INTERIM 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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1 INTRODUCTION

This report provides an overview of the existing Air Quality conditions within the study areas for the South Landfill Phase 2 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 (Walker) 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 m3 and is expected to reach maximum capacity by 2029 to 2031.

The proposed Phase 2 of the South Landfill would extend its approved capacity by approximately 18 million m3 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.

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, which will be conducted during the EA. This report focuses on characterizing the existing conditions within the study areas for the South Landfill Phase 2 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), including all lands (76.12 ha) owned and operated by Walker that are within the existing approved boundaries of the Southeast Quarry;
- 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 Niagara Campus boundary.

Although the SSA is limited to the Southeast Quarry, the Air Quality assessment will consider the combined impacts from the existing landfill operations at the South Landfill Phase I, the closed East Landfill, and the other operations occurring at the Niagara 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 Niagara Campus property boundary. This 5 km RSA is consistent with MECP modelling guidelines and will be 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 will encompass the entire RSA. **Figure 2-1** shows the study areas for Air Quality.

2.1 Receptors

The focus of the modelling will be on identified discrete receptors in the immediate vicinity (within ~1 kilometre) of the SSA. A total of 17 discrete receptors were identified. Discrete receptors consist mostly of residences with the addition 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. Impacts beyond these receptors will be visible in the concentration isopleths. Receptors for the air quality assessment were updated in consultation with Walker from previous studies to incorporate recent land acquisition. 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 were removed from the assessment. Receptors will be confirmed through review of updated aerial imagery as well as a site visit prior to dispersion modelling. Receptor locations are presented in **Figure 2-2**. All discrete receptors are modelled using a flagpole height of 1.5m.

In addition, the modelling will be 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 will extend 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.

3 METHODOLOGY

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

- 2024 Proposed Terms of Reference: Walker South Landfill Phase 2 Environmental Assessment, dated June 28th, 2024;
- 2005 EA South Landfill Phase I;
- 2023 WEG, Walker Aggregates Inc. (WAI), and Integrated Gas Recovery Services (IGRS) Emission Summary and Dispersion Modelling (ESDM) Report, dated April 2nd, 2024;

- 2023 Compost and Biosolids Facility ESDM, dated April 2, 2024;
- Odour complaint logs from 2022 to 2024;
- Site-specific meteorological data prepared by the MECP 2013 – 2017;
- Historic annual ambient monitoring reports;
- National Ambient Pollution Surveillance Program Data;
- Site Specific Sampling Data
  - Gas quality sampling – used to determine methane and Volatile Organic Compound (VOC) concentrations;
  - Flux chamber measurements for odour, hydrogen sulphide (H2S) and total reduced sulphurs (TRS);
  - Roadway sampling of paved and unpaved roads for silt loading/content, moisture content, and particle size range;
  - 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:
  - Three months of H2S and 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 Environmental Group hosted a pre-consultation meeting with the MECP on December 17th, 2024, to decide how the existing Air Quality environment would be characterized. Characterization of the existing Air Quality environment will be 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 (PM10) 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 (PM2.5), in addition to PM10, was conducted during the South Landfill Phase 1 EA. Historical ambient monitoring data collected as part of the South Landfill Phase 1 EA, will be used to determine ratios of PM10 to TSP and PM2.5. These ratios will be applied to the most recent PM10 monitoring data from the site to determine TSP and PM2.5 background concentrations.

Similarly to particulate matter historical VOC monitoring data has been collected. However, for the characterization of the existing environment, fence line VOC sampling will be completed on a more regular basis, with fixed location 24-hour sampling. Current landfill operations will be considered when siting the monitoring locations. If deemed necessary, monitoring at or near discrete receptor location(s) may be considered based on community participation. Walker Environmental Group owns several residential properties in close proximity to the site which may be used for ambient monitoring locations.

Off-site continuous monitoring for H2S and TRS will be used to characterize existing emissions from site.

Upwind measurements from all ambient monitoring programs will be used to characterize background concentrations while downwind measurements will be used to inform existing conditions. Downwind ambient monitoring data for all measured contaminants will be compared to dispersion modelling results and if required used to determine scaling factors for calibration of modelling results.

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

Source specific flux chamber analysis may be used to characterize specific emissions of VOCs, H2S and TRS compounds at the landfill. Samples of the landfill gas from the existing landfill will be collected in order to characterize the landfill gas composition. Source specific sampling for dust sources will include 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 complaints history will be 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 3.4.

3.2 Indicator Contaminants

The South Landfill Phase 1 has been well characterized through studies such as the 2005 South Landfill Environmental Assessment, the 2022 Integrated Gas Recovery System (IGRS) ECA application for the addition of the Renewable Natural Gas (RNG) facility at the South Landfill, and most recently, the 2023 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 (H2S) (CAS# 7783-06-4);
    g. Nitrogen Oxides (NOx) / Nitrogen Dioxide (NO2) (CAS# 10102-44-0); and
    h. Sulphur Dioxide (SO2) (CAS# 7446-09-5).
4) Dust:
    i. Total Suspended Particulate (TSP);

j. Particulate Matter less than 10 µm in diameter (PM10); and
k. Particulate Matter less than 2.5 µm in diameter (PM2.5).

Assessment criteria for these contaminants were obtained from:

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

Contaminants will be compared against criteria from O.Reg. 419/05, AAQC and screening levels where available. In the absence of any MECP criteria, contaminants will be compared to the CAAQs criteria. PM2.5 does not have criteria under O.Reg.419/05 or AAQC, so the CAAQs criteria will be used for comparison. 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 PM2.5. CAAQs also provides criteria for nitrogen dioxide and sulphur dioxide. These criteria will not be 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
Total Suspended Particulate (TSP)	Dust	24-hour	120	AAQC & O.Reg 419/05
		Annual	60	AAQC
Particulate Matter Less than 10 µm in diameter (PM_{10})	Dust	24-Hour	50	AAQC
Particulate Matter Less than 2.5 µm in diameter ($PM_{2.5}$)	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
		Annual	10	Screening Level
Hydrogen Sulphide (H_2S)	Landfill Gas	10-minute	13	AAQC & O.Reg 419/05
		24-hour	7	AAQC & O.Reg 419/05
Total Reduced Sulphurs (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

Contaminant	Applicable Sub-Assessment	Averaging Period	Air Quality Criteria (ug/m^3)	Source
Nitrogen Oxides/Nitrogen Dioxides (NO_X/NO_2)	Combustion	1-hour	400	AAQC & O.Reg 419/05
		24-hour	200	AAQC & O.Reg 419/05
Sulphur Dioxide (SO_2)	Combustion	1-hour	100	AAQC & O.Reg 419/05
		Annual	10	AAQC & O.Reg 419/05

Notes:

[1] The 24-hour PM2.5 CAAQs criteria is based on the 3-year average of the annual 98th percentile of the daily 24-hour average concentration.

[2] The annual PM2.5 CAAQs criteria is based on the 3-year average of the annual average of the daily 24-hour average concentration.

3.3 Background Data

Background data refers to concentrations of the contaminants of interest in the environment resulting from sources other than the SSA. 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 will be obtained from publicly available sources such as the National Air Pollution Surveillance (NAPS) regional ambient monitoring program.

Background data is used in conjunction with dispersion modelling in order to assess the potential for cumulative impacts on the surrounding areas from the South Landfill Phase 2, and surrounding industrial and agricultural activities, traffic, and other source of like air emissions. When calculating background concentrations from site-specific ambient monitoring data, only upwind sample data will be considered so as not to double count emissions associated with landfill operations.

Background concentrations will be taken as the 90th percentile value when comparing to 10-minute, 1-hour, and 24-hour averaging period criteria, while the average concentration will be considered when assessing annual criteria. Twenty four-hour 90th percentile concentrations were converted to 10-minute and 1-hour averaging periods using the methodology found in Section 4.4 of MECP's Guideline A-11 published in February 2017.

3.4 Ambient Dust and VOC Monitoring

3.4.1 PM10 Monitoring

As part of the WAI, Walker Brothers Quarry (WBQ) Aggregate Resource Act License No. 8336 and No. 11175 Walker's has maintained an ambient monitoring program at the Campus for PM10 since 2004. This program includes two monitoring locations:

- 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 are taken over a 24-hour period, on a six-day cycle corresponding with the National Air Pollutant Surveillance (NAPS) sampling schedule as outlined by the U.S. EPA. PM10 data from historical sampling campaigns will be used to characterize background concentrations. When calculating background concentrations from PM10 monitoring data, only upwind sample data was considered so as not to double count emissions associated with landfill operations.

