



# Coffin Butte Landfill 2024-25 CUP Application

Benton County Planning Commission, April 29, 2025

**Coffin Butte Landfill's new expansion proposal is the culmination of more than three years of active listening and understanding, dialogue and consideration, and planning that incorporates feedback from various community stakeholders wherever possible.**



Photos courtesy Benton County (via Benton County Talks Trash Final Report).



## EXPANSION PROPOSAL MAP



## APPLICATION PROPOSAL HIGHLIGHTS

### 2021 PROPOSAL

Additional 12 years of landfill life.

Closure of Coffin Butte Road.

Anticipated final grade of 270 feet.

Portions of landfill expansions located on parcels zoned for other uses.

Lacked community input.

### OUR CURRENT PROPOSAL

Reduces volume and scope by 50% (6 years of additional life).

Maintains and improves Coffin Butte Road (designated truck turn lane and new bike lanes).

Anticipated final grade of 180 feet.

Operations contained to parcels designated as Landfill Site and owned by Valley Landfills, Inc.

2+ years of community input, including Benton County Talks process and outreach meetings.





Improved vegetative screening along transportation corridors.

Includes robust technical studies, including odor modeling, wildlife, leachate and groundwater monitoring.



## COMMUNITY BENEFITS

### Why Expansion Makes Sense

-  Critical infrastructure for growing communities.
-  Economic engine, contributing between \$2 and \$3.5 million annually to Benton County's discretionary income.
-  Affordable, local disposal of waste for residents and businesses.
-  Continuous and reliable capacity while Benton County continues its work on a solid materials management plan.



## BENTON COUNTY STAFF REPORT

Republic Services has been working earnestly to better understand the concerns outlined in the Benton County Staff Report and is actively engaged in addressing them.

Below is a short timeline of events and steps taken thus far.

### Thursday, April 17

Benton County informs us it will be recommending denial of LU 21-047 (Coffin Butte CUP application) based on some of the findings in our odor and noise studies. The County provided certain feedback from the draft staff report for our review.

### Friday, April 18

Republic Services immediately begins meeting with our consultants to begin discussing County's concerns. We formally reach out to the County to request a meeting with staff and their consultants.

### Monday, April 21

We distributed a written memo the county addressing the concerns that had been provided with us. We had an initial meeting with the County's consultants to discuss findings, differences in methodology and approach, and potential areas of common ground.

### Tuesday, April 22

Staff report released with additional comments we continue to address.

### Tuesday, April 29

Benton County Planning Commission hearing on LU 21-047.

## APPLICABLE CRITERIA

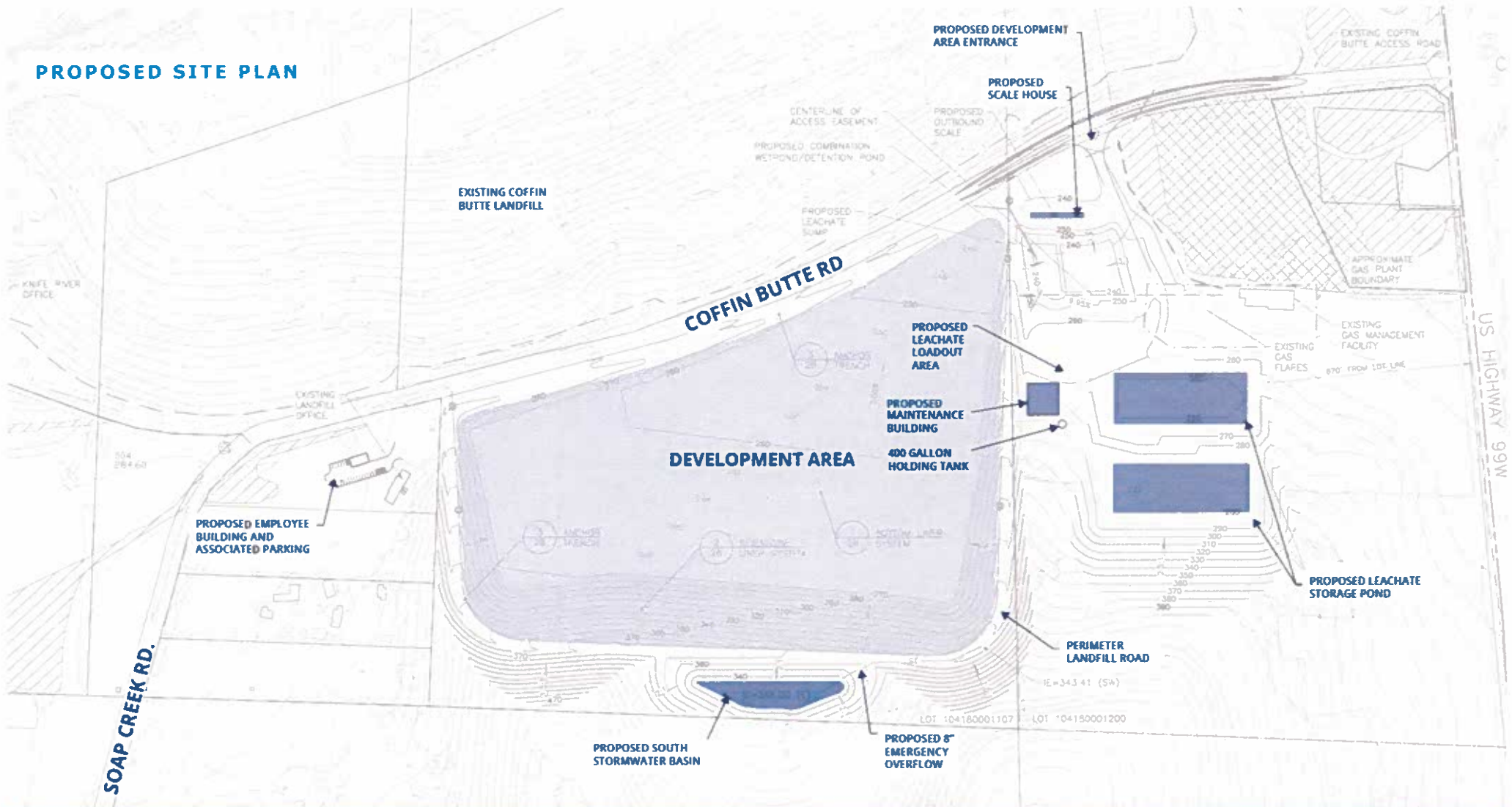
**1** Landfills are permitted uses in the Landfill zone and the Forest Conservation Zone, subject to obtaining a conditional use permit.

