Appendix F-3

Air Quality & Odour Existing Conditions Report

DRAFT REPORT

WALKER SOUTH LANDFILL PHASE 2 ENVIRONMENTAL ASSESSMENT

NIAGARA FALLS, ONTARIO

AIR QUALITY EXISTING CONDITIONS

RWDI #2402272

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SUBMITTED TO

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

1 INTRODUCTION

This report provides an overview of the existing Air Quality conditions within the study areas for the South Landfill Phase 2 (SLF2) Environmental Assessment (EA). The Minister of the Environment, Conservation and Parks (Minister) Approved Terms of Reference (ToR) for the EA included a preliminary description of the existing environmental conditions and made a commitment to expand upon this description during the EA.

Walker Environmental Group (WEG) initiated a Comprehensive EA under the Ontario EA Act seeking approval to expand the capacity of its existing South Landfill located at the Walker Resource Management Campus (Campus) in Niagara Falls. The South Landfill is an essential component of Walker's Campus since it began operating in 2009 under Environmental Compliance Approval (ECA) No. 008-78RKAM, as amended, and provides safe, reliable, and affordable disposal capacity for solid, non-hazardous waste from residential and industrial, commercial, and institutional (IC&I) sources to its customer base within the City of Niagara Falls, the Regional Municipality of Niagara, and the Province of Ontario. The South Landfill's total approved disposal capacity is 17.7 million m^3 and is expected to reach maximum capacity by 2029 to 2031.

The proposed Phase 2 of the South Landfill (the Project) would extend its approved capacity by approximately 19.8 million m^3 over a 20-year period, ensuring Walker can continue to provide essential residual waste disposal services to its existing customer base. Walker is proposing to locate the additional disposal capacity (Phase 2) to the east of the existing South Landfill within the area currently occupied by Walker's Southeast Quarry. The proposal would maintain the existing landfill service area, as well as the annual volume of solid, non-hazardous waste from the sources currently accepted. A site plan of the Walker Campus is provided in **Figure 1-1**.

The EA Act requires that proponents describe the environment that may potentially be affected or may reasonably be expected to be affected, directly or indirectly, by the Alternative Methods of Carrying Out the Undertaking (Alternative Methods) proposed as part of an EA. The description of the existing environmental conditions will provide the baseline for the assessment of potential effects for the proposed Undertaking. This report focuses on characterizing the existing conditions within the study areas for the SLF2 EA for Air Quality.

2 STUDY AREA

From an Air Quality perspective, the characterization of existing conditions within the following study areas are appropriate to this EA:

- Site Study Area (SSA), which is consistent across all technical disciplines and encompasses a total of 81.3 ha of land owned and operated by Walker. The SSA includes the current quarry extraction limit, and encompasses the proposed limit of fill, the buffer area, and aligns with the proposed Waste Disposal Site Limit Boundary. While the SSA captures the core area of the proposed landfill development, certain ancillary features related to the landfill are proposed to be located outside the SSA. These features will be addressed within the broader Local Study Area;
- Local Study Area (LSA), including all lands within a 1 km radius of the SSA boundaries; and
- Regional Study Area (RSA), including all lands within 5 km radius of the Walker Campus boundary.

Although the SSA is limited to the areas within the approved Southeast Quarry and surrounding buffer areas, the Air Quality assessment considered the combined impacts from the existing landfill operations at the South Landfill Phase I (SLF1), the closed East Landfill, and the other operations occurring at the Walker Campus that emit contaminants in common with the landfill.

For the Air Quality effects assessment, the potentially affected areas are defined based on the Ministry of Environment, Conservation, and Parks (MECP), modelling guidelines for air quality. For the Air Quality effects assessment, the study area is based on the RSA which includes the area approximately 5 km from the Walker Campus property boundary. This 5 km RSA is consistent with MECP modelling guidelines and was used to establish predicted concentration isopleths for each contaminant within the wider area and ascertain there are no elevated concentration anomalies beyond the immediate vicinity represented by the 1 km LSA. The modelled domain used in the Air Quality assessment encompassed the entire RSA. **Figure 2-1** shows the study areas for Air Quality assessment.

2.1 Receptors

The focus of the modelling was on identified discrete receptors in the immediate vicinity (within ~1 kilometre) of the SSA. A total of 29 discrete receptors were identified. Discrete receptors consist mostly of residences with the addition of a few commercial businesses, and the Niagara Region vehicle service centre. Discrete receptors are closest to the landfill area in various compass directions and are expected to provide the worst-case estimate for predicted contaminant concentrations when compared to residences and businesses located further away. Of the 29 discrete receptors identified in the air quality study, 18 are designated as common receptors that were assessed for all disciplines. The remaining 11 receptors are included only for the air quality study for consistency with previous air quality studies completed at the Walker Campus. A list of the receptors considered in the assessment are provided in **Table 2-1**.

Table 2-1: Summary of Discrete Receptors

Receptor ID	Common Receptor ID	Category	Description	X (m)	Y (m)
R01	--	AQ Receptor Only	Located approximately 1177 m from the boundary of the proposed South Landfill Phase II fill limit. This is a Walker owned rental property located northwest of landfill area.	648976	4778164
R02	CR17	Both AQ and Common Receptor	Located approximately 456 m from the boundary of the proposed South Landfill Phase II fill limit. Representative of the nearest residence northeast of the South Landfill Phase II fill limit, and Gauld Nurseries, an important local business.	650305	4777710
R03	CR19	Both AQ and Common Receptor	Located approximately 1033 m from the boundary of the proposed South Landfill Phase II fill limit. This is a Walker-owned property that is currently tenanted.	648386	4775526
R04	--	AQ Receptor Only	Located approximately 540 m from the boundary of the proposed South Landfill Phase II fill limit. This is a residence located east of the landfill area.	650354	4776343

Receptor ID	Common Receptor ID	Category	Description	X (m)	Y (m)
R05	--	AQ Receptor Only	Located approximately 640 m from the boundary of the proposed South Landfill Phase II fill limit. This is a residence located east of the landfill area.	650431	4776281
R06	--	AQ Receptor Only	Located approximately 600 m from the boundary of the proposed South Landfill Phase II fill limit. This is a residence located east of the landfill area.	650392	4776245
R07	--	AQ Receptor Only	Located approximately 760 m from the boundary of the proposed South Landfill Phase II fill limit. This is a residence located southeast of the landfill area.	650491	4775987
R08	--	AQ Receptor Only	Located approximately 1015 m from the boundary of the proposed South Landfill Phase II fill limit. This is a residence located southeast of the landfill area.	650517	4775493
R09	CR18	Both AQ and Common Receptor	Located approximately 1054m from the boundary of the proposed South Landfill Phase II fill limit. Representative of the cluster of residences on Garner Rd south of the transmission line and north of Thorold Stone Rd.	650488	4775228
R10	CR05	Both AQ and Common Receptor	Located approximately 740 m from the boundary of the proposed South Landfill Phase II fill limit. This is a residence located south of the landfill area.	649688	4775252
R11	--	AQ Receptor Only	Located approximately 1100 m from the boundary of the proposed South Landfill Phase II fill limit. This is a residence located southwest of landfill area.	648888	4775039
R12	--	AQ Receptor Only	Located approximately 1400 m from the boundary of the proposed South Landfill Phase II fill limit. This receptor is a Service Station (Gas, Tim Horton's, Convenience Store) located southwest of landfill area.	648343	4775103
R13	--	AQ Receptor Only	Located approximately 1660 m from the boundary of the proposed South Landfill Phase II fill limit. This is a residence located southwest of the landfill area.	648075	4775002
R14	--	AQ Receptor Only	Located approximately 1745 m from the boundary of the proposed South Landfill Phase II fill limit. This is a residence located southwest of the landfill area.	648413	4774594
R15	CR10	Both AQ and Common Receptor	Niagara Region Traffic Systems and Operations. Located approximately 1186 m west from the boundary of the proposed South Landfill Phase II fill limit. Representative of two public institutional facilities with outdoor components and industrial/commercial operations along Old Thorold Stone Road to the west and southwest.	648200	4775614
R16	--	AQ Receptor Only	Located approximately 1350 m from the boundary of the proposed South Landfill Phase II fill limit. This is a residence located southwest of the landfill area.	648212	4775488
R17	CR01	Common Receptor Only	Located approximately 1094 m from the boundary of the proposed South Landfill Phase II fill limit. Representative of residences on Warner Road and the Niagara Escarpment.	649263	4778222

Receptor ID	Common Receptor ID	Category	Description	X (m)	Y (m)
R18	CR04	Common Receptor Only	Located approximately 550 m from the boundary of the proposed South Landfill Phase II fill limit. Representative of the residences on Garner Rd. south of Mountain Rd. and north of the transmission line that crosses Garner Rd. north of Thorold Stone Rd.	650377	4776171
R19	CR06	Common Receptor Only	Located approximately 2577 m from the boundary of the proposed South Landfill Phase II fill limit. Located at the eastern edge of the urban boundary for the City of Thorold, it serves as representative of a wide variety of residential, institutional, recreational and commercial developments within the City.	646794	4776202
R20	CR07	Common Receptor Only	Located approximately 2005 m southeast from the boundary of the proposed South Landfill Phase II fill limit. Representative of an important public facility, a cluster of residences backing onto Kalar Rd. at Thorold Stone Rd., commercial businesses at the corner of Kalar Rd. and Thorold Stone Rd. and the Shriner's Woodlot Park off Kalar Rd.	651575	4775284
R21	CR8	Common Receptor Only	Lakeview Cemetery located approximately 1280 m from the boundary of the proposed South Landfill Phase II fill limit.	648168	4776074
R22	CR11	Common Receptor Only	Located approximately 1295 m north from the boundary of the proposed South Landfill Phase II fill limit. Representative of the outdoor recreational uses at the Bruce Trail along the Niagara Escarpment, Walker's Living Campus and Royal Niagara Golf Club. Serves as a location along Taylor Road, often used for biking and country drives.	649022	4778348
R23	CR12	Common Receptor Only	Located approximately 1655m northeast from the boundary of the proposed South Landfill Phase II fill limit. Representative of a cluster of residences east of the Queen Elizabeth Way.	651699	4778067
R24	CR13	Common Receptor Only	Located approximately 1787 m south from the boundary of the proposed South Landfill Phase II fill limit. Representative of the outdoor recreational uses at the Beechwood Golf Course and along Beaver Dams Road.	648574	4774065
R25	CR14	Common Receptor Only	Located approximately 1181 m east from the boundary of the proposed South Landfill Phase II fill limit. Representative of an area proposed for future residential development and the western edge of the City of Niagara Falls urban area boundary.	651438	4777192

Receptor ID	Common Receptor ID	Category	Description	X (m)	Y (m)
R26	CR15	Common Receptor Only	Located approximately 1984 m north from the boundary of the proposed South Landfill Phase II fill limit. Representative of the southern edge of the Glendale Secondary Plan Area proposed for future residential development and the Niagara-on-the Lake urban area boundary. Additionally representative of the Royal Niagara Golf Club and Niagara College.	648992	4779071
R27	CR16	Common Receptor Only	Located approximately 2893 m northwest from the boundary of the proposed South Landfill Phase II fill limit. Representative of nearest area within the City of St. Catharines municipal boundary at the corner of Glendale Road and the Well and Canal Parkway and recreational trail.	646847	4778448
R28	CR20	Common Receptor Only	Located approximately 1585 m from the boundary of the proposed South Landfill Phase II fill limit. Representative of subdivision east of Kalar Road.	651517	4776126
R29	CR21	Common Receptor Only	Located approximately 1175 m from the boundary of the proposed South Landfill Phase II fill limit. Represents a golf course.	648669	4777915

Receptors for the air quality assessment were updated in consultation with Walker from previous studies to incorporate recent land acquisitions. In instances where Walker has acquired land with a residence, and that residence is still used as a rental property, the residence was included as a receptor in the assessment. Acquired land without a residence was removed from the assessment. A review of updated aerial imagery as well as a site visit were also conducted prior to dispersion modelling. Receptor locations are presented in **Figure 2-2**. All discrete receptors were modelled using a flagpole height of 1.5m.

In addition, the modelling was performed using a receptor grid covering the off-site study area to produce predicted concentration isopleths. Concentrations for areas not specifically represented by discrete receptors can be extrapolated from these isopleths. The receptor grid extends a minimum of 5 kilometres from the SSA and utilizes the receptor spacing outlined in the MECP guideline A-11, "Air Dispersion Modelling Guideline for Ontario", version 3.0, dated February 2017. The receptor grid used for generating the isopleths is presented in **Figure 2-3**.

3 METHODOLOGY

Available sources of information were collected and reviewed to characterize Air Quality existing conditions within the study areas. The following sources of information were collected and reviewed:

- 2024 Terms of Reference: Walker South Landfill Phase 2 Environmental Assessment, dated June 28th, 2024;
- 2005 EA South Landfill Phase I (2005 EA);
- 2024 WEG, Walker Aggregates Inc. (WAI), and Integrated Gas Recovery Services (IGRS) Emission Summary and Dispersion Modelling (ESDM) Report, dated June 11, 2025;

- 2024 Compost and Biosolids Facility ESDM, dated May 31, 2024;
- Walker Campus complaint logs from 2022 to 2025;
- Site-specific meteorological data prepared by the MECP 2020 – 2024;
- Historic annual ambient monitoring reports;
- National Ambient Pollution Surveillance Program Data;
- Site Specific Sampling Data:
  - Landfill gas quality sampling – used to determine methane and Volatile Organic Compound (VOC) concentrations;
  - Flux chamber measurements for odour, hydrogen sulphide (H_2S), benzene, 1,1,2-trichloroethane, and vinyl chloride);
  - Roadway sampling of paved and unpaved roads for silt loading/content, moisture content, and particle size range; and
  - Bulk material sampling for silt content, moisture content, and particle size range.
- MECP Guideline A-10, "Procedure for Preparing an Emission Summary and Dispersion Modelling (ESDM) Report", version 4, dated March 2018;
- MECP Guideline A-11, "Air Dispersion Modelling Guideline", dated February 2017;
- Onsite operating and construction traffic data;
- 2025 ambient monitoring campaign:
  - Four months of TRS continuous monitoring;
  - Dust ambient monitoring (Particulate less than 10 microns); and
  - VOC ambient monitoring.

3.1 Ministry Pre-Consultation

In addition to collecting and reviewing this data, RWDI, GHD, and Walker hosted a pre-consultation meeting with the MECP on December 17th, 2024, to confirm how the existing Air Quality environment would be characterized. Characterization of the existing Air Quality environment was completed using a combination of modelling and monitoring representing current operations on site as they occur today (2025).

Ambient monitoring for particulate matter less than 10 microns (PM_{10}) is currently being conducted as part of the requirements of the Walker Aggregates Quarry and Asphalt Plant operation. Ambient monitoring for total suspended particulate matter (TSP) and particulate matter less than 2.5 microns ($PM_{2.5}$), in addition to PM_{10}, was conducted during the SLF1 EA. Historical ambient monitoring data collected as part of the SLF1 EA, was used to determine ratios of PM_{10} to TSP and $PM_{2.5}$. These ratios were applied to the most recent PM_{10} monitoring data from the site to determine TSP and $PM_{2.5}$ background concentrations.

Similarly to particulate matter (PM), historical VOC monitoring data has been collected. However, for the characterization of the existing environment, 24-hour fence line VOC sampling was completed on a more regular basis, at fixed locations. Current landfill operations were considered when siting the monitoring locations.

Upwind measurements from all ambient monitoring programs were used to characterize background concentrations, while downwind measurements were used to inform existing conditions.

Characterization of existing odour was completed through a review of historical odour data complaints over the last several years. In addition, flux chamber analysis was used to characterize odour emissions from specific landfill sources.

Source specific flux chamber analysis was used to characterize specific emissions of VOCs and H_2S compounds at the landfill. Samples of the landfill gas (LFG) from the existing landfill were collected in order to characterize the LFG composition. Source specific sampling for dust sources included sampling of the paved and unpaved roads as well as bulk materials to determine silt loading/content, moisture content, and grain size analysis.

In addition to field data, a review of the complaint history was conducted to assist in the characterization of existing conditions.

Further details on the ambient monitoring programs and site-specific sampling are provided in **Section 3.3** and **Section 3.4**.

3.2 Indicator Contaminants

The SLF1 has been well characterized through studies such as the 2005 South Landfill (Phase 1) Environmental Assessment, the 2022 IGRS ECA application for the addition of the Renewable Natural Gas (RNG) facility at the South Landfill, and most recently, the 2024 ESDM Report which is a combined report including sources from the WEG landfills, WAI quarry and asphalt plant, and IGRS gas utilization. Based on the conclusions of these studies as well as an understanding of the contaminants typically emitted by landfill operations, a set of key indicator contaminants were selected for use in the EA.

The key indicator contaminants were divided into four studies:

1) Blowing Litter
    a. Assessed qualitatively as there are no applicable criteria.
2) Odour
3) Landfill Gas and Combustion Byproducts
    b. 1,1,2-Trichloroethane (CAS# 79-00-5);
    c. Benzene (CAS# 71-43-2);
    d. Vinyl Chloride (CAS# 75-01-4);
    e. Total Reduced Sulphurs (TRS);
    f. Hydrogen Sulphide (H_2S) (CAS# 7783-06-4);
    g. Nitrogen Oxides (NO_x) / Nitrogen Dioxide (NO_2) (CAS# 10102-44-0); and
    h. Sulphur Dioxide (SO_2) (CAS# 7446-09-5).
4) Dust:
    i. Total Suspended Particulate (TSP);
    j. Particulate Matter less than 10 microns (PM_{10}); and
    k. Particulate Matter less than 2.5 microns ($PM_{2.5}$).

Assessment criteria for these contaminants were obtained from:

- MECP Regulation 419/05 – Air Contaminants Benchmark (ACB) List;
- MECP Ambient Air Quality Criteria (AAQC); and
- Canadian Council of Ministers of Environment (CCME), Canadian Ambient Air Quality Standards (CAAQs).

Contaminants were compared against criteria from O.Reg. 419/05, AAQC, and screening levels, where available. In the absence of any MECP criteria, contaminants were compared to the CAAQs criteria. $PM_{2.5}$ does not have criteria under O.Reg.419/05 or AAQC, so the CAAQs criteria were used for comparison. Both CAAQS 2020 and CAAQS 2030 criteria were used in the assessment as the landfill lifespan extends past 2030. CAAQs represent regional ambient air quality objectives and are not suitable for comparison for the purpose of facility level compliance. This criterion is only included to provide context for predicted concentrations of $PM_{2.5}$. CAAQs also provides criteria for nitrogen dioxide and sulphur dioxide. These criteria were not considered in this assessment as criteria for these contaminants are available under O.Reg. 419/05 and AAQC. A summary of the contaminants and their applicable criteria are provided in **Table 3-1**.

Table 3-1: Assessment Criteria for Key Indicator Compounds

Contaminant	Applicable Sub-Assessment	Averaging Period	Air Quality Criteria (ug/m^3)	Source
TSP	Dust	24-hour	120	AAQC & O.Reg 419/05
		Annual	60	AAQC
PM_{10}	Dust	24-hour	50	AAQC
$PM_{2.5}$	Dust	24-hour	27 [1]	AAQC/CAAQs
		Annual	8.8 [2]	CAAQs
Vinyl Chloride	Landfill Gas	24-hour	1.0	AAQC & O.Reg 419/05
		Annual	0.2	AAQC
Benzene	Landfill Gas	24-hour	2.3	AAQC
		Annual	0.45	AAQC & O.Reg 419/05
1,1,2-Trichloroethane	Landfill Gas	24-hour	0.3	Screening Level
H_2S	Landfill Gas	10-minute	13	AAQC & O.Reg 419/05
		24-hour	7	AAQC & O.Reg 419/05
TRS	Landfill Gas	10-minute	13	AAQC & O.Reg 419/05
		24-hour	7	AAQC & O.Reg 419/05
Odour	Odour	10-minute	1 OU/m^3	MECP Guidance
NO_X	Combustion	1-hour	400	AAQC & O.Reg 419/05
		24-hour	200	AAQC & O.Reg 419/05
SO_2	Combustion	1-hour	100	AAQC & O.Reg 419/05
		Annual	10	AAQC & O.Reg 419/05

Notes:
[1] The 24-hour $PM_{2.5}$ CAAQs criteria is based on the 3-year average of the annual 98th percentile of the 24-hour average concentration.
[2] The annual $PM_{2.5}$ CAAQs criteria is based on the 3-year average of the annual average of the 24-hour average concentration.

Odour does not have any applicable standards or guidelines, and as such, odour was instead compared to levels typically deemed acceptable by the MECP. Odour concentrations that are greater than 1 OU/m³ are considered acceptable at sensitive receptor locations, as long as the frequency of exceedance is less than 0.5% of the time. An odour unit is defined as the quantity of odourous substance that, when dispersed in 1 m³ of odour free air, becomes just detectable by a "normal" human observer whose sensitivity to the odorant represents the mean of the population. The average odour detection threshold is 1 OU/m³, although odours at this level are not necessarily a nuisance. Odour concentrations that may cause a complaint due to their ability to annoy typically range from 3 to 5 OU/m³. Through experience with other landfills in Southern Ontario, the objectionable level for odour was generally in the range of 3 to 5 OU/m³. These levels are more closely related to public complaints.

For the purposes of this assessment, the predicted sitewide odours from the Walker Campus operations were compared to the 1 OU/m³ detection threshold, the 3 OU/m³ recognition threshold, and the 5 OU/m³ annoyance threshold.

As a conservative approach, the evaluation of 24-hour $PM_{2.5}$ considered the first highest predicted concentration for comparison with the CAAQs criteria. Annual concentrations considered the average over 3-years as specified by the CAAQs criteria. Evaluations of the Existing Conditions against all criteria are made through the lens of an EA. While several criteria used in the evaluation are applicable under O.Reg. 419, the EA presents a broader assessment of potential impacts.

Under O.Reg. 419, facilities are required to comply with MECP Standards and Guidelines at points at and beyond the property line of the facility. The impacts presented in this EA should not be used for direct comparison to the O.Reg. 419 limits, as there are key differences in the way the EA assessment is conducted compared to an O.Reg. 419 assessment, most notably, the inclusion of background concentration.

The EA assessment considers additional differences relating to the sources considered and assumptions made. For instance, O.Reg. 419 excludes the contribution from motor vehicles when comparing to the standards and does not consider the cumulative effects non-Walker Campus sources.

3.3 Summary of Ambient Monitoring Data

3.3.1 Wind Data: Upwind/Downwind/Crosswind Interpretation

The hourly wind directions during the monitoring period were recorded. The wind directions are categorized in ranges for each monitoring station to determine whether the samples collected were considered upwind, downwind or crosswind during each sampling period. The wind direction ranges are presented in **Table 3-2**.

The 'downwind' designation indicates that the sampler was located downwind of the active landfill cell for >50% of the sampling period. Under these conditions the landfilling operations are likely to contribute to measured concentrations. The 'upwind' designation indicates that the sampler was located upwind from the active cell for >50% of the sampling period.

The 'crosswind' designation indicates that the sampler was neither upwind nor downwind for >50% of the sampling period with respect to the active cell. Under the 'upwind' and 'crosswind' conditions, the landfilling operations are unlikely to make a significant contribution to the measured concentrations. **Appendix A** includes wind data interpretation for all sample locations during sample dates in 2025 from January to December.

Table 3-2: Ranges of Upwind and Downwind Wind Direction by Sampling Location

Contaminant for Sampling	Sampling Location	Wind Direction Range (degree)	
		Upwind	Downwind
PM_{10}	Garner	0 – 90	180 – 270
	Townline	180 – 270	0 – 90
VOC and TRS	Northwestern	270 – 22.5	90 – 202.5
VOC	Southeastern	45 – 180	225 – 0

3.3.2 PM_{10} Monitoring

As part of the WAI, Walker Brothers Quarry (WBQ) Aggregate Resource Act License No. 8336 and No. 11175, Walker has maintained an ambient monitoring program at the Campus for PM_{10} since 2004. This program includes two monitoring locations, as shown in **Figure 3-1**:

- Townline station – Located 100 metres southwest of the southern corner of WBQ property along Townline Road; and
- Garner station – Located at the intersection of Mountain Road and Garner Road.

Samples were taken over a 24-hour period, on a six-day cycle corresponding to the National Air Pollution Surveillance (NAPS) sampling schedule as outlined by the United States Environmental Protection Agency (U.S. EPA).

The detailed monitoring data results are provided in **Appendix B1** and A summary of the calculated statistics for measured PM_{10} concentrations is provided in **Table 3-3**.

Table 3-3: Calculated Statistics for Measured PM_{10} Concentrations

Sampling Location	Total No. of Samples	No. of Valid Samples	% of Valid Samples	Measured 24-Hour PM_{10} Concentrations at Different Percentiles (µg/m³)				Annual Average (µg/m³)	No. of Samples above the 24-Hour AAQC (50 µg/m³)
				50	70	90	100		
Garner	61	58	95%	8.3	11.6	18.6	38.7	9.9	0
Townline	61	61	100%	10.6	14.1	24.5	50.2	12.8	1

Of the 119 valid samples collected, 118 samples (99.2%) complied with the 24-hour PM_{10} AAQC, with only one sample exceeding the criteria. The sample exceeded the criteria by a marginal amount (50.2 µg/m³ compared to a criterion of 50 µg/m³). The exceedance was observed at the Townline Station on Aug 5, 2025.

The monitoring program does not include other particulate size fractions. Background concentrations of TSP and $PM_{2.5}$ were scaled based on the measured PM_{10} concentrations. Background concentrations of PM_{10}, TSP and $PM_{2.5}$ used for the existing condition assessment are discussed in **Section 3.5**.

3.3.3 VOC Monitoring

In order to characterize background concentrations of VOCs, a monitoring program for VOCs was conducted from July to November 2025. Sampling was completed at two locations, one to the southeast of the site and another to the northwest of the site, as shown in **Figure 3-1**. The northwestern monitoring station was positioned at dominant downwind directions from the existing South Landfill (SLF1), while the southeastern station was located close to the sensitive receptors.

The samples were collected and analyzed using methods defined in U.S. EPA Method TO-14/15 using evacuated canisters. Sampling for VOCs was conducted over 24-hour durations (midnight to midnight, Eastern Standard Time (EST)) once every six (6) days in concurrence with the NAPS schedule provided by the U.S EPA and as outlined by the MECP. Sampling methodologies followed the Standard Operating Procedures (SOPs) as noted in the current version of the MECP Operations Manual, as amended. The list of VOCs monitored is presented in **Table 3-4**.

The calculated statistics for key indicator VOCs as identified in **Section 3.2** are summarized in **Table 3-7** and the detailed monitoring data results are provided in **Appendix B2**.

Table 3-4: List of VOCs in Ambient Monitoring Program

CAS No.	Compound	CAS No.	Compound
75-71-8	Dichlorodifluoromethane (FREON 12)	156-59-2	cis-1,2-Dichloroethylene
630-20-6	1,1,1,2-Tetrachloroethane	10061-01-5	cis-1,3-Dichloropropene
71-55-6	1,1,1-Trichloroethane	110-82-7	Cyclohexane
79-34-5	1,1,2,2-Tetrachloroethane	124-48-1	Dibromochloromethane
79-00-5	1,1,2-Trichloroethane	64-17-5	Ethanol (ethyl alcohol)
75-34-3	1,1-Dichloroethane	141-78-6	Ethyl Acetate
75-35-4	1,1-Dichloroethylene	100-41-4	Ethylbenzene
120-82-1	1,2,4-Trichlorobenzene	106-93-4	Ethylene Dibromide
95-63-6	1,2,4-Trimethylbenzene	142-82-5	Heptane
95-50-1	1,2-Dichlorobenzene	87-68-3	Hexachlorobutadiene
107-06-2	1,2-Dichloroethane	110-54-3	Hexane
78-87-5	1,2-Dichloropropane	591-78-6	Methyl Butyl Ketone (2-Hexanone)
76-12-0	1,2-Dichlorotetrafluoroethane	78-93-3	Methyl Ethyl Ketone (2-Butanone)
108-67-8	1,3,5-Trimethylbenzene	108-10-1	Methyl Isobutyl Ketone
106-99-0	1,3-Butadiene	1634-04-4	Methyl t-butyl ether (MTBE)
541-73-1	1,3-Dichlorobenzene	75-09-2	Methylene Chloride (Dichloromethane)
106-46-7	1,4-Dichlorobenzene	91-20-3	Naphthalene

CAS No.	Compound	CAS No.	Compound
123-91-1	1,4-Dioxane	95-47-6	o-Xylene
540-84-1	2,2,4-Trimethylpentane	106-42-3 / 108-38-3	p+m-Xylene
67-63-0	2-propanol	115-07-1	Propene
67-64-1	2-Propanone	100-42-5	Styrene
622-96-8	4-ethyltoluene	127-18-4	Tetrachloroethylene
71-43-2	Benzene	109-99-9	Tetrahydrofuran
100-44-7	Benzyl chloride	108-88-3	Toluene
75-27-4	Bromodichloromethane	1330-20-7	Total Xylenes
75-25-2	Bromoform	156-60-5	trans-1,2-Dichloroethylene
74-83-9	Bromomethane	10061-02-6	trans-1,3-Dichloropropene
75-15-0	Carbon Disulfide	79-01-6	Trichloroethylene
56-23-5	Carbon Tetrachloride	75-69-4	Trichlorofluoromethane (FREON 11)
108-90-7	Chlorobenzene	76-13-1	Trichlorotrifluoroethane
75-00-3	Chloroethane	108-05-4	Vinyl Acetate
67-66-3	Chloroform	593-60-2	Vinyl Bromide
74-87-3	Chloromethane	75-01-4	Vinyl Chloride

Table 3-5: Calculated Statistics for Measured VOC Concentrations

Sampling Location	Total No. of Samples	No. of Valid Samples	% of Valid Samples	No. of Samples above the 24-Hour Criteria		
				1,1,2-Trichloroethane (Criteria = 0.3 µg/m³)	Benzene (Criteria = 2.3 µg/m³)	Vinyl Chloride (Criteria = 1.0 µg/m³)
Southeastern	25	19	76%	0	0	0
Northwestern	25	22	88%	0	1	0

For 1,1,2-Trichloroethane, all of the samples were below the detection limit, while only one sample of vinyl chloride was above the detection limit.

For benzene, samples were above detectable levels the majority of the time. One exceedance of the benzene criterion was observed at the northwestern station on July 18, 2025. The wind data for the corresponding day were reviewed; on July 18th, winds were generally blowing from the northwest through east northeast with winds not blowing from the Walker Campus to the monitoring station. Based on this analysis, the exceedance was determined to be the result of off-site influences rather than Walker Campus operations.

A comparison of the benzene monitoring results for upwind, downwind, and crosswind conditions was conducted, to evaluate the potential influence of the Walker Campus operations on ambient air quality in the area. This comparison is presented in **Table 3-6**. Where concentrations downwind of the Walker Campus are elevated relative to upwind or crosswind, it can be indicative that Walker operations are influencing ambient concentrations. Overall, no strong influence from the Walker Campus was observed in the monitoring data.

Table 3-6: Benzene Monitoring Results Comparison

Contaminant	Wind Direction	Measured 24-hour Concentration (µg/m³)		
		Maximum	90th Percentile	Average
Benzene - Northwestern Station	Upwind	0.68	0.62	0.45
	Downwind	n/a	n/a	n/a
	Crosswind	3.45	0.60	0.57
Benzene - Southeastern Station	Upwind	0.85	0.75	0.47
	Downwind	0.58	0.53	0.40
	Crosswind	1.09	0.66	0.47

3.3.4 TRS Monitoring

In order to characterize background concentrations of H_2S and TRS, a station was installed for continuous monitoring of TRS over a 4-month period from July through October 2025. TRS is a group of reduced sulphide compounds in which H_2S is the major component. Therefore, the measured TRS results were considered to be representative of H_2S.

Monitoring was conducted on a 5-minute interval at a monitoring station to the northwest of the site, as shown in **Figure 3-1**. The continuous monitoring approach is capable of achieving much lower detection limits for TRS compared to the use of evacuated cannisters.

A summary of the calculated statistics for measured TRS concentrations is provided in **Table 3-7** and the detailed monitoring data results are provided in **Appendix B3**.

Table 3-7: Calculated Statistics for Measured TRS Concentrations

Contaminant	Averaging Period	No. of Monitoring Averages	No. of Valid Monitoring Averages	% of Valid Monitoring Averages	Criteria (µg/m³)	No. of Averages above the Criteria
TRS	10-minute	17141	15127	88%	13	2
	24-hour	119	108	91%	7	0

During the 4-month continuous monitoring, measured TRS concentrations were below the applicable 24-hour health-based criteria at all times. The TRS concentrations were below the 10-minute odour-based criteria for all periods, with the exception of two 10-minute periods, occurring on July 9 from 22:50 to 23:00 and July 10, 2025 from 00:20 to 00:30. However, the 10-minute criteria applies at odour-sensitive receptor locations only; therefore, these exceedances of the criteria do not represent non-compliances. The measured TRS concentrations were below the 10-minute and 24-hour criteria 99.99% and 100% of the time, respectively.

The wind data for the periods of exceedance were reviewed; on both July 9th at 10 pm to 11 pm and July 10th, 2025 from midnight to 1 am, winds were blowing from the south-southwest. Based on this analysis, this elevated TRS concentration was potentially related to the Walker Campus operations. However, the period of elevated concentrations was short-lived, quickly falling below the criteria. No evidence of sustained levels of elevated TRS concentrations were observed.

A comparison of the TRS monitoring results for upwind, downwind, and crosswind conditions was conducted, to evaluate the potential influence of the Walker Campus operations on ambient air quality in the area. This comparison is presented in **Table 3-8**. A sample calculation for 1 hour of data is presented in **Appendix B-3**. Where concentrations downwind of the Walker Campus are elevated relative to upwind or crosswind, it can be indicative that Walker operations are influencing ambient concentrations. Overall, no strong influence from the Walker Campus was observed in the monitoring data.

Table 3-8: TRS Monitoring Results Comparison

Contaminant	Wind Direction	Measured 10-minute Concentration (µg/m³))		
		Maximum	90th Percentile	Average
TRS	Upwind	11.3	2.4	1.9
	Downwind	13.6	2.5	1.9
	Crosswind	19.4	2.6	1.9

3.4 Emission Source Sampling

In addition to the ambient monitoring programs, on-site source sampling was completed to aid in the development of the emission inventory for the Walker Landfill operations. Details of the source sampling are provided in the following sections.

3.4.1 Odour Flux Chamber Sampling

In order to better characterize fugitive odour emissions from the existing SLF1 and East Landfill, RWDI collected flux chamber samples from landfill areas under final cap, landfill areas under interim cover, the active face with new waste deposited, the freshly exposed waste at the active face following stripping of the daily cover, the contaminated soil pile, and the leachate storage ponds. Sampling was completed on September 2nd, 2025, for interim cover, September 3rd for final cap, September 4th for active face, September 5th for contaminated soil piles, and September 29th for leachate storage ponds. Sampling locations are shown in **Figure 3-2**.

Odour emissions from the final cap areas, interim cover areas, active face, contaminated soil piles and leachate ponds were measured using flux chambers. The flux chambers used are 40.6 cm in diameter and approximately 35 cm in height, and constructed of 14-gauge stainless steel, as per the designer's specifications outlined in Ontario Stack Testing Code Method ON-6. All interior and exterior fittings are constructed from inert stainless-steel material and all lines were made from Teflon tubing. The flux chambers are equipped with four quick connect ports: one for the sweep gas line, one for the sample line, one for the temperature instrument and one for the pressure instrument.

Before taking measurements, each flux chamber was placed on the surface of the landfill, and the inlet of the chamber was embedded slightly into the area to create a seal. Sand was used to surround the chamber and the surface in areas where the chambers could not be inserted. On the leachate pond, a floatation tube was used in order for the chamber to stay afloat just below the water surface.

Ultra-high purity nitrogen gas was used as the sweep gas, which was metered into the chamber at a constant rate of 5 liters per minute. The sweep gas was allowed to run through the chambers for 30 minutes prior to sample collection.

Odour samples were collected through a sample port on the flux chamber into a Tedlar bag. The Tedlar bag was filled and purged three times before sampling over a 10-minute time frame for each of the thirty-seven (37) samples.

All samples were sent to St. Croix Sensory, Inc., for odour panel analysis to determine the concentration in odour unit (OU) per cubic metre. Concentrations for both odour detection and odour recognition were provided by the laboratory.

Measurements were used to determine odour emission rates. Further details regarding the emission rate calculations are provided in **Section 7**.

The results of the odour sampling are summarized in **Table 3-9**, while the odour flux chamber sampling locations, the field notes, and the laboratory analysis are provided in **Appendix C**.

Table 3-9: Summary of Odour Sampling Results

Area	Type of Cover	Average Odour Detection Threshold (OU/m^3)	Average Flux Rate ($OU/m^2/s$) [1]
East Landfill	Final Cap	63	4.04E-02
South Landfill	Active Face	362	2.32E-01
	Interim Cover	131	8.43E-02
	Final Cap	91	5.84E-02
Contaminated Soil Stockpile		77	4.94E-02
Leachate Ponds		264	1.69E-01

Notes:

[1] Average flux rate = Average odour detection threshold (OU/m^3) x Flux chamber flow rate (5 L/min) x Flux chamber area (0.13 m^2).

3.4.2 H_2S and VOC Flux Chamber Sampling

Similar to odour sampling, RWDI also collected flux chamber samples for H_2S and VOC emissions from landfill areas under final cap, interim cover, active face areas, waste soil stockpiles and the leachate storage ponds. Sampling locations are shown in **Figure 3-3**.

The sampling took place on September 2nd to 5th and 29th, 2025. A total of 30 samples were taken, consisting of 3 samples from East Landfill (final cap area), 21 samples from SLF1 (9 samples for interim cover area, 6 samples for final cap area, 6 samples for active face area), 3 samples from the contaminated soil stockpile and 3 samples from the leachate ponds. The flux chambers as well as the measurement methodology adopted in H_2S and VOC sampling were the same as that in the odour sampling.

Both the landfill and the LFG utilization system were operating under normal conditions during the sampling period. Waste soil samples were collected from newly deposited waste soils for the testing purposes. This is a conservative approach as VOC emissions from the contaminated soil pile tend to decrease with the age of the contaminated soil pile.

All samples were sent to ALS Limited for analysis to determine the H_2S and VOC concentrations (in μg/m³). The measurement results were used to calculate the emission rates of H_2S and VOC. As a conservative approach, the detection values were used for samples below detection thresholds. Further details are provided in **Section 8.3**.

The sampling results for H_2S and the key VOC components are presented in **Table 3-10**, and the sampling locations, the field notes and the laboratory analysis are provided in **Appendix D1**.

Table 3-10: Sampling Results for H_2S and Key VOC Components

Contaminant	Average Flux (g/m²/s)				
	South Landfill - Active Face	South Landfill - Interim Cover	South Landfill - Final Cap	East Landfill - Final Cap	South Landfill - Waste Soil Stockpile
Hydrogen sulfide	3.60E-09	3.83E-09	2.50E-09	3.59E-09	3.61E-09
Benzene	1.45E-08	2.69E-09	5.83E-10	2.05E-10	3.42E-10
1,1,2-Trichloroethane	4.83E-08	7.05E-10	1.32E-09	7.05E-10	7.05E-10
Vinyl chloride	2.26E-08	9.12E-09	4.61E-10	3.27E-10	3.27E-10

3.4.3 Landfill Gas Source Sampling

In order to better characterize fugitive emissions of VOC compounds from the SLF1 and East Landfills, RWDI collected samples of LFG from the outlet of the gas collection system blower. Sampling was conducted on January 27, 2026. The same type of evacuated canisters used in VOC and TRS sampling was used.

Samples were sent to ALS Limited for analysis of sulphur compounds and VOCs. Gas composition determined through laboratory analysis was used to calculate VOC and sulphur compound emissions from the LFG combustion equipment (including flares, generators, RNG flare, siloxane flare and thermal oxidizer), while fugitive emissions of VOCs and sulphur compounds from the interim cover and final cap areas were calculated based on the H_2S and VOC sampling discussed in **Section 3.4.2.** Further details on VOC and sulphur compound emissions rate development are provided in **Section 8**.

During the LFG sampling, the landfill and LFG gas collection system were operating under normal conditions. The field notes and the laboratory analysis are provided in **Appendix E**.

3.4.4 Roadway and Material Stockpile Sampling

In order to better characterize fugitive dust emissions from the internal haul routes and material storage piles, RWDI collected dust samples from the paved and unpaved roadway as well as a sample of daily cover material. Sampling was completed on September 3, 2025, and September 29, 2025. The weather was clear, and conditions were dry during the sampling; no significant rainfall had occurred within the previous two days.

Samples were collected in accordance with US EPA AP-42 Appendix C.1 Procedures for Sampling Surface/Bulk Dust Loading. Multiple samples were taken at various locations at the site. In total, 3 samples from paved roads at landfill areas, 5 samples from unpaved roads at landfill areas, 4 samples from unpaved roads at the quarry, and 4 samples from the contaminated soil piles were collected. Sampling locations are shown in **Figure 3-3**.

Samples were sent to ALS Limited for silt content, moisture content, and grain size analysis. Size fractions were used to develop deposition parameters for use in the dispersion model, while the moisture content and silt content were used to replace generic AP-42 values for the calculation of roadway emissions.

A copy of the sampling methodology, field notes, and the laboratory analysis are provided in **Appendix F**.

3.5 Background Data

Background data refers to concentrations of the contaminants of interest in the environment resulting from sources other than the Walker Campus. When available, background concentrations were obtained from the site-specific ambient monitoring data. For contaminants where site specific background data was not available, background data was obtained from publicly available sources such as the NAPS regional ambient monitoring program. No background concentration of odour was considered in the assessment, since odours cannot be measured through ambient monitoring.

Background data was used in conjunction with dispersion modelling in order to assess the potential for cumulative impacts on the surrounding areas from the Walker Campus and surrounding industrial and agricultural activities, traffic, and other sources of air emissions. When calculating background concentrations from site-specific ambient monitoring data, only upwind sample data was considered so as not to double count emissions associated with landfill operations or other activities occurring on the Walker Campus. The upwind analysis was completed in accordance with the methodology outlined in **Section 3.3.1**.

Background concentrations were based on the 90th percentile for the 1-hour and 24-hour averaging periods, and average results for the annual averaging period. Ten-minute averages were converted from the 1-hour background concentrations using the methodology in Section 4.4 of MECP's Guideline A-11 published in February 2017. Where sample results were found to be below the laboratory detection limit, the detection limit was used in the calculation as a conservative approach.

Particulate monitoring was conducted for 24-hour PM_{10} from January to December 2025. As TSP and $PM_{2.5}$ were not sampled, the TSP and $PM_{2.5}$ background concentrations were determined by scaling the measured PM_{10} data, with factors developed from the monitoring results of the 2005 EA. The scaling factors were applied to the 24-hour average and annual average of PM_{10} data to derive data for the TSP and $PM_{2.5}$ fractions of dust. The scaling factors adopted are presented in **Table 3-11**Table 3-.

Table 3-11: TSP and $PM_{2.5}$ Scaling Factors

Particulate Matter	Ratio in 2005 EA	Scaling Factor to PM_{10}
TSP	1	2.33
PM_{10}	0.43	-
$PM_{2.5}$	0.35	0.81

VOC sampling was conducted from July to November 2025. Background concentrations for VOC were calculated based on the results of the upwind measurements from the monitoring program. The measured benzene concentrations were generally consistent throughout the monitoring period, however, there were occasional peaks occurring in July and August which, when coupled with the shorter (less than one year) sampling period, lead to an elevated annual average background above the criteria. The majority of 1,1,2-trichloroethane and vinyl chloride samples were below the detection threshold. In these cases, detection thresholds were assumed as a conservative approach.

TRS monitoring was conducted from July to October 2025. Although the TRS monitoring was conducted on a 5-minute interval, the analysis of upwind/downwind conditions was conducted based on the local 1-hour meteorological data, due to the lack of availability of 10-minute wind data. Therefore, the 1-hour wind direction was applied to all 10-minute averages within the hour. 10-minute TRS background concentrations were calculated based on the 5-minute monitoring data. 10-minute average concentrations were determined by taking the average over the preceding two 5-minute average concentrations. The 90th percentile value of all 10-minute averages was used.

For contaminants that were not included in the ambient monitoring program, background concentrations were obtained from publicly available sources. This included NO_x and SO_2.

Background concentrations of NO_x were calculated based on data from the St. Catharines station (NAPS ID 061302). This station represents the location nearest to the Walker Campus that records NO_x concentrations. The station is located in a residential neighborhood surrounded by low-density housing, approximately 6.5 km from the Project. The station is located in a more urban setting than the Walker Campus. In urban settings, background concentrations of NO_x are typically higher due to the increase in vehicle traffic and proximity to industrial and residential sources. The NO_x concentrations from the St. Catharines station may be higher than what would be expected in a rural area, therefore, they provide a conservative estimate of background concentration. Concentrations were based on the 90th percentile 1-hour and 24-hour NO_x averages from the most recent 5 years of available data (i.e. 2020 – 2024).

SO_2 is not monitored at the St. Catharines station. There are only a limited number of NAPS stations in Ontario that are currently monitoring SO_2, many of which are in areas with large sources of SO_2. Therefore, background concentrations of SO_2 were calculated based on data from the Toronto station (NAPS ID 060430), which is located adjacent to Highway 401 The station is located in a more urban setting than the surrounding area of the Walker Campus and is expected to provide a conservative estimate of background concentration. Concentrations were based on the 90th percentile 1-hour and annual averages of SO_2 concentrations from the most recent 5 years of data (i.e. 2020 – 2024).

The background concentrations for each key indicator contaminants as well as the source of data are summarized in **Table 3-12**.

Table 3-12: Background Concentrations

Contaminant	Averaging Period		Criteria (µg/m³)	Background Concentrations (µg/m³)	% of Criteria	Source of Data
TSP	24-hour		120	51.0	42%	[1]
TSP	Annual		60	26.0	43%	[2]
PM_{10}	24-hour		50	21.9	44%	[3]
$PM_{2.5}$	CAAQS 2020	24-hour	27	17.8	66%	[1]
$PM_{2.5}$	CAAQS 2020	Annual	8.8	9.1	103%	[2]
$PM_{2.5}$	CAAQS 2030	24-hour	23	17.8	78%	[1]
$PM_{2.5}$	CAAQS 2030	Annual	8	9.1	114%	[2]
Vinyl Chloride	24-hour		1.0	0.05	5%	[3]
Vinyl Chloride	Annual		0.2	0.05	26%	[4]
Benzene	24-hour		2.3	0.69	30%	[3]
Benzene	Annual		0.45	0.46	103%	[4]
1,1,2-Trichloroethane	24-hour		0.3	0.07	22%	[3]
H_2S	10-minute		13	2.4	19%	[5]
H_2S	24-hour		7	2.2	31%	[6]
TRS	10-minute		13	2.4	19%	[7]
TRS	24-hour		7	2.2	31%	[8]
NOx	1-hour		400	23.4	6%	[9]
NOx	24-hour		200	21.6	11%	[10]
SO_2	1-hour		100	1.1	1.1%	[11]
SO_2	Annual		10	0.53	5.3%	[12]

Notes:

[1] Derived from the measured 24-hour PM_{10} concentration based on a scaling factor extracted from the monitoring results of the 2005 EA.

[2] Derived from the measured annual average PM_{10} based on a scaling factor extracted from the monitoring results of the 2005 EA.

[3] 90th percentile concentration of the upwind 24-hour monitoring data.

[4] Annual average of the upwind 24-hour monitoring data.

[5] Assumed the same as 10-minute TRS for conservative assessment due to the lack of H_2S monitoring.

[6] Assumed the same as 24-hour TRS for conservative assessment due to the lack of H_2S monitoring.

[7] Derived from the calculated 1-hour averages, which were based on the measured 5-minute averages, as per Section 4.4 of MECP's Guideline A-11.

[8] Derived from the calculated 1-hour averages, which were based on the measured 5-minute averages.

[9] 5-year average of the 90th percentile of 1-hour averages from NAPS data for St. Catharines station (NAPS ID 061302) for the period of 2020-2024.

[10] 5-year average of the 90th percentile of 24-hour averages from NAPS data for St. Catharines station (NAPS ID 061302) for the period of 2020-2024.

[11] 5-year average of the 90th percentile of 1-hour averages from NAPS data for Toronto station (NAPS ID 060430) for the period of 2020-2024.

[12] 5-year average of the annual averages of 1-hour averages from NAPS data for Toronto station (NAPS ID 060430) for the period of 2020-2024.

4 DISPERSION MODELLING

The existing conditions at the identified receptor locations were determined using a dispersion model and reasonable worst-case emission rates for the odour, LFG and combustion byproducts, and dust. Dispersion modelling was performed using the U.S EPA AERMOD dispersion model (AERMOD), version 24142, to predict concentrations of contaminants of interest emitted from the landfill operations at identified discrete receptors. The AERMOD model is an advanced dispersion model that has been approved for use in Ontario by the MECP. AERMOD is a steady-state Gaussian model that is capable of handling multiple emission sources. Within the model, grids as well as discrete receptor locations of interest can be considered. The modelling assessment was conducted in accordance with MECP Guideline A11: "Air Dispersion Modelling Guideline for Ontario", February 2017.

The individual contaminant emission rates were calculated and applied to various sources in the dispersion model to predict the off-site concentrations.

Additional elements of the dispersion modelling assessment are discussed in the following sections.

4.1 Sources Modelled

Sources specific to each study were identified as part of the characterization of the existing environment. Common sources associated with landfill operations are:

- Final cap areas;
- Interim cover areas;
- Active face area;
- Leachate ponds;
- Active face equipment;
- LFG flares;
- Contaminated soil pile;
- Material handling;
- Bulldozer activity;
- Vehicle traffic on internal haul routes;
- Idling vehicles at the active face and weigh scale;
- Generators;
- Onsite equipment; and
- Wind erosion.

In addition to modelling sources associated with landfill operations, sources of like emissions from the other operations at the Campus were considered in the dispersion modelling. These sources include:

- Vehicle traffic on internal haul routes;
- Quarry and Asphalt Plant sources such as:
  - Blasting;
  - Processing;
  - Material handling;
  - Storage piles; and
  - Onsite equipment.
- IGRS facility sources, such as:
  - LFG-fired generators;
  - RNG elevated flare;
  - Siloxane flare; and
  - Thermal oxidizer.
- Compost facility sources such as:
  - Compost windrows;
  - Handling and processing of compost material; and
  - Onsite equipment.

The landfill final cap areas, interim cover areas, active face area, leachate ponds, contaminated soil pile, and compost windrows were modelled as area sources. The landfill active face, which moves throughout the landfill over the course of its life, was modelled in a single worst-case location within the active cell. The LFG flares, generators, RNG elevated flare, siloxane flare, thermal oxidizer, and baghouses at silos, were modelled as point sources. Material handling, idling vehicles, onsite equipment, blasting and processing were modelled as volume sources, while the internal haul routes were modelled as line volume sources.

During the course of the life of the landfill, the landfilling operations could occur at different levels, reaching a final height of 212 m above sea level (i.e. 31 m above grade). Dispersion modelling tests were previously completed by RWDI for a different landfill facility, where air quality impacts associated with landfilling operations were assessed on different levels, including at grade, top of the landfill mound, and at the middle height of the landfill mound. Findings showed that emissions at grade (i.e. the shortest vertical distance to the nearby receptors) resulted in the worst air quality impact. In view of this, all the landfill area sources were modelled at the grade level, for a conservative assessment.

The locations of all modelled emission sources are shown in **Figure 4-1**.

All modelled sources were assumed to emit reasonable worst-case emissions concurrently throughout the modelled period. A summary of all sources considered in the dispersion model and their emission rates are provided in **Appendix G**. Emission rate calculations for odour, LFG and combustion byproducts, and dust are discussed in **Section 7** to **Section 9**.

4.1.1 Meteorological Data

To ensure that a broad range of dispersion conditions are addressed, five years of site-specific meteorological data (2020 – 2024) were used in the AERMOD model. The meteorological data set was developed by the MECP's Environmental Monitoring and Reporting Branch (EMRB) specifically for the Project and provided on April 17, 2026. The data set was based on wind-sector dependent land use specific to the landfill site, surface meteorological data collected from the St. Catherine's station, and upper air meteorological data from the White Lake, Michigan. The data set provided by the EMRB was used directly in the model, with no changes or alterations conducted by RWDI.

4.1.2 Area of Modelling

All discrete receptor points identified in **Section 2.1** were included in this study. Humans were assumed to be present at receptors representing residences for 24 hours per day. Discrete receptors were modelled at flagpole heights of 1.5 m above grade. The locations of these discrete receptors are shown in **Figure 2-2**.

In addition, the modelling was performed using a receptor grid covering the RSA to produce isopleths of predicted concentrations. The receptor grid covers the lands within approximately 5 kilometres centered on the emission sources following MECP guideline A-11. The locations of the grid receptors are shown in **Figure 2-3**.

4.1.3 Terrain data

Terrain information for the area surrounding the facility was obtained from the MECP Regional Meteorological and Terrain Data for Air Dispersion Modelling website. The terrain data is based on the Canadian Digital Elevation Model (CDEM) horizontal reference datum. These data were run through the AERMAP terrain pre-processor to estimate base elevations for sources and receptors to help the model account for changes in elevation. Base elevations for sources located on the quarry/landfill floor were adjusted based on site-specific elevation data in order to account for operational changes in elevation not captured by regional terrain data.

4.1.4 Building Information

The Building Profile Input Program (BPIP) was used to calculate the effects of building downwash on point sources, such as stacks. The IGRS facility, Biosolids facility and the compost facility were included in the modelling, as these structures have the potential to affect emissions from their associated sources. The BPIP model was run prior to running the AERMOD model in order to incorporate the potential building downwash effects.

The potential building downwash effects were evaluated for all point sources within the dispersion model. Building downwash effects are not applicable to volume, line volume, or area sources. Although the landfill mound may be considered as a "structure", dispersion modelling tests completed by RWDI for a different landfill facility found that the effects of mound downwash have insignificant impacts on the maximum off-site concentrations. The effects of the mound downwash are insignificant as the sloping features of the mound do not act as a solid block building. Therefore, the landfill mound was not considered in the assessment of potential building downwash effects.

4.1.5 Averaging Periods Used

Emissions were modelled for 1-hour, 24-hour, and annual averaging times, to correspond with the criteria for the various compounds, as listed in **Table 3-1**. A conversion factor of 1.65 was used to convert 1-hour results to 10-minute averages, based on guidance provided in the MECP's "Procedure for Preparing an Emission Summary and Dispersion Modelling Report", March 2018.

5 CHARACTERIZATION OF THE EXISTING ENVIRONMENT

The existing Air Quality environment for landfill and non-landfill sources at the Walker Campus was characterized using a combination of ambient monitoring data and dispersion modelling as described in **Section 4**. Dispersion modelling was completed for the identified discrete receptors for odour, landfill gas and combustion byproducts, and dust contaminants. Modelling results were combined with upwind background concentrations, as discussed in **Section 3.5**, in order to capture cumulative impacts from non-landfill related operations.

Emissions were quantified from landfill sources for odour, landfill gas and combustion byproducts, and dust. Blowing litter was assessed qualitatively. Details on the evaluation of each contaminant are provided in the following sections.

6 BLOWING LITTER

A potential nuisance created by the landfill is wind-blown litter. Litter typically consists of loose, lightweight materials that can be picked up by the wind, such as paper products, empty plastic bags, and cardboard. These materials are commonly found at the active face where freshly deposited waste is exposed to the wind. Litter may be transported off-site during events with above average wind speeds.

Extreme weather events have the potential to create short-term nuisance effects such as blowing plastic litter. These events occur several times per year on average. Walker has procedures in place to prepare for and manage these events; however, these events may still result in blowing litter off-site. Walker takes great effort to collect litter than has moved off-site within a timely manner, typically within 48-72 hours.

Non-active waste filling areas are covered by daily and interim covers, or final cap to minimize the potential for windblown litter. Blowing litter was assessed by means of the following tasks:

- Review of existing mitigation measures;
- Review of litter-related complaints;
- Evaluation of landfill characteristics and assumptions against literature and wind climate information; and
- Analysis of local meteorological conditions and their influence on litter events.

6.1 Existing Best Management Practices

Although it is not feasible to completely eliminate blowing litter, litter can be reduced significantly with proper control practices. In an effort to minimize the potential for litter events for landfill operations, Walker has developed and implemented a Litter Control procedure as part of their South Landfill Standard Operating Procedures (SOP), dated February 18, 2025. This procedure is used to manage the migration of litter off-property. The plan implements mitigation controls such as:

- Monitoring the weather forecast to anticipate the need for operational changes and litter controls;
- Relocating the active face to minimize wind exposure;
- Repositioning unloading vehicles to minimize wind exposure;
- Use of portable litter fences that are moved around the active face and surrounding areas to capture blowing litter based on forecasted meteorological conditions;
- Suspension of unloading of waste until conditions become more favourable (winds sustained below 30 km/hr);
- Installation of a permanent high fence along the entire eastern side of the south landfill;
- Inspection of the permanent high fence to ensure fences are in working condition;

- Application of soil cover to the active face tipping area at the end of each working day;
- Execution of the Community Litter Collection Program by completing continuous visual checks of the landfill litter control, ensure appropriate manpower is available to control litter, weekly/monthly drive-by inspections of all routes and properties listed in the procedure, and the collection of litter acceptable for receipt at Walker's landfill;
- Mobilization of litter collection crews in a timely manner after a high wind event has occurred; and
- Training of relevant staff on these policies.

Further details regarding the complete set of litter controls and protocols are provided in the copy of the blowing litter procedure provided in **Appendix H**.

6.2 Complaints History

A review of the complaints log was conducted in order to determine the current level of blowing litter impacts in the vicinity of the landfill. From 2020 to 2025, only one litter related complaint was received.

The only complaint received by Walker during this period was in 2021. Walker removed the litter from that off-site location after receiving the complaint, in accordance with the SOP. No complaints were received consecutively, which suggests that the issue was resolved and did not persist once the corrective action was taken.

The most recent high-wind event occurred on January 27th, 2025. As a result of this event, Walker implemented its litter SOPs and mobilized litter collection crews to collect litter from off site. No complaints were received from this event.

In general, these litter events were independent incidents. The limited litter-related complaints also indicate that the Litter SOP is effective in controlling the off-site migration of litter.

6.3 Wind Speed and Blowing Litter Literature

Waste is exposed to wind during unloading and landfilling operations, and lighter components of the waste can be blown off-site. **Table 6-1** and **Table 6-2** show the approximate relationship between wind speed and type of refuse that is carried away from the working area of a landfill, based on two different studies.

Table 6-1: Wind Speed and Wastes Blown (based on calculations presented by Lapp, 1983)

Wind Speed Range (km/h)	Type of Waste
16 - 24	Envelope, dry slightly crumpled paper
24 – 32	Empty plastic bag
32 – 48	Corrugated cardboard, crumpled paper towel
48 - 62	Plastic strips, tissue box, tightly crumpled paper
62 - 88	Milk carton, corrugated box
> 88	170cc metal can

Table 6-2: Threshold Speeds for Blowing Litter (based on a previous RWDI wind tunnel study)

Wind Speed Range (km/h)	Type of Waste	Impact Category
0 - 22	None	None
22 – 33	Newsprint, tissue, paper towel, light bond paper	Light
33 – 47	All of the above plus plastic bags, small boxes, small cardboard tubes, paper bags, small plastic sheets	Moderate
> 47	All of the above plus heavy bond paper	Heavy

6.4 Zones of Impact

During the 1990's, Ontario's Interim Waste Authority Limited (IWA) conducted a literature review and interviewed landfill operators to get an indication of the potential for blowing litter impacts during high wind speed events as noted in **Table 6-1** and **Table 6-2**. Their findings are summarized in **Table 6-3**.

Table 6-3: Blowing Litter Potential Zones of Impact for Above-Grade Landfills (IWA, 1994)

Distance from Landfill Perimeter	Finding	Impact Category
0 to 500 m	50% of escaping litter retained in this area	Medium
500 to 1,000 m	Remaining 50% of escaping litter retained in this area	Low
Beyond 1,000 m	Very little litter escapes beyond this distance	None

The background data presented previously in **Table 6-3** indicates that potential blowing litter impacts are expected to occur within 500 m of the landfill and to a lesser degree limited to within 1 km of the proposed landfill. A figure showing these litter zones and discrete receptors is provided in **Figure 6-1**.

6.5 Meteorological Analysis

Litter events are highly dependent on meteorological conditions, primarily wind speed and wind direction, as shown in **Tables 6-1** and **6-2** above. The Lapp study suggests minimum wind speeds for litter events of 16 - 24 km/h, whereas RWDI concluded that 22 - 33 km/h were the minimum wind speeds for litter events. As a conservative approach, the conclusions of the Lapp study, i.e. wind speeds ranging from 16 – 24 km/h, were considered the minimum wind speeds required for potential litter events. As wind speed increases, more materials have the potential to be lifted by the wind which then increases the potential for litter. The predominant wind direction can be used to determine where the litter from these events are most likely to impact. Understanding the zones for litter allows for effective implementation of mitigation measures.

An examination of site-specific meteorological data provided by the MECP was used in order to determine the zones for litter. **Figure 6-2** provides the wind rose for 5-years of site-specific meteorological data prepared by the MECP for the years 2020 to 2024. A wind rose shows the joint distribution of wind speed and wind direction. A lobe indicates the direction that the wind originated from and the percentage of time. A longer lobe means that wind direction occurred more frequently.

Wind speeds above 16 km/h are relevant to blowing litter, as demonstrated by the data presented previously in **Table 6-1** and **Table 6-2**. Wind speeds above 16 km/h are shown in the wind rose. Wind speeds below 16 km/h are considered calm for the purpose of this assessment. **Figure 6-2** shows that wind speeds greater than 16 km/h can be associated with any wind direction but are most often associated with winds blowing from south-westerly directions (SSW through WNW). The frequency of winds greater than 16 km/h varies between <1% to 8% depending on wind direction. Winds are less than 16 km/h for 60% of the time.

As shown in **Figure 6-1**, four receptors, R03, R15, R16 and R21 are located within 500 m of the existing south landfill. Based on the wind rose presented in Figure 6-2 and the wind speed thresholds presented in **Table 6-1** and **Table** 6-2, high winds that could potentially cause litter to blow toward these residences are expected to occur infrequently, less than 2% of the time from the northeast. All receptors are located southwest of the existing landfill which has the least common wind blowing from the existing south landfill. Therefore, the potential for litter impacts at the receptors within 500 m of the landfill is low.

Between a distance of 500 m and 1,000 m there are 4 discrete receptors, none of which are located in the predominant wind direction. As mentioned in **Table 6-3**, the impact in the area is expected to be low. Thus, the potential for litter impacts at these receptors is expected to be low.

Other residences in the area are farther than 1 km from the existing South Landfill Phase I and have little or no potential for blowing litter impacts.

6.6 Blowing Litter Conclusion

Between 2020 and 2025, only one litter related complaint was received. In that event, the litter-related complaint was addressed in accordance with the SOP. During high wind events, Walker implemented their SOPs and mobilized litter collection crews in a timely manner. The meteorological analysis combined with the location of nearby residences allows for the identification of litter zones which allows Walker to focus their mitigation and inspections in these areas. Overall, with the blowing litter SOPs in place, Walker' is effective in minimizing off-site impacts such that impacts to existing residences are low.

7 ODOUR

As part of the characterization of the existing Air Quality environment, the potential for odour related impacts were considered. This study assessed potential for nuisance effects at sensitive off-site receptors from odour associated with landfill operations. Receptors considered in the assessment are outlined in **Section 2.1**. Potential odour impacts were assessed by means of the following tasks:

- Review of existing mitigation measures;
- Review of odour related complaints;
- Review of potential odour sources;
- Quantification of odour emissions through field measurements and engineering calculations; and
- Prediction of potential impacts using dispersion modelling.

Exposure to odours does not necessarily pose a health risk to individuals residing adjacent to a landfill, but the odours can potentially become a nuisance. Site-wide odours from the landfill operation, including sources such as landfill gas, fresh waste, leachate, and contaminated soil odours, were evaluated due to their potential for nuisance impacts on the environment surrounding the landfill. Although these odours are distinct from one another, as a conservative approach they have been treated as cumulative odours for the purpose of this odour study.

Typically, Ontario Regulation 419/05 provides air quality standards used in Ontario. However, Reg. 419 does not include a standard for “odour” as a mixture of compounds. According to section 14 of the Ontario Environmental Protection Act, an odour is deemed to be a nuisance if it is detected and considered to be unpleasant. The MECP provided some guidance regarding the assessment of odour impacts in their document, “Methodology for Modelling Assessments of Contaminants with 10-Minute Average Standards and Guidelines under O.Reg, 419/05”, dated September 2016. This guidance document indicates that odour concentrations need only be assessed at odour-sensitive receptor locations, such as residences, commercial buildings, and outdoor parks and recreation areas. Odour impacts that are greater than 1 OU per cubic metre (m^3) are considered acceptable at sensitive receptor locations, as long as the frequency of exceedance is less than 0.5% of the time.

An odour unit is defined as the quantity of odourous substance that, when dispersed in 1 m^3 of odour free air, becomes just detectable by a “normal” human observer whose sensitivity to the odorant represents the mean of the population. The average odour detection threshold is 1 OU/m^3, although odours at this level are not necessarily a nuisance. Often, odours become recognizable at a threshold of 3 OU/m^3. Odour concentrations that may cause a complaint due to their ability to annoy typically range from 3 to 5 OU/m^3. Through RWDI’s experience with other landfills in Southern Ontario, the objectionable level for odour was generally in the range of 3 to 5 OU/m^3. These levels are more closely related to public complaints. For the purposes of this assessment, the predicted site-wide odours from the Walker Landfill operations were compared to the 1 OU/m^3 detection threshold, the 3 OU/m^3 recognition threshold, and the 5 OU/m^3 annoyance threshold.

Although certain contaminants known to be present in LFG, such as H_2S, have odour-based standards under O. Reg. 419, these contaminant-specific standards are not applicable to the overall mixture of compounds that form the LFG odours. Comparisons of the impacts from individual contaminants to their odour-based O. Reg. 419 Standards were evaluated in the landfill gas portion of this assessment. Odours are generally best evaluated by the human response to smell (olfactory response).

The odours from the landfill itself are based on a mixture of compounds contained within the landfill gas and surface emissions (e.g., active face odour), while that from other landfill-related sources are based on a mixture of compounds contained in the leachate ponds and in the contaminated soil piles.

Potential odour sources were identified based on previous assessments of odour from the SLF1 and East landfills. The existing environment was characterized with site-specific odour sampling data. The resulting odour emissions were then incorporated into the dispersion model to assess potential impacts at the identified odour-sensitive receptor locations.

Odour from landfill traffic represents a small proportion of the traffic along the external haul route. Although waste haul trucks can be a source of odour, any potential impacts from travel along haul routes would be short-term and transient in nature and thus were not considered.

There are no other facilities within the LSA with active landfilling operations that could contribute to odour impacts. Odour emissions associated with the compost facility, asphalt plant, and quarry operations are unique and therefore were not considered additive for the purposes of characterizing the Air Quality environment. The facility is surrounded primarily by agricultural land which can be a source of odour but landfill odours are unique and distinct from agricultural odours and therefore cannot be considered cumulatively for the evaluation of potential odour impacts.

7.1 Best Management Practices Plan

Solid waste landfills have the potential to produce odour at several locations including the active face and fresh waste materials, spills on roadways, inactive work area, LFG collection system, landfill gas infrastructure, and the leachate collection system. Landfill gas escaping through the daily and interim covers and final cap are also potential odour sources. The active face and adjacent working area are also significant sources of odour. In an effort to minimize odour emissions from the site, Walker has prepared and implemented an odour Best Management Practices Plan (BMPP), dated June 2024, to minimize the off-site impacts associated with odour. This BMPP (Odour) outlines details on standard operating procedures, mitigation measures, and training to control key operations typically associated with odour emissions. Key control measures outlined in the plan include:

- Inspection of incoming waste to identify overly offensive waste streams may be refused disposal, adhere to designated delivery windows, required bagging, or mandate pre-treatment with deodorizers;
- Washing of roadways within the landfill when temperatures are above freezing to remove odourous spills;
- Where possible, limiting the size of the active face;
- Unloading and burial of waste material as quickly as possible;
- Application of a minimum of 150 mm / 6 inches of daily cover at the end of each working day;

- Monitoring cover integrity and reapplying as required;
- Application of biofilter material to be used as cover to absorb odours, where necessary;
- Application of surface deodorizer as needed using a watering truck when temperatures are above freezing;
- Covering inactive areas with a minimum of 300 mm / 12 inches of interim cover;
- Daily monitoring of landfill gas collection volumes and quality;
- Continuous expansion of the landfill gas collection infrastructure;
- Minimized exposure of waste during maintenance or construction activities;
- Application of odour suppressant and defoamers to leachate lagoons;
- Routine inspection and maintenance of leachate infrastructure;
- Application of perimeter deodorizer system to help neutralize odours;
- Completing daily inspections and odour surveys and record any observable odours;
- Completing preventative maintenance following the schedule outlined in the BMPP;
- Maintain a public response line to provide the community an avenue to provide feedback;
- Log and investigate all odour related complaints received in relation to landfill operations following the procedure outlined in section 12 of the BMPP; and
- Training of relevant staff.

The BMPP includes a robust record keeping program, which includes keeping records of daily diaries and notes, daily inspection checks, monthly EH&S inspections, and complaints for a minimum of 2 years.

Although it is impossible to completely eliminate odour from landfills, these mitigative measures and operating procedures help to minimize odours associated with landfill activities. A copy of the BMPP (Odour) is provided in **Appendix I**.

7.2 Complaint History

A review of the Walker complaint log was conducted in order to determine the level of odour impacts in the vicinity of the Walker Campus. From 2022 to 2025 a total of 113 odour-related complaints were received. The majority of these odour-related complaints have been logged in 2022 and 2023, with 41 complaints in 2022, 31 in 2023, 15 in 2024 and 26 in 2025.

Where complaints were received, the complaint is recorded in the formal log and the appropriate investigations into the potential source of the complaint are completed.

As a result of the investigation process, odour complaints were assigned to one of four sites:

- Compost which is associated with odour from the composting operations area;
- Landfill which is associated with odour from landfill operations;
- IGRS which is associated with odour from the landfill gas recovery operations area; or
- Campus which includes compost, landfill, and IGRS operations, which is used when the specific operation related to the odour could not be determined.

Table 7-1 summarizes the odour complaints by respective area.

Table 7-1: Summary of Odour Complaints

Suspected Source of Odour Emissions	Count of Odour Complaints Received			
	2022	2023	2024	2025
Campus	23	6	3	0
Compost	10	15	7	18
Landfill	5	10	5	8
IGRS	3	0	0	0
Total	41	31	15	26

In 2022 and 2023 new gas collection wells were being drilled as part of the construction of the Renewable Natural Gas (RNG) facility. Drilling operations penetrate the cap and provide a conduit for landfill gas to be released to the atmosphere which can increase the potential for odour emissions. The installation of a significant expansion of the landfill gas extraction wellfield including new extraction wells and conveyance piping is likely the cause of elevated complaints in 2022 and 2023. Upon completion of construction, there was a substantial decrease in the number of landfill-related odour complaints (i.e. including "Campus", "Landfill" and "IGRS") in 2024 and 2025, suggesting that odour from landfill operations is being managed effectively using current best management practices.

A summary of these complaints, including location, wind conditions, and suspected source is provided in **Appendix J**.

7.3 Odour Emission Sources

Under normal operating conditions, solid waste landfills have the potential to produce odours from several areas such as:

- LFG and waste odours from the landfill and waste acceptance activities: active face, interim cover areas, final cap areas, waste transport, and excavation of exposed waste;
- Leachate odours from the leachate collection and storage ponds; and
- Hydrocarbon odours from contaminated soils.

Each of these odour emission sources is discussed in the following sections. Odour emissions associated with the compost facility, asphalt plant, and quarry operations are unique and therefore were not considered additive for the purposes of characterizing the air quality environment.

The locations of all modelled emission sources are shown in **Figure 4-1**.

7.3.1 Landfill Mound under Final Cap

The landfill mound under final cap is the portion of the landfill where waste is no longer being deposited. This area is characterized by the presence of a landfill cap and LFG collection system.

Odour from the landfill mound under final cap results from the fugitive emissions of LFG released through the surface of the landfill. The LFG collection system in the final cap area of the landfill serves to apply a vacuum and extract the LFG from the mound, thus reducing the amount of LFG available to escape through the surface of the mound. In addition, the cap material filters and limits the ability of the LFG to be released through the surface of the landfill. However, even with the LFG collection system and landfill cap in place, some LFG can be released to the atmosphere from seepage through the landfill cap soils. The final cap areas at the closed East Landfill and SLF1 were included in the quantitative assessment.

7.3.2 Active Stage (Interim Cover Area)

The active stage of the landfill is the area where waste has been deposited more recently. The active stage is characterized by the presence of an interim cover. The active stage may or may not have a LFG collection system installed, resulting in a greater potential for landfill gas related odours seeping through interim cover soils. The interim cover area at SLF1 was included in the quantitative assessment.

7.3.3 Active Face

The active face is the area where landfilling is actively occurring, and fresh waste is deposited during normal operations. The active face location was determined based on the actual existing condition in Year 2025 and in a size of approximately 1,000 m^2. Odours from the active face include contributions from the waste itself, as well as LFG seepage from underlying waste. Starting at 6am, the daily cover from the previous day is stripped from the active face before new waste is added between 7am to 4:30 pm. This freshly uncovered waste tends to be more odourous than the regular daily waste fill. The emission from active face at SLF1 for the period of 7am to 5pm was considered in the quantitative assessment, as a conservative approach.

7.3.4 Waste Transport

Waste hauling trucks arriving or leaving the site have the potential to be odourous. The odour levels from individual vehicles vary and are dependent on the operator and type of waste being transported. When travelling along the off-site haul routes, any potential odours from these vehicles will be transitory and are not expected to be significant at any single receptor location. Specific controls for waste haul trucks will be addressed through the best management practices plan. Emissions from the waste vehicles are typically small relative to the overall landfill operation and, as such, was not considered in the dispersion modelling assessment.

7.3.5 Cracks/Fissures in Landfill Cap

The final cap of the landfill limits the migration of LFG through the capped surface of the landfill. However, cracks and fissures can form in this layer, allowing LFG to pass through. These cracks and fissures can form for a variety of reasons, including the effect of freeze/thaw cycles, erosion due to surface water runoff, and heavy equipment operating on the capped area. These cracks and fissures in the landfill cap represent conditions not indicative of normal landfill operation. Therefore, cracks and fissures were not considered in the modelling assessment and is better addressed through best management practices. The final cap is routinely inspected in order to minimize the potential for odours. When required, repairs to the mound are completed as soon as practicable in order to manage the potential for odour emissions.

7.3.6 Excavation of Exposed Waste

It may become necessary to excavate exposed waste at the landfill for purposes such as installation of a landfill gas well or gas collection system piping.

Excavating through the landfill final clay cap opens a temporary conduit for LFG to escape directly into the atmosphere which may contribute to off-site impacts of odour. This type of excavation represents upset conditions and, as such, was not considered in the quantitative assessment; instead, this activity is best addressed through the implementation of best management practices to minimize potential impacts if/when required.

7.3.7 Leachate Collection and Storage Ponds

Leachate produces a strong, unpleasant odour that is distinct from the LFG odours. The leachate collection mains are placed under negative pressure to minimize the potential for odours to escape from the maintenance holes or other open points in the leachate management system. Despite the control measures in place, it is possible for leachate maintenance holes to be a source of odour emissions. However, compared to emissions from the landfill mound, active stage and active face, these intermittent sources represent an insignificant portion of total odour emissions and therefore the leachate collection system was excluded from the quantitative assessment.

Leachate on site is stored in leachate storage ponds for pre-treatment prior to being transferred to the Regional wastewater treatment plant for final treatment. Leachate stored in the ponds has the potential to contribute to odour emissions and was considered in the assessment.

7.3.8 Contaminated Soil Stockpiles

The landfill receives contaminated soil from off-site locations for use as daily cover. A portion of this soil contains VOCs, which can be odourous. Contaminated soil odours are distinct from landfill odours. However, to provide a conservative estimate of facility-wide odours, odour from contaminated soil was considered in the potential cumulative impacts with odour from other landfill operations.

7.4 Emission Calculations

The new source testing data conducted in 2025 was used as the basis for developing new flux rates for all odour emissions from the existing SLF1 and East Landfill. Flux chamber samples were taken in triplicate for most of the locations and duplicate for contaminated soil stockpile, and odour concentrations were determined by odour panel evaluation. Concentrations for both odour detection and odour recognition were provided by the laboratory. As a conservative approach, the detection level values were used, rather than the recognition level values. Odour concentrations were converted to flux rates by multiplying the odour concentration by the flux chamber flow rate during the sampling and dividing by the flux chamber area. The average flux rate was applied to each source respectively in the dispersion modelling.

The sampling was completed on September 2nd to 5th and 29th, 2025. Samples collected were sent to St. Croix Sensory, Inc. for analysis by an odour panel to determine odour flux rates for each source. Samples were collected for each of the following sources:

- 1 area from final cap areas of East Landfill (ELF);
- 2 areas from final cap areas of South Landfill Phase 1 (SLF1);
- 3 areas from the interim cover areas of SLF1;
- 2 areas from the active face of SLF1;
- 1 area from the leachate storage ponds; and
- 3 areas from the contaminated soil piles.

7.4.1 Final Cap and Interim Cover Areas

Overall, the results from the final cap and interim cover areas were found to be valid and were reflective of expected findings based RWDI's experience from the previous sampling results. Sampling was completed under normal conditions, and the landfill gas utilization system was operating under normal conditions. The sampling results were used to develop the odour emission rates at final cap and interim cover areas. Fugitive odour emissions from final cap and interim cover areas were assumed to be continuous for 24 hours, 365 days per year.

7.4.2 Active Face

The sampling results from the active face were compared with the previous sampling exercises at the same landfill site. Measurement results were found to be around 5 times higher than the previous results. Considering that the sampling was completed under normal conditions and the landfill gas utilization system was operating under normal conditions, the results were still considered valid and used to develop the odour emission rates at active face.

Odour from the active face varies by time of day. Starting at 6am, daily cover from the previous day is stripped from the active face to improve the hydraulic connectivity of the waste mound. The stripping process takes approximately one hour to complete and during this time freshly uncovered waste is exposed. New waste will be deposited from 7am to 4:30 pm, followed by daily cover application from 4:30 pm to 5:30 pm. For the purpose of modelling, it was assumed waste deposit from 7am to 5pm, followed by 1-hour daily cover application from 5pm to 6pm. Odour emissions from the active face were assumed from 7am to 5pm for conservative assessment.

7.4.3 Leachate Storage Ponds

Overall, the results from the leachate storage ponds were found to be 4 times higher than the previous sampling results. Considering that the sampling was completed under normal conditions and the leachate collection system was operating under normal conditions, the results were still considered valid and used to develop the odour emission rates at leachate storage ponds. Fugitive odour emissions from leachate storage ponds were assumed to be continuous for 24 hours.

7.4.4 Contaminated Soil Pile

Overall, the results from the contaminated soil pile were found to be valid and were reflective of expected findings based RWDI's experience from the previous sampling results. Sampling was completed under normal conditions, and the contaminated soil pile was representative of the general material that is used on-site. The sampling results were used to develop the odour emission rates at contaminated soil pile. Fugitive odour emissions from contaminated soil pile were assumed to be continuous for 24 hours.

7.5 Dispersion Modelling

The potential odour impacts from landfill operations were determined using dispersion modelling and reasonable worst-case emission rates. Dispersion modelling for odour was completed in accordance with the methodology outlined in **Section 4**. Modifications to the methodology specific to odour modelling are provided in the following sections.

7.5.1 Sources Modelled

The sources included in the dispersion model were the active face, interim cover area, the final cap area, the contaminated soil piles, and the leachate ponds. Each of these sources were modelled as an area source. All modelled sources were assumed to emit maximum odour emissions concurrently throughout the entire modelled period.

The locations of all modelled sources are shown in **Figure 4.1**.

7.5.2 Area of Modelling Coverage

The potential for odour impacts is assessed using a 10-minute averaging period at discrete receptors only. All discrete receptor points identified in **Section 4.1.2** were included in the odour modelling. Discrete receptors were modelled at flagpole heights of 1.5 m above grade. The locations of these discrete receptors are shown in **Figure 2-2**.

In addition, modelling was performed using a receptor grid covering the site-vicinity and regional study areas to produce isopleths of predicted concentrations. The receptor grid covers the lands within approximately 5 kilometres centered at the Walker Campus. The locations of the grid receptors are shown in **Figure 2-3**.

7.6 Odour Baseline Condition Results

Modelling was completed for the 1-hour averaging period. One-hour concentrations were converted to 10-minute concentrations following the methodology outlined in MECP Guideline A-11. Predicted concentrations were assessed at discrete receptors only.

Exposure to odours does not necessarily pose a health risk, however, odour can cause nuisance impacts at sensitive receptors in the immediate vicinity of the landfill. When assessing odour-related impacts, three thresholds were considered:

- 1 OU – associated with detection of odour;
- 3 OU – recognition of the odour; and
- 5 OU – nuisance resulting from the odour.

A summary of the maximum predicted concentrations and frequency of exceedance over 5 modelling years for 1 OU, 3 OU, and 5 OU is provided in **Table 7-2**.

The overall highest maximum predicted concentration was 6.8 OU/m³ which is predicted at R03.

Maximum predicted concentrations at all receptors exceed the MECP odour guideline objective of 1 OU/m³. A frequency analysis was performed on the predicted concentrations. The 1 OU/m³ guideline shows exceedances at a frequency greater than 0.5% of the time at all receptors except for R20, and R23 through R28. The highest overall frequency of exceedance of 1 OU/m³ is 4.7% which is predicted at R21.

Exceedances of 3 OU/m³ were predicted at 15 receptors, R01, R03, R10 through R17, R21, R22, R24, R26, and R29. The frequency analysis indicates that exceedances of 3 OU/m³ are predicted to occur less than 0.5% at all receptors, except for R03, R15, and R21. The highest overall frequency of exceedance of 3 OU/m³ is 1.0% which was predicted at R21.

Exceedances of 5 OU/m³ were predicted at 5 receptors, R03, R11, R15, R16, and R21. Exceedance of 5 OU/m³ was predicted to occur less than 0.5% of the time at all receptors, with the highest overall frequency of exceedance being 0.2% at R03.

A contour of maximum predicted odour concentrations extending 5km around the site is provided in **Appendix K**.

Table 7-2: Odour Concentrations and Frequency Analysis (Maximum over 5 Years)

AQ Receptor ID	Common Receptor ID (if Applicable)	Maximum Concentration (OU/m³)	Events > 1 OU		Events > 3 OU		Events > 5 OU	
			Count	Frequency of Exceedance	Count	Frequency of Exceedance	Count	Frequency of Exceedance
R01	--	4.4	115	1.3%	18	0.2%	0	0.0%
R02	**CR17**	2.5	81	0.9%	0	0.0%	0	0.0%
R03	**CR19**	6.8	241	2.8%	62	0.7%	15	0.2%
R04	--	2.7	132	1.5%	0	0.0%	0	0.0%
R05	--	2.6	116	1.3%	0	0.0%	0	0.0%
R06	--	2.7	119	1.4%	0	0.0%	0	0.0%
R07	--	2.5	98	1.1%	0	0.0%	0	0.0%
R08	--	2.3	70	0.8%	0	0.0%	0	0.0%
R09	**CR18**	2.3	56	0.6%	0	0.0%	0	0.0%

AQ Receptor ID	Common Receptor ID (if Applicable)	Maximum Concentration (OU/m³)	Events > 1 OU		Events > 3 OU		Events > 5 OU	
			Count	Frequency of Exceedance	Count	Frequency of Exceedance	Count	Frequency of Exceedance
R10	**CR05**	4.0	101	1.2%	15	0.2%	0	0.0%
R11	--	5.1	96	1.1%	20	0.2%	2	0.0%
R12	--	5.0	103	1.2%	24	0.3%	0	0.0%
R13	--	4.3	80	0.9%	15	0.2%	0	0.0%
R14	--	3.8	47	0.5%	5	0.1%	0	0.0%
R15	**CR10**	6.3	239	2.7%	55	0.6%	12	0.1%
R16	--	6.0	187	2.1%	34	0.4%	4	0.0%
R17	**CR01**	3.8	99	1.1%	8	0.1%	0	0.0%
R18	**CR04**	2.7	113	1.3%	0	0.0%	0	0.0%
R19	**CR06**	2.5	80	0.9%	0	0.0%	0	0.0%
R20	**CR07**	1.6	31	0.4%	0	0.0%	0	0.0%
R21	**CR08**	5.7	415	4.7%	88	1.0%	13	0.1%
R22	**CR11**	4.1	92	1.1%	13	0.1%	0	0.0%
R23	**CR12**	1.5	25	0.3%	0	0.0%	0	0.0%
R24	**CR13**	3.2	25	0.3%	2	0.0%	0	0.0%
R25	**CR14**	1.8	38	0.4%	0	0.0%	0	0.0%
R26	**CR15**	3.0	43	0.5%	1	0.0%	0	0.0%
R27	**CR16**	2.1	31	0.4%	0	0.0%	0	0.0%
R28	**CR20**	1.7	39	0.4%	0	0.0%	0	0.0%
R29	**CR21**	4.8	154	1.8%	35	0.4%	0	0.0%

It should be noted that upset conditions within the landfill operations were not considered in the model, such as flare shutdowns, repairs and maintenance of gas collection infrastructure, unusually odourous waste, and maintenance and repair of waste cover and filling areas. These upset conditions are unpredictable and represent irregular operations onsite which have the potential to cause additional adverse odour impacts. In the past, increases in odour complaints have been found to coincide with these upset conditions. Given the unpredictable nature and unique characteristics of upset conditions, defining the emissions from such events would be extremely difficult. Therefore, it is not feasible to assess all potential upset conditions at the site when assessing the potential for odour impacts and the odour results presented represent the worst-case scenario under normal operating conditions.

Based on the predicted odour concentrations there is potential that landfill-related odours will be detectable at discrete receptors from time to time. At some discrete receptors, the odours will be strong enough to be recognizable on occasion.

7.7 Odour Conclusions and Recommendations

Dispersion modelling predicts maximum odour concentrations at all sensitive receptors to exceed the MECP odour guideline objective of 1 OU/m³, based on detection of odours. Frequency of exceedance of the 1 OU/m³ detection level was predicted to be greater than 0.5% at 22 of the 29 receptors considered, while frequency of exceedance of the 3 OU/m³ recognition level was predicted to be greater than 0.5% of the time at 3 receptors. Exceedances of the 5 OU/m³ annoyance level were predicted at 5 receptors, with frequencies less than 0.5% of the time at all receptors.

Based on the predicted odour concentrations there is potential that landfill-related odours will be detectable at discrete receptors from time to time. Overall, modelling results indicate that odours from the landfill will be detectable at some off-site receptors from time to time, occasionally recognizable, and infrequently strong enough to trigger complaints. This aligns with the complaint record, where landfill-related odour complaints are occasionally received.

Landfill areas under interim and final cover and operations at the active face are the greatest contributors of odour under normal operations. Walker should continue to manage emissions of landfill gas by routine maintenance of the final cap and interim cover areas and the gas and leachate collection systems. Conditions outside normal operations, such as leaks or fissures through the landfill cap, may result in increased odour impacts. Preventing these types of conditions and mitigating them as quickly as possible when they may occur are key to minimizing potential off-site odour impacts. In an effort to address the potential for odour related impacts from both normal operation and potential upset conditions a review of the existing odour best management practices plan will be completed as part of the preferred alternative assessment. The proper development and implementation of the BMPP (Odour) can help reduce the potential for these conditions.

8 LANDFILL GAS AND COMBUSTION BYPRODUCTS

LFG is created through decomposition of the biodegradable waste within the landfill. LFG consists mainly of methane and carbon dioxide; however, it also contains trace amounts of VOCs and reduced sulphur compounds. VOCs include a broad spectrum of contaminants however, this study focuses on the key indicator contaminants outlined in **Section 3.2**, which are vinyl chloride, benzene, and 1,1,2-trichloroethane. These contaminants were selected as they represent the VOC compounds with the highest concentrations relative to the MECP criteria, based on the 2024 ESDM. Therefore, when compliance with these indicator compounds is achieved, compliance for all other VOC compounds is anticipated.

The indicator contaminants for reduced sulphur compounds are H_2S and TRS. TRS represents the combination of sulphur compounds emitted from the landfill, including carbonyl sulphide, H_2S, carbon disulfide, methyl mercaptan, ethyl mercaptan, and dimethyl sulphide. Potential impacts from H_2S emissions were assessed both individually as well as a part of TRS.

For products of combustion the indicator contaminants were NOx and SO_2. These contaminants are released from the combustion of landfill gas and other fuels such as diesel, natural gas, and gasoline. Other contaminants can be released from fuel combustion but typically NOx and SO_2 represent the highest predicted concentrations relative to their respective criteria and compliance with NOx and SO_2 implies compliance of other contaminants.

Potential LFG and combustion byproduct impacts were assessed by means of the following tasks:

- Review of existing mitigation measures;
- Review of LFG related complaints;
- Review of potential LFG and combustion byproduct sources;
- Quantification of LFG and combustion byproduct emissions through field measurements and engineering calculations; and
- Prediction of potential impacts using dispersion modelling.

The majority of the landfill gas generated at Walker's SLF1 and East Landfill is collected by the landfill gas collection system and sent for destruction or for utilization such as electricity generation, distribution to the neighbouring GM plant for use in their process, or conversion to RNG for use in the regional natural gas pipeline. However, a portion of the landfill gas that is not collected is released through the landfill surface as fugitive emissions.

Landfill gas that is collected but not utilized is destroyed by combustion through the landfill gas flares. Combustion of landfill gas produces combustion byproducts, including NOx, SO_2, and particulate matter. In addition, it is assumed that landfill gas-fired combustion equipment has a destruction efficiency of 98%, meaning that 2% of the VOCs and sulphurs in the combusted LFG are released to the atmosphere.

This section considers the potential impacts from the landfill gas emissions of VOCs and sulphurs, as well as the combustion byproducts NOx and SO_2. Potential impacts of particulate matter are discussed in **Section 9**. Emissions of NOx and SO_2 are commonly associated with other fuel-burning combustion equipment used during landfill activities, such as the landfill gas flares, on-site vehicles and heavy equipment, and diesel generators.

8.1 Complaint History

A review of the Walker complaint log was conducted in order to determine the current level of VOC and combustion byproduct impacts in the vicinity of the landfill. From 2020 - 2025 no VOC or combustion byproduct related complaints were received. However, as discussed in **Section 7** there were odour related complaints. Reduced sulphur compounds such as H_2S and TRS are known to be odourous and can therefore contribute to odour impacts. Although no specific VOC or combustion byproduct complaints were received, it is reasonable to assume that some of the odour related complaints are influenced by emissions of reduced sulphur species.

8.2 Landfill Gas and Combustion Byproduct Emission Sources

Gas generated by decomposing waste in a landfill can migrate through the soil cover to the surface of the landfill, mix into the atmosphere, and disperse downwind and off-site. The landfill gas consists primarily of methane, carbon dioxide and trace amounts of VOCs and TRS compounds. Although the levels of VOC and TRS account for less than one percent by volume of the gas escaping from a landfill, the concentrations of these gases must be considered because of the potential for health or odour impacts at receptors in proximity to the landfill.

Under normal operating conditions, Walker landfill operations have the potential to emit LFG contaminants, including VOCs and TRS compounds, from several areas:

- Fugitive emissions of LFG through the surface of the landfill, through both final cap and interim cover areas, excavation of exposed waste, and cracks/fissures in the landfill covers;
- Fugitive emissions from the leachate storage ponds;
- VOCs from contaminated soils;
- Uncombusted LFG compounds emitted from the flares; and
- Tailpipe emissions from mobile equipment.

Combustion byproducts are generated by the combustion of fuels. Under normal operating conditions, the Walker SLF1 and East Landfills have the potential to emit combustion byproducts from the following sources:

- Landfill gas flares;
- RNG facility thermal oxidizer, siloxane flare, generators, and flare;
- Portable generators; and
- Tailpipe emissions from mobile equipment.

Each of these sources is discussed in the following sections. Although the landfill operations contribute the majority of LFG and combustion byproduct emissions, sources of like emissions from the quarry plant, asphalt plant, Biosolids facility and compost facility operations were considered in the assessment in order to evaluate cumulative effects, these sources may include:

- Uncombusted LFG compounds from the RNG facility thermal oxidizer, siloxane flare, generators, and flare;
- Quarry, asphalt plant, Biosolids facility, compost facility or office natural gas combustion equipment;
- Quarry plant, asphalt plant and compost facility mobile equipment tailpipe emissions; and
- Process emissions associated with quarry plant operation and asphalt production.

The locations of all modelled emission sources are shown in **Figure 4-1**.

8.2.1 Landfill Mound under Final Cap

The landfill mound under final cap is the portion of the landfill where waste is no longer being deposited. This area is characterized by the presence of a final cap and complete LFG collection systems have been put in place.

Fugitive emissions of LFG are released through the surface of the landfill mound under final cap. The LFG collection systems in the final capped areas of the landfill serve to help maximize extraction of LFG from the mound, thus reducing the amount of LFG available to escape through the surface. In addition, the capping materials filter and limit the ability of the LFG to be released through the surface of the landfill. However, even with the LFG collection system and final cap in place, some LFG is released to the atmosphere through the final cap. The overall LFG collection efficiency from areas under final cap is conservatively assumed to be 85%, with the remaining 15% of the gas released through the surface of the landfill. The final capped areas at the closed East Landfill and SLF1 were included in the quantitative assessment.

8.2.2 Active Stage (Interim Cover Area)

The active stage of the landfill is the area where waste has been deposited more recently. The active stage is characterized by the presence of an interim cover. The active stage does not have a completely installed LFG collection system; therefore, collection of LFG occurs with a lower overall collection efficiency, conservatively assumed to be 70%. The interim cover area at SFL1 was included in the quantitative assessment, and the extent of interim cover area was determined based on the existing filling plan provided by Walker.

The active face, where incoming waste is deposited each day, is located within the active stage. However, the fresh waste does not contribute to the LFG emissions (which are a result of the decomposition of waste) so the active face was not included as a source for the LFG and combustion byproducts assessment.

8.2.3 Portable Generators

Two portable generators are used to provide on demand power for Walker's operations. One of them is a 49-kW diesel-fired generator and the other one is a 8 kW gasoline-fired generator. The 8-kW gasoline-fired generator was considered an insignificant source in the latest Walker ESDM report and therefore not included in this quantitative assessment. As diesel combustion results in combustion by-products, emissions of combustion by-products from the 49-kW diesel-fired portable generators were included in this quantitative assessment.

8.2.4 Stationary Generator

There is one 45-kW generator that is used as part of the quarry plant operations to provide energy supply to water pump for water trucks. This generator uses diesel fuel, and diesel combustion results in combustion by-products. Emissions of combustion byproducts from the diesel generator were included in this quantitative assessment.

8.2.5 Landfill Tippers

There are two diesel-fired landfill tippers at the Walker SLF1, one with a 129-kW engine and one with a 125-kW engine. The assessment considered the operation of both tipper units at maximum capacity. For consistency with previous studies, both tippers were assumed to have the larger engine (129-kW) for the purposes of the assessment. The tippers are used during waste filling hours only, so it was assessed as operating between the hours of 7 am to 5 pm.

8.2.6 Landfill Gas Generators

A portion of the LFG collected from the LFG collection system is used to generate electricity. There are currently two 1.064 MW landfill gas-fired electricity generators in operation and IGRS has approval to install up to 2 more units. As a conservative assumption, all four generators were assumed to operate for all contaminants with the exception of SO_2, which considered the operation of only the two existing generators as part of the refined operating scenario for this contaminant. The details of the SO_2 emission refinement are discussed in **Section 8.3.4**. Gas received from the landfill is passed through an aftercooler, a gas dryer, a chiller, and a siloxane removal filter prior to combustion in the generators or prior to being sold to off-site industrial clients. Siloxanes from the siloxane removal process are treated in the siloxane flare.

Similar to the landfill gas flares, some emissions of uncombusted VOCs and methane are expected from the landfill gas generators. Emissions of these contaminants were included in this quantitative assessment.

8.2.7 Landfill Gas Flare

Collected landfill gas is combusted in enclosed flares or is diverted to the IGRS landfill gas utilization facility. The landfill currently has three enclosed existing landfill gas flares on site.

Flaring of the landfill gas typically converts about 99.9% of the methane to carbon dioxide and destroys 98% of the trace organic compounds. For this assessment, the overall destruction efficiency was capped at 98% for all contaminants as a conservative approach. Emissions of LFG constituents and combustion byproducts from the LFG flares were included in the quantitative assessment.

8.2.8 Renewable Natural Gas (RNG) Facility

The RNG facility upgrades the landfill gas to a quality similar to fossil natural gas so it can be injected into the natural gas distribution system. In verbal terms, the raw landfill gas (biogas) will pass through a chiller and then through an activated carbon-based H_2S removal system. The gas then passes through a Temperature Swing Adsorption (TSA) system to remove VOCs and siloxanes. The TSA will send regen cycle gases to the new siloxane flare. The gas then passes through a membrane system to remove carbon dioxide and a Pressure Swing Adsorption (PSA) system to remove nitrogen and oxygen gas. After that the RNG will be compressed and sent to the pipeline. The RNG Facility also includes a flare which is used to treat several potential gas streams, including excess landfill gas or off-spec RNG gas and a thermal oxidizer.

Similar to the landfill gas flares, some emissions of uncombusted VOCs and methane are expected from the RNG facility. Emissions of these contaminants were included in this quantitative assessment.

8.2.9 Cracks/Fissures in Landfill Cap

The final cap of the landfill limits the migration of LFG through the capped surface of the landfill. However, cracks and fissures can form in the cap, allowing LFG to pass through unchecked. These cracks and fissures can form for a variety of reasons, including the effect of freeze/thaw cycles, erosion due to surface water runoff, and heavy equipment operating on the capped area.

Cracks and fissures in the landfill cap represent conditions outside of normal operations and, as such, were not considered in the quantitative assessment; instead, this is best assessed through the development of best management practices to minimize potential impacts to the integrity of the landfill cap.

8.2.10 Excavation of Exposed Waste

It may become necessary to excavate exposed waste at the landfill for purposes such as installation of a landfill gas well or gas collection system piping.

Excavating through the landfill final clay cap opens a conduit for LFG to escape directly into the atmosphere. This type of excavation represents upset conditions and, as such, were not considered in the quantitative assessment; instead, this activity is best addressed through the development of best management practices to minimize potential impacts if/when required.

8.2.11 Leachate Collection and Storage Ponds

Leachate contains many of the same contaminants that are contained in LFG. The leachate collection mains are placed under negative pressure so that no gases escape from maintenance holes or other open points in the leachate management system. Although these systems are designed to be under negative pressure and effectively sealed, gases may occasionally be emitted through maintenance holes. However, compared to emissions from the landfill mound and active stage, these intermittent sources represent an insignificant portion of total emissions and therefore the leakage of leachate collection system was excluded from the quantitative assessment.

Leachate on site is stored in leachate storage ponds. Leachate stored in the ponds has the potential to contribute to fugitive VOC emissions and was considered in the assessment.

8.2.12 Leachate Seepage

Leachate seepage can occur if leachate “breaks through” the cap of the landfill and pools on the surface. Leachate seepage can occur due to poor drainage, or cracks and fissures in the landfill cap. Leachate seepage represents an upset condition and as such was not considered in the quantitative assessment; instead, this is best assessed through the development of best management practices to minimize occurrence of leachate seepage and its potential impacts.

8.2.13 Contaminated Soil Piles

The landfill receives waste soil from off-site locations. The majority of the soil is petroleum fuel-contaminated and contains fuel-related VOCs such as benzene, vinyl chloride, 1,1,2-trichloroethane and other light aromatics. Fugitive VOC emissions from the contaminated soil piles were included in the quantitative assessment.

8.2.14 Tailpipe Emissions

Vehicles associated with landfill operations emit VOCs and combustion byproducts from their tailpipes. The vehicle tailpipe emissions were considered in the quantitative assessment.

8.2.15 Asphalt Plant Emissions

Sources of like emissions from the asphalt plant were considered as part of the assessment. Based on the 2024 Walker ESDM report, several sources at the facility have the potential for benzene emissions such as:

- The asphalt cement storage tanks;
- The asphalt plant dust collector;
- The hot mix asphalt (HMA) loadout at the mixer and silo;
- Silo filling operations; and
- Movement of loaded HMA trucks and tailpipe emissions.

8.2.16 Quarry Operation Emissions

Sources of like emissions from the quarry operations were considered as part of the assessment. The quarry operations themselves are not expected to be a significant source of VOCs or combustion byproducts, however tailpipe emissions of combust byproducts associated with haul truck and heavy equipment were considered.

8.3 Emission Calculations

Emissions of LFG and combustion byproducts from the facility were quantified using a combination of site-specific flux chamber analysis, published emission factors, and engineering calculations. Emissions were determined for sources such as:

- Fugitive emissions from the final cap areas of the landfill;
- Fugitive emissions from the interim cover areas of the landfill;
- Fugitive emissions from the leachate storage ponds;
- Fugitive emissions from the contaminated soil pile(s);
- Emissions from diesel-fired landfill tippers;
- Combustion emissions from generators, flares, the siloxane flare, and the thermal oxidizer; and
- Emissions from vehicle tailpipes.

In addition to sources associated with landfill operations sources of like emissions from the asphalt plant and quarry were also considered such as:

- Emissions from the asphalt plant storage tanks;
- Emissions from the asphalt plant dust collector;
- Emissions from the HMA mixer loadout and silo loadout;
- Emissions from silo filling operations;
- Movement of HMA trucks; and
- Tailpipe emissions from asphalt plant and quarry operations, haul trucks and heavy equipment.

For most of the contaminants except SO_2, all the above sources were included in the model as a conservative assessment. For SO_2, three sub-scenarios were modelled based on the actual situation according to Walker to reflect a more realistic impact. The three sub-scenarios are as below:

- "Normal worst-case operation" scenario including:
    - Two existing LFG-fired generators (GEN1 and GEN2)
    - RNG Flare (RNGFLARE) processing excess landfill gas.
    - Siloxane flare (SILFLAR2)
- "Enclosed Flare" scenario, including:
    - Three LFG-fired flares (FLARE1, FLARE2 and FLAR3)
- "Process Tail Gas" scenario, including:
    - RNG Flare (RNGTAIL) processing off-spec RNG.

The gas flow to the LFG equipment and emissions were also refined based on the information provided by Walker. The calculations are discussed in the following sections.

8.3.1 Final Cap and Interim Cover Areas

The closed East Landfill covers approximately 53.7 ha (entirely final cap area) and SLF consists of approximately 19.6 ha for final cap area and 31.2 ha for interim cover area respectively.

The emission rates for VOCs, H_2S, and TRS from the final cap and interim cover areas were derived based on the sampling results collected on September 2nd to 5th and 29th, 2025. Where sampling results were reported by the lab as "not detect", the detection values were used as the sample result as a conservative approach. The contaminant concentrations were converted to flux rates by multiplying the concentration recorded by the flux chamber flow rate during the sampling and dividing by the flux chamber area. The average flux rate was applied to each source respectively in the dispersion modelling.

A summary of the sampling data for different areas of the closed East Landfill and SLF1 are provided in **Appendix D1**.

8.3.2 Diesel and Gasoline-Fired Combustion Equipment

For the portable diesel-fired generator, emissions of NOx and PM were calculated based on emission factors provided in the manufacturer's specifications. SO_2 emissions were calculated based on emission factors provided in US EPA's AP-42 Document, Chapter 3.3 Gasoline and Diesel Industrial Engines.

For the portable gasoline-fired generator and the two tippers, emissions of NOx, SO_2 and PM were calculated based on emission factors provided in US EPA's AP-42 Document, Chapter 3.3 Gasoline and Diesel Industrial Engines. As discussed in **Section 8.2.3**, the gasoline-fired generator was not included in this assessment due to its insignificant contribution.

For the generator for water trucks (SEQ), emissions of NOx and PM were calculated based on emission factors provided in US EPA's Nonroad Compression-Ignition Engines: Exhaust Emission Standards, with the assumption of Tier 1 engine for conservative assessment, while SO_2 emissions were calculated based on emission factors provided in US EPA's AP-42 Document, Chapter 3.3 Gasoline and Diesel Industrial Engines.

The detailed combustion emission calculations for the diesel and gasoline-fired combustion equipment are presented in **Appendix L**.

8.3.3 LFG-fired Equipment Flow Calculations

The quantity of landfill gas generated by the landfill was estimated using the Environment and Climate Change Canada (ECCC) Landfill Methane Modelling Tool, version 1.3. The ECCC Landfill Methane Modelling Tool is a spreadsheet-based emission calculation tool that was released in December 2025 for the purpose of estimating methane generation from Canadian landfills. The methodology applied in the model aligns with the Intergovernmental Panel on Climate Change (IPCC) Waste Model as described in Volume 5, Chapter 3 of the 2006 IPCC Guidelines for National Greenhouse Gas Inventories. Inputs to the ECCC tool include:

- The amount of degradable organic carbon (DOC)
- The fraction of degradable carbon that decomposes (DOCf)
- The decay rate (k)
- Local precipitation
- Waste disposal rate
- Methane correction factor (MCF)
- Methane content in the landfill
- Leachate recirculation (optional)
- Site-specific waste composition (optional)

Default values for waste DOC, DOCf, and MCF were used in the model. The tool has a fixed methane gas concentration of 50%, which aligns with the average methane gas concentration measured at the South Landfill Phase I of 49.5%. The decay rate (k) was determined based on the precipitation method using the default waste composition for bulk Municipal Solid Waste (MSW). No future diversion of waste was considered in the calculation. Precipitation data was based on the Canadian Climate Normals as recommended by the ECCC guidance. The nearest station to the site is Welland-Pelham which recorded an average annual precipitation of 967 mm from 1991 to 2020. This precipitation rate was entered into the model and used to determine the site-specific decay rate. Historic landfill filling rates were entered into the model from 2009 through to the current operating year 2025 for SLF1 and from 1982 to 2017 for the East Landfill. The ECCC tool spreadsheet provides a detailed list of the model parameters used in the methane generation calculation. A copy of the ECCC tool spreadsheets is provided in **Appendix M1** to **Appendix M2**.

The total gas generation predicted by the ECCC was used to determine the total amount of LFG collected, based on a collection efficiency of 85% for areas of the landfill under final cover and 70% for areas under interim cover. The collected gas was proportionally distributed between all LFG combustion equipment on-site, including the flares, generators, RNG flare, siloxane flare, and thermal oxidizer based on the maximum flow rate for each piece of equipment. This is a conservative assessment as under this scenario, no LFG was assumed to be converted to RNG or sent to GM. Details regarding the flow rate and emission calculations are provided in **Appendix M3** to **Appendix M4**.

For SO_2, the use of this conservative LFG utilization scenario resulted in elevated off-site concentrations. Therefore, a refined scenario was developed for SO_2, which considered more refined operating details as provided by Walker. The typical gas flows and equipment operation were directly adopted in the calculations. The following operating scenarios were considered for SO_2:

- Normal operating scenario: concurrent operation of two LFG-fired generators (at 400 cfm each), the siloxane flare (130 cfm), and the RNG flare processing LFG (300 cfm).
- Maintenance: concurrent operation of the three LFG flares during scheduled maintenance, at a combined flow of 2500 cfm.
- Tailgas: RNG flare processing non-pipeline RNG (3200 cfm).

Further details regarding the flow rates and emission rates used for the refined SO_2 scenario are provided in **Appendix M5** to **Appendix M7**.

8.3.4 LFG-fired Generators

VOC, H_2S, and TRS emissions from the four LFG-fired generators were calculated using the concentration of each contaminant measured in the landfill gas sampling conducted in 2026, the LFG volume flowing to each generator in 2025, and the LFG destruction efficiency for each generator.

For emissions of combustion byproducts, the emission rates of NOx were based on emission factors provided by the manufacturer, while emissions of SO_2 were calculated based on the total sulphur content of the collected landfill gas and the total amount of landfill gas combusted in each piece of equipment. Emission rates of PM were calculated based on the emission factors provided in US EPA AP-42 Chapter 2.4 Municipal Solid Waste Landfills.

Exit velocity was calculated based on the design gas flow, design exit velocity and the actual gas flow.

A summary of LFG source testing results is provided in **Appendix E**.

The detailed LFG emission calculations for the LFG-fired generators are presented in **Appendix M**.

The detailed combustion emission calculations for the LFG-fired generators are presented in **Appendix L**.

8.3.5 LFG-fired Flares

VOC, H_2S, TRS and SO_2 combustion byproducts emissions from the 3 LFG-fired flares were calculated analogously to those from the LFG-fired generators, considering the LFG volume flowing to each flare in 2025 and a destruction efficiency of 98% as a conservative assessment. Emissions of SO_2 were calculated based on the total sulphur content of the collected landfill gas and the total amount of landfill gas combusted in each piece of equipment. Emission rates of NOx and PM were calculated based on the emission factors provided in US EPA AP-42 Chapter 2.4 Municipal Solid Waste Landfills.

The detailed LFG emission and combustion calculations for the LFG-fired flares are presented in **Appendix M**.

8.3.6 RNG Elevated Flare

The RNG flare emits VOCs, H_2S, and TRS and by-products of combustion. Details regarding the RNG flare were obtained from the manufacturer's specifications. The elevated flare uses propane gas to fire the pilot light and will treat three potential waste streams: landfill gas, partially treated RNG gas, and off-spec sales RNG gas. As per the ESDM report, it was determined that the landfill gas flaring scenario provided the worst-case emissions for landfill gas contaminants, NOx, and PM. Therefore, this scenario was used for the RNG flare. For the SO_2 refinement assessment, two scenarios were considered: one under normal operation flaring 300 cfm of landfill gas and one tail gas scenario flaring 3200 cfm of higher sulphur off-spec RNG.

Since the flare is an elevated open flare the MECP provides guidance on the calculation of pseudo-parameters to be used in the dispersion modelling. Guidance is provided in the technical bulletin "Modelling Open Flares under O.Reg. 419/05", dated February 2017. These calculations account for the combustion that occurs above the physical stack by determining and effective stack height, diameter, and exit velocity. The details of these calculations are provided in **Appendix N**.

VOC, H_2S, TRS, NOx, SO_2, and PM emissions from the RNG elevated flare were calculated analogously to those from the LFG-fired generators, considering the LFG volume flowing to the RNG elevated flare in 2025 and a destruction efficiency of 98% provided in AP-42 Chapter 2.4 Municipal Solid Waste Landfills.

The detailed LFG emission and combustion calculations for the RNG elevated flare are presented in **Appendix M**.

8.3.7 Siloxane Flare

Emission rates of NOx and PM from the siloxane flare were calculated based on maximum capacity of the equipment and emission factors provided in AP-42 Chapter 2.4 Municipal Solid Waste Landfills. The siloxane can operate using either LFG or natural gas. NOx emissions from combustion were calculated based on the amount of methane in the gas stream. In order to capture the worst-case emissions, it was conservatively assumed that natural gas was 100% methane, this was used to calculate NOx emissions from the siloxane flare.

For the refined SO_2 modelling scenario, the gas flow of the siloxane flare was based on the typical gas flow to the flare, as provided by Walker. This typical gas flow was directly adopted in the calculations. SO_2 emissions were calculated based on the total sulphur content of the collected landfill gas and the total amount of landfill gas combusted in the siloxane flare.

The detailed combustion emission calculations and flow rate conversion for the siloxane flare are presented in **Appendix M** and **Appendix O** respectively.

8.3.8 Thermal Oxidizer

The thermal oxidizer emits VOCs, H_2S, and TRS and by-products of combustion. Details regarding the thermal oxidizer were obtained from manufacturer's specifications. The thermal oxidizer uses natural gas to fire the main burner and will treat a waste stream similar to landfill gas. Emissions were calculated based on the LFG volume flowing to the thermal oxidizer in 2025, which was calculated analogously to those from the LFG-fired generators. The manufacturer provided the worst-case NMOC concentration of 300 ppm at the thermal oxidizer outlet, based on a destruction efficiency of 98%.

The total VOCs released in the thermal oxidizer exhaust were speciated to the key VOC compounds based on the relative proportion of each of the landfill gas compounds of interest in the LFG stream, scaled relative to the 300-ppm thermal oxidizer outlet concentration and total NMOC concentration of 595 ppm. The exception to this was H_2S which will have a maximum concentration of 4 ppm at the thermal oxidizer inlet, based on manufacturer data. The thermal oxidizer was assumed to have a destruction efficiency of 98%. Combustion by-product (NOx, SO_2 and PM) emissions from the thermal oxidizer were calculated analogously to those from the LFG-fired generators.

Under upset conditions, the waste stream normally combusted in the thermal oxidizer will be ducted to the RNG elevated flare for destruction. However, based on the findings in 2024 Walker ESDM report, the difference in resulted air quality impact would be minor. Therefore, only the normal operation of thermal oxidizer was considered in this quantitative assessment.

Since the gas in thermal oxidizer is essentially desulphurized. No SO_2 emission is anticipated from the thermal oxidizer, and this source was not included in operating scenarios considered for the refined SO_2 modelling.

The detailed LFG emission calculations for the thermal oxidizer are presented in **Appendix P**.

The detailed combustion emission calculations and flow rate conversion for the thermal oxidizer are presented in **Appendix M**.

8.3.9 Leachate Storage Ponds

The emission rates of VOCs, H_2S, and TRS from the leachate storage ponds were determined based on the concentrations from the samples taken on September 29, 2025. Sampling results are provided in **Appendix D1**. The emission flux rate of each individual contaminant was calculated by multiplying the contaminant concentration to the flux chamber flow rate and dividing by the flux chamber area.

The detailed LFG emission calculations for the leachate storage ponds are presented in **Appendix D2**.

8.3.10 Contaminated Soil Pile

The emission rates of VOCs, H_2S, and TRS from the contaminated soil pile were determined based on the concentrations from the samples taken on September 5, 2025. Sampling results are provided in **Appendix D1**. The emission flux rate of each individual contaminant was calculated by multiplying the contaminant concentration to the flux chamber flow rate and dividing by the flux chamber area.

The detailed LFG emission calculations for the contaminated soil pile are presented in **Appendix D2**.

8.3.11 On-Site Vehicle Emissions

VOC and combustion by-product emissions from on-road vehicles were obtained using the US EPA's Motor Vehicle Emission Simulator (MOVES), version MOVES4.0. MOVES is a model that has been developed for the purpose of estimating vehicular emissions using computer simulation techniques based on extensive previous testing of a wide range of vehicles. MOVES provides an aggregate emission factor that includes emissions associated with fuel combustion in the engine, as well as brake and tire wear. MOVES4.0 was used to generate vehicle emission factors for the baseline year 2025.

Tailpipe emissions for landfill equipment, such as compactors, loaders, skid steers, excavators, graders and bulldozers, were also developed using MOVES4.0. These emissions were generated using the MOVES non-road option. This option is designed specifically for calculating emissions of non-road sources and produces emission rates in gram per hour based on the type of equipment and its rated horsepower. The horsepower of all off-road equipment was based on information provided by Walker.

8.3.11.1 Vehicle Traffic

Traffic volumes related to the operations of landfill, quarry plant, asphalt plant and compost facility were provided by Walker or estimated based on the material usage and capacity of the vehicles. The traffic volumes and the corresponding operation hours for each service are summarized in **Table 8-1**. Diurnal variation of waste incoming trucks for the waste receipt hours (i.e. 7am to 5pm) also provided by Walker is presented in **Table 8-3**.

Table 8-1: Vehicle Traffic on Internal Haul Routes

Location	Service	Vehicle Type	Max. No. of Trips per Day [1]	Modelled Hours
Landfill	Waste import	Triaxle truck	425	7am – 5pm
	Soil transport for daily cover	Triaxle truck	38	5pm – 6pm
	Miscellaneous material delivery for cell construction	Tractor semi-trailer	26	7am – 5pm
	Miscellaneous material delivery for final cap construction	Tractor semi-trailer	54	7am – 5pm
Quarry Plant	Delivery of finished products	Tractor semi-trailer	80	5am – 7pm [2]
	Stone transport	Off-highway truck	89	5am – 7pm [2]
Asphalt Plant	Delivery of raw / finished products	Tractor semi-trailer	65	5am – 7pm [3]
Compost Facility	Dropoff of organics	Triaxle truck	57	7am – 5pm [4]
	Pickup of finished compost	Triaxle truck	20	7am – 5pm [4]

Notes:

[1] Number of trips per day is defined as the number of vehicles entering the facility. These values were doubled in the assessment to consider vehicles both leaving and entering the facility.

[2] According to the 2024 Walker ESDM report, the quarry plant has the potential to operate for 24 hours but typically operate from 6am to 7pm daily. In this assessment, the quarry plant was assumed to operate during typical operation hours (i.e. 6am to 7pm) throughout the year to provide a more realistic evaluation of air quality impacts.

[3] According to the 2024 Walker ESDM report, the asphalt plant has the potential to operate for 24 hours but typically operate from 5am to 7pm on weekdays (excluding winter months). In this assessment, the asphalt plant was assumed to operate during the typical operation hours (i.e. 5am to 7pm) daily throughout the year to provide a more realistic evaluation of air quality impacts, while reserving flexibility for the plant operations.

[4] According to the 2024 N-Viro Systems Canada ESDM report, the compost facility has the potential to operate for 24 hours but typically operate from 7am to 5pm from Monday to Saturday according to a signage on site. In this assessment, the compost facility was assumed to operate during the typical operation hours (i.e. 7am to 5pm) daily throughout the year to provide a more realistic evaluation of air quality impacts, while reserving flexibility for the plant operations.

Table 8-2: Diurnal Variation of Waste Incoming Trucks

Hour of the Day	Diurnal Traffic Distribution Provided by Walker
0700 - 0800	14%
0800 - 0900	11%
0900 - 1000	11%
1000 - 1100	9%
1100 - 1200	10%
1200 - 1300	10%
1300 - 1400	10%
1400 - 1500	13%
1500 - 1600	8%
1600 - 1700	4%

8.3.11.2 Tailpipe Emission Rates

The MOVES4.0 model allows the user to generate emission factors by time of day and day of year, which accounts for diurnal and seasonal fluctuations in temperature and relative humidity. The average vehicle speed on the Campus roadways adopted in the model are based on the speed limit presented in the "South Landfill Environmental Overview", i.e. 50 km/h for paved roads, 25 km/h for unpaved roads. In particular, waste trucks were modelled at a speed limit of 20 km/h on either paved or unpaved roads according to the requirements stipulated in the current ECA. Four sets of daily emission factors were generated for both January and July – morning (AM, 8am), mid-day (MD, 12pm), evening (PM, 6pm) and overnight (ON, 3am) with vehicle speeds 0, 20, 25 and 50 km/h. For each vehicle type and speed, the maximum emission factor among the AM, MD, PM and ON time periods was applied for all time periods.

Given the variety of traffic on site, traffic data was divided in terms of vehicle size ("small", "medium", "large"). MOVES4.0 emission rates were grouped according to size and vehicle speed then averaged. For example, an average emission factor for "small" vehicles consisting of MOVES4.0 Vehicle Types "PassengerCar", "PassengerTruck", and "LightCommercialTruck" was calculated for each contaminant and speed. These average emission factors were then applied to roadway segments based on the vehicle types on that roadway. For roadways with mixed vehicle fleets, an aggregated emission rate was determined using the weighted average of each vehicle type to produce a composite emission factor for each pollutant, representing the average vehicle.

MOVES4.0 emission factors for 0km/h are provided in g/s, and these emission rates were applied to idling vehicles. For the other speeds, emission factors are provided in grams per vehicle mile traveled (g/VMT). These emission factors were converted to grams per kilometre traveled (g/VKT) by multiplying the g/VMT factors by 0.621.

For landfill equipment and construction equipment such as bulldozers and loaders, the nonroad emission factors from MOVES4.0 in g/hr for the maximum capacity of each equipment utilized on site based on the information provided by Walker or the maximum emission factors were used for conservative assessment when in lack of on-site information. The non-road emission factors were then scaled according to the number of equipment operating concurrently during each hour.

A gram per second (g/s) emission rate was calculated for each roadway segment. This emission rate is based on the tailpipe emission factor developed using MOVES4.0, the length of the roadway segment as well as the number of vehicles travelling upon it.

Roadways were modelled as line volume sources, meaning that the roadway segments were broken up into a number of volume sources. The emission rate calculations consider a single vehicle travelling across the entire length of the roadway segment. The single-vehicle emission rate is then multiplied by the number of vehicles travelling along the roadway over each hour of the day to develop hourly emission rates based on all traffic.

Please refer to **Appendix Q** for full details on the roadway emissions calculations for on-site haul routes.

8.3.11.3 Idling Vehicles

Idling emissions were calculated based on MOVES, as outlined in **Section 8.3.11.2**. Idling was simulated by entering a vehicle speed of 0 km/hr into the MOVES run. MOVES provides a gram/hour emission factor during idling. For the purposes of the assessment, two waste trucks were assumed to be idling at the weigh scale and two waste trucks were assumed to be idling at the active face constantly during the operating hours for the landfill (i.e. from 7am to 5pm). Further details are provided in **Appendix Q**.

