REPUBLIC SERVICES

Sustainability in Action

Valley Landfills Inc. d/b/a Coffin Butte Landfill CUP

Appeal of Planning Commission Decision: Responses and Additional Evidence

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In support of the Applicant's appeal of the Benton County Board of Commissioners' findings regarding the proposed Coffin Butte Landfill Expansion, the following responses are provided to address and refute the assertions and claims raised by the Planning Commissioners during the hearing and in the Board's written findings. For clarity, these claims have been organized into categories: groundwater, fire, odor, traffic, sound, and conjecture. Each claim is presented in blue text, followed by Valley Landfills, Inc.'s corresponding response.

Groundwater Impacts – Response to Commissioner Lee

> ***"If the applicant's assumptions about the nature of the fractured bedrock are incorrect, dewatering will have taken place by the time they [begin] monitoring... This is permanent and irreversible." – Commissioner Lee Opening Statement***

Commissioner Lee's assertion ignores the expert opinions of Valley Landfills Inc.'s (the Applicant) expert and the County's own independent expert. In fact, the Applicant testimony regarding fractures being discontinuous is based on mapped observations during excavation of past cells and observations of geologic conditions in boreholes drilled at the site and was used to form the basis for some of the Applicant's testimony. However, the Applicant's used a porous media equivalent assumption in its groundwater model. This is intentionally even more conservative than modeling the subsurface in order to model a worst-case scenario for potential groundwater drawdown. Even under that assumption, predicted impacts to public water supply wells are minimal. Nevertheless, Condition OP-13 mandates installation of sentinel wells to detect and allow mitigation before any off-site effect could occur, satisfying both legal and technical requirements for prevention of harm.

> ***"The applicant states an assumption that the fractures in the basalt that hold and transport groundwater are uniform and equally interconnected, such as a glass of sand that you fill with water and then drain out the bottom. Their modelling is based on that assumption..." – Commissioner Lee Opening Statement***

Contrary to Commissioner Lee's claim, the model was developed using hydrogeologic data from 15 wells and boreholes located within or near the expansion footprint. It is standard practice to extrapolate such data across short distances during preliminary design, particularly where the geology is continuous, as is the case with the Siletz River Volcanics underlying both the existing landfill and the expansion area. This approach is consistent with accepted professional standards and meets the evidentiary threshold for reliable modeling assumptions.

> ***"Evidence of toxic impacts to groundwater associated with CBL and landfills in general is already clear from testimony… Leachate Leaks from torn liners or stormwater pose serious, long-term impacts on adjacent property and the character of the area… The burden of proof is not met." – Commissioner Lee Opening Statement***

As stated in previous the Applicant testimony, historical and current groundwater chemistry

data further support the argument that the elevated concentrations in arsenic in groundwater at the site are not the result of a leachate release (See Appendix A for background arsenic concentrations). Project opponents cite the elevated arsenic concentrations in samples from wells M-9S, M-26, and M-27, but ignore the vast majority of groundwater chemistry data collected from these wells. This selective approach to the data conflicts with the Planning Commission's obligation to weigh conflicting evidence and explain why it finds certain evidence more probative. It is important to note that groundwater and leachate samples are tested for more than 90 analytes during each monitoring period (see Appendix B for complete list of monitoring parameters).

Historical data collected from wells M-9S, M-26 and M-27 show no increasing trends of inorganic constituent concentrations that are common leachate indicators (chloride, sodium, total dissolved solids) and few or no detections of volatile organic compounds. These historical data are not refutable: the data are measured and certified by an independent, nationally-accredited laboratory, and supported by rigorous quality assurance analyses that validate the measurements.

If a leachate release were to occur, it would be apparent by increasing concentrations of several monitoring parameters. In fact, because arsenic is a heavy metal it tends to move more slowly in groundwater than other indicator parameters like chloride, dissolved solids, sodium, and volatile organic compounds, which makes these analytes better indicators of a release than arsenic. There is simply no evidence of leachate leaks.

> ***"Nor have they made any effort to gather baseline data to use for comparison after the construction even though they have had the time, the adjacent land, and the resources to take baseline groundwater" – Commissioner Lee Opening Statement***

Baseline groundwater data are provided in Appendix C.

the Applicant has been monitoring groundwater conditions at the Coffin Butte Landfill for more than 30 years. Contrary to Commissioner Lee's allegations, the Applicant has ample background information pertaining to groundwater elevations and groundwater chemistry for monitoring wells, piezometers, and groundwater production wells, including wells that are located within and adjacent to the proposed expansion area. Groundwater elevation and groundwater chemistry data have been provided to DWR on an annual basis in the Environmental Monitoring Reports required by the operating permit. In addition to historical groundwater elevation data, the Applicant has been sampling and testing groundwater in the vicinity of the expansion area for decades. These data, collected and reported annually to Oregon DEQ in Environmental Monitoring Reports, satisfy the evidentiary requirement for establishing baseline conditions. They have been part of the public record for decades. Commissioner Lee's statement is inconsistent with the substantial evidence requirement and disregards the obligation to consider all relevant information in the record.

> ***"The water would be draining into the constructed open pit, as deep as 155 ft below the natural land surface on the north end of Tampico Ridge. Water from the pond on Tampico Ridge could drain into this pit. Any water-bearing features (such as fractured zones of the basalt) that are intersected by this excavation will drain into the resulting pit." – Commissioner Lee Opening Statement***

Commissioner Lee ignores all of the experts who have reviewed the application. Commissioner Lee's analogy misrepresents aquifer behavior. The drawdown caused by excavation will stabilize at a steady-state condition when groundwater recharge equals discharge. The cone of depression will be shaped and limited by fracture conductivity and recharge rates - parameters which are incorporated into the Applicant's modeling. Condition OP-13 ensures early detection and corrective measures if drawdown deviates from predicted conditions, preventing off-site impacts. The Applicant is committed to ensuring that the proposed expansion area will not negatively affect public
well water supply.

Fire Impacts – Response to Commissioner Biscoe

> ***"5 fires were reported during Republic Services testimony while nearby Adair Rural Fire & Rescue documented response to 111 calls to fires near or on the landfill site" -- Commissioner Biscoe Opening Statement***

This is inaccurate. Data provided by Adair Rural Fire & Rescue data from 2013 through July 2025 confirm that, in more than twelve years, there were eight fires requiring suppression and eleven additional calls that were investigated but determined not to involve active fires - typically false alarms caused by visible steam or methane flare activity. See Appendix D. This equates to fewer than one suppression-required fire per year, all of which were promptly addressed without injury to personnel or damage to adjacent properties. It is important to note that fires at landfills do occur on occasion. They are typically small, manageable, and not caused by the landfill operator or are a reflection on the landfill itself. There is no evidence in the record to suggest the landfill is a significant fire risk.

Odor Impacts – Response to Planning Commission Findings

> ***"Odor from current landfill operations limits [adjacent property owners] from opening their windows and going outside… The applicant's consultants' odor studies and the third party reviewers' evidence [are] less credible… potential impact on these adjacent uses was not specifically evaluated." – Planning Commission Findings***

The Commission's conclusion overlooks significant, tangible, measures already implemented in 2025 to actively reduce odor emissions. Coffin Bute Landfill acknowledges sporadic odor events in the past. The Applicant is aggressively addressing these issues. In the last 12 months,

Valley Landfills has constructed 21 new vertical gas collection wells and made improvements to 18 existing horizontal wells, supported by the installation of 16,835 feet of new gas piping to improve gas capture efficiency across the site and installed an enclosed flare to combust 99% more efficiently. These upgrades increase landfill gas collection rates, reducing the potential for fugitive emissions that could cause offsite odors.

To directly address concerns about ongoing and future odor impacts, Valley Landfills will commit to a phased closure plan of approximately five separate closure events with the last event occurring once final elevations have been reached. The first closure event will begin within the range of calendar year 2027 to 2029, dependent on landfill tonnage volumes. The last event will occur once all operations are moved to the expansion area. In addition, we will continue to enhance the existing gas collection system by installing new gas wells in areas with elevated emissions Finally, we are prepared to adopt objective, enforceable mitigation triggers. For example, immediate operational adjustments will be made if nuisance-level offsite odors are verified through monitoring, thereby demonstrating our commitment to protecting neighboring properties.

Traffic Impacts – Response to Planning Commissioner Biscoe

> ***"Traffic Impact Analysis submitted by applicant does not include 3-4 years of construction traffic, increase of traffic from nearby housing developments traffic– witness accounts used in part to determine traffic impacts…leaving questions regarding modeling used and validity of report."*** ***--Commissioner Biscoe Opening Statement***

This comment is inaccurate. The transportation impact analysis for Coffin Butte was finalized in February 2024 and supplemental information responsive to this comment was provided on May 23, 2025 within the public open record period. As summarized in Appendix F, trip rates for landfills are somewhat variable depending on the amount of public versus commercial access, as well as the landfill tonnage and area supported. To capture the specific characteristics of Coffin Butte Landfill, traffic counts were collected at the site entrance and surrounding roads in January 2021, March 2021, January 2022, September 2023, and April 2025. The actual volume of entering cars and trucks was used to identify current operations.

The activity captured at Coffin Butte Landfill not only captured trips associated with the landfill, but also with the adjacent construction of the former Knife River quarry site, which was being excavated to serve as the future landfill site. Accordingly, the traffic counts include quarry trips (construction trips) plus landfill trips. In fact, the April 2025 traffic counts also included the accelerated construction of the landfill expansion area to the west to enable near-term use of this airspace.

As noted, the traffic study does not directly account for any nearby housing development traffic using what is commonly referred to as "in-process trips" as there were no nearby housing developments identified by staff within the scoping process that contribute trips onto Coffin Butte Road or impact the study intersections. The study does, however, broadly account for traffic growth as part of regional housing changes using growth rates identified in the Linn-Benton Transportation System Plans.

The traffic study was reviewed by County staff, ODOT staff, and the County's consultant reviewer. Each reviewer found that the traffic study reasonably assesses the system impacts and agreed with the reports' findings and conclusions. See Appendix F for Construction Traffic Assessment Memo.

> ***"Traffic impact analysis that does not address remaining 35% increase of waste intake at current site, simultaneously as the blasting and development of proposed site, the filling of Cell 6 simultaneously or any impact from removal of tonnage cap – based on assumption traffic volumes will not change" --Commissioner Biscoe Opening Statement***

The Transportation Impact Analysis had been prepared assuming that the current level of traffic and nearby quarry (landfill construction) operations could increase by 50% within the future analysis scenario. This analysis found that the study findings do not change, and all of the study intersections continue to operate acceptably and well within their carrying capacity.

As previously noted, tonnage and trips are not directly correlated; the presence of transfer stations that "intercept" landfill trips results in fewer trips with larger trucks (heavier loads and higher per-vehicle tonnage) from longer distances. Some transfer stations also include solid waste compactors, which can increase tonnage within an equivalent volume. Accordingly, as the site is already a regional landfill that provides trash services for adjacent counties, any increase in tonnage would necessarily occur from longer-distance transport. A 35 (or 50) percent increase in site trips (which would predominantly consist of larger transfer trucks rather than personal vehicles, dump trailers, or even garbage trucks) equates to more than double the current tonnage and would still provide a very conservative analysis.

Finally, as part of its July 16, 2025, submittal, Valley Landfills, Inc. proposed amending the Conditions of Approval to include a tonnage cap that would take effect upon expiration of the tonnage cap in the Franchise Agreement. Commissioner Biscoe's assertion failed to take this proposal into account.

Sound Impacts – Response to Planning Commission Statements

> ***"I am particularly moved by adjacent neighbor testimony indicating blasting is causing stress on livestock, impacting their livelihood. One top of existing operation noise, the expansion will have three to four years of six to eight months per year of major earth moving in advance of operations. Anyone with pets on the 4th of July not only empathizes but can see adverse impact from development noise. And, blowing debris also threatens livestock. These are serious interferences, not nuisances. Fencing may, but is not guaranteed, to address ingestion risk to livestock. I do not see how the existing proposed conditions of approval sufficiently mitigate the impact of noise on both the agricultural and residential zones." – Commissioner Fowler Opening Statement***

Operations within the expansion area are anticipated to be quieter than median existing sound levels and up to 6 dB above the quietest existing daytime sound level. This does not constitute serious interference. Please refer to the response in Appendix G for additional information regarding construction noise and blasting.

