Ontario County Landfill Expansion

Supplemental Information to the Air Quality Review

Prepared in Support of the State Environmental Quality Review

June 2012

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1.0 Introduction

This document has been prepared to provide supplemental information to the Air Quality Review submitted with the Draft Environmental Impact Statement (DEIS) for the proposed Ontario County Landfill Expansion project. With the exception of the updates/revisions noted in Section 1.1, the review presented in the DEIS has not changed. This document provides supplemental information in support of the DEIS review and responds to information requests received during the public comment period of the DEIS. Additional information is included in this document regarding:

- Landfill Gas Generation and Collection/Control at the existing and proposed landfill;
- Combined emissions analysis from the landfill and nearby landfill gas to energy (LFGTE) facility;
- Particulate matter (PM) emissions from dust generating activities from the operational landfill;
- Speciated leachate hazardous air pollutant (HAP) emissions;
- Cumulative greenhouse gas (GHG) emissions from peak year operations;
- Regulatory review of the project;
- Ambient air sample results for comparison to ambient air quality guidelines and standards; and
- Ambient Air Screening of peak year fugitive emissions for comparison to ambient air quality guidelines and standards.

As part of the proposed project, a Title V Permit Modification Application will be required to be submitted prior to construction which will permit the proposed emission sources.

1.1 Revisions to DEIS Air Quality Review

The following revisions have been made to the DEIS Air Quality Review and are presented in this supplemental information document:

- The NMOC emission factor used to calculate the fugitive landfill gas potential to emit in DEIS was not correct. The NMOC emission factor has been corrected from 59.5 lb/10^6 scf LFG to 231.3 lb/10^6 scf. The result of this change increases NMOC and VOC emissions associated with fugitive landfill gas emissions from that which was presented in the DEIS. The revised emission estimates are provided in Appendix J of this document. The NMOC emission factor used to calculate flared landfill gas potential to emit is correct as presented in the DEIS Air Quality Review.

- The leachate generation estimates have been revised in this document from what was previously reported in the DEIS Air Quality Review to more accurately reflect existing permitted landfill annual generation rate, expansion landfill generation rate and peak year leachate generation from the existing and expansion landfills.
- In order to more accurately predict actual site data, Waste Industry Air Coalition (WIAC) concentration values for Acrylonitrile and Vinyl Chloride were used in fugitive emission estimates.
- Added fugitive emission estimate of hydrogen sulfide emissions to the hazardous air pollutant (HAP) fugitive emission tables (provided in Appendix J to this document).

2.0 Landfill Gas Generation, Collection & Control

The quantity of landfill gas generation was conservatively estimated using the EPA LandGEM model. Based on site specific gas generation modeling and collection efficiency estimates, a maximum PTE landfill gas generation rate estimate for the landfill expansion of 9,618 scfm is projected to occur following the permitted landfill closure year. When combined with the landfill gas still being generated from the closed landfills at the time of the expansion landfill closure, the maximum PTE landfill gas generation rate estimate for the entire facility is 12,576 scfm. Table 1 summarizes the landfill gas generation and collection/control estimates for the existing landfill and expansion landfill, as well as the estimated control capacity of the adjacent LFGTE facility engines. Appendix A presents a graph of landfill gas generation estimates, as well as a comparison of landfill gas generation to the LFGTE facility control capacity. As shown on this graph, landfill gas generated from the existing landfill is estimated to support operation of the LFGTE facility for approximately 13 years of operation at full capacity, and several years after that at reduced capacity.

Landfill gas flare capacity will be permitted and constructed such that 100 percent of the actual collected landfill gas will be able to be flared in onsite landfill flares. This is important because should the LFGTE facility go down for any reason, sufficient control capacity will be available to control the landfill gas. Landfill gas generation estimates are conservative and represent the worst case estimate of generation potential. As such, it is anticipated that total peak landfill gas generation and collection presented in the analysis are overestimated; with the actual environmental impacts of the project being less that those described in this review.

Please note that landfill gas generation and collection information provided in the DEIS/FEIS and in this supplement are based on best available data and modeling available; however, the resulting emission rates presented are estimates. All emissions data presented in the DEIS/FEIS and in this supplemental report shall be assumed to be estimates unless otherwise noted.