The monitoring stations do not measure other particulate size fractions. Instead, background concentrations of TSP and PM2.5 will be determined based on scaling factors developed from the expanded monitoring program completed for the 2005 South Landfill Phase I EA. The scaling factors will be applied to the 1-year of PM10 data to derive data for the TSP and PM2.5 fractions of dust.

3.4.2 VOC Monitoring

In order to characterize background concentrations of VOCs, fence line field measurements will be collected on a six-day cycle from May to September and a twelve-day cycle from for periods outside this time. Sampling would be completed at two locations positioned at dominant upwind and downwind directions from the site. This method prevents the double counting of emissions from landfilling operations.

3.4.3 H2S and TRS Monitoring

In order to characterize background concentrations of H2S and TRS, a single continuous monitoring station will be installed for a 3-month period from May through July. Although H2S and TRS are assessed on a 10-minute averaging period, local 1-hour meteorological data will be used to complete an upwind downwind analysis to ensure concentrations recorded by the monitoring station do not double count emissions from landfill operations. This is due to the lack of availability of 10-minute wind data. The results of this H2S monitoring may be used to develop and apply a scaling factor to the model, if necessary, to ensure the model is representative for H2S.

3.5 Emission Source Sampling

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

3.5.1 Odour Flux Chamber Sampling

In order to better characterize fugitive odour emissions from the existing South Landfill Phase 1 and East Landfill RWDI will collect flux chamber samples from landfill areas under final cover, 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(s), and the leachate storage ponds. Sampling will be completed during the summer months between May and September during dry conditions. Samples collected will be sent to a laboratory to be analysed by an odour panel to determine odour flux rates for each source.

3.5.2 H2S and TRS Flux Chamber Sampling

In order to better characterize H2S and TRS emissions from the South Landfill Phase 1 and East Landfill, RWDI will collect flux chamber samples from landfill areas under final cover, interim cover, active face areas, and the leachate storage ponds. Sampling will be completed during the summer months between May and September during dry conditions. Samples collected will be sent to a 3rd party laboratory for analysis.

3.5.3 Landfill Gas Source Sampling

In order to better characterize fugitive emissions of VOC compounds from the Walker's South Landfill Phase 1 and East Landfill, historical gas sampling will be reviewed and if required additional landfill gas samples from the outlet of the landfill gas collection system will be collected. Samples will be collected under normal operating conditions. Samples will be sent a 3rd party laboratory for analysis.

3.5.4 Roadway and Material Stockpile Sampling

In order to better characterize fugitive dust emissions from the internal haul routes and material storage piles, RWDI will collect dust samples from the paved and unpaved roadway as well as a sample of daily cover material. Sampling will be completed during the late spring or summer months when weather conditions are dry and there has been no reported rain for the previous two days to capture the maximum potential for dust emissions. Samples will be collected in accordance with US EPA AP-42 Appendix C.1 Procedures for Sampling Surface/Bulk Dust Loading.

Samples will be sent for laboratory analysis to determine silt content, moisture content, and grain size analysis. Size fractions will be used to develop deposition parameters for use in the dispersion modelling.

4 DISPERSION MODELLING

The existing conditions at the identified receptor locations will be determined using a dispersion model and reasonable worst-case emission rates for the odour, landfill gas and combustion byproducts, and dust. Dispersion modelling will be performed using the United States Environmental Protection Agency (U.S EPA), AERMOD dispersion model (AERMOD), version 22112, 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, will be 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 will be 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

Sources specific to each study will be 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;
- Active face equipment;
- Landfill Gas (LFG) flares;
- Waste soil storage pile;
- Material handling;
- Vehicle traffic on internal haul routes;
- Idling vehicles at the active face and weigh scale; and
- Generators.

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

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

4.1.1 Meteorological Data

To ensure that a broad range of dispersion conditions are addressed, five years of site-specific meteorological data (2013 – 2017) will be used in the AERMOD model. The meteorological data set was developed by the MECP's Environmental Monitoring and Reporting Branch (EMRB). 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 will be 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** will be included in this study. Humans will be assumed to be present at receptors representing residences for 24-hours per day. Non-residential receptors will be assessed during their regular hours of operation. Discrete receptors were modelled at flagpole heights of 1.5 m above grade. The locations of these discrete receptors are shown on **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 from the existing landfill site.

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 will be 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) is used to calculate the effects of building downwash on point sources, such as stacks. The IGRS facility and asphalt plant will be included in the modelling, as these structures have the potential to affect emissions from their associated sources. The BPIP model will be run prior to running the AERMOD model in order to incorporate the potential building downwash effects.

The potential building downwash effects will be 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 will be 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 will be 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 at the Walker's Landfill will be characterized using a combination of ambient monitoring data and dispersion modelling as described in Section 4. Dispersion modelling will be completed for the identified discrete receptors for odour, landfill gas and combustion byproducts, and dust contaminants. Modelling results will be combined with upwind background concentrations, developed from ambient monitoring data as described in Section 3, in order to capture cumulative impacts from non-landfill related operations. Background values for contaminants without site specific monitoring data will be obtained from published ambient monitoring data. There will be no background concentration of odour considered in the assessment. Emissions will be quantified from landfill sources for odour, landfill gas and combustion byproducts, and dust. Blowing litter will be 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. Walkers 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, interim, or final cover to minimize the potential for windblown litter. Blowing litter will be 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 working face to minimize wind exposure;
- Repositioning unloading vehicles to minimize wind exposure;
- Use of portable litter fences that are moved around the working face and surrounding areas to capture blowing litter based on forecasted meteorological conditions;
- Suspension of unloading wastes until conditions become more favourable;
- Installation of 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 working 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 A**.

6.2 Complaints History

A review of the Walker's complaints log was conducted in order to determine the current level of blowing litter impacts in the vicinity of the landfill. From 2022 to 2024 no litter related complaints were received.

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.

Therefore, the lack of litter-related complaints 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. **Tables 6-1** and **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 6-1: 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 **Tables 6-1** and **6-2**. Their findings are summarized in **Table 6-3**.

Table 6-2: 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 6-2**.

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, wind speeds ranging from 16 – 24 km/h, were considered the minimum wind speeds required for potential litter events. As wind speed increases, more material has 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 6-1** provides the wind rose for 5-years of site-specific meteorological data prepared by the MECP for the years 2013 to 2017. 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 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 **Tables 6-1** and **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 6-1** 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 NW). The frequency of winds greater than 16 km/h vary between <1% to 5% depending on wind direction. Winds are less than 16 km/h 55% of the time.

As showing in **Figure 6-2**, three receptors, R7, R21, and R22 are located within 500 m of the existing south landfill. Based on the wind rose presented in **Figure 6-1** and the wind speed thresholds presented in **Tables 6-1** and **6-2**, high winds that could potentially cause litter to blow toward these residences are expected to occur infrequently, less than 1% of the time from the northeast. All receptors are located southwest of the existing landfill which is the least common wind direction. 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 5 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 proposed landfill and have little or no potential for blowing litter impacts.

6.6 Blowing Litter Conclusion

Between 2022 and 2024, no litter related complaints were received. During high wind events, Walker's 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's to focus their mitigation and inspections in these areas. Overall, with the blowing litter SOPs in place Walker's is effective in minimize off-site impacts such that existing impacts to residences are low.

7 ODOUR

As part of the characterization of the existing Air Quality environment, the potential for odour related impacts will be considered. This study will assess potential for nuisance effects at sensitive off-site receptors from odour associated with landfill operations. Receptors that will be considered in the assessment are outlined in **Section 2.1**. Potential odour impacts will be 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 waste soil odours, will be 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 does provide 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 odour unit (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. 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's Landfill operations will be compared to both the 1 OU/m^3 detection threshold and the 3 OU/m^3 and 5 OU/m^3 annoyance thresholds.

Although certain contaminants known to be present in landfill gas (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 will be 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). The odours from other landfill-related sources are based on a mixture of compounds contained in the leachate area sources and in the waste soil piles.