8.4 Dispersion Modelling

The potential LFG and combustion byproduct impacts from landfill operations were determined using dispersion modelling and reasonable worst-case emission rates. Dispersion modelling was completed in accordance with the methodology outlined in **Section 4**. Modifications to the methodology specific to LFG and combustion byproduct modelling are provided in the following sections.

8.4.1 Area of Modelling Coverage

The potential for LFG and combustion byproduct impacts was assessed using a 1-hour, 24-hour and annual averaging period at discrete receptors only. All discrete receptors were considered in the LFG and combustion byproduct modelling. The locations of these discrete receptors are shown in **Figure 2-2.**

In addition, modelling was performed using a receptor grid covering the site-vicinity and regional study areas to produce isopleths of predicted concentrations. The receptor grid covers the lands within approximately 5 kilometres centered at the Campus. The locations of the grid receptors are shown in **Figure 2-3**.

8.5 Landfill Gas and Combustion byproducts Modelling Results

Results for vinyl chloride, benzene, 1,1,2-trichloroethane, H_2S, TRS, NOx and SO_2 were compared against their applicable criteria as outlined in **Table 3-1**Table 8-3. Modelling was conducted for the 1-hour, 24-hour and annual averaging periods. One-hour concentrations were converted to 10-minute averaging periods following the methodology outlined in MECP Guideline A-11. Predicted concentrations were assessed at discrete receptor locations. Background concentrations were added to the predicted concentrations in order to assess cumulative effects. The 90^{th} percentile background concentration was used for the 10-minute, 1-hour and 24-hour averaging periods, and the average background concentration was used for annual averaging period.

Table 8-3 provides a summary of the maximum predicted concentration of each contaminant and averaging period among all discrete receptors. Maximum predicted concentrations at all discrete receptors are provided in **Appendix R**.

Predicted concentrations without background for benzene, vinyl chloride, 1,1,2-trichloroethane, and TRS are below 10% of their criteria and therefore, isopleths for these contaminants are not provided. H_2S is also below 10% of the criteria but has been included for illustrative purposes. Concentration isopleths for 10-minute H2S, 1-hour NOx, 24-hour NOx, and 1-hour SO_2 are provided in **Appendix S**. As shown in the contour plots, maximums occur at or near the property boundary and decrease with distance away from the sources.

Table 8-3: Summary of VOC's and Combustion Byproduct Dispersion Modelling Results

Contaminant	CAS Number	Averaging Period	Criteria (μg/m³)	Background Concentration (μg/m³)	Maximum Modelled Concentration (μg/m³)		Percentage of Criteria (%)	
					With Background	Without Background	With Background	Without Background
Vinyl Chloride	75-01-4	24-hour	1	0.05	0.149	0.095	15%	10%
		Annual	0.2	0.05	0.057	0.005	29%	2%
Benzene	71-43-2	24-hour	2.3	0.69	0.719	0.034	31%	1%
		Annual	0.45	0.46	**0.465**	0.002	**103%**	1%
1,1,2-Trichloroethane	79-00-5	24-hour	0.3	0.07	0.087	0.022	29%	7%
		Annual	10	0.07	0.066	0.001	1%	0%
H_2S	7783-06-4	10-minute	13	2.44	3.589	1.152	28%	9%
		24-hour	7	2.20	2.492	0.293	36%	4%
TRS	NA - TRS	10-minute	13	2.44	3.610	1.173	28%	9%
		24-hour	7	2.20	2.497	0.298	36%	4%
NOx	10102-44-0	1-hour	400	23.47	378	355	95%	89%
		24-hour	200	21.44	60	39	30%	19%
SO_2	7446-09-5	1-hour	100	1.10	49	48	49%	48%
		Annual	10	0.53	1.03	0.50	10%	5%

All contaminants, except for annual benzene, are predicted to be below their applicable criteria at all discrete receptors with background included. The background of annual benzene concentrations derived based on the monitoring data in upwind direction exceeds the criteria and are even higher than that in downwind direction, indicating that the benzene concentrations associated with the landfill operations are relatively minor when compared to the ambient. The modelled annual benzene concentrations were also very limited, only accounting for less than 0.5% of the criteria.

8.6 Landfill Gas and Combustion Byproducts Conclusions

LFG and combustion byproduct contaminants from the existing landfill and like emissions from the asphalt and quarry operations were characterized using dispersion modelling. Modelling results were compared to relevant criteria.

The dispersion modelling results show compliance for vinyl chloride, 1,1,2-trichloroethane, H_2S, TRS, NOx, 24-hour benzene, and SO_2 at all at all discrete receptors. Annual benzene concentrations were predicted to exceed the respective criteria at the discrete receptors. The exceedances are dominated by elevated background concentrations, which are above the criteria on their own. The predicted annual benzene without background are limited, accounting for less than 1% of the cumulative concentrations. Overall, the dispersion modelling results indicate that the contribution from Walker operations is relatively low relative to background. From 2020-2025, no complaints related to LFG or combustion byproducts were received by Walker. Monitoring results for vinyl chloride, 1,1,2-trichlororethane, benzene, and TRS are similar across the upwind, downwind, and crosswind conditions, indicating that the ambient concentrations of these contaminants are not strongly influenced by the presence of the Walker operations.

9 DUST

Dust or particulate matter emissions can become a nuisance by infiltrating residences through open windows, soiling cars and house siding, affecting visibility, and, in the case of the smaller particulate fractions, can cause health effects. Dust at landfills consists primarily of relatively inert particulate matter from native and impacted soils. The dust is emitted on an intermittent basis, largely during landfill operations and construction activities, with significant emissions occurring during dry weather only. There are typically three contaminants of interest related to the dust emissions from landfills: TSP, PM_{10}, and $PM_{2.5}$. The primary concerns associated with TSP are reduced visibility and general nuisance, while inhalable PM_{10} and respirable $PM_{2.5}$ particulate matter fractions may result in health effects.

TSP refers to particles less than 44 μm in aerodynamic diameter (defined as a particle that would have the same aerodynamic behaviour in air as a sphere, with a specific gravity of 1.0 and a diameter of 44 μm). These particles are small enough to remain suspended in the atmosphere over long periods of time due to their low settling velocity. When present in large quantities, they can affect visibility and cause soiling effects.

PM_{10} refers to particles that are less than 10 μm in aerodynamic diameter. These particles are referred to as the inhalable portion of particulate matter as they have the ability to enter the lungs. When exposed to elevated levels of PM_{10} over a long period of time, negative health effects can result.

$PM_{2.5}$ refers to solid or liquid particles that are less than 2.5 μm in aerodynamic diameter. These particles are referred to as the respirable portion of particulate matter as these very small particles can be inhaled into the lungs and are small enough to reach the gas transfer sites in the lungs. When exposed to elevated levels of $PM_{2.5}$ over a long period of time, detrimental health effects can result.

Potential dust impacts were assessed by means of the following tasks:

- Review of existing mitigation measures;
- Review of dust related complaints;
- Review of potential dust sources;
- Quantification of dust emissions through field measurements and engineering calculations; and
- Prediction of potential impacts using dispersion modelling.

9.1 Complaints History

A review of the complaints logs from 2022 to 2025 was conducted in order to determine the current level of dust impacts in the vicinity of the landfill. For the years 2022 to 2025, only one dust complaint was received. Dust-related complaints are infrequent, which suggests that current best management practices are effective in managing the potential for dust impacts.

9.2 Best Management Practices Plan

Landfill operations can be a significant source of fugitive dust. In an effort to minimize fugitive dust emissions from the site, Walker's has previously prepared and implemented a dust SOP, dated February 19, 2025, to minimize the off-site migration of fugitive dust. This Dust SOP outlines details on standard operating procedures, mitigation measures, and training to control key operations typically associated with dust emissions. Key control measures outlined in the plan include:

- Posting and enforcing paved and unpaved road speed limits;
- Application of chemical or water dust suppression systems on construction and haul roads when necessary;
- Wet vacuum sweeper on internal and external paved roadways;
- Water trucks to control internal and external paved roadways as well as internal gravel roads.
- Maintain a vegetated perimeter/inside property for dust screening;
- On windy days, refuse loads that have presented a dust control issue and direct loads to areas that minimize dust impacts, where possible;
- Requirement than any material that has a potential to create an abundance of dust is to be bagged prior to arrival at the landfill;

- Progressively vegetate and maintain final cap areas of the landfill with tall grasses that provide year-round density;
- Placement of access roads below grade, where possible;
- Monitoring of dust and wind conditions during each day's operation, and adjusting levels of control as necessary;
- Inspection and maintenance of internal and external roadways; and
- Training of relevant staff.

A copy of the Dust SOP is provided in **Appendix T**.

9.3 Dust Emission Sources

Under normal operating conditions, Walker landfill operations have the potential to emit dust from several sources, such as:

- Paved and unpaved roadway vehicle tailpipe and entrained dust;
- Idling vehicles;
- Wind erosion of exposed areas;
- Material handling, including waste soils and daily cover material;
- Bulldozer activity;
- Landfill gas flares; and
- Portable generators.

Each of these sources is discussed in the following sections. Additional sources of traffic, material handling, and bulldozing are associated with landfill cell construction and landfill capping activities. Sources associated with landfilling, construction, and capping activities were all considered in the assessment.

Asphalt plant, quarry, and compost operations also include sources of dust emissions. Sources of like emissions from the asphalt plant and quarry operations were considered in the assessment in order to evaluate cumulative effects. Sources of dust from the quarry and asphalt operations may include:

- The IGRS siloxane flare;
- The RNG plant thermal oxidizer;
- IGRS landfill gas fired generators; and,
- The asphalt plant dust collector stack;
- The asphalt plant tank heaters;
- HMA loadout from the mixer;
- HMA loadout from the silos;
- HMA silo filling;
- Asphalt cement storage tanks;
- Wind erosion from the Recycled Asphalt Pavement (RAP) stockpile;
- Material handling of RAP, and asphalt raw materials;
- Quarry drilling and blasting;

- Quarry material handling operations:
  - Truck loading;
  - Material drops; and
  - Truck unloading.
- Material crushing and screening;
- Compost material handling operations:
  - Truck loading;
  - Material drops; and,
  - Stacking.
- Compost screens;
- Compost grinders;
- Compost silo bin vents;
- Paved and unpaved roadway vehicle tailpipe and entrained dust;
- Heavy equipment tailpipe emissions;
- Generators; and
- Welding.

Vehicle traffic on interior haul routes, landfill heavy equipment operation, and wind erosion from exposed areas and material storage piles have the potential to generate fugitive dust, especially during extended periods of dry weather. These sources are managed under the current BMPP and would typically not be included when modelling to assess compliance with O.Reg. 419/05 criteria (as seen in the 2024 Walker ESDM report). However, for the purposes of this study all sources of fugitive dust were considered, including these activities. The locations of all modelled emission sources are shown in **Figure 4-1**.

9.3.1 On-Site Vehicle Traffic

A network of paved and unpaved roadways allows trucks to travel from the entrance of the landfill site to the active face, waste soil pile, and other areas on-site. Vehicles associated with the other operations at the Walker Campus also travel along shared and dedicated internal road networks. Particulate matter emissions generated by the vehicles traveling along these unpaved and paved surfaces include emissions from tailpipes, brake wear, tire wear, and re-entrainment of loose material on the road surfaces. Emissions of particulate matter from these sources were included in this quantitative assessment.

The movement of on-site heavy equipment, such as loaders, at the landfill active face was also included in the assessment of on-site roadway sources.

The traffic generated due to ancillary operations and landfill maintenance operations was not considered in the dust assessment because the traffic volumes are relatively small; the generation of particulate matter would therefore be insignificant relative to the generation of particulate matter from the traffic volumes traveling on the on-site main haul routes.

9.3.2 Idling Vehicles

During landfill operation, there are some periods where trucks will be idling at specific locations. During idling, there will be emissions from vehicle tailpipes, but no road dust re-entrainment will occur. For the purposes of the study, it was conservatively assumed that two landfill trucks will be idling at the weigh scale, and two landfill trucks will be idling at the active face at all times during the operating hours of the landfill. The particulate emissions from these idling trucks were considered in the assessment.

9.3.3 Diesel-Fired Combustion Equipment

Diesel fired tippers are used at the landfill active face to empty waste trailers into the landfill. Particulate emissions associated with diesel combustion were considered in the assessment.

A 82 bhp diesel-fired portable generator is employed on site. Particulate emissions from the combustion of the generator were also considered in the assessment.

9.3.4 Wind Erosion of Exposed Areas

Wind erosion occurs when exposed areas are subjected to high wind speeds, typically greater than 6 m/s. Wind erosion will cause both fine and sand size particles to become airborne, but the fine particles are of greatest importance since they can travel much further.

The wind erosion sources included all exposed areas that are not vegetated, such as soil stockpiles and areas with daily and interim soil cover.

The exposed areas subject to wind erosion were assumed to be recently disturbed areas of the waste soil stockpile and the landfill active face. Other areas, such as the landfill stages under final cap were assumed to be vegetated and/or crusted over and therefore not subject to wind erosion.

Wind erosion of material stockpiles associated with quarry and asphalt operations were considered such as raw material stockpiles and quarry final product stockpiles.

9.3.5 Material Handling

Dust producing materials, such as waste soils, are handled during normal landfill operations. Particulate matter emissions are generated during material handling activities at the landfill such as:

- Material loading and unloading at waste soil stockpile; and
- Material unloading at the landfill active face.

Material handling activities associated with the asphalt plant and quarry operations were included in the assessment such as:

- Truck unloading of raw materials at stockpiles;
- Truck loading at the processing plant and working face; and
- Stacking of various materials into their respective storage piles.

Material handling activities associated with the compost operations were included in the assessment such as:

- Truck unloading/loading; and,
- Stacking of compost materials.

Only like emissions of particulate matter from these activities were included in this quantitative assessment.

9.3.6 Bulldozer Activity

As part of landfill operations dust producing materials, such as waste soils, are smoothed and contoured by bulldozers and other heavy equipment. Particulate matter emissions are generated during bulldozer activity at locations such as:

- Soil stockpile(s); and
- Removal and replacement of daily cover at the landfill active face.

Particulate matter emissions from these bulldozer activities were included in the assessment.

9.3.7 Landfill Gas Flares

Collected LFG is combusted in fully enclosed flares. The combustion of the landfill gas results in the emission of combustion by-products, including particulate matter. Emissions of particulate matter from the LFG flares were included in this quantitative assessment.

9.3.8 RNG Facility

As described in **Section 8.2.4**, the RNG facility upgrades the landfill gas to a quality similar to fossil natural gas and is added to the pipeline. Off-spec gas as well as process gas are combusted which can result in the release of a small amount of particulate matter. Emissions associated with combustion equipment at the RNG facility were considered in the assessment such as:

- The RNG flare;
- The siloxane flare; and
- The thermal oxidizer.

9.3.9 Landfill Gas Generators

As described in **Section 8.2.5**, a portion of the LFG collected from the LFG collection system is used to generate electricity by the landfill gas generators. Incomplete combustion results in releases of particulate matter from the generators which was considered in the assessment.

9.3.10 Diesel and Gasoline-Fired Generators

Two portable generators are currently used to provide on demand power for Walker's operations. One of them is powered by diesel fuel (82 bhp) and the other one is by gasoline (11 bhp). Fuel combustion results in combustion by-products, including particulate matter. However, it was proved in its own ESDM report that the particulate emissions from the gasoline generator are considered insignificant and therefore not included in the assessment. Only emissions from the diesel-fired generator were considered in the assessment.

A 45-kW diesel-fired generator is also used as an energy supply for water pumping for water trucks supporting the quarry plant operation. Emissions of particulate matter are generated from the combustion of diesel.

9.3.11 Quarry and Asphalt Plant Operations

The Walker Aggregates Quarry portion extracts virgin aggregate from the working face to produce a variety of aggregate products such as manufactured sand, clear stone, and Granular A, B, and M material, as well as other aggregate products. Aggregate material is extracted via blasting and transferred to the on-site crushing and screening plant for processing. The associated asphalt plant combines asphalt cement with new and recycled aggregates to produce hot mix asphalt (HMA).

The assessment included all sources of dust emissions from the quarry and asphalt plant including aggregate production sources (such as crushing and screening), material handling sources (such as conveyors and stackers, and truck loading), and the asphalt dryer stack. The quarry and asphalt plant also have paved roadways, unpaved roadways and aggregate storage piles located on site.

9.3.12 Compost and Biosolids Facility Operations

The compost facility receives source separated organic and food waste as well as wood, leaf, and yard waste. Received material is grinded and screened into the appropriate carbon/nitrogen mixture. Mixed waste enters either the GORE cover area or traditional open windrows area. Heavy equipment is used to shape the final windrows in the respective areas. Suitable wood waste is processed using a grinder to produce mulch which is stacked and eventually loaded and shipped for sale.

The assessment included all sources of dust emissions from the compost facility including waste processing sources, (such as grinders and screens), material handling sources (such as stackers, heavy equipment handling, and truck loading), and equipment tailpipe emissions. The compost facility has a mix of paved and unpaved roadways which were considered in the assessment.

The biosolids facility can receive and process up to a maximum of 300 tonnes per day of dewatered biosolids. Biosolid processing involves mixing alkaline admixture followed by heating, drying and curing. All processes at the Facility occur within buildings. These buildings are maintained under negative pressure and outgoing exhaust is passed through a biofilter. The office building adjacent to the biosolids facility has comfort heating equipment that was included in the assessment.

9.4 Emission Calculations

All emissions of dust from landfill operations and sources of like emissions from other operations at the Walker Campus were quantified using a combination of site-specific sampling, published emission factors, and engineering calculations. Additional details and sample calculations are provided in the Appendices.

- Emissions from on-site vehicle traffic;
- Emissions from idling vehicles;
- Emissions associated with wind erosion of exposed areas;
- Emissions from material handling;
- Emissions associated with bulldozing activities;
- Emissions from combustion sources including landfill gas flares, the siloxane flare, the thermal oxidizer, and generators;
- Quarry and asphalt plant operations; and
- Compost and Biosolids Facility operations.

9.4.1 On-Site Vehicle Traffic

Dust emissions from vehicle movements are generated from three mechanisms, re-entrained road particulate from vehicles travelling on the road, vehicle brake and tire wear, and tailpipe particulate emissions as combustion by-products.

Estimates of the re-entrained road particulate matter emission rates from vehicle movements were developed based on equations from United States Environmental Protection Agency AP-42 Chapters 13.2.1 “Paved Roads” and 13.2.2 “Unpaved Roads” using site-specific data collected from the sampling described in **Section 3.4.4**.

Estimates of tailpipe particulate emissions from on-road vehicles were obtained using the US EPA’s Motor Vehicle Emission Simulator (MOVES), version MOVES4.0. MOVES is a model that has been developed for the purpose of estimating vehicular emissions using computer simulation techniques based on extensive previous testing of a wide range of vehicles. MOVES provides an aggregate emission factor that includes emissions associated with vehicle break and tire wear. MOVES4.0 was used to generate vehicle emission factors for the baseline year 2025.

Tailpipe emissions for landfill equipment were developed using MOVES4.0. These emissions were generated using the MOVES non-road option. This option is designed specifically for calculating emissions of non-road sources and produces emission rates in gram per hour based on the type of equipment and its rated horsepower. The horsepower of all off-road equipment was based on the data provided by Walker.

Further details are provided in **Appendix Q**.

9.4.2 Idling Vehicles

Idling emissions were calculated based on MOVES, as outlined in **Section 8.3.11.28.3.11.3**. Idling was simulated by entering a vehicle speed of 0 km/hr into the MOVES run. MOVES provides a gram/hour emission factor during idling. For the purposes of the assessment, two waste trucks were assumed to be idling at the weigh scale and two waste trucks were assumed to be idling at the active face constantly during the operating hours for the landfill (i.e. from 7am to 5pm). Further details are provided in **Appendix Q**.

9.4.3 Wind Erosion of Exposed Areas

Wind Erosion sources include the active face and material storage piles. Emission factors from AP-42, Chapter 13.2.5 "Industrial Wind Erosion" were used to predict particulate matter emission rates from wind erosion. These emission factors are dependent on wind speed; therefore, to accurately reflect the change in emissions with changes in wind speed, hourly wind speeds from the local meteorological data file were used in combination with the emission factor to develop a file of hourly emission rates for use in the dispersion modelling analysis. Further details are provided in **Appendix U**.

9.4.4 Material Handling

Emission factors from AP-42 Chapter 13.2.4 "Aggregate Handling and Storage Piles", are used to predict the emission rates from the bulk material handling.

These emission factors are dependent on wind speed. To accurately reflect the change in emissions with changes in wind speed, hourly wind speeds from the meteorological data file are used in conjunction with the emission factor to develop a file of hourly emission rates for use in the dispersion modelling analysis.

The emissions factors are also dependent on moisture content of the material being handled. The moisture values for the material handled were based on site-specific moisture contents, where available, or default values provided in Chapter 13.2.4.

Further details are provided in **Appendix V**.

9.4.5 Bulldozer Activity

Estimates of the particulate matter emission rates from bulldozer and other heavy equipment activity at the active face and soil storage area were obtained using AP-42 Chapter 11.9 "Western Surface Coal Mining". The required inputs into the AP-42 equation are moisture content and silt content of the material, which were based on site-specific values. Further details are provided in **Appendix W**.

9.4.6 Combustion Equipment

Emissions of particulate from the various pieces of combustion equipment on-site, including flares, generators, and the thermal oxidizer were calculated as described in **Section 8.3**.

9.4.7 Quarry and Asphalt Plant Operations

Processing operations include quarry truck loading, crushing, screening and conveying of aggregate material. Emission factors from Chapter 11.19.2 of AP-42, "Crushed Stone Processing & Pulverized Mineral Processing", were used to predict the emission rates from the processing operations. Emission factors from Chapter 11.9 of AP-42, "Western Surface Coal Mining", are used to predict the emissions rates from the blasting operations.

Emissions from the asphalt plant stack were based on the maximum asphalt production rate and emission factors from AP-42 Chapter 11.1 "Hot Mix Asphalt Plants". Emissions from the hot mix asphalt silo filling, loadout, and asphalt vapours during transport were also calculated using emission factors from AP-42 Chapter 11.1.

Emissions from the natural gas-fired asphalt cement tank heater at the asphalt plant were calculated based on the maximum heat input rating for the heater and emission factors from AP-42 Chapter 1.4 "Natural Gas Fired Combustion".

Further details are provided in **Appendix V** and **Appendix X**.

9.4.8 Compost and Biosolids Facility Operations

Compost processing operations including grinding, screening, conveying and pneumatic silo loading of waste material. Emission factors from Chapter 11.12 of AP-42, "Concrete Batching" and Chapter 11.19 "Crushed Stone Processing and Pulverized Mineral Processing", were used to predict emission rates from the processing operations.

Emissions associated with material handling were calculated based on AP-42 Chapter 13.2.4, "Aggregate Handling and Storage Piles". Where available site-specific silt content and moisture data was used to estimate emissions. Emissions from all processes were based on their individual maximum processing capacities.

Emissions from the biosolids building biofilter were based on engineering estimates provided by Sandwell Consulting Engineers in the original ESDM report. Emissions of combustion equipment from process and comfort heating equipment were based on emission factors provided in AP-42 Chapter 1.3, "Fuel Oil Combustion" and Chapter 1.4, "Natural Gas Combustion".

Further details are provided in **Appendix V**, **Appendix X2** and **Appendix Y**.

9.5 Dispersion Modelling

The potential dust impacts from landfill operations were determined using dispersion modelling and reasonable worst-case emission rates. Dispersion modelling was completed in accordance with the methodology outlined in **Section 4**. Modifications to the methodology specific to dust modelling are provided in the following sections.

9.5.1 Deposition and Dry Depletion

Particulate matter plumes differ from gaseous plumes in that the particles can settle out due to gravity. Heavier particles will tend to settle out quickly, reducing the particulate concentration in the plume as it moves farther from the source.

The AERMOD model allows the user to account for this settling through the use of deposition and plume depletion algorithms. The deposition results that are produced by the model represent the deposition flux rate, in grams per square metre (g/m^2). With the deposition algorithm, the model does not reduce the plume size by the deposition flux rate; it merely predicts the amount of deposition that could occur from the plume at any receptor point. In order to decrease the plume by the deposited amount, the plume depletion algorithm must also be activated. For the purposes of this assessment, only the effects of dry deposition and dry plume depletion were considered.

In order to apply the deposition and depletion parameters, the modelling requires additional inputs, namely particle size ranges, mass fractions within each particle size category, and the density of the material. Surface samples from paved and unpaved roadways as well as samples of overburden material from the SLF1 landfill were collected and used to determine particle size distributions for use in the modelling. For other sources, default particle size data were derived from AP-42 or other references. The site-specific samples collected had a greater percentage of fine material, relative to AP-42 derived values, therefore, the use of the site-specific data represents a conservative approach. Further details regarding the particle size sampling are discussed in **Section 3.4.4**.

Additional details regarding the deposition parameters used in the assessment are provided in **Appendix Z**.

9.5.2 Area of Modelling

The potential for dust impacts was assessed using a 24-hour and annual averaging period at discrete receptors only. All discrete receptors were considered in the dust modelling. The locations of these discrete receptors are shown in **Figure 2-2**.

In addition, modelling was performed using a receptor grid covering the site-vicinity and regional study areas to produce isopleths of predicted concentrations. The receptor grid covers the lands within approximately 5 kilometres of the Campus. The locations of the grid receptors are shown in **Figure 2-3**.

9.6 Dust Baseline Condition Results

Results for TSP, PM_{10} and $PM_{2.5}$ were compared against their applicable criteria as outlined in **Table 3-1**. Modelling was conducted for the 24-hour and annual averaging periods. Predicted concentrations were assessed at both grid and discrete receptor locations. Background concentrations were added to the predicted concentrations in order to assess cumulative effects. The 90^{th} percentile background concentration was used for the 24-hour averaging period, and the average background concentration was used for annual averaging period.

Table 9-1 to **Table 9-5** provide a summary of the predicted 24-hour TSP, annual TSP, 24-hour PM_{10}, 24-hour $PM_{2.5}$ and annual $PM_{2.5}$ concentrations at all discrete receptors. Contour plots are provided in **Appendix AA**.

Table 9-1: Predicted 24-Hour TSP Concentrations

Criteria (µg/m³)	Receptor ID	Common Receptor ID	Background Concentration (µg/m³)	All Walker Operations Included				
				Maximum Predicted Concentration (µg/m³)		Percentage of Criteria (µg/m³)		Days Exceeding 120 µg/m³ over 5-Years
				With Background	Without Background	With Background	Without Background	
120	R01	--	51	106	55	89%	46%	0
120	R02	CR17	51	88	37	73%	31%	0
120	R03	CR19	51	123	72	102%	60%	1
120	R04	--	51	76	25	64%	21%	0
120	R05	--	51	75	24	62%	20%	0
120	R06	--	51	75	24	62%	20%	0
120	R07	--	51	68	17	57%	14%	0
120	R08	--	51	67	16	56%	14%	0
120	R09	CR18	51	67	16	56%	13%	0
120	R10	CR05	51	81	30	67%	25%	0
120	R11	--	51	80	29	67%	24%	0
120	R12	--	51	97	46	80%	38%	0
120	R13	--	51	89	38	74%	32%	0
120	R14	--	51	72	21	60%	18%	0
120	R15	CR10	51	109	58	91%	48%	0
120	R16	--	51	105	54	87%	45%	0
120	R17	CR01	51	95	44	79%	36%	0
120	R18	CR04	51	73	22	61%	19%	0
120	R19	CR06	51	89	38	74%	32%	0
120	R20	CR07	51	62	11	52%	9%	0
120	R21	CR8	51	156	105	130%	87%	1
120	R22	CR11	51	92	41	77%	34%	0
120	R23	CR12	51	72	21	60%	18%	0
120	R24	CR13	51	69	18	57%	15%	0
120	R25	CR14	51	70	19	59%	16%	0
120	R26	CR15	51	72	21	60%	17%	0
120	R27	CR16	51	66	15	55%	12%	0
120	R28	CR20	51	67	16	56%	14%	0
120	R29	CR21	51	155	104	129%	87%	6

Table 9-2: Predicted Annual TSP Concentrations

Receptor ID	Criteria (µg/m³)	Background (µg/m³)	Modelled Concentration (µg/m³)		Percentage of Criteria (%)	
			With Background	Without Background	With Background	Without Background
R01	60	26	27	1.3	46%	2%
R02	60	26	27	0.8	45%	1%
R03	60	26	27	1.2	45%	2%
R04	60	26	27	0.8	45%	1%
R05	60	26	27	0.7	45%	1%
R06	60	26	27	0.7	45%	1%
R07	60	26	27	0.5	44%	1%
R08	60	26	26	0.4	44%	1%
R09	60	26	26	0.3	44%	1%
R10	60	26	27	0.5	44%	1%
R11	60	26	27	0.5	44%	1%
R12	60	26	27	0.5	44%	1%
R13	60	26	26	0.4	44%	1%
R14	60	26	26	0.3	44%	0.5%
R15	60	26	27	1.1	45%	2%
R16	60	26	27	0.9	45%	2%
R17	60	26	27	1.1	45%	2%
R18	60	26	27	0.7	45%	1%
R19	60	26	26	0.4	44%	1%
R20	60	26	26	0.2	44%	0.3%
R21	60	26	27	1.4	46%	2%
R22	60	26	27	0.9	45%	2%
R23	60	26	26	0.3	44%	0.5%
R24	60	26	26	0.2	44%	0.3%
R25	60	26	26	0.4	44%	1%
R26	60	26	26	0.4	44%	1%
R27	60	26	26	0.2	44%	0.4%
R28	60	26	26	0.3	44%	1%
R29	60	26	29	2.5	48%	4%

Table 9-3: Predicted 24-Hour PM_{10} Concentrations

Criteria (µg/m³)	Receptor ID	Common Receptor ID	Background Concentration (µg/m³)	All Walker Operations Included				
				Maximum Predicted Concentration (µg/m³)		Percentage of Criteria (µg/m³)		Days Exceeding 50 µg/m³ over 5-Years
				With Background	Without Background	With Background	Without Background	
50	R01	--	22	39	17	77%	33%	0
50	R02	CR17	22	34	12	68%	24%	0
50	R03	CR19	22	43	21	86%	42%	0
50	R04	--	22	31	9	61%	17%	0
50	R05	--	22	30	8	60%	16%	0
50	R06	--	22	30	8	60%	16%	0
50	R07	--	22	28	6	55%	11%	0
50	R08	--	22	27	5	55%	11%	0
50	R09	CR18	22	27	5	54%	10%	0
50	R10	CR05	22	30	9	61%	17%	0
50	R11	--	22	30	8	60%	17%	0
50	R12	--	22	36	14	71%	27%	0
50	R13	--	22	33	11	66%	22%	0
50	R14	--	22	28	6	56%	13%	0
50	R15	CR10	22	39	17	77%	33%	0
50	R16	--	22	39	17	77%	34%	0
50	R17	CR01	22	36	14	72%	28%	0
50	R18	CR04	22	29	7	59%	15%	0
50	R19	CR06	22	33	11	67%	23%	0
50	R20	CR07	22	26	4	51%	8%	0
50	R21	CR8	22	53	31	106%	62%	1
50	R22	CR11	22	35	13	69%	25%	0
50	R23	CR12	22	29	7	57%	13%	0
50	R24	CR13	22	27	5	55%	11%	0
50	R25	CR14	22	28	7	57%	13%	0
50	R26	CR15	22	28	7	57%	13%	0
50	R27	CR16	22	27	5	54%	10%	0
50	R28	CR20	22	27	6	55%	11%	0
50	R29	CR21	22	51	29	102%	58%	1

Table 9-4: Predicted 24-Hour $PM_{2.5}$ Concentrations

Receptor ID	Common Receptor ID	Background (µg/m³)	Modelled Concentration (µg/m³)		Comparison against CAAQS 2020			Comparison against CAAQS 2030		
					Percentage of Criteria (%) [1]		Days Exceeding 23 µg/m³ over 5-Years	Percentage of Criteria (%) [2]		Days Exceeding 23 µg/m³ over 5-Years
			With Background	Without Background	With Background	Without Background		With Background	Without Background	
R01	--	18	22	4	81%	15%	0	95%	18%	0
R02	CR17	18	21	3	78%	12%	0	92%	14%	0
R03	CR19	18	23	5	85%	19%	0	100%	22%	0
R04	--	18	20	2	74%	8%	0	87%	9%	0
R05	--	18	20	2	74%	7%	0	86%	9%	0
R06	--	18	20	2	74%	8%	0	86%	9%	0
R07	--	18	20	2	72%	6%	0	85%	7%	0
R08	--	18	20	2	73%	6%	0	85%	8%	0
R09	CR18	18	19	1	71%	5%	0	83%	6%	0
R10	CR05	18	20	2	74%	8%	0	87%	10%	0
R11	--	18	20	2	73%	7%	0	85%	8%	0
R12	--	18	21	3	79%	13%	0	93%	15%	0
R13	--	18	20	2	75%	9%	0	88%	10%	0
R14	--	18	19	1	71%	5%	0	84%	6%	0
R15	CR10	18	22	4	82%	16%	0	97%	19%	0
R16	--	18	21	4	80%	13%	0	93%	16%	0
R17	CR01	18	22	4	81%	15%	0	95%	17%	0
R18	CR04	18	20	2	74%	7%	0	86%	9%	0
R19	CR06	18	21	3	76%	10%	0	89%	12%	0
R20	CR07	18	19	1	70%	4%	0	82%	5%	0
R21	CR8	18	23	5	86%	20%	0	101%	23%	1

Receptor ID	Common Receptor ID	Background (µg/m³)	Modelled Concentration (µg/m³)		Comparison against CAAQS 2020			Comparison against CAAQS 2030		
					Percentage of Criteria (%) [1]		Days Exceeding 23 µg/m³ over 5-Years	Percentage of Criteria (%) [2]		Days Exceeding 23 µg/m³ over 5-Years
			With Background	Without Background	With Background	Without Background		With Background	Without Background	
R22	CR11	18	21	3	78%	12%	0	91%	14%	0
R23	CR12	18	20	2	73%	7%	0	86%	8%	0
R24	CR13	18	19	2	72%	6%	0	84%	7%	0
R25	CR14	18	20	2	73%	7%	0	86%	8%	0
R26	CR15	18	20	2	72%	6%	0	85%	7%	0
R27	CR16	18	19	2	72%	6%	0	84%	7%	0
R28	CR20	18	19	1	72%	5%	0	84%	6%	0
R29	CR21	18	25	7	91%	25%	0	107%	29%	4

Notes:

[1] 24-Hour $PM_{2.5}$ Criteria for CAAQS 2020 = 27 µg/m³.

[2] 24-Hour $PM_{2.5}$ Criteria for CAAQS 2030 = 23 µg/m³.

Table 9-5: Predicted Annual $PM_{2.5}$ Concentrations

Receptor ID	Common Receptor ID	Background (µg/m³)	Modelled Concentration (µg/m³)		Comparison against CAAQS 2020 Percentage of Criteria (%) [1]		Comparison against CAAQS 2030 Percentage of Criteria (%) [2]	
			With Background	Without Background	With Background	Without Background	With Background	Without Background
R01	--	9.1	9.5	0.4	108%	5%	119%	5%
R02	CR17	9.1	9.4	0.3	107%	3%	117%	3%
R03	CR19	9.1	9.5	0.4	108%	4%	119%	5%
R04	--	9.1	9.4	0.3	107%	3%	117%	3%
R05	--	9.1	9.4	0.2	106%	3%	117%	3%
R06	--	9.1	9.4	0.2	106%	3%	117%	3%
R07	--	9.1	9.3	0.2	106%	2%	116%	2%
R08	--	9.1	9.2	0.1	105%	1%	116%	2%
R09	CR18	9.1	9.2	0.1	105%	1%	115%	1%
R10	CR05	9.1	9.3	0.2	106%	2%	116%	2%
R11	--	9.1	9.3	0.2	105%	2%	116%	2%
R12	--	9.1	9.3	0.2	106%	2%	116%	2%
R13	--	9.1	9.3	0.1	105%	2%	116%	2%
R14	--	9.1	9.2	0.1	105%	1%	115%	1%
R15	CR10	9.1	9.5	0.4	108%	4%	119%	5%
R16	--	9.1	9.4	0.3	107%	4%	118%	4%
R17	CR01	9.1	9.5	0.4	108%	4%	119%	5%
R18	CR04	9.1	9.3	0.2	106%	3%	117%	3%
R19	CR06	9.1	9.3	0.2	105%	2%	116%	2%
R20	CR07	9.1	9.2	0.1	104%	1%	115%	1%
R21	CR8	9.1	9.6	0.5	109%	6%	120%	6%

Receptor ID	Common Receptor ID	Background (µg/m³)	Modelled Concentration (µg/m³)		Comparison against CAAQS 2020 Percentage of Criteria (%) [1]		Comparison against CAAQS 2030 Percentage of Criteria (%) [2]	
			With Background	Without Background	With Background	Without Background	With Background	Without Background
R22	CR11	9.1	9.4	0.3	107%	3%	118%	4%
R23	CR12	9.1	9.2	0.1	105%	1%	115%	1%
R24	CR13	9.1	9.2	0.1	104%	1%	115%	1%
R25	CR14	9.1	9.3	0.1	105%	2%	116%	2%
R26	CR15	9.1	9.2	0.1	105%	1%	116%	2%
R27	CR16	9.1	9.2	0.1	105%	1%	115%	1%
R28	CR20	9.1	9.2	0.1	105%	1%	115%	1%
R29	CR21	9.1	9.8	0.7	111%	8%	122%	8%

Notes:

[1] Annual $PM_{2.5}$ Criteria for CAAQS 2020 = 8.8 µg/m³.

[2] Annual $PM_{2.5}$ Criteria for CAAQS 2030 = 8 µg/m³.

The maximum predicted 24-hour TSP concentration among all discrete receptors was 156 µg/m^3 at R21. Exceedances of the criteria of 120 µg/m^3 were predicted at R03, R21 and R29. The maximum frequency of exceedance among all discrete receptors is 0.3%, which is equivalent to 6 events over the 5 modelled years. It should be noted that exceedances are only predicted with background concentrations considered, and predicted concentrations without background at all discrete receptors are below the criteria.

The predicted annual TSP concentrations at all discrete receptors are well below the criteria of 60 µg/m^3. The maximum predicted annual TSP concentration including background is 29 µg/m^3 at R29 which is less than 50% of the criteria. Background concentrations dominate the result, with Walker Campus sources contributing a maximum of 10% to the total concentration.

TSP has a standard under Regulation 419/05. Under Reg. 419, facilities are required to comply with MECP Standards and Guidelines at points at and beyond the property line of the facility. The impacts presented in this EA should not be used for direct comparison to the Reg. 419 limits, as there are key differences in the way the EA assessment is conducted versus a Reg. 419 assessment, most notably the inclusion of background concentrations. As shown in **Table 9-1**, concentrations without background are all below the criteria.

The EA assessment considers additional differences relating to the sources considered and assumptions made. For instance, Reg. 419 excludes the contribution from motor vehicles when comparing to the standards and does not consider the cumulative effects from other sources. In addition, sources such as fugitive dust from on-site haul routes and wind erosion are typically excluded from modelling under a Reg. 419 assessment, instead these sources are typically managed through a BMPP for dust. For the landfill, the only identified sources of particulate that would be modelled when assessing compliance with Reg. 419 requirements would be the landfill gas flares, thermal oxidizers, generators and material handling. For the dust assessment, these sources were not significant contributors to off-site concentrations; therefore, the dust impact associated with the landfill would be even smaller and is considered to be capable of achieving Reg. 419 compliance. This is supported by the most recent ESDM report dated June 11th, 2025.

The maximum predicted 24-hour PM_{10} concentration among all discrete receptors was 53 µg/m^3 at R21. Exceedances of the criteria of 50 µg/m^3 were predicted at R21 and R29. The maximum frequency of exceedance among all discrete receptors is 0.1%, or 1 event over the 5 modelled years. It should be noted that exceedances are only predicted with background concentrations considered, and predicted concentrations without background at all discrete receptors are below the criteria.

The maximum predicted 24-hour $PM_{2.5}$ concentration among all discrete receptors was 25 µg/m^3 at R29, which is below the CAAQS 2020 criteria of 27 µg/m^3. However, exceedances of the CAAQS 2030 criteria of 23 µg/m^3 were predicted at R21 and R29. The maximum frequency of exceedance among all discrete receptors is 0.2%, or 4 events over the 5 modelled years. It should be noted that exceedances are only predicted with background concentrations considered, and predicted concentrations without background at all discrete receptors are below the criteria.

The predicted annual $PM_{2.5}$ concentration at all discrete receptors exceed the CAAQS 2020 criteria of 8.8 µg/m^3 and CAAQS 2030 criteria of 8 µg/m^3. The maximum predicted annual $PM_{2.5}$ concentration was 9.8 µg/m^3 at R29. The exceedances are due to the elevated background concentration of 9.1 µg/m^3, which exceeds both criteria. It should be noted that exceedances are only predicted with background concentrations considered, and predicted concentrations without background at all discrete receptors are below the criteria.

The predicted dust concentrations are conservative, as they are based on maximum operating activity paired with the worst-case dry meteorological conditions over 5 years. In addition, the dispersion modelling did not account for precipitation or vegetation interception of particulate matter which can further decrease the concentration at the receptors.

9.7 Dust Conclusions and Recommendations

Predicted annual TSP concentrations are well below the criteria at all discrete receptors. Although the predicted 24-hour TSP, PM_{10} and $PM_{2.5}$ concentrations are expected to exceed the respective criteria at 2 to 3 discrete receptors, the frequencies of exceedance are low at not more than 0.2%. All these exceedances are predicted only when background concentration is applied. The impact associated with the landfill, quarry plant, asphalt plant and compost facility operations are all below the criteria. Annual $PM_{2.5}$ concentrations are expected to exceed the criteria at all discrete receptors due to the elevated background, which exceeds the criteria even when considered on its own. The predicted annual $PM_{2.5}$ concentrations associated with the landfill, quarry and asphalt plant operations are all below the criteria.

In addition, the maximum predicted concentrations and frequencies for all particulate species are based on a conservative model, which assumes reasonable worst-case operations and dry conditions occurring in worst-case locations every day for the 5-year modelled period, which is not realistic. These conservatisms include, but are not limited to, the following:

- All operations were assumed to take place at their maximum capacities every day;
- When calculating emissions, conservative assumptions were made; and
- The assessment did not consider the effects of precipitation and snow cover, which would serve to reduce particulate emissions.

Overall, owing to the above conservatisms included in the assessment, the dust impacts from the landfill, quarry plant, asphalt plant and compost facility operations are expected to be even lower.

Over the past five years, only one dust-related complaint has been received by Walker regarding their Walker Campus operations. Monitoring data indicated that measured quantities of PM_{10} are generally less than the criteria, with only one sample marginally exceeding the criteria in 2025. Together, the complaint record and monitoring results indicate that dust impacts are well controlled, despite the large amount of activity occurring at the site.

Based on the assessment, it appears that Walker is effectively managing fugitive dust at their site through the implementation of their BMPP (dust).

10 CONCLUSIONS

The Existing Conditions Report establishes a baseline for four studies areas:

1) Blowing Litter;
2) Odour;
3) Landfill Gas and Combustion Byproducts; and
4) Dust

Existing conditions were assessed through a combination of ambient monitoring, source sampling, complaint record review, and dispersion modelling.

The Existing Conditions Report shows blowing litter impacts are being effectively managed. With current practices in place Walker is able to minimize off-site impacts such that existing impacts to residences are low.

Based on the predicted odour concentrations there is potential that landfill-related odours will be detectable at discrete receptors from time to time. Overall, modelling results indicate that odours from the landfill will be detectable at some off-site receptors from time to time, occasionally recognizable, and infrequently strong enough to trigger complaints. This aligns with the complaint record, where landfill-related odour complaints are occasionally received. Walker has implemented a best management practices plan for odour, which assists in managing odours from their operations.

Landfill gas and combustion impacts were assessed based on indicator contaminants, including 1,1,2-trichloroethane, benzene, vinyl chloride, H_2S, TRS, NO_x, and SO_2. From 2020 through 2025, no complaints related to LFG or combustion byproducts were received by Walker. Vinyl chloride, 1,1,2-trichlororethane, benzene, and TRS monitoring was conducted in 2025. Monitoring results were generally less than criteria, with one elevated sample for benzene associated with non-Walker Campus sources and two short-term elevated results for TRS. Vinyl chloride, 1,1,2-trichlororethane, benzene, and TRS monitoring results were similar across the upwind, downwind, and crosswind conditions, indicating that the ambient concentrations of these contaminants are not strongly influenced by the presence of the Walker operations. Dispersion modelling results predict compliance with criteria for all contaminants at all discrete receptors, with the exception of annual benzene, where the elevated background concentration is above the criteria on its own; Walker operations are predicted to contribute only a small fraction (<1%) to the annual benzene concentrations. Overall, impacts of landfill gas and combustion contaminants are low.

For dust, monitoring data indicated that measured quantities of PM_{10} are generally less than the criteria, with only one sample marginally exceeding the criteria in 2025. Dust complaints are rare, with only one complaint received over the past five years. Dispersion modelling predicted 24-hour concentrations of TSP, PM_{10}, and $PM_{2.5}$ to be below criteria at discrete receptors most of the time, with infrequent exceedances of the 24-hour criteria at three receptors, on the order of 1-6 days over five years and only when background is included. Modelling of annual TSP resulted in predicted concentrations below criteria at all times, while annual $PM_{2.5}$ was above criteria at multiple receptors based on elevated background values, with Walker Campus sources contributing <10% of the concentration. Based on the assessment, it appears that Walker is effectively managing fugitive dust at their site through the implementation of their best management practices plan for dust.

11 STATEMENT OF LIMITATIONS

This report entitled "Draft Air Quality Existing Conditions Report, Walker South Landfill Phase 2 Environmental Assessment" was prepared by RWDI AIR Inc. ("RWDI") for Walker Environmental Group. The findings and conclusions presented in this report have been prepared for the Client and are specific to the project described herein ("Project"). The conclusions and recommendations contained in this report are based on the information available to RWDI when this report was prepared. Because the contents of this report may not reflect the final design of the Project or subsequent changes made after the date of this report, RWDI recommends that it be retained by Client during the final stages of the project to verify that the results and recommendations provided in this report have been correctly interpreted in the final design of the Project.

The conclusions and recommendations contained in this report have also been made for the specific purpose(s) set out herein. Should the Client or any other third party utilize the report and/or implement the conclusions and recommendations contained therein for any other purpose or project without the involvement of RWDI, the Client or such third party assumes any and all risk of any and all consequences arising from such use and RWDI accepts no responsibility for any liability, loss, or damage of any kind suffered by Client or any other third party arising therefrom.

Finally, it is imperative that the Client and/or any party relying on the conclusions and recommendations in this report carefully review the stated assumptions contained herein and to understand the different factors which may impact the conclusions and recommendations provided.

12 REFERENCES

Ontario Ministry of the Environment, Conservation, and Parks. (2018). *Air Dispersion Modelling Guideline.*

Ontario Ministry of the Environment, Conservation, and Parks. (2018). *Procedure for Preparing an Emission Summary and Dispersion Modelling (ESDM) Report.*

RWDI. (2006). *Walker Enivornmental Assessment Blowing Litter Impact Assessment.* Guelph.

RWDI. (2006). *Walker Environmental Assessment Haul Route Air Quality Impact Assessment.* Guelph.

RWDI. (2006). *Walker Environmental Assessment Landfill Gas Air Quality Impact Assessment.* Guelph.

RWDI. (2006). *Walker Environmental Assessment Odour Impact Assessment.* Guelph.

RWDI. (2006). *Walker Environmental Assessment Particulate Matter Impact Assessment.* Guelph.

RWDI. (2024). *N-VIRO SYSTEMS CANADA INC. 2024 Emission Summary and Dispersion Modelling Report.* Guelph.

RWDI. (2025). *WAI, WEG, & IGRS 2024 Emission Summary and Dispersion Modelling Report.* Guelph.

United States of America Environmental Protection Agency. (2024, 1 24). *AP-42: Compilation of Air Emissions factors from Stationary Sources.* Retrieved from United States Environmental Protection Agency: https://www.epa.gov/air-emissions-factors-and-quantification/ap-42-compilation-air-emissions-factors-stationary-sources

Walker Environmental Group. (2024). *Proposed Terms of Reference: Walker South Landfill Phase 2 Environmental Assessment.* Toronto: GHD Limited.

Ontario Ministry of the Environment, Conservation, and Parks. (2021). *Air Contaminants Benchmarks List: standards, guidelines and screening levels for assessing point of impingement concentrations of air contaminants*.

Ontario Ministry of the Environment, Conservation, and Parks. (2016). *Ontario's Ambient Air Quality Criteria*.

Environment and Climate Change Canada (2025). *Canadian Ambient Air Quality Standards*.

Lapp, James M. (1983). *Sanitary Landfill, Controlling Blowing Litter*.

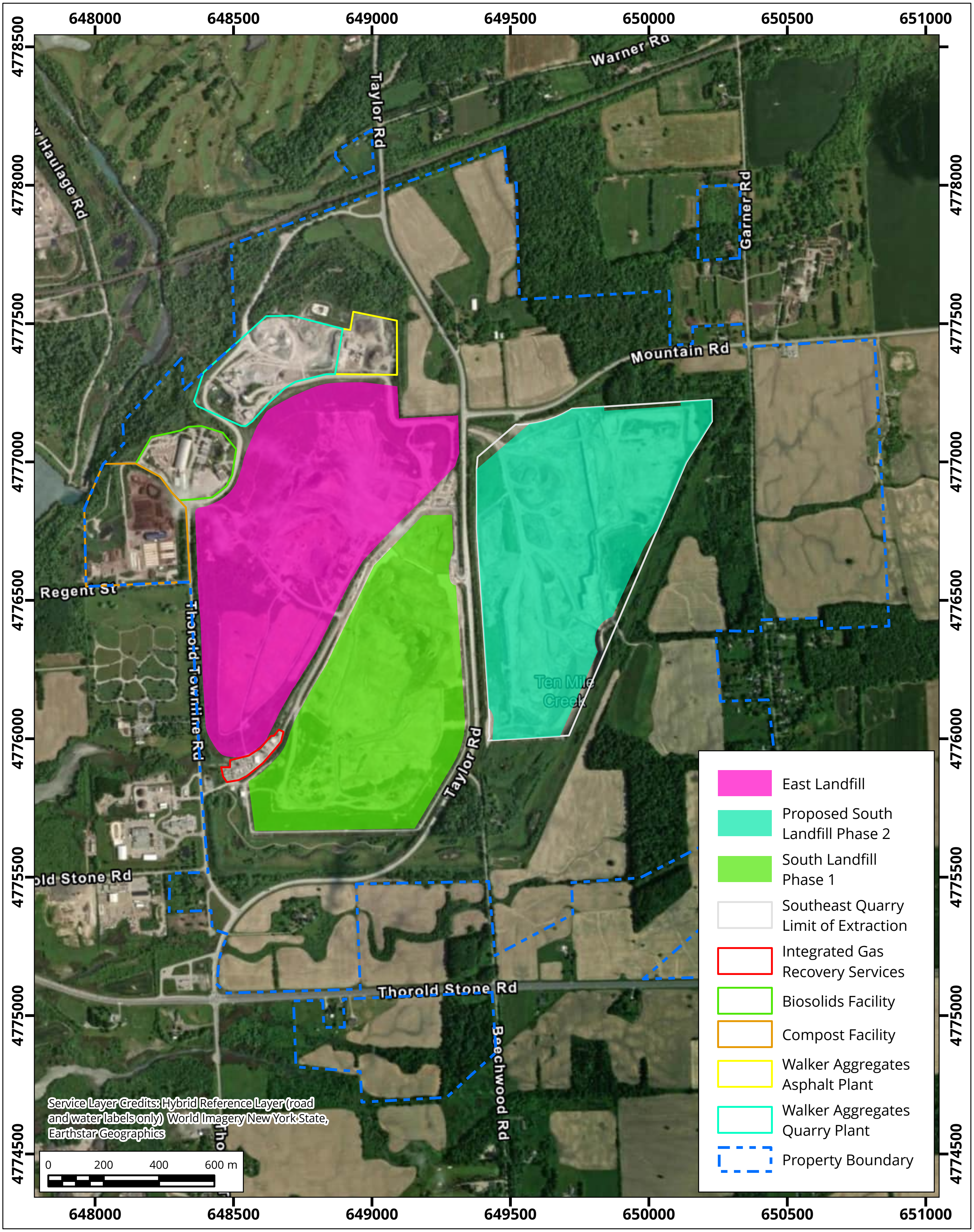
Interim Waste Authority Ltd (IWA). (1994). *Detailed Assessment of the Proposed Site EE11 for Durham Region Landfill Site Search*.

MECP. (2016). *Methodology for Modelling Assessments of Contaminants with 10-Minute Average Standards and Guidelines under O.Reg. 419/05*.

Environment and Climate Change Canada (2025). *Landfill Methane Modelling Tool*.

United States of America Environmental Protection Agency. (2023) *MOtor Vehicle Emission Simulator (MOVES4)*.

FIGURES



Site Plan of Walker Resource Management Campus

True North

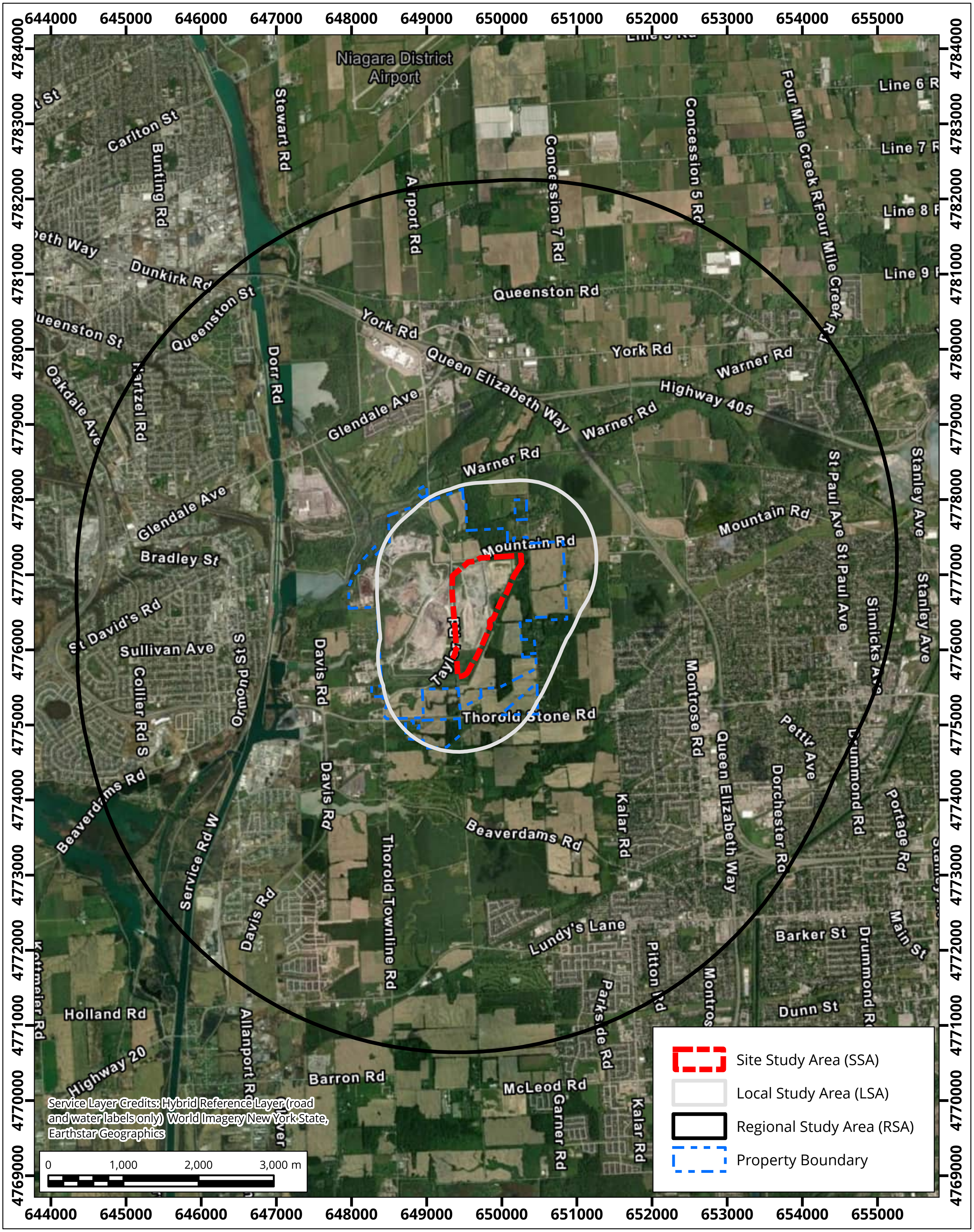
Drawn by: PIP	Figure: 1-1
Approx. Scale:	1:19,000
Date Revised:	Jun 11, 2026

Map Projection: NAD 1983 UTM Zone 17N

Walker Landfill - Regional Municipality of Niagara, Ontario

Project #: 2402272

Map Document: C:\WorkingFolder\Jobs_AMER\P2402272\P2402272.aprx



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Site Plan Showing Site Study Area, Local Study Area, and Regional Study Area

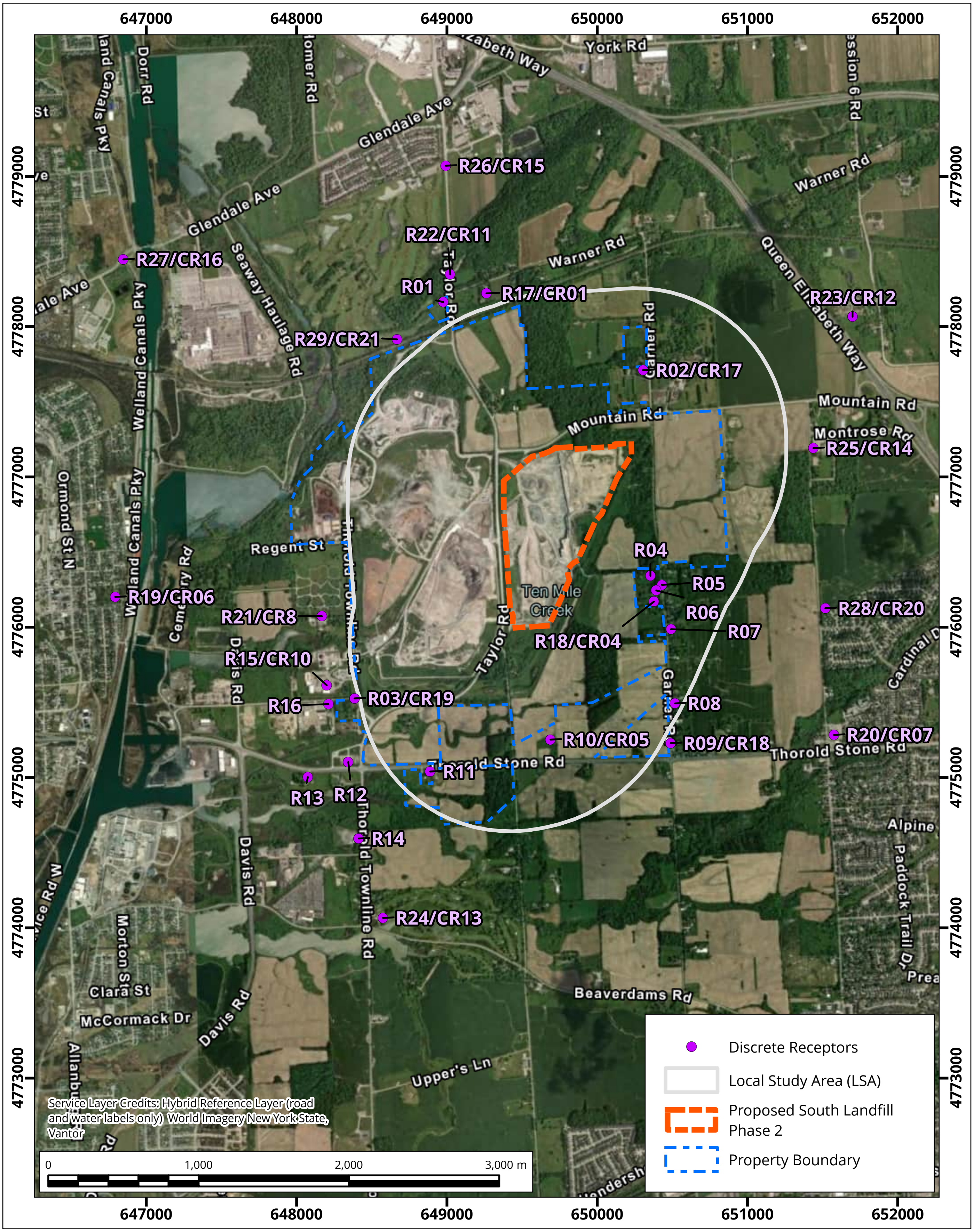
True North

Drawn by: PIP	Figure: 2-1
Approx. Scale:	1:70,000
Date Revised:	Jun 11, 2026

Map Projection: NAD 1983 UTM Zone 17N

Walker Landfill - Regional Municipality of Niagara, Ontario

Project #: 2402272



Site Plan Showing Discrete Receptor Locations

True North

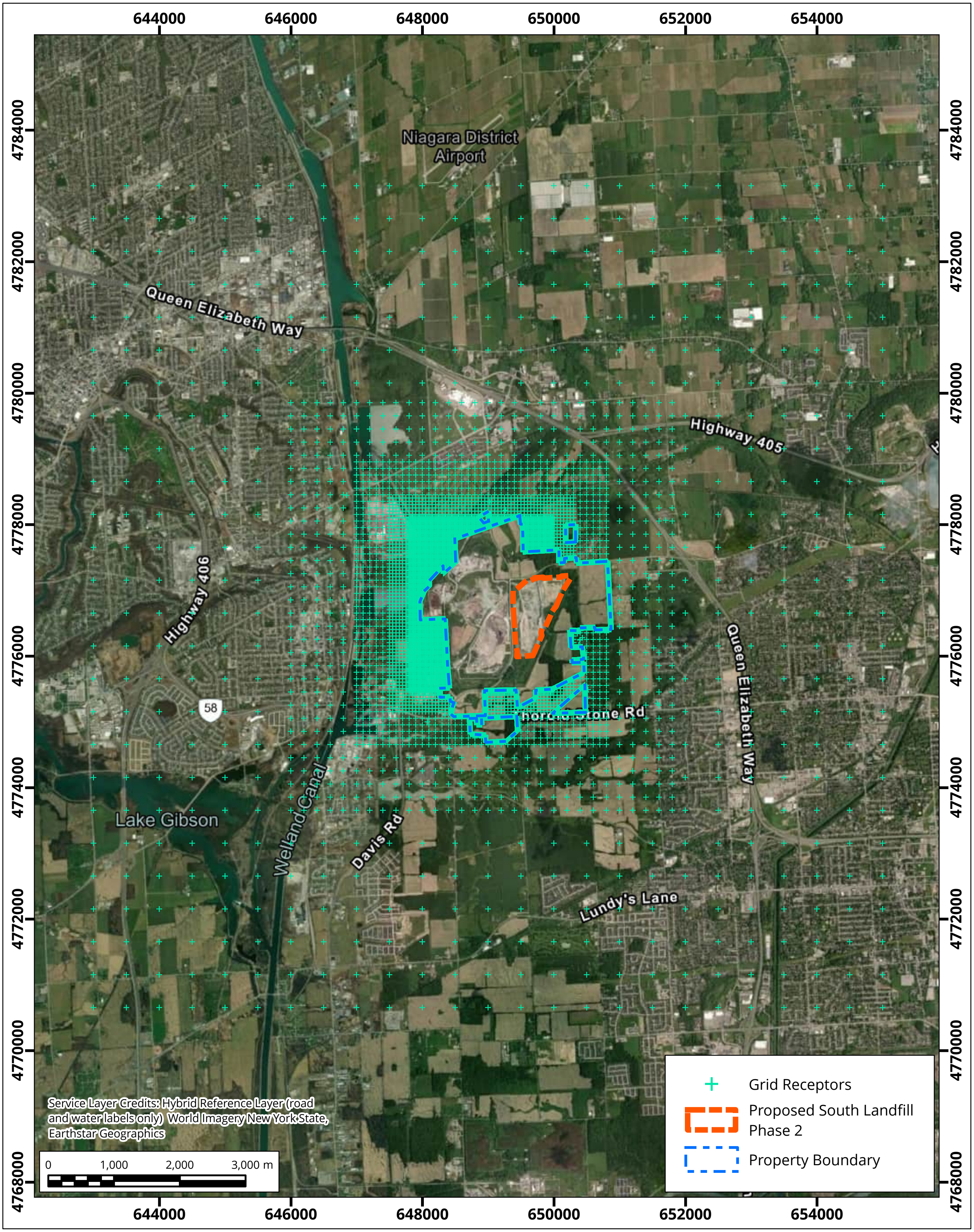
Drawn by: PIP	Figure: 2-2
Approx. Scale:	1:35,000
Date Revised:	Jun 15, 2026

Map Projection: NAD 1983 UTM Zone 17N

Walker Landfill - Regional Municipality of Niagara, Ontario

Project #: 2402272

Map Document: C:\WorkingFolder\Jobs_AMER\P2402272\P2402272.aprx



Site Plan Showing Grid Receptor Locations

True North

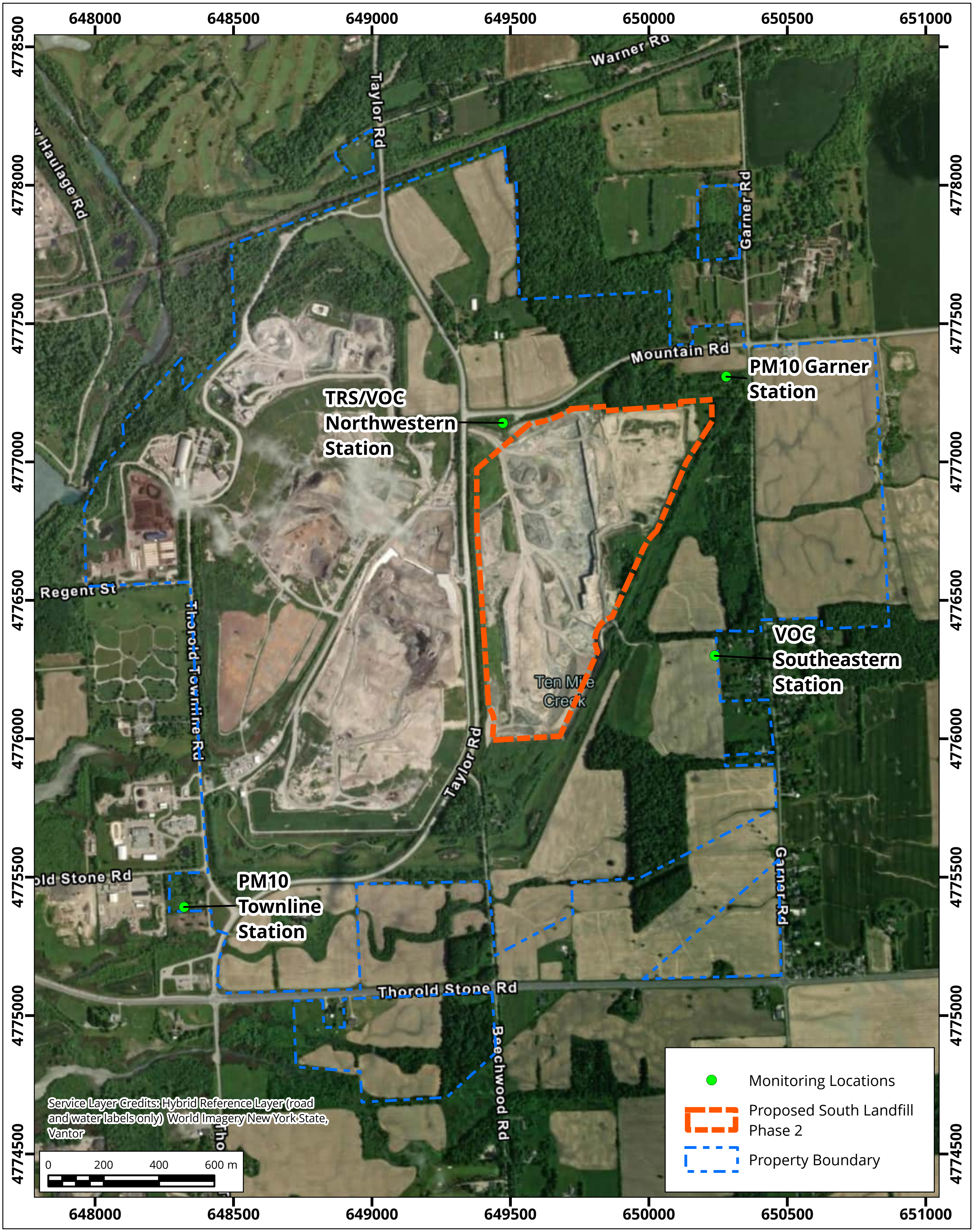
Drawn by: PIP	Figure: 2-3
Approx. Scale:	1:80,000
Date Revised:	Jun 11, 2026

Map Projection: NAD 1983 UTM Zone 17N

Walker Landfill - Regional Municipality of Niagara, Ontario

Project #: 2402272

Map Document: C:\WorkingFolder\Jobs_AMER\P2402272\P2402272.aprx



PM10, TRS and VOC Monitoring Locations

True North

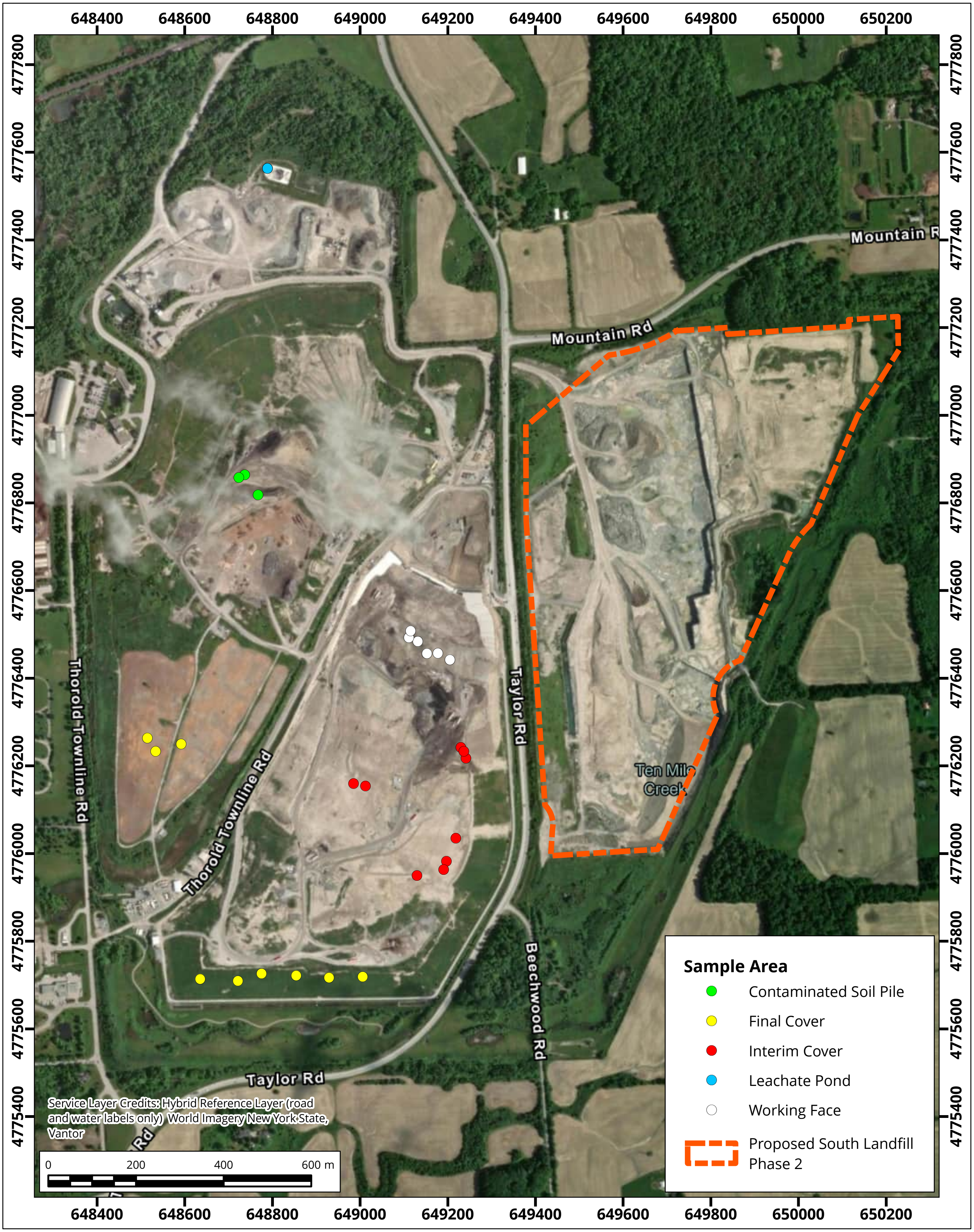
Drawn by: PIP	Figure: 3-1
Approx. Scale:	1:19,000
Date Revised:	Jun 11, 2026

Map Projection: NAD 1983 UTM Zone 17N

Walker Landfill - Regional Municipality of Niagara, Ontario

Project #: 2402272

Map Document: C:\WorkingFolder\Jobs_AMER\P2402272\P2402272.aprx



Map Document: C:\WorkingFolder\Jobs_AMER\P2402272\P2402272.aprx

Odour, H_2S and VOC Sampling Locations

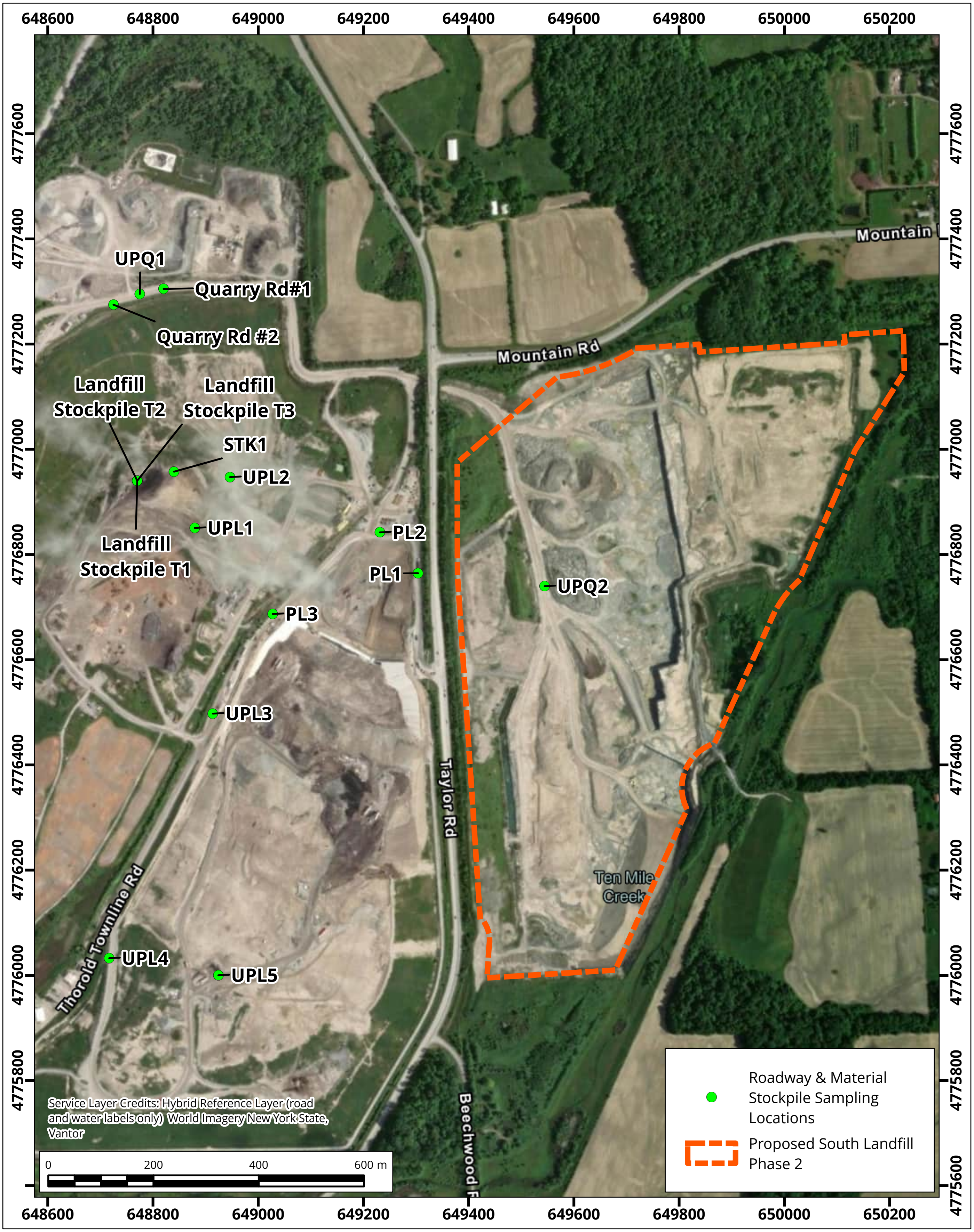
True North

Map Projection: NAD 1983 UTM Zone 17N

Walker Landfill - Regional Municipality of Niagara, Ontario

Project #: 2402272

Drawn by: PIP	Figure: 3-2
Approx. Scale:	1:12,000
Date Revised:	Jun 11, 2026



Map Document: C:\WorkingFolder\Jobs_AMER\P2402272\P2402272.aprx

Roadway and Material Stockpile Sampling Locations

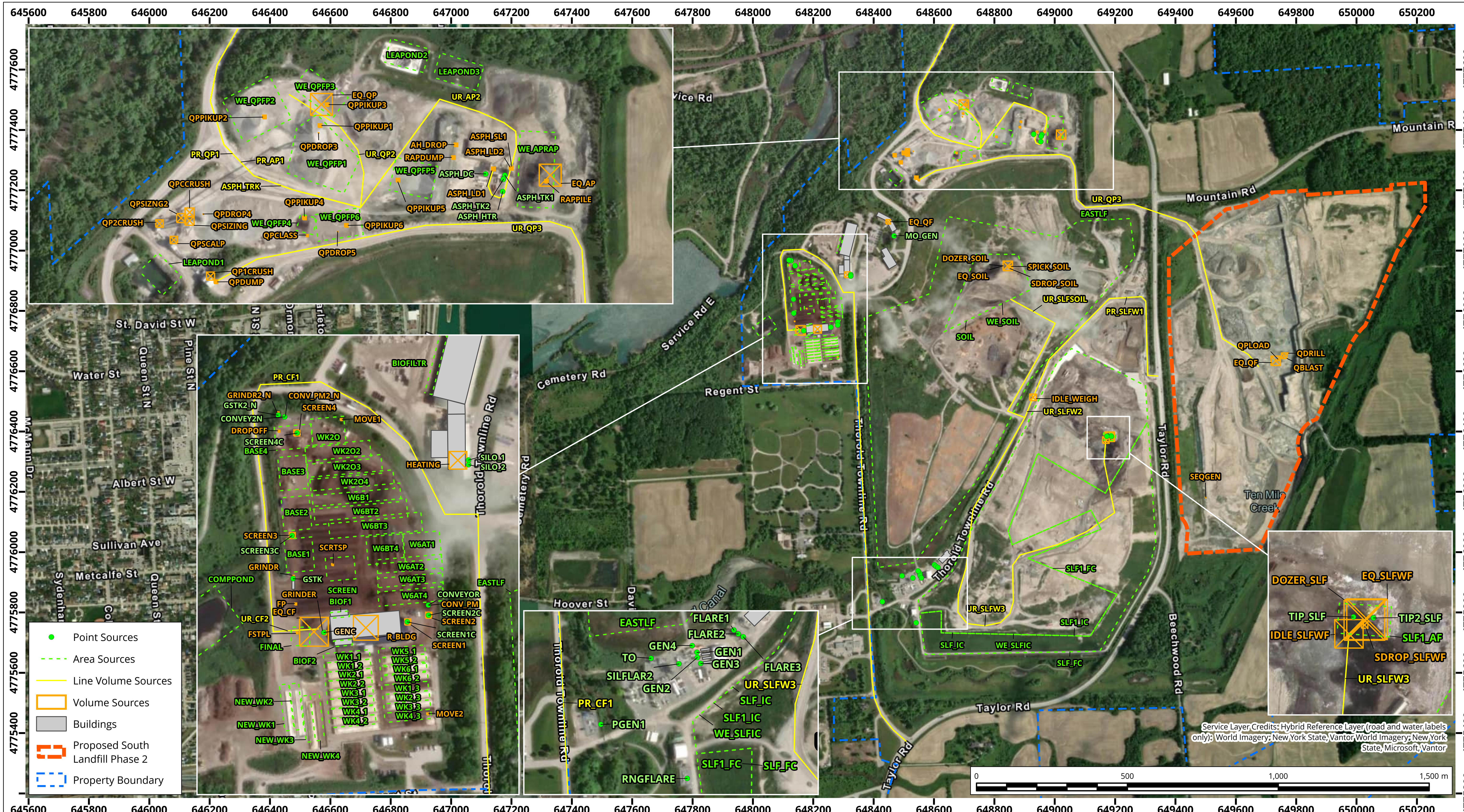
True North

Drawn by: PIP	Figure: 3-3
Approx. Scale:	1:10,000
Date Revised:	Jun 11, 2026

Map Projection: NAD 1983 UTM Zone 17N

Walker Landfill - Regional Municipality of Niagara, Ontario

Project #: 2402272



Site Plan Showing Locations of Modelled Sources, Buildings, and Property Boundary

Map Projection: NAD 1983 UTM Zone 17N

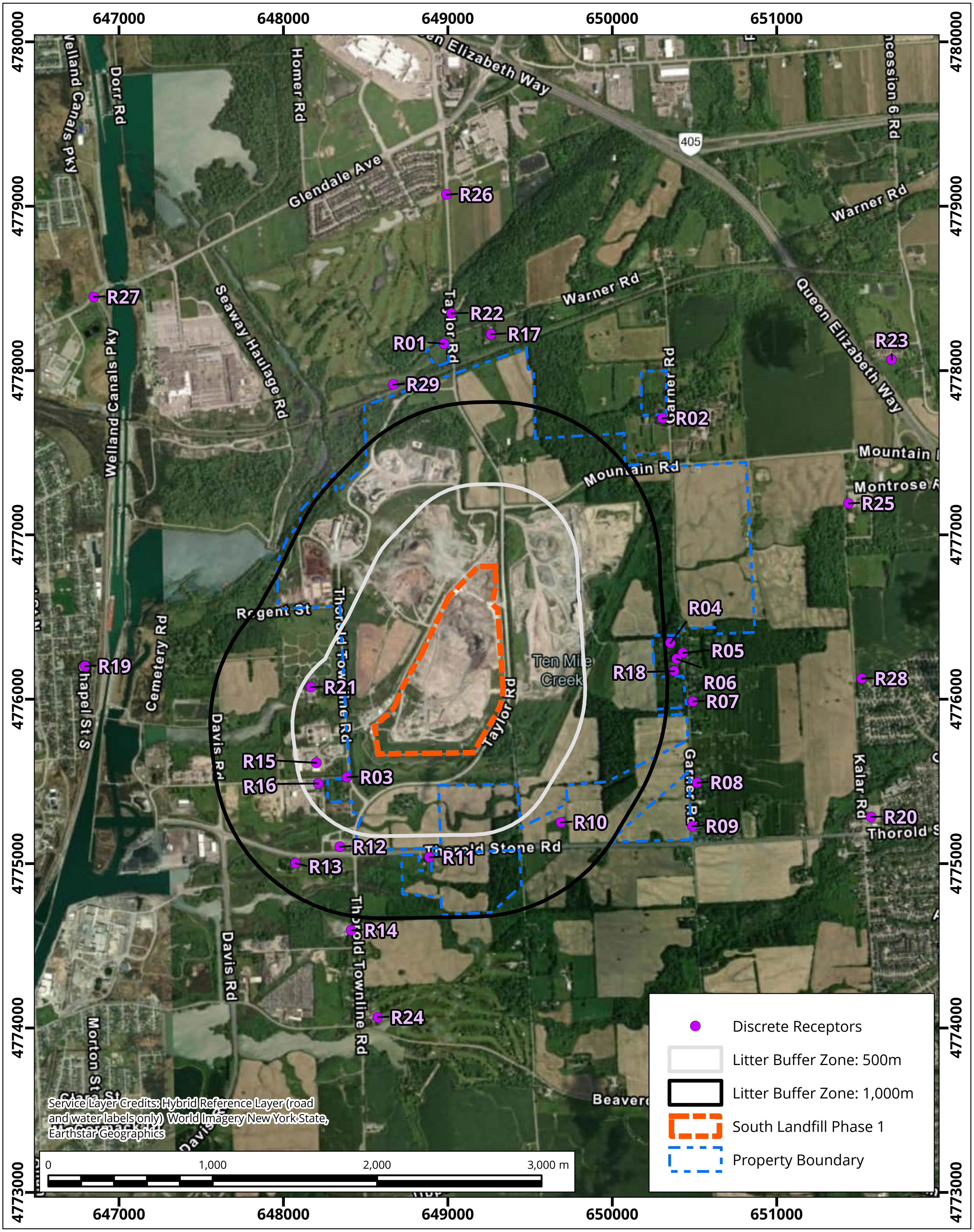
Walker Landfill - Regional Municipality of Niagara, Ontario

True North

Project #: 2402272

Drawn by: PIP	Figure: 4-1
Approx. Scale:	1:12,000
Date Revised:	Jun 12, 2026

Map Document: C:\WorkingFolder\Jobs_AMER\P2402272\P2402272.aprx



Site Plan Showing Discrete Receptors, Property Boundary, and Litter Buffer Zones for Existing Conditions

True North

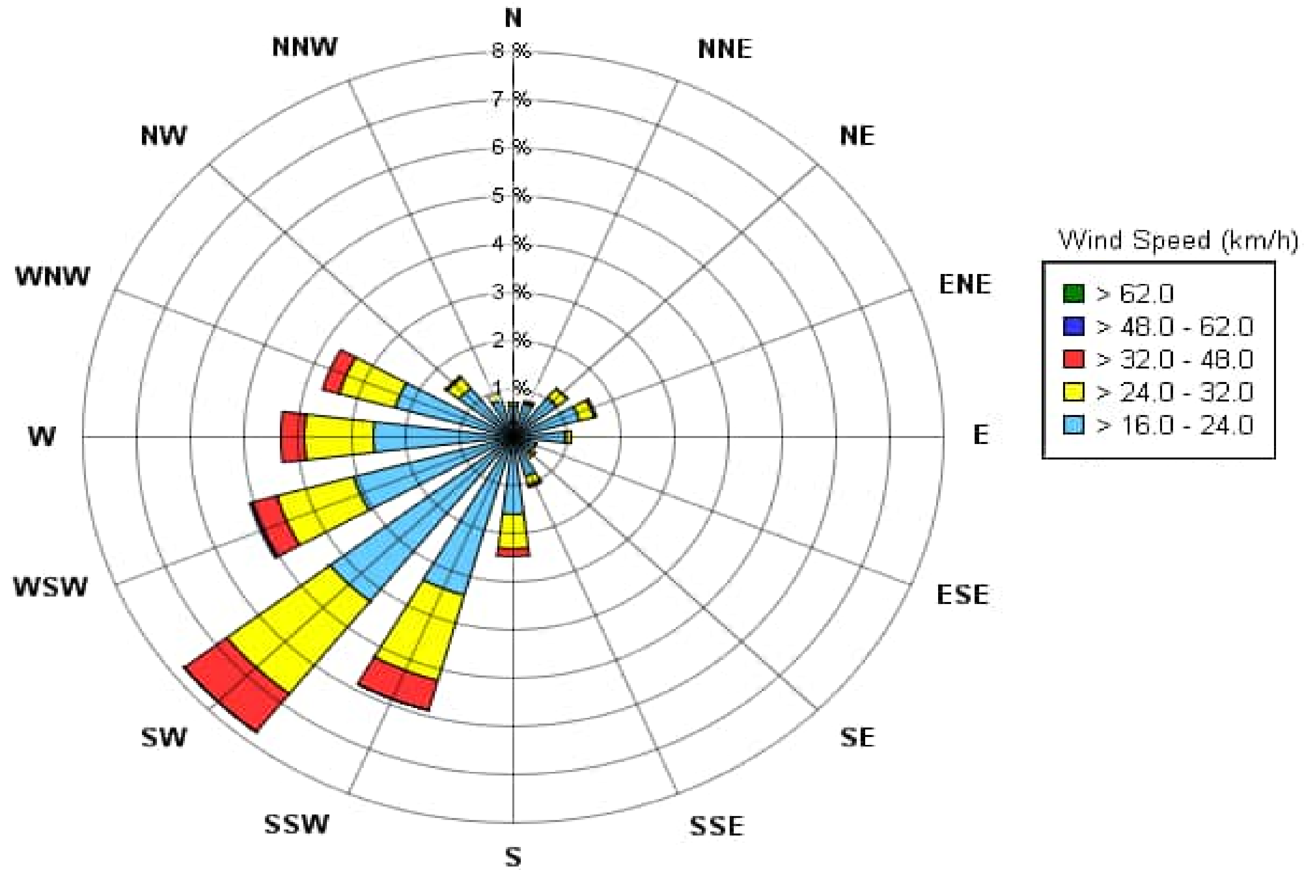
Map Projection: NAD 1983 UTM Zone 17N

Walker Landfill - Regional Municipality of Niagara, Ontario

Project #: 2402272

Drawn by: PIP	Figure: 6-1
Approx. Scale:	1:32,000
Date Revised:	Jun 11, 2026

Map Document: C:\WorkingFolder\Jobs_AMER\P2402272\P2402272.aprx



Wind Rose (Blowing From)
Wind Speeds > 16 km/h
Site-Specific Meteorological Data 2020 - 2024

Walker's South Landfill Phase 2 Existing Conditions - Thorold, ON

RWDI# 2402272

Drawn by: MW

Figure: 6-2

Approx. Scale: not to scale

Date Revised: May 27, 2026

APPENDIX A

Appendix A-1: Summary of Ambient TRS and VOC Wind Direction Determination

Walker South Landfill Phase II Environmental Assessment **RWDI Project #2402272**

The below data provides a sample of the methodology applied for determining upwind/downwind wind directions for the assessment of background data. This analysis was completed for hourly winds from July 1, 2025 to September 30, 2025. The full dataset is available upon request.

Time Check	DATE (EST)	Wind Direction - 1 hr	Wind Speed - 1 hr	Northeast Downwind	Southeast Downwind
7/1/2025 0:00	7/1/2025 0:00	186	12	1	
7/1/2025 1:00	7/1/2025 1:00	206	8		
7/1/2025 2:00	7/1/2025 2:00	251	10		1
7/1/2025 3:00	7/1/2025 3:00	230	8		1
7/1/2025 4:00	7/1/2025 4:00	208	11		
7/1/2025 5:00	7/1/2025 5:00	198	12	1	
7/1/2025 6:00	7/1/2025 6:00	207	11		
7/1/2025 7:00	7/1/2025 7:00	211	11		
7/1/2025 8:00	7/1/2025 8:00	242	8		1
7/1/2025 9:00	7/1/2025 9:00	258	9		1
7/1/2025 10:00	7/1/2025 10:00	240	7		1
7/1/2025 11:00	7/1/2025 11:00	240	7		1
7/1/2025 12:00	7/1/2025 12:00	226	9		1
7/1/2025 13:00	7/1/2025 13:00	225	11		
7/1/2025 14:00	7/1/2025 14:00	224	11		
7/1/2025 15:00	7/1/2025 15:00	228	12		1
7/1/2025 16:00	7/1/2025 16:00	267	7		1
7/1/2025 17:00	7/1/2025 17:00	266	8		1
7/1/2025 18:00	7/1/2025 18:00	243	10		1
7/1/2025 19:00	7/1/2025 19:00	304	13		1
7/1/2025 20:00	7/1/2025 20:00	305	12		1
7/1/2025 21:00	7/1/2025 21:00	300	10		1
7/1/2025 22:00	7/1/2025 22:00	293	7		1
7/1/2025 23:00	7/1/2025 23:00	299	7		1
7/2/2025 0:00	7/2/2025 0:00	296	6		1
7/2/2025 1:00	7/2/2025 1:00	290	5		1
7/2/2025 2:00	7/2/2025 2:00	288	5		1
7/2/2025 3:00	7/2/2025 3:00	231	4		1
7/2/2025 4:00	7/2/2025 4:00	217	4		
7/2/2025 5:00	7/2/2025 5:00	265	5		1
7/2/2025 6:00	7/2/2025 6:00	267	5		1
7/2/2025 7:00	7/2/2025 7:00	254	5		1
7/2/2025 8:00	7/2/2025 8:00	248	6		1
7/2/2025 9:00	7/2/2025 9:00	256	7		1
7/2/2025 10:00	7/2/2025 10:00	277	8		1
7/2/2025 11:00	7/2/2025 11:00	292	8		1
7/2/2025 12:00	7/2/2025 12:00	267	9		1
7/2/2025 13:00	7/2/2025 13:00	252	10		1
7/2/2025 14:00	7/2/2025 14:00	234	12		1
7/2/2025 15:00	7/2/2025 15:00	215	16		
7/2/2025 16:00	7/2/2025 16:00	207	18		
7/2/2025 17:00	7/2/2025 17:00	207	17		
7/2/2025 18:00	7/2/2025 18:00	215	19		
7/2/2025 19:00	7/2/2025 19:00	216	18		
7/2/2025 20:00	7/2/2025 20:00	222	16		
7/2/2025 21:00	7/2/2025 21:00	220	14		
7/2/2025 22:00	7/2/2025 22:00	223	11		
7/2/2025 23:00	7/2/2025 23:00	209	12		
7/3/2025 0:00	7/3/2025 0:00	192	8	1	
7/3/2025 1:00	7/3/2025 1:00	194	8	1	
7/3/2025 2:00	7/3/2025 2:00	220	12		
7/3/2025 3:00	7/3/2025 3:00	178	14	1	
7/3/2025 4:00	7/3/2025 4:00	173	9	1	
7/3/2025 5:00	7/3/2025 5:00	180	8	1	
7/3/2025 6:00	7/3/2025 6:00	189	8	1	
7/3/2025 7:00	7/3/2025 7:00	181	9	1	
7/3/2025 8:00	7/3/2025 8:00	254	8		1
7/3/2025 9:00	7/3/2025 9:00	312	7		1
7/3/2025 10:00	7/3/2025 10:00	18	7		
7/3/2025 11:00	7/3/2025 11:00	19	6		
7/3/2025 12:00	7/3/2025 12:00	313	6		1
7/3/2025 13:00	7/3/2025 13:00	302	10		1
7/3/2025 14:00	7/3/2025 14:00	298	13		1
7/3/2025 15:00	7/3/2025 15:00	311	16		1
7/3/2025 16:00	7/3/2025 16:00	312	17		1
7/3/2025 17:00	7/3/2025 17:00	327	12		1
7/3/2025 18:00	7/3/2025 18:00	337	8		1
7/3/2025 19:00	7/3/2025 19:00	338	7		1
7/3/2025 20:00	7/3/2025 20:00	346	5		1
7/3/2025 21:00	7/3/2025 21:00	351	3		1
7/3/2025 22:00	7/3/2025 22:00	351	3		1
7/3/2025 23:00	7/3/2025 23:00	318	1		1

Appendix A-1: Summary of Ambient TRS and VOC Wind Direction Determination

Walker South Landfill Phase II Environmental Assessment **RWDI Project #2402272**

Northeast TRS & VOC		
Wind Designation	**Wind Direction Lower Bound**	**Wind Direction Upper Bound**
Downwind	90	202.5
Upwind	270	22.5
Cross 1	22.5	90
Cross 2	202.5	270

Southeast VOC		
Wind Designation	**Wind Direction Lower Bound**	**Wind Direction Upper Bound**
Downwind	225	0
Upwind	45	180
Cross 1	0	45
Cross 2	180	225

Appendix A2: Summary of Ambient PM_{10} Wind Direction Determination

Walker South Landfill Phase II Environmental Assessment **RWDI Project #2402272**

Townline Station

Date	Number of Hours in the Day			Wind Direction Determination
	Upwind	Downwind	Crosswind	
1/1/2025	3	3	18	CROSSWIND
1/7/2025	0	0	24	CROSSWIND
1/13/2025	24	0	0	UPWIND
1/19/2025	2	10	12	CROSSWIND
1/25/2025	21	0	3	UPWIND
1/31/2025	8	7	2	UPWIND
2/6/2025	14	6	4	UPWIND
2/12/2025	0	19	1	DOWNWIND
2/18/2025	24	0	0	UPWIND
2/24/2025	18	0	6	UPWIND
3/2/2025	14	0	10	UPWIND
3/8/2025	11	0	13	CROSSWIND
3/14/2025	1	6	17	CROSSWIND
3/20/2025	16	0	8	UPWIND
3/26/2025	13	0	11	UPWIND
4/1/2025	0	6	18	CROSSWIND
4/7/2025	10	2	12	CROSSWIND
4/13/2025	9	0	15	CROSSWIND
4/19/2025	16	0	8	UPWIND
4/25/2025	0	11	13	CROSSWIND
5/1/2025	0	19	5	DOWNWIND
5/7/2025	17	0	7	UPWIND
5/13/2025	2	2	20	CROSSWIND
5/19/2025	0	3	21	CROSSWIND
5/25/2025	10	0	14	CROSSWIND
5/31/2025	0	0	24	CROSSWIND
6/6/2025	0	10	14	CROSSWIND
6/12/2025	8	0	16	CROSSWIND
6/18/2025	15	1	8	UPWIND
6/24/2025	21	0	3	UPWIND
6/30/2025	6	0	18	CROSSWIND
7/6/2025	22	0	2	UPWIND
7/12/2025	14	0	10	UPWIND
7/18/2025	0	18	6	DOWNWIND
7/24/2025	16	0	8	UPWIND
7/30/2025	0	10	14	CROSSWIND
8/5/2025	0	17	7	DOWNWIND
8/11/2025	13	0	11	UPWIND
8/17/2025	2	10	12	CROSSWIND
8/23/2025	14	0	10	UPWIND
8/29/2025	0	0	24	CROSSWIND
9/4/2025	13	0	11	UPWIND
9/10/2025	5	6	13	CROSSWIND
9/16/2025	0	18	6	DOWNWIND
9/22/2025	15	0	9	UPWIND
9/28/2025	6	1	17	CROSSWIND
10/4/2025	7	0	17	CROSSWIND
10/10/2025	8	0	16	CROSSWIND
10/16/2025	5	10	9	DOWNWIND
10/22/2025	21	0	3	UPWIND
10/28/2025	0	10	14	CROSSWIND

Appendix A2: Summary of Ambient PM_{10} Wind Direction Determination

Walker South Landfill Phase II Environmental Assessment **RWDI Project #2402272**

Townline Station

Date	Number of Hours in the Day			Wind Direction Determination
	Upwind	Downwind	Crosswind	
11/3/2025	21	0	3	UPWIND
11/9/2025	0	24	0	DOWNWIND
11/15/2025	6	0	18	CROSSWIND
11/21/2025	15	0	9	UPWIND
11/27/2025	24	0	0	UPWIND
12/3/2025	21	0	3	UPWIND
12/9/2025	12	0	12	UPWIND
12/15/2025	23	0	1	UPWIND
12/21/2025	19	0	5	UPWIND
12/27/2025	0	18	5	DOWNWIND

Appendix A2: Summary of Ambient PM_{10} Wind Direction Determination

Walker South Landfill Phase II Environmental Assessment **RWDI Project #2402272**

Gardiner Station

Date	Number of Hours in the Day			Wind Direction Determination
	Upwind	Downwind	Crosswind	
1/1/2025	3	3	18	CROSSWIND
1/7/2025	0	0	24	CROSSWIND
1/13/2025	0	24	0	DOWNWIND
1/19/2025	10	2	12	CROSSWIND
1/25/2025	0	21	3	DOWNWIND
1/31/2025	7	8	2	DOWNWIND
2/6/2025	6	14	4	DOWNWIND
2/12/2025	19	0	1	UPWIND
2/18/2025	0	24	0	DOWNWIND
2/24/2025	0	18	6	DOWNWIND
3/2/2025	0	14	10	DOWNWIND
3/8/2025	0	11	13	CROSSWIND
3/14/2025	6	1	17	CROSSWIND
3/20/2025	0	16	8	DOWNWIND
3/26/2025	0	13	11	DOWNWIND
4/1/2025	6	0	18	CROSSWIND
4/7/2025	2	10	12	CROSSWIND
4/13/2025	0	9	15	CROSSWIND
4/19/2025	0	16	8	DOWNWIND
4/25/2025	11	0	13	CROSSWIND
5/1/2025	19	0	5	UPWIND
5/7/2025	0	17	7	DOWNWIND
5/13/2025	2	2	20	CROSSWIND
5/19/2025	3	0	21	CROSSWIND
5/25/2025	0	10	14	CROSSWIND
5/31/2025	0	0	24	CROSSWIND
6/6/2025	10	0	14	CROSSWIND
6/12/2025	0	8	16	CROSSWIND
6/18/2025	1	15	8	DOWNWIND
6/24/2025	0	21	3	DOWNWIND
6/30/2025	0	6	18	CROSSWIND
7/6/2025	0	22	2	DOWNWIND
7/12/2025	0	14	10	DOWNWIND
7/18/2025	18	0	6	UPWIND
7/24/2025	0	16	8	DOWNWIND
7/30/2025	10	0	14	CROSSWIND
8/5/2025	17	0	7	UPWIND
8/11/2025	0	13	11	DOWNWIND
8/17/2025	10	2	12	CROSSWIND
8/23/2025	0	14	10	DOWNWIND
8/29/2025	0	0	24	CROSSWIND
9/4/2025	0	13	11	DOWNWIND
9/10/2025	6	5	13	CROSSWIND
9/16/2025	18	0	6	UPWIND
9/22/2025	0	15	9	DOWNWIND
9/28/2025	1	6	17	CROSSWIND
10/4/2025	0	7	17	CROSSWIND
10/10/2025	0	8	16	CROSSWIND
10/16/2025	10	5	9	UPWIND
10/22/2025	0	21	3	DOWNWIND
10/28/2025	10	0	14	CROSSWIND

Appendix A2: Summary of Ambient PM_{10} Wind Direction Determination

Walker South Landfill Phase II Environmental Assessment **RWDI Project #2402272**

Gardiner Station

Date	Number of Hours in the Day			Wind Direction Determination
	Upwind	Downwind	Crosswind	
11/3/2025	0	21	3	DOWNWIND
11/9/2025	24	0	0	UPWIND
11/15/2025	0	6	18	CROSSWIND
11/21/2025	0	15	9	DOWNWIND
11/27/2025	0	24	0	DOWNWIND
12/3/2025	0	21	3	DOWNWIND
12/9/2025	0	12	12	DOWNWIND
12/15/2025	0	23	1	DOWNWIND
12/21/2025	0	19	5	DOWNWIND
12/27/2025	18	0	5	UPWIND

APPENDIX B

Appendix B1: Summary of Particulate Matter Ambient Monitoring Data

Walker South Landfill Phase 2 Environmental Assessment

Table 1: 24-Hour Ambient Monitoring Data

Quarter 1					Quarter 2					Quarter 3					Quarter 4				
Date	Garner Station		Townline Station		Date	Garner Station		Townline Station		Date	Garner Station		Townline Station		Date	Garner Station		Townline Station	
	Wind Direction	24 hour average PM_{10} Conc. (µg/m^3)	Wind Direction	24 hour average PM_{10} Conc. (µg/m^3)		Wind Direction	24 hour average PM_{10} Conc. (µg/m^3)	Wind Direction	24 hour average PM_{10} Conc. (µg/m^3)		Wind Direction	24 hour average PM_{10} Conc. (µg/m^3)	Wind Direction	24 hour average PM_{10} Conc. (µg/m^3)		Wind Direction	24 hour average PM_{10} Conc. (µg/m^3)	Wind Direction	24 hour average PM_{10} Conc. (µg/m^3)
1/1/2025	CROSSWIND	3	CROSSWIND	3	2025/04/01	CROSSWIND	5	CROSSWIND	6	2025/07/06	DOWNWIND	15	UPWIND	17	2025/10/04	CROSSWIND	16	CROSSWIND	17
1/7/2025	CROSSWIND	6	CROSSWIND	3	2025/04/07	CROSSWIND	5	CROSSWIND	6	2025/07/12	DOWNWIND	12	UPWIND	14	2025/10/10	CROSSWIND	6	CROSSWIND	15
1/13/2025	DOWNWIND	9	UPWIND	8	2025/04/13	CROSSWIND	3	CROSSWIND	10	2025/07/18	UPWIND	3	DOWNWIND	12	2025/10/16	UPWIND	6	DOWNWIND	21
1/19/2025	CROSSWIND	3	CROSSWIND	3	2025/04/19	DOWNWIND	13	UPWIND	12	2025/07/24	DOWNWIND	Invalid	UPWIND	24	2025/10/22	DOWNWIND	3	UPWIND	4
1/25/2025	DOWNWIND	19	UPWIND	11	2025/04/25	CROSSWIND	13	CROSSWIND	15	2025/07/30	CROSSWIND	19	CROSSWIND	28	2025/10/28	CROSSWIND	4	CROSSWIND	12
1/31/2025	DOWNWIND	8	UPWIND	9	2025/05/01	UPWIND	8	DOWNWIND	8	2025/08/05	UPWIND	39	DOWNWIND	50	2025/11/03	DOWNWIND	7	UPWIND	4
2/6/2025	DOWNWIND	6	UPWIND	6	2025/05/07	DOWNWIND	9	UPWIND	11	2025/08/11	DOWNWIND	17	UPWIND	23	2025/11/09	UPWIND	10	DOWNWIND	3
2/12/2025	UPWIND	8	DOWNWIND	13	2025/05/13	CROSSWIND	18	CROSSWIND	20	2025/08/17	CROSSWIND	9	CROSSWIND	6	2025/11/15	CROSSWIND	10	CROSSWIND	14
2/18/2025	DOWNWIND	4	UPWIND	3	2025/05/19	CROSSWIND	6	CROSSWIND	5	2025/08/23	DOWNWIND	7	UPWIND	10	2025/11/21	DOWNWIND	19	UPWIND	18
2/24/2025	DOWNWIND	12	UPWIND	12	2025/05/25	CROSSWIND	Invalid	CROSSWIND	4	2025/08/29	CROSSWIND	4	CROSSWIND	8	2025/11/27	DOWNWIND	5	UPWIND	5
3/2/2025	DOWNWIND	3	UPWIND	3	2025/05/31	CROSSWIND	7	CROSSWIND	10	2025/09/04	DOWNWIND	5	UPWIND	8	2025/12/03	DOWNWIND	9	UPWIND	12
3/8/2025	CROSSWIND	3	CROSSWIND	4	2025/06/06	CROSSWIND	Invalid	CROSSWIND	44	2025/09/10	CROSSWIND	10	CROSSWIND	24	2025/12/09	DOWNWIND	6	UPWIND	10
3/14/2025	CROSSWIND	28	CROSSWIND	34	2025/06/12	CROSSWIND	21	CROSSWIND	24	2025/09/16	UPWIND	12	DOWNWIND	28	2025/12/15	DOWNWIND	3	UPWIND	4
3/20/2025	DOWNWIND	10	UPWIND	8	2025/06/18	DOWNWIND	13	UPWIND	20	2025/09/22	DOWNWIND	11	UPWIND	11	2025/12/21	DOWNWIND	3	UPWIND	3
3/26/2025	DOWNWIND	3	UPWIND	6	2025/06/24	DOWNWIND	31	UPWIND	28	2025/09/28	CROSSWIND	10	CROSSWIND	13	2025/12/27	UPWIND	3	DOWNWIND	3
					2025/06/30	CROSSWIND	12	CROSSWIND	14										
Limit		50		50			50		50			50		50			50		50
No. > Limit	-	0	-	0		-	0	-	0		-	0	-	1		-	0	-	0
Max. Concentration	-	28	-	34		-	31	-	44		-	39	-	50		-	19	-	21
Min. Concentration	-	3	-	3		-	3	-	4		-	3	-	6		-	3	-	3

Table 2: Summary of Ambient Monitoring Data - 2025 Year

90th Percentile	
PM10	21.93
PM2.5 [1]	17.85
TSP [1]	51.00

Average	
PM10	11.20
PM2.5 [1]	9.12
TSP [1]	26.05

Note:

[1] $PM_{2.5}$ and TSP concentrations are derived based on scaling factors developed as part of the 2005 EA.

Appendix B2: Summary of Ambient VOC Concentrations

Walker South Landfill Phase 2 Environmental Assessment

			Sample Date	06-Jul-25				12-Jul-25				18-Jul-25				24-Jul-25				30-Jul-25				05-Aug-25				11-Aug-25				17-Aug-25				23-Aug-29		
			Sample ID	SE JULY 6		NW JULY 6		SE JULY 12		NW JULY 12		SE JULY 18		NW JULY 18		SE JULY 24		NW JULY 24		SE JULY 30		NW JULY 30		SE AUG 05		NW AUG 05		SE AUG 11		NW AUG 11		SE AUG 17		NW AUG 17		SE AUG 23		NW AUG 23
Compound	Lowest Detection Limit ppb	Lowest Detection Limit ug/m³	24 -Hour AAQC ug/m³	ppb	ug/m³	ppb	ug/m³	ppb	ug/m³	ppb	ug/m³	ppb	ug/m³	ppb	ug/m³	ppb	ug/m³	ppb	ug/m³	ppb	ug/m³	ppb	ug/m³	ppb	ug/m³	ppb	ug/m³	ppb	ug/m³	ppb	ug/m³	ppb	ug/m³	ppb	ug/m³	ppb	ug/m³	
Dichlorodifluoromethane (FREON 12)	0.2	0.99	500,000	0.39	1.92					0.39	1.93	0.41	2.02	0.44	2.18	0.38	1.88	0.41	2.02	0.40	1.96	0.40	1.97	0.43	2.11	0.42	2.08	0.38	1.89	0.39	1.9	0.41	2.04	0.37	1.85	0.39	1.91	
1,1,1,2-Tetrachloroethane	0.021	0.14	-	ND	ND					ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
1,1,1-Trichloroethane	0.05	0.27	115,000	ND	ND					ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
1,1,2,2-Tetrachloroethane	0.0027	0.019	-	ND	ND					ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
1,1,2-Trichloroethane	0.012	0.065	-	ND	ND					ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
1,1-Dichloroethane	0.05	0.2	165	ND	ND					ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
1,1-Dichloroethylene	0.05	0.2	-	ND	ND					ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
1,2,4-Trichlorobenzene	0.1	0.74	400	ND	ND					ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
1,2,4-Trimethylbenzene	0.5	2.5	220	ND	ND					ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
1,2-Dichlorobenzene	0.05	0.3	-	ND	ND					ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
1,2-Dichloroethane	0.01	0.04	-	0.02	0.081					0.026	0.106	0.017	0.068	0.02	0.082	0.02	0.065	0.028	0.112	0.017	0.068	0.018	0.07	0.02	0.069	0.02	0.07	0.02	0.06	0.02	0.08	0.02	0.07	0.02	0.07	0.01	0.05	
1,2-Dichloropropane	0.05	0.23	-	ND	ND					ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
1,2-Dichlorotetrafluoroethane	0.17	1.2	-	ND	ND					ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
1,3,5-Trimethylbenzene	0.5	2.5	220	ND	ND					ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
1,3-Butadiene	0.5	1.1	10	ND	ND					ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
1,3-Dichlorobenzene	0.4	2.4	-	ND	ND					ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
1,4-Dichlorobenzene	0.05	0.3	95	ND	ND					ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
1,4-Dioxane	1	3.6	3,500	ND	ND					ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
2,2,4-Trimethylpentane	0.2	0.93	-	ND	ND					ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
2-propanol	1	2.5	7,300	ND	ND					ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
2-Propanone	0.1	0.24	-	3.47	8.24					3.79	9.01	1.33	3.15	3.6	8.56	2.83	6.73	4.22	10	3.71	8.82	4.31	10.2	9.39	22.3	3.94	9.36	3.58	8.49	10	23.8	6.26	14.9	3.03	7.2	2.59	6.15	
4-ethyltoluene	0.5	2.5	-	ND	ND					ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Benzene	0.05	0.16	2.3	0.086	0.28					0.086	0.27	0.051	0.16	1.08	3.45	0.34	1.09	0.129	0.41	0.181	0.58	0.213	0.68	0.27	0.85	0.27	0.86	0.13	0.41	0.14	0.46	0.14	0.43	0.13	0.41	0.12	0.37	
Benzyl chloride	0.5	2.6	-	ND	ND					ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Bromodichloromethane	0.2	1.3	-	ND	ND					ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Bromoform	0.1	1	55	ND	ND					ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Bromomethane	0.05	0.19	-	ND	ND					ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Carbon Disulfide	0.5	1.6	-	ND	ND					ND	ND	ND	ND	0.52	1.6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.41	4.40	ND	ND	1.02	3.20	ND	ND	
Carbon Tetrachloride	0.05	0.31	2.4	0.092	0.58					0.089	0.56	0.088	0.55	0.06	0.4	0.08	0.47	0.078	0.49	0.09	0.58	0.09	0.59	0.09	0.57	0.09	0.55	0.08	0.53	0.08	0.52	0.08	0.52	0.07	0.46	0.08	0.53	
Chlorobenzene	0.05	0.23	-	ND	ND					ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Chloroethane	0.3	0.79	5,600	ND	ND					ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Chloroform	0.04	0.2	1	ND	ND					ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.05	0.23	ND	ND	ND	ND	ND	ND	ND	ND	
Chloromethane	0.3	0.62	-	0.44	0.91					0.46	0.96	0.4	0.82	0.45	0.93	0.42	0.87	0.42	0.87	0.41	0.86	0.43	0.89	0.42	0.88	0.4	0.82	0.44	0.91	0.54	1.12	0.44	0.91	0.42	0.87	0.42	0.86	
cis-1,2-Dichloroethylene	0.05	0.2	105	ND	ND	Invalid		Invalid		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	Invalid
cis-1,3-Dichloropropene	0.05	0.23	-	ND	ND					ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Cyclohexane	0.2	0.69	6,100	ND	ND					ND	ND	ND	ND	1.88	6.46	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Dibromochloromethane	0.2	1.7	-	ND	ND					ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Ethanol (ethyl alcohol)	1	1.9	4,000	1.2	2.30					2.4	4.50	ND	ND	1.6	3.1	1.6	3	20.1	37.9	1.2	2.2	1.5	2.9	1.9	3.5	1.4	2.7	1	2	3.6	6.7	1.2	2.3	1.4	2.7	1.1	2	
Ethyl Acetate	1	3.6	-	ND	ND					ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Ethylbenzene	0.05	0.22	-	ND	ND					ND	ND	ND	ND	0.16	0.7	0.07	0.3	0.086	0.37	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Ethylene Dibromide	0.01	0.077	3	ND	ND					ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Heptane	0.3	1.2	11,000	ND	ND					ND	ND	ND	ND	1.8	7.4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Hexachlorobutadiene	0.0047	0.05	-	ND	ND					ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Hexane	0.1	0.35	7,500	ND	ND					ND	ND	ND	ND	4.96	17.5	0.28	1	0.18	0.63	ND	ND	ND	ND	0.12	0.43	ND	ND	0.12	0.41	0.12	0.44	ND	ND	0.11	0.37	0.12	0.43	
Methyl Butyl Ketone (2-Hexanone)	1	4.1	-	ND	ND					ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Methyl Ethyl Ketone (2-Butanone)	0.1	0.29	1,000	0.51	1.49					0.81	2.39	0.17	0.51	0.17	0.49	0.51	1.5	1.03	3.03	0.34	1.01	0.5	1.48	0.41	1.2	0.4	1.19	0.54	1.59	1.65	4.87	0.39	1.16	0.44	1.29	0.29	0.85	
Methyl Isobutyl Ketone	0.1	0.41	1,200	ND	ND					ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Methyl t-butyl ether (MTBE)	0.1	0.36	7,000	ND	ND					ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Methylene Chloride(Dichloromethane)	0.05	0.17	220	0.119	0.41					0.148	0.51	0.2	0.7	0.23	0.8	0.25	0.85	0.484	1.68	0.135	0.47	0.13	0.45	0.16	0.56	0.13	0.44	0.13	0.43	0.14	0.49	0.15	0.52	0.15	0.52	0.16	0.56	
Naphthalene	0.1	0.52	22.5	ND	ND					ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
o-Xylene	0.05	0.22	-	ND	ND					ND	ND	ND	ND	ND	ND	ND	ND	0.085	0.37	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
p+m-Xylene	0.1	0.43	-	ND	ND					0.1	0.44	ND	ND	0.21	0.9	0.15	0.64	0.25	1.1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.12	0.52	ND	ND	ND	ND	ND	ND	
Propene	0.5	0.86	-	ND	ND					ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Styrene	0.05	0.21	400	ND	ND					ND	ND	ND	ND	ND	ND	ND	ND	0.062	0.26	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Tetrachloroethylene	0.05	0.34	-	ND	ND					ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Tetrahydrofuran	0.4	1.2	93,000	ND	ND					ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Toluene	0.05	0.19	2,000	0.143	0.54					0.191	0.72	0.093	0.35	0.12	0.46	0.15	0.58	0.389	1.47	0.215	0.81	0.223	0.84	0.27	1	0.2	0.74	0.2	0.76	0.2	0.76	0.2	0.76	0.18	0.66	0.19	0.71	
Total Xylenes	0.15	0.65	730	ND	ND					ND	ND	ND	ND	0.21	0.9	ND	ND	0.34	1.47	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
trans-1,2-Dichloroethylene	0.1	0.4	105	ND	ND					ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
trans-1,3-Dichloropropene	0.05	0.23	-	ND	ND					ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Trichloroethylene	0.05	0.27	12	ND	ND					ND	ND	ND	ND	0.06	0.33	ND	ND	0.129	0.69	ND	ND	ND	ND	ND	ND	0.16	0.85	ND	ND	ND	ND	ND	ND	0.11	0.59	ND	ND	
Trichlorofluoromethane (FREON 11)	0.2	1.1	6,000	0.27	1.50					0.29	1.60	0.26	1.4	0.28	1.6	0.26	1.5	0.29	1.6	0.29	1.6	0.28	1.6	0.3	1.7	0.27	1.5	0.27	1.5	0.28	1.6	0.28	1.6	0.25	1.4	0.27	1.5	
Trichlorotrifluoroethane	0.15	1.2	-	ND	ND					ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Vinyl Acetate	0.2	0.7	-	ND	ND					ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Vinyl Bromide	0.2	0.87	-	ND	ND					ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Vinyl Chloride	0.02	0.051	1	ND	ND					ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	

Notes:

INV - Invalid sample as final canister pressure was outside of Operations Manual for Air Monitoring in Ontario criteria.