Table 1 – LFG Generation Estimates and Control Capacities – Existing and Proposed Landfill Facilities

	LFG Generation Potential *(scfm)*	LFG Collection/Control Potential [1] *(scfm)*	Constructed Flare Capacity [2] *(scfm)*	Total Permitted Flare Capacity [3] *(scfm)*	8-Engine LFGTE Capacity *(scfm)*	3-Engine LFGTE Capacity *(scfm)*	Total LFGTE Capacity [4] *(scfm)*	Total Cumulative LFG Control Capacity (Landfill + LFGTE) *(scfm)*
Existing Landfill	6,805	6,465	4,650	6,450	2,640	1,593	4,233	10,683
Expansion Landfill	9,618	9,137	N/A	11,950	2,640	1,593	4,233	16,183
Peak Year LFG Generation (Expansion Closure Year)	12,576	11,947	N/A	11,950	2,640	1,593	4,233	16,183

Notes:

1. Collection/Control potential based on 95% LFG collection efficiency

2. Existing Landfill: Includes Enclosed Flare 002FL (500 scfm), Enclosed Flare 003FL (1,750 scfm), and two open flares (1,200 scfm each) approved for temporary operation by NYSDEC (as of June 2012).

3. Expansion Landfill and Peak: Includes Flare XXXFL (1,200 scfm, permitted), Flare 004FL (3,000 scfm, permitted in Title V Renewal), and Flare EXPFL (5,500 scfm, proposed for expansion). Difference in existing permitted flare capacity and collection/control potential for the existing landfill is de minimus.

4. Per Seneca Energy II, LLC Ontario LF LFGTE Facility Title V Permit. The 3-Engine LFGTE facility is under permit review and has not been constructed yet (as of June 2012).

3.0 Landfill & LFGTE Facility Cumulative Impact Assessment

An emission inventory was presented in the DEIS Air Quality Review that included the "baseline" emissions, which are considered peak emissions from the existing permitted landfill facility, and the "project" emissions, which are considered the peak emissions from the proposed landfill expansion project.

Although separately owned and permitted facilities, the combined emissions from the Ontario County Landfill and the Ontario LF LFGTE Facility emission sources were evaluated in this supplemental information report for the purpose of SEQR review. The operation of the LFGTE facility decreases the amount of landfill gas that would otherwise be flared at the Ontario County Landfill. Since there is a finite quantity of landfill gas that will be generated from the landfill, the combined landfill gas emissions from both the landfill and LFGTE facility are not additive, and will consist of a combination of flared emissions from the landfill and engine emissions from the LFGTE facility. Under typical operations, the engines will be operational and available to control landfill gas generated from the landfill, with the flares operating as backup control devices. Based on landfill gas model estimates, the existing landfill has the potential to generate sufficient quantities of landfill gas to supply the existing and proposed LFGTE facilities. The LFGTE facility has the potential to control at least 65 percent of the landfill gas collected from the existing permitted landfill based on peak generation estimates. The collected landfill gas that is routed to the LFGTE facility is treated through dewatering, filtration, and compression processes prior to combustion. The LFGTE facility provides a beneficial control measure of the landfill gas generated at the landfill. The landfill facility also maintains permitted enclosed flares for landfill gas control during periods when the LFGTE facility is not operational, or when excess gas is available that the LFGTE facility cannot utilize.

In general, combustion emissions from the LFGTE engines are greater than that of the landfill gas flares; however, this does not account for secondary emissions that may be offset from the production of electricity from landfill gas (such as emissions from power plants, and the greenhouse gas emission offsets from the beneficial use of the landfill gas). Table 2 presents the general difference in emission rates from landfill gas combustion (per volumetric methane (CH4) flow rate). This table utilizes the estimated emission factors used in the permitting of the LFGTE facilities (the 8-engine facility and 3-engine facility have different emission rates based on the size and operation of these engines) converted to a pounds per standard cubic feet (scf) of CH4, and a typical enclosed flare. Actual emission rates from onsite enclosed flares in operation are less based on site specific emissions testing.