> ***"Noise pollution and heavy truck and waste hauling traffic has been a persistent complaint topic regarding current operations of the Coffin Butte Landfill. The expansion application did not address noise concussions, increased heavy truck traffic to remove 2.1 million cubic yards of blast material from the expansion site, and other heavy equipment noises and impacts for the construction of the expansion area, including removal and mitigation of the current leachate ponds."– Commissioner Biscoe Opening Statement***

An assessment of construction noise has now been completed, including noise from blasting and hauling activities within the expansion area. Construction noise is anticipated to be up to 5 dB louder than typical existing daytime levels, which does not result in any significant noise effects. Sound from blasting is predicted to be 10dB quieter than the sound limits for blasting identified in the OAR, which is approximately half as loud as what is allowed by Code. Vibration from blasting is not expected to affect any existing structures within 675 feet of the center of the blast site. Therefore structures will not be affected. Please refer to Appendix G for the construction noise assessment.

Response to Planning Commission Conjecture

> ***"Coffin Butte Landfill is the second largest landfill in Oregon…and one of Republic Services most profitable revenue generating landfill" --Commissioner Biscoe Opening Statement***

The record contains no financial or operational data to substantiate Commissioner Biscoe's claim regarding profitability.

> ***"Some residents point to increasing cancer clusters in their neighborhood and suggest that poor air quality may be responsible."—Commissioner Lee Opening Statement***

This assertion is entirely unsupported by any evidence in the record. No studies, reports, or data were introduced during the proceedings to substantiate the claim, nor is there any indication that public health authorities have identified or confirmed such a phenomenon in proximity to Coffin Butte Landfill. Moreover, the vagueness of the statement, offered without reference to location, timeframe, or affected population renders it impossible to meaningfully confirm or rebut. Introducing unsubstantiated and undefined allegations of serious public health impacts not only falls outside the evidentiary record but also risks misleading the public and improperly influencing the decision-making process. The Commission's findings must be based on credible, record-based evidence, not conjecture or generalized fears.

> ***"Additionally, in-person testimony… carries more weight than those not directly impacted by the landfill's adverse impacts. The weight therefore that this public testimony is given is significant." — Commissioner Catherine Biscoe, Opening Statement***

Substantial evidence requires information that is relevant, reliable, and supported by objective data. Public testimony does not become more relevant merely because the speaker appears at a hearing.

By elevating in-person testimony above technical studies and professional conclusions, the Commission's approach departs from the legal standard and undermines the requirement that land use decisions rest on reliable, site-specific data rather than subjective impressions.

> ***"Reclamation – a Conditions of Approval – Benton County and public didn't anticipate the landfill being covered indefinitely under tarps, due to delayed cell closures… Torn tarps and cover not being maintained, not being used as farm areas, or for recreational or green space." -- Commissioner Biscoe Opening Statement***

This statement mischaracterizes both current practice and future commitments. Interim tarping is a standard and DEQ-approved method of daily and intermediate cover used at modern landfills, designed specifically to reduce odor, litter, and leachate generation. This approach ensures progressive reclamation, reduction of the exposed temporary, intermediate fill, and corresponding decreases in odor and visual impact.

The record also documents substantial upgrades to the landfill's gas collection and control system, including the installation of new vertical wells, rehabilitation of existing horizontal wells, and addition of thousands of feet of collection piping. These actions directly address odor

at its source and demonstrate proactive mitigation, not indefinite reliance on tarps.

Finally, final cover areas will be reclaimed for beneficial use once installed. The suggestion that the site will remain permanently under tarps without reclamation is unsupported and contradicted by both the applicant's permit commitments and enforceable conditions.

> ***"Coffin Butte leachate is processed at the Corvallis municipal water treatment center… and we have no evidence that such treatment mitigates PFAS." — Commissioner Fowler, Opening Statement***

This observation falls outside the scope of the applicable land use approval criteria. The Conditional Use Permit review is not the forum for regulating PFAS treatment technology at municipal wastewater facilities. Instead, PFAS monitoring and treatment are governed under state and federal water quality regulations through the Department of Environmental Quality and the Clean Water Act's permitting framework. The applicant's responsibility under this proceeding is to demonstrate compliance with Benton County Code criteria—specifically, that landfill operations will not create undue adverse impacts to surrounding uses.

The record demonstrates that leachate is properly managed, transported, and treated under valid permits, and there is no evidence of noncompliance. For this reason, Commissioner Fowler's assertion that "we have no evidence" of PFAS treatment is not relevant evidence under the law: Land use decisions must rest on competent, material evidence, not conjecture about matters already regulated under separate environmental programs.

Appendix A – Basalt Arsenic Concentrations

Apex Laboratories, LLC

12232 S.W. Garden Place
Tigard, OR 97223
503-718-2323
EPA ID: OR01039

Friday, August 24, 2018

Gabriel Iltis
Geo-Logic Associates (Lakewood, CO)
13949 West Colfax Avenue, Suite 220
Lakewood, CO 80401

RE: A8H0221 - Corvallis Basalt Testing - Coffin Butte/AU18.1148.00

Thank you for using Apex Laboratories. We greatly appreciate your business and strive to provide the highest quality services to the environmental industry.

Enclosed are the results of analyses for work order A8H0221, which was received by the laboratory on 8/8/2018 at 3:30:00PM.

If you have any questions concerning this report or the services we offer, please feel free to contact me by email at: ldomenighini@apex-labs.com, or by phone at 503-718-2323.

Please note: All samples will be disposed of within 30 days of final reporting, unless prior arrangements have been made.

This Final Report is the official version of the data results for this sample submission, unless superseded by a subsequent, labeled amended report.

All other deliverables derived from this data, including Electronic Data Deliverables (EDDs), CLP-like forms, client requested summary sheets, and all other products are considered secondary to this report.

Apex Laboratories

The results in this report apply to the samples analyzed in accordance with the chain of custody document. This analytical report must be reproduced in its entirety.

Lisa A Domenighini

Lisa Domenighini, Client Services Manager

Apex Laboratories, LLC

12232 S.W. Garden Place
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EPA ID: OR01039

Geo-Logic Associates (Lakewood, CO)	Project: **Corvallis Basalt Testing**	
13949 West Colfax Avenue, Suite 220	Project Number: **Coffin Butte/AU18.1148.00**	**Report ID:**
Lakewood, CO 80401	Project Manager: **Gabriel Iltis**	**A8H0221 - 08 24 18 1450**

ANALYTICAL REPORT FOR SAMPLES

SAMPLE INFORMATION

Client Sample ID	Laboratory ID	Matrix	Date Sampled	Date Received
GLA-BG-1 (As Received)	A8H0221-01	Solid	08/07/18 12:30	08/08/18 15:30
GLA-BG-1 (After Processing)	A8H0221-02	Solid	08/07/18 12:30	08/08/18 15:30
GLA-BG-2 (As Received)	A8H0221-03	Solid	08/07/18 12:40	08/08/18 15:30
GLA-BG-2 (After Processing)	A8H0221-04	Solid	08/07/18 12:40	08/08/18 15:30
GLA-BG-3 (As Received)	A8H0221-05	Solid	08/07/18 12:55	08/08/18 15:30
GLA-BG-3 (After Processing)	A8H0221-06	Solid	08/07/18 12:55	08/08/18 15:30
GLA-BG-4 (As Received)	A8H0221-07	Solid	08/07/18 13:05	08/08/18 15:30
GLA-BG-4 (After Processing)	A8H0221-08	Solid	08/07/18 13:05	08/08/18 15:30
GLA-BG-5 (As Received)	A8H0221-09	Solid	08/07/18 13:15	08/08/18 15:30
GLA-BG-5 (After Processing)	A8H0221-10	Solid	08/07/18 13:15	08/08/18 15:30
GLA-BG-6 (As Received)	A8H0221-11	Solid	08/07/18 13:30	08/08/18 15:30
GLA-BG-6 (After Processing)	A8H0221-12	Solid	08/07/18 13:30	08/08/18 15:30
GLA-BG-7 (As Received)	A8H0221-13	Solid	08/07/18 13:35	08/08/18 15:30
GLA-BG-7 (After Processing)	A8H0221-14	Solid	08/07/18 13:35	08/08/18 15:30

Apex Laboratories

Lisa Domenighini, Client Services Manager

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Lakewood, CO 80401	Project Manager: **Gabriel Iltis**	**A8H0221 - 08 24 18 1450**

ANALYTICAL SAMPLE RESULTS

Total Metals by EPA 6020 (ICPMS)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
GLA-BG-1 (After Processing) (A8H0221-02)				**Matrix: Solid**				
Batch: 8080783								
Antimony	ND	---	1.11	mg/kg	10	08/20/18	EPA 6020A	
Arsenic	ND	---	1.11	mg/kg	10	08/20/18	EPA 6020A	
Barium	**37.2**	---	1.11	mg/kg	10	08/20/18	EPA 6020A	
Beryllium	**0.489**	---	0.221	mg/kg	10	08/20/18	EPA 6020A	
Cadmium	**1.05**	---	0.221	mg/kg	10	08/20/18	EPA 6020A	
Chromium	**20.7**	---	1.11	mg/kg	10	08/20/18	EPA 6020A	
Cobalt	**34.6**	---	0.221	mg/kg	10	08/20/18	EPA 6020A	
Copper	**191**	---	1.11	mg/kg	10	08/20/18	EPA 6020A	
Lead	**1.05**	---	0.221	mg/kg	10	08/20/18	EPA 6020A	
Manganese	**659**	---	1.11	mg/kg	10	08/20/18	EPA 6020A	
Mercury	ND	---	0.0885	mg/kg	10	08/20/18	EPA 6020A	
Nickel	**27.8**	---	1.11	mg/kg	10	08/20/18	EPA 6020A	
Selenium	ND	---	1.11	mg/kg	10	08/20/18	EPA 6020A	
Silver	ND	---	0.221	mg/kg	10	08/20/18	EPA 6020A	
Thallium	ND	---	0.221	mg/kg	10	08/20/18	EPA 6020A	
Vanadium	**99.6**	---	1.11	mg/kg	10	08/20/18	EPA 6020A	
Zinc	**59.2**	---	4.42	mg/kg	10	08/20/18	EPA 6020A	
GLA-BG-2 (After Processing) (A8H0221-04)				**Matrix: Solid**				
Batch: 8080783								
Antimony	ND	---	1.08	mg/kg	10	08/20/18	EPA 6020A	
Arsenic	**1.75**	---	1.08	mg/kg	10	08/20/18	EPA 6020A	
Barium	**199**	---	1.08	mg/kg	10	08/20/18	EPA 6020A	
Beryllium	**0.540**	---	0.216	mg/kg	10	08/20/18	EPA 6020A	
Cadmium	**0.806**	---	0.216	mg/kg	10	08/20/18	EPA 6020A	
Chromium	**40.0**	---	1.08	mg/kg	10	08/20/18	EPA 6020A	
Cobalt	**33.5**	---	0.216	mg/kg	10	08/20/18	EPA 6020A	
Copper	**134**	---	1.08	mg/kg	10	08/20/18	EPA 6020A	
Lead	**2.51**	---	0.216	mg/kg	10	08/20/18	EPA 6020A	
Manganese	**947**	---	1.08	mg/kg	10	08/20/18	EPA 6020A	
Mercury	ND	---	0.0862	mg/kg	10	08/20/18	EPA 6020A	
Nickel	**49.7**	---	1.08	mg/kg	10	08/20/18	EPA 6020A	
Selenium	ND	---	1.08	mg/kg	10	08/20/18	EPA 6020A	
Silver	ND	---	0.216	mg/kg	10	08/20/18	EPA 6020A	
Thallium	ND	---	0.216	mg/kg	10	08/20/18	EPA 6020A	
Vanadium	**134**	---	1.08	mg/kg	10	08/20/18	EPA 6020A	
Zinc	**74.3**	---	4.31	mg/kg	10	08/20/18	EPA 6020A	

Apex Laboratories

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Lisa A Domenighini

Lisa Domenighini, Client Services Manager

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13949 West Colfax Avenue, Suite 220	Project Number: **Coffin Butte/AU18.1148.00**	**Report ID:**
Lakewood, CO 80401	Project Manager: **Gabriel Iltis**	**A8H0221 - 08 24 18 1450**