Potential odour sources were identified based on previous assessments of odour from the Walker's landfill. The existing environment will be characterized using a combination of emission factors and site-specific odour sampling. The resulting odour emissions will then be incorporated into a dispersion model to assess potential impacts at residential receptors.

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 will not be considered.

There are no other facilities within the LSA with active landfilling operations that could contribute to odour impacts. 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 working face and fresh waste materials, spills on roadways, inactive work area, 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 expected to be the dominant odour source. In an effort to minimize odour emissions from the site, Walker's 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 when temperatures are above freezing to remove odourous spills;
- Where possible, limiting the size of the working 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;

- Application of surface deodorizer 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 robust record keeping programs including daily diaries and notes, daily inspection checks and monthly EH&S inspections, and complaints for a minimum of 2 years.

Although it is impossible to 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 B**.

7.2 Complaints History

A review of the Walker's complaints log was conducted in order to determine the level of odour impacts in the LSA. From 2022 to 2024 a total of 87 odour-related complaints were received. The majority of these odour-related complaints have been logged in 2022 and 2033, with 41 complaints in 2022, 31 in 2023, and only 15 in 2024.

Where complaints were received, Walker's records the complaint in the formal log and completes the appropriate investigations into the potential source of the complaint.

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 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 summarize 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	Total
Campus	23	6	3	32
Compost	10	15	7	32
Landfill	5	10	5	20
IGRS	3	0	0	3
Total	41	31	15	87

In 2022 and 2023 new gas collection wells were being drilled as part of the construction of the 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 the new gas collection wells is likely the cause of elevated complains in 2022 and 2023. Upon completion of construction in 2024 there was a substantial decrease in odour complains. The year over year decrease in odour complaints suggest that odour from 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 C**.

7.3 Odour Emission Sources

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

- Landfill gas (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.

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 area will be 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 does not have a completely installed LFG collection system, therefore has greater potential for landfill gas related odours. The interim cover area will be 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. Odours from the active face include contributions from the waste itself, as well as LFG seepage from underlying waste.

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 received. 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, will not be 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 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 will not be 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 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 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. However, even with control measures in place it is possible for leachate maintenance holes to be a source of odour emissions. Leachate on site is stored in two leachate storage ponds. Leachate stored in the ponds has the potential to contribute to odour emissions and will be 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 due to potential cumulative impacts with odour from other landfill operations.

7.4 Emission Calculations

All emissions of odour from the facility will be quantified using a combination of flux chamber sampling, published emission factors, and/or engineering calculations. The new source testing data will be used as the basis for developing new flux rates for landfill sources. Historic odour flux rates may also be used to help characterize landfill sources as necessary.

Flux chamber samples will be taken in triplicate, and odour concentrations will be determined by odour panel evaluation. Odour concentrations will be converted to flux rates and the average flux rate will be applied to each source respectively. Flux chamber sampling will be completed during the summer months between May and September during dry conditions. Samples collected will be sent to a laboratory to be analysed by an odour panel to determine odour flux rates for each source. Emissions will be determined for sources such as:

- Fugitive emissions from the final cover areas of the landfill;
- Fugitive emissions from the interim cover areas of the landfill;
- Fugitive emissions from the active face of the landfill;
- Fugitive emissions from the leachate storage ponds; and
- Fugitive emissions from the contaminated soil pile(s).

7.5 Dispersion Modelling

The potential odour impacts from landfill operations will be determined using dispersion modelling and reasonable worst-case emission rates. Dispersion modelling for odour will be completed in accordance with the methodology outlined in Section 4. Modifications to the methodology specific to odour modelling are provided in the following sections. Detailed dispersion modelling will be completed after the site-specific sampling campaign is completed.

7.5.1 Area of Modelling

The potential for odour impacts will be assessed using a 10-minute averaging period at discrete receptors only. All discrete receptors will be considered in the odour modelling. The locations of these discrete receptors are shown on **Figure 2-2**.

In addition, modelling will be performed using a receptor grid covering LSA and RSA areas to produce isopleths of predicted concentrations. The receptor grid covers the lands within approximately 5 kilometres from the existing landfill site.

7.6 Odour Conclusion

Odour from the existing landfill will be characterized using dispersion modelling. Modelling results will be compared to 1, 3, and 5 OU thresholds and compared to the predictions from the 2005 EA. Detailed dispersion modelling will be completed after the site-specific sampling campaign is completed.

8 LANDFILL GAS AND COMBUSTION BYPRODUCTS

Landfill gas (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 will focus on the key indicator contaminants outlined in Section 3, which are vinyl chloride, benzene, and 1,1,2-trichloroethane. The most recent ESDM at the Walker's Environmental Group South Landfill operations show compliance for all three of these indicator contaminants. Therefore, compliance for all other VOC compounds is anticipated. As discussed in Section 3, these contaminants represent the highest predicted concentrations relative to their respective criteria.

The indicator contaminants for reduced sulphur compounds are H2S and TRS. TRS represents the combination of sulphur compounds such as carbonyl sulphide, H2S, carbon disulfide, methyl mercaptan, ethyl mercaptan, dimethyl sulphide, 1-propyl mercaptan, methyl ethyl sulphide, and dimethyl disulphide. Potential impacts from H2S emissions will be assessed both individually as well as a part of TRS.

For products of combustion the indicator contaminants will be nitrogen oxides (NOx) and sulphur dioxide (SO2), 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 SO2 represent the highest predicted concentrations relative to their respective criteria and compliance with NOx and SO2 results in compliance of other contaminants.

- Potential LFG and combustion byproduct impacts will be 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 Environmental Group South Landfill is collected by the landfill gas collection system and sent for destruction or for utilization such as electricity generation, or conversion to RNG for use in the regional natural gas pipeline. However, a portion of the landfill gas that is not destroyed or utilized 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, SO2, and particulate matter. This section considers the potential impacts from the combustion byproducts NO2, SO2, and D&F. Potential impacts of particulate matter are discussed in Section 9. Emissions of NOx, and SO2 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 Environmental Group South Landfill complaints log was conducted in order to determine the current level of VOC and combustion byproduct impacts in the vicinity of the landfill. From 2022 - 2024 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 though 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's 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 Environmental Group South Landfill has 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, where appropriate sources of like emissions from the asphalt plant and quarry operations will be 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, or office natural gas combustion equipment;
- Quarry and asphalt plant mobile equipment tailpipe emissions; and
- Process emissions associated with asphalt production.

8.2.1 Landfill Mound under Final Cover

The landfill mound under final cover 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 final LFG collection systems have been put in place.

Fugitive emissions of LFG are released through the surface of the landfill mound under final cover. 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 cap in place, some LFG is released to the atmosphere through the final cover. 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 area will be 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 50%. Although some cells within a given stage of the landfill may be under final cap, for the purposes of the assessment the entire stage will be assumed to be under interim cover as a conservative approach. The interim cover area will be included in the quantitative assessment.

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 is not included as a source for the LFG and combustion byproducts assessment.

8.2.3 Landfill Gas Flare

Collected landfill gas is combusted in fully enclosed flares or is diverted to the IGRS facility. The landfill currently has three existing flares on-site. There is one additional flare that is associated with IGRS, for a total of four landfill gas flares on-site.

Emissions of LFG constituents and combustion byproducts from the LFG flares will be included in the quantitative assessment.

8.2.4 RNG Facility

The RNG facility upgrades the landfill gas to a quality similar to fossil natural gas. In verbal terms, the raw landfill gas (biogas) will pass through a chiller and then through an activated carbon-based hydrogen sulfide (H_2S) removal system. The gas then passes through a Temperature Swing Adsorption (TSA) system to remove volatile organic compounds (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.

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

8.2.5 Landfill Gas Generators

A portion of the LFG collected from the LFG collection system is used to generate electricity. There is currently one 1.064 MW landfill gas-fired electricity generator in operation and IGRS has approval to install up to 3 more units. Operation of all 4 units will be considered in the existing conditions since they have already been approved for installation. 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 will be included in this quantitative assessment.

8.2.6 Portable Generators

Two portable generators are used to provide on demand power for Walker's operations. These portable generators use diesel fuel, and diesel combustion results in combustion by-products. Emissions of combustion byproducts from the diesel generators will be included in this quantitative assessment.

