

RISK EVALUATION WORK PLAN (REVISION 1)

SHORTSTACK BELMONT
2721–2731 SE BELMONT STREET
PORTLAND, OREGON
ESCI SITE ID#5731



Prepared for
SHORTSTACK BELMONT LLC
June 23, 2023
Project No. M2473.01.001

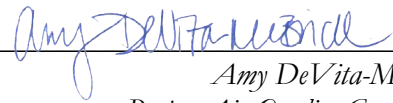
Prepared by
Maul Foster & Alongi, Inc.
3140 NE Broadway Street, Portland, OR 97232

RISK EVALUATION WORK PLAN (REVISION 1)

SHORTSTACK BELMONT
2721-2731 SE BELMONT STREET
PORTLAND, OREGON
ESCI SITE ID#5731

*The material and data in this report were prepared
under the supervision and direction of the undersigned.*

MAUL FOSTER & ALONGI, INC.



Amy DeVita-McBride
Project Air Quality Consultant



Chad Darby
Principal Air Quality Consultant

CONTENTS

TABLES AND FIGURES	IV
ACRONYMS AND ABBREVIATIONS	V
1 INTRODUCTION	1
1.1 BACKGROUND	1
1.2 RISK EVALUATION	1
2 SITE DESCRIPTION	2
2.1 SITE LOCATION	2
2.1 SITE SOILS AND GROUNDWATER	2
2.2 PASSIVE VENTING SYSTEM	2
3 EMISSION ESTIMATES	3
3.1 EMISSION POINTS	3
3.2 FLOW RATE ESTIMATES	3
3.3 EMISSION ESTIMATES	6
4 MODEL DEVELOPMENT	6
4.1 EXPOSURE LOCATIONS	7
4.2 DISPERSION FACTORS	7
4.3 RISK CALCULATIONS	7
5 PRELIMINARY RISK RESULTS	8
5.1 EXCESS CANCER RISK	8
5.2 CHRONIC NONCANCER HAZARD INDEX	9
5.3 ACUTE NONCANCER HAZARD INDEX	9
5.4 RISK ASSESSMENT ANALYSIS	9
LIMITATIONS	
REFERENCES	
TABLES	
FIGURES	
ATTACHMENT	
WPA BUILDING PROFILES	

TABLES AND FIGURES

TABLES IN TEXT:

- 3-2 PROPOSED FLOW RATE CALCULATION INPUT PARAMETERS
- 5-3 LEVEL 1 RA RESULT SUMMARY

TABLES FOLLOWING TEXT:

- 3-1 PROPOSED LEVEL 1 RISK ASSESSMENT INPUTS
- 3-3 SUMMARY OF ANALYTICAL RESULTS
- 3-4 PROPOSED LEVEL 1 RISK ASSESSMENT EMISSION RATES
- 4-1 PROPOSED DISPERSION FACTORS

FIGURES

- 2-1 AERIAL IMAGE OF PROPERTY
- 2-2 LOCAL TOPOGRAPHY
- 2-3 PLOT PLAN AND STACK LOCATIONS
- 3-1 SOIL VAPOR SAMPLE LOCATIONS
- 4-1 EXISTING ZONING
- 4-2 LAND USE CLASSIFICATIONS
- 4-3 RESIDENTIAL EXPOSURE LOCATION DISTANCES
- 4-4 NONRESIDENTIAL WORKER AND ACUTE EXPOSURE LOCATION DISTANCES
- 4-5 NONRESIDENTIAL CHILD EXPOSURE LOCATION DISTANCES

ACRONYMS AND ABBREVIATIONS

bgs	below ground surface
CES	Cascade Environmental Solutions
CAO	Cleaner Air Oregon
DEQ	Oregon Department of Environmental Quality
design document	<i>Design Document for Passive Bioventing</i>
md	millidarcy
MFA	Maul Foster & Alongi, Inc.
NRCS	National Resources Conservation Service
OAR	Oregon Administrative Rule
PCE	tetrachloroethylene
PSVE	passive soil vapor extraction
RA	risk assessment
RBC	risk-based concentration
REWP	risk evaluation work plan
Shortstack	Shortstack Belmont LLC
the Site	2721–2731 SE Belmont Street, Portland, Oregon

1 INTRODUCTION

Maul Foster & Alongi, Inc. (MFA), has been retained by Shortstack Belmont LLC (Shortstack), to prepare this risk evaluation work plan (REWP) for the Shortstack site located at 2721–2731 SE Belmont Street, Portland, Oregon (the Site). The purpose of this REWP is to describe the methodology that will be used to evaluate risk from subsurface pollutants that will be passively vented at the Site. The risk will be evaluated at the nearest locations where people may live or congregate, consistent with how that is defined by the Oregon Department of Environmental Quality (DEQ) Cleaner Air Oregon (CAO) air toxics program.

1.1 Background

The Site historically operated as a dry cleaner. During its operation, dry cleaning solvents containing tetrachloroethylene (PCE) were released to the subsurface and impacted soil, groundwater, soil gas, and indoor air at the Site. Subsequent subsurface investigations identified the presence of PCE in soil gas at concentrations exceeding the DEQ’s risk-based screening levels for vapor intrusion into buildings with occupational and urban residential receptors (DEQ 2023).

The Site was enrolled in the DEQ Voluntary Cleanup Program (DEQ File No. 5731) via the Independent Cleanup Pathway in 2012. A vapor extraction system, comprised of perforated extraction pipes beneath the floor slab of the existing building on the Site attached to a vacuum blower, was installed in 2014 as an interim remedial action measure. The active vapor extraction system operated from October 2014 through 2016 when concentrations of PCE in indoor air were reduced to acceptable levels for occupational receptors.

A Consent Order, also known as a Prospective Purchaser Agreement, between SE 28th & Belmont, LLC, and the DEQ was recorded with Multnomah County on March 4, 2016. An amendment to the Scope of Work was issued by DEQ on June 14, 2022, with the selected remedial action consisting of the following element addressed in this REWP:

- Predesign risk evaluation to confirm passive venting is adequately protective of human health.

1.2 Risk Evaluation

To conduct a predesign risk evaluation in accordance with the consent order, MFA proposes to conduct a Level 1 risk assessment (RA) as defined in the CAO program (Oregon Administrative Rule [OAR] 340-245). A Level 1 RA is a conservative methodology developed by the DEQ to determine the potential excess cancer risk and chronic and acute noncancer risk (expressed numerically through the chronic and acute hazard index) impacts from a source of toxic air contaminants. As requested by the DEQ, MFA will evaluate risks for comparison to the applicable risk action levels in OAR 340-

245-8010 Table 1 and the DEQ's Cleanup Program Acceptable Risk Levels. This REWP outlines the proposed RA methodology and specific information required by OAR 340-245-0210(1)(a).

2 SITE DESCRIPTION

2.1 Site Location

The Site is located in southeast Portland, Oregon. The area immediately surrounding the Site is relatively flat and is bordered by land zoned for residential and commercial use.

An aerial image of the Site location is shown in Figure 2-1. The topography of the area immediately surrounding the Site is shown in Figure 2-2.

2.1 Site Soils and Groundwater

According to the Natural Resources Conservation Service (NRCS), the site is underlain by soil that is identified as the Urban land-Multnomah complex, 3 to 8 percent slopes. This soil consists of loam to 56 inches below ground surface (bgs) and very gravelly sandy loam from 56 inches bgs to 66 inches bgs. In November 2021, Cascade Environmental Solutions (CES) advanced six soil borings at the site (identified as P-01 through P-06) from 8 to 30 feet below bgs (CES 2022). Soils encountered in the borings consisted of silty to sandy soils to the maximum depth explored of 30 feet bgs. Consistent with the NRCS soil type mapped at the site, soils in the borings become slightly coarser grained with depth, being mostly sandy silt to a depth of about 8 to 12 feet bgs and becoming silty sand and sand below that. The apparent static groundwater level was encountered at approximately 18 feet bgs at borings P-04 and P-06.

2.2 Passive Venting System

Shortstack is proposing to install a passive soil vapor extraction (PSVE) system as part of the site development. Passive venting will be provided below building slabs of the enclosed buildings to allow collection and venting of potential vapors that could otherwise have the potential to migrate into indoor air. The PSVE system will consist of vapor barriers to prevent migration into indoor spaces and perforated horizontal pipes below the vapor barrier, connected to solid wall header pipes that discharge to vents located above the roofline of the buildings.

PSVE systems are designed to allow conversion to active venting systems if the passive systems fail to prevent vapor intrusion based on sub-slab and internal building vapor-monitoring results. Conversion may consist of the addition of powered fans and blowers on strategically identified vent risers to depressurize the sub-slab. Only the PSVE system is addressed in this REWP.

The location of the proposed building plot plan and vent locations is shown in Figure 2-3. A profile view of the buildings and vent risers is included in the Attachment.

3 EMISSION ESTIMATES

3.1 Emission Points

The proposed redevelopment includes three four-story residential buildings: Building A, Building B, and Building C. Building B will have a single PSVE system with two vent risers (stack IDs B_1, B_2). Building A will have two PSVE systems: one large system with three vent risers (stack IDs A_1, A_2, A_3) and one on the east side of the building with a single vent riser (stack ID A_4). Similarly, Building C will have two PSVE systems: one larger system with two vent risers (stack IDs C_2, C_3) and one smaller system on the north portion of the building with a single vent riser (stack ID C_1).

The proposed Level 1 RA inputs for all vent risers are presented in Table 3-1, which follows this report.

3.2 Flow Rate Estimates

Estimates of flow rates from the PSVE systems were developed using guidance outlined in *Design Document for Passive Bioventing* (design document) developed for the U.S. Department of Defense (DOD 2006). Table 3 of the design document outlines the steps to estimate flow rates from PSVE systems. The equation for flow rate (as a function of time) is presented in Equation 3-1:

Equation 3-1.

$$Q(t) = b \frac{4\pi}{\mu_{\text{air}}} \frac{k_{\text{air}}^{\text{radial}} \Delta P_z}{\ln \left(2.25 \frac{k_{\text{air}}^{\text{radial}} P_{\text{avg}} t}{n_{\text{air}} \mu_{\text{air}} r_w^2} \right)}$$

Where,

$Q(t)$ = flow rate as a function of time, cubic meters per second (m³/s)

b = wall screen length, meters (m)

$k_{\text{air}}^{\text{radial}}$ = radial air permeability, meters squared (m²)

ΔP_z = pressure differential between surface and subsurface, Pascal (Pa)

μ_{air} = viscosity of air, kilograms per meter per second (kg/m/s)

P_{avg} = average atmospheric pressure, Pa

t = evaluation time, seconds (s)

n_{air} = air filled porosity, cubic centimeter per cubic centimeter (cm³/cm³)

r_w = well radius, m

The pressure differential between the surface and subsurface is calculated using Equation 3-2,

Equation 3-2.

$$\Delta P_z = \Delta P_{\text{diurnal}}^{\text{max}} \left(1 - \exp \left[-z \sqrt{\frac{0.123}{k_{\text{air}}^z}} \right] \times \sin \left[\frac{\pi}{2} - z \sqrt{\frac{0.123}{k_{\text{air}}^z}} \right] \right)$$

Where,

ΔP_z = pressure differential between surface and subsurface, pounds per square inch (psi)

$\Delta P_{\text{diurnal}}^{\text{max}}$ = diurnal pressure differential, psi

z = depth below ground surface, feet (ft)

k_{air}^z = vertical air permeability, millidarcy (md)

MFA made conservative assumptions when developing parameters for the flow rate calculations. Table 3-2 shows the parameters used in the flow rate calculations with notes and the corresponding references.

The values for vertical and radial permeability were selected based on the soil types encountered at the borings advanced by CES and mapped by the NRCS. Figure 6 of the design document provides permeability values based on NRCS soil types. The deeper sandy soils at the site correspond to sandy loam and sand with permeability values of 1,000 to 10,000 millidarcy (md). The shallower sandy silt soils correspond to loam with permeability values of 100 to 1,000 md. Based on guidance presented in the design document, the value of vertical permeability should be selected based on the least permeable soil layer located between the ground surface and the contaminated soil and the radial permeability should be selected from the most permeable soil layer. Therefore, a vertical permeability of 100 md and a radial permeability of 10,000 md are used for the flow rate estimate.

Table 3-2. Proposed Flow Rate Calculation Input Parameters

Parameter	Variable	Units	Value	Note and Reference
Vertical Permeability	k_{air}^z	md	100	Conservatively assumes lowest permeability of soil types from boring logs. Permeability from Figure 6 of design document (DOD 2006).
Depth Below Ground Surface	z	ft	0.5	Conservative estimate based on PSVE system design. Minimum depth of 4 inches.
Diurnal Pressure Differential	$\Delta P_{diurnal}^{max}$	psi	0.15	Maximum of seasonal range presented for Portland, Oregon, presented in Figures 8 through 11 of design document (DOD 2006).
Radial Air Permeability	k_{air}^{radial}	md	10,000	Conservatively assumes highest permeability of soil types from boring logs. Permeability from Figure 6 of design document (DOD 2006).
		m ²	9.9E-12	
Wall Screen Length	b	ft	68.0	Conservatively assume longest length of pipe in any system for all systems.
		m	20.7	
Viscosity of Air	μ_{air}	kg/m/s	1.83E-05	Viscosity of air at 18 °C.
Evaluation Time	t	min	60	Conservatively evaluates flow rate 1 hour after barometric pressure increase. Flow rates will decrease with time. However, this assessment will conservatively assume a constant flow rate.
		s	3,600	
Pipe Radius	r_w	in	1	From the engineering design report (MFA 2023).
		m	0.0254	
Average Atmospheric Pressure	P_{avg}	Pa	101,490	Mean annual barometric pressure for Portland, Oregon, for calendar years 1991–2020. From Local Climatological Data Summaries compiled by the National Oceanic and Atmospheric Administration.
Air Filled Porosity	n_{air}	cm ³ /cm ³	0.2	Estimate based on guidance in Appendix A of design document (DOD 2006).

Notes

°C = degrees Celsius.
cm³ = cubic centimeter.
ft = foot.
hr = hour.
in = inch.
kg = kilogram.
m = meter.
m² = square meter.
md = millidarcy.
Pa = Pascal.
psi = pounds per square inch.
PSVE = passive soil vapor extraction.
s = second.

References

DOD. 2006. *Design Document for Passive Bioventing*. Department of Defense, U.S. Navy, Naval Facilities Engineering Service Center. March.
MFA. 2023. *Engineering Design Report, Shortstack Belmont LLC*. Maul Foster & Alongi, Inc., Portland, OR. June 21.
NOAA. n.d. "Local Climatological Data. Portland Oregon, 1991–2020." Accessed February 23, 2023.
<https://www.ncei.noaa.gov/pub/orders/IPS/IPS-B7BEE8C9-672D-463C-A3A7-F8EF772D1512.pdf>

Using the above parameters and the calculation methodology outlined in the design document, MFA estimated a flow rate of approximately 0.4 cubic feet per minute resulting from a step increase in

barometric pressure of 0.15 pounds per square inch. It should be noted that diurnal pressure changes do not occur instantaneously; however, for the purposes of this calculation, instantaneous changes to barometric pressure are assumed. As another layer of conservatism, MFA proposes to use a flow rate of 1.0 cubic feet per minute to calculate the mass emission rate for all vent risers.

3.3 Emission Estimates

MFA reviewed analytical results from soil vapor samples collected in November 2015, December 2015, July 2017, and November 2021. Sample locations are shown in Figure 3-1. The results of these analyses are presented in Table 3-3. Maximum and average concentrations were calculated for each chemical species. If all analytical results for a chemical species were below the method detection limit (noted by either ND or < in Table 3-3), then it is assumed the chemical is not present in the soil vapor and a concentration of zero was assigned. For chemical species with only a portion of the analytical results below the method detection limit, one-half of the method detection limit was used for the non-detect samples to calculate the average or maximum for that result.

MFA did incorporate exceptions to the analytical result methodology above in the case of daughter products of PCE including vinyl chloride (CAS 75-01-4), *trans*-1,2-dichloroethene (CAS 156-60-5), *cis*-1,2-dichloroethane (CAS 156-59-2), and 1,1-dichloroethene (CAS 75-35-4). This was incorporated as these compounds would be expected from the degradation of the PCE in the subsurface. MFA assumed one-half of the method detection limit for these non-detect samples to calculate the average or maximum concentration for that species. For these compounds, MFA excluded the results of sample P-02-SV of the November 2021 study as the method detection limits for this analysis were erroneously high relative to the other samples. The high method detection limits were a result of the high level of PCE in the samples, necessitating a greater dilution of the P-02-SV sample compared to the others. The increase in detection limit for the four daughter products in sample P-02-SV compared to the other sample results from that study was disproportionately high relative to the increase in PCE concentrations in sample P-02-SV.

Annual and daily emissions estimates were developed using the average and maximum concentrations, respectively. Table 3-4 presents the emission estimates for all chemical species with an RBC from the DEQ Cleanup Program or the CAO program. Table 3-4 does not include chemical species for which all analytical results were below the method detection limit, aside from the daughter products of PCE discussed above. Daily emission estimates are used for the acute risk evaluation. Annual emission estimates are used for the cancer and chronic hazard risk evaluations.

4 MODEL DEVELOPMENT

MFA proposes to estimate cancer and noncancer risk from the Site by conducting a Level 1 RA using the methodology outlined in OAR 340-245-0050(8) and the Level 1 RA directions from OAR 340-245-0200(2). The following subsections detail the proposed inputs and assumptions that will be used in support of the Level 1 RAs.

4.1 Exposure Locations

MFA conducted a GIS analysis of the land-use zoning designations around the Site to determine the nearest exposure location for each of the four exposure classification types provided in OAR 340-245-8010, Table 2 (discussed below). Zoning information obtained from the Oregon Department of Land Conservation and Development is used as the basis for initial land-use zoning designations. Figure 4-1 presents a map depicting the initial land-use zoning within 1 kilometer of the Site.

As noted above, MFA consolidated the land-use zoning designations into the four classifications of exposure locations. The exposure location classifications are Residential, Nonresidential Worker, Nonresidential Child, and Acute.

To improve the accuracy of the initial zoning-based designations, a review of current land use was conducted for the area within 1 kilometer of the Site. Locations of childcare facilities, schools, hospitals, and current land-use classes included in the tax lot data were used to update exposure classifications. Childcare facilities were obtained from the Oregon Department of Education. School and hospital locations were obtained from the Oregon Department of Human Services and the Oregon Health Authority. Tax lot data were obtained from Multnomah County. Figure 4-2 provides a map presenting the proposed land-use zoning classification modifications that will be used for the Level 1 RAs.

4.2 Dispersion Factors

MFA proposes to use the dispersion factors listed in OAR 340-245-8010, Table 3, for the Level 1 RA. Dispersion factors shown in Tables 3A and 3B will be used to estimate chronic risk and acute risk, respectively, for each PSVE system vent riser. Tables 3A and 3B require the vent riser height and distance to the nearest exposure location, presented in Table 3-1 of this REWP. MFA proposes to assess both Nonresidential Worker and Acute exposure using the distance from the vent riser to the worker exposure location. MFA will assess all but the Nonresidential Child exposure locations using the 50-meter minimum distance listed in OAR 340-245-8010, Table 3. The proposed dispersion factors for the vent risers are presented in Table 4-1.

The distances from each vent riser to the nearest proposed exposure locations that will be used in the Level 1 RAs were measured in ArcGIS. The distances from the vent risers to the nearest proposed Residential exposure locations are shown in Figure 4-3. The distances from the vent risers to the proposed Nonresidential Worker and Acute exposure locations are shown in Figure 4-4. Lastly, the distances from the vent risers to the nearest Nonresidential Child exposure locations are shown in Figure 4-5.

4.3 Risk Calculations

For each exposure location, the proposed emission rate from each emission point will be multiplied by the appropriate dispersion factor from OAR 340-245-8010, Table 3. This will result in a concentration in units of micrograms per cubic meter. The calculated concentration will then be divided by the appropriate RBC from OAR 340-245-8010, Table 2, and the DEQ Cleanup Program

to obtain risk estimates. MFA compared the RBCs from the CAO program against those from the Cleanup Program and selected the lower of the two RBCs, therefore resulting in the more conservative risk assessment. The risk calculations are based on the equations below:

Equation 4-1.

$$\text{Excess Cancer Risk (chances in a million)} = \frac{(\text{annual emission rate [lb/yr]}) \times \left(\text{proposed dispersion factor} \left[\frac{\text{ug/m}^3}{\text{lb/yr}} \right] \right)}{(\text{applicable RBC at exposure location [ug/m}^3\text{])}}$$

Equation 4-2.

$$\text{Chronic Noncancer Hazard Index} = \frac{(\text{annual emission rate [lb/yr]}) \times \left(\text{proposed dispersion factor} \left[\frac{\text{ug/m}^3}{\text{lb/yr}} \right] \right)}{(\text{applicable RBC at exposure location [ug/m}^3\text{])}}$$

Equation 4-3.

$$\text{Acute Noncancer Hazard Index} = \frac{(\text{annual emission rate [lb/day]}) \times \left(\text{proposed dispersion factor} \left[\frac{\text{ug/m}^3}{\text{lb/day}} \right] \right)}{(\text{applicable RBC at exposure location [ug/m}^3\text{])}}$$

Where:

lb/yr = pounds per year.

lb/day = pounds per day.

ug/m³ = micrograms per cubic meter.

The resulting risk for each chemical species emitted from a given emission point will be summed to obtain the total risk estimate for that emission point at each exposure location. The total risk for each emission point will then be summed to obtain the total risk estimate for each exposure location type.

The cumulative risk estimate will be compared against the risk action levels in OAR 340-245-8010, Table 1, and the DEQ Cleanup Program acceptable risk levels. The process will be completed for each proposed emission point and each exposure classification.

5 PRELIMINARY RISK RESULTS

MFA has prepared a preliminary risk evaluation based on the protocol proposed in previous sections. These results are presented in this section. In the event that the proposed assessment procedure is acceptable, this section will serve as the final documentation of the risk evaluation for the Site.

5.1 Excess Cancer Risk

The maximum predicted excess lifetime cancer risk for the PSVE system is less than 0.01 additional chances of developing cancer in a population of 1,000,000 people (chances in a million) as shown in Table 5-1.

5.2 Chronic Noncancer Hazard Index

The maximum predicted chronic noncancer hazard index for the PSVE system is less than 0.001 as shown in Table 5-2.

5.3 Acute Noncancer Hazard Index

The maximum predicted acute noncancer hazard index for the PSVE system is less than 0.01 as shown in Table 5-2.

5.4 Risk Assessment Analysis

As shown in Table 5-3 below, the results of the Level 1 RA for all exposure categories are below the DEQ's Cleanup Program's Acceptable Risk Levels. The Acceptable Risk Level for cancer (cumulative carcinogens) is 10 and for non-cancer (cumulative noncarcinogens), both chronic and acute, the Acceptable Risk Level is 1. Likewise, the risk results for individual compounds are well below the Acceptable Risk Levels for both cancer and non-cancer (see Tables 5-1 and 5-2).

Table 5-3. Level 1 RA Result Summary

Exposure Assessment	Risk Result	Below Acceptable Risk Level?
Excess Cancer Risk (increased chances in a million)		
Residential	1.2E-03	Yes
Nonresidential Child	8.8E-06	Yes
Nonresidential Worker	1.0E-04	Yes
Chronic Noncancer Hazard Index		
Residential	5.8E-04	Yes
Nonresidential Child	4.8E-06	Yes
Nonresidential Worker	1.3E-04	Yes
Acute Noncancer Hazard Index		
Acute	4.0E-03	Yes

Because the Level 1 RA results are below the DEQ's Acceptable Risk Level, the proposed PSVE system is considered to be sufficiently protective of human health.

LIMITATIONS

The services undertaken in completing this plan were performed consistent with generally accepted professional consulting principles and practices. No other warranty, express or implied, is made. These services were performed consistent with our agreement with our client. This plan is solely for the use and information of our client unless otherwise noted. Any reliance on this plan by a third party is at such party's sole risk.

The approach and underlying assumptions contained in this plan apply to conditions existing when services were performed and are intended only for the client, purposes, locations, time frames, and project parameters indicated. We are not responsible for the impacts of any changes in environmental standards, practices, or regulations subsequent to performance of services. We do not warrant the accuracy of information supplied by others, or the use of segregated portions of this document.

