SYSTEM 12/04/2000	NORTH COLLECTION SYSTEM 02/08/2001	SOUTH COLLECTION SYSTEM 12/04/2000	SOUTH COLLECTION SYSTEM 02/08/2001
DISSOLVED METALS (FILTERED):						
Boron (Dissolved)	1000	(ug/l)	260	49.8 B	6140	
Iron (Dissolved)	600**	(ug/l)	4490	1040	5370	
Manganese (Dissolved)	600**	(ug/l)	972	65	772	
METALS (UNFILTERED):						
Boron	1000	(ug/l)	261	53.0 J	6340	140 J
Iron	600**	(ug/l)	4310	960	4270	5100
Manganese	600**	(ug/l)	932	63.0	789	140
Zinc	5000	(ug/l)	715	130	4740	6200
PESTICIDES AND PCBs:						
beta-BHC	0	(ug/l)	0.05 U	0.05 U	0.029JP	0.05 U
delta-BHC	0	(ug/l)	0.05 U	0.05 U	0.039 JP	0.05 U
gamma-BHC (Lindane)	0	(ug/l)	0.05 U	0.0083 J	0.05 U	0.05 U
Aldrin	0	(ug/l)	0.05 U	0.05 U	0.05 U	0.024 J
Dieldrin	0.004	(ug/l)	0.1 U	0.028 J	0.1 U	0.14
Endrin	0	(ug/l)	0.1 U	0.1 U	0.1 U	0.54
Aroclor 1016	0.1	(ug/l)	1 U	1 U	1 U	20 PEX

* 6NYCRR Part 703.6 Groundwater Effluent Limitations to Class GA Waters

** Effluent limitation for Nassau, Suffolk Counties

NA Not Analyzed

U Compound not detected

Concentration Exceeds Action Level

The following qualifier(s) exist: CLP Q: U, J

Section 5

5.0 LANDFILL GAS CONDENSATE MANAGEMENT OPTIONS

As noted in Section 4, the quality of the landfill gas condensate exceeds the allowable levels of select contaminants to allow for continued discharge to the groundwater system. As such, the existing method of disposal via the leaching rings will have to be replaced by a system which provides for off-site disposal at a wastewater treatment facility. Given the relatively small quantity of condensate generated and the fact that the site is unmanned, on-site treatment and disposal will not be considered.

The available options for off-site disposal include:

- Discharge to a public sewer system
- On-site storage, transport via tanker truck and disposal at a wastewater treatment facility.

5.1 Discharge to a Public Sewer System

The Sonia Road Landfill is outside the boundaries of the Suffolk County Southwest Sewer District. The area surrounding the Sonia Road Landfill is not sewered. Area residential properties dispose of their sanitary wastes by on-site disposal systems (e.g., cesspools, septic systems).

The New York State owned and operated Pilgrim State Psychiatric Hospital is located approximately 2.5 miles to the north of the Sonia Road Landfill. The Pilgrim State facility is connected to the Southwest Sewer District by means of a 12-inch diameter force main which is installed in Corbin Avenue and passes directly across the main gate to the Sonia Road Landfill. The terminal manhole for this force main is located approximately 2.5 miles to the south of the Sonia Road Landfill in the vicinity of the Southern State Parkway. The distance to the existing gravity sewer makes the construction of a dedicated force main from the Sonia Road Landfill to the terminal manhole impractical.

Discussions with the Suffolk County Department of Public Works (SCDPW) indicate that a connection to the Pilgrim State force main in the vicinity of the Sonia Road Landfill is a remote possibility with a number of complications. The force main is maintained by the SCDPW but is owned by the New York State Department of Mental Health and would require approvals from both agencies, and, in all likelihood, compensation to the New York State Department of Mental Health. More importantly, it is not common engineering practice to discharge to a sanitary force main. This approach is rarely pursued given the hydraulic competition which will exist between the two pump stations and the potential for the flow from the dominant pump station (Pilgrim State) to backflow into the lesser pump station (Sonia Road).

Interlocking of the two pump stations to allow only one to operate at a given time may be a necessity but is less desirable to the dominant pump station. In addition to these issues, other fees to purchase capacity in the system, non-District fees, annual user fees, industrial/hazardous waste charges and ad valorem charges will be required.

The SCDPW has indicated that pursuit of this method of disposal will be a lengthy process with no guarantee of a successful conclusion.

In light of the above, off-site disposal by discharge to a public sewer system will not be given further consideration.

5.2 On-site Storage with Off-site Disposal

The option for on-site storage with off-site disposal will require:

- A means to convey condensate from the water separator/barometric drain to a storage vessel.
- A storage vessel to allow for the accumulation and proper storage of condensate.
- A means to offload condensate from the storage vessel to a tanker truck for transport to a disposal facility.

- Controls, alarms and interlocks to properly manage the storage and offloading of condensate in accordance with prevailing regulations.

The on-site storage of landfill gas condensate must comply with the requirements of 6 NYCRR Part 360-6 Liquid Storage and the Suffolk County Sanitary Code – Article 12 Toxic and Hazardous Materials Storage and Handling Controls. By virtue of the fact that the landfill gas condensate exceeds the 6 NYCRR Part 703.6 effluent limitations for discharge to Class GA groundwater, the Suffolk County Sanitary Code considers the condensate to be a toxic material.

The nature of the on-site storage vessel will dictate the complexity of the overall on-site system. An underground storage tank which is set deep enough will allow condensate to flow by gravity from the barometric drains and avoid the need for pumping. An aboveground storage tank will require the installation of an intermediate pump station to receive gravity flow from the barometric drains and lift the liquid up to the aboveground storage tank. An aboveground storage tank and its associated pipes, valves, fittings and appurtenances is also more susceptible to difficulties associated with freezing when compared to an underground tank. Aboveground tanks are typically available in steel construction and would require protective coating systems to resist corrosion and be compatible with the landfill gas condensate. Underground storage tanks can be obtained in steel or fiberglass construction with fiberglass providing a more favorable material for corrosion resistance and compatibility with the landfill gas condensate. Both aboveground and underground tanks are available in double wall construction to allow for secondary containment and leak detection.

The regulations of 6 NYCRR Part 360-6 and Suffolk County Sanitary Code Article 12 provide for the use of either aboveground or underground tanks. However, it must be noted that 6 NYCRR Part 360-6.4(a) stipulates that an underground tank must be installed a minimum of 2 feet above the seasonally high groundwater table. In the case of the Sonia Road Landfill, compliance with this requirement would essentially preclude the installation of an underground tank. For discussion purposes, the groundwater table in the area of the site is estimated to be elevation 50. The slab elevation of the blower pad is approximately elevation 58.25 and the invert elevation of the two 4-inch diameter outlets from the barometric drains is approximately

56.50. The vertical distance between the barometric drain outlets and the groundwater table is only 6.50 feet. If the 2-foot separation between the tank and the water table is applied, along with allowances for piping geometry, an underground tank would be limited to a diameter of 2 to 3 feet and would be impractical.

The installation of underground tanks within the water table or perched water is routinely performed with appropriate detailing to address the buoyant forces generated by the submergence of the tank. The use of a double-walled underground tank with interstitial monitoring should alleviate any issues associated with the tank being situated in the groundwater and the potential threat to the groundwater. The restriction imposed by 6 NYCRR Part 360-6.4(a) is unique to underground tank installations at solid waste management facilities and is not duplicated by other state or local regulations which govern the storage of chemical or petroleum products.

Telephone discussions with Mr. Robert Phaneuf, P.E. (NYSDEC – Albany – Division of Solid and Hazardous Materials) indicate that the restriction to placement of an underground tank in the groundwater could be waived and satisfied by proper engineering controls. In support of this approach, Mr. Phaneuf pointed out that NYSDEC has adjusted its position to consider the construction of the bottom of double-lined landfills in the groundwater table when proper engineering controls are implemented (6 NYCRR Part 360-2.13[d]).

In the case of the Sonia Road Landfill, the use of an underground storage tank for the accumulation and storage of landfill gas condensate offers several advantages.

- The area in and around the existing landfill gas management system compound is very limited given its proximity to the site main gate, Recharge Basin 1 and the fact that the footprint of the capped and closed waste mass leaves little buffer area between the limits of the cap and the property boundaries.
- An underground tank can more readily accommodate the sloping topography in the area of the landfill gas management compound.
- An underground tank can receive flow by gravity from the barometric drains and avoid the need for a pumping station.

- An underground tank will provide less potential for spills during the transfer of the tank contents to a tanker truck. The tanker truck will be filled using vacuum from the truck. Any liquid which remains in the piping and hosing when filling is complete can drain back into the underground tank. In the case of an aboveground tank, this liquid would have to be repumped into the tank.

- An underground tank and piping is less susceptible to freezing. An aboveground tank and its associated piping would require heat tracing and insulation.

- An underground tank should be more cost effective given the opportunity to avoid the construction of an intermediate pump station and its associated electrical systems and controls. The avoidance of an intermediate pump station will also simplify the overall control and alarm schemes for the condensate management system.

- The use of an underground tank will allow for truck filling directly from the storage tank and avoid the need for a truck fill station.

On the basis of these advantages, an underground storage tank will be considered as the preferred approach on the presumption that the tank can be installed in or partially in the groundwater and satisfy the intent of the regulations of 6 NYCRR Part 360-6.

The sizing of a storage tank must be coordinated with the rate at which condensate is generated and also accommodate the mechanics of removing the condensate by tanker truck for off-site disposal. As noted in Section 3, the average rate of condensate generation was measured as 3.3 gallons per hour of operation during a period of continuous operation. Intermittent operation of the landfill gas collection system may cause this rate to deviate up or down. Assuming the system is operated around the clock, the average rate of 3.3 gph equates to approximately 80 gallons per day, 7 days per week. Given that the rate of condensate generation will vary seasonally in response to the temperature of the extracted gas, the ambient temperature and precipitation conditions, the rate of generation for design purposes should be multiplied by a peaking factor. In this case, a peaking factor of 2.5 is proposed to yield a peak generation rate of 200 gallons per day. This estimate should be appropriate for the Sonia Road Landfill given the age of the waste and the existence of the landfill capping system. This estimate is substantially below a rule of thumb for landfill gas systems where 1,200 to 1,400 gallons of condensate would be anticipated for each one million cubic feet of landfill gas processed. With both blowers operating around the clock, approximately 3,327,000 cubic feet of gas can be extracted from the

Sonia Road Landfill in a day. For a more active landfill, the rule of thumb for condensate generation would be more appropriate and would provide an estimated generation rate of 4,000 to 4,700 gallons per day.

The capacity of the storage tank should provide sufficient volume to allow for the routine scheduling of trucks to remove the condensate without approaching an overfill condition. In accordance with regulations, an overfill condition would necessitate that the source of the condensate be interrupted and, therefore, require that the landfill gas extraction be stopped by shutting down the blowers. The interruption of the landfill gas management system due to lack of condensate storage volume would not be an acceptable condition.