NA - Not analyzed by lab

ND - Not detected

Exceedance

Appendix B2: Summary of Ambient VOC Concentrations

Walker South Landfill Phase 2 Environmental Assessment

Sample Date				29-Aug-25				04-Sep-25				10-Sep-25				16-Sep-25				22-Sep-25				28-Sep-25				04-Oct-25				10-Oct-25			
Sample ID				SE AUG 29		NW AUG 29		SE SEP 4		NW SEP 4		SE SEP 10		NW SEP 10		SE SEP 16		NW SEP 16		SE SEP 22		NW SEP 22		SE SEP 28		NW SEP 28		SE OCT 04		NW OCT 04		SE OCT 10		NW OCT 10	
Compound	Lowest Detection Limit ppb	Lowest Detection Limit ug/m^3	24 -Hour AAQC ug/m^3	ppb	ug/m^3	ppb	ug/m^3	ppb	ug/m^3	ppb	ug/m^3	ppb	ug/m^3	ppb	ug/m^3	ppb	ug/m^3	ppb	ug/m^3	ppb	ug/m^3	ppb	ug/m^3	ppb	ug/m^3	ppb	ug/m^3	ppb	ug/m^3	ppb	ug/m^3	ppb	ug/m^3	ppb	ug/m^3
Dichlorodifluoromethane (FREON 12)	0.2	0.99	500,000	0.38	1.88	0.40	1.96	0.39	1.93	0.39	1.93	0.36	1.79	0.37	1.81	0.38	1.86	0.38	1.89	0.37	1.85			0.40	1.97	0.39	1.92			0.41	2.03			0.41	2.04
1,1,1,2-Tetrachloroethane	0.021	0.14	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			ND	ND	ND	ND			ND	ND			ND	ND
1,1,1-Trichloroethane	0.05	0.27	115,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			ND	ND	ND	ND			ND	ND			ND	ND
1,1,2,2-Tetrachloroethane	0.0027	0.019	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			ND	ND	ND	ND			ND	ND			ND	ND
1,1,2-Trichloroethane	0.012	0.065	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			ND	ND	ND	ND			ND	ND			ND	ND
1,1-Dichloroethane	0.05	0.2	165	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			ND	ND	ND	ND			ND	ND			ND	ND
1,1-Dichloroethylene	0.05	0.2	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			ND	ND	ND	ND			ND	ND			ND	ND
1,2,4-Trichlorobenzene	0.1	0.74	400	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			ND	ND	ND	ND			ND	ND			ND	ND
1,2,4-Trimethylbenzene	0.5	2.5	220	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			ND	ND	ND	ND			ND	ND			ND	ND
1,2-Dichlorobenzene	0.05	0.3	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			ND	ND	ND	ND			ND	ND			ND	ND
1,2-Dichloroethane	0.01	0.04	-	0.01	0.06	0.02	0.08	0.02	0.06	0.022	0.089	0.013	0.052	0.016	0.065	0.015	0.061	0.015	0.06	0.019	0.077			0.021	0.086	0.021	0.086			0.022	0.091			0.024	0.095
1,2-Dichloropropane	0.05	0.23	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			ND	ND	ND	ND			ND	ND			ND	ND
1,2-Dichlorotetrafluoroethane	0.17	1.2	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			ND	ND	ND	ND			ND	ND			ND	ND
1,3,5-Trimethylbenzene	0.5	2.5	220	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			ND	ND	ND	ND			ND	ND			ND	ND
1,3-Butadiene	0.5	1.1	10	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			ND	ND	ND	ND			ND	ND			ND	ND
1,3-Dichlorobenzene	0.4	2.4	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			ND	ND	ND	ND			ND	ND			ND	ND
1,4-Dichlorobenzene	0.05	0.3	95	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			ND	ND	ND	ND			ND	ND			ND	ND
1,4-Dioxane	1	3.6	3,500	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			ND	ND	ND	ND			ND	ND			ND	ND
2,2,4-Trimethylpentane	0.2	0.93	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			ND	ND	ND	ND			ND	ND			ND	ND
2-propanol	1	2.5	7,300	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			ND	ND	ND	ND			ND	ND			ND	ND
2-Propanone	0.1	0.24	-	4.34	10.3	2.07	4.92	1.83	4.36	2.21	5.26	2.92	6.94	5.96	14.2	2.11	5.01	2.18	5.17	3	7.14			2.08	4.93	2.18	5.19			5.3	12.6			2.32	5.5
4-ethyltoluene	0.5	2.5	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			ND	ND	ND	ND			ND	ND			ND	ND
Benzene	0.05	0.16	2.3	0.07	0.22	0.1	0.32	0.15	0.47	0.107	0.34	0.136	0.43	0.138	0.44	0.148	0.47	0.135	0.43	0.096	0.31			0.19	0.61	0.145	0.46			0.142	0.45			0.141	0.45
Benzyl chloride	0.5	2.6	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			ND	ND	ND	ND			ND	ND			ND	ND
Bromodichloromethane	0.2	1.3	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			ND	ND	ND	ND			ND	ND			ND	ND
Bromoform	0.1	1	55	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			ND	ND	ND	ND			ND	ND			ND	ND
Bromomethane	0.05	0.19	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			ND	ND	ND	ND			ND	ND			ND	ND
Carbon Disulfide	0.5	1.6	-	ND	ND	ND	ND	ND	ND	0.60	1.90	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			ND	ND	ND	ND			ND	ND			ND	ND
Carbon Tetrachloride	0.05	0.31	2.4	0.08	0.47	0.08	0.47	0.07	0.46	0.07	0.44	0.08	0.47	0.07	0.45	0.08	0.47	0.08	0.47	0.08	0.48			0.07	ND	0.08	0.48			0.089	0.56			0.09	0.53
Chlorobenzene	0.05	0.23	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			ND	ND	ND	ND			ND	ND			ND	ND
Chloroethane	0.3	0.79	5,600	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			ND	ND	ND	ND			ND	ND			ND	ND
Chloroform	0.04	0.2	1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			0.04	0.20	ND	ND			ND	ND			ND	ND
Chloromethane	0.3	0.62	-	0.4	0.82	0.39	0.8	0.39	0.81	0.41	0.84	0.39	0.8	0.41	0.84	0.37	0.77	0.35	ND	0.42	0.88	Invalid		0.38	0.78	0.37	0.76	Invalid		0.39	0.8	Invalid		0.38	0.78
cis-1,2-Dichloroethylene	0.05	0.2	105	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			ND	ND	ND	ND			ND	ND			ND	ND
cis-1,3-Dichloropropene	0.05	0.23	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			ND	ND	ND	ND			ND	ND			ND	ND
Cyclohexane	0.2	0.69	6,100	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			ND	ND	ND	ND			ND	ND			ND	ND
Dibromochloromethane	0.2	1.7	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			ND	ND	ND	ND			ND	ND			ND	ND
Ethanol (ethyl alcohol)	1	1.9	4,000	1.2	2.2	1.3	2.5	ND	ND	2.1	4	1.5	2.9	2.5	4.6	1.2	2.3	1.4	2.7	1.2	2.2			2	3.9	1.4	2.6			1.8	3.4			2.2	4.1
Ethyl Acetate	1	3.6	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			ND	ND	ND	ND			ND	ND			ND	ND
Ethylbenzene	0.05	0.22	-	ND	ND	ND	ND	ND	ND	0.62	2.68	0.05	0.23	ND	ND	ND	ND	ND	ND	ND	ND			0.06	0.25	ND	ND			ND	ND			ND	ND
Ethylene Dibromide	0.01	0.077	3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			ND	ND	ND	ND			ND	ND			ND	ND
Heptane	0.3	1.2	11,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			ND	ND	ND	ND			ND	ND			ND	ND
Hexachlorobutadiene	0.0047	0.05	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			ND	ND	ND	ND			ND	ND			ND	ND
Hexane	0.1	0.35	7,500	ND	ND	0.12	0.42	0.15	0.54	0.14	0.48	0.12	0.41	0.12	0.42	ND	ND	ND	ND	ND	ND			0.17	0.60	0.13	0.47			0.14	0.5			0.19	0.65
Methyl Butyl Ketone (2-Hexanone)	1	4.1	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			ND	ND	ND	ND			ND	ND			ND	ND
Methyl Ethyl Ketone (2-Butanone)	0.1	0.29	1,000	0.17	0.51	0.39	1.15	0.28	0.82	0.91	2.68	0.35	1.04	0.38	1.12	0.29	0.86	0.27	0.8	0.46	1.37			0.37	1.09	0.37	1.09			0.55	1.62			0.64	1.88
Methyl Isobutyl Ketone	0.1	0.41	1,200	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			ND	ND	ND	ND			ND	ND			ND	ND
Methyl t-butyl ether (MTBE)	0.1	0.36	7,000	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			ND	ND	ND	ND			ND	ND			ND	ND
Methylene Chloride(Dichloromethane)	0.05	0.17	220	0.17	0.6	0.14	0.48	0.14	0.49	0.16	0.56	0.123	0.43	0.136	0.47	0.114	0.39	0.115	0.4	0.138	0.48			0.146	0.51	0.142	0.49			0.199	0.69			0.273	0.95
Naphthalene	0.1	0.52	22.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			ND	ND	ND	ND			ND	ND			ND	ND
o-Xylene	0.05	0.22	-	ND	ND	ND	ND	ND	ND	0.12	0.53	0.06	0.26	0.05	0.23	ND	ND	ND	ND	ND	ND			0.06	0.27	ND	ND			ND	ND			ND	ND
p+m-Xylene	0.1	0.43	-	ND	ND	ND	ND	0.12	0.53	0.64	2.79	0.17	0.72	0.15	0.66	ND	ND	ND	ND	ND	ND			0.17	0.72	0.11	0.48			0.1	0.45			0.10	0.45
Propene	0.5	0.86	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			ND	ND	ND	ND			ND	ND			ND	ND
Styrene	0.05	0.21	400	ND	ND	ND	ND	ND	ND	0.09	0.36	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			ND	ND	ND	ND			ND	ND			ND	ND
Tetrachloroethylene	0.05	0.34	-	0.06	0.39	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			ND	ND	ND	ND			ND	ND			ND	ND
Tetrahydrofuran	0.4	1.2	93,000	ND	ND	ND	ND	ND	ND	1.58	4.70	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			ND	ND	ND	ND			ND	ND			ND	ND
Toluene	0.05	0.19	2,000	0.16	0.61	0.18	0.66	0.21	0.8	0.58	2.19	0.269	1.02	0.264	0.99	0.193	0.73	0.155	0.58	0.125	0.47			0.419	1.58	0.238	0.9			0.232	0.88			0.255	0.96
Total Xylenes	0.15	0.65	730	ND	ND	ND	ND	ND	ND	0.76	3.32	0.22	0.98	0.20	0.88	ND	ND	ND	ND	ND	ND			0.23	0.98	ND	ND			ND	ND			ND	ND
trans-1,2-Dichloroethylene	0.1	0.4	105	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			ND	ND	ND	ND			ND	ND			ND	ND
trans-1,3-Dichloropropene	0.05	0.23	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			ND	ND	ND	ND			ND	ND			ND	ND
Trichloroethylene	0.05	0.27	12	ND	ND	0.11	0.58	ND	ND	ND	ND	0.08	0.44	ND	ND	ND	ND	ND	ND	0.09	0.51			ND	ND	ND	ND			ND	ND			ND	ND
Trichlorofluoromethane (FREON 11)	0.2	1.1	6,000	0.25	1.4	0.25	1.4	0.25	1.4	0.27	1.5	0.24	1.3	0.25	1.4	0.25	1.4	0.24	1.3	0.24	1.3			0.25	1.4	0.25	1.4			0.29	1.6			0.29	1.7
Trichlorotrifluoroethane	0.15	1.2	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			ND	ND	ND	ND			ND	ND			ND	ND
Vinyl Acetate	0.2	0.7	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			ND	ND	ND	ND			ND	ND			ND	ND
Vinyl Bromide	0.2	0.87	-	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			ND	ND	ND	ND			ND	ND			ND	ND
Vinyl Chloride	0.02	0.051	1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND			ND	ND	ND	ND			0.027	0.07			ND	ND

Notes:

INV - Invalid sample as final canister pressure was outside of Operations Manual for Air Monitoring in Ontari

NA - Not analyzed by lab

ND - Not detected

Exceedance

Appendix B2: Summary of Ambient VOC Concentrations

Walker South Landfill Phase 2 Environmental Assessment

			Sample Date	16-Oct-25				22-Oct-25				28-Oct-25				09-Nov-25				21-Nov-25				03-Dec-25			
			Sample ID	SE OCT 16		NW OCT 16		SE OCT 22		NW OCT 22		SE OCT 28		NW OCT 28		SE NOV 09		NW NOV 09		SE NOV 21		NW NOV 21		SE DEC 03		NW DEC 03	
Compound	Lowest Detection Limit ppb	Lowest Detection Limit ug/m³	24 -Hour AAQC ug/m³	ppb	ug/m³	ppb	ug/m³	ppb	ug/m³	ppb	ug/m³	ppb	ug/m³	ppb	ug/m³	ppb	ug/m³	ppb	ug/m³	ppb	ug/m³	ppb	ug/m³	ppb	ug/m³	ppb	ug/m³
Dichlorodifluoromethane (FREON 12)	0.2	0.99	500,000	0.44	2.18	0.40	2			0.46	2.28	0.45	2.22	0.48	2.38	0.47	2.35	0.47	2.32	0.44	2.19	0.44	2.17	0.44	2.19	0.44	2.18
1,1,1,2-Tetrachloroethane	0.021	0.14	-	ND	ND	ND	ND			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,1-Trichloroethane	0.05	0.27	115,000	ND	ND	ND	ND			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2,2-Tetrachloroethane	0.0027	0.019	-	ND	ND	ND	ND			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1,2-Trichloroethane	0.012	0.065	-	ND	ND	ND	ND			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	0.05	0.2	165	ND	ND	ND	ND			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethylene	0.05	0.2	-	ND	ND	ND	ND			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene	0.1	0.74	400	ND	ND	ND	ND			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trimethylbenzene	0.5	2.5	220	ND	ND	ND	ND			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichlorobenzene	0.05	0.3	-	ND	ND	ND	ND			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichloroethane	0.01	0.04	-	0.019	0.077	0.022	ND			0.03	0.121	0.02	0.081	0.02	0.079	0.021	0.085	0.022	0.09	0.018	0.074	0.02	0.08	0.018	0.072	0.023	0.093
1,2-Dichloropropane	0.05	0.23	-	ND	ND	ND	ND			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2-Dichlorotetrafluoroethane	0.17	1.2	-	ND	ND	ND	ND			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3,5-Trimethylbenzene	0.5	2.5	220	ND	ND	ND	ND			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3-Butadiene	0.5	1.1	10	ND	ND	ND	ND			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,3-Dichlorobenzene	0.4	2.4	-	ND	ND	ND	ND			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	0.05	0.3	95	ND	ND	ND	ND			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,4-Dioxane	1	3.6	3,500	ND	ND	ND	ND			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2,2,4-Trimethylpentane	0.2	0.93	-	ND	ND	ND	ND			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-propanol	1	2.5	7,300	ND	ND	ND	ND			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Propanone	0.1	0.24	-	1.41	3.34	2.39	5.68			1.84	4.36	6.87	16.3	1.44	3.43	2.15	5.1	0.84	2	1.69	4.02	1.29	3.05	1.26	3	1.49	3.53
4-ethyltoluene	0.5	2.5	-	ND	ND	ND	ND			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzene	0.05	0.16	2.3	0.126	0.4	0.113	0.36			0.088	0.28	0.097	0.31	0.078	0.25	0.091	0.29	0.089	0.28	0.146	0.47	0.142	0.45	0.114	0.37	0.118	0.38
Benzyl chloride	0.5	2.6	-	ND	ND	ND	ND			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromodichloromethane	0.2	1.3	-	ND	ND	ND	ND			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromoform	0.1	1	55	ND	ND	ND	ND			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Bromomethane	0.05	0.19	-	ND	ND	ND	ND			ND	ND	0.05	0.21	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Disulfide	0.5	1.6	-	ND	ND	ND	ND			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Carbon Tetrachloride	0.05	0.31	2.4	0.08	0.53	0.08	0.51			0.10	0.60	0.09	0.59	0.10	0.63	0.09	0.57	0.10	0.60	0.06	0.35	0.06	0.36	0.08	0.47	0.07	0.46
Chlorobenzene	0.05	0.23	-	ND	ND	ND	ND			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroethane	0.3	0.79	5,600	ND	ND	ND	ND			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroform	0.04	0.2	1	ND	ND	ND	ND			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloromethane	0.3	0.62	-	0.39	0.8	0.36	0.74	Invalid		0.37	0.77	1.14	2.36	0.38	0.78	0.39	0.82	0.38	ND	0.4	0.83	0.4	0.82	0.5	1.04	0.51	1.05
cis-1,2-Dichloroethylene	0.05	0.2	105	ND	ND	ND	ND			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
cis-1,3-Dichloropropene	0.05	0.23	-	ND	ND	ND	ND			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Cyclohexane	0.2	0.69	6,100	ND	ND	ND	ND			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Dibromochloromethane	0.2	1.7	-	ND	ND	ND	ND			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethanol (ethyl alcohol)	1	1.9	4,000	1.4	2.6	2.2	4.2			8.4	15.8	4.5	8.4	2.2	4.1	2.4	4.5	ND	ND	2.8	5.3	2.3	4.3	ND	ND	2.8	5.4
Ethyl Acetate	1	3.6	-	ND	ND	ND	ND			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	0.05	0.22	-	ND	ND	ND	ND			0.07	0.28	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethylene Dibromide	0.01	0.077	3	ND	ND	ND	ND			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Heptane	0.3	1.2	11,000	ND	ND	ND	ND			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Hexachlorobutadiene	0.0047	0.05	-	ND	ND	ND	ND			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Hexane	0.1	0.35	7,500	0.15	0.52	0.14	0.48			0.24	0.86	0.27	0.95	0.18	0.62	0.13	0.45	0.23	0.81	0.19	0.68	0.19	0.66	ND	ND	0.14	0.49
Methyl Butyl Ketone (2-Hexanone)	1	4.1	-	ND	ND	ND	ND			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methyl Ethyl Ketone (2-Butanone)	0.1	0.29	1,000	0.23	0.68	0.27	0.81			0.49	1.46	0.77	2.29	0.11	0.33	0.36	1.05	ND	ND	0.38	1.11	0.31	0.91	0.22	0.66	0.41	1.21
Methyl Isobutyl Ketone	0.1	0.41	1,200	ND	ND	ND	ND			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methyl t-butyl ether (MTBE)	0.1	0.36	7,000	ND	ND	ND	ND			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Methylene Chloride(Dichloromethane)	0.05	0.17	220	0.179	0.62	0.184	0.64			0.317	1.1	0.431	1.5	0.216	0.75	0.207	0.72	0.388	1.35	0.124	0.43	0.119	0.41	0.103	0.36	0.148	0.51
Naphthalene	0.1	0.52	22.5	ND	ND	ND	ND			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
o-Xylene	0.05	0.22	-	0.05	<0.22	ND	ND			0.07	0.28	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
p+m-Xylene	0.1	0.43	-	0.13	0.56	0.11	0.49			0.20	0.87	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Propene	0.5	0.86	-	ND	ND	ND	ND			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Styrene	0.05	0.21	400	ND	ND	ND	ND			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrachloroethylene	0.05	0.34	-	ND	ND	ND	ND			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Tetrahydrofuran	0.4	1.2	93,000	ND	ND	ND	ND			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Toluene	0.05	0.19	2,000	0.269	1.01	0.233	0.88			0.27	1.02	0.159	0.6	0.107	0.4	0.068	0.26	0.068	0.26	0.201	0.76	0.174	0.66	0.105	0.39	0.182	0.68
Total Xylenes	0.15	0.65	730	0.18	0.78	ND	ND			0.26	1.15	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,2-Dichloroethylene	0.1	0.4	105	ND	ND	ND	ND			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
trans-1,3-Dichloropropene	0.05	0.23	-	ND	ND	ND	ND			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichloroethylene	0.05	0.27	12	0.05	0.27	ND	ND			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Trichlorofluoromethane (FREON 11)	0.2	1.1	6,000	0.28	1.6	0.29	1.6			0.29	1.6	0.28	1.6	0.28	1.6	0.28	1.6	0.27	1.5	0.24	1.3	0.22	1.3	0.22	1.2	0.22	1.2
Trichlorotrifluoroethane	0.15	1.2	-	ND	ND	ND	ND			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl Acetate	0.2	0.7	-	ND	ND	ND	ND			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl Bromide	0.2	0.87	-	ND	ND	ND	ND			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Vinyl Chloride	0.02	0.051	1	ND	ND	ND	ND			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

Notes:

INV - Invalid sample as final canister pressure was outside of Operations Manual for Air Monitoring in Ontari

NA - Not analyzed by lab

ND - Not detected

Exceedance

Appendix B2: Summary of Ambient VOC Concentrations

RWDI #2402272

Walker South Landfill Phase 2 Environmental Assessment

Sample Date				15-Dec-25				27-Dec-25				Maximum Concentration SE	Maximum Concentration NW	Percent of AAQC SE	Percent of AAQC NW	Percent Validity SE	Percent Validity NW
Sample ID				SE DEC 15		NW DEC 15		SE DEC 27		NW DEC 27							
Compound	Lowest Detection Limit ppb	Lowest Detection Limit ug/m3	24 -Hour AAQC ug/m3	ppb	ug/m3	ppb	ug/m3	ppb	ug/m3	ppb	ug/m3	ug/m3	ug/m3	%	%	%	%
Dichlorodifluoromethane (FREON 12)	0.2	0.99	500,000			0.43	2.11			0.43	2.15	2.35	2.38	0.0005%	0.0005%	76	88
1,1,1,2-Tetrachloroethane	0.021	0.14	-			ND	ND			ND	ND	-	-	-	-	76	88
1,1,1-Trichloroethane	0.05	0.27	115,000			ND	ND			ND	ND	-	-	-	-	76	88
1,1,2,2-Tetrachloroethane	0.0027	0.019	-			ND	ND			ND	ND	-	-	-	-	76	88
1,1,2-Trichloroethane	0.012	0.065	-			ND	ND			ND	ND	-	-	-	-	76	88
1,1-Dichloroethane	0.05	0.2	165			ND	ND			ND	ND	-	-	-	-	76	88
1,1-Dichloroethylene	0.05	0.2	-			ND	ND			ND	ND	-	-	-	-	76	88
1,2,4-Trichlorobenzene	0.1	0.74	400			ND	ND			ND	ND	-	-	-	-	76	88
1,2,4-Trimethylbenzene	0.5	2.5	220			ND	ND			ND	ND	-	-	-	-	76	88
1,2-Dichlorobenzene	0.05	0.3	-			ND	ND			ND	ND	-	-	-	-	76	88
1,2-Dichloroethane	0.01	0.04	-			0.018	0.073			0.019	0.075	0.09	0.12	-	-	76	88
1,2-Dichloropropane	0.05	0.23	-			ND	ND			ND	ND	-	-	-	-	76	88
1,2-Dichlorotetrafluoroethane	0.17	1.2	-			ND	ND			ND	ND	-	-	-	-	76	88
1,3,5-Trimethylbenzene	0.5	2.5	220			ND	ND			ND	ND	-	-	-	-	76	88
1,3-Butadiene	0.5	1.1	10			ND	ND			ND	ND	-	-	-	-	76	88
1,3-Dichlorobenzene	0.4	2.4	-			ND	ND			ND	ND	-	-	-	-	76	88
1,4-Dichlorobenzene	0.05	0.3	95			ND	ND			ND	ND	-	-	-	-	76	88
1,4-Dioxane	1	3.6	3,500			ND	ND			ND	ND	-	-	-	-	76	88
2,2,4-Trimethylpentane	0.2	0.93	-			ND	ND			ND	ND	-	-	-	-	76	88
2-propanol	1	2.5	7,300			ND	ND			ND	ND	-	-	-	-	76	88
2-Propanone	0.1	0.24	-			1.05	2.48			0.65	1.55	22.30	23.80	-	-	76	88
4-ethyltoluene	0.5	2.5	-			ND	ND			ND	ND	-	-	-	-	76	88
Benzene	0.05	0.16	2.3			0.111	0.35			0.113	0.36	1.09	3.45	47%	150%	76	88
Benzyl chloride	0.5	2.6	-			ND	ND			ND	ND	-	-	-	-	76	88
Bromodichloromethane	0.2	1.3	-			ND	ND			ND	ND	-	-	-	-	76	88
Bromoform	0.1	1	55			ND	ND			ND	ND	-	-	-	-	76	88
Bromomethane	0.05	0.19	-			ND	ND			ND	ND	0.21	-	-	-	76	88
Carbon Disulfide	0.5	1.6	-			ND	ND			ND	ND	-	4.40	-	-	76	88
Carbon Tetrachloride	0.05	0.31	2.4			0.06	0.38			0.06	0.40	0.59	0.63	25%	26%	76	88
Chlorobenzene	0.05	0.23	-			ND	ND			ND	ND	-	-	-	-	76	88
Chloroethane	0.3	0.79	5,600			ND	ND			ND	ND	-	-	-	-	76	88
Chloroform	0.04	0.2	1			ND	ND			ND	ND	0.23	-	23%	-	76	88
Chloromethane	0.3	0.62	-			0.37	0.76			0.37	0.76	2.36	1.12	-	-	76	88
cis-1,2-Dichloroethylene	0.05	0.2	105	Invalid		ND	ND	Invalid		ND	ND	-	-	-	-	76	88
cis-1,3-Dichloropropene	0.05	0.23	-			ND	ND			ND	ND	-	-	-	-	76	88
Cyclohexane	0.2	0.69	6,100			ND	ND			ND	ND	-	6.46	-	0.1%	76	88
Dibromochloromethane	0.2	1.7	-			ND	ND			ND	ND	-	-	-	-	76	88
Ethanol (ethyl alcohol)	1	1.9	4,000			1.3	2.5			ND	ND	8.40	37.90	0.2%	0.9%	76	88
Ethyl Acetate	1	3.6	-			ND	ND			ND	ND	-	-	-	-	76	88
Ethylbenzene	0.05	0.22	-			ND	ND			ND	ND	0.30	2.68	-	-	76	88
Ethylene Dibromide	0.01	0.077	3			ND	ND			ND	ND	-	-	-	-	76	88
Heptane	0.3	1.2	11,000			ND	ND			ND	ND	-	7.40	-	0.1%	76	88
Hexachlorobutadiene	0.0047	0.05	-			ND	ND			ND	ND	-	-	-	-	76	88
Hexane	0.1	0.35	7,500			ND	ND			ND	ND	1.00	17.50	0.0%	0.2%	76	88
Methyl Butyl Ketone (2-Hexanone)	1	4.1	-			ND	ND			ND	ND	-	-	-	-	76	88
Methyl Ethyl Ketone (2-Butanone)	0.1	0.29	1,000			0.18	0.53			ND	ND	2.29	4.87	0.2%	0.5%	76	88
Methyl Isobutyl Ketone	0.1	0.41	1,200			ND	ND			ND	ND	-	-	-	-	76	88
Methyl t-butyl ether (MTBE)	0.1	0.36	7,000			ND	ND			ND	ND	-	-	-	-	76	88
Methylene Chloride(Dichloromethane)	0.05	0.17	220			0.104	0.36			0.114	0.4	1.50	1.68	0.7%	0.8%	76	88
Naphthalene	0.1	0.52	22.5			ND	ND			ND	ND	-	-	-	-	76	88
o-Xylene	0.05	0.22	-			ND	ND			ND	ND	0.27	0.53	-	-	76	88
p+m-Xylene	0.1	0.43	-			ND	ND			ND	ND	0.72	2.79	-	-	76	88
Propene	0.5	0.86	-			ND	ND			ND	ND	-	-	-	-	76	88
Styrene	0.05	0.21	400			ND	ND			ND	ND	-	0.36	-	0.1%	76	88
Tetrachloroethylene	0.05	0.34	-			ND	ND			ND	ND	0.39	-	-	-	76	88
Tetrahydrofuran	0.4	1.2	93,000			ND	ND			ND	ND	-	4.70	-	0.01%	76	88
Toluene	0.05	0.19	2,000			0.085	0.32			0.068	0.26	1.58	2.19	0.1%	0.1%	76	88
Total Xylenes	0.15	0.65	730			ND	ND			ND	ND	0.98	3.32	0.1%	0.5%	76	88
trans-1,2-Dichloroethylene	0.1	0.4	105			ND	ND			ND	ND	-	-	-	-	76	88
trans-1,3-Dichloropropene	0.05	0.23	-			ND	ND			ND	ND	-	-	-	-	76	88
Trichloroethylene	0.05	0.27	12			ND	ND			ND	ND	0.51	0.85	4.3%	7.1%	76	88
Trichlorofluoromethane (FREON 11)	0.2	1.1	6,000			0.24	1.3			0.23	1.3	1.70	1.70	0.03%	0.03%	76	88
Trichlorotrifluoroethane	0.15	1.2	-			ND	ND			ND	ND	-	-	-	-	76	88
Vinyl Acetate	0.2	0.7	-			ND	ND			ND	ND	-	-	-	-	76	88
Vinyl Bromide	0.2	0.87	-			ND	ND			ND	ND	-	-	-	-	76	88
Vinyl Chloride	0.02	0.051	1			ND	ND			ND	ND	-	0.07	-	7%	76	88

Notes:

INV - Invalid sample as final canister pressure was outside of Operations Manual for Air Monitoring in Ontari

NA - Not analyzed by lab

ND - Not detected

Exceedance

Appendix B3: Summary of Ambient TRS Concentrations

RWDI Project #2402272

Walker South Landfill Phase II Environmental Assessment

Table 1 - TRS Hourly Monitoring Data

Date	00:00	01:00	02:00	03:00	04:00	05:00	06:00	07:00	08:00	09:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	Mean
	(Results Expressed in ppb)																								
AAQC (ppb)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	*13*
June 30, 2025	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2
July 1, 2025	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	INS
July 2, 2025	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	NoData	SC	SC	2	3	4	2	4	2	2	INS
July 3, 2025	2	1	1	2	2	2	2	1	1	SC	SC	SC	SC	1	1	1	1	1	1	1	1	1	1	1	1
July 4, 2025	1	1	1	2	2	2	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
July 5, 2025	1	2	2	1	1	1	1	1	1	2	1	1	2	2	2	2	2	2	2	2	2	1	1	1	1
July 6, 2025	1	1	1	1	1	1	1	2	2	1	1	1	1	2	2	2	2	2	3	2	1	1	1	1	1
July 7, 2025	1	1	1	1	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
July 8, 2025	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
July 9, 2025	1	2	2	2	3	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	4	2
July 10, 2025	6	2	2	1	1	3	2	1	1	1	1	1	1	1	1	1	1	1	1	1	3	5	1	1	2
July 11, 2025	2	1	1	2	2	2	1	1	1	1	SC	SC	2	1	1	1	1	1	1	2	1	1	1	1	1
July 12, 2025	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	2	1	1
July 13, 2025	2	3	3	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
July 14, 2025	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	1
July 15, 2025	1	1	2	2	1	1	2	1	1	1	SC	SC	SC	SC	SC	SC	2	2	2	3	2	2	2	2	2
July 16, 2025	2	2	2	2	2	1	1	1	2	1	1	1	1	1	1	2	2	1	1	1	1	1	1	1	1
July 17, 2025	1	1	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
July 18, 2025	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
July 19, 2025	1	1	2	1	2	2	3	2	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1
July 20, 2025	2	1	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
July 21, 2025	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
July 22, 2025	2	2	2	1	1	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
July 23, 2025	1	1	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	2	2	1	1	1	1
July 24, 2025	1	1	1	1	1	1	2	2	1	1	1	2	2	2	2	1	1	1	2	2	1	1	1	1	1
July 25, 2025	2	2	3	2	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1
July 26, 2025	1	1	3	2	1	1	1	1	1	1	1	1	1	1	1	2	1	2	2	2	2	1	1	2	1
July 27, 2025	2	2	3	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
July 28, 2025	1	2	4	2	1	1	2	2	1	1	1	1	1	1	1	1	1	2	2	2	2	1	1	1	2

Appendix B3: Summary of Ambient TRS Concentrations

RWDI Project #2402272

Walker South Landfill Phase II Environmental Assessment

Table 1 - TRS Hourly Monitoring Data

(Results Expressed in ppb)																									
Date	00:00	01:00	02:00	03:00	04:00	05:00	06:00	07:00	08:00	09:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	Mean
AAQC (ppb)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	*13*
July 29, 2025	1	1	3	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	2	3	1	1	1	2
July 30, 2025	1	1	3	2	3	2	1	1	1	1	SC	SC	SC	NoData	1	1	1	1	1	1	1	1	1	1	1
July 31, 2025	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
August 1, 2025	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	1
August 2, 2025	2	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	4	4	2	1
August 3, 2025	2	1	2	1	3	1	2	2	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1
August 4, 2025	1	1	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
August 5, 2025	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
August 6, 2025	1	1	1	1	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	INS
August 7, 2025	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	INS
August 8, 2025	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	INS
August 9, 2025	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	INS
August 10, 2025	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	INS
August 11, 2025	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	INS
August 12, 2025	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	INS
August 13, 2025	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	SM	INS
August 14, 2025	SM	SM	SM	SM	SM	SM	SM	SM	SM	NoData	Maint	SC	SC	SC	1	1	1	1	1	1	1	1	2	1	INS
August 15, 2025	1	1	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
August 16, 2025	1	1	2	1	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
August 17, 2025	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
August 18, 2025	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
August 19, 2025	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
August 20, 2025	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
August 21, 2025	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1
August 22, 2025	2	2	2	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
August 23, 2025	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1
August 24, 2025	1	2	2	1	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
August 25, 2025	1	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1
August 26, 2025	2	1	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Appendix B3: Summary of Ambient TRS Concentrations

RWDI Project #2402272

Walker South Landfill Phase II Environmental Assessment

Table 1 - TRS Hourly Monitoring Data

(Results Expressed in ppb)																									
Date	00:00	01:00	02:00	03:00	04:00	05:00	06:00	07:00	08:00	09:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	Mean
AAQC (ppb)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	*13*
August 27, 2025	1	1	2	1	2	2	2	2	1	1	1	1	1	1	1	1	1	2	2	2	2	6	3	3	2
August 28, 2025	2	2	2	2	2	2	2	2	1	1	1	1	2	1	2	1	1	1	2	2	2	1	1	1	2
August 29, 2025	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
August 30, 2025	2	3	2	2	2	2	3	2	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1	2
August 31, 2025	1	1	2	1	1	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
September 1, 2025	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
September 2, 2025	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
September 3, 2025	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	1	1	1	1	1	1	1
September 4, 2025	1	2	3	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	2	2	2	1	3	1	1
September 5, 2025	1	1	2	1	1	1	1	1	1	1	2	2	2	1	1	2	1	1	1	1	1	1	2	4	1
September 6, 2025	2	4	3	2	2	1	1	3	2	1	1	1	1	1	2	2	1	1	1	1	2	1	1	1	2
September 7, 2025	1	3	2	2	2	1	2	1	1	1	1	1	1	1	1	2	2	2	1	1	1	2	2	2	2
September 8, 2025	2	1	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
September 9, 2025	1	1	2	1	1	2	1	1	1	1	1	SC	SC	SC	2	1	1	1	1	1	1	1	1	1	1
September 10, 2025	2	1	2	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1
September 11, 2025	2	1	2	1	1	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1
September 12, 2025	2	1	2	2	2	2	1	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1
September 13, 2025	2	2	2	2	1	1	1	1	2	1	1	1	1	1	1	1	2	2	2	2	2	2	2	1	1
September 14, 2025	2	1	2	2	2	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
September 15, 2025	1	1	3	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
September 16, 2025	1	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
September 17, 2025	1	1	2	1	1	1	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	3	1
September 18, 2025	3	2	4	2	3	1	1	2	1	1	1	1	1	1	1	1	2	2	1	2	1	1	1	1	2
September 19, 2025	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	1	2	1
September 20, 2025	2	2	3	1	2	2	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
September 21, 2025	1	1	2	2	2	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1
September 22, 2025	1	1	2	1	1	1	1	1	1	1	2	2	2	2	2	2	1	1	1	1	1	2	2	2	1
September 23, 2025	2	2	2	1	1	1	2	2	1	1	1	1	1	1	1	1	1	1	3	1	1	1	1	1	1
September 24, 2025	2	1	2	1	2	2	1	2	2	1	SC	SC	SC	SC	2	1	1	1	1	1	1	1	1	1	1

Appendix B3: Summary of Ambient TRS Concentrations

RWDI Project #2402272

Walker South Landfill Phase II Environmental Assessment

Table 1 - TRS Hourly Monitoring Data

(Results Expressed in ppb)																									
Date	**00:00**	**01:00**	**02:00**	**03:00**	**04:00**	**05:00**	**06:00**	**07:00**	**08:00**	**09:00**	**10:00**	**11:00**	**12:00**	**13:00**	**14:00**	**15:00**	**16:00**	**17:00**	**18:00**	**19:00**	**20:00**	**21:00**	**22:00**	**23:00**	**Mean**
AAQC (ppb)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	*13*
September 25, 2025	1	1	2	1	1	1	2	2	1	1	1	1	1	1	1	1	1	1	1	2	3	2	2	1	1
September 26, 2025	1	1	2	2	1	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
September 27, 2025	1	3	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1	1
September 28, 2025	1	1	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	3	2	1
September 29, 2025	2	2	2	2	2	2	2	1	2	3	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
September 30, 2025	1	1	1	3	2	1	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
October 1, 2025	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	1
October 2, 2025	1	1	1	1	1	1	1	2	2	1	1	2	2	2	2	1	2	2	1	2	2	2	2	2	2
October 3, 2025	2	2	2	2	2	2	1	2	2	2	2	2	1	2	2	2	2	2	1	1	2	2	2	2	2
October 4, 2025	1	2	2	2	1	2	1	1	1	1	1	1	1	1	1	1	1	1	3	1	1	1	1	1	1
October 5, 2025	2	1	2	2	1	2	1	1	1	1	2	1	2	1	1	1	2	2	1	1	2	1	1	1	1
October 6, 2025	1	2	2	1	1	2	1	2	2	2	2	2	1	2	2	2	2	2	2	1	1	1	1	1	2
October 7, 2025	1	1	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	2
October 8, 2025	1	1	2	1	1	1	1	1	1	1	1	2	1	1	1	1	1	1	1	1	1	2	1	2	1
October 9, 2025	2	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	2	1	2	1	1	1	1	2	2
October 10, 2025	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	3	2	2	2	2	2	2	2
October 11, 2025	2	2	2	2	2	2	2	2	1	1	2	2	2	2	1	1	2	2	2	2	2	2	2	2	2
October 12, 2025	1	2	2	2	2	2	2	2	2	2	2	1	1	1	2	1	1	1	1	1	2	2	2	1	2
October 13, 2025	2	1	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	2	1	1	1
October 14, 2025	1	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	2	2	2	2	1	1	1	2
October 15, 2025	1	2	2	1	1	1	1	1	1	2	1	1	1	1	2	1	2	1	2	2	2	1	1	1	1
October 16, 2025	2	1	2	2	1	2	2	2	2	2	2	1	2	2	2	1	2	3	3	3	2	2	2	2	2
October 17, 2025	2	2	2	3	2	2	2	2	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
October 18, 2025	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	2	2	2	2
October 19, 2025	2	2	2	1	2	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2
October 20, 2025	3	1	2	1	1	2	1	2	2	1	2	1	1	2	1	1	2	1	2	1	1	4	2	2	2
October 21, 2025	1	1	2	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	4	3	2	2	2	2
October 22, 2025	3	2	3	3	4	3	3	3	2	2	2	3	2	2	3	3	3	2	2	2	2	2	2	3	2
October 23, 2025	2	2	2	2	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	2	2

Appendix B3: Summary of Ambient TRS Concentrations

RWDI Project #2402272

Walker South Landfill Phase II Environmental Assessment

Table 1 - TRS Hourly Monitoring Data

(Results Expressed in ppb)																									
Date	**00:00**	**01:00**	**02:00**	**03:00**	**04:00**	**05:00**	**06:00**	**07:00**	**08:00**	**09:00**	**10:00**	**11:00**	**12:00**	**13:00**	**14:00**	**15:00**	**16:00**	**17:00**	**18:00**	**19:00**	**20:00**	**21:00**	**22:00**	**23:00**	**Mean**
AAQC (ppb)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	*13*
October 24, 2025	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
October 25, 2025	2	2	2	3	3	2	2	2	2	2	2	2	2	2	2	2	2	5	3	2	3	2	2	2	2
October 26, 2025	2	2	2	2	2	3	4	2	2	2	1	2	2	2	2	2	2	2	2	2	2	2	1	2	2
October 27, 2025	2	2	2	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	1	2	2	2	2	2	2
October 28, 2025	2	2	2	2	2	2	2	2	2	2	2	SC	SC	SC	SC	-	-	-	-	-	-	-	-	-	INS
October 29, 2025	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	INS
October 30, 2025	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	INS
October 31, 2025	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	INS

Notes:

[1] SM = Sample Malfunction

[1] SC = Sample Calibration

Table 2: 2025 TRS Monitoring Results Summary

Data Statistics	**Events > 10 min AAQC**	**Events > 24 hr AAQC**	**Arithmetic Mean**	**Maximum 10 min Rolling Mean**	**Maximum 1 hr Rolling Mean**	**Maximum 24 hr Rolling Mean**	**Number of Valid Hours**	**Valid Data**
Month	TRS							
	No.	No.	(ppb)	(ppb)	(ppb)	(ppb)	No.	%
July	1	0	1.4	13.9	6.0	2.0	687	92.3
August	0	0	1.2	8.5	5.8	2.0	542	72.8
September	0	0	1.5	7.8	3.8	1.8	713	99.03
October	0	0	1.6	10.3	5.2	2.5	659	98.07

Appendix B4: Sample Calculations of Ambient TRS Concentrations

RWDI #2402272

Walker South Landfill Phase 2 Environmental Assessment

<u>Sample Calculations of 10-Minute Average and 1-Hour Average for TRS Concentrations</u>

Date and Time	1-Hour Wind Direction Determination [1]	TRS Concentration (ppb)		
		5-min Average Recorded [2]	10-min Average [3]	1-Hour Average [4]
2025-07-04 03:00	Upwind	1.4	1.55	1.7
2025-07-04 03:05	Upwind	1.7		
2025-07-04 03:10	Upwind	1.6	1.45	
2025-07-04 03:15	Upwind	1.3		
2025-07-04 03:20	Upwind	1.6	1.8	
2025-07-04 03:25	Upwind	2		
2025-07-04 03:30	Upwind	1.8	1.85	
2025-07-04 03:35	Upwind	1.9		
2025-07-04 03:40	Upwind	2	2.1	
2025-07-04 03:45	Upwind	2.2		
2025-07-04 03:50	Upwind	1.8	1.6	
2025-07-04 03:55	Upwind	1.4		

Notes:

[1] The analysis of upwind/downwind conditions was conducted based on the local 1-hour meteorological data, due to the lack of availability of 10-minute wind data. The 1-hour wind direction was then applied to all 10-minute averages within the hour.

[2] From continuous montioring.

[3] 10-Minute average concentrations were determined by taking the average over the succeeding two 5-minute average concentrations.

[4] 1-Hour average concentrations were determined by taking the average over all 5-minutes average concentrations within the hour.

Sample Calculation:

10-minute average concentration

$$\text{10-minute average con}\text{minute average concentration} = \frac{\text{(Previous 5 minute period concentration + current 5 minute period concentration)}}{2}$$

$$\text{10-minute average concentration} = \frac{1.4 + 1.7}{2}$$

10-minute average concentration = 1.55 ppb

APPENDIX C

Appendix C: Odour Flux Chamber Sampling Data

RWDI #2402272

Walker South Landfill Phase 2 Environmental Assessment

Odour sampling was completed at the Walker's Facility located in Thorold Ontario on September 2nd 2025 to September 5th and September 29th 2025.

Flux Chamber Flow Rate = 5 (L/min)

Source	Sample Location	Sample ID	Lab No.	Analysis Date	Analysis Time	Flux Chamber Area	ODTV-Detection		ORTV-Recognition	
							Lab Results	Flux Rate	Lab Results	Flux Rate
					Unit	(m^2)	(ou/m^3)	(ou/(s*m²))	(ou/m^3)	(ou/(s*m²))
South Landfill Interim Cover	ICA #1	WSL - ICA #1	-	2025-09-02	11:05 - 11:15	0.13	88	0.056	42	0.027
	ICA #2	WSL - ICA #2	-	2025-09-02	11:13 - 11:23	0.13	159	0.102	59	0.038
	ICA #3	WSL - ICA #3	-	2025-09-02	12:14 - 12:24	0.13	578	0.371	226	0.145
	ICA #4	WSL - ICA #4	-	2025-09-02	13:11 - 13:21	0.13	74	0.047	41	0.026
	ICA #5	WSL - ICA #5	-	2025-09-02	13:10 - 13:20	0.13	81	0.052	41	0.026
	ICA #6	WSL - ICA #6	-	2025-09-02	14:37 - 14:47	0.13	53	0.034	29	0.019
	ICA #7	WSL - ICA #7	-	2025-09-02	14:35 - 14:45	0.13	49	0.031	31	0.020
	ICA #8	WSL - ICA #8	-	2025-09-02	15:51 - 16:01	0.13	53	0.034	29	0.019
	ICA #9	WSL - ICA #9	-	2025-09-02	15:52 - 16:02	0.13	48	0.031	27	0.017
	Blank	Blank	-	2025-09-02	-	-	37	-	20	-
South Landfill Final Cover	FCA #1	WSL-FCA #1	-	2025-09-03	10:58 - 11:08	0.13	104	0.067	52	0.033
	FCA #2	WSL-FCA #2	-	2025-09-03	10:58 - 11:08	0.13	74	0.047	41	0.026
	FCA #3	WSL-FCA #3	-	2025-09-03	12:22 - 12:32	0.13	97	0.062	48	0.031
	FCA #4	WSL-FCA #4	-	2025-09-03	12:22 - 12:33	0.13	88	0.056	45	0.029
	FCA #5	WSL-FCA #5	-	2025-09-03	13:45 - 13:55	0.13	88	0.056	53	0.034
	FCA #6	WSL-FCA #6	-	2025-09-03	13:45 - 13:55	0.13	96	0.062	53	0.034
East Landfill Final Cover	FCA #7	ELF-FCA #7	-	2025-09-03	15:25 - 15:35	0.13	74	0.047	31	0.020
	FCA #8	ELF-FCA #8	-	2025-09-03	15:20 - 15:30	0.13	53	0.034	34	0.022
	FCA #9	ELF-FCA #9	-	2025-09-03	16:42 - 16:52	0.13	62	0.040	37	0.024
	Blank	Blank	-	2025-09-03	-	-	41	-	24	-
South Landfill Active Face	WF #1	WSL-WF #1	-	2025-09-04	10:50 - 11:00	0.13	268	0.172	136	0.087
	WF #2	WSL-WF #2	-	2025-09-04	10:50 - 11:00	0.13	413	0.265	174	0.112
	WF #3	WSL-WF #3	-	2025-09-04	11:50 - 12:00	0.13	411	0.263	190	0.122
	WF #4	WSL-WF #4	-	2025-09-04	11:50 - 12:00	0.13	319	0.204	176	0.113
	WF #5	WSL-WF #5	-	2025-09-04	12:36 - 12:46	0.13	268	0.172	147	0.094
	WF #6	WSL-WF #6	-	2025-09-04	12:50 - 1:00	0.13	490	0.314	226	0.145
	Blank	Blank	-	2025-09-04	-	0.13	75	0.048	34	0.022
Waste Soil Stockpile	WSS#1A	WSL - WSS#1A	-	2025-09-05	9:15 - 9:25	0.13	69	0.044	29	0.019
	WSS#1B	WSL - WSS#1B	-	2025-09-05	9:34 - 9:44	0.13	68	0.044	45	0.029
	WSS#2A	WSL - WSS#2A	-	2025-09-05	9:08 - 9:18	0.13	105	0.067	58	0.037
	WSS#2B	WSL - SSF#2B	-	2025-09-05	9:27 - 9:37	0.13	89	0.057	48	0.031
	WSS#3A	WSL - WSS#3A	-	2025-09-05	10:17 - 10:27	0.13	68	0.044	41	0.026
	WSS#3B	WSL - WSS#3B	-	2025-09-05	10:37 - 10:47	0.13	63	0.040	40	0.026
	Blank	Blank	-	2025-09-05	-	-	58	-	31	-
Leachate Pond	SLFLP#1	SLFLP#1	-	2025-09-29	10:44 - 10:54	0.13	219	0.140	114	0.073
	SLFLP#2	SLFLP#2	-	2025-09-29	10:55 - 11:05	0.13	262	0.168	153	0.098
	SLFLP#3	SLFLP#3	-	2025-09-29	11:10 - 11:20	0.13	310	0.199	152	0.097

Notes:

ODTV- Odour Detection Threshold Values

ORTV- Odour Recognition Threshold Values

Table 1: Summary of Average Odour Detection Results

Source	Average Flux Rate (ou/m^2 s)	Note
East Landfill Final Cover	4.04E-02	-
South Landfill Final Cover	5.84E-02	-
Study Landfill Final Cover	5.84E-02	[1]
South Landfill Interim Cover	8.43E-02	-
Study Landfill Interim Cover	8.43E-02	-
South Landfill Active Face	2.32E-01	-
Study Landfill Active Face	2.32E-01	[2]
Waste Soil Stockpile	4.94E-02	-
Leachate Pond	1.69E-01	-

Notes:

[1] Final cover emissions from the study site were assumed to be the higher of the two values between the East and South landfills.

[2] Interim cover and active working face emissions from the study site were assumed to be same as South Landfill Phase 1.

E

Table 2: Summary of Change in Odour Emission Rates since Previous Assessments - Average Scenario

Source	2020 Testing Flux Rate (ou/m^2 s)	September 2021 Testing Flux Rate (ou/m^2 s)	November 2022 South Testing Flux Rate (ou/m^2 s)	September 2025 Testing Flux Rate (ou/m^2 s)	Percentage Change (%) - with the Latest Available Data
East Landfill Final Cover	2.67E-02	1.41E-02	--	4.04E-02	186%
South Landfill Final Cover	2.97E-02	2.44E-02	8.93E-02	5.84E-02	-35%
Study Site Final Cover [1]	2.97E-02	2.44E-02	8.93E-02	5.84E-02	-35%
South Landfill Interim Cover	4.52E-02	1.71E-02	7.55E-02	8.43E-02	12%
Study Site Interim Cover [2]	4.52E-02	1.71E-02	7.55E-02	8.43E-02	12%
South Landfill Active Face	5.72E-02	3.87E-02	--	2.32E-01	499%
Study Site Active Face [2]	5.72E-02	3.87E-02	--	2.32E-01	499%
Waste Soil Stockpile	5.60E-02	--	--	4.94E-02	-12%
Leachate Pond	3.38E-02	--	--	1.69E-01	401%
West Landfill [3]	--	--	--	--	No Change

Notes:

[1] Final cover emissions from the study site were assumed to be the higher of the two values between the East Landfill and South Landfill Phase 1 in accordance with the previous modelling methodology.

[2] Interim cover and active working face emissions from the study site were assumed to be same as South Landfill Phase 1.

[3] Emissions from the West Landfill vary based on stage and were not changed for the 2025 update.

APPENDIX D

Appendix D1: H2S and VOC Flux Chamber Sampling Data

Walker South Landfill Phase 2 Environmental Assessment

RWDI Project #2402272

Results	Units	South Landfill - Interim Cover									South Landfill - Final Cover					
		SOUTH LANDFILL INTERMITTENT COVER AREA #1	SOUTH LANDFILL INTERMITTENT COVER AREA #2	SOUTH LANDFILL INTERMITTENT COVER AREA #3	SOUTH LANDFILL INTERMITTENT COVER AREA #4	SOUTH LANDFILL INTERMITTENT COVER AREA #5	SOUTH LANDFILL INTERMITTENT COVER AREA #6	SOUTH LANDFILL INTERMITTENT COVER AREA #7	SOUTH LANDFILL INTERMITTENT COVER AREA #8	SOUTH LANDFILL INTERMITTENT COVER AREA #9	SOUTH LANDFILL FINAL COVER AREA #1	SOUTH LANDFILL FINAL COVER AREA #2	SOUTH LANDFILL FINAL COVER AREA #3	SOUTH LANDFILL FINAL COVER AREA #4	SOUTH LANDFILL FINAL COVER AREA #5	SOUTH LANDFILL FINAL COVER AREA #6
Hydrogen sulfide	$\mu g/m^3$	8.8	5.6	5.6	5.6	5.6	5.6	5.8	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6
Acetone	$\mu g/m^3$	14.7	30.6	67.9	11.9	33	8.1	8.6	12.8	21.8	35.4	6.9	57.5	59.4	16.2	16.6
Allyl chloride	$\mu g/m^3$	0.63	0.63	0.63	0.63	0.63	0.63	0.66	0.63	0.63	0.63	0.63	0.63	0.63	0.63	0.63
Benzene	$\mu g/m^3$	0.32	0.32	32.9	0.32	1.15	0.32	0.32	0.32	1.85	0.32	0.83	0.32	0.32	0.32	0.32
Benzyl chloride	$\mu g/m^3$	1	1	1	1	1	1	1.1	1	1	1	1	1	1	1	1
Bromodichloromethane	$\mu g/m^3$	1.3	1.3	1.3	1.3	1.3	1.3	1.4	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
Bromoform	$\mu g/m^3$	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
Bromomethane	$\mu g/m^3$	0.78	0.78	0.78	0.78	0.78	0.78	0.82	0.78	0.78	0.78	0.78	0.78	0.78	0.78	0.78
1,3-Butadiene	$\mu g/m^3$	0.44	0.44	2.85	0.44	0.44	0.44	0.46	0.44	0.77	0.44	0.44	0.44	0.44	0.44	0.44
Carbon disulfide	$\mu g/m^3$	1.6	1.7	2.3	1.6	1.6	1.6	1.6	1.6	1.6	13.5	1.6	1.6	2.2	1.6	2.9
Carbon tetrachloride	$\mu g/m^3$	1.26	1.26	1.26	1.26	1.26	1.26	1.32	1.26	1.26	1.26	1.26	1.26	1.26	1.26	1.26
Chlorobenzene	$\mu g/m^3$	0.92	0.92	0.92	0.92	0.92	0.92	0.97	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Chloroethane	$\mu g/m^3$	0.53	3.67	34.3	0.53	1.61	0.53	0.55	0.53	4.8	0.53	0.53	0.53	0.53	0.53	0.53
Chloroform	$\mu g/m^3$	0.98	0.98	1.46	0.98	0.98	0.98	1.02	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Chloromethane	$\mu g/m^3$	0.56	2.06	4.38	0.41	1.47	0.41	0.43	0.41	3.49	0.41	0.43	0.56	0.41	0.91	0.7
Cyclohexane	$\mu g/m^3$	0.69	1.82	86	0.69	1.96	0.69	0.72	0.69	16.6	0.69	0.69	0.89	0.69	0.69	0.69
Dibromochloromethane	$\mu g/m^3$	1.7	1.7	1.7	1.7	1.7	1.7	1.8	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
1,2-Dibromoethane	$\mu g/m^3$	1.5	1.5	1.5	1.5	1.5	1.5	1.6	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
1,2-Dichlorobenzene	$\mu g/m^3$	1.2	1.2	1.2	1.2	1.2	1.2	1.3	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
1,3-Dichlorobenzene	$\mu g/m^3$	1.2	1.2	1.2	1.2	1.2	1.2	1.3	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
1,4-Dichlorobenzene	$\mu g/m^3$	1.2	1.2	1.2	1.2	1.2	1.2	1.3	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Dichlorodifluoromethane	$\mu g/m^3$	1.5	5	18.5	1	2.5	1	1	1	1.9	1	1	1.3	1	1.6	1.5
1,1-Dichloroethane	$\mu g/m^3$	0.81	0.81	0.81	0.81	0.81	0.81	0.85	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
1,2-Dichloroethane	$\mu g/m^3$	0.81	0.81	15.2	0.81	0.81	0.81	0.85	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
1,1-Dichloroethylene	$\mu g/m^3$	0.79	0.79	2.62	0.79	0.79	0.79	0.83	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79
cis-1,2-Dichloroethylene	$\mu g/m^3$	0.79	0.79	204	0.79	7.41	0.79	0.83	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79
trans-1,2-Dichloroethylene	$\mu g/m^3$	0.79	0.79	15.6	0.79	0.79	0.79	0.83	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79
Dichloromethane	$\mu g/m^3$	0.69	0.69	9.38	0.69	1.01	0.69	0.73	0.69	0.73	0.69	0.69	0.69	0.69	0.69	0.69
1,2-Dichloropropane	$\mu g/m^3$	0.9	0.9	2.1	0.9	0.9	0.9	1	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
1,3-Dichloropropylene (cis+trans)	$\mu g/m^3$	1.8	1.8	1.8	1.8	1.8	1.8	1.9	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
cis-1,3-Dichloropropylene	$\mu g/m^3$	0.9	0.9	0.9	0.9	0.9	0.9	1	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
trans-1,3-Dichloropropylene	$\mu g/m^3$	0.9	0.9	0.9	0.9	0.9	0.9	1	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
1,2-Dichlorotetrafluoroethane (Freon 114)	$\mu g/m^3$	1.4	1.4	1.4	1.4	1.4	1.4	1.5	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
1,4-Dioxane	$\mu g/m^3$	0.72	0.72	0.72	0.72	0.72	0.72	0.76	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72
Ethyl acetate	$\mu g/m^3$	0.76	0.76	12.8	0.83	0.9	0.9	1.01	0.97	0.97	0.9	0.83	0.86	1.3	0.83	1.01
Ethylbenzene	$\mu g/m^3$	0.43	0.48	70.8	0.43	3.82	0.43	0.43	0.43	2.21	0.43	0.43	0.43	0.43	0.43	0.43
4-Ethyltoluene	$\mu g/m^3$	1	1	4	1	1	1	1	1	1	1	1	1	1	1	1
n-Heptane	$\mu g/m^3$	0.82	0.82	240	0.82	8.24	0.82	0.86	0.82	41.4	0.82	0.82	0.82	0.82	0.82	0.82
Hexachlorobutadiene	$\mu g/m^3$	2.1	2.1	2.1	2.1	2.1	2.1	2.2	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
n-Hexane	$\mu g/m^3$	0.88	0.7	152	0.7	4.69	0.7	0.74	0.7	34	0.7	0.7	0.85	0.7	0.7	0.7
2-Hexanone	$\mu g/m^3$	4.1	4.1	4.92	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
Isopropanol	$\mu g/m^3$	12.3	12.3	37.1	12.3	12.3	12.3	12.3	12.3	17	12.3	12.3	12.3	12.3	12.3	12.3
Isopropylbenzene (cumene)	$\mu g/m^3$	1	1	2.6	2.1	1	1.2	1	2	1	1	1	1	1	1	1
Methyl ethyl ketone (MEK)	$\mu g/m^3$	1.47	3.21	86.7	1.27	5.99	0.91	0.86	2.06	2.09	3.57	1.3	3.27	2.09	1.74	2.48
Methyl isobutyl ketone (MIBK)	$\mu g/m^3$	0.82	0.82	9.83	0.82	0.82	0.82	0.86	0.82	1.56	0.82	0.82	0.82	0.82	0.82	0.82
Methyl-tert-butyl ether (MTBE)	$\mu g/m^3$	0.72	0.72	2.13	0.72	0.72	0.72	0.76	0.72	0.72	0.72	0.72	0.72	0.72	0.72	0.72
Naphthalene	$\mu g/m^3$	0.94	0.52	0.52	0.52	0.73	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52	0.52
Propylene	$\mu g/m^3$	4.3	37.5	286	0.45	8.4	0.34	0.5	0.55	88.4	1.17	0.52	3.82	0.5	0.81	0.67
Styrene	$\mu g/m^3$	0.85	0.85	5.88	0.85	0.85	0.85	0.89	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
1,1,2,2-Tetrachloroethane	$\mu g/m^3$	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
Tetrachloroethylene	$\mu g/m^3$	1.4	1.4	34.6	1.4	1.8	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
Tetrahydrofuran	$\mu g/m^3$	0.59	0.59	23.1	0.59	0.74	0.59	0.62	0.59	0.59	0.65	0.59	0.59	0.59	0.59	0.59
Toluene	$\mu g/m^3$	1.77	1.77	357	5.46	17.2	4.07	1.09	2.86	5.88	0.87	0.38	2.41	0.6	0.72	0.45
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	$\mu g/m^3$	1.5	1.5	1.5	1.5	1.5	1.5	1.6	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
1,2,4-Trichlorobenzene	$\mu g/m^3$	1.5	1.5	1.5	1.5	1.5	1.5	1.6	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
1,1,1-Trichloroethane	$\mu g/m^3$	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
1,1,2-Trichloroethane	$\mu g/m^3$	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
Trichloroethylene	$\mu g/m^3$	1.1	1.1	26.8	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
Trichlorofluoromethane	$\mu g/m^3$	1.1	1.1	64	1.1	2.5	1.1	1.2	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
1,2,4-Trimethylbenzene	$\mu g/m^3$	1	1	7.6	1	4.2	1	1	1	1	1	1	1	1	1	1
1,3,5-Trimethylbenzene	$\mu g/m^3$	1	1	3.7	1	1	1	1	1	1	1	1	1	1	1	1
2,2,4-Trimethylpentane	$\mu g/m^3$	0.9	1.7	68.2	0.9	1.8	0.9	1	0.9	17.1	0.9	0.9	0.9	0.9	0.9	0.9
Vinyl acetate	$\mu g/m^3$	17.6	17.6	29.9	17.6	17.6	17.6	17.6	17.6	17.6	17.6	17.6	17.6	17.6	17.6	17.6
Vinyl bromide	$\mu g/m^3$	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Vinyl chloride	$\mu g/m^3$	0.51	0.66	120	0.51	3.3	0.51	0.54	0.51	1.46	0.51	0.51	0.51	0.51	0.51	0.51
m+p-Xylene (mixture)	$\mu g/m^3$	1	1.13	214	0.87	11.6	0.87	1.04	0.87	5.56	0.87	0.87	0.87	0.87	0.87	0.87
o-Xylene	$\mu g/m^3$	0.43	0.43	61.6	0.43	3.47	0.43	0.43	0.43	1.48	0.43	0.43	0.43	0.43	0.43	0.43
Xylenes, total	$\mu g/m^3$	1.3	1.6	276	1.3	15.1	1.3	1.5	1.3	7	1.3	1.3	1.3	1.3	1.3	1.3
BTEX, total	$\mu g/m^3$	2.8	3.8	737	5.5	37.2	4.1	2.6	2.9	17	2.4	2.4	2.4	2.4	2.4	2.4

Notes:

[1] Sampling was conducted on Sep 2-5, 2025 and Sep 29, 2025.

[2] Samples with data below the dection threshold were assumed as the lowest dectection threshold for conservative assessment.

Appendix D1: H2S and VOC Flux Chamber Sampling Data

RWDI Project #2402272

Walker South Landfill Phase 2 Environmental Assessment

Results	Units	East Landfill - Final Cover			South Landfill - Working Face						Waste Soil Stockpile			Leachate Pond		
		EAST LANDFILLL FIANL COVER AREA #7	EAST LANDFILLL FIANL COVER AREA #8	EAST LANDFILLL FIANL COVER AREA #9	SOUTH LANDFILL WORKING FACE #1	SOUTH LANDFILL WORKING FACE #2	SOUTH LANDFILL WORKING FACE #3	SOUTH LANDFILL WORKING FACE #4	SOUTH LANDFILL WORKING FACE #5	SOUTH LANDFILL WORKING FACE #6	SOUTH LANDFILL WASTE SOIL STOCKPILE #1	SOUTH LANDFILL WASTE SOIL STOCKPILE #2	SOUTH LANDFILL WASTE SOIL STOCKPILE #3	SCFLP#1	SCFLP#2	SCFLP#3
Hydrogen sulfide	$\mu g/m^3$	5.6	5.6	5.6	5.6	5.6	5.6	5.7	5.6	5.6	5.7	5.6	5.6	5.6	5.6	5.6
Acetone	$\mu g/m^3$	24.9	17.6	17.3	406	1040	205	125	143	1770	14.7	6.6	14.2	1240	603	748
Allyl chloride	$\mu g/m^3$	0.63	0.63	0.63	3.04	15.6	15.8	15.6	15.7	196	0.63	0.63	0.63	0.63	0.63	0.63
Benzene	$\mu g/m^3$	0.32	0.32	0.32	3.8	7.99	8.05	7.99	8.02	99.7	0.35	0.42	0.83	4.63	3.61	4.34
Benzyl chloride	$\mu g/m^3$	1	1	1	1	25.3	26.1	25.9	26	324	1	1	1	1	1	1
Bromodichloromethane	$\mu g/m^3$	1.3	1.3	1.3	1.3	33.5	33.8	33.5	33.6	419	1.3	1.3	1.3	4.2	2.7	3.1
Bromoform	$\mu g/m^3$	2.1	2.1	2.1	2.1	51.7	52.2	51.7	51.9	646	2.1	2.1	2.1	2.1	2.1	2.1
Bromomethane	$\mu g/m^3$	0.78	0.78	0.78	0.78	19.4	19.6	19.4	19.5	243	0.78	0.78	0.78	0.82	0.78	0.78
1,3-Butadiene	$\mu g/m^3$	0.44	0.44	0.44	0.44	11.1	11.2	11.1	11.1	138	0.44	0.44	0.44	65.9	60.2	76.5
Carbon disulfide	$\mu g/m^3$	1.7	2.6	1.6	3.4	38.9	39.2	38.9	39.2	486	1.6	1.6	1.6	3.3	3.3	3.7
Carbon tetrachloride	$\mu g/m^3$	1.26	1.26	1.26	1.26	31.4	31.8	31.4	31.6	393	1.26	1.26	1.26	1.26	1.26	1.26
Chlorobenzene	$\mu g/m^3$	0.92	0.92	0.92	0.92	23	23.2	23	23.1	288	0.92	0.92	0.92	0.92	0.92	0.92
Chloroethane	$\mu g/m^3$	0.53	0.53	0.53	0.53	13.2	13.3	13.2	13.2	165	0.53	0.53	0.53	0.58	0.53	1.37
Chloroform	$\mu g/m^3$	0.98	0.98	0.98	0.98	24.4	24.6	24.4	24.5	305	0.98	0.98	0.98	3.96	3.03	2.54
Chloromethane	$\mu g/m^3$	0.41	0.41	0.41	1.3	10.3	10.4	10.3	10.4	129	0.47	0.83	0.66	1.42	1.05	5.97
Cyclohexane	$\mu g/m^3$	0.69	0.69	0.69	3.51	17.2	17.4	17.2	17.3	215	0.69	0.69	0.69	0.69	0.69	0.69
Dibromochloromethane	$\mu g/m^3$	1.7	1.7	1.7	1.7	42.6	43	42.6	42.8	532	1.7	1.7	1.7	4.2	3.2	4.3
1,2-Dibromoethane	$\mu g/m^3$	1.5	1.5	1.5	1.5	38.4	38.8	38.4	38.6	480	1.5	1.5	1.5	1.5	1.5	1.5
1,2-Dichlorobenzene	$\mu g/m^3$	1.2	1.2	1.2	1.2	30.1	30.4	30.1	30.2	376	1.2	1.2	1.2	1.2	1.2	1.2
1,3-Dichlorobenzene	$\mu g/m^3$	1.2	1.2	1.2	1.2	30.1	30.4	30.1	30.2	376	1.2	1.2	1.2	1.2	1.2	1.2
1,4-Dichlorobenzene	$\mu g/m^3$	1.2	1.2	1.2	1.2	30.1	30.4	30.1	30.2	376	1.2	1.2	1.2	1.2	2.3	1.2
Dichlorodifluoromethane	$\mu g/m^3$	1	1	1	3	24.7	25	24.7	24.8	309	1	2.2	1.7	1	1	1
1,1-Dichloroethane	$\mu g/m^3$	0.81	0.81	0.81	0.81	20.2	20.4	20.2	20.3	253	0.81	0.81	0.81	0.81	0.81	0.81
1,2-Dichloroethane	$\mu g/m^3$	0.81	0.81	0.81	3.08	20.2	20.4	20.2	20.3	253	0.81	0.81	0.81	0.81	0.81	0.81
1,1-Dichloroethylene	$\mu g/m^3$	0.79	0.79	0.79	0.79	19.8	20	19.8	19.9	248	0.79	0.79	0.79	0.79	0.79	0.79
cis-1,2-Dichloroethylene	$\mu g/m^3$	0.79	0.79	0.79	0.79	19.8	20	19.8	19.9	248	0.79	0.79	0.79	0.79	0.79	0.79
trans-1,2-Dichloroethylene	$\mu g/m^3$	0.79	0.79	0.79	0.79	19.8	20	19.8	19.9	248	0.79	0.79	0.79	0.79	0.79	0.79
Dichloromethane	$\mu g/m^3$	0.69	0.69	0.69	2.43	24.2	17.5	17.4	17.4	217	0.69	0.69	0.69	0.9	0.73	0.69
1,2-Dichloropropane	$\mu g/m^3$	0.9	0.9	0.9	0.9	23.1	23.3	23.1	23.2	289	0.9	0.9	0.9	0.9	0.9	0.9
1,3-Dichloropropylene (cis+trans)	$\mu g/m^3$	1.8	1.8	1.8	1.8	45.4	45.8	45.4	45.6	567	1.8	1.8	1.8	1.8	1.8	1.8
cis-1,3-Dichloropropylene	$\mu g/m^3$	0.9	0.9	0.9	0.9	22.7	22.9	22.7	22.8	284	0.9	0.9	0.9	0.9	0.9	0.9
trans-1,3-Dichloropropylene	$\mu g/m^3$	0.9	0.9	0.9	0.9	22.7	22.9	22.7	22.8	284	0.9	0.9	0.9	0.9	0.9	0.9
1,2-Dichlorotetrafluoroethane (Freon 114)	$\mu g/m^3$	1.4	1.4	1.4	1.4	35	35.3	35	35.1	437	1.4	1.4	1.4	1.4	1.4	1.4
1,4-Dioxane	$\mu g/m^3$	0.72	0.72	0.72	1.4	18	18.2	18	18.1	225	0.72	0.72	0.72	0.72	8.14	0.79
Ethyl acetate	$\mu g/m^3$	0.72	0.72	0.72	117	34.3	18.2	18	18.1	225	0.72	0.72	0.72	8.22	6.85	10.4
Ethylbenzene	$\mu g/m^3$	0.43	0.43	0.43	13.8	15.9	11.6	10.8	13.4	135	0.43	0.43	0.52	2.82	2.43	3.21
4-Ethyltoluene	$\mu g/m^3$	1	1	1	5.6	24.6	24.8	24.6	24.7	307	1	1	1	1	1	1
n-Heptane	$\mu g/m^3$	0.82	0.82	0.82	34.8	20.5	20.7	20.5	20.6	256	0.82	0.82	0.82	9.02	5.74	7.54
Hexachlorobutadiene	$\mu g/m^3$	2.1	2.1	2.1	2.1	53.3	53.8	53.3	53.5	666	2.1	2.1	2.1	2.1	2.1	2.1
n-Hexane	$\mu g/m^3$	0.7	0.7	0.7	18.7	17.6	17.8	17.6	17.7	220	0.7	0.7	0.7	7.16	5.18	6.31
2-Hexanone	$\mu g/m^3$	4.1	4.1	4.1	21.7	102	103	102	103	1280	4.1	4.1	4.1	6.96	4.1	6.56
Isopropanol	$\mu g/m^3$	12.3	12.3	12.3	84.3	61.4	61.9	61.4	61.7	767	12.3	12.3	12.3	32.9	33.7	23.6
Isopropylbenzene (cumene)	$\mu g/m^3$	1	1	1	2.2	24.6	24.8	24.6	24.7	307	1	1	1	1	1.9	1
Methyl ethyl ketone (MEK)	$\mu g/m^3$	2.48	2.09	1.18	1370	964	419	428	351	8400	1.68	1.18	3.21	271	183	295
Methyl isobutyl ketone (MIBK)	$\mu g/m^3$	0.82	0.82	0.82	11.6	20.5	20.7	20.5	20.6	256	0.82	0.82	0.82	3.11	2.87	2.7
Methyl-tert-butyl ether (MTBE)	$\mu g/m^3$	0.72	0.72	0.72	0.72	18	18.2	18	18.1	225	0.72	0.72	0.72	0.97	0.76	0.79
Naphthalene	$\mu g/m^3$	0.52	0.52	0.52	3.77	13.1	13.2	13.1	13.2	164	0.52	0.63	1.68	1.15	4.19	1.05
Propylene	$\mu g/m^3$	0.41	0.34	0.45	10.1	86.7	12.2	22.5	8.64	108	0.74	1.26	0.98	6.47	6.95	9.07
Styrene	$\mu g/m^3$	0.85	0.85	0.85	13.9	27.3	25	21.3	21.4	266	0.85	0.85	0.94	3.41	2.17	3.88
1,1,2,2-Tetrachloroethane	$\mu g/m^3$	1.4	1.4	1.4	1.4	34.3	34.7	34.3	34.5	429	1.4	1.4	1.4	1.4	1.4	1.4
Tetrachloroethylene	$\mu g/m^3$	1.4	1.4	1.4	4.1	33.9	4480	33.9	40.7	424	1.4	1.4	2.4	1.4	1.4	1.4
Tetrahydrofuran	$\mu g/m^3$	0.59	0.59	0.59	18	14.7	14.9	14.7	14.8	184	0.59	0.59	0.59	298	439	360
Toluene	$\mu g/m^3$	0.38	0.83	0.38	41.1	43	24.7	11	16	118	0.9	4.3	6.18	505	320	475
1,1,2-Trichloro-1,2,2-trifluoroethane (Freon 113)	$\mu g/m^3$	1.5	1.5	1.5	1.5	38.3	38.7	38.3	38.5	479	1.5	1.5	1.5	1.5	1.5	1.5
1,2,4-Trichlorobenzene	$\mu g/m^3$	1.5	1.5	1.5	1.5	37.1	37.5	37.1	37.2	464	1.5	1.5	1.5	1.5	1.5	1.5
1,1,1-Trichloroethane	$\mu g/m^3$	1.1	1.1	1.1	1.1	27.3	27.6	27.3	27.4	341	1.1	1.1	1.1	1.1	1.1	1.1
1,1,2-Trichloroethane	$\mu g/m^3$	1.1	1.1	1.1	1.1	27.3	27.6	27.3	27.4	341	1.1	1.1	1.1	1.1	1.1	1.1
Trichloroethylene	$\mu g/m^3$	1.1	1.1	1.1	1.1	26.9	27.1	26.9	27	336	1.1	1.1	1.1	1.1	1.1	1.1
Trichlorofluoromethane	$\mu g/m^3$	1.1	1.1	1.1	7.4	28.1	28.4	28.1	28.2	351	1.1	1.1	1.1	1.1	1.1	1.1
1,2,4-Trimethylbenzene	$\mu g/m^3$	1	1	1	22.8	31.3	24.8	24.6	24.7	307	1	1	1	2.1	4.7	2.3
1,3,5-Trimethylbenzene	$\mu g/m^3$	1	1	1	6.9	24.6	24.8	24.6	24.7	307	1	1	1	1	3.1	1
2,2,4-Trimethylpentane	$\mu g/m^3$	0.9	0.9	0.9	10.6	23.4	23.6	23.4	23.4	292	0.9	0.9	0.9	14.5	10.3	13.5
Vinyl acetate	$\mu g/m^3$	17.6	17.6	17.6	299	141	86.6	44	44.4	549	1.8	1.8	1.8	10.9	10.2	10.9
Vinyl bromide	$\mu g/m^3$	0.9	0.9	0.9	0.9	21.9	22.1	21.9	22	273	0.9	0.9	0.9	0.9	0.9	0.9
Vinyl chloride	$\mu g/m^3$	0.51	0.51	0.51	0.51	12.8	12.9	12.8	12.8	160	0.51	0.51	0.51	0.51	0.51	0.51
m+p-Xylene (mixture)	$\mu g/m^3$	0.87	0.87	0.87	39.1	34.5	30.6	21.7	38	271	0.87	0.87	1.26	8.42	15.4	9.81
o-Xylene	$\mu g/m^3$	0.43	0.43	0.43	14.2	15.1	12.7	10.8	11.8	135	0.43	0.43	0.43	2.91	12.9	3.6
Xylenes, total	$\mu g/m^3$	1.3	1.3	1.3	53.3	49.6	43.4	32.6	49.8	407	1.3	1.3	1.3	11.3	28.3	13.4
BTEX, total	$\mu g/m^3$	2.4	2.4	2.4	112	108	79.6	60.8	79.3	760	2.4	4.7	8.8	524	355	496

Notes:

[1] Sampling was conducted on Sep 2-5, 2025 and Sep 29, 2025.

[2] Samples with data below the dection threshold were assumed as the lowest dectection threshold for conservative assessment.

Appendix D2: H2S and VOC Flux Chamber Data - Emission Flux Rate Calculation

RWDI Project #2402272

Walker South Landfill Phase 2 Environmental Assessment

Contaminant	Average Emisison Flux Rate (g/m2/s) [1] [2]					
	East Landfill - Final Cover	South Landfill - Working Face	South Landfill - Interim Cover	South Landfill - Final Cover	Waste Soil Stockpile	Leachate Pond
Hydrogen sulfide	3.59E-09	3.60E-09	3.83E-09	2.50E-09	3.61E-09	3.59E-09
Benzene	2.05E-10	1.45E-08	2.69E-09	5.83E-10	3.42E-10	2.69E-09
1,1,2-Trichloroethane	7.05E-10	4.83E-08	7.05E-10	1.32E-09	7.05E-10	7.05E-10
Vinyl chloride	3.27E-10	2.26E-08	9.12E-09	4.61E-10	3.27E-10	3.27E-10

Notes:

[1] Sampling was conducted on Sep 2-5, 2025 and Sep 29, 2025.

[2] Samples with data below the dection threshold were assumed as the lowest dectection threshold for conservative assessment.

Sample Calculation forEast Landfill - Final Cover (Hydrogen sulfide)

Flow Rate = 5 L/min

Flux chamber area = 0.13 m^2

Average Hydrogen sulfide concentration = 5.6 μg/m³

Emission flux rate =

$$\frac{5.6\ \mu g}{1\ m^3} \times \frac{1\ g}{1000000\ \mu g} \times \frac{5\ L}{1\ min} \times \frac{1\ m^3}{1000\ L} \times \frac{1\ min}{60\ s} \times \frac{1}{0.13\ m^2} = 3.59E\text{-}09\ g/s$$

APPENDIX E

Appendix E: Landfill Gas Sampling Data

RWDI Project #2402272

Walker South Landfill Phase 2 Environmental Assessment

Results	CAS Number	Molecular Weight	CANISTER 1	CANISTER 2	Units	Maximum (%)	AVG (%)
Matrix Gases and CH4							
%v/v Dry Basis (Correct)							
O2 %			1.79%	1.07%	%	1.79%	1.43%
N2 %			99.16%	99.12%	%	99.16%	99.14%
CO2%			34.40%	36.40%	%	36.40%	35.40%
CH4 %			48.20%	50.90%	%	50.90%	49.55%

Non Methane Compounds	CAS Number	Molecular Weight	CANISTER 1	CANISTER 2	Units	Maximum (mg/m^3)	AVG (mg/m^3)	AVG (ppm)
Carbon disulfide	75-15-0	76.13	1.97	1.99	mg/m^3	1.99	1.98	0.64
Carbonyl sulfide	463-58-1	60.07	4.35	5.18	mg/m^3	5.18	4.77	1.94
Dimethyl disulfide	624-92-0	94.19	2.44	2.47	mg/m^3	2.47	2.46	0.64
Dimethyl sulfide	75-18-3	62.13	13.60	14.20	mg/m^3	14.20	13.90	5.47
Hydrogen sulfide	7783-06-4	34.08	914.00	1140.00	mg/m^3	1140.00	1027.00	736.80
Methyl mercaptan	74-93-1	48.10	9.88	9.58	mg/m^3	9.88	9.73	4.95
Sulfur, total reduced (as H2S), N	-	34.08	931.00	1160.00	mg/m^3	1160.00	1045.50	750.07
Acetone	67-64-1	58.08	26.10	33.00	mg/m^3	33.00	29.55	12.44
Allyl chloride	107-05-1	76.52	0.28	0.27	mg/m^3	0.28	0.28	0.09
Benzene	71-43-2	78.11	5.02	6.84	mg/m^3	6.84	5.93	1.86
Benzyl chloride	100-44-7	126.58	0.46	0.45	mg/m^3	0.46	0.46	0.09
Bromodichloromethane	75-27-4	163.82	0.60	0.59	mg/m^3	0.60	0.59	0.09
Bromoform	75-25-2	252.73	0.92	0.91	mg/m^3	0.92	0.91	0.09
Bromomethane	74-83-9	94.94	0.35	0.34	mg/m^3	0.35	0.34	0.09
Butadiene, 1,3-	106-99-0	54.09	0.27	0.31	mg/m^3	0.31	0.29	0.13
Carbon tetrachloride	56-23-5	153.81	0.56	0.55	mg/m^3	0.56	0.56	0.09
Chlorobenzene	108-90-7	112.56	0.41	0.40	mg/m^3	0.41	0.41	0.09
Chloroethane	75-00-3	64.51	0.30	0.34	mg/m^3	0.34	0.32	0.12
Chloroform	67-66-3	119.38	0.44	0.43	mg/m^3	0.44	0.43	0.09
Chloromethane	74-87-3	50.49	0.18	0.18	mg/m^3	0.18	0.18	0.09
Cyclohexane	110-82-7	84.16	2.73	3.42	mg/m^3	3.42	3.08	0.89
Dibromochloromethane	124-48-1	208.28	0.76	0.75	mg/m^3	0.76	0.75	0.09
Dibromoethane, 1,2-	106-93-4	187.86	0.69	0.67	mg/m^3	0.69	0.68	0.09
Dichlorobenzene, 1,2-	95-50-1	147.00	0.54	0.53	mg/m^3	0.54	0.53	0.09
Dichlorobenzene, 1,3-	541-73-1	147.00	0.54	0.53	mg/m^3	0.54	0.53	0.09
Dichlorobenzene, 1,4-	106-46-7	147.00	0.54	1.48	mg/m^3	1.48	1.01	0.17
Dichlorodifluoromethane	75-71-8	120.91	0.98	1.17	mg/m^3	1.17	1.08	0.22
Dichloroethane, 1,1-	75-34-3	98.96	0.36	0.36	mg/m^3	0.36	0.36	0.09
Dichloroethane, 1,2-	107-06-2	98.96	0.81	1.06	mg/m^3	1.06	0.93	0.23
Dichloroethylene, 1,1-	75-35-4	96.94	0.35	0.35	mg/m^3	0.35	0.35	0.09
Dichloroethylene, cis-1,2-	156-59-2	96.94	1.32	1.65	mg/m^3	1.65	1.49	0.37
Dichloroethylene, trans-1,2-	156-60-5	96.94	0.48	1.33	mg/m^3	1.33	0.91	0.23
Dichloromethane	75-09-2	84.93	0.51	0.63	mg/m^3	0.63	0.57	0.16
Dichloropropane, 1,2-	78-87-5	112.99	0.41	0.47	mg/m^3	0.47	0.44	0.10
Dichloropropylene, cis+trans-1,3	542-75-6	110.97	0.81	1.02	mg/m^3	1.02	0.92	0.20
Dichloropropylene, cis-1,3-	10061-01-5	110.97	0.41	0.40	mg/m^3	0.41	0.40	0.09
Dichloropropylene, trans-1,3-	10061-02-6	110.97	0.41	0.63	mg/m^3	0.63	0.52	0.11
Dichlorotetrafluoroethane, 1,2-	76-14-2	170.92	0.62	0.61	mg/m^3	0.62	0.62	0.09
Dioxane, 1,4-	123-91-1	88.11	0.32	0.32	mg/m^3	0.32	0.32	0.09
Ethyl acetate	141-78-6	88.11	10.60	16.20	mg/m^3	16.20	13.40	3.72
Ethylbenzene	100-41-4	106.17	7.56	26.30	mg/m^3	26.30	16.93	3.90
Ethyltoluene, 4-	622-96-8	120.19	0.44	2.75	mg/m^3	2.75	1.59	0.32
Heptane, n-	142-82-5	100.20	8.53	12.10	mg/m^3	12.10	10.32	2.52
Hexachlorobutadiene	87-68-3	260.74	0.95	0.93	mg/m^3	0.95	0.94	0.09
Hexane, n-	110-54-3	86.18	4.12	4.97	mg/m^3	4.97	4.55	1.29
Hexanone, 2-	591-78-6	100.16	1.83	11.00	mg/m^3	11.00	6.42	1.57
Isopropanol	67-63-0	60.10	21.10	29.70	mg/m^3	29.70	25.40	10.33
Isopropylbenzene	98-82-8	120.19	0.46	2.70	mg/m^3	2.70	1.58	0.32

Appendix E: Landfill Gas Sampling Data

RWDI Project #2402272

Walker South Landfill Phase 2 Environmental Assessment

Results	CAS Number	Molecular Weight	CANISTER 1	CANISTER 2	Units	Maximum (%)	AVG (%)
Matrix Gases and CH4							
%v/v Dry Basis (Correct)							
O2 %			1.79%	1.07%	%	1.79%	1.43%
N2 %			99.16%	99.12%	%	99.16%	99.14%
CO2%			34.40%	36.40%	%	36.40%	35.40%
CH4 %			48.20%	50.90%	%	50.90%	49.55%

Non Methane Compounds	CAS Number	Molecular Weight	CANISTER 1	CANISTER 2	Units	Maximum (mg/m^3)	AVG (mg/m^3)	AVG (ppm)
Methyl ethyl ketone [MEK]	78-93-3	72.11	35.10	52.80	mg/m³	52.80	43.95	14.90
Methyl isobutyl ketone [MIBK]	108-10-1	100.16	1.35	3.71	mg/m³	3.71	2.53	0.62
Methyl-tert-butyl ether [MTBE]	1634-04-4	88.15	0.32	0.32	mg/m³	0.32	0.32	0.09
Naphthalene	91-20-3	128.17	0.23	1.83	mg/m³	1.83	1.03	0.20
Propylene	115-07-1	42.08	30.50	37.90	mg/m³	37.90	34.20	19.87
Styrene	100-42-5	104.15	0.38	3.13	mg/m³	3.13	1.76	0.41
Tetrachloroethane, 1,1,2,2-	79-34-5	167.85	0.61	0.60	mg/m³	0.61	0.61	0.09
Tetrachloroethylene	127-18-4	165.83	0.88	2.27	mg/m³	2.27	1.57	0.23
Tetrahydrofuran	109-99-9	72.11	9.11	11.80	mg/m³	11.80	10.46	3.54
Toluene	108-88-3	92.14	34.90	64.80	mg/m³	64.80	49.85	13.23
Trichloro-1,2,2-trifluoroethane,	76-13-1	187.37	0.68	0.67	mg/m³	0.68	0.68	0.09
Trichlorobenzene, 1,2,4-	120-82-1	181.44	0.66	0.65	mg/m³	0.66	0.66	0.09
Trichloroethane, 1,1,1-	71-55-6	133.40	0.49	0.48	mg/m³	0.49	0.48	0.09
Trichloroethane, 1,1,2-	79-00-5	133.40	0.49	0.48	mg/m³	0.49	0.48	0.09
Trichloroethylene	79-01-6	131.38	0.84	1.31	mg/m³	1.31	1.08	0.20
Trichlorofluoromethane	75-69-4	137.36	0.67	0.84	mg/m³	0.84	0.76	0.13
Trimethylbenzene, 1,2,4-	95-63-6	120.19	0.44	7.77	mg/m³	7.77	4.10	0.83
Trimethylbenzene, 1,3,5-	108-67-8	120.19	0.44	3.19	mg/m³	3.19	1.81	0.37
Trimethylpentane, 2,2,4-	540-84-1	114.23	2.36	2.91	mg/m³	2.91	2.64	0.56
Vinyl acetate	108-05-4	86.09	0.79	0.77	mg/m³	0.79	0.78	0.22
Vinyl bromide	593-60-2	106.95	0.39	0.38	mg/m³	0.39	0.39	0.09
Vinyl chloride	75-01-4	62.50	0.77	0.92	mg/m³	0.92	0.84	0.33
Xylene, m+p-	108-38-3 / 106-42-3	106.16	9.64	53.00	mg/m³	53.00	31.32	7.21
Xylene, o-	95-47-6	106.17	3.51	20.10	mg/m³	20.10	11.81	2.72
Xylenes, total	1330-20-7	106.17	13.10	73.10	mg/m³	73.10	43.10	9.93
BTEX, total	-	-	60.60	171.00	mg/m³	171.00	115.80	28.90

Results	CAS Number	Molecular Weight	CANISTER 1	CANISTER 2	Units	Maximum (%)	AVG (%)
4-Bromofluorobenzene	-	-	8.98%	8.44%	%	8.98%	8.71%

Notes:

[1] Testing based on stream analysis conducted on Jan 27, 2026.

[2] Conversion (25°C, 1 atm): Concentration (ppm) = 24.45 × concentration (mg/m3) ÷ molecular weight.

APPENDIX F

Appendix C.1

Procedures For Sampling Surface/Bulk Dust Loading

This appendix presents procedures recommended for the collection of material samples from paved and unpaved roads and from bulk storage piles. (AP-42, Appendix C.2, "Procedures For Laboratory Analysis Of Surface/Bulk Dust Loading Samples", presents analogous information for the analysis of the samples.) These recommended procedures are based on a review of American Society For Testing And Materials (ASTM) methods, such as C-136 (sieve analysis) and D-2216 (moisture content). The recommendations follow ASTM standards where practical, and where not, an effort has been made to develop procedures consistent with the intent of the pertinent ASTM standards.

This appendix emphasizes that, before starting any field sampling program, one must first define the study area of interest and then determine the number of samples that can be collected and analyzed within the constraints of time, labor, and money available. For example, the study area could be defined as an individual industrial plant with its network of paved/unpaved roadways and material piles. In that instance, it is advantageous to collect a separate sample for each major dust source in the plant. This level of resolution is useful in developing cost-effective emission reduction plans. On the other hand, if the area of interest is geographically large (say a city or county, with a network of public roads), collecting at least 1 sample from each source would be highly impractical. However, in such an area, it is important to obtain samples representative of different source types within the area.

C.1.1 Samples From Unpaved Roads

Objective -

The overall objective in an unpaved road sampling program is to inventory the mass of particulate matter (PM) emissions from the roads. This is typically done by:

1. Collecting "representative" samples of the loose surface material from the road;
2. Analyzing the samples to determine silt fractions; and
3. Using the results in the predictive emission factor model given in AP-42, Section 13.2.2, Unpaved Roads, together with traffic data (e. g., number of vehicles traveling the road each day).

Before any field sampling program, it is necessary to define the study area of interest and to determine the number of unpaved road samples that can be collected and analyzed within the constraints of time, labor, and money available. For example, the study area could be defined as a very specific industrial plant having a network of roadways. Here it is advantageous to collect a separate sample for each major unpaved road in the plant. This level of resolution is useful in developing cost-effective emission reduction plans involving dust suppressants or traffic rerouting. On the other hand, the area of interest may be geographically large, and well-defined traffic information may not be easily obtained. In this case, resolution of the PM emission inventory to specific road segments would not be feasible, and it would be more important to obtain representative road-type samples within the area by aggregating several sample increments.

Procedure -

For a network consisting of many relatively short roads contained in a *well-defined study area* (as would be the case at an industrial plant), it is recommended that one collect a sample for each 0.8 kilometers (km) (0.5 miles [mi]) length, or portion thereof, for each major road segment. Here, the term "road segment" refers to the length of road between intersections (the nodes of the network) with other paved or unpaved roads. Thus, for a major segment 1 km (0.6 mi) long, 2 samples are recommended.

For longer roads in *study areas that are spatially diverse*, it is recommended that one collect a sample for each 4.8 km (3 mi) length of the road. Composite a sample from a minimum of 3 incremental samples. Collect the first sample increment at a random location within the first 0.8 km (0.5 mi), with additional increments taken from each remaining 0.8 km (0.5 mi) of the road, up to a maximum length of 4.8 km (3 mi). For a road less than 1.5 mi in length, an acceptable method for selecting sites for the increments is based on drawing 3 random numbers (x1, x2, x3) between zero and the length. Random numbers may be obtained from tabulations in statistical reference books, or scientific calculators may be used to generate pseudorandom numbers. See Figure C.1-1.

The following steps describe the collection method for samples (increments).

1. Ensure that the site offers an unobstructed view of traffic and that sampling personnel are visible to drivers. If the road is heavily traveled, use 1 person to "spot" and route traffic safely around another person collecting the surface sample (increment).

2. Using string or other suitable markers, mark a 0.3 meters (m) (1 foot [ft]) wide portion across the road. (WARNING: *Do not mark the collection area with a chalk line or in any other method likely to introduce fine material into the sample*.)

3. With a whisk broom and dustpan, remove the loose surface material from the hard road base. Do not abrade the base during sweeping. Sweeping should be performed slowly so that fine surface material is not injected into the air. NOTE: *Collect material only from the portion of the road over which the wheels and carriages routinely travel* (i. e., not from berms or any "mounds" along the road centerline).

4. Periodically deposit the swept material into a clean, labeled container of suitable size, such as a metal or plastic 19 liter (L) (5 gallon [gal]) bucket, having a sealable polyethylene liner. Increments may be mixed within this container.

5. Record the required information on the sample collection sheet (Figure C.1-2).

Sample Specifications -

For uncontrolled unpaved road surfaces, a gross sample of 5 kilograms (kg) (10 pounds [lb]) to 23 kg (50 lb) is desired. Samples of this size will require splitting to a size amenable for analysis (see Appendix C.2). For unpaved roads having been treated with chemical dust suppressants (such as petroleum resins, asphalt emulsions, etc.), the above goal may not be practical in well-defined study areas because a very large area would need to be swept. In general, a minimum of 400 grams (g) (1 lb) is required for silt and moisture analysis. Additional increments should be taken from heavily controlled unpaved surfaces, until the minimum sample mass has been achieved.

C.1.2 Samples From Paved Roads

Objective -

The overall objective in a paved road sampling program is to inventory the mass of particulate emissions from the roads. This is typically done by:

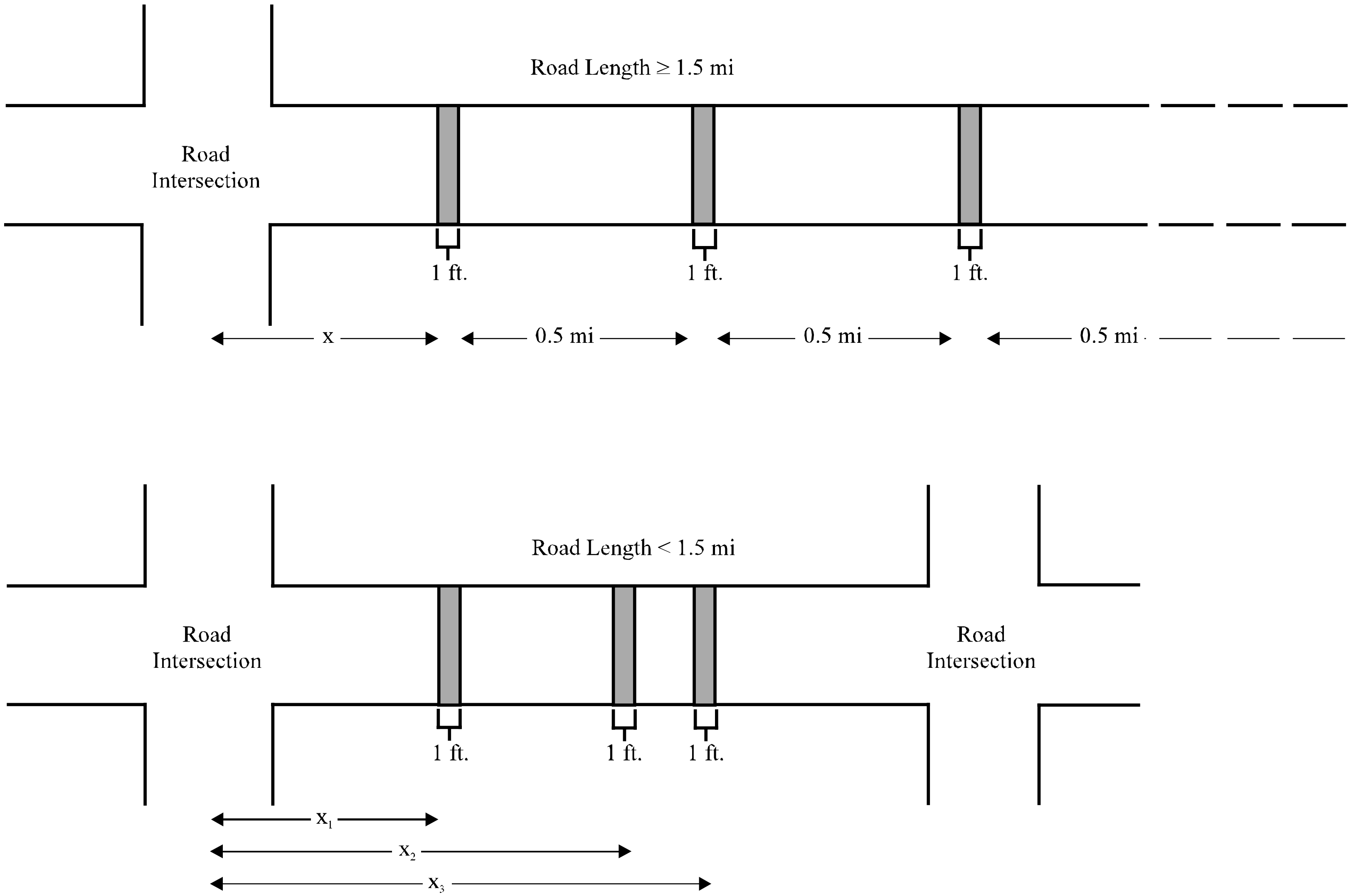


Figure C.1-1. Sampling locations for unpaved roads.

SAMPLING DATA FOR UNPAVED ROADS

Date Collected ___________ Recorded by ___________

Road Material (e.g., gravel, slag, dirt, etc.):* ____

Site of Sampling: ____

METHOD:

1. Sampling device: whisk broom and dustpan
2. Sampling depth: loose surface material (do not abrade road base)
3. Sample container: bucket with sealable liner
4. Gross sample specifications:
   a. Uncontrolled surfaces -- 5 kg (10 lb) to 23 kg (50 lb)
   b. Controlled surfaces -- minimum of 400 g (1 lb) is required for analysis

Refer to AP-42 Appendix B.1 for more detailed instructions.

Indicate any deviations from the above: ____

SAMPLING DATA COLLECTED:

Sample No.	Time	Location +	Surf. Area	Depth	Mass of Sample

* Indicate and give details if roads are controlled.

\+ Use code given on plant or road map for segment identification. Indicate sampling location on map.

Figure C.1-2. Example data form for unpaved road samples.

1. Collecting "representative" samples of the loose surface material from the road;
2. Analyzing the sample to determine the silt fraction; and
3. Combining the results with traffic data in a predictive emission factor model.

The remarks above about definition of the study area and the appropriate level of resolution for sampling unpaved roads are equally applicable to paved roads. Before a field sampling program, it is necessary first to define the study area of interest and then to determine the number of paved road samples that can be collected and analyzed. For example, in a well-defined study area (e. g., an industrial plant), it is advantageous to collect a separate sample for each major paved road, because the resolution can be useful in developing cost-effective emission reduction plans. Similarly, in geographically large study areas, it may be more important to obtain samples representative of road types within the area by aggregating several sample increments.

Compared to unpaved road sampling, planning for a paved road sample collection exercise necessarily involves greater consideration as to types of equipment to be used. Specifically, provisions must be made to accommodate the characteristics of the vacuum cleaner chosen. For example, paved road samples are collected by cleaning the surface with a vacuum cleaner with "tared" (i. e., weighed before use) filter bags. Upright "stick broom" vacuums use relatively small, lightweight filter bags, while bags for industrial-type vacuums are bulky and heavy. Because the mass collected is usually several times greater than the bag tare weight, uprights are thus well suited for collecting samples from lightly loaded road surfaces. On the other hand, on heavily loaded roads, the larger industrial-type vacuum bags are easier to use and can be more readily used to aggregate incremental samples from all road surfaces. These features are discussed further below.

Procedure -

For a network of many relatively short roads *contained in a well-defined study area* (as would be the case at an industrial plant), it is recommended that one collect a sample for each 0.8 km (0.5 mi) length, or portion thereof, for each major road segment. For a 1 km long (0.6 mi) segment, then, 2 samples are recommended. As mentioned, the term "road segment" refers to the length of road between intersections with other paved or unpaved roads (the nodes of the network).

For longer roads *in spatially heterogeneous study areas*, it is recommended that one collect a sample for each 4.8 km (3 mi) of sampled road length. Create a composite sample from a minimum of 3 incremental samples. Collect the first increment at a random location within the first 0.8 km (0.5 mi), with additional increments taken from each remaining 0.8 km (0.5 mi) of the road, up to a maximum length of 4.8 km (3 mi.) For a road less than 2.4 km (1.5 mi) long, an acceptable method for selecting sites for the increments is based on drawing 3 random numbers (x1, x2, x3) between zero and the length (See Figure C.1-3). Random numbers may be obtained from tabulations in statistical reference books, or scientific calculators may be used to generate pseudorandom numbers.

The following steps describe the collection method for samples (increments).

1. Ensure that the site offers an unobstructed view of traffic and that sampling personnel are visible to drivers. If the road is heavily traveled, use 1 crew member to "spot" and route traffic safely around another person collecting the surface sample (increment).

2. Using string or other suitable markers, mark the sampling portion across the road. (WARNING: *Do not mark the collection area with a chalk line or in any other method likely to introduce fine material into the sample*.) The widths may be varied between 0.3 m (1 ft) for visibly dirty roads and 3 m (10 ft) for clean roads. When an industrial-

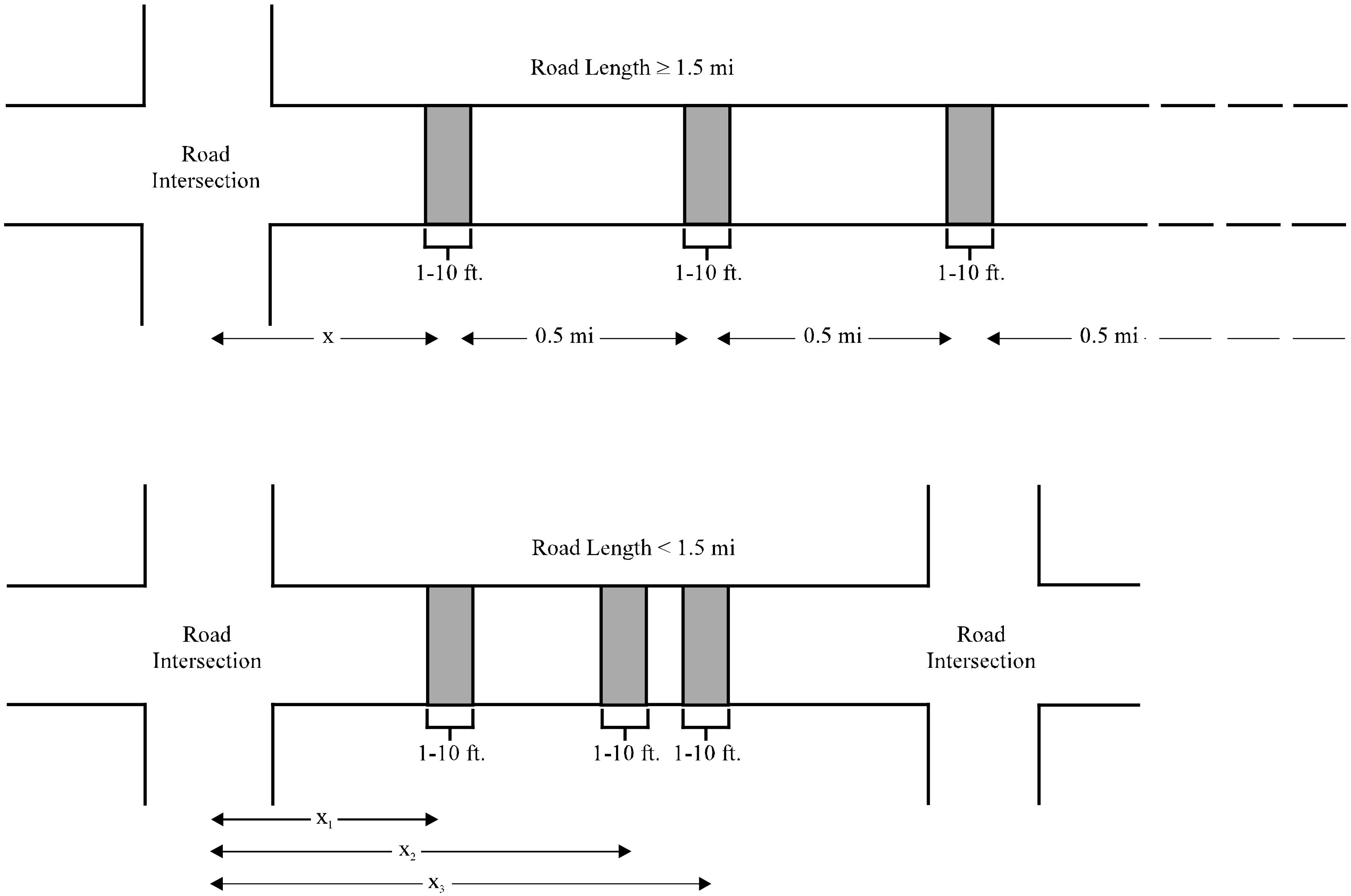


Figure C.1-3. Sampling locations for paved roads.

type vacuum is used to sample lightly loaded roads, a width greater than 3 m (10 ft) may be necessary to meet sample specifications, unless increments are being combined.

3. If large, loose material is present on the surface, it should be collected with a whisk broom and dustpan. NOTE: *Collect material only from the portion of the road over which the wheels and carriages routinely travel* (i. e., not from berms or any "mounds" along the road centerline). On roads with painted side markings, collect material "from white line to white line" (but avoid centerline mounds). Store the swept material in a clean, labeled container of suitable size, such as a metal or plastic 19 L (5 gal) bucket, with a sealable polyethylene liner. Increments for the same sample may be mixed within the container.

4. Vacuum the collection area using a portable vacuum cleaner fitted with an empty tared (preweighed) filter bag. NOTE: *Collect material only from the portion of the road over which the wheels and carriages routinely travel* (i. e., not from berms or any "mounds" along the road centerline). On roads with painted side markings, collect material "from white line to white line" (but avoid centerline mounds). The same filter bag may be used for different increments for 1 sample. For heavily loaded roads, more than 1 filter bag may be needed for a sample (increment).

5. Carefully remove the bag from the vacuum sweeper and check for tears or leaks. If necessary, reduce samples (using the procedure in Appendix C.2) from broom sweeping to a size amenable to analysis. Seal broom-swept material in a clean, labeled plastic jar for transport (alternatively, the swept material may be placed in the vacuum filter bag). Fold the unused portion of the filter bag, wrap a rubber band around the folded bag, and store the bag for transport.

6. Record the required information on the sample collection sheet (Figure C.1-4).

Sample Specifications -

When broom swept samples are collected, they should be at least 400 g (1 lb) for silt and moisture analysis. Vacuum swept samples should be at least 200 g (0.5 lb). Also, the weight of an "exposed" filter bag should be at least 3 to 5 times greater than when empty. Additional increments should be taken until these sample mass goals have been attained.

C.1.3 Samples From Storage Piles

Objective -

The overall objective of a storage pile sampling and analysis program is to inventory particulate matter emissions from the storage and handling of materials. This is done typically by:

1. Collecting "representative" samples of the material;
2. Analyzing the samples to determine moisture and silt contents; and
3. Combining analytical results with material throughput and meteorological information in an emission factor model.

As initial steps in storage pile sampling, it is necessary to decide (a) what emission mechanisms - material load-in to and load-out from the pile, wind erosion of the piles - are of interest, and (b) how many samples can be collected and analyzed, given time and monetary constraints. (In general, annual average PM emissions from material handling can be expected to be

SAMPLING DATA FOR PAVED ROADS

Date Collected __________ Recorded by __________

Sampling location* ______________________________ No. of Lanes __________

Surface type (e.g., asphalt, concrete, etc.)_______________________________________

Surface condition (e.g., good, rutted, etc.) _______________________________________

* Use code given on plant or road map for segment identification. Indication sampling location on map.

METHOD:

1. Sampling device: portable vacuum cleaner (whisk broom and dustpan if heavy loading present)
2. Sampling depth: loose surface material (do not sample curb areas or other untravelled portions of the road)
3. Sample container: tared and numbered vacuum cleaner bags (bucket with sealable liner if heavy loading present)
4. Gross sample specifications: Vacuum swept samples should be at least 200 g (0.5 lb), with the exposed filter bag weight should be at least 3 to 5 times greater than the empty bag tare weight.

Refer to AP-42 Appendix C.1 for more detailed instructions.

Indicate any deviations from the above: ____

____

____

SAMPLING DATA COLLECTED:

Sample No.	Vacuum Bag ID	Vacuum Bag Tare Wgt (g)	Sampling Surface Dimensions (l x w)	Time	Mass of Broom-Swept Sample +

\+ Enter "0" if no broom sweeping is performed.

Figure C.1-4. Example data form for paved roads.

much greater than those from wind erosion.) For an industrial plant, it is recommended that at least 1 sample be collected for each major type of material handled within the facility.

In a program to characterize load-in emissions, representative samples should be collected from material recently loaded into the pile. Similarly, representative samples for load-out emissions should be collected from areas that are worked by load-out equipment such as front end loaders or clamshells. For most "active" piles (i. e., those with frequent load-in and load-out operations), 1 sample may be considered representative of both loaded-in and loaded-out materials. Wind erosion material samples should be representative of the surfaces exposed to the wind.

In general, samples should consist of increments taken from all exposed areas of the pile (i. e., top, middle, and bottom). If the same material is stored in several piles, it is recommended that piles with at least 25 percent of the amount in storage be sampled. For large piles that are common in industrial settings (e. g., quarries, iron and steel plants), access to some portions may be impossible for the person collecting the sample. In that case, increments should be taken no higher than it is practical for a person to climb carrying a shovel and a pail.

Procedure -

The following steps describe the method for collecting samples from storage piles:

1. Sketch plan and elevation views of the pile. Indicate if any portion is not accessible. Use the sketch to plan where the N increments will be taken by dividing the perimeter into N-1 roughly equivalent segments.

    a. For a large pile, collect a minimum of 10 increments, as near to mid-height of the pile as practical.

    b. For a small pile, a sample should be a minimum of 6 increments, evenly distributed among the top, middle, and bottom.

    "Small" or "large" piles, for practical purposes, may be defined as those piles which can or cannot, respectively, be scaled by a person carrying a shovel and pail.

2. Collect material with a straight-point shovel or a small garden spade, and store the increments in a clean, labeled container of suitable size (such as a metal or plastic 19 L [5 gal] bucket) with a sealable polyethylene liner. Depending upon the ultimate goals of the sampling program, choose 1 of the following procedures:

    a. To characterize emissions from *material handling operations at an active pile*, take increments from the portions of the pile which most recently had material added and removed. Collect the material with a shovel to a depth of 10 to 15 centimeters (cm) (4 to 6 inches [in]). Do not deliberately avoid larger pieces of aggregate present on the surface.

    b. To characterize *handling emissions from an inactive pile*, obtain increments of the core material from a 1 m (3 ft) depth in the pile. A sampling tube 2 m (6 ft) long, with a diameter at least 10 times the diameter of the largest particle being sampled, is recommended for these samples. Note that, for piles containing large particles, the diameter recommendation may be impractical.

c. If characterization of *wind erosion*, rather than material handling is the goal of the sampling program, collect the increments by skimming the surface in an upwards direction. The depth of the sample should be 2.5 cm (1 in), or the diameter of the largest particle, whichever is less. Do not deliberately avoid collecting larger pieces of aggregate present on the surface.

In most instances, collection method "a" should be selected.

3. Record the required information on the sample collection sheet (Figure C.1-5). Note the space for deviations from the summarized method.

Sample Specifications -

For any of the procedures, the sample mass collected should be at least 5 kg (10 lb). When most materials are sampled with procedures 2a or 2b, 10 increments will normally result in a sample of at least 23 kg (50 lb). Note that storage pile samples usually require splitting to a size more amenable to laboratory analysis.

SAMPLING DATA FOR STORAGE PILES

Date Collected __________ Recorded by __________

Type of material sampled ____

Sampling location* ____

METHOD:

1. Sampling device: pointed shovel (hollow sampling tube if inactive pile is to be sampled)
2. Sampling depth:
   For material handling of active piles: 10-15 cm (4-6 in.)
   For material handling of inactive piles: 1 m (3 ft)
   For wind erosion samples: 2.5 cm (1 in.) or depth of the largest particle (whichever is less)
3. Sample container: bucket with sealable liner
4. Gross sample specifications:
   For material handling of active or inactive piles: minimum of 6 increments with total sample weight of 5 kg (10 lb) [10 increments totalling 23 kg (50 lb) are recommended]
   For wind erosion samples: minimum of 6 increments with total sample weight of 5 kg (10 lb)

Refer to AP-42 Appendix C.1 for more detailed instructions.

Indicate any deviations from the above: ____

____

____

SAMPLING DATA COLLECTED:

Sample No.	Time	Location* of Sample Collection	Device Used S/T **	Depth	Mass of Sample

* Use code given of plant or area map for pile/sample identification. Indicate each sampling location on map.

** Indicate whether shovel or tube.

Figure C.1-5. Example data form for storage piles.

SAMPLING DATA FOR UNPAVED ROADS

Date Collected Sept 3/25 Recorded by MDKB

Road Material (e.g., gravel, slag, dirt, etc.):* Granular A

Site of Sampling: Landfill Road - Unpaved

METHOD:

1. Sampling device: whisk broom and dustpan
2. Sampling depth: loose surface material (do not abrade road base)
3. Sample container: bucket with sealable liner
4. Gross sample specifications:
   a. Uncontrolled surfaces -- 5 kg (10 lb) to 23 kg (50 lb)
   b. Controlled surfaces -- minimum of 400 g (1 lb) is required for analysis

Refer to AP-42 Appendix B.1 for more detailed instructions.

Indicate any deviations from the above: Two Samples on UPL-1 and UPL-2 because road was 1.2 km (1 sample per 0.6 km)

SAMPLING DATA COLLECTED: Granular A is applied to maintain roads.

	Sample No.	Time	Location +	Surf. Area	Depth	Mass of Sample
Maint. ~~Landfill Haul~~	UPL_1	13:05	LF Road - maint	1'x20'	two lane	
	UPL_2	13:23	LF Road - maint	1'x25'	two lane	
	~~UPL_3~~					
LF other Haul Road.	UP_~~1~~3	14:08	LF Road - Haul	1'x24"	Two lane	
	UP_~~5~~4	14:41	LF Road - Haul	1'x23.5"	Two lane	
	UP_~~6~~5	14:59	LF Road - Haul	1'x20"	1 lane	

* Indicate and give details if roads are controlled.

\+ Use code given on plant or road map for segment identification. Indicate sampling location on map.

Figure C.1-2. Example data form for unpaved road samples.

SAMPLING DATA FOR PAVED ROADS

Date Collected Sept 3/25 Recorded by mdkb

Sampling location* landfill entrance No. of Lanes ______

Surface type (e.g., asphalt, concrete, etc.) asphalt

Surface condition (e.g., good, rutted, etc.) good - controls off peak traffic worst-case conditions watering missed by 2hrs due to test

* Use code given on plant or road map for segment identification. Indication sampling location on map.

METHOD:

1. Sampling device: portable vacuum cleaner (whisk broom and dustpan if heavy loading present)
2. Sampling depth: loose surface material (do not sample curb areas or other untravelled portions of the road)
3. Sample container: tared and numbered vacuum cleaner bags (bucket with sealable liner if heavy loading present)
4. Gross sample specifications: Vacuum swept samples should be at least 200 g (0.5 lb), with the exposed filter bag weight should be at least 3 to 5 times greater than the empty bag tare weight.

Refer to AP-42 Appendix C.1 for more detailed instructions.

Indicate any deviations from the above: ______

SAMPLING DATA COLLECTED:

Sample No.	Vacuum Bag ID	Vacuum Bag Tare Wgt (g)	Sampling Surface Dimensions (l x w)	Time	Mass of Broom-Swept Sample +	
PL-1	PL1	56	3' x 24'	1058	N/A	2 Lane
PL-2	PL2	57	4' x 25'	1034	N/A	2 Lane
PL-3	PL3	56	4' x 24.5'	11:13	N/A	2 Lane

\+ Enter "0" if no broom sweeping is performed.

Figure C.1-4. Example data form for paved roads.

SAMPLING DATA FOR UNPAVED ROADS

Date Collected Sept 3 /25 Recorded by MDEB

Road Material (e.g., gravel, slag, dirt, etc.):* granular A

Site of Sampling: Quarry Road.

METHOD:

1. Sampling device: whisk broom and dustpan
2. Sampling depth: loose surface material (do not abrade road base)
3. Sample container: bucket with sealable liner
4. Gross sample specifications:
   a. Uncontrolled surfaces -- 5 kg (10 lb) to 23 kg (50 lb)
   b. Controlled surfaces -- minimum of 400 g (1 lb) is required for analysis

Refer to AP-42 Appendix B.1 for more detailed instructions.

Indicate any deviations from the above:

SAMPLING DATA COLLECTED:

Sample No.	Time	Location +	Surf. Area	Depth	Mass of Sample
UPQ_1	12:00	Quarry - West	1'x42'	Surf	
UPQ_2	12:23	LF construction	1'x32'	Surf	
~~UPQ_3~~					
~~UPQ_4~~					
~~UPQ_5~~					
~~UPQ_6~~					

* Indicate and give details if roads are controlled.

\+ Use code given on plant or road map for segment identification. Indicate sampling location on map.

UPQ 2 - landfill construction

UPQ 1 - Quarry regular operations.

Figure C.1-2. Example data form for unpaved road samples.

Google Maps

Imagery ©2025 Airbus, CNES / Airbus, Maxar Technologies, Map data ©2025 200 m

SAMPLING DATA FOR UNPAVED ROADS

Date Collected 2025-09-29 Recorded by Jacob Hardwick

Road Material (e.g., gravel, slag, dirt, etc.):* gravel road - quarry road

Site of Sampling: ______

METHOD:

1. Sampling device: whisk broom and dustpan
2. Sampling depth: loose surface material (do not abrade road base)
3. Sample container: bucket with sealable liner
4. Gross sample specifications:
   a. Uncontrolled surfaces -- 5 kg (10 lb) to 23 kg (50 lb)
   b. Controlled surfaces -- minimum of 400 g (1 lb) is required for analysis

Refer to AP-42 Appendix B.1 for more detailed instructions.

Indicate any deviations from the above: ______

SAMPLING DATA COLLECTED:

Sample No.	Time	Location +	Surf. Area	Depth	Mass of Sample
Quarry Rd #1	12:33	648820 m E 4777305 m N	1ft x 44ft	surface	
Quarry Rd #2	12:46	648725 m E 4777275 m N	1 ft x 44ft	surface	

* Indicate and give details if roads are controlled.

\+ Use code given on plant or road map for segment identification. Indicate sampling location on map.

Figure C.1-2. Example data form for unpaved road samples.

SAMPLING DATA FOR STORAGE PILES

Date Collected 2025-09-24

Recorded by Jacob Hardwick

Type of material sampled Soil, "landfill cover material"

Sampling location* ______

METHOD:

1. Sampling device: pointed shovel (hollow sampling tube if inactive pile is to be sampled)
2. Sampling depth:
   For material handling of active piles: 10-15 cm (4-6 in.)
   For material handling of inactive piles: 1 m (3 ft)
   For wind erosion samples: 2.5 cm (1 in.) or depth of the largest particle (whichever is less)
3. Sample container: bucket with sealable liner
4. Gross sample specifications:
   For material handling of active or inactive piles: minimum of 6 increments with total sample weight of 5 kg (10 lb) [10 increments totalling 23 kg (50 lb) are recommended]
   For wind erosion samples: minimum of 6 increments with total sample weight of 5 kg (10 lb)

Refer to AP-42 Appendix C.1 for more detailed instructions.

Indicate any deviations from the above: ______

SAMPLING DATA COLLECTED:

Dark pile / k pile → (Landfill Stockpile T1, T2)

gravel / el pile → (Landfill Stockpile T3)

Sample No.	Time	Location* of Sample Collection	Device Used S/T **	Depth	Mass of Sample
Landfill Stockpile T1	13:03	~648770mE 4776940mN	Shovel	6"	
Landfill Stockpile T2	13:03	"	Shovel	6"	
Landfill Stockpile T3	13:05	"	Shovel	6"	

* Use code given of plant or area map for pile/sample identification. Indicate each sampling location on map.

** Indicate whether shovel or tube.

Figure C.1-5. Example data form for storage piles.

ALS Canada Ltd.

CERTIFICATE OF ANALYSIS

Work Order	: **WT2525408**		
Client	: **RWDI Air Inc.**	Laboratory	: ALS Environmental - Waterloo
Contact	: Anthony Vanderheyden	Account Manager	: Gayle Braun
Address	: 600 Southgate Drive Guelph Ontario Canada N1G 4P6	Address	: 60 Northland Road, Unit 1 Waterloo ON Canada N2V 2B8
Telephone	: 519 823 1311	E-mail	: Gayle.Braun@ALSGlobal.com
Project	: ----	Telephone	: +1 519 886 6910
PO	: ----	Date Samples Received	: 11-Sep-2025 08:40
C-O-C number	: ----	Date Analysis Commenced	: 12-Sep-2025
Sampler	: ----	Issue Date	: 19-Sep-2025 11:37
Site	: ----		
Quote number	: Grain Size		
No. of samples received	: 11		
No. of samples analysed	: 11		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Hedy Lai	Team Leader - Inorganics	Sask Soils, Saskatoon, Saskatchewan
Hedy Lai	Team Leader - Inorganics	Inorganics, Saskatoon, Saskatchewan
Jeremy Greuel	Laboratory Analyst	Inorganics, Saskatoon, Saskatchewan
Mitra Ardakani	Laboratory Assistant	Organics, Saskatoon, Saskatchewan

General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key: CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances.
LOR: Limit of Reporting (detection limit).