REFERENCES

CES, 2022. *Phase II: Soil, Groundwater & Soil Vapor Investigation, Shortstack Development (Former Washworld Facility), 2721-2731 SE Belmont Street Portland, Oregon*. Prepared for Sister City. Cascade Environmental Solutions: Portland, OR. January 18.

DEQ. 2023. *Table 1. Chronic and Acute Vapor Intrusion Risk-Based Concentrations*. Oregon Department of Environmental Quality. June.

DOD. 2006. *Design Document for Passive Bioventing*. Department of Defense, U.S. Navy, Naval Facilities Engineering Service Center. March.

TABLES



Table 3-1
Proposed Level 1 Risk Assessment Inputs
Shortstack Belmont LLC—Portland, Oregon

Stack ID	Stack Description	Stack or Fugitive?	Stack Height ⁽¹⁾ (m)	Exposure Location Distance (m)			
				Chronic			Acute ⁽²⁾
				Residential ⁽²⁾	Nonresidential Child ⁽³⁾	Nonresidential Worker ⁽²⁾	
A_1	Building A, Vent 1	Stack	13.9	50.0	273	50.0	50.0
A_2	Building A, Vent 2	Stack	13.9	50.0	268	50.0	50.0
A_3	Building A, Vent 3	Stack	13.9	50.0	261	50.0	50.0
A_4	Building A, Vent 4	Stack	13.9	50.0	254	50.0	50.0
B_1	Building B, Vent 1	Stack	13.9	50.0	280	50.0	50.0
B_2	Building B, Vent 2	Stack	13.9	50.0	277	50.0	50.0
C_1	Building C, Vent 1	Stack	13.9	50.0	264	50.0	50.0
C_2	Building C, Vent 2	Stack	13.9	50.0	266	50.0	50.0
C_3	Building C, Vent 3	Stack	13.9	50.0	269	50.0	50.0

Notes

m = meter.

References

⁽¹⁾ Proposed stack height of 45.75 feet for each vent riser. Vent risers to exceed roof elevation by 5 feet.

⁽²⁾ Exposure location distances were measured in ArcGIS from the source location to the closest exposure location type. The exposure distance is less than the 50-m minimum distance listed in OAR 340-245-8010, Table 3; therefore, 50 m will be assumed.

⁽³⁾ Exposure location distances were measured in ArcGIS from the source location to the closest exposure location type.

Table 3-3
Summary of Analytical Results
Shortstack Belmont LLC—Portland, Oregon

Chemical	CAS	RBC? ⁽¹⁾ (Yes/No)	Concentration (ug/m ³)														Maximum Concentration (ug/m ³)	Average Concentration (ug/m ³)
			November 2021 Study ⁽²⁾					July 2017 Study ⁽³⁾			November 2015 Study ⁽⁴⁾		December 2015 Study ⁽⁵⁾					
			P-01-SV	P-02-SV	P-03-SV	P-04-SV	P-05-SV	SV-01	SV-03	SV-04	SV-01	SV-05	SG-01	SG-05				
Propylene	115-07-1	Yes	ve 650	930	< 20.0	440	< 20.0	--	--	--	--	--	--	--	930 ⁽⁶⁾	408 ⁽⁷⁾		
Dichlorodifluoromethane (Freon 12)	75-71-8	Yes	< 8.90	< 250	< 8.40	< 8.40	< 8.40	--	--	--	--	--	--	--	0 ⁽⁸⁾	0 ⁽⁹⁾		
Chloromethane (Methyl chloride)	74-87-3	Yes	< 67.0	< 1,900	< 63.0	< 63.0	< 63.0	--	--	--	--	--	--	--	0 ⁽⁸⁾	0 ⁽⁹⁾		
Vinyl chloride	75-01-4	Yes	< 4.60	< 130	< 4.30	< 4.30	< 4.30	ND 1.02	ND 1.02	ND 1.02	ND 1.02	ND 12.8	ND 1.02	ND 1.02	6.40 ⁽¹⁰⁾	1.66 ⁽¹¹⁾		
1,3-Butadiene	106-99-0	Yes	< 0.79	200	< 0.75	< 0.75	< 0.75	--	--	--	--	--	--	--	200 ⁽⁶⁾	40.3 ⁽⁷⁾		
Bromomethane (Methyl bromide)	74-83-9	Yes	< 42.0	< 1,200	< 40.0	< 40.0	< 40.0	--	--	--	--	--	--	--	0 ⁽⁸⁾	0 ⁽⁹⁾		
Chloroethane (Ethyl chloride)	75-00-3	Yes	< 47.0	< 1,300	< 45.0	< 45.0	< 45.0	--	--	--	--	--	--	--	0 ⁽⁸⁾	0 ⁽⁹⁾		
Vinyl bromide	593-60-2	Yes	< 7.90	< 220	< 7.40	< 7.40	< 7.40	--	--	--	--	--	--	--	0 ⁽⁸⁾	0 ⁽⁹⁾		
Acrolein	107-02-8	Yes	9.50	< 57.0	< 1.90	6.70	< 1.90	--	--	--	--	--	--	--	28.5 ⁽⁶⁾	9.32 ⁽⁷⁾		
Trichlorofluoromethane (Freon 11)	75-69-4	Yes	< 40.0	< 1,100	< 38.0	< 38.0	< 38.0	--	--	--	--	--	--	--	0 ⁽⁸⁾	0 ⁽⁹⁾		
Acetone	67-64-1	Yes	ve 750	< 2,400	< 81.0	350	< 81.0	--	--	--	--	--	--	--	1,200 ⁽⁶⁾	476 ⁽⁷⁾		
Isopropyl alcohol	67-63-0	Yes	ve 69,000	ve 24,000	< 150	250	< 150	--	--	--	--	--	--	--	69,000 ⁽⁶⁾	18,680 ⁽⁷⁾		
Vinylidene chloride (1,1-dichloroethene)	75-35-4	Yes	< 7.10	< 200	< 6.70	< 6.70	< 6.70	ND 1.59	ND 1.59	ND 1.59	--	--	--	--	3.55 ⁽¹⁰⁾	2.28 ⁽¹¹⁾		
cis-1,2-dichloroethene	156-59-2	Yes	< 7.10	< 200	< 6.70	< 6.70	< 6.70	ND 1.59	ND 1.59	ND 1.59	ND 1.59	ND 19.8	ND 1.59	ND 1.59	9.90 ⁽¹⁰⁾	2.57 ⁽¹¹⁾		
trans-1,2-dichloroethene	156-60-5	Yes	< 7.10	< 200	< 6.70	< 6.70	< 6.70	ND 1.59	ND 1.59	ND 1.59	ND 1.59	ND 19.8	ND 1.59	ND 1.59	9.90 ⁽¹⁰⁾	2.57 ⁽¹¹⁾		
tert-Butyl alcohol	75-65-0	Yes	< 220	< 6,100	< 210	< 210	< 210	--	--	--	--	--	--	--	0 ⁽⁸⁾	0 ⁽⁹⁾		
Methylene Chloride	75-09-2	Yes	< 630	< 17,000	< 590	< 590	< 590	--	--	--	--	--	--	--	0 ⁽⁸⁾	0 ⁽⁹⁾		
Allyl chloride	107-05-1	Yes	< 28.0	< 780	< 27.0	< 27.0	< 27.0	--	--	--	--	--	--	--	0 ⁽⁸⁾	0 ⁽⁹⁾		
Chlorinated fluorocarbon (CFC-113)	76-13-1	Yes	< 14.0	< 380	< 13.0	< 13.0	< 13.0	--	--	--	--	--	--	--	0 ⁽⁸⁾	0 ⁽⁹⁾		
Carbon disulfide	75-15-0	Yes	< 110	< 3,100	< 110	< 110	< 110	--	--	--	--	--	--	--	0 ⁽⁸⁾	0 ⁽⁹⁾		
Methyl tert-butyl ether	1634-04-4	Yes	< 32.0	< 900	< 31.0	< 31.0	< 31.0	--	--	--	--	--	--	--	0 ⁽⁸⁾	0 ⁽⁹⁾		
Vinyl acetate	108-05-4	Yes	< 130	< 3,500	< 120	< 120	< 120	--	--	--	--	--	--	--	0 ⁽⁸⁾	0 ⁽⁹⁾		
1,1-Dichloroethane (Ethylidene dichloride)	75-34-3	Yes	< 7.30	< 200	< 6.90	< 6.90	< 6.90	--	--	--	--	--	--	--	0 ⁽⁸⁾	0 ⁽⁹⁾		
Hexane	110-54-3	Yes	< 63.0	< 1,800	< 60.0	< 60.0	< 60.0	--	--	--	--	--	--	--	0 ⁽⁸⁾	0 ⁽⁹⁾		
Chloroform	67-66-3	Yes	< 0.88	< 24.0	0.91	< 0.83	1.70	--	--	--	--	--	--	--	12.0 ⁽⁶⁾	3.09 ⁽⁷⁾		
Ethyl acetate	141-78-6	Yes	< 130	< 3,600	< 120	< 120	< 120	--	--	--	--	--	--	--	0 ⁽⁸⁾	0 ⁽⁹⁾		
Tetrahydrofuran	109-99-9	Yes	< 11.0	< 290	< 10.0	< 10.0	< 10.0	--	--	--	--	--	--	--	0 ⁽⁸⁾	0 ⁽⁹⁾		
2-Butanone (Methyl ethyl ketone)	78-93-3	Yes	89.0	< 1,500	< 50.0	< 50.0	< 50.0	--	--	--	--	--	--	--	750 ⁽⁶⁾	183 ⁽⁷⁾		
Ethylene dichloride (EDC, 1,2-Dichloroethane)	107-06-2	Yes	< 0.73	< 20.0	< 0.69	< 0.69	< 0.69	--	--	--	--	--	--	--	0 ⁽⁸⁾	0 ⁽⁹⁾		
1,1,1-Trichloroethane (Methyl chloroform)	71-55-6	Yes	< 9.80	< 270	< 9.30	< 9.30	< 9.30	--	--	--	--	--	--	--	0 ⁽⁸⁾	0 ⁽⁹⁾		
Carbon tetrachloride	56-23-5	Yes	< 5.70	< 160	< 5.30	< 5.30	< 5.30	--	--	--	--	--	--	--	0 ⁽⁸⁾	0 ⁽⁹⁾		
Benzene	71-43-2	Yes	37.0	< 160	< 5.40	35.0	< 5.40	--	--	--	--	--	--	--	80.0 ⁽⁶⁾	31.5 ⁽⁷⁾		
Cyclohexane	110-82-7	Yes	< 120	< 3,400	< 120	< 120	< 120	--	--	--	--	--	--	--	0 ⁽⁸⁾	0 ⁽⁹⁾		
1,2-Dichloropropane (Propylene dichloride)	78-87-5	Yes	< 4.20	< 120	< 3.90	< 3.90	7.30	--	--	--	--	--	--	--	60.0 ⁽⁶⁾	14.7 ⁽⁷⁾		
1,4-Dioxane	123-91-1	Yes	< 6.50	< 180	< 6.10	< 6.10	< 6.10	--	--	--	--	--	--	--	0 ⁽⁸⁾	0 ⁽⁹⁾		
2,2,4-Trimethylpentane	540-84-1	No	< 84.0	< 2,300	< 79.0	< 79.0	< 79.0	--	--	--	--	--	--	--	0 ⁽⁸⁾	0 ⁽⁹⁾		
Methyl methacrylate	80-62-6	Yes	< 74.0	< 2,000	< 70.0	< 70.0	< 70.0	--	--	--	--	--	--	--	0 ⁽⁸⁾	0 ⁽⁹⁾		
Heptane	142-82-5	Yes	< 74.0	< 2,000	< 70.0	< 70.0	< 70.0	--	--	--	--	--	--	--	0 ⁽⁸⁾	0 ⁽⁹⁾		
Bromodichloromethane	75-27-4	Yes	< 1.20	< 34.0	< 1.10	< 1.10	< 1.10	--	--	--	--	--	--	--	0 ⁽⁸⁾	0 ⁽⁹⁾		
Trichloroethene (TCE, Trichloroethylene)	79-01-6	Yes	3.50	< 54.0	1.80	3.80	< 1.80	ND 2.14	ND 2.14	ND 2.14	ND 2.14	ND 26.8	ND 2.14	2.50	27.0 ⁽⁶⁾	4.71 ⁽⁷⁾		
cis-1,3-Dichloropropene	542-75-6	Yes	< 8.20	< 230	< 7.70	< 7.70	< 7.70	--	--	--	--	--	--	--	0 ⁽⁸⁾	0 ⁽⁹⁾		
Methyl isobutyl ketone (MIBK, Hexone)	108-10-1	Yes	< 74.0	< 2,000	< 70.0	< 70.0	< 70.0	--	--	--	--	--	--	--	0 ⁽⁸⁾	0 ⁽⁹⁾		
trans-1,3-Dichloropropene	542-75-6	Yes	< 8.20	< 230	< 7.70	< 7.70	< 7.70	--	--	--	--	--	--	--	0 ⁽⁸⁾	0 ⁽⁹⁾		
Toluene	108-88-3	Yes	< 340	< 9,400	< 320	< 320	< 320	--	--	--	--	--	--	--	0 ⁽⁸⁾	0 ⁽⁹⁾		
1,1,2-Trichloroethane (Vinyl trichloride)	79-00-5	Yes	< 0.98	< 27.0	< 0.93	< 0.93	< 0.93	--	--	--	--	--	--	--	0 ⁽⁸⁾	0 ⁽⁹⁾		

Table 3-3
Summary of Analytical Results
Shortstack Belmont LLC—Portland, Oregon

Chemical	CAS	RBC? ⁽¹⁾ (Yes/No)	Concentration (ug/m ³)												Maximum Concentration (ug/m ³)	Average Concentration (ug/m ³)
			November 2021 Study ⁽²⁾					July 2017 Study ⁽³⁾			November 2015 Study ⁽⁴⁾		December 2015 Study ⁽⁵⁾			
			P-01-SV	P-02-SV	P-03-SV	P-04-SV	P-05-SV	SV-01	SV-03	SV-04	SV-01	SV-05	SG-01	SG-05		
2-Hexanone	591-78-6	Yes	< 74.0	< 2,000	< 70.0	< 70.0	< 70.0	--	--	--	--	--	--	--	0 ⁽⁸⁾	0 ⁽⁹⁾
Tetrachloroethene (PCE, Perchloroethylene)	127-18-4	Yes	ve 19,000	ve 88,000	ve 16,000	1,400	ve 2,900	4,000	534	39.0	3,110	ND 33.9	3,280	7.09	88,000 ⁽⁶⁾	11,524 ⁽⁷⁾
Dibromochloromethane	124-48-1	Yes	< 1.50	< 43.0	< 1.40	< 1.40	< 1.40	--	--	--	--	--	--	--	0 ⁽⁸⁾	0 ⁽⁹⁾
Ethylene dibromide (EDB, 1,2-Dibromoethane)	106-93-4	Yes	< 1.40	< 38.0	< 1.30	< 1.30	< 1.30	--	--	--	--	--	--	--	0 ⁽⁸⁾	0 ⁽⁹⁾
Chlorobenzene	108-90-7	Yes	< 8.30	< 230	< 7.80	< 7.80	< 7.80	--	--	--	--	--	--	--	0 ⁽⁸⁾	0 ⁽⁹⁾
Ethyl benzene	100-41-4	Yes	17.0	< 220	8.20	43.0	14.0	--	--	--	--	--	--	--	110 ⁽⁶⁾	38.4 ⁽⁷⁾
1,1,2,2-Tetrachloroethane	79-34-5	Yes	< 2.50	< 69.0	< 2.30	< 2.30	< 2.30	--	--	--	--	--	--	--	0 ⁽⁸⁾	0 ⁽⁹⁾
Nonane	111-84-2	Yes	< 94.0	< 2,600	< 89.0	< 89.0	< 89.0	--	--	--	--	--	--	--	0 ⁽⁸⁾	0 ⁽⁹⁾
Isopropylbenzene (Cumene)	98-82-8	Yes	< 44.0	< 1,200	< 42.0	< 42.0	< 42.0	--	--	--	--	--	--	--	0 ⁽⁸⁾	0 ⁽⁹⁾
Propylbenzene	103-65-1	Yes	< 44.0	< 1,200	< 42.0	< 42.0	< 42.0	--	--	--	--	--	--	--	0 ⁽⁸⁾	0 ⁽⁹⁾
m,p-Xylene	1330-20-7	Yes	40.0	< 430	25.0	140	38.0	--	--	--	--	--	--	--	215 ⁽⁶⁾	91.6 ⁽⁷⁾
o-Xylene	95-47-6	Yes	15.0	< 220	8.80	46.0	16.0	--	--	--	--	--	--	--	110 ⁽⁶⁾	39.2 ⁽⁷⁾
Styrene	100-42-5	Yes	< 15.0	< 430	< 14.0	< 14.0	< 14.0	--	--	--	--	--	--	--	0 ⁽⁸⁾	0 ⁽⁹⁾
Bromoform	75-25-2	Yes	< 37.0	< 1,000	< 35.0	< 35.0	< 35.0	--	--	--	--	--	--	--	0 ⁽⁸⁾	0 ⁽⁹⁾
Benzyl chloride	100-44-7	Yes	< 0.93	< 26.0	< 0.88	< 0.88	< 0.88	--	--	--	--	--	--	--	0 ⁽⁸⁾	0 ⁽⁹⁾
1,3,5-Trimethylbenzene	108-67-8	Yes	< 44.0	< 1,200	< 42.0	< 42.0	< 42.0	--	--	--	--	--	--	--	0 ⁽⁸⁾	0 ⁽⁹⁾
1,2,4-Trimethylbenzene	95-63-6	Yes	< 44.0	< 1,200	< 42.0	< 42.0	< 42.0	--	--	--	--	--	--	--	0 ⁽⁸⁾	0 ⁽⁹⁾
1,3-Dichlorobenzene	541-73-1	No	< 11.0	< 300	< 10.0	< 10.0	< 10.0	--	--	--	--	--	--	--	0 ⁽⁸⁾	0 ⁽⁹⁾
p-Dichlorobenzene (1,4-Dichlorobenzene)	106-46-7	Yes	< 4.10	< 110	< 3.90	< 3.90	< 3.90	--	--	--	--	--	--	--	0 ⁽⁸⁾	0 ⁽⁹⁾
1,2-Dichlorobenzene	95-50-1	Yes	< 11.0	< 300	< 10.0	< 10.0	< 10.0	--	--	--	--	--	--	--	0 ⁽⁸⁾	0 ⁽⁹⁾
1,2,4-Trichlorobenzene	120-82-1	Yes	< 13.0	< 370	< 13.0	< 13.0	< 13.0	--	--	--	--	--	--	--	0 ⁽⁸⁾	0 ⁽⁹⁾
Naphthalene	91-20-3	Yes	< 4.70	< 130	< 4.50	< 4.50	< 4.50	--	--	--	--	--	--	--	0 ⁽⁸⁾	0 ⁽⁹⁾
Hexachlorobutadiene	87-68-3	Yes	< 3.80	< 110	< 3.60	< 3.60	< 3.60	--	--	--	--	--	--	--	0 ⁽⁸⁾	0 ⁽⁹⁾

Notes

- < = below the method detection limit. Method detection limit shown.
- m³ = cubic meter.
- ND = non-detect. Method detection limit shown.
- ug = microgram.
- RBC = risk based concentration.
- ve = The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

References

- ⁽¹⁾ Comparison of chemical species against list of RBC values in DEQ's Cleaner Air Oregon program (OAR 340-245-8010, Table 2) and the DEQ's Cleanup Program.
- ⁽²⁾ Friedman & Bruya, Inc. Analytical Report dated November 16, 2021. Soil vapor samples collected on November 2, 2021.
- ⁽³⁾ ESC Lab Sciences. Analytical Report dated July 19, 2017. Soil vapor samples collected on July 17, 2017.
- ⁽⁴⁾ GeoDesign Inc. Analytical Report dated December 1, 2015. Soil vapor samples collected on November 25, 2015.
- ⁽⁵⁾ GeoDesign Inc. Analytical Report dated December 9, 2015. Soil vapor samples collected on December 4, 2015.
- ⁽⁶⁾ Only a portion of the results are below the method detection limit. For those samples below the detection limit, assume one half the method detection limit when calculating the maximum concentration.
- ⁽⁷⁾ Only a portion of the results are below the method detection limit. For those samples below the detection limit, assume one half the method detection limit when calculating the average concentration.
- ⁽⁸⁾ All results are below the method detection limit and therefore it is assumed the species is not present and the maximum concentration is zero.
- ⁽⁹⁾ All results are below the method detection limit and therefore it is assumed the species is not present and the average concentration is zero.
- ⁽¹⁰⁾ For daughter products of PCE, assume some amount is present in soil vapor despite all samples below detection limits. Assume one half the method detection limit when calculating the maximum concentration. Results of sample P-02-SV from November 2021 study were excluded as detection limit was erroneously high due to concentration of PCE.
- ⁽¹¹⁾ For daughter products of PCE, assume some amount is present in soil vapor despite all samples below detection limits. Assume one half the method detection limit when calculating the average concentration. Results of sample P-02-SV from November 2021 study were excluded as detection limit was erroneously high due to concentration of PCE.