**2** The CUP criteria focus on impacts on adjacent properties and the surrounding area.

- a. The proposed use does not “seriously interfere” with uses on adjacent properties.
- b. The proposed use does not “seriously interfere” with the character of the area or the purpose of the zone.
- c. The proposed use does not impose an “undue burden” on public facilities/services.

**3** These criteria must be considered in the context of the existing landfill operation and the fact that regional solid waste disposal has been occurring on this site for over 50 years.

## PROPOSED SITE PLAN







01

# Noise Study & Findings

## METHODOLOGY & APPROACH

Our noise modeling assessment measured both existing sounds and predicted sounds. The smaller scope of the expansion proposal resulted in a revised noise model.

**Predicted sound levels from the proposed operation do not exceed state code noise standards.**

*A noise-sensitive property is defined as one that is used for sleeping, churches, schools, hospitals or public libraries.*



## NOISE LIMITS & EXISTING SOUND LEVELS

The noise study measured existing sound levels near the proposed expansion area and sound levels produced by equipment currently being used at the landfill. We predicted sound emissions from future operations both for beginning grade and maximum anticipated grade.

- Regulatory sound limits are detailed in the Oregon Administrative Rules.
- The Department of Environmental Quality oversees noise thresholds.
- Benton County does not have its own noise limits, use state thresholds because there are no local requirements

Sound levels in noise study. (Includes sound levels measured during all hours, not just proposed operating hours.)

Measurement Location	Daytime, dBA	Nighttime, dBA
	L <sub>50</sub>	L <sub>50</sub>
Location 1	21-51 (32)	15-50 (22)
Location 2	30-50 (38)	26-48 (29)
Location 3	45-56 (53)	27-53 (36)
Location 4	26-47 (39)	24-46 (29)



## NOISE LIMITS & EXISTING SOUND LEVELS

Modeling and outcomes on this slide were adjusted in response to staff report feedback. This slide shows updated sound levels based on operating hours.

- This model is based on feedback from County reviewers about the 10db increase to existing conditions at Location 1.
- The submitted noise study was conservative and used all hours (i.e. 10 p.m. to 7 a.m. as nighttime) to calculate existing sound levels.
- Existing sound levels are higher during proposed operating hours, so the Noise Study overstates the potential for noise impact.
- Using the decibel average instead of the median would yield the same result at Locations 2 and 3 and increase existing ambient levels at Locations 1 and 4 by 1dB.
- Using only operating hours, predicted levels are less than existing ambient conditions (median L50) at all locations for Scenario 1.

Updated sound levels for only those hours during which the facility would be operating.

Measurement Location	Daytime, dBA	Nighttime, dBA
	L <sub>50</sub>	L <sub>50</sub>
Location 1	27-41 <b>(34)</b>	30-38 <b>(34)</b>
Location 2	33-41 <b>(38)</b>	34-39 <b>(37)</b>
Location 3	47-56 <b>(54)</b>	47-53 <b>(51)</b>
Location 4	28-47 <b>(41)</b>	34-46 <b>(40)</b>

## PROJECT SOUND LIMITS

Predicted sound levels included in this Noise Study comply with applicable regulatory criteria without the inclusion of noise mitigation. Although not required to comply with code limits, **it is recommended that backup alarms used on the site be replaced with ambient sensing broadband backup alarms**, if permitted by safety regulations.