ANALYTICAL SAMPLE RESULTS

Total Metals by EPA 6020 (ICPMS)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
GLA-BG-3 (After Processing) (A8H0221-06)				**Matrix: Solid**				
Batch: 8080783								
Antimony	ND	---	1.01	mg/kg	10	08/20/18	EPA 6020A	
Arsenic	ND	---	1.01	mg/kg	10	08/20/18	EPA 6020A	
Barium	**47.9**	---	1.01	mg/kg	10	08/20/18	EPA 6020A	
Beryllium	**0.577**	---	0.202	mg/kg	10	08/20/18	EPA 6020A	
Cadmium	**1.04**	---	0.202	mg/kg	10	08/20/18	EPA 6020A	
Chromium	**9.63**	---	1.01	mg/kg	10	08/20/18	EPA 6020A	
Cobalt	**35.1**	---	0.202	mg/kg	10	08/20/18	EPA 6020A	
Copper	**268**	---	1.01	mg/kg	10	08/20/18	EPA 6020A	
Lead	**1.23**	---	0.202	mg/kg	10	08/20/18	EPA 6020A	
Manganese	**339**	---	1.01	mg/kg	10	08/20/18	EPA 6020A	
Mercury	ND	---	0.0808	mg/kg	10	08/20/18	EPA 6020A	
Nickel	**29.3**	---	1.01	mg/kg	10	08/20/18	EPA 6020A	
Selenium	ND	---	1.01	mg/kg	10	08/20/18	EPA 6020A	
Silver	ND	---	0.202	mg/kg	10	08/20/18	EPA 6020A	
Thallium	ND	---	0.202	mg/kg	10	08/20/18	EPA 6020A	
Vanadium	**75.1**	---	1.01	mg/kg	10	08/20/18	EPA 6020A	
Zinc	**42.3**	---	4.04	mg/kg	10	08/20/18	EPA 6020A	
GLA-BG-4 (After Processing) (A8H0221-08)				**Matrix: Solid**				
Batch: 8080783								
Antimony	ND	---	0.977	mg/kg	10	08/20/18	EPA 6020A	Q-42
Arsenic	**1.65**	---	0.977	mg/kg	10	08/20/18	EPA 6020A	
Barium	**111**	---	0.977	mg/kg	10	08/20/18	EPA 6020A	**Q-42**
Beryllium	**0.446**	---	0.195	mg/kg	10	08/20/18	EPA 6020A	
Cadmium	**0.662**	---	0.195	mg/kg	10	08/20/18	EPA 6020A	
Chromium	**48.8**	---	0.977	mg/kg	10	08/20/18	EPA 6020A	
Cobalt	**29.5**	---	0.195	mg/kg	10	08/20/18	EPA 6020A	
Copper	**139**	---	0.977	mg/kg	10	08/20/18	EPA 6020A	**Q-42**
Lead	**1.09**	---	0.195	mg/kg	10	08/20/18	EPA 6020A	
Manganese	**601**	---	0.977	mg/kg	10	08/20/18	EPA 6020A	**Q-42**
Mercury	ND	---	0.0781	mg/kg	10	08/20/18	EPA 6020A	
Nickel	**48.5**	---	0.977	mg/kg	10	08/20/18	EPA 6020A	
Selenium	ND	---	0.977	mg/kg	10	08/20/18	EPA 6020A	
Silver	ND	---	0.195	mg/kg	10	08/20/18	EPA 6020A	
Thallium	ND	---	0.195	mg/kg	10	08/20/18	EPA 6020A	
Vanadium	**131**	---	0.977	mg/kg	10	08/20/18	EPA 6020A	**Q-42**

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Lisa A Domenighini

Lisa Domenighini, Client Services Manager

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EPA ID: OR01039

Geo-Logic Associates (Lakewood, CO)	Project: **Corvallis Basalt Testing**	
13949 West Colfax Avenue, Suite 220	Project Number: **Coffin Butte/AU18.1148.00**	**Report ID:**
Lakewood, CO 80401	Project Manager: **Gabriel Iltis**	**A8H0221 - 08 24 18 1450**

ANALYTICAL SAMPLE RESULTS

Total Metals by EPA 6020 (ICPMS)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
GLA-BG-4 (After Processing) (A8H0221-08)				**Matrix: Solid**				
Zinc	**55.9**	---	3.91	mg/kg	10	08/20/18	EPA 6020A	
GLA-BG-5 (After Processing) (A8H0221-10)				**Matrix: Solid**				
Batch: 8080783								
Antimony	ND	---	1.10	mg/kg	10	08/20/18	EPA 6020A	
Arsenic	**1.32**	---	1.10	mg/kg	10	08/20/18	EPA 6020A	
Beryllium	**0.594**	---	0.220	mg/kg	10	08/20/18	EPA 6020A	
Cadmium	**0.939**	---	0.220	mg/kg	10	08/20/18	EPA 6020A	
Chromium	**33.2**	---	1.10	mg/kg	10	08/20/18	EPA 6020A	
Cobalt	**30.7**	---	0.220	mg/kg	10	08/20/18	EPA 6020A	
Copper	**202**	---	1.10	mg/kg	10	08/20/18	EPA 6020A	
Lead	**1.31**	---	0.220	mg/kg	10	08/20/18	EPA 6020A	
Manganese	**568**	---	1.10	mg/kg	10	08/20/18	EPA 6020A	
Mercury	ND	---	0.0881	mg/kg	10	08/20/18	EPA 6020A	
Nickel	**46.7**	---	1.10	mg/kg	10	08/20/18	EPA 6020A	
Selenium	ND	---	1.10	mg/kg	10	08/20/18	EPA 6020A	
Silver	ND	---	0.220	mg/kg	10	08/20/18	EPA 6020A	
Thallium	ND	---	0.220	mg/kg	10	08/20/18	EPA 6020A	
Vanadium	**112**	---	1.10	mg/kg	10	08/20/18	EPA 6020A	
Zinc	**63.5**	---	4.41	mg/kg	10	08/20/18	EPA 6020A	
GLA-BG-5 (After Processing) (A8H0221-10RE1)				**Matrix: Solid**				
Batch: 8080783								
Barium	**111**	---	1.10	mg/kg	10	08/21/18	EPA 6020A	
GLA-BG-6 (After Processing) (A8H0221-12)				**Matrix: Solid**				
Batch: 8080783								
Antimony	ND	---	1.08	mg/kg	10	08/20/18	EPA 6020A	
Arsenic	ND	---	1.08	mg/kg	10	08/20/18	EPA 6020A	
Beryllium	**0.840**	---	0.216	mg/kg	10	08/20/18	EPA 6020A	
Cadmium	**1.08**	---	0.216	mg/kg	10	08/20/18	EPA 6020A	
Chromium	**33.7**	---	1.08	mg/kg	10	08/20/18	EPA 6020A	
Cobalt	**43.6**	---	0.216	mg/kg	10	08/20/18	EPA 6020A	
Copper	**228**	---	1.08	mg/kg	10	08/20/18	EPA 6020A	
Lead	**2.45**	---	0.216	mg/kg	10	08/20/18	EPA 6020A	
Manganese	**1180**	---	1.08	mg/kg	10	08/20/18	EPA 6020A	
Mercury	ND	---	0.0864	mg/kg	10	08/20/18	EPA 6020A	

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13949 West Colfax Avenue, Suite 220	Project Number: **Coffin Butte/AU18.1148.00**	**Report ID:**
Lakewood, CO 80401	Project Manager: **Gabriel Iltis**	**A8H0221 - 08 24 18 1450**

ANALYTICAL SAMPLE RESULTS

Total Metals by EPA 6020 (ICPMS)

Analyte	Sample Result	Detection Limit	Reporting Limit	Units	Dilution	Date Analyzed	Method Ref.	Notes
GLA-BG-6 (After Processing) (A8H0221-12)				**Matrix: Solid**				
Nickel	**31.7**	---	1.08	mg/kg	10	08/20/18	EPA 6020A	
Selenium	ND	---	1.08	mg/kg	10	08/20/18	EPA 6020A	
Silver	ND	---	0.216	mg/kg	10	08/20/18	EPA 6020A	
Thallium	ND	---	0.216	mg/kg	10	08/20/18	EPA 6020A	
Vanadium	**179**	---	1.08	mg/kg	10	08/20/18	EPA 6020A	
Zinc	**78.7**	---	4.32	mg/kg	10	08/20/18	EPA 6020A	
GLA-BG-6 (After Processing) (A8H0221-12RE1)				**Matrix: Solid**				
Batch: 8080783								
Barium	**57.9**	---	1.08	mg/kg	10	08/21/18	EPA 6020A	
GLA-BG-7 (After Processing) (A8H0221-14)				**Matrix: Solid**				
Batch: 8080783								
Antimony	ND	---	0.967	mg/kg	10	08/20/18	EPA 6020A	
Arsenic	ND	---	0.967	mg/kg	10	08/20/18	EPA 6020A	
Beryllium	**0.576**	---	0.193	mg/kg	10	08/20/18	EPA 6020A	
Cadmium	**0.939**	---	0.193	mg/kg	10	08/20/18	EPA 6020A	
Chromium	**16.5**	---	0.967	mg/kg	10	08/20/18	EPA 6020A	
Cobalt	**39.8**	---	0.193	mg/kg	10	08/20/18	EPA 6020A	
Copper	**214**	---	0.967	mg/kg	10	08/20/18	EPA 6020A	
Lead	**0.818**	---	0.193	mg/kg	10	08/20/18	EPA 6020A	
Manganese	**391**	---	0.967	mg/kg	10	08/20/18	EPA 6020A	
Mercury	ND	---	0.0774	mg/kg	10	08/20/18	EPA 6020A	
Nickel	**32.9**	---	0.967	mg/kg	10	08/20/18	EPA 6020A	
Selenium	ND	---	0.967	mg/kg	10	08/20/18	EPA 6020A	
Silver	ND	---	0.193	mg/kg	10	08/20/18	EPA 6020A	
Thallium	ND	---	0.193	mg/kg	10	08/20/18	EPA 6020A	
Vanadium	**117**	---	0.967	mg/kg	10	08/20/18	EPA 6020A	
Zinc	**67.7**	---	3.87	mg/kg	10	08/20/18	EPA 6020A	
GLA-BG-7 (After Processing) (A8H0221-14RE1)				**Matrix: Solid**				
Batch: 8080783								
Barium	**64.4**	---	0.967	mg/kg	10	08/21/18	EPA 6020A	

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Lakewood, CO 80401	Project Manager: **Gabriel Iltis**	**A8H0221 - 08 24 18 1450**

QUALITY CONTROL (QC) SAMPLE RESULTS

Total Metals by EPA 6020 (ICPMS)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 8080783 - EPA 3051A							**Solid**					
Blank (8080783-BLK1)		Prepared: 08/15/18 12:57		Analyzed: 08/20/18 19:53								
EPA 6020A												
Antimony	ND	---	0.962	mg/kg	10	---	---	---	---	---	---	
Arsenic	ND	---	0.962	mg/kg	10	---	---	---	---	---	---	
Barium	ND	---	0.962	mg/kg	10	---	---	---	---	---	---	
Beryllium	ND	---	0.192	mg/kg	10	---	---	---	---	---	---	
Cadmium	ND	---	0.192	mg/kg	10	---	---	---	---	---	---	
Chromium	ND	---	0.962	mg/kg	10	---	---	---	---	---	---	
Cobalt	ND	---	0.192	mg/kg	10	---	---	---	---	---	---	
Copper	ND	---	0.962	mg/kg	10	---	---	---	---	---	---	
Lead	ND	---	0.192	mg/kg	10	---	---	---	---	---	---	
Manganese	ND	---	0.962	mg/kg	10	---	---	---	---	---	---	
Mercury	ND	---	0.0769	mg/kg	10	---	---	---	---	---	---	
Nickel	ND	---	0.962	mg/kg	10	---	---	---	---	---	---	
Selenium	ND	---	0.962	mg/kg	10	---	---	---	---	---	---	
Silver	ND	---	0.192	mg/kg	10	---	---	---	---	---	---	
Thallium	ND	---	0.192	mg/kg	10	---	---	---	---	---	---	
Vanadium	ND	---	0.962	mg/kg	10	---	---	---	---	---	---	
Zinc	ND	---	3.85	mg/kg	10	---	---	---	---	---	---	
LCS (8080783-BS1)		Prepared: 08/15/18 12:57		Analyzed: 08/20/18 20:06								
EPA 6020A												
Antimony	23.6	---	1.00	mg/kg	10	25.0	---	94	80-120%	---	---	
Arsenic	48.4	---	1.00	mg/kg	10	50.0	---	97	80-120%	---	---	
Barium	52.4	---	1.00	mg/kg	10	50.0	---	105	80-120%	---	---	
Beryllium	23.1	---	0.200	mg/kg	10	25.0	---	92	80-120%	---	---	
Cadmium	47.9	---	0.200	mg/kg	10	50.0	---	96	80-120%	---	---	
Chromium	47.7	---	1.00	mg/kg	10	50.0	---	95	80-120%	---	---	
Cobalt	51.0	---	0.200	mg/kg	10	50.0	---	102	80-120%	---	---	
Copper	47.4	---	1.00	mg/kg	10	50.0	---	95	80-120%	---	---	
Lead	49.1	---	0.200	mg/kg	10	50.0	---	98	80-120%	---	---	
Manganese	55.3	---	1.00	mg/kg	10	50.0	---	111	80-120%	---	---	
Mercury	0.962	---	0.0800	mg/kg	10	1.00	---	96	80-120%	---	---	
Nickel	48.0	---	1.00	mg/kg	10	50.0	---	96	80-120%	---	---	
Selenium	24.1	---	1.00	mg/kg	10	25.0	---	96	80-120%	---	---	

