



A Subsidiary of SoundEarth Strategies

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June 15, 2020

Ms. Stacey Lange
Property Manager
American Life, Inc.
270 South Hanford Street
Seattle, Washington 98134

Re: Indoor Vapor Trend Evaluation
North Lot
201 and 255 South King Street
Seattle, Washington 98134
Ecology Site ID 5378137

Dear Ms. Lange:

EHSI-International, Inc. (EHSI), behalf of American Life, Inc., has prepared this indoor vapor evaluation report for the North Lot, located at 201 and 255 South King Street in Seattle, Washington (the site; Figure 1). The purpose of the indoor vapor evaluation is to respond to an e-mail request from the Washington State Department of Ecology (Ecology) for an evaluation of trends in indoor air quality and vapor mitigation measures. The Ecology e-mail was in response to the Annual Indoor Air and Groundwater Sampling Report prepared by EHSI in January 2020 in conformance with Ecology's *DRAFT Guidance for Evaluating Soil Vapor Intrusion in Washington State: Investigation and Remedial Action*, prepared by the Ecology and dated April 2018 (Ecology Guidance 2018).

BACKGROUND

The site, which is in the Pioneer Square neighborhood of Seattle, Washington, consists of two rectangular parcels (Parcels A and B) covering approximately 3.87 acres of land. A 2011 remedial investigation by Landau Associates (Landau) noted that the site was originally undeveloped tide flats of Elliott Bay (Landau 2011a). The site was filled and developed in the late 1890s and early 1900s with a rail yard that operated until the late 1960s. The site was initially developed with streets, buildings, and railroad tracks supported on wood pilings. The land was then filled between the pilings. The fill material consisted of remnants of the former rail yard operations and construction debris. Early site structures were engine maintenance buildings, sand houses, coal houses, oil houses, and material storage areas. Several sets of railroad tracks were also present on the site. King County purchased the site in the 1970s to facilitate construction of the former Kingdome stadium adjacent to the south. The Kingdome was later replaced by the existing Century Link Field. The site was used as a parking lot from the 1970s until redevelopment with the existing high-rise buildings in 2014. King Street LP purchased the site from North Lot Development in 2013 and built the existing high-rise hotel, residential, and commercial/retail buildings with below-grade parking.

REGULATORY STATUS OF THE SITE

The site was entered into a prospective purchaser consent decree in August 2011. The eastern parcel (Parcel B) was subsequently entered into a different consent decree in 2014 that superseded the earlier prospective purchaser. Detailed discussions of past investigations, regulatory actions, cleanup, and monitoring requirements

- Environmental Consulting
- Hazardous Materials Management
- Industrial Hygiene Services
- Construction Management
- Indoor Air Quality

are provided in the Remedial Investigation Report (Landau 2011a), Feasibility Study (Landau 2011b), Cleanup Action Plan (Ecology 2011), and the Cleanup Action Plan Addendum (Landau 2013).

On May 19, 2020, Ecology sent an email to the client regarding the January 2020 sampling event (Ecology 2020). The email noted that after reviewing the 2020 Annual Groundwater and Indoor Air Sampling report, it was likely that Ecology can further reduce monitoring frequency at the site. Furthermore, Ecology noted that there may not be a need to take air samples from the parking garage since the detected benzene concentrations were consistent with typical ranges for parking garages. The email requested that the client's consultant prepare a supporting document that would include an analysis of all the monitoring data that has been collected since long-term monitoring began in order to demonstrate that the site is not likely to pose a threat to human health and the environment. The email further requested a discussion of how the implementation of institutional controls, as required under the Consent Decree, as well as any other controls, could further reduce potential risks at the site. A copy of the May 19 e-mail is included in Appendix A.

SUBSURFACE INVESTIGATIONS

Various subsurface investigations were completed at the site between 2008 and 2014. The subsurface materials encountered consisted of heterogeneous fill material to depths up to 20 feet below ground surface. The environmental investigations documented the nature and extent and concentration of total petroleum hydrocarbons, benzene, arsenic, and carcinogenic polycyclic aromatic hydrocarbons in the media of concern and identified exposure pathways for human health and the environment.

REMEDIAL INVESTIGATION

Remedial excavation work was done in 2015 in conjunction with the redevelopment of the site and mass removal of the soil (Rothman 2019a). A total of 57,007 tons of contaminated soil and debris was excavated and disposed of at the Republic Service facility, AAA Monroe Rock, and Waste Management for permitted landfill disposal. Following excavation, a protective cap was constructed across the site to prevent contact with remaining contaminated soil (if any). To mitigate risks associated with vapor intrusion, the building water barrier was also designed as a vapor barrier and the foundation was constructed with an impermeable seal-slab floor system.