The removal of condensate from the Sonia Road Landfill will be performed by a tanker truck in much the same way that leachate is removed from other landfills, such as the Town of Islip Blydenburgh Road Landfill. Available tanker trucks can generically be categorized as fixed body trucks with a capacity on the order of 3,000 gallons or tractor-trailer arrangements with a capacity on the order of 7,000 gallons. The main gate area and area in the vicinity of the landfill gas management compound is too confined to allow the use of a tractor trailer and will limit this operation to a fixed body tank truck. As such, the storage capacity should provide for efficient use of the transport vehicle by allowing for full loads on the truck (i.e., 3,000 to 3,500 gallons). Good engineering practices suggests that the storage capacity should provide at least 150% of the vehicle capacity in order to make efficient use of the truck and accommodate scheduling difficulties due to weather, availability, etc. As such, the proposed storage tank should provide 5,000 to 6,000 gallons of on-site storage capacity or an equivalent of 25 to 30 days of operating volume at peak generation rates.

The Suffolk County Sanitary Code Article 12 stipulates that the truck loading station must be provided with a means to contain a spill. Typically, this would involve the construction of a concrete pad with curbs, a holding tank, a roof and a means to drain precipitation which has accumulated in the holding tank. For this application, the tanker truck can fill directly from the tank without the need for a remote fill station. Given that the tank truck will be filled by vacuum, the potential to spill is, for all practical purposes, limited to the contents of the hosing and truck

piping used to make the connection from the truck to the withdrawal piping of the underground tank. The permanent withdrawal piping from the underground tank will be contained in a watertight riser section and will only contain liquid when the truck applies a vacuum. This arrangement will place the fluid and piping under negative pressure and will not be capable of leaking outward. When the vacuum is removed, the liquid will drain back to the underground tank. In this way, single wall piping for the condensate withdrawal piping within the watertight riser should be sufficient. The Suffolk County Department of Health Services has indicated that the gravity drain piping from the barometric drains to the tank should be double walled piping.

Other requirements of the Suffolk County Sanitary Code Article 12 which apply to this facility include:

- The underground tank must be double walled.
- The interstitial space between the inner and outer tank must be monitored for leakage.
- The tank must be monitored for overfill protection and be provided with overfill alarms.
- The source of condensate must be interrupted in the event that an overfill condition exists.

Section 6

6.0 RECOMMENDATIONS

The landfill gas condensate generated at the Town of Islip Sonia Road Landfill as a byproduct of the landfill gas management system is not suitable for the continued discharge to the groundwater system. The landfill gas condensate is not suitable on the basis that its quality exceeds the effluent limitations for discharge to Class GA groundwaters as promulgated by 6 NYCRR Part 703.6.

Alternative methods of managing and disposing of the landfill gas condensate have been considered and the recommended approach is to provide on-site storage of the accumulated condensate with off-site disposal at a wastewater treatment plant. The Town of Islip currently disposes of landfill leachate generated at the Town of Islip Blydenburgh Road Landfill Complex at the Suffolk County Bergen Point Wastewater Treatment Plant. It is assumed that the Sonia Road landfill gas condensate can also be disposed of at the Bergen Point Wastewater Treatment Plant. The Bergen Point Wastewater Treatment Plant currently receives landfill leachate, which is delivered by tanker truck, at its Septage Handling facility. The proposed method to deliver the Sonia Road landfill gas condensate to the Bergen Point Wastewater Treatment Plant is also by tanker truck.

The landfill gas condensate will be stored in a double-walled fiberglass underground storage tank which will be installed to allow condensate to drain by gravity into the tank from the two barometric drains. The underground storage tank will be installed partially in the groundwater table and will be constructed to resist the buoyant forces associated with this installation. The detailed design will address whether deadmen or a complete slab below the tank is required for this purpose. The tank will be continuously monitored for leaks in the interstitial space between the two tanks as well as for overfill conditions. An overfill condition will cause the landfill gas blowers to stop operating, thereby, interrupting the generation of additional condensate. Alarms will be signaled on-site as well as by the activation of an auto-dialer to alert the appropriate Town personnel via telephone. Given that the site is unmanned, the tank monitoring system will also include a caution alarm to alert Town personnel that the tank is sufficiently full to allow the scheduling of a tank truck prior to an overfill condition.

The site geometry at the main gate of the Sonia Road Landfill and in the vicinity of the landfill gas management compound is not adequate to accommodate a tractor-trailer tanker truck. The area should be sufficient to accommodate a fixed body tanker truck with a capacity of 3,000 to 3,500 gallons. Truck loading will be performed directly from the underground tank. Truck loading will be performed under vacuum generated by the truck and will only require a hose connection from the truck to the tank.

The details of construction will be in compliance with 6 NYCRR Part 360-6 with the exception that the tank will be installed partially within the groundwater table. The details of construction will also be in accordance with the requirements of Suffolk County Sanitary Code Article 12. Approval of the final design by the Suffolk County Department of Health Services will be required.

A preliminary cost estimate for this work is included as Table 6-1. A preliminary layout for this installation is shown on Figure 6-1. A more detailed cost estimate will be prepared as part of the Final Design for this facility.

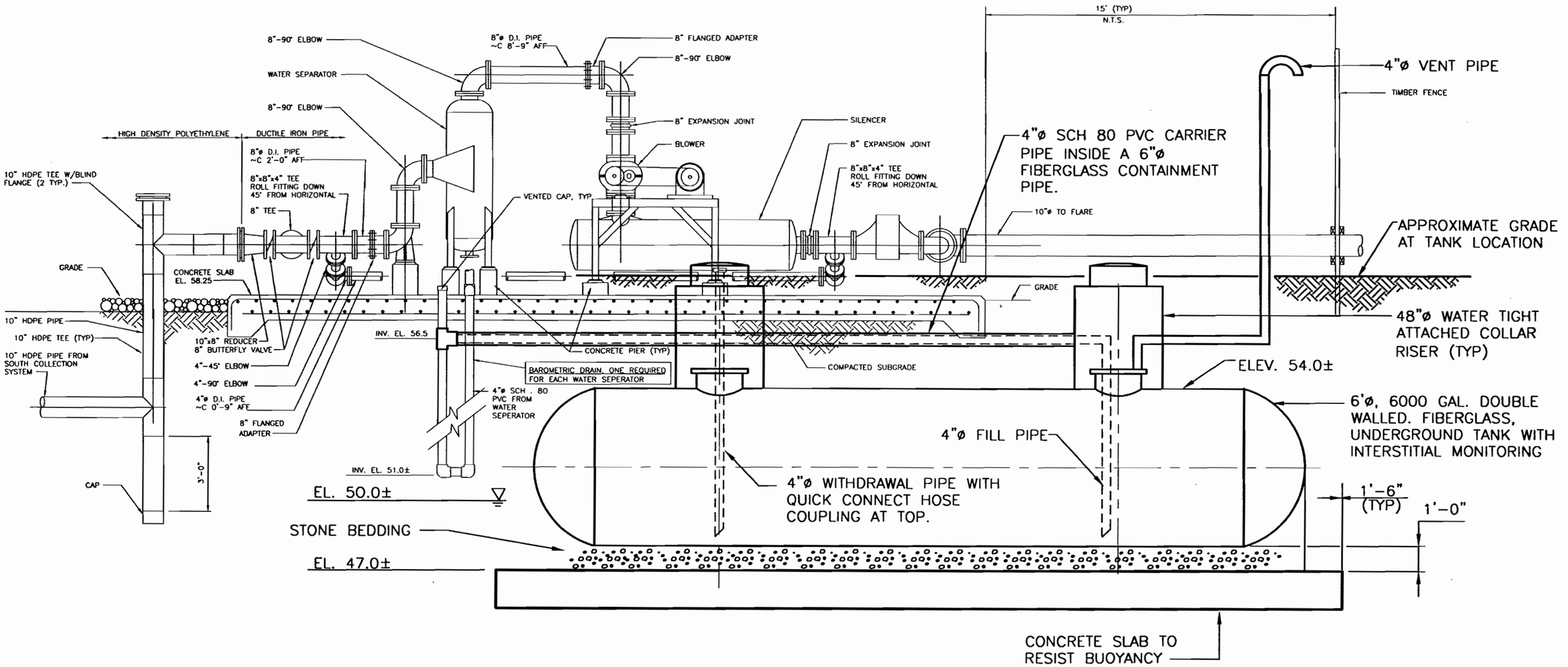
The design and construction of the proposed landfill gas condensate management system is an extension of the design and construction of the presumptive remedy landfill capping and landfill gas management systems. The intent of the existing on-site disposal system offered a least cost approach to condensate management if the quality of the condensate were found to be suitable. As noted in the NYSDEC correspondence of January 19, 1999, the NYSDEC design review found this approach to be acceptable if the quality of the condensate was found to be suitable for the continued use of the on-site disposal system. As noted above, the quality of the landfill gas condensate generated at the Sonia Road Landfill exceeds the effluent limitations for discharge to Class GA groundwater as defined by 6 NYCRR Part 703.6. Therefore, by extension of the NYSDEC review comments, the remedial design must now provide for the storage and off-site disposal of landfill gas condensate. Clearly, the design and construction of the proposed landfill gas condensate management system should be considered as an eligible cost associated with the site remediation and should qualify for EQBA funding.

Table 6-1

TOWN OF ISLIP
SONIA ROAD LANDFILL
LANDFILL GAS CONDENSATE MANAGEMENT

Cost Estimate

Mobilization/Demobilization	$15,000
Temporary Sheeting/Dewatering	40,000
Excavation	5,000
Underground Storage Tank	30,000
Pea Gravel/Backfill	10,500
Piping	10,000
Concrete	10,000
Electrical	15,000
Site Restoration	5,000
	$140,500



SCALE 1/4" = 1'-0'

TOWN OF ISLIP
SONIA ROAD LANDFILL
LANDFILL GAS CONDENSATE MANAGEMENT

PRELIMINARY LAYOUT

FIGURE 6-1

Dvirka and Bartilucci
CONSULTING ENGINEERS
A DIVISION OF WILLIAM F. COSULICH ASSOCIATES, P.C.

FRI, AUG 10, 2001 11:58 A JAV F:\15941I\1594-LFG-FIG-6-1.DWG

Appendix A

APPENDIX A

NYSDEC CORRESPONDENCE OF JANUARY 19, 1999

New York State Department of Environmental Conservation
Division of Environmental Remediation
Bureau of Eastern Remedial Action, Room 242
50 Wolf Road, Albany, New York 12233-7010
Phone: (518) 457-7924 FAX: (518) 457-4198

John P. Cahill
Commissioner

January 19, 1999

William F. Graner, P.E., PhD.
Chief Engineer
Islip Resource Recovery Agency
401 Main Street
Islip, NY 11751

Dear Dr. Graner:

Re: Sonia Road Landfill
Site No. 152013

The New York State Department of Environmental Conservation (NYSDEC) has reviewed the plans, specifications and Contract Documents for the above site remedial design. Our comments follow:

1. General Provisions 1.12 Project Signs: Signs should identify the Town as the lead agency for the project with 1986 EQBA Funding.