8.2.7 Stationary Generator

There is one 45-kilowatt generator that are used at the SEQ pond as part of the quarry and asphalt plant operations. This generator uses diesel fuel, and diesel combustion results in combustion by-products. Emissions of combustion byproducts from the diesel generator will be included in this quantitative assessment.

8.2.8 Landfill Tippers

There are two diesel-fired landfill tippers at the Walker Environmental Group Landfill, one with a 129-kW engine and one with a 125-kW engine. The assessment will consider the operation of both tipper units at maximum capacity. For consistency with previous studies, both tippers will be assumed to have the larger engine (129-kW) for the purposes of the assessment. The tipper is used during landfill operating hours only, so it was assessed as operating between the hours of 7 am to 6 pm.

8.2.9 Cracks/Fissures in Landfill Cap

The final cap of the landfill limits the migration of LFG through the 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, will not be 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, will not be 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 leachate collection system was excluded from the quantitative assessment.

Leachate on site is stored in two leachate storage ponds. Leachate stored in the ponds has the potential to contribute to VOC emissions and will be 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 will not be 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 Waste Soil Stockpiles

The landfill receives waste soil from off-site locations. The majority of this soil is petroleum fuel-contaminated and contains fuel-related VOCs such as benzene and other light aromatics. VOC emissions from the waste soil stockpiles will be included in the quantitative assessment.

8.2.14 Tailpipe Emissions

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

8.2.15 Asphalt Plant Emissions

Sources of like emissions from the asphalt plant will be considered as part of the assessment. Based on the 2023 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 will be 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 will be considered.

8.3 Emission Calculations

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

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

In addition to sources associated with landfill operations sources of like emissions from the asphalt plant and quarry will also be 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 operation haul trucks and heavy equipment.

Additional source may be added through the quantitative assessment.

8.4 Dispersion Modelling

The potential LFG and combustion byproduct impacts from landfill operations will be determined using dispersion modelling and reasonable worst-case emission rates. Dispersion modelling will be 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. Detailed dispersion modelling will be completed after the site-specific sampling campaign is completed.

8.4.1 Area of Modelling

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

In addition, modelling will be 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 from the existing landfill site.

8.5 Landfill Gas and Combustion Byproducts Conclusion

LFG and combustion byproduct contaminants from the existing landfill and like emissions from the asphalt and quarry operations will be characterized using dispersion modelling. Modelling results will be compared to relevant criteria. Detailed dispersion modelling will be completed after the site-specific sampling campaign is completed.

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: total suspended particulate matter (TSP), inhalable particulate matter (PM_{10}), and respirable particulate matter ($PM_{2.5}$). 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 will be 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 Walker's complaints logs from 2022 to 2024 was conducted in order to determine the current level of dust impacts in the vicinity of the landfill. For the years 2022 to 2024, three blasting and one road watering complaint was received. Although impacts from dust are not specifically mentioned in the complaint, these activities are commonly associated with fugitive dust. However, complaints are infrequent and suggest 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 cover 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 D**.

9.3 Dust Emission Sources

Under normal operating conditions, Walker's South Landfill Phase 1 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;
- Bulldozing;
- Landfill gas flares; and
- Portable generators.

Each of these sources is discussed in the following sections. Asphalt plant and quarry operations have the potential to be source of dust emissions. Where appropriate sources of like emissions from the asphalt plant and quarry operations will be 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 Four 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;
- 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 2023 ESDM report). However, for the purposes of this study all sources of fugitive dust were considered, including these activities.

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. The movement of on-site heavy equipment, such as loaders, will be included in the assessment of on-site roadway sources. Particulate matter emissions generated by the vehicles traveling along these unpaved and paved surfaces include particulate matter emissions from tailpipes, brake wear, tire wear, and re-entrainment of loose material on the road surfaces. Emissions of particulate matter from these sources will be included in this quantitative assessment. The road-dust re-entrainment will consider site-specific data collected from the sampling described in **Section 3.7**.

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 will be 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. This assumption may be modified based on landfill operations. The particulate emissions from these idling trucks will be considered in the assessment.

9.3.3 Tippers

Diesel fired tippers are used at the landfill working face to empty waste trailers into the landfill. Particulate emissions associated with diesel combustion will be 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 will include all exposed areas that will not be vegetated, such as soil stockpiles and areas with daily and interim soil cover.

The exposed areas subject to wind erosion will be 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 cover will be 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 will also be 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 will be 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.

Only like emissions of particulate matter from these activities will be 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);
- Removal and replacement of daily cover at the landfill active face; and
- Various construction activities as applicable.

9.3.7 Landfill Gas Flares

Collected LFG is combusted in fully enclosed flares. There are a total of five flares that are currently used on site with one of the flares being associated with IGRS operations. 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 will be 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 will be considered in the assessment such as:

- The landfill gas 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. Incomplete combustion results in releases of particulate matter from the generators which will be considered in the assessment.

9.3.10 Portable Generators

Two portable generators will be used to provide on demand power for Walker's operations. These portable generators use diesel fuel, and diesel combustion results in combustion by-products, including particulate matter. Emissions of particulate matter from the diesel generators will be included in this quantitative assessment.

9.4 Emission Calculations

All emissions of dust from landfill operations will be quantified using a combination of site-specific sampling, published emission factors, and engineering calculations. Emissions will be determined for the following sources:

- Tailpipe and entrained dust emissions associated with 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; and
- Emissions from combustion sources including landfill gas flares, the siloxane flare, the thermal oxidizer, and generators.

9.5 Dispersion Modelling

The potential dust impacts from landfill operations will be determined using dispersion modelling and reasonable worst-case emission rates. Dispersion modelling will be 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 Walker's landfill will be collected and used to determine particle size distributions for use in the modelling, as discussed in **Section 3.7**.

This methodology of using dry deposition and dry plume depletion for ground-based fugitive emissions has been historically accepted by the MECP for the assessment of particulate matter emissions from landfills and quarries as part of the EA processes. Parameters required for deposition/dry depletion may be determined through site specific measurements, historical parameters, and published factors.

9.5.2 Area of Modelling

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

In addition, modelling will be 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 from the existing landfill site.

9.6 Dust Conclusion

Dust contaminants from the existing landfill and like emissions from the asphalt and quarry operations will be characterized using dispersion modelling. Modelling results will be compared to relevant criteria. Detailed dispersion modelling will be completed after the site-specific sampling campaign is completed.

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

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

In order to properly characterize the existing Air Quality environment for odour, landfill gas and combustion byproducts, and dust detailed dispersion modelling is required. Prior to dispersion modelling extensive field sampling is required in order to characterize emission sources at the site including odour flux chamber measurements of the landfill final cover, interim cover, and active face areas, leachate storage ponds, and contaminated waste pile(s). Flux chamber measurements are required at the same locations for H2S and TRS emissions with the exception of the contaminated soil pile(s) which are not expected to be a substantial source of H2S or TRS compounds. Flux chamber sampling is expected to be completed through the spring/summer of 2025.

Gas samples are required to characterize the concentrations of VOC compounds within the landfill gas collected on-site and fugitive releases through the landfill mound. Road dust sampling of paved and unpaved roads as well as material stockpiles is required to characterize the silt loading, silt content, moisture content, grain size for the quantification of emissions and application of deposition parameters in the dispersion modelling. LFG sampling and roadway dust sampling is expected to be performed throughout the summer of 2025. Ambient monitoring will be conducted to aid in the development of background concentrations and support the existing conditions modelling results. The existing conditions report will be updated upon completion of the dispersion modelling for all indicator contaminants and compared to their applicable criteria.