INDOOR AIR EVALUATIONS—Rothman & Associates LLC 2018 to 2019

Rothman & Associates LLC (Rothman) conducted air sampling at the site from 2018 to 2019 (Rothman 2018a). The initial event in May 2018 took place during the day, and the two samples were collected from the occupied manager's office near the southeast corner of the parking garage and near the northeast corner of the parking garage. Both samples exceeded the Washington State Model Toxics Control Act (MTCA) Method B indoor air cleanup level for benzene.

In September 2018, Rothman collected three samples during the day from locations at the manager's office in the parking garage, the northeast corner of the parking garage, and the rooftop near the intake vent (Rothman 2018b). All three samples exceeded the MTCA Method B indoor air cleanup level for benzene.

In December 2018, Rothman collected three samples from locations at the manager's office in the parking garage, the northeast corner of the parking garage, and the rooftop near the intake vent (Rothman 2018b). The samples were collected overnight to reduce inputs from daytime activities. All three samples exceeded the MTCA Method B indoor air cleanup level for benzene.

In March 2019 during the nighttime, Rothman again collected three samples from the manager's office, parking garage, and rooftop (Rothman 2019c). All three samples exceeded the MTCA Method B indoor air cleanup level for benzene.

INDOOR AIR SAMPLING AND GROUNDWATER SAMPLING—EHSI 2020

In January 2020, EHSI completed annual groundwater and indoor air monitoring (EHSI 2020). The groundwater sampling demonstrated compliance with site-specific cleanup levels. The indoor air sampling indicated compliance with MTCA cleanup levels for the basement hotel office sample after adjusting for ambient air concentration for benzene. EHSI collected ambient air samples from the rooftop and parking garage, and both contained concentrations of benzene that exceeded the MTCA Method B cleanup level.

BENZENE INDOOR AIR CONCENTRATION TRENDS 2018 to 2020

Indoor air has been sampled at the site since March 2018, and both indoor and ambient air have been sampled since September 2018. The ambient air concentrations of benzene were subtracted from the indoor air concentrations in accordance with Ecology's 2018 guidance document.

Beginning in December 2018, samples were collected overnight to minimize the potential impact of daytime traffic emissions on benzene concentrations for both indoor and ambient air sampling.

The indoor benzene concentrations in the garage space have shown a decreasing trend since sampling began in March 2018. It appears that conducting the sampling overnight for the December 2018 through January 2020 period generally resulted in lower concentrations of benzene, likely due to less traffic in the garage. For the monitoring period, the concentrations of benzene in the garage have exceeded the MTCA Method B cleanup level of 0.32 milligrams per cubic meter. However, the detected concentrations are consistent with typical parking garage use.

The indoor benzene concentrations in the basement office spaces (garage manager's office and hotel office) have shown a decreasing trend since March 2018. The adjusted testing results have been compliant with the MTCA Method B cleanup level since overnight sampling began in December 2018.

The attached Chart 1 shows the benzene concentrations from March 2018 through January 2020.

INDOOR AND AMBIENT AIR DISCUSSION

Landau prepared an Engineering Design Report Addendum for the site on February 28, 2014 (Landau 2014). The report notes that the water barrier included in the building's design would also serve as a barrier to mitigate the potential for vapor intrusion. The construction plans detailed an integrated, contained, and welded sheet pile wall extending to 40 feet below ground surface and a minimum 26-inch-thick, watertight seal-slab concrete flooring system. The concrete flooring system consisted of an upper 12-inch-thick, impermeable Hydarcrete slab that connects to the perimeter sheetpile walls using bentonite plugs and bands. The report also notes that the ventilation system for the sub-grade parking garage would be designed to operate under positive pressure to allow for proper ventilation.

The concentrations of benzene detected in the rooftop ambient air samples have exceeded the MTCA Method B indoor air cleanup level since sampling began there in September 2018. This information suggests that the urban setting of the site results in elevated benzene concentrations from surrounding vehicle emissions.

As noted earlier, the benzene concentrations from the samples collected in the parking garage are generally consistent with typical garage conditions due to the presence of stored and driving vehicles.