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13949 West Colfax Avenue, Suite 220	Project Number:	Coffin Butte/AU18.1148.00
Lakewood, CO 80401	Project Manager:	Gabriel Iltis
	Report ID:	A8H0221 - 08 24 18 1450

QUALITY CONTROL (QC) SAMPLE RESULTS

Total Metals by EPA 6020 (ICPMS)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 8080783 - EPA 3051A							Solid					
LCS (8080783-BS1)		Prepared: 08/15/18 12:57		Analyzed: 08/20/18 20:06								
Silver	24.7	---	0.200	mg/kg	10	25.0	---	99	80-120%	---	---	
Thallium	23.8	---	0.200	mg/kg	10	25.0	---	95	80-120%	---	---	
Vanadium	46.5	---	1.00	mg/kg	10	50.0	---	93	80-120%	---	---	
Zinc	48.8	---	4.00	mg/kg	10	50.0	---	98	80-120%	---	---	
Duplicate (8080783-DUP1)		Prepared: 08/15/18 12:57		Analyzed: 08/20/18 20:38								
QC Source Sample: GLA-BG-4 (After Processing) (A8H0221-08)												
EPA 6020A												
Antimony	ND	---	1.09	mg/kg	10	---	ND	---	---	---	40%	
Arsenic	**1.93**	---	1.09	mg/kg	10	---	1.65	---	---	16	40%	
Beryllium	**0.477**	---	0.218	mg/kg	10	---	0.446	---	---	7	40%	
Cadmium	**0.663**	---	0.218	mg/kg	10	---	0.662	---	---	0.2	40%	
Chromium	**56.1**	---	1.09	mg/kg	10	---	48.8	---	---	14	40%	
Cobalt	**32.3**	---	0.218	mg/kg	10	---	29.5	---	---	9	40%	
Copper	**149**	---	1.09	mg/kg	10	---	139	---	---	7	40%	
Lead	**1.16**	---	0.218	mg/kg	10	---	1.09	---	---	7	40%	
Manganese	**643**	---	1.09	mg/kg	10	---	601	---	---	7	40%	
Mercury	ND	---	0.0873	mg/kg	10	---	ND	---	---	---	40%	
Nickel	**54.6**	---	1.09	mg/kg	10	---	48.5	---	---	12	40%	
Selenium	ND	---	1.09	mg/kg	10	---	ND	---	---	---	40%	
Silver	ND	---	0.218	mg/kg	10	---	ND	---	---	---	40%	
Thallium	ND	---	0.218	mg/kg	10	---	ND	---	---	---	40%	
Vanadium	**150**	---	1.09	mg/kg	10	---	131	---	---	14	40%	
Zinc	**64.1**	---	4.37	mg/kg	10	---	55.9	---	---	14	40%	
Duplicate (8080783-DUP2)		Prepared: 08/15/18 12:57		Analyzed: 08/21/18 19:31								
QC Source Sample: GLA-BG-4 (After Processing) (A8H0221-08)												
EPA 6020A												
Barium	**127**	---	1.09	mg/kg	10	---	111	---	---	14	40%	Q-16
Matrix Spike (8080783-MS1)		Prepared: 08/15/18 12:57		Analyzed: 08/20/18 20:43								
QC Source Sample: GLA-BG-4 (After Processing) (A8H0221-08)												
EPA 6020A												

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13949 West Colfax Avenue, Suite 220	Project Number: **Coffin Butte/AU18.1148.00**	**Report ID:**
Lakewood, CO 80401	Project Manager: **Gabriel Iltis**	**A8H0221 - 08 24 18 1450**

QUALITY CONTROL (QC) SAMPLE RESULTS

Total Metals by EPA 6020 (ICPMS)

Analyte	Result	Detection Limit	Reporting Limit	Units	Dilution	Spike Amount	Source Result	% REC	% REC Limits	RPD	RPD Limit	Notes
Batch 8080783 - EPA 3051A							**Solid**					
Matrix Spike (8080783-MS1)		Prepared: 08/15/18 12:57		Analyzed: 08/20/18 20:43								
QC Source Sample: GLA-BG-4 (After Processing) (A8H0221-08)												
Antimony	16.7	---	1.04	mg/kg	10	26.1	ND	**64**	**75-125%**	---	---	A-02, Q-01
Arsenic	53.1	---	1.04	mg/kg	10	52.2	1.65	99	75-125%	---	---	
Beryllium	26.4	---	0.209	mg/kg	10	26.1	0.446	99	75-125%	---	---	
Cadmium	52.4	---	0.209	mg/kg	10	52.2	0.662	99	75-125%	---	---	
Chromium	111	---	1.04	mg/kg	10	52.2	48.8	120	75-125%	---	---	
Cobalt	88.6	---	0.209	mg/kg	10	52.2	29.5	113	75-125%	---	---	
Copper	215	---	1.04	mg/kg	10	52.2	139	**144**	**75-125%**	---	---	Q-04
Lead	50.8	---	0.209	mg/kg	10	52.2	1.09	95	75-125%	---	---	
Manganese	726	---	1.04	mg/kg	10	52.2	601	**239**	**75-125%**	---	---	Q-03
Mercury	1.03	---	0.0835	mg/kg	10	1.04	ND	98	75-125%	---	---	
Nickel	109	---	1.04	mg/kg	10	52.2	48.5	117	75-125%	---	---	
Selenium	24.0	---	1.04	mg/kg	10	26.1	ND	92	75-125%	---	---	
Silver	26.5	---	0.209	mg/kg	10	26.1	ND	102	75-125%	---	---	
Thallium	24.3	---	0.209	mg/kg	10	26.1	ND	93	75-125%	---	---	
Vanadium	205	---	1.04	mg/kg	10	52.2	131	**143**	**75-125%**	---	---	Q-04
Zinc	118	---	4.18	mg/kg	10	52.2	55.9	120	75-125%	---	---	
Matrix Spike (8080783-MS2)		Prepared: 08/15/18 12:57		Analyzed: 08/21/18 19:38								
QC Source Sample: GLA-BG-4 (After Processing) (A8H0221-08)												
EPA 6020A												
Barium	186	---	1.04	mg/kg	10	52.2	111	**144**	**75-125%**	---	---	Q-16

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SAMPLE PREPARATION INFORMATION

Total Metals by EPA 6020 (ICPMS)

Prep: EPA 3051A

Lab Number	Matrix	Method	Sampled	Prepared	Sample Initial/Final	Default Initial/Final	RL Prep Factor
Batch: 8080783							
A8H0221-02	Solid	EPA 6020A	08/07/18 12:30	08/15/18 12:57	0.452g/50mL	0.5g/50mL	1.11
A8H0221-04	Solid	EPA 6020A	08/07/18 12:40	08/15/18 12:57	0.464g/50mL	0.5g/50mL	1.08
A8H0221-06	Solid	EPA 6020A	08/07/18 12:55	08/15/18 12:57	0.495g/50mL	0.5g/50mL	1.01
A8H0221-08	Solid	EPA 6020A	08/07/18 13:05	08/15/18 12:57	0.512g/50mL	0.5g/50mL	0.98
A8H0221-10	Solid	EPA 6020A	08/07/18 13:15	08/15/18 12:57	0.454g/50mL	0.5g/50mL	1.10
A8H0221-10RE1	Solid	EPA 6020A	08/07/18 13:15	08/15/18 12:57	0.454g/50mL	0.5g/50mL	1.10
A8H0221-12	Solid	EPA 6020A	08/07/18 13:30	08/15/18 12:57	0.463g/50mL	0.5g/50mL	1.08
A8H0221-12RE1	Solid	EPA 6020A	08/07/18 13:30	08/15/18 12:57	0.463g/50mL	0.5g/50mL	1.08
A8H0221-14	Solid	EPA 6020A	08/07/18 13:35	08/15/18 12:57	0.517g/50mL	0.5g/50mL	0.97
A8H0221-14RE1	Solid	EPA 6020A	08/07/18 13:35	08/15/18 12:57	0.517g/50mL	0.5g/50mL	0.97

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QUALIFIER DEFINITIONS

Client Sample and Quality Control (QC) Sample Qualifier Definitions:

Apex Laboratories

A-02	Serial dilution was performed and was within limits. Data is acceptable.
Q-01	Spike recovery and/or RPD is outside acceptance limits.
Q-03	Spike recovery and/or RPD is outside control limits due to the high concentration of analyte present in the sample.
Q-04	Spike recovery and/or RPD is outside control limits due to a non-homogeneous sample matrix.
Q-16	Reanalysis of an original Batch QC sample.
Q-42	Matrix Spike and/or Duplicate analysis was performed on this sample. % Recovery or RPD for this analyte is outside laboratory control limits. (Refer to the QC Section of Analytical Report.)

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REPORTING NOTES AND CONVENTIONS:

Abbreviations:

DET Analyte DETECTED at or above the detection or reporting limit.

ND Analyte NOT DETECTED at or above the detection or reporting limit.

NR Result Not Reported

RPD Relative Percent Difference

Detection Limits: Limit of Detection (LOD)

Limits of Detection (LODs) are normally set at a level of one half the validated Limit of Quantitation (LOQ).
If no value is listed ('---- '), then the data has not been evaluated below the Reporting Limit.

Reporting Limits: Limit of Quantitation (LOQ)

Validated Limits of Quantitation (LOQs) are reported as the Reporting Limits for all analyses where the LOQ, MRL, PQL or CRL are requested. The LOQ represents a level at or above the low point of the calibration curve, that has been validated according to Apex Laboratories' comprehensive LOQ policies and procedures.

Reporting Conventions:

Basis: Results for soil samples are generally reported on a 100% dry weight basis.
The Result Basis is listed following the units as " dry", " wet", or " " (blank) designation.

" dry" Sample results and Reporting Limits are reported on a dry weight basis. (i.e. "ug/kg dry")
See Percent Solids section for details of dry weight analysis.

" wet" Sample results and Reporting Limits for this analysis are normally dry weight corrected, but have not been modified in this case.

" " Results without 'wet' or 'dry' designation are not normally dry weight corrected. These results are considered 'As Received'.

QC Source:

In cases where there is insufficient sample provided for Sample Duplicates and/or Matrix Spikes, a Lab Control Sample Duplicate (LCS Dup) may be analyzed to demonstrate accuracy and precision of the extraction batch.

Non-Client Batch QC Samples (Duplicates and Matrix Spike/Duplicates) are not included in this report. Please request a Full QC report if this data is required.

Miscellaneous Notes:

" --- " QC results are not applicable. For example, % Recoveries for Blanks and Duplicates, % RPD for Blanks, Blank Spikes and Matrix Spikes, etc.

" *** " Used to indicate a possible discrepancy with the Sample and Sample Duplicate results when the %RPD is not available. In this case, either the Sample or the Sample Duplicate has a reportable result for this analyte, while the other is Non Detect (ND).

Blanks:

Standard practice is to evaluate the results from Blank QC Samples down to a level equal to ½ the Reporting Limit (RL).
-For Blank hits falling between ½ the RL and the RL (J flagged hits), the associated sample and QC data will receive a 'B-02' qualifier.
-For Blank hits above the RL, the associated sample and QC data will receive a 'B' qualifier, per Apex Laboratories' Blank Policy.
For further details, please request a copy of this document.

Apex Laboratories

Lisa A Domenighini

Lisa Domenighini, Client Services Manager

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Apex Laboratories, LLC

12232 S.W. Garden Place
Tigard, OR 97223
503-718-2323
EPA ID: OR01039

Geo-Logic Associates (Lakewood, CO)	Project: **Corvallis Basalt Testing**	
13949 West Colfax Avenue, Suite 220	Project Number: **Coffin Butte/AU18.1148.00**	**Report ID:**
Lakewood, CO 80401	Project Manager: **Gabriel Iltis**	**A8H0221 - 08 24 18 1450**

REPORTING NOTES AND CONVENTIONS (Cont.):

Blanks (Cont.):

Sample results flagged with a 'B' or 'B-02' qualifier are potentially biased high if the blank results are less than ten times the level found in the blank for inorganic analyses, or less than five times the level found in the blank for organic analyses.

'B' and 'B-02' qualifications are only applied to sample results detected above the Reporting Level.

Preparation Notes:

Mixed Matrix Samples:

Water Samples:

Water samples containing significant amounts of sediment are decanted or separated prior to extraction, and only the water portion analyzed, unless otherwise directed by the client.

Soil and Sediment Samples:

Soil and Sediment samples containing significant amounts of water are decanted prior to extraction, and only the solid portion analyzed, unless otherwise directed by the client.