Table 2 – Flare vs. Engine Emission Rates			
Pollutant	**Flared Emissions** [1] *(lb/10^6 scf CH4)*	**CAT G3516 Engine Emissions** [2] *(lb/10^6 scf CH4)*	**CAT G3520C Engine Emissions** [2] *(lb/10^6 scf CH4)*
NOx	60.7	267.9	308.4
CO	202.4	691.4	986.8
SO2	88.5	88.5	88.5
PM-10/PM-2.5	17.0	48.0	30.8
Control Efficiencies [3]	**Flare** *(%)*	**CAT G3516 Engine** *(%)*	**CAT G3520C Engine** *(%)*
VOC	98	97.2	97.2
HAPs	98	97.2	97.2

Notes:

1. Flared emissions - based on enclosed flare emission estimates.

2. Engine combustion emissions converted to lb/10^6 scf CH4 from facility emissions inventory presented in Title V Air Permit Mod App (Jan 2012).

3. Per AP-42, Section 2.4 (11/98).

A summary table of all combustion source emissions from the landfill facility and LFGTE facility is provided in Appendix B, Table B-1.

3.1 Current Landfill Flare Emissions

The DEIS public comments requested that the existing facility potential emissions be summarized for the Ontario County Landfill. The existing landfill facility has the following flare devices currently installed:

- (1) 500-scfm enclosed flare
- (1) 1,750-scfm enclosed flare
- (2) 1,200-scfm open flares

The annual potential to emit from these installed flare sources is provided in Appendix C, Table C-1. These emissions do not include contribution from the LFGTE facility, and assume all of the landfill gas is flared.

3.2 Landfill & LFGTE Operating Scenarios

The DEIS public comments requested various operating scenarios for the landfill and LFGTE facility to consider the cumulative impacts of the two facilities. The following operating scenarios and associated emissions are provided as appendices to this document. Although different combinations of control devices and landfill gas collection may occur throughout the life of the landfill, these represent a summary of the peak emissions for each scenario.

- Operating Scenario 1 – Peak LFG collection from the existing permitted landfill, with the 8-Engine LFGTE Facility 100% operational, with the remaining LFG flared in the enclosed flares 003FL and 004FL (see Appendix D, Table D-1).
- Operating Scenario 2 – Peak LFG collection from existing permitted landfill with 11-Engine LFGTE Facility 100% operational, with the remaining LFG flared in enclosed flare 004FL (see Appendix D, Table D-2).
- Operating Scenario 3 – Peak LFG collection from the expansion landfill (plus LFG Generation from the existing landfill at the expansion landfill closure), with 11-Engine LFGTE Facility 100% operational, with the remaining LFG flared in enclosed flares 004FL and EXPFL (see Appendix D, Table D-3).
- Operating Scenario 4 – Peak LFG collection from the expansion landfill (plus LFG Generation from the existing landfill at the expansion landfill closure), with 100% of LFG flared in enclosed flares (LFGTE Facility not operational) (see Appendix D, Table D-4).

4.0 Landfill Fugitive PM Emissions from On-Site Vehicle & Equipment Operation

Particulate emissions at the site are attributed to vehicular traffic within the landfill site boundaries, and by the operation of heavy equipment such as bulldozers and trash compactors to facilitate the placement and compaction of waste materials.

Fugitive emissions of PM-10 and PM-2.5 generated from on-site vehicle and heavy equipment operations are estimated in accordance with AP-42 Sections 13.2 and 11.9. These emissions include particulates generated from vehicles traveling over paved and unpaved landfill roads, particulates generated from filling and dumping of borrow haul trucks, and particulates generated with the operation of earth moving equipment. The landfill has both paved roads and unpaved roads that are traveled by waste trucks, borrow haul trucks and other vehicles. Inputs to the emission calculations are based on the number of vehicles hauling waste, length of site roads, number of vehicles hauling soil, and equipment utilized in the soil borrow operations including soil cover spreading. Calculation sheets detailing the fugitive particulate generation for PM-10 and PM-2.5 from vehicle traffic are presented in Appendix E.

Particulate emissions are controlled by watering of roads within the landfill site. The facility maintains best management practices for dust control to limit offsite emissions including road watering. The resulting net controlled fugitive particulate emissions attributed to vehicle travel are estimated to total 34.35 tons of PM-10 per year, and 6.65 tons of PM-2.5 per year. Typical daily landfill operations that generate fugitive particulates will not change as a result of the landfill expansion. Waste hauling operations and soil borrow operations within the landfill facility will remain unchanged. In addition, future landfill cell construction activities that may generate fugitive particulates will be similar to existing cell construction activities and will not present a significant increase in fugitive particulate matter emissions.