The office sampling location was changed from the basement manager's office to the hotel office for the January 2020 event because the manager's office was no longer occupied. Once the benzene concentrations found in ambient air at the rooftop were deducted from the basement office results, the indoor air was found to be in compliance with MTCA cleanup levels and appears to be safe for human health.

CONCLUSION

The sampling conducted to date has shown compliance with MTCA Method B cleanup levels in the occupied basement office spaces for the overnight sampling events. This information indicates that the built-in vapor mitigation measures are effectively isolating residual benzene in the soil from the interior of the occupied basement portions of the building. Given the methane mitigation measures built into the building and the sampling data indicating compliance with MTCA Method B cleanup levels, it appears that conditions at the site do not appear to present a risk to human health and the environment at this time and the sampling frequency may be reduced.

It is our opinion that continued sampling of the garage parking space will not demonstrate compliance with cleanup levels due to its use of vehicle storage and is therefore not warranted.

CLOSING

Thank you for the opportunity to assist you in this matter. If you have any questions regarding the project, please do not hesitate to contact us.

Respectfully submitted,



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Appendix A – Ecology E-mail

Attachments: Figure 1, Site Location Map
Chart 1, Benzene Concentrations Over Time

JSC/TJC:dnm

REFERENCES

- EHSI. 2020. *Annual Groundwater and Indoor Vapor Monitoring – 2020, North Lot, 205 and 255 South King Street, Seattle, Washington*. March 27.
- Landau Associates. 2011a. *Remedial Investigation Report, North Lot Development, Seattle, Washington*. May 23.
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- Rothman & Associates LLC (Rothman). 2018a. *Indoor Air Assessment Report, First Quarter 2018, North Lot Development, 225 South King Street, Seattle, Washington*. June 2.
- _____. 2018b. *Indoor Air Assessment Report, Third Quarter 2018, North Lot Development, 225 South King Street, Seattle, Washington*. October 28.
- _____. 2019a. *Cleanup Action Report, North Lot Development, 225 South King Street, Seattle, Washington*. January 10.
- _____. 2019b. *Indoor Air Assessment Report, Fourth Quarter 2018, North Lot Development, 225 South King Street, Seattle, Washington*. January 14.
- _____. 2019c. *Indoor Air Assessment Report, First Quarter 2019, North Lot Development, 225 South King Street, Seattle, Washington*. April 28.
- Washington State Department of Ecology (Ecology). 2011. *Cleanup Action Plan, North Lot Redevelopment Property, Seattle, Washington*. July.
- _____. 2018. *DRAFT Guidance for Evaluating Soil Vapor Intrusion in Washington State: Investigation and Remedial Action*. Publication No. 09-09-047. April.
- _____. 2020. Email Communication Regarding the January 2020 Annual Groundwater and Indoor Air Sampling Report. From Jing Liu of Washington State Department of Ecology. To Stacey Lange of American Life, Inc.

Hi Stacey and Alan,

I reviewed the 2020 Annual Groundwater and Indoor Air Sampling report. I'm glad to know that the results from the groundwater monitoring wells at both West Parcel and East Parcel all show compliance with cleanup levels. Also results from indoor air sampling at East Parcel show the air in the office hasn't exceeded the benzene cleanup level. Though the concentration at the parking space still exceeds the cleanup level, but that concentration is within the typical range of benzene in a parking garage.

With all the data that have been collected so far, it's very likely that Ecology can further reduce the monitoring frequency at the Site. Also I don't feel there is a need to further take air samples from the parking space within the garage since the benzene data collected are within the typical range of a parking garage. I'm thinking to only require air sampling in the office since that's where the highest exposures are likely to occur, as well as ambient air.

I will need a letter of request and a supporting document from you to justify the decision. I would suggest you talk to your consultant and ask them to prepare a supporting document, which should include an analysis of all the monitoring data that have been collected since the long term monitoring started to demonstrate that the Site is not likely to pose a threat to the environment and human health. Also the document should discuss how the implementation of institutional controls as required in the Consent Decree as well as any other mechanisms that could further reduce any potential risks posed at the Site.

Hope this makes sense. Please let me know if you have any questions. Thanks!