Table 3-4
Proposed Level 1 Risk Assessment Emission Rates
Shortstack Belmont LLC—Portland, Oregon

Chemical	CAS	Concentration ⁽¹⁾ (ug/m³)		Emission Rates																	
				Building A								Building B				Building C					
		Vent 1		Vent 2		Vent 3		Vent 4		Vent 1		Vent 2		Vent 1		Vent 2		Vent 3			
		Daily ⁽¹⁾ (lb/day)	Annual ⁽¹⁾ (lb/yr)	Daily ^(a) (lb/day)	Annual ^(b) (lb/yr)	Daily ^(a) (lb/day)	Annual ^(b) (lb/yr)	Daily ^(a) (lb/day)	Annual ^(b) (lb/yr)	Daily ^(a) (lb/day)	Annual ^(b) (lb/yr)	Daily ^(a) (lb/day)	Annual ^(b) (lb/yr)	Daily ^(a) (lb/day)	Annual ^(b) (lb/yr)	Daily ^(a) (lb/day)	Annual ^(b) (lb/yr)	Daily ⁽¹⁾ (lb/day)	Annual ⁽¹⁾ (lb/yr)	Daily ⁽¹⁾ (lb/day)	Annual ⁽¹⁾ (lb/yr)
Emission Point ID				A_1		A_2		A_3		A_4		B_1		B_2		C_1		C_2		C_3	
Propylene	115-07-1	930	408	8.4E-05	0.013	8.4E-05	0.013	8.4E-05	0.013	8.4E-05	0.013	8.4E-05	0.013	8.4E-05	0.013	8.4E-05	0.013	8.4E-05	0.013	8.4E-05	0.013
Vinyl chloride	75-01-4	6.40	1.66	5.8E-07	5.4E-05	5.8E-07	5.4E-05	5.8E-07	5.4E-05	5.8E-07	5.4E-05	5.8E-07	5.4E-05	5.8E-07	5.4E-05	5.8E-07	5.4E-05	5.8E-07	5.4E-05	5.8E-07	5.4E-05
1,3-Butadiene	106-99-0	200	40.3	1.8E-05	1.3E-03	1.8E-05	1.3E-03	1.8E-05	1.3E-03	1.8E-05	1.3E-03	1.8E-05	1.3E-03	1.8E-05	1.3E-03	1.8E-05	1.3E-03	1.8E-05	1.3E-03	1.8E-05	1.3E-03
Acrolein	107-02-8	28.5	9.32	2.6E-06	3.1E-04	2.6E-06	3.1E-04	2.6E-06	3.1E-04	2.6E-06	3.1E-04	2.6E-06	3.1E-04	2.6E-06	3.1E-04	2.6E-06	3.1E-04	2.6E-06	3.1E-04	2.6E-06	3.1E-04
Acetone	67-64-1	1,200	476	1.1E-04	0.016	1.1E-04	0.016	1.1E-04	0.016	1.1E-04	0.016	1.1E-04	0.016	1.1E-04	0.016	1.1E-04	0.016	1.1E-04	0.016	1.1E-04	0.016
Isopropyl alcohol	67-63-0	69,000	18,680	6.2E-03	0.61	6.2E-03	0.61	6.2E-03	0.61	6.2E-03	0.61	6.2E-03	0.61	6.2E-03	0.61	6.2E-03	0.61	6.2E-03	0.61	6.2E-03	0.61
Vinylidene chloride (1,1-dichloroethene)	75-35-4	3.55	2.28	3.2E-07	7.5E-05	3.2E-07	7.5E-05	3.2E-07	7.5E-05	3.2E-07	7.5E-05	3.2E-07	7.5E-05	3.2E-07	7.5E-05	3.2E-07	7.5E-05	3.2E-07	7.5E-05	3.2E-07	7.5E-05
cis-1,2-dichloroethene	156-59-2	9.90	2.57	8.9E-07	8.4E-05	8.9E-07	8.4E-05	8.9E-07	8.4E-05	8.9E-07	8.4E-05	8.9E-07	8.4E-05	8.9E-07	8.4E-05	8.9E-07	8.4E-05	8.9E-07	8.4E-05	8.9E-07	8.4E-05
trans-1,2-dichloroethene	156-60-5	9.90	2.57	8.9E-07	8.4E-05	8.9E-07	8.4E-05	8.9E-07	8.4E-05	8.9E-07	8.4E-05	8.9E-07	8.4E-05	8.9E-07	8.4E-05	8.9E-07	8.4E-05	8.9E-07	8.4E-05	8.9E-07	8.4E-05
Chloroform	67-66-3	12.0	3.09	1.1E-06	1.0E-04	1.1E-06	1.0E-04	1.1E-06	1.0E-04	1.1E-06	1.0E-04	1.1E-06	1.0E-04	1.1E-06	1.0E-04	1.1E-06	1.0E-04	1.1E-06	1.0E-04	1.1E-06	1.0E-04
2-Butanone (Methyl ethyl ketone)	78-93-3	750	183	6.7E-05	6.0E-03	6.7E-05	6.0E-03	6.7E-05	6.0E-03	6.7E-05	6.0E-03	6.7E-05	6.0E-03	6.7E-05	6.0E-03	6.7E-05	6.0E-03	6.7E-05	6.0E-03	6.7E-05	6.0E-03
Benzene	71-43-2	80.0	31.5	7.2E-06	1.0E-03	7.2E-06	1.0E-03	7.2E-06	1.0E-03	7.2E-06	1.0E-03	7.2E-06	1.0E-03	7.2E-06	1.0E-03	7.2E-06	1.0E-03	7.2E-06	1.0E-03	7.2E-06	1.0E-03
1,2-Dichloropropane (Propylene dichloride)	78-87-5	60.0	14.7	5.4E-06	4.8E-04	5.4E-06	4.8E-04	5.4E-06	4.8E-04	5.4E-06	4.8E-04	5.4E-06	4.8E-04	5.4E-06	4.8E-04	5.4E-06	4.8E-04	5.4E-06	4.8E-04	5.4E-06	4.8E-04
Trichloroethene (TCE, Trichloroethylene)	79-01-6	27.0	4.71	2.4E-06	1.5E-04	2.4E-06	1.5E-04	2.4E-06	1.5E-04	2.4E-06	1.5E-04	2.4E-06	1.5E-04	2.4E-06	1.5E-04	2.4E-06	1.5E-04	2.4E-06	1.5E-04	2.4E-06	1.5E-04
Tetrachloroethene (Perchloroethylene)	127-18-4	88,000	11,524	7.9E-03	0.38	7.9E-03	0.38	7.9E-03	0.38	7.9E-03	0.38	7.9E-03	0.38	7.9E-03	0.38	7.9E-03	0.38	7.9E-03	0.38	7.9E-03	0.38
Ethyl benzene	100-41-4	110	38.4	9.9E-06	1.3E-03	9.9E-06	1.3E-03	9.9E-06	1.3E-03	9.9E-06	1.3E-03	9.9E-06	1.3E-03	9.9E-06	1.3E-03	9.9E-06	1.3E-03	9.9E-06	1.3E-03	9.9E-06	1.3E-03
m,p-Xylene	1330-20-7	215	91.6	1.9E-05	3.0E-03	1.9E-05	3.0E-03	1.9E-05	3.0E-03	1.9E-05	3.0E-03	1.9E-05	3.0E-03	1.9E-05	3.0E-03	1.9E-05	3.0E-03	1.9E-05	3.0E-03	1.9E-05	3.0E-03
o-Xylene	95-47-6	110	39.2	9.9E-06	1.3E-03	9.9E-06	1.3E-03	9.9E-06	1.3E-03	9.9E-06	1.3E-03	9.9E-06	1.3E-03	9.9E-06	1.3E-03	9.9E-06	1.3E-03	9.9E-06	1.3E-03	9.9E-06	1.3E-03

Notes

ft³ = cubic feet.
g = gram.
hr = hour.
lb = pound.
m³ = cubic meter.
min = minute.
RBC = Risk-Based Concentration.
ug = microgram.
yr = year.

^(a) Daily emission estimate (lb/day) = (flow rate [ft³/min]) x (m³/35.3147 ft³) x (60 min/hr) x (24 hr/day) x (maximum concentration [ug/m³]) x (g/1,000,000 ug) x (lb/453.592 g)

Flow rate (ft³/min) = 1.00 (2)

^(b) Annual emission estimate (lb/yr) = (flow rate [ft³/min]) x (m³/35.3147 ft³) x (60 min/hr) x (8,760 hr/yr) x (average concentration [ug/m³]) x (g/1,000,000 ug) x (lb/453.592 g)

Flow rate (ft³/min) = 1.00 (2)

References

⁽¹⁾ See Table 3-3, Summary of Analytical Results. Assume same concentration at every vent risers.

⁽²⁾ Conservative estimate based on calculations developed using guidance presented in "Design Document for Passive Bioventing" (DOD, March 2006). Assume same flow through all vent risers.

Table 4-1
Proposed Dispersion Factors
Shortstack Belmont LLC—Portland, Oregon

Stack ID	Stack Description	Dispersion Factor			
		Annual Exposure (ug/m ³ /lb/yr)			Daily Exposure (ug/m ³ /lb/day)
		Residential ⁽¹⁾	Nonresidential Child ⁽²⁾	Nonresidential Worker ⁽¹⁾	Acute ⁽³⁾
A_1	Building A, Vent 1	8.93E-04	1.59E-04	8.93E-04	2.24
A_2	Building A, Vent 2	8.93E-04	1.62E-04	8.93E-04	2.24
A_3	Building A, Vent 3	8.93E-04	1.67E-04	8.93E-04	2.24
A_4	Building A, Vent 4	8.93E-04	1.72E-04	8.93E-04	2.24
B_1	Building B, Vent 1	8.93E-04	1.53E-04	8.93E-04	2.24
B_2	Building B, Vent 2	8.93E-04	1.56E-04	8.93E-04	2.24
C_1	Building C, Vent 1	8.93E-04	1.65E-04	8.93E-04	2.24
C_2	Building C, Vent 2	8.93E-04	1.64E-04	8.93E-04	2.24
C_3	Building C, Vent 3	8.93E-04	1.61E-04	8.93E-04	2.24

Notes

lb = pound.

m³ = cubic meter.

ug = microgram.

yr = year.

References

- ⁽¹⁾ OAR 340-245-8010 Table 3A, "Stack Emission Dispersion Factors for Annual Exposure (ug/m³/pounds/year)." Values were interpolated between closest dispersion factors for the stack release height and the minimum exposure location distance.
- ⁽²⁾ OAR 340-245-8010 Table 3A, "Stack Emission Dispersion Factors for Annual Exposure (ug/m³/pounds/year)." Values were interpolated between closest dispersion factors for both the stack release height and the exposure location distance.
- ⁽³⁾ OAR 340-245-8010 Table 3B, "Stack Emission Dispersion Factors for 24 hour Exposure (ug/m³/pounds/day)." Values were interpolated between closest dispersion factors for the stack release height and the minimum exposure location distance.

Table 5-1
Level 1 Cancer Risk Assessment Summary
Shortstack Belmont LLC—Portland, Oregon

TAC	CAS/ ODEQ ID	TAC Annual Emission Rate ⁽¹⁾ (lb/yr)	Residential Exposure		Nonresidential Child Exposure		Nonresidential Worker Exposure	
			RBC (ug/m ³)	Excess Cancer Risk ^(a)	RBC ⁽²⁾ (ug/m ³)	Excess Cancer Risk ^(a)	RBC (ug/m ³)	Excess Cancer Risk ^(a)
Cumulative Facility-Wide Risk			--	1.2E-03	--	8.8E-06	--	1.0E-04
A_1								
Cumulative TEU Risk			--	1.4E-04	--	9.6E-07	--	1.1E-05
TEU Dispersion Factor (ug/m ³ /lb/yr) ⁽⁴⁾			8.93E-04		1.59E-04		8.93E-04	
Propylene	115-07-1	0.013	--	--	--	--	--	--
Vinyl chloride	75-01-4	5.4E-05	0.11 ⁽²⁾	4.4E-07	0.22	3.9E-08	2.70 ⁽²⁾	1.8E-08
1,3-Butadiene	106-99-0	1.3E-03	0.033 ⁽²⁾	3.6E-05	0.86	2.4E-07	0.40 ⁽²⁾	3.0E-06
Acrolein	107-02-8	3.1E-04	--	--	--	--	--	--
Acetone	67-64-1	0.016	--	--	--	--	--	--
Isopropyl alcohol	67-63-0	0.61	--	--	--	--	--	--
Vinylidene chloride (1,1-dichloroethene)	75-35-4	7.5E-05	210 ⁽³⁾	3.2E-10	--	--	880 ⁽³⁾	7.6E-11
cis-1,2-dichloroethene	156-59-2	8.4E-05	--	--	--	--	--	--
trans-1,2-dichloroethene	156-60-5	8.4E-05	--	--	--	--	--	--
Chloroform	67-66-3	1.0E-04	0.12 ⁽³⁾	7.6E-07	--	--	0.53 ⁽³⁾	1.7E-07
2-Butanone (Methyl ethyl ketone)	78-93-3	6.0E-03	--	--	--	--	--	--
Benzene	71-43-2	1.0E-03	0.13 ⁽²⁾	7.1E-06	3.30	5.0E-08	1.50 ⁽²⁾	6.1E-07
1,2-Dichloropropane (Propylene dichloride)	78-87-5	4.8E-04	--	--	--	--	--	--
Trichloroethene (TCE, Trichloroethylene)	79-01-6	1.5E-04	0.20 ⁽²⁾	6.9E-07	3.50	7.0E-09	2.90 ⁽²⁾	4.8E-08
Tetrachloroethene (Perchloroethylene)	127-18-4	0.38	3.80 ⁽²⁾	8.9E-05	100	6.0E-07	46.0 ⁽²⁾	7.3E-06
Ethyl benzene	100-41-4	1.3E-03	0.40 ⁽²⁾	2.8E-06	10.0	2.0E-08	4.80 ⁽²⁾	2.3E-07
m,p-Xylene	1330-20-7	3.0E-03	100 ⁽³⁾	2.7E-08	--	--	440 ⁽³⁾	6.1E-09
o-Xylene	95-47-6	1.3E-03	--	--	--	--	--	--
A_2								
Cumulative TEU Risk			--	1.4E-04	--	9.8E-07	--	1.1E-05
TEU Dispersion Factor (ug/m ³ /lb/yr) ⁽⁴⁾			8.93E-04		1.62E-04		8.93E-04	
Propylene	115-07-1	0.013	--	--	--	--	--	--
Vinyl chloride	75-01-4	5.4E-05	0.11 ⁽²⁾	4.4E-07	0.22	4.0E-08	2.70 ⁽²⁾	1.8E-08
1,3-Butadiene	106-99-0	1.3E-03	0.033 ⁽²⁾	3.6E-05	0.86	2.5E-07	0.40 ⁽²⁾	3.0E-06
Acrolein	107-02-8	3.1E-04	--	--	--	--	--	--
Acetone	67-64-1	0.016	--	--	--	--	--	--
Isopropyl alcohol	67-63-0	0.61	--	--	--	--	--	--
Vinylidene chloride (1,1-dichloroethene)	75-35-4	7.5E-05	210 ⁽³⁾	3.2E-10	--	--	880 ⁽³⁾	7.6E-11
cis-1,2-dichloroethene	156-59-2	8.4E-05	--	--	--	--	--	--
trans-1,2-dichloroethene	156-60-5	8.4E-05	--	--	--	--	--	--
Chloroform	67-66-3	1.0E-04	0.12 ⁽³⁾	7.6E-07	--	--	0.53 ⁽³⁾	1.7E-07
2-Butanone (Methyl ethyl ketone)	78-93-3	6.0E-03	--	--	--	--	--	--
Benzene	71-43-2	1.0E-03	0.13 ⁽²⁾	7.1E-06	3.30	5.1E-08	1.50 ⁽²⁾	6.1E-07
1,2-Dichloropropane (Propylene dichloride)	78-87-5	4.8E-04	--	--	--	--	--	--
Trichloroethene (TCE, Trichloroethylene)	79-01-6	1.5E-04	0.20 ⁽²⁾	6.9E-07	3.50	7.2E-09	2.90 ⁽²⁾	4.8E-08
Tetrachloroethene (Perchloroethylene)	127-18-4	0.38	3.80 ⁽²⁾	8.9E-05	100	6.1E-07	46.0 ⁽²⁾	7.3E-06
Ethyl benzene	100-41-4	1.3E-03	0.40 ⁽²⁾	2.8E-06	10.0	2.0E-08	4.80 ⁽²⁾	2.3E-07
m,p-Xylene	1330-20-7	3.0E-03	100 ⁽³⁾	2.7E-08	--	--	440 ⁽³⁾	6.1E-09
o-Xylene	95-47-6	1.3E-03	--	--	--	--	--	--
A_3								
Cumulative TEU Risk			--	1.4E-04	--	1.0E-06	--	1.1E-05
TEU Dispersion Factor (ug/m ³ /lb/yr) ⁽⁴⁾			8.93E-04		1.67E-04		8.93E-04	
Propylene	115-07-1	0.013	--	--	--	--	--	--
Vinyl chloride	75-01-4	5.4E-05	0.11 ⁽²⁾	4.4E-07	0.22	4.1E-08	2.70 ⁽²⁾	1.8E-08
1,3-Butadiene	106-99-0	1.3E-03	0.033 ⁽²⁾	3.6E-05	0.86	2.6E-07	0.40 ⁽²⁾	3.0E-06
Acrolein	107-02-8	3.1E-04	--	--	--	--	--	--
Acetone	67-64-1	0.016	--	--	--	--	--	--
Isopropyl alcohol	67-63-0	0.61	--	--	--	--	--	--
Vinylidene chloride (1,1-dichloroethene)	75-35-4	7.5E-05	210 ⁽³⁾	3.2E-10	--	--	880 ⁽³⁾	7.6E-11
cis-1,2-dichloroethene	156-59-2	8.4E-05	--	--	--	--	--	--
trans-1,2-dichloroethene	156-60-5	8.4E-05	--	--	--	--	--	--
Chloroform	67-66-3	1.0E-04	0.12 ⁽³⁾	7.6E-07	--	--	0.53 ⁽³⁾	1.7E-07
2-Butanone (Methyl ethyl ketone)	78-93-3	6.0E-03	--	--	--	--	--	--
Benzene	71-43-2	1.0E-03	0.13 ⁽²⁾	7.1E-06	3.30	5.2E-08	1.50 ⁽²⁾	6.1E-07
1,2-Dichloropropane (Propylene dichloride)	78-87-5	4.8E-04	--	--	--	--	--	--
Trichloroethene (TCE, Trichloroethylene)	79-01-6	1.5E-04	0.20 ⁽²⁾	6.9E-07	3.50	7.4E-09	2.90 ⁽²⁾	4.8E-08
Tetrachloroethene (Perchloroethylene)	127-18-4	0.38	3.80 ⁽²⁾	8.9E-05	100	6.3E-07	46.0 ⁽²⁾	7.3E-06
Ethyl benzene	100-41-4	1.3E-03	0.40 ⁽²⁾	2.8E-06	10.0	2.1E-08	4.80 ⁽²⁾	2.3E-07
m,p-Xylene	1330-20-7	3.0E-03	100 ⁽³⁾	2.7E-08	--	--	440 ⁽³⁾	6.1E-09
o-Xylene	95-47-6	1.3E-03	--	--	--	--	--	--

Table 5-1
Level 1 Cancer Risk Assessment Summary
Shortstack Belmont LLC—Portland, Oregon

TAC	CAS/ ODEQ ID	TAC Annual Emission Rate ⁽¹⁾ (lb/yr)	Residential Exposure		Nonresidential Child Exposure		Nonresidential Worker Exposure	
			RBC (ug/m ³)	Excess Cancer Risk ^(a)	RBC ⁽²⁾ (ug/m ³)	Excess Cancer Risk ^(a)	RBC (ug/m ³)	Excess Cancer Risk ^(a)
A_4								
Cumulative TEU Risk			--	1.4E-04	--	1.0E-06	--	1.1E-05
TEU Dispersion Factor (ug/m ³ /lb/yr) ⁽⁴⁾			8.93E-04		1.72E-04		8.93E-04	
Propylene	115-07-1	0.013	--	--	--	--	--	--
Vinyl chloride	75-01-4	5.4E-05	0.11 ⁽²⁾	4.4E-07	0.22	4.2E-08	2.70 ⁽²⁾	1.8E-08
1,3-Butadiene	106-99-0	1.3E-03	0.033 ⁽²⁾	3.6E-05	0.86	2.6E-07	0.40 ⁽²⁾	3.0E-06
Acrolein	107-02-8	3.1E-04	--	--	--	--	--	--
Acetone	67-64-1	0.016	--	--	--	--	--	--
Isopropyl alcohol	67-63-0	0.61	--	--	--	--	--	--
Vinylidene chloride (1,1-dichloroethene)	75-35-4	7.5E-05	210 ⁽³⁾	3.2E-10	--	--	880 ⁽³⁾	7.6E-11
cis-1,2-dichloroethene	156-59-2	8.4E-05	--	--	--	--	--	--
trans-1,2-dichloroethene	156-60-5	8.4E-05	--	--	--	--	--	--
Chloroform	67-66-3	1.0E-04	0.12 ⁽³⁾	7.6E-07	--	--	0.53 ⁽³⁾	1.7E-07
2-Butanone (Methyl ethyl ketone)	78-93-3	6.0E-03	--	--	--	--	--	--
Benzene	71-43-2	1.0E-03	0.13 ⁽²⁾	7.1E-06	3.30	5.4E-08	1.50 ⁽²⁾	6.1E-07
1,2-Dichloropropane (Propylene dichloride)	78-87-5	4.8E-04	--	--	--	--	--	--
Trichloroethene (TCE, Trichloroethylene)	79-01-6	1.5E-04	0.20 ⁽²⁾	6.9E-07	3.50	7.6E-09	2.90 ⁽²⁾	4.8E-08
Tetrachloroethene (Perchloroethylene)	127-18-4	0.38	3.80 ⁽²⁾	8.9E-05	100	6.5E-07	46.0 ⁽²⁾	7.3E-06
Ethyl benzene	100-41-4	1.3E-03	0.40 ⁽²⁾	2.8E-06	10.0	2.2E-08	4.80 ⁽²⁾	2.3E-07
m,p-Xylene	1330-20-7	3.0E-03	100 ⁽³⁾	2.7E-08	--	--	440 ⁽³⁾	6.1E-09
o-Xylene	95-47-6	1.3E-03	--	--	--	--	--	--
B_1								
Cumulative TEU Risk			--	1.4E-04	--	9.3E-07	--	1.1E-05
TEU Dispersion Factor (ug/m ³ /lb/yr) ⁽⁴⁾			8.93E-04		1.53E-04		8.93E-04	
Propylene	115-07-1	0.013	--	--	--	--	--	--
Vinyl chloride	75-01-4	5.4E-05	0.11 ⁽²⁾	4.4E-07	0.22	3.8E-08	2.70 ⁽²⁾	1.8E-08
1,3-Butadiene	106-99-0	1.3E-03	0.033 ⁽²⁾	3.6E-05	0.86	2.4E-07	0.40 ⁽²⁾	3.0E-06
Acrolein	107-02-8	3.1E-04	--	--	--	--	--	--
Acetone	67-64-1	0.016	--	--	--	--	--	--
Isopropyl alcohol	67-63-0	0.61	--	--	--	--	--	--
Vinylidene chloride (1,1-dichloroethene)	75-35-4	7.5E-05	210 ⁽³⁾	3.2E-10	--	--	880 ⁽³⁾	7.6E-11
cis-1,2-dichloroethene	156-59-2	8.4E-05	--	--	--	--	--	--
trans-1,2-dichloroethene	156-60-5	8.4E-05	--	--	--	--	--	--
Chloroform	67-66-3	1.0E-04	0.12 ⁽³⁾	7.6E-07	--	--	0.53 ⁽³⁾	1.7E-07
2-Butanone (Methyl ethyl ketone)	78-93-3	6.0E-03	--	--	--	--	--	--
Benzene	71-43-2	1.0E-03	0.13 ⁽²⁾	7.1E-06	3.30	4.8E-08	1.50 ⁽²⁾	6.1E-07
1,2-Dichloropropane (Propylene dichloride)	78-87-5	4.8E-04	--	--	--	--	--	--
Trichloroethene (TCE, Trichloroethylene)	79-01-6	1.5E-04	0.20 ⁽²⁾	6.9E-07	3.50	6.8E-09	2.90 ⁽²⁾	4.8E-08
Tetrachloroethene (Perchloroethylene)	127-18-4	0.38	3.80 ⁽²⁾	8.9E-05	100	5.8E-07	46.0 ⁽²⁾	7.3E-06
Ethyl benzene	100-41-4	1.3E-03	0.40 ⁽²⁾	2.8E-06	10.0	1.9E-08	4.80 ⁽²⁾	2.3E-07
m,p-Xylene	1330-20-7	3.0E-03	100 ⁽³⁾	2.7E-08	--	--	440 ⁽³⁾	6.1E-09
o-Xylene	95-47-6	1.3E-03	--	--	--	--	--	--
B_2								
Cumulative TEU Risk			--	1.4E-04	--	9.4E-07	--	1.1E-05
TEU Dispersion Factor (ug/m ³ /lb/yr) ⁽⁴⁾			8.93E-04		1.56E-04		8.93E-04	
Propylene	115-07-1	0.013	--	--	--	--	--	--
Vinyl chloride	75-01-4	5.4E-05	0.11 ⁽²⁾	4.4E-07	0.22	3.9E-08	2.70 ⁽²⁾	1.8E-08
1,3-Butadiene	106-99-0	1.3E-03	0.033 ⁽²⁾	3.6E-05	0.86	2.4E-07	0.40 ⁽²⁾	3.0E-06
Acrolein	107-02-8	3.1E-04	--	--	--	--	--	--
Acetone	67-64-1	0.016	--	--	--	--	--	--
Isopropyl alcohol	67-63-0	0.61	--	--	--	--	--	--
Vinylidene chloride (1,1-dichloroethene)	75-35-4	7.5E-05	210 ⁽³⁾	3.2E-10	--	--	880 ⁽³⁾	7.6E-11
cis-1,2-dichloroethene	156-59-2	8.4E-05	--	--	--	--	--	--
trans-1,2-dichloroethene	156-60-5	8.4E-05	--	--	--	--	--	--
Chloroform	67-66-3	1.0E-04	0.12 ⁽³⁾	7.6E-07	--	--	0.53 ⁽³⁾	1.7E-07
2-Butanone (Methyl ethyl ketone)	78-93-3	6.0E-03	--	--	--	--	--	--
Benzene	71-43-2	1.0E-03	0.13 ⁽²⁾	7.1E-06	3.30	4.9E-08	1.50 ⁽²⁾	6.1E-07
1,2-Dichloropropane (Propylene dichloride)	78-87-5	4.8E-04	--	--	--	--	--	--
Trichloroethene (TCE, Trichloroethylene)	79-01-6	1.5E-04	0.20 ⁽²⁾	6.9E-07	3.50	6.9E-09	2.90 ⁽²⁾	4.8E-08
Tetrachloroethene (Perchloroethylene)	127-18-4	0.38	3.80 ⁽²⁾	8.9E-05	100	5.9E-07	46.0 ⁽²⁾	7.3E-06
Ethyl benzene	100-41-4	1.3E-03	0.40 ⁽²⁾	2.8E-06	10.0	2.0E-08	4.80 ⁽²⁾	2.3E-07
m,p-Xylene	1330-20-7	3.0E-03	100 ⁽³⁾	2.7E-08	--	--	440 ⁽³⁾	6.1E-09
o-Xylene	95-47-6	1.3E-03	--	--	--	--	--	--