Unit	*Description*
-	no units
%	percent
g	grams

<: less than.
>: greater than.
Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical Results

Sub-Matrix: Soil
(Matrix: Soil/Solid)

Analyte	CAS Number	Method/Lab	LOR	Unit	PL1	PL2	PL3	UPQ1	UPQ2
				Client sample ID	----	----	----	----	----
				Client sampling date / time	03-Sep-2025 10:58	03-Sep-2025 10:34	03-Sep-2025 11:13	03-Sep-2025 12:00	03-Sep-2025 12:23
					WT2525408-001	WT2525408-002	WT2525408-003	WT2525408-004	WT2525408-005
					Result	Result	Result	Result	Result
Physical Tests									
Moisture	----	E144/SK	0.25	%	<0.25	0.27	<0.25	0.82	0.98
Sample weight, total	----	E146/SK	0.10	g	280	766	810	2860	682
Particle Size									
Sand (2.0mm - 0.05mm)	----	E180/SK	1.0	%	94.3	88.3	89.2	65.3	26.0
Silt (0.05mm - 0.002mm)	----	E180/SK	1.0	%	2.7	7.2	6.0	26.2	46.9
Clay (<0.002mm)	----	E180/SK	1.0	%	3.0	4.5	4.8	8.5	27.0
Texture class	----	E180/SK	-	-	Sand	Sand	Sand	Sandy Loam	Clay Loam
Grain size curve	----	E185/SK	-	-	See Attached	See Attached	See Attached	See Attached	See Attached
Percent Passing									
Passing (9.5mm)	----	E181/SK	1.0	%	100.0	99.8	99.8	36.1	93.6
Passing (4.75mm)	----	E181/SK	1.0	%	97.3	94.3	97.2	24.1	84.1
Passing (19mm)	----	E181/SK	1.0	%	100.0	100.0	100.0	86.4	100.0
Passing (25.4mm)	----	E181/SK	1.0	%	100.0	100.0	100.0	96.5	100.0
Passing (38.1mm)	----	E181/SK	1.0	%	100.0	100.0	100.0	100.0	100.0
Passing (50.8mm)	----	E181/SK	1.0	%	100.0	100.0	100.0	100.0	100.0
Passing (76.2mm)	----	E181/SK	1.0	%	100.0	100.0	100.0	100.0	100.0
Passing (1.0mm)	----	E182/SK	1.0	%	42.1	38.5	51.5	15.1	69.1
Passing (0.841mm)	----	E182/SK	1.0	%	35.2	33.4	46.4	14.6	68.3
Passing (0.50mm)	----	E182/SK	1.0	%	21.8	22.2	29.9	12.7	66.1
Passing (0.420mm)	----	E182/SK	1.0	%	18.6	19.7	26.1	12.2	65.5
Passing (0.250mm)	----	E182/SK	1.0	%	14.0	15.8	19.4	10.9	63.8

Analytical Results

Sub-Matrix: Soil
(Matrix: Soil/Solid)

Analyte	CAS Number	Method/Lab	LOR	Unit	PL1	PL2	PL3	UPQ1	UPQ2
				Client sample ID	----	----	----	----	----
				Client sampling date / time	03-Sep-2025 10:58	03-Sep-2025 10:34	03-Sep-2025 11:13	03-Sep-2025 12:00	03-Sep-2025 12:23
					WT2525408-001	WT2525408-002	WT2525408-003	WT2525408-004	WT2525408-005
					Result	Result	Result	Result	Result
Percent Passing									
Passing (0.149mm)	----	E182/SK	1.0	%	11.3	13.7	15.8	9.8	62.1
Passing (0.125mm)	----	E182/SK	1.0	%	10.3	12.9	14.5	9.3	61.1
Passing (0.075mm)	----	E182/SK	1.0	%	8.4	11.3	11.9	8.2	59.0
Passing (0.063mm)	----	E182/SK	1.0	%	6.5	9.7	10.3	7.3	57.0
Passing (0.05mm)	----	E182/SK	1.0	%	4.9	8.2	8.9	6.4	54.9
Passing (0.0312mm)	----	E183/SK	1.0	%	3.7	6.8	6.7	4.8	50.9
Passing (0.020mm)	----	E183/SK	1.0	%	3.4	5.0	5.8	3.6	44.6
Passing (0.005mm)	----	E183/SK	1.0	%	2.6	3.5	4.1	2.0	27.0
Passing (0.004mm)	----	E183/SK	1.0	%	2.6	3.5	4.1	2.0	24.9
Passing (0.002mm)	----	E183/SK	1.0	%	2.6	3.2	3.9	1.6	20.1
Passing (2.0mm)	----	E181/SK	1.0	%	85.7	70.1	82.5	18.5	74.2

Please refer to the General Comments section for an explanation of any qualifiers detected.

Analytical Results

Sub-Matrix: Soil
(Matrix: Soil/Solid)

Analyte	CAS Number	Method/Lab	LOR	Unit	UPL1	UPL2	UP3	UP4	UP5
				Client sample ID	----	----	----	----	----
				Client sampling date / time	03-Sep-2025 13:05	03-Sep-2025 13:23	03-Sep-2025 14:08	03-Sep-2025 14:41	03-Sep-2025 14:59
					WT2525408-006	WT2525408-007	WT2525408-008	WT2525408-009	WT2525408-010
					Result	Result	Result	Result	Result
Physical Tests									
Moisture	----	E144/SK	0.25	%	0.42	0.46	0.61	0.97	0.35
Sample weight, total	----	E146/SK	0.10	g	1850	4590	731	1060	4070

Analytical Results

Sub-Matrix: Soil
(Matrix: Soil/Solid)

Analyte	CAS Number	Method/Lab	LOR	Unit	UPL1 ---- 03-Sep-2025 13:05 WT2525408-006 Result	UPL2 ---- 03-Sep-2025 13:23 WT2525408-007 Result	UP3 ---- 03-Sep-2025 14:08 WT2525408-008 Result	UP4 ---- 03-Sep-2025 14:41 WT2525408-009 Result	UP5 ---- 03-Sep-2025 14:59 WT2525408-010 Result
Particle Size									
Sand (2.0mm - 0.05mm)	----	E180/SK	1.0	%	78.5	77.5	85.3	78.4	71.5
Silt (0.05mm - 0.002mm)	----	E180/SK	1.0	%	15.6	16.7	10.2	15.0	21.8
Clay (<0.002mm)	----	E180/SK	1.0	%	6.0	5.8	4.5	6.5	6.7
Texture class	----	E180/SK	-	-	Loamy Sand	Loamy Sand	Loamy Sand	Loamy Sand	Sandy Loam
Grain size curve	----	E185/SK	-	-	See Attached	See Attached	See Attached	See Attached	See Attached
Percent Passing									
Passing (9.5mm)	----	E181/SK	1.0	%	53.0	49.6	79.5	52.0	78.5
Passing (4.75mm)	----	E181/SK	1.0	%	35.2	30.7	52.1	30.5	59.8
Passing (19mm)	----	E181/SK	1.0	%	99.2	95.1	100.0	96.4	99.6
Passing (25.4mm)	----	E181/SK	1.0	%	100.0	100.0	100.0	100.0	100.0
Passing (38.1mm)	----	E181/SK	1.0	%	100.0	100.0	100.0	100.0	100.0
Passing (50.8mm)	----	E181/SK	1.0	%	100.0	100.0	100.0	100.0	100.0
Passing (76.2mm)	----	E181/SK	1.0	%	100.0	100.0	100.0	100.0	100.0
Passing (1.0mm)	----	E182/SK	1.0	%	16.8	13.0	16.1	14.8	35.1
Passing (0.841mm)	----	E182/SK	1.0	%	15.7	12.0	14.1	13.6	33.6
Passing (0.50mm)	----	E182/SK	1.0	%	12.4	10.0	10.3	10.7	28.4
Passing (0.420mm)	----	E182/SK	1.0	%	11.6	9.5	9.4	10.0	27.1
Passing (0.250mm)	----	E182/SK	1.0	%	9.8	8.3	7.4	8.4	23.5
Passing (0.149mm)	----	E182/SK	1.0	%	8.6	7.3	6.4	7.4	20.8
Passing (0.125mm)	----	E182/SK	1.0	%	8.1	6.8	6.0	7.0	19.6
Passing (0.075mm)	----	E182/SK	1.0	%	7.0	6.0	5.3	6.2	17.2

Analytical Results

Sub-Matrix: Soil
(Matrix: Soil/Solid)

Analyte	CAS Number	Method/Lab	LOR	Unit	UPL1 ----	UPL2 ----	UP3 ----	UP4 ----	UP5 ----
				Client sampling date / time	03-Sep-2025 13:05	03-Sep-2025 13:23	03-Sep-2025 14:08	03-Sep-2025 14:41	03-Sep-2025 14:59
					WT2525408-006	WT2525408-007	WT2525408-008	WT2525408-009	WT2525408-010
					Result	Result	Result	Result	Result
Percent Passing									
Passing (0.063mm)	----	E182/SK	1.0	%	6.1	5.2	4.7	5.5	15.0
Passing (0.05mm)	----	E182/SK	1.0	%	5.2	4.4	4.2	4.7	12.8
Passing (0.0312mm)	----	E183/SK	1.0	%	4.0	3.4	3.4	3.8	9.5
Passing (0.020mm)	----	E183/SK	1.0	%	3.2	2.6	2.6	3.0	7.7
Passing (0.005mm)	----	E183/SK	1.0	%	1.7	1.4	1.4	1.6	4.0
Passing (0.004mm)	----	E183/SK	1.0	%	1.7	1.3	1.4	1.5	3.9
Passing (0.002mm)	----	E183/SK	1.0	%	1.4	1.1	1.3	1.4	3.0
Passing (2.0mm)	----	E181/SK	1.0	%	24.2	19.4	28.4	22.0	44.7

Please refer to the General Comments section for an explanation of any qualifiers detected.

Analytical Results

Sub-Matrix: Soil
(Matrix: Soil/Solid)

Analyte	CAS Number	Method/Lab	LOR	Unit	STK1 ----	----	----	----	----
				Client sampling date / time	03-Sep-2025 12:38	----	----	----	----
					WT2525408-011	----	----	----	----
					Result	----	----	----	----
Physical Tests									
Moisture	----	E144/SK	0.25	%	13.4	----	----	----	----
Sample weight, total	----	E146/SK	0.10	g	3130	----	----	----	----
Particle Size									
Sand (2.0mm - 0.05mm)	----	E180/SK	1.0	%	19.5	----	----	----	----
Silt (0.05mm - 0.002mm)	----	E180/SK	1.0	%	34.7	----	----	----	----
Clay (<0.002mm)	----	E180/SK	1.0	%	45.8	----	----	----	----

Analytical Results

Sub-Matrix: Soil
(Matrix: Soil/Solid)

Analyte	CAS Number	Method/Lab	LOR	Unit	STK1 ----	----	----	----	----
				Client sampling date / time	03-Sep-2025 12:38	----	----	----	----
					WT2525408-011	----	----	----	----
					Result	----	----	----	----
Particle Size									
Texture class	----	E180/SK	-	-	Clay	----	----	----	----
Grain size curve	----	E185/SK	-	-	See Attached	----	----	----	----
Percent Passing									
Passing (9.5mm)	----	E181/SK	1.0	%	100.0	----	----	----	----
Passing (4.75mm)	----	E181/SK	1.0	%	98.7	----	----	----	----
Passing (19mm)	----	E181/SK	1.0	%	100.0	----	----	----	----
Passing (25.4mm)	----	E181/SK	1.0	%	100.0	----	----	----	----
Passing (38.1mm)	----	E181/SK	1.0	%	100.0	----	----	----	----
Passing (50.8mm)	----	E181/SK	1.0	%	100.0	----	----	----	----
Passing (76.2mm)	----	E181/SK	1.0	%	100.0	----	----	----	----
Passing (1.0mm)	----	E182/SK	1.0	%	86.4	----	----	----	----
Passing (0.841mm)	----	E182/SK	1.0	%	85.6	----	----	----	----
Passing (0.50mm)	----	E182/SK	1.0	%	82.9	----	----	----	----
Passing (0.420mm)	----	E182/SK	1.0	%	82.2	----	----	----	----
Passing (0.250mm)	----	E182/SK	1.0	%	80.0	----	----	----	----
Passing (0.149mm)	----	E182/SK	1.0	%	78.0	----	----	----	----
Passing (0.125mm)	----	E182/SK	1.0	%	77.2	----	----	----	----
Passing (0.075mm)	----	E182/SK	1.0	%	75.4	----	----	----	----
Passing (0.063mm)	----	E182/SK	1.0	%	74.4	----	----	----	----
Passing (0.05mm)	----	E182/SK	1.0	%	73.3	----	----	----	----
Passing (0.0312mm)	----	E183/SK	1.0	%	71.8	----	----	----	----

Analytical Results

Sub-Matrix: Soil
(Matrix: Soil/Solid)

Analyte	CAS Number	Method/Lab	LOR	Unit	STK1 ----	----	----	----	----
				Client sampling date / time	03-Sep-2025 12:38	----	----	----	----
					WT2525408-011	----	----	----	----
					Result	----	----	----	----
Percent Passing									
Passing (0.020mm)	----	E183/SK	1.0	%	68.0	----	----	----	----
Passing (0.005mm)	----	E183/SK	1.0	%	54.2	----	----	----	----
Passing (0.004mm)	----	E183/SK	1.0	%	51.7	----	----	----	----
Passing (0.002mm)	----	E183/SK	1.0	%	41.7	----	----	----	----
Passing (2.0mm)	----	E181/SK	1.0	%	91.1	----	----	----	----

Please refer to the General Comments section for an explanation of any qualifiers detected.

ALS Canada Ltd.

right solutions.
right partner.

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **WT2525408**	Page	: 1 of 13
Client	: **RWDI Air Inc.**	Laboratory	: ALS Environmental - Waterloo
Contact	: Anthony Vanderheyden	Account Manager	: Gayle Braun
Address	: 600 Southgate Drive Guelph ON Canada N1G 4P6	Address	: 60 Northland Road, Unit 1 Waterloo, Ontario Canada N2V 2B8
Telephone	: 519 823 1311	Telephone	: +1 519 886 6910
Project	: ----	Date Samples Received	: 11-Sep-2025 08:40
PO	: ----	Issue Date	: 19-Sep-2025 11:37
C-O-C number	: ----		
Sampler	: ----		
Site	: ----		
Quote number	: Grain Size		
No. of samples received	: 11		
No. of samples analysed	: 11		

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number: Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO: Data Quality Objective.
LOR: Limit of Reporting (detection limit).
RPD: Relative Percent Difference.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- No Analysis Holding Time Outliers exist.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method	Method	Sampling Date	Extraction / Preparation				Analysis			
Container / Client Sample ID(s)			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Particle Size : CSSC Particle Size Classification by Hydrometer										
LDPE bag PL1	E180	03-Sep-2025	----	----	----		16-Sep-2025	365 days	13 days	✓
Particle Size : CSSC Particle Size Classification by Hydrometer										
LDPE bag PL2	E180	03-Sep-2025	----	----	----		16-Sep-2025	365 days	13 days	✓
Particle Size : CSSC Particle Size Classification by Hydrometer										
LDPE bag PL3	E180	03-Sep-2025	----	----	----		16-Sep-2025	365 days	13 days	✓
Particle Size : CSSC Particle Size Classification by Hydrometer										
LDPE bag STK1	E180	03-Sep-2025	----	----	----		16-Sep-2025	365 days	13 days	✓
Particle Size : CSSC Particle Size Classification by Hydrometer										
LDPE bag UP3	E180	03-Sep-2025	----	----	----		16-Sep-2025	365 days	13 days	✓
Particle Size : CSSC Particle Size Classification by Hydrometer										
LDPE bag UP4	E180	03-Sep-2025	----	----	----		16-Sep-2025	365 days	13 days	✓
Particle Size : CSSC Particle Size Classification by Hydrometer										
LDPE bag UP5	E180	03-Sep-2025	----	----	----		16-Sep-2025	365 days	13 days	✓

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
			Preparation Date	*Holding Times Rec*	*Holding Times Actual*	*Eval*	*Analysis Date*	*Holding Times Rec*	*Holding Times Actual*	*Eval*
Particle Size : CSSC Particle Size Classification by Hydrometer										
LDPE bag UPL1	E180	03-Sep-2025	----	----	----		16-Sep-2025	365 days	13 days	✓
Particle Size : CSSC Particle Size Classification by Hydrometer										
LDPE bag UPL2	E180	03-Sep-2025	----	----	----		16-Sep-2025	365 days	13 days	✓
Particle Size : CSSC Particle Size Classification by Hydrometer										
LDPE bag UPQ1	E180	03-Sep-2025	----	----	----		16-Sep-2025	365 days	13 days	✓
Particle Size : CSSC Particle Size Classification by Hydrometer										
LDPE bag UPQ2	E180	03-Sep-2025	----	----	----		16-Sep-2025	365 days	13 days	✓
Particle Size : Grain Size Report (Attachment) Hydrometer/Sieve Method										
LDPE bag PL1	E185	03-Sep-2025	----	----	----		17-Sep-2025	----	----	
Particle Size : Grain Size Report (Attachment) Hydrometer/Sieve Method										
LDPE bag PL2	E185	03-Sep-2025	----	----	----		17-Sep-2025	----	----	
Particle Size : Grain Size Report (Attachment) Hydrometer/Sieve Method										
LDPE bag PL3	E185	03-Sep-2025	----	----	----		17-Sep-2025	----	----	
Particle Size : Grain Size Report (Attachment) Hydrometer/Sieve Method										
LDPE bag STK1	E185	03-Sep-2025	----	----	----		17-Sep-2025	----	----	
Particle Size : Grain Size Report (Attachment) Hydrometer/Sieve Method										
LDPE bag UP3	E185	03-Sep-2025	----	----	----		17-Sep-2025	----	----	

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Extraction / Preparation: Holding Times Rec	Extraction / Preparation: Holding Times Actual	Extraction / Preparation: Eval	Analysis: Analysis Date	Analysis: Holding Times Rec	Analysis: Holding Times Actual	Analysis: Eval
Particle Size : Grain Size Report (Attachment) Hydrometer/Sieve Method										
LDPE bag UP4	E185	03-Sep-2025	----	----	----		17-Sep-2025	----	----	
Particle Size : Grain Size Report (Attachment) Hydrometer/Sieve Method										
LDPE bag UP5	E185	03-Sep-2025	----	----	----		17-Sep-2025	----	----	
Particle Size : Grain Size Report (Attachment) Hydrometer/Sieve Method										
LDPE bag UPL1	E185	03-Sep-2025	----	----	----		17-Sep-2025	----	----	
Particle Size : Grain Size Report (Attachment) Hydrometer/Sieve Method										
LDPE bag UPL2	E185	03-Sep-2025	----	----	----		17-Sep-2025	----	----	
Particle Size : Grain Size Report (Attachment) Hydrometer/Sieve Method										
LDPE bag UPQ1	E185	03-Sep-2025	----	----	----		17-Sep-2025	----	----	
Particle Size : Grain Size Report (Attachment) Hydrometer/Sieve Method										
LDPE bag UPQ2	E185	03-Sep-2025	----	----	----		17-Sep-2025	----	----	
Percent Passing : Particle Size Analysis - Hydrometer										
LDPE bag PL1	E183	03-Sep-2025	15-Sep-2025	365 days	12 days	✓	15-Sep-2025	365 days	12 days	✓
Percent Passing : Particle Size Analysis - Hydrometer										
LDPE bag PL2	E183	03-Sep-2025	15-Sep-2025	365 days	12 days	✓	15-Sep-2025	365 days	12 days	✓
Percent Passing : Particle Size Analysis - Hydrometer										
LDPE bag PL3	E183	03-Sep-2025	15-Sep-2025	365 days	12 days	✓	15-Sep-2025	365 days	12 days	✓

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis: Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Percent Passing : Particle Size Analysis - Hydrometer										
LDPE bag STK1	E183	03-Sep-2025	15-Sep-2025	365 days	12 days	✓	15-Sep-2025	365 days	12 days	✓
Percent Passing : Particle Size Analysis - Hydrometer										
LDPE bag UP3	E183	03-Sep-2025	15-Sep-2025	365 days	12 days	✓	15-Sep-2025	365 days	12 days	✓
Percent Passing : Particle Size Analysis - Hydrometer										
LDPE bag UP4	E183	03-Sep-2025	15-Sep-2025	365 days	12 days	✓	15-Sep-2025	365 days	12 days	✓
Percent Passing : Particle Size Analysis - Hydrometer										
LDPE bag UP5	E183	03-Sep-2025	15-Sep-2025	365 days	12 days	✓	15-Sep-2025	365 days	12 days	✓
Percent Passing : Particle Size Analysis - Hydrometer										
LDPE bag UPL1	E183	03-Sep-2025	15-Sep-2025	365 days	12 days	✓	15-Sep-2025	365 days	12 days	✓
Percent Passing : Particle Size Analysis - Hydrometer										
LDPE bag UPL2	E183	03-Sep-2025	15-Sep-2025	365 days	12 days	✓	15-Sep-2025	365 days	12 days	✓
Percent Passing : Particle Size Analysis - Hydrometer										
LDPE bag UPQ1	E183	03-Sep-2025	15-Sep-2025	365 days	12 days	✓	15-Sep-2025	365 days	12 days	✓
Percent Passing : Particle Size Analysis - Hydrometer										
LDPE bag UPQ2	E183	03-Sep-2025	15-Sep-2025	365 days	12 days	✓	15-Sep-2025	365 days	12 days	✓
Percent Passing : Particle Size Analysis - Sieve <2mm										
LDPE bag PL1	E182	03-Sep-2025	15-Sep-2025	365 days	12 days	✓	15-Sep-2025	365 days	12 days	✓

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times: Rec	Holding Times: Actual	Eval	Analysis: Analysis Date	Holding Times: Rec	Holding Times: Actual	Eval
Percent Passing : Particle Size Analysis - Sieve <2mm										
LDPE bag PL2	E182	03-Sep-2025	15-Sep-2025	365 days	12 days	✓	15-Sep-2025	365 days	12 days	✓
Percent Passing : Particle Size Analysis - Sieve <2mm										
LDPE bag PL3	E182	03-Sep-2025	15-Sep-2025	365 days	12 days	✓	15-Sep-2025	365 days	12 days	✓
Percent Passing : Particle Size Analysis - Sieve <2mm										
LDPE bag STK1	E182	03-Sep-2025	15-Sep-2025	365 days	12 days	✓	15-Sep-2025	365 days	12 days	✓
Percent Passing : Particle Size Analysis - Sieve <2mm										
LDPE bag UP3	E182	03-Sep-2025	15-Sep-2025	365 days	12 days	✓	15-Sep-2025	365 days	12 days	✓
Percent Passing : Particle Size Analysis - Sieve <2mm										
LDPE bag UP4	E182	03-Sep-2025	15-Sep-2025	365 days	12 days	✓	15-Sep-2025	365 days	12 days	✓
Percent Passing : Particle Size Analysis - Sieve <2mm										
LDPE bag UP5	E182	03-Sep-2025	15-Sep-2025	365 days	12 days	✓	15-Sep-2025	365 days	12 days	✓
Percent Passing : Particle Size Analysis - Sieve <2mm										
LDPE bag UPL1	E182	03-Sep-2025	15-Sep-2025	365 days	12 days	✓	15-Sep-2025	365 days	12 days	✓
Percent Passing : Particle Size Analysis - Sieve <2mm										
LDPE bag UPL2	E182	03-Sep-2025	15-Sep-2025	365 days	12 days	✓	15-Sep-2025	365 days	12 days	✓
Percent Passing : Particle Size Analysis - Sieve <2mm										
LDPE bag UPQ1	E182	03-Sep-2025	15-Sep-2025	365 days	12 days	✓	15-Sep-2025	365 days	12 days	✓

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis: Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Percent Passing : Particle Size Analysis - Sieve <2mm										
LDPE bag UPQ2	E182	03-Sep-2025	15-Sep-2025	365 days	12 days	✓	15-Sep-2025	365 days	12 days	✓
Percent Passing : Particle Size Analysis - Sieve >2mm										
LDPE bag PL1	E181	03-Sep-2025	15-Sep-2025	365 days	12 days	✓	15-Sep-2025	365 days	12 days	✓
Percent Passing : Particle Size Analysis - Sieve >2mm										
LDPE bag PL2	E181	03-Sep-2025	15-Sep-2025	365 days	12 days	✓	15-Sep-2025	365 days	12 days	✓
Percent Passing : Particle Size Analysis - Sieve >2mm										
LDPE bag PL3	E181	03-Sep-2025	15-Sep-2025	365 days	12 days	✓	15-Sep-2025	365 days	12 days	✓
Percent Passing : Particle Size Analysis - Sieve >2mm										
LDPE bag STK1	E181	03-Sep-2025	15-Sep-2025	365 days	12 days	✓	15-Sep-2025	365 days	12 days	✓
Percent Passing : Particle Size Analysis - Sieve >2mm										
LDPE bag UP3	E181	03-Sep-2025	15-Sep-2025	365 days	12 days	✓	15-Sep-2025	365 days	12 days	✓
Percent Passing : Particle Size Analysis - Sieve >2mm										
LDPE bag UP4	E181	03-Sep-2025	15-Sep-2025	365 days	12 days	✓	15-Sep-2025	365 days	12 days	✓
Percent Passing : Particle Size Analysis - Sieve >2mm										
LDPE bag UP5	E181	03-Sep-2025	15-Sep-2025	365 days	12 days	✓	15-Sep-2025	365 days	12 days	✓
Percent Passing : Particle Size Analysis - Sieve >2mm										
LDPE bag UPL1	E181	03-Sep-2025	15-Sep-2025	365 days	12 days	✓	15-Sep-2025	365 days	12 days	✓

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis: Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Percent Passing : Particle Size Analysis - Sieve >2mm										
LDPE bag UPL2	E181	03-Sep-2025	15-Sep-2025	365 days	12 days	✓	15-Sep-2025	365 days	12 days	✓
Percent Passing : Particle Size Analysis - Sieve >2mm										
LDPE bag UPQ1	E181	03-Sep-2025	15-Sep-2025	365 days	12 days	✓	15-Sep-2025	365 days	12 days	✓
Percent Passing : Particle Size Analysis - Sieve >2mm										
LDPE bag UPQ2	E181	03-Sep-2025	15-Sep-2025	365 days	12 days	✓	15-Sep-2025	365 days	12 days	✓
Physical Tests : Moisture Content by Gravimetry										
LDPE bag PL1	E144	03-Sep-2025	----	----	----		15-Sep-2025	----	----	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag PL2	E144	03-Sep-2025	----	----	----		15-Sep-2025	----	----	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag PL3	E144	03-Sep-2025	----	----	----		15-Sep-2025	----	----	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag STK1	E144	03-Sep-2025	----	----	----		15-Sep-2025	----	----	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag UP3	E144	03-Sep-2025	----	----	----		15-Sep-2025	----	----	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag UP4	E144	03-Sep-2025	----	----	----		15-Sep-2025	----	----	

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis: Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : Moisture Content by Gravimetry										
LDPE bag UP5	E144	03-Sep-2025	----	----	----		15-Sep-2025	----	----	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag UPL1	E144	03-Sep-2025	----	----	----		15-Sep-2025	----	----	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag UPL2	E144	03-Sep-2025	----	----	----		15-Sep-2025	----	----	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag UPQ1	E144	03-Sep-2025	----	----	----		15-Sep-2025	----	----	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag UPQ2	E144	03-Sep-2025	----	----	----		15-Sep-2025	----	----	
Physical Tests : Total Sample Weight by Gravimetry										
LDPE bag PL1	E146	03-Sep-2025	----	----	----		12-Sep-2025	----	----	
Physical Tests : Total Sample Weight by Gravimetry										
LDPE bag PL2	E146	03-Sep-2025	----	----	----		12-Sep-2025	----	----	
Physical Tests : Total Sample Weight by Gravimetry										
LDPE bag PL3	E146	03-Sep-2025	----	----	----		12-Sep-2025	----	----	
Physical Tests : Total Sample Weight by Gravimetry										
LDPE bag STK1	E146	03-Sep-2025	----	----	----		12-Sep-2025	----	----	

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : Total Sample Weight by Gravimetry										
LDPE bag UP3	E146	03-Sep-2025	----	----	----		12-Sep-2025	----	----	
Physical Tests : Total Sample Weight by Gravimetry										
LDPE bag UP4	E146	03-Sep-2025	----	----	----		12-Sep-2025	----	----	
Physical Tests : Total Sample Weight by Gravimetry										
LDPE bag UP5	E146	03-Sep-2025	----	----	----		12-Sep-2025	----	----	
Physical Tests : Total Sample Weight by Gravimetry										
LDPE bag UPL1	E146	03-Sep-2025	----	----	----		12-Sep-2025	----	----	
Physical Tests : Total Sample Weight by Gravimetry										
LDPE bag UPL2	E146	03-Sep-2025	----	----	----		12-Sep-2025	----	----	
Physical Tests : Total Sample Weight by Gravimetry										
LDPE bag UPQ1	E146	03-Sep-2025	----	----	----		12-Sep-2025	----	----	
Physical Tests : Total Sample Weight by Gravimetry										
LDPE bag UPQ2	E146	03-Sep-2025	----	----	----		12-Sep-2025	----	----	

Legend & Qualifier Definitions

Rec. HT: ALS recommended hold time (see units).

Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Soil/Solid**

Evaluation: × = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Duplicates (DUP)							
Moisture Content by Gravimetry	E144	2219888	1	11	9.0	5.0	✓
CSSC Particle Size Classification by Hydrometer	E180	2221899	1	17	5.8	5.0	✓
Particle Size Analysis - Sieve <2mm	E182	2218803	1	12	8.3	5.0	✓
Particle Size Analysis - Hydrometer	E183	2218804	1	12	8.3	5.0	✓
Laboratory Control Samples (LCS)							
Moisture Content by Gravimetry	E144	2219888	1	11	9.0	5.0	✓
CSSC Particle Size Classification by Hydrometer	E180	2221899	1	17	5.8	5.0	✓
Particle Size Analysis - Sieve >2mm	E181	2218802	1	12	8.3	5.0	✓
Particle Size Analysis - Sieve <2mm	E182	2218803	1	12	8.3	5.0	✓
Particle Size Analysis - Hydrometer	E183	2218804	1	12	8.3	5.0	✓
Method Blanks (MB)							
Moisture Content by Gravimetry	E144	2219888	1	11	9.0	5.0	✓

Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by “mod”).

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Moisture Content by Gravimetry	E144 ALS Environmental - Saskatoon	Soil/Solid	CCME PHC in Soil - Tier 1	Moisture is measured gravimetrically by drying the sample at 105°C. Moisture content is calculated as the weight loss (due to water) divided by the wet weight of the sample, expressed as a percentage.
Total Sample Weight by Gravimetry	E146 ALS Environmental - Saskatoon	Soil/Solid	Direct Measurement	The whole sample is removed from the sample container and weighed.
CSSC Particle Size Classification by Hydrometer	E180 ALS Environmental - Saskatoon	Soil/Solid	CCME Vol 4 Analytical Methods	A soil sample is disaggregated to pass a 2mm sieve. The <2mm specimen is then further disaggregated using Calgon solution and suspended in solution. Two hydrometer readings are measured at specific times to determine %clay and %silt+clay using the principles of Stokes' law. %silt and %sand are determined mathematically.
Particle Size Analysis - Sieve >2mm	E181 ALS Environmental - Saskatoon	Soil/Solid	ASTM D6913-17 (mod)	Soil samples are disaggregated and sieved through a 2mm sieve. Material retained on the sieve is then further sieved through a series of sieves. The amount passing through the sieves is measured gravimetrically.
Particle Size Analysis - Sieve <2mm	E182 ALS Environmental - Saskatoon	Soil/Solid	ASTM D6913-17 (mod)	Soil samples are disaggregated and sieved through a 2mm sieve. Material passed through the sieve is then further disaggregated using calgon solution and passed through a series of sieves. The amount passing through the sieves is measured gravimetrically.
Particle Size Analysis - Hydrometer	E183 ALS Environmental - Saskatoon	Soil/Solid	ASTM D7928-21 (mod)	Soil material is separated from coarse material (>2mm). A specimen is then disaggregated through mixing with Calgon solution. The material is then suspended in solution wherein regular hydrometer readings are taken at specific time intervals. The principles of Stokes' Law are applied to determine the amount of material remaining in solution as well as the maximum particle size remaining in solution at the specified time.
Grain Size Report (Attachment) Hydrometer/Sieve Method	E185 ALS Environmental - Saskatoon	Soil/Solid	ASTM D6913/D7928	A grain size curve is a graphical representation of the particle sizing of a sample representing the percent passing against the effective particle size.

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Dry and Grind in Soil/Solid <60°C	EPP442 ALS Environmental - Saskatoon	Soil/Solid	Soil Sampling and Methods of Analysis, Carter 2008	After removal of any coarse fragments and reservation of wet subsamples a portion of homogenized sample is set in a tray and dried at less than 60°C until dry. The sample is then particle size reduced with an automated crusher or mortar and pestle, typically to <2 mm. Further size reduction may be needed for particular tests.

ALS Canada Ltd.

QUALITY CONTROL REPORT

Work Order	: **WT2525408**		
Client	: RWDI Air Inc.	Laboratory	: ALS Environmental - Waterloo
Contact	: Anthony Vanderheyden	Account Manager	: Gayle Braun
Address	: 600 Southgate Drive Guelph ON Canada N1G 4P6	Address	: 60 Northland Road, Unit 1 Waterloo, Ontario Canada N2V 2B8
Telephone	: 519 823 1311	Telephone	: +1 519 886 6910
Project	: ----	Date Samples Received	: 11-Sep-2025 08:40
PO	: ----	Date Analysis Commenced	: 12-Sep-2025
C-O-C number	: ----	Issue Date	: 19-Sep-2025 11:37
Sampler	: ----		
Site	: ----		
Quote number	: Grain Size		
No. of samples received	: 11		
No. of samples analysed	: 11		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- Reference Material (RM) Report; Recovery and Data Quality Objectives
- Method Blank (MB) Report; Recovery and Data Quality Objectives
- Laboratory Control Sample (LCS) Report; Recovery and Data Quality Objectives

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Hedy Lai	Team Leader - Inorganics	Saskatoon Inorganics, Saskatoon, Saskatchewan
Hedy Lai	Team Leader - Inorganics	Saskatoon Sask Soils, Saskatoon, Saskatchewan
Jeremy Greuel	Laboratory Analyst	Saskatoon Inorganics, Saskatoon, Saskatchewan
Mitra Ardakani	Laboratory Assistant	Saskatoon Organics, Saskatoon, Saskatchewan

General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number = Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO = Data Quality Objective.
LOR = Limit of Reporting (detection limit).
RPD = Relative Percent Difference
# = Indicates a QC result that did not meet the ALS DQO.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test-specific).

Sub-Matrix: **Soil/Solid**

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Physical Tests (QC Lot: 2219888)											
SK2505487-003	Anonymous	Moisture	----	E144	0.25	%	21.8	22.1	1.29%	20%	----
Particle Size (QC Lot: 2221899)											
YL2500929-005	Anonymous	Clay (<0.002mm)	----	E180	1.0	%	5.2	5.2	0.0	Diff <2x LOR	----
		Sand (2.0mm - 0.05mm)	----	E180	1.0	%	68.2	68.0	0.342%	10%	----
		Silt (0.05mm - 0.002mm)	----	E180	1.0	%	26.6	26.8	0.732%	10%	----
Percent Passing (QC Lot: 2218803)											
SK2505537-001	Anonymous	Passing (0.05mm)	----	E182	1.0	%	5.0	5.0	0.0	Diff <2x LOR	----
		Passing (0.063mm)	----	E182	1.0	%	6.7	7.0	0.3	Diff <2x LOR	----
		Passing (0.075mm)	----	E182	1.0	%	9.0	9.7	0.7	Diff <2x LOR	----
		Passing (0.125mm)	----	E182	1.0	%	26.4	25.2	4.62%	15%	----
		Passing (0.149mm)	----	E182	1.0	%	34.8	32.7	6.19%	15%	----
		Passing (0.250mm)	----	E182	1.0	%	80.4	79.4	1.26%	15%	----
		Passing (0.420mm)	----	E182	1.0	%	98.1	98.0	0.0990%	15%	----
		Passing (0.50mm)	----	E182	1.0	%	98.8	98.8	0.0568%	15%	----
		Passing (0.841mm)	----	E182	1.0	%	99.9	99.9	0.00835%	15%	----
		Passing (1.0mm)	----	E182	1.0	%	99.9	99.9	0.00874%	15%	----
Percent Passing (QC Lot: 2218804)											
SK2505537-001	Anonymous	Passing (0.002mm)	----	E183	1.0	%	4.0	4.0	0.0	Diff <2x LOR	----
		Passing (0.004mm)	----	E183	1.0	%	4.0	4.0	0.0	Diff <2x LOR	----
		Passing (0.005mm)	----	E183	1.0	%	4.0	4.0	0.0	Diff <2x LOR	----
		Passing (0.020mm)	----	E183	1.0	%	5.0	5.0	0.0	Diff <2x LOR	----
		Passing (0.0312mm)	----	E183	1.0	%	5.0	5.0	0.0	Diff <2x LOR	----

Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: **Soil/Solid**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 2219888)						
Moisture	----	E144	0.25	%	<0.25	----

Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: **Soil/Solid**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Target Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 2219888)									
Moisture	----	E144	0.25	%	50 %	100	90.0	110	----

Reference Material (RM) Report

A Reference Material (RM) is a homogenous material with known and well-established analyte concentrations. RMs are processed in an identical manner to test samples, and are used to monitor and control the accuracy and precision of a test method for a typical sample matrix. RM results are expressed as percent recovery of the target analyte concentration. RM targets may be certified target concentrations provided by the RM supplier, or may be ALS long-term mean values (for empirical test methods).

Sub-Matrix:

					Reference Material (RM) Report				
					RM Target	Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Reference Material ID	Analyte	CAS Number	Method	Concentration	RM	Low	High	Qualifier
Particle Size (QCLot: 2221899)									
QC-2221899-001	RM	Clay (<0.002mm)	----	E180	26.5 %	91.7	80.0	120	----
QC-2221899-001	RM	Sand (2.0mm - 0.05mm)	----	E180	44.8 %	105	90.0	110	----
QC-2221899-001	RM	Silt (0.05mm - 0.002mm)	----	E180	28.7 %	99.7	82.0	118	----
Percent Passing (QCLot: 2218802)									
QC-2218802-001	RM	Passing (19mm)	----	E181	100 %	100	90.0	110	----
QC-2218802-001	RM	Passing (2.0mm)	----	E181	100 %	100	90.0	110	----
QC-2218802-001	RM	Passing (25.4mm)	----	E181	100 %	100	90.0	110	----
QC-2218802-001	RM	Passing (38.1mm)	----	E181	100 %	100	90.0	110	----
QC-2218802-001	RM	Passing (4.75mm)	----	E181	100 %	100	90.0	110	----
QC-2218802-001	RM	Passing (50.8mm)	----	E181	100 %	100	90.0	110	----
QC-2218802-001	RM	Passing (76.2mm)	----	E181	100 %	100	90.0	110	----
QC-2218802-001	RM	Passing (9.5mm)	----	E181	100 %	100	90.0	110	----
Percent Passing (QCLot: 2218803)									
QC-2218803-001	RM	Passing (0.05mm)	----	E182	54.1 %	93.3	90.0	110	----
QC-2218803-001	RM	Passing (0.063mm)	----	E182	57.1 %	96.6	90.8	109	----
QC-2218803-001	RM	Passing (0.075mm)	----	E182	60.2 %	99.0	91.4	109	----
QC-2218803-001	RM	Passing (0.125mm)	----	E182	68.2 %	98.9	92.7	107	----
QC-2218803-001	RM	Passing (0.149mm)	----	E182	72 %	98.9	93.1	107	----
QC-2218803-001	RM	Passing (0.250mm)	----	E182	82.3 %	98.7	94.1	106	----
QC-2218803-001	RM	Passing (0.420mm)	----	E182	89.9 %	99.1	94.6	105	----
QC-2218803-001	RM	Passing (0.50mm)	----	E182	91.2 %	99.2	94.7	105	----
QC-2218803-001	RM	Passing (0.841mm)	----	E182	95.6 %	99.6	94.9	105	----
QC-2218803-001	RM	Passing (1.0mm)	----	E182	96.3 %	99.7	94.9	105	----
Percent Passing (QCLot: 2218804)									
QC-2218804-001	RM	Passing (0.002mm)	----	E183	24.6 %	88.5	76.0	124	----
QC-2218804-001	RM	Passing (0.004mm)	----	E183	29.3 %	89.9	80.0	120	----
QC-2218804-001	RM	Passing (0.005mm)	----	E183	31.2 %	88.9	82.0	118	----
QC-2218804-001	RM	Passing (0.020mm)	----	E183	43.3 %	91.4	87.0	113	----
QC-2218804-001	RM	Passing (0.0312mm)	----	E183	48.2 %	95.1	88.0	112	----

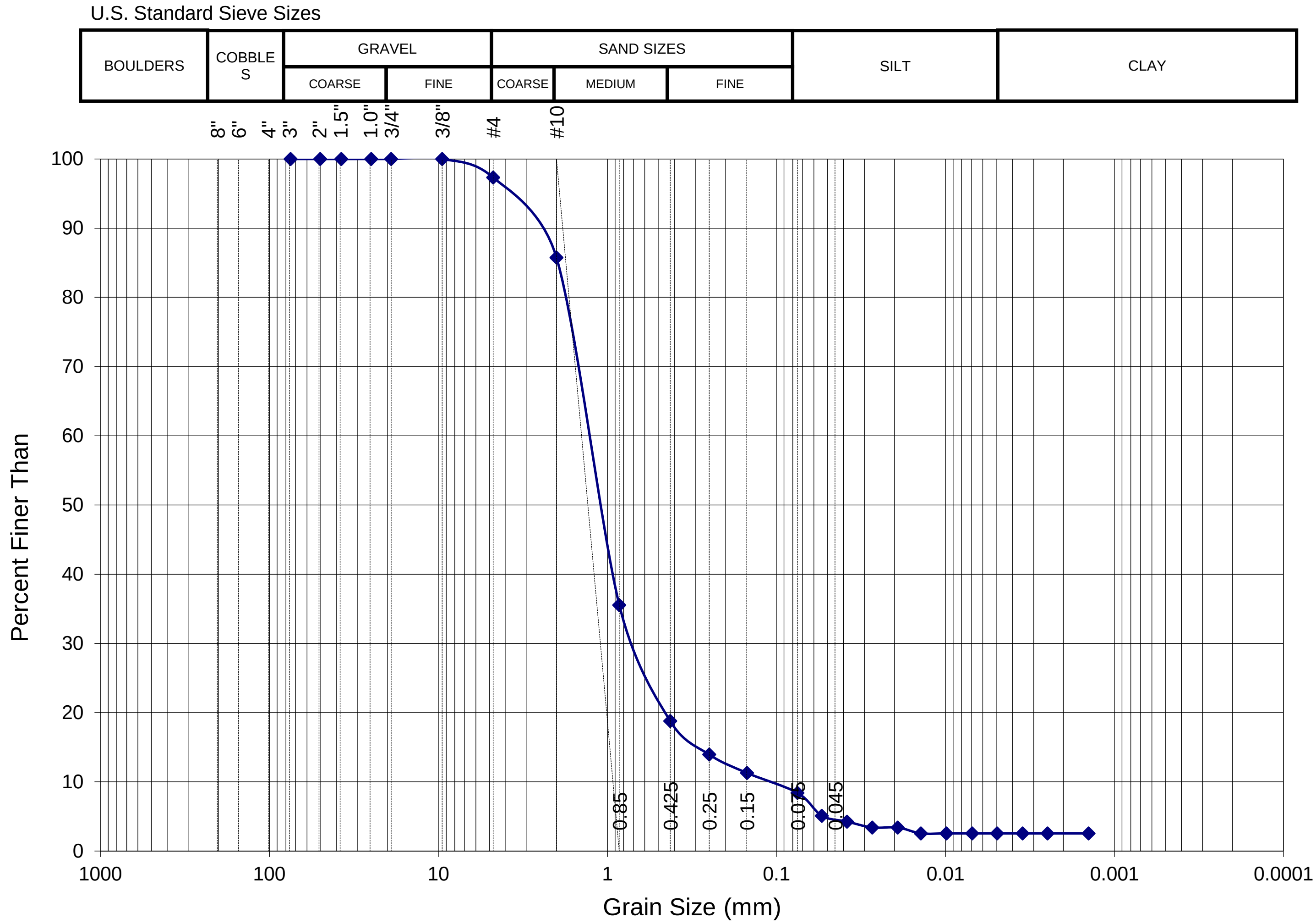
ALS Laboratory Group

819-58th Street, Saskatoon,SK

PARTICLE SIZE DISTRIBUTION CURVE

Client Name: WT2525408001
Project Number:
Client Sample ID PL1
Lab Sample ID WT2525408001

Test Completion Date: 15-Sep-25
Analyst: SIH



METHOD DESCRIPTION	
Method Reference: ASTM D6913 & D7928	
Dispersion method: Mechanical	
Dispersion period: 1 minute	cm/s

DESCRIPTION OF SAND AND GRAVEL PARTICLES

Shape: Angular
Hardness: Hard

SUMMARY OF RESULTS

GRAIN SIZE	WT %	DIA. RANGE (mm)
% GRAVEL :	2.66	> 4.75
% COARSE SAND :	11.60	2.0 - 4.75
% MEDIUM SAND :	66.94	0.425 - 2.0
% FINE SAND :	10.39	0.075 - 0.425
% SILT :	5.86	0.075 - 0.005
% CLAY :	2.55	< 0.005

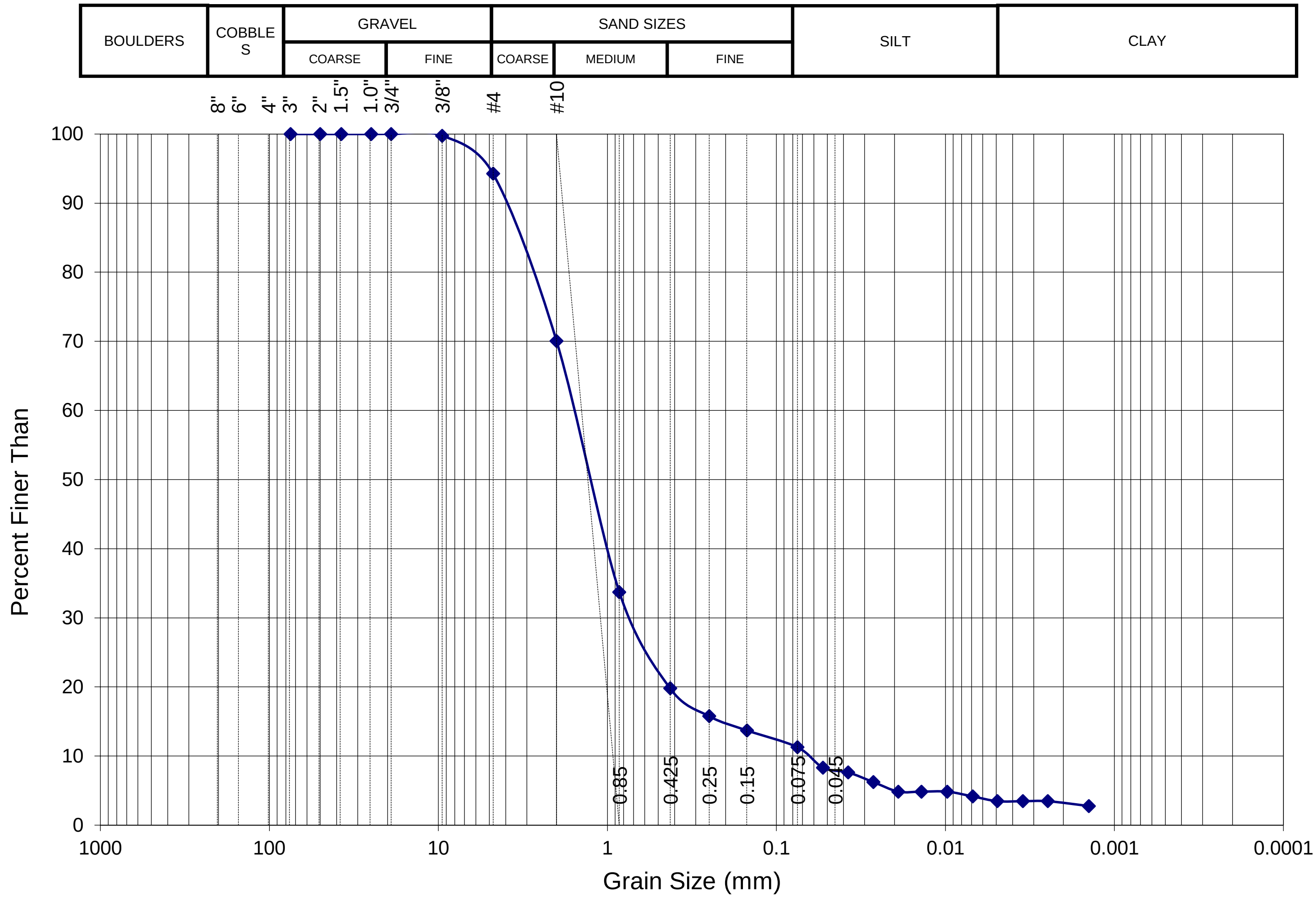
ALS Laboratory Group

819-58th Street, Saskatoon,SK

PARTICLE SIZE DISTRIBUTION CURVE

Client Name:	WT2525408002
Project Number:	
Client Sample ID	PL2
Lab Sample ID	WT2525408002
Test Completion Date:	15-Sep-25
Analyst:	SIH

U.S. Standard Sieve Sizes



METHOD DESCRIPTION	
Method Reference: ASTM D6913 & D7928	
Dispersion method: Mechanical	
Dispersion period: 1 minute	cm/s

DESCRIPTION OF SAND AND GRAVEL PARTICLES
Shape: Angular
Hardness: Hard

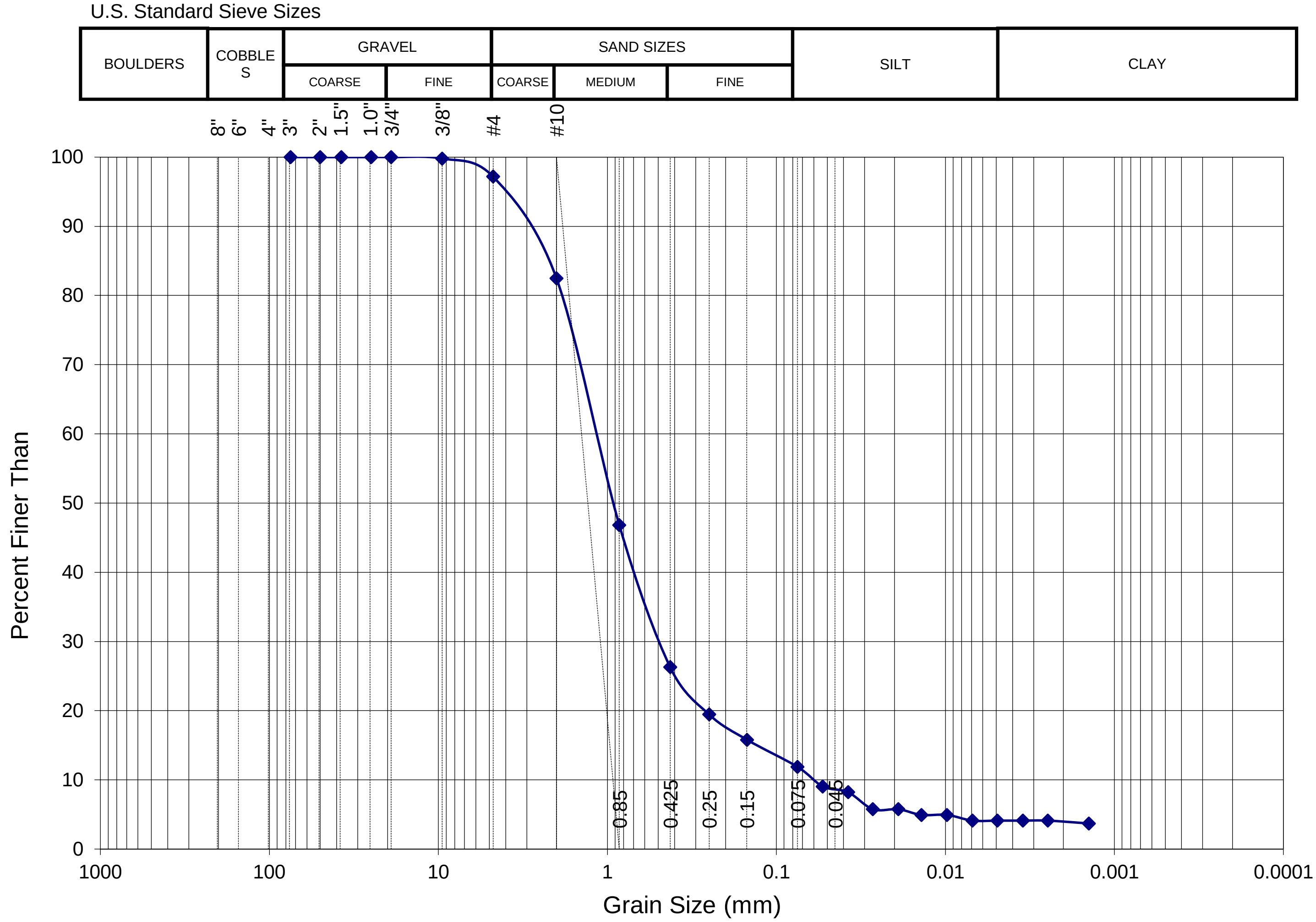
SUMMARY OF RESULTS		
GRAIN SIZE	WT %	DIA. RANGE (mm)
% GRAVEL :	5.73	> 4.75
% COARSE SAND :	24.21	2.0 - 4.75
% MEDIUM SAND :	50.28	0.425 - 2.0
% FINE SAND :	8.51	0.075 - 0.425
% SILT :	7.77	0.075 - 0.005
% CLAY :	3.50	< 0.005

ALS Laboratory Group

819-58th Street, Saskatoon,SK

PARTICLE SIZE DISTRIBUTION CURVE

Client Name:	WT2525408003
Project Number:	
Client Sample ID	PL3
Lab Sample ID	WT2525408003
Test Completion Date:	15-Sep-25
Analyst:	SIH



METHOD DESCRIPTION	
Method Reference: ASTM D6913 & D7928	
Dispersion method: Mechanical	
Dispersion period: 1 minute	cm/s

DESCRIPTION OF SAND AND GRAVEL PARTICLES
Shape: Angular
Hardness: Hard

SUMMARY OF RESULTS		
GRAIN SIZE	WT %	DIA. RANGE (mm)
% GRAVEL :	2.82	> 4.75
% COARSE SAND :	14.70	2.0 - 4.75
% MEDIUM SAND :	56.19	0.425 - 2.0
% FINE SAND :	14.41	0.075 - 0.425
% SILT :	7.77	0.075 - 0.005
% CLAY :	4.11	< 0.005

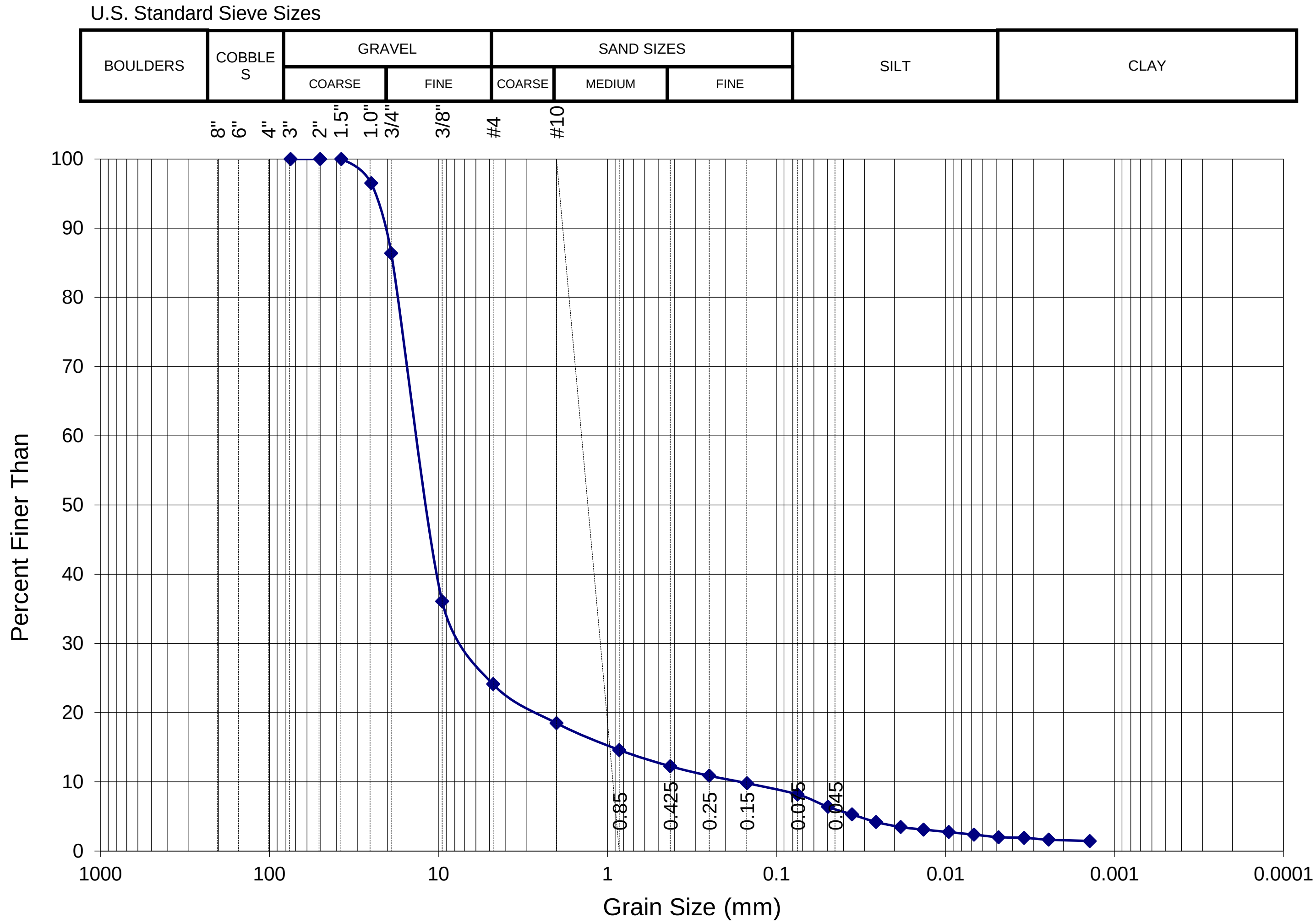
ALS Laboratory Group

819-58th Street, Saskatoon,SK

PARTICLE SIZE DISTRIBUTION CURVE

Client Name: WT2525408004
Project Number:
Client Sample ID UPQ1
Lab Sample ID WT2525408004

Test Completion Date: 15-Sep-25
Analyst: SIH



METHOD DESCRIPTION	
Method Reference: ASTM D6913 & D7928	
Dispersion method: Mechanical	
Dispersion period: 1 minute	cm/s

DESCRIPTION OF SAND AND GRAVEL PARTICLES
Shape: Angular
Hardness: Hard

SUMMARY OF RESULTS

GRAIN SIZE	WT %	DIA. RANGE (mm)
% GRAVEL :	75.88	> 4.75
% COARSE SAND :	5.65	2.0 - 4.75
% MEDIUM SAND :	6.21	0.425 - 2.0
% FINE SAND :	4.07	0.075 - 0.425
% SILT :	6.15	0.075 - 0.005
% CLAY :	2.04	< 0.005

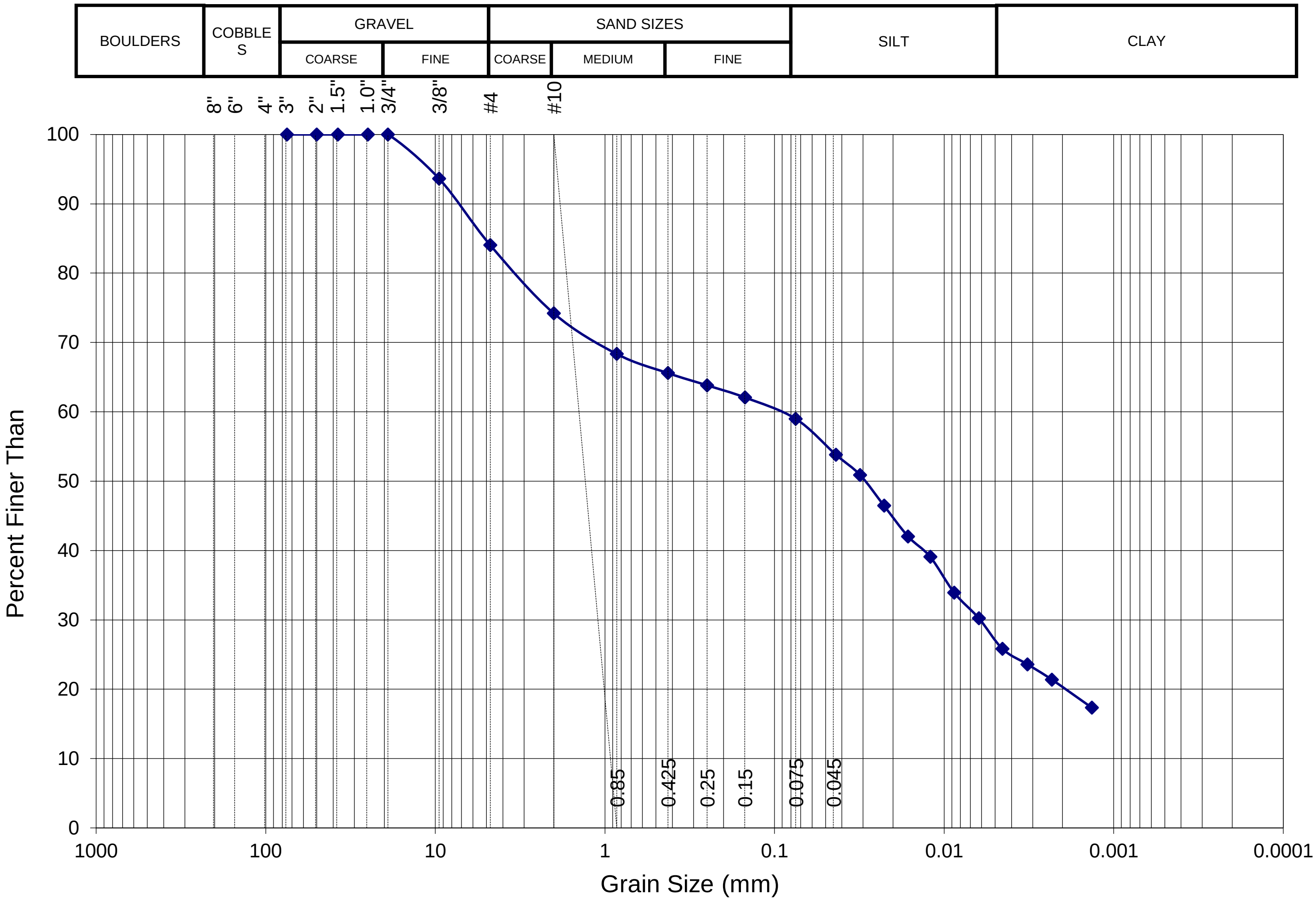
ALS Laboratory Group

819-58th Street, Saskatoon,SK

PARTICLE SIZE DISTRIBUTION CURVE

Client Name:	WT2525408005
Project Number:	
Client Sample ID	UPQ2
Lab Sample ID	WT2525408005
Test Completion Date:	15-Sep-25
Analyst:	SIH

U.S. Standard Sieve Sizes



METHOD DESCRIPTION	
Method Reference: ASTM D6913 & D7928	
Dispersion method: Mechanical	
Dispersion period: 1 minute	cm/s

DESCRIPTION OF SAND AND GRAVEL PARTICLES
Shape: Angular
Hardness: Hard

SUMMARY OF RESULTS		
GRAIN SIZE	WT %	DIA. RANGE (mm)
% GRAVEL :	15.93	> 4.75
% COARSE SAND :	9.87	2.0 - 4.75
% MEDIUM SAND :	8.61	0.425 - 2.0
% FINE SAND :	6.59	0.075 - 0.425
% SILT :	31.82	0.075 - 0.005
% CLAY :	27.18	< 0.005

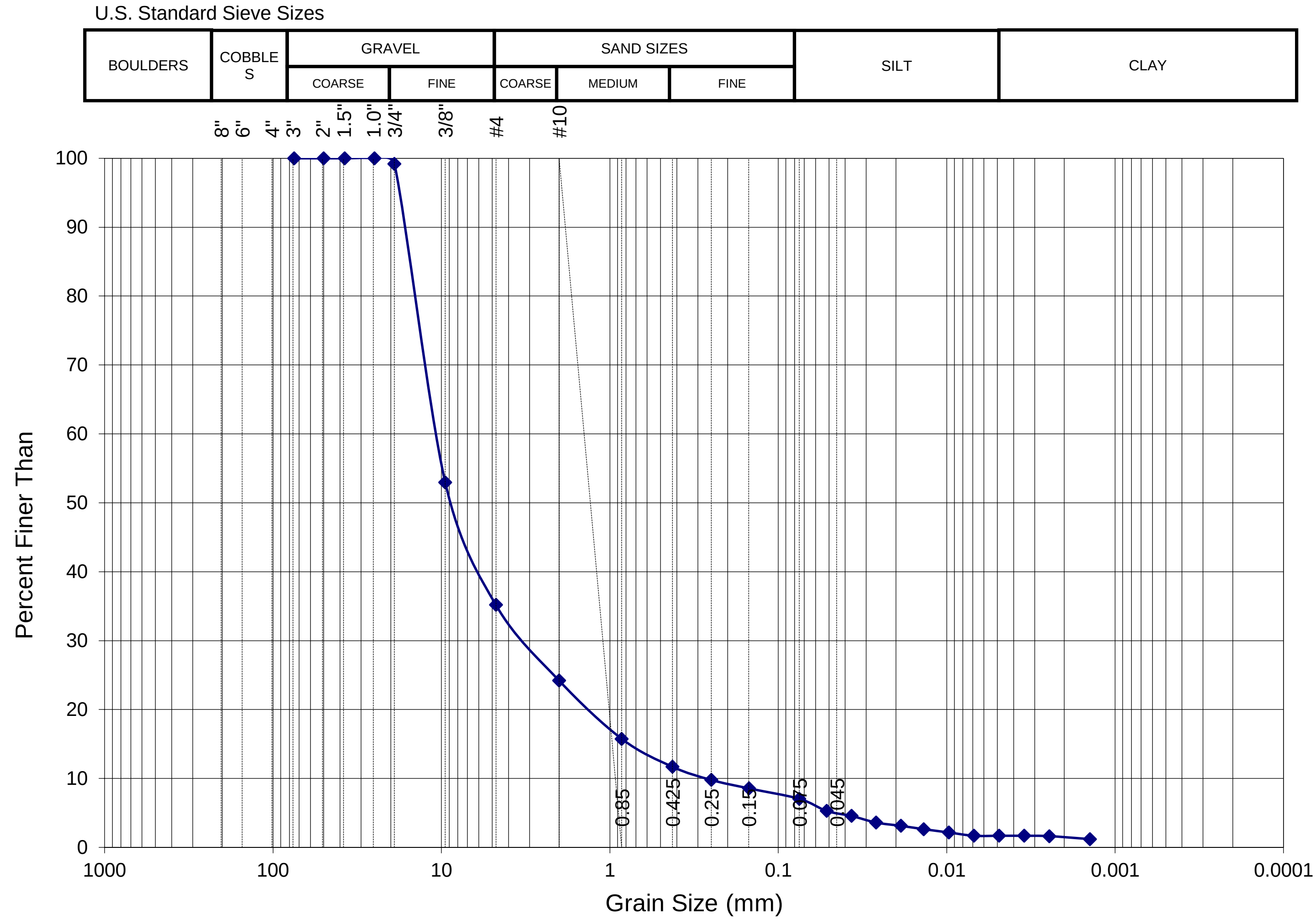
ALS Laboratory Group

819-58th Street, Saskatoon,SK

PARTICLE SIZE DISTRIBUTION CURVE

Client Name: WT2525408006
Project Number:
Client Sample ID UPL1
Lab Sample ID WT2525408006

Test Completion Date: 15-Sep-25
Analyst: SIH



METHOD DESCRIPTION	
Method Reference: ASTM D6913 & D7928	
Dispersion method: Mechanical	
Dispersion period: 1 minute	cm/s

DESCRIPTION OF SAND AND GRAVEL PARTICLES

Shape: Angular
Hardness: Hard

SUMMARY OF RESULTS

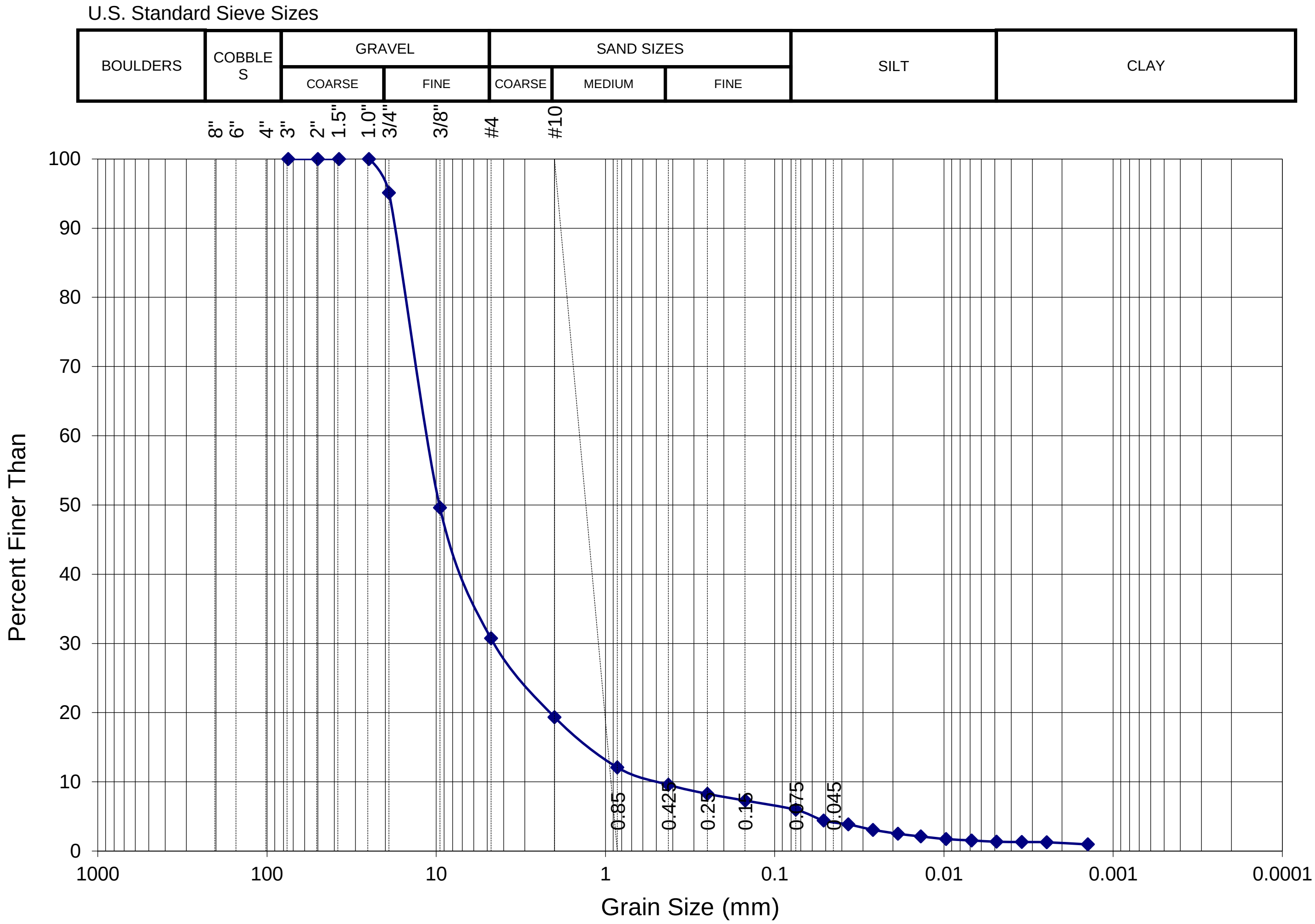
GRAIN SIZE	WT %	DIA. RANGE (mm)
% GRAVEL :	64.81	> 4.75
% COARSE SAND :	11.00	2.0 - 4.75
% MEDIUM SAND :	12.49	0.425 - 2.0
% FINE SAND :	4.66	0.075 - 0.425
% SILT :	5.36	0.075 - 0.005
% CLAY :	1.68	< 0.005

ALS Laboratory Group

819-58th Street, Saskatoon,SK

PARTICLE SIZE DISTRIBUTION CURVE

Client Name:	WT2525408007
Project Number:	
Client Sample ID	UPL2
Lab Sample ID	WT2525408007
Test Completion Date:	15-Sep-25
Analyst:	SIH



METHOD DESCRIPTION	
Method Reference: ASTM D6913 & D7928	
Dispersion method: Mechanical	
Dispersion period: 1 minute	cm/s

SUMMARY OF RESULTS		
GRAIN SIZE	WT %	DIA. RANGE (mm)
% GRAVEL :	69.26	> 4.75
% COARSE SAND :	11.39	2.0 - 4.75
% MEDIUM SAND :	9.78	0.425 - 2.0
% FINE SAND :	3.60	0.075 - 0.425
% SILT :	4.61	0.075 - 0.005
% CLAY :	1.36	< 0.005

DESCRIPTION OF SAND AND GRAVEL PARTICLES

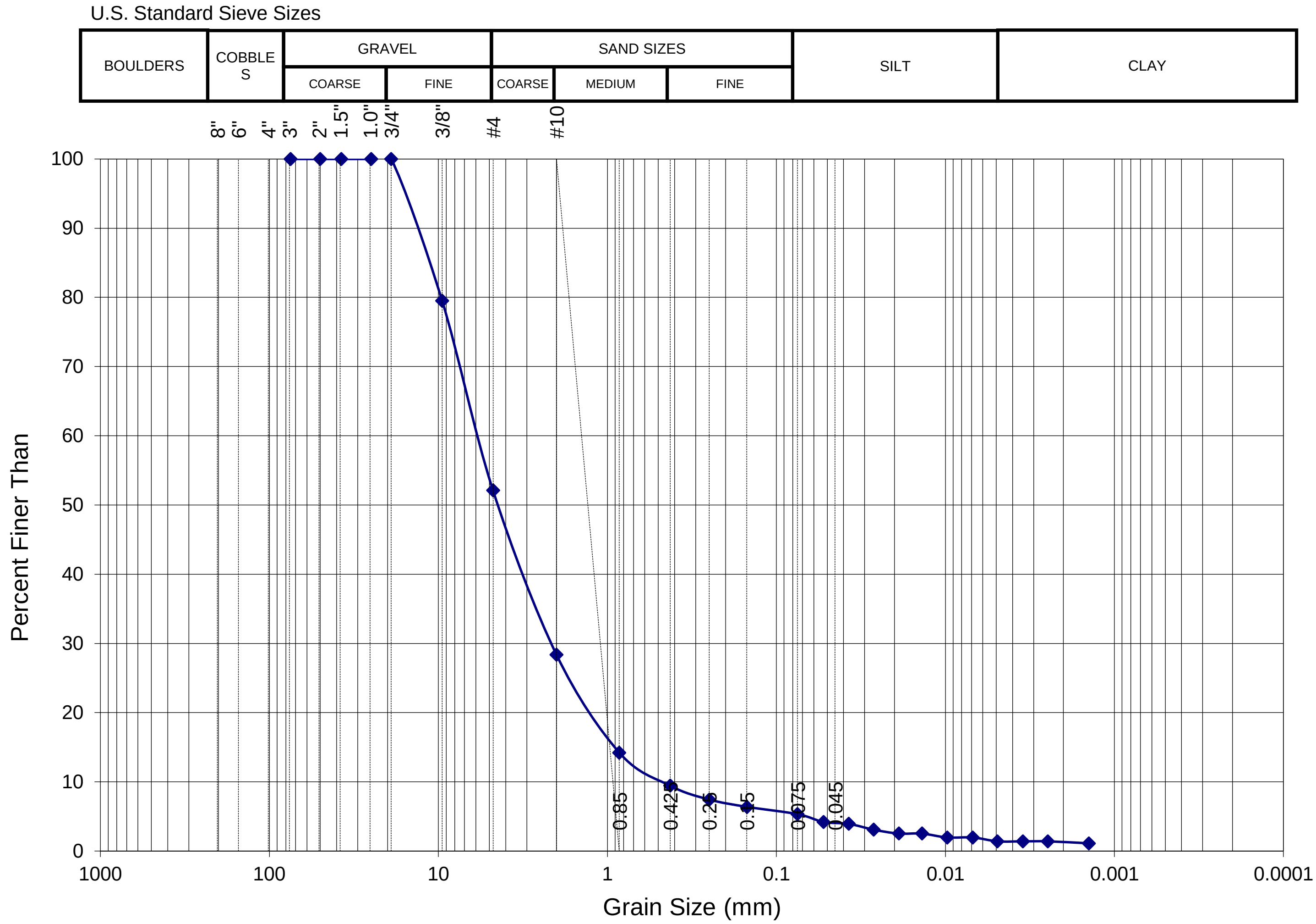
Shape: Angular
Hardness: Hard

ALS Laboratory Group

819-58th Street, Saskatoon,SK

PARTICLE SIZE DISTRIBUTION CURVE

Client Name:	WT2525408008
Project Number:	
Client Sample ID	UP3
Lab Sample ID	WT2525408008
Test Completion Date:	15-Sep-25
Analyst:	SIH



METHOD DESCRIPTION	
Method Reference: ASTM D6913 & D7928	
Dispersion method: Mechanical	
Dispersion period: 1 minute	cm/s

DESCRIPTION OF SAND AND GRAVEL PARTICLES
Shape: Angular
Hardness: Hard

SUMMARY OF RESULTS

GRAIN SIZE	WT %	DIA. RANGE (mm)
% GRAVEL :	47.90	> 4.75
% COARSE SAND :	23.73	2.0 - 4.75
% MEDIUM SAND :	18.93	0.425 - 2.0
% FINE SAND :	4.10	0.075 - 0.425
% SILT :	3.91	0.075 - 0.005
% CLAY :	1.43	< 0.005

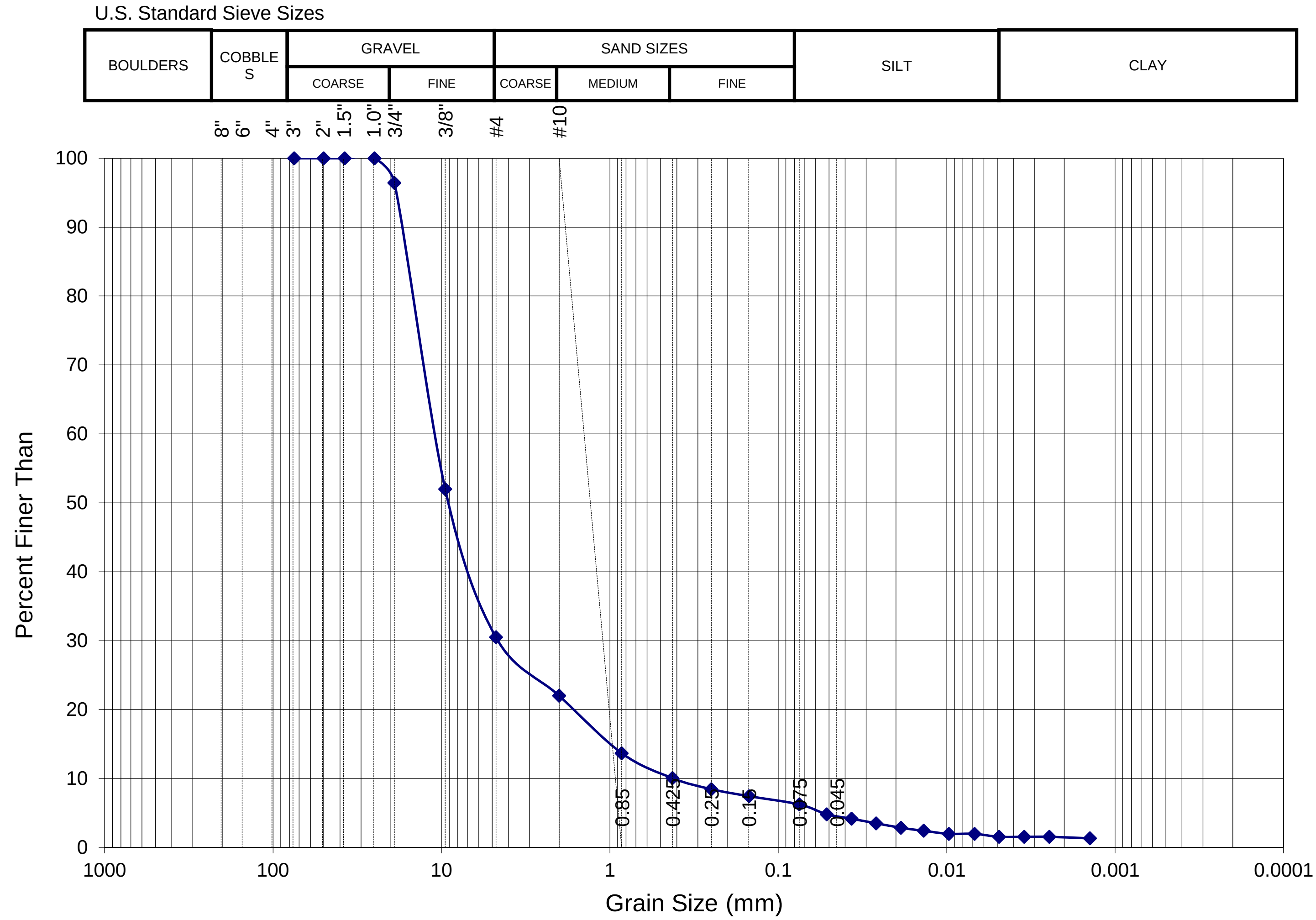
ALS Laboratory Group

819-58th Street, Saskatoon,SK

PARTICLE SIZE DISTRIBUTION CURVE

Client Name: WT2525408009
Project Number:
Client Sample ID UP4
Lab Sample ID WT2525408009

Test Completion Date: 15-Sep-25
Analyst: SIH



METHOD DESCRIPTION	
Method Reference: ASTM D6913 & D7928	
Dispersion method: Mechanical	
Dispersion period: 1 minute	cm/s

DESCRIPTION OF SAND AND GRAVEL PARTICLES
Shape: Angular
Hardness: Hard

SUMMARY OF RESULTS

GRAIN SIZE	WT %	DIA. RANGE (mm)
% GRAVEL :	69.50	> 4.75
% COARSE SAND :	8.50	2.0 - 4.75
% MEDIUM SAND :	11.95	0.425 - 2.0
% FINE SAND :	3.81	0.075 - 0.425
% SILT :	4.68	0.075 - 0.005
% CLAY :	1.56	< 0.005

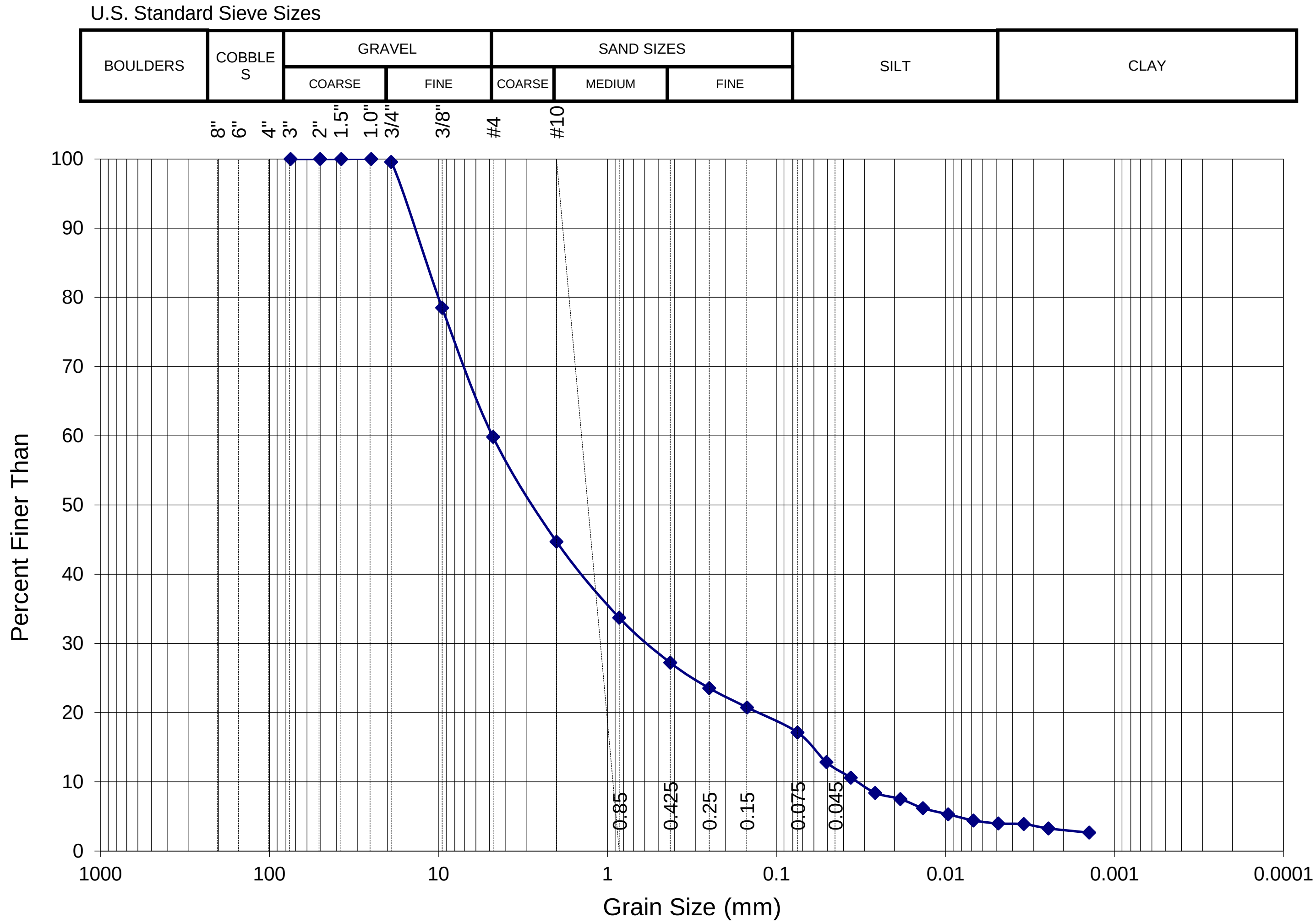
ALS Laboratory Group

819-58th Street, Saskatoon,SK

PARTICLE SIZE DISTRIBUTION CURVE

Client Name: WT2525408010
Project Number:
Client Sample ID UP5
Lab Sample ID WT2525408010

Test Completion Date: 15-Sep-25
Analyst: SIH



METHOD DESCRIPTION	
Method Reference: ASTM D6913 & D7928	
Dispersion method: Mechanical	
Dispersion period: 1 minute	cm/s

DESCRIPTION OF SAND AND GRAVEL PARTICLES
Shape: Angular
Hardness: Hard

SUMMARY OF RESULTS

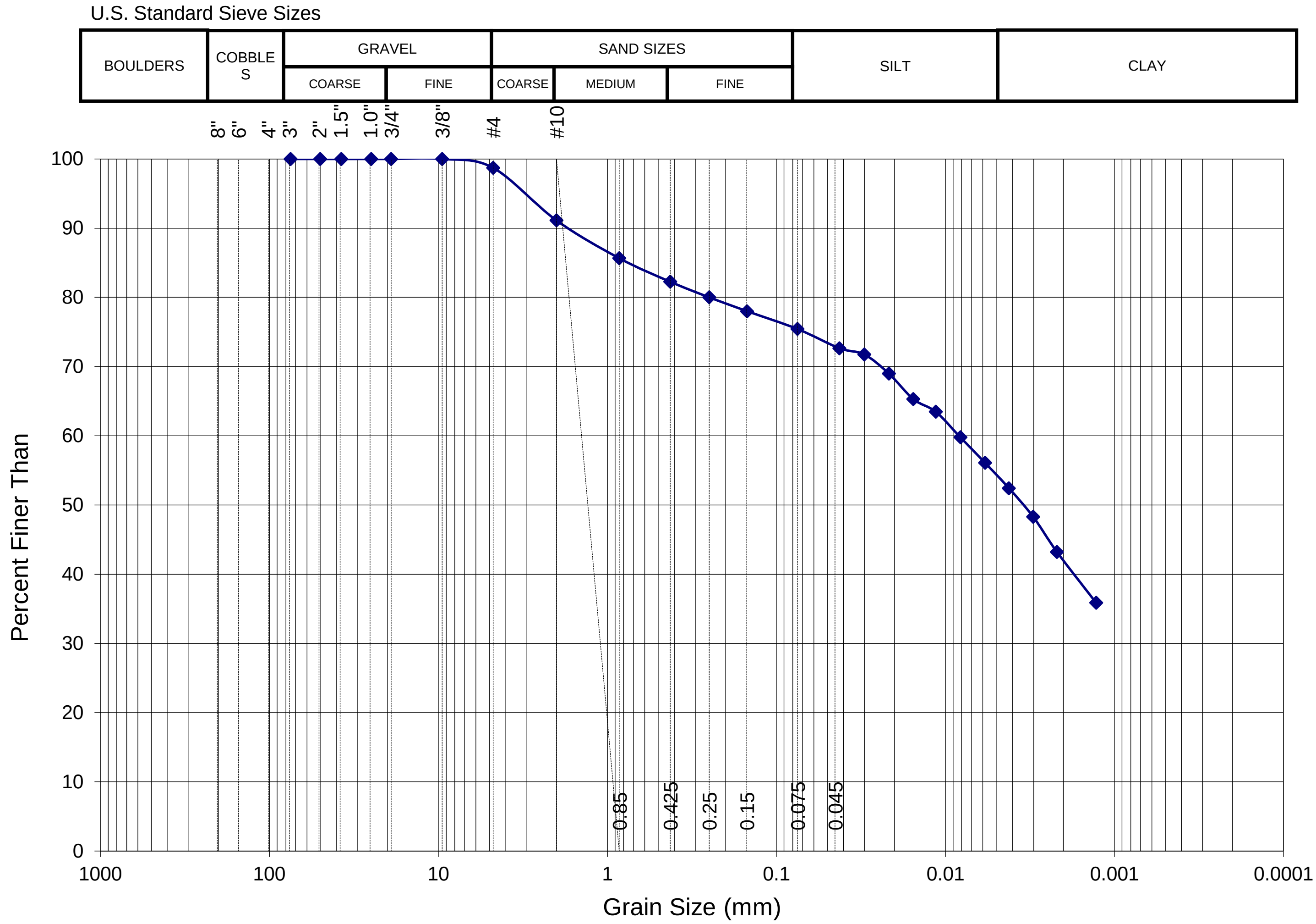
GRAIN SIZE	WT %	DIA. RANGE (mm)
% GRAVEL :	40.16	> 4.75
% COARSE SAND :	15.13	2.0 - 4.75
% MEDIUM SAND :	17.48	0.425 - 2.0
% FINE SAND :	10.08	0.075 - 0.425
% SILT :	13.13	0.075 - 0.005
% CLAY :	4.02	< 0.005

ALS Laboratory Group

819-58th Street, Saskatoon,SK

PARTICLE SIZE DISTRIBUTION CURVE

Client Name:	WT2525408011
Project Number:	
Client Sample ID	STK1
Lab Sample ID	WT2525408011
Test Completion Date:	15-Sep-25
Analyst:	SIH



METHOD DESCRIPTION	
Method Reference: ASTM D6913 & D7928	
Dispersion method: Mechanical	
Dispersion period: 1 minute	cm/s

DESCRIPTION OF SAND AND GRAVEL PARTICLES
Shape: Angular
Hardness: Hard

SUMMARY OF RESULTS

GRAIN SIZE	WT %	DIA. RANGE (mm)
% GRAVEL :	1.27	> 4.75
% COARSE SAND :	7.61	2.0 - 4.75
% MEDIUM SAND :	8.86	0.425 - 2.0
% FINE SAND :	6.83	0.075 - 0.425
% SILT :	21.09	0.075 - 0.005
% CLAY :	54.34	< 0.005

NS

Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

www.alsglobal.com

COC Number: 22 -

Page 1 of 1

Environmental Division
Waterloo
Work Order Reference
WT2525408

Telephone : +1 519 886 6910

Report To	Contact and company name below will appear on the final report	**Reports / Recipients**	
Company:	RWDI	Select Report Format:	☑ PDF ☑ EXCEL ☐ EDD (DIGITAL)
Contact:	Anthony Vanderheyden	Merge QC/QCI Reports with COA	☑ YES ☐ NO ☐ N/A
Phone:	519.823.1311	☐ Compare Results to Criteria on Report - provide details below if box checked	
	Company address below will appear on the final report	Select Distribution:	☑ EMAIL ☐ MAIL ☐ FAX
Street:	600 Southgate Drive	Email 1 or Fax	Anthony.Vanderheyden@rwdi.com
City/Province:	Guelph, ON	Email 2	Matthew.Butts@rwdi.com
Postal Code:	N1G 4P6	Email 3	Sarah.Pellatt@rwdi.com
Invoice To	Same as Report To ☑ YES ☐ NO	**Invoice Recipients**	
	Copy of Invoice with Report ☑ YES ☐ NO	Select Invoice Distribution:	☑ EMAIL ☐ MAIL ☐ FAX
Company:	RWDI	Email 1 or Fax	Anthony.Vanderheyden@rwdi.com
Contact:	Anthony Vanderheyden	Email 2	
Project Information		**Oil and Gas Required Fields (client use)**	
ALS Client Code / QUOTE #:		AFE/Cost Center:	PO#
Job / Project #:		Major/Minor Code:	Routing Code:
PO / AFE:		Requisitioner:	
LSD:		Location:	
ALS Lab Work Order # (ALS use only):	WT2525408	ALS Contact:	Sampler:

Turnaround Time (TAT) Requested

- ☑ Routine [R] if received by 3pm M-F - no surcharges apply
- ☐ 4 day [P4] if received by 3pm M-F - 20% rush surcharge minimu
- ☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimu
- ☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimu
- ☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minimu
- ☐ Same day [E2] if received by 10am M-S - 200% rush surcharge.

Additional fees may apply to rush requests on weekends,

Date and Time Required for all E&P TATs:

For all tests with rush TATs requested, please cont

Analysis Request — Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (ALS use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	Grain Size	Moisture Content	Sample Weight	PM44	PM10	PM2.5	Silt Content	SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes)
	PL1	3-Sep-25	10:58	Soil	1	R	R	R	R	R	R	R			
	PL2	3-Sep-25	10:34	Soil	1	R	R	R	R	R	R	R			
	PL3	3-Sep-25	11:13	Soil	1	R	R	R	R	R	R	R			
	UPQ1	3-Sep-25	12:00	Soil	1	R	R	R	R	R	R	R			
	UPQ2	3-Sep-25	12:23	Soil	1	R	R	R	R	R	R	R			
	UPL1	3-Sep-25	13:05	Soil	1	R	R	R	R	R	R	R			
	UPL2	3-Sep-25	13:23	Soil	1	R	R	R	R	R	R	R			
	UP3	3-Sep-25	14:08	Soil	1	R	R	R	R	R	R	R			
	UP4	3-Sep-25	14:41	Soil	1	R	R	R	R	R	R	R			
	UP5	3-Sep-25	14:59	Soil	1	R	R	R	R	R	R	R			
	STK1	3-Sep-25	12:38	Soil	1	R	R	R	R	R	R	R			

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System?
☐ YES ☐ NO

Are samples for human consumption/ use?
☐ YES ☐ NO

Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)

SAMPLE RECEIPT DETAILS (ALS use only)

Cooling Method: ☑ NONE ☐ ICE ☐ ICE PACKS ☐ FROZEN ☐ COOLING INITIATED

Cooler Custody Seals Intact: ☐ YES ☐ N/A Sample Custody Seals Intact: ☐ YES ☐ N/A

INITIAL COOLER TEMPERATURES °C:

FINAL COOLER TEMPERATURES °C: 8.3

SHIPMENT RELEASE (client use)				INITIAL SHIPMENT RECEPTION (ALS use only)			FINAL SHIPMENT RECEPTION (ALS use only)		
Released by: Anthony Vanderheyden	Date: 9/10/2025	Time:		Received by:	Date:	Time:	Received by: Vw - P	Date: 11/Sept/25	Time: 8:40

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

MAY 2023 FRONT

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.

CERTIFICATE OF ANALYSIS

Work Order	: **WT2527895**		
Client	: **RWDI Air Inc.**	Laboratory	: ALS Environmental - Waterloo
Contact	: Anthony Vanderheyden	Account Manager	: Gayle Braun
Address	: 600 Southgate Drive Guelph Ontario Canada N1G 4P6	Address	: 60 Northland Road, Unit 1 Waterloo ON Canada N2V 2B8
Telephone	: 519 823 1311	E-mail	: Gayle.Braun@ALSGlobal.com
Project	: ----	Telephone	: +1 519 886 6910
PO	: ----	Date Samples Received	: 01-Oct-2025 20:20
C-O-C number	: ----	Date Analysis Commenced	: 03-Oct-2025
Sampler	: CLIENT	Issue Date	: 09-Oct-2025 19:55
Site	: ----		
Quote number	: Grain Size		
No. of samples received	: 5		
No. of samples analysed	: 5		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Colby Bingham	Laboratory Supervisor	Inorganics, Saskatoon, Saskatchewan
Fary Fazeliiman	Laboratory Assistant	Organics, Saskatoon, Saskatchewan
Hedy Lai	Team Leader - Inorganics	Inorganics, Saskatoon, Saskatchewan
Hedy Lai	Team Leader - Inorganics	Sask Soils, Saskatoon, Saskatchewan

General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key:

CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances.
LOR: Limit of Reporting (detection limit).

Unit	*Description*
-	no units
%	percent
g	grams

<: less than.
>: greater than.
Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical Results

Sub-Matrix: Soil/Solid
(Matrix: Soil/Solid)

Analyte	CAS Number	Method/Lab	LOR	Unit	QUARRY ROAD SAMPLE #1 ----	QUARRY ROAD SAMPLE #2 ----	LANDFILL COVER STOCKPILE T1 ----	LANDFILL COVER STOCKPILE T2 ----	LANDFILL COVER STOCKPILE T3 ----
				Client sampling date / time	29-Sep-2025 12:33	29-Sep-2025 12:46	29-Sep-2025 13:03	29-Sep-2025 13:03	29-Sep-2025 13:05
					WT2527895-001	WT2527895-002	WT2527895-003	WT2527895-004	WT2527895-005
					Result	Result	Result	Result	Result
Physical Tests									
Moisture	----	E144/SK	0.25	%	11.0	12.0	45.8	45.2	26.6
Sample weight, total	----	E146/SK	0.10	g	806	1240	1140	1340	1350
Particle Size									
Sand (2.0mm - 0.05mm)	----	E180/SK	1.0	%	75.3	67.9	73.8	75.2	74.9
Silt (0.05mm - 0.002mm)	----	E180/SK	1.0	%	20.1	25.8	18.6	16.6	18.4
Clay (<0.002mm)	----	E180/SK	1.0	%	4.6	6.3	7.6	8.2	6.6
Texture class	----	E180/SK	-	-	Loamy Sand	Sandy Loam	Sandy Loam	Sandy Loam	Sandy Loam
Grain size curve	----	E185/SK	-	-	See Attached	See Attached	See Attached	See Attached	See Attached
Percent Passing									
Passing (9.5mm)	----	E181/SK	1.0	%	49.6	65.0	89.1	93.9	98.7
Passing (4.75mm)	----	E181/SK	1.0	%	28.0	46.0	76.2	81.9	95.5
Passing (19mm)	----	E181/SK	1.0	%	93.3	98.8	97.3	100.0	100.0
Passing (25.4mm)	----	E181/SK	1.0	%	100.0	100.0	100.0	100.0	100.0
Passing (38.1mm)	----	E181/SK	1.0	%	100.0	100.0	100.0	100.0	100.0
Passing (50.8mm)	----	E181/SK	1.0	%	100.0	100.0	100.0	100.0	100.0
Passing (76.2mm)	----	E181/SK	1.0	%	100.0	100.0	100.0	100.0	100.0
Passing (1.0mm)	----	E182/SK	1.0	%	15.1	31.2	59.7	63.6	88.0
Passing (0.841mm)	----	E182/SK	1.0	%	14.4	30.3	58.9	62.5	87.4
Passing (0.50mm)	----	E182/SK	1.0	%	12.0	26.7	55.3	58.1	81.1
Passing (0.420mm)	----	E182/SK	1.0	%	11.5	25.8	54.4	57.0	79.5

Analytical Results

Sub-Matrix: Soil/Solid
(Matrix: Soil/Solid)

				Client sample ID	QUARRY ROAD SAMPLE #1 ----	QUARRY ROAD SAMPLE #2 ----	LANDFILL COVER STOCKPILE T1 ----	LANDFILL COVER STOCKPILE T2 ----	LANDFILL COVER STOCKPILE T3 ----
				Client sampling date / time	29-Sep-2025 12:33	29-Sep-2025 12:46	29-Sep-2025 13:03	29-Sep-2025 13:03	29-Sep-2025 13:05
Analyte	*CAS Number*	*Method/Lab*	*LOR*	*Unit*	**WT2527895-001**	**WT2527895-002**	**WT2527895-003**	**WT2527895-004**	**WT2527895-005**
					Result	Result	Result	Result	Result
Percent Passing									
Passing (0.250mm)	----	E182/SK	1.0	%	10.0	23.1	51.8	53.7	70.0
Passing (0.149mm)	----	E182/SK	1.0	%	8.9	20.8	50.1	51.5	60.3
Passing (0.125mm)	----	E182/SK	1.0	%	8.4	19.7	49.7	51.1	57.4
Passing (0.075mm)	----	E182/SK	1.0	%	7.5	17.4	48.9	50.2	51.3
Passing (0.063mm)	----	E182/SK	1.0	%	6.2	14.6	32.3	33.1	37.2
Passing (0.05mm)	----	E182/SK	1.0	%	4.9	11.6	16.9	17.4	22.8
Passing (0.0312mm)	----	E183/SK	1.0	%	3.4	9.1	13.9	14.7	20.1
Passing (0.020mm)	----	E183/SK	1.0	%	2.9	6.9	11.1	12.2	17.6
Passing (0.005mm)	----	E183/SK	1.0	%	1.4	3.4	6.6	7.2	6.8
Passing (0.004mm)	----	E183/SK	1.0	%	1.3	3.0	6.4	7.1	6.7
Passing (0.002mm)	----	E183/SK	1.0	%	<1.0	2.3	4.9	5.8	6.0
Passing (2.0mm)	----	E181/SK	1.0	%	19.7	36.3	64.4	70.0	91.0

Please refer to the General Comments section for an explanation of any qualifiers detected.

ALS Canada Ltd.

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **WT2527895**	Page	: 1 of 9
Client	: **RWDI Air Inc.**	Laboratory	: ALS Environmental - Waterloo
Contact	: Anthony Vanderheyden	Account Manager	: Gayle Braun
Address	: 600 Southgate Drive Guelph ON Canada N1G 4P6	Address	: 60 Northland Road, Unit 1 Waterloo, Ontario Canada N2V 2B8
Telephone	: 519 823 1311	Telephone	: +1 519 886 6910
Project	: ----	Date Samples Received	: 01-Oct-2025 20:20
PO	: ----	Issue Date	: 09-Oct-2025 19:55
C-O-C number	: ----		
Sampler	: CLIENT		
Site	: ----		
Quote number	: Grain Size		
No. of samples received	: 5		
No. of samples analysed	: 5		

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.

CAS Number: Chemical Abstracts Service number is a unique identifier assigned to discrete substances.

DQO: Data Quality Objective.

LOR: Limit of Reporting (detection limit).

RPD: Relative Percent Difference.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- No Analysis Holding Time Outliers exist.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Particle Size : CSSC Particle Size Classification by Hydrometer										
LDPE bag LANDFILL COVER STOCKPILE T1	E180	29-Sep-2025	----	----	----		06-Oct-2025	365 days	7 days	✓
Particle Size : CSSC Particle Size Classification by Hydrometer										
LDPE bag LANDFILL COVER STOCKPILE T2	E180	29-Sep-2025	----	----	----		06-Oct-2025	365 days	7 days	✓
Particle Size : CSSC Particle Size Classification by Hydrometer										
LDPE bag LANDFILL COVER STOCKPILE T3	E180	29-Sep-2025	----	----	----		06-Oct-2025	365 days	7 days	✓
Particle Size : CSSC Particle Size Classification by Hydrometer										
LDPE bag QUARRY ROAD SAMPLE #1	E180	29-Sep-2025	----	----	----		06-Oct-2025	365 days	7 days	✓
Particle Size : CSSC Particle Size Classification by Hydrometer										
LDPE bag QUARRY ROAD SAMPLE #2	E180	29-Sep-2025	----	----	----		06-Oct-2025	365 days	7 days	✓
Particle Size : Grain Size Report (Attachment) Hydrometer/Sieve Method										
LDPE bag LANDFILL COVER STOCKPILE T1	E185	29-Sep-2025	----	----	----		08-Oct-2025	----	----	
Particle Size : Grain Size Report (Attachment) Hydrometer/Sieve Method										
LDPE bag LANDFILL COVER STOCKPILE T2	E185	29-Sep-2025	----	----	----		08-Oct-2025	----	----	

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Particle Size : Grain Size Report (Attachment) Hydrometer/Sieve Method										
LDPE bag LANDFILL COVER STOCKPILE T3	E185	29-Sep-2025	----	----	----		08-Oct-2025	----	----	
Particle Size : Grain Size Report (Attachment) Hydrometer/Sieve Method										
LDPE bag QUARRY ROAD SAMPLE #1	E185	29-Sep-2025	----	----	----		08-Oct-2025	----	----	
Particle Size : Grain Size Report (Attachment) Hydrometer/Sieve Method										
LDPE bag QUARRY ROAD SAMPLE #2	E185	29-Sep-2025	----	----	----		08-Oct-2025	----	----	
Percent Passing : Particle Size Analysis - Hydrometer										
LDPE bag LANDFILL COVER STOCKPILE T1	E183	29-Sep-2025	03-Oct-2025	365 days	4 days	✓	03-Oct-2025	365 days	4 days	✓
Percent Passing : Particle Size Analysis - Hydrometer										
LDPE bag LANDFILL COVER STOCKPILE T2	E183	29-Sep-2025	03-Oct-2025	365 days	4 days	✓	03-Oct-2025	365 days	4 days	✓
Percent Passing : Particle Size Analysis - Hydrometer										
LDPE bag LANDFILL COVER STOCKPILE T3	E183	29-Sep-2025	03-Oct-2025	365 days	4 days	✓	03-Oct-2025	365 days	4 days	✓
Percent Passing : Particle Size Analysis - Hydrometer										
LDPE bag QUARRY ROAD SAMPLE #1	E183	29-Sep-2025	03-Oct-2025	365 days	4 days	✓	03-Oct-2025	365 days	4 days	✓
Percent Passing : Particle Size Analysis - Hydrometer										
LDPE bag QUARRY ROAD SAMPLE #2	E183	29-Sep-2025	03-Oct-2025	365 days	4 days	✓	03-Oct-2025	365 days	4 days	✓
Percent Passing : Particle Size Analysis - Sieve <2mm										
LDPE bag LANDFILL COVER STOCKPILE T1	E182	29-Sep-2025	03-Oct-2025	365 days	4 days	✓	03-Oct-2025	365 days	4 days	✓

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Extraction / Preparation: Holding Times Rec	Extraction / Preparation: Holding Times Actual	Extraction / Preparation: Eval	Analysis: Analysis Date	Analysis: Holding Times Rec	Analysis: Holding Times Actual	Analysis: Eval
Percent Passing : Particle Size Analysis - Sieve <2mm										
LDPE bag LANDFILL COVER STOCKPILE T2	E182	29-Sep-2025	03-Oct-2025	365 days	4 days	✓	03-Oct-2025	365 days	4 days	✓
Percent Passing : Particle Size Analysis - Sieve <2mm										
LDPE bag LANDFILL COVER STOCKPILE T3	E182	29-Sep-2025	03-Oct-2025	365 days	4 days	✓	03-Oct-2025	365 days	4 days	✓
Percent Passing : Particle Size Analysis - Sieve <2mm										
LDPE bag QUARRY ROAD SAMPLE #1	E182	29-Sep-2025	03-Oct-2025	365 days	4 days	✓	03-Oct-2025	365 days	4 days	✓
Percent Passing : Particle Size Analysis - Sieve <2mm										
LDPE bag QUARRY ROAD SAMPLE #2	E182	29-Sep-2025	03-Oct-2025	365 days	4 days	✓	03-Oct-2025	365 days	4 days	✓
Percent Passing : Particle Size Analysis - Sieve >2mm										
LDPE bag LANDFILL COVER STOCKPILE T1	E181	29-Sep-2025	03-Oct-2025	365 days	4 days	✓	03-Oct-2025	365 days	4 days	✓
Percent Passing : Particle Size Analysis - Sieve >2mm										
LDPE bag LANDFILL COVER STOCKPILE T2	E181	29-Sep-2025	03-Oct-2025	365 days	4 days	✓	03-Oct-2025	365 days	4 days	✓
Percent Passing : Particle Size Analysis - Sieve >2mm										
LDPE bag LANDFILL COVER STOCKPILE T3	E181	29-Sep-2025	03-Oct-2025	365 days	4 days	✓	03-Oct-2025	365 days	4 days	✓
Percent Passing : Particle Size Analysis - Sieve >2mm										
LDPE bag QUARRY ROAD SAMPLE #1	E181	29-Sep-2025	03-Oct-2025	365 days	4 days	✓	03-Oct-2025	365 days	4 days	✓
Percent Passing : Particle Size Analysis - Sieve >2mm										
LDPE bag QUARRY ROAD SAMPLE #2	E181	29-Sep-2025	03-Oct-2025	365 days	4 days	✓	03-Oct-2025	365 days	4 days	✓

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation: Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis: Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : Moisture Content by Gravimetry										
LDPE bag LANDFILL COVER STOCKPILE T1	E144	29-Sep-2025	----	----	----		04-Oct-2025	----	----	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag LANDFILL COVER STOCKPILE T2	E144	29-Sep-2025	----	----	----		04-Oct-2025	----	----	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag LANDFILL COVER STOCKPILE T3	E144	29-Sep-2025	----	----	----		04-Oct-2025	----	----	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag QUARRY ROAD SAMPLE #1	E144	29-Sep-2025	----	----	----		04-Oct-2025	----	----	
Physical Tests : Moisture Content by Gravimetry										
LDPE bag QUARRY ROAD SAMPLE #2	E144	29-Sep-2025	----	----	----		04-Oct-2025	----	----	
Physical Tests : Total Sample Weight by Gravimetry										
LDPE bag LANDFILL COVER STOCKPILE T1	E146	29-Sep-2025	----	----	----		03-Oct-2025	----	----	
Physical Tests : Total Sample Weight by Gravimetry										
LDPE bag LANDFILL COVER STOCKPILE T2	E146	29-Sep-2025	----	----	----		03-Oct-2025	----	----	
Physical Tests : Total Sample Weight by Gravimetry										
LDPE bag LANDFILL COVER STOCKPILE T3	E146	29-Sep-2025	----	----	----		03-Oct-2025	----	----	
Physical Tests : Total Sample Weight by Gravimetry										
LDPE bag QUARRY ROAD SAMPLE #1	E146	29-Sep-2025	----	----	----		03-Oct-2025	----	----	

Matrix: **Soil/Solid**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Physical Tests : Total Sample Weight by Gravimetry										
LDPE bag QUARRY ROAD SAMPLE #2	E146	29-Sep-2025	----	----	----		03-Oct-2025	----	----	

Legend & Qualifier Definitions

Rec. HT: ALS recommended hold time (see units).

Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Soil/Solid**

Evaluation: × = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Duplicates (DUP)							
Moisture Content by Gravimetry	E144	2258910	1	15	6.6	5.0	✓
CSSC Particle Size Classification by Hydrometer	E180	2261027	1	13	7.6	5.0	✓
Particle Size Analysis - Sieve <2mm	E182	2257113	1	5	20.0	5.0	✓
Particle Size Analysis - Hydrometer	E183	2257114	1	5	20.0	5.0	✓
Laboratory Control Samples (LCS)							
Moisture Content by Gravimetry	E144	2258910	1	15	6.6	5.0	✓
CSSC Particle Size Classification by Hydrometer	E180	2261027	1	13	7.6	5.0	✓
Particle Size Analysis - Sieve >2mm	E181	2257112	1	5	20.0	5.0	✓
Particle Size Analysis - Sieve <2mm	E182	2257113	1	5	20.0	5.0	✓
Particle Size Analysis - Hydrometer	E183	2257114	1	5	20.0	5.0	✓
Method Blanks (MB)							
Moisture Content by Gravimetry	E144	2258910	1	15	6.6	5.0	✓

Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by “mod”).

Analytical Methods	*Method / Lab*	*Matrix*	*Method Reference*	*Method Descriptions*
Moisture Content by Gravimetry	E144 ALS Environmental - Saskatoon	Soil/Solid	CCME PHC in Soil - Tier 1	Moisture is measured gravimetrically by drying the sample at 105°C. Moisture content is calculated as the weight loss (due to water) divided by the wet weight of the sample, expressed as a percentage.
Total Sample Weight by Gravimetry	E146 ALS Environmental - Saskatoon	Soil/Solid	Direct Measurement	The whole sample is removed from the sample container and weighed.
CSSC Particle Size Classification by Hydrometer	E180 ALS Environmental - Saskatoon	Soil/Solid	CCME Vol 4 Analytical Methods	A soil sample is disaggregated to pass a 2mm sieve. The <2mm specimen is then further disaggregated using Calgon solution and suspended in solution. Two hydrometer readings are measured at specific times to determine %clay and %silt+clay using the principles of Stokes' law. %silt and %sand are determined mathematically.
Particle Size Analysis - Sieve >2mm	E181 ALS Environmental - Saskatoon	Soil/Solid	ASTM D6913-17 (mod)	Soil samples are disaggregated and sieved through a 2mm sieve. Material retained on the sieve is then further sieved through a series of sieves. The amount passing through the sieves is measured gravimetrically.
Particle Size Analysis - Sieve <2mm	E182 ALS Environmental - Saskatoon	Soil/Solid	ASTM D6913-17 (mod)	Soil samples are disaggregated and sieved through a 2mm sieve. Material passed through the sieve is then further disaggregated using calgon solution and passed through a series of sieves. The amount passing through the sieves is measured gravimetrically.
Particle Size Analysis - Hydrometer	E183 ALS Environmental - Saskatoon	Soil/Solid	ASTM D7928-21 (mod)	Soil material is separated from coarse material (>2mm). A specimen is then disaggregated through mixing with Calgon solution. The material is then suspended in solution wherein regular hydrometer readings are taken at specific time intervals. The principles of Stokes' Law are applied to determine the amount of material remaining in solution as well as the maximum particle size remaining in solution at the specified time.
Grain Size Report (Attachment) Hydrometer/Sieve Method	E185 ALS Environmental - Saskatoon	Soil/Solid	ASTM D6913/D7928	A grain size curve is a graphical representation of the particle sizing of a sample representing the percent passing against the effective particle size.

Preparation Methods	*Method / Lab*	*Matrix*	*Method Reference*	*Method Descriptions*
Dry and Grind in Soil/Solid <60°C	EPP442 ALS Environmental - Saskatoon	Soil/Solid	Soil Sampling and Methods of Analysis, Carter 2008	After removal of any coarse fragments and reservation of wet subsamples a portion of homogenized sample is set in a tray and dried at less than 60°C until dry. The sample is then particle size reduced with an automated crusher or mortar and pestle, typically to <2 mm. Further size reduction may be needed for particular tests.

ALS Canada Ltd.

QUALITY CONTROL REPORT

Work Order	: **WT2527895**	Page	: 1 of 6
Client	: RWDI Air Inc.	Laboratory	: ALS Environmental - Waterloo
Contact	: Anthony Vanderheyden	Account Manager	: Gayle Braun
Address	: 600 Southgate Drive Guelph ON Canada N1G 4P6	Address	: 60 Northland Road, Unit 1 Waterloo, Ontario Canada N2V 2B8
Telephone	: 519 823 1311	Telephone	: +1 519 886 6910
Project	: ----	Date Samples Received	: 01-Oct-2025 20:20
PO	: ----	Date Analysis Commenced	: 03-Oct-2025
C-O-C number	: ----	Issue Date	: 09-Oct-2025 19:55
Sampler	: CLIENT		
Site	: ----		
Quote number	: Grain Size		
No. of samples received	: 5		
No. of samples analysed	: 5		

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- Reference Material (RM) Report; Recovery and Data Quality Objectives
- Method Blank (MB) Report; Recovery and Data Quality Objectives
- Laboratory Control Sample (LCS) Report; Recovery and Data Quality Objectives

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	*Position*	*Laboratory Department*
Colby Bingham	Laboratory Supervisor	Saskatoon Inorganics, Saskatoon, Saskatchewan
Fary Fazeliiman	Laboratory Assistant	Saskatoon Organics, Saskatoon, Saskatchewan
Hedy Lai	Team Leader - Inorganics	Saskatoon Inorganics, Saskatoon, Saskatchewan
Hedy Lai	Team Leader - Inorganics	Saskatoon Sask Soils, Saskatoon, Saskatchewan

General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.
CAS Number = Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
DQO = Data Quality Objective.
LOR = Limit of Reporting (detection limit).
RPD = Relative Percent Difference
# = Indicates a QC result that did not meet the ALS DQO.

Workorder Comments

Holding times are displayed as "---" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test-specific).

Sub-Matrix: **Soil/Solid**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Physical Tests (QC Lot: 2258910)											
KS2504009-001	Anonymous	Moisture	----	E144	0.25	%	12.1	11.9	1.75%	20%	----
Particle Size (QC Lot: 2261027)											
WT2527805-001	Anonymous	Clay (<0.002mm)	----	E180	1.0	%	7.8	7.8	0.0	Diff <2x LOR	----
		Sand (2.0mm - 0.05mm)	----	E180	1.0	%	76.2	76.2	0.0943%	10%	----
		Silt (0.05mm - 0.002mm)	----	E180	1.0	%	16.0	16.1	0.0	Diff <2x LOR	----
Percent Passing (QC Lot: 2257113)											
WT2527895-002	QUARRY ROAD SAMPLE #2	Passing (0.05mm)	----	E182	1.0	%	11.6	11.5	0.2	Diff <2x LOR	----
		Passing (0.063mm)	----	E182	1.0	%	14.6	14.5	0.965%	15%	----
		Passing (0.075mm)	----	E182	1.0	%	17.4	17.3	0.745%	15%	----
		Passing (0.125mm)	----	E182	1.0	%	19.7	19.6	0.496%	15%	----
		Passing (0.149mm)	----	E182	1.0	%	20.8	20.8	0.396%	15%	----
		Passing (0.250mm)	----	E182	1.0	%	23.1	23.1	0.178%	15%	----
		Passing (0.420mm)	----	E182	1.0	%	25.8	25.8	0.0639%	15%	----
		Passing (0.50mm)	----	E182	1.0	%	26.7	26.7	0.0308%	15%	----
		Passing (0.841mm)	----	E182	1.0	%	30.3	30.3	0.0862%	15%	----
		Passing (1.0mm)	----	E182	1.0	%	31.2	31.2	0.0751%	15%	----
Percent Passing (QC Lot: 2257114)											
WT2527895-002	QUARRY ROAD SAMPLE #2	Passing (0.002mm)	----	E183	1.0	%	2.3	2.4	0.1	Diff <2x LOR	----
		Passing (0.004mm)	----	E183	1.0	%	3.0	3.2	0.1	Diff <2x LOR	----
		Passing (0.005mm)	----	E183	1.0	%	3.4	3.6	0.3	Diff <2x LOR	----
		Passing (0.020mm)	----	E183	1.0	%	6.9	6.8	0.2	Diff <2x LOR	----
		Passing (0.0312mm)	----	E183	1.0	%	9.1	9.0	0.1	Diff <2x LOR	----

Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: **Soil/Solid**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 2258910)						
Moisture	----	E144	0.25	%	<0.25	----

Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: **Soil/Solid**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Target Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 2258910)									
Moisture	----	E144	0.25	%	50 %	102	90.0	110	----

Reference Material (RM) Report

A Reference Material (RM) is a homogenous material with known and well-established analyte concentrations. RMs are processed in an identical manner to test samples, and are used to monitor and control the accuracy and precision of a test method for a typical sample matrix. RM results are expressed as percent recovery of the target analyte concentration. RM targets may be certified target concentrations provided by the RM supplier, or may be ALS long-term mean values (for empirical test methods).