11 STATEMENT OF LIMITATIONS

This report entitled "Interim 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.*

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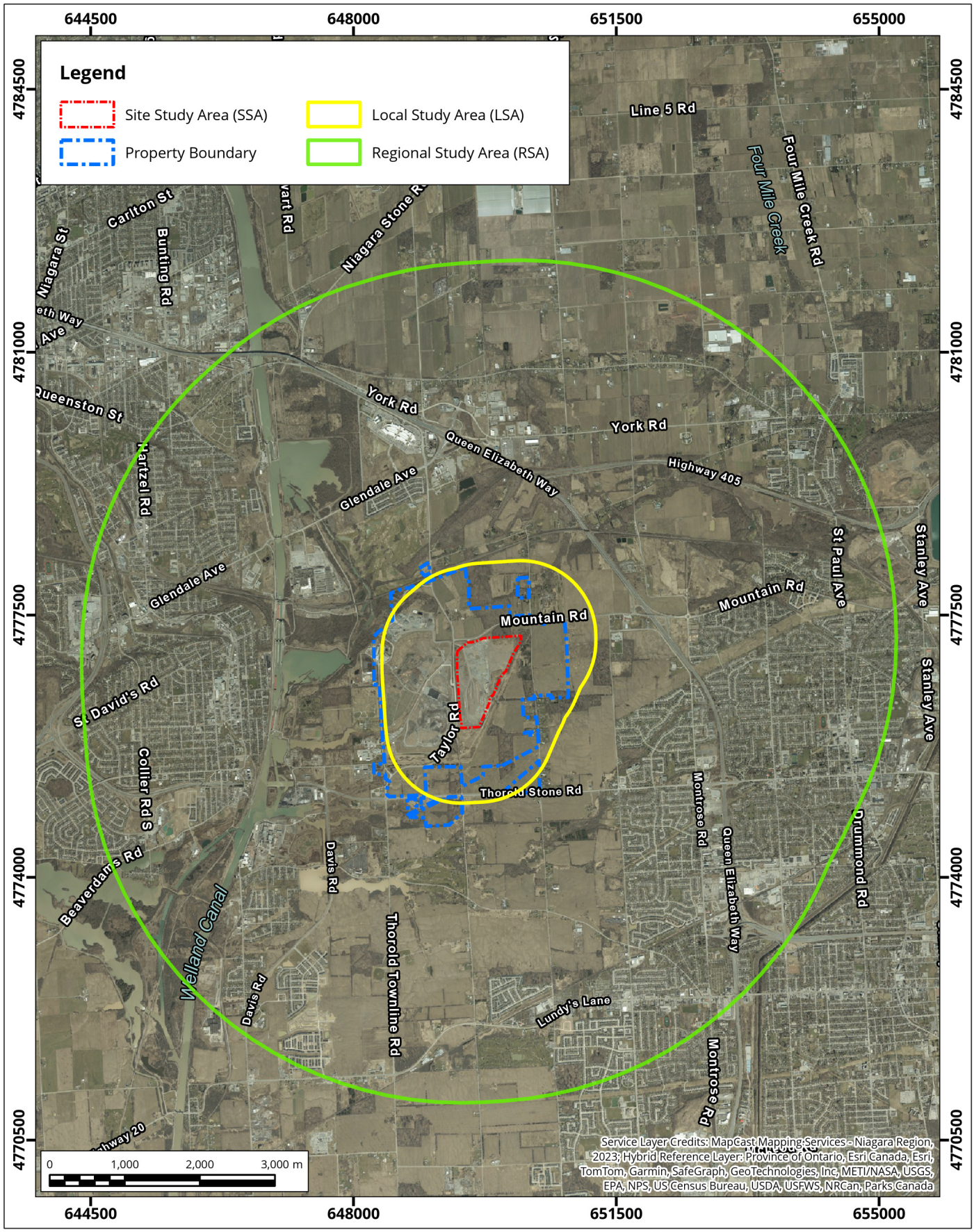
United States of America Environmental Protection Agency. (2024, 1 24). *AP-42: Compilation of Air Emissions factors from Stationary Sources.* Retrieved from United States Environmental Protection Agency: https://www.epa.gov/air-emissions-factors-and-quantification/ap-42-compilation-air-emissions-factors-stationary-sources

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

FIGURES



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

Map Projection: NAD 1983 UTM Zone 17N

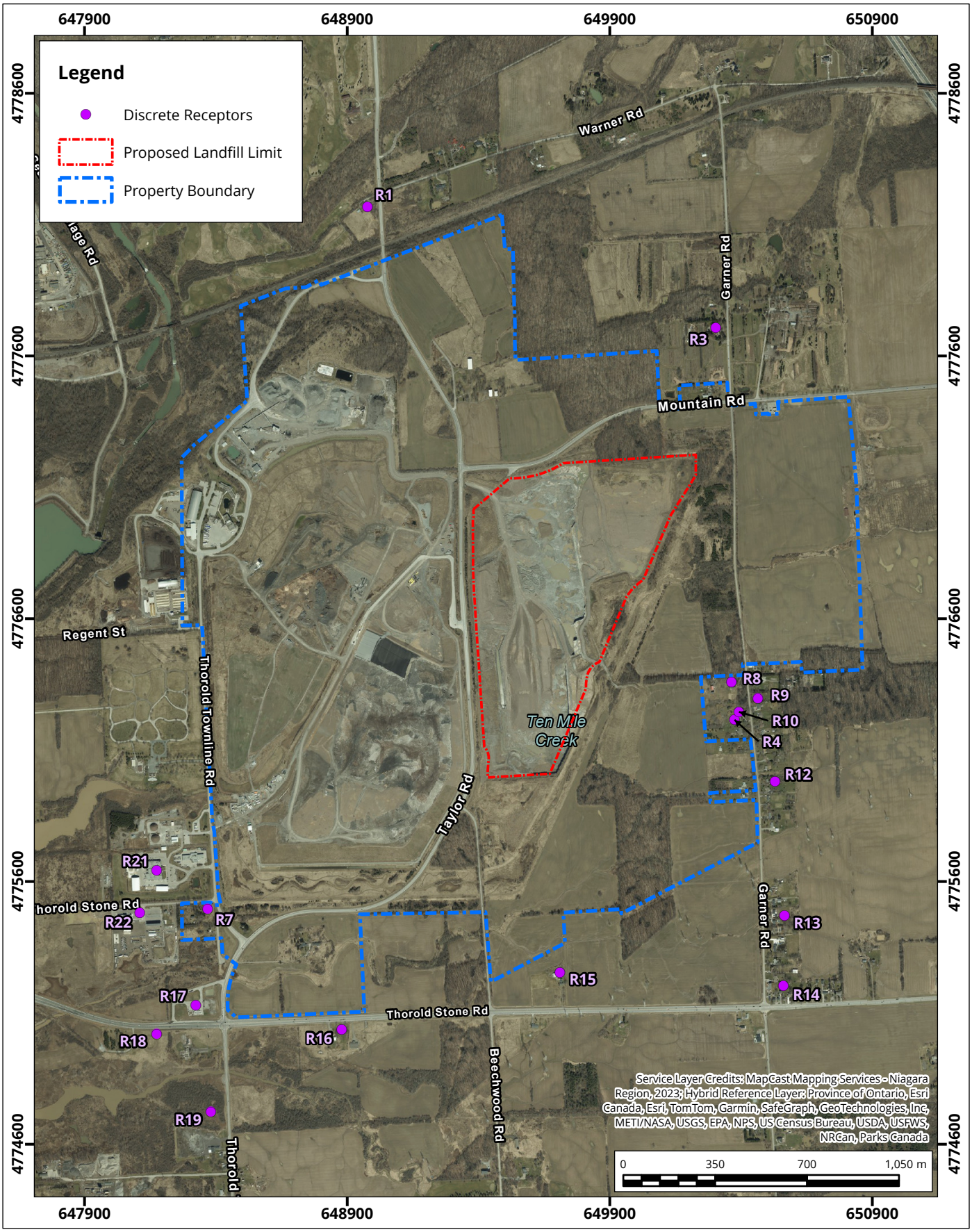
Walker Aggregates Inc., Walker Environmental Group, and Integrated Gas Recovery Inc. | South Landfill Phase 2 - Thorold, ON

Project #: 2402272

True North

Drawn by: RCL	Figure: 2-1
Approx. Scale:	1:70,000
Date Revised:	Feb 26, 2025

Map Document: C:\GIS\2402272_WalkersSouthLandfill_Phase2\P2402272_WalkersSouthLandfill_Phase2.aprx



Site Plan Showing Discrete Receptors, and Property Boundary

Map Projection: NAD 1983 UTM Zone 17N

Walker Aggregates Inc., Walker Environmental Group, and Integrated Gas Recovery Inc. | South Landfill Phase 2 - Thorold, ON