Table 5-1
Level 1 Cancer Risk Assessment Summary
Shortstack Belmont LLC—Portland, Oregon

TAC	CAS/ ODEQ ID	TAC Annual Emission Rate ⁽¹⁾ (lb/yr)	Residential Exposure		Nonresidential Child Exposure		Nonresidential Worker Exposure	
			RBC (ug/m ³)	Excess Cancer Risk ^(a)	RBC ⁽²⁾ (ug/m ³)	Excess Cancer Risk ^(a)	RBC (ug/m ³)	Excess Cancer Risk ^(a)
C_1								
Cumulative TEU Risk			--	1.4E-04	--	1.0E-06	--	1.1E-05
TEU Dispersion Factor (ug/m ³ /lb/yr) ⁽⁴⁾			8.93E-04		1.65E-04		8.93E-04	
Propylene	115-07-1	0.013	--	--	--	--	--	--
Vinyl chloride	75-01-4	5.4E-05	0.11 ⁽²⁾	4.4E-07	0.22	4.1E-08	2.70 ⁽²⁾	1.8E-08
1,3-Butadiene	106-99-0	1.3E-03	0.033 ⁽²⁾	3.6E-05	0.86	2.5E-07	0.40 ⁽²⁾	3.0E-06
Acrolein	107-02-8	3.1E-04	--	--	--	--	--	--
Acetone	67-64-1	0.016	--	--	--	--	--	--
Isopropyl alcohol	67-63-0	0.61	--	--	--	--	--	--
Vinylidene chloride (1,1-dichloroethene)	75-35-4	7.5E-05	210 ⁽³⁾	3.2E-10	--	--	880 ⁽³⁾	7.6E-11
cis-1,2-dichloroethene	156-59-2	8.4E-05	--	--	--	--	--	--
trans-1,2-dichloroethene	156-60-5	8.4E-05	--	--	--	--	--	--
Chloroform	67-66-3	1.0E-04	0.12 ⁽³⁾	7.6E-07	--	--	0.53 ⁽³⁾	1.7E-07
2-Butanone (Methyl ethyl ketone)	78-93-3	6.0E-03	--	--	--	--	--	--
Benzene	71-43-2	1.0E-03	0.13 ⁽²⁾	7.1E-06	3.30	5.2E-08	1.50 ⁽²⁾	6.1E-07
1,2-Dichloropropane (Propylene dichloride)	78-87-5	4.8E-04	--	--	--	--	--	--
Trichloroethene (TCE, Trichloroethylene)	79-01-6	1.5E-04	0.20 ⁽²⁾	6.9E-07	3.50	7.3E-09	2.90 ⁽²⁾	4.8E-08
Tetrachloroethene (Perchloroethylene)	127-18-4	0.38	3.80 ⁽²⁾	8.9E-05	100	6.2E-07	46.0 ⁽²⁾	7.3E-06
Ethyl benzene	100-41-4	1.3E-03	0.40 ⁽²⁾	2.8E-06	10.0	2.1E-08	4.80 ⁽²⁾	2.3E-07
m,p-Xylene	1330-20-7	3.0E-03	100 ⁽³⁾	2.7E-08	--	--	440 ⁽³⁾	6.1E-09
o-Xylene	95-47-6	1.3E-03	--	--	--	--	--	--
C_2								
Cumulative TEU Risk			--	1.4E-04	--	9.9E-07	--	1.1E-05
TEU Dispersion Factor (ug/m ³ /lb/yr) ⁽⁴⁾			8.93E-04		1.64E-04		8.93E-04	
Propylene	115-07-1	0.013	--	--	--	--	--	--
Vinyl chloride	75-01-4	5.4E-05	0.11 ⁽²⁾	4.4E-07	0.22	4.0E-08	2.70 ⁽²⁾	1.8E-08
1,3-Butadiene	106-99-0	1.3E-03	0.033 ⁽²⁾	3.6E-05	0.86	2.5E-07	0.40 ⁽²⁾	3.0E-06
Acrolein	107-02-8	3.1E-04	--	--	--	--	--	--
Acetone	67-64-1	0.016	--	--	--	--	--	--
Isopropyl alcohol	67-63-0	0.61	--	--	--	--	--	--
Vinylidene chloride (1,1-dichloroethene)	75-35-4	7.5E-05	210 ⁽³⁾	3.2E-10	--	--	880 ⁽³⁾	7.6E-11
cis-1,2-dichloroethene	156-59-2	8.4E-05	--	--	--	--	--	--
trans-1,2-dichloroethene	156-60-5	8.4E-05	--	--	--	--	--	--
Chloroform	67-66-3	1.0E-04	0.12 ⁽³⁾	7.6E-07	--	--	0.53 ⁽³⁾	1.7E-07
2-Butanone (Methyl ethyl ketone)	78-93-3	6.0E-03	--	--	--	--	--	--
Benzene	71-43-2	1.0E-03	0.13 ⁽²⁾	7.1E-06	3.30	5.1E-08	1.50 ⁽²⁾	6.1E-07
1,2-Dichloropropane (Propylene dichloride)	78-87-5	4.8E-04	--	--	--	--	--	--
Trichloroethene (TCE, Trichloroethylene)	79-01-6	1.5E-04	0.20 ⁽²⁾	6.9E-07	3.50	7.2E-09	2.90 ⁽²⁾	4.8E-08
Tetrachloroethene (Perchloroethylene)	127-18-4	0.38	3.80 ⁽²⁾	8.9E-05	100	6.2E-07	46.0 ⁽²⁾	7.3E-06
Ethyl benzene	100-41-4	1.3E-03	0.40 ⁽²⁾	2.8E-06	10.0	2.1E-08	4.80 ⁽²⁾	2.3E-07
m,p-Xylene	1330-20-7	3.0E-03	100 ⁽³⁾	2.7E-08	--	--	440 ⁽³⁾	6.1E-09
o-Xylene	95-47-6	1.3E-03	--	--	--	--	--	--
C_3								
Cumulative TEU Risk			--	1.4E-04	--	9.7E-07	--	1.1E-05
TEU Dispersion Factor (ug/m ³ /lb/yr) ⁽⁴⁾			8.93E-04		1.61E-04		8.93E-04	
Propylene	115-07-1	0.013	--	--	--	--	--	--
Vinyl chloride	75-01-4	5.4E-05	0.11 ⁽²⁾	4.4E-07	0.22	4.0E-08	2.70 ⁽²⁾	1.8E-08
1,3-Butadiene	106-99-0	1.3E-03	0.033 ⁽²⁾	3.6E-05	0.86	2.5E-07	0.40 ⁽²⁾	3.0E-06
Acrolein	107-02-8	3.1E-04	--	--	--	--	--	--
Acetone	67-64-1	0.016	--	--	--	--	--	--
Isopropyl alcohol	67-63-0	0.61	--	--	--	--	--	--
Vinylidene chloride (1,1-dichloroethene)	75-35-4	7.5E-05	210 ⁽³⁾	3.2E-10	--	--	880 ⁽³⁾	7.6E-11
cis-1,2-dichloroethene	156-59-2	8.4E-05	--	--	--	--	--	--
trans-1,2-dichloroethene	156-60-5	8.4E-05	--	--	--	--	--	--
Chloroform	67-66-3	1.0E-04	0.12 ⁽³⁾	7.6E-07	--	--	0.53 ⁽³⁾	1.7E-07
2-Butanone (Methyl ethyl ketone)	78-93-3	6.0E-03	--	--	--	--	--	--
Benzene	71-43-2	1.0E-03	0.13 ⁽²⁾	7.1E-06	3.30	5.0E-08	1.50 ⁽²⁾	6.1E-07
1,2-Dichloropropane (Propylene dichloride)	78-87-5	4.8E-04	--	--	--	--	--	--
Trichloroethene (TCE, Trichloroethylene)	79-01-6	1.5E-04	0.20 ⁽²⁾	6.9E-07	3.50	7.1E-09	2.90 ⁽²⁾	4.8E-08
Tetrachloroethene (Perchloroethylene)	127-18-4	0.38	3.80 ⁽²⁾	8.9E-05	100	6.1E-07	46.0 ⁽²⁾	7.3E-06
Ethyl benzene	100-41-4	1.3E-03	0.40 ⁽²⁾	2.8E-06	10.0	2.0E-08	4.80 ⁽²⁾	2.3E-07
m,p-Xylene	1330-20-7	3.0E-03	100 ⁽³⁾	2.7E-08	--	--	440 ⁽³⁾	6.1E-09
o-Xylene	95-47-6	1.3E-03	--	--	--	--	--	--

Notes
lb = pound.
m³ = cubic meter.
RBC = risk-based concentration
TAC = Toxic Air Contaminant.
TEU = toxic emission unit.
ug = microgram.
yr = year.
^(a) Excess cancer risk = (TAC annual emission rate [lb/yr]) x (TEU dispersion factor [ug/m³/lb/yr]) / (RBC [ug/m³])

References
⁽¹⁾ See Table 3-4, Proposed Level 1 Risk Assessment Emission Rates.
⁽²⁾ RBC from OAR 340-245-8010, Table 2.
⁽³⁾ RBC from DEQ's RBDM spreadsheet.
⁽⁴⁾ See Table 4-1, Proposed Dispersion Factors.

Table 5-2
Level 1 Noncancer Risk Assessment Summary
Shortstack Belmont LLC—Portland, Oregon

TAC	CAS/ ODEQ ID	TAC Emission Rate ⁽¹⁾		Chronic Noncancer						Acute Noncancer	
				Residential		Nonresidential Child		Nonresidential Worker			
		Daily (lb/day)	Annual (lb/yr)	RBC (ug/m ³)	Hazard Index ^(a)	RBC ⁽²⁾ (ug/m ³)	Hazard Index ^(a)	RBC (ug/m ³)	Hazard Index ^(a)	RBC (ug/m ³)	Hazard Index ^(b)
Cumulative Facility-Wide Risk				--	5.8E-04	--	4.8E-06	--	1.3E-04	--	4.0E-03
A_1											
Cumulative TEU Risk				--	6.5E-05	--	5.2E-07	--	1.5E-05	--	4.4E-04
TEU Dispersion Factor (ug/m ³ /lb/yr) ⁽⁴⁾				8.93E-04		1.59E-04		8.93E-04		--	
TEU Dispersion Factor (ug/m ³ /lb/day) ⁽⁴⁾				--		--		--		2.24	
Propylene	115-07-1	8.4E-05	0.013	3,000 ⁽²⁾	4.0E-09	13,000	1.6E-10	13,000 ⁽³⁾	9.2E-10	--	--
Vinyl chloride	75-01-4	5.8E-07	5.4E-05	0.17 ⁽³⁾	2.9E-07	440	2.0E-11	2.80 ⁽³⁾	1.7E-08	1,300 ⁽⁴⁾	9.9E-10
1,3-Butadiene	106-99-0	1.8E-05	1.3E-03	0.094 ⁽³⁾	1.3E-05	8.80	2.4E-08	0.41 ⁽³⁾	2.9E-06	660 ⁽⁴⁾	6.1E-08
Acrolein	107-02-8	2.6E-06	3.1E-04	0.021 ⁽³⁾	1.3E-05	1.50	3.2E-08	0.088 ⁽³⁾	3.1E-06	6.90 ⁽⁴⁾	8.3E-07
Acetone	67-64-1	1.1E-04	0.016	31,000 ⁽²⁾	4.5E-10	140,000	1.8E-11	140,000 ⁽²⁾	1.0E-10	62,000 ⁽⁴⁾	3.9E-09
Isopropyl alcohol	67-63-0	6.2E-03	0.61	200 ⁽²⁾	2.7E-06	880	1.1E-07	880 ⁽³⁾	6.2E-07	3,200 ⁽⁴⁾	4.3E-06
Vinylidene chloride (1,1-dichloroethene)	75-35-4	3.2E-07	7.5E-05	200 ⁽²⁾	3.3E-10	880	1.4E-11	880 ⁽³⁾	7.6E-11	200 ⁽⁴⁾	3.6E-09
cis-1,2-dichloroethene	156-59-2	8.9E-07	8.4E-05	42.0 ⁽³⁾	1.8E-09	--	--	180 ⁽³⁾	4.2E-10	--	--
trans-1,2-dichloroethene	156-60-5	8.9E-07	8.4E-05	42.0 ⁽³⁾	1.8E-09	--	--	180 ⁽³⁾	4.2E-10	790 ⁽⁴⁾	2.5E-09
Chloroform	67-66-3	1.1E-06	1.0E-04	0.12 ⁽³⁾	7.6E-07	1,300	1.2E-11	0.53 ⁽³⁾	1.7E-07	490 ⁽⁴⁾	4.9E-09
2-Butanone (Methyl ethyl ketone)	78-93-3	6.7E-05	6.0E-03	5,000 ⁽²⁾	1.1E-09	22,000	4.3E-11	22,000 ⁽³⁾	2.4E-10	5,000 ⁽⁴⁾	3.0E-08
Benzene	71-43-2	7.2E-06	1.0E-03	0.36 ⁽³⁾	2.6E-06	13.0	1.3E-08	1.60 ⁽³⁾	5.8E-07	29.0 ⁽⁴⁾	5.6E-07
1,2-Dichloropropane (Propylene dichloride)	78-87-5	5.4E-06	4.8E-04	0.76 ⁽³⁾	5.7E-07	18.0	4.2E-09	3.30 ⁽³⁾	1.3E-07	230 ⁽⁴⁾	5.3E-08
Trichloroethene (TCE, Trichloroethylene)	79-01-6	2.4E-06	1.5E-04	0.48 ⁽³⁾	2.9E-07	9.20	2.7E-09	3.00 ⁽³⁾	4.6E-08	2.10 ⁽⁴⁾	2.6E-06
Tetrachloroethene (Perchloroethylene)	127-18-4	7.9E-03	0.38	11.0 ⁽³⁾	3.1E-05	180	3.3E-07	47.0 ⁽³⁾	7.2E-06	41.0 ⁽⁴⁾	4.3E-04
Ethyl benzene	100-41-4	9.9E-06	1.3E-03	1.10 ⁽³⁾	1.0E-06	1,100	1.8E-10	4.90 ⁽³⁾	2.3E-07	22,000 ⁽⁴⁾	1.0E-09
m,p-Xylene	1330-20-7	1.9E-05	3.0E-03	100 ⁽³⁾	2.7E-08	970	4.9E-10	440 ⁽³⁾	6.1E-09	8,700 ⁽⁴⁾	5.0E-09
o-Xylene	95-47-6	9.9E-06	1.3E-03	100 ⁽³⁾	1.1E-08	880	2.3E-10	440 ⁽³⁾	2.6E-09	8,700 ⁽²⁾	2.5E-09
A_2											
Cumulative TEU Risk				--	6.5E-05	--	5.3E-07	--	1.5E-05	--	4.4E-04
TEU Dispersion Factor (ug/m ³ /lb/yr) ⁽⁴⁾				8.93E-04		1.62E-04		8.93E-04		--	
TEU Dispersion Factor (ug/m ³ /lb/day) ⁽⁴⁾				--		--		--		2.24	
Propylene	115-07-1	8.4E-05	0.013	3,000 ⁽²⁾	4.0E-09	13,000	1.7E-10	13,000 ⁽³⁾	9.2E-10	--	--
Vinyl chloride	75-01-4	5.8E-07	5.4E-05	0.17 ⁽³⁾	2.9E-07	440	2.0E-11	2.80 ⁽³⁾	1.7E-08	1,300 ⁽⁴⁾	9.9E-10
1,3-Butadiene	106-99-0	1.8E-05	1.3E-03	0.094 ⁽³⁾	1.3E-05	8.80	2.4E-08	0.41 ⁽³⁾	2.9E-06	660 ⁽⁴⁾	6.1E-08
Acrolein	107-02-8	2.6E-06	3.1E-04	0.021 ⁽³⁾	1.3E-05	1.50	3.3E-08	0.088 ⁽³⁾	3.1E-06	6.90 ⁽⁴⁾	8.3E-07
Acetone	67-64-1	1.1E-04	0.016	31,000 ⁽²⁾	4.5E-10	140,000	1.8E-11	140,000 ⁽²⁾	1.0E-10	62,000 ⁽⁴⁾	3.9E-09
Isopropyl alcohol	67-63-0	6.2E-03	0.61	200 ⁽²⁾	2.7E-06	880	1.1E-07	880 ⁽³⁾	6.2E-07	3,200 ⁽⁴⁾	4.3E-06
Vinylidene chloride (1,1-dichloroethene)	75-35-4	3.2E-07	7.5E-05	200 ⁽²⁾	3.3E-10	880	1.4E-11	880 ⁽³⁾	7.6E-11	200 ⁽⁴⁾	3.6E-09
cis-1,2-dichloroethene	156-59-2	8.9E-07	8.4E-05	42.0 ⁽³⁾	1.8E-09	--	--	180 ⁽³⁾	4.2E-10	--	--
trans-1,2-dichloroethene	156-60-5	8.9E-07	8.4E-05	42.0 ⁽³⁾	1.8E-09	--	--	180 ⁽³⁾	4.2E-10	790 ⁽⁴⁾	2.5E-09
Chloroform	67-66-3	1.1E-06	1.0E-04	0.12 ⁽³⁾	7.6E-07	1,300	1.3E-11	0.53 ⁽³⁾	1.7E-07	490 ⁽⁴⁾	4.9E-09
2-Butanone (Methyl ethyl ketone)	78-93-3	6.7E-05	6.0E-03	5,000 ⁽²⁾	1.1E-09	22,000	4.4E-11	22,000 ⁽³⁾	2.4E-10	5,000 ⁽⁴⁾	3.0E-08
Benzene	71-43-2	7.2E-06	1.0E-03	0.36 ⁽³⁾	2.6E-06	13.0	1.3E-08	1.60 ⁽³⁾	5.8E-07	29.0 ⁽⁴⁾	5.6E-07
1,2-Dichloropropane (Propylene dichloride)	78-87-5	5.4E-06	4.8E-04	0.76 ⁽³⁾	5.7E-07	18.0	4.3E-09	3.30 ⁽³⁾	1.3E-07	230 ⁽⁴⁾	5.3E-08
Trichloroethene (TCE, Trichloroethylene)	79-01-6	2.4E-06	1.5E-04	0.48 ⁽³⁾	2.9E-07	9.20	2.7E-09	3.00 ⁽³⁾	4.6E-08	2.10 ⁽⁴⁾	2.6E-06
Tetrachloroethene (Perchloroethylene)	127-18-4	7.9E-03	0.38	11.0 ⁽³⁾	3.1E-05	180	3.4E-07	47.0 ⁽³⁾	7.2E-06	41.0 ⁽⁴⁾	4.3E-04
Ethyl benzene	100-41-4	9.9E-06	1.3E-03	1.10 ⁽³⁾	1.0E-06	1,100	1.9E-10	4.90 ⁽³⁾	2.3E-07	22,000 ⁽⁴⁾	1.0E-09
m,p-Xylene	1330-20-7	1.9E-05	3.0E-03	100 ⁽³⁾	2.7E-08	970	5.0E-10	440 ⁽³⁾	6.1E-09	8,700 ⁽⁴⁾	5.0E-09
o-Xylene	95-47-6	9.9E-06	1.3E-03	100 ⁽³⁾	1.1E-08	880	2.4E-10	440 ⁽³⁾	2.6E-09	8,700 ⁽²⁾	2.5E-09
A_3											
Cumulative TEU Risk				--	6.5E-05	--	5.5E-07	--	1.5E-05	--	4.4E-04
TEU Dispersion Factor (ug/m ³ /lb/yr) ⁽⁴⁾				8.93E-04		1.67E-04		8.93E-04		--	
TEU Dispersion Factor (ug/m ³ /lb/day) ⁽⁴⁾				--		--		--		2.24	
Propylene	115-07-1	8.4E-05	0.013	3,000 ⁽²⁾	4.0E-09	13,000	1.7E-10	13,000 ⁽³⁾	9.2E-10	--	--
Vinyl chloride	75-01-4	5.8E-07	5.4E-05	0.17 ⁽³⁾	2.9E-07	440	2.1E-11	2.80 ⁽³⁾	1.7E-08	1,300 ⁽⁴⁾	9.9E-10
1,3-Butadiene	106-99-0	1.8E-05	1.3E-03	0.094 ⁽³⁾	1.3E-05	8.80	2.5E-08	0.41 ⁽³⁾	2.9E-06	660 ⁽⁴⁾	6.1E-08
Acrolein	107-02-8	2.6E-06	3.1E-04	0.021 ⁽³⁾	1.3E-05	1.50	3.4E-08	0.088 ⁽³⁾	3.1E-06	6.90 ⁽⁴⁾	8.3E-07
Acetone	67-64-1	1.1E-04	0.016	31,000 ⁽²⁾	4.5E-10	140,000	1.9E-11	140,000 ⁽²⁾	1.0E-10	62,000 ⁽⁴⁾	3.9E-09
Isopropyl alcohol	67-63-0	6.2E-03	0.61	200 ⁽²⁾	2.7E-06	880	1.2E-07	880 ⁽³⁾	6.2E-07	3,200 ⁽⁴⁾	4.3E-06
Vinylidene chloride (1,1-dichloroethene)	75-35-4	3.2E-07	7.5E-05	200 ⁽²⁾	3.3E-10	880	1.4E-11	880 ⁽³⁾	7.6E-11	200 ⁽⁴⁾	3.6E-09
cis-1,2-dichloroethene	156-59-2	8.9E-07	8.4E-05	42.0 ⁽³⁾	1.8E-09	--	--	180 ⁽³⁾	4.2E-10	--	--
trans-1,2-dichloroethene	156-60-5	8.9E-07	8.4E-05	42.0 ⁽³⁾	1.8E-09	--	--	180 ⁽³⁾	4.2E-10	790 ⁽⁴⁾	2.5E-09
Chloroform	67-66-3	1.1E-06	1.0E-04	0.12 ⁽³⁾	7.6E-07	1,300	1.3E-11	0.53 ⁽³⁾	1.7E-07	490 ⁽⁴⁾	4.9E-09
2-Butanone (Methyl ethyl ketone)	78-93-3	6.7E-05	6.0E-03	5,000 ⁽²⁾	1.1E-09	22,000	4.6E-11	22,000 ⁽³⁾	2.4E-10	5,000 ⁽⁴⁾	3.0E-08
Benzene	71-43-2	7.2E-06	1.0E-03	0.36 ⁽³⁾	2.6E-06	13.0	1.3E-08	1.60 ⁽³⁾	5.8E-07	29.0 ⁽⁴⁾	5.6E-07
1,2-Dichloropropane (Propylene dichloride)	78-87-5	5.4E-06	4.8E-04	0.76 ⁽³⁾	5.7E-07	18.0	4.5E-09	3.30 ⁽³⁾	1.3E-07	230 ⁽⁴⁾	5.3E-08
Trichloroethene (TCE, Trichloroethylene)	79-01-6	2.4E-06	1.5E-04	0.48 ⁽³⁾	2.9E-07	9.20	2.8E-09	3.00 ⁽³⁾	4.6E-08	2.10 ⁽⁴⁾	2.6E-06
Tetrachloroethene (Perchloroethylene)	127-18-4	7.9E-03	0.38	11.0 ⁽³⁾	3.1E-05	180	3.5E-07	47.0 ⁽³⁾	7.2E-06	41.0 ⁽⁴⁾	4.3E-04
Ethyl benzene	100-41-4	9.9E-06	1.3E-03	1.10 ⁽³⁾	1.0E-06	1,100	1.9E-10	4.90 ⁽³⁾	2.3E-07	22,000 ⁽⁴⁾	1.0E-09
m,p-Xylene	1330-20-7	1.9E-05	3.0E-03	100 ⁽³⁾	2.7E-08	970	5.2E-10	440 ⁽³⁾	6.1E-09	8,700 ⁽⁴⁾	5.0E-09
o-Xylene	95-47-6	9.9E-06	1.3E-03	100 ⁽³⁾	1.1E-08	880	2.4E-10	440 ⁽³⁾	2.6E-09	8,700 ⁽²⁾	2.5E-09