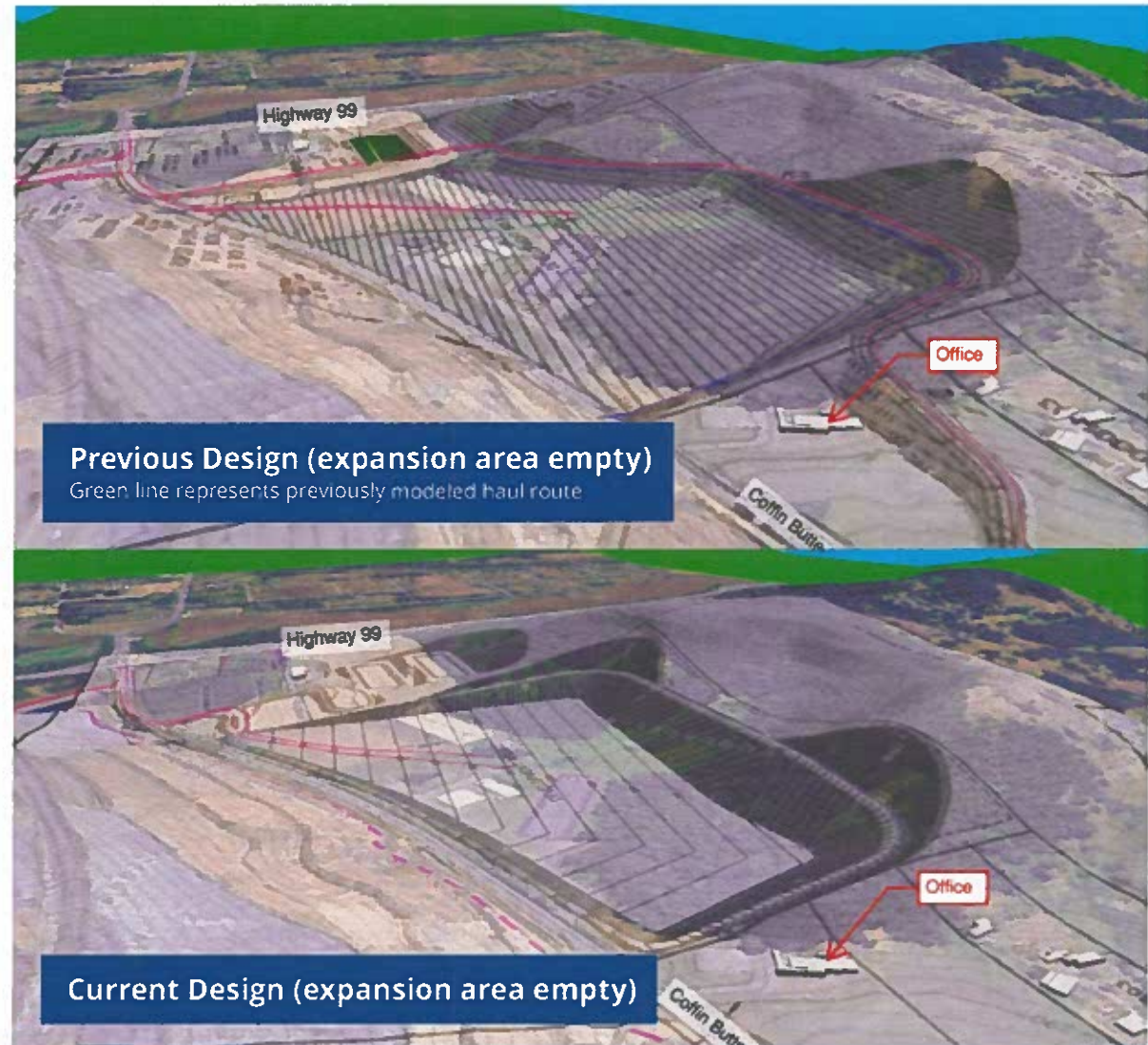
Updated sound levels for only those hours during which the facility would be operating.

		OAR Table 8 Limits (X)	Existing Sound Levels	Existing + 10 dB (Y)	Project Limit (lowest of X and Y)	Scenario 1 Predicted	Level Above Existing
Location 1	Daytime	55	34	44	44	27	0
	Nighttime	50	34	44	44	27	0
Location 2	Daytime	50	38	48	48	35	0
	Nighttime	55	37	47	47	35	0
Location 3	Daytime	55	54	64	55	39	0
	Nighttime	50	51	61	50	39	0
Location 4	Daytime	55	41	51	51	39	0
	Nighttime	50	40	50	50	39	0

## UPDATED EXPANSION PROPOSAL

The new, smaller design of the proposed CUP expansion area significantly impacted our sound modeling predictions, especially the new haul route.

We modeled both with the expansion area empty, and at capacity.