2. Landscaping (Item 19): Landscaping will not be eligible for reimbursement under Title 3 since it is an aesthetic and not an essential erosion control item.

3. Landfill gas must be sampled upon completion of construction to confirm that significant concentrations of non-methane organic compounds are present which the flare will be unable to destroy and which would contravene NYS air quality standards. Two rounds of sampling by an approved method, at the blowers and prior to flaring, will be eligible for Title 3 reimbursement. The O&M Plan must include future monitoring of gas composition, if necessary (not eligible).

4. Sampling of condensate will be necessary to confirm it may be disposed of in the "condensate drain system" on Drawing 20 (i.e., discharged to groundwater). Access for condensate sampling needs to be included and there must be provision in the operation, maintenance and monitoring ("O&M") plan for periodic sampling.

5. The O&M plan must make provision for inspection and refilling of the northern slopes (Drawing 9), if necessary to accommodate long-term settlement where the slopes will be backfilled with unscreened compost.

6. Health and Safety Plan, 10.5.5 Excavation/ Trenching Safety, page 10-14: A maximum depth of excavations and trenches of four feet (rather than five feet) is recommended where stated in this section.

It is our understanding any design or contract revisions will be conveyed to the contractor by means of addenda before contract award. Provided the above concerns will be addressed in the appropriate documents, the Remedial Design is herein approved.

This approval of the Remedial Design encompasses the items for which variances from 6NYCRR Part 360 were requested by the Town: the modification of minimum slope from 4 percent to 2 percent; and modification of passive gas vents to active gas collection wells. These items, as designed, meet substantive technical requirements for a variance from these applicable "standards, criteria and guidance," as required under 6NYCRR Part 375-1.7 and 1.10(1).

Please note the following are required before the Town of Islip can award Contract No. IRRA 1-99 for General Construction:

1. All contract addenda reviewed and approved by NYSDEC before the bid opening.

2. A legal opinion that all necessary property access and easements have been obtained.

3. A tabulation of all bids received including the engineer's pre-bid estimate, certified by a registered New York State Professional Engineer.

4. A copy of the apparent low bid, including a signed copy of the proposed Affirmative Action Work Plan (note that DEC approval of the Affirmative Action Work Plan is a condition of award).

5. Evidence of intent of surety to insure necessary performance and labor and material bonds and evidence of intent to obtain the required insurance for the apparent low bidder.

6. A statement from the authorized municipal official indicating the names of the bidders to whom contracts are to be awarded, the amount of the contracts and discussion of bid and recommendation for award.

7. Proof of advertising indicating the circulation of the publication and time allowed for preparation and receipt by all the bidders.

8. A copy of each addendum issued during the bidding period and acknowledgment of receipt by all the bidders.

9. Signed copies of the certification by the apparent low bidder regarding compliance with non-collusive bidding requirements.

10. An explanation and evaluation of any substantial variance from the pre-bid estimate.

11. A plan, acceptable to NYSDEC, for full-time inspection of the work by a New York State registered professional engineer as required under paragraph 7(g) of the 1986 EQBA State Assistance Contract. This engineer must certify at the end of the project that the work was performed in accordance with the approved contract documents. NYSDEC will review this plan for EQBA eligibility.

12. Other documents required to conform with applicable state and local laws and ordinances.

13. Authorization to award issued by NYSDEC.

Rejection of all bids and re-advertisement of the project may be done only for good cause.

With this approval of the Remedial Design for the Sonia Road Landfill, project management will be assumed hereafter by the Bureau of Construction Services. Please direct all future documents and correspondence to Mr. Jeffrey Trad, P.E., Project Manager, Bureau of Construction Services, Room 267. Ms. Kathleen McCue will continue to process payment requests and handle EQBA matters related to the Remedial Design.

Please contact Mr. Trad at (518) 457-9280 if you have any questions concerning these comments.

Sincerely,

Robert J. Cozzy, P.E.
Chief, Remedial Section C
Bureau of Eastern Remedial Action
Division of Environmental Remediation

cc: E. Hofmeister, IRRA
J. Trad, DER-BCS

Appendix B

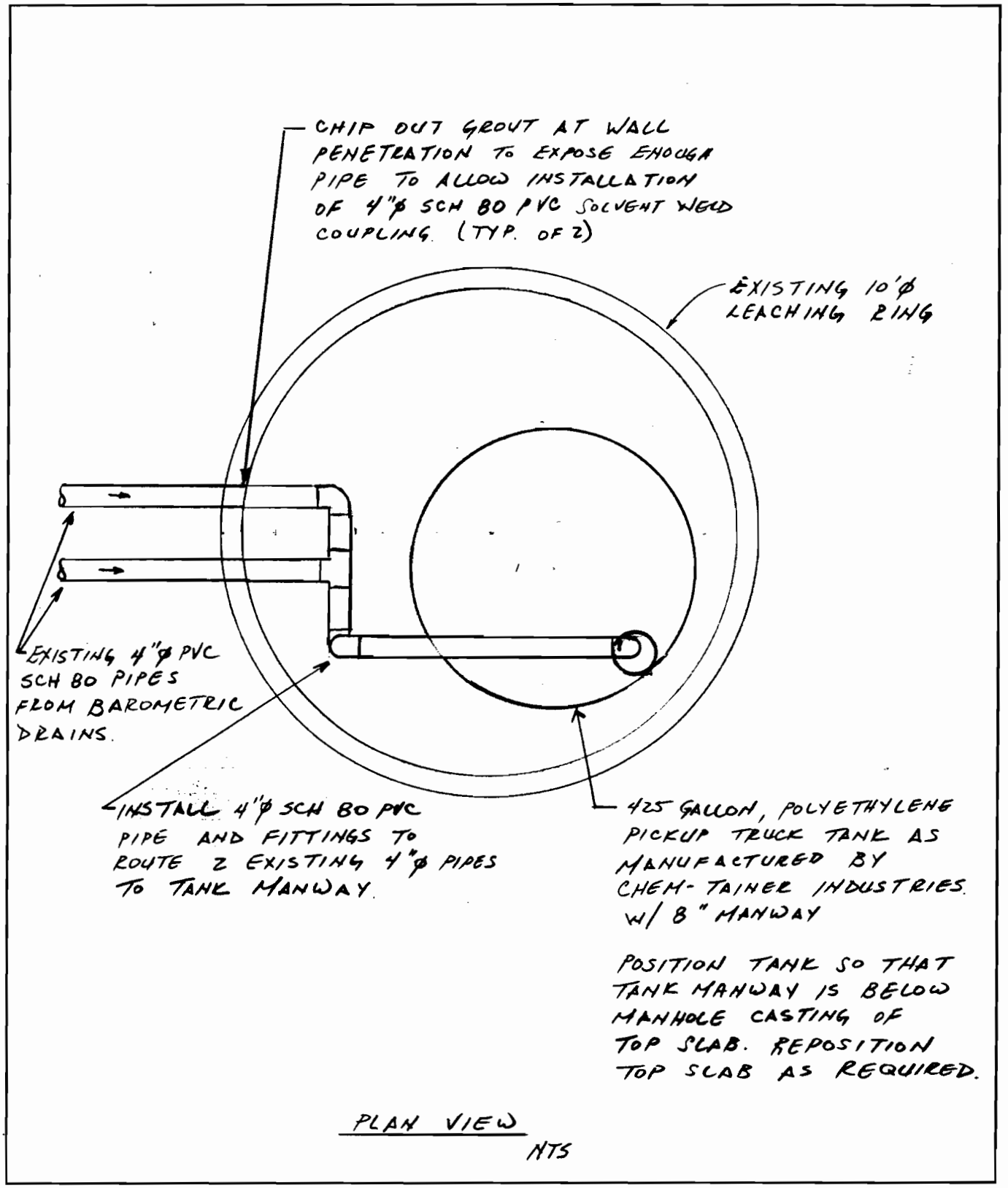
APPENDIX B

TEMPORARY TANK FOR
GAUGING LANDFILL GAS CONDENSATE GENERATION

Dvirka and Bartilucci
CONSULTING ENGINEERS

Sheet No. ____ of ____
By EJR Date 2/21/01
Chkd. by ____ Date ____

Project: ISLIP RESOURCE RECOVERY AGENCY Job No. 1594 II
Subject: SONIA ROAD LANDFILL - LFG CONDENSATE

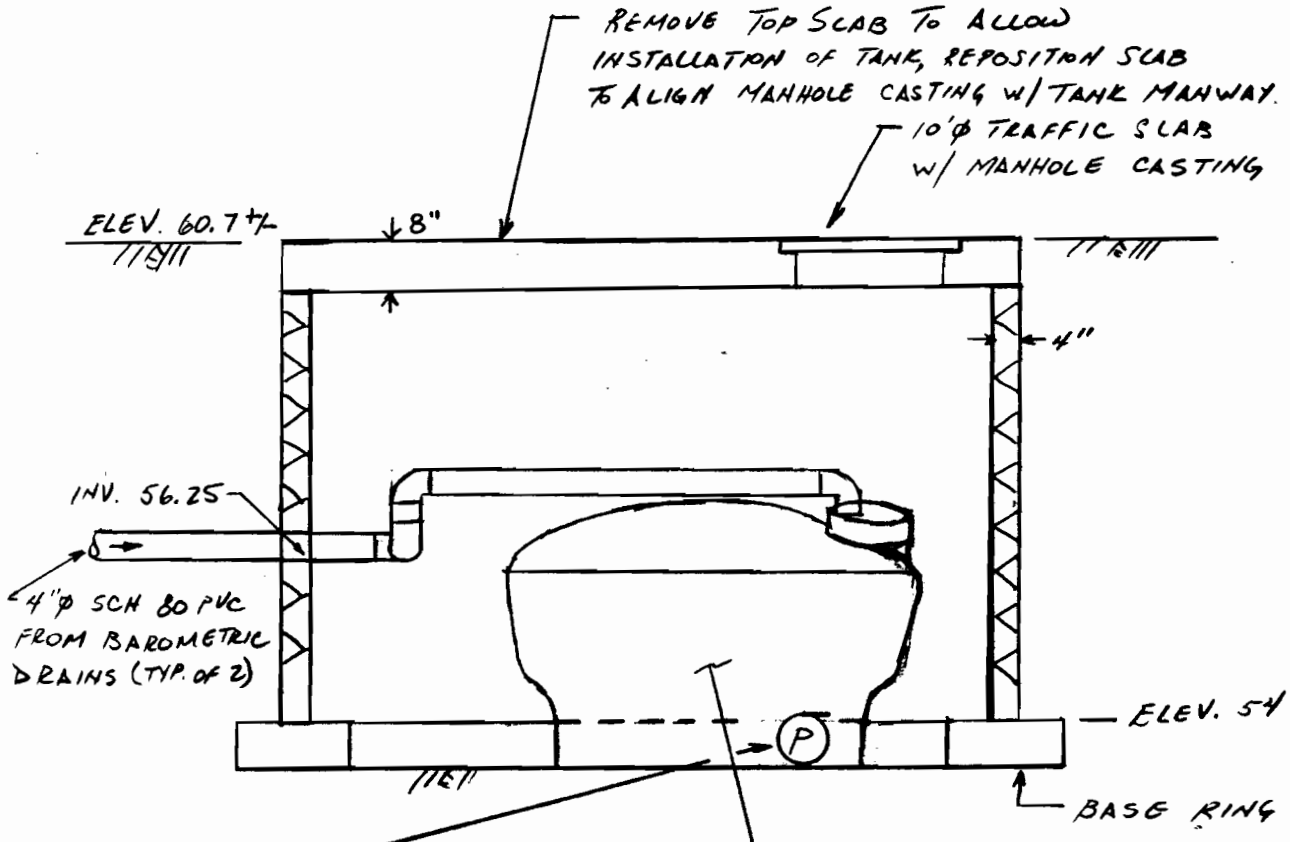


PLAN VIEW
NTS

Dvirka and Bartilucci
CONSULTING ENGINEERS

Sheet No. ____ of ____
By EJR Date 2/21/01
Chkd. by ____ Date ____

Project: ISLIP RESOURCE RECOVERY AGENCY Job No. 1594II
Subject: SONIA ROAD LANDFILL - LFG CONDENSATE



SECTION
NTS.