Sub-Matrix:

Laboratory sample ID	Reference Material ID	Analyte	CAS Number	Method	Reference Material (RM) Report: RM Target Concentration	Recovery (%) RM	Recovery Limits (%) Low	Recovery Limits (%) High	Qualifier
Particle Size (QCLot: 2261027)									
QC-2261027-001	RM	Clay (<0.002mm)	----	E180	26.5 %	98.1	80.0	120	----
QC-2261027-001	RM	Sand (2.0mm - 0.05mm)	----	E180	44.8 %	101	90.0	110	----
QC-2261027-001	RM	Silt (0.05mm - 0.002mm)	----	E180	28.7 %	100	82.0	118	----
Percent Passing (QCLot: 2257112)									
QC-2257112-001	RM	Passing (19mm)	----	E181	100 %	100	90.0	110	----
QC-2257112-001	RM	Passing (2.0mm)	----	E181	100 %	100	90.0	110	----
QC-2257112-001	RM	Passing (25.4mm)	----	E181	100 %	100	90.0	110	----
QC-2257112-001	RM	Passing (38.1mm)	----	E181	100 %	100	90.0	110	----
QC-2257112-001	RM	Passing (4.75mm)	----	E181	100 %	100	90.0	110	----
QC-2257112-001	RM	Passing (50.8mm)	----	E181	100 %	100	90.0	110	----
QC-2257112-001	RM	Passing (76.2mm)	----	E181	100 %	100	90.0	110	----
QC-2257112-001	RM	Passing (9.5mm)	----	E181	100 %	100	90.0	110	----
Percent Passing (QCLot: 2257113)									
QC-2257113-001	RM	Passing (0.05mm)	----	E182	54.1 %	94.2	90.0	110	----
QC-2257113-001	RM	Passing (0.063mm)	----	E182	57.1 %	98.8	90.8	109	----
QC-2257113-001	RM	Passing (0.075mm)	----	E182	60.2 %	102	91.4	109	----
QC-2257113-001	RM	Passing (0.125mm)	----	E182	68.2 %	102	92.7	107	----
QC-2257113-001	RM	Passing (0.149mm)	----	E182	72 %	102	93.1	107	----
QC-2257113-001	RM	Passing (0.250mm)	----	E182	82.3 %	101	94.1	106	----
QC-2257113-001	RM	Passing (0.420mm)	----	E182	89.9 %	100	94.6	105	----
QC-2257113-001	RM	Passing (0.50mm)	----	E182	91.2 %	100	94.7	105	----
QC-2257113-001	RM	Passing (0.841mm)	----	E182	95.6 %	100	94.9	105	----
QC-2257113-001	RM	Passing (1.0mm)	----	E182	96.3 %	100	94.9	105	----
Percent Passing (QCLot: 2257114)									
QC-2257114-001	RM	Passing (0.002mm)	----	E183	24.6 %	82.4	76.0	124	----
QC-2257114-001	RM	Passing (0.004mm)	----	E183	29.3 %	90.5	80.0	120	----
QC-2257114-001	RM	Passing (0.005mm)	----	E183	31.2 %	91.4	82.0	118	----
QC-2257114-001	RM	Passing (0.020mm)	----	E183	43.3 %	88.1	87.0	113	----
QC-2257114-001	RM	Passing (0.0312mm)	----	E183	48.2 %	90.3	88.0	112	----

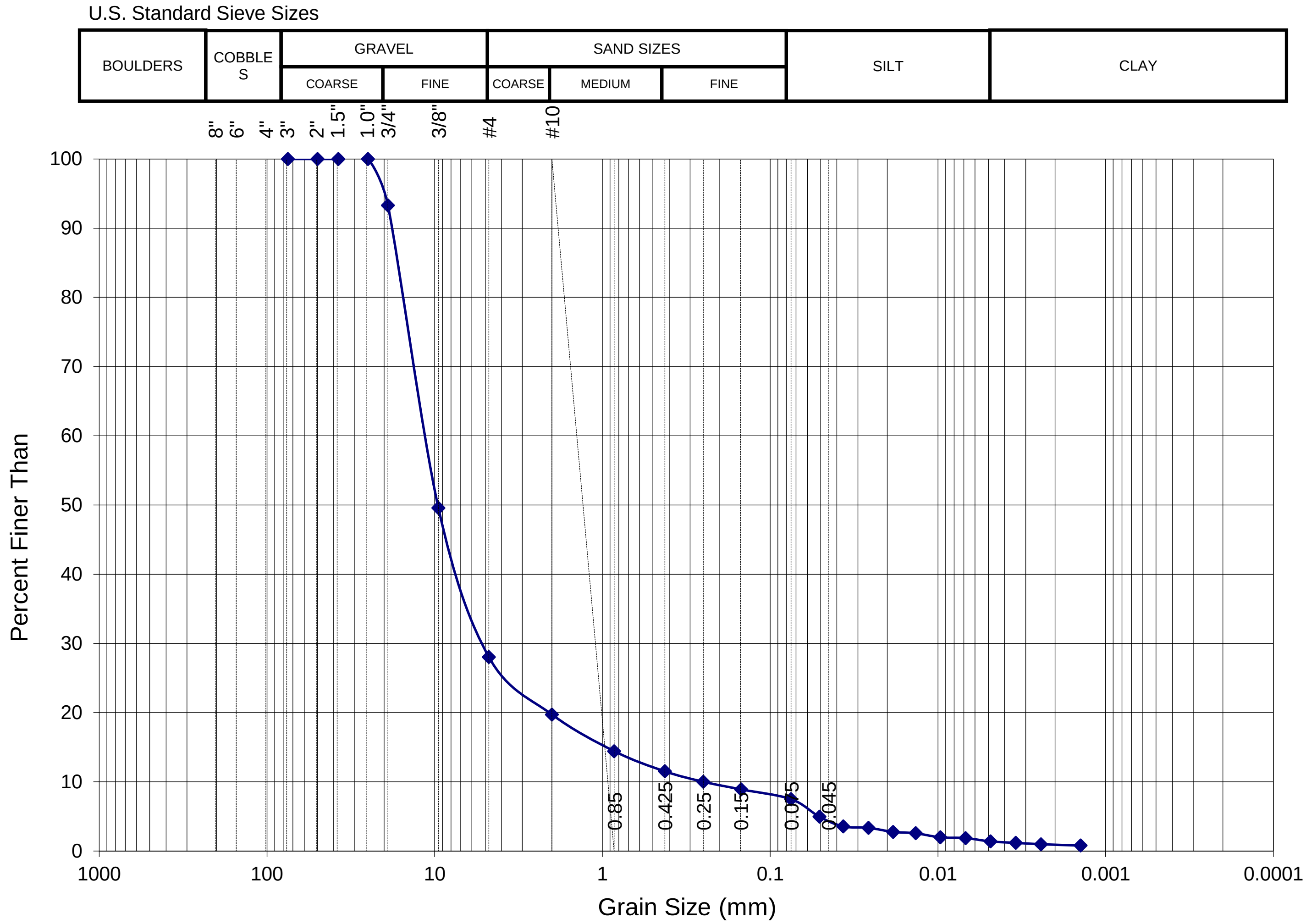
ALS Laboratory Group

819-58th Street, Saskatoon,SK

PARTICLE SIZE DISTRIBUTION CURVE

Client Name: WT2527895001
Project Number:
Client Sample ID QUARRY ROAD SAMPLE #1
Lab Sample ID WT2527895001

Test Completion Date: 07-Oct-25
Analyst: SIH



METHOD DESCRIPTION	
Method Reference: ASTM D6913 & D7928	
Dispersion method: Mechanical	
Dispersion period: 1 minute	cm/s

DESCRIPTION OF SAND AND GRAVEL PARTICLES
Shape: Angular
Hardness: Hard

SUMMARY OF RESULTS

GRAIN SIZE	WT %	DIA. RANGE (mm)
% GRAVEL :	71.98	> 4.75
% COARSE SAND :	8.29	2.0 - 4.75
% MEDIUM SAND :	8.21	0.425 - 2.0
% FINE SAND :	4.02	0.075 - 0.425
% SILT :	6.08	0.075 - 0.005
% CLAY :	1.42	< 0.005

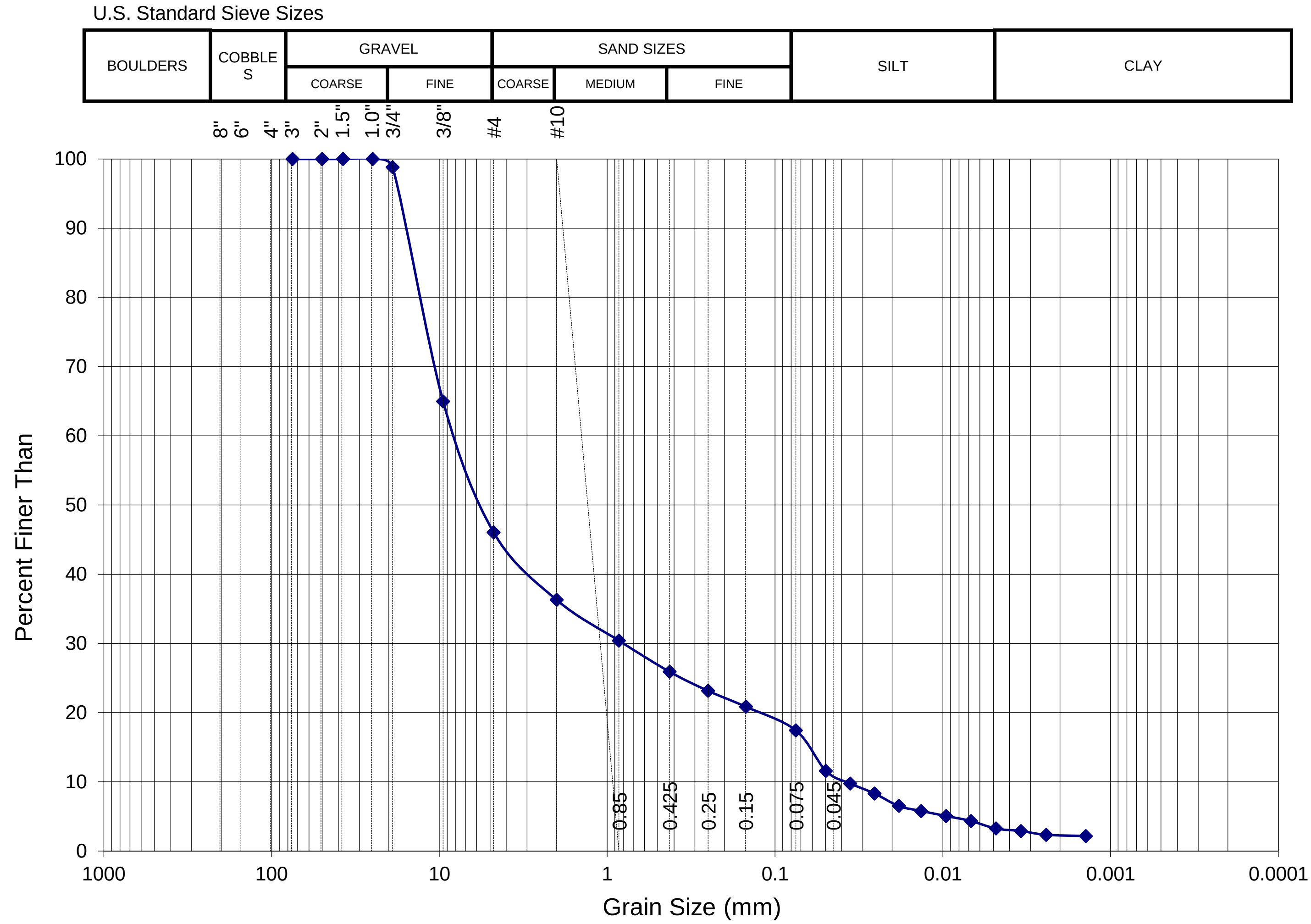
ALS Laboratory Group

819-58th Street, Saskatoon,SK

PARTICLE SIZE DISTRIBUTION CURVE

Client Name: WT2527895002
Project Number:
Client Sample ID QUARRY ROAD SAMPLE #2
Lab Sample ID WT2527895002

Test Completion Date: 07-Oct-25
Analyst: SIH



METHOD DESCRIPTION	
Method Reference: ASTM D6913 & D7928	
Dispersion method: Mechanical	
Dispersion period: 1 minute	cm/s

DESCRIPTION OF SAND AND GRAVEL PARTICLES
Shape: Angular
Hardness: Hard

SUMMARY OF RESULTS

GRAIN SIZE	WT %	DIA. RANGE (mm)
% GRAVEL :	53.95	> 4.75
% COARSE SAND :	9.77	2.0 - 4.75
% MEDIUM SAND :	10.37	0.425 - 2.0
% FINE SAND :	8.48	0.075 - 0.425
% SILT :	14.07	0.075 - 0.005
% CLAY :	3.36	< 0.005

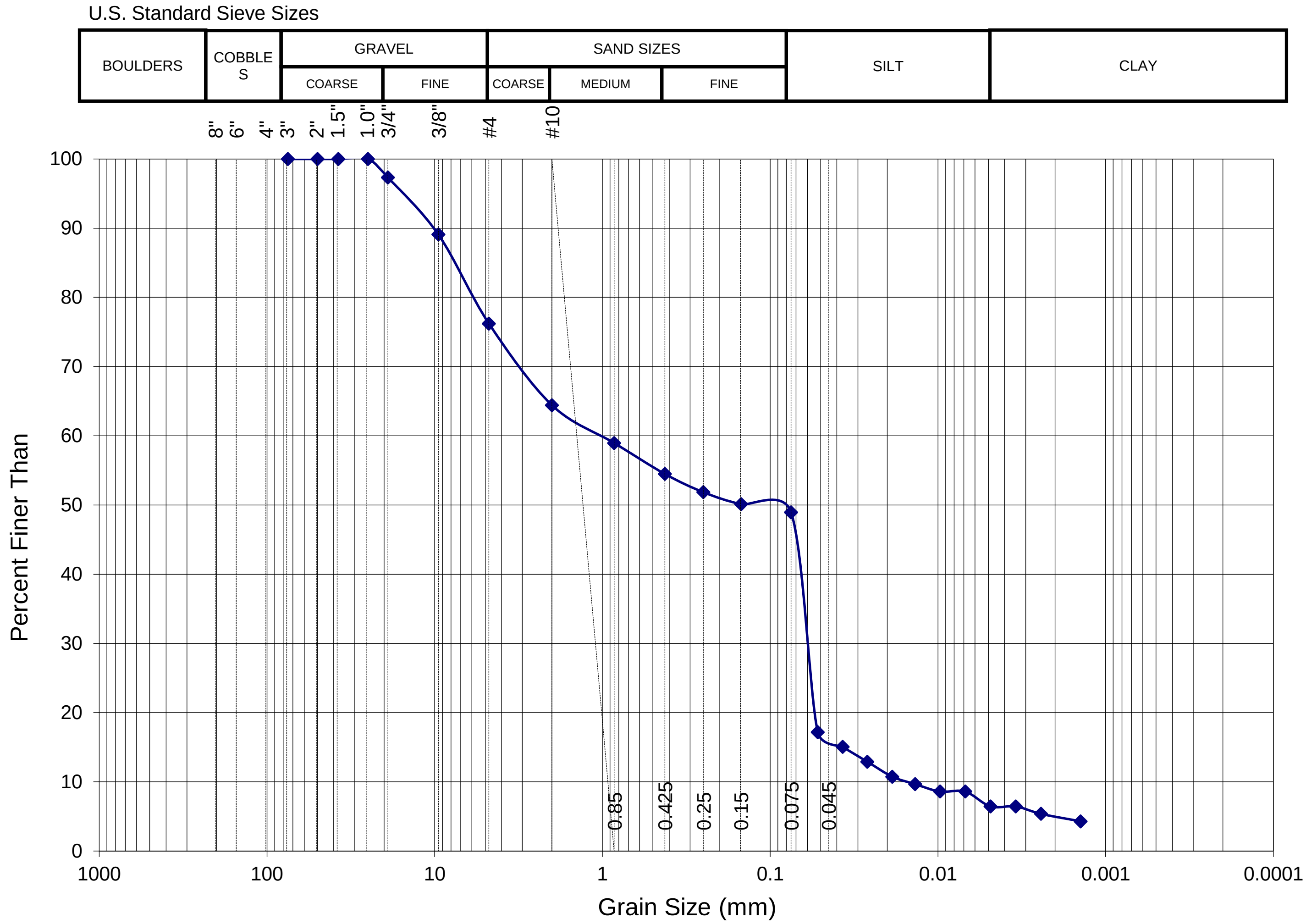
ALS Laboratory Group

819-58th Street, Saskatoon,SK

PARTICLE SIZE DISTRIBUTION CURVE

Client Name: WT2527895003
Project Number:
Client Sample ID LANDFILL COVER STOCKPILE T1
Lab Sample ID WT2527895003

Test Completion Date: 07-Oct-25
Analyst: SIH



METHOD DESCRIPTION	
Method Reference: ASTM D6913 & D7928	
Dispersion method: Mechanical	
Dispersion period: 1 minute	cm/s

DESCRIPTION OF SAND AND GRAVEL PARTICLES
Shape: Angular
Hardness: Hard

SUMMARY OF RESULTS

GRAIN SIZE	WT %	DIA. RANGE (mm)
% GRAVEL :	23.78	> 4.75
% COARSE SAND :	11.79	2.0 - 4.75
% MEDIUM SAND :	9.93	0.425 - 2.0
% FINE SAND :	5.57	0.075 - 0.425
% SILT :	42.33	0.075 - 0.005
% CLAY :	6.60	< 0.005

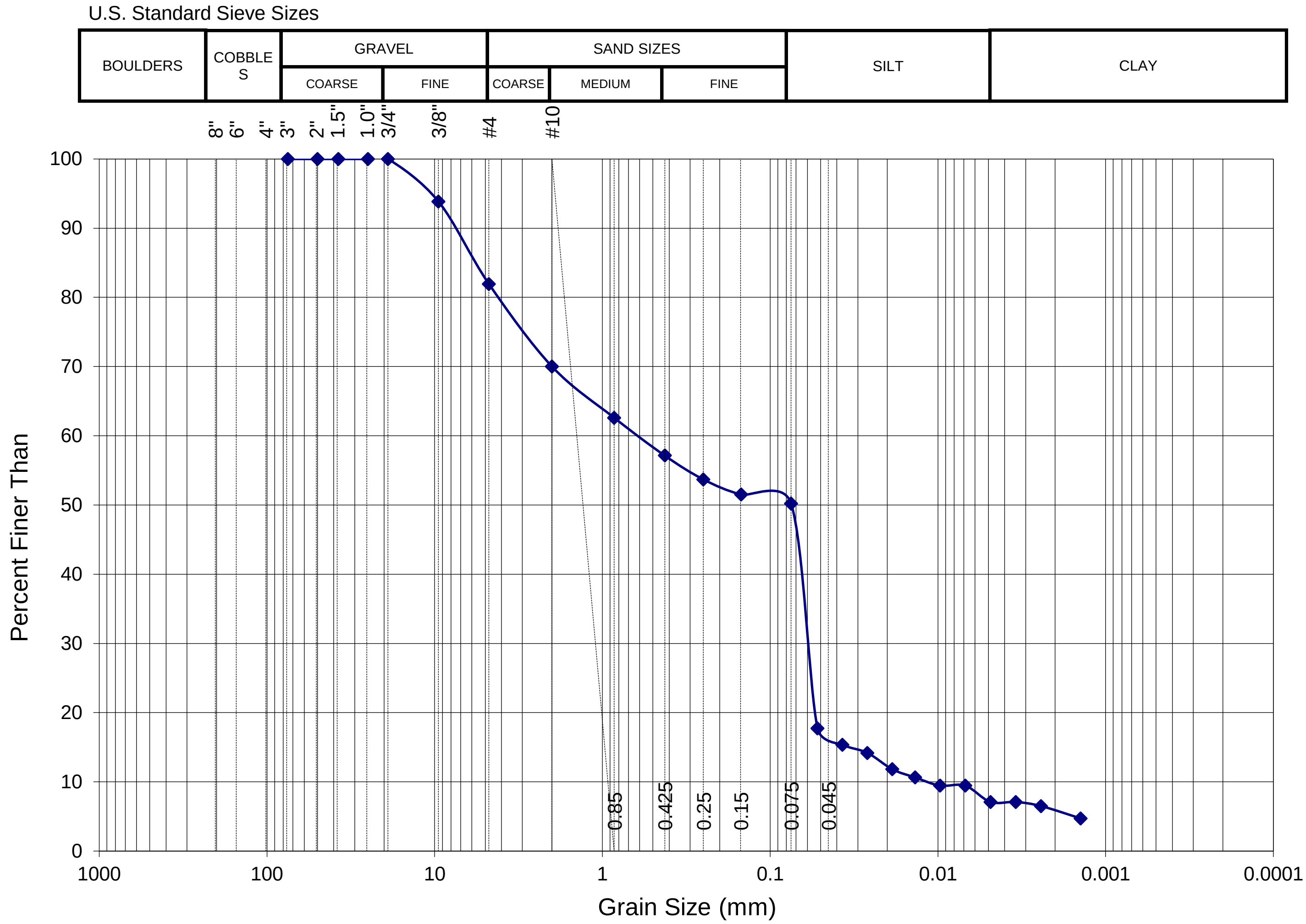
ALS Laboratory Group

819-58th Street, Saskatoon,SK

PARTICLE SIZE DISTRIBUTION CURVE

Client Name: WT2527895004
Project Number:
Client Sample ID LANDFILL COVER STOCKPILE T2
Lab Sample ID WT2527895004

Test Completion Date: 07-Oct-25
Analyst: SIH



METHOD DESCRIPTION

Method Reference: ASTM D6913 & D7928

Dispersion method: Mechanical

Dispersion period: 1 minute cm/s

DESCRIPTION OF SAND AND GRAVEL PARTICLES

Shape: Angular

Hardness: Hard

SUMMARY OF RESULTS

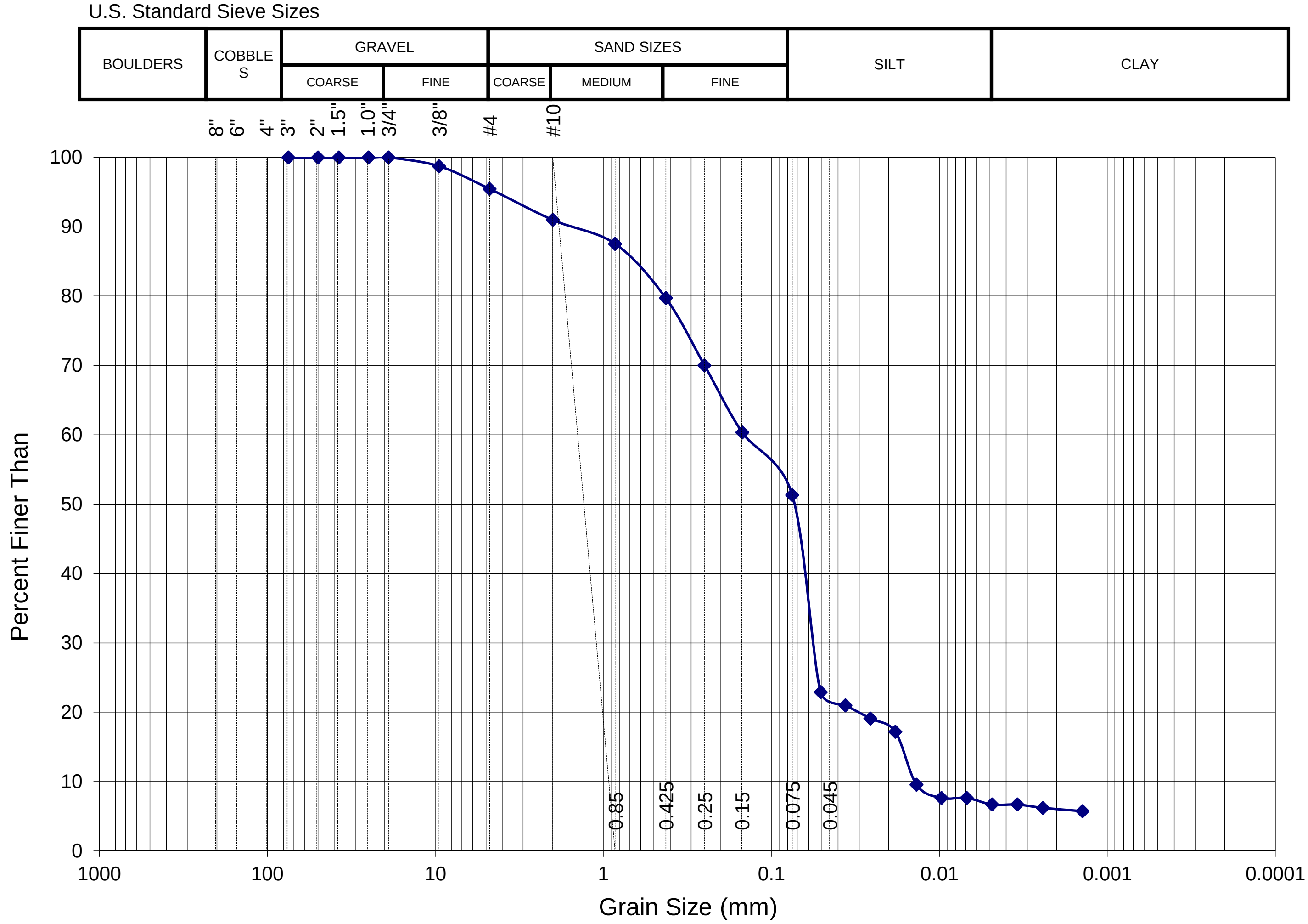
GRAIN SIZE	WT %	DIA. RANGE (mm)
% GRAVEL :	18.06	> 4.75
% COARSE SAND :	11.93	2.0 - 4.75
% MEDIUM SAND :	12.87	0.425 - 2.0
% FINE SAND :	6.94	0.075 - 0.425
% SILT :	42.94	0.075 - 0.005
% CLAY :	7.26	< 0.005

ALS Laboratory Group

819-58th Street, Saskatoon,SK

PARTICLE SIZE DISTRIBUTION CURVE

Client Name:	WT2527895005
Project Number:	
Client Sample ID	LANDFILL COVER STOCKPILE T3
Lab Sample ID	WT2527895005
Test Completion Date:	07-Oct-25
Analyst:	SIH



METHOD DESCRIPTION	
Method Reference: ASTM D6913 & D7928	
Dispersion method: Mechanical	
Dispersion period: 1 minute	cm/s

DESCRIPTION OF SAND AND GRAVEL PARTICLES
Shape: Angular
Hardness: Hard

SUMMARY OF RESULTS

GRAIN SIZE	WT %	DIA. RANGE (mm)
% GRAVEL :	4.54	> 4.75
% COARSE SAND :	4.48	2.0 - 4.75
% MEDIUM SAND :	11.24	0.425 - 2.0
% FINE SAND :	28.42	0.075 - 0.425
% SILT :	44.56	0.075 - 0.005
% CLAY :	6.76	< 0.005

Environmental Division
Waterloo
Work Order Reference
WT2527895

Telephone : +1 519 886 6910

Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

www.alsglobal.com

COC Number: 22 -

Page 1 of 1

Report To	Contact and company name below will appear on the final report
Company:	RWDI
Contact:	Anthony Vanderheyden
Phone:	519.823.1311
	Company address below will appear on the final report
Street:	600 Southgate Drive
City/Province:	Guelph, ON
Postal Code:	N1G 4P6
Invoice To	Same as Report To ☑ YES ☐ NO
	Copy of Invoice with Report ☑ YES ☐ NO
Company:	RWDI
Contact:	Anthony Vanderheyden

Reports / Recipients

Select Report Format: ☑ PDF ☑ EXCEL ☐ EDD (DIGITAL)
Merge QC/QCI Reports with COA ☑ YES ☐ NO ☐ N/A
☐ Compare Results to Criteria on Report - provide details below if box checked
Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax Anthony.Vanderheyden@rwdi.com
Email 2 Matthew.Butts@rwdi.com
Email 3 Sarah.Pellatt@rwdi.com

Invoice Recipients

Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax Anthony.Vanderheyden@rwdi.com
Email 2

Turnaround Time (TAT) Requested

☑ Routine [R] if received by 3pm M-F - no surcharges apply
☐ 4 day [P4] if received by 3pm M-F - 20% rush surcharge minimum
☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum
☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum
☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum
☐ Same day [E2] if received by 10am M-S - 200% rush surcharge.
Additional fees may apply to rush requests on weekends, statutory holi...
Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm am/pm
For all tests with rush TATs requested, please contact your AM to confirm availability.

Project Information

ALS Client Code / QUOTE #:
Job / Project #:
PO / AFE:
LSD:

Oil and Gas Required Fields (client use)

AFE/Cost Center: | PO#
Major/Minor Code: | Routing Code:
Requisitioner:
Location:

ALS Lab Work Order # (ALS use only): WT2527895

ALS Contact: | Sampler:

Analysis Request — Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (ALS use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	Grain Size	Moisture Content	Sample Weight	PM44	PM10	PM2.5	Silt Content	SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes)
	Quarry Road Sample #1	29-Sep-25	12:33	Soil	1	R	R	R	R	R	R	R			
	Quarry Road Sample #2	29-Sep-25	12:46	Soil	1	R	R	R	R	R	R	R			
	Landfill Cover Stockpile T1	29-Sep-25	13:03	Soil	1	R	R	R	R	R	R	R			
	Landfill Cover Stockpile T2	29-Sep-25	13:03	Soil	1	R	R	R	R	R	R	R			
	Landfill Cover Stockpile T3	29-Sep-25	13:05	Soil	1	R	R	R	R	R	R	R			

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System?
☐ YES ☐ NO
Are samples for human consumption/ use?
☐ YES ☐ NO

Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)

SAMPLE RECEIPT DETAILS (ALS use only)

Cooling Method: ☑ NONE ☐ ICE ☐ ICE PACKS ☐ FROZEN ☐ COOLING INITIATED
Cooler Custody Seals Intact: ☐ YES ☐ N/A Sample Custody Seals Intact: ☐ YES ☐ N/A
INITIAL COOLER TEMPERATURES °C | FINAL COOLER TEMPERATURES °C: 16.6

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (ALS use only)			FINAL SHIPMENT RECEPTION (ALS use only)		
Released by:	Date:	Time:	Received by:	Date:	Time:	Received by: BM	Date: 01/10/25	Time: 20:20

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION WHITE - LABORATORY COPY YELLOW - CLIENT COPY

MAY 2023 FRONT

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an **Authorized DW COC form**.

APPENDIX G

Appendix G1: Source Summary Table - Odour (Year 2025)

RWDI #2402272

Walker South Landfill Phase 2 Environmental Assessment

Source ID	Source Type	Source Description	Source Data								Emission Data							
			Stack Volumetric Flow Rate (Am^3/s)	Stack Exit Gas Temp. (°C)	Stack Inner Diameter (m)	Stack Exit Velocity (m/s)	Stack Height Above Grade	Stack Height Above Roof	Source Coordinates X (m)	Source Coordinates Y (m)	Contaminant	CAS Number	Emission Rate (OU/s)	Emission Rate ($OU/m^2/s$)	Averaging Period (hours)	Emission Estimating Technique [1]	Emissions Data Quality [2]	Percentage of Overall Emissions (%)
Walker Environmental Group Inc. – Landfill																		
EASTLF	AREAPOLY	Fugitive Emissions from Areas under Final Cover at East Landfill	n/a	n/a	n/a	n/a	n/a	n/a	648369	4776777	Odour	n/a	21,666	4.04E-02	10 minute	ST	Above-Average	33%
LEAPOND1	AREA	Leachate Aeration Pond 1	n/a	n/a	n/a	n/a	n/a	n/a	648441	4777248	Odour	n/a	294	1.69E-01	10 minute	ST	Above-Average	<1%
LEAPOND2	AREA	Leachate Aeration Pond 2	n/a	n/a	n/a	n/a	n/a	n/a	648787	4777544	Odour	n/a	328	1.69E-01	10 minute	ST	Above-Average	<1%
LEAPOND3	AREA	Leachate Aeration Pond 3	n/a	n/a	n/a	n/a	n/a	n/a	648856	4777523	Odour	n/a	389	1.69E-01	10 minute	ST	Above-Average	<1%
SLF1_AF	AREA	Fugitive Emissions from Active Face at South Landfill	n/a	n/a	n/a	n/a	n/a	n/a	649160	4776372	Odour	n/a	213	2.32E-01	10 minute	ST	Above-Average	<1%
SLF1_IC	AREAPOLY	Fugitive Emissions from Areas under Interim Cover at South Landfill	n/a	n/a	n/a	n/a	n/a	n/a	649308	4776433	Odour	n/a	26,266	8.43E-02	10 minute	ST	Above-Average	41%
SLF1_FC	AREAPOLY	Fugitive Emissions from Areas under Final Cover at South Landfill	n/a	n/a	n/a	n/a	n/a	n/a	648553	4775798	Odour	n/a	11,432	5.84E-02	10 minute	ST	Above-Average	18%
SOIL	AREAPOLY	Contaminated Soil Pile	n/a	n/a	n/a	n/a	n/a	n/a	648632	4776730	Odour	n/a	1,864	4.94E-02	10 minute	ST	Above-Average	3%
Sources at N-Viro Facility																		
BIOFILTR	Area	Biofilter Exhaust (including emissions from Natural Gas Dryer Flue Gas)	n/a	n/a	n/a	n/a	n/a	N/A	648277	4776993	Odour	n/a	221	4.20E-01	10 minute	ST	Above-Average	<1%
Sources at WEG Compost Facility																		
COMPPOND	AREA	Compost Pond	n/a	n/a	n/a	n/a	n/a	n/a	648030	4776700	Odour	n/a	36	1.10E-02	10 minute	ST	Above-Average	<1%
GRINDER	Volume	Fugitive emissions from Grinder	n/a	n/a	n/a	n/a	n/a	n/a	648170	4776728	Odour	n/a	8	-	10 minute	ST	Above-Average	<1%
R_BLDG	Volume	Receiving Building - During Operation of Grinder with Doors Open	n/a	n/a	n/a	n/a	n/a	n/a	648215	4776733	Odour	n/a	100	-	10 minute	ST	Above-Average	<1%
WK1_1	Area	Windrow of Compost Material in Week 1 of Treatment	n/a	n/a	n/a	n/a	n/a	n/a	648170	4776695	Odour	n/a	51	1.01E-01	10 minute	ST	Above-Average	<1%
WK1_2	Area	Windrow of Compost Material in Week 1 of Treatment	n/a	n/a	n/a	n/a	n/a	n/a	648171	4776685	Odour	n/a	51	1.01E-01	10 minute	ST	Above-Average	<1%
WK2_1	Area	Windrow of Compost Material in Week 2	n/a	n/a	n/a	n/a	n/a	n/a	648171	4776675	Odour	n/a	37	7.35E-02	10 minute	ST	Above-Average	<1%
WK2_2	Area	Windrow of Compost Material in Week 2	n/a	n/a	n/a	n/a	n/a	n/a	648172	4776666	Odour	n/a	37	7.35E-02	10 minute	ST	Above-Average	<1%
WK3_1	Area	Windrow of Compost Material in Week 3	n/a	n/a	n/a	n/a	n/a	n/a	648173	4776656	Odour	n/a	23	4.56E-02	10 minute	ST	Above-Average	<1%
WK3_2	Area	Windrow of Compost Material in Week 3	n/a	n/a	n/a	n/a	n/a	n/a	648174	4776646	Odour	n/a	23	4.56E-02	10 minute	ST	Above-Average	<1%
WK4_1	Area	Windrow of Compost Material in Week 4	n/a	n/a	n/a	n/a	n/a	n/a	648175	4776635	Odour	n/a	14	2.70E-02	10 minute	ST	Above-Average	<1%
WK4_2	Area	Windrow of Compost Material in Week 4	n/a	n/a	n/a	n/a	n/a	n/a	648176	4776625	Odour	n/a	14	2.70E-02	10 minute	ST	Above-Average	<1%
WK5_1	Area	Windrow of Compost Material in Week 5	n/a	n/a	n/a	n/a	n/a	n/a	648229	4776701	Odour	n/a	9	1.89E-02	10 minute	ST	Above-Average	<1%
WK5_2	Area	Windrow of Compost Material in Week 5	n/a	n/a	n/a	n/a	n/a	n/a	648230	4776691	Odour	n/a	9	1.89E-02	10 minute	ST	Above-Average	<1%
WK6_1	Area	Windrow of Compost Material in Week 6	n/a	n/a	n/a	n/a	n/a	n/a	648231	4776682	Odour	n/a	8	1.59E-02	10 minute	ST	Above-Average	<1%
WK6_2	Area	Windrow of Compost Material in Week 6	n/a	n/a	n/a	n/a	n/a	n/a	648232	4776671	Odour	n/a	8	1.59E-02	10 minute	ST	Above-Average	<1%
WK1_3	Area	Windrow of Compost Material in Week 1	n/a	n/a	n/a	n/a	n/a	n/a	648233	4776661	Odour	n/a	51	1.01E-01	10 minute	ST	Above-Average	<1%
WK2_3	Area	Windrow of Compost Material in Week 2	n/a	n/a	n/a	n/a	n/a	n/a	648234	4776651	Odour	n/a	37	7.35E-02	10 minute	ST	Above-Average	<1%
WK3_3	Area	Windrow of Compost Material in Week 3	n/a	n/a	n/a	n/a	n/a	n/a	648235	4776641	Odour	n/a	23	4.56E-02	10 minute	ST	Above-Average	<1%
WK4_3	Area	Windrow of Compost Material in Week 4	n/a	n/a	n/a	n/a	n/a	n/a	648236	4776631	Odour	n/a	14	2.70E-02	10 minute	ST	Above-Average	<1%
SCREEN	Area	Screening Operations	n/a	n/a	n/a	n/a	n/a	n/a	648173	4776783	Odour	n/a	49	6.38E-02	10 minute	ST	Above-Average	<1%
BIOF1	Area	Processing and Screening Building Biofilter 1	n/a	n/a	n/a	n/a	n/a	n/a	648177	4776744	Odour	n/a	7	6.10E-02	10 minute	ST	Above-Average	<1%
BIOF2	Area	Processing and Screening Building Biofilter 2	n/a	n/a	n/a	n/a	n/a	n/a	648179	4776709	Odour	n/a	7	6.10E-02	10 minute	ST	Above-Average	<1%
BASE1	Area	Incoming Leaf & Yard Material (Open Windrow Pad)	n/a	n/a	n/a	n/a	n/a	n/a	648130	4776793	Odour	n/a	28	2.58E-02	10 minute	ST	Above-Average	<1%
BASE2	Area	Incoming Leaf & Yard Material (Open Windrow Pad)	n/a	n/a	n/a	n/a	n/a	n/a	648127	4776837	Odour	n/a	28	2.58E-02	10 minute	ST	Above-Average	<1%
BASE3	Area	Incoming Leaf & Yard Material (Open Windrow Pad)	n/a	n/a	n/a	n/a	n/a	n/a	648123	4776881	Odour	n/a	28	2.58E-02	10 minute	ST	Above-Average	<1%
BASE4	Area	Incoming Leaf & Yard Material (Open Windrow Pad)	n/a	n/a	n/a	n/a	n/a	n/a	648118	4776924	Odour	n/a	26	2.58E-02	10 minute	ST	Above-Average	<1%
WK2O	Area	Open Windrow - Week 2 Material	n/a	n/a	n/a	n/a	n/a	n/a	648158	4776928	Odour	n/a	118	1.09E-01	10 minute	ST	Above-Average	<1%
WK2O2	Area	Open Windrow - Week 2 Material	n/a	n/a	n/a	n/a	n/a	n/a	648151	4776909	Odour	n/a	153	1.09E-01	10 minute	ST	Above-Average	<1%
WK2O3	Area	Open Windrow - Week 2 Material	n/a	n/a	n/a	n/a	n/a	n/a	648153	4776893	Odour	n/a	174	1.09E-01	10 minute	ST	Above-Average	<1%
WK2O4	Area	Open Windrow - Week 2 Material	n/a	n/a	n/a	n/a	n/a	n/a	648156	4776876	Odour	n/a	196	1.09E-01	10 minute	ST	Above-Average	<1%
W6B1	Area	Open Windrow - Week 6 Material (Before Turning)	n/a	n/a	n/a	n/a	n/a		648158	4776861	Odour	n/a	60	3.15E-02	10 minute	ST	Above-Average	<1%
W6BT2	Area	Open Windrow - Week 6 Material (Before Turning)	n/a	n/a	n/a	n/a	n/a	n/a	648160	4776844	Odour	n/a	63	3.15E-02	10 minute	ST	Above-Average	<1%
W6BT3	Area	Open Windrow - Week 6 Material (Before Turning)	n/a	n/a	n/a	n/a	n/a	n/a	648176	4776829	Odour	n/a	63	3.15E-02	10 minute	ST	Above-Average	<1%
W6BT4	Area	Open Windrow - Week 6 Material (Before Turning)	n/a	n/a	n/a	n/a	n/a	n/a	648218	4776801	Odour	n/a	38	3.15E-02	10 minute	ST	Above-Average	<1%
W6AT1	Area	Open Windrow - Week 6 Material (After Turning)	n/a	n/a	n/a	n/a	n/a	n/a	648256	4776804	Odour	n/a	74	6.16E-02	10 minute	ST	Above-Average	<1%
W6AT2	Area	Open Windrow - Week 6 Material (After Turning)	n/a	n/a	n/a	n/a	n/a	n/a	648228	4776786	Odour	n/a	86	6.16E-02	10 minute	ST	Above-Average	<1%
W6AT3	Area	Open Windrow - Week 6 Material (After Turning)	n/a	n/a	n/a	n/a	n/a	n/a	648229	4776772	Odour	n/a	86	6.16E-02	10 minute	ST	Above-Average	<1%
W6AT4	Area	Open Windrow - Week 6 Material (After Turning)	n/a	n/a	n/a	n/a	n/a	n/a	648229	4776757	Odour	n/a	86	6.16E-02	10 minute	ST	Above-Average	<1%
FINAL	Area	Final Product Storage	n/a	n/a	n/a	n/a	n/a	n/a	648134	4776714	Odour	n/a	2	4.99E-03	10 minute	ST	Above-Average	<1%
NEW_WK1	Area	Windrow of Compost Material in Week 1	n/a	n/a	n/a	n/a	n/a	n/a	648137	4776621	Odour	n/a	51	1.01E-01	10 minute	ST	Above-Average	<1%
NEW_WK2	Area	Windrow of Compost Material in Week 2	n/a	n/a	n/a	n/a	n/a	n/a	648148	4776622	Odour	n/a	37	7.35E-02	10 minute	ST	Above-Average	<1%
NEW_WK3	Area	Windrow of Compost Material in Week 3	n/a	n/a	n/a	n/a	n/a	n/a	648160	4776609	Odour	n/a	23	4.56E-02	10 minute	ST	Above-Average	<1%
NEW_WK4	Area	Windrow of Compost Material in Week 4	n/a	n/a	n/a	n/a	n/a	n/a	648170	4776610	Odour	n/a	14	2.70E-02	10 minute	ST	Above-Average	<1%
										Total	**Odour**	**n/a**	**64,718**	**-**	**-**	**-**	**-**	**100%**

Notes:

[1] Emission Estimating Technique Short-Forms are V-ST (Validated Source Test), "ST" (Source Test), EF (Emission Factor), MB (Mass Balance), and EC (Engineering Calculation).

[2] Data Quality Categories: Highest; Above-Average; Average; and Marginal.

Appendix G2: Source Summary Tables - Dust, Landfill Gas and Combustion By-Products (Year 2025)

RWDI Project #2402272

Walker South Landfill Phase 2 Environmental Assessment

Source ID [1]	Source Type [1]	Source Description	Source Data								Emission Data							
			Stack Volumetric Flow Rate (Am³/s)	Stack Exit Gas Temp. (°C)	Stack Inner Diameter (m)	Stack Exit Velocity (m/s)	Stack Height Above Grade (m)	Stack Height Above Roof (m)	Source Coordinates X (m)	Source Coordinates Y (m)	Contaminant	CAS Number	Emission Rate (g/s)	Emission Rate (g/m2-s)	Averaging Period (hours)	Emission Estimating Technique [2]	Emissions Data Quality [3]	% of Overall Emissions (%)
Walker Aggregates Inc. - Quarry and Asphalt Plant																		
ASPH_DC	POINT	Asphalt Plant Stack (Dust collector blower)	23.5	120	1.22	20.1	20	6 [1]	648930	4777386	TSP	n/a - TSP	2.0E+00		24	EC	Above-Average	25%
											PM10	n/a - PM10	4.8E-01		24	EC	Above-Average	15%
											PM2.5	n/a - PM2.5	4.0E-01		24	EC	Above-Average	23%
											Nitrogen Oxides (NOx)	10102-44-0	1.2E+00		1, 24	EC	Marginal	11%
											Sulphur Dioxide (SO2)	7446-09-5	2.2E-01		1, 8760	EC	Marginal	3%
											Benzene	71-43-2	1.4E-02		24	EC	Marginal	81%
											Benzene (Annual)		2.5E-03		8760	EC	Marginal	97%
ASPH_HTR	POINT	Asphalt Cement Tank Heater	0.25	125	0.17 (6" x 6")	10.8	5	1	648954	4777361	Nitrogen Oxides (NOx)	10102-44-0	2.6E-02		1, 24	EF	Above-Average	<1%
											Sulphur Dioxide (SO2)	7446-09-5	1.6E-04		1, 8760	EF	Above-Average	<1%
											TSP	n/a - TSP	2.0E-03		24	EF	Marginal	<1%
											PM10	n/a - PM10	2.0E-03		24	EF	Marginal	<1%
											PM2.5	n/a - PM2.5	2.0E-03		24	EF	Marginal	<1%
ASPH_LD1	VOLUME	HMA Load Out to Trucks at Mixer	n/a	n/a	n/a	n/a	n/a	n/a	648941	4777393	TSP	n/a - TSP	2.4E-02		24	EF	Average	<1%
											PM10	n/a - PM10	2.4E-02		24	EF	Average	<1%
											PM2.5	n/a - PM2.5	2.4E-02		24	EF	Average	1%
											Benzene	71-43-2	1.2E-04		24	EF	Average	<1%
											Benzene (Annual)		2.2E-05		8760	EF	Average	<1%
ASPH_LD2	VOLUME	HMA Load Out to Trucks at Silo	n/a	n/a	n/a	n/a	n/a	n/a	648966	4777394	TSP	n/a - TSP	1.6E-02		24	EF	Average	<1%
											PM10	n/a - PM10	1.6E-02		24	EF	Average	<1%
											PM2.5	n/a - PM2.5	1.6E-02		24	EF	Average	<1%
											Benzene	71-43-2	8.0E-05		24	EF	Average	<1%
											Benzene (Annual)		1.5E-05		8760	EF	Average	<1%
ASPH_SL1	VOLUME	Filling HMA Silo	n/a	n/a	n/a	n/a	n/a	n/a	648966	4777394	TSP	n/a - TSP	1.6E-02		24	EF	Average	<1%
											PM10	n/a - PM10	1.6E-02		24	EF	Average	<1%
											PM2.5	n/a - PM2.5	1.6E-02		24	EF	Average	<1%
											Benzene	71-43-2	1.4E-04		24	EF	Average	<1%
											Benzene (Annual)		2.7E-05		8760	EF	Average	1%
ASPH_TK1	POINT	Asphalt Cement Storage Tank (1 of 2)	n/a	177	0.001	0.001	7.6	n/a	648957	4777384	TSP	n/a - TSP	2.5E-02		24	EF	Average	<1%
											PM10	n/a - PM10	2.5E-02		24	EF	Average	<1%
											PM2.5	n/a - PM2.5	2.5E-02		24	EF	Average	1%
											Benzene	71-43-2	3.3E-05		24	EF	Average	<1%
											Benzene (Annual)		5.0E-06		8760	EF	Average	<1%
ASPH_TK2	POINT	Asphalt Cement Storage Tank (2 of 2)	n/a	177	0.001	0.001	7.6	n/a	648955	4777379	TSP	n/a - TSP	2.5E-02		24	EF	Average	<1%
											PM10	n/a - PM10	2.5E-02		24	EF	Average	<1%
											PM2.5	n/a - PM2.5	2.5E-02		24	EF	Average	1%
											Benzene	71-43-2	3.3E-05		24	EF	Average	<1%
											Benzene (Annual)		5.0E-06		8760	EF	Average	<1%
RAPPILE	VOLUME	Loading RAP to RAP stockpile	n/a	n/a	n/a	n/a	n/a	n/a	649016	4777376	TSP	n/a - TSP	4.6E-02		24	EF	Marginal	<1%
											PM10	n/a - PM10	2.0E-02		24	EF	Marginal	<1%
											PM2.5	n/a - PM2.5	3.1E-03		24	EF	Marginal	<1%
RAPDUMP	VOLUME	Loading RAP to Plant	n/a	n/a	n/a	n/a	n/a	n/a	648884	4777409	TSP	n/a - TSP	4.6E-02		24	EF	Marginal	<1%
											PM10	n/a - PM10	2.0E-02		24	EF	Marginal	<1%
											PM2.5	n/a - PM2.5	3.1E-03		24	EF	Marginal	<1%
AH_DROP	VOLUME	Drop off of raw aggregate material at asphalt plant	n/a	n/a	n/a	n/a	n/a	n/a	648888	4777427	TSP	n/a - TSP	7.0E-03		24	EF	Marginal	<1%
											PM10	n/a - PM10	4.9E-03		24	EF	Marginal	<1%
											PM2.5	n/a - PM2.5	7.3E-04		24	EF	Marginal	<1%
ASPH_TRK	LINE_VOLUME	Movement of Loaded HMA Trucks	n/a	n/a	n/a	n/a	n/a	n/a	648941	4777393	Benzene	71-43-2	2.8E-05		24	EF	Marginal	<1%
											Benzene (Annual)		5.2E-06		8760	EF	Marginal	<1%
PR_AP1	LINE_VOLUME	Paved Road at Asphalt Plant - to/from Asphalt Plant Entrance	n/a	n/a	n/a	n/a	n/a	n/a	648658	4777363	Nitrogen Oxides (NOx)	10102-44-0	1.32E-03		1, 24	ST	Above-Average	<1%
											Sulphur Dioxide (SO2)	7446-09-5	5.29E-06		1, 8760	ST	Above-Average	<1%
											Benzene	71-43-2	1.37E-06		24	ST	Above-Average	<1%
											TSP	n/a - TSP	5.08E-02		24	ST	Above-Average	<1%
											PM10	n/a - PM10	6.66E-03		24	ST	Above-Average	<1%
											PM2.5	n/a - PM2.5	1.65E-03		24	ST	Above-Average	<1%
UR_AP2	LINE_VOLUME	Unpaved Road at Asphalt Plant - between Entrance and Asphalt Plant	n/a	n/a	n/a	n/a	n/a	n/a	648941	4777393	Nitrogen Oxides (NOx)	10102-44-0	1.05E-03		1, 24	ST	Above-Average	<1%
											Sulphur Dioxide (SO2)	7446-09-5	5.12E-06		1, 8760	ST	Above-Average	<1%
											Benzene	71-43-2	1.29E-06		24	ST	Above-Average	<1%
											TSP	n/a - TSP	7.71E-02		24	ST	Above-Average	<1%
											PM10	n/a - PM10	1.93E-02		24	ST	Above-Average	<1%
											PM2.5	n/a - PM2.5	1.97E-03		24	ST	Above-Average	<1%

Appendix G2: Source Summary Tables - Dust, Landfill Gas and Combustion By-Products (Year 2025)

Walker South Landfill Phase 2 Environmental Assessment

RWDI Project #2402272

Source ID [1]	Source Type [1]	Source Description	Source Data: Stack Volumetric Flow Rate (Am³/s)	Stack Exit Gas Temp. (°C)	Stack Inner Diameter (m)	Stack Exit Velocity (m/s)	Stack Height Above Grade (m)	Stack Height Above Roof (m)	Source Coordinates X (m)	Source Coordinates Y (m)	Emission Data: Contaminant	CAS Number	Emission Rate (g/s)	Emission Rate (g/m2-s)	Averaging Period (hours)	Emission Estimating Technique [2]	Emissions Data Quality [3]	% of Overall Emissions (%)
EQ_AP	VOLUME	Tailpipe Emission of Onsite Equipment at Asphalt Plant	n/a	n/a	n/a	n/a	n/a	n/a	649021	4777384	Nitrogen Oxides (NOx)	10102-44-0	2.53E-03		1, 24	ST	Above-Average	<1%
											Sulphur Dioxide (SO2)	7446-09-5	1.56E-05		1, 8760	ST	Above-Average	<1%
											Benzene	71-43-2	9.11E-06		24	ST	Above-Average	<1%
											TSP	n/a - TSP	2.11E-04		24	ST	Above-Average	<1%
											PM10	n/a - PM10	2.11E-04		24	ST	Above-Average	<1%
											PM2.5	n/a - PM2.5	2.11E-04		24	ST	Above-Average	<1%
QBLAST	VOLUME	Blasting at Quarry Face	n/a	n/a	n/a	n/a	n/a	n/a	649760	4776651	TSP	n/a - TSP	3.9E-01		24	EF	Marginal	5%
											PM10	n/a - PM10	2.0E-01		24	EF	Marginal	6%
											PM2.5	n/a - PM2.5	1.2E-02		24	EF	Marginal	<1%
QPDROP3	VOLUME	Quarry Drop Point at Granular A Pile	n/a	n/a	n/a	n/a	n/a	n/a	648694	4777444	TSP	n/a - TSP	3.4E-03		24	EF	Marginal	<1%
											PM10	n/a - PM10	2.1E-03		24	EF	Marginal	<1%
											PM2.5	n/a - PM2.5	5.9E-04		24	EF	Marginal	<1%
QPDROP4	VOLUME	Quarry Drop Point at Surge Pile	n/a	n/a	n/a	n/a	n/a	n/a	648531	4777329	TSP	n/a - TSP	3.4E-03		24	EF	Marginal	<1%
											PM10	n/a - PM10	2.1E-03		24	EF	Marginal	<1%
											PM2.5	n/a - PM2.5	5.9E-04		24	EF	Marginal	<1%
QPDROP5	VOLUME	Quarry Drop Point at Sand/Concrete Stone Pile	n/a	n/a	n/a	n/a	n/a	n/a	648721	4777304	TSP	n/a - TSP	3.4E-03		24	EF	Marginal	<1%
											PM10	n/a - PM10	2.1E-03		24	EF	Marginal	<1%
											PM2.5	n/a - PM2.5	5.9E-04		24	EF	Marginal	<1%
QPDUMP	VOLUME	Quarry truck Unloading at Processing Plant	n/a	n/a	n/a	n/a	n/a	n/a	648549	4777234	TSP	n/a - TSP	7.3E-04		24	EF	Marginal	<1%
											PM10	n/a - PM10	5.3E-04		24	EF	Marginal	<1%
											PM2.5	n/a - PM2.5	8.0E-05		24	EF	Marginal	<1%
QPLOAD	VOLUME	Quarry Handling: Truck Loading at Quarry Active Face	n/a	n/a	n/a	n/a	n/a	n/a	649741	4776637	TSP	n/a - TSP	2.4E-03		24	EF	Marginal	<1%
											PM10	n/a - PM10	1.8E-03		24	EF	Marginal	<1%
											PM2.5	n/a - PM2.5	2.7E-04		24	EF	Marginal	<1%
QPPIKUP1	VOLUME	Quarry Granular A Loading at Processing Plant	n/a	n/a	n/a	n/a	n/a	n/a	648696	4777454	TSP	n/a - TSP	4.2E-01		24	EF	Marginal	5%
											PM10	n/a - PM10	1.8E-01		24	EF	Marginal	6%
											PM2.5	n/a - PM2.5	2.8E-02		24	EF	Marginal	2%
QPPIKUP2	VOLUME	Quarry Granular B Loading at Processing Plant	n/a	n/a	n/a	n/a	n/a	n/a	648618	4777466	TSP	n/a - TSP	9.1E-02		24	EF	Marginal	1%
											PM10	n/a - PM10	4.0E-02		24	EF	Marginal	1%
											PM2.5	n/a - PM2.5	6.0E-03		24	EF	Marginal	<1%
QPPIKUP3	VOLUME	Quarry Granular M Loading at Processing Plant	n/a	n/a	n/a	n/a	n/a	n/a	648706	4777484	TSP	n/a - TSP	2.1E-02		24	EF	Marginal	<1%
											PM10	n/a - PM10	9.2E-03		24	EF	Marginal	<1%
											PM2.5	n/a - PM2.5	1.4E-03		24	EF	Marginal	<1%
QPPIKUP4	VOLUME	Quarry Screenings Loading at Processing Plant	n/a	n/a	n/a	n/a	n/a	n/a	648674	4777324	TSP	n/a - TSP	7.0E-03		24	EF	Marginal	<1%
											PM10	n/a - PM10	3.1E-03		24	EF	Marginal	<1%
											PM2.5	n/a - PM2.5	4.6E-04		24	EF	Marginal	<1%
QPPIKUP5	VOLUME	Quarry Clear Stone Loading at Processing Plant	n/a	n/a	n/a	n/a	n/a	n/a	648806	4777377	TSP	n/a - TSP	1.4E-01		24	EF	Marginal	2%
											PM10	n/a - PM10	6.1E-02		24	EF	Marginal	2%
											PM2.5	n/a - PM2.5	9.3E-03		24	EF	Marginal	<1%
QPPIKUP6	VOLUME	Quarry Manufactured Sand Loading at Processing Plant	n/a	n/a	n/a	n/a	n/a	n/a	648733	4777313	TSP	n/a - TSP	2.1E-02		24	EF	Marginal	<1%
											PM10	n/a - PM10	9.2E-03		24	EF	Marginal	<1%
											PM2.5	n/a - PM2.5	1.4E-03		24	EF	Marginal	<1%
QP1CRUSH	VOLUME	Quarry Primary Crusher (Processing Plant)	n/a	n/a	n/a	n/a	n/a	n/a	648542	4777242	TSP	n/a - TSP	2.3E-02		24	EF	Marginal	<1%
											PM10	n/a - PM10	1.8E-02		24	EF	Marginal	<1%
											PM2.5	n/a - PM2.5	3.3E-03		24	EF	Marginal	<1%
QP2CRUSH	VOLUME	Quarry Secondary Crusher (Processing Plant)	n/a	n/a	n/a	n/a	n/a	n/a	648470	4777316	TSP	n/a - TSP	1.6E-02		24	EF	Marginal	<1%
											PM10	n/a - PM10	1.3E-02		24	EF	Marginal	<1%
											PM2.5	n/a - PM2.5	2.3E-03		24	EF	Marginal	<1%
QPCLASS	VOLUME	Classifier (Processing Plant)	n/a	n/a	n/a	n/a	n/a	n/a	648678	4777299	TSP	n/a - TSP	7.0E-02		24	EF	Marginal	<1%
											PM10	n/a - PM10	3.3E-02		24	EF	Marginal	<1%
											PM2.5	n/a - PM2.5	1.3E-02		24	EF	Marginal	<1%
QPSCALP	VOLUME	Quarry Scalping Screen (Processing Plant)	n/a	n/a	n/a	n/a	n/a	n/a	648490	4777293	TSP	n/a - TSP	3.7E-02		24	EF	Marginal	<1%
											PM10	n/a - PM10	2.5E-02		24	EF	Marginal	<1%
											PM2.5	n/a - PM2.5	1.7E-03		24	EF	Marginal	<1%
QPSIZING	VOLUME	Quarry Sizing Screen (Processing Plant)	n/a	n/a	n/a	n/a	n/a	n/a	648512	4777320	TSP	n/a - TSP	2.6E-02		24	EF	Marginal	<1%
											PM10	n/a - PM10	1.7E-02		24	EF	Marginal	<1%
											PM2.5	n/a - PM2.5	1.2E-03		24	EF	Marginal	<1%
QDRILL	VOLUME	Quarry Drilling at active face (drilling holes for blasting charges)	n/a	n/a	n/a	n/a	n/a	n/a	649773	4776660	TSP	n/a - TSP	1.6E-05		24	EF	Marginal	<1%
											PM10	n/a - PM10	1.1E-05		24	EF	Marginal	<1%
											PM2.5	n/a - PM2.5	1.7E-06		24	EF	Marginal	<1%
QPCCRUSH	VOLUME	Quarry Cone Crusher (Processing Plant)	n/a	n/a	n/a	n/a	n/a	n/a	648512	4777332	TSP	n/a - TSP	5.7E-03		24	EF	Marginal	<1%
											PM10	n/a - PM10	4.5E-03		24	EF	Marginal	<1%
											PM2.5	n/a - PM2.5	8.3E-04		24	EF	Marginal	<1%

Source ID [1]	Source Type [1]	Source Description	Source Data: Stack Volumetric Flow Rate (Am³/s)	Stack Exit Gas Temp. (°C)	Stack Inner Diameter (m)	Stack Exit Velocity (m/s)	Stack Height Above Grade (m)	Stack Height Above Roof (m)	Source Coordinates X (m)	Source Coordinates Y (m)	Emission Data: Contaminant	CAS Number	Emission Rate (g/s)	Emission Rate (g/m2-s)	Averaging Period (hours)	Emission Estimating Technique [2]	Emissions Data Quality [3]	% of Overall Emissions (%)
QPSIZNG2	VOLUME	Quarry Screen After Cone Crusher (Processing Plant)	n/a	n/a	n/a	n/a	n/a	n/a	648500	4777324	TSP	n/a - TSP	9.3E-03		24	EF	Marginal	<1%
											PM10	n/a - PM10	6.2E-03		24	EF	Marginal	<1%
											PM2.5	n/a - PM2.5	4.2E-04		24	EF	Marginal	<1%
SEQGen	VOLUME	Energy Supply to Water Pump for Water Trucks	n/a	n/a	n/a	n/a	n/a	n/a	649500	4776181	Nitrogen Oxides (NOx)	10102-44-0	1.15E-01		1, 24	EF	Marginal	1%
											Sulphur Dioxide (SO2)	7446-09-5	1.56E-02		1, 8760	EF	Marginal	<1%
											TSP	n/a - TSP	5.00E-03		24	EF	Marginal	<1%
											PM10	n/a - PM10	5.00E-03		24	EF	Marginal	<1%
											PM2.5	n/a - PM2.5	5.00E-03		24	EF	Marginal	<1%
WE_APRAP	AREA	Wind Erosion from Recycled Asphalt Pavement (RAP) Stockpile	n/a	n/a	n/a	n/a	n/a	n/a	649025	4777338	TSP	n/a - TSP	0.00E+00	0.00E+00	24	ST	Above-Average	<1%
											PM10	n/a - PM10	0.00E+00	0.00E+00	24	ST	Above-Average	<1%
											PM2.5	n/a - PM2.5	0.00E+00	0.00E+00	24	ST	Above-Average	<1%
WE_QPFP1	AREA_POLY	Wind Erosion from Quarry Finished Product Stockpile (Granular A)	n/a	n/a	n/a	n/a	n/a	n/a	648650	4777387	TSP	n/a - TSP	0.00E+00	0.00E+00	24	ST	Above-Average	<1%
											PM10	n/a - PM10	0.00E+00	0.00E+00	24	ST	Above-Average	<1%
											PM2.5	n/a - PM2.5	0.00E+00	0.00E+00	24	ST	Above-Average	<1%
WE_QPFP2	AREA	Wind Erosion from Quarry Finished Product Stockpile (Granular B)	n/a	n/a	n/a	n/a	n/a	n/a	648589	4777430	TSP	n/a - TSP	0.00E+00	0.00E+00	24	ST	Above-Average	<1%
											PM10	n/a - PM10	0.00E+00	0.00E+00	24	ST	Above-Average	<1%
											PM2.5	n/a - PM2.5	0.00E+00	0.00E+00	24	ST	Above-Average	<1%
WE_QPFP3	AREA	Wind Erosion from Quarry Finished Product Stockpile (Granular M)	n/a	n/a	n/a	n/a	n/a	n/a	648658	4777507	TSP	n/a - TSP	0.00E+00	0.00E+00	24	ST	Above-Average	<1%
											PM10	n/a - PM10	0.00E+00	0.00E+00	24	ST	Above-Average	<1%
											PM2.5	n/a - PM2.5	0.00E+00	0.00E+00	24	ST	Above-Average	<1%
WE_QPFP4	AREA	Wind Erosion from Quarry Finished Product Stockpile (Screenings)	n/a	n/a	n/a	n/a	n/a	n/a	648663	4777306	TSP	n/a - TSP	0.00E+00	0.00E+00	24	ST	Above-Average	<1%
											PM10	n/a - PM10	0.00E+00	0.00E+00	24	ST	Above-Average	<1%
											PM2.5	n/a - PM2.5	0.00E+00	0.00E+00	24	ST	Above-Average	<1%
WE_QPFP5	AREA	Wind Erosion from Quarry Finished Product Stockpile (Clear Stone)	n/a	n/a	n/a	n/a	n/a	n/a	648794	4777363	TSP	n/a - TSP	0.00E+00	0.00E+00	24	ST	Above-Average	<1%
											PM10	n/a - PM10	0.00E+00	0.00E+00	24	ST	Above-Average	<1%
											PM2.5	n/a - PM2.5	0.00E+00	0.00E+00	24	ST	Above-Average	<1%
WE_QPFP6	AREA	Wind Erosion from Quarry Finished Product Stockpile (Sand)	n/a	n/a	n/a	n/a	n/a	n/a	648694	4777291	TSP	n/a - TSP	0.00E+00	0.00E+00	24	ST	Above-Average	<1%
											PM10	n/a - PM10	0.00E+00	0.00E+00	24	ST	Above-Average	<1%
											PM2.5	n/a - PM2.5	0.00E+00	0.00E+00	24	ST	Above-Average	<1%
PR_QP1	LINE_VOLUME	Paved Road at Quarry Plant - Export of Finished Products	n/a	n/a	n/a	n/a	n/a	n/a	648658	4777363	Nitrogen Oxides (NOx)	10102-44-0	1.03E-03		1, 24	ST	Above-Average	<1%
											Sulphur Dioxide (SO2)	7446-09-5	4.53E-06		1, 8760	ST	Above-Average	<1%
											Benzene	71-43-2	1.11E-06		24	ST	Above-Average	<1%
											TSP	n/a - TSP	5.07E-02		24	ST	Above-Average	<1%
											PM10	n/a - PM10	6.63E-03		24	ST	Above-Average	<1%
											PM2.5	n/a - PM2.5	1.64E-03		24	ST	Above-Average	<1%
UR_QP2	LINE_VOLUME	Unpaved Road at Quarry Plant - Export of Finished Products	n/a	n/a	n/a	n/a	n/a	n/a	648653	4777498	Nitrogen Oxides (NOx)	10102-44-0	7.43E-04		1, 24	ST	Above-Average	<1%
											Sulphur Dioxide (SO2)	7446-09-5	4.30E-06		1, 8760	ST	Above-Average	<1%
											Benzene	71-43-2	1.06E-06		24	ST	Above-Average	<1%
											TSP	n/a - TSP	4.26E-02		24	ST	Above-Average	<1%
											PM10	n/a - PM10	1.07E-02		24	ST	Above-Average	<1%
											PM2.5	n/a - PM2.5	1.10E-03		24	ST	Above-Average	<1%
UR_QP3	LINE_VOLUME	Unpaved Road at Quarry Plant - between Quarry Face and Quarry Plant	n/a	n/a	n/a	n/a	n/a	n/a	648549	4777234	Nitrogen Oxides (NOx)	10102-44-0	1.99E-03		1, 24	ST	Above-Average	<1%
											Sulphur Dioxide (SO2)	7446-09-5	4.56E-06		1, 8760	ST	Above-Average	<1%
											Benzene	71-43-2	1.32E-06		24	ST	Above-Average	<1%
											TSP	n/a - TSP	3.03E-01		24	ST	Above-Average	4%
											PM10	n/a - PM10	7.56E-02		24	ST	Above-Average	2%
											PM2.5	n/a - PM2.5	7.63E-03		24	ST	Above-Average	<1%
EQ_QP	VOLUME	Tailpipe Emission of Onsite Equipment at Quarry Plant	n/a	n/a	n/a	n/a	n/a	n/a	648698	4777484	Nitrogen Oxides (NOx)	10102-44-0	2.53E-03		1, 24	ST	Above-Average	<1%
											Sulphur Dioxide (SO2)	7446-09-5	1.56E-05		1, 8760	ST	Above-Average	<1%
											Benzene	71-43-2	9.11E-06		24	ST	Above-Average	<1%
											TSP	n/a - TSP	2.11E-04		24	ST	Above-Average	<1%
											PM10	n/a - PM10	2.11E-04		24	ST	Above-Average	<1%
											PM2.5	n/a - PM2.5	2.11E-04		24	ST	Above-Average	<1%
EQ_QF	VOLUME	Tailpipe Emission of Onsite Equipment at Quarry Working Face	n/a	n/a	n/a	n/a	n/a	n/a	649732	4776634	Nitrogen Oxides (NOx)	10102-44-0	2.53E-03		1, 24	ST	Above-Average	<1%
											Sulphur Dioxide (SO2)	7446-09-5	1.56E-05		1, 8760	ST	Above-Average	<1%
											Benzene	71-43-2	9.11E-06		24	ST	Above-Average	<1%
											TSP	n/a - TSP	2.11E-04		24	ST	Above-Average	<1%
											PM10	n/a - PM10	2.11E-04		24	ST	Above-Average	<1%
											PM2.5	n/a - PM2.5	2.11E-04		24	ST	Above-Average	<1%
Niagara Biosolids Facility																		
BIOFILTR	AREA	Dryer Flue Gas	22.2	36	65.0 m x 8.1 m	0.028632412	1.52	N/A	648277	4776993	Nitrogen Oxides (NOx)	10102-44-0	8.56E-03	1.63E-05	1, 24	EF	Above-Average	<1%
											Sulphur Dioxide (SO2)	7446-09-5	1.33E-03	2.53E-06	1, 8760	EF	Above-Average	<1%
SILO_1	POINT	Silo #1 Bin Vent [4]	0.7	20	0.6x0.6	17.5	15	2.4	648324	4776920	TSP	n/a - TSP	2.00E-03		24	EF	Average	<1%
											PM10	n/a - PM10	1.33E-03		24	EF	Average	<1%
											PM2.5	n/a - PM2.5	2.00E-04		24	EF	Average	<1%

Appendix G2: Source Summary Tables - Dust, Landfill Gas and Combustion By-Products (Year 2025)

Walker South Landfill Phase 2 Environmental Assessment

Source ID [1]	Source Type [1]	Source Description	Source Data: Stack Volumetric Flow Rate (Am³/s)	Stack Exit Gas Temp. (°C)	Stack Inner Diameter (m)	Stack Exit Velocity (m/s)	Stack Height Above Grade (m)	Stack Height Above Roof (m)	Source Coordinates X (m)	Source Coordinates Y (m)	Emission Data: Contaminant	CAS Number	Emission Rate (g/s)	Emission Rate (g/m2-s)	Averaging Period (hours)	Emission Estimating Technique [2]	Emissions Data Quality [3]	% of Overall Emissions (%)
SILO_2	POINT	Silo #2 Bin Vent [4]	0.7	20	0.6x0.6	17.5	15	2.4	648324	4776915	TSP	n/a - TSP	2.00E-03		24	EF	Average	<1%
											PM10	n/a - PM10	1.33E-03		24	EF	Average	<1%
											PM2.5	n/a - PM2.5	2.00E-04		24	EF	Average	<1%
HEATING	VOLUME	Natural Gas Fired Comfort Heating	n/a	n/a	n/a	n/a	n/a	n/a	648313	4776920	Nitrogen Oxides (NOx)	10102-44-0	1.51E-02		1, 24	EF	Above-Average	<1%
											Sulphur Dioxide (SO2)	7446-09-5	9.04E-05		1, 8760	EF	Above-Average	<1%
											TSP	n/a - TSP	1.15E-03		24	EF	Above-Average	<1%
											PM10	n/a - PM10	1.15E-03		24	EF	Above-Average	<1%
											PM2.5	n/a - PM2.5	1.15E-03		24	EF	Above-Average	<1%
MO_GEN	POINT	55 kW Natural Gas Fired Emergency Generator	0.2	427	0.15	11.31768	4	1	648467	4777049	Nitrogen Oxides (NOx)	10102-44-0	1.69E-01		1, 24	EF	Above-Average	2%
											Sulphur Dioxide (SO2)	7446-09-5	1.92E-03		1, 8760	EF	Above-Average	<1%
											TSP	n/a - TSP	2.43E-02		24	EF	Above-Average	<1%
											PM10	n/a - PM10	2.43E-02		24	EF	Above-Average	<1%
											PM2.5	n/a - PM2.5	2.43E-02		24	EF	Above-Average	1%
BOILERS	VOLUME	Two 650,000 MBTU natural gas fired boilers	0.172	175	n/a	n/a	n/a	n/a	648448	4777095	Nitrogen Oxides (NOx)	10102-44-0	1.61E-02		1, 24	EF	Above-Average	<1%
											Sulphur Dioxide (SO2)	7446-09-5	9.63E-05		1, 8760	EF	Above-Average	<1%
											TSP	n/a - TSP	1.22E-03		24	EF	Above-Average	<1%
											PM10	n/a - PM10	1.22E-03		24	EF	Above-Average	<1%
											PM2.5	n/a - PM2.5	1.22E-03		24	EF	Above-Average	<1%
DROPOFF	VOLUME	Receiving Leaf & yard Material in Open Windro	n/a	n/a	n/a	n/a	n/a	n/a	648120	4776951	TSP	n/a - TSP	7.86E-03		24	EF	Average	<1%
											PM10	n/a - PM10	3.44E-03		24	EF	Average	<1%
											PM2.5	n/a - PM2.5	5.21E-04		24	EF	Average	<1%
MOVE1	VOLUME	Movement of Material into Windrow (Open Wi	n/a	n/a	n/a	n/a	n/a	n/a	648187	4776964	TSP	n/a - TSP	7.86E-03		24	EF	Average	<1%
											PM10	n/a - PM10	3.44E-03		24	EF	Average	<1%
											PM2.5	n/a - PM2.5	5.21E-04		24	EF	Average	<1%
MOVE2	VOLUME	Movement of Material into Windrow (GORE ar	n/a	n/a	n/a	n/a	n/a	n/a	648280	4776647	TSP	n/a - TSP	7.86E-03		24	EF	Average	<1%
											PM10	n/a - PM10	3.44E-03		24	EF	Average	<1%
											PM2.5	n/a - PM2.5	5.21E-04		24	EF	Average	<1%
SCRTSP	VOLUME	Drop at Screening Area	n/a	n/a	n/a	n/a	n/a	n/a	648178	4776807	TSP	n/a - TSP	7.86E-03		24	EF	Average	<1%
											PM10	n/a - PM10	3.44E-03		24	EF	Average	<1%
											PM2.5	n/a - PM2.5	5.21E-04		24	EF	Average	<1%
SCREEN1	VOLUME	Screening Emissions	n/a	n/a	n/a	n/a	n/a	n/a	648259	4776746	TSP	n/a - TSP	1.22E-02		24	EF	Average	<1%
											PM10	n/a - PM10	1.22E-02		24	EF	Average	<1%
											PM2.5	n/a - PM2.5	1.83E-03		24	EF	Average	<1%
SCREEN2	VOLUME	Screening Emissions	n/a	n/a	n/a	n/a	n/a	n/a	648281	4776753	TSP	n/a - TSP	1.22E-02		24	EF	Average	<1%
											PM10	n/a - PM10	1.22E-02		24	EF	Average	<1%
											PM2.5	n/a - PM2.5	1.83E-03		24	EF	Average	<1%
SCREEN3	VOLUME	Screening Emissions	n/a	n/a	n/a	n/a	n/a	n/a	648135	4776839	TSP	n/a - TSP	2.29E-02		24	EF	Average	<1%
											PM10	n/a - PM10	2.29E-02		24	EF	Average	<1%
											PM2.5	n/a - PM2.5	3.44E-03		24	EF	Average	<1%
SCREEN4	VOLUME	Screening Emissions	n/a	n/a	n/a	n/a	n/a	n/a	648139	4776949	TSP	n/a - TSP	2.29E-02		24	EF	Average	<1%
											PM10	n/a - PM10	2.29E-02		24	EF	Average	<1%
											PM2.5	n/a - PM2.5	3.44E-03		24	EF	Average	<1%
FSTPL	VOLUME	Drop at Final Stockpile	n/a	n/a	n/a	n/a	n/a	n/a	648140	4776734	TSP	n/a - TSP	7.86E-03		24	EF	Average	<1%
											PM10	n/a - PM10	3.44E-03		24	EF	Average	<1%
											PM2.5	n/a - PM2.5	5.21E-04		24	EF	Average	<1%
FP	VOLUME	Loading of Material for Shipment Off-Site	n/a	n/a	n/a	n/a	n/a	n/a	648138	4776765	TSP	n/a - TSP	7.86E-03		24	EF	Average	<1%
											PM10	n/a - PM10	3.44E-03		24	EF	Average	<1%
											PM2.5	n/a - PM2.5	5.21E-04		24	EF	Average	<1%
GRINDR	VOLUME	Fugitive emissions from Grinder [7]	n/a	n/a	n/a	n/a	n/a	n/a	648136	4776795	TSP	n/a - TSP	2.29E-02		24	EF	Average	<1%
											PM10	n/a - PM10	2.29E-02		24	EF	Average	<1%
											PM2.5	n/a - PM2.5	3.44E-03		24	EF	Average	<1%
GRINDR2_N	VOLUME	Fugitive emissions from Grinder #2 [6]	n/a	n/a	n/a	n/a	n/a	n/a	648119	4776971	TSP	n/a - TSP	2.29E-02		24	EF	Average	<1%
											PM10	n/a - PM10	2.29E-02		24	EF	Average	<1%
											PM2.5	n/a - PM2.5	3.44E-03		24	EF	Average	<1%
CONV_PM	VOLUME	Stacking Conveyor Fugitive Emissions [7]	n/a	n/a	n/a	n/a	n/a	n/a	648281	4776764	TSP	n/a - TSP	8.22E-04		24	EF	Average	<1%
											PM10	n/a - PM10	5.11E-04		24	EF	Average	<1%
											PM2.5	n/a - PM2.5	1.44E-04		24	EF	Average	<1%
CONV_PM2_N	VOLUME	Stacking Conveyor #2 Fugitive Emissions - North Location [6]	n/a	n/a	n/a	n/a	n/a	n/a	648126	4776966	TSP	n/a - TSP	8.22E-04		24	EF	Average	<1%
											PM10	n/a - PM10	5.11E-04		24	EF	Average	<1%
											PM2.5	n/a - PM2.5	1.44E-04		24	EF	Average	<1%

Appendix G2: Source Summary Tables - Dust, Landfill Gas and Combustion By-Products (Year 2025)

Walker South Landfill Phase 2 Environmental Assessment

RWDI Project #2402272

Source ID [1]	Source Type [1]	Source Description	Source Data: Stack Volumetric Flow Rate (Am³/s)	Stack Exit Gas Temp. (°C)	Stack Inner Diameter (m)	Stack Exit Velocity (m/s)	Stack Height Above Grade (m)	Stack Height Above Roof (m)	Source Coordinates X (m)	Source Coordinates Y (m)	Emission Data: Contaminant	CAS Number	Emission Rate (g/s)	Emission Rate (g/m2-s)	Averaging Period (hours)	Emission Estimating Technique [2]	Emissions Data Quality [3]	% of Overall Emissions (%)
GSTK	POINT	Grinder Engine - 860 kW, Diesel Fired [7]	2.7	575	0.2	86	5.5	1.5	648135	4776792	Nitrogen Oxides (NOx)	10102-44-0	9.45E-01		1, 24	EF	Marginal	9%
											Sulphur Dioxide (SO2)	7446-09-5	1.05E-01		1, 8760	EF	Marginal	1%
											TSP	n/a - TSP	5.55E-02		24	EF	Marginal	<1%
											PM10	n/a - PM10	5.55E-02		24	EF	Marginal	2%
											PM2.5	n/a - PM2.5	5.55E-02		24	EF	Marginal	3%
GSTK2_N	POINT	Grinder #2 Engine 860 kW, Diesel Fired - North Location [6]	2.7	575	0.2	86	5.5	1.5	648119	4776968	Nitrogen Oxides (NOx)	10102-44-0	9.45E-01		1, 24	EF	Marginal	9%
											Sulphur Dioxide (SO2)	7446-09-5	1.05E-01		1, 8760	EF	Marginal	1%
											TSP	n/a - TSP	5.55E-02		24	EF	Marginal	<1%
											PM10	n/a - PM10	5.55E-02		24	EF	Marginal	2%
											PM2.5	n/a - PM2.5	5.55E-02		24	EF	Marginal	3%
GENC	POINT	Generator #1 600 kW, Diesel Fired	2.4	553	0.25	48	3.5	0.5	648169	4776734	Nitrogen Oxides (NOx)	10102-44-0	2.43E+00		1, 24	EF	Marginal	22%
											Sulphur Dioxide (SO2)	7446-09-5	1.23E-03		1, 8760	EF	Marginal	<1%
											TSP	n/a - TSP	1.80E-02		24	EF	Marginal	<1%
											PM10	n/a - PM10	1.48E-02		24	EF	Marginal	<1%
											PM2.5	n/a - PM2.5	1.24E-02		24	EF	Marginal	<1%
SCREEN1C	POINT	Screen #1 Engine 130 kW, Diesel Fired	0.5	427	0.12	42	4	0.5	648258	4776746	Nitrogen Oxides (NOx)	10102-44-0	2.93E-01		1, 24	EF	Marginal	3%
											Sulphur Dioxide (SO2)	7446-09-5	1.94E-02		1, 8760	EF	Marginal	<1%
											TSP	n/a - TSP	2.08E-02		24	EF	Marginal	<1%
											PM10	n/a - PM10	2.08E-02		24	EF	Marginal	<1%
											PM2.5	n/a - PM2.5	2.08E-02		24	EF	Marginal	1%
SCREEN2C	POINT	Screen #2 Engine 130 kW, Diesel Fired	0.5	427	0.12	42	4	0.5	648281	4776753	Nitrogen Oxides (NOx)	10102-44-0	2.93E-01		1, 24	EF	Marginal	3%
											Sulphur Dioxide (SO2)	7446-09-5	1.94E-02		1, 8760	EF	Marginal	<1%
											TSP	n/a - TSP	2.08E-02		24	EF	Marginal	<1%
											PM10	n/a - PM10	2.08E-02		24	EF	Marginal	<1%
											PM2.5	n/a - PM2.5	2.08E-02		24	EF	Marginal	1%
SCREEN3C	POINT	Screen #3 Engine 130 kW, Diesel Fired	0.5	427	0.12	42	4	0.5	648134	4776839	Nitrogen Oxides (NOx)	10102-44-0	2.93E-01		1, 24	EF	Marginal	3%
											Sulphur Dioxide (SO2)	7446-09-5	1.94E-02		1, 8760	EF	Marginal	<1%
											TSP	n/a - TSP	2.08E-02		24	EF	Marginal	<1%
											PM10	n/a - PM10	2.08E-02		24	EF	Marginal	<1%
											PM2.5	n/a - PM2.5	2.08E-02		24	EF	Marginal	1%
SCREEN4C	POINT	Screen #4 Engine 60 kW, Diesel Fired	0.24	525	0.1	31	4	0.5	648140	4776949	Nitrogen Oxides (NOx)	10102-44-0	1.35E-01		1, 24	EF	Marginal	1%
											Sulphur Dioxide (SO2)	7446-09-5	8.94E-03		1, 8760	EF	Marginal	<1%
											TSP	n/a - TSP	9.59E-03		24	EF	Marginal	<1%
											PM10	n/a - PM10	9.59E-03		24	EF	Marginal	<1%
											PM2.5	n/a - PM2.5	9.59E-03		24	EF	Marginal	<1%
CONVEYOR	POINT	Stacking Conveyor Engine 60 kW, Diesel Fired [7]	0.24	525	0.1	31	2	n/a	648281	4776764	Nitrogen Oxides (NOx)	10102-44-0	6.60E-02		1, 24	EF	Marginal	<1%
											Sulphur Dioxide (SO2)	7446-09-5	4.36E-03		1, 8760	EF	Marginal	<1%
											TSP	n/a - TSP	4.68E-03		24	EF	Marginal	<1%
											PM10	n/a - PM10	4.68E-03		24	EF	Marginal	<1%
											PM2.5	n/a - PM2.5	4.68E-03		24	EF	Marginal	<1%
CONVEY2N	POINT	Stacking Conveyor #2 Engine 60 kW, Diesel Fired [6]	0.24	525	0.1	31	2	n/a	648126	4776967	Nitrogen Oxides (NOx)	10102-44-0	6.60E-02		1, 24	EF	Marginal	<1%
											Sulphur Dioxide (SO2)	7446-09-5	4.36E-03		1, 8760	EF	Marginal	<1%
											TSP	n/a - TSP	4.68E-03		24	EF	Marginal	<1%
											PM10	n/a - PM10	4.68E-03		24	EF	Marginal	<1%
											PM2.5	n/a - PM2.5	4.68E-03		24	EF	Marginal	<1%
R_BLDG	VOLUME	Processing Building - Operation of Diesel-Fired Heater	0.049	175	0.14	3.2	1.2	n/a	648214	4776739	Nitrogen Oxides (NOx)	10102-44-0	6.55E-03		1, 24	EF	Marginal	<1%
											Sulphur Dioxide (SO2)	7446-09-5	2.33E-02		1, 8760	EF	Above-Average	<1%
											TSP	n/a - TSP	1.08E-03		24	EF	Above-Average	<1%
											PM10	n/a - PM10	6.55E-04		24	EF	Above-Average	<1%
											PM2.5	n/a - PM2.5	4.26E-04		24	EF	Above-Average	<1%
PR_CF1	LINE_VOLUME	Paved Road at Compost Facility - Inbound and Outbound Delivery	n/a	n/a	n/a	n/a	n/a	n/a	648507	4775373	Nitrogen Oxides (NOx)	10102-44-0	1.22E-03		1, 24	ST	Above-Average	<1%
											Sulphur Dioxide (SO2)	7446-09-5	3.73E-06		1, 8760	ST	Above-Average	<1%
											Benzene	71-43-2	1.01E-06		24	ST	Above-Average	<1%
											TSP	n/a - TSP	3.23E-02		24	ST	Above-Average	<1%
											PM10	n/a - PM10	4.26E-03		24	ST	Above-Average	<1%
											PM2.5	n/a - PM2.5	1.06E-03		24	ST	Above-Average	<1%
UR_CF2	LINE_VOLUME	Unpaved Road at Compost Facility - Inbound and Outbound Delivery	n/a	n/a	n/a	n/a	n/a	n/a	648114	4776735	Nitrogen Oxides (NOx)	10102-44-0	3.93E-04		1, 24	ST	Above-Average	<1%
											Sulphur Dioxide (SO2)	7446-09-5	3.23E-06		1, 8760	ST	Above-Average	<1%
											Benzene	71-43-2	7.71E-07		24	ST	Above-Average	<1%
											TSP	n/a - TSP	3.00E-03		24	ST	Above-Average	<1%
											PM10	n/a - PM10	5.72E-04		24	ST	Above-Average	<1%
											PM2.5	n/a - PM2.5	7.76E-05		24	ST	Above-Average	<1%

Appendix G2: Source Summary Tables - Dust, Landfill Gas and Combustion By-Products (Year 2025)

RWDI Project #2402272

Walker South Landfill Phase 2 Environmental Assessment

Source ID [1]	Source Type [1]	Source Description	Source Data: Stack Volumetric Flow Rate (Am³/s)	Stack Exit Gas Temp. (°C)	Stack Inner Diameter (m)	Stack Exit Velocity (m/s)	Stack Height Above Grade (m)	Stack Height Above Roof (m)	Source Coordinates X (m)	Source Coordinates Y (m)	Emission Data: Contaminant	CAS Number	Emission Rate (g/s)	Emission Rate (g/m2-s)	Averaging Period (hours)	Emission Estimating Technique [2]	Emissions Data Quality [3]	% of Overall Emissions (%)
EQ_CF	VOLUME	Tailpipe Emission of Onsite Equipment at Compost Facility	n/a	n/a	n/a	n/a	n/a	n/a	648158	4776735	Nitrogen Oxides (NOx)	10102-44-0	2.16E-03		1, 24	ST	Above-Average	<1%
											Sulphur Dioxide (SO2)	7446-09-5	6.72E-06		1, 8760	ST	Above-Average	<1%
											Benzene	71-43-2	1.06E-05		24	ST	Above-Average	<1%
											TSP	n/a - TSP	2.27E-04		24	ST	Above-Average	<1%
											PM10	n/a - PM10	2.27E-04		24	ST	Above-Average	<1%
											PM2.5	n/a - PM2.5	2.27E-04		24	ST	Above-Average	<1%
Walker Environmental Group Inc. – Landfill																		
LEAPOND1	AREA	Existing Leachate Pond #1	- -	- -	- -	- -	- -	- -	648441	4777248	Hydrogen sulfide	7783-06-4	6.24E-06	3.59E-09	10 min, 24	ST	Above-Average	<1%
											Benzene	71-43-2	4.67E-06	2.69E-09	24	ST	Above-Average	<1%
											1,1,2-Trichloroethane	79-00-5	1.23E-06	7.05E-10	24	ST	Above-Average	<1%
											Vinyl chloride	75-01-4	5.69E-07	3.27E-10	24	ST	Above-Average	<1%
LEAPOND2	AREA	Existing Leachate Pond #2	- -	- -	- -	- -	- -	- -	648787	4777544	Hydrogen sulfide	7783-06-4	6.96E-06	3.59E-09	10 min, 24	ST	Above-Average	<1%
											Benzene	71-43-2	5.21E-06	2.69E-09	24	ST	Above-Average	<1%
											1,1,2-Trichloroethane	79-00-5	1.37E-06	7.05E-10	24	ST	Above-Average	<1%
											Vinyl chloride	75-01-4	6.34E-07	3.27E-10	24	ST	Above-Average	<1%
LEAPOND3	AREA	Existing Leachate Pond #3	- -	- -	- -	- -	- -	- -	648856	4777523	Hydrogen sulfide	7783-06-4	8.27E-06	3.59E-09	10 min, 24	ST	Above-Average	<1%
											Benzene	71-43-2	6.19E-06	2.69E-09	24	ST	Above-Average	<1%
											1,1,2-Trichloroethane	79-00-5	1.62E-06	7.05E-10	24	ST	Above-Average	<1%
											Vinyl chloride	75-01-4	7.53E-07	3.27E-10	24	ST	Above-Average	<1%
SOIL	AREA_POLY	Fugitive Emissions from Wast Soil Stockpile	- -	- -	- -	- -	- -	- -	648632	4776730	Hydrogen sulfide	7783-06-4	1.36E-04	3.61E-09	10 min, 24	ST	Above-Average	<1%
											Benzene	71-43-2	1.29E-05	3.42E-10	24	ST	Above-Average	<1%
											1,1,2-Trichloroethane	79-00-5	2.66E-05	7.05E-10	24	ST	Above-Average	3%
											Vinyl chloride	75-01-4	1.23E-05	3.27E-10	24	ST	Above-Average	<1%
SDrop_Soil	VOLUME	Soil Drop off at Waste Soil Pile	n/a	n/a	n/a	n/a	n/a	n/a	648849	4776943	TSP	n/a - TSP	9.9E-04		24	EF	Marginal	<1%
											PM10	n/a - PM10	4.3E-04		24	EF	Marginal	<1%
											PM2.5	n/a - PM2.5	6.6E-05		24	EF	Marginal	<1%
SPick_Soil	VOLUME	Soil Pick up from Waste Soil Pile	n/a	n/a	n/a	n/a	n/a	n/a	648854	4776948	TSP	n/a - TSP	1.5E-02		24	EF	Marginal	<1%
											PM10	n/a - PM10	6.5E-03		24	EF	Marginal	<1%
											PM2.5	n/a - PM2.5	9.9E-04		24	EF	Marginal	<1%
SDrop_SLFWF	VOLUME	Soil Drop off at Working Face of South Landfill Phase 1	n/a	n/a	n/a	n/a	n/a	n/a	649181	4776378	TSP	n/a - TSP	1.5E-02		24	EF	Marginal	<1%
											PM10	n/a - PM10	6.5E-03		24	EF	Marginal	<1%
											PM2.5	n/a - PM2.5	9.9E-04		24	EF	Marginal	<1%
DROP_SLFCON	VOLUME	Clay Drop off at Cell Construction Area of South Landfill Phase 1	n/a	n/a	n/a	n/a	n/a	n/a	649243	4776509	TSP	n/a - TSP	3.0E-03		24	EF	Marginal	<1%
											PM10	n/a - PM10	1.3E-03		24	EF	Marginal	<1%
											PM2.5	n/a - PM2.5	2.0E-04		24	EF	Marginal	<1%
DROP_SLFCAP	VOLUME	Clay Drop off at Final Capping Construction Area of South Landfill Phase 1	n/a	n/a	n/a	n/a	n/a	n/a	649040	4775836	TSP	n/a - TSP	1.5E-03		24	EF	Marginal	<1%
											PM10	n/a - PM10	6.4E-04		24	EF	Marginal	<1%
											PM2.5	n/a - PM2.5	9.7E-05		24	EF	Marginal	<1%
DOZER_Soil	VOLUME	Bulldozer at Waste Soil Pile - Fugitive dust	n/a	n/a	n/a	n/a	n/a	n/a	648844	4776949	TSP	n/a - TSP	9.8E-01		24	EF		12%
											PM10	n/a - PM10	3.0E-01		24	EF		9%
											PM2.5	n/a - PM2.5	1.0E-01		24	EF		6%
DOZER_SLF	VOLUME	Bulldozer at Working Face of South Landfill Phase 1 - Fugitive dust	n/a	n/a	n/a	n/a	n/a	n/a	649181	4776382	TSP	n/a - TSP	9.8E-01		24	EF		12%
											PM10	n/a - PM10	3.0E-01		24	EF		9%
											PM2.5	n/a - PM2.5	1.0E-01		24	EF		6%
DOZER_SLFCON	VOLUME	Bulldozer at Cell Construction Area of South Landfill Phase 1 - Fugitive dust	n/a	n/a	n/a	n/a	n/a	n/a	649244	4776502	TSP	n/a - TSP	9.8E-01		24	EF	Above-Average	12%
											PM10	n/a - PM10	3.0E-01		24	EF	Above-Average	9%
											PM2.5	n/a - PM2.5	1.0E-01		24	EF	Above-Average	6%
EQ_Soil	VOLUME	Tailpipe Emission of Onsite Equipment at Soil Pile	n/a	n/a	n/a	n/a	n/a	n/a	648844	4776949	Nitrogen Oxides (NOx)	10102-44-0	6.1E-03		1, 24	EF	Above-Average	<1%
											Sulphur Dioxide (SO2)	7446-09-5	3.0E-05		1, 8760	EF	Above-Average	<1%
											Benzene	71-43-2	1.6E-05		24	EF	Above-Average	<1%
											TSP	n/a - TSP	4.1E-04		24	EF	Above-Average	<1%
											PM10	n/a - PM10	4.1E-04		24	EF	Above-Average	<1%
											PM2.5	n/a - PM2.5	4.1E-04		24	EF	Above-Average	<1%
TIP_SLF	POINT	173 hp Diesel-Fired Landfill Tipper - Combustion	1.25	349	0.25	25.5	2	n/a	649173	4776384	Nitrogen Oxides (NOx)	10102-44-0	6.76E-01		1, 24	EF	Above-Average	6%
											Sulphur Dioxide (SO2)	7446-09-5	4.47E-02		1, 8760	EF	Marginal	<1%
											TSP	n/a - TSP	4.80E-02		24	EF	Above-Average	<1%
											PM10	n/a - PM10	4.80E-02		24	EF	Above-Average	1%
											PM2.5	n/a - PM2.5	4.80E-02		24	EF	Above-Average	3%
TIP2_SLF	POINT	173 hp Diesel-Fired Landfill Tipper #2 - Combustion	1.25	349	0.25	25.5	2	n/a	649188	4776384	Nitrogen Oxides (NOx)	10102-44-0	6.76E-01		1, 24	EF	Above-Average	6%
											Sulphur Dioxide (SO2)	7446-09-5	4.47E-02		1, 8760	EF	Marginal	<1%
											TSP	n/a - TSP	4.80E-02		24	EF	Above-Average	<1%
											PM10	n/a - PM10	4.80E-02		24	EF	Above-Average	1%
											PM2.5	n/a - PM2.5	4.80E-02		24	EF	Above-Average	3%

Appendix G2: Source Summary Tables - Dust, Landfill Gas and Combustion By-Products (Year 2025)

RWDI Project #2402272

Walker South Landfill Phase 2 Environmental Assessment

Source ID [1]	Source Type [1]	Source Description	Source Data: Stack Volumetric Flow Rate (Am^3/s)	Stack Exit Gas Temp. (°C)	Stack Inner Diameter (m)	Stack Exit Velocity (m/s)	Stack Height Above Grade (m)	Stack Height Above Roof (m)	Source Coordinates X (m)	Source Coordinates Y (m)	Emission Data: Contaminant	CAS Number	Emission Rate (g/s)	Emission Rate (g/m2-s)	Averaging Period (hours)	Emission Estimating Technique [2]	Emissions Data Quality [3]	% of Overall Emissions (%)
EASTLF	AREA_POLY	Fugitive Emissions from East Landfill Mound (approximate area 536,493 m2)	- -	- -	- -	- -	- -	- -	648369	4776777	Hydrogen sulfide	7783-06-4	1.93E-03	3.59E-09	10 min, 24	ST	Above-Average	7%
											Benzene	71-43-2	1.10E-04	2.05E-10	24	ST	Above-Average	<1%
											1,1,2-Trichloroethane	79-00-5	3.78E-04	7.05E-10	24	ST	Above-Average	37%
											Vinyl chloride	75-01-4	1.75E-04	3.27E-10	24	ST	Above-Average	5%
SLF_IC	AREA_POLY	Fugitive Emissions from Areas under Interim Cover at South Landfill Phase 1	- -	- -	- -	- -	- -	- -	649308	4776433	Hydrogen sulfide	7783-06-4	1.19E-03	3.83E-09	10 min, 24	ST	Above-Average	4%
											Benzene	71-43-2	8.40E-04	2.69E-09	24	ST	Above-Average	5%
											1,1,2-Trichloroethane	79-00-5	2.20E-04	7.05E-10	24	ST	Above-Average	22%
											Vinyl chloride	75-01-4	2.84E-03	9.12E-09	24	ST	Above-Average	85%
SLF_FC	AREA_POLY	Fugitive Emissions from Areas under Final Cover at South Landfill Phase 1	- -	- -	- -	- -	- -	- -	648553	4775798	Hydrogen sulfide	7783-06-4	4.88E-04	2.50E-09	10 min, 24	ST	Above-Average	2%
											Benzene	71-43-2	1.14E-04	5.83E-10	24	ST	Above-Average	<1%
											1,1,2-Trichloroethane	79-00-5	2.58E-04	1.32E-09	24	ST	Above-Average	26%
											Vinyl chloride	75-01-4	9.01E-05	4.61E-10	24	ST	Above-Average	3%
WE_SLFIC	AREA_POLY	Wind Erosion from Areas under Interim Cover at South Landfill	- -	- -	- -	- -	- -	- -	649308	4776433	TSP	n/a - TSP	0.00E+00	0.00E+00	24	ST	Above-Average	<1%
											PM10	n/a - PM10	0.00E+00	0.00E+00	24	ST	Above-Average	<1%
											PM2.5	n/a - PM2.5	0.00E+00	0.00E+00	24	ST	Above-Average	<1%
WE_SLFCON	AREA	Wind Erosion from Cell Construction Area at South Landfill	- -	- -	- -	- -	- -	- -	649179	4776524	TSP	n/a - TSP	0.00E+00	0.00E+00	24	ST	Above-Average	<1%
											PM10	n/a - PM10	0.00E+00	0.00E+00	24	ST	Above-Average	<1%
											PM2.5	n/a - PM2.5	0.00E+00	0.00E+00	24	ST	Above-Average	<1%
WE_SLFCAP	AREA	Wind Erosion from Final Capping Construction Area at South Landfill	- -	- -	- -	- -	- -	- -	648976	4775851	TSP	n/a - TSP	0.00E+00	0.00E+00	24	ST	Above-Average	<1%
											PM10	n/a - PM10	0.00E+00	0.00E+00	24	ST	Above-Average	<1%
											PM2.5	n/a - PM2.5	0.00E+00	0.00E+00	24	ST	Above-Average	<1%
WE_SOIL	AREA_POLY	Wind Erosion from Waste Soil Stockpile	- -	- -	- -	- -	- -	- -	648632	4776730	TSP	n/a - TSP	0.00E+00	0.00E+00	24	ST	Above-Average	<1%
											PM10	n/a - PM10	0.00E+00	0.00E+00	24	ST	Above-Average	<1%
											PM2.5	n/a - PM2.5	0.00E+00	0.00E+00	24	ST	Above-Average	<1%
IDLE_WEIGH	VOLUME	Trucks Idling at the Weigh Scale	n/a	n/a	n/a	n/a	n/a	n/a	648928	4776513	Nitrogen Oxides (NOx)	10102-44-0	9.3E-03		1, 24	EF	Above-Average	<1%
											Sulphur Dioxide (SO2)	7446-09-5	3.6E-06		1, 8760	EF	Above-Average	<1%
											Benzene	71-43-2	4.6E-06		24	EF	Above-Average	<1%
											TSP	n/a - TSP	3.43E-04		24	ST	Above-Average	<1%
											PM10	n/a - PM10	3.43E-04		24	ST	Above-Average	<1%
											PM2.5	n/a - PM2.5	3.16E-04		24	ST	Above-Average	<1%
IDLE_SLFWF	VOLUME	Trucks Idling at the Working Face of South Landfill Phase 1	n/a	n/a	n/a	n/a	n/a	n/a	649169	4776372	Nitrogen Oxides (NOx)	10102-44-0	9.3E-03		1, 24	EF	Above-Average	<1%
											Sulphur Dioxide (SO2)	7446-09-5	3.6E-06		1, 8760	EF	Above-Average	<1%
											Benzene	71-43-2	4.6E-06		24	EF	Above-Average	<1%
											TSP	n/a - TSP	3.43E-04		24	ST	Above-Average	<1%
											PM10	n/a - PM10	3.43E-04		24	ST	Above-Average	<1%
											PM2.5	n/a - PM2.5	3.16E-04		24	ST	Above-Average	<1%
EQ_SLFWF	VOLUME	Tailpipe Emission of Onsite Equipment at Working Face of South Landfill Phase 1	n/a	n/a	n/a	n/a	n/a	n/a	649183	4776383	Nitrogen Oxides (NOx)	10102-44-0	9.1E-03		1, 24	EF	Above-Average	<1%
											Sulphur Dioxide (SO2)	7446-09-5	2.2E-05		1, 8760	EF	Above-Average	<1%
											Benzene	71-43-2	1.7E-05		24	EF	Above-Average	<1%
											TSP	n/a - TSP	3.77E-04		24	EF	Above-Average	<1%
											PM10	n/a - PM10	3.77E-04		24	ST	Above-Average	<1%
											PM2.5	n/a - PM2.5	3.77E-04		24	ST	Above-Average	<1%
EQ_SLFCON	VOLUME	Tailpipe Emission of Onsite Equipment at Cell Construction Area of South Landfill Phase 1	n/a	n/a	n/a	n/a	n/a	n/a	649244	4776502	Nitrogen Oxides (NOx)	10102-44-0	6.1E-03		1, 24	EF	Above-Average	<1%
											Sulphur Dioxide (SO2)	7446-09-5	3.0E-05		1, 8760	EF	Above-Average	<1%
											Benzene	71-43-2	1.6E-05		24	EF	Above-Average	<1%
											TSP	n/a - TSP	4.1E-04		24	EF	Above-Average	<1%
											PM10	n/a - PM10	4.1E-04		24	EF	Above-Average	<1%
											PM2.5	n/a - PM2.5	4.1E-04		24	EF	Above-Average	<1%
UR_SLFSoil	LINE_VOLUME	Unpaved Road at South Landfill Phase 1 - Transport of Soil between Waste Soil Pile and Working Face	n/a	n/a	n/a	n/a	n/a	n/a	648901	4776446	Nitrogen Oxides (NOx)	10102-44-0	7.0E-04		1, 24	EF	Above-Average	<1%
											Sulphur Dioxide (SO2)	7446-09-5	1.1E-06		1, 8760	EF	Above-Average	<1%
											Benzene	71-43-2	3.6E-07		24	EF	Above-Average	<1%
											TSP	n/a - TSP	3.73E-02		24	ST	Above-Average	<1%
											PM10	n/a - PM10	6.56E-03		24	ST	Above-Average	<1%
											PM2.5	n/a - PM2.5	6.79E-04		24	ST	Above-Average	<1%
PR_SLFW1	LINE_VOLUME	Paved Road at South Landfill Phase 1 - Transport of Waste between Entrance and Weigh Scale	n/a	n/a	n/a	n/a	n/a	n/a	649341	4776584	Nitrogen Oxides (NOx)	10102-44-0	1.08E-03		1, 24	ST	Above-Average	<1%
											Sulphur Dioxide (SO2)	7446-09-5	1.07E-06		1, 8760	ST	Above-Average	<1%
											Benzene	71-43-2	4.50E-07		24	ST	Above-Average	<1%
											TSP	n/a - TSP	4.87E-02		24	ST	Above-Average	<1%
											PM10	n/a - PM10	6.38E-03		24	ST	Above-Average	<1%
											PM2.5	n/a - PM2.5	1.56E-03		24	ST	Above-Average	<1%
UR_SLFW2	LINE_VOLUME	Unpaved Road at South Landfill Phase 1 - Transport of Waste between Weigh Scale and Working Face	n/a	n/a	n/a	n/a	n/a	n/a	648928	4776513	Nitrogen Oxides (NOx)	10102-44-0	1.42E-04		1, 24	ST	Above-Average	<1%
											Sulphur Dioxide (SO2)	7446-09-5	5.39E-07		1, 8760	ST	Above-Average	<1%
											Benzene	71-43-2	1.45E-07		24	ST	Above-Average	<1%
											TSP	n/a - TSP	5.41E-03		24	ST	Above-Average	<1%
											PM10	n/a - PM10	1.00E-03		24	ST	Above-Average	<1%
											PM2.5	n/a - PM2.5	1.06E-04		24	ST	Above-Average	<1%

Appendix G2: Source Summary Tables - Dust, Landfill Gas and Combustion By-Products (Year 2025)

Walker South Landfill Phase 2 Environmental Assessment

RWDI Project #2402272

Source ID [1]	Source Type [1]	Source Description	Source Data								Emission Data							
			Stack Volumetric Flow Rate (Am³/s)	Stack Exit Gas Temp. (°C)	Stack Inner Diameter (m)	Stack Exit Velocity (m/s)	Stack Height Above Grade (m)	Stack Height Above Roof (m)	Source Coordinates X (m)	Source Coordinates Y (m)	Contaminant	CAS Number	Emission Rate (g/s)	Emission Rate (g/m2-s)	Averaging Period (hours)	Emission Estimating Technique [2]	Emissions Data Quality [3]	% of Overall Emissions (%)
UR_SLFW3	LINE_VOLUME	Unpaved Road at South Landfill Phase 1 - Transport of Soil, Clay and Waste between Weigh Scale and Working Face	n/a	n/a	n/a	n/a	n/a	n/a	648901	4776446	Nitrogen Oxides (NOx)	10102-44-0	1.16E-03		1, 24	ST	Above-Average	<1%
											Sulphur Dioxide (SO2)	7446-09-5	9.39E-07		1, 8760	ST	Above-Average	<1%
											Benzene	71-43-2	4.22E-07		24	ST	Above-Average	<1%
											TSP	n/a - TSP	6.95E-02		24	ST	Above-Average	<1%
											PM10	n/a - PM10	1.28E-02		24	ST	Above-Average	<1%
											PM2.5	n/a - PM2.5	1.32E-03		24	ST	Above-Average	<1%
UR_SLFW4	LINE_VOLUME	Unpaved Road at South Landfill Phase 1 - Transport of Soil and Waste between Weigh Scale and Working Face	n/a	n/a	n/a	n/a	n/a	n/a	648863	4775836	Nitrogen Oxides (NOx)	10102-44-0	9.34E-04		1, 24	ST	Above-Average	<1%
											Sulphur Dioxide (SO2)	7446-09-5	8.16E-07		1, 8760	ST	Above-Average	<1%
											Benzene	71-43-2	3.53E-07		24	ST	Above-Average	<1%
											TSP	n/a - TSP	5.53E-02		24	ST	Above-Average	<1%
											PM10	n/a - PM10	1.02E-02		24	ST	Above-Average	<1%
											PM2.5	n/a - PM2.5	1.05E-03		24	ST	Above-Average	<1%
UR_SLFCON	LINE_VOLUME	Unpaved Road at South Landfill Phase 1 - Transport of Clay between Soil Pile and Cell Construction Area	n/a	n/a	n/a	n/a	n/a	n/a	648855	4776837	Nitrogen Oxides (NOx)	10102-44-0	1.34E-03		1, 24	ST	Above-Average	<1%
											Sulphur Dioxide (SO2)	7446-09-5	4.66E-06		1, 8760	ST	Above-Average	<1%
											Benzene	71-43-2	1.24E-06		24	ST	Above-Average	<1%
											TSP	n/a - TSP	5.68E-02		24	ST	Above-Average	<1%
											PM10	n/a - PM10	9.53E-03		24	ST	Above-Average	<1%
											PM2.5	n/a - PM2.5	1.01E-03		24	ST	Above-Average	<1%
UR_SLFCAP	LINE_VOLUME	Unpaved Road at South Landfill Phase 1 - Transport of Clay between Soil Pile and Final Capping Construction Area	n/a	n/a	n/a	n/a	n/a	n/a	648863	4775835	Nitrogen Oxides (NOx)	10102-44-0	9.00E-04		1, 24	ST	Above-Average	<1%
											Sulphur Dioxide (SO2)	7446-09-5	7.28E-06		1, 8760	ST	Above-Average	<1%
											Benzene	71-43-2	1.74E-06		24	ST	Above-Average	<1%
											TSP	n/a - TSP	1.12E-02		24	ST	Above-Average	<1%
											PM10	n/a - PM10	2.11E-03		24	ST	Above-Average	<1%
											PM2.5	n/a - PM2.5	2.57E-04		24	ST	Above-Average	<1%
FLARE1	POINT	Landfill Gas Flare	5.9	871	3.0	0.8	12.2	n/a	648601	4775958	Nitrogen Oxides (NOx)	10102-44-0	7.60E-02		1, 24	EF	Above-Average	<1%
											Sulphur Dioxide (SO2)	7446-09-5	8.12E-01		1, 8760	MB	Average	10%
											TSP	n/a - TSP	3.36E-02		24	EF	Marginal	<1%
											PM10	n/a - PM10	3.36E-02		24	EF	Marginal	1%
											PM2.5	n/a - PM2.5	3.36E-02		24	EF	Marginal	2%
											Hydrogen Sulfide	7783-06-4	5.44E-03		10 min, 24	EF	Above-Average	19%
											Vinyl Chloride	75-01-4	4.45E-06		24	EF	Above-Average	<1%
											Benzene	71-43-2	3.14E-05		24	EF	Above-Average	<1%
											1,1,2-Trichloroethane	79-00-5	2.55E-06		24	EF	Above-Average	<1%
FLARE2	POINT	Landfill Gas Flare	5.9	871	4.0	0.5	15.2	n/a	648607	4775953	Nitrogen Oxides (NOx)	10102-44-0	7.60E-02		1, 24	EF	Above-Average	<1%
											Sulphur Dioxide (SO2)	7446-09-5	8.12E-01		1, 8760	MB	Average	10%
											TSP	n/a - TSP	3.36E-02		24	EF	Marginal	<1%
											PM10	n/a - PM10	3.36E-02		24	EF	Marginal	1%
											PM2.5	n/a - PM2.5	3.36E-02		24	EF	Marginal	2%
											Hydrogen Sulfide	7783-06-4	5.44E-03		10 min, 24	EF	Above-Average	19%
											Vinyl Chloride	75-01-4	4.45E-06		24	EF	Above-Average	<1%
											Benzene	71-43-2	3.14E-05		24	EF	Above-Average	<1%
											1,1,2-Trichloroethane	79-00-5	2.55E-06		24	EF	Above-Average	<1%
FLARE3	POINT	Landfill Gas Flare	5.9	871	4.0	0.5	15.2	n/a	648613	4775949	Nitrogen Oxides (NOx)	10102-44-0	7.60E-02		1, 24	EF	Above-Average	<1%
											Sulphur Dioxide (SO2)	7446-09-5	8.12E-01		1, 8760	MB	Average	10%
											TSP	n/a - TSP	3.36E-02		24	EF	Marginal	<1%
											PM10	n/a - PM10	3.36E-02		24	EF	Marginal	1%
											PM2.5	n/a - PM2.5	3.36E-02		24	EF	Marginal	2%
											Hydrogen Sulfide	7783-06-4	5.44E-03		10 min, 24	EF	Above-Average	19%
											Vinyl Chloride	75-01-4	4.45E-06		24	EF	Above-Average	<1%
											Benzene	71-43-2	3.14E-05		24	EF	Above-Average	<1%
											1,1,2-Trichloroethane	79-00-5	2.55E-06		24	EF	Above-Average	<1%
PGEN1	POINT	82 bhp Portable Diesel Fired Generator Cummins Model #4BT3.3-G2	0.17	510	0.08	33.8	2.5	n/a	648429	4775836	Nitrogen Oxides (NOx)	10102-44-0	8.72E-02		1, 24	EF	Above-Average	<1%
											Sulphur Dioxide (SO2)	7446-09-5	1.70E-02		1, 8760	EF	Marginal	<1%
											TSP	n/a - TSP	7.30E-03		24	EF	Above-Average	<1%
											PM10	n/a - PM10	7.30E-03		24	EF	Above-Average	<1%
											PM2.5	n/a - PM2.5	7.30E-03		24	EF	Above-Average	<1%
Integrated Gas Recovery Services I																		
GEN1	POINT	1,064 kW Landfill Gas Fired Generator GE Jenbacher Model #J 320 GS-L/L	1.6	509	0.25	31.4	6.0	3.0	648553	4775929	Nitrogen Oxides (NOx)	10102-44-0	4.49E-01		1, 24	EF	Above-Average	4%
											Sulphur Dioxide (SO2)	7446-09-5	7.96E-02		1, 8760	MB	Average	<1%
											TSP	n/a - TSP	3.97E-02		24	EF	Marginal	<1%
											PM10	n/a - PM10	3.97E-02		24	EF	Marginal	1%
											PM2.5	n/a - PM2.5	3.97E-02		24	EF	Marginal	2%
											Hydrogen Sulfide	7783-06-4	2.25E-03		10 min, 24	EF	Above-Average	8%
											Vinyl Chloride	75-01-4	1.84E-06		24	EF	Above-Average	<1%
											Benzene	71-43-2	1.30E-05		24	EF	Above-Average	<1%
											1,1,2-Trichloroethane	79-00-5	1.06E-06		24	EF	Above-Average	<1%

Appendix G2: Source Summary Tables - Dust, Landfill Gas and Combustion By-Products (Year 2025)

Walker South Landfill Phase 2 Environmental Assessment

RWDI Project #2402272

Source ID [1]	Source Type [1]	Source Description	Source Data								Emission Data							
			Stack Volumetric Flow Rate (Am³/s)	Stack Exit Gas Temp. (°C)	Stack Inner Diameter (m)	Stack Exit Velocity (m/s)	Stack Height Above Grade (m)	Stack Height Above Roof (m)	Source Coordinates X (m)	Source Coordinates Y (m)	Contaminant	CAS Number	Emission Rate (g/s)	Emission Rate (g/m2-s)	Averaging Period (hours)	Emission Estimating Technique [2]	Emissions Data Quality [3]	% of Overall Emissions (%)
GEN2	POINT	1,064 kW Landfill Gas Fired Generator GE Jenbacher Model #J 320 GS-L/L	1.6	509	0.25	31.4	6.0	3.0	648554	4775922	Nitrogen Oxides (NOx)	10102-44-0	4.49E-01		1, 24	EF	Above-Average	4%
											Sulphur Dioxide (SO2)	7446-09-5	7.96E-02		1, 8760	MB	Average	<1%
											TSP	n/a - TSP	3.97E-02		24	EF	Marginal	<1%
											PM10	n/a - PM10	3.97E-02		24	EF	Marginal	1%
											PM2.5	n/a - PM2.5	3.97E-02		24	EF	Marginal	2%
											Hydrogen Sulfide	7783-06-4	2.25E-03		10 min, 24	EF	Above-Average	8%
											Vinyl Chloride	75-01-4	1.84E-06		24	EF	Above-Average	<1%
											Benzene	71-43-2	1.30E-05		24	EF	Above-Average	<1%
											1,1,2-Trichloroethane	79-00-5	1.06E-06		24	EF	Above-Average	<1%
GEN3	POINT	1,064 kW Landfill Gas Fired Generator GE Jenbacher Model #J 320 GS-L/L	1.6	509	0.25	31.4	6.0	3.0	648558	4775914	Nitrogen Oxides (NOx)	10102-44-0	4.49E-01		1, 24	EF	Above-Average	4%
											Sulphur Dioxide (SO2)	7446-09-5	0.00E+00		1, 8760	MB	Average	<1%
											TSP	n/a - TSP	3.97E-02		24	EF	Marginal	<1%
											PM10	n/a - PM10	3.97E-02		24	EF	Marginal	1%
											PM2.5	n/a - PM2.5	3.97E-02		24	EF	Marginal	2%
											Hydrogen Sulfide	7783-06-4	2.25E-03		10 min, 24	EF	Above-Average	8%
											Vinyl Chloride	75-01-4	1.84E-06		24	EF	Above-Average	<1%
											Benzene	71-43-2	1.30E-05		24	EF	Above-Average	<1%
											1,1,2-Trichloroethane	79-00-5	1.06E-06		24	EF	Above-Average	<1%
GEN4	POINT	1,064 kW Landfill Gas Fired Generator GE Jenbacher Model #J 320 GS-L/L	1.6	509	0.25	31.4	6.0	3.0	648547	4775938	Nitrogen Oxides (NOx)	10102-44-0	4.49E-01		1, 24	EF	Above-Average	4%
											Sulphur Dioxide (SO2)	7446-09-5	0.00E+00		1, 8760	MB	Average	<1%
											TSP	n/a - TSP	3.97E-02		24	EF	Marginal	<1%
											PM10	n/a - PM10	3.97E-02		24	EF	Marginal	1%
											PM2.5	n/a - PM2.5	3.97E-02		24	EF	Marginal	2%
											Hydrogen Sulfide	7783-06-4	2.25E-03		10 min, 24	EF	Above-Average	8%
											Vinyl Chloride	75-01-4	1.84E-06		24	EF	Above-Average	<1%
											Benzene	71-43-2	1.30E-05		24	EF	Above-Average	<1%
											1,1,2-Trichloroethane	79-00-5	1.06E-06		24	EF	Above-Average	<1%
SILFLAR2	POINT	Siloxane Flare 2 (new)	0.87	871	1.2	0.77	7.8	n/a	648530	4775914	Nitrogen Oxides (NOx)	10102-44-0	2.38E-02		1, 24	EF	Above-Average	<1%
											Sulphur Dioxide (SO2)	7446-09-5	3.45E-02		1, 8760	MB	Average	<1%
											TSP	n/a - TSP	5.22E-03		24	EF	Marginal	<1%
											PM10	n/a - PM10	5.22E-03		24	EF	Marginal	<1%
											PM2.5	n/a - PM2.5	5.22E-03		24	EF	Marginal	<1%
RNGFLARE	POINT	RNG Elevated Flare [8]	1.1	871	0.4	8.2	15.13	n/a	648541	4775766	Nitrogen Oxides (NOx)	10102-44-0	3.17E-01		1, 24	EF	Above-Average	3%
											Sulphur Dioxide (SO2)	7446-09-5	4.38E-01		1, 8760	MB	Average	5%
											TSP	n/a - TSP	1.40E-01		24	EF	Marginal	2%
											PM10	n/a - PM10	1.40E-01		24	EF	Marginal	4%
											PM2.5	n/a - PM2.5	1.40E-01		24	EF	Marginal	8%
											Hydrogen Sulfide	7783-06-4	0.00E+00		10 min, 24	EF	Above-Average	<1%
											Vinyl Chloride	75-01-4	1.84E-05		24	EF	Above-Average	<1%
											Benzene	71-43-2	1.30E-04		24	EF	Above-Average	<1%
											1,1,2-Trichloroethane	79-00-5	1.06E-05		24	EF	Above-Average	1%
RNGTAIL	POINT	RNG Elevated Flare - Tail Gas [8]	1.5	871	0.4	11.8	15.13	n/a	648541	4775766	Sulphur Dioxide (SO2)	7446-09-5	4.67E+00		1, 8760	EF	Above-Average	56%
TO	POINT	Thermal Oxidizer	10.5	787	1.1	10.8	13.72	n/a	648494	4775921	Nitrogen Oxides (NOx)	10102-44-0	6.33E-02		1, 24	EF	Above-Average	<1%
											Sulphur Dioxide (SO2)	7446-09-5	0.00E+00		1, 8760	MB	Average	<1%
											TSP	n/a - TSP	2.26E-02		24	EF	Marginal	<1%
											PM10	n/a - PM10	2.26E-02		24	EF	Marginal	<1%
											PM2.5	n/a - PM2.5	2.26E-02		24	EF	Marginal	1%
											Hydrogen Sulfide	7783-06-4	4.66E-05		10 min, 24	EF	Above-Average	<1%
											Vinyl Chloride	75-01-4	1.77E-04		24	EF	Above-Average	5%
											Benzene	71-43-2	1.25E-03		24	EF	Above-Average	7%
											1,1,2-Trichloroethane	79-00-5	1.02E-04		24	EF	Above-Average	10%

Appendix G2: Source Summary Tables - Dust, Landfill Gas and Combustion By-Products (Year 2025)

RWDI Project #2402272

Walker South Landfill Phase 2 Environmental Assessment

Source ID [1]	Source Type [1]	Source Description	Source Data								Emission Data							
			Stack Volumetric Flow Rate (Am³/s)	Stack Exit Gas Temp. (°C)	Stack Inner Diameter (m)	Stack Exit Velocity (m/s)	Stack Height Above Grade (m)	Stack Height Above Roof (m)	Source Coordinates X (m)	Source Coordinates Y (m)	Contaminant	CAS Number	Emission Rate (g/s)	Emission Rate (g/m2-s)	Averaging Period (hours)	Emission Estimating Technique [2]	Emissions Data Quality [3]	% of Overall Emissions (%)
Total																		
Total	- -	Total From all Sources	- -	- -	- -	- -	- -	- -	- -	- -	Nitrogen Oxides (NOx)	10102-44-0	1.10E+01	1.09E+01	1, 24	- -	- -	100%
											Sulphur Dioxide (SO2)	7446-09-5	8.40E+00	8.39E+00	1, 8760	- -	- -	100%
											TSP	n/a - TSP	8.30E+00	7.48E+00	24	- -	- -	100%
											PM10	n/a - PM10	3.27E+00	3.10E+00	24	- -	- -	100%
											PM2.5	n/a - PM2.5	1.72E+00	1.70E+00	24	- -	- -	100%
											Hydrogen Sulfide	7783-06-4	2.91E-02	2.54E-02	10 min, 24	- -	- -	100%
											Vinyl Chloride	75-01-4	3.34E-03	2.17E-04	24	- -	- -	100%
											Benzene	71-43-2	1.68E-02	1.56E-02	24	- -	- -	100%
											Benzene (Annual)	71-43-2	2.60E-03	2.60E-03	8760	- -	- -	100%
											1,1,2-Trichloroethane	79-00-5	1.01E-03	1.24E-04	24	- -	- -	100%

Notes:

[1] Source ID, Source Type: should provide information on the modelling source type (e.g., Point, Area, Areapoly, Volume or Line Volume Source); the process source or sources within the modelling source (e.g., Process Line #1); and the stack or stacks within each process source.