Sampling and Preservation Notes:

Certain regulatory programs, such as National Pollutant Discharge Elimination System (NPDES), require that activities such as sample filtration (for dissolved metals, orthophosphate, hexavalent chromium, etc.) and testing of short hold analytes (pH, Dissolved Oxygen, etc.) be performed in the field (on-site) within a short time window. In addition, sample matrix spikes are required for some analyses, and sufficient volume must be provided, and billable site specific QC requested, if this is required. All regulatory permits should be reviewed to ensure that these requirements are being met.

Data users should be aware of which regulations pertain to the samples they submit for testing. If related sample collection activities are not approved for a particular regulatory program, results should be considered estimates. Apex Laboratories will qualify these analytes according to the most stringent requirements, however results for samples that are for non-regulatory purposes may be acceptable.

Samples that have been filtered and preserved at Apex Laboratories per client request are listed in the preparation section of the report with the date and time of filtration listed.

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Lakewood, CO 80401	Project Manager: **Gabriel Iltis**	**A8H0221 - 08 24 18 1450**

LABORATORY ACCREDITATION INFORMATION

TNI Certification ID: OR100062 (Primary Accreditation) - EPA ID: OR01039

All methods and analytes reported from work performed at Apex Laboratories are included on Apex Laboratories' ORELAP Scope of Certification, with the exception of any analyte(s) listed below:

Apex Laboratories

Matrix	Analysis	TNI_ID	Analyte	TNI_ID	Accreditation

All reported analytes are included in Apex Laboratories' current ORELAP scope.

Secondary Accreditations

Apex Laboratories also maintains reciprocal accreditation with non-TNI states (Washington DOE), as well as other state specific accreditations not listed here.

Subcontract Laboratory Accreditations

Subcontracted data falls outside of Apex Laboratories' Scope of Accreditation.
Please see the Subcontract Laboratory report for full details, or contact your Project Manager for more information.

Field Testing Parameters

Results for Field Tested data are provded by the client or sampler, and fall outside of Apex Laboratories' Scope of Accreditation.

Apex Laboratories, LLC

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Lisa A Domenighini

Lisa Domenighini, Client Services Manager

Apex Laboratories, LLC

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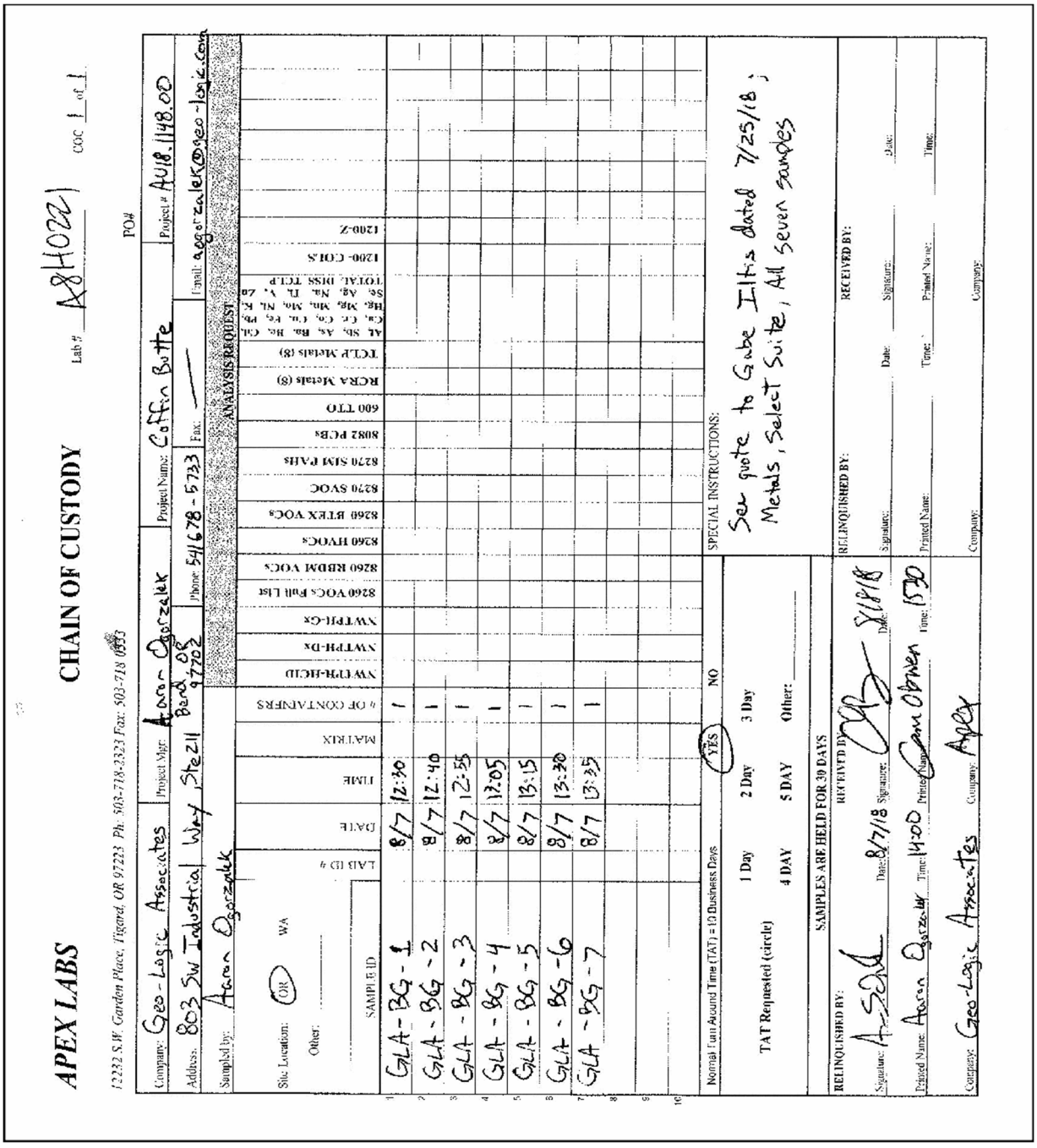

APEX LABS

12232 S.W. Garden Place, Tigard, OR 97223 Ph: 503-718-2323 Fax: 503-718-0333

CHAIN OF CUSTODY

Lab # A8H0221 COC 1 of 1

PO#

Company: Geo-Logic Associates | Project Mgr: Aaron Ogorzalek | Project Name: Coffin Butte | Project # AU18.1148.00

Address: 803 SW Industrial Way Ste 211 Bend, OR 97702 | Phone: 541 678-5733 | Fax: | Email: aogorzalek@geo-logic.com

Sampled by: Aaron Ogorzalek

Site Location: OR WA

Other:

ANALYSIS REQUEST

SAMPLE ID	LAB ID #	DATE	TIME	MATRIX	# OF CONTAINERS	NWTPH-HCID	NWTPH-Dx	NWTPH-Gx	8260 VOCs Full List	8260 RBDM VOCs	8260 HVOCs	8260 BTEX VOCs	8270 SVOC	8270 SIM PAHs	8082 PCBs	600 TTO	RCRA Metals (8)	TCLP Metals (8)	Al, Sb, As, Ba, Be, Cd, Ca, Cr, Co, Cu, Fe, Pb, Mg, Mn, Mo, Ni, K, Se, Ag, Na, Tl, V, Zn TOTAL DISS TCLP	1200-COLS	1200-Z
1 GLA-BG-1		8/7	12:30		1																
2 GLA-BG-2		8/7	12:40		1																
3 GLA-BG-3		8/7	12:55		1																
4 GLA-BG-4		8/7	13:05		1																
5 GLA-BG-5		8/7	13:15		1																
6 GLA-BG-6		8/7	13:30		1																
7 GLA-BG-7		8/7	13:35		1																
8																					
9																					
10																					

Normal Turn Around Time (TAT) = 10 Business Days YES NO

TAT Requested (circle): 1 Day 2 Day 3 Day 4 DAY 5 DAY Other:

SPECIAL INSTRUCTIONS: See quote to Gabe Iltis dated 7/25/18; Metals, Select Suite, All seven samples

SAMPLES ARE HELD FOR 30 DAYS

RELINQUISHED BY: Signature: Date: 8/7/18 Time: 14:00 Printed Name: Aaron Ogorzalek Company: Geo-Logic Associates

RECEIVED BY: Signature: Date: 8/8/18 Time: 1530 Printed Name: Sam O'Brien Company: APEX

RELINQUISHED BY: Signature: Date: Time: Printed Name: Company:

RECEIVED BY: Signature: Date: Time: Printed Name: Company:

Apex Laboratories

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Lisa A Domenighini

Lisa Domenighini, Client Services Manager

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Lakewood, CO 80401	Project Manager: **Gabriel Iltis**	**A8H0221 - 08 24 18 1450**

APEX LABS COOLER RECEIPT FORM

Client: Geo-Logic Associates Element WO#: A8 H0221

Project/Project #: Coffin Butte /AU18.1148.00

Delivery info:

Date/Time Received: 8/8/18 @ 1530 By: CM

Delivered by: Apex ___ Client ___ ESS ___ FedEx X UPS ___ Swift ___ Senvoy ___ SDS ___ Other ___

Cooler Inspection Inspected by: CM : 8/8/18 @ 1530

Chain of Custody Included? Yes X No ___ Custody Seals? Yes ___ No ✓

Signed/Dated by Client? Yes X No ___

Signed/Dated by Apex? Yes X No ___

	Cooler #1	Cooler #2	Cooler #3	Cooler #4	Cooler #5	Cooler #6	Cooler #7
Temperature (deg. C)							
Received on Ice? (Y/N)							
Temp. Blanks? (Y/N)	5.6						
Ice Type: (Gel/Real/Other)							
Condition:							

Cooler out of temp? (Y/N) Possible reason why: ___

If some coolers are in temp and some out, were green dot applied to out of temperature samples? Yes/No/NA

Samples Inspection: Inspected by: CM : 8/8/18 @ 1849

All Samples Intact? Yes X No ___ Comments: ___

Bottle Labels/COCs agree? Yes X No ___ Comments: ___

Containers/Volumes Received Appropriate for Analysis? Yes X No ___ Comments:

Do VOA Vials have Visible Headspace? Yes ___ No ___ NA X

Comments ___

Water Samples: pH Checked and Appropriate (except VOAs): Yes ___ No ___ NA X

Comments: ___

Additional Information: ___

Labeled by: CM Witness: WS Cooler Inspected by: CM See Project Contact Form: Y

Apex Laboratories

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Lisa A Domenighini

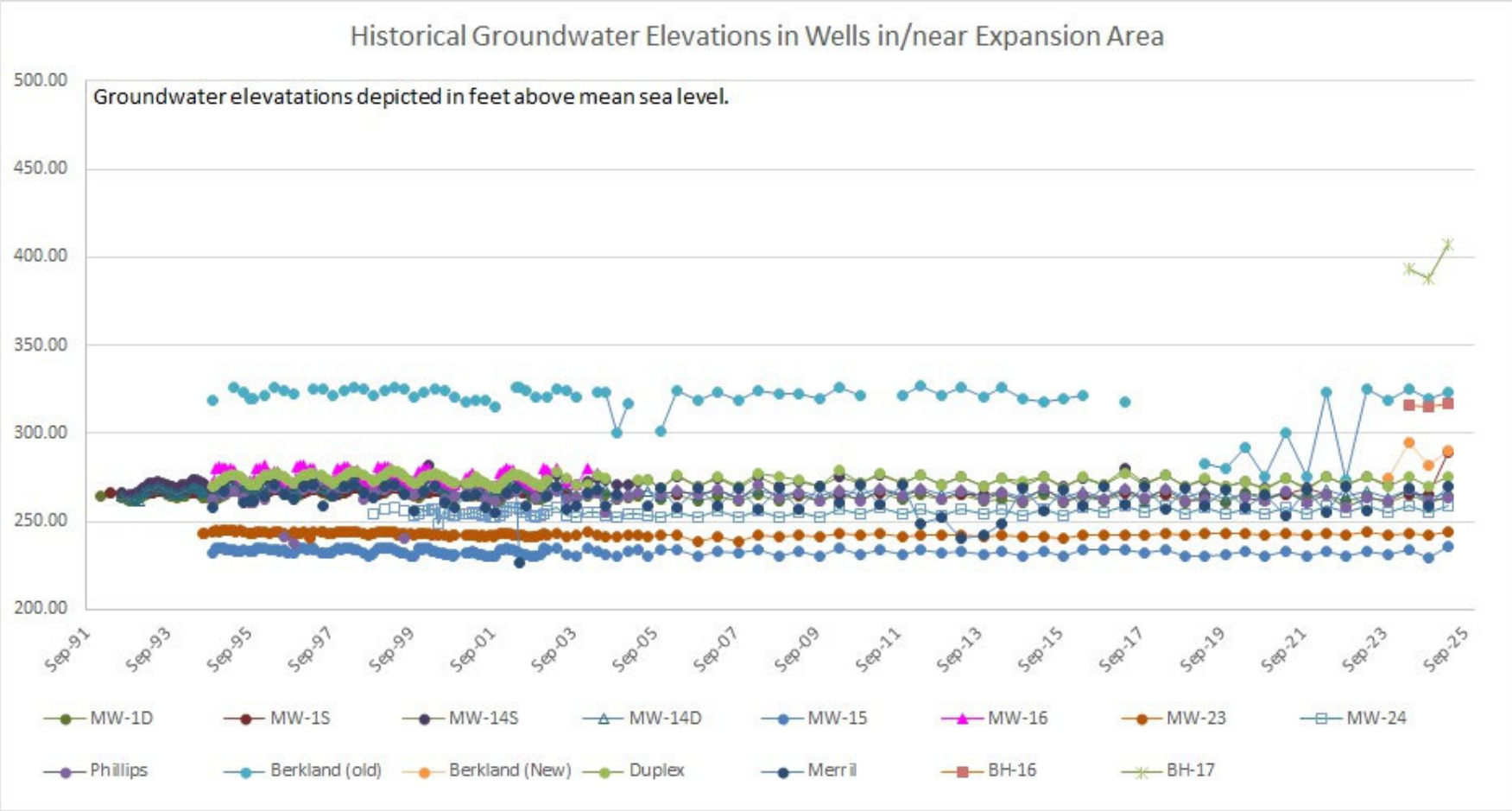
Lisa Domenighini, Client Services Manager