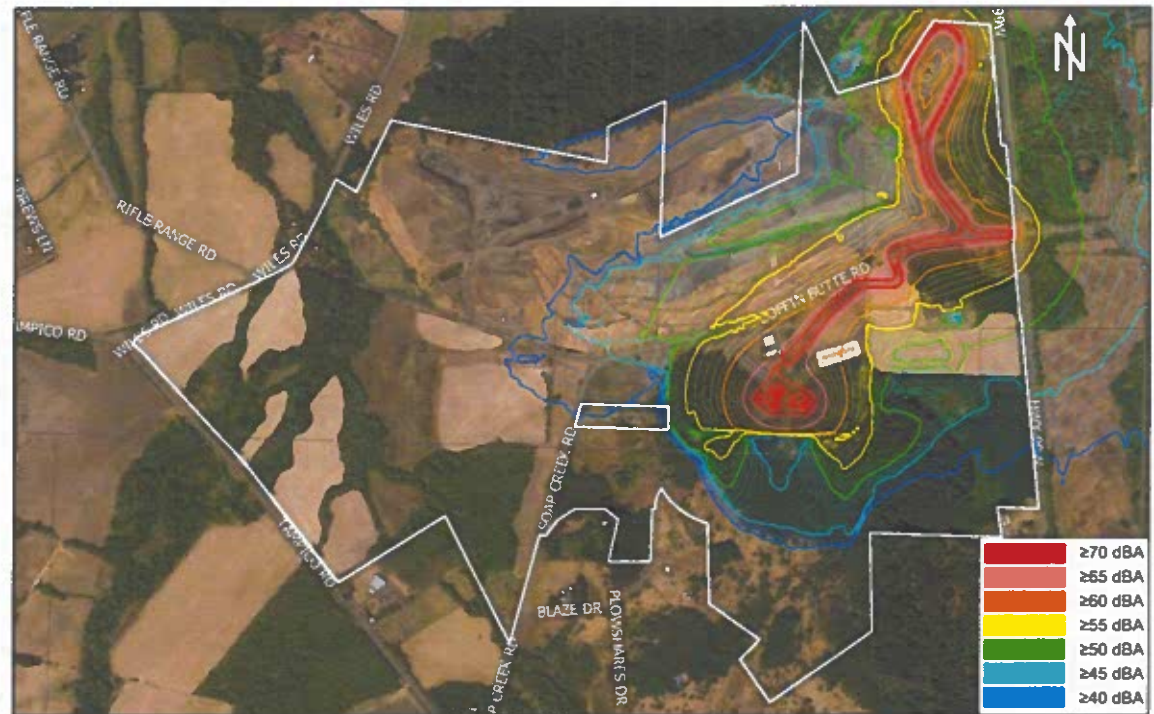




## PREDICTED SOUND LEVELS - WHEN EXPANSION AREA IS EMPTY

Modeling and updated ambient noise analysis shows the predicted sound levels will be well below the noise thresholds set in the Oregon Administrative Rules.

Predicted noise from the landfill does not constitute an off-site impact that will “**seriously interfere**” with the uses of the adjacent and nearby properties.



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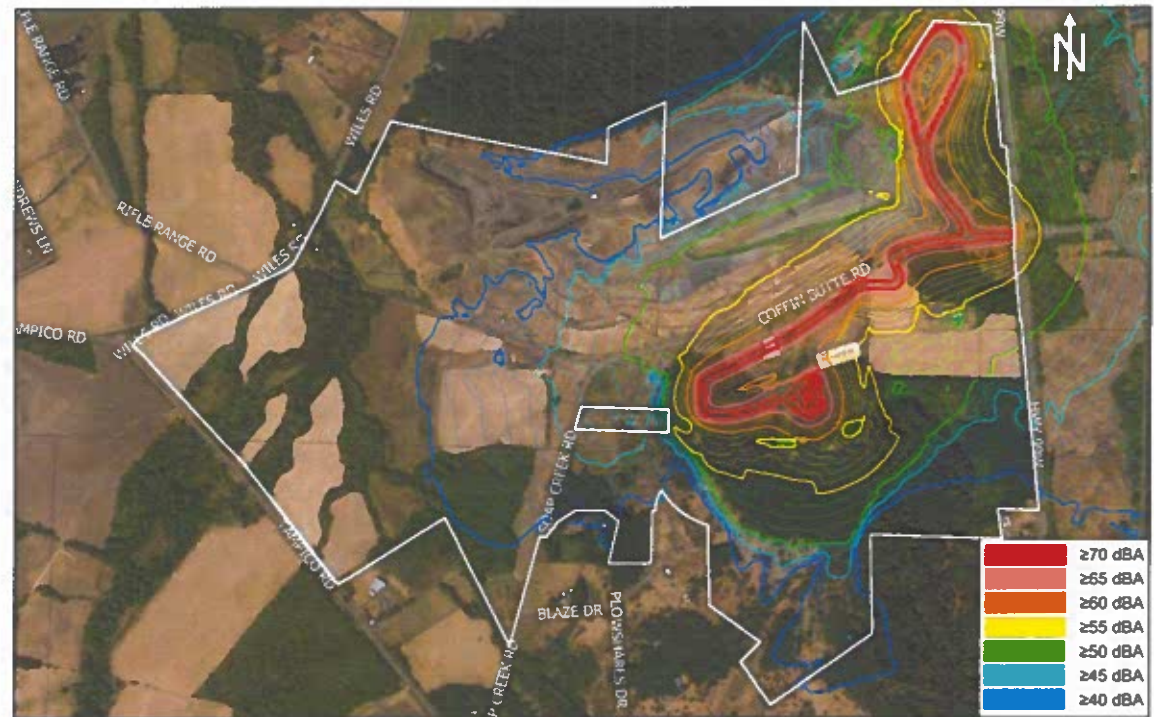




## PREDICTED SOUND LEVELS – EXPANSION AREA AT CAPACITY

Modeling analysis shows the predicted sound levels will be well below the noise threshold set in the Oregon Administrative Rules.

Predicted noise from the landfill does not constitute an off-site impact that will “**seriously interfere**” with the uses of the adjacent and nearby properties.





## EQUIPMENT & LOCATION MODELING

In determining noise impact, the study assessed the types of vehicular equipment currently used at the landfill, including excavators, compactors, dozers, tippers and idling and moving trucks.

### In Summary

- Existing and projected sound levels comply with limits set forth in the OAR.
- Predicted noise levels will not “seriously interfere” with the surrounding properties.
- Recommend backup alarms at the site be replaced with ambient sensing broadband backup alarms.



02

# Odor Complaint Review & Modeling Study

*Conducted by SCS Engineers*

## ODOR COMPLAINT REVIEW

SCS Engineers, a leader in air dispersion modeling, was asked to review odor complaints submitted to the Oregon Department of Environmental Quality. We then attempted to determine if Coffin Butte Landfill was the likely odor source.