[2] Emission Estimating Technique Short-Forms are V-ST (Validated Source Test), "ST" (Source Test), EF (Emission Factor), MB (Mass Balance), and EC (Engineering Calculation).

[3] Data Quality Categories: Highest; Above-Average; Average; and Marginal.

[4] These volume sources represent sources of fugitive dust emissions. The emissions from these sources are not ducted through any sort of stack or vent, therefore, no stack parameters are provided for these sources in the source summary table.

[5] ASPH_DC stack height above roof is the stack height above the adjacent dust collector structure.

APPENDIX H

1. PURPOSE

To summarize and expand upon the requirements of the Environmental Assessment (EA), Environmental Compliance Approval (ECA), and Design and Operations (D&O) report for the South Landfill (SLF) in providing additional details and directions for the control and management of litter.

2. BACKGROUND

The EA, ECA and D&O all place requirements for the control and management of litter as follows:

- Section 8.1.2 of the EA report describes our commitment to a community litter collection program throughout the life of the SLF within the areas shown in Figure 8-1 of the EA.
- Condition 67 of the ECA requires the SLF to take all reasonable steps to operate and maintain the site so litter does not create a nuisance.
- Section 7.2.5.3 of the EA report and 5.6.1 of the Design and Operations (D&O) report anticipates the SLF to require 2 full-time Ground Maintenance Staff.

3. PROCEDURE

3.1. Litter Prevention

Unloading of Waste During Wind Events

The Operations Manager will monitor the weather forecast in anticipation of having to make operational changes to prevent and control litter and will take all necessary corrective actions to prevent and minimize the blowing of litter offsite. Steps may include the relocation of working face(s), re-positioning of vehicles unloading, placement of portable fencing, or the suspension of unloading wastes that can become airborne until winds return to more favorable conditions.

When sustained wind speeds are greater than 30 km per hour the unloading of wastes that can become easily airborne will be evaluated (i.e. loose and light wastes such mixed recycling residuals, loose paper…). Of particular concern is sustained high winds from the west and southwest as these winds have the greatest potential to blow litter offsite onto non-Walker owner properties and Taylor Road.

3.2. Litter Control

Litter Control Fencing

Portable litter fences: these portable structures can be moved by onsite equipment and are to be strategically placed at the working face and surrounding areas. These portable fences are the first line of defense in preventing litter from blowing away from the working face.

Permanent High Fence: This high fence is constructed with large hydro poles and heavy netting and covers the entire eastern side of the SLF. This fence is meant to collect blowing waste that was not captured by the portable fences.

The Operations Manager will ensure these fences are available and in working condition at all times.

Covering of Waste

Covering of waste is an important task in controlling blowing litter. Refer to SOP 6.1 Cover, Maintenance and Construction Material Management for more information on the requirements for covering waste to control litter, vector and vermin, and odours.

3.3. Litter Collection

Section 8.1.2 of the EA outlines the litter collection program for the SLF as follows:

8.1.2 Community Litter Collection Program

Walker has been in the practice of collecting litter in the surrounding community for some time. This includes not only litter that may have blown from its landfill, but also litter from others. Walker will commit to continuing this program throughout the operational life of the landfill expansion, within the area shown in Figure 8-1. Among other benefits, this program will help improve general community aesthetics and thereby offset any residual views of the landfill operations by the traveling public.

Key elements of the program include:

- Continuous visual checks of the landfill litter control by the Landfill Superintendent and immediate communication with the Litter Control Person should additional attention be required outside normal operating conditions.
- Review of weather forecasts to identify problem conditions and plan additional manpower, if required.
- Drive-by inspections of all routes and properties a minimum of twice per week to ensure problem areas are identified in a timely manner.
- Collected litter acceptable for receipt at Walker's landfill is placed in garbage bags and transported back to the site for disposal.
- Regional Niagara's Works Department is contacted to deal with off-site litter or wastes that are unacceptable for receipt at Walker's landfill, such as fridges, propane tanks, tires, etc.

To this end, the following litter collection program will be undertaken.

1. The site will employ at least one full-time Grounds Maintenance employee. Additional employees will be hired or subcontracted as demands for grounds maintenance activities warrant.

2. The site will promote one Grounds Maintenance employee to the position of Grounds Maintenance Lead Hand. This employee will be responsible for the daily coordination of grounds maintenance activities, under the direction of the Operations Manager.

3. Ground maintenance activities will be undertaken by Ground Maintenance staff in the following areas as identified in figure 8-1 of the EA under the following schedule:

   a) Daily visual inspections and grounds maintenance of the following roadways and adjacent lands:
      - Taylor Road: Beachwood Road to Mountain Road including main entrance to landfill
      - Mountain Road: Taylor Road to Garner Road
      - Thorold Townline Road: Taylor Road to Head Office

   b) Weekly visual inspections and grounds maintenance of the following roadways and adjacent lands:
      - Taylor Road: Beachwood Road to Thorold Stone Road and Mountain Road to Glendale Avenue, including entrance to Woodend Conservation Area
      - Mountain Road: Garner Road to Kalar Road
      - Garner Road: Mountain Road to Thorold Stone Road
      - Old Thorold Stone Road: Thorold Townline Road to Davis Road
      - Davis Road: Old Thorold Stone Road to Thorold Stone Road
      - Entrance road from landfill gates to landfill scales
      - Entrance road from Thorold Townline Road to the Residential Drop-off
      - Main internal roads running from Taylor Road to Thorold Townline Road
      - Head Office and WEG Building grounds and parking lot

   c) Monthly visual inspection and grounds maintenance of the following roadways and adjacent lands:
      - Old Thorold Stone Road: Davis Road to Seaway Haulage Road
      - Warner Road: Taylor Road to Garner Road
      - Davis Road: Old Thorold Stone Road to Hoover Street – if accessible
      - Thorold Stone Road: Highway 58 to Kalar Road – Note: road speed and traffic along this stretch of road may require additional safety measures to allow for safe grounds maintenance activities. Any grounds maintenance activities in this area must be approved by the Operations Manager.

   d) The following onsite areas are the responsibility of other WEG business units. However, the Grounds Maintenance Lead Hand and the Operations Manager will monitor these areas frequently and offer assistance in ground maintenance activities as necessary:
      - Wooding Systems: Main parking lot and fuel station

- Compost Site: all composting production areas, Regent Street and grinder pad and adjacent Bruce Trail areas
- Residential Drop-off (RDO): roadway from 4-way stop to scales, roadway from scales to dump pad and back to scales, bin yard and bin yard entrance areas, and adjacent Bruce Trail areas

4. Litter materials collected by staff will be transported back to the SLF or the RDO for disposal.

5. Collected materials that are not acceptable for receipt at the SLF or RDO (i.e. batteries, propane tanks, paint cans…) will be delivered by staff to the Region of Niagara's Hazardous Waste Depot at 3557 Thorold Townline Road.

   Staff should not collect materials they believe could pose a risk to their health or safety. In these cases, the Ground Maintenance Lead Hand will report the issue to the Operations Manager who will investigate, and coordinate removal as required.

   Note, this requirement is different than the EA requirement to contact the Region for pick-up. This change was made when the Region of Niagara developed their Hazardous Waste Depot on Thorold Townline Road.

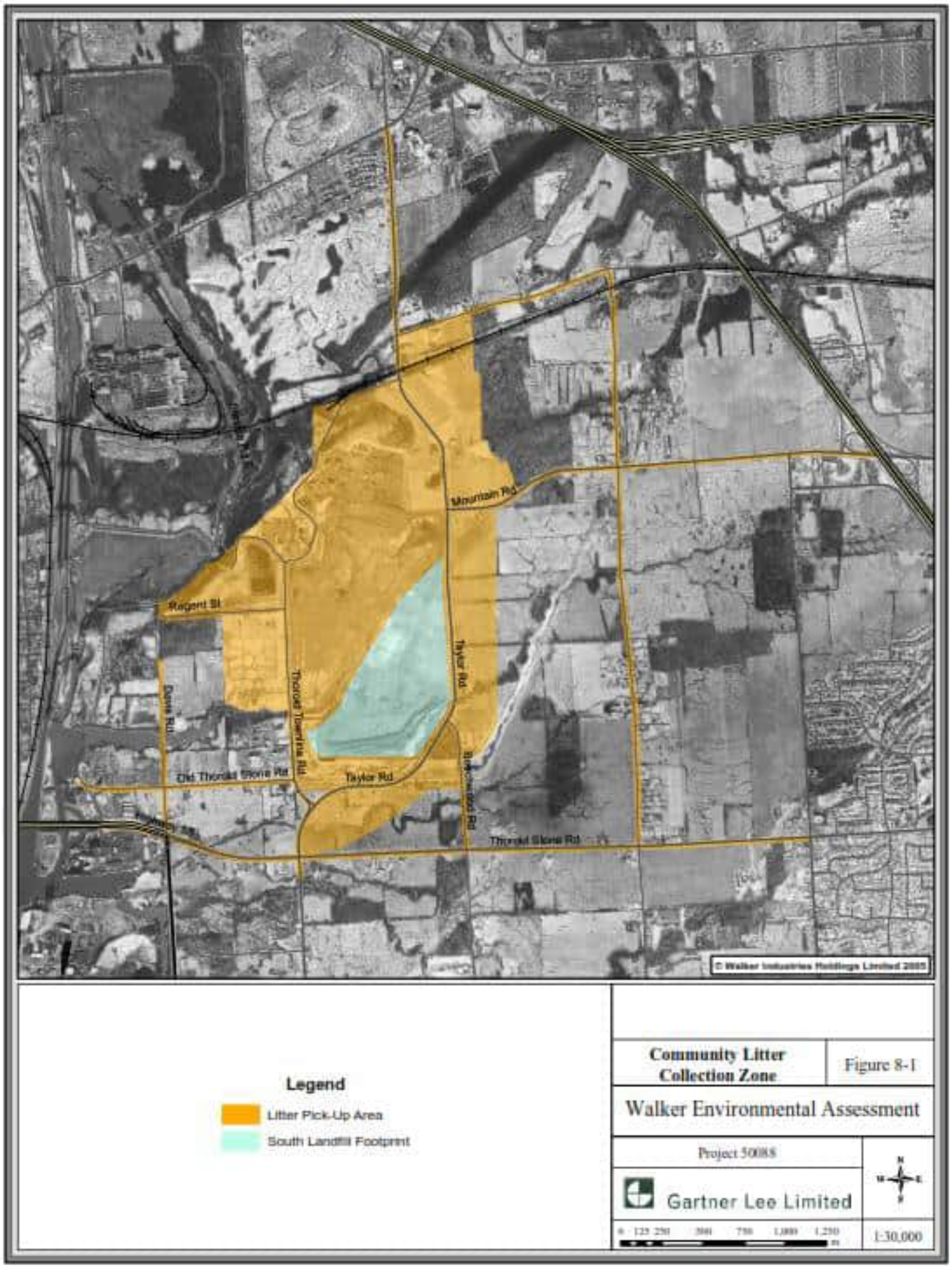
6. The Grounds Maintenance Lead Hand will record daily grounds maintenance activities in a daily litter log. Completed logs will be given to the Operations Manager who will ensure they are filed with the Operations Assistant for future reference and inspection.

7. The Operations Manager will inspect all litter control areas / routes twice per week.

8. The Operations Manager will arrange for increased litter control as necessary (i.e. after high wind events) to ensure compliance with EA, ECA and D&D commitments.

4. ADDITIONAL RESOURCES

4.1. <u>Photographs & Figures</u>



5. APPLICABILITY

The following individuals must review and acknowledge their awareness of this SOP and its requirements:

- SLF General Manager, Operations Manager, and Operations Supervisor, SLF (all sections)
- SLF Grounds Maintenance Staff
- WIHL Environmental Coordinator(s) / Manager(s) assigned to the SLF (all sections)

6. Manager(s) of LFG operations, IGRS / Comcor (section 3.1 landfill gas)

7. AMENDMENT RECORD

Revision no.	Page no.	Section no.	Reason/detail	Date	Who
1	Entire SOP	Entire SOP	Revision of old SOP 11.2, change to section 6	05-Apr-2021	SJ
2.	Entire SOP	Entire SOP	SOP name changed back to section 11.2 (from 6.2). SOP reviewed by GM. No other updated made	08-Feb-2022	SJ
3.	Entire SOP	Entire SOP	Minor grammar and spelling revisions made to SOP.	13-Feb-2025	RK/LP

APPENDIX I

Walker Environmental Group

Best Management Practices Plan for Odour Mitigation For Landfill Operations at the Niagara Campus

June 2024

Table of Contents

1.0 Introduction

This Best Management Practices Plan (BMPP) provides guidance for the identification and mitigation of odours from the South Landfill and East Landfills.

2.0 Facility Description

South Landfill

Located at 3081 Taylor Road, Niagara Falls, Ontario, L0S 1P0, the South Landfill is a 53.9 hectare waste disposal site within a total site area of 85.68 hectares.

The South Landfill has a maximum capacity of 17.7 million cubic meters to accept solid non-hazardous waste, including asbestos. Only waste generated in Ontario from residential, commercial, institutional and industrial sources are accepted at the site. The site can receive a maximum quantity of 1,100,000 tonnes of waste per year (850,000 tonnes of solid non-hazardous waste and 250,000 tonnes of solid non-hazardous waste that meets the description of waste permitted for use as daily/interim cover), and a maximum quantity of 10,000 tonnes of waste per day. 100,000 tonnes of the maximum capacity annually is dedicated exclusively to the Region of Niagara.

Waste shall only be accepted at the site between 7:00 am and 7:00 pm Monday to Friday with the exception of statutory holidays, and between 7:00 am to 1:00 pm on Saturdays.

Currently, the site accepts waste from 7am to 5pm, Monday to Friday, and 7am to 1pm on Saturdays with the following exceptions:

1. Site operations maybe suspended Saturday during the year (i.e. from January to March). These decisions are reviewed annually with Operations and Sales.
2. Saturdays following a Statutory Holiday the site may be required to stay open until 4pm to accept Municipal (curbside) waste from the Region of Niagara. The decision to open on these days are made by Operations and Sales in conjunction / instruction from Region of Niagara staff.

East Landfill

Located at 3081 Taylor Road, Niagara Falls, Ontario, L0S 1P0, the East Landfill is a 69.8 hectare waste disposal site within a total site area of 119 hectares.

The East Landfill is approved to accept solid non-hazardous waste, including asbestos. Only waste generated in Ontario from residential, commercial, institutional and industrial sources are accepted at the site. The site can receive a maximum quantity of 627,750 tonnes of waste per year, and a maximum quantity of 5,000 tonnes of waste per day.

Waste shall only be accepted at the site between 7:00 am and 7:00 pm Monday to Friday with the exception of statutory holidays, and between 7:00 am to 1:00 pm on Saturdays.

Currently, the site accepts waste from 7am to 5pm, Monday to Friday, and 7am to 1pm on Saturdays with the following exceptions:

1. Site operations maybe suspended Saturday during the year (i.e. from January to March). These decisions are reviewed annually with Operations and Sales.
2. Saturdays following a Statutory Holiday the site may be required to stay open until 4pm to accept Municipal (curbside) waste from the Region of Niagara. The decision to open on these days are made by Operations and Sales in conjunction / instruction from Region of Niagara staff.

3.0 ECA Requirements

In addition to requirements from the EPA and other environmental laws and regulations, the South and East landfills are also bound by specific ECA requirements to operate in a manner that does not create an adverse effect:

South Landfill ECA Approval Number: 0084-78RKAM

Per condition 67 of ECA#0084-78RKAM, "The Owner shall take all reasonable steps to operate and maintain the Site such that the vermin, vectors, dust, litter, odour, noise and traffic do not create an adverse effect.

East Landfill ECA Approval Number: A120211

Per condition 5.15 of ECA#A120211, "The Owner shall take all reasonable steps to operate and maintain the Site such that the vermin, vectors, dust, litter, odour, noise and traffic do not create an adverse effect."

4.0 Responsibilities

Senior Management (EVP, VP and GM of Operations)

- Provide the support and resources for the successful implementation of this BMPP.

Site Management (Operations Manager and Operations Supervisor)

- Implement, guide, and support the actions and resources identified in this BMPP.
- Communicate issues and facilitate corrective actions to control odours, as necessary.

Environmental Performance Department (Business Managers and Business Partners)

- Lead an annual review of this BMPP with operations.
- Update this BMPP as needed, including those updates made from the annal review or continuous improvements.
- Coordinate the response to odour complaints including:
    - Monitoring and maintaining the odour complaint Public Response Line,
    - Providing information about complaint(s) to operations,
    - Coordinating responses to odour complaints, including notifications to the MECP, and
    - Coordinate complaint investigations with Operations, where warranted (i.e. intensity of complaint(s) is abnormal is frequency, duration, or severity).
- Ensure all identified personnel are trained on the contents of the BMPP and other odour control procedures.

Landfill Operations Staff (Scalehouse Operators, Inspection Booth Operator, Compactor and Tipper Operators, Grounds Maintenance Staff)

- Undertake actions in this BMPP to help identify and control potential odours from operations.
- Adhere to the requirements of this BMPP and notify their immediate supervisor of any nonconformances with this BMPP.
- Notify their immediate supervisor, as soon as practicable, of any release or potential generation of excessive odorous emissions.

5.0 Process Description and Process Flow

1. Waste Screening and Approval
    - Before accepting a customer's waste, the waste must be screened and approved by the EPD. This involves:
        - Reviewing the waste type and volume.

    - Setting conditions for acceptance as necessary.
- Contact the EPD or the Operations Manager, or their designate, to review detailed procedures for waste acceptance.

2. Site Entry and Scalehouse Verification
- The customer arrives at the site and proceeds to the scalehouse.
- The scalehouse operator collects the customer's information and verifies that the waste is acceptable for receipt.

3. Waste Inspection
- The waste is inspected at the inspection booth to ensure it matches the approved waste type and volume.

4. Staging Area
- The driver is directed to the staging area to wait for further instructions.

5. Tipping Face Unloading
- When called, the driver proceeds to the tipping face.
- The driver unloads the waste at the tipping face, where landfill operators inspect the waste during unloading to ensure compliance with approved waste types.

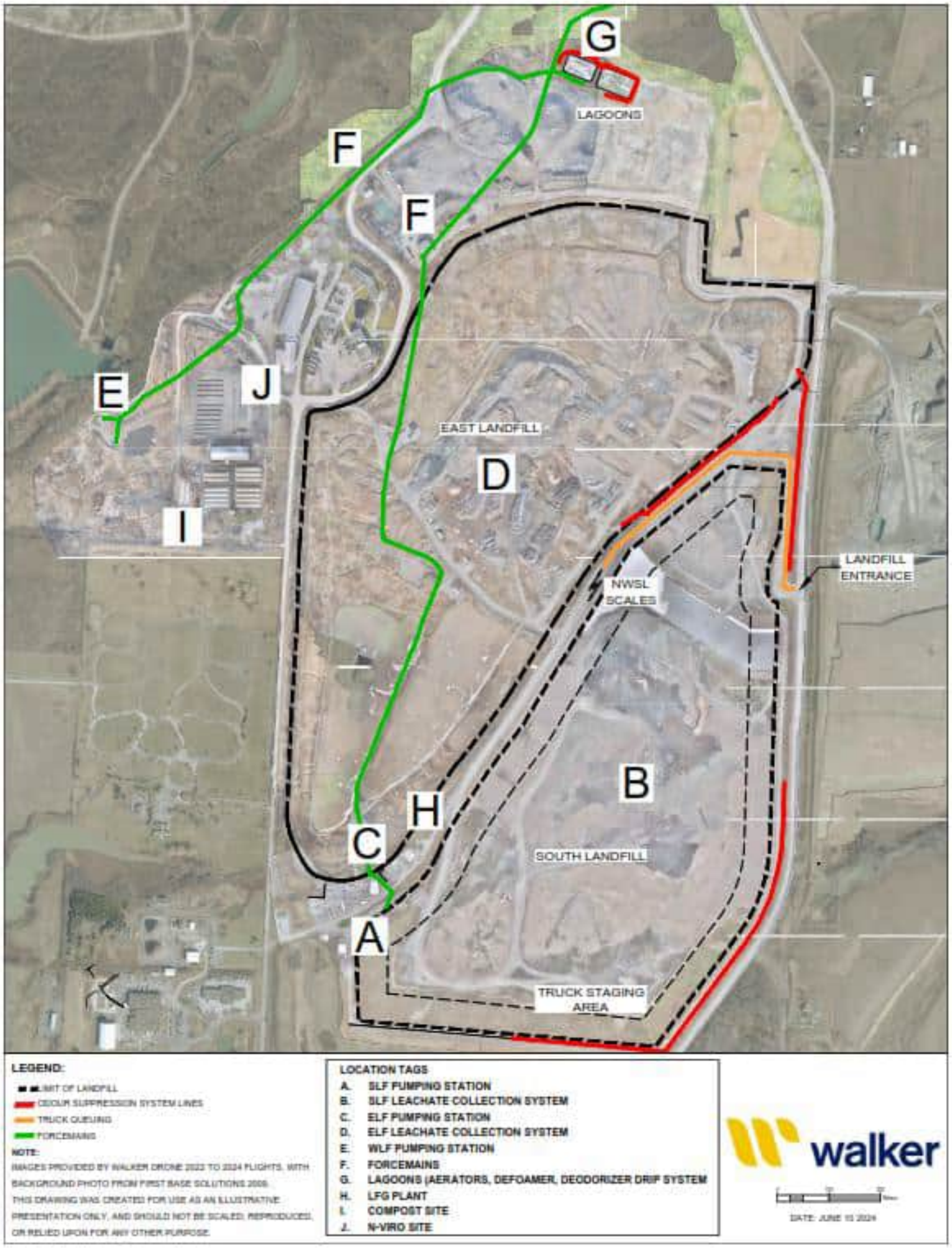
6. Clean-Out Area
- After unloading, the driver moves to the clean-out area to clean their vehicle as necessary.

7. Transaction Completion
- The driver returns to the scalehouse to complete the transaction, including final weight verification and documentation.

8. Site Exit
- The driver leaves the site.

6.0 Facility Maps

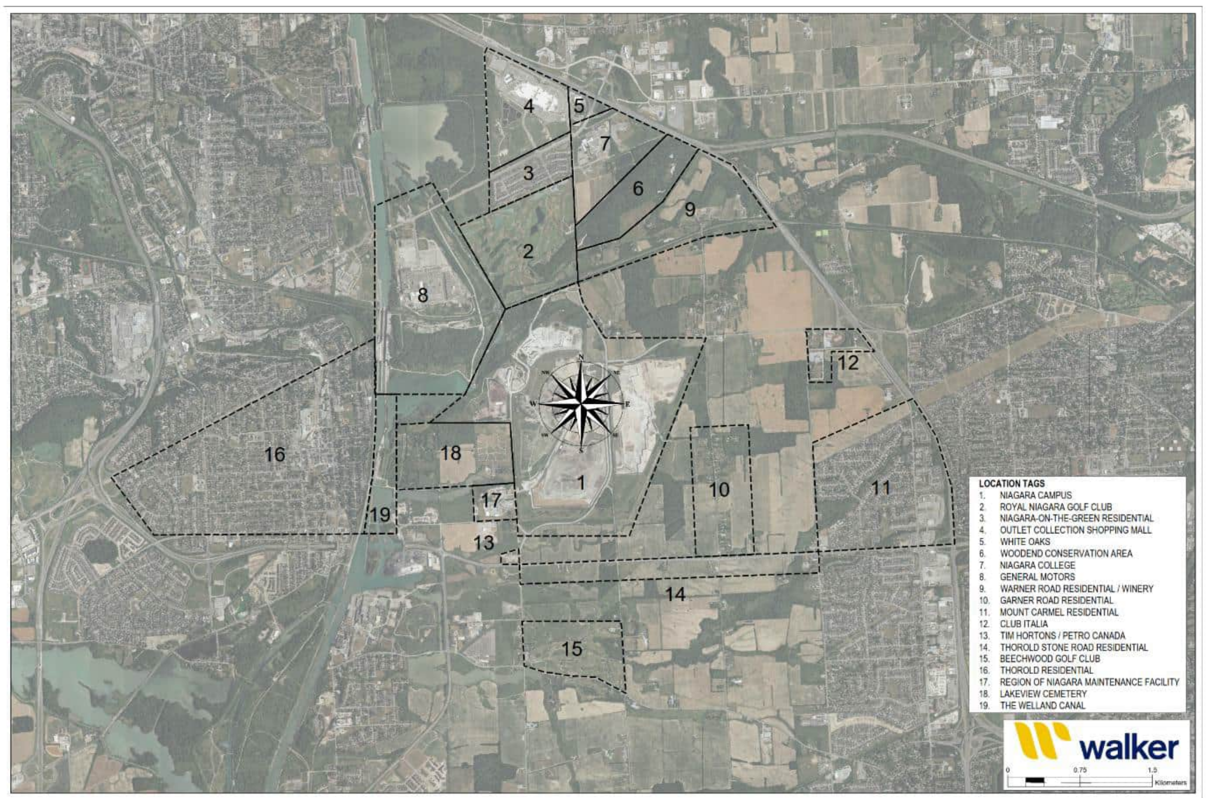
Facility Process Map



Surrounding Community Map

The Walker Industries Niagara Campus, including the East Landfill and South Landfill, is located on the Niagara Escarpment in Niagara Falls. Winds in this area predominantly prevail from the southwest, south, and east. The following residential, community, and business areas located around the Niagara Campus are areas for which operations should be aware, specifically for the potential to cause odour impacts:

Areas to the:			
North	**East**	**South**	**West**
• Royal Niagara Golf Club, • Niagara-on-the Green residential subdivision • Niagara Collations Outlet, shopping mall • White Oaks, conference center, hotel, spa and fitness complex • Woodend Conservation Area, community hiking • Niagara College • General Motors, manufacturing facility • Warner Road, residential house and local winery	• Garner Road, residential • Mount Carmel, residential community • Club Italia, business / community center	• Tim Hortons and Petro Canada, business center • Thorold Stone Road, a few residential homes • Beachwood Golf Club	• Thorold, large residential community • Region of Niagara Maintenance Facilities, business • Lakeview Cemetery • The Welland Canal



Based on historical complaint data and prevailing wind and weather patterns, site operations typically have a greater potential to cause odour issues for residents in Niagara-on-the-Green and Thorold. As such, operations should take extra precautions when wind and weather conditions are aligned with these areas.

7.0 Odour Perception and Impacts

Odour is perceived by our brains in response to chemicals present in the air we breathe – it is the effect those chemicals have on us. The effect arises from a two-stage process where the brain first senses the chemical stimulus and then interprets it based on previous life experiences; we often give meaning to odour. Natural variation in sensitivity and life experiences can result in individuals having different sensations and emotional responses to the same odour compounds. For example, odours that are widely perceived as offensive may be acceptable to those working in the 'industry'.

Humans have a sensitive sense of smell and can detect odour even when chemicals are present in very, very low concentrations. It is generally accepted that people will tolerate an offensive odour for about 10 minutes before complaining.

Negative impacts from offensive odours can include nausea, headaches, frustration, annoyance, stress, and embarrassment. All of these contribute to a reduced quality of life for the individuals who are exposed to the odour and underscore the importance of taking odour complaints seriously and ensuring operations are managed in a way that reduced the potential for odour impacts.

8.0 Relationship Management

The starting point for effective odour management is to build a positive relationship with the community through effective and open communication. This helps establish trust and a good relationship, which are crucial during times when odour problems occur. Involving the community in the problem-solving process is important, both to help identify issues and to negotiate solutions, including timeframes for implementation.

Abnormal odour events can occur without warning or may result from planned maintenance. Informing people surrounding the site about such events as early as possible helps reduce annoyance in the community. When an odour incident does occur, the discharger should inform people about what is being done to remedy the problem, prevent its recurrence, and how long the problem will take to fix. The level of annoyance may reduce if people see that the discharger is genuinely addressing adverse effects in a proactive manner.

9.0 Identification and Control of Potential Odour Sources

Potential odour sources from landfill operations have been identified by management based on visual and factory observations as well as historical data on odour generation. The following table represents landfill activities that have been identified as having the potential to generate odours and the mitigation measures to control these potential impacts:

Source	Potential Odour and Intensity	Mitigation Measures	Responsibility
Waste Materials	General odours from daily fresh waste receipts are similar to black garbage bag waste and maybe described as an unpleasant odour that combines elements of rotting food, decaying organic matter, and sometimes a sharp, acidic or sour note from decomposing fruits and vegetables. Odours from fresh waste can range in intensity based on several factors including the mix of organics in the waste and the age of the waste material. These odours can also be	Per the site's Waste Acceptance Procedures, all waste streams undergo a thorough review to identify any potentially overly offensive waste streams. Waste streams known to be overly offensive, such as sewage sludge, are prohibited from disposal. For waste streams with the potential to produce overly offensive odours, specific restrictions are required. These may include adhering to	EPD

	impacted by weather conditions such as increased temperature. Some specific waste stream can also have a unique odour, such as biosolids wastes which can have a cabbage like odour.	designated delivery windows, requiring waste to be bagged, or mandating pre-treatment with deodorizers.	
Roads	Any liquids that have dripped from a waste trailer / container have the potential to generate odours that can range from low to medium in intensity similar to the odours of fresh waste.	When temperatures are above freezing, roads are washed as necessary.	Site Management
Active Fill Areas / Working Face	General odours from daily fresh waste receipts are similar to black garbage bag waste and maybe described as an unpleasant odour that combines elements of rotting food, decaying organic matter, and sometimes a sharp, acidic or sour note from decomposing fruits and vegetables. Odours from fresh waste can range in intensity based on several factors including the mix of organics in the waste and the age of the waste material. These odours can also be impacted by weather conditions such as increased temperature.	The working face should be kept as small as possible while maintaining a safe work environment for operators and customers.	Operations Manager or their designate
		Waste materials should be unloaded and buried as quickly as possible while maintaining a safe working environment for staff and customers.	
		Application of minimum 150 mm / 6 inches of cover at the working face at the end of each working day. Monitor cover and reapply as needed.	
		Biofilter material can also be purchased from the compost site and used as a top dressing or cover to help absorb odours. Caution must be taken to ensure the biofilter does not become an odour source itself, as saturated material can release its own unpleasant musty odours.	
		A surface deodorizer can be deployed to deal with odours as well. The surface deodorizer is water based and applied by water truck limiting it use to temperatures above freezing.	
	Water (i.e. rainwater) that was come in contact with waste can create a damp, earthy odour mixed with the initial stages of decomposition from the fresh waste. The rainwater can bring out a more pronounced scent from the waste, highlighting organic, vegetative smells or the freshness of discarded food products.	Maintain proper drainage to prevent ponding / pooling of water.	
Inactive Areas	Odours from buried and aged waste can be a complex mix of odours, featuring an earthy and musty scent, underscored by the decomposition of organic material. As the waste breaks down anaerobically (without	Areas of fill that remain inactive for six months must be covered with at least 300 mm / 12 inches of interim cover. For areas that will remain untouched for an extended period, operations will evaluate the opportunity to apply a thicker layer of	Operations Manager or their designate

	oxygen), it can produce a sulfurous or methane-like smell, which can be quite pungent and similar to the smell of rotten eggs.	cover using denser materials, such as silty-clay soil. Filling at the site should be designed to bring areas to final grade as quickly as possible. Once areas are at final grade Final Cap it to be applied. Final Cap material must be • At least 600 mm / 24 inches thick • A denser materials, such as silty-clay soil • Free of large materials such as rocks • Seeded as soon as possible to control erosion See the sites DnO report or O.Reg 232/98 for more details on the application of Final Cover.	
Landfill Gas Infrastructure	Odours from buried and aged waste can be a complex mix of odours, featuring an earthy and musty scent, underscored by the decomposition of organic material. As the waste breaks down anaerobically (without oxygen), it can produce a sulfurous or methane-like smell, which can be quite pungent and similar to the smell of rotten eggs.	The site monitors gas collection volumes and gas quality daily. These values are generally reported to site operators daily. This data can be used to identify potential collection issues and alert staff to investigate operations. Expansion of the landfill gas collection system (e.g., new wells, horizontal collectors, laterals) should be completed as soon as practicable following the completion of all filling activities in a cell. Areas that are not at final grade but may remain inactive for longer periods of time should also be evaluated for the installation of landfill gas collection infrastructure. During landfill gas installation and maintenance activities that require exposure of waste: • Minimize areas exposed • Apply surface deodorizers • Place deodorizers in the area • Backfill excavations at the end of the day.	Operations Manager or their designate in coordination with Comcor & IGRS Staff
Leachate Collection System	Odours from leachate may have a musty or earthy odour, with hints of decay and organic material. Some may also detect a slightly sour or acidic note.	Leachate Lagoons Operations • Maintain active aeration (4 aerators per active lagoon) • Operation of Hinsilblon odour control system wraps around the lagoons • Added odour suppressant and defoamer to lagoons Pumping Stations • Ensure pumps, controls and valves are sealed to prevent leaks	Operations Manger

		Interior Cleanouts (Rockets) • Inspect for leaks at seams and top hats, and repair as necessary • Rockets identified as containing landfill gas are to be connected to the landfill gas system • When raising Rockets insure the use of air bladder to contain and control landfill gas.	Operations Manager or their designate in coordination with Comcor & IGRS Staff
		Exterior Cleanouts (Manholes) • Inspect for leaks at seams / seals and repair as necessary.	Operations Manager or their designate
Miscellaneous	The permitter deodorize use a product called HEV300. This product is oil based and has a citrus odour. The intensity of this odour can be increased and decreased at the systems controls.	The site operates a perimeter deodorizer system to help mask / neutralize odours that have the potential to leave the site. Care needs to be taken to ensure the smell of the deodorizer does not become a nuisance as well. This involves controlling when the system is operated and how much deodorizer is used or diffused	Operations Manager or their designate
	Odours from buried and aged waste can be a complex mix of odours, featuring an earthy and musty scent, underscored by the decomposition of organic material. As the waste breaks down anaerobically (without oxygen), it can produce a sulfurous or methane-like smell, which can be quite pungent and similar to the smell of rotten eggs.	The following controls should be implemented during waste excavation activities: • Minimize areas of excavation. • Limit time of operation. • Cover at the end of the day. • Apply surface deodorizers. • Monitor weather conditions; if not favourable, do not proceed with excavation activities.	

10.0 Inspection, Maintenance and Monitoring Procedures

Daily Inspections

The Operations Manager or their designate is responsible for visually inspecting the site daily and recording observations of their inspections in their diaries. Notes should include the date, time, weather, a general description of operational activities, and any odour observations. Upon identification of an odour complaint, these daily notes will be used to aid in the investigation.

This inspection and notes are in tandem with the requirement for the Operations Manager or their designate to complete the site’s Daily Inspection Check List for each day of site operations.

Daily Odour Surveys

In addition to daily site inspections, the Operations Manager or their designate is responsible for completing daily odour surveys during working hours. Security personnel are responsible for conducting odour surveys after hours, on weekends, and on holidays. The routes for odour surveys depend on the current wind direction, as listed below:

Winds Blowing To:				
North	**SW, W, NW**	**South**	**East, Northeast**	**Southeast**
• Head office Flag	• Head office Flag	• Head office Flag	• Head office Flag	• Head office Flag

• 4 way stop at head office • RDO scale house • Regent Street and Townline Road • Cemetery • 3 way stop at Mountain Road and Taylor Road • Lower Entrance	• 4 way stop at head office • RDO scale house • Regent Street and Townline Road • Cemetery • 3 way stop at Mountain Road and Taylor Road • 3482 Garner Road • 9688 Warner Road • Lower Entrance	• 4 way stop at head office • IMS scale house • Regent Street and Townline Road • Cemetery • 3 way stop at Mountain Road and Taylor Road • 3482 Garner Road • 9688 Warner Road • Young Crescent • Wright Crescent • Cole Crescent • Stevens Drive • Lower Entrance	• 4 way stop at head office • RDO scale house • Regent Street and Townline Road • Cemetery • Old Thorold Stone Road and Davis Road • Portland Street and Chapel Street S • Albert Street E and Chapel Street S • York Street • Regent Street • Albert Street W and Pine Street S • Lower Entrance	• 4 way stop at head office • RDO scale house • Regent Street and Townline Road • Cemetery • Old Thorold Stone Road and Davis Road • Portland Street and Chapel Street S • Albert Street E and Chapel Street S • York Street • Regent Street • Albert Street W and Pine Street S • GM Plant • Lower Entrance

Windsocks are located at various points across the Niagara Campus, and weather station data from RWDI is used to monitor meteorological conditions. Operations are responsible for monitoring this data and adjusting operations accordingly to minimize the potential for off-site impacts.

Like daily inspections, the Operations Manager or their designate must record observations from their daily odour surveys in their diaries. Notes should include the date, time, weather, a general description of operational activities, and any odour observations. Depending on site activities and weather conditions, it may be necessary to complete more than one odour survey per day. This is also required when a complaint is received.

Monthly Inspections

The Operations Manager or their designate is responsible for ensuring Monthly Environmental, Health and Safety inspections are completed monthly, and that action items or deficiencies are documents, communicated and acted upon.

Preventative Maintenance

The following table lists general preventive maintenance tasks for site equipment or features related to odour management. For detailed maintenance and troubleshooting requirements, please refer to the operations manuals for the equipment (e.g., pumps, controls).

Leachate Management	
Equipment / Device Name / Description	**General Requirements**
South Landfill primary liners high pump, low pump and secondary liner pump. East Landfill trash pump. West Landfill trash pumps Well 1, Well 2, Well 3 and Well 4.	Pumps are to be removed from service annually for cleaning and inspection by a 3rd party contractor familiar with pump operations and maintenance.
Valves and control	Visually inspect monthly, looking for leaks or signs of damage. Replace or repair as needed.

VFD	Ensure adequate airflow to the VFD to prevent overheating. Inspect and clean monthly, removing any accumulated dust or debris. The VFD should be inspected by a licensed electrician annually.
Digital controls	Inspect controls for correct display readings. Replace controls as required.
Flow Meters / Mag Meters	Meters are to be inspected, cleaned, and calibrated at least every two years or when meter readings become inconsistent (e.g., flow readings do not match hour meter readings). This work is to be completed by an experienced third-party contractor.
Buildings	Inspect building monthly for housekeeping, security, and signs of damage. Repair damage as necessary.
Leachate Collection Pipes	Collection pipes must be inspected at least annually for the first five years after placement of waste over top of each pipe and then as often as future inspections indicate to be necessary. Collection pipes must be cleaned whenever an inspection indicates that cleaning is necessary.
Forcemains	Forcemains should be inspected by video at least every 2 years and no longer than 5 years. Forcemains must be cleaned whenever an inspection indicates that cleaning is necessary.
Leachate Lagoons	Inspect monthly looking for sign of leaking. Cut grass and vegetation around ponds, prevent clipping from entering the pond.
Lagoon Aerators	Inspect and grease shafts every 3 months. Inspect shaft bearings annually and replace as needed from inspection. Inspect pontoon straps bi-annually and replace as needed.
Lagoon Defoamer	Inspect diaphragm on pump annually and replace as necessary.
Lagoon Deodorizer (drip system)	Inspect blower housing annually, replace as needed.

Odour Control Units	
Equipment / Device Name / Description	**General Requirements**
Hinsilblon Vapor Odour Control Units 3 at SLF, 1 at Leachate Lagoon	Inspect and clean blower monthly. Grease blower bearings every 6 weeks. Change air filters every 3 weeks or as needed based on site conditions. Inspect deodorizer delivery pipes monthly looking for cracks or separation of pipe.
Landfill Gas Collection	
Equipment / Device Name / Description	**General Requirements**
Wellfield and Landfill Gas Plant	Maintenance programs for the Landfill Gas Wellfield and Collection plant are maintained by Comcor environmental. Contact the Operations Manager or their designate or the EPD for more information.
Daily / Interim / Final Cover	
Equipment / Device Name / Description	**General Requirements**
Daily / Interim / Final Cover used to cover waste	Areas of daily, interim, and final cover are to be frequently inspected (i.e., daily) by Operations staff for potential waste exposure (such as soil erosion, desiccation, or loss of thickness). When issues are discovered, Operations should make plans to correct these areas (e.g., filling, compacting, re-surfacing) as soon as practicably possible.

11.0 Public Response Line (PRL)

The Walker Niagara Falls / Thorold Campus has a Public Response Line (1-866-699-9425). This number was established as a means for residents and local community members to share concerns about campus operations, including odour complaints. It is communicated to residents and local community members through multiple outlets such as our bi-annual newsletter, spring open house, fall open house, and our website.

12.0 Odour Complaint Response Procedure

Per section 79 of the SLF ECA, the site is required to undertake the following in response to complaints:

"If at any time, the Owner receives complaints regarding the operation of the Site, the Owner shall respond to these complaints according to the following procedure:

a. The Owner shall record and number each complaint, either electronically or in a log book, and shall include the following information: the nature of the complaint, the name, address and the telephone number of the complainant if the complainant will provide this information and the time and date of the complaint;

b. The Owner, upon notification of the complaint, shall initiate appropriate steps to determine all possible causes of the complaint, proceed to take the necessary actions to eliminate the cause(s) (related to the Site) of the complaint and forward a reply to the complainant; and

c. The Owner shall complete and retain on-site a report written within one (1) week of the complaint date, listing the actions taken to resolve the complaint and any recommendations for remedial measures, and managerial or operational changes to reasonably avoid the recurrence of similar incidents.

To comply with these requirements, and in line with the MECP Best management practices for industrial sources of odour, the following process is to be followed when responding to an odour complaint.

<table>
<tr><th>Step</th><th>Action</th></tr>
<tr><td>Step 1: Complaint is Received</td><td>When a complaint is made to the Public Response Line (PRL), it goes to voicemail where the complaint is recorded and emailed to:

• Environmental Performance Department
• Operations Manager
• Security

Complaints received during working hours are managed by the EPD. Calls received after hours are investigated by Security. Complaints received in any other format (e.g., by text, email, call to head office) are to be forwarded to the EPD for management.</td></tr>
<tr><td>Step 2a: Initial Response to Complaint</td><td>The EPD will contact the complainant as soon as possible after the complaint is received to confirm receipt, collect more information (see FIDLO below), and determine if the complainant would like to meet with a Walker staff member to assess the odour (if it is still present).</td></tr>
<tr><td>Step 2b: Initial Notification to MECP</td><td>Within one business day, the EPD will send an email to the MECP indicating that a complaint was received, the nature of the complaint, and that Walker staff have been notified and are investigating.</td></tr>
<tr><td>Step 3: Investigate the Complaint</td><td>During Working Hours:

The EPD will start the complaint investigation process by sending an email to the Odour Control Group (a listing of site operations and other Walker staff). In the email, the EPD will:

a. Provide details about the complaint.
b. Share the complainant's voicemail.
c. Provide weather data from the site weather station.
d. Request operations investigate the location of the complainant.
e. Request information about daily operations and any upset conditions.

Once this email is received, the Operations Manager or their designate should visit the site of the complainant as soon as possible. When visiting the location of the complaint, the following activities should be taken:

a. Visit the area of the complaint for at least 10 minutes. If the complainant is available, the site visit should include a meeting with the complainant to obtain more information and verify any issues together.
b. Record:
• The time of arrival.
• Weather conditions during your visit (wind speed, direction, temperature, cloud cover).
c. Assess and record FIDOL factors.

1) Frequency: How often an individual is exposed to the odour (is this a one-time event or frequent event?)

2) Intensity: Strength of any odours on a scale of 0 to 6 with
<table><tr><td>0 = No Odour</td></tr><tr><td>1 = Faint / Very Weak</td></tr><tr><td>2 = Weak</td></tr><tr><td>3 = Noticeable / Distinct</td></tr><tr><td>4 = Strong</td></tr></table></td></tr>
</table>

<table>
<tr>
<td></td>
<td>
<table>
<tr><td>5 = Very Strong</td></tr>
<tr><td>6 = Extremely Strong</td></tr>
</table>
3) Duration: Time frame in which odour is observed.
4) Offensiveness Characteristics: How would you describe the odours? When describing the odours, it is important to remain unbiased. This can help determine the source of the odour if it is coming from campus operations. Some common odour characteristics include:
<table>
<tr><th>Odour Description</th><th>Possible Source</th></tr>
<tr><td>Perfumy / Fragrant</td><td>Site deodorizers</td></tr>
<tr><td>Fruity / Sweet</td><td>Compost Processing</td></tr>
<tr><td>Sour</td><td>Compost Processing, SSO receipt, Waste Receipt</td></tr>
<tr><td>Musty, Earthy</td><td>Compost Processing, Waste Receipt</td></tr>
<tr><td>Sharp / Pungent</td><td>Compost Processing, Waste Receipt</td></tr>
<tr><td>Putrid / Foul</td><td>Compost Processing, SSO receipt, Waste Receipt</td></tr>
<tr><td>Rotten Eggs / Sulphur</td><td>Landfill Gas</td></tr>
<tr><td>Manure / Sewer</td><td>Compost Processing, Biosolids Processing at NVIRO</td></tr>
</table>
5) Location: Note the type of land use and nature of human activity in the vicinity (i.e. residential with residents outside their homes).

Record areas where odours were observed.
Record any conversation had with the complainant or others in the area.
Record inspection completion time.

Outside of Working Hours: Security will investigate the area of the complaint following the same steps outlined above and report their findings to the EPD. The EPD will then share these findings with the Odour Control Group during working hours to start the investigation process.
</td>
</tr>
<tr>
<td>Step 3: If there is an odour observed and the source is identified as being or possibly being a Walker operation</td>
<td>
The person complaint the investigation should:
<ol type="a">
Assess the odour upwind of the suspected source. Where practicable, conduct a 360^{o} sweep around the source to eliminate other possible sources of odour.
Record any observations of recognizable odour at other locations surrounding the alleged source, including times of observations at each location.
Visit the site suspected of causing the odour
Confirm the site operations taking place at the time of the complaint and any other operations that may have occurred recently that may be related to the odour discharge.

</td>
</tr>
<tr>
<td>Step 4: Make Overall Assessment and Undertake any Identified Actions</td>
<td>
Within 48 hours of the investigation, the data collected by the Operations Manager or their designate is to be shared with the EPD and used to complete the site Odour Complaint Investigation Form, which can be made available. In addition to the information collected during the investigation, this form also requests:
<ol type="a">
specific information be provided about operations

</td>
</tr>
</table>

	b. actions taken, or to be take, to address source of odour Once complete this form will be reviewed with the General Manager of Operations to finalize next steps and necessary actions. ** Ideally, the Operations Manager or their designate will provide ongoing updates to the EPD and the General Manager regarding their investigation findings.
Step 5a: Follow up with Complainant	Once the investigation and assessments are complete, the EPD will follow up with the complainant, noting our findings, conclusions and any corrective actions being taken. Depending on the nature of the complaint, it may be beneficial to consult with the General Manager to ensure clear and effective communication before sending our response.
Step 5b: Follow up with MECP	Once the investigation and assessments are complete, the EPD will notify the MECP, noting our findings, conclusions and any corrective actions being taken.

Depending on the nature of the complaint, the above process may need to be modified to complete investigations and assessments. For example, calls from several complainants would likely warrant a more direct and focused investigation and assessment, while calls received several days after a suspected odour event could be more difficult to investigate.

13.0 Record Keeping

Daily Diaries and Notes (Site Inspections, Odour Surveys, General Observations…): Daily notes made by staff are to be maintained by the individuals completing the notes. These diaries and notes must be retained for a minimum of 2 years.

Daily Inspection Check List and Monthly EH&S Inspections: The Operations Manager or their designate are to forward complete Daily Inspection Check Lists and Monthly EH&S Inspections to the Operations Assistance for filing. These records are scanned and uploaded to the company electronic servers for safe keeping.

Complaints: Complaint records and details of complaints are managed by the EPD and stored electronically on the company's electronic servers (i.e. MS Teams & Network Drives). Access to the site is limited to those individuals directly involved in the management of complaints. The MS Teams site is managed by the EPD.

All complaint records will be kept on-site for a minimum of 2 years.

14.0 Training

The following personnel required training on this procedure within 90 days of being hired, and annual there after:

Management	Landfill Operations Staff	EPD Staff
• VP T&D • GM T&D • Operations Manager, Landfill • Site Supervisor, Landfill	• Ground Maintenance • Compactor / Tipper / Equipment Operators • Scalehouse Operator	• VP EPD • Business Partner, Landfill • Business Partner Manager, Landfill

The EPD is responsible for coordinating, delivering, and tracking training.

15.0 BMPP Review Procedure and Schedule

The EPD will coordinate the review of this BMPP annually with operations. The BMPP may be reviewed sooner based on operational changes or responses to complaints. The BMPP will be updated as required, including updates made from the annual review or continuous improvements. Reviews and updates of the BMPP are coordinated by the EPD.

Log of reviews and updates

Date	Review / Update	Summary of Changes
June 13, 2024	Update	Major update sites odour control SOP to MECP BMP format.

APPENDIX J

Appendix J: Complaint Logs

RWDI Project #2402272

Walker South Landfill Phase 2 Environmental Assessment -

Date	Time	Location	Winds	Site	Source
2020 Complaint Summary					
8-Apr	1:00 PM	Niagara Falls	N/A	Walker Brothers Quarry	One monitor was triggered but was under an exceedance
8-Sep	10:00 AM	Niagara Falls	N/A	Walker Brothers Quarry	
28-Sep	12:48 PM	Niagara Falls	N/A	Walker Brothers Quarry	
2021 Complaint Summary					
15-Mar	12:12 PM	Niagara Falls	N/A	Landfill	Garbage flying over on Taylor Road
22-Apr	12:21 PM	Niagara Falls	N/A	Walker Brothers Quarry	Blast monitors were in compliance
29-Apr	12:21 PM	Niagara Falls	N/A	Walker Brothers Quarry	
5-Oct	12:03 PM	Thorold	N/A	Walker Brothers Quarry	Blast monitors were in compliance
2022 Complaint Summary					
3-Jan	7:15 PM	NOTG	9 km/hr S	Campus	Unknown
4-Jan	6:33 PM	St Catharines	9 km/hr SSE	IGRS	LFG
10-Jan	7:40 PM	Niagara Falls	24 km/hr W	Campus	Unknown
24-Jan	10:45 PM	NOTG	9 km/hr S	Campus	Unknown
2-Feb	12:45 PM	NOTG	16 km/hr SSW	Compost	Very saturated material
2-Feb	1:08 PM	NOTG	16 km/hr SSW	Compost	Very saturated material
4-Feb	9:27 PM	Niagara Falls	4 km/hr WNW	Campus	Unknown
9-Feb	7:00 PM	NOTG	13 km/hr S	Campus	Unknown
25-Feb	6:30 PM	Niagara Falls	3 km/hr SSW	Campus	Unknown
8-Mar	9:15 PM	NOTG	varied from 10 km/hr S to SSE	Campus	Unknown
	11:08 PM		5 km/hr S		
16-Mar	11:45 AM	Thorold	Little to no wind.	Campus	Unknown
17-Mar	7:15 PM	NOTG	varied from 13 km/hr	Campus	Unknown
23-Mar	10:30 AM	Thorold	20 km/hr E	Campus	Unknown
30-Mar	10:30 AM	White Oaks	15 km/hr ESE	Campus	Unknown
11-Apr	8:20 AM	St Catharines	12 km/hr SE	Campus	Unknown
12-Apr	1:15 PM	Thorold	11 km/hr S	Campus	Unknown
12-Apr	8:05 PM	NOTG		Landfill	
13-Apr	7:29 PM	NOTG	11 km/hr S	Landfill	
	11:00 PM	Niagara Falls	varied from 10 km/hr SW to SSW		
18-May	6:50 AM	Niagara Falls	0 km/hr N	Campus	Unknown
19-May	11:30 AM	Niagara Falls	0 km/hr N/NW	Campus	Unknown
3-Jun	8:59 AM	Niagara Falls	varied from 1-10 km/hr W	Campus	Unknown
6-Jun	18:09	NOTG	varied from 3-5 km/hr S to SE	Campus	Unknown
8-Jun	8:30 AM	Niagara Falls	5 km/hr WNW	Campus	Unknown
14-Jun	10:10 PM	Thorold	varied from 4-6 km/hr E to ESE	Compost	Receiving Building
15-Jun	8:45 PM	Thorold	2 km/hr ESE	Compost	Receiving Building
29-Jun	10:41 AM	Niagara Falls	2 km/hr WSW	Campus	Unknown
9-Jul	9:15 PM	Thorold	5 km/hr NE	Campus	Unknown
12-Jul	11:24 AM	Niagara Falls	11 km/hr S	Landfill	
2-Aug	8:30 PM	Thorold	varied from 0-2 km/hr ENE to E	IGRS	Power failure
5-Aug	8:06 PM	Thorold	0 km/hr ESE	Compost	High temperature and humidity
9-Aug	8:00 PM	Thorold	0 km/hr N	Landfill	
13-Aug	9:00 AM	Niagara Falls	0 km/hr N	Campus	Unknown
25-Aug	8:30 AM	Thorold	0 km/hr N	Compost	Deodorizer
6-Sep	9:30 PM	Thorold	0 km/hr N	Compost	Deodorizer
9-Sep	8:30 PM	Thorold	0 km/hr ENE	IGRS	Reduced vacuum
13-Sep	8:30 AM	NOTG	0 km/hr S	Landfill	
23-Sep	9:29 PM	NOTG	0 km/hr N	Campus	Unknown
30-Sep	10:45 AM	Thorold	0 km/hr SE	Compost	Moving Phase 1 to Phase 2

Date	Time	Location	Winds	Site	Source
5-Oct	7:55 AM	NOTG	0 km/hr SSE	Compost	Weather conditions: low lying fog, low ground level air temperatures under a cap of higher air temperatures
	8:45 PM		1 km/hr SSE		
27-Oct	6:43 PM	Thorold	0 km/hr N	Compost	
24-Nov	10:52 AM	NOTG	varied from 12-13 km/hr S	Campus	Unknown
2-Nov	2:28 PM	Niagara Falls	N/A	Landfill	Water truck on Taylor Road to clean road and prevent drag out
2023 Complaint Summary					
15-Feb	9:45 AM	White Oaks	29 km/hr SSW	Campus	Unknown
4-Jun	8:45 PM	Thorold	varied from 6 km/hr ESE to NNW	Campus	Unknown
20-Jun	11:47 AM	Thorold		Campus	Deodorizer
29-Jun	8:17 AM	NOTG	5 km/hr SSE	Landfill	LFG Expansion
30-Jun	8:46 AM	NOTG	11 km/hr SSE	Landfill	LFG Expansion
12-Jul	8:00 PM	Thorold	6 km/hr ENE	Landfill	
14-Jul	6:09 AM	NOTG	5 km/hr SSE	Landfill	LFG Expansion
14-Jul	10:23 PM	NOTG	9 km/hr S	Landfill	LFG Expansion
5-Aug	9:34 PM	Thorold	5 km/hr ENE	Campus	Unknown
14-Aug	9:55 PM	Thorold	5 km/hr ENE	Compost	Unknown
17-Aug	7:59 AM	NOTG	13 km/hr SSE	Campus	Unknown
28-Aug	10:33 PM	Thorold	varied from 1 km/hr ENE to ENE/E/SE/E/ENE	Compost	Unknown
29-Aug	9:36 PM	NOTG	9 km/hr S	Compost	Unknown
31-Aug	11:36 PM	NOTG	5 km/hr SSE	Compost	
1-Sep	8:03 PM	Thorold	6 km/hr E	Compost	
5-Sep	8:45 AM	NOTG	8 km/hr SSE	Compost	
6-Sep	9:18 AM	NOTG	13 km/hr S	Compost	
10-Sep	11:08 PM	Thorold	5 km/hr ENE	Compost	
22-Sep	9:01 PM	Thorold	7 km/hr ENE	Compost	Communication system glitch in GORE cell
Sept 22 to Sept 24	9:04 PM	Thorold	predominantly E	Compost	Communication system glitch in GORE cell
23-Sep	8:32 PM	Thorold	8 km/hr E	Compost	Communication system glitch in GORE cell
25-Sep	6:29 PM	Thorold	8 km/hr ENE	Compost	Communication system glitch in GORE cell
26-Sep	1:15 PM	Thorold	12 km/hr E	Compost	Communication system glitch in GORE cell
1-Oct	Unknown	NOTG		Campus	Unknown
2-Oct	Evening	NOTG	varied from 9 to 13 km/hr S to SSW	Landfill	
3-Oct	8:19 PM	NOTG	8 km/hr S	Landfill	
3-Oct	8:49 PM	NOTG	7 km/hr S	Landfill	
4-Oct	9:04 AM	NOTG	13 km/hr SSE	Landfill	
18-Oct	9:06 AM	NOTG	6 km/hr S	Landfill	LFG Expansion
8-Nov	7:44 AM	Thorold	7 km/hr ENE	Compost	Movement from Phase 1 to Phase 2
16-Nov	8:24 AM	NOTG	8 km/hr S	Compost	Grinding Leaves
5-May	12:10 PM	Niagara Falls	N/A	Walker Brothers Quarry	Blast monitors were in compliance.

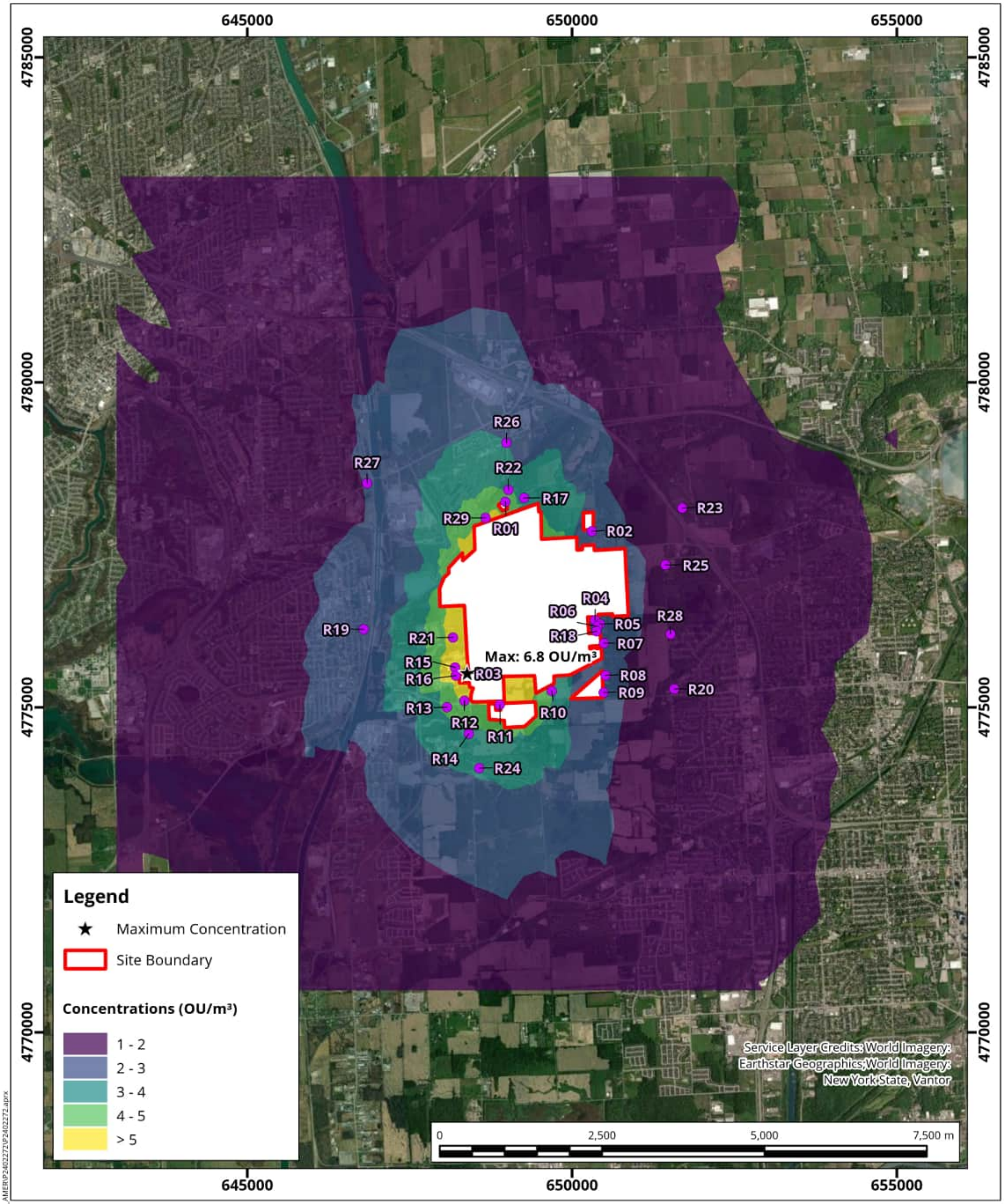
Appendix J: Complaint Logs

RWDI Project #2402272

Walker South Landfill Phase 2 Environmental Assessment -

Date	Time	Location	Winds	Site	Source
2024 Complaint Summary					
11-Jan	9:11 AM	NOTG	7 km/hr S	Campus	Unknown
29-Jan	8:54 PM	NOTG	8 km/hr SSW	Compost	Windrow Turning
	8:54 PM	NOTG			
	8:54 PM	NOTG			
31-Jan	8:29 AM	NOTG	9 km/hr S	Compost	Moving Phase 1 to Phase 2
	8:53 AM	NOTG	10 km/hr SSW		
3-Feb	11:07 PM	NOTG	7 km/hr SSE	Campus	Unknown
27-Feb	11:46 AM	NOTG	18 km/hr S	Compost	Unknown
15-Apr	9:39 AM	Niagara Falls	8 km/hr N	Landfill	LFG / Waste
15-Apr	9:12 PM	Niagara Falls	5 km/hr WNW	Landfill	LFG / Waste
18-Apr	12:26 PM	Niagara Falls	15 km/hr W	Landfill	LFG / Waste
17-Jun	12:07 PM	NOTG	18 km/hr S	Compost	Screening / Turning
26-Jul	9:08 AM	Niagara Falls	6 km/hr WNW	Campus	Unknown
26-Aug	8:02 AM	NOTG	8 km/hr SSE	Landfill	Waste
12-Sep	8:29 AM	White Oaks	4 km/hr SE	Landfill	LFG
27-Sep	11:36 AM	Thorold	11 km/hr E	Compost	Compost
30-Sep	12:20 AM	Thorold	5 km/hr E	Compost	North Pad
22-Oct	8:35 AM	NOTG	15 km/hr S	Compost	Moving Phase 1 to Phase 2
10-Sep	12:00 PM	Niagara Falls	Low wind	Walker Brothers Quarry	Blast vibration and air over-pressure were within provincial guidelines.
10-Sep	1:30 PM	Niagara Falls	Low wind	Walker Brothers Quarry	Vibration and air over-pressure readings at monitor closest to blast were within provincial guidelines.
2025 Complaint Summary					
4-Jul	9:30 AM	Thorold East	2 km/hr ESE	COMPOST	Screening
17-Jul	2:03 PM	Niagara Falls	21 km/hr WNW	LANDFILL	Active Face
18-Jul	12:20 PM	Thorold East	11 km/hr E	COMPOST	Deodorizer
18-Jul	10:03 PM	Thorold East	7 km/hr ENE	COMPOST	
21-Jul	10:04 PM	Thorold East	2 km/hr SE	COMPOST	
22-Jul	7:24 AM	NOTG	5-6 km/hr S/SSE	LANDFILL	Active Face
22-Jul	9:33 PM	Thorold (Unknown)	7 km/hr ENE	COMPOST	
	9:35 PM	Thorold East	7 km/hr ENE		
23-Jul	7:50 AM	Thorold East	3 km/hr ESE	COMPOST	
	8:30 AM	Thorold East	4 km/hr SE		
	8:33 AM	Thorold East	7 km/hr ESE		
1-Aug	9:16 PM	Thorold East	3 km/hr SE	COMPOST	
5-Aug	9:50 AM	Thorold East	6 km/hr ESE	COMPOST	
8-Aug	8:56 AM	NOTG	17 km/hr S	LANDFILL	Active Face
14-Aug	8:55 PM	Thorold (Unknown)	5 km/hr E	LANDFILL	LFG
18-Aug	8:28 AM	Thorold East	11 km/hr ENE	COMPOST	North Pad/ puddles
18-Aug	9:38 PM	Thorold East	6 km/hr E	COMPOST	
19-Aug	4:55 PM	Thorold East	5 km/hr E	COMPOST	
25-Aug	11:07 AM	Niagara Falls	11 km/hr WNW	LANDFILL	Active Face
26-Aug to 27-Aug	5:11 PM	Niagara Falls	14 km/hr WNW	LANDFILL	Active Face
	1:03 PM	Niagara Falls	13 km/hr WNW		
11-Sep	8:28 PM	Thorold East	4km/hr NE	COMPOST	Sour Odour
14-Sep	9:04 PM	Thorold East	6 km/hr ENE	COMPOST	Sour Odour
	8:53 PM	Thorold East			
15-Sep	8:49 PM	Thorold East	10 km/hr ENE	COMPOST	Sour Odour
	Evening (exact time unknown)	Unknown	NA		
17-Sep	8:19 AM	Thorold East	km/hr SSW to 2 km/hr S	COMPOST	Screening
19-Sep	7:30 PM	Thorold East	5 km/hr NE	COMPOST	
	8:10 PM	Thorold East	6 km/hr E		
25-Sep	12:19 PM	Niagara Falls	7 km/hr WNW	LANDFILL	
26-Sep	2:17 PM	Niagara Falls	13 km/hr W	LANDFILL	
27-Sep	9:12 AM	NOTG	12 km/hr S	COMPOST	
30-Sep	7:24 PM	Thorold East	7 km/hr E	COMPOST	
20-May	3:15 PM	Niagara Falls	N/A	Landfill	Water truck on Taylor Road to clean road and prevent drag out

APPENDIX K



Predicted 10-Minute Odour Concentrations (in OU/m^3)

Map Document: C:\WorkingFolder\Jobs_AMER\P2402272\P2402272.aprx

Map Projection: NAD 1983 UTM Zone 17N

Walker Landfill - Regional Municipality of Niagara, Ontario

Project #: 2402272

Drawn by: PIP	Figure: K.1
Approx. Scale:	1:80,000
Date Revised:	Jun 17, 2026

RWDI

APPENDIX L

Appendix L1: Combustion Source Emission Rate Calculations (All Contaminants except SO_2)

RWDI Project #2402272

Walker South Landfill Phase 2 Environmental Assessment

Source ID	Description	Source Characteristics Horse Power [9] (hp)	Engine Power (kW)	Total LFG Gas Volume [9] (dscm/hr)	Total LFG Gas Volume [9] (dscm/s)	Total Methane Gas Volume [10] (dscm/hr)	Total Methane Gas Volume (dscm/s)	Flow Rate (standard) [9] (m³/s)	Flow Rate (actual) (m³/s)	Load Factor	Contaminant	Emission Rate Calculations – Emission Factor [1] (kg/10^6dscm methane)	[2] (g/m³ landfill gas)	[3] (lb/hp-hr)	[4] (lb/hp-hr)	[5] (lb/MMBTU)	[6] (g/kW-hr)	[7] (g/hp-hr)	[8] (lb/10^6 scf)	Emission Rate (g/s)
SEQGen	Energy Supply to Water Pump for Water Trucks	60	45	- -	- -	- -	- -	n/a	n/a	1.00	Nitrogen Oxides (NOx)	- -	- -	- -	- -	- -	9.2	- -	- -	0.115
										1.00	TSP	- -	- -	- -	- -	- -	0.4	- -	- -	0.005
										1.00	PM10	- -	- -	- -	- -	- -	0.4	- -	- -	0.005
										1.00	PM2.5	- -	- -	- -	- -	- -	0.4	- -	- -	0.005
TIP_SLF	173 hp Diesel-Fired Landfill Tipper	173	- -	- -	- -	- -	- -	-	1.25	1.00	Nitrogen Oxides (NOx)	- -	- -	0.031	- -	- -	- -	- -	- -	0.676
										1.00	TSP	- -	- -	2.20E-03	- -	- -	- -	- -	- -	0.048
										1.00	PM10	- -	- -	2.20E-03	- -	- -	- -	- -	- -	0.048
										1.00	PM2.5	- -	- -	2.20E-03	- -	- -	- -	- -	- -	0.048
TIP2_SLF	173 hp Diesel-Fired Landfill Tipper #2	173	- -	- -	- -	- -	- -	-	1.25	1.00	Nitrogen Oxides (NOx)	- -	- -	0.031	- -	- -	- -	- -	- -	0.676
										1.00	TSP	- -	- -	2.20E-03	- -	- -	- -	- -	- -	0.048
										1.00	PM10	- -	- -	2.20E-03	- -	- -	- -	- -	- -	0.048
										1.00	PM2.5	- -	- -	2.20E-03	- -	- -	- -	- -	- -	0.048
Gen1	1,064 kW Landfill Gas Fired Generator	1,468	- -	374	0	186	0	0.59	1.59	1.00	Nitrogen Oxides (NOx)	- -	- -	- -	- -	- -	- -	1.10E+00	- -	0.449
										1.00	TSP	7.70E+02	- -	- -	- -	- -	- -	- -	- -	0.040
										1.00	PM10	7.70E+02	- -	- -	- -	- -	- -	- -	- -	0.040
										1.00	PM2.5	7.70E+02	- -	- -	- -	- -	- -	- -	- -	0.040
Gen2	1,064 kW Landfill Gas Fired Generator	1,468	- -	374	0	186	0	0.59	1.59	1.00	Nitrogen Oxides (NOx)	- -	- -	- -	- -	- -	- -	1.10E+00	- -	0.449
										1.00	TSP	7.70E+02	- -	- -	- -	- -	- -	- -	- -	0.040
										1.00	PM10	7.70E+02	- -	- -	- -	- -	- -	- -	- -	0.040
										1.00	PM2.5	7.70E+02	- -	- -	- -	- -	- -	- -	- -	0.040
Gen3	1,064 kW Landfill Gas Fired Generator	1,468	- -	374	0	186	0	0.59	1.59	1.00	Nitrogen Oxides (NOx)	- -	- -	- -	- -	- -	- -	1.10E+00	- -	0.449
										1.00	TSP	7.70E+02	- -	- -	- -	- -	- -	- -	- -	0.040
										1.00	PM10	7.70E+02	- -	- -	- -	- -	- -	- -	- -	0.040
										1.00	PM2.5	7.70E+02	- -	- -	- -	- -	- -	- -	- -	0.040
Gen4	1,064 kW Landfill Gas Fired Generator	1,468	- -	374	0	186	0	0.59	1.59	1.00	Nitrogen Oxides (NOx)	- -	- -	- -	- -	- -	- -	1.10E+00	- -	0.449
										1.00	TSP	7.70E+02	- -	- -	- -	- -	- -	- -	- -	0.040
										1.00	PM10	7.70E+02	- -	- -	- -	- -	- -	- -	- -	0.040
										1.00	PM2.5	7.70E+02	- -	- -	- -	- -	- -	- -	- -	0.040
PGen1	49 kW Portable Diesel Fired Generator Cummins Model #4BT3.3-G2	66	49	- -	- -	- -	- -	- -	0.17	1.00	Nitrogen Oxides (NOx)	-	- -	- -	- -	- -	- -	4.78E+00	- -	0.087
										1.00	TSP	-	- -	- -	- -	- -	- -	4.00E-01	- -	0.007
										1.00	PM10	-	- -	- -	- -	- -	- -	4.00E-01	- -	0.007
										1.00	PM2.5	-	- -	- -	- -	- -	- -	4.00E-01	- -	0.007
Screen1C	Screen #1 Engine 130 kW, Diesel Fired	174	130	- -	- -	- -	- -	-	0.48	0.43	Nitrogen Oxides (NOx)	- -	- -	0.031	- -	- -	- -	- -	- -	0.293
										0.43	TSP	- -	- -	2.20E-03	- -	- -	- -	- -	- -	0.021
										0.43	PM10	- -	- -	2.20E-03	- -	- -	- -	- -	- -	0.021
										0.43	PM2.5	- -	- -	2.20E-03	- -	- -	- -	- -	- -	0.021
Screen2C	Screen #2 Engine 130 kW, Diesel Fired	174	130	- -	- -	- -	- -	-	0.48	0.43	Nitrogen Oxides (NOx)	- -	- -	0.031	- -	- -	- -	- -	- -	0.293
										0.43	TSP	- -	- -	2.20E-03	- -	- -	- -	- -	- -	0.021
										0.43	PM10	- -	- -	2.20E-03	- -	- -	- -	- -	- -	0.021
										0.43	PM2.5	- -	- -	2.20E-03	- -	- -	- -	- -	- -	0.021
Screen3C	Screen #3 Engine 130 kW, Diesel Fired	174	130	- -	- -	- -	- -	-	0.48	0.43	Nitrogen Oxides (NOx)	- -	- -	0.031	- -	- -	- -	- -	- -	0.293
										0.43	TSP	- -	- -	2.20E-03	- -	- -	- -	- -	- -	0.021
										0.43	PM10	- -	- -	2.20E-03	- -	- -	- -	- -	- -	0.021
										0.43	PM2.5	- -	- -	2.20E-03	- -	- -	- -	- -	- -	0.021
Screen4C	Screen #4 Engine 60 kW, Diesel Fired	80	60	- -	- -	- -	- -	-	0.48	0.43	Nitrogen Oxides (NOx)	- -	- -	0.031	- -	- -	- -	- -	- -	0.135
										0.43	TSP	- -	- -	2.20E-03	- -	- -	- -	- -	- -	0.010
										0.43	PM10	- -	- -	2.20E-03	- -	- -	- -	- -	- -	0.010
										0.43	PM2.5	- -	- -	2.20E-03	- -	- -	- -	- -	- -	0.010

Appendix L1: Combustion Source Emission Rate Calculations (All Contaminants except SO_2)

Walker South Landfill Phase 2 Environmental Assessment

Source ID	Description	Source Characteristics: Horse Power [9] (hp)	Engine Power (kW)	Total LFG Gas Volume [9] (dscm/hr)	Total LFG Gas Volume [9] (dscm/s)	Total Methane Gas Volume [10] (dscm/hr)	Total Methane Gas Volume (dscm/s)	Flow Rate (standard) [9] (m³/s)	Flow Rate (actual) (m³/s)	Load Factor	Contaminant	Emission Factor [1] (kg/10⁶dscm methane)	[2] (g/m³ landfill gas)	[3] (lb/hp-hr)	[4] (lb/hp-hr)	[5] (lb/MMBTU)	[6] (g/kW-hr)	[7] (g/hp-hr)	[8] (lb/10⁶ scf)	Emission Rate (g/s)
CONVEYOR	Stacking Conveyor Engine 60 kW, Diesel Fired	80	60	- -	- -	- -	- -	-	0.24	0.21	Nitrogen Oxides (NOx)	- -	- -	0.031	- -	- -	- -	- -	- -	0.066
										0.21	TSP	- -	- -	2.20E-03	- -	- -	- -	- -	- -	0.005
										0.21	PM10	- -	- -	2.20E-03	- -	- -	- -	- -	- -	0.005
										0.21	PM2.5	- -	- -	2.20E-03	- -	- -	- -	- -	- -	0.005
CONVEY2N	Stacking Conveyor #2 Engine 60 kW, Diesel Fired	80	60	- -	- -	- -	- -	-	0.24	0.21	Nitrogen Oxides (NOx)	- -	- -	0.031	- -	- -	- -	- -	- -	0.066
										0.21	TSP	- -	- -	2.20E-03	- -	- -	- -	- -	- -	0.005
										0.21	PM10	- -	- -	2.20E-03	- -	- -	- -	- -	- -	0.005
										0.21	PM2.5	- -	- -	2.20E-03	- -	- -	- -	- -	- -	0.005
GSTK	Grinder Engine 860 kW, Diesel Fired	1,153	860	- -	- -	- -	- -	-	2.70	0.43	Nitrogen Oxides (NOx)	- -	- -	- -	- -	- -	9.2	- -	- -	0.945
										0.43	TSP	- -	- -	- -	- -	- -	0.54	- -	- -	0.055
										0.43	PM10	- -	- -	- -	- -	- -	0.54	- -	- -	0.055
										0.43	PM2.5	- -	- -	- -	- -	- -	0.54	- -	- -	0.055
GSTK2_N	Grinder #2 Engine 860 kW, Diesel Fired	1,153	860	- -	- -	- -	- -	-	2.70	0.43	Nitrogen Oxides (NOx)	- -	- -	- -	- -	- -	9.2	- -	- -	0.945
										0.43	TSP	- -	- -	- -	- -	- -	0.54	- -	- -	0.055
										0.43	PM10	- -	- -	- -	- -	- -	0.54	- -	- -	0.055
										0.43	PM2.5	- -	- -	- -	- -	- -	0.54	- -	- -	0.055
GENC	Generator #1 600 kW, Diesel Fired	805	600	- -	- -	- -	- -	-	2.36	1.00	Nitrogen Oxides (NOx)	- -	- -	- -	0.024	- -	- -	- -	- -	2.433
										1.00	TSP	- -	- -	- -	- -	0.0697	- -	- -	- -	0.018
										1.00	PM10	- -	- -	- -	- -	0.0573	- -	- -	- -	0.015
										1.00	PM2.5	- -	- -	- -	- -	0.0479	- -	- -	- -	0.012
MO_GEN	55 kW Natural Gas Fired Emergency Generator	74	55	- -	- -	- -	- -	-	0.20	1.00	Nitrogen Oxides (NOx)	- -	- -	- -	- -	- -	- -	8.23	- -	0.169
										1.00	TSP	- -	- -	- -	- -	- -	- -	- -	7.6	0.024
										1.00	PM10	- -	- -	- -	- -	- -	- -	- -	7.6	0.024
										1.00	PM2.5	- -	- -	- -	- -	- -	- -	- -	7.6	0.024
- -	Total	- -	- -	- -	- -	- -	- -	- -	- -	- -	Nitrogen Oxides (NOx)	- -	- -	- -	- -	- -	- -	- -	- -	**8.985**
											TSP	- -	- -	- -	- -	- -	- -	- -	- -	**0.501**
											PM10	- -	- -	- -	- -	- -	- -	- -	- -	**0.498**
											PM2.5	- -	- -	- -	- -	- -	- -	- -	- -	**0.496**

Notes:

[1] Emission Factors taken from US EPA AP-42 Chapter 2.4, Table 2.4-4. TSP is assumed to same as PM_{10} and $PM_{2.5}$.
[2] Emission Factor calculated based on concentration of sulphur compounds in raw landfill gas (see Appendix F2).
[3] Emission Factors taken from US EPA AP-42 Chapter 3.3, Table 3.3-1. PM is assumed to same for TSP, PM_{10} and $PM_{2.5}$.
[4] Emission Factors taken from US EPA AP-42 Chapter 3.4, Table 3.4-1.
[5] Emission Factors taken from US EPA AP-42 Chapter 3.4, Table 3.4-2.
[6] Emission Factors taken from "Nonroad Compression-Ignition Engines: Exhaust Emission Standards" (US EPA, 2016).
[7] Emission Factors supplied by the Manufacturer.
[8] Emission Factors taken from US EPA AP-42 Chapter 1.4, Table 1.4-1 and Table 1.4-2. PM is assumed to same for TSP, PM_{10} and $PM_{2.5}$.
[9] Operating parameters from all generators obtained from manufacturer's specifications.
[10] Methane content of landfill gas, based on 2026 source testing = 50%

Appendix L2: Combustion Source Emission Rate Calculations (SO_2)

RWDI Project #2402272

Walker South Landfill Phase 2 Environmental Assessment

Source Info		Source Characteristics								Load Factor	Contaminant	Emission Rate Calculations								
												Emission Factor								Emission Rate
Source ID	Description	Horse Power [9] (hp)	Engine Power (kW)	Total LFG Gas Volume [9] (dscm/hr)	Total LFG Gas Volume [9] (dscm/s)	Total Methane Gas Volume [10] (dscm/hr)	Total Methane Gas Volume (dscm/s)	Flow Rate (standard) [9] (m^3/s)	Flow Rate (actual) (m^3/s)			[1] ($kg/10^6$dscm methane)	[2] (g/m^3 landfill gas)	[3] (lb/hp-hr)	[4] (lb/hp-hr)	[5] (lb/MMBTU)	[6] (g/kW-hr)	[7] (g/hp-hr)	[8] ($lb/10^6$ scf)	(g/s)
SEQGen	Energy Supply to Water Pump for Water Trucks	60	45	- -	- -	- -	- -	n/a	n/a	1.00	Sulphur Dioxide (SO2)	- -	- -	2.05E-03	- -	- -	- -	- -	- -	0.016
TIP_SLF	173 hp Diesel-Fired Landfill Tipper	173	- -	- -	- -	- -	- -	-	1.25	1.00	Sulphur Dioxide (SO2)	- -	- -	2.05E-03	- -	- -	- -	- -	- -	0.045
TIP2_SLF	173 hp Diesel-Fired Landfill Tipper #2	173	- -	- -	- -	- -	- -	-	1.25	1.00	Sulphur Dioxide (SO2)	- -	- -	2.05E-03	- -	- -	- -	- -	- -	0.045
Gen1	1,064 kW Landfill Gas Fired Generator	1,468	- -	679.60	0.19	336.74	0.09	1.06	2.89	1.00	Sulphur Dioxide (SO2)	- -	4.22E-01	- -	- -	- -	- -	- -	- -	0.080
Gen2	1,064 kW Landfill Gas Fired Generator	1,468	- -	679.60	0.19	336.74	0.09	1.06	2.89	1.00	Sulphur Dioxide (SO2)	- -	4.22E-01	- -	- -	- -	- -	- -	- -	0.080
Gen3	1,064 kW Landfill Gas Fired Generator	1,468	- -	0.00	0.00	0.00	0.00	0.00	0.00	1.00	Sulphur Dioxide (SO2)	- -	0.00E+00	- -	- -	- -	- -	- -	- -	0.000
Gen4	1,064 kW Landfill Gas Fired Generator	1,468	- -	0.00	0.00	0.00	0.00	0.00	0.00	1.00	Sulphur Dioxide (SO2)	- -	0.00E+00	- -	- -	- -	- -	- -	- -	0.000
PGen1	49 kW Portable Diesel Fired Generator Cummins Model #4BT3.3-G2	66	49	- -	- -	- -	- -	- -	0.17	1.00	Sulphur Dioxide (SO2)	-	- -	2.05E-03	- -	- -	- -	- -	- -	0.017
Screen1C	Screen #1 Engine 130 kW, Diesel Fired	174	130	- -	- -	- -	- -	-	0.48	0.43	Sulphur Dioxide (SO2)	- -	- -	2.05E-03	- -	- -	- -	- -	- -	0.019
Screen2C	Screen #2 Engine 130 kW, Diesel Fired	174	130	- -	- -	- -	- -	-	0.48	0.43	Sulphur Dioxide (SO2)	- -	- -	2.05E-03	- -	- -	- -	- -	- -	0.019
Screen3C	Screen #3 Engine 130 kW, Diesel Fired	174	130	- -	- -	- -	- -	-	0.48	0.43	Sulphur Dioxide (SO2)	- -	- -	2.05E-03	- -	- -	- -	- -	- -	0.019
Screen4C	Screen #4 Engine 60 kW, Diesel Fired	80	60	- -	- -	- -	- -	-	0.48	0.43	Sulphur Dioxide (SO2)	- -	- -	2.05E-03	- -	- -	- -	- -	- -	0.009
CONVEYOR	Stacking Conveyor Engine 60 kW, Diesel Fired	80	60	- -	- -	- -	- -	-	0.24	0.21	Sulphur Dioxide (SO2)	- -	- -	2.05E-03	- -	- -	- -	- -	- -	0.004
CONVEY2N	Stacking Conveyor #2 Engine 60 kW, Diesel Fired	80	60	- -	- -	- -	- -	-	0.24	0.21	Sulphur Dioxide (SO2)	- -	- -	2.05E-03	- -	- -	- -	- -	- -	0.004
GSTK	Grinder Engine 860 kW, Diesel Fired	1,153	860	- -	- -	- -	- -	-	2.70	0.43	Sulphur Dioxide (SO2)	- -	- -	- -	- -	- -	- -	0.76	- -	0.105
GSTK2_N	Grinder #2 Engine 860 kW, Diesel Fired	1,153	860	- -	- -	- -	- -	-	2.70	0.43	Sulphur Dioxide (SO2)	- -	- -	- -	- -	- -	- -	0.76	- -	0.105
GENC	Generator #1 600 kW, Diesel Fired	805	600	- -	- -	- -	- -	-	2.36	1.00	Sulphur Dioxide (SO2)	- -	- -	- -	1.21E-05	- -	- -	- -	- -	0.001
MO_GEN	55 kW Natural Gas Fired Emergency Generator	74	55	- -	- -	- -	- -	-	0.20	1.00	Sulphur Dioxide (SO2)	- -	- -	- -	- -	- -	- -	- -	0.6	0.002

Notes:

[1] Emission Factors taken from US EPA AP-42 Chapter 2.4, Table 2.4-4. TSP is assumed to same as PM_{10} and $PM_{2.5}$.
[2] Emission Factor calculated based on concentration of sulphur compounds in raw landfill gas (see Appendix F2).
[3] Emission Factors taken from US EPA AP-42 Chapter 3.3, Table 3.3-1. PM is assumed to same for TSP, PM_{10} and $PM_{2.5}$.
[4] Emission Factors taken from US EPA AP-42 Chapter 3.4, Table 3.4-1.
[5] Emission Factors taken from US EPA AP-42 Chapter 3.4, Table 3.4-2.
[6] Emission Factors taken from "Nonroad Compression-Ignition Engines: Exhaust Emission Standards" (US EPA, 2016).
[7] Emission Factors supplied by the Manufacturer.
[8] Emission Factors taken from US EPA AP-42 Chapter 1.4, Table 1.4-1 and Table 1.4-2. PM is assumed to same for TSP, PM_{10} and $PM_{2.5}$.
[9] Operating parameters from all generators obtained from manufacturer's specifications.
[10] Methane content of landfill gas, based on 2026 source testing = 50%

APPENDIX M

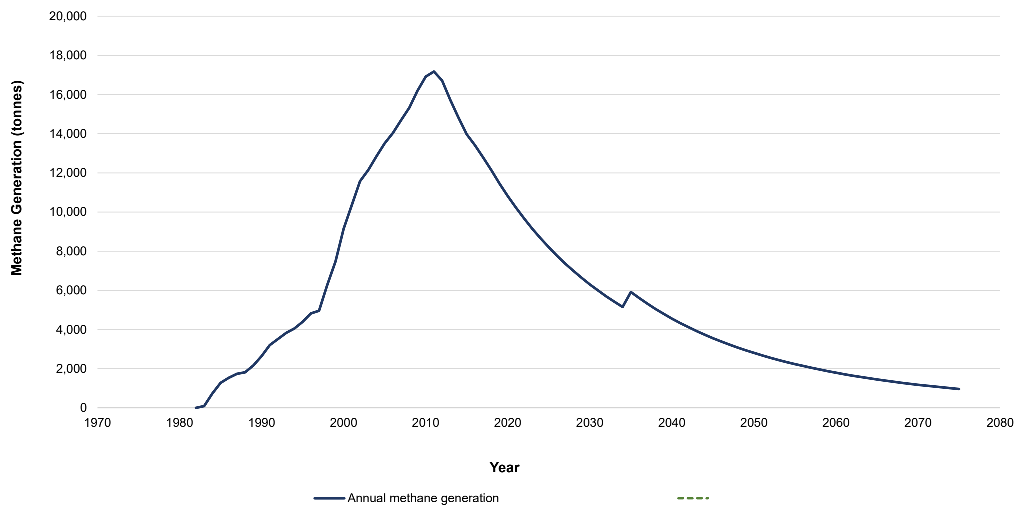
Landfill Methane Modelling Tool: Results

Landfill Name: Walker East Landfill

Year opened: 1982

Closure year: 2034

Province : ON



Year	Total Annual Waste Disposed	Total Waste in Place	Methane generation (no diversion)		
	tonnes/year	tonnes	tonnes/year	m^3 methane/year	scfm methane (standard cubic feet per minute)
1982	24,365	24,365	0	0	0
1983	172,820	197,185	91	138,778	28,445
1984	156,931	354,116	731	1,114,679	228,473
1985	90,330	444,446	1,273	1,940,758	397,792
1986	79,125	523,571	1,534	2,337,826	479,178
1987	48,729	572,300	1,737	2,647,940	542,741
1988	124,125	696,425	1,815	2,767,241	567,194
1989	160,702	857,127	2,171	3,310,009	678,443
1990	190,079	1,047,206	2,643	4,029,349	825,884
1991	133,415	1,180,621	3,206	4,887,314	1,001,739
1992	136,711	1,317,332	3,520	5,365,127	1,099,675
1993	120,328	1,437,660	3,827	5,833,163	1,195,607
1994	152,810	1,590,470	4,053	6,178,721	1,266,435
1995	182,732	1,773,202	4,390	6,691,560	1,371,550
1996	111,998	1,885,200	4,819	7,346,367	1,505,764
1997	423,809	2,309,009	4,955	7,553,776	1,548,276
1998	419,774	2,728,783	6,264	9,548,703	1,957,171

User-selected and Default Model parameters

The following material parameters were used in the methane generation calculations, based on user sele
inputs:

Waste Type	Decay Rate (k) (User-selected) Average annual precipitation >500 to 1000mm	DOC (Default)	DOC_f (Default)
Food	0.09	0.15	0.7
Paper	0.04	0.4	0.5
Yard and Garden	0.09	0.2	0.7
Soiled Paper	0.09	0.4	0.5
Wood	0.02	0.43	0.1
Textiles	0.04	0.24	0.5
Pet Waste	0.09	0.24	0.5
Diapers and Sanitary	0.09	0.24	0.5
Rubber and Leather	0.02	0.39	0.1
Other - Residential	0.09	0.1	0.5
Other - ICI	0.09	0.05	0.5
Other - Unknown	0.09	0.05	0.5
Sludge	0.09	0.05	0.7
Soil	0.02	0.03	0.1

Other Parameters and Defaults		Constants	
Methane Correction Factor (MCF)	1	Molar ratio of CH_4:C	1.33
CH_4 content in LFG (%CH_4)	50%	CH_4 density (at 25 °C and 1 atm) (kg/m^3)	0.656

Waste modelled	Bulk MSW
User-specified waste composition?	No
Diversion?	No

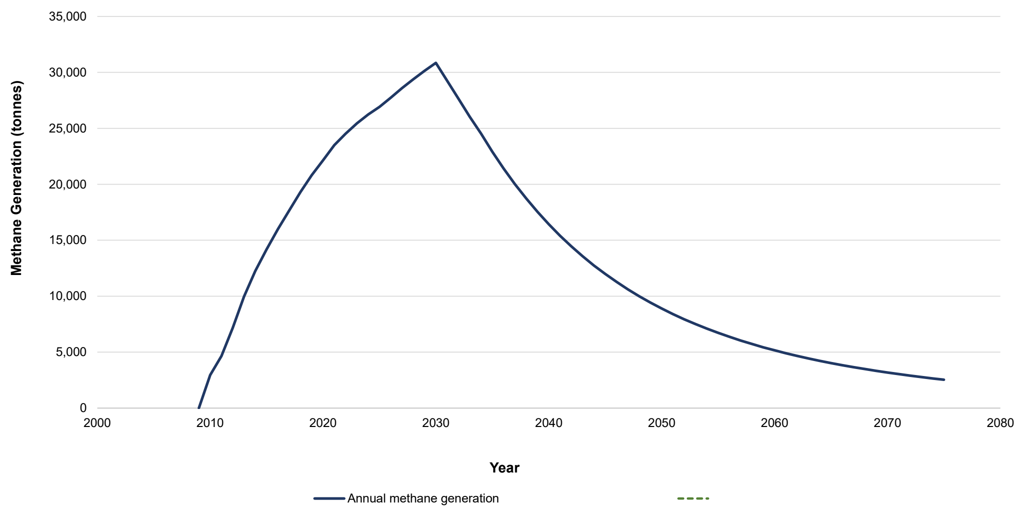
1999	562,124	3,290,907	7,476	11,395,963	2,335,799
2000	464,649	3,755,556	9,151	13,950,161	2,859,325
2001	487,143	4,242,699	10,354	15,784,073	3,235,217
2002	433,609	4,676,308	11,570	17,636,545	3,614,913
2003	483,057	5,159,365	12,145	18,513,845	3,794,731
2004	483,057	5,642,422	12,842	19,576,196	4,012,478
2005	446,699	6,089,121	13,507	20,590,670	4,220,412
2006	498,249	6,587,370	14,036	21,396,562	4,385,593
2007	499,459	7,086,829	14,694	22,400,055	4,591,277
2008	507,718	7,594,547	15,326	23,363,531	4,788,757
2009	488,585	8,083,132	16,186	24,673,139	5,057,184
2010	369,023	8,452,155	16,911	25,779,540	5,283,960
2011	162,929	8,615,083	17,173	26,178,195	5,365,671
2012	1,104	8,616,187	16,710	25,473,112	5,221,152
2013	304	8,616,491	15,727	23,974,535	4,913,993
2014	4,478	8,620,969	14,809	22,574,634	4,627,059
2015	71,412	8,692,381	13,967	21,291,641	4,364,088
2016	39,422	8,731,803	13,410	20,441,985	4,189,936
2017	21,587	8,753,391	12,780	19,481,295	3,993,026
2018	0	8,753,391	12,132	18,494,120	3,790,688
2019	0	8,753,391	11,451	17,456,465	3,578,003
2020	0	8,753,391	10,816	16,487,070	3,379,309
2021	0	8,753,391	10,221	15,580,872	3,193,568
2022	0	8,753,391	9,665	14,733,213	3,019,825
2023	0	8,753,391	9,145	13,939,804	2,857,202
2024	0	8,753,391	8,657	13,196,696	2,704,890
2025	0	8,753,391	8,200	12,500,253	2,562,142

Landfill Methane Modelling Tool: Results

Landfill Name: Walker South Landfill

Year opened: 2009 **Province :** ON

Closure year: 2033



Year	Total Annual Waste Disposed	Total Waste in Place	Methane generation (no diversion)		
	tonnes/year	tonnes	tonnes/year	m^3 methane/year	scfm methane (standard cubic feet per minute)
2009	867,310	867,310	0	0	0
2010	562,486	1,429,796	2,948	4,494,461	921,217
2011	839,394	2,269,190	4,646	7,082,463	1,451,673
2012	973,641	3,242,831	7,163	10,919,355	2,238,110
2013	885,361	4,128,192	9,956	15,176,165	3,110,616
2014	824,271	4,952,463	12,248	18,670,867	3,826,915
2015	834,513	5,786,976	14,171	21,601,563	4,427,612
2016	825,541	6,612,517	15,993	24,380,244	4,997,150
2017	830,748	7,443,265	17,659	26,919,396	5,517,593
2018	823,194	8,266,459	19,307	29,431,507	6,032,493
2019	802,355	9,068,814	20,812	31,726,054	6,502,800
2020	837,075	9,905,890	22,139	33,749,073	6,917,453
2021	830,209	10,736,099	23,496	35,817,209	7,341,353
2022	820,073	11,556,171	24,520	37,377,489	7,661,159
2023	798,633	12,354,804	25,446	38,788,990	7,950,471
2024	775,916	13,130,720	26,244	40,006,797	8,200,081
2025	832,054	13,962,774	26,921	41,038,623	8,411,572

User-selected and Default Model parameters

The following material parameters were used in the methane generation calculations, based on user sele inputs:

Waste Type	Decay Rate (k) (User-selected) Average annual precipitation >500 to 1000mm	DOC (Default)	DOC_f (Default)
Food	0.09	0.15	0.7
Paper	0.04	0.4	0.5
Yard and Garden	0.09	0.2	0.7
Soiled Paper	0.09	0.4	0.5
Wood	0.02	0.43	0.1
Textiles	0.04	0.24	0.5
Pet Waste	0.09	0.24	0.5
Diapers and Sanitary	0.09	0.24	0.5
Rubber and Leather	0.02	0.39	0.1
Other - Residential	0.09	0.1	0.5
Other - ICI	0.09	0.05	0.5
Other - Unknown	0.09	0.05	0.5
Sludge	0.09	0.05	0.7
Soil	0.02	0.03	0.1

Other Parameters and Defaults		Constants	
Methane Correction Factor (MCF)	1	Molar ratio of CH_4:C	1.33
CH_4 content in LFG (%CH_4)	50%	CH_4 density (at 25 °C and 1 atm) (kg/m^3)	0.656

Waste modelled	Bulk MSW
User-specified waste composition?	No
Diversion?	No

Appendix M3: Landfill Gas Flow and Emission Rate Calculations (All Contaminants except SO_2)

RWDI Project #2402272

Walker South Landfill Phase 2 Environmental Assessment

Volume of Methane and LFG Generated in Year 2025

Landfill	Volume of Methane Generated from ECCC Methane Tool (m3/yr)	Volume of LFG Generated (m3/yr) [1]
East Landfill	12,500,253	25,000,506
South Landfill Phase 1	41,038,623	82,077,246
Total	**53,538,876**	**107,077,752**

Note:

[1] Methane accounts for 50% of LFG, as a default in the ECCC Methane Tool.

Total Volume of LFG Collected in Year 2025

Landfill	Source ID	Cover	Gas Collection Efficiency (%)	Area	Volume of LFG Generated for the Entire Landfill from ECCC Methane Tool (m3/yr)	Volume of LFG Generated (m3/yr)	Volume of LFG Collected (m3/yr)
East Landfill	EASTLF_IC	Interim Cover	70%	0	25,000,506	0	0
East Landfill	EASTLF	Final Cover	85%	536,493	25,000,506	25,000,506	21,250,430
South Landfill Phase 1	SLF_IC	Interim Cover	70%	311,723	82,077,246	50,430,488	35,301,342
South Landfill Phase 1	SLF_FC	Final Cover	85%	195,616	82,077,246	31,646,758	26,899,744
				Total	**-**	**107,077,752**	**83,451,516**

Flow Rate of Each of the Equipment

LFG-Fired Equipment	Volume of LFG Provided by WEG [1]			Scaled Volume of LFG [2]	
	(cfm)	(m3/yr)	Ratio	(m3/yr)	(m3/s)
FLARE1	967	14,387,223	9%	7,925,899	0.25
FLARE2	967	14,387,223	9%	7,925,899	0.25
FLARE3	967	14,387,223	9%	7,925,899	0.25
Silflar2	150	2,232,500	1%	1,229,881	0.04
GEN1	400	5,953,334	4%	3,279,682	0.10
GEN2	400	5,953,334	4%	3,279,682	0.10
GEN3	400	5,953,334	4%	3,279,682	0.10
GEN4	400	5,953,334	4%	3,279,682	0.10
RNGFLARE	4,000	59,533,338	39%	32,796,823	1.04
TO	1,528	22,741,735	15%	12,528,386	0.40
Total	**10,178**	**151,482,579**	**100%**	**83,451,516**	**2.65**

Notes:

[1] LFG volume provided by WEG for a conservative operating scenario, assuming all equipment operates simultaneously. LFG volume of SILFLAR2 and TO are based on the maximum capacity due to the lack of information.

[2] LFG volume is scaled based on the collected LFG volume as predicted in ECCC Tool.

Modelling Parameters - Scaled Flow Rate for Gas Quantity

Source ID	Maximum Design Gas Flow Rate (m^3/s)	Maximum Design Exhaust Flow Rate (m^3/s)	Actual Gas Flow Rate (m^3/s)	Actual Exhaust Flow Rate (m^3/s)
FLARE1	1.18	27.8	0.25	5.9
FLARE2	2.37	55.8	0.25	5.9
FLARE3	2.37	55.8	0.25	5.9
RNGFLARE	2.36	2.4	1.04	1.1
Silflar2	0.07	1.57	0.04	0.9
TO	0.72	18.95	0.40	10.5
GEN1	0.21	3.21	0.10	1.6
GEN2	0.21	3.21	0.10	1.6
GEN3	0.21	3.21	0.10	1.6
GEN4	0.21	3.21	0.10	1.6

NMOC Emission Rate of Each Flare and Generator

Compound	CAS Number	Molecular Weight (g/mol)	Conc. In Raw LFG (from tesitng results in 2026)		Flare 1 Emission Rate (g/s)	Flare 2 Emission Rate (g/s)	Flare 3 Emission Rate (g/s)	RNG_FLARE Emission Rate (g/s)	Gen 1 Emission Rate (g/s)	Gen 2 Emission Rate (g/s)	Gen 3 Emission Rate (g/s)	Gen 4 Emission Rate (g/s)
			(ppm)	(g/m^3)								
Maximum LFG Volumetric Flow (m^3/s)	- -	- -	- -		**0.25**	**0.25**	**0.25**	**1.04**	**0.10**	**0.10**	**0.10**	**0.10**
Destruction Efficiency	- -	- -	- -		**98.0%**	**98.0%**	**98.0%**	**98.0%**	**98.0%**	**98.0%**	**98.0%**	**98.0%**
Hydrogen Sulfide	7783-06-4	34.08	736.80	1.08E+00	5.44E-03	5.44E-03	5.44E-03	0.00E+00	2.25E-03	2.25E-03	2.25E-03	2.25E-03
Vinyl Chloride	75-01-4	62.50	0.33	8.86E-04	4.45E-06	4.45E-06	4.45E-06	1.84E-05	1.84E-06	1.84E-06	1.84E-06	1.84E-06
Benzene	71-43-2	78.11	1.86	6.24E-03	3.14E-05	3.14E-05	3.14E-05	1.30E-04	1.30E-05	1.30E-05	1.30E-05	1.30E-05
1,1,2-Trichloroethane	79-00-5	133.40	0.09	5.08E-04	2.55E-06	2.55E-06	2.55E-06	1.06E-05	1.06E-06	1.06E-06	1.06E-06	1.06E-06

Sample Calculation

Calculation of Hydrogen Sulphide Emission Rate (Flare1) = Maximum LFG Flow (m^3/s) * Concentration in Raw LFG (g/m^3) * (1 - Detruction Efficiency)

= 0.25 m^3/s * 5.44E-03 g/m^3 * (1 - 0.98)

= 5.44E-03 g/s

Appendix M4: Landfill Gas Flare Combustion Emission Rate Calculations (All Contaminants except SO_2)

RWDI Project #2402272

Walker South Landfill Phase 2 Environmental Assessment

Source ID	Description	Maximum LFG Volumetric Flow [1] (m³/s)	Maximum Methane Volumetric Flow [2] [3] [4] [5] (m³/s)	Emission Rate Calculations: Contaminant [6]	Emission Factor [7] (kg/10⁶dscm methane)	Emission Factor [8] [9] (g/m³ landfill gas)	Emission Rate (g/s)
FLARE1	Landfill Gas Flare	0.25	0.12	Nitrogen Oxides (NOx)	610	- -	7.60E-02
				Particulate Matter (PM)	270	- -	3.36E-02
FLARE2	Landfill Gas Flare	0.25	0.12	Nitrogen Oxides (NOx)	610	- -	7.60E-02
				Particulate Matter (PM)	270	- -	3.36E-02
FLARE3	Landfill Gas Flare	0.25	0.12	Nitrogen Oxides (NOx)	610	- -	7.60E-02
				Particulate Matter (PM)	270	- -	3.36E-02
RNGFlare	RNG Off-spec Gas Flare	1.04	0.52	Nitrogen Oxides (NOx)	610	- -	3.17E-01
				Particulate Matter (PM)	270	- -	1.40E-01
SILFLAR2	Siloxane Flare 2 (new)	0.04	0.02	Nitrogen Oxides (NOx)	610	- -	1.18E-02
				Particulate Matter (PM)	270	- -	5.22E-03
SILFLAR2	Siloxane Flare 2 - Natural gas scenario	0.04	0.04	Nitrogen Oxides (NOx)	610	- -	2.38E-02
TO	Thermal Oxidizer	0.40	0.08	Nitrogen Oxides (NOx)	610	- -	4.85E-02
				Particulate Matter (PM)	270	- -	2.15E-02

Notes:

[1] Dry standard (actual)
[2] Methane content of landfill gas, based on 2026 source testing = 50%
[3] Methane content of landfill gas, based on design methane concentration for the elevated flare = 50%
[4] Emissions for the siloxane flare natural gas scenario were calculated based on a methan concentration of 100%
[5] Methane Content in gas stream to Thermal Oxidizer, based on client provided data = 20%
[6] Emissions from the siloxane flare natural gas scenario only considered emissions of nitrogen oxides.
[7] Emission Factor from AP-42 Chapter 2.4 (Final version, November 1998)
[8] Emission Factor calculated based on concentration of sulphur compounds in raw landfill gas (see Appendix F2)
[9] Sulphur is removed from the LFG for RNG processing and therefore no SO2 emission is expected from RNG Flare.

Sample Calculation

Calculation of Nitrogen Oxides Emission Rate (FLARE1) = Maximum LFG Flow (m³/s) * Emission Factor for NOx (kg/10^6 dscm) * (1000 g/100000 dscm)
= 0.12 m³/s * 610 kg/10^6 dscm * 1000/1000000
= 7.60E-02 g/s

Appendix M5: Landfill Gas Flow Calculations (SO_2)

RWDI Project #2402272

Walker South Landfill Phase 2 Environmental Assessment

Flow Rate of Each of the Equipment

LFG-Fired Equipment	Volume of LFG Provided by WEG [1]		
	(cfm)	(m3/yr)	(m3/s)
FLARE1	833	12,402,779	0.39
FLARE2	833	12,402,779	0.39
FLARE3	833	12,402,779	0.39
Silflar2	130	1,934,833	0.06
GEN1	400	5,953,334	0.19
GEN2	400	5,953,334	0.19
GEN3	0	0	0.00
GEN4	0	0	0.00
RNGFLARE	300	4,465,000	0.14
RNGTAIL	3,200	47,626,671	1.51
TO	1,528	22,741,735	0.72
Total	**8,458**	**125,883,244**	**3.99**

[1] LFG volume provided by WEG for refined scenario for SO2. LFG volume of TO is based on the maximum capacity due to the lack of information.

Modelling Parameters - Scaled Flow Rate for Gas Quantity

Source ID [1]	Maximum Design Gas Flow Rate (m^3/s)	Maximum Design Exhaust Flow Rate (m^3/s)	Actual Gas Flow Rate (m^3/s)	Actual Exhaust Flow Rate (m^3/s)
FLARE1	1.18	27.8	0.39	9.3
FLARE2	2.37	55.8	0.39	9.3
FLARE3	2.37	55.8	0.39	9.3
Silflar2	0.07	1.57	0.06	1.4
TO	0.72	18.95	0.72	19.0
GEN1	0.21	3.21	0.19	2.9
GEN2	0.21	3.21	0.19	2.9
GEN3	0.21	3.21	0.00	0.0
GEN4	0.21	3.21	0.00	0.0

[1] Pseudo parameters are used for RNGFLARE and RNGTAIL. See calculations in Appendix N1 and Appendix N2

Appendix M6: Calculation of SO_2 Emission Factor (SO_2)

Walker South Landfill Phase 2 Environmental Assessment

RWDI Project #2402272

Concentration of Sulphur in Landfill Gas (from 2026 Source Testing)

Sulphurs	MW (g/mol)	Concentration (ppm)	Number of Sulphurs per Compound	Concentration of Sulphur Compounds as S (ppm)
Carbonyl Sulphide	60.07	1.94	1	1.94
Carbon Disulphide	76.14	0.64	2	1.27
Dimethyl Sulphide	62.13	5.47	1	5.47
Ethyl Mercaptan	62.13	-	1	-
Hydrogen Sulphide	34.08	736.80	1	736.80
Methyl Mercaptan	48.11	4.95	1	4.95
		Total	**7**	**750.43**

Concentration of Sulphur in Landfill Gas (Scaled based on Actual H2S concentrations of Each Equipment)

Equipment	H2S Concentration	Compounds as S (ppm)	Concentration		$Concentration_{SO2}$ =
	(ppm)		µg/m³	g/m³	g/m³
FLARE1	735.00	748.59	1,033,582	1.03	2.07
FLARE2	735.00	748.59	1,033,582	1.03	2.07
FLARE3	735.00	748.59	1,033,582	1.03	2.07
RNGFLARE	1100.00	1120.34	1,546,857	1.55	3.09
RNGTAIL	1100.00	1120.34	1,546,857	1.55	3.09
GEN1	150.00	152.77	210,935	0.21	0.42
GEN2	150.00	152.77	210,935	0.21	0.42
GEN3	0.00	0.00	0	0.00	0.00
GEN4	0.00	0.00	0	0.00	0.00
Silflar2	200.00	203.70	281,247	0.28	0.56
TO	0.00	0.00	0	0.00	0.00

Sample Calculation for FLARE1

Conversion of Concentration from ppm to µg/m³

$Concentration_{ug/m^3}$ = $Concentration_{ppm}$ * [(MW * 1.0 atm)/(8.205 x10-5 m^3-atm/gmol-K)*(273+ToK)

MW_S = Molecular weight of Sulphur (32.06 g/gmol)

T = Temperature of landfill gas (assumed 10°C)

Concentration =	**1,033,582**	µg/m³ of total sulphur in landfill gas
=	1.034	g/m³ of total sulphur in landfill gas

Assuming 100% of the sulphur in the landfill gas is converted to sulphur dioxide (SO_2) during combustion

$Concentration_{SO2}$ = ConcentrationS * (MWSO2 / MWS)

MW_S = Molecular weight of Sulphur (32.06 g/gmol)

MW_{SO2} = Molecular weight of Sulphur Dioxide (64.07 g/gmol)

$Concentration_{SO2}$ = 2.066 g/m³ of total sulphur dioxide in combusted landfill gas

Appendix M7: Landfill Gas Combustion Emission Rate Calculations (SO2)

RWDI Project #2402272

Walker South Landfill Phase 2 Environmental Assessment

				Emission Rate Calculations			
Source ID	Description	Maximum LFG Volumetric Flow [1] (m³/s)	Maximum Methane Volumetric Flow [2] [3] [4] [5] (m³/s)	Contaminant [6]	Emission Factor [7] (kg/10^6dscm methane)	Emission Factor [8] (g/m³ landfill gas)	Emission Rate (g/s)
FLARE1	Landfill Gas Flare	0.39	0.19	Sulphur Dioxide (SO2)	- -	2.07E+00	8.12E-01
FLARE2	Landfill Gas Flare	0.39	0.19	Sulphur Dioxide (SO2)	- -	2.07E+00	8.12E-01
FLARE3	Landfill Gas Flare	0.39	0.19	Sulphur Dioxide (SO2)	- -	2.07E+00	8.12E-01
RNGFlare	RNG Off-spec Gas Flare	0.14	0.07	Sulphur Dioxide (SO2)	- -	3.09E+00	4.38E-01
RNGTAIL	RNG Off-spec Gas Flare	1.51	0.76	Sulphur Dioxide (SO2)	- -	3.09E+00	4.67E+00
SILFLAR2	Siloxane Flare 2 (new)	0.06	0.03	Sulphur Dioxide (SO2)	- -	5.62E-01	3.45E-02
TO	Thermal Oxidizer	0.72	0.14	Sulphur Dioxide (SO2)	- -	0.00E+00	0.00E+00

Notes:

[1] Dry standard (actual)
[2] Methane content of landfill gas, based on 2026 source testing = 50%
[3] Methane content of landfill gas, based on design methane concentration for the elevated flare = 50%
[4] Emissions for the siloxane flare natural gas scenario were calculated based on a methan concentration of 100%
[5] Methane Content in gas stream to Thermal Oxidizer, based on client provided data = 20%
[6] Emissions from the siloxane flare natural gas scenario only considered emissions of nitrogen oxides.
[7] Emission Factor from AP-42 Chapter 2.4 (Final version, November 1998)
[8] Emission Factor calculated based on concentration of sulphur compounds in raw landfill gas (see Appendix M6: Calculation of SO2 Emission Factor (SO2)).

Sample Calculation

Calculation of Nitrogen Oxides Emission Rate (FLARE1) = Maximum LFG Flow (m³/s) * Emission Factor for NOx (kg/10^6 dscm) * (1000 g/100000 dscm)
= 0.19 m³/s * 610 kg/10^6 dscm * 1000/1000000
= 1.19E-01 g/s

APPENDIX N

Appendix N1: Elevated Flare Pseudo Parameter Calculation - RNGFLARE

RWDI Project #2402272

Walker South Landfill Phase 2 Environmental Assessment

Based on MECP Technical Bulletin - Modelling Open Flares under O. Reg. 419/05 dated February 2017

Table 1: Scenario Summary

Parameter	Value
Date of Flare Event	--
Source ID	RNG_FLARE

Table 2: Properties of Gas

Parameter	Value	Unit
Density	1.2	kg/m³ @ 311 K and 101.3 kPa
Molecular Weight	30.0	g/mol
Lower Heating Value	16.0	MJ/m³ @ 311K and 101.3 kPa
Mole Fraction in Feed	1	-

Table 3: Composition of Gas Streams to be Flared

Parameter	Stream 1 - Landfill Gas	Propane Pilot Flow	Total Stream to Flare	Unit
Stream MW	30.0	16.04	30.0	kg/kgmol
Volumetric Rate to Flare	509.7	0.62	510	m^3/hr

Table 4: Properties of Flare Gas

Parameter	Value	Unit
Stream MW	30.0	kg/kgmol
Site Atmospheric Pressure	101.3	kPa
Universal Gas Constant (R)	8.3145	(kPa-m³)/(K-kgmol)
Gas Temperature (T_{gas})	37.78	ºC
	310.78	K
Volumetric Rate to Flare	510.3	m³/hr
Total Heat Release Rate	2.4	MJ/s

Table 5: Flare Parameters

Total Maximum to Flare		
Parameter	**Value**	**Unit**
Complete Combustion Total Heat Release Rate (Q_T)	2.4	MJ/s
	2.40E+06	J/s
Flame Radiation Loss (*f*)	55	%
	0.55	fraction
Flare Stack Tip Height (H_S)	15.13	m
Volumetric Rate to Flare (20ºC, 101.15 kPa)	510	m³/hr
	0.142	m³/s
Flare Stack Tip Diameter (D_{nozzle})	0.41	m
Density of Flared Gas (ρ_{gas})	1.177	kg/m³
Density of Air at Ambient Temperature (ρ_{air})	1.183	kg/m³
Gravitational Constant (g)	9.807	m/s²
Air Specific Heat at Ambient Air Temperature ($C_{p, air}$)	1004	J/(kg-K)
Modelled Ambient Air Temperature (T_{amb})	25	ºC
	298	K
Assumed Stack Gas Exit Temperature (T_{stack})	871	ºC

Appendix N1: Elevated Flare Pseudo Parameter Calculation - RNGFLARE

RWDI Project #2402272

Walker South Landfill Phase 2 Environmental Assessment

Table 6: Summary of Calculated Parameters

Total Maximum to Flare		
Parameter	**Value**	**Unit**
Net Heat Release (Q_n)	1.081E+06	J/s
Effective Stack Height (H_{eff})	16.89	m
Actual Gas Exit Velocity (V_{nozzle})	1.093	m/s
Momentum Flux (F_m)	0.04905	m^4/s^2
Buoyancy Flux (F_b)	9.5	m^4/s^3
Effective Exit Velocity (V_{eff}) [1]	1.500000	m/s
Effective Diameter (D_{eff})	1.99	m

[1] Effective exit velocity has a minimum value of 1.5 m/s as per the MECP Technical Bulletin "Modelling Open Flares under O. Reg. 419/05", February 2017.

Sample Calculations:

1) Calculation of net heat release rate (Q_n)

$$Q_n = Q_T \times (1 - f)$$

= 2403186 J/s * (1 - 0.55)

= 1.08E+06 J/s

2) Calculation of Effective Stack Height (H_{eff})

$$H_{eff} = H_S + 4.56 \times 10^{-3} * (Q_n/4.1868)^{0.478}$$

= 15.1257m + 0.00456 * (1081434 J/s / 4.1868)^0.478

= 16.89 m

3) Calculation of Actual Gas Exit Velocity (including lift gas) at flare nozzle before combustion (V_{nozzle})

$$V_{nozzle} = \frac{\text{Volumetric Flow Rate to Flare } (m^3/s)}{\pi D^2/4}$$

$$V_{nozzle} = \frac{0.14\ m^3/s}{\pi * (0.4064m)^2 / 4)}$$

V_{nozzle} = 1.093 m/s

4) Calculation of Momentum Flux (F_M)

$$F_M = \frac{\rho_{gas}}{\rho_{air} * 4} * D_{nozzle}^2 * V_{nozzle}^2$$

$$= \frac{1.177\ kg/m^3}{1.183\ kg/m^3 * 4} * (0.4064m)^2 * (1.1m)^2$$

= 4.90E-02 m^4/s^2

5) Calculation of Buoyancy Flux (F_b)

$$F_b = g * \frac{Q_n}{(\pi * \rho_{air} * T_{amb} * C_{p,air})}$$

$$= 9.807\ m/s^2 * \frac{1081434\ J/s}{(\pi * 1.183kg/m^3 * 298\ K * 1004\ J/(kg\text{-}K))}$$

= 9.5 m^4/s^3

6) Calculation of Effective Exit Velocity (V_{eff})

$$V_{eff} = g * \frac{Fm}{Fb} * \frac{Tstack - Tamb}{Tamb}$$

$$= 9.807\ m/s^2 * \frac{0.049\ m^4/s^2}{9.5\ m^4/s^3} * \frac{871\ ^oC - 298\ K}{298\ K}$$

= 0.097 m/s

Minimum effective exit velociy is 1.5 m/s; if calculated value is less than minimum, 1.5 m/s is used.

7) Calculation of Effective Diameter (D_{eff})

$$D_{eff} = 2 * \left(\frac{Fb * Tstack}{g * Veff * (Tstack - Tamb)}\right)^{0.5}$$

$$= 2 * \left(\frac{9.5\ m^4/s^3 * 871\ ^oC}{9.807\ m/s^2 * 1.5\ m/s * (871\ ^oC - 298\ K)}\right)^{0.5}$$

= 1.99 m

Appendix N2: Elevated Flare Pseudo Parameter Calculation - RNGTAIL

RWDI Project #2402272

Walker South Landfill Phase 2 Environmental Assessment

Based on MECP Technical Bulletin - Modelling Open Flares under O. Reg. 419/05 dated February 2017

Table 1: Scenario Summary

Parameter	Value
Date of Flare Event	--
Source ID	RNGTAIL

Table 2: Properties of Gas

Parameter	Value	Unit
Density	1.2	kg/m³ @ 311 K and 101.3 kPa
Molecular Weight	16.6	g/mol
Lower Heating Value	31.4	MJ/m³ @ 311K and 101.3 kPa
Mole Fraction in Feed	1	-

Table 3: Composition of Gas Streams to be Flared

Parameter	Stream 1 - Landfill Gas	Propane Pilot Flow	Total Stream to Flare	Unit
Stream MW	16.6	16.04	16.6	kg/kgmol
Volumetric Rate to Flare	5436.8	0.62	5437	m^3/hr

Table 4: Properties of Flare Gas

Parameter	Value	Unit
Stream MW	16.6	kg/kgmol
Site Atmospheric Pressure	101.3	kPa
Universal Gas Constant (R)	8.3145	(kPa-m³)/(K-kgmol)
Gas Temperature (T_{gas})	37.78	°C
	310.78	K
Volumetric Rate to Flare	5437.5	m³/hr
Total Heat Release Rate	50.2	MJ/s

Table 5: Flare Parameters

Total Maximum to Flare		
Parameter	**Value**	**Unit**
Complete Combustion Total Heat Release Rate (Q_T)	50.2	MJ/s
	5.02E+07	J/s
Flame Radiation Loss (*f*)	55	%
	0.55	fraction
Flare Stack Tip Height (H_S)	15.13	m
Volumetric Rate to Flare (20ºC, 101.15 kPa)	5437	m³/hr
	1.510	m³/s
Flare Stack Tip Diameter (D_{nozzle})	0.41	m
Density of Flared Gas (ρ_{gas})	1.177	kg/m³
Density of Air at Ambient Temperature (ρ_{air})	1.183	kg/m³
Gravitational Constant (g)	9.807	m/s²
Air Specific Heat at Ambient Air Temperature ($C_{p, air}$)	1004	J/(kg-K)
Modelled Ambient Air Temperature (T_{amb})	25	ºC
	298	K
Assumed Stack Gas Exit Temperature (T_{stack})	871	ºC

Table 6: Summary of Calculated Parameters

Total Maximum to Flare		
Parameter	**Value**	**Unit**
Net Heat Release (Q_n)	2.259E+07	J/s
Effective Stack Height (H_{eff})	22.66	m
Actual Gas Exit Velocity (V_{nozzle})	11.644	m/s
Momentum Flux (F_m)	5.56817	m^4/s^2
Buoyancy Flux (F_b)	199.2	m^4/s^3
Effective Exit Velocity (V_{eff}) [1]	1.500000	m/s
Effective Diameter (D_{eff})	9.07	m

[1] Effective exit velocity has a minimum value of 1.5 m/s as per the MECP Technical Bulletin "Modelling Open Flares under O. Reg. 419/05", February 2017.