Table 5-2
Level 1 Noncancer Risk Assessment Summary
Shortstack Belmont LLC—Portland, Oregon

TAC	CAS/ ODEQ ID	TAC Emission Rate ⁽¹⁾		Chronic Noncancer						Acute Noncancer	
		Daily (lb/day)	Annual (lb/yr)	Residential		Nonresidential Child		Nonresidential Worker		RBC (ug/m ³)	Hazard Index ^(b)
				RBC (ug/m ³)	Hazard Index ^(a)	RBC ⁽²⁾ (ug/m ³)	Hazard Index ^(a)	RBC (ug/m ³)	Hazard Index ^(a)		
A_4											
Cumulative TEU Risk				--	6.5E-05	--	5.6E-07	--	1.5E-05	--	4.4E-04
TEU Dispersion Factor (ug/m ³ /lb/yr) ⁽⁴⁾				8.93E-04		1.72E-04		8.93E-04		--	
TEU Dispersion Factor (ug/m ³ /lb/day) ⁽⁴⁾				--		--		--		2.24	
Propylene	115-07-1	8.4E-05	0.013	3,000 ⁽²⁾	4.0E-09	13,000	1.8E-10	13,000 ⁽³⁾	9.2E-10	--	--
Vinyl chloride	75-01-4	5.8E-07	5.4E-05	0.17 ⁽³⁾	2.9E-07	440	2.1E-11	2.80 ⁽³⁾	1.7E-08	1,300 ⁽⁴⁾	9.9E-10
1,3-Butadiene	106-99-0	1.8E-05	1.3E-03	0.094 ⁽³⁾	1.3E-05	8.80	2.6E-08	0.41 ⁽³⁾	2.9E-06	660 ⁽⁴⁾	6.1E-08
Acrolein	107-02-8	2.6E-06	3.1E-04	0.021 ⁽³⁾	1.3E-05	1.50	3.5E-08	0.088 ⁽³⁾	3.1E-06	6.90 ⁽⁴⁾	8.3E-07
Acetone	67-64-1	1.1E-04	0.016	31,000 ⁽²⁾	4.5E-10	140,000	1.9E-11	140,000 ⁽²⁾	1.0E-10	62,000 ⁽⁴⁾	3.9E-09
Isopropyl alcohol	67-63-0	6.2E-03	0.61	200 ⁽²⁾	2.7E-06	880	1.2E-07	880 ⁽³⁾	6.2E-07	3,200 ⁽⁴⁾	4.3E-06
Vinylidene chloride (1,1-dichloroethene)	75-35-4	3.2E-07	7.5E-05	200 ⁽²⁾	3.3E-10	880	1.5E-11	880 ⁽³⁾	7.6E-11	200 ⁽⁴⁾	3.6E-09
cis-1,2-dichloroethene	156-59-2	8.9E-07	8.4E-05	42.0 ⁽³⁾	1.8E-09	--	--	180 ⁽³⁾	4.2E-10	--	--
trans-1,2-dichloroethene	156-60-5	8.9E-07	8.4E-05	42.0 ⁽³⁾	1.8E-09	--	--	180 ⁽³⁾	4.2E-10	790 ⁽⁴⁾	2.5E-09
Chloroform	67-66-3	1.1E-06	1.0E-04	0.12 ⁽³⁾	7.6E-07	1,300	1.3E-11	0.53 ⁽³⁾	1.7E-07	490 ⁽⁴⁾	4.9E-09
2-Butanone (Methyl ethyl ketone)	78-93-3	6.7E-05	6.0E-03	5,000 ⁽²⁾	1.1E-09	22,000	4.7E-11	22,000 ⁽³⁾	2.4E-10	5,000 ⁽⁴⁾	3.0E-08
Benzene	71-43-2	7.2E-06	1.0E-03	0.36 ⁽³⁾	2.6E-06	13.0	1.4E-08	1.60 ⁽³⁾	5.8E-07	29.0 ⁽⁴⁾	5.6E-07
1,2-Dichloropropane (Propylene dichloride)	78-87-5	5.4E-06	4.8E-04	0.76 ⁽³⁾	5.7E-07	18.0	4.6E-09	3.30 ⁽³⁾	1.3E-07	230 ⁽⁴⁾	5.3E-08
Trichloroethene (TCE, Trichloroethylene)	79-01-6	2.4E-06	1.5E-04	0.48 ⁽³⁾	2.9E-07	9.20	2.9E-09	3.00 ⁽³⁾	4.6E-08	2.10 ⁽⁴⁾	2.6E-06
Tetrachloroethene (Perchloroethylene)	127-18-4	7.9E-03	0.38	11.0 ⁽³⁾	3.1E-05	180	3.6E-07	47.0 ⁽³⁾	7.2E-06	41.0 ⁽⁴⁾	4.3E-04
Ethyl benzene	100-41-4	9.9E-06	1.3E-03	1.10 ⁽³⁾	1.0E-06	1,100	2.0E-10	4.90 ⁽³⁾	2.3E-07	22,000 ⁽⁴⁾	1.0E-09
m,p-Xylene	1330-20-7	1.9E-05	3.0E-03	100 ⁽³⁾	2.7E-08	970	5.3E-10	440 ⁽³⁾	6.1E-09	8,700 ⁽⁴⁾	5.0E-09
o-Xylene	95-47-6	9.9E-06	1.3E-03	100 ⁽³⁾	1.1E-08	880	2.5E-10	440 ⁽³⁾	2.6E-09	8,700 ⁽²⁾	2.5E-09
B_1											
Cumulative TEU Risk				--	6.5E-05	--	5.0E-07	--	1.5E-05	--	4.4E-04
TEU Dispersion Factor (ug/m ³ /lb/yr) ⁽⁴⁾				8.93E-04		1.53E-04		8.93E-04		--	
TEU Dispersion Factor (ug/m ³ /lb/day) ⁽⁴⁾				--		--		--		2.24	
Propylene	115-07-1	8.4E-05	0.013	3,000 ⁽²⁾	4.0E-09	13,000	1.6E-10	13,000 ⁽³⁾	9.2E-10	--	--
Vinyl chloride	75-01-4	5.8E-07	5.4E-05	0.17 ⁽³⁾	2.9E-07	440	1.9E-11	2.80 ⁽³⁾	1.7E-08	1,300 ⁽⁴⁾	9.9E-10
1,3-Butadiene	106-99-0	1.8E-05	1.3E-03	0.094 ⁽³⁾	1.3E-05	8.80	2.3E-08	0.41 ⁽³⁾	2.9E-06	660 ⁽⁴⁾	6.1E-08
Acrolein	107-02-8	2.6E-06	3.1E-04	0.021 ⁽³⁾	1.3E-05	1.50	3.1E-08	0.088 ⁽³⁾	3.1E-06	6.90 ⁽⁴⁾	8.3E-07
Acetone	67-64-1	1.1E-04	0.016	31,000 ⁽²⁾	4.5E-10	140,000	1.7E-11	140,000 ⁽²⁾	1.0E-10	62,000 ⁽⁴⁾	3.9E-09
Isopropyl alcohol	67-63-0	6.2E-03	0.61	200 ⁽²⁾	2.7E-06	880	1.1E-07	880 ⁽³⁾	6.2E-07	3,200 ⁽⁴⁾	4.3E-06
Vinylidene chloride (1,1-dichloroethene)	75-35-4	3.2E-07	7.5E-05	200 ⁽²⁾	3.3E-10	880	1.3E-11	880 ⁽³⁾	7.6E-11	200 ⁽⁴⁾	3.6E-09
cis-1,2-dichloroethene	156-59-2	8.9E-07	8.4E-05	42.0 ⁽³⁾	1.8E-09	--	--	180 ⁽³⁾	4.2E-10	--	--
trans-1,2-dichloroethene	156-60-5	8.9E-07	8.4E-05	42.0 ⁽³⁾	1.8E-09	--	--	180 ⁽³⁾	4.2E-10	790 ⁽⁴⁾	2.5E-09
Chloroform	67-66-3	1.1E-06	1.0E-04	0.12 ⁽³⁾	7.6E-07	1,300	1.2E-11	0.53 ⁽³⁾	1.7E-07	490 ⁽⁴⁾	4.9E-09
2-Butanone (Methyl ethyl ketone)	78-93-3	6.7E-05	6.0E-03	5,000 ⁽²⁾	1.1E-09	22,000	4.2E-11	22,000 ⁽³⁾	2.4E-10	5,000 ⁽⁴⁾	3.0E-08
Benzene	71-43-2	7.2E-06	1.0E-03	0.36 ⁽³⁾	2.6E-06	13.0	1.2E-08	1.60 ⁽³⁾	5.8E-07	29.0 ⁽⁴⁾	5.6E-07
1,2-Dichloropropane (Propylene dichloride)	78-87-5	5.4E-06	4.8E-04	0.76 ⁽³⁾	5.7E-07	18.0	4.1E-09	3.30 ⁽³⁾	1.3E-07	230 ⁽⁴⁾	5.3E-08
Trichloroethene (TCE, Trichloroethylene)	79-01-6	2.4E-06	1.5E-04	0.48 ⁽³⁾	2.9E-07	9.20	2.6E-09	3.00 ⁽³⁾	4.6E-08	2.10 ⁽⁴⁾	2.6E-06
Tetrachloroethene (Perchloroethylene)	127-18-4	7.9E-03	0.38	11.0 ⁽³⁾	3.1E-05	180	3.2E-07	47.0 ⁽³⁾	7.2E-06	41.0 ⁽⁴⁾	4.3E-04
Ethyl benzene	100-41-4	9.9E-06	1.3E-03	1.10 ⁽³⁾	1.0E-06	1,100	1.8E-10	4.90 ⁽³⁾	2.3E-07	22,000 ⁽⁴⁾	1.0E-09
m,p-Xylene	1330-20-7	1.9E-05	3.0E-03	100 ⁽³⁾	2.7E-08	970	4.7E-10	440 ⁽³⁾	6.1E-09	8,700 ⁽⁴⁾	5.0E-09
o-Xylene	95-47-6	9.9E-06	1.3E-03	100 ⁽³⁾	1.1E-08	880	2.2E-10	440 ⁽³⁾	2.6E-09	8,700 ⁽²⁾	2.5E-09
B_2											
Cumulative TEU Risk				--	6.5E-05	--	5.1E-07	--	1.5E-05	--	4.4E-04
TEU Dispersion Factor (ug/m ³ /lb/yr) ⁽⁴⁾				8.93E-04		1.56E-04		8.93E-04		--	
TEU Dispersion Factor (ug/m ³ /lb/day) ⁽⁴⁾				--		--		--		2.24	
Propylene	115-07-1	8.4E-05	0.013	3,000 ⁽²⁾	4.0E-09	13,000	1.6E-10	13,000 ⁽³⁾	9.2E-10	--	--
Vinyl chloride	75-01-4	5.8E-07	5.4E-05	0.17 ⁽³⁾	2.9E-07	440	1.9E-11	2.80 ⁽³⁾	1.7E-08	1,300 ⁽⁴⁾	9.9E-10
1,3-Butadiene	106-99-0	1.8E-05	1.3E-03	0.094 ⁽³⁾	1.3E-05	8.80	2.3E-08	0.41 ⁽³⁾	2.9E-06	660 ⁽⁴⁾	6.1E-08
Acrolein	107-02-8	2.6E-06	3.1E-04	0.021 ⁽³⁾	1.3E-05	1.50	3.2E-08	0.088 ⁽³⁾	3.1E-06	6.90 ⁽⁴⁾	8.3E-07
Acetone	67-64-1	1.1E-04	0.016	31,000 ⁽²⁾	4.5E-10	140,000	1.7E-11	140,000 ⁽²⁾	1.0E-10	62,000 ⁽⁴⁾	3.9E-09
Isopropyl alcohol	67-63-0	6.2E-03	0.61	200 ⁽²⁾	2.7E-06	880	1.1E-07	880 ⁽³⁾	6.2E-07	3,200 ⁽⁴⁾	4.3E-06
Vinylidene chloride (1,1-dichloroethene)	75-35-4	3.2E-07	7.5E-05	200 ⁽²⁾	3.3E-10	880	1.3E-11	880 ⁽³⁾	7.6E-11	200 ⁽⁴⁾	3.6E-09
cis-1,2-dichloroethene	156-59-2	8.9E-07	8.4E-05	42.0 ⁽³⁾	1.8E-09	--	--	180 ⁽³⁾	4.2E-10	--	--
trans-1,2-dichloroethene	156-60-5	8.9E-07	8.4E-05	42.0 ⁽³⁾	1.8E-09	--	--	180 ⁽³⁾	4.2E-10	790 ⁽⁴⁾	2.5E-09
Chloroform	67-66-3	1.1E-06	1.0E-04	0.12 ⁽³⁾	7.6E-07	1,300	1.2E-11	0.53 ⁽³⁾	1.7E-07	490 ⁽⁴⁾	4.9E-09
2-Butanone (Methyl ethyl ketone)	78-93-3	6.7E-05	6.0E-03	5,000 ⁽²⁾	1.1E-09	22,000	4.3E-11	22,000 ⁽³⁾	2.4E-10	5,000 ⁽⁴⁾	3.0E-08
Benzene	71-43-2	7.2E-06	1.0E-03	0.36 ⁽³⁾	2.6E-06	13.0	1.2E-08	1.60 ⁽³⁾	5.8E-07	29.0 ⁽⁴⁾	5.6E-07
1,2-Dichloropropane (Propylene dichloride)	78-87-5	5.4E-06	4.8E-04	0.76 ⁽³⁾	5.7E-07	18.0	4.2E-09	3.30 ⁽³⁾	1.3E-07	230 ⁽⁴⁾	5.3E-08
Trichloroethene (TCE, Trichloroethylene)	79-01-6	2.4E-06	1.5E-04	0.48 ⁽³⁾	2.9E-07	9.20	2.6E-09	3.00 ⁽³⁾	4.6E-08	2.10 ⁽⁴⁾	2.6E-06
Tetrachloroethene (Perchloroethylene)	127-18-4	7.9E-03	0.38	11.0 ⁽³⁾	3.1E-05	180	3.3E-07	47.0 ⁽³⁾	7.2E-06	41.0 ⁽⁴⁾	4.3E-04
Ethyl benzene	100-41-4	9.9E-06	1.3E-03	1.10 ⁽³⁾	1.0E-06	1,100	1.8E-10	4.90 ⁽³⁾	2.3E-07	22,000 ⁽⁴⁾	1.0E-09
m,p-Xylene	1330-20-7	1.9E-05	3.0E-03	100 ⁽³⁾	2.7E-08	970	4.8E-10	440 ⁽³⁾	6.1E-09	8,700 ⁽⁴⁾	5.0E-09
o-Xylene	95-47-6	9.9E-06	1.3E-03	100 ⁽³⁾	1.1E-08	880	2.3E-10	440 ⁽³⁾	2.6E-09	8,700 ⁽²⁾	2.5E-09

Table 5-2
Level 1 Noncancer Risk Assessment Summary
Shortstack Belmont LLC—Portland, Oregon

TAC	CAS/ ODEQ ID	TAC Emission Rate ⁽¹⁾		Chronic Noncancer						Acute Noncancer	
				Residential		Nonresidential Child		Nonresidential Worker			
		Daily (lb/day)	Annual (lb/yr)	RBC (ug/m ³)	Hazard Index ^(a)	RBC ⁽²⁾ (ug/m ³)	Hazard Index ^(a)	RBC (ug/m ³)	Hazard Index ^(a)	RBC (ug/m ³)	Hazard Index ^(b)
C_1											
Cumulative TEU Risk				--	6.5E-05	--	5.4E-07	--	1.5E-05	--	4.4E-04
TEU Dispersion Factor (ug/m ³ /lb/yr) ⁽⁴⁾				8.93E-04		1.65E-04		8.93E-04		--	
TEU Dispersion Factor (ug/m ³ /lb/day) ⁽⁴⁾				--		--		--		2.24	
Propylene	115-07-1	8.4E-05	0.013	3,000 ⁽²⁾	4.0E-09	13,000	1.7E-10	13,000 ⁽³⁾	9.2E-10	--	--
Vinyl chloride	75-01-4	5.8E-07	5.4E-05	0.17 ⁽³⁾	2.9E-07	440	2.0E-11	2.80 ⁽³⁾	1.7E-08	1,300 ⁽⁴⁾	9.9E-10
1,3-Butadiene	106-99-0	1.8E-05	1.3E-03	0.094 ⁽³⁾	1.3E-05	8.80	2.5E-08	0.41 ⁽³⁾	2.9E-06	660 ⁽⁴⁾	6.1E-08
Acrolein	107-02-8	2.6E-06	3.1E-04	0.021 ⁽³⁾	1.3E-05	1.50	3.4E-08	0.088 ⁽³⁾	3.1E-06	6.90 ⁽⁴⁾	8.3E-07
Acetone	67-64-1	1.1E-04	0.016	31,000 ⁽²⁾	4.5E-10	140,000	1.8E-11	140,000 ⁽²⁾	1.0E-10	62,000 ⁽⁴⁾	3.9E-09
Isopropyl alcohol	67-63-0	6.2E-03	0.61	200 ⁽²⁾	2.7E-06	880	1.1E-07	880 ⁽³⁾	6.2E-07	3,200 ⁽⁴⁾	4.3E-06
Vinylidene chloride (1,1-dichloroethene)	75-35-4	3.2E-07	7.5E-05	200 ⁽²⁾	3.3E-10	880	1.4E-11	880 ⁽³⁾	7.6E-11	200 ⁽⁴⁾	3.6E-09
cis-1,2-dichloroethene	156-59-2	8.9E-07	8.4E-05	42.0 ⁽³⁾	1.8E-09	--	--	180 ⁽³⁾	4.2E-10	--	--
trans-1,2-dichloroethene	156-60-5	8.9E-07	8.4E-05	42.0 ⁽³⁾	1.8E-09	--	--	180 ⁽³⁾	4.2E-10	790 ⁽⁴⁾	2.5E-09
Chloroform	67-66-3	1.1E-06	1.0E-04	0.12 ⁽³⁾	7.6E-07	1,300	1.3E-11	0.53 ⁽³⁾	1.7E-07	490 ⁽⁴⁾	4.9E-09
2-Butanone (Methyl ethyl ketone)	78-93-3	6.7E-05	6.0E-03	5,000 ⁽²⁾	1.1E-09	22,000	4.5E-11	22,000 ⁽³⁾	2.4E-10	5,000 ⁽⁴⁾	3.0E-08
Benzene	71-43-2	7.2E-06	1.0E-03	0.36 ⁽³⁾	2.6E-06	13.0	1.3E-08	1.60 ⁽³⁾	5.8E-07	29.0 ⁽⁴⁾	5.6E-07
1,2-Dichloropropane (Propylene dichloride)	78-87-5	5.4E-06	4.8E-04	0.76 ⁽³⁾	5.7E-07	18.0	4.4E-09	3.30 ⁽³⁾	1.3E-07	230 ⁽⁴⁾	5.3E-08
Trichloroethene (TCE, Trichloroethylene)	79-01-6	2.4E-06	1.5E-04	0.48 ⁽³⁾	2.9E-07	9.20	2.8E-09	3.00 ⁽³⁾	4.6E-08	2.10 ⁽⁴⁾	2.6E-06
Tetrachloroethene (Perchloroethylene)	127-18-4	7.9E-03	0.38	11.0 ⁽³⁾	3.1E-05	180	3.5E-07	47.0 ⁽³⁾	7.2E-06	41.0 ⁽⁴⁾	4.3E-04
Ethyl benzene	100-41-4	9.9E-06	1.3E-03	1.10 ⁽³⁾	1.0E-06	1,100	1.9E-10	4.90 ⁽³⁾	2.3E-07	22,000 ⁽⁴⁾	1.0E-09
m,p-Xylene	1330-20-7	1.9E-05	3.0E-03	100 ⁽³⁾	2.7E-08	970	5.1E-10	440 ⁽³⁾	6.1E-09	8,700 ⁽⁴⁾	5.0E-09
o-Xylene	95-47-6	9.9E-06	1.3E-03	100 ⁽³⁾	1.1E-08	880	2.4E-10	440 ⁽³⁾	2.6E-09	8,700 ⁽²⁾	2.5E-09
C_2											
Cumulative TEU Risk				--	6.5E-05	--	5.4E-07	--	1.5E-05	--	4.4E-04
TEU Dispersion Factor (ug/m ³ /lb/yr) ⁽⁴⁾				8.93E-04		1.64E-04		8.93E-04		--	
TEU Dispersion Factor (ug/m ³ /lb/day) ⁽⁴⁾				--		--		--		2.24	
Propylene	115-07-1	8.4E-05	0.013	3,000 ⁽²⁾	4.0E-09	13,000	1.7E-10	13,000 ⁽³⁾	9.2E-10	--	--
Vinyl chloride	75-01-4	5.8E-07	5.4E-05	0.17 ⁽³⁾	2.9E-07	440	2.0E-11	2.80 ⁽³⁾	1.7E-08	1,300 ⁽⁴⁾	9.9E-10
1,3-Butadiene	106-99-0	1.8E-05	1.3E-03	0.094 ⁽³⁾	1.3E-05	8.80	2.5E-08	0.41 ⁽³⁾	2.9E-06	660 ⁽⁴⁾	6.1E-08
Acrolein	107-02-8	2.6E-06	3.1E-04	0.021 ⁽³⁾	1.3E-05	1.50	3.3E-08	0.088 ⁽³⁾	3.1E-06	6.90 ⁽⁴⁾	8.3E-07
Acetone	67-64-1	1.1E-04	0.016	31,000 ⁽²⁾	4.5E-10	140,000	1.8E-11	140,000 ⁽²⁾	1.0E-10	62,000 ⁽⁴⁾	3.9E-09
Isopropyl alcohol	67-63-0	6.2E-03	0.61	200 ⁽²⁾	2.7E-06	880	1.1E-07	880 ⁽³⁾	6.2E-07	3,200 ⁽⁴⁾	4.3E-06
Vinylidene chloride (1,1-dichloroethene)	75-35-4	3.2E-07	7.5E-05	200 ⁽²⁾	3.3E-10	880	1.4E-11	880 ⁽³⁾	7.6E-11	200 ⁽⁴⁾	3.6E-09
cis-1,2-dichloroethene	156-59-2	8.9E-07	8.4E-05	42.0 ⁽³⁾	1.8E-09	--	--	180 ⁽³⁾	4.2E-10	--	--
trans-1,2-dichloroethene	156-60-5	8.9E-07	8.4E-05	42.0 ⁽³⁾	1.8E-09	--	--	180 ⁽³⁾	4.2E-10	790 ⁽⁴⁾	2.5E-09
Chloroform	67-66-3	1.1E-06	1.0E-04	0.12 ⁽³⁾	7.6E-07	1,300	1.3E-11	0.53 ⁽³⁾	1.7E-07	490 ⁽⁴⁾	4.9E-09
2-Butanone (Methyl ethyl ketone)	78-93-3	6.7E-05	6.0E-03	5,000 ⁽²⁾	1.1E-09	22,000	4.5E-11	22,000 ⁽³⁾	2.4E-10	5,000 ⁽⁴⁾	3.0E-08
Benzene	71-43-2	7.2E-06	1.0E-03	0.36 ⁽³⁾	2.6E-06	13.0	1.3E-08	1.60 ⁽³⁾	5.8E-07	29.0 ⁽⁴⁾	5.6E-07
1,2-Dichloropropane (Propylene dichloride)	78-87-5	5.4E-06	4.8E-04	0.76 ⁽³⁾	5.7E-07	18.0	4.4E-09	3.30 ⁽³⁾	1.3E-07	230 ⁽⁴⁾	5.3E-08
Trichloroethene (TCE, Trichloroethylene)	79-01-6	2.4E-06	1.5E-04	0.48 ⁽³⁾	2.9E-07	9.20	2.8E-09	3.00 ⁽³⁾	4.6E-08	2.10 ⁽⁴⁾	2.6E-06
Tetrachloroethene (Perchloroethylene)	127-18-4	7.9E-03	0.38	11.0 ⁽³⁾	3.1E-05	180	3.4E-07	47.0 ⁽³⁾	7.2E-06	41.0 ⁽⁴⁾	4.3E-04
Ethyl benzene	100-41-4	9.9E-06	1.3E-03	1.10 ⁽³⁾	1.0E-06	1,100	1.9E-10	4.90 ⁽³⁾	2.3E-07	22,000 ⁽⁴⁾	1.0E-09
m,p-Xylene	1330-20-7	1.9E-05	3.0E-03	100 ⁽³⁾	2.7E-08	970	5.1E-10	440 ⁽³⁾	6.1E-09	8,700 ⁽⁴⁾	5.0E-09
o-Xylene	95-47-6	9.9E-06	1.3E-03	100 ⁽³⁾	1.1E-08	880	2.4E-10	440 ⁽³⁾	2.6E-09	8,700 ⁽²⁾	2.5E-09