# 84

COMPLAINTS REVIEWED

### Factors & Methodology

Correlated wind direction using Coffin Butte's on-site meteorological station.

Compared wind direction at the time of the complaint to landfill and complainant's location.

### Results & Findings

# 1%

OF ODOR COMPLAINTS  
ARE "LIKELY" ATTRIBUTED  
TO THE LANDFILL

Complaints peak in the morning, from 8 to 11 a.m., during winter months.

# 58%

OF ODOR COMPLAINTS  
ARE "POSSIBLY" ATTRIBUTED  
TO THE LANDFILL

Complaints are mostly south/southeast of the landfill, and range in distance from ½ mile to 7 miles away.

# 29%

OF ODOR COMPLAINTS  
ARE "NOT LIKELY" ATTRIBUTED  
TO THE LANDFILL



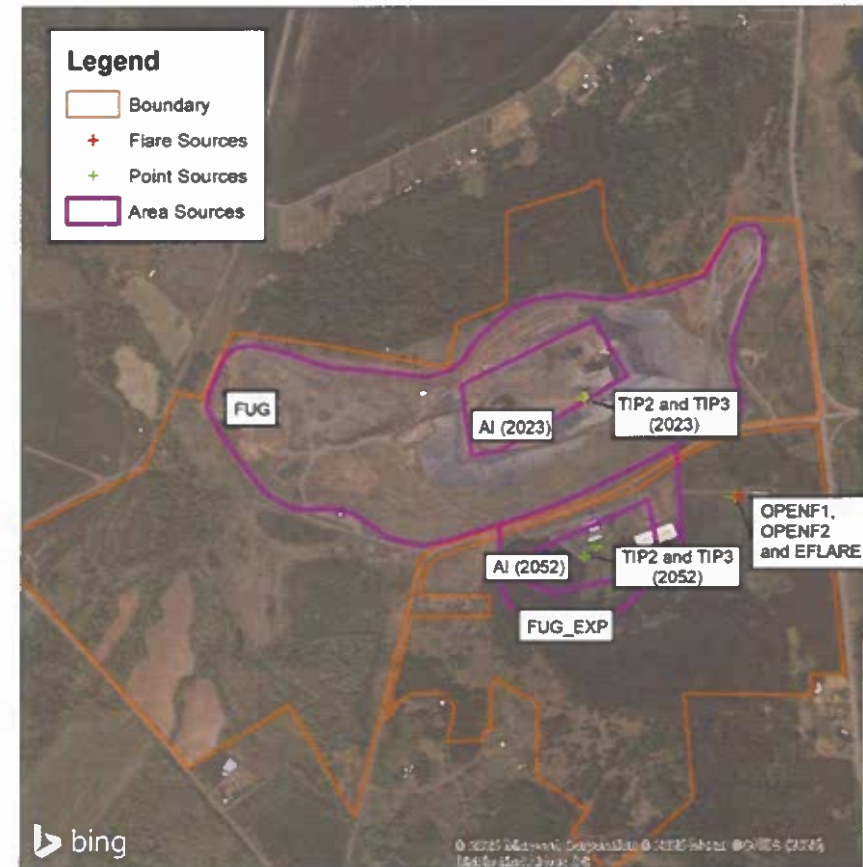
## ODOR MODELING STUDY

The study assessed odor based on two scenarios. Scenario 1 (2023) modeled odor based on the landfill's fugitive emissions and its previous open flare system. Scenario 2 (2052) is based on the final buildout of the landfill, as specified in the expansion application.

### Methodology

- SCS' methodology and approach has previously been approved by DEQ for Cleaner Air Oregon (HRA modeling), the Washington Department of Ecology and the San Diego Air Pollution and Control District, among others.
- Assessed multiple emissions sources, including fugitive, flare and tipper/working face emissions.
- Scenario 2 assumes tippers and active face have moved to the expansion parcel.
- Flare emissions based on updated technology is Scenario #2 (Coffin Butte had two open flares in 2023, now has one enclosed flare).
- Assumed 75 percent of the landfill's generated gas is going to the flare.

The 75 percent threshold is a standardized number in the industry, used by both ODEQ and federal agencies.