Sample Calculations:

1) Calculation of net heat release rate (Q_n)

$$Q_n = Q_T \times (1 - f)$$

$$= 50198275 \text{ J/s} * (1 - 0.55)$$

$$= 2.26E+07 \text{ J/s}$$

2) Calculation of Effective Stack Height (H_{eff})

$$H_{eff} = H_S + 4.56 \times 10^{-3} * (Q_n/4.1868)^{0.478}$$

$$= 15.1257m + 0.00456 * (22589224 \text{ J/s} / 4.1868)\text{^}0.478$$

$$= 22.66 \text{ m}$$

3) Calculation of Actual Gas Exit Velocity (including lift gas) at flare nozzle before combustion (V_{nozzle})

$$V_{nozzle} = \frac{\text{Volumetric Flow Rate to Flare } (m^3/s)}{\pi D^2/4}$$

$$V_{nozzle} = \frac{1.51 \ m^3/s}{\pi * (0.4064m)^2 / 4)}$$

$$V_{nozzle} = 11.644 \text{ m/s}$$

4) Calculation of Momentum Flux (F_M)

$$F_M = \frac{\rho_{gas}}{\rho_{air} * 4} * D_{nozzle}^2 * V_{nozzle}^2$$

$$= \frac{1.177 \text{ kg/m}^3}{1.183 \text{ kg/m}^3 * 4} * (0.4064m)^2 * (11.6m)^2$$

$$= 5.57E+00 \ m^4/s^2$$

5) Calculation of Buoyancy Flux (F_b)

$$F_b = g * \frac{Q_n}{(\pi * \rho_{air} * T_{amb} * C_{p,air})}$$

$$= 9.807 \ m/s^2 * \frac{22589224 \text{ J/s}}{(\pi * 1.183 kg/m^3 * 298 K * 1004 \text{ J/(kg-K)})}$$

$$= 199.2 \ m^4/s^3$$

6) Calculation of Effective Exit Velocity (V_{eff})

$$V_{eff} = g * \frac{Fm}{Fb} * \frac{Tstack - Tamb}{Tamb}$$

$$= 9.807 \ m/s^2 * \frac{5.5682 \ m^4/s^2}{199.2 \ m^4/s^3} * \frac{871 \ ^\circ C - 298 K}{298 K}$$

$$= 0.527 \text{ m/s}$$

Minimum effective exit velociy is 1.5 m/s; if calculated value is less than minimum, 1.5 m/s is used.

7) Calculation of Effective Diameter (D_{eff})

$$D_{eff} = 2 * (\frac{Fb * Tstack}{g * Veff * (Tstack - Tamb)})\text{^}{0.5}$$

$$= 2 * (\frac{199.2 \ m^4/s^3 * 871 \ ^\circ C}{9.807 \ m/s^2 * 1.5 \ m/s * (871 \ ^\circ C - 298 K)})\text{^}{0.5}$$

$$= 9.07 \text{ m}$$

APPENDIX O

Appendix O: Siloxane Flare Actual Flow Rate Calculation

RWDI Project #2402272

Walker South Landfill Phase 2 Environmental Assessment

LFG Flow Rate	0.06	m^3/sec
CH_4 Flow Rate	0.03	m^3/sec, assuming 50% of gas to be CH_4
CO_2 Flow Rate	0.03	m^3/sec, assuming 50% of gas to be CO_2
No. of Moles CH_4 in Gas	1.25	, under 1atm and 298K
Moles in Exhaust Gas	10.52	(based on stoiciometry)
Moles to Volume of Gas	13.20	total no. of moles of CH_4
	0.32	m^3 of exhaust gas from CH_4 combustion (standard)
	0.35	m^3 of exhaust gas from CH_4 + CO_2 (standard)
Convert to Actual Conditions	1144	actual exhaust temperature (K)
	1.36	total exhaust flow at actual conditions (m^3/s)

Note:

Actual flow rate considering both siloxane and fuel gas combustion

APPENDIX P

Appendix P: Thermal Oxidizer Emission Rate Calculations

RWDI Project #2402272

Walker South Landfill Phase 2 Environmental Assessment

Vertical up-fired Thermal Oxidizer with one main burner and auxiliary pilot burner
Secondry air train for oxidation of waste streams

Design Basis (May August 2021)

Exhaust Flow	0.7	m^3/s
Methane Content	5%	%

Design Temp	787 - 982	°C
VOC destruction Efficiency	98%	%

Compound	CAS Number	Molecular Weight (g/mol)	Average Conc. In Raw LFG (from testing results in 2026) (ppm)	Manufacturer Guarenteed Outlet Concentration (ppm) [1]	Average Conc. In gas to Thermal Oxidizer (g/m³) [2]	Scaled relative to total NMOC in Landgem [3]	Scaled relative to outlet NMOC (ppm) [3]	Average Conc. In gas from Thermal Oxidizer (g/m³) [4]	Thermal Oxidizer Emission Rate (g/s)
Maximum LFG Volumetric Flow (m³/s)	- -	- -	- -		- -	- -	- -	- -	**0.72**
Destruction Efficiency	- -	- -	- -		- -	- -	- -	- -	**98%**
NMOC Concentration (ppm)						**595.00**	**300.00**	- -	- -
VOC									
Hydrogen Sulfide	7783-06-4	34.1	736.80	4.00	0.0059	--	--	--	8.47E-05
Vinyl Chloride	75-01-4	62.5	0.33	--	0.0009	0.06%	0.17	4.46E-04	3.22E-04
Benzene	71-43-2	78.1	1.86	--	0.0062	0.31%	0.94	3.15E-03	2.27E-03
1,1,2-Trichloroethane	79-00-5	133.4	0.09	--	0.0005	0.01%	0.04	2.56E-04	1.85E-04

Sample Calculation for Thermal Oxidizer

Calculation of Hydrogen Sulphide Emission Rate = Maximum LFG Flow (m³/s) * Concentration in Raw LFG (g/m³) * (1 - Detruction Efficiency)
= 0.72 m³/s * 0.0059 g/m³ * (1 - 0.98)
= 8.5E-05 g/s

Notes:
[1] H2S emissions were calculated using the manufacturer guarenteed outlet concentration.
[2] Concentration for each contaminant calculated using raw LFG concentration ratios
[3] Average concentration for Thermal Oxidizer based on manufacturer outlet concentration of NMOC scaled by Landgem NMOC concentration for contaminants of intrest.
[4] Conversion Formula: Concentration (ppm) = 24.45 x concentration (mg/m3) ÷ molecular weight

NOx Emissions from Natural Gas Burner in Thermal Oxidizer

Burner Firing Rate 1.2 MMBTU/hr
1.18E-03 10^6 scf/hr , assuming a heating value of 1020 MMBTU/10^6 scf

Contaminants	Emission Factor (lb/10^6scf) [1]	Emission Rate from Natural Gas Combustion (g/s)	Emissions from Waste Stream Combustion (g/s) [2]	Total Emissions (g/s) [3]
Nitrogen Oxides	100	1.48E-02	8.80E-02	1.03E-01
Particulate Matter	7.6	1.13E-03	3.89E-02	4.01E-02

Sample Calculation

Nitrogen Oxides Emission Rate from natural gas combustion= (1.18E-03 10^6 scf/h) x (100 lb / 10^6 scf) x (453.6 g / lb) / (3600 s / h)
= 1.48E-02 g/s

Notes:
[1] Emission Factors taken from US EPA AP-42 Chapter 1.4, Table 1.4-1 and Table 1.4-2. PM is assumed to same for TSP, PM_{10} and $PM_{2.5}$.
[2] Refer to Appendix F1 for waste stream analysis.
[3] Combustion emissions calculated by summation of natural gas combustion and waste stream combustion rates.

APPENDIX Q

Appendix Q1: On-Site Mobile Equipment Emissions - Fugitive Dust

RWDI Project #2402272

Walker South Landfill Phase 2 Environmental Assessment

UNPAVED ROAD SECTIONS - AP-42 Section 13.2.2
PAVED ROAD SECTIONS - AP-42 Section 13.2.1

Paved Roads: $E = k\,(sL)^{0.91}\,(W)^{1.02}$
Unpaved Roads - Industrial: $E = 281.9\,k\,(s / 12)^{a}\,(W / 3)^{b}$
Unpaved Roads - Public: $E = 281.9\,k\,(s / 12)^{a}\,(S / 30)^{d} / (M / 0.5)^{c} - C$

E particulate emission factor (g/VKT)
k particle size multiplier (see below)
sL road surface silt loading (g/m²)
W average weight of the vehicles traveling the road (US short tons)
s surface material silt content (%)
C emission factor for 1980's vehicle fleet exhaust, brake wear and tire wear
M surface material moisture content (%)
S mean vehicle speed (mph)
a,b,c,d constants (see below)

Route ID [1]	Route Description	Traffic Passes [2] Hourly (#/h)	Daily (#/d)	Annual (#/a)	Segment Length [2] (m)	Road Surface [3]	Roadway Type [4]	Mean Vehicle Speed (km/h)	(mph)	Average Vehicle Weight [5] (tons)	Surface Material Moisture Content [6] (%)	Surface Silt Content [7] (%)	Road Surface Silt Loading [8] (g/m²)
PR_QP1	Paved Road at Quarry Plant - Export of Finished Products	1	1	1	848	Paved	Industrial	50	31	41.7	-	-	1.0
UR_QP2	Unpaved Road at Quarry Plant - Export of Finished Products	1	1	1	308	Unpaved	Industrial	25	16	41.7	-	23.03%	-
UR_QP3	Unpaved Road at Quarry Plant - between Quarry Face and Quarry Plant	1	1	1	1605	Unpaved	Industrial	25	16	83.0	-	23.03%	-
PR_AP1	Paved Road at Asphalt Plant - to/from Asphalt Plant Entrance	1	1	1	848	Paved	Industrial	50	31	41.7	-	-	1.0
UR_AP2	Unpaved Road at Asphalt Plant - between Entrance and Asphalt Plant	1	1	1	556	Unpaved	Industrial	25	16	41.7	-	23.03%	-
PR_CF1	Paved Road at Compost Facility - Inbound and Outbound Delivery	1	1	1	861	Paved	Industrial	50	31	26.3	-	-	1.0
UR_CF2	Unpaved Road at Compost Facility - Inbound and Outbound Delivery	1	1	1	49	Unpaved	Industrial	25	16	26.3	-	8.35%	-
UR_SLFSoil	Unpaved Road at South Landfill Phase 1 - Transport of Soil between Waste Soil Pile and Working Face	1	1	1	559	Unpaved	Industrial	25	16	39.8	-	7.04%	-
PR_SLFW1	Paved Road at South Landfill Phase 1 - Transport of Waste between Entrance and Weigh Scale	1	1	1	826	Paved	Industrial	50	31	41.0	-	-	1.0
UR_SLFW2	Unpaved Road at South Landfill Phase 1 - Transport of Waste between Weigh Scale and Working Face	1	1	1	72	Unpaved	Industrial	20	12	41.0	-	8.35%	-
UR_SLFW3	Unpaved Road at South Landfill Phase 1 - Transport of Soil, Clay and Waste between Weigh Scale and Working Face	1	1	1	940	Unpaved	Industrial	20	12	39.8	-	8.35%	-
UR_SLFW4	Unpaved Road at South Landfill Phase 1 - Transport of Soil and Waste between Weigh Scale and Working Face	1	1	1	749	Unpaved	Industrial	20	12	39.8	-	8.35%	-
UR_SLFCON	Unpaved Road at South Landfill Phase 1 - Transport of Clay between Soil Pile and Cell Construction Area	1	1	1	921	Unpaved	Industrial	25	16	41.7	-	5.97%	-
UR_SLFCAP	Unpaved Road at South Landfill Phase 1 - Transport of Clay between Soil Pile and Final Capping Construction Area	1	1	1	148	Unpaved	Industrial	25	16	41.7	-	8.35%	-

Route ID [1]	Base AP-42 Emission Factor TSP (g/VKT)	PM_{10} (g/VKT)	$PM_{2.5}$ (g/VKT)	Base Emission Rate TSP (g/s)	PM_{10} (g/s)	$PM_{2.5}$ (g/s)	Additional Control Efficiency Applied (%)	Final Controlled Emission Rate TSP (g/s)	Data Quality Rating	PM_{10} (g/s)	Data Quality Rating	$PM_{2.5}$ (g/s)	Data Quality Rating
PR_QP1	2.15E+02	2.78E+01	6.73E+00	5.07E-02	6.56E-03	1.59E-03		5.07E-02		6.56E-03		1.59E-03	
UR_QP2	9.97E+03	2.48E+03	2.48E+02	8.52E-01	2.12E-01	2.12E-02	95%	4.26E-02		1.06E-02		1.06E-03	
UR_QP3	1.36E+04	3.39E+03	3.39E+02	6.06E+00	1.51E+00	1.51E-01	95%	3.03E-01		7.55E-02		7.55E-03	
PR_AP1	2.15E+02	2.78E+01	6.73E+00	5.07E-02	6.56E-03	1.59E-03		5.07E-02		6.56E-03		1.59E-03	
UR_AP2	9.97E+03	2.48E+03	2.48E+02	1.54E+00	3.84E-01	3.84E-02	95%	7.70E-02		1.92E-02		1.92E-03	
PR_CF1	1.35E+02	1.74E+01	4.22E+00	3.22E-02	4.17E-03	1.01E-03		3.22E-02		4.17E-03		1.01E-03	
UR_CF2	4.41E+03	8.11E+02	8.11E+01	5.96E-02	1.09E-02	1.09E-03	95%	2.98E-03		5.47E-04		5.47E-05	
UR_SLFSoil	4.80E+03	8.37E+02	8.37E+01	7.44E-01	1.30E-01	1.30E-02	95%	3.72E-02		6.50E-03		6.50E-04	
PR_SLFW1	2.12E+02	2.74E+01	6.62E+00	4.86E-02	6.29E-03	1.52E-03		4.86E-02		6.29E-03		1.52E-03	
UR_SLFW2	5.38E+03	9.90E+02	9.90E+01	1.08E-01	1.98E-02	1.98E-03	95%	5.40E-03		9.92E-04		9.92E-05	
UR_SLFW3	5.31E+03	9.76E+02	9.76E+01	1.39E+00	2.55E-01	2.55E-02	95%	6.94E-02		1.27E-02		1.27E-03	
UR_SLFW4	5.31E+03	9.76E+02	9.76E+01	1.10E+00	2.03E-01	2.03E-02	95%	5.52E-02		1.02E-02		1.02E-03	
UR_SLFCON	4.44E+03	7.37E+02	7.37E+01	1.13E+00	1.89E-01	1.89E-02	95%	5.67E-02		9.43E-03		9.43E-04	
UR_SLFCAP	5.43E+03	9.97E+02	9.97E+01	2.24E-01	4.11E-02	4.11E-03	95%	1.12E-02		2.05E-03		2.05E-04	

Notes:

[1] Route ID numbers provided on site plan.
[2] Length of a specific road segment. A separate segment should be used whenever one or more parameters change.
[3] Paved surfaces include asphalt, concrete, and recycled asphalt (if it forms a relatively consistent surface).
[4] Publicly accessible and dominated by light vehicles, or industrial, and dominated by heavy vehicles.
[5] The average vehicle weight reflects the average of the empty and loaded vehicle weight, for travel in both directions.
[6] Required only for publicly accessible unpaved roads.
[7] Required only for unpaved roads (public and industrial).
[8] Required only for industrial paved roads.

Comments

Silica content is based onsite sampling data.
Constants for TSP (PM44) extrapolated from published factors for PM30, PM10 and PM2.5. Data quality downgraded by one step.

Constants for Mobile Emission Equations

Roadway Type	k	a	b	c	d	Quality
Paved Roads:	0.15	-	-	-	-	-
	0.62	-	-	-	-	-
	3.23	-	-	-	-	-
	4.79	-	-	-	-	-
Unpaved Roads - Industrial:	0.15	0.9	0.45	-	-	C
	1.5	0.9	0.45	-	-	B
	4.9	0.7	0.45	-	-	B
	7.32	0.6	0.45	-	-	C
Unpaved Roads - Public:	0.18	1	-	0.2	0.5	C
	1.8	1	-	0.2	0.5	B
	6	1	-	0.3	0.3	B
	8.96	1	-	0.49	0.2	C

Sample calculation for uncontrolled TSP emission factor for Source PR_QP1: Paved Road at Quarry Plant - Export of Finished Products

EF = (4.79) x (1 g/m²)^0.91 x (41.7 tons)^1.02 = 215 g TSP / vehicle kilometer travelled (vkt)

Sample calculation for TSP emission rate for Source PR_QP1: Paved Road at Quarry Plant - Export of Finished Products

$$\frac{1\ \text{vehicles}}{1\ \text{h}} \times \frac{1\ \text{km}}{1000\ \text{m}} \times \frac{215\ g_{TSP}}{1\ \text{vehicle km}} \times \frac{1\ \text{h}}{3600\ \text{s}} \times \frac{1\ g_{TSP\ uncontrolled}}{1\ g_{TSP}} = 5.07\text{E-}02\ g_{TSP} / s$$

Appendix Q2: Averaged Emission Rates for On-road Vehicles Based on Speed and Vehicle Class (Year 2025)

RWDI Project #2402272

Walker South Landfill Phase 2 Environmental Assessment

Km to Mile Conversion Factor	1.609	km per mile
Hour to Seconds	3600	s/hr

Contaminant Emission Rate by Vehicle Speed (km/hr)

Vehicle Type		TSP				PM10				PM2.5				Benzene			
		0	20	25	50	0	20	25	50	0	20	25	50	0	20	25	50
		g/s	g/vkt	g/vkt	g/vkt	g/s	g/vkt	g/vkt	g/vkt	g/s	g/vkt	g/vkt	g/vkt	g/s	g/vkt	g/vkt	g/vkt
small	PassengerCar	8.60E-06	6.73E-02	6.24E-02	3.03E-02	8.60E-06	6.73E-02	6.24E-02	3.03E-02	7.61E-06	1.06E-02	9.63E-03	5.22E-03	6.03E-06	2.11E-03	1.83E-03	1.16E-03
small	PassengerTruck	1.91E-05	7.78E-02	7.25E-02	3.39E-02	1.91E-05	7.78E-02	7.25E-02	3.39E-02	1.74E-05	1.48E-02	1.35E-02	7.08E-03	4.14E-06	2.94E-03	2.70E-03	1.65E-03
small	LightCommercialTruck	3.05E-05	8.44E-02	7.83E-02	3.84E-02	3.05E-05	8.44E-02	7.83E-02	3.84E-02	2.79E-05	1.95E-02	1.77E-02	9.45E-03	7.06E-06	4.60E-03	4.28E-03	2.26E-03
medium	SingleUnitShortHaulTruck	6.11E-04	4.55E-01	3.73E-01	2.17E-01	6.11E-04	4.55E-01	3.73E-01	2.17E-01	5.62E-04	2.45E-01	2.07E-01	1.38E-01	2.27E-05	1.10E-02	9.43E-03	5.43E-03
medium	SingleUnitLongHaulTruck	5.59E-04	4.31E-01	3.55E-01	2.04E-01	5.59E-04	4.31E-01	3.55E-01	2.04E-01	5.14E-04	2.21E-01	1.88E-01	1.25E-01	2.44E-05	1.23E-02	1.06E-02	6.18E-03
large	CombinationShortHaulTruck	7.89E-04	8.41E-01	7.11E-01	4.32E-01	7.89E-04	8.41E-01	7.11E-01	4.32E-01	7.26E-04	3.75E-01	3.60E-01	2.74E-01	1.08E-05	3.46E-03	2.83E-03	1.64E-03
large	CombinationLongHaulTruck	5.84E-04	8.13E-01	6.66E-01	3.84E-01	5.84E-04	8.13E-01	6.66E-01	3.84E-01	5.38E-04	3.04E-01	2.89E-01	2.17E-01	7.64E-06	2.46E-03	2.00E-03	1.14E-03
	Small	**1.94E-05**	**7.65E-02**	**7.11E-02**	**3.42E-02**	**1.94E-05**	**7.65E-02**	**7.11E-02**	**3.42E-02**	**1.76E-05**	**1.50E-02**	**1.36E-02**	**7.25E-03**	**5.74E-06**	**3.22E-03**	**2.94E-03**	**1.69E-03**
	Medium	**5.85E-04**	**4.43E-01**	**3.64E-01**	**2.10E-01**	**5.85E-04**	**4.43E-01**	**3.64E-01**	**2.10E-01**	**5.38E-04**	**2.33E-01**	**1.98E-01**	**1.31E-01**	**2.35E-05**	**1.17E-02**	**1.00E-02**	**5.80E-03**
	Large	**6.87E-04**	**8.27E-01**	**6.89E-01**	**4.08E-01**	**6.87E-04**	**8.27E-01**	**6.89E-01**	**4.08E-01**	**6.32E-04**	**3.40E-01**	**3.24E-01**	**2.45E-01**	**9.23E-06**	**2.96E-03**	**2.42E-03**	**1.39E-03**

Vehicle Type		Nitrogen Dioxide				Nitrogen Oxides				Sulphur Dioxide			
		0	20	25	50	0	20	25	50	0	20	25	50
		g/s	g/vkt	g/vkt	g/vkt	g/s	g/vkt	g/vkt	g/vkt	g/s	g/vkt	g/vkt	g/vkt
small	PassengerCar	1.15E-05	1.09E-02	1.01E-02	8.83E-03	1.38E-04	1.25E-01	1.16E-01	9.79E-02	3.96E-06	1.53E-03	1.36E-03	9.37E-04
small	PassengerTruck	4.66E-05	2.30E-02	2.13E-02	1.78E-02	5.40E-04	2.43E-01	2.25E-01	1.81E-01	5.03E-06	1.95E-03	1.73E-03	1.20E-03
small	LightCommercialTruck	1.02E-04	3.03E-02	2.80E-02	2.01E-02	1.01E-03	3.11E-01	2.87E-01	2.05E-01	5.50E-06	2.17E-03	1.93E-03	1.31E-03
medium	SingleUnitShortHaulTruck	7.00E-04	3.11E-01	2.75E-01	1.79E-01	8.59E-03	3.91E+00	3.50E+00	2.46E+00	6.54E-06	3.50E-03	3.19E-03	2.47E-03
medium	SingleUnitLongHaulTruck	6.86E-04	3.09E-01	2.74E-01	1.78E-01	8.09E-03	3.82E+00	3.44E+00	2.41E+00	6.65E-06	3.51E-03	3.20E-03	2.44E-03
large	CombinationShortHaulTruck	2.15E-03	1.00E+00	8.82E-01	5.77E-01	1.89E-02	9.35E+00	8.50E+00	6.19E+00	7.19E-06	5.04E-03	4.85E-03	4.00E-03
large	CombinationLongHaulTruck	2.49E-03	1.15E+00	1.01E+00	6.46E-01	1.85E-02	8.87E+00	7.98E+00	5.56E+00	7.22E-06	5.18E-03	5.00E-03	4.11E-03
	Small	**5.32E-05**	**2.14E-02**	**1.98E-02**	**1.56E-02**	**5.63E-04**	**2.26E-01**	**2.09E-01**	**1.61E-01**	**4.83E-06**	**1.88E-03**	**1.67E-03**	**1.15E-03**
	Medium	**6.93E-04**	**3.10E-01**	**2.75E-01**	**1.79E-01**	**8.34E-03**	**3.87E+00**	**3.47E+00**	**2.43E+00**	**6.59E-06**	**3.51E-03**	**3.19E-03**	**2.45E-03**
	Large	**2.32E-03**	**1.08E+00**	**9.45E-01**	**6.11E-01**	**1.87E-02**	**9.11E+00**	**8.24E+00**	**5.88E+00**	**7.20E-06**	**5.11E-03**	**4.93E-03**	**4.05E-03**

Appendix Q3: Summary of Emission Rates for On-road and Non-road Vehicles Based on Speed and Vehicle Class (Year 2025)

RWDI Project #2402272

Walker South Landfill Phase 2 Environmental Assessment

Vehicle Type				Contaminant Emission Rate																				
MOVES Identifier			Speed (km/hr)	TSP			PM10			PM2.5			Benzene			Nitrogen Dioxide			Nitrogen Oxides			Sulphur Dioxide		
On-road / Non-road	Vehicle Type	HP ID		g/VKT	g/hr	g/s	g/VKT	g/hr	g/s	g/VKT	g/hr	g/s	g/VKT	g/hr	g/s	g/VKT	g/hr	g/s	g/VKT	g/hr	g/s	g/VKT	g/hr	g/s
On-road	Large	-	0	-	-	6.87E-04	-	-	6.87E-04	-	-	6.32E-04	-	-	9.23E-06	-	-	2.32E-03	-	-	1.87E-02	-	-	7.20E-06
On-road	Large	-	20	8.27E-01	-	-	8.27E-01	-	-	3.40E-01	-	-	2.96E-03	-	-	1.08E+00	-	-	9.11E+00	-	-	5.11E-03	-	-
On-road	Large	-	25	6.89E-01	-	-	6.89E-01	-	-	3.24E-01	-	-	2.42E-03	-	-	9.45E-01	-	-	8.24E+00	-	-	4.93E-03	-	-
On-road	Large	-	50	4.08E-01	-	-	4.08E-01	-	-	2.45E-01	-	-	1.39E-03	-	-	6.11E-01	-	-	5.88E+00	-	-	4.05E-03	-	-
On-road	Small	-	25	7.11E-02	-	-	7.11E-02	-	-	1.36E-02	-	-	2.94E-03	-	-	1.98E-02	-	-	2.09E-01	-	-	1.67E-03	-	-
Non-road	Tractors/Loaders/Backhoes	300	-	-	8.04E+00	2.23E-03	-	8.04E+00	2.23E-03	-	8.04E+00	2.23E-03	-	3.91E-01	1.09E-04	-	-	-	-	6.75E+01	1.88E-02	-	7.87E-02	2.19E-05
Non-road	Skid Steer Loaders	100	-	-	8.24E+00	2.29E-03	-	8.24E+00	2.29E-03	-	8.24E+00	2.29E-03	-	3.35E-01	9.30E-05	-	-	-	-	5.33E+01	1.48E-02	-	3.73E-02	1.04E-05
Non-road	Excavators	600	-	-	5.91E+00	1.64E-03	-	5.91E+00	1.64E-03	-	5.91E+00	1.64E-03	-	2.29E-01	6.37E-05	-	-	-	-	7.64E+01	2.12E-02	-	3.52E-01	9.78E-05
Non-road	Graders	750	-	-	1.29E+01	3.60E-03	-	1.29E+01	3.60E-03	-	1.29E+01	3.60E-03	-	5.06E-01	1.41E-04	-	-	-	-	1.85E+02	5.15E-02	-	6.49E-01	1.80E-04
Non-road	Off-highway Trucks	300	-	-	9.64E-01	2.68E-04	-	9.64E-01	2.68E-04	-	9.64E-01	2.68E-04	-	3.36E-02	9.33E-06	-	-	-	-	1.65E+01	4.59E-03	-	2.04E-01	5.66E-05
Non-road	Off-highway Trucks	600	-	-	2.29E+00	6.37E-04	-	2.29E+00	6.37E-04	-	2.29E+00	6.37E-04	-	8.31E-02	2.31E-05	-	-	-	-	3.77E+01	1.05E-02	-	3.52E-01	9.77E-05
Non-road	Off-highway Trucks	1000	-	-	1.44E+01	4.00E-03	-	1.44E+01	4.00E-03	-	1.44E+01	4.00E-03	-	1.11E+00	3.10E-04	-	-	-	-	1.15E+03	3.21E-01	-	7.32E-01	2.03E-04
Non-road	Crawler Tractor/Dozers	600	-	-	7.70E+00	2.14E-03	-	7.70E+00	2.14E-03	-	7.70E+00	2.14E-03	-	3.09E-01	8.60E-05	-	-	-	-	1.11E+02	3.08E-02	-	3.69E-01	1.02E-04

Appendix Q4: Traffic Count and Total Emission per Roadway

Walker South Landfill Phase 2 Environmental Assessment

Peak Hourly Traffic Count per Roadway

			Haul Trucks						Onsite Equipment													
			Trucks on Paved Roads (delivering raw materials, finished products, composts)	Trucks on Unpaved Roads (delivering raw materials, finished products)	Trucks (Transport of Refuse)	Trucks (Transport of Refuse - Idling)	Trucks (Transport of Waste Soil)	Site Pick-up Truck/Car	Compactor	Tipper	Water Truck	Fuel Truck	Sweeper Truck	Loader	Skid Steer	Excavator	Pick-up Trucks (on Unpaved Road)	Grader	Bulldozer	End-Dump Tractor Trailer / Tractor Trailer on Paved Roads	End-Dump Tractor Trailer / Tractor Trailer on Unpaved Roads	Tandem Delivery Truck (on Unpaved Road)
MOVES Identifier		On-road / Non-road	On-road	On-road	On-road	On-road	On-road	On-road	Non-road	Non-road	Non-road	Non-road	Non-road	Non-road	Non-road	Non-road	On-road	Non-road	Non-road	On-road	On-road	On-road
		Vehicle Type	Large	Large	Large	Large	Large	Small	Crawler Tractor/Dozers	Off-Highway Trucks	Off-Highway Trucks	Off-Highway Trucks	Off-Highway Trucks	Tractors/Loaders/Backhoes	Skid Steer Loaders	Excavators	Small	Graders	Crawler Tractor/Dozers	Large	Large	Large
		Speed (km/hr)	50	25	20	0	25	25	-	-	-	-	-	-	-	-	25	-	-	50	25	25
		Engine (hp)	-	-	-	-	-	-	523	400	400	825	200	272	80	303	-	600	347	-	-	-
Route	**Source ID**	**Segment Length (m)**																				
Paved Road at Quarry Plant - Export of Finished Products	PR_QP1	848.2	6	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
Unpaved Road at Quarry Plant - Export of Finished Products	UR_QP2	307.6	0	6	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
Unpaved Road at Quarry Plant - between Quarry Face and Quarry Plant	UR_QP3	1604.5	0	7	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
Tailpipe Emission of Onsite Equipment at Quarry Plant	EQ_QP	-	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0
Tailpipe Emission of Onsite Equipment at Quarry Working Face	EQ_QF	-	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0
Paved Road at Asphalt Plant - to/from Asphalt Plant Entrance	PR_AP1	848.2	0	5	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
Unpaved Road at Asphalt Plant - between Entrance and Asphalt Plant	UR_AP2	556.1	0	5	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
Tailpipe Emission of Onsite Equipment at Asphalt Plant	EQ_AP	-	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0
Paved Road at Compost Facility - Inbound and Outbound Delivery	PR_CF1	860.9	0	8	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
Unpaved Road at Compost Facility - Inbound and Outbound Delivery	UR_CF2	48.6	0	8	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
Tailpipe Emission of Onsite Equipment at Compost Facility	EQ_CF	-	0	0	0	0	0	0	0	0	1	0	0	5	0	0	0	0	0	0	0	0
Tailpipe Emission of Onsite Equipment at Soil Pile	EQ_SOIL	-	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0
Tailpipe Emission of Onsite Equipment at Working Face of South Landfill Phase 1	EQ_SLFWF	-	0	0	0	0	0	0	5	2	1	1	1	1	1	3	4	0	1	0	0	0
Tailpipe Emission of Onsite Equipment at Cell Construction Area of South Landfill Phase 1	EQ_SLFCON	-	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0
Unpaved Road at South Landfill Phase 1 - Transport of Soil between Waste Soil Pile and Working Face	UR_SLFSoil	558.7	0	0	0	0	38	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
Trucks Idling at the Weigh Scale	IDLE_WEIGH	-	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Trucks Idling at the Working Face of South Landfill Phase 1	IDLE_SLFWF	-	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Paved Road at South Landfill Phase 1 - Transport of Waste between Entrance and Weigh Scale	PR_SLFW1	826.4	0	0	58	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
Unpaved Road at South Landfill Phase 1 - Transport of Waste between Weigh Scale and Working Face	UR_SLFW2	72.2	0	0	58	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
Unpaved Road at South Landfill Phase 1 - Transport of Soil, Clay and Waste between Weigh Scale and Working Face	UR_SLFW3	940.1	0	0	58	0	38	0	0	0	1	0	0	0	0	0	0	0	0	0	3	0
Unpaved Road at South Landfill Phase 1 - Transport of Soil and Waste between Weigh Scale and Working Face	UR_SLFW4	748.7	0	0	58	0	38	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
Unpaved Road at South Landfill Phase 1 - Transport of Clay between Soil Pile and Cell Construction Area	UR_SLFCON	920.6	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	6	0
Unpaved Road at South Landfill Phase 1 - Transport of Clay between Soil Pile and Final Capping Construction Area	UR_SLFCAP	148.3	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	3	0

Note:

[1] Load factors are extracted from "Median Life, Annual Activity, and Load Factor Values for Nonroad Engine Emissions Modeling", EPA-420-R-10-016, NR-005d, July 2010.

Appendix Q4: Traffic Count and Total Emission per Roadway

Walker South Landfill Phase 2 Environmental Assessment

RWDI Project #2402272

Tailpipe Emission Factor by Equipment Type

			Tailpipe Emission Factor by Equipment Type																			
			Haul Trucks						Onsite Equipment													
			Trucks on Paved Roads (delivering raw materials, finished products, composts)	Trucks on Unpaved Roads (delivering raw materials, finished products)	Trucks (Transport of Refuse)	Trucks (Transport of Refuse - Idling)	Trucks (Transport of Waste Soil)	Site Pick-up Truck/Car	Compactor	Tipper	Water Truck	Fuel Truck	Sweeper Truck	Loader	Skid Steer	Excavator	Pick-up Trucks (on Unpaved Road)	Grader	Bulldozer	End-Dump Tractor Trailer / Tractor Trailer on Paved Roads	End-Dump Tractor Trailer / Tractor Trailer on Unpaved Roads	Tandem Delivery Truck (on Unpaved Road)
MOVES Identifier		On-road / Non-road	On-road	On-road	On-road	On-road	On-road	On-road	Non-road	Non-road	Non-road	Non-road	Non-road	Non-road	Non-road	Non-road	On-road	Non-road	Non-road	On-road	On-road	On-road
		Vehicle Type	Large	Large	Large	Large	Large	Small	Crawler Tractor/Dozers	Off-Highway Trucks	Off-Highway Trucks	Off-Highway Trucks	Off-Highway Trucks	Tractors/Loaders/Backhoes	Skid Steer Loaders	Excavators	Small	Graders	Crawler Tractor/Dozers	Large	Large	Large
		Speed (km/hr)	50	25	20	0	25	25	-	-	-	-	-	-	-	-	25	-	-	50	25	25
		Engine (hp)	-	-	-	-	-	-	523	400	400	825	200	272	80	303	-	600	347	-	-	-
		Load Factor	-	-	-	-	-	-	0.59	0.59	0.59	0.59	0.59	0.21	0.21	0.59	-	0.59	0.59	-	-	-
Contaminant	CAS Number	Pollutantid	g/VKT	g/VKT	g/VKT	g/s	g/VKT	g/VKT	g/hr	g/hr	g/hr	g/hr	g/hr	g/hr	g/hr	g/hr	g/VKT	g/hr	g/hr	g/VKT	g/VKT	g/VKT
TSP	PM	100	4.08E-01	6.89E-01	8.27E-01	6.87E-04	6.89E-01	7.11E-02	7.70E+00	2.29E+00	2.29E+00	1.44E+01	9.64E-01	8.04E+00	8.24E+00	5.91E+00	7.11E-02	1.29E+01	7.70E+00	4.08E-01	6.89E-01	6.89E-01
PM10	PM10	100	4.08E-01	6.89E-01	8.27E-01	6.87E-04	6.89E-01	7.11E-02	7.70E+00	2.29E+00	2.29E+00	1.44E+01	9.64E-01	8.04E+00	8.24E+00	5.91E+00	7.11E-02	1.29E+01	7.70E+00	4.08E-01	6.89E-01	6.89E-01
PM2.5	PM25	110	2.45E-01	3.24E-01	3.40E-01	6.32E-04	3.24E-01	1.36E-02	7.70E+00	2.29E+00	2.29E+00	1.44E+01	9.64E-01	8.04E+00	8.24E+00	5.91E+00	1.36E-02	1.29E+01	7.70E+00	2.45E-01	3.24E-01	3.24E-01
Benzene	71-43-2	20	1.39E-03	2.42E-03	2.96E-03	9.23E-06	2.42E-03	2.94E-03	3.09E-01	8.31E-02	8.31E-02	1.11E+00	3.36E-02	3.91E-01	3.35E-01	2.29E-01	2.94E-03	5.06E-01	3.09E-01	1.39E-03	2.42E-03	2.42E-03
Nitrogen Dioxide	NO2	33	6.11E-01	9.45E-01	1.08E+00	2.32E-03	9.45E-01	1.98E-02	-	-	-	-	-	-	-	-	1.98E-02	-	-	6.11E-01	9.45E-01	9.45E-01
Nitrogen Oxides	10102-44-0	3	5.88E+00	8.24E+00	9.11E+00	1.87E-02	8.24E+00	2.09E-01	1.11E+02	3.77E+01	3.77E+01	1.15E+03	1.65E+01	6.75E+01	5.33E+01	7.64E+01	2.09E-01	1.85E+02	1.11E+02	5.88E+00	8.24E+00	8.24E+00
Sulphur Dioxide	7446-09-5	31	4.05E-03	4.93E-03	5.11E-03	7.20E-06	4.93E-03	1.67E-03	3.69E-01	3.52E-01	3.52E-01	7.32E-01	2.04E-01	7.87E-02	3.73E-02	3.52E-01	1.67E-03	6.49E-01	3.69E-01	4.05E-03	4.93E-03	4.93E-03

Emission Rate per Roadway

Source ID	Vehicle Passes per Hour	Number of Volume Sources	Tailpipe Emission Rate per Roadway (g/hr)							Tailpipe + Fugitive Emission Rate per Vehicle per Roadway (g/s)							Emission Rate per Vehicle per Roadway per Volume Source (g/s)						
			TSP	PM10	PM2.5	Benzene	Nitrogen Dioxide	Nitrogen Oxides	Sulphur Dioxide	TSP	PM10	PM2.5	Benzene	Nitrogen Dioxide	Nitrogen Oxides	Sulphur Dioxide	TSP	PM10	PM2.5	Benzene	Nitrogen Dioxide	Nitrogen Oxides (NOx)	Sulphur Dioxide (SO2)
			g/hr	g/hr	g/hr	g/hr	g/hr	g/hr	g/hr	g/s	g/s	g/s	g/s	g/s	g/s	g/s	g/s	g/s	g/s	g/s	g/s	g/s	g/s
PR_QP1	14	42	3.43E+00	3.43E+00	2.60E+00	5.61E-02	3.11E+00	5.22E+01	2.28E-01	5.07E-02	6.63E-03	1.64E-03	1.11E-06	6.17E-05	1.03E-03	4.53E-06	1.21E-03	1.58E-04	3.90E-05	2.65E-08	1.47E-06	2.46E-05	1.08E-07
UR_QP2	14	15	2.62E+00	2.62E+00	1.95E+00	5.35E-02	1.74E+00	3.75E+01	2.17E-01	4.26E-02	1.07E-02	1.10E-03	1.06E-06	3.46E-05	7.43E-04	4.30E-06	2.84E-03	7.11E-04	7.33E-05	7.08E-08	2.31E-06	4.95E-05	2.87E-07
UR_QP3	16	80	9.09E+00	9.09E+00	5.00E+00	7.62E-02	1.06E+01	1.15E+02	2.63E-01	3.03E-01	7.56E-02	7.63E-03	1.32E-06	1.84E-04	1.99E-03	4.56E-06	3.79E-03	9.45E-04	9.54E-05	1.65E-08	2.30E-06	2.49E-05	5.70E-08
EQ_QP	4	1	3.04E+00	3.04E+00	3.04E+00	1.31E-01	0.00E+00	3.64E+01	2.24E-01	2.11E-04	2.11E-04	2.11E-04	9.11E-06	0.00E+00	2.53E-03	1.56E-05	2.11E-04	2.11E-04	2.11E-04	9.11E-06	0.00E+00	2.53E-03	1.56E-05
EQ_QF	4	1	3.04E+00	3.04E+00	3.04E+00	1.31E-01	0.00E+00	3.64E+01	2.24E-01	2.11E-04	2.11E-04	2.11E-04	9.11E-06	0.00E+00	2.53E-03	1.56E-05	2.11E-04	2.11E-04	2.11E-04	9.11E-06	0.00E+00	2.53E-03	1.56E-05
PR_AP1	12	42	4.27E+00	4.27E+00	2.73E+00	5.93E-02	4.01E+00	5.72E+01	2.28E-01	5.08E-02	6.66E-03	1.65E-03	1.37E-06	9.28E-05	1.32E-03	5.29E-06	1.21E-03	1.59E-04	3.93E-05	3.27E-08	2.21E-06	3.15E-05	1.26E-07
UR_AP2	12	28	3.27E+00	3.27E+00	2.25E+00	5.58E-02	2.63E+00	4.52E+01	2.21E-01	7.71E-02	1.93E-02	1.97E-03	1.29E-06	6.08E-05	1.05E-03	5.12E-06	2.75E-03	6.88E-04	7.04E-05	4.61E-08	2.17E-06	3.73E-05	1.83E-07
EQ_AP	4	1	3.04E+00	3.04E+00	3.04E+00	1.31E-01	0.00E+00	3.64E+01	2.24E-01	2.11E-04	2.11E-04	2.11E-04	9.11E-06	0.00E+00	2.53E-03	1.56E-05	2.11E-04	2.11E-04	2.11E-04	9.11E-06	0.00E+00	2.53E-03	1.56E-05
PR_CF1	18	54	6.10E+00	6.10E+00	3.59E+00	6.57E-02	6.51E+00	7.90E+01	2.41E-01	3.23E-02	4.26E-03	1.06E-03	1.01E-06	1.00E-04	1.22E-03	3.73E-06	5.98E-04	7.90E-05	1.97E-05	1.88E-08	1.86E-06	2.26E-05	6.90E-08
UR_CF2	18	3	1.62E+00	1.62E+00	1.48E+00	5.00E-02	3.67E-01	2.55E+01	2.09E-01	3.00E-03	5.72E-04	7.76E-05	7.71E-07	5.67E-06	3.93E-04	3.23E-06	1.00E-03	1.91E-04	2.59E-05	2.57E-07	1.89E-06	1.31E-04	1.08E-06
EQ_CF	12	1	9.79E+00	9.79E+00	9.79E+00	4.59E-01	0.00E+00	9.31E+01	2.90E-01	2.27E-04	2.27E-04	2.27E-04	1.06E-05	0.00E+00	2.16E-03	6.72E-06	2.27E-04	2.27E-04	2.27E-04	1.06E-05	0.00E+00	2.16E-03	6.72E-06
EQ_SOIL	4	1	5.90E+00	5.90E+00	5.90E+00	2.32E-01	0.00E+00	8.76E+01	4.25E-01	4.09E-04	4.09E-04	4.09E-04	1.61E-05	0.00E+00	6.09E-03	2.95E-05	4.09E-04	4.09E-04	4.09E-04	1.61E-05	0.00E+00	6.09E-03	2.95E-05
EQ_SLFWF	40	1	5.43E+01	5.43E+01	5.43E+01	2.48E+00	0.00E+00	1.31E+03	3.13E+00	3.77E-04	3.77E-04	3.77E-04	1.72E-05	0.00E+00	9.10E-03	2.17E-05	3.77E-04	3.77E-04	3.77E-04	1.72E-05	0.00E+00	9.10E-03	2.17E-05
EQ_SLFCON	4	1	5.90E+00	5.90E+00	5.90E+00	2.32E-01	0.00E+00	8.76E+01	4.25E-01	4.09E-04	4.09E-04	4.09E-04	1.61E-05	0.00E+00	6.09E-03	2.95E-05	4.09E-04	4.09E-04	4.09E-04	1.61E-05	0.00E+00	6.09E-03	2.95E-05
UR_SLFSoil	78	47	1.60E+01	1.60E+01	8.24E+00	1.00E-01	2.01E+01	1.97E+02	3.12E-01	3.73E-02	6.56E-03	6.79E-04	3.57E-07	7.14E-05	7.02E-04	1.11E-06	7.93E-04	1.39E-04	1.45E-05	7.60E-09	1.52E-06	1.49E-05	2.36E-08
IDLE_WEIGH	4	1	4.94E+00	4.94E+00	4.55E+00	6.64E-02	1.67E+01	1.35E+02	5.18E-02	3.43E-04	3.43E-04	3.16E-04	4.61E-06	1.16E-03	9.35E-03	3.60E-06	3.43E-04	3.43E-04	3.16E-04	4.61E-06	1.16E-03	9.35E-03	3.60E-06
IDLE_SLFWF	4	1	4.94E+00	4.94E+00	4.55E+00	6.64E-02	1.67E+01	1.35E+02	5.18E-02	3.43E-04	3.43E-04	3.16E-04	4.61E-06	1.16E-03	9.35E-03	3.60E-06	3.43E-04	3.43E-04	3.16E-04	4.61E-06	1.16E-03	9.35E-03	3.60E-06
PR_SLFW1	118	61	4.10E+01	4.10E+01	1.76E+01	1.91E-01	5.15E+01	4.59E+02	4.53E-01	4.87E-02	6.38E-03	1.56E-03	4.50E-07	1.21E-04	1.08E-03	1.07E-06	7.98E-04	1.05E-04	2.56E-05	7.37E-09	1.99E-06	1.77E-05	1.75E-08
UR_SLFW2	118	5	4.81E+00	4.81E+00	2.78E+00	6.15E-02	4.50E+00	6.04E+01	2.29E-01	5.41E-03	1.00E-03	1.06E-04	1.45E-07	1.06E-05	1.42E-04	5.39E-07	1.08E-03	2.01E-04	2.12E-05	2.89E-08	2.12E-06	2.84E-05	1.08E-07
UR_SLFW3	200	70	7.30E+01	7.30E+01	3.24E+01	3.04E-01	9.50E+01	8.37E+02	6.76E-01	6.95E-02	1.28E-02	1.32E-03	4.22E-07	1.32E-04	1.16E-03	9.39E-07	9.92E-04	1.84E-04	1.89E-05	6.03E-09	1.89E-06	1.66E-05	1.34E-08
UR_SLFW4	194	55	5.68E+01	5.68E+01	2.53E+01	2.46E-01	7.36E+01	6.52E+02	5.70E-01	5.53E-02	1.02E-02	1.05E-03	3.53E-07	1.05E-04	9.34E-04	8.16E-07	1.01E-03	1.86E-04	1.91E-05	6.42E-09	1.92E-06	1.70E-05	1.48E-08
UR_SLFCON	14	68	5.16E+00	5.16E+00	3.14E+00	6.24E-02	5.22E+00	6.77E+01	2.35E-01	5.68E-02	9.53E-03	1.01E-03	1.24E-06	1.04E-04	1.34E-03	4.66E-06	8.36E-04	1.40E-04	1.48E-05	1.82E-08	1.52E-06	1.98E-05	6.85E-08
UR_SLFCAP	8	11	1.66E+00	1.66E+00	1.50E+00	5.01E-02	4.20E-01	2.59E+01	2.10E-01	1.12E-02	2.11E-03	2.57E-04	1.74E-06	1.46E-05	9.00E-04	7.28E-06	1.02E-03	1.92E-04	2.34E-05	1.58E-07	1.33E-06	8.18E-05	6.62E-07

Appendix Q5: Hourly Profile of Roadway Traffic Passess

RWDI Project #2402272

Walker South Landfill Phase 2 Environmental Assessment

Hourly Traffic Passess per Roadway

Operation Hours (starting from)		Source ID	Description	Number of Passess per Hour																							
from	to			0000 - 0100	0100 - 0200	0200 - 0300	0300 - 0400	0400 - 0500	0500 - 0600	0600 - 0700	0700 - 0800	0800 - 0900	0900 - 1000	1000 - 1100	1100 - 1200	1200 - 1300	1300 - 1400	1400 - 1500	1500 - 1600	1600 - 1700	1700 - 1800	1800 - 1900	1900 - 2000	2000 - 2100	2100 - 2200	2200 - 2300	2300 - 2400
5	19	PR_QP1	Paved Road at Quarry Plant - Export of Finished Products	0	0	0	0	0	14	14	14	14	14	14	14	14	14	14	14	14	14	14	0	0	0	0	0
5	19	UR_QP2	Unpaved Road at Quarry Plant - Export of Finished Products	0	0	0	0	0	14	14	14	14	14	14	14	14	14	14	14	14	14	14	0	0	0	0	0
5	19	UR_QP3	Unpaved Road at Quarry Plant - between Quarry Face and Quarry Plant	0	0	0	0	0	16	16	16	16	16	16	16	16	16	16	16	16	16	16	0	0	0	0	0
5	19	EQ_QP	Tailpipe Emission of Onsite Equipment at Quarry Plant	0	0	0	0	0	4	4	4	4	4	4	4	4	4	4	4	4	4	4	0	0	0	0	0
5	19	EQ_QF	Tailpipe Emission of Onsite Equipment at Quarry Working Face	0	0	0	0	0	4	4	4	4	4	4	4	4	4	4	4	4	4	4	0	0	0	0	0
5	19	PR_AP1	Paved Road at Asphalt Plant - to/from Asphalt Plant Entrance	0	0	0	0	0	12	12	12	12	12	12	12	12	12	12	12	12	12	12	0	0	0	0	0
5	19	UR_AP2	Unpaved Road at Asphalt Plant - between Entrance and Asphalt Plant	0	0	0	0	0	12	12	12	12	12	12	12	12	12	12	12	12	12	12	0	0	0	0	0
5	19	EQ_AP	Tailpipe Emission of Onsite Equipment at Asphalt Plant	0	0	0	0	0	4	4	4	4	4	4	4	4	4	4	4	4	4	4	0	0	0	0	0
7	17	PR_CF1	Paved Road at Compost Facility - Inbound and Outbound Delivery	0	0	0	0	0	0	0	18	18	18	18	18	18	18	18	18	18	0	0	0	0	0	0	0
7	17	UR_CF2	Unpaved Road at Compost Facility - Inbound and Outbound Delivery	0	0	0	0	0	0	0	18	18	18	18	18	18	18	18	18	18	0	0	0	0	0	0	0
7	17	EQ_CF	Tailpipe Emission of Onsite Equipment at Compost Facility	0	0	0	0	0	0	0	12	12	12	12	12	12	12	12	12	12	0	0	0	0	0	0	0
5	19	EQ_SOIL	Tailpipe Emission of Onsite Equipment at Soil Pile	0	0	0	0	0	4	4	4	4	4	4	4	4	4	4	4	4	4	4	0	0	0	0	0
7	17	EQ_SLFWF	Tailpipe Emission of Onsite Equipment at Working Face of South Landfill Phase 1	0	0	0	0	0	0	2	38	38	38	38	38	38	38	38	38	38	2	0	0	0	0	0	0
7	17	EQ_SLFCON	Tailpipe Emission of Onsite Equipment at Cell Construction Area of South Landfill Phase 1	0	0	0	0	0	0	0	4	4	4	4	4	4	4	4	4	4	0	0	0	0	0	0	0
17	18	UR_SLFSoil	Unpaved Road at South Landfill Phase 1 - Transport of Soil between Waste Soil Pile and Working Face	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	78	0	0	0	0	0	0
7	17	IDLE_WEIGH	Trucks Idling at the Weigh Scale	0	0	0	0	0	0	0	4	4	4	4	4	4	4	4	4	4	0	0	0	0	0	0	0
7	17	IDLE_SLFWF	Trucks Idling at the Working Face of South Landfill Phase 1	0	0	0	0	0	0	0	4	4	4	4	4	4	4	4	4	4	0	0	0	0	0	0	0
7	17	PR_SLFW1	Paved Road at South Landfill Phase 1 - Transport of Waste between Entrance and Weigh Scale	0	0	0	0	0	0	0	118	94	98	82	90	90	90	114	70	36	0	0	0	0	0	0	0
7	17	UR_SLFW2	Unpaved Road at South Landfill Phase 1 - Transport of Waste between Weigh Scale and Working Face	0	0	0	0	0	0	0	118	94	98	82	90	90	90	114	70	36	0	0	0	0	0	0	0
7	18	UR_SLFW3	Unpaved Road at South Landfill Phase 1 - Transport of Soil, Clay and Waste between Weigh Scale and Working	0	0	0	0	0	0	0	124	100	104	88	96	96	96	120	76	42	78	0	0	0	0	0	0
7	17	UR_SLFW4	Unpaved Road at South Landfill Phase 1 - Transport of Soil and Waste between Weigh Scale and Working Face	0	0	0	0	0	0	0	118	94	98	82	90	90	90	114	70	36	78	0	0	0	0	0	0
7	17	UR_SLFCON	Unpaved Road at South Landfill Phase 1 - Transport of Clay between Soil Pile and Cell Construction Area	0	0	0	0	0	0	0	14	14	14	14	14	14	14	14	14	14	0	0	0	0	0	0	0
7	17	UR_SLFCAP	Unpaved Road at South Landfill Phase 1 - Transport of Clay between Soil Pile and Final Capping Construction A	0	0	0	0	0	0	0	8	8	8	8	8	8	8	8	8	8	0	0	0	0	0	0	0

APPENDIX R

Appendix R: Landfill Gas Modelling Results RWDI Project #2402272

Table 1: Predicted Concentrations of 24-Hour Vinyl Chloride at Discrete Receptors

Walker South Landfill Phase 2 Environmental Assessment - Existing Conditions

Criteria (µg/m³)	Receptor ID	Common Receptor ID	Background Concentration (µg/m³)	All Walker Operations Included					Landfill Only				
				Maximum Predicted Concentration (µg/m³)		Percentage of Criteria (µg/m³)		Days Exceeding 1 µg/m³ over 5-Years	Maximum Predicted Concentration (µg/m³)		Percentage of Criteria (µg/m³)		Days Exceeding 1 µg/m³ over 5-Years
				With Background	Without Background	With Background	Without Background		With Background	Without Background	With Background	Without Background	
1	R01	--	0.05	0.07	0.02	7%	2%	0	0.07	0.02	7%	2%	0
1	R02	CR17	0.05	0.08	0.02	8%	2%	0	0.08	0.02	8%	2%	0
1	R03	CR19	0.05	0.11	0.06	11%	6%	0	0.11	0.06	11%	6%	0
1	R04	--	0.05	0.07	0.02	7%	2%	0	0.07	0.02	7%	2%	0
1	R05	--	0.05	0.07	0.02	7%	2%	0	0.07	0.02	7%	2%	0
1	R06	--	0.05	0.07	0.02	7%	2%	0	0.07	0.02	7%	2%	0
1	R07	--	0.05	0.07	0.02	7%	2%	0	0.07	0.02	7%	2%	0
1	R08	--	0.05	0.07	0.01	7%	1%	0	0.07	0.01	7%	1%	0
1	R09	CR18	0.05	0.07	0.01	7%	1%	0	0.07	0.01	7%	1%	0
1	R10	CR05	0.05	0.08	0.02	8%	2%	0	0.08	0.02	8%	2%	0
1	R11	--	0.05	0.08	0.03	8%	3%	0	0.08	0.03	8%	3%	0
1	R12	--	0.05	0.09	0.04	9%	4%	0	0.09	0.04	9%	4%	0
1	R13	--	0.05	0.08	0.03	8%	3%	0	0.08	0.03	8%	3%	0
1	R14	--	0.05	0.07	0.02	7%	2%	0	0.07	0.02	7%	2%	0
1	R15	CR10	0.05	0.10	0.05	10%	5%	0	0.10	0.05	10%	5%	0
1	R16	--	0.05	0.09	0.04	9%	4%	0	0.09	0.04	9%	4%	0
1	R17	CR01	0.05	0.07	0.01	7%	1%	0	0.07	0.01	7%	1%	0
1	R18	CR04	0.05	0.07	0.02	7%	2%	0	0.07	0.02	7%	2%	0
1	R19	CR06	0.05	0.07	0.01	7%	1%	0	0.07	0.01	7%	1%	0
1	R20	CR07	0.05	0.06	0.01	6%	1%	0	0.06	0.01	6%	1%	0
1	R21	CR8	0.05	0.15	0.10	15%	10%	0	0.15	0.10	15%	10%	0
1	R22	CR11	0.05	0.07	0.01	7%	1%	0	0.07	0.01	7%	1%	0
1	R23	CR12	0.05	0.06	0.01	6%	1%	0	0.06	0.01	6%	1%	0
1	R24	CR13	0.05	0.07	0.01	7%	1%	0	0.07	0.01	7%	1%	0
1	R25	CR14	0.05	0.06	0.01	6%	1%	0	0.06	0.01	6%	1%	0
1	R26	CR15	0.05	0.06	0.01	6%	1%	0	0.06	0.01	6%	1%	0
1	R27	CR16	0.05	0.06	0.01	6%	1%	0	0.06	0.01	6%	1%	0
1	R28	CR20	0.05	0.06	0.01	6%	1%	0	0.06	0.01	6%	1%	0
1	R29	CR21	0.05	0.08	0.03	8%	3%	0	0.08	0.03	8%	3%	0

Appendix R: Landfill Gas Modelling Results

RWDI Project #2402272

Table 2: Predicted Concentrations of Annual Vinyl Chloride at Discrete Receptors

Walker South Landfill Phase 2 Environmental Assessment - Existing Conditions

Criteria (µg/m³)	Receptor ID	Common Receptor ID	Background Concentration (µg/m³)	All Walker Operations Included				Landfill Only			
				Maximum Predicted Concentration (µg/m³)		Percentage of Criteria (µg/m³)		Maximum Predicted Concentration (µg/m³)		Percentage of Criteria (µg/m³)	
				With Background	Without Background	With Background	Without Background	With Background	Without Background	With Background	Without Background
0.2	R01	--	0.05	0.05	0.0014	27%	0.7%	0.05	0.0014	27%	0.7%
0.2	R02	CR17	0.05	0.05	0.0014	27%	0.7%	0.05	0.0014	27%	0.7%
0.2	R03	CR19	0.05	0.06	0.0041	28%	2.1%	0.06	0.0041	28%	2.1%
0.2	R04	--	0.05	0.05	0.0023	27%	1.2%	0.05	0.0023	27%	1.2%
0.2	R05	--	0.05	0.05	0.0021	27%	1.0%	0.05	0.0021	27%	1.0%
0.2	R06	--	0.05	0.05	0.0022	27%	1.1%	0.05	0.0022	27%	1.1%
0.2	R07	--	0.05	0.05	0.0017	27%	0.9%	0.05	0.0017	27%	0.9%
0.2	R08	--	0.05	0.05	0.0012	27%	0.6%	0.05	0.0012	27%	0.6%
0.2	R09	CR18	0.05	0.05	0.0010	27%	0.5%	0.05	0.0010	27%	0.5%
0.2	R10	CR05	0.05	0.05	0.0016	27%	0.8%	0.05	0.0016	27%	0.8%
0.2	R11	--	0.05	0.05	0.0014	27%	0.7%	0.05	0.0014	27%	0.7%
0.2	R12	--	0.05	0.05	0.0017	27%	0.9%	0.05	0.0017	27%	0.9%
0.2	R13	--	0.05	0.05	0.0013	27%	0.6%	0.05	0.0013	27%	0.6%
0.2	R14	--	0.05	0.05	0.0008	26%	0.4%	0.05	0.0008	26%	0.4%
0.2	R15	CR10	0.05	0.06	0.0038	28%	1.9%	0.06	0.0038	28%	1.9%
0.2	R16	--	0.05	0.06	0.0029	28%	1.4%	0.06	0.0029	28%	1.4%
0.2	R17	CR01	0.05	0.05	0.0013	27%	0.6%	0.05	0.0013	27%	0.6%
0.2	R18	CR04	0.05	0.05	0.0022	27%	1.1%	0.05	0.0022	27%	1.1%
0.2	R19	CR06	0.05	0.05	0.0009	27%	0.5%	0.05	0.0009	27%	0.5%
0.2	R20	CR07	0.05	0.05	0.0006	26%	0.3%	0.05	0.0006	26%	0.3%
0.2	R21	CR8	0.05	0.06	0.0050	29%	2.5%	0.06	0.0050	29%	2.5%
0.2	R22	CR11	0.05	0.05	0.0011	27%	0.6%	0.05	0.0011	27%	0.6%
0.2	R23	CR12	0.05	0.05	0.0005	26%	0.3%	0.05	0.0005	26%	0.3%
0.2	R24	CR13	0.05	0.05	0.0004	26%	0.2%	0.05	0.0004	26%	0.2%
0.2	R25	CR14	0.05	0.05	0.0009	27%	0.4%	0.05	0.0009	27%	0.4%
0.2	R26	CR15	0.05	0.05	0.0007	26%	0.3%	0.05	0.0007	26%	0.3%
0.2	R27	CR16	0.05	0.05	0.0005	26%	0.2%	0.05	0.0005	26%	0.2%
0.2	R28	CR20	0.05	0.05	0.0008	26%	0.4%	0.05	0.0008	26%	0.4%
0.2	R29	CR21	0.05	0.05	0.0017	27%	0.8%	0.05	0.0017	27%	0.8%

Appendix R: Landfill Gas Modelling Results **RWDI Project #2402272**

Table 3: Predicted Concentrations of 24-Hour Benzene at Discrete Receptors

Walker South Landfill Phase 2 Environmental Assessment - Existing Conditions

Criteria (µg/m³)	Receptor ID	Common Receptor ID	Background Concentration (µg/m³)	All Walker Operations Included					Landfill Only				
				Maximum Predicted Concentration (µg/m³)		Percentage of Criteria (µg/m³)		Days Exceeding 2.3 µg/m³ over 5-Years	Maximum Predicted Concentration (µg/m³)		Percentage of Criteria (µg/m³)		Days Exceeding 2.3 µg/m³ over 5-Years
				With Background	Without Background	With Background	Without Background		With Background	Without Background	With Background	Without Background	
2.3	R01	--	0.69	0.70	0.019	31%	0.8%	0	0.69	0.007	30%	0.3%	0
2.3	R02	CR17	0.69	0.70	0.016	30%	0.7%	0	0.69	0.007	30%	0.3%	0
2.3	R03	CR19	0.69	0.71	0.023	31%	1.0%	0	0.71	0.021	31%	0.9%	0
2.3	R04	--	0.69	0.69	0.010	30%	0.4%	0	0.69	0.009	30%	0.4%	0
2.3	R05	--	0.69	0.69	0.009	30%	0.4%	0	0.69	0.006	30%	0.3%	0
2.3	R06	--	0.69	0.69	0.009	30%	0.4%	0	0.69	0.006	30%	0.3%	0
2.3	R07	--	0.69	0.69	0.009	30%	0.4%	0	0.69	0.006	30%	0.3%	0
2.3	R08	--	0.69	0.69	0.008	30%	0.4%	0	0.69	0.007	30%	0.3%	0
2.3	R09	CR18	0.69	0.69	0.007	30%	0.3%	0	0.69	0.004	30%	0.2%	0
2.3	R10	CR05	0.69	0.70	0.013	30%	0.6%	0	0.69	0.009	30%	0.4%	0
2.3	R11	--	0.69	0.70	0.012	30%	0.5%	0	0.70	0.011	30%	0.5%	0
2.3	R12	--	0.69	0.70	0.018	31%	0.8%	0	0.70	0.016	30%	0.7%	0
2.3	R13	--	0.69	0.70	0.013	30%	0.6%	0	0.70	0.011	30%	0.5%	0
2.3	R14	--	0.69	0.69	0.009	30%	0.4%	0	0.69	0.006	30%	0.3%	0
2.3	R15	CR10	0.69	0.71	0.021	31%	0.9%	0	0.70	0.019	31%	0.8%	0
2.3	R16	--	0.69	0.70	0.016	30%	0.7%	0	0.70	0.013	30%	0.6%	0
2.3	R17	CR01	0.69	0.70	0.020	31%	0.9%	0	0.69	0.006	30%	0.3%	0
2.3	R18	CR04	0.69	0.69	0.009	30%	0.4%	0	0.69	0.006	30%	0.3%	0
2.3	R19	CR06	0.69	0.69	0.008	30%	0.3%	0	0.69	0.007	30%	0.3%	0
2.3	R20	CR07	0.69	0.69	0.006	30%	0.3%	0	0.69	0.003	30%	0.1%	0
2.3	R21	CR8	0.69	0.72	0.034	31%	1.5%	0	0.72	0.033	31%	1.5%	0
2.3	R22	CR11	0.69	0.70	0.014	30%	0.6%	0	0.69	0.005	30%	0.2%	0
2.3	R23	CR12	0.69	0.69	0.007	30%	0.3%	0	0.69	0.004	30%	0.2%	0
2.3	R24	CR13	0.69	0.69	0.007	30%	0.3%	0	0.69	0.004	30%	0.2%	0
2.3	R25	CR14	0.69	0.69	0.007	30%	0.3%	0	0.69	0.005	30%	0.2%	0
2.3	R26	CR15	0.69	0.69	0.007	30%	0.3%	0	0.69	0.003	30%	0.1%	0
2.3	R27	CR16	0.69	0.69	0.006	30%	0.3%	0	0.69	0.003	30%	0.1%	0
2.3	R28	CR20	0.69	0.69	0.007	30%	0.3%	0	0.69	0.003	30%	0.1%	0
2.3	R29	CR21	0.69	0.71	0.025	31%	1.1%	0	0.70	0.016	30%	0.7%	0

Appendix R: Landfill Gas Modelling Results RWDI Project #2402272

Table 4: Predicted Concentrations of Annual Benzene at Discrete Receptors

Walker South Landfill Phase 2 Environmental Assessment - Existing Conditions

Criteria (µg/m³)	Receptor ID	Common Receptor ID	Background Concentration (µg/m³)	All Walker Operations Included				Landfill Only			
				Maximum Predicted Concentration (µg/m³)		Percentage of Criteria (µg/m³)		Maximum Predicted Concentration (µg/m³)		Percentage of Criteria (µg/m³)	
				With Background	Without Background	With Background	Without Background	With Background	Without Background	With Background	Without Background
0.45	R01	--	0.46	0.46	0.0011	103%	0.2%	0.46	0.0007	103%	0.1%
0.45	R02	CR17	0.46	0.46	0.0010	103%	0.2%	0.46	0.0007	103%	0.1%
0.45	R03	CR19	0.46	0.46	0.0020	103%	0.4%	0.46	0.0019	103%	0.4%
0.45	R04	--	0.46	0.46	0.0013	103%	0.3%	0.46	0.0011	103%	0.2%
0.45	R05	--	0.46	0.46	0.0011	103%	0.3%	0.46	0.0010	103%	0.2%
0.45	R06	--	0.46	0.46	0.0012	103%	0.3%	0.46	0.0010	103%	0.2%
0.45	R07	--	0.46	0.46	0.0009	103%	0.2%	0.46	0.0008	103%	0.2%
0.45	R08	--	0.46	0.46	0.0007	103%	0.1%	0.46	0.0006	103%	0.1%
0.45	R09	CR18	0.46	0.46	0.0006	103%	0.1%	0.46	0.0005	103%	0.1%
0.45	R10	CR05	0.46	0.46	0.0009	103%	0.2%	0.46	0.0008	103%	0.2%
0.45	R11	--	0.46	0.46	0.0007	103%	0.2%	0.46	0.0007	103%	0.1%
0.45	R12	--	0.46	0.46	0.0008	103%	0.2%	0.46	0.0008	103%	0.2%
0.45	R13	--	0.46	0.46	0.0007	103%	0.1%	0.46	0.0006	103%	0.1%
0.45	R14	--	0.46	0.46	0.0004	103%	0.1%	0.46	0.0004	103%	0.1%
0.45	R15	CR10	0.46	0.46	0.0019	103%	0.4%	0.46	0.0017	103%	0.4%
0.45	R16	--	0.46	0.46	0.0015	103%	0.3%	0.46	0.0014	103%	0.3%
0.45	R17	CR01	0.46	0.46	0.0012	103%	0.3%	0.46	0.0006	103%	0.1%
0.45	R18	CR04	0.46	0.46	0.0011	103%	0.3%	0.46	0.0010	103%	0.2%
0.45	R19	CR06	0.46	0.46	0.0005	103%	0.1%	0.46	0.0004	103%	0.1%
0.45	R20	CR07	0.46	0.46	0.0004	103%	0.1%	0.46	0.0003	103%	0.1%
0.45	R21	CR8	0.46	0.46	0.0023	103%	0.5%	0.46	0.0021	103%	0.5%
0.45	R22	CR11	0.46	0.46	0.0009	103%	0.2%	0.46	0.0006	103%	0.1%
0.45	R23	CR12	0.46	0.46	0.0004	103%	0.1%	0.46	0.0003	103%	0.1%
0.45	R24	CR13	0.46	0.46	0.0003	103%	0.1%	0.46	0.0002	103%	0.05%
0.45	R25	CR14	0.46	0.46	0.0006	103%	0.1%	0.46	0.0005	103%	0.1%
0.45	R26	CR15	0.46	0.46	0.0005	103%	0.1%	0.46	0.0003	103%	0.1%
0.45	R27	CR16	0.46	0.46	0.0003	103%	0.1%	0.46	0.0002	103%	0.05%
0.45	R28	CR20	0.46	0.46	0.0005	103%	0.1%	0.46	0.0004	103%	0.1%
0.45	R29	CR21	0.46	0.46	0.0014	103%	0.3%	0.46	0.0008	103%	0.2%

Appendix R: Landfill Gas Modelling Results **RWDI Project #2402272**

Table 5: Predicted Concentrations of 24-Hour 1,1,2-Trichloroethane at Discrete Receptors

Walker South Landfill Phase 2 Environmental Assessment - Existing Conditions

Criteria (µg/m³)	Receptor ID	Common Receptor ID	Background Concentration (µg/m³)	All Walker Operations Included					Landfill Only				
				Maximum Predicted Concentration (µg/m³)		Percentage of Criteria (µg/m³)		Days Exceeding 0.3 µg/m³ over 5-Years	Maximum Predicted Concentration (µg/m³)		Percentage of Criteria (µg/m³)		Days Exceeding 0.3 µg/m³ over 5-Years
				With Background	Without Background	With Background	Without Background		With Background	Without Background	With Background	Without Background	
0.3	R01	--	0.07	0.07	0.005	23%	2%	0	0.07	0.005	23%	2%	0
0.3	R02	CR17	0.07	0.07	0.004	23%	1%	0	0.07	0.004	23%	1%	0
0.3	R03	CR19	0.07	0.08	0.011	25%	4%	0	0.08	0.011	25%	4%	0
0.3	R04	--	0.07	0.07	0.005	23%	2%	0	0.07	0.005	23%	2%	0
0.3	R05	--	0.07	0.07	0.004	23%	1%	0	0.07	0.004	23%	1%	0
0.3	R06	--	0.07	0.07	0.004	23%	1%	0	0.07	0.004	23%	1%	0
0.3	R07	--	0.07	0.07	0.004	23%	1%	0	0.07	0.004	23%	1%	0
0.3	R08	--	0.07	0.07	0.003	23%	1%	0	0.07	0.003	23%	1%	0
0.3	R09	CR18	0.07	0.07	0.002	22%	1%	0	0.07	0.002	22%	1%	0
0.3	R10	CR05	0.07	0.07	0.006	24%	2%	0	0.07	0.006	24%	2%	0
0.3	R11	--	0.07	0.07	0.005	23%	2%	0	0.07	0.005	23%	2%	0
0.3	R12	--	0.07	0.07	0.008	24%	3%	0	0.07	0.008	24%	3%	0
0.3	R13	--	0.07	0.07	0.005	23%	2%	0	0.07	0.005	23%	2%	0
0.3	R14	--	0.07	0.07	0.004	23%	1%	0	0.07	0.004	23%	1%	0
0.3	R15	CR10	0.07	0.07	0.010	25%	3%	0	0.07	0.010	25%	3%	0
0.3	R16	--	0.07	0.07	0.008	24%	3%	0	0.07	0.008	24%	3%	0
0.3	R17	CR01	0.07	0.07	0.006	24%	2%	0	0.07	0.006	24%	2%	0
0.3	R18	CR04	0.07	0.07	0.004	23%	1%	0	0.07	0.004	23%	1%	0
0.3	R19	CR06	0.07	0.07	0.006	24%	2%	0	0.07	0.006	24%	2%	0
0.3	R20	CR07	0.07	0.07	0.002	22%	1%	0	0.07	0.002	22%	1%	0
0.3	R21	CR8	0.07	0.09	0.022	29%	7%	0	0.09	0.022	29%	7%	0
0.3	R22	CR11	0.07	0.07	0.004	23%	1%	0	0.07	0.004	23%	1%	0
0.3	R23	CR12	0.07	0.07	0.002	22%	1%	0	0.07	0.002	22%	1%	0
0.3	R24	CR13	0.07	0.07	0.003	23%	1%	0	0.07	0.003	23%	1%	0
0.3	R25	CR14	0.07	0.07	0.002	22%	1%	0	0.07	0.002	22%	1%	0
0.3	R26	CR15	0.07	0.07	0.002	22%	1%	0	0.07	0.002	22%	1%	0
0.3	R27	CR16	0.07	0.07	0.003	23%	1%	0	0.07	0.003	23%	1%	0
0.3	R28	CR20	0.07	0.07	0.002	22%	1%	0	0.07	0.002	22%	1%	0
0.3	R29	CR21	0.07	0.07	0.008	24%	3%	0	0.07	0.008	24%	3%	0

Appendix R: Landfill Gas Modelling Results **RWDI Project #2402272**

Table 6: Predicted Concentrations of 10-Minute Hydrogen Sulphide at Discrete Receptors

Walker South Landfill Phase 2 Environmental Assessment - Existing Conditions

Criteria (µg/m³)	Receptor ID	Common Receptor ID	Background Concentration (µg/m³)	All Walker Operations Included					Landfill Only				
				Maximum Predicted Concentration (µg/m³)		Percentage of Criteria (µg/m³)		Hours Exceeding 13 µg/m³ over 5-Years	Maximum Predicted Concentration (µg/m³)		Percentage of Criteria (µg/m³)		Hours Exceeding 13 µg/m³ over 5-Years
				With Background	Without Background	With Background	Without Background		With Background	Without Background	With Background	Without Background	
13	R01	--	2.44	2.87	0.43	22%	3%	0	2.87	0.43	22%	3%	0
13	R02	CR17	2.44	2.88	0.44	22%	3%	0	2.88	0.44	22%	3%	0
13	R03	CR19	2.44	3.40	0.96	26%	7%	0	3.40	0.96	26%	7%	0
13	R04	--	2.44	2.88	0.44	22%	3%	0	2.88	0.44	22%	3%	0
13	R05	--	2.44	2.87	0.44	22%	3%	0	2.87	0.44	22%	3%	0
13	R06	--	2.44	2.87	0.43	22%	3%	0	2.87	0.43	22%	3%	0
13	R07	--	2.44	2.85	0.42	22%	3%	0	2.85	0.42	22%	3%	0
13	R08	--	2.44	2.87	0.43	22%	3%	0	2.87	0.43	22%	3%	0
13	R09	CR18	2.44	2.85	0.41	22%	3%	0	2.85	0.41	22%	3%	0
13	R10	CR05	2.44	2.85	0.42	22%	3%	0	2.85	0.42	22%	3%	0
13	R11	--	2.44	2.86	0.43	22%	3%	0	2.86	0.43	22%	3%	0
13	R12	--	2.44	2.90	0.46	22%	4%	0	2.90	0.46	22%	4%	0
13	R13	--	2.44	2.89	0.46	22%	4%	0	2.89	0.46	22%	4%	0
13	R14	--	2.44	2.91	0.48	22%	4%	0	2.91	0.48	22%	4%	0
13	R15	CR10	2.44	3.32	0.88	26%	7%	0	3.32	0.88	26%	7%	0
13	R16	--	2.44	3.18	0.74	24%	6%	0	3.18	0.74	24%	6%	0
13	R17	CR01	2.44	2.86	0.43	22%	3%	0	2.86	0.43	22%	3%	0
13	R18	CR04	2.44	2.88	0.44	22%	3%	0	2.88	0.44	22%	3%	0
13	R19	CR06	2.44	2.85	0.42	22%	3%	0	2.85	0.42	22%	3%	0
13	R20	CR07	2.44	2.82	0.39	22%	3%	0	2.82	0.39	22%	3%	0
13	R21	CR8	2.44	3.59	1.15	28%	9%	0	3.59	1.15	28%	9%	0
13	R22	CR11	2.44	2.85	0.42	22%	3%	0	2.85	0.42	22%	3%	0
13	R23	CR12	2.44	2.81	0.37	22%	3%	0	2.81	0.37	22%	3%	0
13	R24	CR13	2.44	2.89	0.46	22%	4%	0	2.89	0.46	22%	4%	0
13	R25	CR14	2.44	2.82	0.38	22%	3%	0	2.82	0.38	22%	3%	0
13	R26	CR15	2.44	2.79	0.36	21%	3%	0	2.79	0.36	21%	3%	0
13	R27	CR16	2.44	2.73	0.29	21%	2%	0	2.73	0.29	21%	2%	0
13	R28	CR20	2.44	2.84	0.41	22%	3%	0	2.84	0.41	22%	3%	0
13	R29	CR21	2.44	2.84	0.41	22%	3%	0	2.84	0.41	22%	3%	0

Appendix R: Landfill Gas Modelling Results RWDI Project #2402272

Table 7: Predicted Concentrations of 24-Hour Hydrogen Sulphide at Discrete Receptors

Walker South Landfill Phase 2 Environmental Assessment - Existing Conditions

Criteria (µg/m³)	Receptor ID	Common Receptor ID	Background Concentration (µg/m³)	All Walker Operations Included					Landfill Only				
				Maximum Predicted Concentration (µg/m³)		Percentage of Criteria (µg/m³)		Days Exceeding 7 µg/m³ over 5-Years	Maximum Predicted Concentration (µg/m³)		Percentage of Criteria (µg/m³)		Days Exceeding 7 µg/m³ over 5-Years
				With Background	Without Background	With Background	Without Background		With Background	Without Background	With Background	Without Background	
7	R01	--	2.20	2.24	0.04	32%	0.6%	0	2.24	0.04	32%	0.6%	0
7	R02	CR17	2.20	2.24	0.04	32%	0.6%	0	2.24	0.04	32%	0.6%	0
7	R03	CR19	2.20	2.47	0.27	35%	3.8%	0	2.47	0.27	35%	3.8%	0
7	R04	--	2.20	2.28	0.08	33%	1.1%	0	2.28	0.08	33%	1.1%	0
7	R05	--	2.20	2.27	0.07	32%	1.0%	0	2.27	0.07	32%	1.0%	0
7	R06	--	2.20	2.27	0.07	32%	1.0%	0	2.27	0.07	32%	1.0%	0
7	R07	--	2.20	2.25	0.05	32%	0.7%	0	2.25	0.05	32%	0.7%	0
7	R08	--	2.20	2.25	0.05	32%	0.7%	0	2.25	0.05	32%	0.7%	0
7	R09	CR18	2.20	2.24	0.04	32%	0.6%	0	2.24	0.04	32%	0.6%	0
7	R10	CR05	2.20	2.29	0.09	33%	1.3%	0	2.29	0.09	33%	1.3%	0
7	R11	--	2.20	2.30	0.10	33%	1.4%	0	2.30	0.10	33%	1.4%	0
7	R12	--	2.20	2.31	0.11	33%	1.5%	0	2.31	0.11	33%	1.5%	0
7	R13	--	2.20	2.31	0.11	33%	1.6%	0	2.31	0.11	33%	1.6%	0
7	R14	--	2.20	2.26	0.06	32%	0.9%	0	2.26	0.06	32%	0.9%	0
7	R15	CR10	2.20	2.49	0.29	36%	4.2%	0	2.49	0.29	36%	4.2%	0
7	R16	--	2.20	2.37	0.17	34%	2.5%	0	2.37	0.17	34%	2.5%	0
7	R17	CR01	2.20	2.25	0.05	32%	0.7%	0	2.25	0.05	32%	0.7%	0
7	R18	CR04	2.20	2.27	0.07	32%	1.0%	0	2.27	0.07	32%	1.0%	0
7	R19	CR06	2.20	2.26	0.06	32%	0.8%	0	2.26	0.06	32%	0.8%	0
7	R20	CR07	2.20	2.23	0.03	32%	0.4%	0	2.23	0.03	32%	0.4%	0
7	R21	CR8	2.20	2.43	0.23	35%	3.4%	0	2.43	0.23	35%	3.4%	0
7	R22	CR11	2.20	2.24	0.04	32%	0.5%	0	2.24	0.04	32%	0.5%	0
7	R23	CR12	2.20	2.23	0.03	32%	0.5%	0	2.23	0.03	32%	0.5%	0
7	R24	CR13	2.20	2.24	0.04	32%	0.6%	0	2.24	0.04	32%	0.6%	0
7	R25	CR14	2.20	2.23	0.03	32%	0.5%	0	2.23	0.03	32%	0.5%	0
7	R26	CR15	2.20	2.23	0.03	32%	0.4%	0	2.23	0.03	32%	0.4%	0
7	R27	CR16	2.20	2.23	0.03	32%	0.4%	0	2.23	0.03	32%	0.4%	0
7	R28	CR20	2.20	2.23	0.04	32%	0.5%	0	2.23	0.04	32%	0.5%	0
7	R29	CR21	2.20	2.25	0.05	32%	0.7%	0	2.25	0.05	32%	0.7%	0

Appendix R: Landfill Gas Modelling Results

Table 8: Predicted Concentrations of 10-Minute Total Reduced Sulphur at Discrete Receptors

Walker South Landfill Phase 2 Environmental Assessment - Existing Conditions

Criteria (µg/m^3)	Receptor ID	Common Receptor ID	Background Concentration (µg/m^3)	All Walker Operations Included					Landfill Only				
				Maximum Predicted Concentration (µg/m^3)		Percentage of Criteria (µg/m^3)		Hours Exceeding 13 µg/m^3 over 5-Years	Maximum Predicted Concentration (µg/m^3)		Percentage of Criteria (µg/m^3)		Hours Exceeding 13 µg/m^3 over 5-Years
				With Background	Without Background	With Background	Without Background		With Background	Without Background	With Background	Without Background	
13	R01	--	2.44	2.88	0.44	22%	3%	0	2.88	0.44	22%	3%	0
13	R02	CR17	2.44	2.89	0.45	22%	3%	0	2.89	0.45	22%	3%	0
13	R03	CR19	2.44	3.42	0.98	26%	8%	0	3.42	0.98	26%	8%	0
13	R04	--	2.44	2.89	0.45	22%	3%	0	2.89	0.45	22%	3%	0
13	R05	--	2.44	2.88	0.44	22%	3%	0	2.88	0.44	22%	3%	0
13	R06	--	2.44	2.88	0.44	22%	3%	0	2.88	0.44	22%	3%	0
13	R07	--	2.44	2.86	0.42	22%	3%	0	2.86	0.42	22%	3%	0
13	R08	--	2.44	2.87	0.44	22%	3%	0	2.87	0.44	22%	3%	0
13	R09	CR18	2.44	2.86	0.42	22%	3%	0	2.86	0.42	22%	3%	0
13	R10	CR05	2.44	2.86	0.42	22%	3%	0	2.86	0.42	22%	3%	0
13	R11	--	2.44	2.87	0.43	22%	3%	0	2.87	0.43	22%	3%	0
13	R12	--	2.44	2.91	0.47	22%	4%	0	2.91	0.47	22%	4%	0
13	R13	--	2.44	2.90	0.46	22%	4%	0	2.90	0.46	22%	4%	0
13	R14	--	2.44	2.92	0.48	22%	4%	0	2.92	0.48	22%	4%	0
13	R15	CR10	2.44	3.34	0.90	26%	7%	0	3.34	0.90	26%	7%	0
13	R16	--	2.44	3.19	0.75	25%	6%	0	3.19	0.75	25%	6%	0
13	R17	CR01	2.44	2.87	0.44	22%	3%	0	2.87	0.44	22%	3%	0
13	R18	CR04	2.44	2.88	0.45	22%	3%	0	2.88	0.45	22%	3%	0
13	R19	CR06	2.44	2.86	0.42	22%	3%	0	2.86	0.42	22%	3%	0
13	R20	CR07	2.44	2.83	0.39	22%	3%	0	2.83	0.39	22%	3%	0
13	R21	CR8	2.44	3.61	1.17	28%	9%	0	3.61	1.17	28%	9%	0
13	R22	CR11	2.44	2.86	0.43	22%	3%	0	2.86	0.43	22%	3%	0
13	R23	CR12	2.44	2.82	0.38	22%	3%	0	2.82	0.38	22%	3%	0
13	R24	CR13	2.44	2.90	0.47	22%	4%	0	2.90	0.47	22%	4%	0
13	R25	CR14	2.44	2.82	0.39	22%	3%	0	2.82	0.39	22%	3%	0
13	R26	CR15	2.44	2.80	0.36	22%	3%	0	2.80	0.36	22%	3%	0
13	R27	CR16	2.44	2.73	0.30	21%	2%	0	2.73	0.30	21%	2%	0
13	R28	CR20	2.44	2.85	0.41	22%	3%	0	2.85	0.41	22%	3%	0
13	R29	CR21	2.44	2.85	0.42	22%	3%	0	2.85	0.42	22%	3%	0

[1] As TRS sampling was not conducted at the landfill areas and H2S is the major constitutent of TRS, concentrations of TRS were derived based on the ratio of H2S emission rate to TRS emission rate obtained in the sampling of landfill gas collection system.

Appendix R: Landfill Gas Modelling Results **RWDI Project #2402272**

Table 9: Predicted Concentrations of 24-Hour Total Reduced Sulphur at Discrete Receptors

Walker South Landfill Phase 2 Environmental Assessment - Existing Conditions

Criteria (µg/m³)	Receptor ID	Common Receptor ID	Background Concentration (µg/m³)	All Walker Operations Included					Landfill Only				
				Maximum Predicted Concentration (µg/m³)		Percentage of Criteria (µg/m³)		Days Exceeding 7 µg/m³ over 5-Years	Maximum Predicted Concentration (µg/m³)		Percentage of Criteria (µg/m³)		Days Exceeding 7 µg/m³ over 5-Years
				With Background	Without Background	With Background	Without Background		With Background	Without Background	With Background	Without Background	
7	R01	--	2.20	2.24	0.04	32%	1%	0	2.24	0.04	32%	1%	0
7	R02	CR17	2.20	2.24	0.04	32%	1%	0	2.24	0.04	32%	1%	0
7	R03	CR19	2.20	2.47	0.27	35%	4%	0	2.47	0.27	35%	4%	0
7	R04	--	2.20	2.28	0.08	33%	1%	0	2.28	0.08	33%	1%	0
7	R05	--	2.20	2.27	0.07	32%	1%	0	2.27	0.07	32%	1%	0
7	R06	--	2.20	2.27	0.07	32%	1%	0	2.27	0.07	32%	1%	0
7	R07	--	2.20	2.25	0.05	32%	1%	0	2.25	0.05	32%	1%	0
7	R08	--	2.20	2.25	0.05	32%	1%	0	2.25	0.05	32%	1%	0
7	R09	CR18	2.20	2.24	0.05	32%	1%	0	2.24	0.05	32%	1%	0
7	R10	CR05	2.20	2.29	0.09	33%	1%	0	2.29	0.09	33%	1%	0
7	R11	--	2.20	2.30	0.10	33%	1%	0	2.30	0.10	33%	1%	0
7	R12	--	2.20	2.31	0.11	33%	2%	0	2.31	0.11	33%	2%	0
7	R13	--	2.20	2.31	0.11	33%	2%	0	2.31	0.11	33%	2%	0
7	R14	--	2.20	2.26	0.06	32%	1%	0	2.26	0.06	32%	1%	0
7	R15	CR10	2.20	2.50	0.30	36%	4%	0	2.50	0.30	36%	4%	0
7	R16	--	2.20	2.37	0.18	34%	3%	0	2.37	0.18	34%	3%	0
7	R17	CR01	2.20	2.25	0.05	32%	1%	0	2.25	0.05	32%	1%	0
7	R18	CR04	2.20	2.27	0.07	32%	1%	0	2.27	0.07	32%	1%	0
7	R19	CR06	2.20	2.26	0.06	32%	1%	0	2.26	0.06	32%	1%	0
7	R20	CR07	2.20	2.23	0.03	32%	0.4%	0	2.23	0.03	32%	0.4%	0
7	R21	CR8	2.20	2.44	0.24	35%	3%	0	2.44	0.24	35%	3%	0
7	R22	CR11	2.20	2.24	0.04	32%	1%	0	2.24	0.04	32%	1%	0
7	R23	CR12	2.20	2.23	0.04	32%	0.5%	0	2.23	0.04	32%	0.5%	0
7	R24	CR13	2.20	2.24	0.04	32%	1%	0	2.24	0.04	32%	1%	0
7	R25	CR14	2.20	2.23	0.03	32%	0.5%	0	2.23	0.03	32%	0.5%	0
7	R26	CR15	2.20	2.23	0.03	32%	0.4%	0	2.23	0.03	32%	0.4%	0
7	R27	CR16	2.20	2.23	0.03	32%	0.4%	0	2.23	0.03	32%	0.4%	0
7	R28	CR20	2.20	2.23	0.04	32%	1%	0	2.23	0.04	32%	1%	0
7	R29	CR21	2.20	2.25	0.05	32%	1%	0	2.25	0.05	32%	1%	0

[1] As TRS sampling was not conducted at the landfill areas and H2S is the major constitutent of TRS, concentrations of TRS were derived based on the ratio of H2S emission rate to TRS emission rate obtained in the sampling of landfill gas collection system.

Appendix R: Landfill Gas Modelling Results **RWDI Project #2402272**

Table 10: Predicted Concentrations of 1-Hour Nitrogen Oxides at Discrete Receptors

Walker South Landfill Phase 2 Environmental Assessment - Existing Conditions

Criteria (µg/m^3)	Receptor ID	Common Receptor ID	Background Concentration (µg/m^3)	All Walker Operations Included					Landfill Only				
				Maximum Predicted Concentration (µg/m^3)		Percentage of Criteria (µg/m^3)		Hours Exceeding 400 µg/m^3 over 5-Years	Maximum Predicted Concentration (µg/m^3)		Percentage of Criteria (µg/m^3)		Hours Exceeding 400 µg/m^3 over 5-Years
				With Background	Without Background	With Background	Without Background		With Background	Without Background	With Background	Without Background	
400	R01	--	23.4	151	127	38%	32%	0	79	56	20%	14%	0
400	R02	CR17	23.4	121	97	30%	24%	0	118	94	29%	24%	0
400	R03	CR19	23.4	132	109	33%	27%	0	129	105	32%	26%	0
400	R04	--	23.4	139	116	35%	29%	0	113	90	28%	22%	0
400	R05	--	23.4	134	110	33%	28%	0	103	80	26%	20%	0
400	R06	--	23.4	146	123	36%	31%	0	96	73	24%	18%	0
400	R07	--	23.4	174	150	43%	38%	0	93	69	23%	17%	0
400	R08	--	23.4	189	166	47%	41%	0	105	82	26%	20%	0
400	R09	CR18	23.4	140	117	35%	29%	0	69	45	17%	11%	0
400	R10	CR05	23.4	121	98	30%	25%	0	115	92	29%	23%	0
400	R11	--	23.4	134	111	34%	28%	0	111	88	28%	22%	0
400	R12	--	23.4	122	99	31%	25%	0	119	95	30%	24%	0
400	R13	--	23.4	110	87	28%	22%	0	106	83	27%	21%	0
400	R14	--	23.4	112	89	28%	22%	0	80	56	20%	14%	0
400	R15	CR10	23.4	157	134	39%	33%	0	139	116	35%	29%	0
400	R16	--	23.4	134	110	33%	28%	0	111	88	28%	22%	0
400	R17	CR01	23.4	111	88	28%	22%	0	88	65	22%	16%	0
400	R18	CR04	23.4	162	139	41%	35%	0	97	73	24%	18%	0
400	R19	CR06	23.4	113	90	28%	22%	0	85	62	21%	16%	0
400	R20	CR07	23.4	137	113	34%	28%	0	68	44	17%	11%	0
400	R21	CR8	23.4	378	355	95%	89%	0	157	133	39%	33%	0
400	R22	CR11	23.4	113	90	28%	22%	0	79	56	20%	14%	0
400	R23	CR12	23.4	92	69	23%	17%	0	79	56	20%	14%	0
400	R24	CR13	23.4	110	87	28%	22%	0	77	53	19%	13%	0
400	R25	CR14	23.4	106	83	27%	21%	0	103	80	26%	20%	0
400	R26	CR15	23.4	81	57	20%	14%	0	66	43	17%	11%	0
400	R27	CR16	23.4	123	100	31%	25%	0	62	39	16%	10%	0
400	R28	CR20	23.4	101	77	25%	19%	0	69	46	17%	11%	0
400	R29	CR21	23.4	162	138	40%	35%	0	114	91	28%	23%	0

Appendix R: Landfill Gas Modelling Results

Table 11: Predicted Concentrations of 24-Hour Nitrogen Oxides at Discrete Receptors

Walker South Landfill Phase 2 Environmental Assessment - Existing Conditions

Criteria (µg/m³)	Receptor ID	Common Receptor ID	Background Concentration (µg/m³)	All Walker Operations Included					Landfill Only				
				Maximum Predicted Concentration (µg/m³)		Percentage of Criteria (µg/m³)		Days Exceeding 200 µg/m³ over 5-Years	Maximum Predicted Concentration (µg/m³)		Percentage of Criteria (µg/m³)		Days Exceeding 200 µg/m³ over 5-Years
				With Background	Without Background	With Background	Without Background		With Background	Without Background	With Background	Without Background	
200	R01	--	21.6	36	15	18%	7%	0	26	5	13%	2%	0
200	R02	CR17	21.6	35	14	18%	7%	0	28	7	14%	3%	0
200	R03	CR19	21.6	60	39	30%	19%	0	57	36	29%	18%	0
200	R04	--	21.6	34	13	17%	6%	0	30	9	15%	4%	0
200	R05	--	21.6	33	11	16%	6%	0	29	8	15%	4%	0
200	R06	--	21.6	32	11	16%	5%	0	29	8	15%	4%	0
200	R07	--	21.6	32	10	16%	5%	0	27	6	14%	3%	0
200	R08	--	21.6	35	13	17%	7%	0	29	8	15%	4%	0
200	R09	CR18	21.6	32	10	16%	5%	0	27	5	13%	3%	0
200	R10	CR05	21.6	36	14	18%	7%	0	31	9	15%	5%	0
200	R11	--	21.6	36	14	18%	7%	0	30	9	15%	4%	0
200	R12	--	21.6	37	15	18%	8%	0	34	13	17%	6%	0
200	R13	--	21.6	39	17	19%	9%	0	35	13	18%	7%	0
200	R14	--	21.6	32	10	16%	5%	0	28	6	14%	3%	0
200	R15	CR10	21.6	56	34	28%	17%	0	56	34	28%	17%	0
200	R16	--	21.6	47	26	24%	13%	0	47	25	23%	13%	0
200	R17	CR01	21.6	35	14	18%	7%	0	27	6	14%	3%	0
200	R18	CR04	21.6	32	11	16%	5%	0	29	7	14%	3%	0
200	R19	CR06	21.6	37	15	18%	8%	0	30	9	15%	4%	0
200	R20	CR07	21.6	31	9	15%	5%	0	25	4	13%	2%	0
200	R21	CR8	21.6	58	37	29%	18%	0	50	29	25%	14%	0
200	R22	CR11	21.6	36	14	18%	7%	0	27	5	13%	3%	0
200	R23	CR12	21.6	32	10	16%	5%	0	27	5	13%	3%	0
200	R24	CR13	21.6	30	8	15%	4%	0	27	5	13%	3%	0
200	R25	CR14	21.6	32	10	16%	5%	0	28	6	14%	3%	0
200	R26	CR15	21.6	30	8	15%	4%	0	25	4	13%	2%	0
200	R27	CR16	21.6	32	10	16%	5%	0	26	4	13%	2%	0
200	R28	CR20	21.6	29	7	14%	4%	0	26	4	13%	2%	0
200	R29	CR21	21.6	40	18	20%	9%	0	30	8	15%	4%	0

Appendix R: Landfill Gas Modelling Results RWDI Project #2402272

Table 12: Predicted Concentrations of 1-Hour Sulphur Dioxides at Discrete Receptors

Walker South Landfill Phase 2 Environmental Assessment - Existing Conditions

Criteria (µg/m³)	Receptor ID	Common Receptor ID	Background Concentration (µg/m³)	All Walker Operations Included					Landfill Only				
				Maximum Predicted Concentration (µg/m³)		Percentage of Criteria (µg/m³)		Hours Exceeding 100 µg/m³ over 5-Years	Maximum Predicted Concentration (µg/m³)		Percentage of Criteria (µg/m³)		Hours Exceeding 100 µg/m³ over 5-Years
				With Background	Without Background	With Background	Without Background		With Background	Without Background	With Background	Without Background	
100	R01	--	1.1	7	6	7%	6%	0	7	6	7%	6%	0
100	R02	CR17	1.1	10	9	10%	9%	0	10	9	10%	9%	0
100	R03	CR19	1.1	46	45	46%	45%	0	46	45	46%	45%	0
100	R04	--	1.1	10	9	10%	9%	0	10	9	10%	9%	0
100	R05	--	1.1	10	8	10%	8%	0	9	8	9%	8%	0
100	R06	--	1.1	10	9	10%	9%	0	10	8	10%	8%	0
100	R07	--	1.1	10	8	10%	8%	0	10	8	10%	8%	0
100	R08	--	1.1	10	9	10%	9%	0	9	8	9%	8%	0
100	R09	CR18	1.1	9	8	9%	8%	0	9	8	9%	8%	0
100	R10	CR05	1.1	13	12	13%	12%	0	13	12	13%	12%	0
100	R11	--	1.1	20	19	20%	19%	0	19	18	19%	18%	0
100	R12	--	1.1	21	20	21%	20%	0	20	19	20%	19%	0
100	R13	--	1.1	16	15	16%	15%	0	16	15	16%	15%	0
100	R14	--	1.1	12	11	12%	11%	0	12	11	12%	11%	0
100	R15	CR10	1.1	40	39	40%	39%	0	40	39	40%	39%	0
100	R16	--	1.1	32	31	32%	31%	0	32	31	32%	31%	0
100	R17	CR01	1.1	9	8	9%	8%	0	9	8	9%	8%	0
100	R18	CR04	1.1	10	9	10%	9%	0	10	9	10%	9%	0
100	R19	CR06	1.1	10	9	10%	9%	0	10	9	10%	9%	0
100	R20	CR07	1.1	9	8	9%	8%	0	9	8	9%	8%	0
100	R21	CR8	1.1	49	48	49%	48%	0	49	48	49%	48%	0
100	R22	CR11	1.1	7	6	7%	6%	0	7	6	7%	6%	0
100	R23	CR12	1.1	10	8	10%	8%	0	9	8	9%	8%	0
100	R24	CR13	1.1	11	10	11%	10%	0	9	8	9%	8%	0
100	R25	CR14	1.1	10	9	10%	9%	0	9	8	9%	8%	0
100	R26	CR15	1.1	8	6	8%	6%	0	7	6	7%	6%	0
100	R27	CR16	1.1	9	8	9%	8%	0	7	6	7%	6%	0
100	R28	CR20	1.1	9	8	9%	8%	0	9	8	9%	8%	0
100	R29	CR21	1.1	8	7	8%	7%	0	8	7	8%	7%	0

[1] 1-Hour SO_2 results are based on the maximum among the three operating secenarios, namely Normal Operating Scenario, Maintenance Scenario and Tailgas Scenario, considered in the SO_2 model.

Appendix R: Landfill Gas Modelling Results

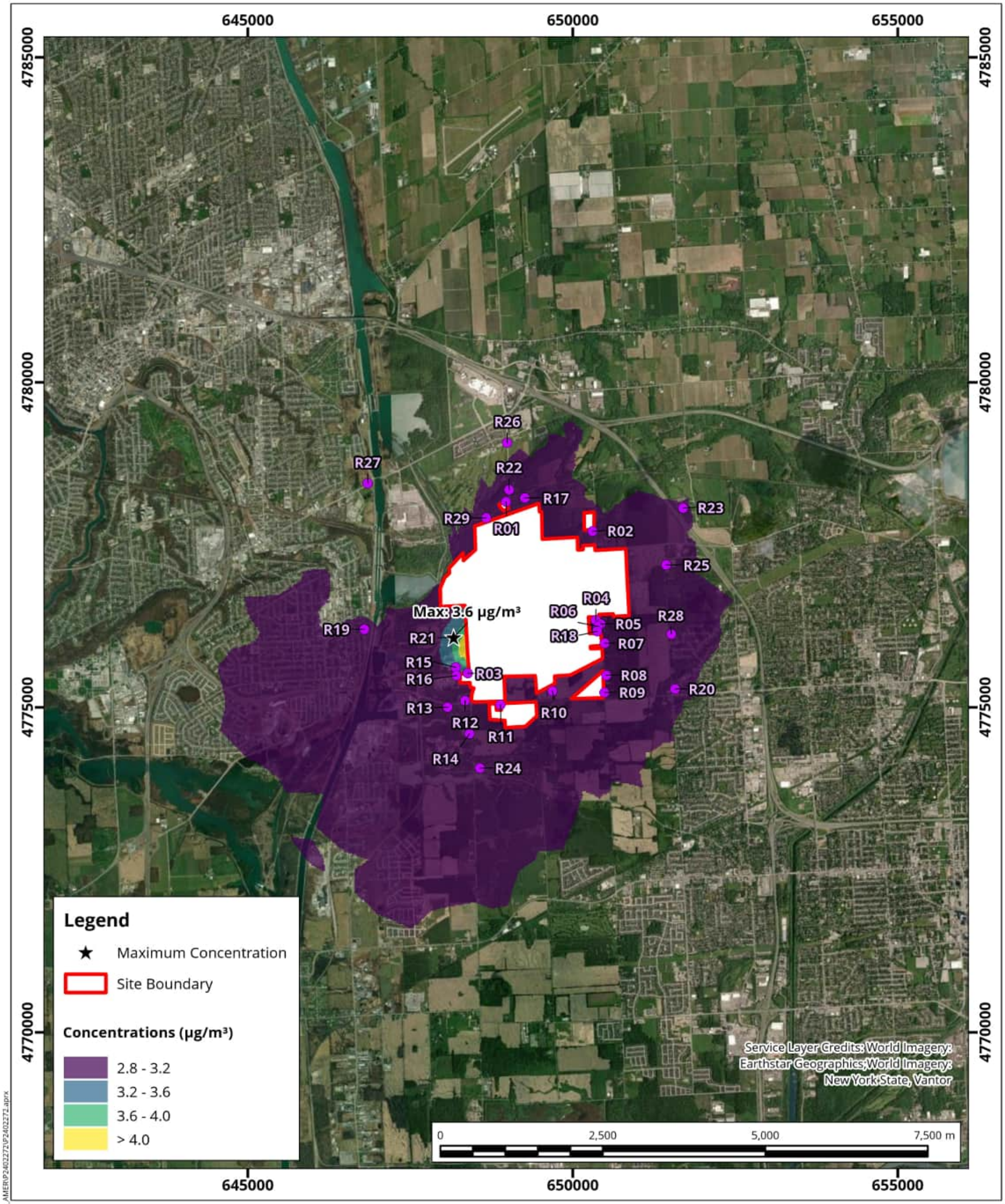
Table 13: Predicted Concentrations of Annual Sulphur Dioxides at Discrete Receptors

Walker South Landfill Phase 2 Environmental Assessment - Existing Conditions

Criteria (µg/m³)	Receptor ID	Common Receptor ID	Background Concentration (µg/m³)	All Walker Operations Included				Landfill Only			
				Maximum Predicted Concentration (µg/m³)		Percentage of Criteria (µg/m³)		Maximum Predicted Concentration (µg/m³)		Percentage of Criteria (µg/m³)	
				With Background	Without Background	With Background	Without Background	With Background	Without Background	With Background	Without Background
10	R01	--	0.5	0.7	0.1	7%	1%	0.6	0.1	6%	1%
10	R02	CR17	0.5	0.7	0.1	7%	1%	0.6	0.1	6%	1%
10	R03	CR19	0.5	1.0	0.5	10%	5%	1.0	0.5	10%	5%
10	R04	--	0.5	0.7	0.2	7%	2%	0.7	0.2	7%	2%
10	R05	--	0.5	0.7	0.2	7%	2%	0.7	0.2	7%	2%
10	R06	--	0.5	0.7	0.2	7%	2%	0.7	0.2	7%	2%
10	R07	--	0.5	0.7	0.2	7%	2%	0.7	0.1	7%	1%
10	R08	--	0.5	0.6	0.1	6%	1%	0.6	0.1	6%	1%
10	R09	CR18	0.5	0.6	0.1	6%	1%	0.6	0.1	6%	1%
10	R10	CR05	0.5	0.7	0.2	7%	2%	0.7	0.2	7%	2%
10	R11	--	0.5	0.7	0.2	7%	2%	0.7	0.2	7%	2%
10	R12	--	0.5	0.7	0.2	7%	2%	0.7	0.2	7%	2%
10	R13	--	0.5	0.7	0.1	7%	1%	0.7	0.1	7%	1%
10	R14	--	0.5	0.6	0.1	6%	1%	0.6	0.1	6%	1%
10	R15	CR10	0.5	1.0	0.5	10%	5%	1.0	0.5	10%	5%
10	R16	--	0.5	0.9	0.4	9%	4%	0.9	0.3	9%	3%
10	R17	CR01	0.5	0.7	0.2	7%	2%	0.6	0.1	6%	1%
10	R18	CR04	0.5	0.7	0.2	7%	2%	0.7	0.2	7%	2%
10	R19	CR06	0.5	0.6	0.1	6%	1%	0.6	0.1	6%	1%
10	R20	CR07	0.5	0.6	0.1	6%	1%	0.6	0.1	6%	1%
10	R21	CR8	0.5	0.9	0.4	9%	4%	0.9	0.3	9%	3%
10	R22	CR11	0.5	0.6	0.1	6%	1%	0.6	0.1	6%	1%
10	R23	CR12	0.5	0.6	0.1	6%	1%	0.6	0.1	6%	1%
10	R24	CR13	0.5	0.6	0.1	6%	1%	0.6	0.1	6%	1%
10	R25	CR14	0.5	0.6	0.1	6%	1%	0.6	0.1	6%	1%
10	R26	CR15	0.5	0.6	0.1	6%	1%	0.6	0.1	6%	1%
10	R27	CR16	0.5	0.6	0.1	6%	1%	0.6	0.04	6%	0.4%
10	R28	CR20	0.5	0.6	0.1	6%	1%	0.6	0.1	6%	1%
10	R29	CR21	0.5	0.7	0.1	7%	1%	0.6	0.1	6%	1%

[1] Annual SO_2 results are based on the Normal Operating Scenario considered in the SO_2 model, as the other two scenarios rarely happen and should not be taken into account in the long-term impact.

APPENDIX S



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Predicted 10-Minute Hydrogen Sulphide Concentrations (in µg/m³)

True North

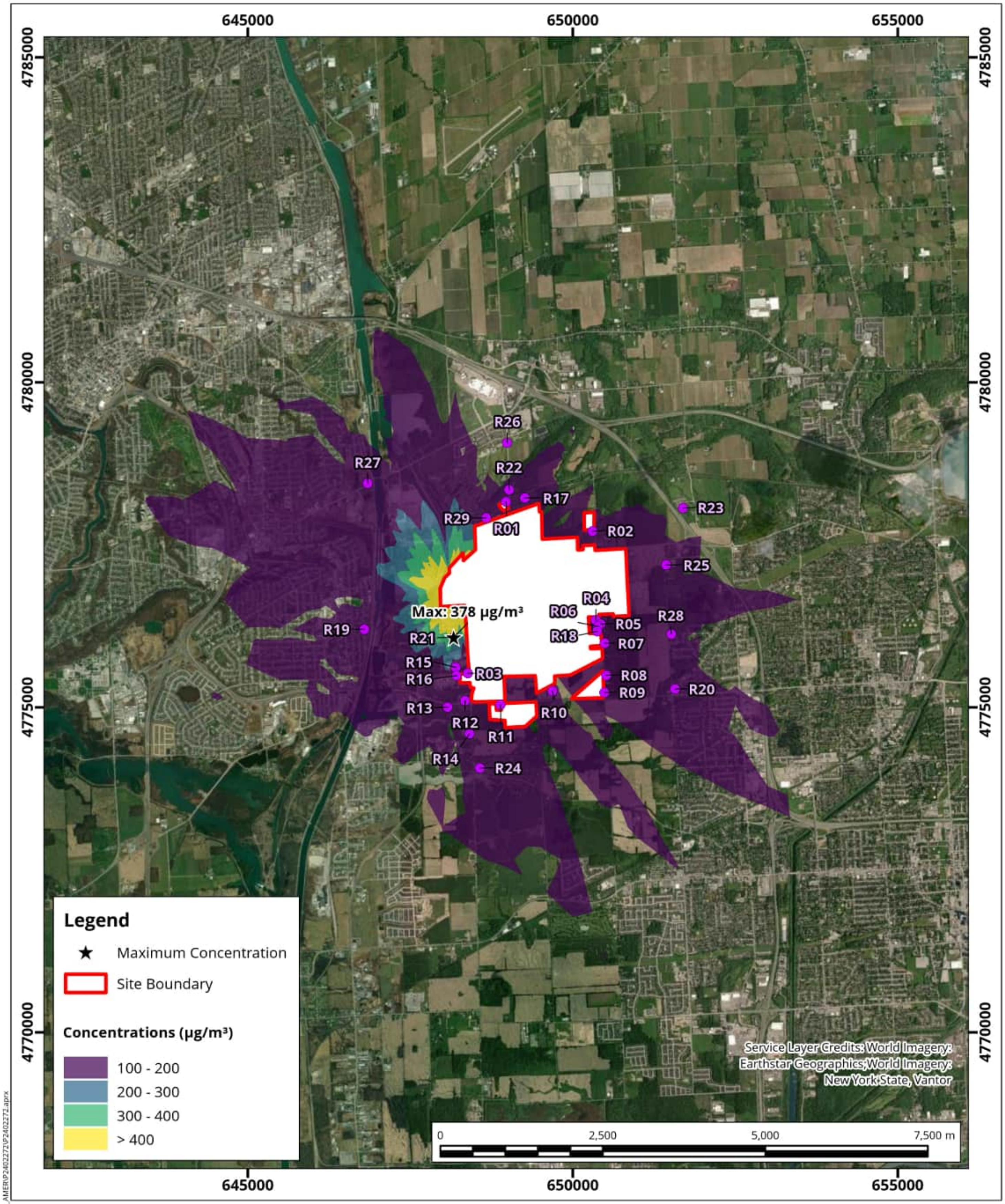
Map Projection: NAD 1983 UTM Zone 17N

Walker Landfill - Regional Municipality of Niagara, Ontario

Background Concentration: 2.4 µg/m³
AAQC: 13 µg/m³
Project #: 2402272

Drawn by: PIP	Figure: S.1
Approx. Scale:	1:80,000
Date Revised:	Jun 17, 2026

RWDI



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Predicted 1-Hour Nitrogen Oxides Concentrations (in μg/m³)

True North

Map Projection: NAD 1983 UTM Zone 17N

Walker Landfill - Regional Municipality of Niagara, Ontario

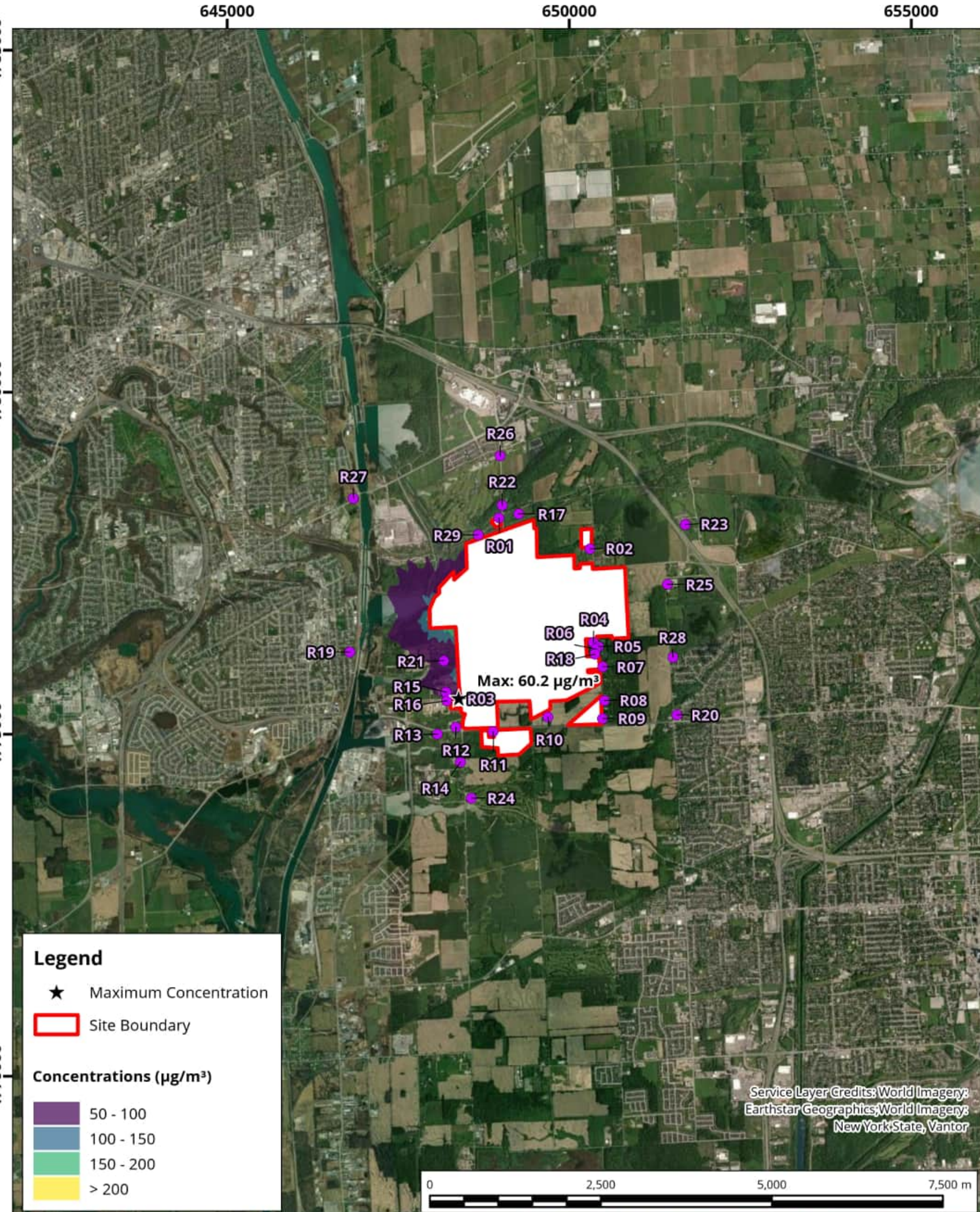
Background Concentration: 23.4 μg/m³

AAQC: 400 μg/m³

Project #: 2402272

Drawn by: PIP	Figure: S.2
Approx. Scale:	1:80,000
Date Revised:	Jun 17, 2026

RWDI



Predicted 24-Hour Nitrogen Oxides Concentrations (in µg/m³)

True North

Map Projection: NAD 1983 UTM Zone 17N

Walker Landfill - Regional Municipality of Niagara, Ontario

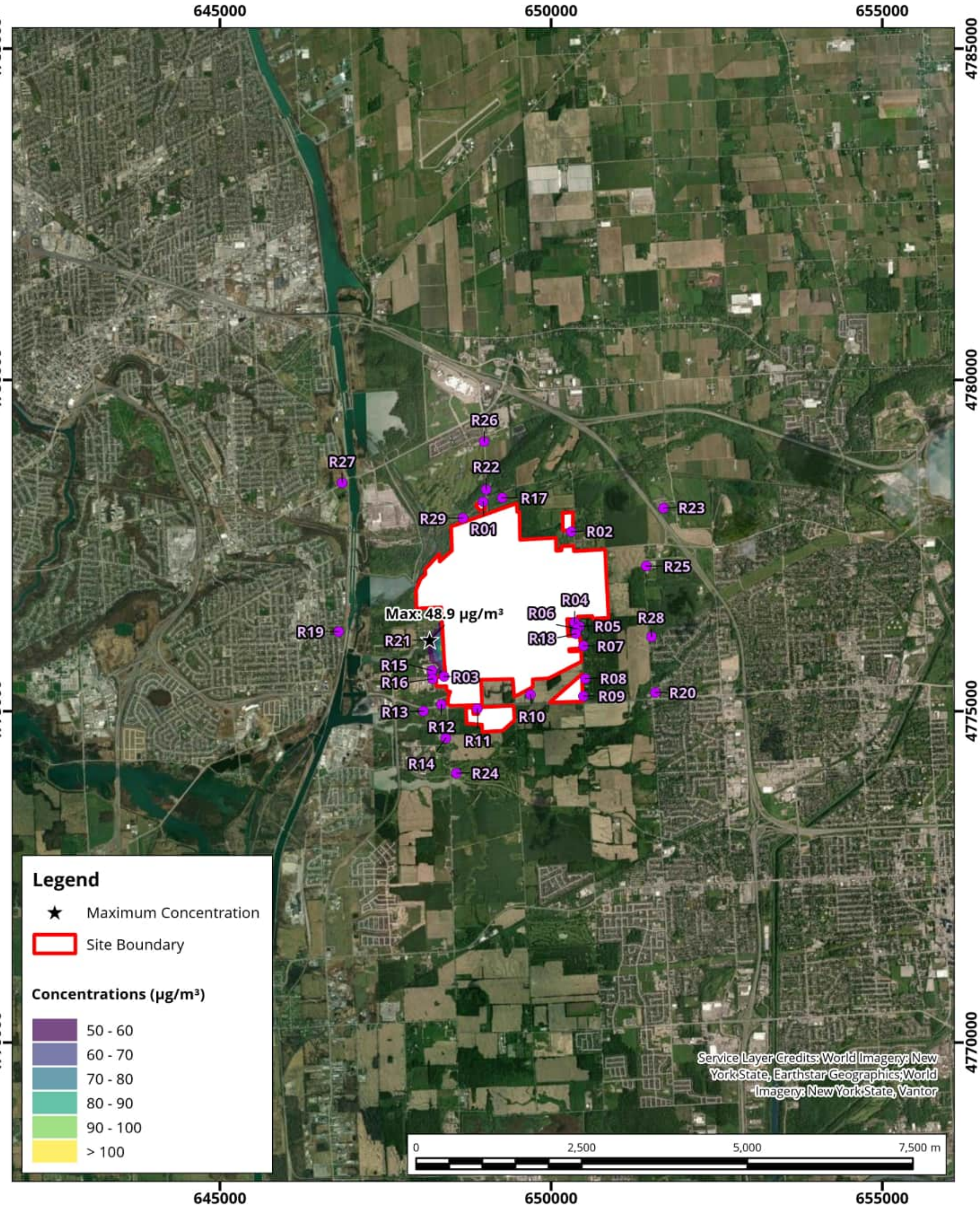
Background Concentration: 21.6 µg/m³

AAQC: 200 µg/m³

Project #: 2402272

Drawn by: PIP	Figure: S.3
Approx. Scale:	1:80,000
Date Revised:	Jun 23, 2026

Map Document: C:\WorkingFolder\Jobs_AMER\P2402272\P2402272.aprx



Predicted 1-Hour Sulphur Dioxide Concentrations (in µg/m³)

Map Document: C:\WorkingFolder\Jobs_AMER\P2402272\P2402272.aprx

Map Projection: NAD 1983 UTM Zone 17N

Walker Landfill - Regional Municipality of Niagara, Ontario

Background Concentration: 1.1 µg/m³

AAQC: 100 µg/m³

Project #: 2402272

Drawn by: PIP	Figure: S.4
Approx. Scale:	1:80,000
Date Revised:	Jun 23, 2026

APPENDIX T

1. PURPOSE

To summarize and expand upon the requirements of the Environmental Assessment (EA), Environmental Compliance Approval (ECA), and Design and Operations (D&O) report for the South Landfill (SLF) in providing additional details and directions for the control of excessive dust generation during the daily operations.