Appendix C

APPENDIX C

LANDFILL GAS CONDENSATE GENERATION RATES

Dvirka and Bartilucci
CONSULTING ENGINEERS

Sheet № 1 of 5
By EJR Date 7/24/01
Chkd. by ____ Date ____

Project: IRRA - SONIA ROAD Job № 1594
Subject: LFG CONDENSATE GENERATION RATES

DATE	TIME	MEASUREMENT (INCHES)	ELAPSED TIME (HOURS)	VOLUME (GALS)	Δ VOLUME	RATE (GPH)
		BYPASS VALVES OPEN				
3/8/01	14:45	0		START		
			24		75	3.13
3/9/01	14:45	7"		75		
			64		350+	5.47+
3/12/01	07:00	OVERFLOWING		425+		
	08:40	EMPTY				
			23		118	5.13
3/13/01	07:30	11"		118		
			24		118	4.92
3/14/01	07:30	19.5"		236		
		BYPASS VALVES CLOSED				
3/19/01	12:00	1"	-	11		
			6.83		75	10.9
3/19/01	18:50	8"		86		
			17.42		53	3.04
3/20/01	12:15	12.75		139		

Dvirka and Bartilucci
CONSULTING ENGINEERS

By EJR **Date** 7/24/01
Chkd. by ____ **Date** ____

Project: IRRA - SONIA ROAD **Job No.** ____
Subject: LFG CONDENSATE - GENERATION RATES

DATE	TIME	MEASUREMENT (INCHES)	ELAPSED TIME (HOURS)	VOLUME (GALS)	Δ VOLUME	RATE (GPH)
3/20/01	12:15	12.75		139		
3/20/01	16:00	16	3.75	186	47	12.5
					3/19 - 3/20 175/26	6.7 (AVE)
3/26/01	09:30	0		0		
3/26/01	15:00	1	5.5	10.5	10.5	1.9
3/27/01	0745	6.5	16.75	68	57.5	3.43
3/28/01	1500	14	31.25	157	89	2.8
3/29/01	0800	23.5	17	293	136	8.00
					3/26 - 3/29 293/70.5	4.16 (AVE)

Dvirka and Bartilucci
CONSULTING ENGINEERS

Sheet No 3 of ____
By EJR Date 7/24/01
Chkd. by ____ Date ____

Project: IRRA - SONIA ROAD **Job No** ____
Subject: LFG CONDENSATE - GENERATION RATES

DATE	TIME	MEASUREMENT (INCHES)	ELAPSED TIME (HOURS)	VOLUME (GALS)	Δ VOLUME	RATE (GPH)
3/29/01	0930	0		0		
4/2/01	07:10	25	93.5	315	315	3.37
	08:30	0		0		
4/3/01	0900	8	24.5	86	86	3.5
4/4/01	15:00	14	30	157	71	2.4
4/5/01	07:00	17	16	200	43	2.7
4/5/01	15:00	18.5	8	222	22	2.8
4/6/01	0700	23	16	286	64	4.0
					4/2-4/6 286/84.5	3.4 (AVE)

Dvirka and Bartilucci
CONSULTING ENGINEERS

Sheet No 4 of ____
By EJR Date 7/24/01
Chkd. by ____ Date ____

Project: IRRA - SONIA ROAD **Job No** 1594
Subject: LFG CONDENSATE GENERATION RATES

DATE	TIME	MEASUREMENT (INCHES)	ELAPSED TIME (HOURS)	VOLUME (GALS)	Δ VOLUME	RATE (GPH)
4/6/01	0830 (EST)	0		0		
4/9/01	0900	19	71.5	229	229	3.2
4/10/01	0715	29	22.25	372	143	6.4
					4/6 - 4/10 372/94.75	3.9 (AVE)
4/10/01	0900 (EST)	0		0		
4/11/01	0700	5	22	54	54	2.5
4/12/01	1200	17	29	200	146	5.0
					4/10 - 4/12 200/51	3.9 (AVE)

Dvirka and Bartilucci
CONSULTING ENGINEERS

Sheet № 5 of ____
By EJR Date 7/24/[illegible]
Chkd. by ____ Date ____

Project: IRRA - SONIA ROAD **Job №** ____
Subject: LFG CONDENSATE GENERATION RATES

DATE	TIME	MEASUREMENT (INCHES)	ELAPSED TIME (HOURS)	VOLUME (GALS)	Δ VOLUME	RATE (GPH)
4/12/01	1330 (EST)	0		0		
4/13/01	0800	5	18.5	54	54	2.9
4/16/01	0730	19	71.5	229	175	2.4
					4/12-4/16 229/90	2.5 (AVE)
4/16/01	0900 (EST)	0		0		
4/23/01	0730	26	166.5	329	329	1.9

END OF TEST

Appendix D

APPENDIX D

SAMPLING PROTOCOL - LANDFILL GAS CONDENSATE

TOWN OF ISLIP
SONIA ROAD LANDFILL
NYSDEC SITE NO. 152013

SAMPLING PROTOCOL
LANDFILL GAS CONDENSATE

Purpose: To provide analytical data for the landfill gas condensate generated by the Landfill Gas Management System for the purpose of determining whether the condensate can be discharged to the waste mass.

Arrangements: Make arrangements with the analytical laboratory under contract with the Town of Islip/Islip Resource Recovery Agency to obtain coolers, sample bottles, blue ice, chain of custody forms, trip blank, etc. for analysis of two landfill gas condensate samples. Field blanks are not required. Analysis to include:

- 6 NYCRR Part 360-2.11 Expanded Parameters NYSDEC ASP Protocol. See attached Table Nos. 1 and 2.

Supplies: The Sampling of landfill gas condensate from the two barometric drains associated with the Landfill Gas Management System is comparable to the sampling of groundwater monitoring wells with the exception that purging or pumping is not required.

Samples will be retrieved using disposable balers.

The procedures for sampling, field testing, sample preservation, holding times, quality assurance/quality control, etc., shall be as prescribed for the sampling of groundwater monitoring wells in the site specific Sampling and Analysis Plan for the Sonia Road Landfill, dated February 1997 or as amended.

Hand tools may be required to remove the 4-inch diameter vented PVC caps from the atmospheric leg of each of the two barometric drains to allow retrieval of the samples.

Frequency: Sample each barometric drain twice per month for 2 months for a total of four sampling events. Each sampling event will provide two grab samples of landfill gas condensate; one from the barometric drain located on the western side of the blower pad and the second from the barometric drain located on the eastern side of the blower pad.

The barometric drain located in the southwest corner of the property (adjacent to the southeast corner of Recharge Basin No. 2) will not be sampled. This barometric drain only services a low point in the header piping of the Southern Landfill Gas Collection System to prevent the accumulation of condensate at the low point. The condensate associated with the Southern Landfill Gas Collection System is more appropriately represented by the sampling of the barometric drain located on the eastern side of the blower pad discussed above.

Procedures:

1) The Landfill Gas Management System must be in operation for at least two hours prior to the retrieval of condensate samples in order to provide representative samples. If the Landfill Gas Management System is not in operation at the time of sampling, the system must be placed in operation and allowed to operate for at least two hours.

2) The Landfill Gas Management System must be shut down at the time of retrieval of landfill gas condensate samples.

3) The condensate sample containers for the barometric drain located on the west side of the blower pad should be labeled "Northern Landfill Gas Collection System – Landfill Gas Condensate."

4) The condensate sample containers for the barometric drain located on the east side of the blower pad should be labeled "Southern Landfill Gas Collection System – Landfill Gas Condensate."

5) The condensate samples will be retrieved from the atmospheric (downstream) leg of each barometric drain. Remove the 4-inch diameter vented cap (not glued) to expose the 4-inch diameter PVC vertical leg (pipe) of the barometric drain.

6) Lower a disposable baler into the pipe to retrieve the condensate sample. There is no need to purge the barometric drain or to dispose of any of the collected liquid.

7) Take field measurements for pH, temperature, turbidity and conductivity.

8) Fill the sample containers, preserve, store and deliver in accordance with the procedures of the Sampling and Analysis Plan.

9) Refill each barometric drain by pouring approximately 10 gallons of clean water down each 4-inch diameter pipe and reinstall the vented cap (no glue).

10) If appropriate, restart the Landfill Gas Management System and return it to operation.

Analysis of Results:

1) Arrange for delivery of condensate samples to the Town of Islip/Islip Resource Recovery Agency's contracted analytical laboratory and preserve the chain of custody.

2) Analysis to include 6 NYCRR Part 360-2.11 Expanded Parameters - NYSDEC ASP Protocol. See attached Table Nos. 1 and 2.

3) Analytical reports will be forwarded by the laboratory to the Town of Islip/Islip Resource Recovery Agency after which the reports will be provided to Dvirka and Bartilucci Consulting Engineers for data validation and evaluation in accordance with the Sampling and Analytical Plan.

Evaluation of Results:

1) Perform data validation and data usability analysis.

2) Compare condensate data to the groundwater effluent limitations for Class GA groundwater as defined by 6 NYCRR Part 703.6 and other appropriate groundwater data.

Reporting of Results:

1) Compile analytical data for the four sampling events in one report.

2) Provide interpretation of data as appropriate.

3) Submit report to Town of Islip/Islip Resource Recovery Agency.

4) Town of Islip/Islip Resource Recovery Agency submission of report to NYSDEC - Central Office.