Project #: 2402272

True North

Drawn by: RCL	Figure: 2-2
Approx. Scale:	1:20,000
Date Revised:	Jan 30, 2025

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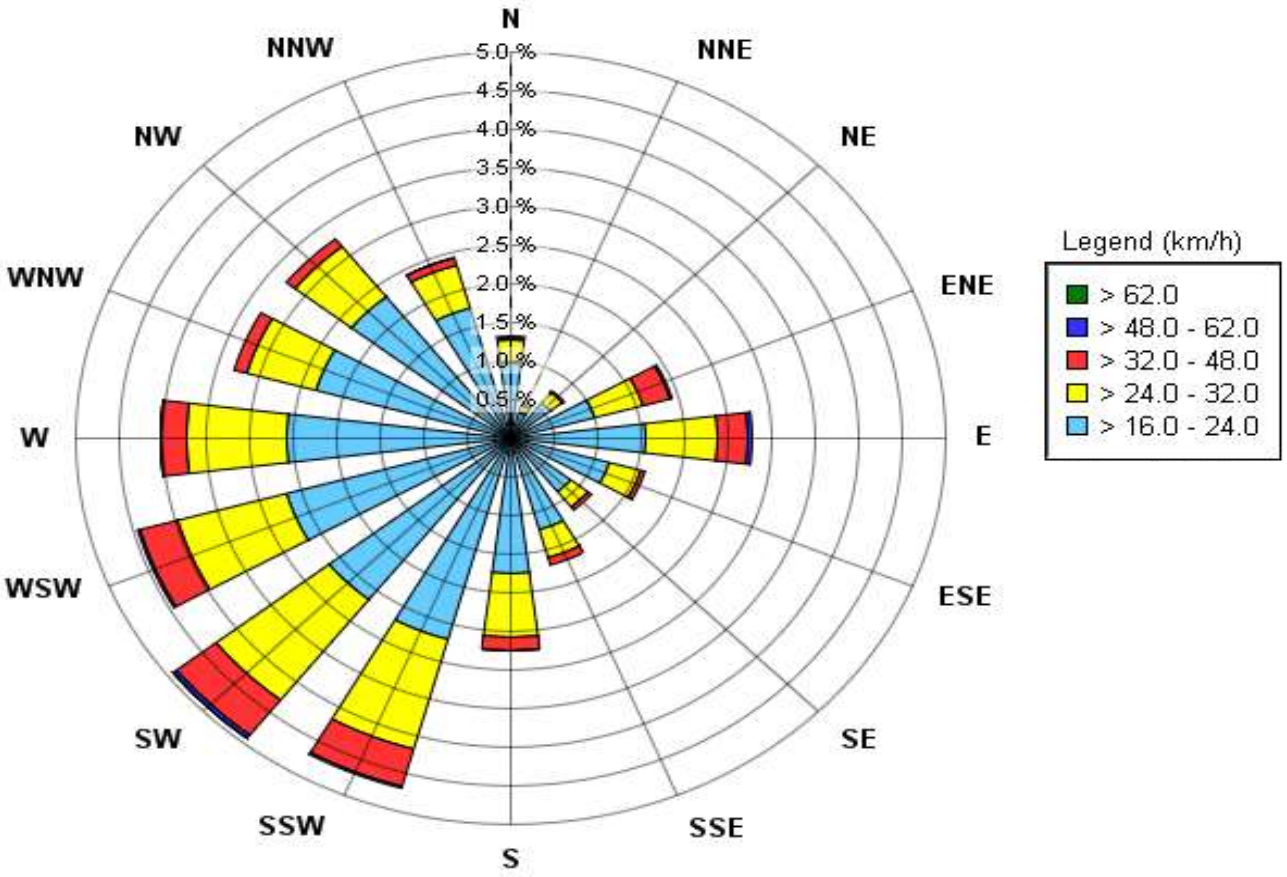
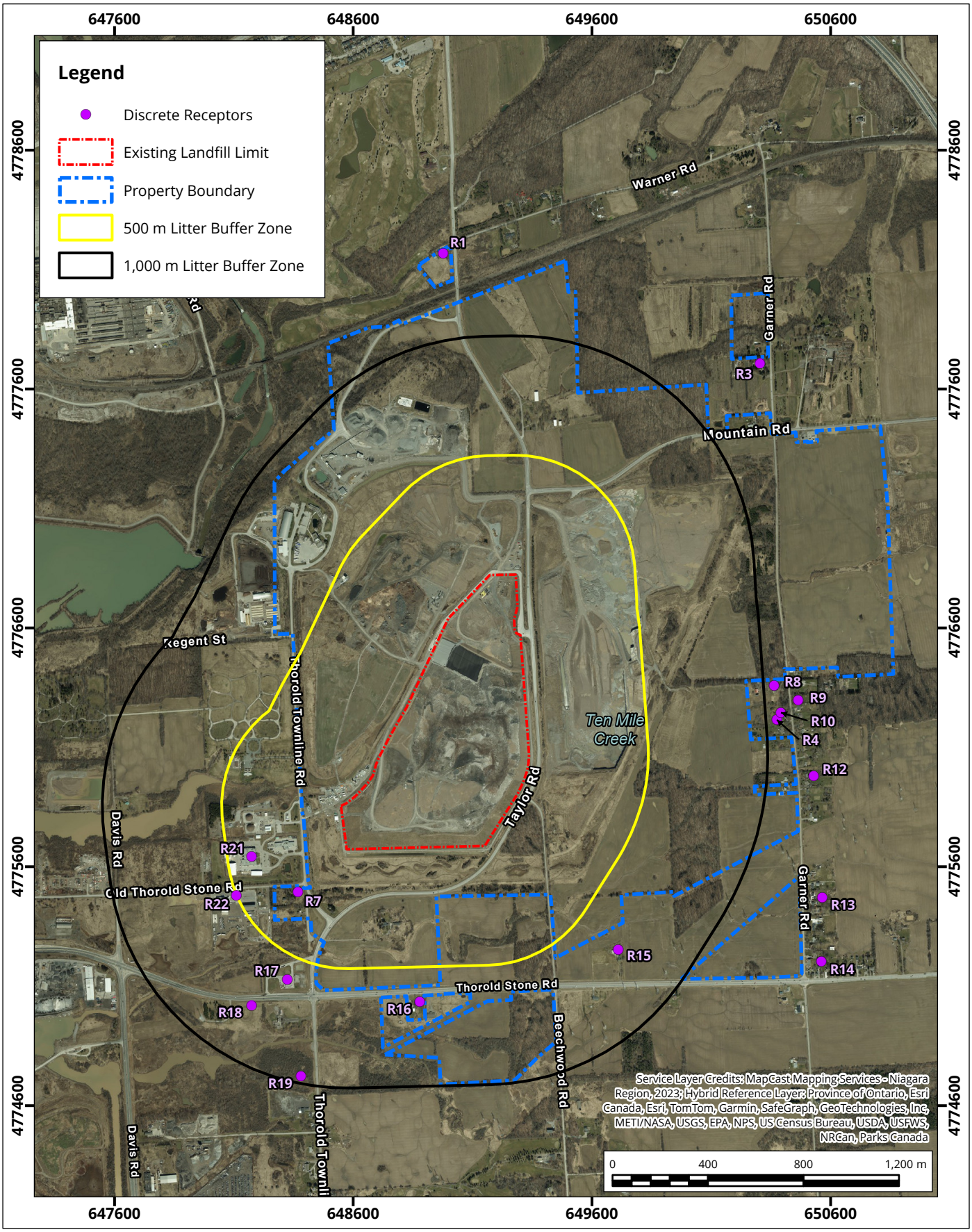


Wind Rose (Blowing From)
Wind Speeds > 16 km/h
Site-Specific Meteorological Data 2013 - 2017

Walker's South Landfill Phase 2 Existing Conditions - Thorold, ON RWDI# 2402272

Drawn by: MDKB	Figure: 6-1
Approx. Scale: not to scale	
Date Revised: January 24, 2025	



Map Document: C:\GIS\2402272_WalkersSouthLandfill_Phase2\P2402272_WalkersSouthLandfill_Phase2.aprx

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

Walker Aggregates Inc., Walker Environmental Group, and Integrated Gas Recovery Inc. | South Landfill Phase 2 - Thorold, ON

True North

Map Projection: NAD 1983 UTM Zone 17N

Project #: 2402272

Drawn by: RCL	Figure: 6.2
Approx. Scale:	1:22,000
Date Revised:	Jan 30, 2025

APPENDIX A

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.