Appendix B – Groundwater Analytes

General Chemistry	Metals	Volatile Organic Compounds	
Ammonia as Nitrogen	Antimony	1,1,1,2-Tetrachloroethane	Bromomethane
Bicarbonate Alkalinity	Arsenic	1,1,1-Trichloroethane	Carbon disulfide
Chemical Oxygen Demand	Barium	1,1,2,2-Tetrachloroethane	Carbon tetrachloride
Chloride	Beryllium	1,1,2-Trichloroethane	Chlorobenzene
Nitrate and Nitrite as Nitrogen	Cadmium	1,1-Dichloroethane	Chloroethane
Sulfate	Calcium	1,1-Dichloroethene	Chloroform
Total Dissolved Solids	Chromium	1,1-Dichloropropene	Chloromethane
Total Suspended Solids	Cobalt	1,2,3-Trichlorobenzene	cis-1,2-Dichloroethene
Total Organic Carbon	Copper	1,2,3-Trichloropropane	cis-1,2-Dichloropropene
	Iron	1,2,4-Trichlorobenzene	Dibromochloromethane
	Magnesium	1,2,4-Trimethylbenzene	Dibromomethane
	Manganese	1,2-Dibromo-3-chloropropane	Dichlorodifluoromethane
	Lead	1,2-Dibromoethane	Ethylbenzene
	Nickel	1,2-Dichlorobenzene	Hexachlorobutadiene
	Potassium	1,2-Dichloroethane	Isopropylbenzene
	Selenium	1,2-Dichloropropane	Methylene Chloride
	Silver	1,3,5-Trimethlybenzene	Naphthalene
	Sodium	1,3-Dichlorobenzene	n-Butylbenzene
	Thallium	1,3-Dichloropropane	n-Propylbenzene
	Vanadium	1,4-Dichlorobenzene	sec-Butylbenzene
	Zinc	2,2-Dichloropropane	Styrene
		2-Butanone	tert-Butylbenzene
		2-Chlorotoluene	Tetrachloroethene
		2-Hexanone	Toluene
		4-Chlorotoluene	trans-1,2-Dichloroethene
		4-Isopropyltoluene	trans-1,2-Dichloropropene
		4-Methly-2-pentanone	Trichloroethene
		Acetone	Trichlorofluoromethane
		Benzene	Vinyl Chloride
		Bromobenzene	Xylenes-m
		Bromochloromethane	Xylenes-o
		Bromodichloromethane	Xylenes-p
		Bromoform	

Groundwater monitoring is conducted on a semiannual basis, and the results, including statistical analysis, time-series charts, hydrographs, equipotential contour maps, groundwater flow direction and gradients, and other information is provided as a comprehensive report to DEQ every year and provides the burden of proof to refute the Commissioner's allegations.

Appendix C – Well Level Data



Appendix D – Adair Fire Documentation

ADAIR RURAL FIRE & RESCUE

6021 NE Marcus Harris Ave • Adair Village, OR 97330 • Tel 541-745-7212 • Fax 541-745-2059

Broc Kienholz,
Valley Landfill, Inc.
28972 Coffin Butte Rd.
Corvallis, OR 97330

Dear Broc,

Enclosed is the response to your 6-10-2025 public records request asking for the "*Adair FD to confirm that we've received 28 calls for "Fires" at the coffin Butte Landfill from 2013-2025. This will not include PRC or any dispatched personal for other calls*".

Data was gathered from run sheets, call logs and electronic reporting data to filter out all motor vehicle fires, pole fires, medical calls, motor vehicle accidents or other events at or adjacent to the landfill address. None of the fires or other calls to the PRC location are included.

Eight of the nineteen calls listed on the attached chart were confirmed fires requiring suppression efforts. The eleven investigations were responded to as working fires tying up resources until they are proven to be false alarms, typically caused by the methane stacks.

Sincerely,

Mike Larkin, Staff Officer
Adair Rural Fire & Rescue

Enclosure: Page 2. Data Set.
CC: Chief Aaron Harris

"Desire to Serve • Ability to Perform • Courage to Act"

ADAIR RURAL FIRE & RESCUE
6021 NE Marcus Harris Ave • Adair Village, OR 97330 • Tel 541-745-7212 • Fax 541-745-2059

Fire Calls to Valley Landfills 28972 Coffin Butte Road facilities from January 1, 2013, through July 25, 2025. Data does not include fires at the PRC.

Date	Run#	Location	Type
4/28/2013	13-39	Land Fill Fire	Fire
7/20/2013	13-72	Land Fill Fire	Fire
8/20/2013	13-98	Land Fill Fire	Fire
12/1/2013	13-131	99 & Coffin Butte Road	Investigation
11/25/2014	14-126	99 & Coffin Butte Road	Investigation
6/20/2016	16-59	Land Fill Fire	Fire
5/27/2018	18-51	Land Fill Fire	Fire
8/11/2018	18-84	Land Fill Fire	Fire
3/2/2019	19-35	99 & Coffin Butte Road	Investigation
12/13/2019	19-172	99 & Coffin Butte Road	Investigation
3/1/2020	20-34	99 & Coffin Butte Road	Investigation
1/17/2020	21-11	99 & Coffin Butte Road	Investigation
21-189	21-189	99 & Coffin Butte Road	Investigation
12/24/2023	23-154	99 & Coffin Butte Road	Investigation
1/7/2024	24-01	99 & Coffin Butte Road	Investigation
1/11/2024	24-06	99 & Coffin Butte Road	Investigation
2/22/2024	24-19	99 & Coffin Butte Road	Investigation
5/18/2024	24-63	Land Fill Fire	Fire
7/24/2024	24-110	Stacks Grass Fire	Fire

Appendix E – John Hower, PE, CEG - Groundwater Responses

Joel Geier.

Mr. Geier provided 12 general comments directed at County staff following by 3 “Annexes” containing more specific comments. More specific comments are provided in the “Annexes”. The general comments are re-iterated in the Annexes, and require no formal response.

Geier Annex 1, Comment 6:

Assertion: Staff suggests that groundwater impacts will be addressed by “multiple levels of state and federal regulation” but they have not identified any specific regulatory steps in which risks of impacts on nearby wells will be assessed, nor have they event contacted the most appropriate state agency (Oregon Water Resources Department).

Response: the Applicant is required to comply will all site-specific, state, and federal regulations concerning the siting, design, construction, monitoring, and closure of the CBL. With respect to groundwater monitoring and reporting, these regulations include:

- Federal regulations concerning municipal solid waste landfill environmental monitoring and reporting requirements, including detection monitoring, assessment monitoring, evaluation and selection of a remedy, and implementation of corrective actions are found in Title 40, Part 258.50 through 258.58 of the Code of Federal Regulations.
- State of Oregon regulations concerning municipal solid waste landfill environmental monitoring and reporting requirements are found in Oregon Administrative Rules Chapter 340, Division 40 and Division 94, Rule 340-094-0080.
- Site-specific environmental monitoring requirements are found in Solid Waste Disposal Site Permit No. 306 and the site-specific Environmental Monitoring Plan.
- Oregon Department of Environmental Quality (not Oregon Water Resources Department) is the lead agency responsible for ensure proper implementation and adherence to these regulations.

Geier Annex 1, Comments 7-8. Comment directed at County. No response required.

Geier Annex 1, Comment 9.

Assertion: *Information presented by the applicant on groundwater topics is misleading on numerous counts, possibly deliberately so. It is also inadequate to support the applicant’s claim that groundwater resources will not be adversely affected, either in terms of quantity or quality.*

Response: See specific responses below.

9.a. Seismic disturbances from blasting

Assertion: the Applicant did not address how far and how strongly seismic waves propagate from blast holes.

Response: In fact, previous responses to comments do exactly that: The anelastic response to blasting is expected to be limited to about 15 feet from the blasting borehole. In addition, past seismic monitoring shows that at a distance of 1100 feet, the peak particle velocity is far below levels of concern for damage to structures.

Assertion: the Applicant and its consultants do not understand the seismic wave velocity/seismic wave amplitude from blasting and how it relates to building damage.

Response: The term "seismic velocity" referenced in the Applicant's response is the peak-particle velocity, which is a key metric in evaluating potential damage to residential structures associated with blasting operations; not the shear wave or seismic velocity that the author states it to be. The seismic measurements conducted by the Applicant follow typical industry standards for monitoring blasting operations.

Assertion: the Applicant has not addressed whether the natural fracture system could be affected by blast-induced seismicity. Applicant should evaluate fracture effects following an earthquake.

Response: Earthquakes and blasting events are very different ground motion events. Earthquakes are typically characterized by low frequency, high velocity, longer duration shaking events that release far more energy by even a magnitude 1 event than a blasting event of the size that would be deployed in the proposed CBL expansion area, which is characterized by high frequency, low velocity, very short duration shaking. Stating that blasting can affect groundwater elevations because earthquakes affect groundwater elevations is a technically inappropriate comparison. The better comparison is to look at the response of groundwater levels at the CBL to past blasting events and extrapolating those effects to the expansion area. Groundwater elevations in the CBL monitoring network have not shown a long-term effect to blasting or landfill development operations. Consequently, it is very unlikely that blasting and landfill development in the proposed expansion area would affect groundwater conditions

the Applicant's commitment to installing and monitoring sentry wells and nearby residential water supply wells (upon gaining permission to do so from the residents) is an appropriate and adequate means in which to evaluate groundwater conditions surrounding the expansion area.

Comment 9.b: Regarding Dewatering Effects on Neighboring Wells

Assertion: Applicant has not provided the mathematical formula used, nor the results, nor the parameter values that they assumed as input for their calculation.

Response: the Applicant used the Dupuis solution supported by conservative assumptions of hydraulic conductivity and fracture interconnectivity to estimate the effect of the proposed expansion development on groundwater conditions upgradient of the proposed expansion area. Recognizing that this is a simplified estimation of groundwater flow, the Applicant is committing to conduct a hydrogeologic investigation of the proposed expansion area to obtain specific information about fracture spacing, distribution, interconnectivity, boundaries, and hydraulic properties. The results of the hydrogeologic investigation will be used to construct a working hydrogeologic model of this portion of the landfill and to site and design sentry wells. Sentry wells along with residential water supply wells will be used to monitor groundwater conditions during and following landfill expansion. If the monitoring data suggest that the development and operation of the expansion area are having a deleterious effect on the community water supply, the Applicant is committed to working with the community to develop a mutually-acceptable solution to mitigate the condition.

Comment 9.c: Arsenic.

Assertion: the Applicant "cherry picked" the information from the USGS study by Hinkle and Polette (1999), omitting mention of contradictory evidence.

Response: Not all data found in the Hinkle and Polette 1999 study are applicable to the geologic conditions at the CBL. the Applicant used the data and findings from that study that appeared most applicable. The important finding from the Hinkle and Polette 1999 study is that arsenic occurs naturally in groundwater in large portions of the State of Oregon at concentrations that are similar to those measured in groundwater at CBL.