2. BACKGROUND

The EA, ECA and D&O all place requirements for the control and management of dust as follows:

- Condition 67 of the ECA requires the SLF to take all reasonable steps to operate and maintain the site so dust does not create a nuisance.
- Section 7.4.2 of the EA report and 5.8.2 of the D&O report contains mitigative measures that WEG will use to control dust.
- Particulate Matter (dust) Assessment Report includes reduction in posted on-site speed limit and use of vacuum wet-sweeping
- Table 8-1: Compliance Monitoring Summary of Commitments from the EA Report includes reduction of on-site speed limit, use of vacuum wet sweeping and use of dust suppressant compounds

3. PROCEDURE

3.1. Dust Reduction

Walker Niagara Campus Asphalt Roads Speed Limit

Walker has implemented a traffic enforcement program that monitors and enforces the posted speed limits within the Niagara Campus internal asphalt roads. This includes Thorold Townline Road and the lower road up passed the quarry from Taylor Road. The Traffic Enforcement employee will report any vehicle disobeying posted speed limits to the Manager of Health and Safety.

SLF Internal Roads Speed Limit

The posted speed limits on all internal SLF roads is 25 km/h, this includes the road from Taylor Rd to Scalehouse, the gravel road to the working face, etc. This will be monitored and enforced by the Operations Manager to ensure safety at the site and to prevent and control dust from being generated.

3.2. Dust Control & Prevention

The three main pieces of equipment used to control dust are:

- SLF Sweeper
- Quarry Water Truck
- Off-Road Water Truck (subcontracted)

SLF Sweeper

The SLF will maintain a full time Sweeper operator. The sweeper will be deployed as the Landfill Operations Manager deems necessary to sweep all internal and external asphalt roads at Walkers Niagara Campus. The Sweeper Operator will record all sweeping events in the Sweeper Log Book and file completed logs with the Operations Manager.

Quarry Water Truck

The Quarry will maintain a full time Water Truck Driver (acting as snow plow driver in winter months). The water truck will work in conjunction with the Landfill Sweeper is responsible for all internal and external asphalt roads.

Off-Road Water Truck

When conditions for dust are favourable (i.e. dry, windy, high temperature) the Operations Manager will coordinate an off-road water truck to maintain all of the SLF Internal gravel roads. These areas include the road from the scale to the working face, the road from the scale to the ELF soil pile, or any other road/ pad the Quarry Water Truck is unable to manage.

Dust Suppressants

Use of winter dust suppressant compounds on the unpaved internal landfill roads in order to reduce roadway dust levels during the critical winter months when water can't be used.

3.3. Other Mitigative Measures

Screening

Maintain vegetation around perimeter/inside property for dust screening. (Vegetation over 2 meters tall that provides year-round density is preferred.)

Administrative

During the review of the waste generators Waste Stream Information Sheet (WSIS), ensure that any material that has a potential to create an abundance of dust is bagged prior to arrival at the SLF. If a material shows up that risks creating an adverse effect, the Operations Manager may refuse the load or if possible, direct the load to an area that minimizes offsite impacts.

Operations

Refuse loads that have presented a dust control issue on windy days. On windy days, direct loads to areas that minimize dust impacts where possible

Progressive Rehabilitation

To assist in controlling dust; as areas of the landfill reach final elevations, the Operations Manager will progressively vegetate and maintain final covered areas with tall grasses that provide year round density.

Access Roads

Access roads within the landfill will be placed below grade wherever possible, to reduce the amount of dust that will be carried by the wind from the site.

3.4. Monitor Wind Conditions

It is the responsibility of the Landfill Operations Manager, compactor operators and the water truck operator to monitor the dust and wind conditions during the day's operation.

When dust and wind conditions dictate the need for control, the Landfill Operations Manager will contact the water truck operator to determine the availability of the water truck. The Landfill Superintendent will contact the driver of this vehicle to describe the areas in need of attention.

Compactor operators are responsible for contacting the Landfill Operations Manager when dust and wind conditions dictate the need for control. Should the Landfill Superintendent not be available, the compactor operator will contact the water truck operator to determine the availability of the water truck and will describe to the driver of this vehicle the areas in need of attention.

The Water Truck Operator should automatically control problem areas on the paved roads leading to all WIHL operations located at the Niagara Campus when dust and wind conditions dictate the need for control.

4. APPLICABILITY

The following individuals must review and acknowledge their awareness of this SOP and its requirements:

- SLF General Manager, Operations Manager, and Operations Supervisor (all sections)
- SLF Operators (all sections)
- SLF Scalehouse / Inspection Staff (all sections)
- WIHL Environmental Coordinator(s) / Manager(s) assigned to the SLF (all sections)Manager(s) of LFG operations, IGRS / Comcor (section 3.1 landfill gas)

5. ADDITIONAL RESOURCES

5.1. SLF Sweeper Daily Log

walker

Sweeper Truck Log

Area Covered	Notes	Total Hours
Main Internal Roads		
Residential Drop Off		
Compost GORE Pad		
Compost Site internal asphalt roads/ pads		
Residential Drop- off Entrance Way & Scales		
WBQ Scales		
Woodington Compound		
WIHL Employee Parking Lot		
Old Thorold Rd./Townline Rd.		
Taylor Rd.		
RQ		
VQ		
Other		
Cleaning & Maintenance		
South Landfill Entrance		

Date: ____________________

Hours Worked: ______________ **Sweeper Unit #: Walker Unit #505**

walkerind.com

6. AMENDMENT RECORD

Revision no.	Page no.	Section no.	Reason/detail	Date	Who
1	Entire SOP	Entire SOP	Revision of old SOP 11.3	19-Feb-2025	RK/LP

APPENDIX U

Appendix U: Wind Erosion Emissions

RWDI Project #2402272

Walker South Landfill Phase 2 Environmental Assessment

INDUSTRIAL WIND EROSION - AP-42 Section 13.2.5

Meteorological Station Anemometer height, z (m):	10	
Maximum recorded hourly wind speed (m/s):	16.03	
Fastest Mile Wind Speed (m/s):	18.4	**[1]**
Shear Velocity u* (m/s):	0.909	**[2]**

Prandtl-von Kármán Equation: $u^* = u_z\, k / \ln(z / z_o)$, k = 0.4

Emission factor: $E = K\, \Sigma\, P_i$ (i from 1 to N)

Erosion potential function: $P = 58\,(u^* - u_t^*)^2 + 25\,(u^* - u_t^*)$

$P = 0$ for $u^* \le u_t^*$

u* shear / friction velocity (m/s)
u_z wind speed at height z (m/s)
k von Kármán's contstant
K particle size multiplier (1, 0.6, 0.5 and 0.075 for TSP, PM_{15}, PM_{10} and $PM_{2.5}$, respectively)
z_o surface roughness length (m)
z anemometer height (m)

ID [3]	Pile	z_o	u*	u_t*	Number of Disturbances [4]			Area	Maximum	Base AP-42 Emission Factor			Base Emission Rate			Additional	Final Controlled Emission Rate at 16.03 m/s					
		(m)		[3] (m/s)	Hourly (#/h)	Daily (#/d)	Annual (#/a)	Disturbed [5] (m^2)	Erosion Potential	TSP (g/m²)	PM_{10} (g/m²)	$PM_{2.5}$ (g/m²)	TSP (g/s)	PM_{10} (g/s)	$PM_{2.5}$ (g/s)	Control Efficiency Applied (%)	TSP (g/s)	Data Quality Rating	PM_{10} (g/s)	Data Quality Rating	$PM_{2.5}$ (g/s)	Data Quality Rating
WE_APRAP	Wind Erosion from Recycled Asphalt Pavement (RAP) Stockpile	0.003	0.909	1.02	1	1	1	5350	0.000	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0%	0.0E+00	E	0.0E+00	E	0.0E+00	E
WE_QPFP1	Wind Erosion from Quarry Finished Product Stockpile (Granular A)	0.003	0.909	1.02	1	1	1	6844	0.000	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0%	0.0E+00	E	0.0E+00	E	0.0E+00	E
WE_QPFP2	Wind Erosion from Quarry Finished Product Stockpile (Granular B)	0.003	0.909	1.02	1	1	1	5100	0.000	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0%	0.0E+00	E	0.0E+00	E	0.0E+00	E
WE_QPFP3	Wind Erosion from Quarry Finished Product Stockpile (Granular M)	0.003	0.909	1.02	1	1	1	2520	0.000	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0%	0.0E+00	E	0.0E+00	E	0.0E+00	E
WE_QPFP4	Wind Erosion from Quarry Finished Product Stockpile (Screenings)	0.003	0.909	1.02	1	1	1	576	0.000	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0%	0.0E+00	E	0.0E+00	E	0.0E+00	E
WE_QPFP5	Wind Erosion from Quarry Finished Product Stockpile (Clear Stone)	0.003	0.909	1.02	1	1	1	2820	0.000	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0%	0.0E+00	E	0.0E+00	E	0.0E+00	E
WE_QPFP6	Wind Erosion from Quarry Finished Product Stockpile (Sand)	0.003	0.909	1.02	1	1	1	2432	0.000	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0%	0.0E+00	E	0.0E+00	E	0.0E+00	E
WE_SLFIC	Wind Erosion from Areas under Interim Cover at South Landfill	0.003	0.909	1.02	1	1	1	311723	0.000	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0%	0.0E+00	E	0.0E+00	E	0.0E+00	E
WE_SLFCON	Wind Erosion from Cell Construction Area at South Landfill	0.003	0.909	1.02	1	1	1	4000	0.000	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0%	0.0E+00	E	0.0E+00	E	0.0E+00	E
WE_SLFCAP	Wind Erosion from Final Capping Construction Area at South Landfill	0.003	0.909	1.02	1	1	1	4000	0.000	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0%	0.0E+00	E	0.0E+00	E	0.0E+00	E
WE_SOIL	Wind Erosion from Waste Soil Stockpile	0.003	0.909	1.02	1	1	1	37767	0.000	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0%	0.0E+00	E	0.0E+00	E	0.0E+00	E

Notes:

[1] Speed-up factor to convert hourly mean wind speeds to fastest mile wind gust taken from Durst curve for in North America (1.15).
(Krayer, William R>, Marshall, Richard D. 1992: Gust Factors Applied to Hurrican Winds. Bulletin of the American Meteorological Society, Vol. 73, No. 5, May 1992)

[2] Used for sample calculations & factor validation

[3] Typical threshold friction veolocities can be taken from Table 13.2.5-2 of AP-42, or other suitable sources.

[4] Reflects the estimated maximum number of disturbances for each pile within the specified time period.

[5] Estimated from type of operations (e.g., loader operations, scraper activity, etc.)

Sample Calculations

Shear Velocity: = (18.4345 m/s) x 0.4 / LN ((10 m) / (0.003 m)) = 0.909 m/s

Maximum Erosion Potential: 0.909 m/s < 1.02 m/s therefore no erosion potential

TSP Emission Factor: no erosion poetntial

Base Emission Rate: no erosion poetntial

APPENDIX V

Appendix V: Bulk Material Handling Emissions

Walker South Landfill Phase 2 Environmental Assessment

Material handling emissions: $E = 0.0016\ k\ (U / 2.2)^{1.3} / (M / 2)^{1.4}$

- **E** emission factor
- **k** particle size multiplier (0.8, 0.35 and 0.053 for TSP, PM_{10} and $PM_{2.5}$) [3]
- **U** mean wind speed, meters per second (m/s)
- **M** material moisture content (%)

AGGREGATE HANDLING AND STORAGE PILES - AP-42 Section 13.2.4

Average recorded hourly wind speed (m/s): 3.9
(used for sample calculations & factor validation)

Source ID	Description	Processing Rate		Site Data				Base AP-42 Emission Factor			Base Emission Rate			Additional Control Efficiency Applied	Final Controlled Emission Rate at 3.9 m/s					
		Hourly (Mg/h)	Daily (Mg/d)	Site Specific Data? (y/n)	Silt Content (%)	Moisture Content (%)	Source Conditions Valid [1]	TSP [2] (kg/Mg)	PM_{10} (kg/Mg)	$PM_{2.5}$ (kg/Mg)	TSP (g/s)	PM_{10} (g/s)	$PM_{2.5}$ (g/s)	(%)	TSP (g/s)	Data Quality Rating	PM_{10} (g/s)	Data Quality Rating	$PM_{2.5}$ (g/s)	Data Quality Rating
Walker Environmental Group Inc. – Landfill																				
SDrop_Soil	Soil Drop off at Waste Soil Pile	67	667	y	56.5%	32.8%	silt too high	5.37E-05	2.35E-05	3.56E-06	9.94E-04	4.35E-04	6.59E-05		9.94E-04	B	4.35E-04	B	6.59E-05	B
SPick_Soil	Soil Pick up from Waste Soil Pile	1000	1000	y	56.5%	32.8%	silt too high	5.37E-05	2.35E-05	3.56E-06	1.49E-02	6.52E-03	9.88E-04		1.49E-02	B	6.52E-03	B	9.88E-04	B
SDrop_SLFWF	Soil Drop off at Working Face of South Landfill Phase 1	1000	1000	y	56.5%	32.8%	silt too high	5.37E-05	2.35E-05	3.56E-06	1.49E-02	6.52E-03	9.88E-04		1.49E-02	B	6.52E-03	B	9.88E-04	B
DROP_SLFCON	Clay Drop off at Cell Construction Area of South Landfill Phase 1	203	2034	y	56.5%	32.8%	silt too high	5.37E-05	2.35E-05	3.56E-06	3.03E-03	1.32E-03	2.00E-04		3.03E-03	B	1.32E-03	B	2.00E-04	B
DROP_SLFCAP	Clay Drop off at Final Capping Construction Area of South Landfill Ph	98	981	y	56.5%	32.8%	silt too high	5.37E-05	2.35E-05	3.56E-06	1.46E-03	6.39E-04	9.68E-05		1.46E-03	B	6.39E-04	B	9.68E-05	B
Walker Aggregates Inc. - Quarry and Asphalt Plant																				
QPPIKUP1	Granular A Loading at Processing Plant (Finished Product)	600	8400	n	1.6%	2.1%	valid	2.52E-03	1.10E-03	1.67E-04	4.19E-01	1.83E-01	2.78E-02		4.19E-01	B	1.83E-01	B	2.78E-02	B
QPPIKUP2	Granular B Loading at Processing Plant (Finished Product)	130	1820	n	1.6%	2.1%	valid	2.52E-03	1.10E-03	1.67E-04	9.09E-02	3.98E-02	6.02E-03		9.09E-02	B	3.98E-02	B	6.02E-03	B
QPPIKUP3	Granular M Loading at Processing Plant (Finished Product)	30	420	n	1.6%	2.1%	valid	2.52E-03	1.10E-03	1.67E-04	2.10E-02	9.17E-03	1.39E-03		2.10E-02	B	9.17E-03	B	1.39E-03	B
QPPIKUP4	Screenings Loading at Processing Plant (Finished Product)	10	140	n	1.6%	2.1%	valid	2.52E-03	1.10E-03	1.67E-04	6.99E-03	3.06E-03	4.63E-04		6.99E-03	B	3.06E-03	B	4.63E-04	B
QPPIKUP5	Clear Stone Loading at Processing Plant (Finished Product)	200	2800	n	1.6%	2.1%	valid	2.52E-03	1.10E-03	1.67E-04	1.40E-01	6.12E-02	9.26E-03		1.40E-01	B	6.12E-02	B	9.26E-03	B
QPPIKUP6	Sand Loading at Processing Plant (Finished Product)	30	420	n	1.6%	2.1%	valid	2.52E-03	1.10E-03	1.67E-04	2.10E-02	9.17E-03	1.39E-03		2.10E-02	B	9.17E-03	B	1.39E-03	B
RAPPILE	Loading RAP to RAP stockpile	67	931	n	1.6%	2.1%	valid	2.52E-03	1.10E-03	1.67E-04	4.65E-02	2.03E-02	3.08E-03		4.65E-02	B	2.03E-02	B	3.08E-03	B
RAPDUMP	Loading RAP to Plant	67	931	n	1.6%	2.1%	valid	2.52E-03	1.10E-03	1.67E-04	4.65E-02	2.03E-02	3.08E-03		4.65E-02	B	2.03E-02	B	3.08E-03	B
Niagara Biosolids Facility and Compost Facility																				
DROPOFF	Receiving Leaf & yard Material in Open Windrow Area	100	1000	n	9%	10%	moisture too high	2.83E-04	1.24E-04	1.88E-05	7.86E-03	3.44E-03	5.21E-04		7.86E-03	C	3.44E-03	C	5.21E-04	C
MOVE1	Movement of Material into Windrow (Open Windrow area)	100	1000	n	9%	10%	moisture too high	2.83E-04	1.24E-04	1.88E-05	7.86E-03	3.44E-03	5.21E-04		7.86E-03	C	3.44E-03	C	5.21E-04	C
MOVE2	Movement of Material into Windrow (GORE area)	100	1000	n	9%	10%	moisture too high	2.83E-04	1.24E-04	1.88E-05	7.86E-03	3.44E-03	5.21E-04		7.86E-03	C	3.44E-03	C	5.21E-04	C
SCRTSP	Drop at Screening Area	100	1000	n	9%	10%	moisture too high	2.83E-04	1.24E-04	1.88E-05	7.86E-03	3.44E-03	5.21E-04		7.86E-03	C	3.44E-03	C	5.21E-04	C
FSTPL	Drop at Final Stockpile	100	1000	n	9%	10%	moisture too high	2.83E-04	1.24E-04	1.88E-05	7.86E-03	3.44E-03	5.21E-04		7.86E-03	C	3.44E-03	C	5.21E-04	C
FP	Loading of Material for Shipment Off-Site	100	1000	n	9%	10%	moisture too high	2.83E-04	1.24E-04	1.88E-05	7.86E-03	3.44E-03	5.21E-04		7.86E-03	C	3.44E-03	C	5.21E-04	C

Notes:

[1] Relates to AP-42 Section 13.2.4-4

[2] k-factor for TSP (PM44) scaled up logarithmically to 0.8 from published k-factor of 0.74 which refers to PM30.

Sample calculation for uncontrolled TSP emission factor for Source QPPIKUP1: Granular A Loading at Processing Plant (Finished Product), at a sample wind speed of 3.9 m/s

EF = 0.0016 x (0.8) x ((3.9 m/s) / 2.2)^1.3 / ((2.1%) / 2)^1.4 = 2.52E-03 kg TSP / Mg handled

Sample calculation for TSP emission rate for Source QPPIKUP1: Granular A Loading at Processing Plant (Finished Product), at a sample wind speed of 5 m/s

$$\frac{600\ Mg_{handled}}{1\ h} \times \frac{2.52E\text{-}03\ kg_{TSP}}{1\ Mg_{handled}} \times \frac{1\ h}{3600\ s} \times \frac{1000\ g_{TSP}}{1\ kg_{TSP}} \times \frac{1\ g_{TSP\ uncontrolled}}{1\ g_{TSP}} = 4.19E\text{-}01\ g_{TSP} / s$$

Comments
Maximum shipping rate of finished stone products is 1000 tonnes per hour (e-mail dated November 28, 2014)
Shipping of finished stone products typically occurs during 5am to 7pm.
Material handling for daily cover application is 1,000 Mg/day (provided by WEG on March 19, 2026). It spans 1 hour from 4:30pm to 5:30pm (for modelling purpose it was modelled during 5pm to 6pm).
Material handling for clay for cell and final capping construction are estimated based on the total amount (provided by WEG on March 19, 2026) and the length of construction period.
Material handling for Compost Facility sources is based on processing capacity of equipment in building (100 tonnes per hour)
Silt content and moisture conent for quarry and asphalt plants and Compost Facility are extracted from their own ESDM report.
Silt content and moisture conent for soil and clay pickup/drop-off at landfill are based on on-site sampling data.

APPENDIX W

Appendix W: Bulldozing Emission Rate Calculations

Walker South Landfill Phase 2 Environmental Assessment

Western Surface Coal Mining AP -42 Section 11.9 (11.9-2, 11.9-4)

Total Parti PM10 PM2.5

ID	Process Name / Description	AP-42 Process Description	Process Code	AP-42 Chapter	Activity Rate			Units	Additional Parameters				Base AP-42 Emission Factor				Base Emission Rate			Additional	Final Controlled Emission Rate					
					Hourly (units/h)	Daily (units/d)	Annual (units/a)		Material Moisture Content [1] (%)	Material Silt Content [2] (%)	Drop Height [3] (m)	Mean Vehicle Speed [4] (km/h)	TSP	PM_{10}	$PM_{2.5}$	Units	TSP (g/s)	PM_{10} (g/s)	$PM_{2.5}$ (g/s)	Control Efficiency Applied [5] (%)	TSP (g/s)	Data Quality Rating	PM_{10} (g/s)	Data Quality Rating	$PM_{2.5}$ (g/s)	Data Quality Rating
DOZER_Soil	Bulldozer at Waste Soil Pile - Fugitive dust	Bulldozing - overburden	4	Table 11.9-2	1	-	-	hours of operation	32.8	56.5	-	-	3.52E+00	1.08E+00	3.70E-01	kg/hr	9.78E-01	3.00E-01	1.03E-01		9.78E-01	B	3.00E-01	D	1.03E-01	D
DOZER_SLF	Bulldozer at Working Face of South Landfill Phase 1 - Fugitive dust	Bulldozing - overburden	4	Table 11.9-2	1	-	-	hours of operation	32.8	56.5	-	-	3.52E+00	1.08E+00	3.70E-01	kg/hr	9.78E-01	3.00E-01	1.03E-01		9.78E-01	B	3.00E-01	D	1.03E-01	D
DOZER_SLFCON	Bulldozer at Cell Construction Area of South Landfill Phase 1 - Fugitive dust	Bulldozing - overburden	4	Table 11.9-2	1	-	-	hours of operation	32.8	56.5	-	-	3.52E+00	1.08E+00	3.70E-01	kg/hr	9.78E-01	3.00E-01	1.03E-01		9.78E-01	B	3.00E-01	D	1.03E-01	D

Notes:

[1] Applies to truck loading, bulldozing and dragline operations only

[2] Applies to bulldozing operations only

[3] Applies to dragline operations only

[4] Applies to grading operations only

[5] Enter the control efficiency for each source - if no controls are applied, leave blank

Sample calculations for TSP emission factor for DOZER_Soil: Bulldozer at Waste Soil Pile - Fugitive dust

TSP Emission Factor = 2.6 x 56.5^1.2 / 32.8^1.3 = 3.52E+00 kg/hr

Sample calculations for TSP emission rate for DOZER_Soil: Bulldozer at Waste Soil Pile - Fugitive dust

$$\frac{3.52E+00\ kg_{TSP}}{1\ hour} \times \frac{1\ h}{3600\ s} \times \frac{1000\ g_{TSP}}{1\ kg_{TSP}} = 9.78E-01\ g_{TSP} / s$$

APPENDIX X

Appendix X1: Blasting Operations Emission

RWDI Project #2402272

Walker South Landfill Phase 2 Environmental Assessment

WESTERN SURFACE COAL MINING - AP-42 Section 11.9
EXPLOSIVES DETONATION - AP-42 Section 13.3

Blasting operation particulate emissions: $E = 0.00022\ k * A^{1.5}$

E emission factor
k particle size multiplier (1, 0.52 and 0.03 for TSP, PM_{10} and $PM_{2.5}$)
A blast surface area (m^2)

Source ID	Source Description	Total Blast Area	Explosive Type		Number of Blasts			Base AP-42 Emission Factor			Base Emission Rate			Additional Control Efficiency Applied	Final Controlled Emission Rate					
					Hourly	Daily	Annual	TSP	PM_{10}	$PM_{2.5}$	TSP	PM_{10}	$PM_{2.5}$		TSP	Data Quality Rating	PM_{10}	Data Quality Rating	$PM_{2.5}$	Data Quality Rating
		(m^2)						(kg/blast)	(kg/blast)	(kg/blast)	(g/s)	(g/s)	(g/s)	(%)	(g/s)		(g/s)		(g/s)	
QBLAST	Blasting at Working Face	346	ANFO		1	2	730	1.42E+00	7.36E-01	4.25E-02	3.93E-01	2.05E-01	1.18E-02	0%	3.93E-01	C	2.05E-01	C	1.18E-02	C

Sample calculation for uncontrolled TSP emission factor for Source QBLAST: Blasting at Working Face.

EF = 0.00022 x (1) x (346 m)^1.5 = 1.42E+00 kg TSP / blast

Sample calculation for TSP emission rate for Source QBLAST: Blasting at Working Face.

1 blast	1.42E+00 kg_{TSP}	1 h	1000 g_{TSP}	1 $g_{TSP\ uncontrolled}$		
1 h	1 blast	3600 s	1 kg_{TSP}	1 g_{TSP}	=	3.93E-01 g_{TSP} / s

Comments
Height of wall = 44ft (13.4m)
Blast area provided via email on February 3, 2015: the typical blasting area is 3720 square feet.

Appendix X2: Processing Emissions

RWDI Project #2402272

Walker South Landfill Phase 2 Environmental Assessment

Soource ID	Source Description / Process Decription	AP-42 Process Description [1]	Process Code	AP-42 Chapter	Processing Rate Hourly (Mg/h)	Daily (Mg/d)	Annual (Mg/a)	Base AP-42 Emission Factor [2] TSP [3] (kg/Mg)	PM_{10} (kg/Mg)	$PM_{2.5}$ (kg/Mg)	Base Emission Rate TSP (g/s)	PM_{10} (g/s)	$PM_{2.5}$ (g/s)	Additional Control Efficiency Applied (%) [4][5][6][7][8]	Final Controlled Emission Rate TSP (g/s)	Data Quality Rating	PM_{10} (g/s)	Data Quality Rating	$PM_{2.5}$ (g/s)	Data Quality Rating
Walker Aggregates Inc. - Quarry and Asphalt Plant																				
QP1CRUSH	Primary Crusher	Primary crushing (controlled)	6	11.19.2-1	800	11,200		3.40E-04	2.70E-04	5.00E-05	7.56E-02	6.00E-02	1.11E-02	70%	2.27E-02	E	1.80E-02	E	3.33E-03	E
QPSCALP	Scalping Screen	Screening (controlled)	2	11.19.2-1	800	11,200		5.60E-04	3.70E-04	2.50E-05	1.24E-01	8.22E-02	5.56E-03	70%	3.73E-02	E	2.47E-02	C	1.67E-03	E
QP2CRUSH	Secondary Crusher	Secondary crushing (controlled)	7	11.19.2-1	560	7,840		3.40E-04	2.70E-04	5.00E-05	5.29E-02	4.20E-02	7.78E-03	70%	1.59E-02	E	1.26E-02	E	2.33E-03	E
QPSIZING	Sizing Screen	Screening (controlled)	2	11.19.2-1	560	7,840		5.60E-04	3.70E-04	2.50E-05	8.71E-02	5.76E-02	3.89E-03	70%	2.61E-02	E	1.73E-02	C	1.17E-03	E
QPCLASS	Classifier	Classifiers (Dry) with Fabric Filter Control (controlled)	19	11.19.2-3	75	1,050		1.12E-02	5.20E-03	2.00E-03	2.33E-01	1.08E-01	4.17E-02	70%	7.00E-02	E	3.25E-02	E	1.25E-02	E
QPCCRUSH	Cone Crusher #3	Tertiary crushing (controlled) [9]	8	11.19.2-1	200	2,800		3.40E-04	2.70E-04	5.00E-05	1.89E-02	1.50E-02	2.78E-03	70%	5.67E-03	E	4.50E-03	C	8.33E-04	E
QPSIZNG2	Screen #2 - After Cone Crusher	Screening (controlled)	2	11.19.2-1	200	2,800		5.60E-04	3.70E-04	2.50E-05	3.11E-02	2.06E-02	1.39E-03	70%	9.33E-03	E	6.17E-03	C	4.17E-04	E
QPDROP3	Quarry Drop Point at Granular A	Conveyor transfer point (controlled)	14	11.19.2-1	328	4,592		3.70E-05	2.30E-05	6.50E-06	3.37E-03	2.10E-03	5.92E-04		3.37E-03	E	2.10E-03	D	5.92E-04	E
QPDROP4	Quarry Drop Point at Surge Pile	Conveyor transfer point (controlled)	14	11.19.2-1	328	4,592		3.70E-05	2.30E-05	6.50E-06	3.37E-03	2.10E-03	5.92E-04		3.37E-03	E	2.10E-03	D	5.92E-04	E
QPDROP5	Quarry Drop Point at sand/concrete stone	Conveyor transfer point (controlled)	14	11.19.2-1	328	4,592		3.70E-05	2.30E-05	6.50E-06	3.37E-03	2.10E-03	5.92E-04		3.37E-03	E	2.10E-03	D	5.92E-04	E
QPLOAD	Quarry Handling: Truck Loading at Quarry Working Face	Truck unloading - fragmented stone	16	11.19.2-1	800	11,200		1.10E-05	8.00E-06	1.20E-06	2.44E-03	1.78E-03	2.67E-04		2.44E-03	E	1.78E-03	E	2.67E-04	E
QPDUMP	Quarry Handling: Truck Unloading at Processing Plant	Truck unloading - fragmented stone	16	11.19.2-1	800	11,200		1.10E-05	8.00E-06	1.20E-06	2.44E-03	1.78E-03	2.67E-04	70%	7.33E-04	E	5.33E-04	E	8.00E-05	E
QDRILL	Quarry - Drilling at active face (drilling holes for blasting charges)	Wet drilling: unfragmented stone	15	11.19.2-1	1	14		5.70E-05	4.00E-05	6.00E-06	1.58E-05	1.11E-05	1.67E-06		1.58E-05	E	1.11E-05	E	1.67E-06	E
AH_DROP	Drop off of raw material at asphalt plant.	Truck unloading - conveyor: crushed stone	17	11.19.2-1	350	4,900		7.20E-05	5.00E-05	7.50E-06	7.00E-03	4.86E-03	7.29E-04		7.00E-03	E	4.86E-03	E	7.29E-04	E
Niagara Biosolids Facility and Compost Facility																				
SILO_1	Silo #1 Bin Vent	Pneumatic cement unloading to elevated storage silo	24	11.12-1	20	240		3.60E-01	2.40E-01	3.60E-02	2.00E+00	1.33E+00	2.00E-01	99.9%	2.00E-03	E	1.33E-03	E	2.00E-04	E
SILO_2	Silo #2 Bin Vent	Pneumatic cement unloading to elevated storage silo	24	11.12-1	20	240		3.60E-01	2.40E-01	3.60E-02	2.00E+00	1.33E+00	2.00E-01	99.9%	2.00E-03	E	1.33E-03	E	2.00E-04	E
SCREEN1	Screening Emissions	Fines screening (controlled)	12	11.19.2-1	40	480		1.10E-03	1.10E-03	1.65E-04	1.22E-02	1.22E-02	1.83E-03		1.22E-02	E	1.22E-02	E	1.83E-03	E
SCREEN2	Screening Emissions	Fines screening (controlled)	12	11.19.2-1	40	480		1.10E-03	1.10E-03	1.65E-04	1.22E-02	1.22E-02	1.83E-03		1.22E-02	E	1.22E-02	E	1.83E-03	E
SCREEN3	Screening Emissions	Fines screening (controlled)	12	11.19.2-1	75	900		1.10E-03	1.10E-03	1.65E-04	2.29E-02	2.29E-02	3.44E-03		2.29E-02	E	2.29E-02	E	3.44E-03	E
SCREEN4	Screening Emissions	Fines screening (controlled)	12	11.19.2-1	75	900		1.10E-03	1.10E-03	1.65E-04	2.29E-02	2.29E-02	3.44E-03		2.29E-02	E	2.29E-02	E	3.44E-03	E
GRINDR	Fugitive emissions from Grinder	Fines screening (controlled)	12	11.19.2-1	75	900		1.10E-03	1.10E-03	1.65E-04	2.29E-02	2.29E-02	3.44E-03		2.29E-02	E	2.29E-02	E	3.44E-03	E
GRINDR2_N	Fugitive emissions from Grinder #2	Fines screening (controlled)	12	11.19.2-1	75	900		1.10E-03	1.10E-03	1.65E-04	2.29E-02	2.29E-02	3.44E-03		2.29E-02	E	2.29E-02	E	3.44E-03	E
CONV_PM	Stacking Conveyor Fugitive Emissions	Conveyor transfer point (controlled)	14	11.19.2-1	80	960		3.70E-05	2.30E-05	6.50E-06	8.22E-04	5.11E-04	1.44E-04		8.22E-04	E	5.11E-04	D	1.44E-04	E
CONV_PM2_N	Stacking Conveyor #2 Fugitive Emissions	Conveyor transfer point (controlled)	14	11.19.2-1	80	960		3.70E-05	2.30E-05	6.50E-06	8.22E-04	5.11E-04	1.44E-04		8.22E-04	E	5.11E-04	D	1.44E-04	E

Notes:

[1] AP-42 process listed as "controlled" reflects between 70-90% control due to high moisture / water sprays, as described in AP-42 Section 11.19.2.
[2] The "controlled" AP-42 emission factors were used, rather than the "uncontrolled" factors.
[3] AP-42 Emission Factor is based on PM44.
[4] All processing activity (crushing, screening, etc) at the Walker Quarry is controlled using water sprays.
[5] The 70% control factor was developed through a previous study by RWDI (see Appendix D).
[6] Control efficiency of 70% applied to all processing sources to account for the fact that processing sources are enclosed within buildings.
[7] The unprocessed stone drop off at the processing plant is also enclosed in a three-sided building, therefore, the 70% control factor was applied.
[8] Baghouse is installed at the silos, with a 99.9% of control efficiency.
[9] There are no emission factors presented for primary or secondary crushing in AP-42, therefore, the tertiary crushing emission factor was applied.

Comments
Percentage of total material handled by each process was outlined by Keith Porter (Walker Brothers Quarry) during a meeting on June 27, 2005.
The percentages are as follows: Primary crushing 100%, secondary crushing 70%, and tertiary crushing 45%.
Future percentages were assumed to be the same as existing conditions.
Classifier - amount of material that is processed through this piece of equipment was provided by Walker via email.
The maximum processing rate for the classifier is 75 Mg/hour.
Quarry Handling/Drop Point number and location as indicated by Keith Porter during June 27/05 meeting at RWDI office.
Mass of material drilled per hour based on 33 holes drilled in 1.25 days, to a depth of 12.5 meters (41 feet), and a stone density of 2,500 kg/m3.
Material handling for cone crusher and Screen #2 = 200 tonnes per hour, as per call with Keith Porter and Shawn Jordan on November 16, 2006.
Emissions have been corrected to PM44, as AP-42 presents PM100.

Sample calculation for TSP emissions from Source QP1CRUSH: Primary Crusher

$$\frac{800\ Mg_{processed}}{1\ h} \times \frac{3.40E\text{-}04\ kg_{TSP}}{1\ Mg_{processed}} \times \frac{1\ h}{3600\ s} \times \frac{1000}{1} \times \frac{30\%\ g_{TSP\ uncontrolled}}{1\ g_{TSP}} = 2.27E\text{-}02\ g_{TSP}/s$$

Appendix X3: Asphalt Plant Data

RWDI Project #2402272

Walker South Landfill Phase 2 Environmental Assessment

HOT MIX ASPHALT PLANTS - AP-42 Section 11.1

General Information		
Natural Gas Heating Value	1020	BTU/scf
Atmospheric Pressure	101.325	kPa
Gas Constant	8.314	L kPa / mol k
Aggregate silica content:	1.8	%
Hot Mix Asphalt Production Information		
Operating Hours	14	hours/day
	275	days/year, March - November, inclusive
HMA Production	350	Mg/hour
	4900	Mg/day
	250000	Mg/year, based on Walker estimates
HMA Load Out		Mg/hour
		Mg/day
		Mg/year
AC Usage	17.5	Mg/hour
	245	Mg/day
	12500	Mg/year
RAP Usage	66.5	Mg/hour
	931	Mg/day
	47500	Mg/hour
Stone Usage	133	Mg/hour
	1862	Mg/day
	95000	Mg/hour
Sand Usage	133	Mg/hour
	1862	Mg/day
	95000	Mg/hour
Hot Mix Asphalt Silo Information		
Number of AC Tanks	2	
HMA Silo Capacity	200	tonnes each
Maximum Daily Silo Filling Rate	2000	Mg/day (maximum 5 fills of each silo per 24-hr period, as per Matthew McMahon 180820)
HMA Silo Height	80	feet
	24.4	m
AC Tank Diameter	17	feet
	5.2	m
HMA Temperature	350	°F (e-mail from Matthew McMahon, 171027)

Appendix X4: Asphalt Plant Mixer Emissions

RWDI Project #2402272

Walker South Landfill Phase 2 Environmental Assessment

HOT MIX ASPHALT PLANTS - AP-42 Section 11.1

Source ID	Source Description	Contaminant	CAS Number	Emission Factor		Data Quality		Source	Emission Rate (g/s)
				(lb/ton HMA)	(kg/Mg HMA)	AP-42	MOE		
ASPH_DC (max hourly)	Natural Gas Batch Mixer with Fabric Filter	Nitrogen Oxides (NOx)	10102-44-0	2.50E-02	1.25E-02	D	Marginal	Table 11.1-5	1.22E+00
		Sulphur Dioxide (SO2)	7446-09-5	4.60E-03	2.30E-03	E	Marginal	Table 11.1-5	2.24E-01
		TSP	n/a - TSP	4.20E-02	2.10E-02	A	Above-Average	Table 11.1-1	2.04E+00
		PM10	n/a - PM10	9.80E-03	4.90E-03	E	Marginal	Table 11.1-2	4.76E-01
		PM2.5	n/a - PM2.5	8.30E-03	4.15E-03	E	Marginal	Table 11.1-2	4.03E-01
		Benzene	71-43-2	2.80E-04	1.40E-04	D	Marginal	Table 11.1-9	1.36E-02
ASPH_DC (max daily)	Natural Gas Batch Mixer with Fabric Filter	Nitrogen Oxides (NOx)	10102-44-0	2.50E-02	1.25E-02	D	Marginal	Table 11.1-5	1.22E+00
		Sulphur Dioxide (SO2)	7446-09-5	4.60E-03	2.30E-03	E	Marginal	Table 11.1-5	2.24E-01
		TSP	n/a - TSP	4.20E-02	2.10E-02	A	Above-Average	Table 11.1-1	2.04E+00
		PM10	n/a - PM10	9.80E-03	4.90E-03	C	Average	Table 11.1-2	4.76E-01
		PM2.5	n/a - PM2.5	8.30E-03	4.15E-03	C	Average	Table 11.1-2	4.03E-01
		Benzene	71-43-2	2.80E-04	1.40E-04	D	Marginal	Table 11.1-9	1.36E-02
ASPH_DC (annual - 275 days)	Natural Gas Batch Mixer with Fabric Filter	Nitrogen Oxides (NOx)	10102-44-0	2.50E-02	1.25E-02	D	Marginal	Table 11.1-5	2.25E-01
		Sulphur Dioxide (SO2)	7446-09-5	4.60E-03	2.30E-03	E	Marginal	Table 11.1-5	4.15E-02
		Particulate Matter	n/a - TSP	4.20E-02	2.10E-02	A	Above-Average	Table 11.1-1	3.79E-01
		PM10	n/a - PM10	9.80E-03	4.90E-03	C	Average	Table 11.1-2	8.84E-02
		PM2.5	n/a - PM2.5	8.30E-03	4.15E-03	C	Average	Table 11.1-2	7.49E-02
		Benzene	71-43-2	2.80E-04	1.40E-04	D	Marginal	Table 11.1-9	2.53E-03

Sample Calculation

TSP Emission Rate (max hourly)

$$\frac{2.10E\text{-}02\ \text{kg TSP}}{1\ \text{Mg HMA}} \times \frac{350\ \text{Mg HMA}}{1\ \text{h}} \times \frac{1000\ \text{g}}{1\ \text{kg}} \times \frac{1\ \text{h}}{3600\ \text{s}} = 2.04E{+}00\ \text{g/s}$$

TSP Emission Rate (max daily)

$$\frac{2.10E\text{-}02\ \text{kg TSP}}{1\ \text{Mg HMA}} \times \frac{4900\ \text{Mg HMA}}{1\ \text{day}} \times \frac{1000\ \text{g}}{1\ \text{kg}} \times \frac{1\ \text{day}}{14\ \text{hrs}} \times \frac{1\ \text{hr}}{3600\ \text{s}} = 2.04E{+}00\ \text{g/s}$$

TSP Emission Rate (annual)

$$\frac{2.10E\text{-}02\ \text{kg TSP}}{1\ \text{Mg HMA}} \times \frac{250000\ \text{Mg HMA}}{1\ \text{year}} \times \frac{1000\ \text{g}}{1\ \text{kg}} \times \frac{1\ \text{year}}{275\ \text{days}} \times \frac{1\ \text{day}}{14\ \text{hrs}} \times \frac{1\ \text{hr}}{3600\ \text{s}} = 3.79E\text{-}01\ \text{g/s}$$

Appendix X5: Asphalt Plant Asphalt Cement Heater Emissions

RWDI Project #2402272

Walker South Landfill Phase 2 Environmental Assessment

NATURAL GAS COMBUSTION - AP-42 Section 1.4

Source ID	Source Description	Contaminant	CAS Number	Emission Factor		Data Quality		Source	Emission Rate
				(lb/10^6scf)		AP-42	MOE		(g/s)
ASPH_HTR	Natural Gas Tank Heater	Nitrogen Oxides (NOx)	10102-44-0	1.00E+02	--	B	Above-Average	Chapter 1.4	2.60E-02
		Sulphur Dioxide (SO2)	7446-09-5	6.00E-01		A	Above-Average	Chapter 1.4	1.56E-04
		TSP	n/a - TSP	7.60E+00	--	D	Marginal	Chapter 1.4	1.97E-03
		PM10	n/a - PM10	7.60E+00	--	D	Marginal	Chapter 1.4	1.97E-03
		PM2.5	n/a - PM2.5	7.60E+00	--	D	Marginal	Chapter 1.4	1.97E-03

Sample Calculation

NOx Emission Rate

$$\frac{1.00E+02 \text{ lb NOx}}{1000000 \text{ scf}} \times \frac{2059 \text{ scf}}{1 \text{ h}} \times \frac{454 \text{ g}}{1 \text{ lb}} \times \frac{1 \text{ h}}{3600 \text{ s}} = 2.60E-02 \text{ g/s}$$

Appendix X6: Asphalt Plant HMA Load Out Emissions

RWDI Project #2402272

Walker South Landfill Phase 2 Environmental Assessment

HOT MIX ASPHALT PLANTS - AP-42 Section 11.1

From Table 11.1-14	Total PM	EF = 0.000181 + 0.00141(-V)e((0.0251)(T + 460) - 20.43)	8.20E-04 lb/ton HMA
	TOC	EF = 0.0172(-V)e((0.0251)(T + 460) - 20.43)	7.79E-03 lb/ton HMA

Asphalt Loadout Scenarios:

Asphalt can be loaded into trucks in one of two locations: at Mixer (ASPH_LD1) or at Silo (ASPH_LD2). For the peak hourly scenario, both loadouts are assumed to be used at the maximum rate of 350 Mg of HMA per hour. For the peak daily scenario, 2000 Mg of HMA is assumed to be loaded from the Silo (based on a maximum daily silo filling rate of 2000 Mg/day. The remaining 2900 tonnes of HMA are assumed to be loaded at the Mixer. For the annual scenario, the total annual mass of HMA was divided between the Silo and the Mixer based on a ratio of 2000:2900.

Source ID	Source Description	Contaminant	CAS Number	Speciation Profile	Emission Factor (lb/ton HMA)	Emission Factor (kg/Mg HMA)	Data Quality AP-42	Data Quality MOE	Source	Emission Rate (g/s)
ASPH_LD1 (max daily)	HMA Load Out at Mixer	TSP	n/a - TSP	n/a	8.20E-04	4.10E-04	C	Average	Table 11.1-14	2.36E-02
		PM10	n/a - PM10	n/a	8.20E-04	4.10E-04	C	Average	Table 11.1-14	2.36E-02
		PM2.5	n/a - PM2.5	n/a	8.20E-04	4.10E-04	C	Average	Table 11.1-14	2.36E-02
		TOC (used only for speciation below)	n/a	n/a	7.79E-03	3.89E-03	C	Average	Table 11.1-14	2.24E-01
		Benzene	71-43-2	0.052%	4.05E-06	2.03E-06	C	Average	Table 11.1-16	1.17E-04
ASPH_LD1 (annual - 275 days)	HMA Load Out at Mixer	TSP	n/a - TSP	n/a	8.20E-04	4.10E-04	C	Average	Table 11.1-14	4.37E-03
		PM10	n/a - PM10	n/a	8.20E-04	4.10E-04	C	Average	Table 11.1-14	4.37E-03
		PM2.5	n/a - PM2.5	n/a	8.20E-04	4.10E-04	C	Average	Table 11.1-14	4.37E-03
		TOC (used only for speciation below)	n/a	n/a	7.79E-03	3.89E-03	C	Average	Table 11.1-14	4.16E-02
		Benzene	71-43-2	0.052%	4.05E-06	2.03E-06	C	Average	Table 11.1-16	2.16E-05
ASPH_LD2 (max daily)	HMA Load Out at Silo	TSP	n/a - TSP	n/a	8.20E-04	4.10E-04	C	Average	Table 11.1-14	1.63E-02
		PM10	n/a - PM10	n/a	8.20E-04	4.10E-04	C	Average	Table 11.1-14	1.63E-02
		PM2.5	n/a - PM2.5	n/a	8.20E-04	4.10E-04	C	Average	Table 11.1-14	1.63E-02
		TOC (used only for speciation below)	n/a	n/a	7.79E-03	3.89E-03	C	Average	Table 11.1-14	1.55E-01
		Benzene	71-43-2	0.052%	4.05E-06	2.03E-06	C	Average	Table 11.1-16	8.04E-05
ASPH_LD2 (annual - 275 days)	HMA Load Out at Silo	TSP	n/a - TSP	n/a	7.98E-06	3.99E-06	C	Average	Table 11.1-14	2.94E-05
		PM10	n/a - PM10	n/a	7.98E-06	3.99E-06	C	Average	Table 11.1-14	2.94E-05
		PM2.5	n/a - PM2.5	n/a	7.98E-06	3.99E-06	C	Average	Table 11.1-14	2.94E-05
		TOC (used only for speciation below)	n/a	n/a	7.79E-03	3.89E-03	C	Average	Table 11.1-14	2.87E-02
		Benzene	71-43-2	0.052%	4.05E-06	2.03E-06	C	Average	Table 11.1-16	1.49E-05

Notes:

[1] Silica refers to cristabolite (14464-46-1), quartz (14808-60-7), and tridymite (15468-32-3) forms. Estimated emissions assume:

Sample Calculation

TSP Emission Rate	4.10E-04 kg TSP	2,900 Mg HMA	1000 g	1 day	1 h			
(daily)	1 Mg HMA	1 day	1 kg	14 hr	3600 s		=	2.36E-02 g/s
TSP Emission Rate	4.10E-04 kg TSP	147,959 Mg HMA	1000 g	1 year	1 day	1 hr		
(annual)	1 Mg HMA	1 year	1 kg	275 days	14 hrs	3600 s	=	4.37E-03 g/s

Appendix X7: Asphalt Plant Data

RWDI Project #2402272

Walker South Landfill Phase 2 Environmental Assessment

HOT MIX ASPHALT PLANTS - AP-42 Section 11.1

Asphalt Cement Tanker Truck		
Tank Truck Capacity	35	tonnes/truck (typical tanker capacity)
	0.5	trucks/h
	357	trucks/year
AC Usage	17.5	Mg/hour
(from Appendix X3)	245	Mg/day (based on 24-hour production)
	12,500	Mg/year
Asphalt Cement Tank Information		
Asphalt volatility	-0.5	% loss on heating (average value for test method)
AC Density	1	kg/L (BITUMAR MSDS)
Number of AC Tanks	2	
AC Tank Capacity	100	tonnes
	100,000	L
	26420	gallons
Turnovers per hour (based on hourly AC usage)	0.2	total turnovers
	0.1	turnovers per tank
Turnovers per day (based on daily AC usage)	2.5	total turnovers
	1.2	turnovers per tank
Turnovers per year (based on annual AC usage)	125	total turnovers
	62.5	turnovers per tank
AC Tank Orientation	Vertical	
AC Tank Height	25	feet (top of cone)
	7.6	m(top of cone)
	23	feet, assuming 2' for cone roof
AC Tank Working Height	18	feet, assuming 80% high level switch
AC Tank Diameter	17	feet (outer shell)
	5.2	m (outer shell)
	16	feet, assuming 6" for insulation
AC Tank Fill Rate	0.6	tonnes/min (e-mail from Kevin Kehl, 161101)
	36,000	L/h (calculated from fill rate and density)
Bulk Liquid Temperature	350	°F (e-mail from Matthew McMahon, 171027)
	177	°C
	450	K
Minimum Surface Temp.	350	°F (use maximum temperature for all emission modelling)
	177	°C
	450	K
Maximum Surface Temp.	350	°F (use maximum temperature for all emission modelling)
	177	°C
	450	K
Average Surface Temp.	350	°F (use maximum temperature for all emission modelling)
	177	°C
	450	K
AC Molecular Weight	105	g/mol (from AP-42 11.2.1.5)
Asphalt Cement Tank Hot Oil Heater Information		
Tank Heater Rating	2,100,000	Btu/h
	2059	scf/h on gas

Appendix X8: Asphalt Cement Storage Emissions

RWDI Project #2402272

Walker South Landfill Phase 2 Environmental Assessment

The EPA TANKS software was used to estimate the emissions from the storage tanks, in accordance with the Owens Corning method, as described in the technical paper:
Trumbore, David C., "*Estimates of Air Emissions from Asphalt Storage Tanks and Truck Loading* ", Asphalt Technology Laboratory. Owens Corning, Summit, IL 60501
The inputs and outputs to the TANKS software is shown on the following pages.

Working Losses:

Working losses are estimated on a "per-fill" basis in TANKS by assuming 1 turnover (fill for fixed roof tanks) per month.
The month with the higest emissions is then used to estimate working losses throughout the year, which is conservative.

Working losses from TANKS =	7.533	lbs/turnover	using actual minimum, average and maximum surface temperature (annual standard)
	9.5017	lbs/turnover	using maximum surface temperature only (URT, DAV, AAV)

Table 1: Emissions from Working Losses

Source ID	Source Description	Contaminant	CAS Number	Speciation Profile	Emission Factor		Data Quality		Source	Emission Rate per Tank (g/s)	Total Emission Rate per Tank - Working + standing losses (g/s)
					(lb/turnover)	(kg/turnover)	AP-42	MOE			
ASPH_TK1, ASPH_TK2 (max daily)	Working Losses	TOC (used only for speciation below)	n/a - TOC	n/a	9.5E+00	4.31E+00	n/a	Average	TANKS	1.03E-01	1.03E-01
		Benzene	71-43-2	0.032%	3.0E-03	1.38E-03	C	Average	Table 11.1-16	3.28E-05	3.30E-05
		Organic PM (used only for speciation below)	n/a	24.7%	2.3E+00	1.06E+00	n/a	Average	[1]	2.54E-02	2.54E-02
		TSP	n/a - TSP	100%	2.3E+00	1.06E+00	n/a	Average	[2]	2.54E-02	2.54E-02
		PM10	n/a - PM10	100%	2.3E+00	1.06E+00	n/a	Average	[3]	2.54E-02	2.54E-02
		PM2.5	n/a - PM2.5	100%	2.3E+00	1.06E+00	n/a	Average	[3]	2.54E-02	2.54E-02
ASPH_TK1, ASPH_TK2 (annual - 275 days)	Working Losses	TOC (used only for speciation below)	n/a - TOC	n/a	7.5E+00	3.42E+00	n/a	Average	TANKS	1.54E-02	1.58E-02
		Benzene	71-43-2	0.032%	2.4E-03	1.09E-03	C	Average	Table 11.1-16	4.93E-06	5.05E-06
		Organic PM (used only for speciation below)	n/a	24.7%	1.9E+00	8.44E-01	n/a	Average	[1]	3.81E-03	3.89E-03
		TSP	n/a - TSP	100%	1.9E+00	8.44E-01	n/a	Average	[2]	3.81E-03	3.89E-03
		PM10	n/a - PM10	100%	1.9E+00	8.44E-01	n/a	Average	[3]	3.81E-03	3.81E-03
		PM2.5	n/a - PM2.5	100%	1.9E+00	8.44E-01	n/a	Average	[3]	3.81E-03	3.81E-03

Notes:
[1] Organic PM is assumed to be 24.7% of the TOC, as per Tank B on Table 4 of "Estimates of Air Emissions from Asphalt Storage Tanks and Truck Loading" by David C. Trumbore, Asphalt Technology Laboratory. Owens Corning.
[2] Organic PM is also the Total PM for this source. There are no silica emissions since all the PM is from organic vapours.
[3] PM10 and PM2.5 are assumed to be the same as TSP, for conservative assessment.

Sample Calculation

Benzene Emission Factor	4.31E+00 kg Benzene / 1 turnover	0.032% g Benzene / 1 g TOC					= 1.38E-03 kg Benzene / Mg HMA
Benzene Emission Rate (daily)	1.38E-03 kg Benzene / 1 turnover	1.2 turnovers / 1 day - tank	1000 g / 1 kg	1 day / 14 hours	1 h / 3600 s		= 3.28E-05 g/s/tank
Benzene Emission Rate (annual)	1.09E-03 kg Benzene / 1 turnover	62.5 turnovers / 1 year	1000 g / 1 kg	1 year / 275 days	1 day / 14 hours	1 h / 3600 s	= 4.93E-06 g/s/tank

Appendix X8: Asphalt Cement Storage Emissions

Walker South Landfill Phase 2 Environmental Assessment

Standing Losses:

The asphalt cement storage tank is set for a maximum temperature of 350 °F. To estimate stasnding losses, an average of 340ºF was used, with an assumed range +/- 10 ºF.
The TANKS model provides total standing losses per month, which vary from month to month only because of the number of days in a month.
From this information the standing losses per day and per year were calculated, using the month with the highest emissions.
Since these tanks are heated, there is little to no variation in standing emissions

Standing losses for month of January from TANKS =	2.105	lb/month
Days in January =	31	
Standing losses per day =	0.0679	lb/day (annual standard only)

Table 2: Emissions from Standing Losses

Source ID	Source Description	ontaminant	CAS Number	Speciation Profile	Emission Factor (lb/day)	(kg/day)	Data Quality AP-42	MOE	Source	Emission Rate per Tank (g/s)
ASPH_TK1, ASPH_TK2 (annual)	Standing Losses	TOC (used only for speciation below)	n/a	n/a	6.8E-02	3.08E-02	n/a	Average	TANKS	3.6E-04
		Benzene	71-43-2	0.032%	2.2E-05	9.86E-06	C	Average	Table 11.1-16	1.1E-07
		Organic PM (used only for speciation below)	n/a	24.7%	1.7E-02	7.61E-03	n/a	Average	[1]	8.8E-05
		Particulate Matter	n/a - TSP	100%	1.7E-02	7.61E-03	n/a	Average	[2]	8.8E-05

Notes:
[1] Organic PM is assumed to be 24.7% of the TOC, as per Tank B on Table 4 of "Estimates of Air Emissions from Asphalt Storage Tanks and Truck Loading" by David C. Trumbore, Asphalt Technology Laboratory. Owens Corning.
[2] Organic PM is also the Total PM for this source. There are no silica emissions since all the PM is from organic vapours.

Sample Calculation

TOC Emission Rate	2.105 lb TOC	1 month	1 kg	1000 g	1 day	1 h	
	1 month	31 days	2.204 lb	1 kg	24 hours	3600 s	= 3.6E-04 g/s

Appendix X9: Asphalt Plant HMA Silo Filling Emissions

RWDI Project #2402272

Walker South Landfill Phase 2 Environmental Assessment

HOT MIX ASPHALT PLANTS - AP-42 Section 11.1

From Table 11.1-14	Total PM	EF = 0.000332 + 0.00105(-V)e((0.0251)(T + 460) - 20.43)	0.000807515	lb/ton HMA
	TOC	EF = 0.0504(-V)e((0.0251)(T + 460) - 20.43)	0.022824716	lb/ton HMA

Source ID	Source Description	Contaminant	CAS Number	Speciation Profile	Emission Factor		Data Quality		Source	Emission Rate
					(lb/ton HMA)	(kg/Mg HMA)	AP-42	MOE		(g/s)
ASPH_SL1 (max daily @ 5 fill per day)	HMA Silo Filling	TSP	n/a - TSP	n/a	8.08E-04	4.04E-04	C	Average	Table 11.1-14	1.60E-02
		PM10	n/a - PM10	n/a	8.08E-04	4.04E-04	C	Average	Table 11.1-14	1.60E-02
		PM2.5	n/a - PM2.5	n/a	8.08E-04	4.04E-04	C	Average	Table 11.1-14	1.60E-02
		TOC (used only for speciation below)	n/a	n/a	2.28E-02	1.14E-02	C	Average	Table 11.1-14	4.53E-01
		Benzene	71-43-2	0.032%	7.30E-06	3.65E-06	C	Average	Table 11.1-16	1.45E-04
ASPH_SL1 (annual @ 5 fill per day for 275 days)	HMA Silo Filling	TSP	n/a - TSP	n/a	8.08E-04	4.04E-04	C	Average	Table 11.1-14	2.97E-03
		PM10	n/a - PM10	n/a	8.08E-04	4.04E-04	C	Average	Table 11.1-14	2.97E-03
		PM2.5	n/a - PM2.5	n/a	8.08E-04	4.04E-04	C	Average	Table 11.1-14	2.97E-03
		TOC (used only for speciation below)	n/a	n/a	2.28E-02	1.14E-02	C	Average	Table 11.1-14	8.40E-02
		Benzene	71-43-2	0.032%	7.30E-06	3.65E-06	C	Average	Table 11.1-16	2.69E-05

Sample Calculation

Benzene Emission Factor	1.14E-02 kg TOC / 1 Mg HMA	0.032% g Benzene / 1 g TOC				=	3.65E-06 kg Benzene / Mg HMA
Benzene Emission Rate (daily)	3.65E-06 kg Benzene / 1 Mg HMA	2000 Mg HMA / 1 h	1000 g / 1 kg	1 day / 14 hrs	1 h / 3600 s	=	1.45E-04 g/s
Benzene Emission Rate (annual)	3.65E-06 kg Benzene / 1 Mg HMA	102041 Mg HMA / 1 year	1000 g / 1 kg	1 year / 275 days	1 day / 14 hrs	1 hr / 3600 s =	2.6887E-05 g/s

Appendix X10: Asphalt Plant Yard Truck Emissions

RWDI Project #2402272

Walker South Landfill Phase 2 Environmental Assessment

HOT MIX ASPHALT PLANTS - AP-42 Section 11.1

Source ID	Source Description	Contaminant	CAS Number	Speciation Profile	Emission Factor		Data Quality		Source	Emission Rate (g/s)
					(lb/ton HMA)	(kg/Mg HMA)	AP-42	MOE		
ASPH_TRK (max daily)	Yard Trucks	TOC (used only for speciation below)	n/a	n/a	1.10E-03	5.50E-04	n/a	n/a	Section 11.1.2.5	3.12E-02
		Benzene	71-43-2	0.052%	5.72E-07	2.86E-07	C	Average	Table 11.1-16	2.78E-05
ASPH_TRK (annual)	Yard Trucks	TOC (used only for speciation below)	n/a	n/a	1.10E-03	5.50E-04	n/a	n/a	Section 11.1.2.5	9.92E-03
		Benzene	71-43-2	0.052%	5.72E-07	2.86E-07	C	Average	Table 11.1-16	5.16E-06

Sample Calculation

Benzene Emission Factor	5.50E-04 kg TOC / 1 Mg HMA	0.052% g Benzene / 1 g TOC					=	2.86E-07 kg Benzene / Mg HMA
Benzene Emission Rate (daily)	2.86E-07 kg Benzene / 1 Mg HMA	4900 Mg HMA / 1 day	1000 g / 1 kg	1 day / 14 hrs	1 hr / 3600 s		=	2.78E-05 g/s
Benzene Emission Rate (annual)	2.86E-07 kg Benzene / 1 Mg HMA	250000 Mg HMA / 1 year	1000 g / 1 kg	1 year / 275 days	1 day / 14 hrs	1 hr / 3600 s	=	5.16E-06 g/s

APPENDIX Y

Appendix Y1: Biosolids and Compost Facility Calculations - SO_2 Emissions for Boiler (BIOFILTR)

RWDI Project #2402272

Walker South Landfill Phase 2 Environmental Assessment

Maximum Production Rate (Biosolids Throughput)	2800	kg DS / hr
Biofilter Flowrate	22.2	m^3/s

CAS No.	Chemical Name	Concentration in Biosolids [1] (g/kg DS/hr)	Source Concentration (µg/m³)	Control Efficiency of Acid Scrubber	Control Efficiency of Biofilter	Maximum Production			Notes
						Emission Rate (g/hr)	Emission Rate (g/s)	Emission Rate (g/m2-s) [1]	
7446-09-5	Sulfur Dioxide	-	1,200	95%	-	-	1.33E-03	2.53E-06	[2]

Notes:

[1] Area of the biofilter is 65m x 8.1m = 526.5 m2.

[2] Based on information provided by Sandwell Consulting Engineers for original application.

Sample calculation for Sulfur Dioxide emission rate for Source: BIOFILTR

1200.00 µg	22.2 m³	5% Loss	1 g		=	2.53E-06 g/m^2-s
1 m³	1 h		1,000,000 µg	526.5 m2		

Appendix Y2: Biosolids and Compost Facility Calculations - Boiler (BIOFILTR)

RWDI Project #2402272

Walker South Landfill Phase 2 Environmental Assessment

Parameter	Value	Units
Fuel Type	Natural Gas	
Fuel Heating Value	1020	(Btu/scf)
Fuel Density		(lb/gal)
Firing Configuration	Wall-fired	
Boiler Efficiency	80%	(%)
Excess Air	0.3	(%)

Rating (enter one set of units)	Value	Units
Boiler Heat Input (Btu/h)	12,660,000	(Btu/h)
Calculated Heat Input	12.66	(MMBtu/hr)
Boiler Size Cut-off	<100	(MMBtu/hr)

Exhaust Information	Value	Units
Exhaust Temperature (°C)	175	(°C)
Calculated Exit Temperature	448	(K)

Fuel Sulphur Information	Value	Units
Natural Gas Sulphur Content	2000	(grains/10^6scf)
Fuel Oil Sulphur Content	0	(%)

Pollution Controls	Value	Units
NSPS	n/a	
Low-NOx Burners	no	
Flue-gas Recirculation	no	

Fuel & Air Parameters	Value	Units	Sample Calculation / Comment
Fuel Consumption	12412	(scf/h)	= (12.66 MMBTU/h) x (1000000 BTU/MMBTU) / (1020 BTU/scf)
	351508	(L/h)	
Fuel Molar Flow Rate (NG Only)	14871	(mol'h)	= (12412 scf/h) x (28.32 L/scf) x (101.3 kPa) / (8.314 L·kPa/mol·K) / (288 K)
Fuel Mass Flow Rate	238	(kg/h)	= (14871 mol/h) x (16.03 g/mol) / (1000 g/kg)
Stoichiometric Ratio (NG only)	13.376	ratio	= 1 CO2 + 2 H2O + 0.6 O2 + 2 x 3.76 x (1 + 0.3) N2 per mol CH4
Theoretical Moist Air (Oil Only)	not applicable		
Combustion Air	184043	(mol/h)	= (14871 mol fuel / h) x (2 mol O2 / mol fuel) x (1 + (30% XS Air)) x (4.76 mol air / mol O2)
	5300	(kg/h)	= (184043 mol air / h) x (28.8 g air / mol air) / (1000 g / kg)
	4124	(m³/h) @ 0°C	= (184043 mol/h) x (8.314 L·kPa/mol·K) x (288 K) / (101.3 kPa) / (1000 L/m³)
	2427	(scfm) @ 0°C	= (4124 m³/h) x (35.31 ft³/m³) / (60 min/h)

Exhaust Parameters	Value	Units	Sample Calculation
Exhaust Gas Molar Flow (NG only)	198914	(mol/h)	= (14871 mol/h) x (13.376 mol exhaust / mol fuel)
Theoretical Flue Gas (Oil Only)	not applicable	(m^3_{air} / L_{fuel})	
Exhaust Gas Mass Flow Rate	5538	(kg/h)	= (14871 mol fuel / h) x (373 g exhaust / mol fuel)
Exhaust Gas Flow	7314	(Am³/h)	= (198914 mol/h) x (8.314 L·kPa/mol·K) x (448 K) / (101.3 kPa) / (1000 L/m³)
	2.03	(Am³/s)	= (7314 m³ / h) / (3600 s / h)
	4702	(m³/h) @ 0°C	= (7314 m³ / h) x (288K) / (448 K)
	2767	(scfm) @ 0°C	= (4702 m³ / h) x (35.31 ft³ / m³) / (60 min / h)

Emission Calculations for the Biosolids Natural Gas Fired Dryer Exhausting through Biofilter
Based on Manufacturer's specifications

Emissions Guarantee from Manufacturer: 45 ppm NOx at 3% O_2

Exhaust Gas Molar Flow Rate (based on calculations in boiler spreadsheet) : 14,871 mol/hr

Molecular Weight of Nitrogen Oxides (based on MW of Nitrogen Dioxide) : 46.05 g/mol

<u>Sample Calculation</u>

NOx Emissions (g/s) = Exhaust Gas Molar Flow Rate x NOx Emission Rate x NOx Molecular Weight x conversion factors
NOx Emissions (g/s) = (14871 mol / hr) * (45 / 1,000,000) * (46.05 g/mol) * (1 hr / 3,600 s)
NOx Emissions (g/s) = 8.56E-03 g/s
NOx Emissions (g/m²-s) = 1.63E-05 g/m²-s , with an area of 65m x 8.1m = 526.5 m2

Appendix Y3: Biosolids and Compost Facility Calculations - Boiler (BOILERS)

RWDI Project #2402272

Walker South Landfill Phase 2 Environmental Assessment

Parameter	Value	Units
Fuel Type	Natural Gas	
Fuel Heating Value	1020	(Btu/scf)
Fuel Density		(lb/gal)
Firing Configuration	Wall-fired	
Boiler Efficiency	80%	(%)
Excess Air	0.3	(%)

Rating (enter one set of units)	Value	Units
Boiler Heat Input (Btu/h)	650,000	(Btu/h)
Calculated Heat Input	0.65	(MMBtu/hr)
Boiler Size Cut-off	<100	(MMBtu/hr)

Exhaust Information	Value	Units
Exhaust Temperature (°C)	125	(°C)
Calculated Exit Temperature	398	(K)

Fuel Sulphur Information	Value	Units
Natural Gas Sulphur Content	2000	(grains/10^6scf)
Fuel Oil Sulphur Content	0	(%)

Pollution Controls	Value	Units
NSPS	n/a	
Low-NOx Burners	no	
Flue-gas Recirculation	no	

Fuel & Air Parameters	Value	Units	Sample Calculation / Comment
Fuel Consumption	637	(scf/h)	= (0.65 MMBTU/h) x (1000000 BTU/MMBTU) / (1020 BTU/scf)
	18040	(L/h)	
Fuel Molar Flow Rate (NG Only)	763	(mol'h)	= (637 scf/h) x (28.32 L/scf) x (101.3 kPa) / (8.314 L·kPa/mol·K) / (288 K)
Fuel Mass Flow Rate	12	(kg/h)	= (763 mol/h) x (16.03 g/mol) / (1000 g/kg)
Stoichiometric Ratio (NG only)	13.376	ratio	= 1 CO2 + 2 H2O + 0.6 O2 + 2 x 3.76 x (1 + 0.3) N2 per mol CH4
Theoretical Moist Air (Oil Only)	not applicable		
Combustion Air	9443	(mol/h)	= (763 mol fuel / h) x (2 mol O2 / mol fuel) x (1 + (30% XS Air)) x (4.76 mol air / mol O2)
	272	(kg/h)	= (9443 mol air / h) x (28.8 g air / mol air) / (1000 g / kg)
	212	(m³/h) @ 0°C	= (9443 mol/h) x (8.314 L·kPa/mol·K) x (288 K) / (101.3 kPa) / (1000 L/m³)
	125	(scfm) @ 0°C	= (212 m³/h) x (35.31 ft³/m³) / (60 min/h)

Exhaust Parameters	Value	Units	Sample Calculation
Exhaust Gas Molar Flow (NG only)	10206	(mol/h)	= (763 mol/h) x (13.376 mol exhaust / mol fuel)
Theoretical Flue Gas (Oil Only)	not applicable	(m^3_{air} / L_{fuel})	
Exhaust Gas Mass Flow Rate	279	(kg/h)	= (763 mol fuel / h) x (373 g exhaust / mol fuel)
Exhaust Gas Flow	333	(Am³/h)	= (10206 mol/h) x (8.314 L·kPa/mol·K) x (398 K) / (101.3 kPa) / (1000 L/m³)
	0.09	(Am³/s)	= (333 m³ / h) / (3600 s / h)
	241	(m³/h) @ 0°C	= (333 m³ / h) x (288K) / (398 K)
	142	(scfm) @ 0°C	= (241 m³ / h) x (35.31 ft³ / m³) / (60 min / h)

Criteria Contaminants	Emission Factor Value	Emission Factor Units	Emission Rate Value	Emission Rate Units	Data Quality	Sample Calculation
Sulphur Dioxide	0.6	(lb/10^6scf)	4.82E-05	(g/s)	A	= (637 scf/h) x (0.6 lb / 10^6 scf) x (453.6 g / lb) / (3600 s / h)
Oxides of Nitrogen	100	(lb/10^6scf)	8.03E-03	(g/s)	B	= (637 scf/h) x (100 lb / 10^6 scf) x (453.6 g / lb) / (3600 s / h)
Filterable Particulate	7.6	(lb/10^6scf)	6.10E-04	(g/s)	D	= (637 scf/h) x (7.6 lb / 10^6 scf) x (453.6 g / lb) / (3600 s / h)
Condensible Particulate	--		--			
Total Particulate	7.6	(lb/10^6scf)	6.10E-04	(g/s)	D	= (637 scf/h) x (7.6 lb / 10^6 scf) x (453.6 g / lb) / (3600 s / h)

Note: Total Particulate = Filterable + Condensible, if applicable. Lowest data quality rating of either filterable or condensible applied.

Appendix Y4: Biosolids and Compost Facility Calculations - Boiler (HEATING) RWDI Project #2402272

Walker South Landfill Phase 2 Environmental Assessment

Parameter	Value	Units
Fuel Type	Natural Gas	
Fuel Heating Value	1020	(Btu/scf)
Fuel Density		(lb/gal)
Firing Configuration	Wall-fired	
Boiler Efficiency	0.8	(%)
Excess Air	0.3	(%)

Rating (enter one set of units)	Value	Units
Boiler Heat Input (Btu/h)	1,215,000	(Btu/h)
Calculated Heat Input	1.22	(MMBtu/hr)
Boiler Size Cut-off	<100	(MMBtu/hr)

Exhaust Information	Value	Units
Exhaust Temperature (°C)	175	(°C)
Calculated Exit Temperature	448	(K)

Fuel Sulphur Information	Value	Units
Natural Gas Sulphur Content	2000	(grains/10^6scf)
Fuel Oil Sulphur Content	0	(%)

Pollution Controls	Value	Units
NSPS	n/a	
Low-NOx Burners	no	
Flue-gas Recirculation	no	

Fuel & Air Parameters	Value	Units	Sample Calculation / Comment
Fuel Consumption	1196	(scf/h)	= (1.22 MMBTU/h) x (1000000 BTU/MMBTU) / (1020 BTU/scf)
	33871	(L/h)	
Fuel Molar Flow Rate (NG Only)	1433	(mol'h)	= (1196 scf/h) x (28.32 L/scf) x (101.3 kPa) / (8.314 L·kPa/mol·K) / (288 K)
Fuel Mass Flow Rate	23	(kg/h)	= (1433 mol/h) x (16.03 g/mol) / (1000 g/kg)
Stoichiometric Ratio (NG only)	13.376	ratio	= 1 CO2 + 2 H2O + 0.6 O2 + 2 x 3.76 x (1 + 0.3) N2 per mol CH4
Theoretical Moist Air (Oil Only)	not applicable		
Combustion Air	17735	(mol/h)	= (1433 mol fuel / h) x (2 mol O2 / mol fuel) x (1 + (30% XS Air)) x (4.76 mol air / mol O2)
	511	(kg/h)	= (17735 mol air / h) x (28.8 g air / mol air) / (1000 g / kg)
	397	(m³/h) @ 0°C	= (17735 mol/h) x (8.314 L·kPa/mol·K) x (288 K) / (101.3 kPa) / (1000 L/m³)
	234	(scfm) @ 0°C	= (397 m³/h) x (35.31 ft³/m³) / (60 min/h)

Exhaust Parameters	Value	Units	Sample Calculation
Exhaust Gas Molar Flow (NG only)	19168	(mol/h)	= (1433 mol/h) x (13.376 mol exhaust / mol fuel)
Theoretical Flue Gas (Oil Only)	not applicable	(m^3_{air} / L_{fuel})	
Exhaust Gas Mass Flow Rate	535	(kg/h)	= (1433 mol fuel / h) x (373 g exhaust / mol fuel)
Exhaust Gas Flow	705	(Am³/h)	= (19168 mol/h) x (8.314 L·kPa/mol·K) x (448 K) / (101.3 kPa) / (1000 L/m³)
	0.20	(Am³/s)	= (705 m³ / h) / (3600 s / h)
	453	(m³/h) @ 0°C	= (705 m³ / h) x (288K) / (448 K)
	267	(scfm) @ 0°C	= (453 m³ / h) x (35.31 ft³ / m³) / (60 min / h)

Criteria Contaminants	Emission Factor Value	Emission Factor Units	Emission Rate Value	Emission Rate Units	Data Quality	Sample Calculation
Sulphur Dioxide	0.6	(lb/10^6scf)	9.04E-05	(g/s)	A	= (1196 scf/h) x (0.6 lb / 10^6 scf) x (453.6 g / lb) / (3600 s / h)
Oxides of Nitrogen	100	(lb/10^6scf)	1.51E-02	(g/s)	B	= (1196 scf/h) x (100 lb / 10^6 scf) x (453.6 g / lb) / (3600 s / h)
Filterable Particulate	7.6	(lb/10^6scf)	1.15E-03	(g/s)	D	= (1196 scf/h) x (7.6 lb / 10^6 scf) x (453.6 g / lb) / (3600 s / h)
Condensible Particulate	--		--			
Total Particulate	7.6	(lb/10^6scf)	1.15E-03	(g/s)	D	= (1196 scf/h) x (7.6 lb / 10^6 scf) x (453.6 g / lb) / (3600 s / h)

Note: Total Particulate = Filterable + Condensible, if applicable. Lowest data quality rating of either filterable or condensible applied.

Appendix Y5: Biosolids and Compost Facility Calculations - Boiler (R_BLDG)

RWDI Project #2402272

Walker South Landfill Phase 2 Environmental Assessment

Parameter	Value	Units
Fuel Type	No. 2 Fuel Oil	
Fuel Heating Value	137000	(Btu/gal)
Fuel Density		(lb/gal)
Firing Configuration	Normal firing	
Boiler Efficiency	0.8	(%)
Excess Air	0.15	(%)

Rating (enter one set of units)	Value	Units
Boiler Heat Input (Btu/h)	350,000	(Btu/h)
Calculated Heat Input	0.35	(MMBtu/hr)
Boiler Size Cut-off	<100	(MMBtu/hr)

Exhaust Information	Value	Units
Exhaust Temperature (°C)	175	(°C)
Calculated Exit Temperature	448	(K)

Fuel Sulphur Information	Value	Units
Natural Gas Sulphur Content	2000	(grains/10^6scf)
Fuel Oil Sulphur Content	0.5	(%)

Pollution Controls	Value	Units
NSPS	n/a	
Low-NOx Burners	no	
Flue-gas Recirculation	no	

Fuel & Air Parameters	Value	Units	Sample Calculation / Comment
Fuel Consumption	2.6	(gal/h)	= (0.35 MMBTU/h) x (1000000 BTU/MMBTU) / (137000 BTU/gal)
	10	(L/h)	
Fuel Molar Flow Rate (NG Only)	not applicable		not applicable
Fuel Mass Flow Rate	0	(kg/h)	= (2.6 gal/h) x (lb/gal) / (2.205 lb/kg)
Stoichiometric Ratio (NG only)	not applicable		not applicable
Theoretical Moist Air (Oil Only)	345	(kg air / MMBT	based on 7.5 lb theoretical dry air per 10,000 BTU of fuel oil
Combustion Air	4810	(mol/h)	= (139 kg air / h) x (1000 g / kg) / (28.8 g air / mol air)
	139	(kg/h)	= 0.35 MMBTU/h x 345 kg/MMBTU x (115% XS Air)
	108	(m³/h) @ 0°C	= (4810 mol/h) x (8.314 L·kPa/mol·K) x (288 K) / (101.3 kPa) / (1000 L/m³)
	64	(scfm) @ 0°C	= (108 m³/h) x (35.31 ft³/m³) / (60 min/h)

Exhaust Parameters	Value	Units	Sample Calculation
Exhaust Gas Molar Flow (NG only)	not applicable	(mol/h)	not applicable
Theoretical Flue Gas (Oil Only)	10.4	(m^3_{air} / L_{fuel})	at standard temperature & pressure
Exhaust Gas Mass Flow Rate	139	(kg/h)	0 kg fuel / h + 139 kg air / h
Exhaust Gas Flow	171	(Am³/h)	= (104 m³ air / h) x (448 K) / (288K)
	0.05	(Am³/s)	= (171 m³ / h) / (3600 s / h)
	104	(m³/h) @ 0°C	= (10.4 m³ air / L fuel) x (10 L fuel / h)
	61	(scfm) @ 0°C	= (104 m³ / h) x (35.31 ft³ / m³) / (60 min / h)

Criteria Contaminants	Emission Factor Value	Emission Factor Units	Emission Rate Value	Emission Rate Units	Data Quality	Sample Calculation
Sulphur Dioxide	71	(lb/10^3gal)	2.33E-02	(g/s)	A	= (2.6 gal / h) x (71 lb / 10³ gal) x (453.6 g / lb) / (3600 s / h)
Oxides of Nitrogen	20	(lb/10^3gal)	6.55E-03	(g/s)	A	= (2.6 gal / h) x (20 lb / 10³ gal) x (453.6 g / lb) / (3600 s / h)
Filterable Particulate	2	(lb/10^3gal)	6.55E-04	(g/s)	A	= (2.6 gal / h) x (2 lb / 10³ gal) x (453.6 g / lb) / (3600 s / h)
Condensible Particulate	1.3	(lb/10^3gal)	4.26E-04	(g/s)	D	= (2.6 gal / h) x (1.3 lb / 10³ gal) x (453.6 g / lb) / (3600 s / h)
Total Particulate	3.3	(lb/10^3gal)	1.08E-03	(g/s)	D	= (2.6 gal / h) x (3.3 lb / 10³ gal) x (453.6 g / lb) / (3600 s / h)

Note: Total Particulate = Filterable + Condensible, if applicable. Lowest data quality rating of either filterable or condensible applied.

APPENDIX Z

Appendix Z1: Deposition Parameters - Paved Roads

Walker South Landfill Phase II Environmental Assessment

Mid Point - PM44

Size (µm)	Midpoints			
	PL1	PL2	PL3	Average
<2	1.0	1	1	1.0
2 - 4	3.0	3.00	3.00	3.0
4 - 5	4.5	4.50	4.50	4.5
5 - 20	12.5	12.50	12.50	12.5
20 - 31.2	25.6	25.60	25.60	25.6
31.2 - 50	40.6	40.60	40.60	40.6

Size Fraction - PM44

Size (µm)	Size Fractions			
	PL1	PL2	PL3	Average
<2	0.53	0.39	0.44	0.453
2 - 4	0.00	0.04	0.02	0.020
4 - 5	0.00	0.00	0.00	0.000
5 - 20	0.16	0.18	0.19	0.179
20 - 31.2	0.06	0.22	0.10	0.127
31.2 - 50	0.24	0.17	0.25	0.221

Mid Point - PM10

Size (µm)	Midpoints			
	PL1	PL2	PL3	Average
<2	1.0	1	1	1.0
2 - 4	3.0	3.00	3.00	3.0
4 - 5	4.5	4.50	4.50	4.5
5 - 20	12.5	12.50	12.50	12.5

Size Fraction - PM10

Size (µm)	Size Fractions			
	PL1	PL2	PL3	Average
<2	0.76	0.64	0.67	0.692
2 - 4	0.00	0.06	0.03	0.031
4 - 5	0.00	0.00	0.00	0.000
5 - 20	0.24	0.30	0.29	0.276

Mid Point - PM2.5

Size (µm)	Midpoints			
	PL1	PL2	PL3	Average
<2	1.0	1	1	1.0
2 - 4	3.0	3.00	3.00	3.0

Size Fraction - PM2.5

Size (µm)	Size Fractions			
	PL1	PL2	PL3	Average
<2	1.00	0.91	0.95	0.955
2 - 4	0.00	0.09	0.05	0.045

Calculating Silt Content

%			
PL1	PL2	PL3	Average
8.41	11.27	11.88	10.52

Calculating Moisture Content

%			
PL1	PL2	PL3	Average
0.25	0.27	0.25	0.26

Appendix Z2: Deposition Parameters - Unpaved Quarry Roads

Walker South Landfill Phase II Environmental Assessment

Mid Point - PM44

Size (µm)	Midpoints				
	UPQ1	UPQ2	UPQ3	UPQ4	Average
<2	1.0	1	1	1	1.0
2 - 4	3.0	3.00	3.00	3.00	3.0
4 - 5	4.5	4.50	4.50	4.50	4.5
5 - 20	12.5	12.50	12.50	12.50	12.5
20 - 31.2	25.6	25.60	25.60	25.60	25.6
31.2 - 50	40.6	40.60	40.60	40.60	40.6

Size Fraction - PM44

Size (µm)	Size Fractions				
	UPQ1	UPQ2	UPQ3	UPQ4	Average
<2	0.25	0.37	0.20	0.20	0.25
2 - 4	0.06	0.09	0.06	0.06	0.07
4 - 5	0.00	0.04	0.02	0.03	0.02
5 - 20	0.25	0.32	0.31	0.30	0.29
20 - 31.2	0.19	0.11	0.10	0.19	0.15
31.2 - 50	0.25	0.07	0.31	0.22	0.21

Mid Point - PM10

Size (µm)	Midpoints				
	UPQ1	UPQ2	UPQ3	UPQ4	Average
<2	1.0	1	1	1	1.0
2 - 4	3.0	3.00	3.00	3.00	3.0
4 - 5	4.5	4.50	4.50	4.50	4.5
5 - 20	12.5	12.50	12.50	12.50	12.5

Size Fraction - PM10

Size (µm)	Size Fractions				
	UPQ1	UPQ2	UPQ3	UPQ4	Average
<2	0.44	0.45	0.34	0.33	0.39
2 - 4	0.11	0.11	0.10	0.10	0.11
4 - 5	0.00	0.05	0.03	0.06	0.03
5 - 20	0.44	0.39	0.52	0.51	0.47

Mid Point - PM2.5

Size (µm)	Midpoints				
	UPQ1	UPQ2	UPQ3	UPQ4	Average
<2	1.0	1	1	1	1.0
2 - 4	3.0	3.00	3.00	3.00	3.0

Size Fraction - PM2.5

Size (µm)	Size Fractions				
	UPQ1	UPQ2	UPQ3	UPQ4	Average
<2	0.80	0.81	0.77	0.77	0.8
2 - 4	0.20	0.19	0.23	0.23	0.2

Calculating Silt Content

%				
UPQ1	UPQ2	UPQ3	UPQ4	Average
8.19	59.00	7.50	17.43	23.03

Calculating Moisture Content

%				
UPQ1	UPQ2	UPQ3	UPQ4	Average
0.82	0.98	11.00	12.00	6.20

Appendix Z3: Deposition Parameters - Unpaved Landfill Roads

Walker South Landfill Phase II Environmental Assessment

Mid Point - PM44

Size (µm)	Midpoints					
	UPL1	UPL2	UP3	UP4	UP5	Average
<2	1.0	1	1	1	1	1.0
2 - 4	3.0	3.00	3.00	3.00	3.00	3.0
4 - 5	4.5	4.50	4.50	4.50	4.50	4.5
5 - 20	12.5	12.50	12.50	12.50	12.50	12.5
20 - 31.2	25.6	25.60	25.60	25.60	25.60	25.6
31.2 - 50	40.6	40.60	40.60	40.60	40.60	40.6

Size Fraction - PM44

Size (µm)	Size Fractions					
	UPL1	UPL2	UP3	UP4	UP5	Average
<2	0.27	0.25	0.31	0.30	0.23	0.272
2 - 4	0.06	0.05	0.02	0.02	0.07	0.044
4 - 5	0.00	0.02	0.00	0.02	0.01	0.010
5 - 20	0.29	0.27	0.29	0.30	0.29	0.287
20 - 31.2	0.15	0.18	0.19	0.17	0.14	0.167
31.2 - 50	0.23	0.23	0.19	0.19	0.26	0.220

Mid Point - PM10

Size (µm)	Midpoints					
	UPL1	UPL2	UP3	UP4	UP5	Average
<2	1.0	1	1	1	1	1.0
2 - 4	3.0	3.00	3.00	3.00	3.00	3.0
4 - 5	4.5	4.50	4.50	4.50	4.50	4.5
5 - 20	12.5	12.50	12.50	12.50	12.50	12.5

Size Fraction - PM10

Size (µm)	Size Fractions					
	UPL1	UPL2	UP3	UP4	UP5	Average
<2	0.44	0.42	0.50	0.47	0.39	0.443
2 - 4	0.09	0.08	0.04	0.03	0.12	0.072
4 - 5	0.00	0.04	0.00	0.03	0.01	0.017
5 - 20	0.47	0.46	0.46	0.47	0.48	0.468

Mid Point - PM2.5

Size (µm)	Midpoints					
	UPL1	UPL2	UP3	UP4	UP5	Average
<2	1.0	1	1	1	1	1.0
2 - 4	3.0	3.00	3.00	3.00	3.00	3.0

Size Fraction - PM2.5

Size (µm)	Size Fractions					
	UPL1	UPL2	UP3	UP4	UP5	Average
<2	0.82	0.85	0.93	0.93	0.77	0.860
2 - 4	0.18	0.15	0.07	0.07	0.23	0.140

Calculating Silt Content

%					
UPL1	UPL2	UP3	UP4	UP5	Average
7.04	5.97	5.34	6.24	17.15	8.35

Calculating Moisture Content

%					
UPL1	UPL2	UP3	UP4	UP5	Average
0.42	0.46	0.61	0.97	0.35	0.56

Appendix Z4: Deposition Parameters - Contaminanted Soil Pile

RWDI #2402272

Walker South Landfill Phase II Environmental Assessment

Mid Point - PM44

Size (µm)	Midpoints				
	STK1	STK2	STK3	STK4	Average
<2	1.0	1.0	1.0	1.0	1.0
2 - 4	3.0	3.0	3.0	3.0	3.0
4 - 5	4.5	4.5	4.5	4.5	4.5
5 - 20	12.5	12.5	12.5	12.5	12.5
20 - 31.2	25.6	25.6	25.6	25.6	25.6
31.2 - 50	40.6	40.6	40.6	40.6	40.6

Size Fraction - PM44

Size (µm)	Size Fractions				
	STK1	STK2	STK3	STK4	Average
<2	0.57	0.29	0.33	0.26	0.4
2 - 4	0.14	0.09	0.07	0.03	0.1
4 - 5	0.03	0.01	0.01	0.004	0.014
5 - 20	0.19	0.27	0.29	0.47	0.3
20 - 31.2	0.05	0.17	0.14	0.11	0.1
31.2 - 50	0.02	0.18	0.16	0.12	0.1

Mid Point - PM10

Size (µm)	Midpoints				
	STK1	STK2	STK3	STK4	Average
<2	1.0	1.0	1.0	1.0	1.0
2 - 4	3.0	3.0	3.0	3.0	3.0
4 - 5	4.5	4.5	4.5	4.5	4.5
5 - 20	12.5	12.5	12.5	12.5	12.5

Size Fraction - PM10

Size (µm)	Size Fractions				
	STK1	STK2	STK3	STK4	Average
<2	0.61	0.44	0.48	0.34	0.5
2 - 4	0.15	0.14	0.11	0.04	0.1
4 - 5	0.04	0.02	0.01	0.01	0.0
5 - 20	0.20	0.41	0.41	0.61	0.4

Mid Point - PM2.5

Size (µm)	Midpoints				
	STK1	STK2	STK3	STK4	Average
<2	1.0	1.0	1.0	1.0	1.0
2 - 4	3.0	3.0	3.0	3.0	3.0

Size Fraction - PM2.5

Size (µm)	Size Fractions				
	STK1	STK2	STK3	STK4	Average
<2	0.81	0.77	0.82	0.90	0.8
2 - 4	0.19	0.23	0.18	0.10	0.2

Calculating Silt Content

%				
STK1	STK2	STK3	STK4	Average
75.43	48.93	50.20	51.32	56.5

Calculating Moisture Content

%				
STK1	STK2	STK3	STK4	Average
13.40	45.80	45.20	26.60	32.8

Appendix Z5: Deposition Parameters – Generic Data from AP-42

1. Particle Size Ranges

Since deposition rates depend on the mass of the particles contained within the plume, particle size ranges need to be included in the AERMOD model. These size ranges are based on the average mass of particles for each size category for each type of source. The particle size ranges are based on generic information from AP-42 and other sources. Particle size ranges were used for all on-site sources included in the AERMOD model.

1.1 Material Handling Sources

The primary source of particle size distribution data for aggregate handling is the Final Section for the U.S. EPA's AP-42 Chapter 13.2.4, Aggregate Handling and Storage Piles. This chapter covers sources specific to bulk handling operations, and provides particle size distributions for loader drops and truck dumping. Although no specific curves are available, as with Chapter 11.19.2, the "k" factor associated with the emission factor for various particle diameters can be used as a reasonable approximation. Chapter 13.2.4 provides "k" factors for $PM_{2.5}$, PM_5, PM_{10}, PM_{15} and PM_{30}, which were used to obtain the particle size distribution given below in **Table 1**.

Table 1: Particle Size Distribution for Material Handling Operations

Material Handling Sources Material Loading	Diameter (μm)	1.25	3.75	7.5	12.5	22.5
	Mass Fraction	0.07	0.20	0.20	0.18	0.35

1.2 Stone Quarry and Processing

The primary sources of particle size distribution data for stone quarrying and processing are the Final Sections for the U.S. EPA's AP-42 Chapter 11.19.2, Crushed Stone Processing and Pulverized Mineral Processing. Figure 1 is taken from the background document for Chapter 11.19.2 and provides the particle size distribution for sources specific to stone quarrying and processing operations, including tertiary crushing, screening, fines screening and conveyor transfer points. It should be noted that the particle size distributions provided in Chapter 11.19.2 extend to particulate matter with an aerodynamic diameter up to 100μm, while the Ontario MOE standard for suspended particulate matter is based on PM_{44} (particulate matter with an aerodynamic diameter less than 44μm). The mass fraction up to PM_{44} are calculated in **Table 2** to **Table 4**.

Chapter 11.19.2 does not provide emission factors or particle size distribution for primary and secondary crushing. RWDI uses the emission factor and particle size distribution for tertiary crushing to estimate emissions from primary and secondary crushers. This is considered to be a conservative approach, as the material processed by primary and secondary crushers is larger in size than that by tertiary crushers, resulting in less generation of fine dust particles.

It should be noted that the particle size distributions provided in Chapter 11.19.2 extend to particulate matter with an aerodynamic diameter up to 100μm, while the Ontario MOE standard for suspended particulate matter is based on PM_{44} (particulate matter with an aerodynamic diameter less than 44μm). This discrepancy is not significant however, as typically over 90% of the particulate emitted from these operations is less than 44μm.

Table 2: Particle Size Distribution for Tertiary Crushing Equipment

Crushers	**Diameter (µm)**	1.25	3.75	7.5	15	25	35	45
	Mass Fraction	0.08	0.13	0.31	0.27	0.11	0.07	0.03

Table 3: Particle Size Distribution for Screening Equipment

Screens	**Diameter (µm)**	1.25	3.75	7.5	15	25	35	45
	Mass Fraction	0.03	0.10	0.22	0.38	0.15	0.08	0.05

Table 4: Particle Size Distribution for Conveyor Transfer Points

Conveyor Transfers	**Diameter (µm)**	1.5	3.5	4.5	5.5	6.5	7.5	8.5	9.5	15	25	35	45
	Mass Fraction	0.15	0.08	0.06	0.07	0.07	0.05	0.04	0.04	0.24	0.09	0.05	0.03

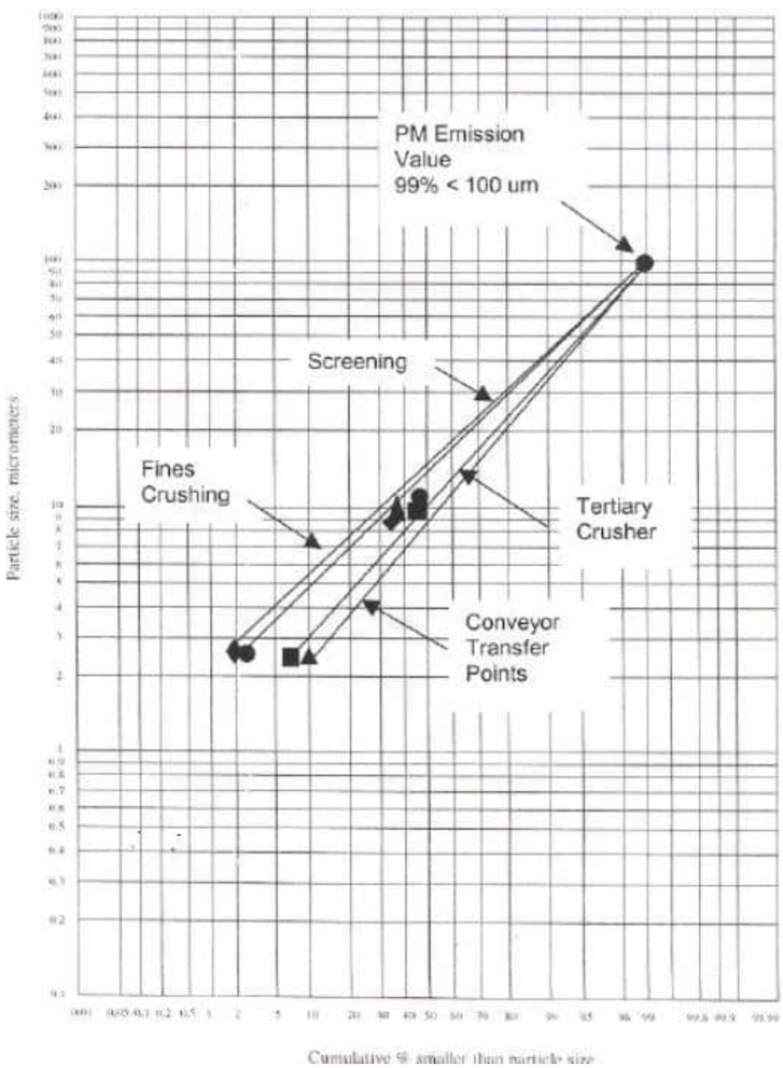


Figure 1: Particle Size Distribution for Stone Quarrying & Processing (AP-42, Chapter 11.19.2)

1.3 Hot Mix Asphalt Manufacturing

The primary sources of particle size distribution data for hot mix asphalt manufacturing are the Final Sections for the U.S. EPA's AP-42 Chapter 11.1, Hot Mix Asphalt Plants. This chapter covers sources specific to hot mix asphalt manufacturing, and provides particle size distributions for batch mix dryers, hot screens and mixers.

No specific curves are available, but particle distribution for $PM_{2.5}$, PM_5, PM_{10}, PM_{15} are provided. The remaining portion is assumed to be PM_{44} for conservative assessment. **Table 6** provides particle size distributions listed in Table 11.1-2. The particle diameter is based on the mid-point for each size bin (e.g., 1.25μm for particles in the $PM_{2.5}$ range and smaller, 3.75μm for particles between the $PM_{2.5}$ and PM_5 ranges, 7.5μm for particles between PM_5 and PM_{10}, etc.).

Table 5: Particle Size Distribution for 1.3 Hot Mix Asphalt Manufacturing Operations

Hot Mix Asphalt Manufacturing	Diameter (μm)	1.25	3.75	7.5	12.5	29.5
	Mass Fraction	0.0083	0.035	0.14	0.23	0.59

1.4 Blasting

The primary sources of particle size distribution data for blasting operations are the Final Sections for the U.S. EPA's AP-42 Chapter 11.9, Western Surface Coal Mining. Although these factors are not specific to quarry operations, at this time, they represent the best available data.

No specific curves are available, but emission factors for $PM_{2.5}$, PM_{10} and PM_{30} are provided, which can be used to develop a reasonable approximation for the particle distribution. **Table 6** provides particle size distributions listed in Table 11.9. The particle diameter is based on the mid-point for each size bin (e.g., 1.25μm for particles in the $PM_{2.5}$ range and smaller, 6.25μm for particles between the $PM_{2.5}$ and PM_{10} ranges, and 20μm for particles between PM_{10} and PM_{30}). As a simplification, the values in Table 11.12-3 and 11.12-4 were not used.

Table 6: Particle Size Distribution for Blasting Operations

Blasting	Diameter (μm)	1.25	6.25	20
	Mass Fraction	0.03	0.49	0.48

1.5 Silo Filling Sources

The primary source of particle size distribution data for silo filling of alkaline admixture is the Final Section for the U.S. EPA's AP-42 Chapter 11.12, Concrete Batching. This chapter covers sources specific to central mix operations of cement and cement supplement.

Although no specific curves are available, as with Chapter 11.12, the "k" factor associated with the emission factor for various particle diameters can be used as a reasonable approximation. Table 11.12-4 provides "k" factors for $PM_{2.5}$, $PM_{2.5-10}$, PM_{10}, PM_{15} and total PM (which are assumed to be PM_{44} for conservative assessment), which were used to obtain the particle size distribution given below in **Table 7**.

Table 7: Particle Size Distribution for Silo Filling Operations

Silo Filling	Diameter (μm)	1.25	3.75	7.5	27
	Mass Fraction	0.06	0.23	0.04	0.67

1.6 Combustion Sources

The particulate released from combustion sources is relatively small. Therefore, the particle size range for combustion sources was assumed to be equal to 1.25 μm in diameter.

Table 8: Particle Size Distribution for Combustion Sources

Combustion	Diameter (μm)	1.25
	Mass Fraction	1

1.7 Particle Size Distributions

The particle size distributions, as presented in **Table 1** through **Table 8**, have been included in the TSP AERMOD model. For the PM_{10} model, the mass fractions were adjusted as only the particles with a diameter equal or less than 10 μm were included. Similarly, for the $PM_{2.5}$ model, the mass fractions were adjusted as only the particles with a diameter equal or less than 2.5 μm were included.

The density information required by AERMOD is based on the average density values of clay (dry excavated, wet excavated) and sand (wet, dry). These values can come from a variety of sources, but RWDI has found the information from the SI Metric organization in the United Kingdom to be a comprehensive resource (Mass, Weight, Density or Specific Gravity of Bulk Materials web-site, http://www.simetric.co.uk/si_materials.htm). Particle densities used to calculate the average particle density for the fugitive dust sources are shown in **Table 9**. For aggregates-related sources, particle density of limestone as shown in **Table 10** were used. All stack emission source were assigned a particle density of 1 g/cm^3.

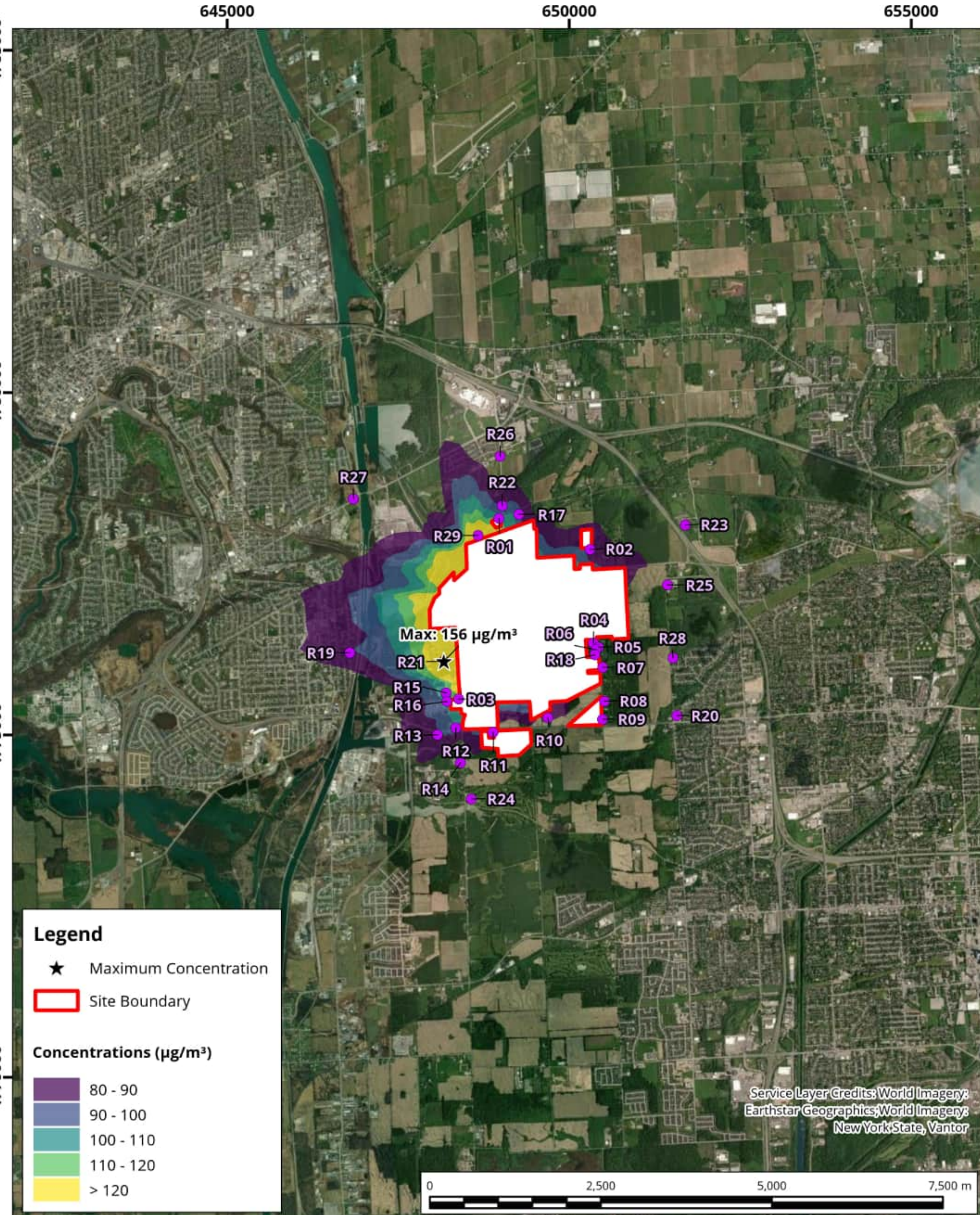
Table 9: Generic Density Information for Soils

Material	Density	
	(kg/m^3)	(g/cm^3)
Clay, dry excavated	1089	1.089
Clay, wet excavated	1826	1.826
Sand, wet	1922	1.922
Sand, dry	1602	1.602
	Average Density	**1.609**

Table 10: Generic Density Information for Aggregate

Material	Density	
	(kg/m^3)	(g/cm^3)
Limestone, solid	2611	2.611

APPENDIX AA



Predicted 24-Hour TSP Concentrations (in µg/m³)

Map Projection: NAD 1983 UTM Zone 17N

Walker Landfill - Regional Municipality of Niagara, Ontario

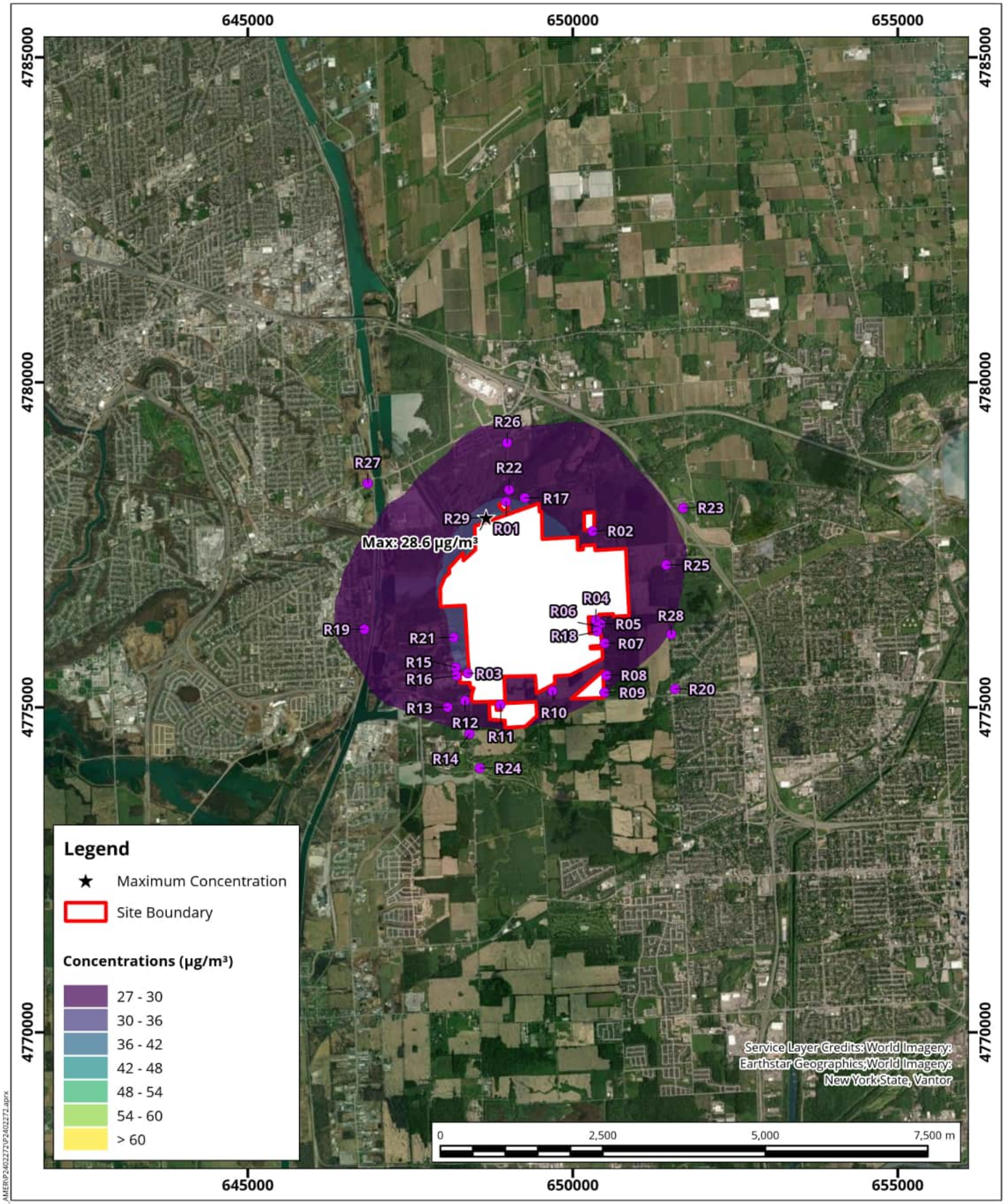
Background Concentration: 51.0 µg/m³

AAQC: 120 µg/m³

Project #: 2402272

Drawn by: PIP	Figure: AA.1
Approx. Scale:	1:80,000
Date Revised:	Jun 17, 2026

Map Document: C:\WorkingFolder\Jobs_AMER\P2402272\P2402272.aprx



Predicted Annual TSP Concentrations (in μg/m³)

True North

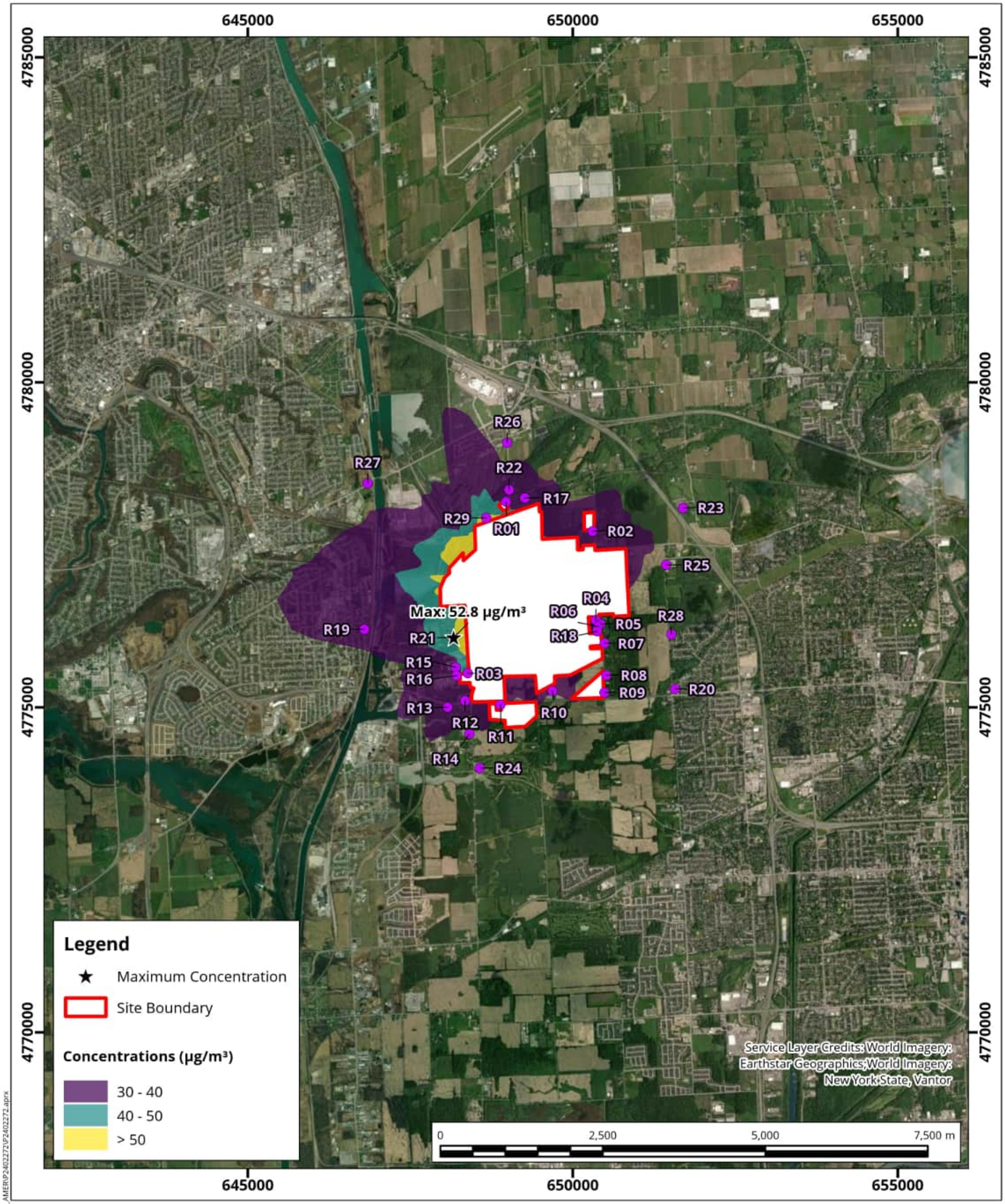
Map Projection: NAD 1983 UTM Zone 17N

Walker Landfill - Regional Municipality of Niagara, Ontario

Background Concentration: 26.0 μg/m³
AAQC: 60 μg/m³
Project #: 2402272

Drawn by: PIP	Figure: AA.2
Approx. Scale:	1:80,000
Date Revised:	Jun 17, 2026

Map Document: C:\WorkingFolder\Jobs_AMER\P2402272\P2402272.aprx



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Predicted 24-Hour PM_{10} Concentrations (in µg/m^3)

True North

Map Projection: NAD 1983 UTM Zone 17N

Walker Landfill - Regional Municipality of Niagara, Ontario

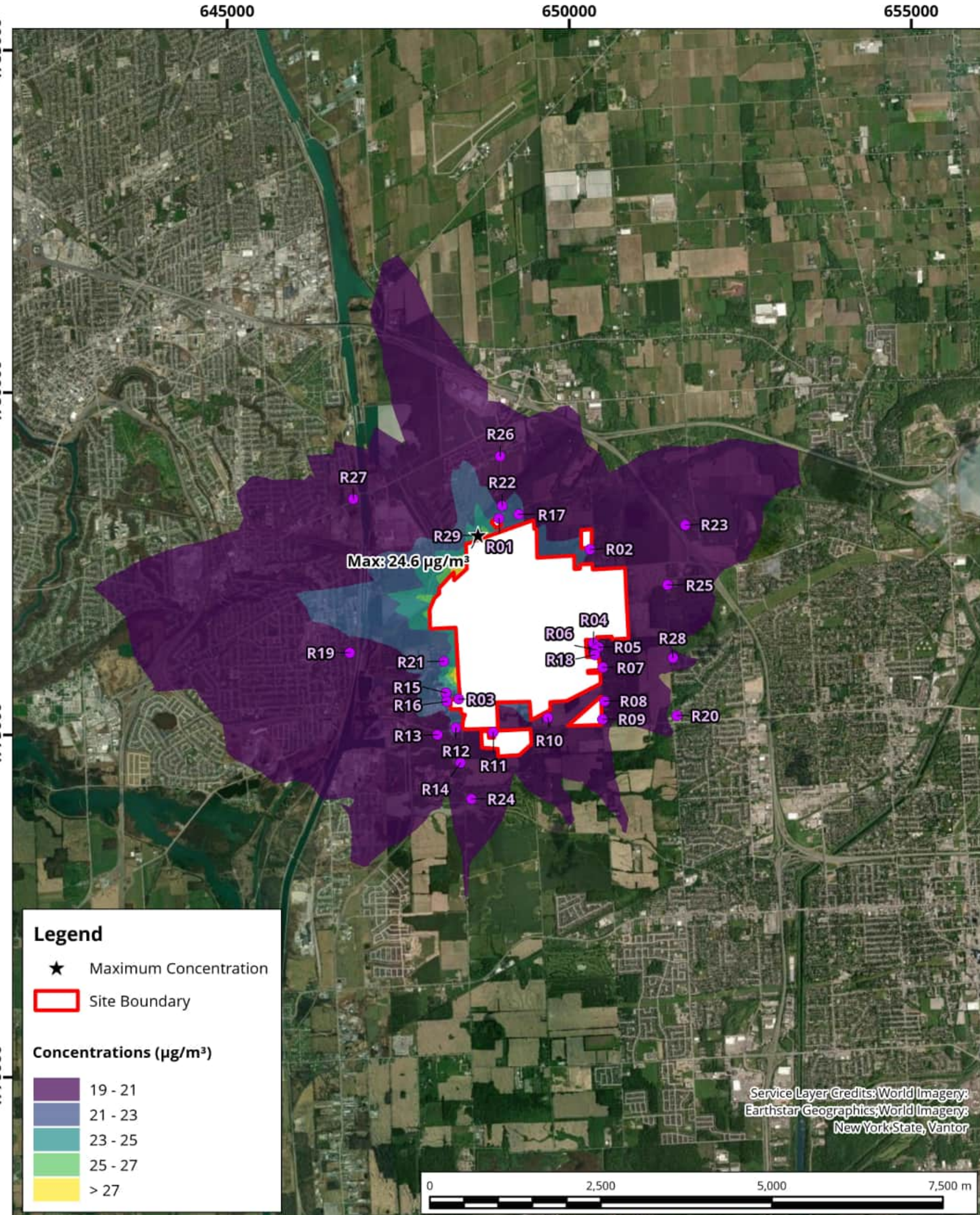
Background Concentration: 21.9 µg/m³

AAQC: 50 µg/m³

Project #: 2402272

Drawn by: PIP	Figure: AA.3
Approx. Scale:	1:80,000
Date Revised:	Jun 17, 2026

RWDI



Map Document: C:\WorkingFolder\Jobs_AMER\P2402272\P2402272.aprx

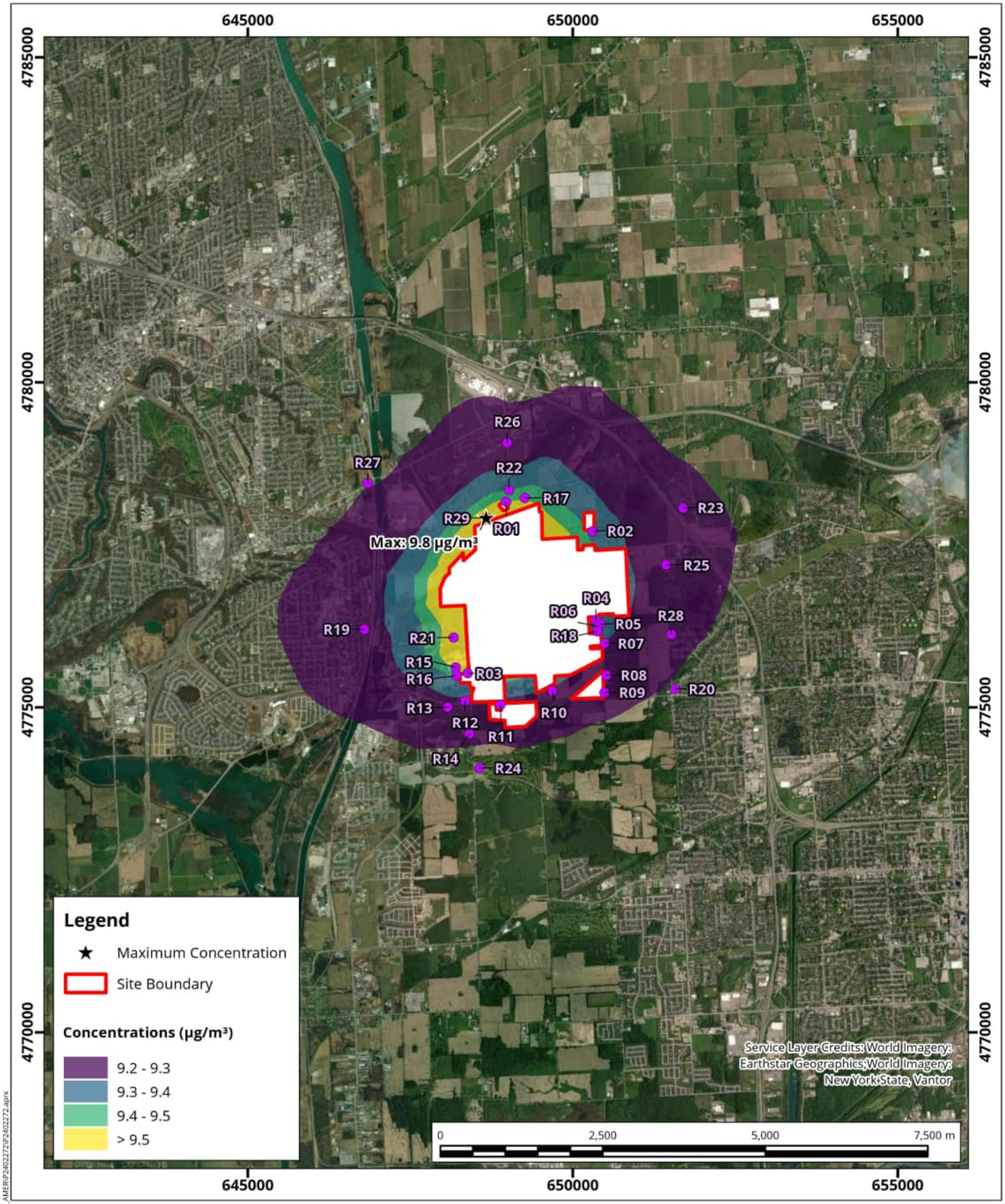
Predicted 24-Hour $PM_{2.5}$ Concentrations (in µg/m³)

True North

Background Concentration: 17.9 µg/m³
CAAQS 2030: 23 µg/m³
AAQC / CAAQS 2020: 27 µg/m³
Project #: 2402272

Drawn by: PIP	Figure: AA.4
Approx. Scale:	1:80,000
Date Revised:	Jun 17, 2026

Map Projection: NAD 1983 UTM Zone 17N
Walker Landfill - Regional Municipality of Niagara, Ontario



Predicted Annual PM$_{2.5}$ Concentrations (in µg/m^3)

True North

Background Concentration: 9.1 µg/m³
CAAQS 2030: 8 µg/m³
AAQC / CAAQS 2020: 8.8 µg/m³
Project #: 2402272

Drawn by: PIP	Figure: AA.5
Approx. Scale:	1:80,000
Date Revised:	Jun 17, 2026

Map Projection: NAD 1983 UTM Zone 17N
Walker Landfill - Regional Municipality of Niagara, Ontario

Map Document: C:\WorkingFolder\Jobs_AMER\P2402272\P2402272.aprx