5.0 Leachate Storage Fugitive Emissions

The Ontario County Sanitary Landfill maintains a lined leachate storage pond. Leachate is stored in the pond while awaiting shipment by tanker truck to a Waste Water Treatment Plant (WWTP). New leachate storage ponds are proposed for the landfill expansion that will take the place of the existing pond.

Leachate typically contains volatile organic compounds that may volatilize to the atmosphere. Emissions from leachate storage have been conservatively estimated in the DEIS Air Quality Review using the total leachate generation from the existing landfill and the peak generation from the expansion landfill facility assuming that 100 percent of the total VOCs are emitted to the atmosphere. Actual VOC emissions from leachate storage are expected to be closer to 20 percent of the total VOCs. The PTE leachate storage will increase from the current landfill peak estimate of approximately 16.7 million gallons to approximately 20.7 million gallons based on updated leachate generation site data and landfill expansion leachate generation estimates.

Speciation of hazardous air pollutant (HAP) emissions from leachate storage has been requested during the public review of the DEIS and is estimated in Appendix F, Tables F-1 (current permitted facility), F-2 (expansion landfill) and F-3 (peak facility operations). The HAP emissions are based on leachate analytical data results from the previous 6 years. The increase in leachate storage emissions from existing estimated emissions to peak emissions from the facility is attributed to the increased leachate generation from the landfill areas (from a peak of 16.7 million gallons per year to 20.1 million gallons per year), or a potential 24 percent increase from peak year operations.

6.0 Greenhouse Gas Emissions

Greenhouse gas emissions from the existing permitted landfill and the proposed landfill expansion were presented in the DEIS Air Quality Review. Additional information regarding the cumulative impact of the existing and proposed expansion landfill during peak year landfill gas generation is provided in Appendix G, Table G-1. During the peak year of landfill gas generation, the expansion landfill will generate approximately 52,612 tons of the greenhouse gas methane (CH4). During that year, an additional 16,181 tons of methane will be generated from the closed landfills, resulting in a peak methane generation of 68,793 tons/yr during the peak year of gas generation. Methane will be collected by the landfill gas collection system and controlled through combustion for mitigation. In addition, greenhouse gas emissions will be offset through the voluntary collection of landfill gas in areas not requiring gas collection by regulation or other mandate, as well as from the beneficial use of the landfill gas methane through the generation of electricity at the nearby LFGTE facility.

7.0 Air Regulatory Review

7.1 PSD and NANSR Review

The DEIS Air Quality Review (Attachment G) includes a review of Prevention of Significant Deterioration of Air Quality (PSD) and Non-Attainment New Source Review (NANSR) rules and concludes that the existing landfill and the proposed landfill expansion are less than major source thresholds, and therefore these regulations are non-applicable to the existing facility and the expansion project.

The NYSDEC issued a common control determination in a letter dated January 5, 2012 that determines for the purposes of NSR and PSD, the Ontario County Landfill and the Ontario LF LFGTE Facility will continue to be treated as two (2) separate facilities. Beginning in December 2010, the PSD and NSR programs were delegated to the NYSDEC by EPA.

A summary table of the facilities potential to emit (PTE) has been requested during the public review of the DEIS and is provided in Appendix H, Table H-1. This information presents the PTE for following facilities operating at maximum capacity:

- Existing Landfill
- Expansion Landfill Project
- 8-Engine LFGTE Facility
- 3-Engine LFGTE Facility

It is important to reiterate from the DEIS Air Quality Review that the operation of the LFGTE facility decreases the amount of landfill gas that would otherwise be flared at the Ontario County Landfill. Since there is a finite quantity of landfill gas that will be generated from the landfill, the combined landfill gas emissions from both the landfill and LFGTE facility are not additive, and will consist of a combination of flared emissions from the landfill and engine emissions from the LFGTE facility. Table H-1 presents the maximum emissions from each facility as well as the applicable major source threshold for PSD/NANSR review. As the regulatory emission thresholds are project specific, the emissions from each facility's operations do not get added together. Based on the analysis contained within the DEIS Air Quality Review, the previously submitted analyses presented in the respective permitting of the separate facilities, and the summary table in Appendix H; the 11-engine LFGTE facility will be considered a major source and subject to the applicable significant emission rate (SER) increase limits of 6 NYCRR Part 231 for any future projects.