Table 1

SONIA ROAD LANDFILL
SUMMARY OF MONITORING PARAMETERS
FOR SAMPLING OF LANDFILL GAS CONDENSATE

Sample Location	Sample Type	Sample Matrix	Sample Fraction	Number of Samples per Event	Frequency	Container Type/Size/No.	Sample Preservation	Maximum Holding Time*	Analytical Method
Landfill Gas Management System Atmospheric leg of two barometric drains.	Grab	LFG Condensate	Volatile Organics	2	Twice per month for 2 months	Glass, clear/40 mL/3 ICHEM 300 series or Equivalent	Cool to 4°C	7 days for analysis	10/95 NYSDEC ASP Method 95-1
	Grab	LFG Condensate	Base Neutral and Acid Extractable Organics	2	Twice per month for 2 months	Glass, amber/1 L/2 ICHEM 300 series or equivalent	Cool to 4°C	5 days for extraction, 40 days after extraction for analysis	10/95 NYSDEC ASP Method 95-2
	Grab	LFG Condensate	Pesticides/PCBs	2	Twice per month for 2 months	Glass, amber/1 L/2 ICHEM 300 series or equivalent	Cool to 4°C	5 days for extraction, 40 days after extraction for analysis	10/95 NYSDEC ASP Method 95-3
	Grab	LFG Condensate	Total Metals***	2	Twice per month for 2 months	Plastic/1 L/1 ICHEM 300 series or equivalent	HNO_3 to pH <2 Cool to 4°C	26 days for Hg analysis, 6 months for analysis of others	10/95 NYSDEC ASP Method 200.7**
	Grab	LFG Condensate	Cyanide	2	Twice per month for 2 months	Plastic/1 L/1 ICHEM 300 series or equivalent	NaOH to pH >12 Cool to 4°C	12 days for analysis	10/95 NYSDEC ASP Method 335.2
	Grab	LFG Condensate	Leachate Parameters	2	Twice per month for 2 months	See Table 2	See Table 2	See Table 2	1995 NYSDEC ASP See Table 2

*Holding times based upon VTSR (Verified Time of Sample Receipt).

**and SW-846 Methods for:

	Method
Mercury	7470

***Dissolved metals may be required if the turbidity of the samples is >50 NTUs.

Table 2

SONIA ROAD LANDFILL
SUMMARY OF MONITORING PARAMETERS
FOR SAMPLING OF LANDFILL GAS CONDENSATE

LEACHATE PARAMETERS
METHOD OF ANALYSIS, PRESERVATION AND HOLDING TIMES*

Parameter	Method of Analysis	Preservation	Container	Holding Time**
Ammonia	Method 350.3	H_2SO_4 to pH <2; Cool to 4°C	Plastic or Glass	26 days
Total Organic Carbon	Method 415.1	H_2SO_4 to pH <2; Cool to 4°C	Plastic or Glass	26 days
Total Dissolved Solids	Method 160.1	Cool to 4°C	Plastic or Glass	5 days
Alkalinity	Method 310.1	Cool to 4°C	Plastic or Glass	12 days
Chloride	Method 325.3	Cool to 4°C	Plastic or Glass	26 days
pH	Method 150.1	None Required	Glass	Field Measurement
Specific Conductance	Method 120.1	None Required	Glass	Field Measurement
Total Kjedahl Nitrogen	Method 351.3	H_2SO_4 to pH <2; Cool to 4°C	Plastic or Glass	26 days
Nitrate	Method 352.1	H_2SO_4 to pH <2; Cool to 4°C	Plastic or Glass	26 days
BOD (5-day)	Method 405.1	Cool to 4°C	Plastic or Glass	24 hours
COD	Method 410.1	H_2SO_4 to pH <2; Cool to 4°C	Plastic or Glass	26 days
Sulfate	Method 375.4	Cool to 4°C	Plastic or Glass	26 days

Table 2 (continued)

SONIA ROAD LANDFILL
SUMMARY OF MONITORING PARAMETERS
FOR SAMPLING OF LANDFILL GAS CONDENSATE

LEACHATE PARAMETERS
METHOD OF ANALYSIS, PRESERVATION AND HOLDING TIMES*

Parameter	Method of Analysis	Preservation	Container	Holding Time**
Chromium (hexavalent)	Method 218.5	Cool to 4°C	Plastic or Glass	24 hours
Color	Method 110.2	Cool to 4°C	Plastic or Glass	24 hours
Hardness (total)	Method 130.2	HNO_3 to pH <2;	Plastic or Glass	6 months
Turbidity	Method 180.1	None required	Plastic or glass	Field measurement
Boron	Method 212.3	None required	Plastic	26 days
Eh	---	None required	Glass	Field Measurement
Phenol	Method 420.1	H_2SO_4 to pH <2 Cool to 4°C	Glass	26 days
Bromide	Method 320.1	Cool to 4°C	Plastic or Glass	26 days

*Taken from the 1995 NYSDEC ASP.

**Holding Times based on VTSR (Validated Time of Sample Receipt)

Appendix E

APPENDIX E

ANALYTICAL RESULTS - LANDFILL GAS CONDENSATE

Table 1

ISLIP RESOURCE RECOVERY AGENCY
SONIA ROAD LANDFILL
LANDFILL GAS CONDENSATE
LEACHATE PARAMETERS

CONSTITUENT	CLASS GA GROUND-WATER EFFLUENT LIMITATIONS *	UNITS	NORTH COLLECTION SYSTEM 12/04/2000	NORTH COLLECTION SYSTEM 02/08/2001	SOUTH COLLECTION SYSTEM 12/04/2000	SOUTH COLLECTION SYSTEM 02/08/2001
Color (APHA Units)	15	(mg/l)	0.10	0.010	0.50	4.0
Alkalinity (as $CaCO_3$)		(mg/l)	20.2	0.29 U	119	50.1
Ammonia (as N)	10**	(mg/l)	0.19	1.47	0.68	0.650
Biochemical Oxygen Demand		(mg/l)	17	0.42 U	18	36.0
Bromide	2	(mg/l)	0.6	0.42 U	0.9	0.600
Chemical Oxygen Demand		(mg/l)	116	70.5	496	1010
Chloride	500	(mg/l)	2 U	0.78 U	7.1	81.0
Chromium (Hexavalent)	0.1	(mg/l)	0.02 U	0.011 U	0.02 U	0.55 U
Hardness (as CaCO3)		(mg/l)	48	12.0	280	200
Nitrate (as N)	10**	(mg/l)	0.1 U	0.028 J	0.26	0.82
Phenols, total	0.002	(mg/l)	0.1	0.012	1.4	0.16
Sulfate	500	(mg/l)	67.5	65 U	39.3	5.90
Total Organic Carbon		(mg/l)	6.7	5.6	116	19.9
TDS	1,000	(mg/l)	41	48	281	77
Total Kjeldahl Nitrogen (as N)	10**	(mg/l)	2.6	13.6	16	21.4
Sulfide	1	(mg/l)	0.5 U	0.09 U	0.9	1
FIELD PARAMETERS						
pH	6.5 - 8.5	(standard)	5.03	4.4	5.91	6.42
Temperature		° C	8.5	5.9	8.2	4.3
Specific Conductance		mS/cm	0.053	0.038	0.368	0.043
Turbidity	5	NTU	100	55.4	>999.0	>1000
Dissolved Oxygen		mg/l	4.77	3	7.05	6.7
Eh		MV	2.29	390	147	315

** Effluent limitation for Nassau, Suffolk Counties

Concentration Exceeds Action Level

The following qualifier(s) exist: CLP Q: U, J NA=Not analyzed

° C	Degrees Celcius
mS/cm	MilliSiemens per centimeter
NTU	Nepholometric Turbidity Units
mg/l	Milligrams Per Liter
MV	Millivolts

Table 2

ISLIP RESOURCE RECOVERY AGENCY
SONIA ROAD LANDFILL
LANDFILL GAS CONDENSATE
VOLATILE ORGANIC COMPOUNDS

CONSTITUENT	CLASS GA GROUND-WATER EFFLUENT LIMITATIONS *	UNITS	NORTH COLLECTION SYSTEM 12/04/2000	NORTH COLLECTION SYSTEM 02/08/2001	SOUTH COLLECTION SYSTEM 12/04/2000	SOUTH COLLECTION SYSTEM 02/08/2001
Dichlorodifluoromethane	5	(ug/l)	5 U	5 U	5 U	5 U
Chloromethane	5	(ug/l)	5 U	5 U	5 U	5 U
Vinyl chloride	2	(ug/l)	1 J	5 U	5 U	5 U
Bromomethane	5	(ug/l)	5 U	5 U	5 U	5 U
Chloroethane	5	(ug/l)	17	13	5 U	5 U
Acetone	50	(ug/l)	47	19	41	15
Acetonitrile		(ug/l)	50 U	50 U	50 U	50 U
Allyl chloride	5	(ug/l)	5 U	5 U	5 U	5 U
Acrolein	5	(ug/l)	50 U	50 U	50 U	50 U
Acrylonitrile	5	(ug/l)	5 U	5 U	5 U	5 U
Iodomethane	5	(ug/l)	5 U	5 U	5 U	5 U
Vinyl Acetate		(ug/l)	5 U	5 U	5 U	5 U
Chloroprene	5	(ug/l)	5 U	5 U	5 U	5 U
2-Butanone	50	(ug/l)	10	3.3 J	7	1.7 J
Carbon disulfide	50	(ug/l)	5 U	5 U	5 U	5 U
Trichlorofluoromethane	5	(ug/l)	5 U	5 U	5 U	5 U
1,1-Dichloroethene	5	(ug/l)	5 U	5 U	5 U	5 U
Methylene chloride	5	(ug/l)	5 U	5 U	5 U	19 B
trans-1,2-Dichloroethene	5	(ug/l)	5 U	5 U	5 U	5 U
1,1-Dichloroethane	5	(ug/l)	7	11	5 U	5 U
Propionitrile		(ug/l)	5 U	5 U	5 U	5 U
Isobutylalcohol		(ug/l)	50 U	5 U	50 U	5 U
Methacrylonitrile	5	(ug/l)	5 U	5 U	5 U	5 U
cis-1,2-Dichloroethene	5	(ug/l)	5 U	2 J	5 U	5 U
Bromochloromethane	5	(ug/l)	5 U	5 U	5 U	5 U
Chloroform	7	(ug/l)	5 U	5 U	5 U	5 U
1,2-Dichloroethane	0.6	(ug/l)	5 U	5 U	5 U	5 U