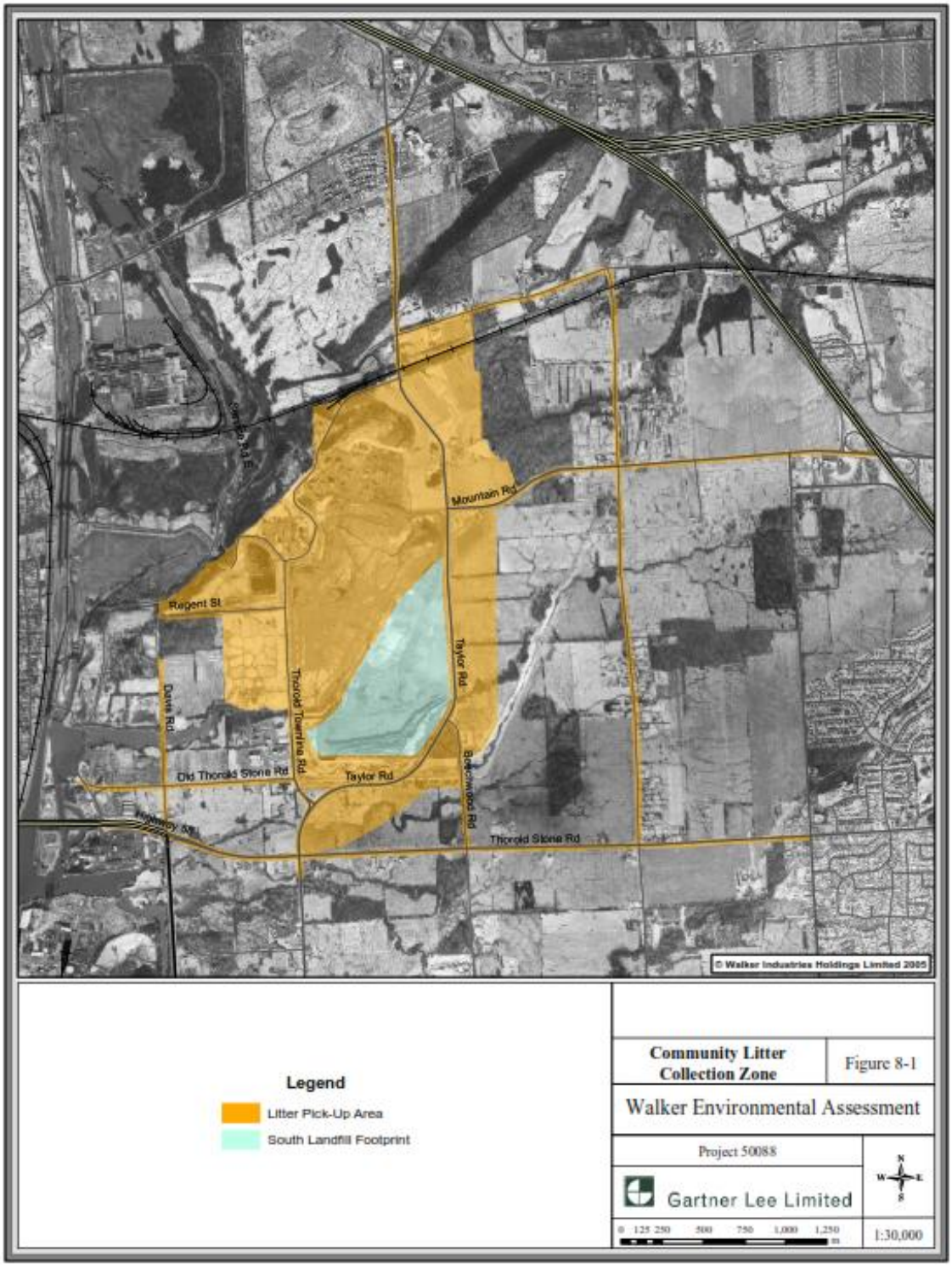
6. The Grounds Maintenance Lead Hand will record daily grounds maintenance activities in a daily litter log. Completed logs will be given to the Operations Manager who will ensure they are filed with the Operations Assistant for future reference and inspection.

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. Photographs & Figures



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 B

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.

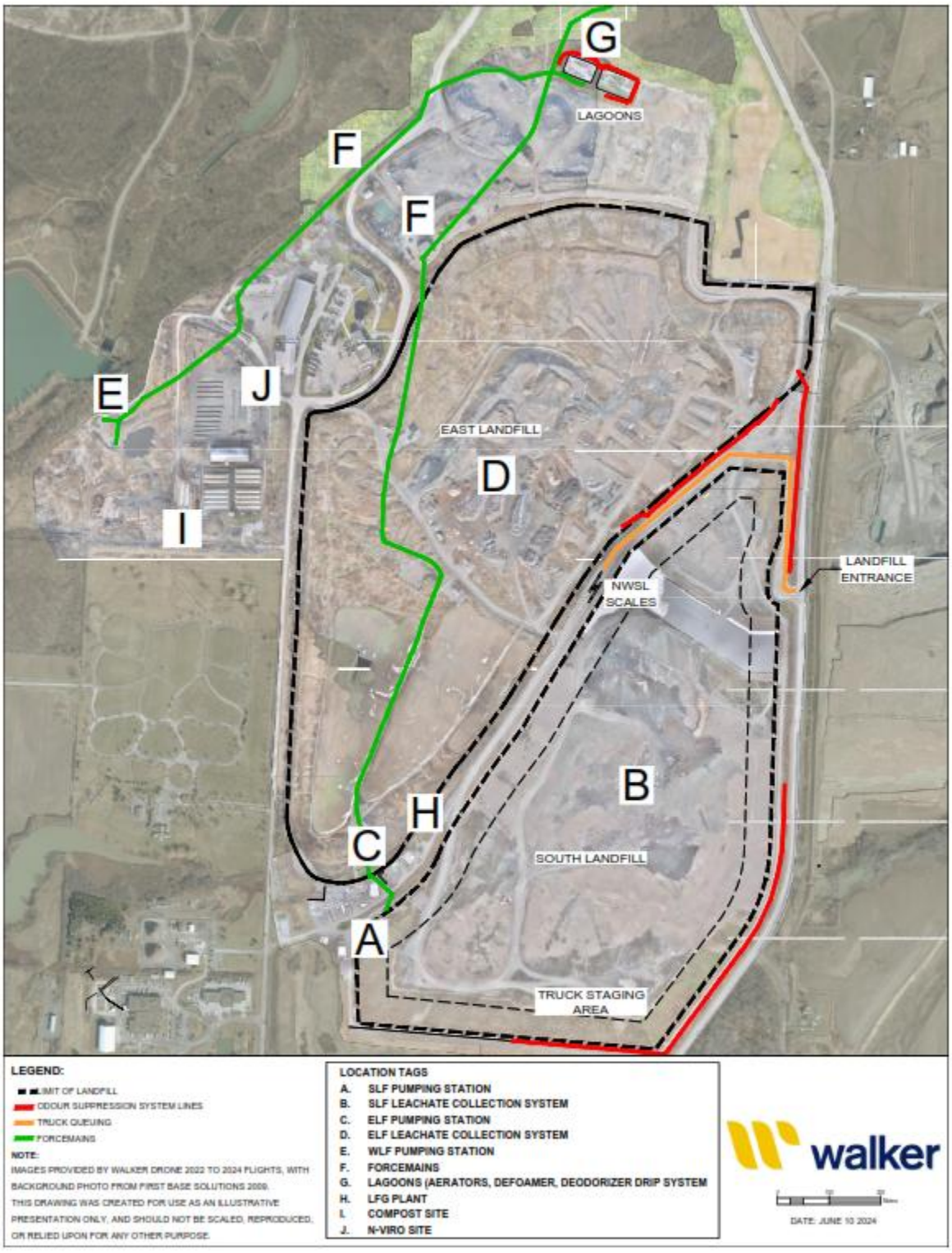
6. Clean-Out Area
    - After unloading, the driver moves to the clean-out area to clean their vehicle as necessary.