7.2 NYSDEC Policy CP-33

NYSDEC has a policy document for assessing particulate matter (PM-2.5) emissions and their "potential for significant adverse health and/or environmental impacts". The policy CP-33: Assessing and Mitigating Impacts of Fine Particulate Matter Emissions provides guidelines for evaluating the potential impacts resulting from the emission of fine particulate matter during the operation of a proposed project.

Particulate emissions from the landfill expansion will include secondary combustion products from the burning of landfill gas and fossil fuels, and from fugitive particulate dust generated during landfill operation as a result of vehicular traffic within the landfill site boundaries, and by the operation of heavy equipment such as bulldozers and trash compactors to facilitate the placement and compaction of waste materials, and equipment and soil haul trucks operating for cover soil mining operations.

Appendix I, Table I-1 provides a summary of facility emissions of PM-2.5 from landfill gas flare combustion and onsite fugitive emissions from vehicles and operating equipment. The project's increase in PM-2.5 generation is estimated to peak below the 15-ton threshold described in the policy; therefore, PM-2.5 emissions are not expected to create an environmental or health impact for this project.

7.3 NSPS for MSW Landfills

The existing Ontario County Landfill facility is subject to the landfill gas collection and control requirements of the EPA New Source Performance Standard (NSPS) 40 CFR Subpart WWW for Municipal Solid Waste Landfills. This regulation specifies that:

1) The expansion landfill will be designed and operated in accordance with the requirements of these regulations, including but not limited to the operation of the landfill gas collection system wells and wellheads, landfill gas flares, and monitoring of surface emissions. Landfill gas collection and control design plans will be prepared and submitted to the regulatory authorities for review in accordance with NSPS regulations. The landfill gas collection system will be designed to handle all of the potential gas collection at the facility, thus providing control of odors and fugitive emissions of landfill gas.

2) The landfill gas collection system will be monitored through the requirements of NSPS to demonstrate appropriate performance to verify that no limits are exceeded that could pose a potential offsite environmental issue. The requirements that the facility currently is required to meet, and will be required to meet in the future, include maintaining landfill gas collection system wells and wellheads at appropriate parameters, ensuring sufficient coverage of the landfill

gas collection system, and monitoring surface emissions on the landfill facility. Landfill gas control requirements consist of operating the gas control devices when the gas collection system is in operation to combust and destroy collected landfill gas, as well as monitoring these system parameters for appropriate destruction in accordance with NSPS requirements.

7.4 Hazardous Air Pollutant (HAP) Review

Fugitive HAP emissions from the site include fugitive landfill gas and leachate emission sources. Landfill gas emissions were analyzed based on a worst case potential to emit estimate of 20% of the total peak generation rate. Leachate emissions were analyzed based on a worst case potential to emit estimate of 100% volatilization of all HAP compounds found in the leachate. The following PTE HAP emission estimate scenarios are provided in Appendix J:

- Existing landfill facility: Appendix J, Tables J-1 & J-2 (updated fugitive LFG emissions from the DEIS).
- Expansion landfill project: Appendix J, Tables J-3 & J-4 (updated fugitive LFG emissions from the DEIS).
- Peak year emissions from landfill expansion and existing landfill facility: Appendix J, Tables J-5 & J-6 (fugitive LFG emissions during peak year) & J-6 (total facility fugitive HAP emissions).

A summary table of the total worst case HAPs from fugitive landfill gas and leachate sources is provided in Appendix J, Table J-7. As summarized in the tables, the facility is an existing minor source of HAPs, and the project is a minor source of HAP emissions (total HAPs less than 25 tons per year, single HAP less than 10 tons per year). After combining the conservative HAP emission estimates from both the existing permitted landfill facility and the expansion landfill, the combined facility HAP fugitive emission rate will exceed the Title V major source threshold of 25 tons per year. The facility already operates under an existing Title V Air Permit and the proposed expansion landfill will be permitted to operate with a Title V Air Permit modification which will address HAP emissions. It should be noted that actual HAP emissions are estimated to remain less than 25 tons.