Table 2

ISLIP RESOURCE RECOVERY AGENCY
SONIA ROAD LANDFILL
LANDFILL GAS CONDENSATE
VOLATILE ORGANIC COMPOUNDS

CONSTITUENT	CLASS GA GROUND-WATER EFFLUENT LIMITATIONS *	UNITS	NORTH COLLECTION SYSTEM 12/04/2000	NORTH COLLECTION SYSTEM 02/08/2001	SOUTH COLLECTION SYSTEM 12/04/2000	SOUTH COLLECTION SYSTEM 02/08/2001
1,1,1-Trichloroethane	5	(ug/l)	5 U	1.2 J	5 U	5 U
1,1-Dichloropropene	5	(ug/l)	5 U	5 U	5 U	5 U
Carbon tetrachloride	5	(ug/l)	5 U	5 U	5 U	5 U
Benzene	1.0	(ug/l)	3 J	1.6 J	3 J	5 U
Methylmethacrylate	50	(ug/l)	5 U	5 U	5 U	5 U
Trichloroethene	5	(ug/l)	5 U	5 U	5 U	5 U
1,2-Dichloropropane	1	(ug/l)	5 U	5 U	5 U	5 U
Dibromomethane	5	(ug/l)	5 U	5 U	5 U	5 U
Bromodichloromethane	50	(ug/l)	5 U	5 U	5 U	5 U
cis-1,3-Dichloropropene	0.4 **	(ug/l)	5 U	5 U	5 U	5 U
Toluene	5	(ug/l)	5 J	2.4 J	3 J	5 U
Ethylmethacrylate		(ug/l)	5 U	5 U	5 U	5 U
trans-1,3-Dichloropropene	0.4 **	(ug/l)	5 U	5 U	5 U	5 U
1,1,2-Trichloroethane	1	(ug/l)	5 U	5 U	5 U	5 U
1,2-Dibromoethane	5	(ug/l)	5 U	5 U	5 U	5 U
4-Methyl-2-pentanone	5	(ug/l)	8	5 U	6	5 U
Chlorobenzene	5	(ug/l)	7	5.3 J	5 U	5 U
Tetrachloroethene	5	(ug/l)	5 U	5 U	5 U	5 U
Dibromochloromethane	50	(ug/l)	5 U	5 U	5 U	5 U
2-Hexanone	50	(ug/l)	5 U	5 U	5 U	5 U
1,1,1,2-Tetrachloroethane	5	(ug/l)	5 U	5 U	5 U	5 U
Ethylbenzene	5	(ug/l)	3 J	1.7 J	2 J	5 U
Xylene (total)	5	(ug/l)	23	5 U	6	6
Styrene	930	(ug/l)	5 U	5 U	5 U	5 U
Bromoform	50	(ug/l)	5 U	5 U	5 U	5 U
trans-1,4-Dichloro-2-butene	5	(ug/l)	5 U	5 U	5 U	5 U
1,1,2,2-Tetrachloroethane	5	(ug/l)	5 U	5 U	5 U	5 U

Table 2

ISLIP RESOURCE RECOVERY AGENCY
SONIA ROAD LANDFILL
LANDFILL GAS CONDENSATE
VOLATILE ORGANIC COMPOUNDS

CONSTITUENT	CLASS GA GROUND-WATER EFFLUENT LIMITATIONS *	UNITS	NORTH COLLECTION SYSTEM 12/04/2000	NORTH COLLECTION SYSTEM 02/08/2001	SOUTH COLLECTION SYSTEM 12/04/2000	SOUTH COLLECTION SYSTEM 02/08/2001
1,2,3-Trichloropropane	0.04	(ug/l)	5 U	5 U	5 U	5 U
1,2-Dibromo-3-chloropropane	0.04	(ug/l)	5 U	5 U	5 U	5 U
1,2-Dichloroethene	5	(ug/l)	NA	5 U	NA	5 U
1,2,4-Trichlorobenzene	5	(ug/l)	10 U	10 U	10 U	100 U
TOTAL VOCs:		(ug/l)	131	60.5	68	41.7

* 6NYCRR Part 703.6 Groundwater Effluent Limitations to Class GA Waters
Greater than Action Level

The following qualifier(s) exist: CLP Q: U, J, B NA=Not analyzed
U: Analyzed for but not detected
** The sum of cis- and trans-1,3-dichloropropene not to exceed 0.4 ug/l

Table 3

ISLIP RESOURCE RECOVERY AGENCY
SONIA ROAD LANDFILL
LANDFILL GAS CONDENSATE
SEMI-VOLATILE ORGANIC COMPOUNDS

CONSTITUENT	CLASS GA GROUND-WATER EFFLUENT LIMITATIONS *	UNITS	NORTH COLLECTION SYSTEM 12/04/2000	NORTH COLLECTION SYSTEM 02/08/2001	SOUTH COLLECTION SYSTEM 12/04/2000	SOUTH COLLECTION SYSTEM 02/08/2001
2-Picoline		(ug/l)	10 U	10 U	10 U	100 U
N-Nitrosomethylethylamine		(ug/l)	10 U	10 U	10 U	100 U
Methyl methanesulfonate		(ug/l)	10 U	10 U	10 U	100 U
N-Nitrosodiethylamine		(ug/l)	10 U	10 U	10 U	100 U
Ethyl methanesulfonate		(ug/l)	10 U	10 U	10 U	100 U
Aniline	5	(ug/l)	10 U	10 U	10 U	100 U
Phenol	1	(ug/l)	18	10 U	240 D	30 J
Bis(2-chloroethyl)ether	1	(ug/l)	10 U	10 U	10 U	100 U
2-Chlorophenol	1	(ug/l)	10 U	10 U	10 U	100 U
1,3-Dichlorobenzene	3	(ug/l)	10 U	10 U	10 U	100 U
Benzyl alcohol		(ug/l)	20	10 U	30	78 J
1,4-Dichlorobenzene	3	(ug/l)	2 J	5 U	1 J	5 U
1,2-Dichlorobenzene	3	(ug/l)	10 U	2.4 J	10 U	5 U
2-Methylphenol	1	(ug/l)	10 U	10 U	4 J	100 U
Propane,2,2'-oxybis[1-chloro		(ug/l)	10 U	10 U	10 U	100 U
Acetophenone		(ug/l)	2 J	10 U	10 U	100 U
N-Nitrosopyrrolidine		(ug/l)	10 U	10 U	10 U	100 U
N-Nitrosomorpholine		(ug/l)	10 U	10 U	10 U	100 U
o-Toludine	5	(ug/l)	10 U	10 U	10 U	100 U
4-Methylphenol	1	(ug/l)	3 J	10 U	1	200 U
N-Nitroso-di-n-propylamine		(ug/l)	10 U	10 U	10 U	100 U
Hexachloroethane	5	(ug/l)	10 U	10 U	10 U	100 U
Nitrobenzene	0.4	(ug/l)	10 U	10 U	10 U	100 U
N-Nitrosopiperidine		(ug/l)	10 U	10 U	10 U	100 U
Isophorone	50	(ug/l)	12	3.4 J	10 U	100 U

Table 3

ISLIP RESOURCE RECOVERY AGENCY
SONIA ROAD LANDFILL
LANDFILL GAS CONDENSATE
SEMI-VOLATILE ORGANIC COMPOUNDS

CONSTITUENT	CLASS GA GROUND-WATER EFFLUENT LIMITATIONS *	UNITS	NORTH COLLECTION SYSTEM 12/04/2000	NORTH COLLECTION SYSTEM 02/08/2001	SOUTH COLLECTION SYSTEM 12/04/2000	SOUTH COLLECTION SYSTEM 02/08/2001
2-Nitrophenol	1	(ug/l)	10 U	10 U	10 U	100 U
2,4-Dimethylphenol	50	(ug/l)	10 U	10 U	10 U	100 U
Bis(2-chloroethoxy)methane	5	(ug/l)	10 U	10 U	10 U	100 U
O,O,O-Triethylphosphorothioate		(ug/l)	10 U	20 U	10 U	200 U
2,4-Dichlorophenol	5	(ug/l)	10 U	10 U	10 U	100 U
1,2,4-Trichlorobenzene	5	(ug/l)	10 U	10 U	10 U	100 U
Naphthalene	10	(ug/l)	11	10 U	10	88 J
4-Chloroaniline	5	(ug/l)	10 U	10 U	10 U	100 U
Hexachloropropene	5	(ug/l)	10 U	10 U	10 U	100 U
alpha, alpha-Dimethylphenethylamine	5	(ug/l)	10 U	10 U	10 U	100 U
Hexachlorobutadiene	0.5	(ug/l)	10 U	10 U	10 U	100 U
N-Nitroso-di-n-butylamine		(ug/l)	10 U	10 U	10 U	100 U
p-Phenylenediamine		(ug/l)	10 U	20 U	10 U	200 U
4-Chloro-3-methylphenol	1	(ug/l)	10 U	10 U	10 U	100 U
Safrole		(ug/l)	10 U	10 U	10 U	100 U
2-Methylnaphthalene		(ug/l)	4 J	10 U	5 J	44 J
1,2,4,5-Tetrachlorobenzene	5	(ug/l)	10 U	10 U	10 U	100 U
Hexachlorocyclopentadiene	5	(ug/l)	10 U	10 U	10 U	100 U
2,4,6-Trichlorophenol	1	(ug/l)	10 U	10 U	10 U	100 U
2,4,5-Trichlorophenol	1	(ug/l)	25 U	25 U	25 U	250 U
Isosafrole		(ug/l)	10 U	10 U	10 U	100 U
2-Chloronaphthalene	10	(ug/l)	10 U	10 U	10 U	100 U
2,6-Dichlorophenol		(ug/l)	10 U	10 U	10 U	100 U
2-Nitroaniline	5	(ug/l)	25 U	25 U	25 U	250 U
1,4-Naphthoquinone		(ug/l)	10 U	10 U	10 U	100 U

Table 3

ISLIP RESOURCE RECOVERY AGENCY
SONIA ROAD LANDFILL
LANDFILL GAS CONDENSATE
SEMI-VOLATILE ORGANIC COMPOUNDS

CONSTITUENT	CLASS GA GROUND-WATER EFFLUENT LIMITATIONS *	UNITS	NORTH COLLECTION SYSTEM 12/04/2000	NORTH COLLECTION SYSTEM 02/08/2001	SOUTH COLLECTION SYSTEM 12/04/2000	SOUTH COLLECTION SYSTEM 02/08/2001
1,3-Dinitrobenzene	5	(ug/l)	10 U	10 U	10 U	100 U
Dimethyl phthalate	50	(ug/l)	10 U	10 U	10 U	100 U
Acenaphthylene		(ug/l)	10 U	10 U	10 U	100 U
2,6-Dinitrotoluene	5	(ug/l)	10 U	10 U	10 U	100 U
3-Nitroaniline	5	(ug/l)	25 U	10 U	25 U	250 U
Acenaphthene	20	(ug/l)	16	10 U	29	220
2,4-Dinitrophenol	10	(ug/l)	25 U	25 U	25 U	250 U
4-Nitrophenol	1	(ug/l)	25 U	25 U	25 U	250 U
Dibenzofuran		(ug/l)	12	10 U	21	170
Pentachlorobenzene	5	(ug/l)	10 U	10 U	10 U	100 U
2,4-Dinitrotoluene	5	(ug/l)	10 U	10 U	10 U	100 U
1-Naphthylamine		(ug/l)	10 U	10 U	10 U	100 U
2-Naphthylamine		(ug/l)	10 U	10 U	10 U	100 U
2,3,4,6-Tetrachlorophenol		(ug/l)	10 U	10 U	10 U	100 U
Diethyl phthalate	50	(ug/l)	10 U	10 U	10 U	100 U
Fluorene	50	(ug/l)	19	10 U	32	270
4-Chlorophenyl phenyl ether		(ug/l)	10 U	10 U	10 U	100 U
5-Nitro-o-toluidine	5	(ug/l)	10 U	10 U	10 U	100 U
4-Nitroaniline	5	(ug/l)	25 U	25 U	25 U	250 U
4,6-Dinitro-2-methylphenol		(ug/l)	10 U	25 U	10 U	250 U
N-Nitrosodiphenylamine	50	(ug/l)	10 U	10 U	10 U	100 U
Diallate		(ug/l)	10 U	10 U	10 U	100 U
1,3,5-Trinitrobenzene		(ug/l)	10 U	10 U	10 U	100 U
Phenacetin		(ug/l)	10 U	10 U	10 U	200 U
Hexachlorobenzene	0.04	(ug/l)	10 U	10 U	10 U	100 U