Assertion: the Applicant misled the County about the arsenic levels near the CBL - of the wells and spring near the CBL that are refenced in the USGS study, only one contained arsenic at a concentration that exceeded the maximum contaminant level.

Response: the Applicant notes that the presence of arsenic in groundwater near the Coffin Butte Landfill is due to two factors: naturally-occurring arsenic in the screened water-bearing zone and a low dissolved oxygen content of the water-bearing zone. Both are needed to yield high concentrations of arsenic in the groundwater. If either factor is absent in the wells cited by the author in the USGS study, then elevated arsenic would not be flagged in the USGS report for those wells and the spring. The dissolved oxygen content of groundwater in the USGS study was not presented, and so it is not possible to conclude that the low arsenic concentrations were because the wells were screened in formations with low arsenic concentrations or the groundwater contained moderate to high dissolved oxygen concentrations that would have precipitated the arsenic out of groundwater.

Assertion: The commentor, citing the 1999 USGS study by Hinkle and Polette, asserts that arsenic is from the rhyolitic and intermediate-compositions of volcanic rock of the Eugene and Fisher formations of Lane and Line counties.

Response: The quotation cited by the commentor actually acknowledges that arsenic can come from basalts. When reviewing the entire quotation citied, it reads: "High arsenic concentrations in Lane and Linn Counties appear to be associated with two regionally extensive associations of rocks, the Fisher and Eugene Formations and correlative rocks, and the undifferentiated tuffaceous sedimentary rocks, tuffs, and **basalt**."

The CBL is underlain by the Siletz River Volcanics, not the Fisher and Eugene formations, so comparison of the arsenic concentrations in those formations is not meaningful. Arsenic is known to occur in soils derived from the Siletz River Volcanics, which are composed primarily of pillow basalt, basalt breccia, and tuffaceous and marine deposits. A 2013 Master's degree thesis published by Portland State University (Ryan Rickard, Tracy, 2013, "Arsenic in the soils of Northwestern Oregon") found arsenic at concentrations ranging from 2.62 to 2.68 milligrams per kilogram in samples collected from Siletz River Volcanics just west of the City of Corvallis. At those concentrations it is conceivable to produce dissolved concentrations on the order of those observed in groundwater at wells MW-9S, MW-26, and MW-27 near the eastern property boundary.

Assertion: the Applicant's presentation of data from monitoring wells at CBL is also misleading. The scale is 10 times the maximum range of the data. The most recent data were omitted from the graphs.

Response: The scale of the graphs presented in the June 12, 2025 memorandum was selected to compare the chloride and arsenic data from all three wells at the same scale. The most recent data were not intentionally omitted, but had not been updated into the Applicant's database. The new data do not change the interpretation of groundwater conditions in this area of the landfill.

Assertion: The AEMR statement about leachate seepage near MW-23 contradicts the statement in oral testimony on July 9th, that there has never been a seepage event from any of the lined cells at Coffin Butte.

Response: The statement made during oral testimony was factual: there has not been leachate discharged through the lined sections of the landfill. The seepage that occurred from Cell 2 was from an open face of the landfill; it did not occur by leakage through the liner system. This seepage occurred prior to the Applicant taking ownership and operational responsibility for the CBL.

Assertion: The second plot in Exhibit 49 (reproduced in the commentor's written statement) shows that the initial measurement of chloride in MW-9S was about 50 mg/L, but soon jumped by nearly a factor of 6.

Response: Well MW-9S was constructed about 40 years ago. It was common practice to introduce potable water to a monitoring well during the well development process to aid in the removal of sediment in the screen and filter pack. Samples were typically collected immediately after development was completed and often contained some amount of the potable well-development water. This resulted in diluted samples that were not representative of aquifer water quality. This phenomenon can be seen in time-series charts for many wells that were constructed during this time period.

Assertion: The commentor notes that lower chloride levels are seen in the two compliance-boundary wells, MW-26 and MW-27, but states that this does not necessarily rule out that the high levels of arsenic observed in those wells could come from past or ongoing leaks.

Response: A release from a landfill is not characterized by elevated concentrations of a single monitoring parameter. As the commentor stated previously, the discharge from Cell 2 resulted in increases in hardness, bicarbonate alkalinity, chloride, TDS, dissolved metals AND arsenic in samples from well MW-23. Likewise, if a leak were to have occurred from the eastern portion of the landfills, concentrations of several monitoring parameters would increase over time. Furthermore, concentrations of arsenic in samples from wells MW-9S, MW-26, and MW-27 are NOT increasing over time. Concentrations show temporal variability inversely proportional to dissolved oxygen concentrations.

Assertion: As noted by the Applicant's consultants, chloride and arsenic have different mobility in the subsurface environment. This means, for example, that arsenic released by seepage from a zone of anoxic conditions below the landfill could precipitate in soils as a leachate plume emerges from under the landfill, even as chloride is carried onward by the groundwater.

Response: It is for this very reason that groundwater at the CBL is monitored for more than 60 monitoring parameters.

Assertion: The commentor suggests that groundwater flow conditions can change the position of a leachate plume.

Response: No leachate plume has been identified from lined portions of the landfill. The groundwater flow conditions at the landfill have not changed significantly since monitoring began. The adequacy of the environmental monitoring network is evaluated by ODEQ with submittal of every annual monitoring point and with submittal of each Environmental Monitoring Plan. compliance boundary.

Comment 10:

Assertion: Applicant provides no model results or other calculations to justify the position of these wells or why just two or three wells just outside the landfill footprint should be sufficient.

Response: Please see response to comment 9.b.

Comment 11: Critique of Benton County staff. No response needed.

Comment 12:

Assertion: Benton County conditions of approval are not legally binding.

Response: The conditions of approval are legally binding and are subject to enforcement by the County up to and including revocation of the CUP.

- Note: all work conducted under the supervision of a State of Oregon Registered Professional Geologist. John Hower not registered to practice in State of Oregon. Gary Lass (John's supervisor) is a State of Oregon Engineering Geologist. Eric Tuppan is a State of Oregon Licensed Geologist

---

Commentor: Camille Hall

Assertion: Blasting and excavation and excavation will affect groundwater and wells on adjacent properties.

Response: Please see response Geier Comment 9.a.

Assertion: Groundwater from the north half of the landfill or expansion area will contaminate wells on adjacent parcels.

Response: Groundwater from Tampico Ridge flows toward the landfill. It does not flow from the landfill toward Tampico Ridge. As a result, it is not reasonable to expect groundwater from the landfill to affect water quality in wells along Tampico Ridge.

Assertion: The applicant does not provide evidence to convince us of the factual basis for this assumption.

Response: The groundwater elevations, flow directions, and gradients beneath the existing landfill have not changed in response to the lined development of the landfill over the last 30 years. This observational evidence is reported in every annual monitoring report.

Commentor: Kate Harris

Assertion: PFAS found near WWTP, PFAS regulations are lacking, Republic should fund PFAS testing in Adair Village.

Response: None needed.

Commentor: Jenny Saarloos

Assertion: Promises can be made to keep the leachate from getting to the groundwater. But there is no way to guarantee that.

Response: The proposed expansion will be fully lined with a state-of-the-art composite liner system. The composite liner system will be constructed under third-party construction quality assurance observation and testing, including geo-electric leak location surveys to ensure the integrity and function of the constructed liner. Leak detection layers will be integrated into routine monitoring program, and will be sampled to evaluate future liner system performance. Groundwater monitoring will continue to identify potential impacts to water quality. These design, construction, and monitoring practices provide assurances that environmental quality will be maintained throughout the active life and post-closure period of the landfill.

Appendix F – Joe Bessman, PE - Construction Traffic Memo

TRANSIGHT CONSULTING, LLC
Transportation Engineering and Planning Services

Date:	August 25, 2025
To:	Petra Schuetz
From:	Joe Bessman, PE
Project Reference No.:	1539
Project Name:	Coffin Butte Landfill Appeal

This memorandum supplements the record for the Coffin Butte Landfill expansion with a response to transportation comments from the Benton County Planning Commission recommendation for denial. There were two comments within the decision that this response addresses:

> **Comment 1:** Traffic Impact Analysis submitted by applicant does not include 3-4 years of construction traffic, increase of traffic from nearby housing developments traffic– witness accounts used in part to determine traffic impacts…leaving questions regarding modeling used and validity of report."
>
> **Comment 2:** Traffic impact analysis that does not address remaining 35% increase of waste intake at current site, simultaneously as the blasting and development of proposed site, the filling of Cell 6 simultaneously or any impact from removal of tonnage cap – based on assumption traffic volumes will not change"

A response to each of these comments is provided below.

Comment 1: Quarry (Construction) Traffic Inclusion

Response: The transportation impact analysis for Coffin Butte was finalized in February 2024 and supplemental information responsive to this comment was provided on May 23, 2025 within the public open record period. As summarized within these materials, trip rates for landfills are somewhat variable depending on the amount of public versus commercial access, as well as the landfill tonnage and area supported. To capture the specific characteristics of Coffin Butte Landfill, traffic counts were collected at the site entrance and surrounding roads in January 2021, March 2021, January 2022, September 2023, and April 2025. The actual volume of entering cars and trucks was used to identify current operations.

The activity captured at Coffin Butte Landfill not only captured trips associated with the landfill, but also with the adjacent construction of the former Knife River quarry site, which was being excavated to serve as the future landfill site. Accordingly, the traffic counts include quarry trips (construction trips) plus landfill trips. In fact, the April 2025 traffic counts even included the accelerated construction of the landfill expansion area to the west to enable near-term use of this airspace.

As noted, the traffic study does not directly account for any nearby housing development traffic using what is commonly referred to as "in-process trips" – there were no nearby housing developments identified by staff within the scoping process that contribute trips onto Coffin Butte Road or impact the study intersections. The study does, however, broadly account for traffic growth as part of regional housing changes using growth rates identified in the Linn-Benton Transportation System Plans.

The traffic study was reviewed by County staff, ODOT staff, and the County's consultant reviewer. Each reviewer found that the traffic study reasonably assesses the system impacts and agreed with the reports' findings and conclusions.

Comment 2: Increased Waste Accommodation

Response: This comment was previously addressed within "Comment 1" of the June 17, 2025 VNEQS response that was submitted into the record. Republic Services has stated that there are no plans to modify site operations beyond its current tonnage. Regardless, the Transportation Impact Analysis had been prepared assuming that the current level of traffic and nearby quarry (landfill construction) operations could increase by 50% within the future analysis scenario. This analysis found that the study findings do not change, and all of the study intersections continue to operate acceptably and well within their carrying capacity.

As previously noted, tonnage and trips are not directly correlated; the presence of transfer stations that "intercept" landfill trips results in fewer trips with larger trucks (heavier loads and higher per-vehicle tonnage) from longer distances. Some transfer stations also include solid waste compactors, which can increase tonnage within an equivalent volume. Accordingly, as the site is already a regional landfill that provides trash services for adjacent counties, any increase in tonnage would necessarily occur from longer-distance transport. A 35 (or 50) percent increase in site trips (which would predominantly consist of larger transfer trucks rather than personal vehicles, dump trailers, or even garbage trucks) equates to more than double the current tonnage and would still provide a very conservative analysis. There are no current plans by Republic Services to increase its operations at the site, but operational fluctuations have occurred historically, and the site's transportation elasticity can readily support these levels.

The comment indicates that new waste streams will occur that will change the results of the traffic study. It is not clear from the comments where the additional 35% of waste intake will come from, but the assumptions within the traffic study fully account for this level of change, as well as the simultaneous blasting and development of Cell 6 (which is largely an on-site operation that does not impact the public street system). The traffic study accounted for conditions at Coffin Butte with the accelerated Knife River construction of an adjacent landfill cell (Cell 6), as well as on-going monitoring and maintenance of older cells. The construction of the proposed expansion site would be similar to these prior activities. Again, the traffic study does not assume traffic volumes will not change, it demonstrates that the system has capacity for the volumes to change by 50% while continuing to operate acceptably with low delays for traffic turning onto or off of Coffin Butte Road.

Assessing construction conditions at a higher level of accuracy is not possible at this time. There are no construction plans developed for the site, and these will vary seasonally and depending on the subsurface materials encountered. If there is a need for a crossing of Coffin Butte Road this could readily be accommodated on this low-volume rural Collector, but further coordination will be required with the County when additional details on the specific location, types of construction vehicles, and duration are known. The prior traffic counts collected by Benton County staff and third-party data collection firms show about one eastbound or westbound vehicle every five minutes on Coffin Butte Road east of the Soap Creek Road intersection during the evening peak hour, and about one vehicle every two minutes during the early afternoon peak hour when the Knife River Quarry site was in operation. When Knife River was operating with an accelerated schedule there was nearly one vehicle in either direction per minute (between 2:00 and 3:00 p.m.), with about 75% of these associated with the quarry. With this elevated level of site operations all of the study intersections operated acceptably at Level of Service "B" or better, which is well within Benton County performance standards.