Table 5-2
Level 1 Noncancer Risk Assessment Summary
Shortstack Belmont LLC—Portland, Oregon

TAC	CAS/ ODEQ ID	TAC Emission Rate ⁽¹⁾		Chronic Noncancer						Acute Noncancer	
				Residential		Nonresidential Child		Nonresidential Worker			
		Daily (lb/day)	Annual (lb/yr)	RBC (ug/m ³)	Hazard Index ^(a)	RBC ⁽²⁾ (ug/m ³)	Hazard Index ^(a)	RBC (ug/m ³)	Hazard Index ^(a)	RBC (ug/m ³)	Hazard Index ^(b)
C_3											
Cumulative TEU Risk				--	6.5E-05	--	5.3E-07	--	1.5E-05	--	4.4E-04
TEU Dispersion Factor (ug/m ³ /lb/yr) ⁽⁴⁾				8.93E-04		1.61E-04		8.93E-04		--	
TEU Dispersion Factor (ug/m ³ /lb/day) ⁽⁴⁾				--		--		--		2.24	
Propylene	115-07-1	8.4E-05	0.013	3,000 ⁽²⁾	4.0E-09	13,000	1.7E-10	13,000 ⁽³⁾	9.2E-10	--	--
Vinyl chloride	75-01-4	5.8E-07	5.4E-05	0.17 ⁽³⁾	2.9E-07	440	2.0E-11	2.80 ⁽³⁾	1.7E-08	1,300 ⁽⁴⁾	9.9E-10
1,3-Butadiene	106-99-0	1.8E-05	1.3E-03	0.094 ⁽³⁾	1.3E-05	8.80	2.4E-08	0.41 ⁽³⁾	2.9E-06	660 ⁽⁴⁾	6.1E-08
Acrolein	107-02-8	2.6E-06	3.1E-04	0.021 ⁽³⁾	1.3E-05	1.50	3.3E-08	0.088 ⁽³⁾	3.1E-06	6.90 ⁽⁴⁾	8.3E-07
Acetone	67-64-1	1.1E-04	0.016	31,000 ⁽²⁾	4.5E-10	140,000	1.8E-11	140,000 ⁽²⁾	1.0E-10	62,000 ⁽⁴⁾	3.9E-09
Isopropyl alcohol	67-63-0	6.2E-03	0.61	200 ⁽²⁾	2.7E-06	880	1.1E-07	880 ⁽³⁾	6.2E-07	3,200 ⁽⁴⁾	4.3E-06
Vinylidene chloride (1,1-dichloroethene)	75-35-4	3.2E-07	7.5E-05	200 ⁽²⁾	3.3E-10	880	1.4E-11	880 ⁽³⁾	7.6E-11	200 ⁽⁴⁾	3.6E-09
cis-1,2-dichloroethene	156-59-2	8.9E-07	8.4E-05	42.0 ⁽³⁾	1.8E-09	--	--	180 ⁽³⁾	4.2E-10	--	--
trans-1,2-dichloroethene	156-60-5	8.9E-07	8.4E-05	42.0 ⁽³⁾	1.8E-09	--	--	180 ⁽³⁾	4.2E-10	790 ⁽⁴⁾	2.5E-09
Chloroform	67-66-3	1.1E-06	1.0E-04	0.12 ⁽³⁾	7.6E-07	1,300	1.3E-11	0.53 ⁽³⁾	1.7E-07	490 ⁽⁴⁾	4.9E-09
2-Butanone (Methyl ethyl ketone)	78-93-3	6.7E-05	6.0E-03	5,000 ⁽²⁾	1.1E-09	22,000	4.4E-11	22,000 ⁽³⁾	2.4E-10	5,000 ⁽⁴⁾	3.0E-08
Benzene	71-43-2	7.2E-06	1.0E-03	0.36 ⁽³⁾	2.6E-06	13.0	1.3E-08	1.60 ⁽³⁾	5.8E-07	29.0 ⁽⁴⁾	5.6E-07
1,2-Dichloropropane (Propylene dichloride)	78-87-5	5.4E-06	4.8E-04	0.76 ⁽³⁾	5.7E-07	18.0	4.3E-09	3.30 ⁽³⁾	1.3E-07	230 ⁽⁴⁾	5.3E-08
Trichloroethene (TCE, Trichloroethylene)	79-01-6	2.4E-06	1.5E-04	0.48 ⁽³⁾	2.9E-07	9.20	2.7E-09	3.00 ⁽³⁾	4.6E-08	2.10 ⁽⁴⁾	2.6E-06
Tetrachloroethene (Perchloroethylene)	127-18-4	7.9E-03	0.38	11.0 ⁽³⁾	3.1E-05	180	3.4E-07	47.0 ⁽³⁾	7.2E-06	41.0 ⁽⁴⁾	4.3E-04
Ethyl benzene	100-41-4	9.9E-06	1.3E-03	1.10 ⁽³⁾	1.0E-06	1,100	1.8E-10	4.90 ⁽³⁾	2.3E-07	22,000 ⁽⁴⁾	1.0E-09
m,p-Xylene	1330-20-7	1.9E-05	3.0E-03	100 ⁽³⁾	2.7E-08	970	5.0E-10	440 ⁽³⁾	6.1E-09	8,700 ⁽⁴⁾	5.0E-09
o-Xylene	95-47-6	9.9E-06	1.3E-03	100 ⁽³⁾	1.1E-08	880	2.4E-10	440 ⁽³⁾	2.6E-09	8,700 ⁽²⁾	2.5E-09

Notes

lb = pound.

m³ = cubic meter.

RBC = risk-based concentration

TAC = Toxic Air Contaminant.

TEU = toxic emission unit.

ug = microgram.

yr = year.

^(a) Chronic noncancer hazard index = (TAC annual emission rate [lb/yr]) x (TEU dispersion factor [ug/m³/lb/yr]) / (RBC [ug/m³])

^(b) Acute noncancer hazard index = (TAC daily emission rate [lb/day]) x (TEU dispersion factor [ug/m³/lb/day]) / (RBC [ug/m³])

References

⁽¹⁾ See Table 3-4, Proposed Level 1 Risk Assessment Emission Rates.

⁽²⁾ RBC from OAR 340-245-8010, Table 2.

⁽³⁾ RBC from DEQ's Table 1, "Chronic and Acute Vapor Intrusion Risk-Based Concentrations."

⁽⁴⁾ RBC from DEQ's Table 1, "Chronic and Acute Vapor Intrusion Risk-Based Concentrations." Conservatively used the lower of the Residential and Occupational RBCs.

⁽⁵⁾ See Table 4-1, Proposed Dispersion Factors.

FIGURES



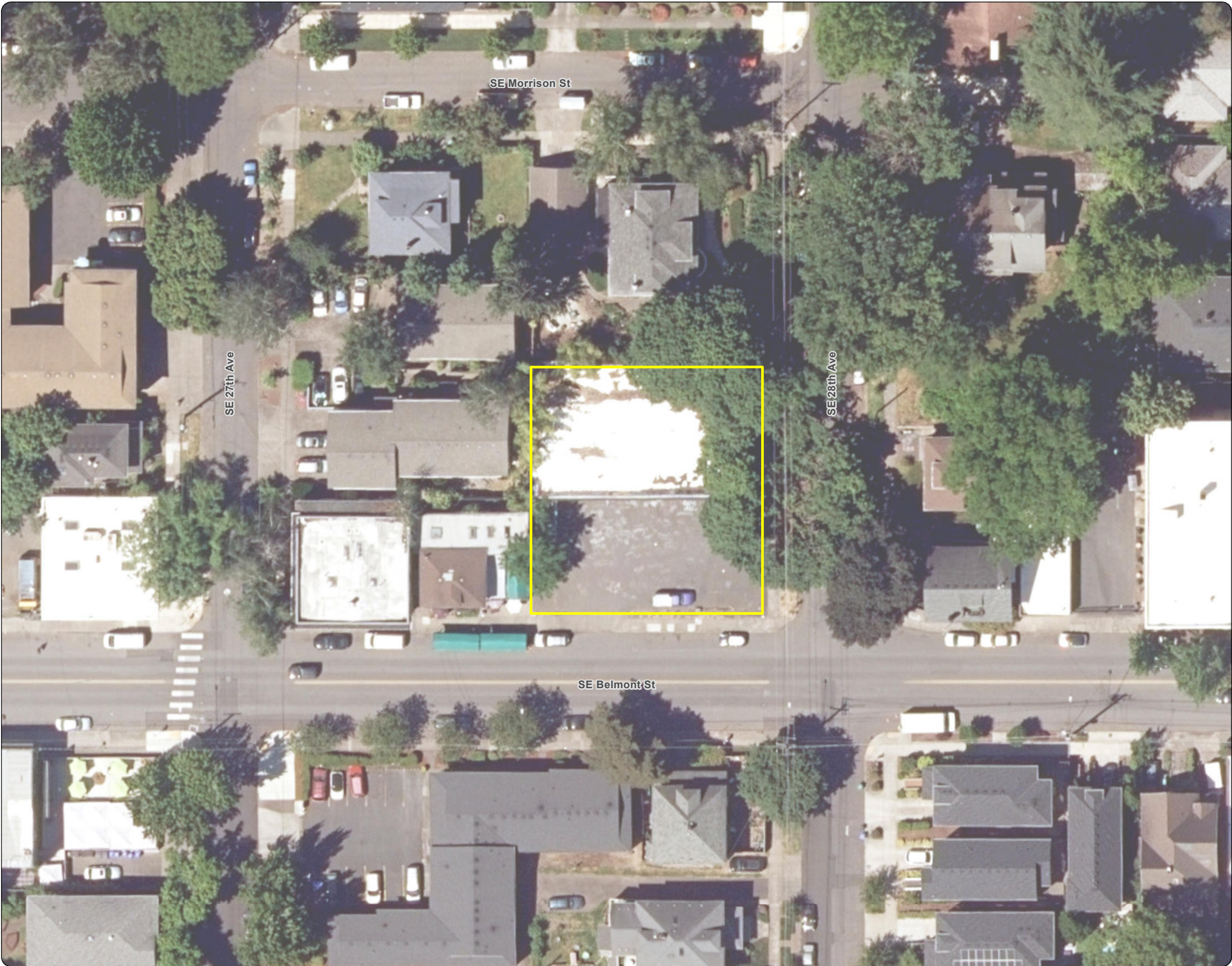
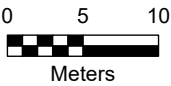
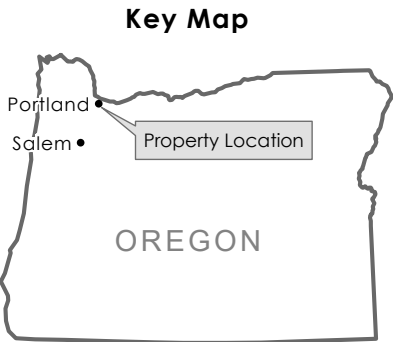


Figure 2-1
Aerial Image of Property
Shortstack Belmont LLC
Portland, OR

Legend
 Property Boundary



Data Sources
Aerial photograph obtained from the City of Portland.

 **MAUL FOSTER ALONGI**
p. 971 544 2139 | www.maulfooster.com

This product is for informational purposes and may not have been prepared for, or be suitable for legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information.

Path: X:\0 MFA Projects\247301\001\Fig 2 Local Topography.mxd
Print Date: 2/22/2023
Reviewed By: beadle
Produced By: sturner
Project: M2473 01.001

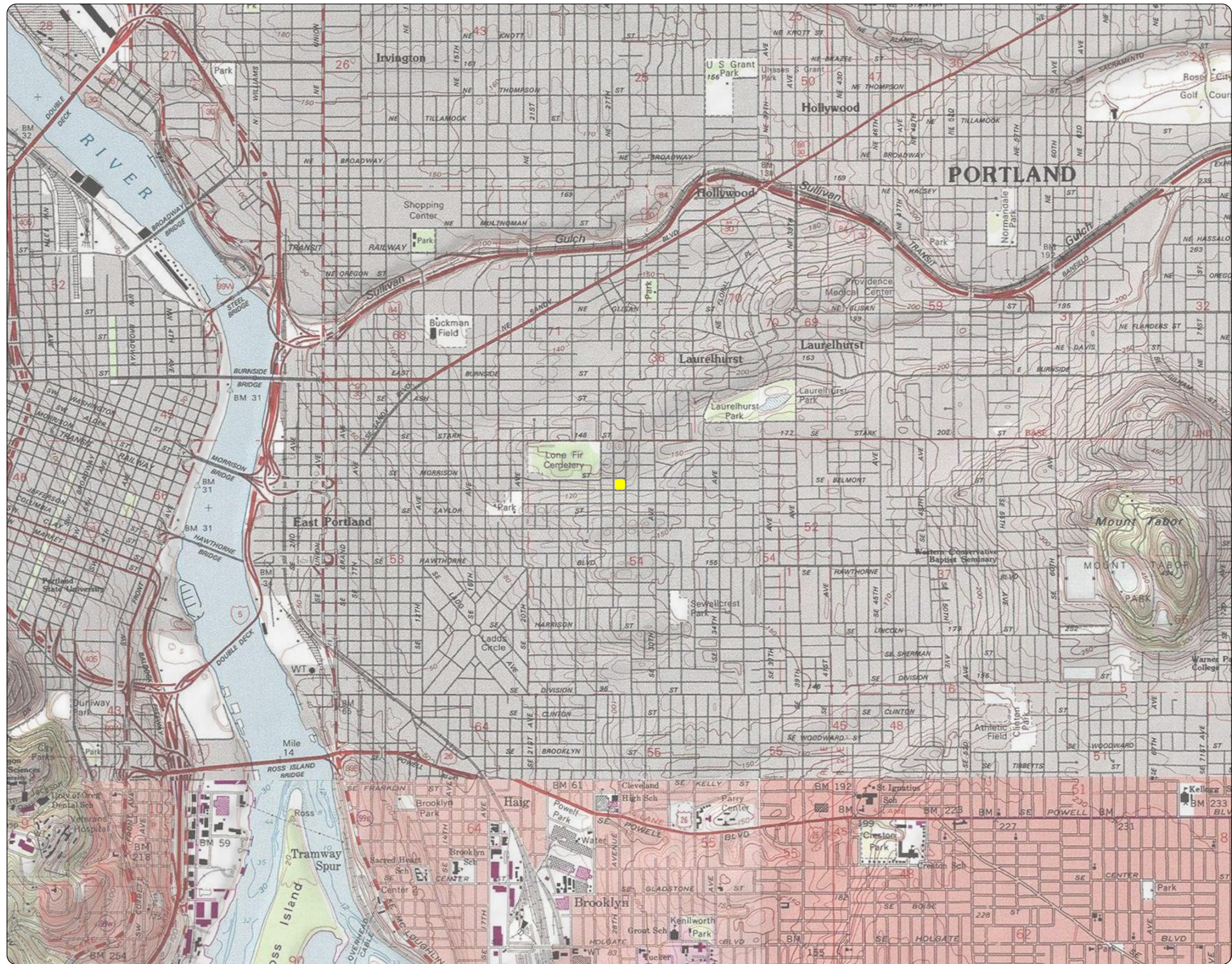
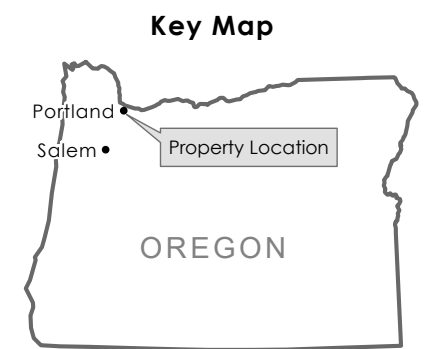


Figure 2-2
Local Topography
Shortstack Belmont LLC
Portland, OR

Legend
 Property Location



Data Sources
Basemap obtained from the US Geological Survey.

MAUL FOSTER ALONGI
p. 971 544 2139 | www.maulfooster.com

This product is for informational purposes and may not have been prepared for, or be suitable for legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information.



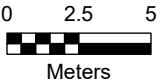
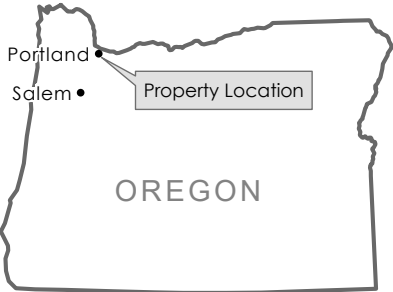
Figure 2-3 Plot Plan and Stack Locations

Shortstack Belmont LLC
Portland, OR

Legend

- Vent Riser
- Building
- Property Boundary

Key Map



Data Sources
Aerial photograph obtained from the City of Portland.

 **MAUL FOSTER ALONGI**
p. 971 544 2139 | www.maulfoster.com

This product is for informational purposes and may not have been prepared for, or be suitable for legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information.



Figure 3-1
Soil Vapor Sample Locations
Shortstack Belmont LLC
Portland, OR

Legend

- 2015 GeoDesign Investigation Soil Vapor Sample
- 2017 Succeed Environmental Investigation Soil Vapor Sample
- 2021 Cascade Environmental Investigation Soil Vapor Sample
- Reported Dry Cleaner Machine Storage Area
- Property Boundary

Key Map

0 2.5 5
Meters

Data Sources
Aerial photograph obtained from the City of Portland.

MAUL FOSTER ALONGI
p. 971 544 2139 | www.maulfoster.com

This product is for informational purposes and may not have been prepared for, or be suitable for legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information.

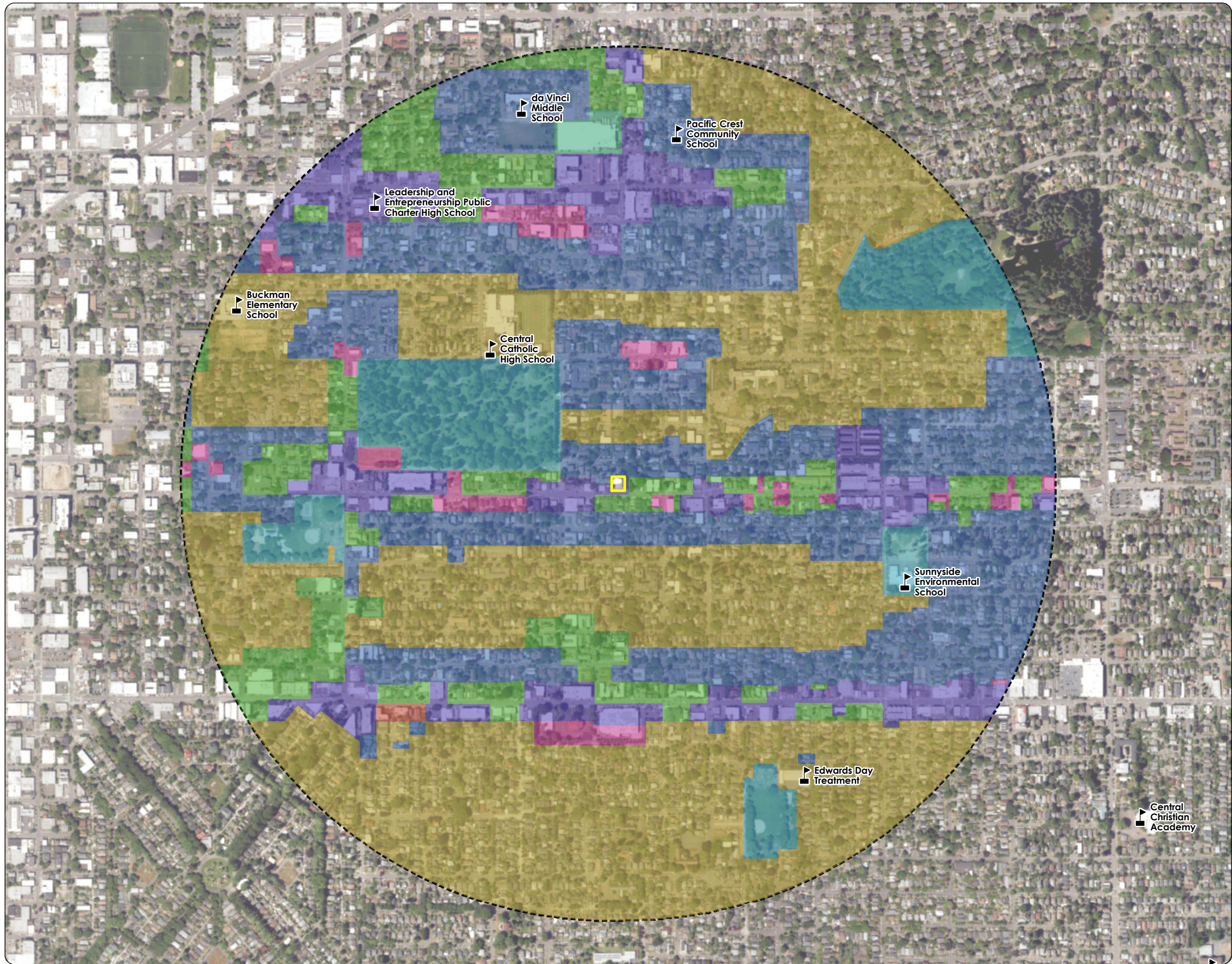
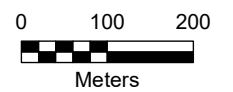


Figure 4-1
Existing Zoning
Shortstack Belmont LLC
Portland, OR

Legend

- School
- 1-Kilometer Radius from Facility
- Property Boundary
- Zoning Designation**
- High-density Res.
- Industrial - Light
- Medium Low-density Res.
- Medium-density Res.
- Mixed-Use Com. & Res. Med-high
- Mixed-Use Com. & Res. V.High
- Parks & Open Space
- Very High-density Res.

Key Map



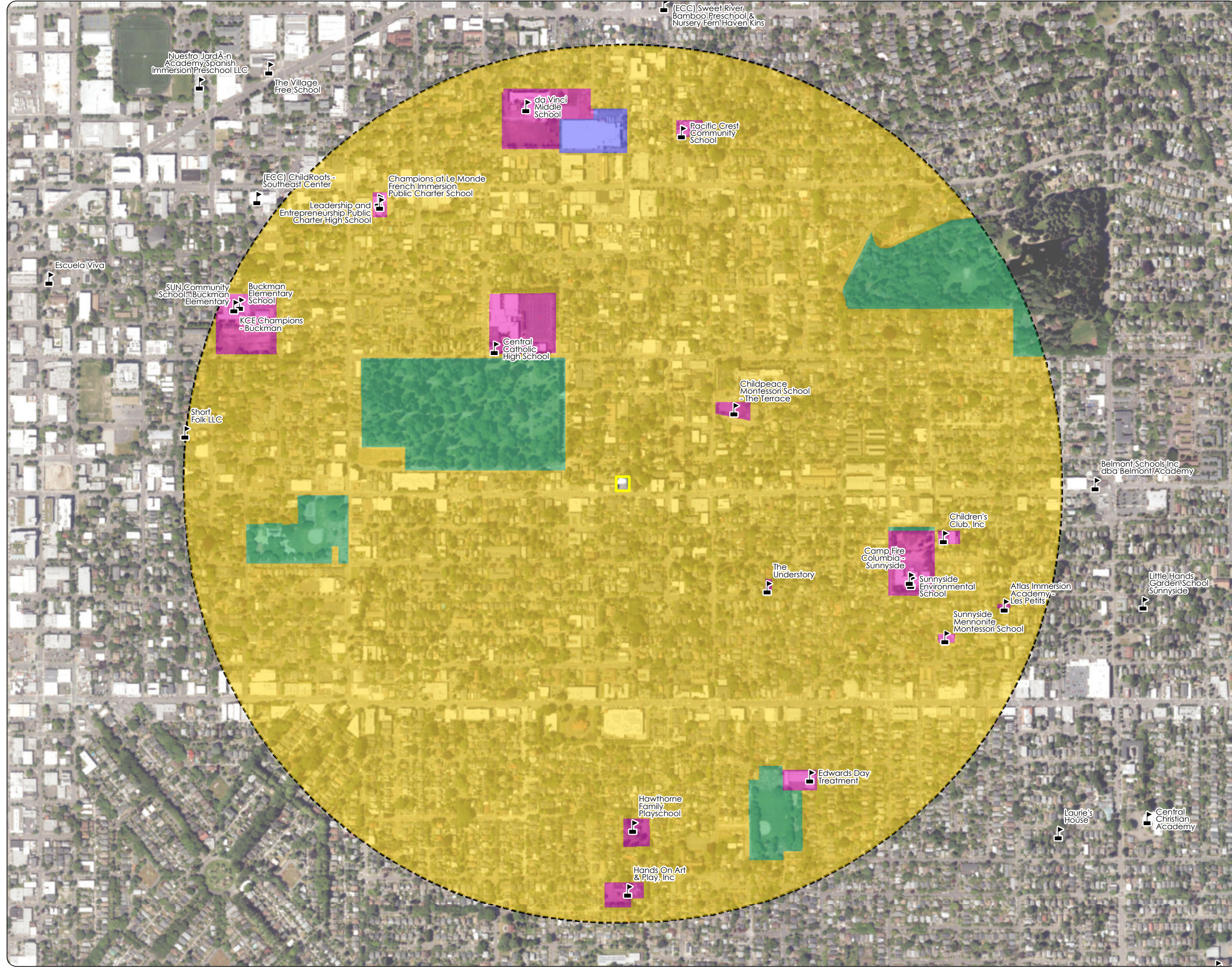
Data Sources
Aerial photograph obtained from the City of Portland.