Jing Liu

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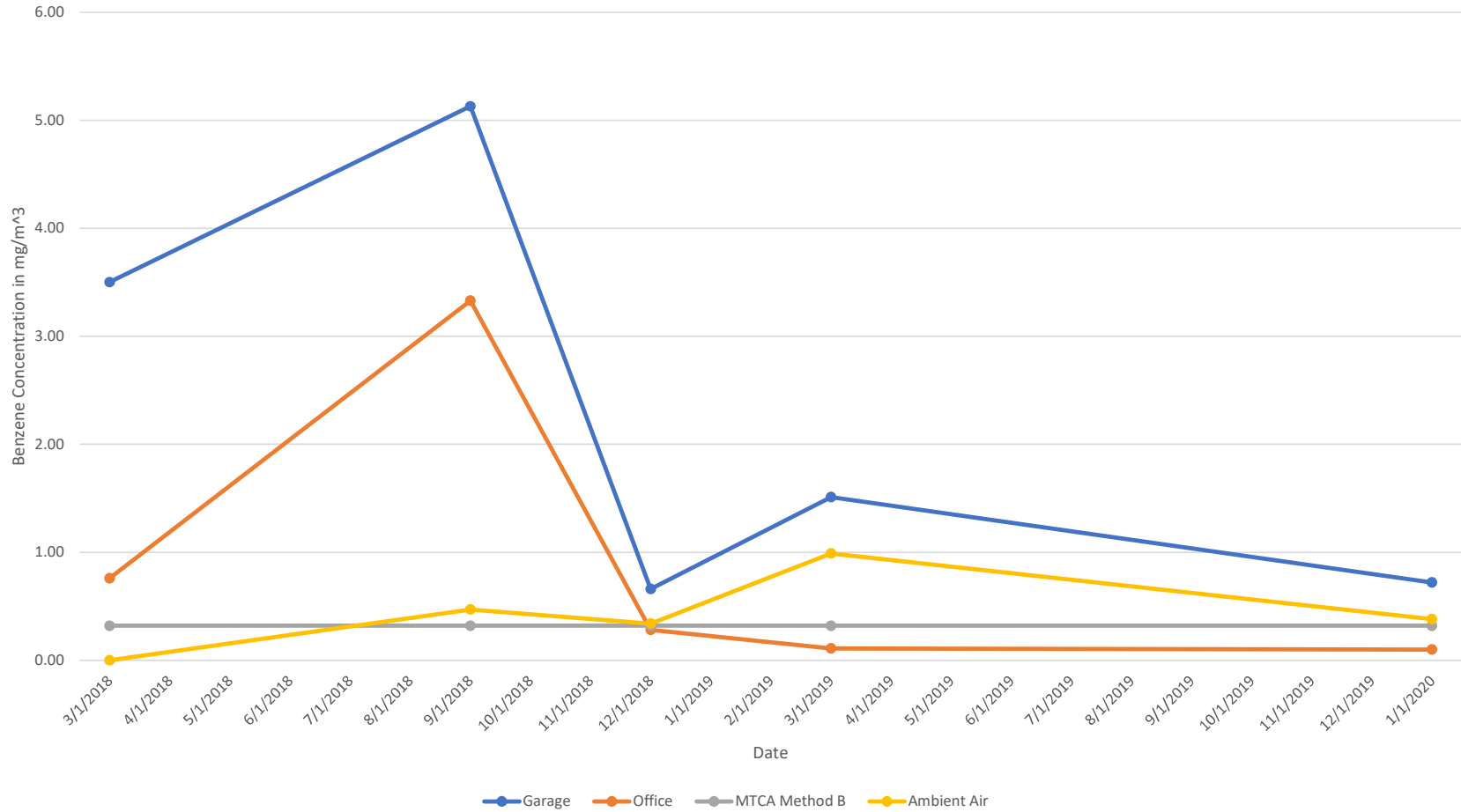
<p>SHEET/FIGURE</p> <p>1</p>	PROJECT MANAGER: J CASS	<p>NORTH LOT</p> <p>201 AND 255 SOUTH KING STREET</p> <p>SEATTLE, WASHINGTON</p> <p>SITE LOCATION MAP</p>	 <p>A Subsidiary of Summit Earth Strategies 1011 SW Kickitat Way, Suite 104 Seattle, Washington 98134 Ph: 206.381.1128 Fax: 206.254.4279</p>
	EHSI PROJECT #: 11404-01		
	PREPARED BY: F DIMALANTA		
	ISSUE DATE: 06/10/20		
	SCALE: SHOWN		

Chart 1
Benzene Concentrations Over Time
North Lot
201 and 255 South King Street
Seattle, Washington



Note: Concentrations shown are adjusted for subtracting the ambient air concentrations.