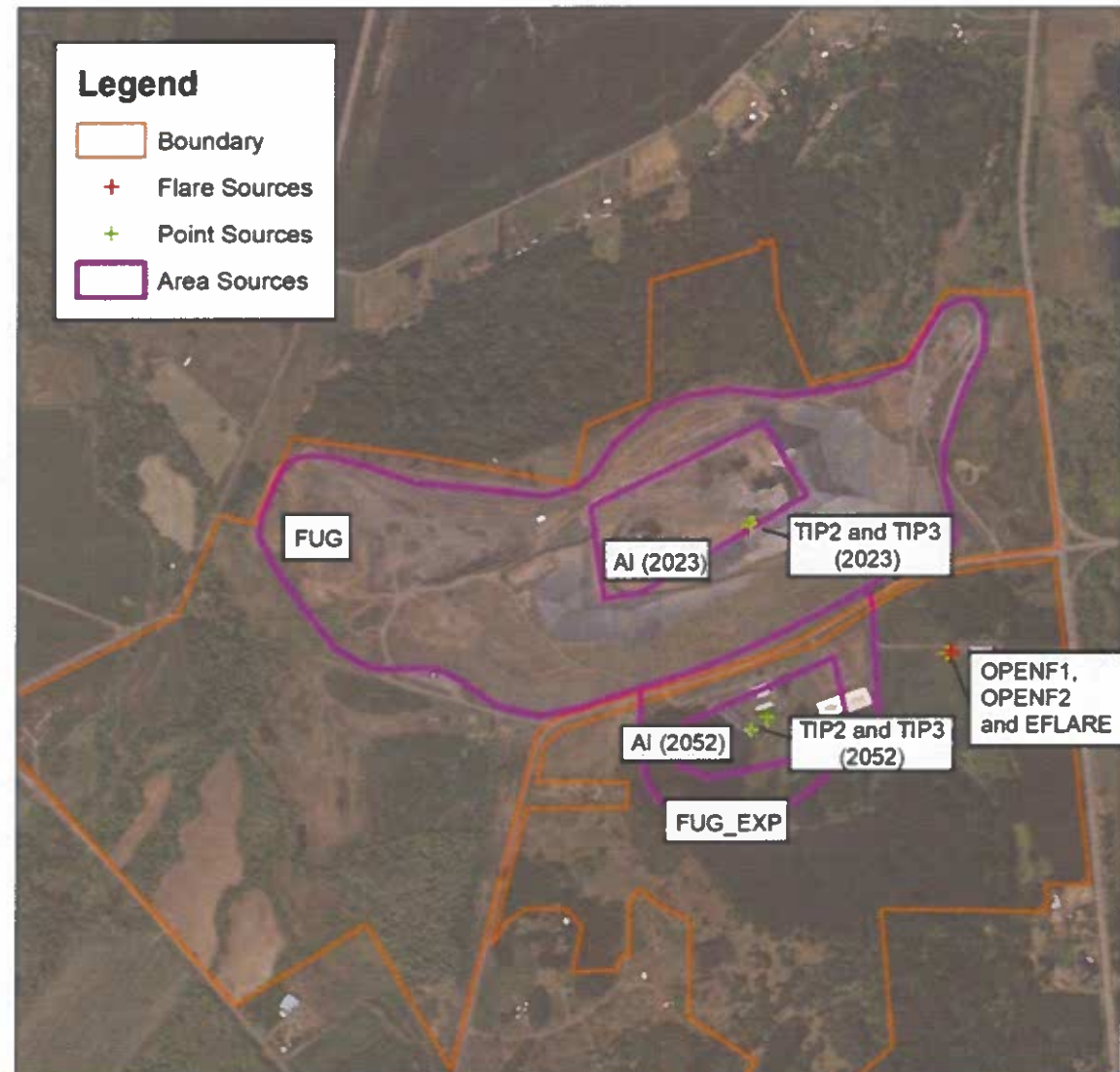
## ODOR MODELING STUDY

### SCENARIO 1 – YEAR 2023

- Assume 75% of generated gas going to this flare.

### SCENARIO 2 – YEAR 2052

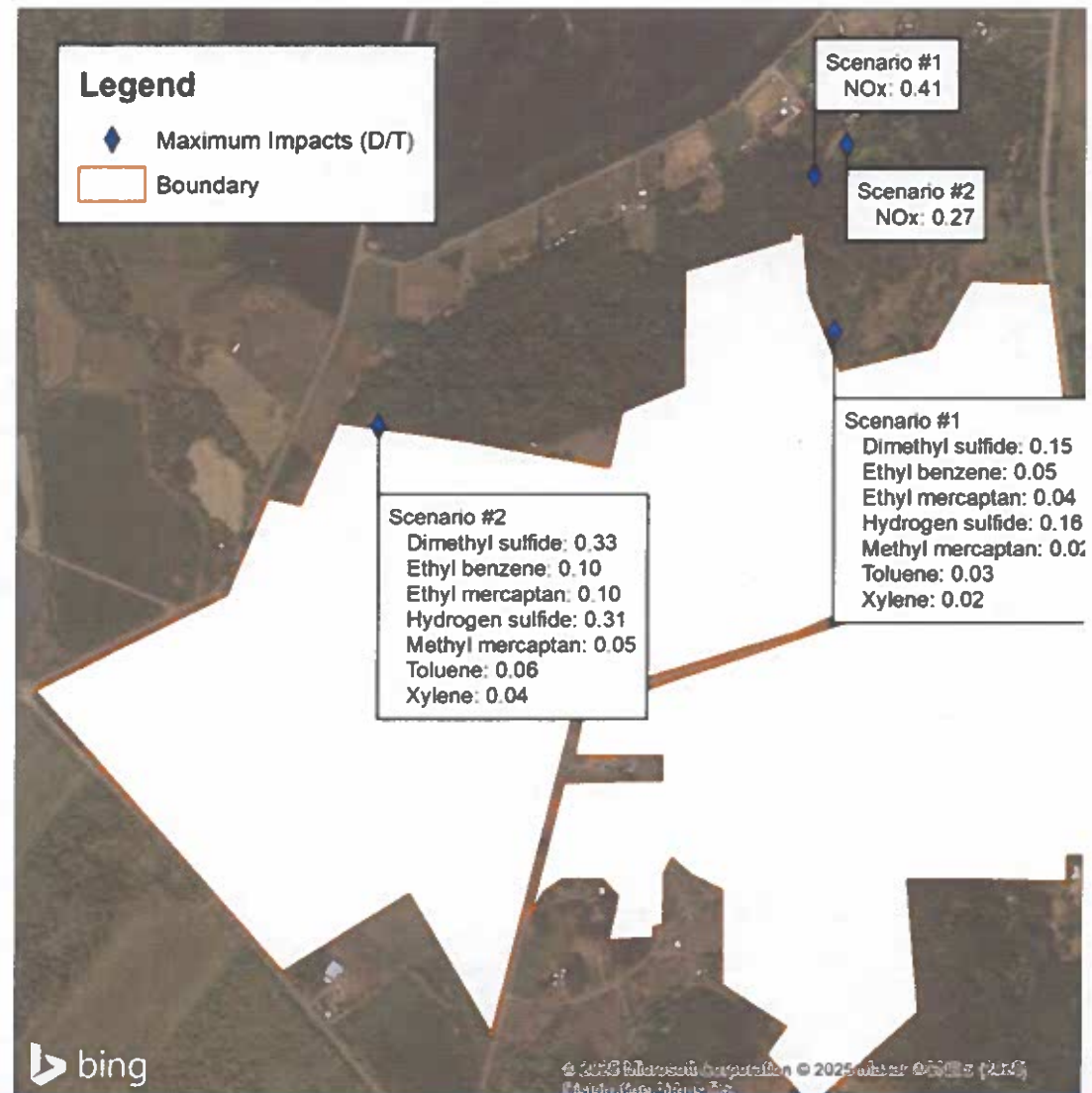
- Had two open flares, now controlled by an enclosed flare. Assumes landfill expansion to the South, with tipper engines and active face moved.