MAUL FOSTER ALONGI
p. 971 544 2139 | www.maulfooster.com

This product is for informational purposes and may not have been prepared for, or be suitable for legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information.

Path: X:\0 MFA Projects\102473\01001\Fig 4-2 Land Use Classifications.mxd
Print Date: 2/23/2023
Reviewed By: beanie
Produced By: sturner
Project: 102473 01 001

Figure 4-2
Land Use Classifications
Shortstack Belmont LLC
Portland, OR



Legend

- School or Daycare Facility
- 1-Kilometer Radius from Property
- Property Boundary

Risk

- Residential
- Child
- Worker
- Acute-only

Key Map

0 100 200
Meters

Data Sources
Aerial photograph obtained from the City of Portland.

 **MAUL FOSTER ALONGI**
p. 971 544 2139 | www.maulfooster.com

This product is for informational purposes and may not have been prepared for, or be suitable for, legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information.

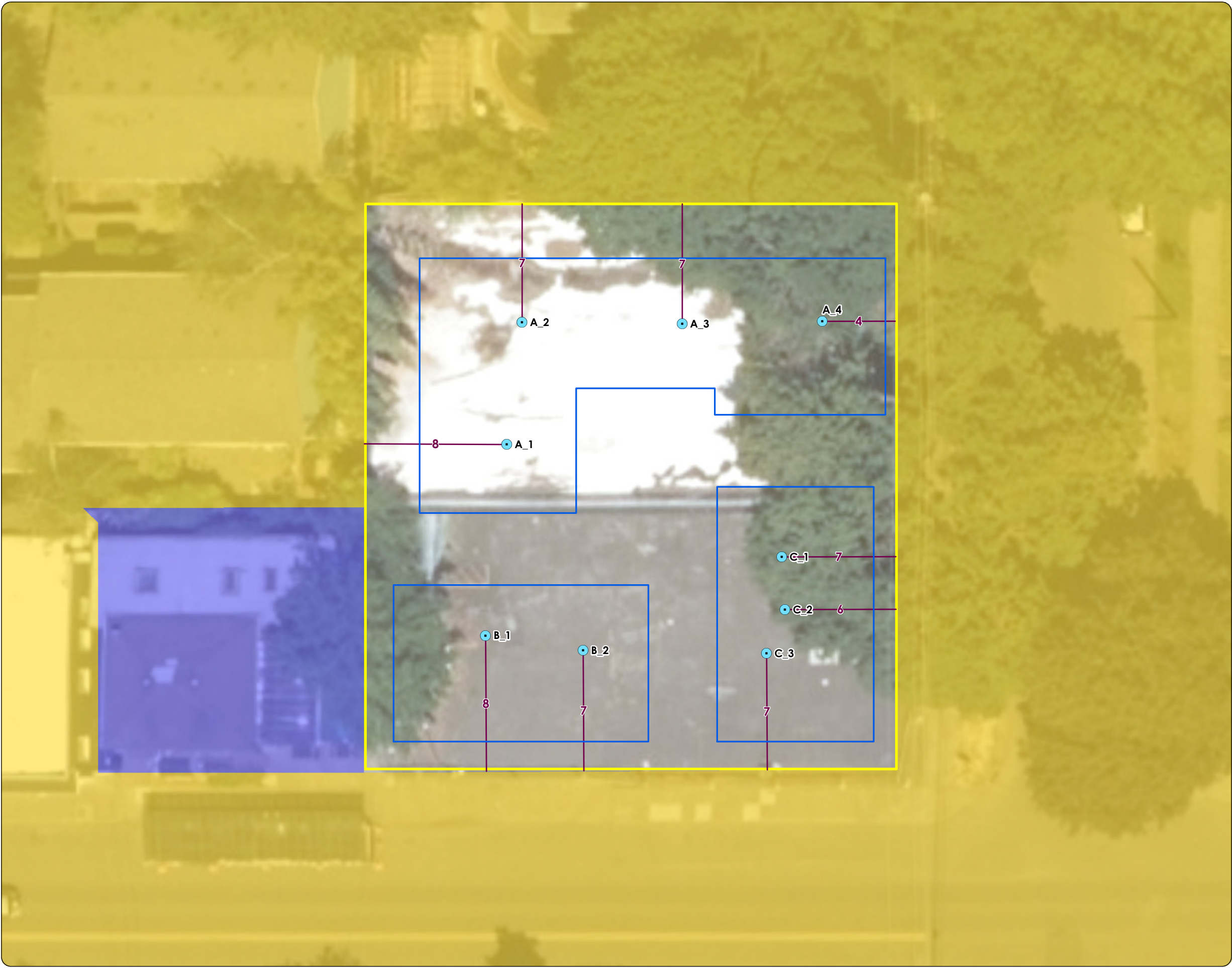







Figure 4-3
Residential Exposure
Location Distances
Shortstack Belmont LLC
Portland, OR

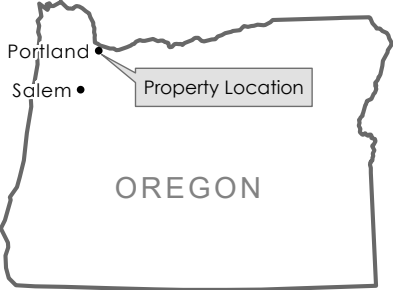
Legend

-  Vent Riser
-  Exposure Distance (Meters)
-  Property Boundary


Risk Designation

-  Residential
-  Worker

Key Map



0 2.5 5
Meters



Data Sources
Aerial photograph obtained from the City of Portland.



MAUL FOSTER ALONGI
p. 971 544 2139 | www.maulfooster.com

This product is for informational purposes and may not have been prepared for, or be suitable for legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information.

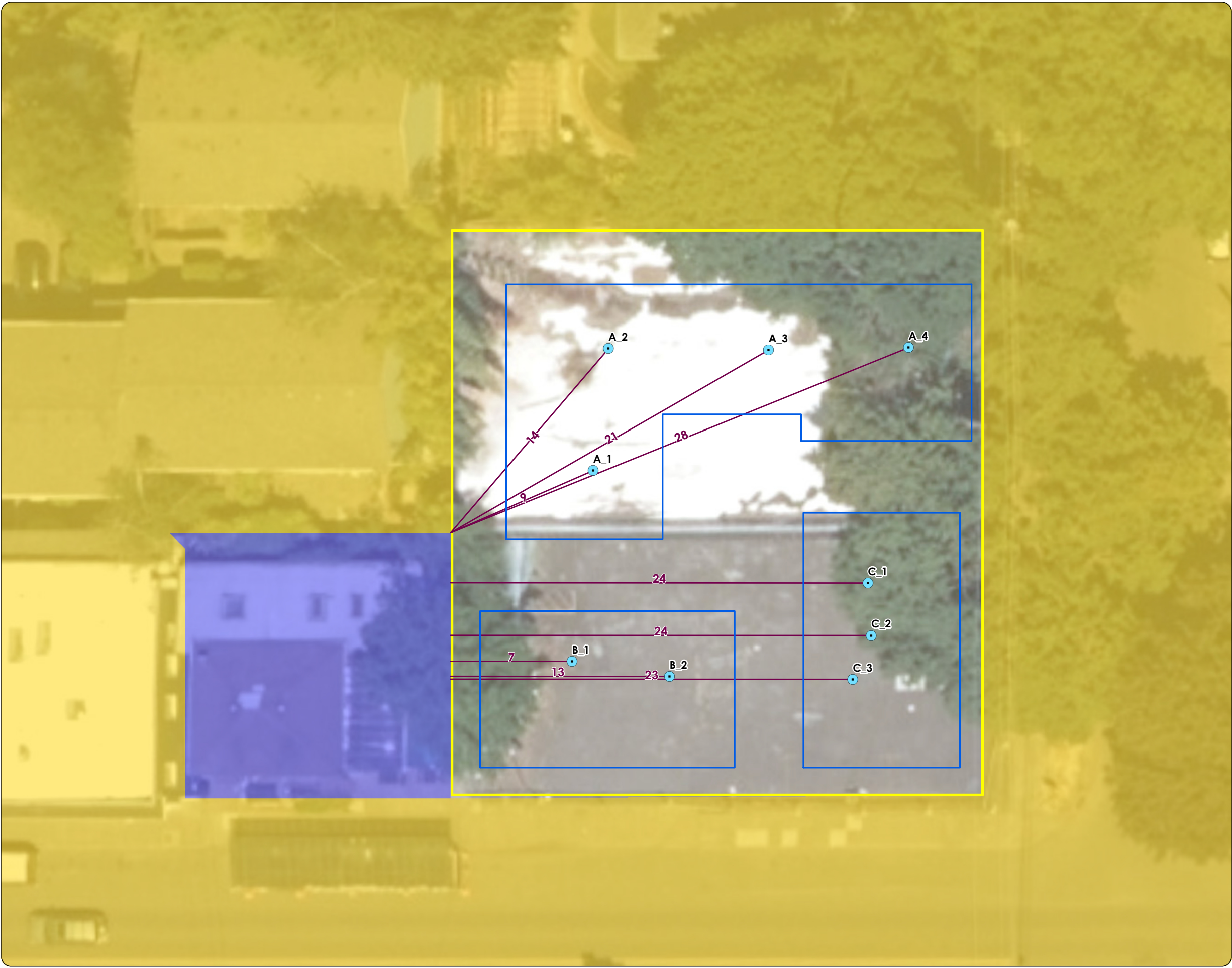


Figure 4-4
Nonresidential Worker
and Acute Exposure
Location Distances
Shortstack Belmont LLC
Portland, OR

Legend

- Vent Riser
- Exposure Distance (Meters)
- Property Boundary

Risk Designation

- Residential
- Worker



Data Sources
Aerial photograph obtained from the City of Portland.

MAUL FOSTER ALONGI
p. 971 544 2139 | www.maulfooster.com

This product is for informational purposes and may not have been prepared for, or be suitable for legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information.

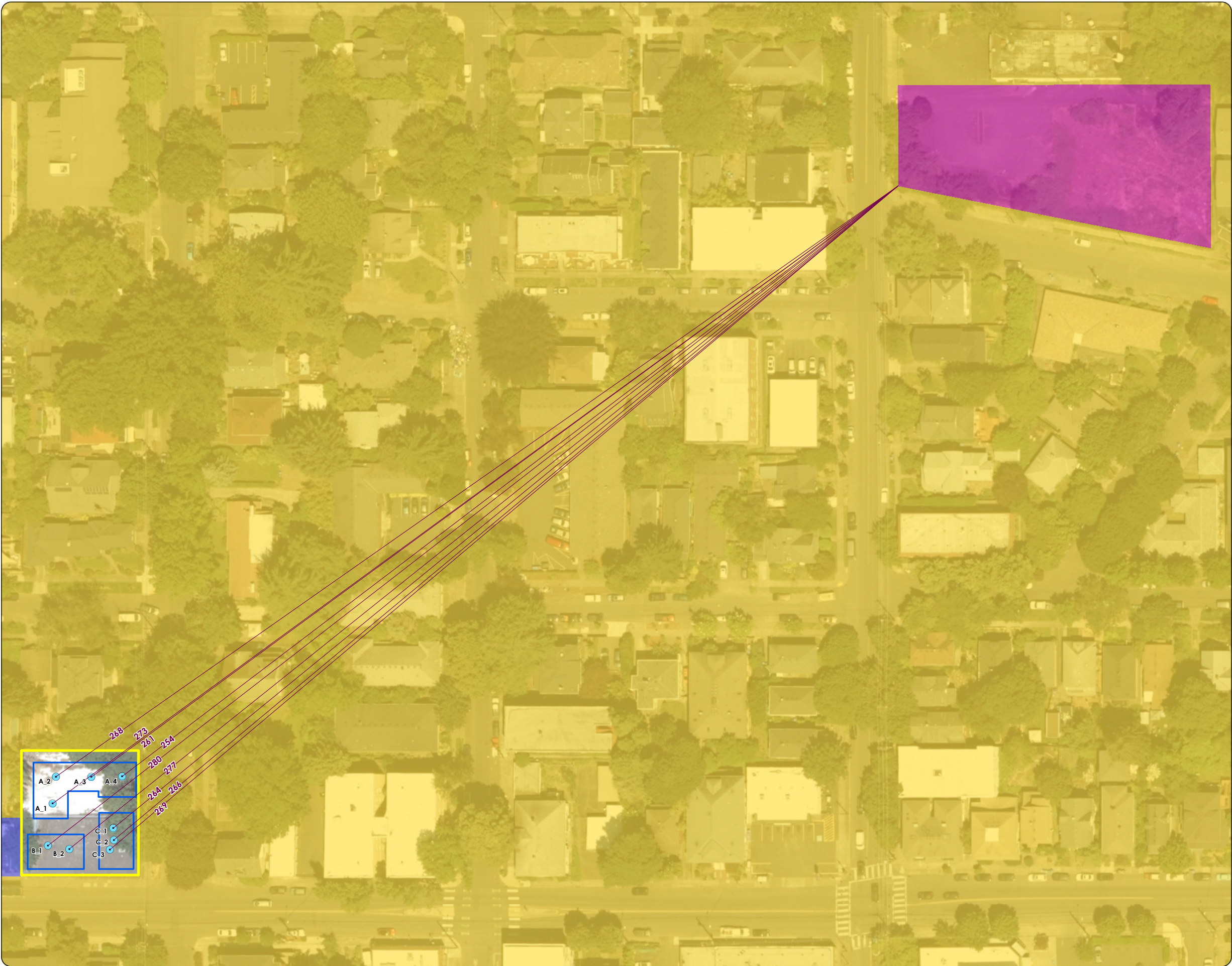


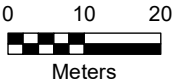
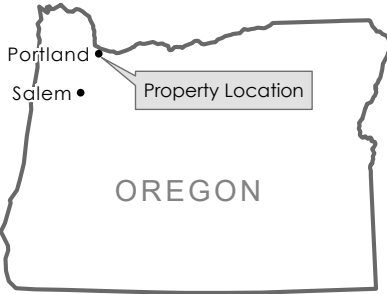
Figure 4-5
Nonresidential Child
Exposure Location
Distances

Shortstack Belmont LLC
Portland, OR

Legend

- Vent Riser
- Exposure Distance (Meters)
- Property Boundary
- Risk Designation**
- Residential
- Child
- Worker

Key Map



Data Sources
Aerial photograph obtained from the City of Portland.

 **MAUL FOSTER ALONGI**
p. 971 544 2139 | www.maulfooster.com

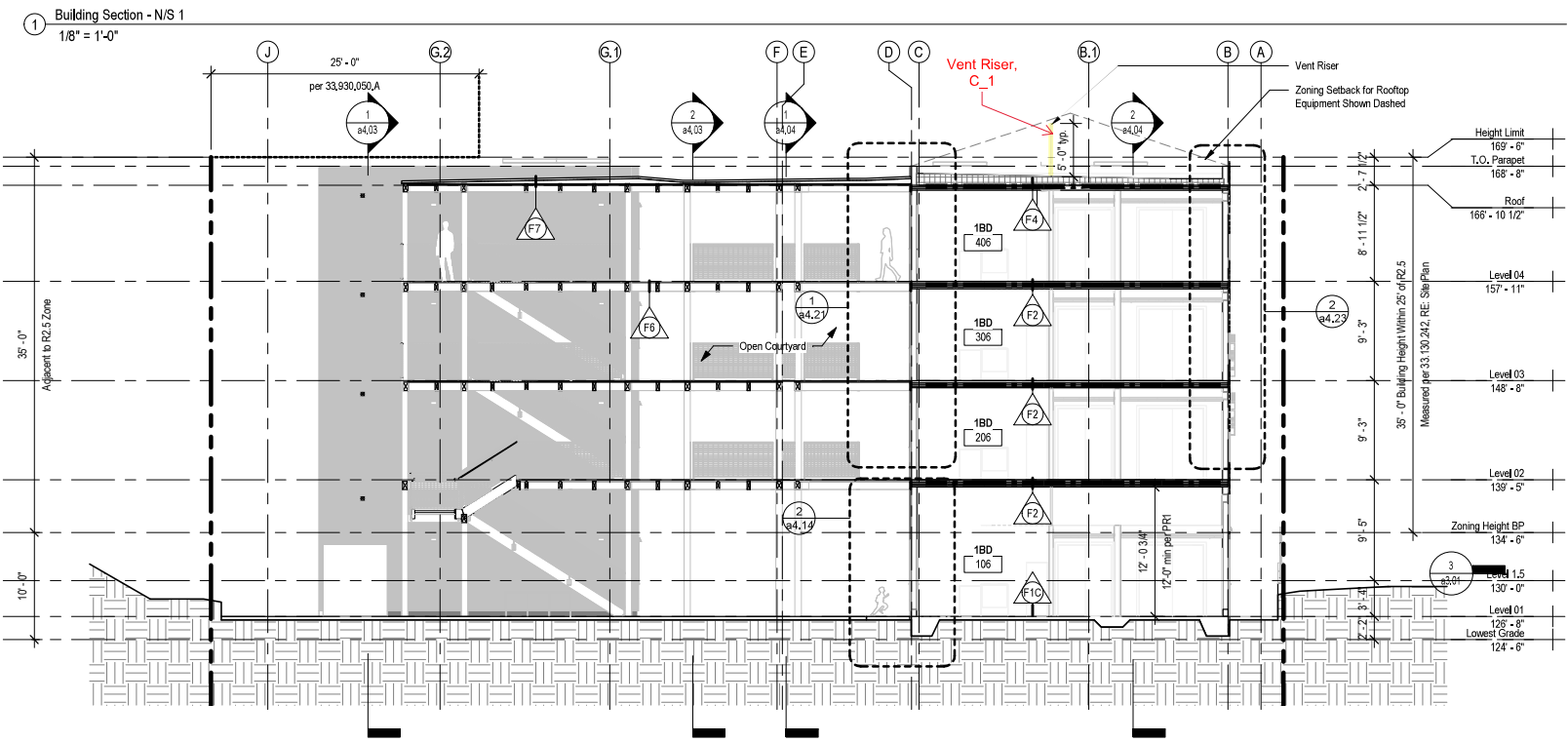
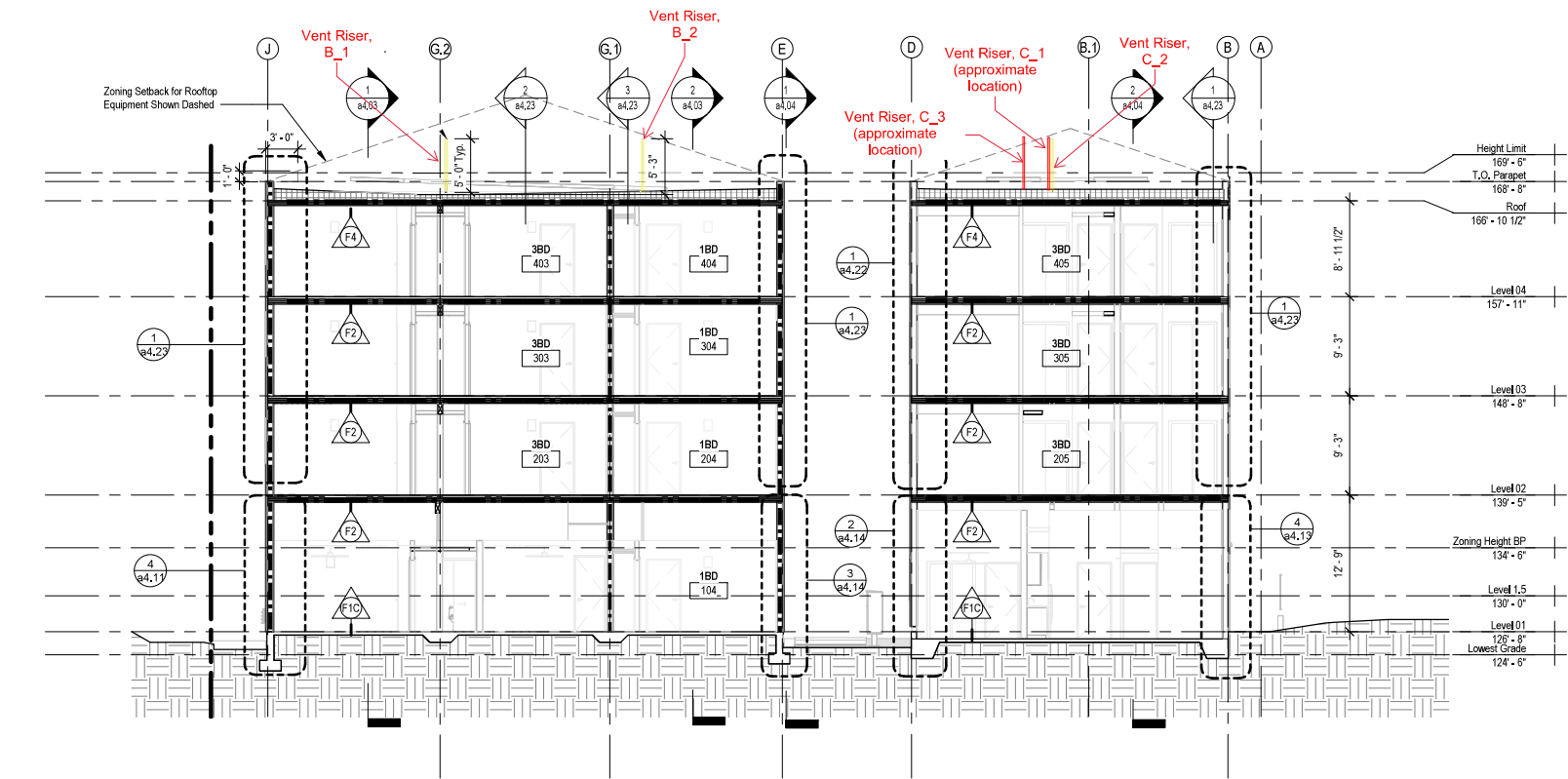
This product is for informational purposes and may not have been prepared for, or be suitable for legal, engineering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information.

ATTACHMENT

WPA BUILDING PROFILES



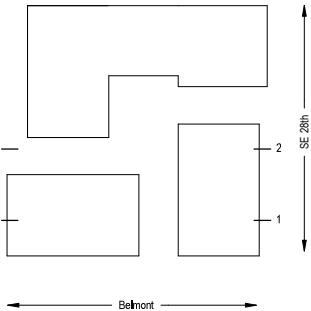
SOURCE: WPA
MODIFIED BY MFA TO HIGHLIGHT RISER PLACEMENT



2 Building Section - N/S 2
1/8" = 1'-0"

Legend

---	1/2 Hour Fire Partition
---	1 Hour Fire Partition
---	2 Hour Fire Barrier
---	3 Hour Fire Barrier



W.P.A
works progress architecture
811 SE Stark Street, Suite 210
Portland OR, 97214
(503) 234-2945
www.worksarchitecture.net

Shortstack
Belmont

2755 SE Belmont St.
Portland, OR 97214
W.P.A Job Number 1355.1

© 2023 Works Progress Architecture, LLP
ALL RIGHTS RESERVED

All drawings are the property of Works
Progress Architecture LLP and are not to be
used or reproduced in any manner without
prior written permission.