The landfill gas fugitive emission rates presented in this supplement and in the DEIS are based on published AP-42 and WIAC default values for HAP compounds (with the exception of H_2S for which actual site data is available). AP-42 default values are typically very conservative and exceed actual HAP concentrations found in municipal solid waste (MSW) landfills in operation today. The WIAC paper studied the AP-42 values and actual measured emissions at landfills across the United States and found significantly lower concentrations of all compounds at modern landfills, since diversion of hazardous waste from modern municipal landfills (post mid 1990s). Based on information from the site,

several WIAC concentration values were used for two (2) speciated HAP compounds to better represent actual site conditions. In addition, volatilization of leachate HAPs is closer to 20% than the 100% that was used in the emission estimates, which provides a "worst case" estimate.

Landfill gas hazardous air pollutants are mitigated through the installation and operation of a landfill gas collection and control system. In addition, leachate fugitive HAP emissions will be limited through leachate removal from storage lagoons and transfer to offsite locations for treatment.

8.0 Ambient Air – Hydrogen Sulfide Evaluation & Sampling

Predominately due to the wet weather during 2011, hydrogen sulfide (H_2S) emissions from the Ontario County Landfill have recently generated complaints and public comments from those who live and work at locations surrounding the landfill. In response to this issue, the site operator has made investments to the gas collection system that have significantly improved gas collection at the facility. In addition, the facility has established a complaint tracking data base to provide appropriate response of odor complaints and document any remediation and/or corrective actions that were implemented or planned for future development. During the permitting of the landfill expansion, an Odor Management Plan will be prepared and implemented to provide further procedures for managing landfill gas, including odor complaints and proper responses and mitigation measures. In addition, a Landfill Gas Collection and Control System Plan will be prepared to provide an appropriate implementation plan of gas collection and control systems.

8.1 Hydrogen Sulfide Evaluation

Hydrogen sulfide (H_2S) is a colorless gas with a strong odor characteristic of rotten eggs. It is the result of the normal microbial activity in landfills during the breakdown of organic matter in the absence of oxygen. Typically in landfills, the primary source of H_2S is the decomposition of construction and demolition (C&D) debris wallboard. H_2S has a very low odor threshold and can be detected at concentrations in parts per billion (ppb) in ambient air.

The health effects from exposures to H_2S are directly related to the airborne concentration. Table 3 provides a summary of reported health effects and the corresponding exposure concentration of H_2S:

Table 3 – Human Health Effects at Various H_2S Concentrations [1]

Health Effect	H_2S Exposure Concentration[2] *(ppb)*
Odor Threshold	8
Bronchial constriction in asthmatic individuals	2,009
Increased eye complaints	3,587
Eye irritation	3,857 – 20,805
Fatigue, loss of appetite, headache, irritability, poor memory, dizziness	20,088
Olfactory paralysis	>100,440
Respiratory distress	>401,760
Death	>502,200

Notes:

1. Source: World Health Organization, 2003. Hydrogen Sulfide: Human Health Aspects. Concise International Chemical Assessment Document 53. World Health Organization, Geneva, Switzerland.
2. Concentrations converted from mg/m^3 to ppb for ease of comparison with other data presented herein.

As shown in the above table, increasing the exposure concentration of H_2S increases the severity of health effects. It should be noted that the lowest H_2S concentration reported to produce adverse health effects in humans is 2,009 ppb, which is more than 250 times greater than the odor threshold of 8 ppb of H_2S. Therefore, the levels of H_2S in ambient air resulting in the detection of odors by an average healthy adult's olfactory senses is significantly less than the levels that may cause adverse health effects. To further respond to odor concerns, the facility performed site specific H_2S monitoring as described below.

8.2 Hydrogen Sulfide Sampling

In order to further investigate the public odor complaints and odor issues from the facility, an ambient air monitoring study was conducted. The initial screening consisted of the operation of Jerome 631X meters that specifically measure airborne concentrations of H_2S to the parts per billion (ppb) level. Preliminary monitoring for H_2S found that fence line concentration were below Agency for Toxic Substances and Disease Registry (ATSDR) recommended values; however, due to sampling instrument accuracy limitations and the resulting detection limits obtained from the initial screening, further testing was conducted utilizing Radiello® sorbent tubes specific to H_2S. The sorbent tubes were placed at six (6) locations around the landfill property boundary (see Figure 1 for locations), and were activated to collect samples continuously for 10 days (June 5 – June 15, 2012). A duplicate sample was also collected at Location 1 for confirmation of data reliability.