NEXT STEPS

As discussed at the Planning Commission hearings, the traffic study for the landfill expansion accounts for expanded operations, adjacent landfill construction, and general population growth, despite the Benton County Talks Trash (BCTT) report showing "steady annual tonnage intake of between 1 million and 1.1 million tons for the duration of the landfill's projected remaining site life." (BCTT, pp 618). Even in a highly aggressive and conservative analysis scenario with a 50% increase in site trips all of the study intersections will operate acceptably, indicating substantial system resiliency. These findings have been reviewed and agreed to by County staff, ODOT, and the County's consultant review team.

Thank you for the opportunity to provide these transportation materials in response to the Planning Commission findings, if you have any questions I can be reached at (503) 997-4473 or via email at joe@transightconsulting.com.

Appendix G – Adam Jenkins, PE, INCE Bd. Cert., CTS-D - Construction Noise Assessment

THE GREENBUSCH GROUP, INC.

Memorandum

DATE: *September 10, 2025*

TO: *Jeff Shepherd, PE – Civil & Environmental Consultants, Inc.*

FROM: *Adam C. Jenkins, PE, INCE Bd. Cert., CTS-D*
Justin Morgan, INCE

RE: *Republic Services Coffin Butte Landfill – Construction Noise Assessment*

This memorandum provides responses to findings relating to noise identified in the Benton County Planning Commission Decision on the Conditional Use Permit for the expansion of the Coffin Butte Landfill issued on July 22, 2025 (Decision). Many of the findings pertained to noise that would be produced during the construction of the expansion area. Additional sound level measurements and analysis were completed since the Decision was issued to investigate concerns identified in the Decision. While not referenced in the Decision, a discussion of vibration levels from blasting activities is also presented since it was mentioned during public testimony.

Exhibit A-1 Fowler Opening Statement

I am particularly moved by adjacent neighbor testimony indicating blasting is causing stress on livestock, impacting their livelihood. One top of existing operation noise, the expansion will have three to four years of six to eight months per year of major earth moving in advance of operations. Anyone with pets on the 4th of July not only empathizes but can see adverse impact from development noise. And, blowing debris also threatens livestock. These are serious interferences, not nuisances. Fencing may, but is not guaranteed, to address ingestion risk to livestock. I do not see how the existing proposed conditions of approval sufficiently mitigate the impact of noise on both the agricultural and residential zones.

Operations within the expansion area are anticipated to be quieter than median existing sound levels and up to 6 dB above the quietest existing daytime sound level. Please refer to the response to Exhibit A-4, Biscoe Opening Statement for additional information regarding construction noise and blasting.

Exhibit A-3, Lee Opening Statement

53.215.1 Noise seriously interferes with uses on adjacent properties and the character of the area:

The applicant stated: *Typically, construction activity to site a proposed use is not considered part of the impact for conditional use review.*

I believe I have the option to disagree.

Noise levels already cause concerns. The applicant proposes blasting and other construction noise to take place over the span of at least 4 years, on top of the noise levels already causing complaint.

OP-2 is intended to mitigate noise only after commercial operation begins, and specifically not during the construction phase. This is not adequate to respond to interference with uses on adjacent properties and the character of the area from the application.

OP-2 relies on reporting noise. Enforcement of this COA would result in lots of reports, but no mitigation.

Please refer to the final comment response to Exhibit A-4, Biscoe Opening Statement for additional information regarding construction noise and blasting .

Exhibit A-4, Biscoe Opening Statement

Expansion impacts of the construction period, reported by RS to be up to 8 months for up to 4 years, resulting in 32 months of blasting, truck hauling rock, increased traffic and noise (Joel Geier, May 6, 2025) – this is not part of the conversation when we consider noise, odor, traffic, livability for nearby neighbors – not been considered in the application and not presented here other than intermittently by public testimony.

Construction noise and noise generated by blasting operations have now been assessed. Please refer to the response to the final comment response for additional information regarding construction and blasting noise.

Noise pollution and heavy truck and waste hauling traffic has been a persistent complaint topic regarding current operations of the Coffin Butte Landfill. The expansion application did not address noise concussions, increased heavy truck traffic to remove 2.1 million cubic yards of blast material from the expansion site, and other heavy equipment noises and impacts for the construction of the expansion area, including removal and mitigation of the current leachate ponds. The combined adverse impacts, undue burden and serious interference of the region due to the noise and traffic increases of the combined current operations and the expansion area were not addressed, including any reasonable mitigation to the region or surrounding properties proposals by Republic Services.

An assessment of construction noise has now been completed, including noise from blasting and hauling activities within the expansion area. Please refer to the final comment response in this section for additional information.

Construction phases of expansion are not included in the LU-24-027 application analysis. There is insufficient information on combined traffic and noise, impacts resulting from applicant reported 2.1 million cubic yards of rock blasted and removed – An estimated 147,000 – 220,000 truckloads for just the expansion phase of this application and easily calculated by the most common size of hauling trucks and volume of material removed. This phase is expected to take place over an estimated 32 months of the next 48… continuously for 6-8 months at a time.

Sound levels generated from blasting are regulated by the Oregon Administrative Rules (OAR) Section 340-035-0035, which prohibits sound levels at nearby properties from exceeding 98 dBC (slow response, LCS_{max}) between the hours of 7 a.m. and 10 p.m. and 93 dBC (slow response, LCS_{max}) between 10 p.m. and 7 a.m. Although sound levels from construction operations are not regulated by local or state noise ordinances, sound levels produced during the construction phase and blasting have now been assessed.

Sound level measurements were made of blasting and construction equipment in existing Cell 6 on August 25th and 28th, 2025. Sound levels from bulldozers, excavators, empty and full haul trucks, rockdrills, and blasting were measured. This information has been used to predict sound levels in nearby areas from construction and blasting operations occurring within the expansion area.

Construction equipment was located within a computer noise model at locations and elevations where construction is likely to occur based on information provided by Republic Services. Haul routes through the expansion area were also included in the model. Equipment sound levels used to model construction noise emissions were based upon the sound levels measured from construction equipment on August 25th and 28th, 2025. Similar construction activities were modeled at three locations within the expansion area, all operating concurrently, and each with a separate haul route. Each haul route was assumed to include 20 haul trucks per hour.

The results of the noise modeling indicate that construction noise will be up to 5 dB louder than median existing daytime L_{50} sound levels in the area. Increases to the existing daytime sound levels are anticipated to be highest near Locations 1 and 4 (please refer to the Republic Services Coffin Butte Landfill Noise Study dated September 25, 2023 for the locations of predicted sound levels).

Sound levels generated by blasting were also modeled. Blasting operations were measured at a nearby site to represent similar soil types found within the expansion area. Sound levels were measured approximately 300 feet away from the blast and the loudest 1-second LCS_{max} recorded during the blast was used as a source level in the noise model. Sound levels used in the computer noise model are likely conservative because the charges that will be used within the expansion area are likely to be less powerful than the ones measured near the site. Blasting was modeled near the southwest corner of the expansion area at the highest elevation that blasting is likely to be needed.

Based on the results of the noise modeling, the loudest 1-second LCS_{max} sound level anticipated to be experienced from blasting is 88 dBC at Location 4, which is 10 dB quieter than the daytime sound limits for blasting identified in the Section 340-035-0035 of the OAR.

In addition to modeling sound levels from blasting, vibration generated by blasting was also modeled. Vibration produced by blasting was measured at four different distances from blasting operations within Cell 6 and was used to predict how vibration propagates through similar soils as those found within the expansion area.

Criteria for potential cosmetic damage to buildings found in the Federal Transit Administration Transit Noise and Vibration Impact Assessment Manual dated September 2018 (FTA Manual) were used. Damage criteria used by the FTA Manual applies to the foundation of structures and is based on the construction of the structure. FTA Damage criteria is shown in Table 1.

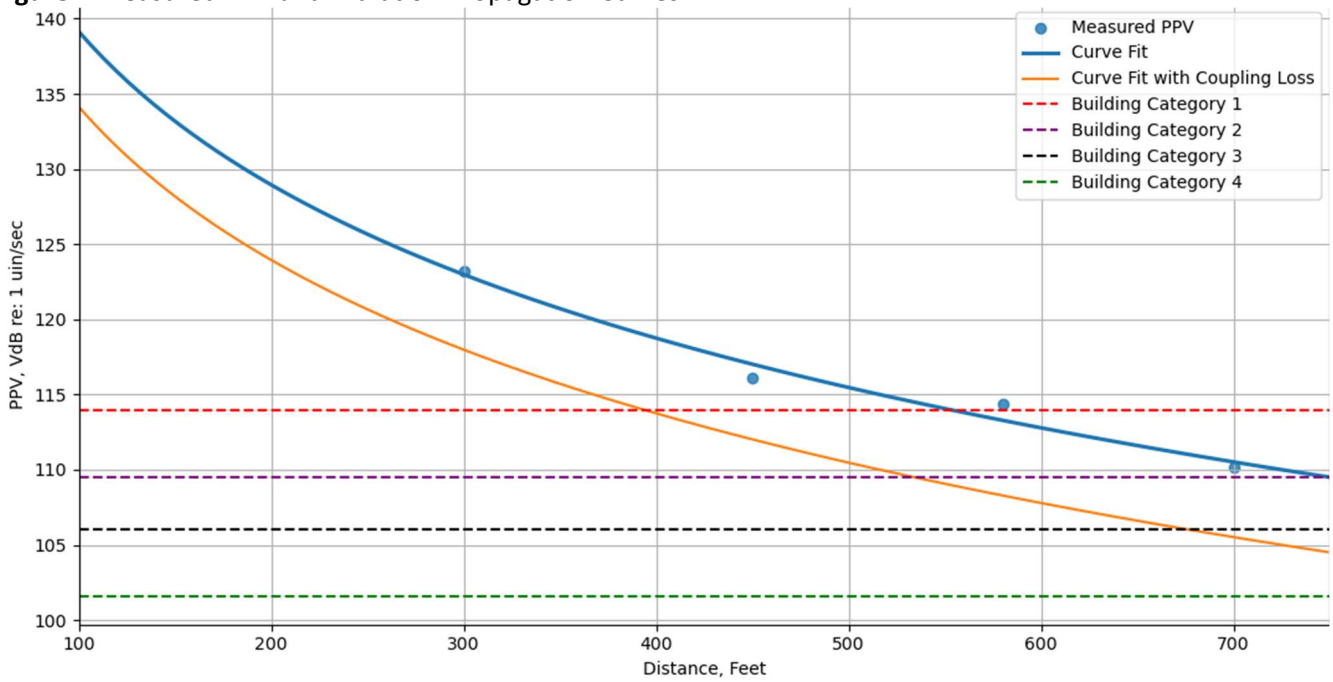
Table 1 FTA Damage Criteria

Building/Structural Category	PPV, in/sec	PPV, VdB re: 1 μin/sec
1.Reinforced-concrete, steel or timber (no plaster)	0.5	114
2.Engineered concrete and masonry (no plaster)	0.3	110
3.Non-engineered timber and masonry buildings	0.2	106
4.Buildings extremely susceptible to vibration damage	0.12	102

The FTA Manual also includes typical coupling losses between soil and a variety of structures and types of foundations. Based on this information, the typical attenuation between soil and wood-framed houses is typically -5 dB.

Measured peak particle velocity levels, resulting vibration propagation curve, and vibration propagation curve including coupling loss between building foundations and the soil are shown in Figure 1. The resulting R^2 value of the curve, which is a measure of how well the curve is fit to the data, was 0.99, and a curve fitting the data exactly would have a value of 1.

Figure 1 Measured PPV and Vibration Propagation Curves



Vibration levels from blasting within the expansion area are anticipated to be less than those measured within Cell 6 and therefore the levels shown in Figure 1 would likely be lower. Reduced vibration levels will likely result from the use of smaller charges within the expansion area. Additionally, vibration propagation was measured through rock that was exposed in Cell 6. The foundations of structures situated near the expansion area are unlikely to be within the same hard subsurface as blasting and therefore vibration propagation between the rock being blasted and the looser surface soils would reduce vibration levels received at the structures.

In conclusion, construction noise is anticipated to be up to 5 dB louder than typical existing daytime levels, which will not result in any significant noise effects. Sound from blasting is predicted to be 10 dB quieter than the sound limits for blasting identified in the OAR, which is approximately half as loud as what is allowed by Code. Vibration from blasting is not expected to affect any existing structures within 675 feet of the center of the blast site, therefore no structures will be affected.

Sincerely,

Adam C. Jenkins, PE, INCE Bd. Cert., CTS-D
Vice President – Acoustical