03/31/23

Permit Set

SET ISSUE

Overall Building
Sections

a4.01

Shortstack
Belmont

2755 SE Belmont St.
Portland, OR 97214
W.PA Job Number 1355.1

© 2023 Works Progress Architecture, LLP
ALL RIGHTS RESERVED

All drawings are the property of Works
Progress Architecture LLP and are not to be
used or reproduced in any manner without
prior written permission.



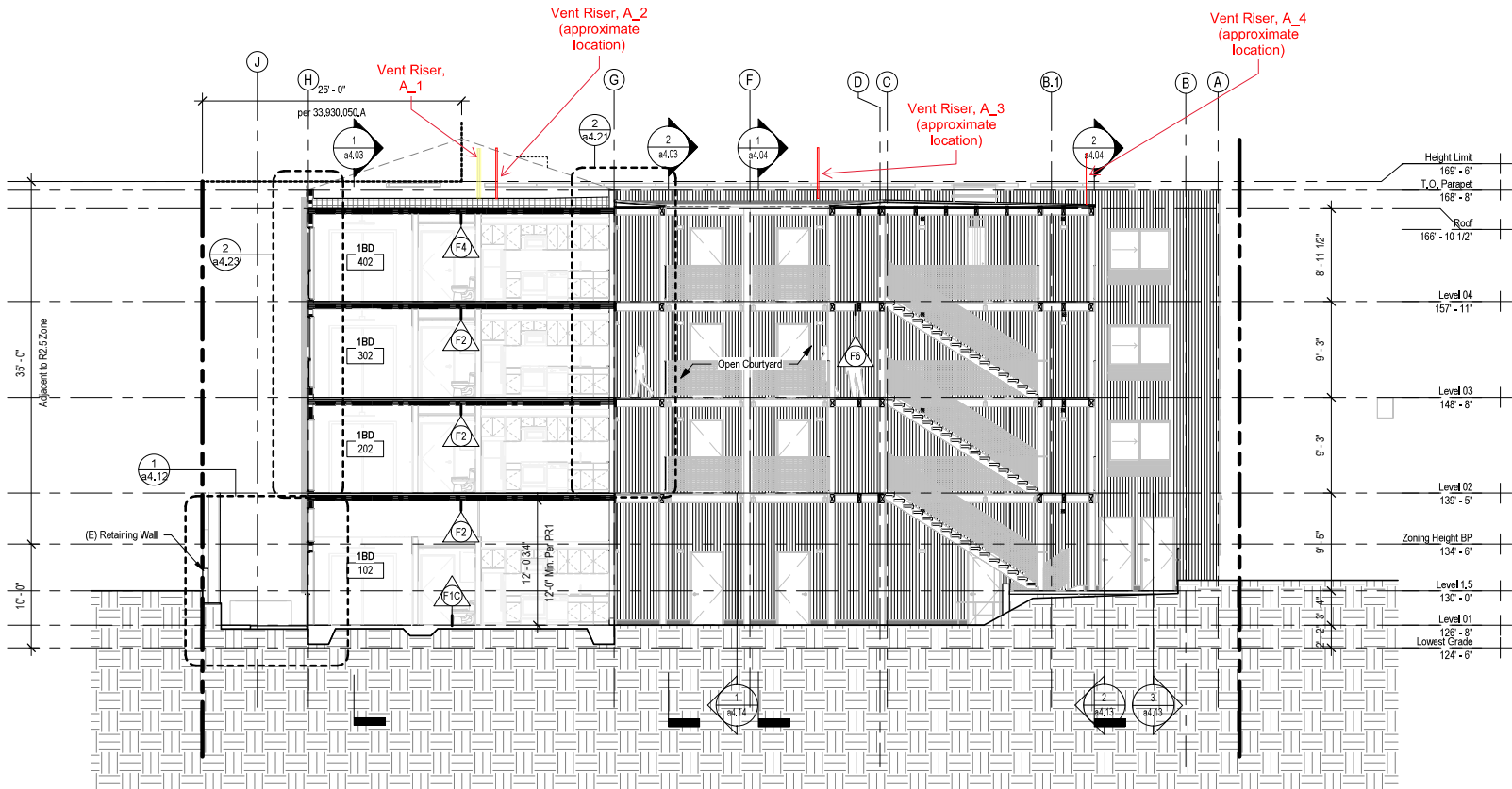
03/31/23

Permit Set

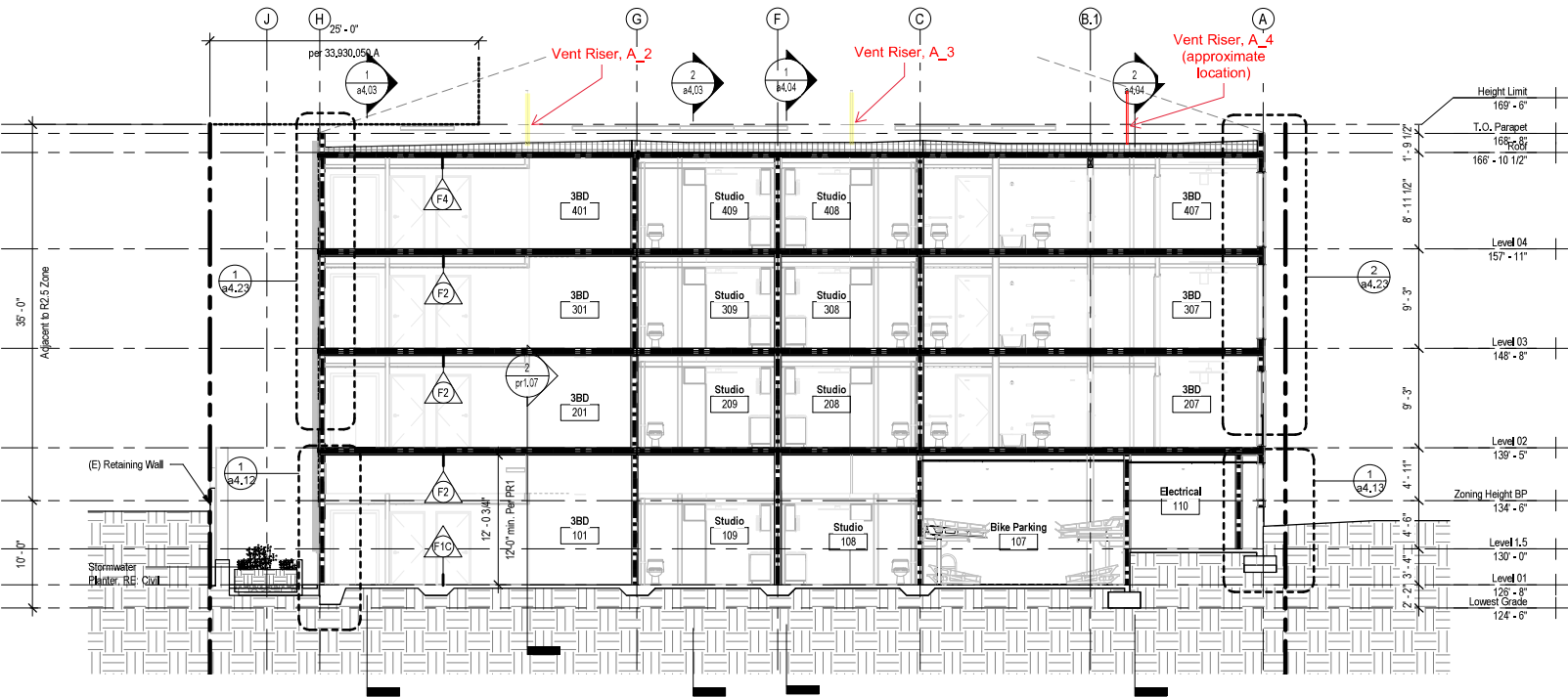
SET ISSUE

Overall Building
Sections

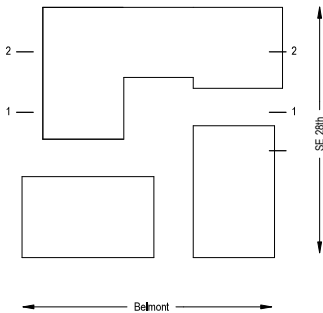
a4.02



① Building Section - N/S 3
1/8" = 1'-0"



② Building Section - N/S 4
1/8" = 1'-0"



Shortstack
Belmont

2755 SE Belmont St.
Portland, OR 97214
W.PA Job Number 1355.1

© 2023 Works Progress Architecture, LLP
ALL RIGHTS RESERVED

All drawings are the property of Works
Progress Architecture LLP and are not to be
used or reproduced in any manner without
prior written permission.



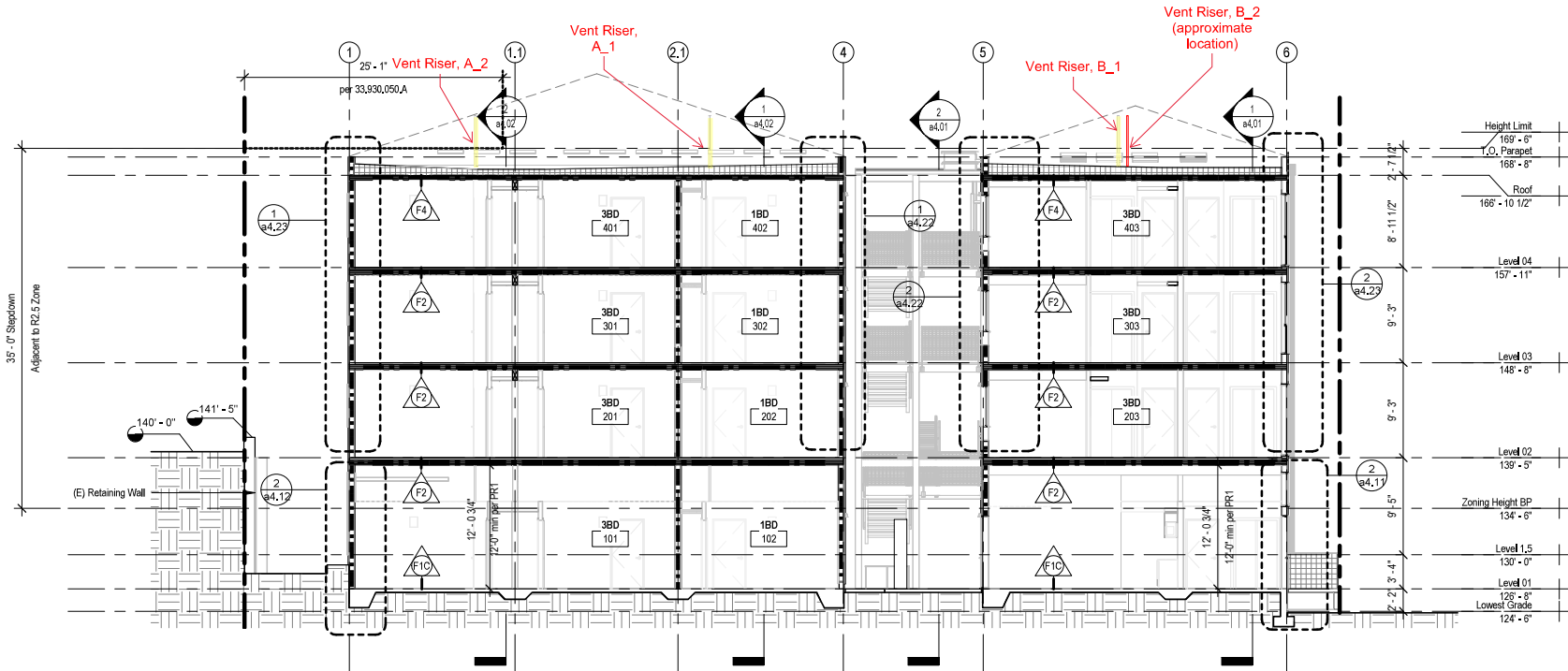
03/31/23

Permit Set

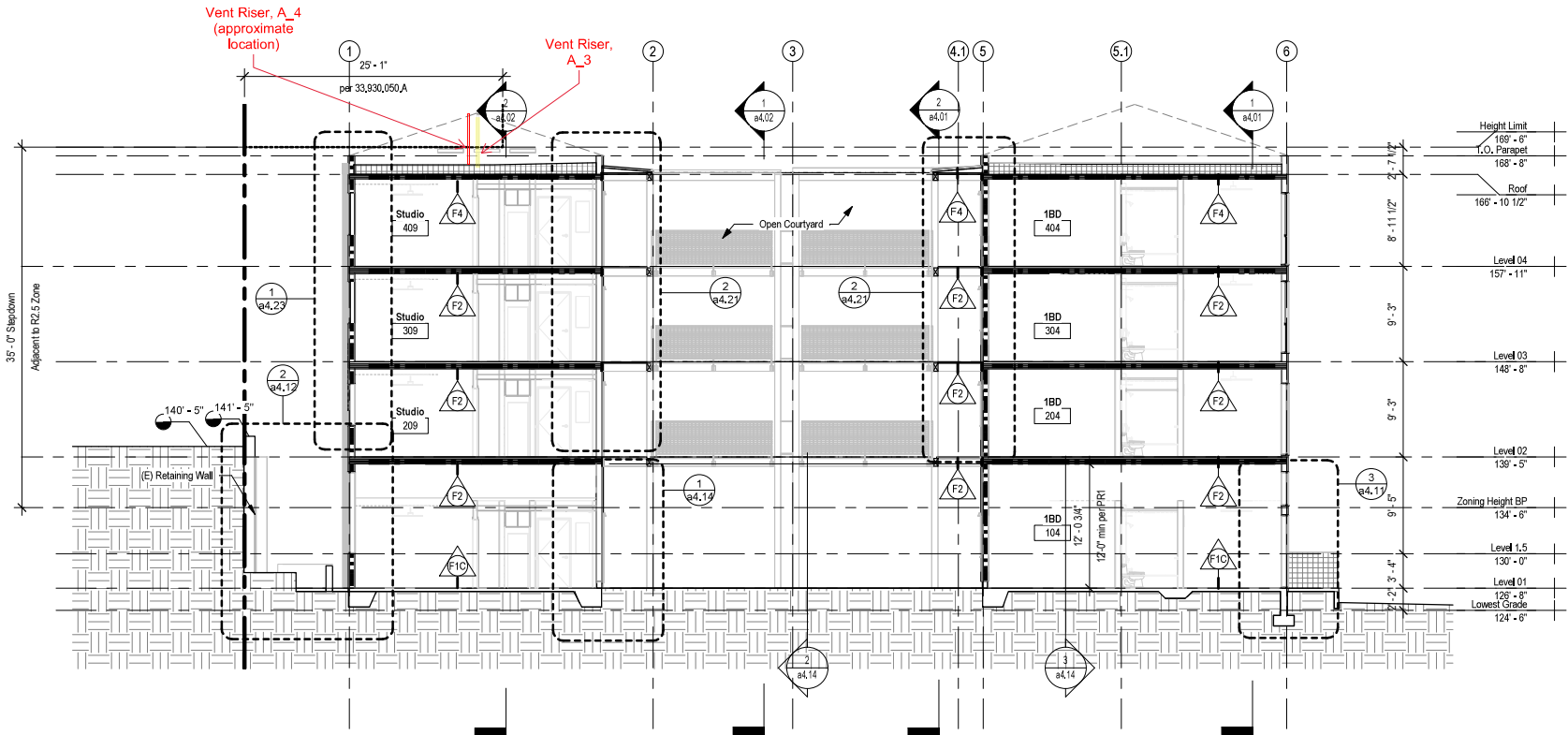
SET ISSUE

Overall Building
Sections

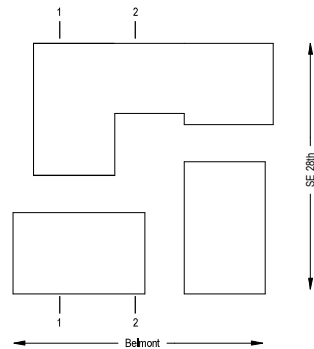
a4.03



1 Building Section - E/W 1
1/8" = 1'-0"



2 Building Section E/W 2
1/8" = 1'-0"



SOURCE: WPA
MODIFIED BY MFA TO HIGHLIGHT RISER PLACEMENT

W.P.A
works progress architecture

811 SE Stark Street, Suite 210
Portland OR, 97214
(503) 234-2945
www.worksarchitecture.net

Shortstack
Belmont

2755 SE Belmont St.
Portland, OR 97214
W.P.A Job Number 1355.1

© 2023 Works Progress Architecture, LLP
ALL RIGHTS RESERVED

All drawings are the property of Works
Progress Architecture LLP and are not to be
used or reproduced in any manner without
prior written permission.



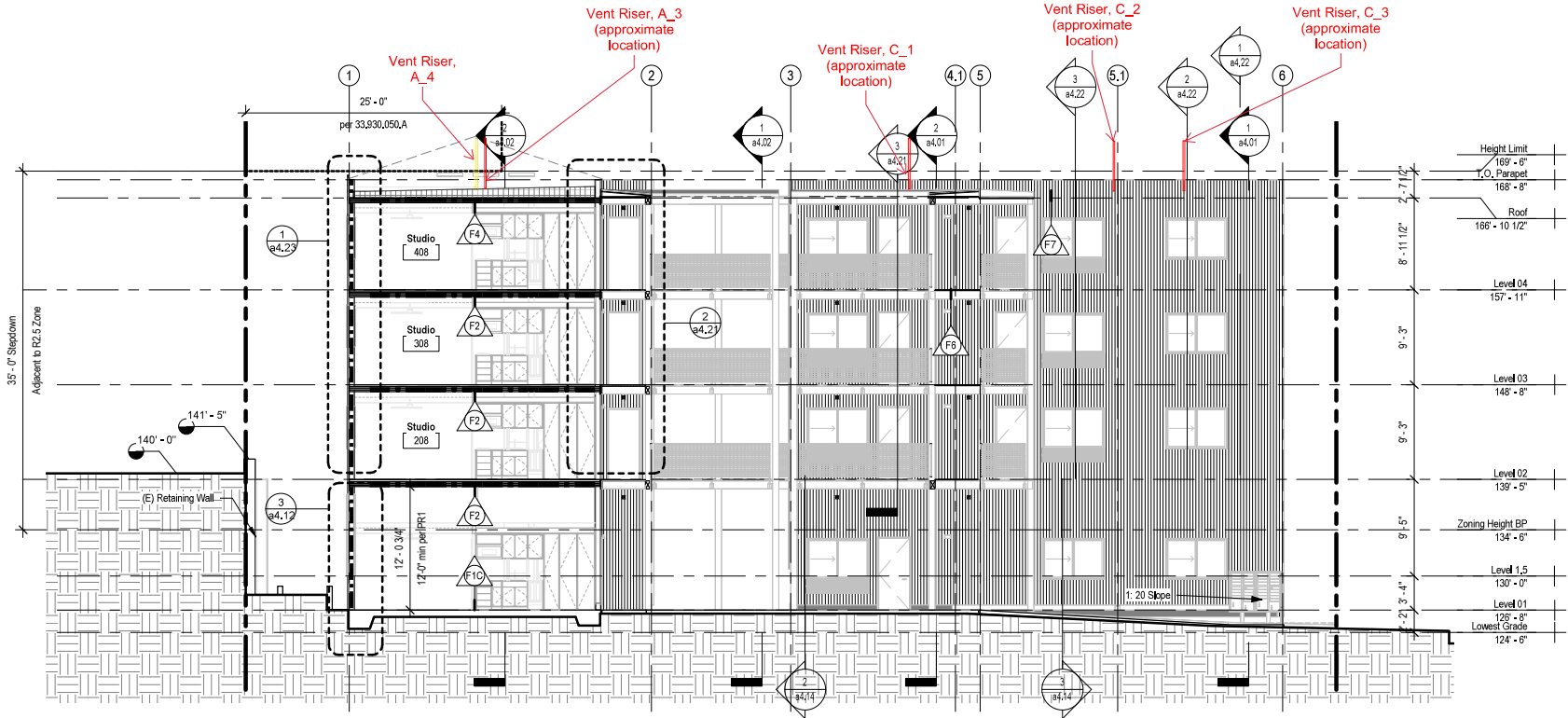
03/31/23

Permit Set

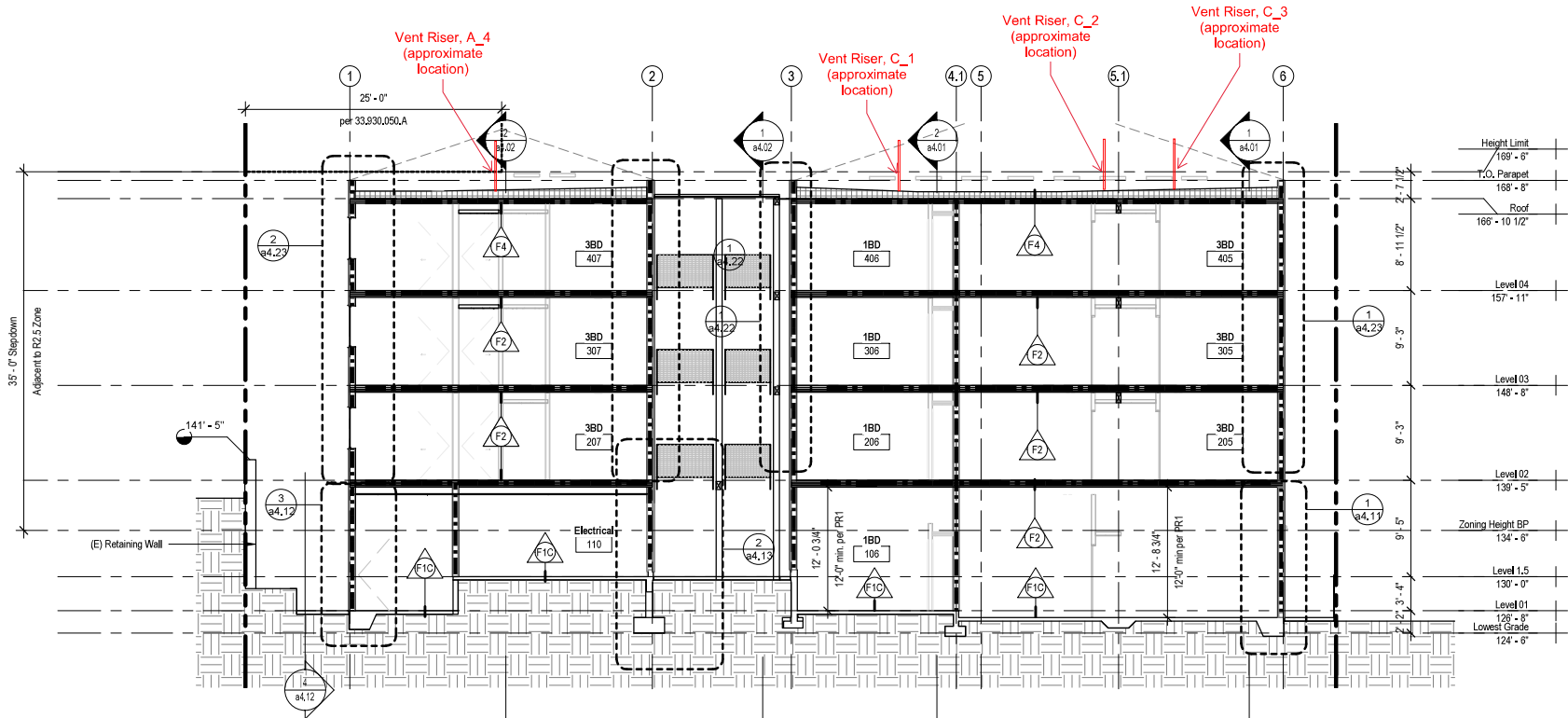
SET ISSUE

Overall Building
Sections

a4.04



1 Building Section E/W 3
1/8" = 1'-0"



2 Building Section E/W 4
1/8" = 1'-0"