Table 3

ISLIP RESOURCE RECOVERY AGENCY
SONIA ROAD LANDFILL
LANDFILL GAS CONDENSATE
SEMI-VOLATILE ORGANIC COMPOUNDS

CONSTITUENT	CLASS GA GROUND-WATER EFFLUENT LIMITATIONS *	UNITS	NORTH COLLECTION SYSTEM 12/04/2000	NORTH COLLECTION SYSTEM 02/08/2001	SOUTH COLLECTION SYSTEM 12/04/2000	SOUTH COLLECTION SYSTEM 02/08/2001
4-Aminobiphenyl	5	(ug/l)	10 U	20 U	10 U	200 U
Pentachlorophenol	1	(ug/l)	25 U	25 U	25 U	250 U
Pronamide		(ug/l)	10 U	10 U	10 U	100 U
Pentachloronitrobenzene	0	(ug/l)	10 U	10 U	10 U	100 U
Phenanthrene	50	(ug/l)	79	2.5 J	98 JD	780
Anthracene	50	(ug/l)	18	10 U	24	360
Methylparathion	1.5	(ug/l)	1 U	1 U	1 U	1 U
Di-n-butylphthalate	50	(ug/l)	10 U	10 U	10 U	100 U
4-Nitroquinoline-1-oxide		(ug/l)	10 U	10 U	10 U	100 U
Parathion	1.5	(ug/l)	1 U	1 U	1 U	0.18 J
Methapyrilene		(ug/l)	10 U	10 U	10 U	100 U
Isodrin	5	(ug/l)	10 U	10 U	10 U	100 U
Fluoranthene	50	(ug/l)	67	17	47	660
Pyrene	50	(ug/l)	44	13	36	600
p-(Dimethylamino)azobenzene		(ug/l)	10 U	10 U	10 U	100 U
Chlorobenzilate		(ug/l)	10 U	20 U	10 U	200 U
3,3'-Dimethylbenzidine	5	(ug/l)	10 U	20 U	10 U	200 U
Butyl benzyl phthalate	50	(ug/l)	10 U	10 U	10 U	100 U
2-Acetylaminofluorene		(ug/l)	10 U	20 U	10 U	200 U
Benzo(a)anthracene	0.002	(ug/l)	25	8.8 J	11	530
3,3'-Dichlorobenzidine	5	(ug/l)	10 U	20 U	10 U	200 U
Chrysene	0.002	(ug/l)	24	7.2 J	11	430
Bis(2-ethylhexyl)phthalate	5	(ug/l)	10 U	3.5 J	10 U	46 J
Di-n-octylphthalate	50	(ug/l)	10 U	10 U	10 U	100 U
Benzo(b)fluoranthene	0.002	(ug/l)	16	3.9 J	6 J	250

Table 3

ISLIP RESOURCE RECOVERY AGENCY
SONIA ROAD LANDFILL
LANDFILL GAS CONDENSATE
SEMI-VOLATILE ORGANIC COMPOUNDS

CONSTITUENT	CLASS GA GROUND-WATER EFFLUENT LIMITATIONS *	UNITS	NORTH COLLECTION SYSTEM 12/04/2000	NORTH COLLECTION SYSTEM 02/08/2001	SOUTH COLLECTION SYSTEM 12/04/2000	SOUTH COLLECTION SYSTEM 02/08/2001
7,12-Dimethybenz(a)anthracene		(ug/l)	10 U	20 U	10 U	200 U
Benzo(k)fluoranthene	0.002	(ug/l)	12	5.5 J	5 J	300
Benzo(a)pyrene	0	(ug/l)	18	4.8 J	8 J	210
3-Methylcholanthrene		(ug/l)	10 U	10 U	10 U	100 U
Indeno(1,2,3-cd)pyrene	0.002	(ug/l)	11	3.1 J	4 J	210
Dibenzo(a,h)anthracene		(ug/l)	2 J	10 U	2 J	110
Benzo(g,h,i)perylene		(ug/l)	11	3.3 J	5 J	220
Dimethoate		(ug/l)	1 U	1 U	1 U	1 U
Dinoseb		(ug/l)	0.2 U	0.008 U	0.2 U	0.008 U
Pyridine	50	(ug/l)	10 U	10 U	10 U	100 U
Thionazin		(ug/l)	1 U	1 U	1 U	0.24 J*
Phorate	0	(ug/l)	1 U	1 U	1 U	1 U
Disulfoton	0	(ug/l)	1 U	1 U	1 U	1 U
4-bromophenyl-phenylether		(ug/l)	10 U	10 U	10 U	100 U
Sulfotepp		(ug/l)	10 U	0.12 J	10 U	1 U

* 6NYCRR Part 703.6 Groundwater Effluent Limitations to Class GA Waters
Greater than Action Level
U: Analyzed for but not detected
The following qualifier(s) exist: CLP Q: U NA=Not analyzed

Table 4

ISLIP RESOURCE RECOVERY AGENCY
SONIA ROAD LANDFILL
LANDFILL GAS CONDENSATE
DISSOLVED METALS

CONSTITUENT	CLASS GA GROUND-WATER EFFLUENT LIMITATIONS *	UNITS	NORTH COLLECTION SYSTEM 12/04/2000	NORTH COLLECTION SYSTEM 02/08/2001	SOUTH COLLECTION SYSTEM 12/04/2000
Aluminum (Dissolved)	2000	(ug/l)	1000	14.8 B	1440
Antimony (Dissolved)	6	(ug/l)	1.7 U	12.3 U	1.7 U
Arsenic (Dissolved)	50	(ug/l)	2.5 U	1.9 U	2.5 U
Barium (Dissolved)	2000	(ug/l)	1430	79.9 B	1270
Beryllium (Dissolved)	3	(ug/l)	0.1 U	0.1 U	0.2 B
Boron (Dissolved)	1000	(ug/l)	260	49.8 B	6140
Cadmium (Dissolved)	10	(ug/l)	0.4 U	0.20 U	0.4 U
Calcium (Dissolved)		(ug/l)	5120	433 B	36400
Chromium (Dissolved)	50	(ug/l)	3.5 U	0.60 U	3.5 U
Cobalt (Dissolved)		(ug/l)	12.6 B	1.7 U	9 B
Copper (Dissolved)	1000	(ug/l)	4.5 B	6.1 B	9.9 B
Iron (Dissolved)	600**	(ug/l)	4490	1040	5370
Lead (Dissolved)	50	(ug/l)	6.6	1.2 B	9.3
Magnesium (Dissolved)	35000	(ug/l)	965 B	166 B	5950
Manganese (Dissolved)	600**	(ug/l)	972	65	772
Mercury (Dissolved)	1.4	(ug/l)	0.1 U	0.1 U	0.1 U
Nickel (Dissolved)	200	(ug/l)	3.5 B	1.9 B	15.5 B
Potassium (Dissolved)		(ug/l)	574 B	546 B	4550 B
Selenium (Dissolved)	20	(ug/l)	1.7 U	1.5 U	1.7 U
Silver (Dissolved)	100	(ug/l)	1 B	1.6 U	0.93 B
Sodium (Dissolved)	20000	(ug/l)	274 B	373 B	4890 B
Thallium (Dissolved)	0.5	(ug/l)	2.3 U	<2.8 B	2.3 U
Vanadium (Dissolved)		(ug/l)	3.1 B	1.7 U	8.7 B
Zinc (Dissolved)	5000	(ug/l)	650	129	4780
Tin (Dissolved)		(ug/l)	NA	2.2 U	NA

* 6NYCRR Part 703.6 Groundwater Effluent Limitations to Class GA Waters

= Greater than Action Level

U: Analyzed for but not detected

NA=Not analyzed

The following qualifier(s) exist: CLP Q: U, B

Table 5

ISLIP RESOURCE RECOVERY AGENCY
SONIA ROAD LANDFILL
LANDFILL GAS CONDENSATE
METALS

CONSTITUENT	CLASS GA GROUND-WATER EFFLUENT LIMITATIONS *	UNITS	NORTH COLLECTION SYSTEM 12/04/2000	NORTH COLLECTION SYSTEM 02/08/2001	SOUTH COLLECTION SYSTEM 12/04/2000	SOUTH COLLECTION SYSTEM 02/08/2001
Aluminum	2000	(ug/l)	919	30.0 J	829	930
Antimony	6	(ug/l)	1.7 U	4.7 U	1.7 U	4.7 U
Arsenic	50	(ug/l)	2.5 U	1.9 U	2.5 U	1.9 U
Barium	2000	(ug/l)	1430	83.0 J	1250	1700
Beryllium	3	(ug/l)	0.1 U	1700 U	0.17 B	1700 U
Boron	1000	(ug/l)	261	53.0 J	6340	140 J
Cadmium	10	(ug/l)	0.4 U	410 U	0.4 U	410 U
Calcium		(ug/l)	5090	350 J	38100	4600 J
Chromium	50	(ug/l)	3.5 U	1.6 U	3.5 U	1.6 U
Cobalt		(ug/l)	12.6 B	2.7 U	8.6 B	2.7 U
Copper	1000	(ug/l)	3.7 B	2000 U	6.7 B	2000 U
Iron	600**	(ug/l)	4310	960	4270	5100
Lead	50	(ug/l)	7.5	1.9 U	7.4	7.5
Magnesium	35000	(ug/l)	966 B	170 J	6150	8300
Manganese	600**	(ug/l)	932	63.0	789	140
Mercury	1.4	(ug/l)	0.1 U	0.1 U	0.1 U	0.1 U
Nickel	200	(ug/l)	3.9 B	2.1 U	14 B	5.2 J
Potassium		(ug/l)	427 B	520 J	3020 B	300 J
Selenium	20	(ug/l)	1.7 U	1.3 U	1.7 U	1.3 U
Silver	100	(ug/l)	0.5 U	0.0015 U	1.1 B	0.0015 U
Sodium	20000	(ug/l)	242 B	350 J	5120	540 J
Thallium	0.5	(ug/l)	2.3 U	4.2 U	2.3 U	4.2 U
Vanadium		(ug/l)	3.1 B	0.39 U	6.5 B	2.2 J
Zinc	5000	(ug/l)	715	130	4740	6200
Cyanide	400	(ug/l)	10 U	3.2 U	10 U	6.9 J
Tin		(ug/l)	NA	2.8 U	NA	22 J