## MODELING & CONCLUSIONS

- None of the odor sources in Scenario 1 nor in Scenario 2 exceed the odor detection level (described as 1 D/T.)
- The highest impact in Scenario 1 is NOx (Nitric Oxide and Nitrogen Oxide), driven by the tippers.
- NOx emissions decrease in Scenario 2 (the expansion model).
- The highest impact in Scenario 2 (expansion buildout) is DMS (Dimethyl Sulfide), which is driven by fugitive landfill gas.

The odor modeling shows that the proposed landfill expansion would not **“seriously interfere”** with uses on adjacent properties or with the character of the area.





03

# Traffic & Transportation



## COFFIN BUTTE TRAFFIC STUDY FINDINGS


- 1 No changes in area travel patterns due to expansion.
- 2 Coffin Butte Road remains open as a “major collector” route.
- 3 No changes to emergency ingress and egress routes to the area.
- 4 No impacts to Tampico Road.
- 5 Major collector streets, including Coffin Butte are far below traffic capacity.





## COFFIN BUTTE ROAD IMPROVEMENTS

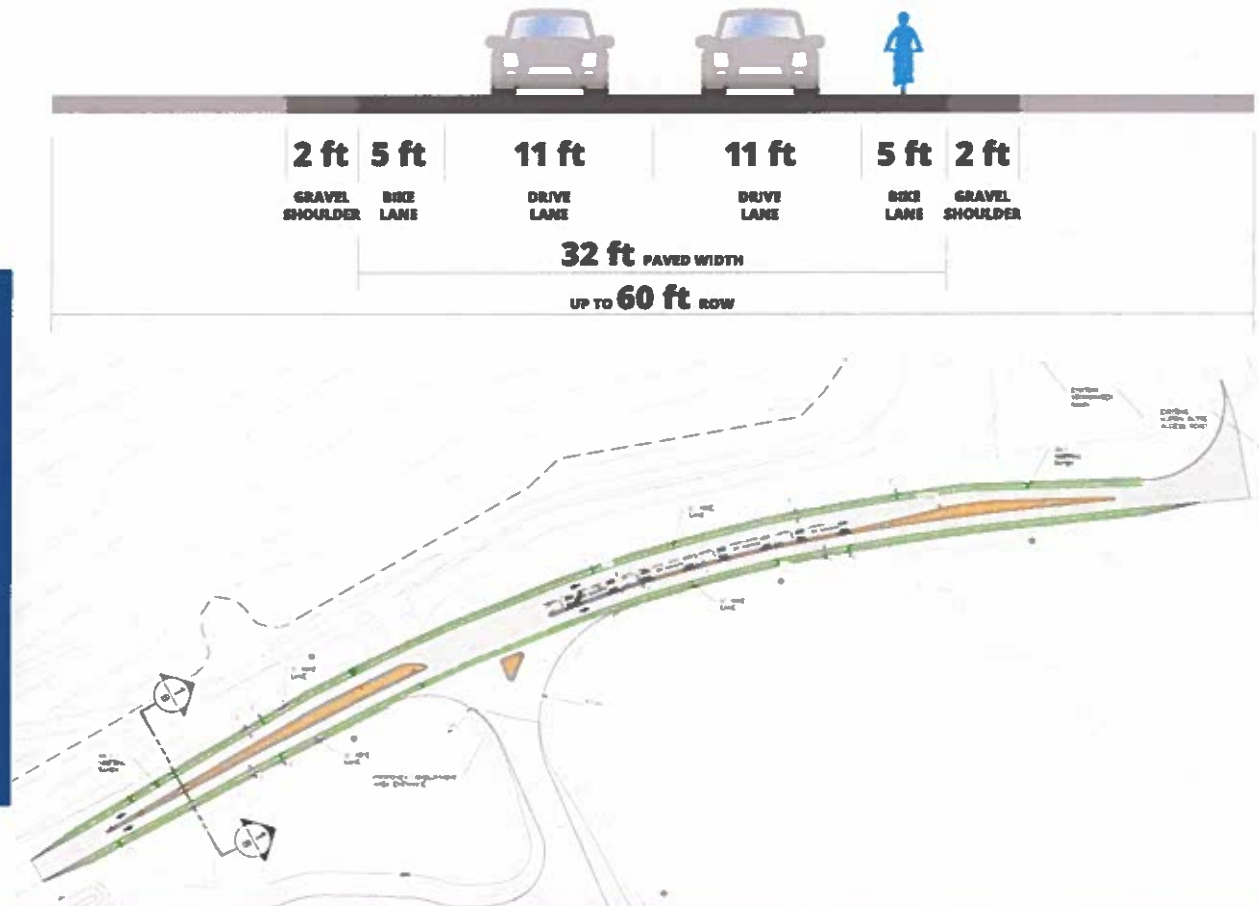
Our previous application proposed the closure of Coffin Butte Road. We've kept it intact in response to community concerns. We're also improving it.