Results of that sampling found that fence line levels are below both ATSDR Minimal Risk Level (MRL) and NYSDEC Air Guide recommended Annual Guidance Concentration (AGC) levels. The ATSDR recommended levels for H_2S exposure is 70-ppb (acute exposure limit)/30-ppb (intermediate exposure limit), and the AGC for H_2S is 1 ppb. The maximum fence line concentration observed was 0.61 ppb . Laboratory results from the Radiello® sampling is provided in Appendix K.

It should be noted that during the 10-day period when the samples were collected, the landfill operations were in the process of re-locating waste on the eastern side of the landfill. Relocation of the waste typically results in reduced landfill gas collection in that area during the relocation process, as a larger than normal area of waste was exposed while the landfill side slope was re-graded. This activity during sampling provides a level of conservatism in the sample results, as it is likely that a larger than normal amount of H_2S was emitted to the atmosphere during the sampling event.

9.0 Ambient Air Screening & Health Risk Assessment

An ambient air quality screening was conducted per NYSDEC comment on the DEIS. The objective of the screening was to assess the off-site impacts to air quality due to fugitive landfill gas emissions using worst case emission rate estimates to compare to health-based guidance values provided by the EPA's National Ambient Air Quality Standards (NAAQS), the ATSDR MRL, and the NYSDEC AGC levels.

9.1 Model Description

In accordance with NYSDEC guidance, the most conservative way to predict the effects of dispersion of fugitive landfill gas compounds is to perform a screening analysis using the NYSDEC DAR-1 (formally Air Guide-1) guidance procedures and modeling program. The DAR-1 screening analysis was conducted in accordance with the NYSDEC DAR-1 guidance document "Guidelines for the Control of Toxic Ambient Air Contaminants". The screening analysis was performed in accordance with the procedures presented in Appendix B of DAR-1, "Ambient Air Impact Screening Analyses".

The NYSDEC DAR-1 screening analysis is a two step process. The first step is conducted under worst case conditions to provide a conservative estimate of the annual ambient air impacts. The second step of the model is a refined analysis utilized to review emissions that exceed NYSDEC Annual Guidance Concentrations (AGCs) and is the DAR-1 version of the USEPA's Industrial Source Complex (ISCLT2) model. The refined model takes into account local meteorological data and surrounding land use to assess dispersion of air contaminants.

The DAR-1 screening analysis was used to assess the AGC concentration values of the modeled HAPs. Worst case default values, as defined in Appendix B of DAR-1, and the calculated annual emission rate (lb/yr) of each compound were used as inputs to the model. Emission rates of HAPs used in the model were obtained from the peak year of landfill gas generation from the landfill expansion, including landfill gas generated from the existing landfill facilities as a peak facility, worst case estimate. The fugitive emissions were assumed to be 20% of the total peak landfill gas generation rate from the site as a worst case estimate. During review of the emission estimates for the model it was determined that the AP-42 default values for vinyl chloride and acrylonitrile (propenenitrile) greatly overestimate the concentrations of these compounds actually found in landfills; therefore, more up to date published concentrations were utilized from the WIAC paper in the modeling of these compounds. The annual emission rates utilized in the model are provided in Appendix K, Table K-1.

An area source was setup in the model to simulate fugitive landfill gas emissions. The location and size of the area source was developed to simulate

the landfill size and height, and was based on the average height of the landfill at during the lifetime of the landfill

9.2 Ambient Air Screening Results

Results from this initial screening indicate that all modeled fugitive compounds are below AGC concentration values. As a result, a refined analysis was not required in accordance with DAR-1 guidance. The DAR-1 model results summary for the initial screening is presented in Appendix L, Table L-1.

Appendices

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LFG Generation Curves

Appendix B

Landfill & LFGTE Facility LFG Emission Source Summary

Appendix C

Existing Landfill Flared Emission Source Summary

Appendix D

Landfill & LFGTE Facility Cumulative Emissions Summary

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Landfill Mobile Vehicle Particulate Emission Calculations

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Leachate Storage Fugitive HAP Emission Estimates

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Fugitive Greenhouse Gas Emissions Summary

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Landfill & LFGTE Facility PTE Summary

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Facility Particulate Emissions Summary

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Updated LFG HAP Emission Calculations

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Hydrogen Sulfide Ambient Air Lab Sample Results

Appendix L

Ambient Air Screening Results Summary

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Figure 1

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