* 6NYCRR Part 703.6 Groundwater Effluent Limitations to Class GA Waters

U: Analyzed for but not detected

Greater than Action Level

The following qualifier(s) exist: CLP Q: J, U, B NA=Not analyzed

** Iron and Manganese combined not to exceed 1,000 ug/l

Table 6

ISLIP RESOURCE RECOVERY AGENCY
SONIA ROAD LANDFILL
LANDFILL GAS CONDENSATE
HERBICIDES

CONSTITUENT	CLASS GA GROUND-WATER EFFLUENT LIMITATIONS *	UNITS	NORTH COLLECTION SYSTEM 12/04/2000	NORTH COLLECTION SYSTEM 02/08/2001	SOUTH COLLECTION SYSTEM 12/04/2000	SOUTH COLLECTION SYSTEM 02/08/2001
2,4-D	50	(ug/l)	0.5 U	0.035 U	0.5 U	0.035 U
2,4,5-TP	0.26	(ug/l)	0.25 U	0.025 U	0.25 U	0.025 U
2,4,5-T	0.35	(ug/l)	0.25 U	0.03 U	0.25 U	0.03 U
Dinoseb		(ug/l)	0.2 U	0.008 U	0.2 U	0.008 U

* 6NYCRR Part 703.6 Groundwater Effluent Limitations to Class GA Waters
The following qualifier(s) exist: CLP Q: U NA=Not analyzed
U: Analyzed for but not detected

Table 7

ISLIP RESOURCE RECOVERY AGENCY
SONIA ROAD LANDFILL
LANDFILL GAS CONDENSATE
PESTICIDES AND PCBs

CONSTITUENT	CLASS GA GROUND-WATER EFFLUENT LIMITATIONS *	UNITS	NORTH COLLECTION SYSTEM 12/04/2000	NORTH COLLECTION SYSTEM 02/08/2001	SOUTH COLLECTION SYSTEM 12/04/2000	SOUTH COLLECTION SYSTEM 02/08/2001
alpha-BHC	0	(ug/l)	0.05 U	0.05 U	0.05 U	0.05 U
beta-BHC	0	(ug/l)	0.05 U	0.05 U	0.029JP	0.05 U
delta-BHC	0	(ug/l)	0.05 U	0.05 U	0.039 JP	0.05 U
gamma-BHC (Lindane)	0	(ug/l)	0.05 U	0.0083 J	0.05 U	0.05 U
Heptachlor	0.04	(ug/l)	0.05 U	0.05 U	0.05 U	0.05 U
Aldrin	0	(ug/l)	0.05 U	0.05 U	0.05 U	0.024 J
Heptachlor epoxide	0.03	(ug/l)	0.05 U	0.05 U	0.05 U	0.05 U
Endosulfan I		(ug/l)	0.05 U	0.05 U	0.05 U	0.05 U
Dieldrin	0.004	(ug/l)	0.1 U	0.028 J	0.1 U	[0.14]
4,4-DDE	0.2	(ug/l)	0.1 U	0.024 J	0.1U	0.11
Endrin	0	(ug/l)	0.1 U	0.1 U	0.1 U	0.54
Endosulfan II		(ug/l)	0.1 U	0.1 U	0.1 U	0.1 U
4,4-DDD	0.3	(ug/l)	0.1 U	0.1 U	0.1 U	0.1 U
Endosulfan sulfate		(ug/l)	0.1 U	0.1 U	0.1 U	0.1 U
4,4-DDT	0.2	(ug/l)	0.1 U	0.1 U	0.1 U	0.1 U
Methoxychlor	35	(ug/l)	0.5 U	0.019 J	0.5 U	2.3
Endrin aldehyde	5	(ug/l)	0.1 U	0.1 U	0.1 U	0.1 U
alpha-Chlordane		(ug/l)	0.05 U	0.05 U	0.05 U	0.05 U
gamma-Chlordane		(ug/l)	0.05 U	0.05 U	0.05 U	0.05 U
Toxaphene	0.06	(ug/l)	5 U	5 U	5 U	5 U
Aroclor 1016	0.1	(ug/l)	1 U	1 U	1 U	20 PEX
Aroclor 1221	0.1	(ug/l)	2 U	2 U	2 U	2 U
Aroclor 1232	0.1	(ug/l)	1 U	1 U	1 U	1 U
Aroclor 1242	0.1	(ug/l)	1 U	1 U	1 U	1 U
Aroclor 1248	0.1	(ug/l)	1 U	1 U	1 U	1 U
Aroclor 1254	0.1	(ug/l)	1 U	1 U	1 U	5 U
Aroclor 1260	0.1	(ug/l)	1 U	1 U	1 U	1 U
Endrin ketone	5	(ug/l)	0.1 U	0.0051 J	0.1 U	0.67
Chlordane	0.05	(ug/l)	1 U	1.2	1 U	1 U

* 6NYCRR Part 703.6 Groundwater Effluent Limitations to Class GA Waters

Greater than Action Level

The following qualifier(s) exist: CLP Q: U, J, P, E, X NA=Not analyzed

U: Analyzed for but not detected

Table 8

ISLIP RESOURCE RECOVERY AGENCY
SONIA ROAD LANDFILL
LANDFILL GAS CONDENSATE
ORGANO-PHOSPHOROUS PESTICIDES

CONSTITUENT	CLASS GA GROUND-WATER EFFLUENT LIMITATIONS *	UNITS	NORTH COLLECTION SYSTEM 12/04/2000	NORTH COLLECTION SYSTEM 02/08/2001	SOUTH COLLECTION SYSTEM 12/04/2000	SOUTH COLLECTION SYSTEM 02/08/2001
Thionazin		(ug/l)	1 U	1 U	1 U	0.24 J*
Phorate	0	(ug/l)	1 U	1 U	1 U	1 U
Disulfoton	0	(ug/l)	1 U	1 U	1 U	1 U
Dimethoate		(ug/l)	1 U	1 U	1 U	1 U
Parathionmethyl	1.5	(ug/l)	1 U	1 U	1 U	1 U
Parathion	1.5	(ug/l)	1 U	1 U	1 U	0.18 J
Famphur		(ug/l)	1 U	1 U	1 U	0.72 J*
Sulfotepp		(ug/l)	10 U	0.12 J	10 U	1 U
O,O,O-Triethylphosphorothioate		(ug/l)	10 U	20 U	10 U	200 U

* 6NYCRR Part 703.6 Groundwater Effluent Limitations to Class GA Waters
The following qualifier(s) exist: CLP Q: U, J, * NA=Not analyzed
U: Analyzed for but not detected

Table 9

ISLIP RESOURCE RECOVERY AGENCY
SONIA ROAD LANDFILL
LANDFILL GAS CONDENSATE
DIOXINS AND FURANS

CONSTITUENT	CLASS GA GROUND-WATER EFFLUENT LIMITATIONS	UNITS	NORTH COLLECTION SYSTEM 12/04/2000	NORTH COLLECTION SYSTEM 02/08/2001	SOUTH COLLECTION SYSTEM 12/04/2000	SOUTH COLLECTION SYSTEM 02/08/2001
Total Tetrachlorodibenzofurans		(ng/l)	0.003 U	0.020 U	0.003 U	0.030 U
Pentachlorodibenzofuran		(ng/l)	0.004 U	0.031 U	0.004 U	0.082 U
Total Hexachlorodibenzofurans		(ng/l)	0.005 U	0.054 U	0.0060 U	0.35 U
Total Heptachlorodibenzofurans		(ng/l)	0.012 U	0.071 U	0.016 U	0.53 U
Octachlorodibenzofuran		(ng/l)	0.13 U	0.53 U	0.18 U	2.1 U
Total Tetrachlorodibenzo-p-dioxins		(ng/l)	0.005 U	0.032 U	0.005 U	3.2
Total Pentachlorodibenzo-p-dioxins		(ng/l)	0.006 U	0.050 U	0.0070 U	0.20 U
Total Hexachlorodibenzo-p-dioxins		(ng/l)	0.008 U	0.083 U	0.0090 U	0.53 U
Total Heptachlorodibenzo-p-dioxins		(ng/l)	0.058	0.10 U	0.078	3.5
Octachlorodibenzo-p-dioxin		(ng/l)	0.57	0.62 U	0.98	1.6
2,3,7,8-Tetrachlorodibenzofuran		(ng/l)	0.0045 U	0.020 U	0.0040 U	0.045 U
2,3,7,8-Tetrachlorodibenzo-p-dioxin		(ng/l)	0.007 U	0.032 U	0.0062 U	0.039 U
1,2,3,7,8-Pentachlorodibenzofuran		(ng/l)	0.0048 U	0.032 U	0.0053 U	0.082 U
2,3,4,7,8-Pentachlorodibenzofuran		(ng/l)	0.0056 U	0.0316 U	0.0052 U	0.081 U
1,2,3,7,8-Pentachlorodibenzo-p-dioxin		(ng/l)	0.0090 U	0.050 U	0.0085 U	0.13 U
1,2,3,4,7,8-Hexachlorodibenzofuran		(ng/l)	0.0060 U	0.052 U	0.0066 U	0.22 U
1,2,3,6,7,8-Hexachlorodibenzofuran		(ng/l)	0.0057 U	0.049 U	0.0062 U	0.21 U
2,3,4,6,7,8-Hexachlorodibenzofuran		(ng/l)	0.0065 U	0.057 U	0.0071 U	0.24 U
1,2,3,7,8,9-Hexachlorodibenzofuran		(ng/l)	0.0072 U	0.062 U	0.0078 U	0.27 U
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin		(ng/l)	0.0099 U	0.085 U	0.011 U	0.37 U
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin		(ng/l)	0.0095 U	0.081 U	0.010 U	0.35 U
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin		(ng/l)	0.0093 U	0.082 U	0.010 U	0.35 U
1,2,3,4,6,7,8-Heptachlorodibenzofuran		(ng/l)	0.013 U	0.066 U	0.017 U	0.33 U
1,2,3,4,7,8,9-Heptachlorodibenzofuran		(ng/l)	0.015 U	0.076 U	0.021 U	0.38 U
1,2,3,4,6,7,8-C17-Dibenzo-p-dioxin		(ng/l)	0.027	0.10 U	0.034	0.48
1,2,3,4,6,7,8,9-Octachlorodibenzofuran		(ng/l)	0.13 U	0.53 U	0.18 U	2.1 U
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin		(ng/l)	0.57	0.62 U	0.98	1.6

* 6NYCRR Part 703.6 Groundwater Effluent Limitations to Class GA Waters

The following qualifier(s) exist: CLP Q: U NA=Not analyzed

U: Analyzed for but not detected

ng/l: nanograms per liter