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

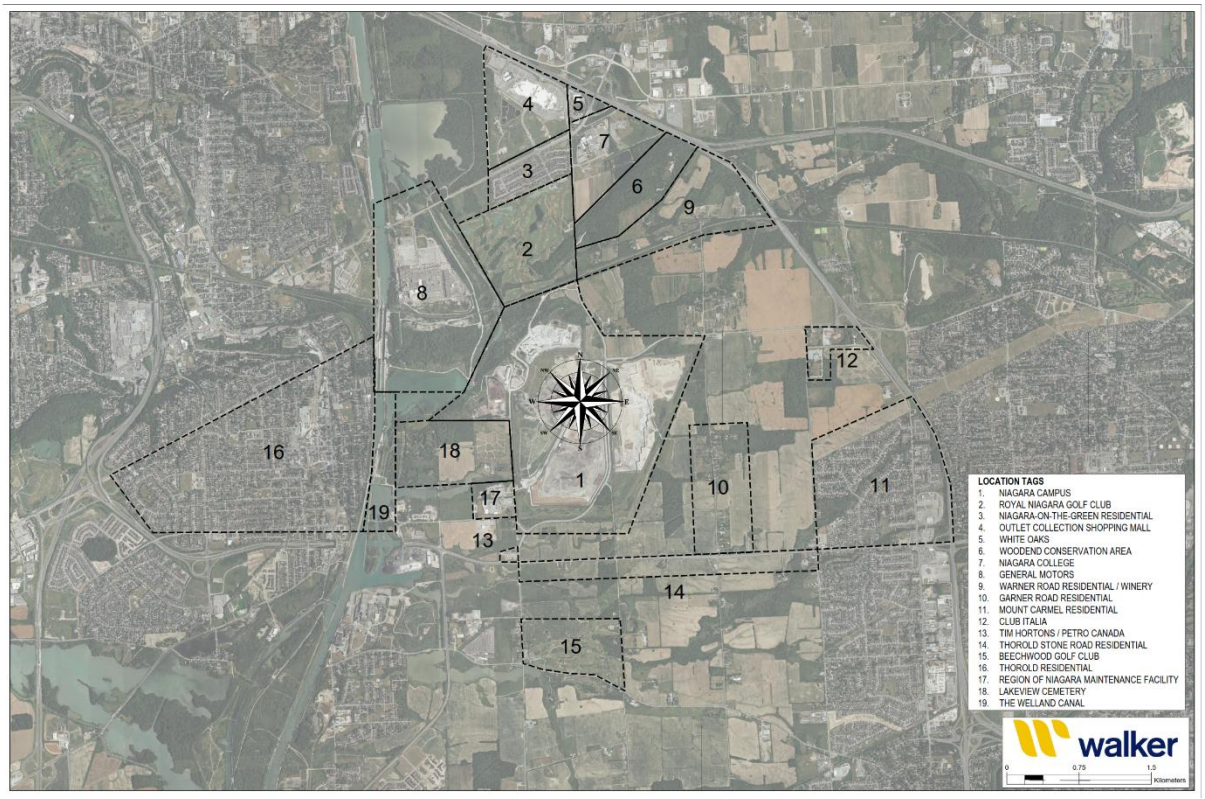
Facility Process Map



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.	Operations Manager or their designate in coordination with Comcor & IGRS Staff
		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.	
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	Operations Manger
		Pumping Stations • Ensure pumps, controls and valves are sealed to prevent leaks	

		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>

	5 = Very Strong
	6 = Extremely Strong

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:

Odour Description	Possible Source
Perfumy / Fragrant	Site deodorizers
Fruity / Sweet	Compost Processing
Sour	Compost Processing, SSO receipt, Waste Receipt
Musty, Earthy	Compost Processing, Waste Receipt
Sharp / Pungent	Compost Processing, Waste Receipt
Putrid / Foul	Compost Processing, SSO receipt, Waste Receipt
Rotten Eggs / Sulphur	Landfill Gas
Manure / Sewer	Compost Processing, Biosolids Processing at NVIRO

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.

Step 3: If there is an odour observed and the source is identified as being or possibly being a Walker operation

The person complaint the investigation should:

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.
b. Record any observations of recognizable odour at other locations surrounding the alleged source, including times of observations at each location.
c. Visit the site suspected of causing the odour
d. 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.

Step 4: Make Overall Assessment and Undertake any Identified Actions

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:

a. specific information be provided about operations

	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 C

Date	Time	Location	Winds	Site	Source
2022 Complaints 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
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 Complaints 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	12:07 PM	Niagara Falls		Walker Brothers Quarry	Blast monitors were in compliance.
2024 Complaints 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.

APPENDIX D

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.

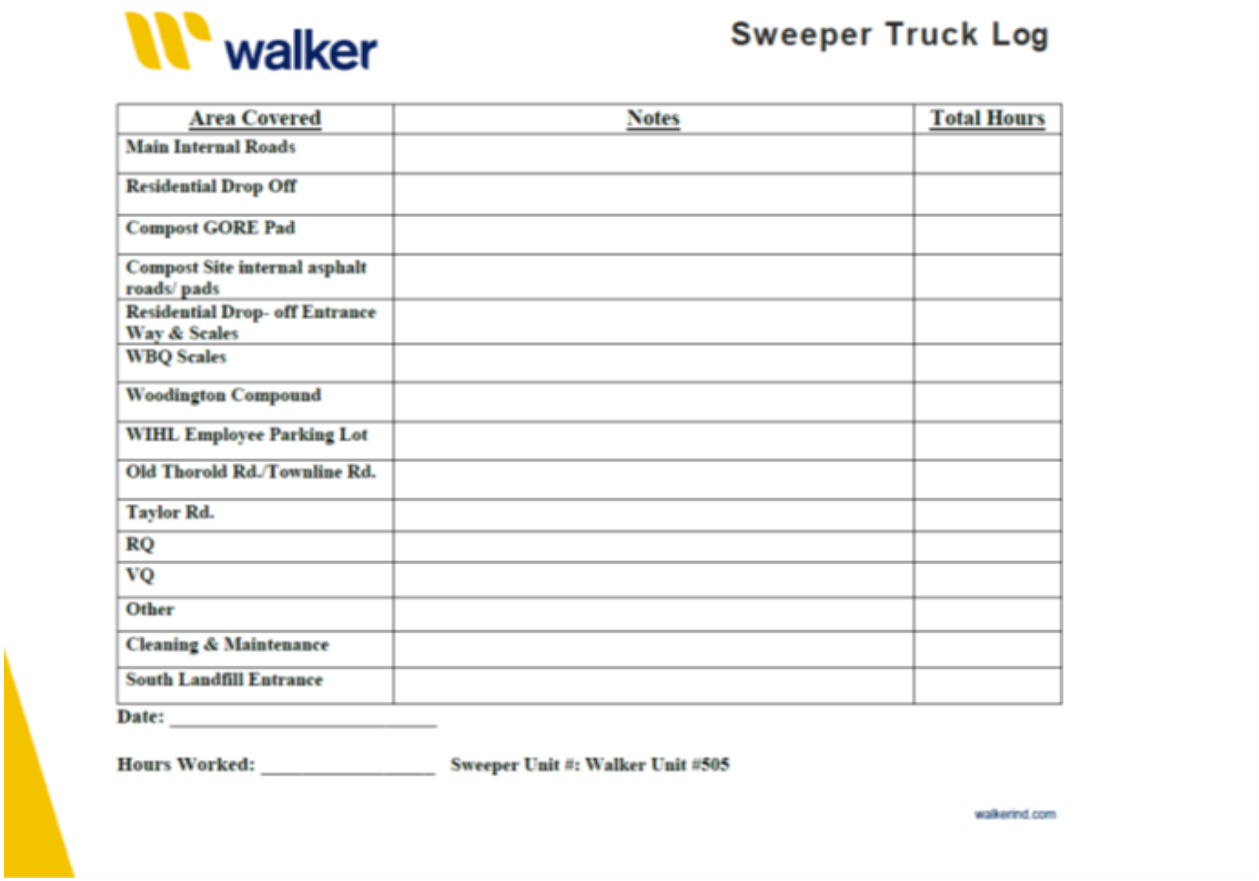
4. APPLICABILITY

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



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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

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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