**850'** Widen and improve an 850-foot-section of roadway (32 feet of paved right of way).

 Build a dedicated left turn lane for trucks.

 Build bike paths in both directions.

 Cost borne by Republic Services.





04

# Groundwater & Leachate



## ENVIRONMENTAL AND OPERATIONAL CONSIDERATIONS

Our assessment took into account both the topography of the area, the direction in which the groundwater flows and the nature of the primary water bearing zone.

### Topographical Features



Proposed Site is on the northern slope of Tampico Ridge.



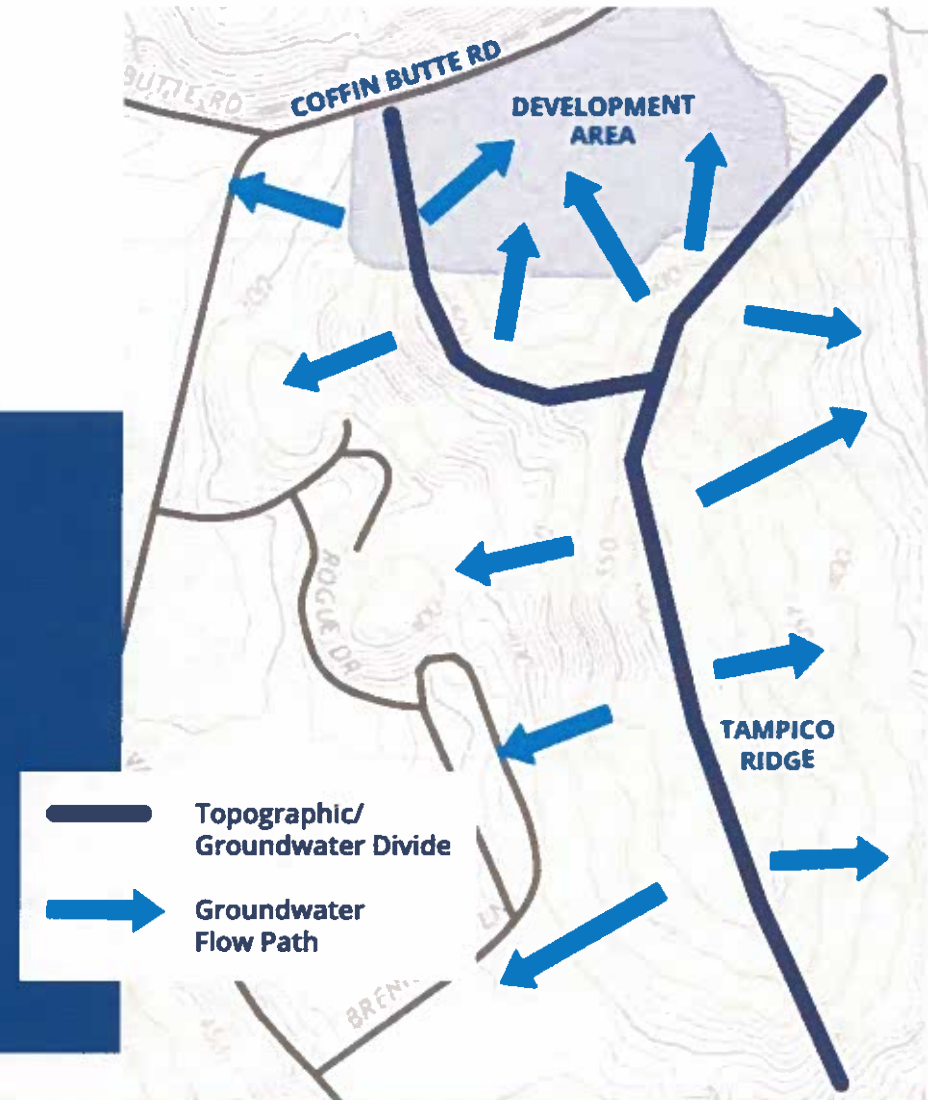
It is separated from adjoining properties by topography (height).



Groundwater flows in multiple directions, including northerly, below the proposed site and away from adjoining properties.



A hydrogeologic drainage divide separates the landfill from adjacent properties.



## ENVIRONMENT AND OPERATIONAL CONSIDERATIONS



### Groundwater Supply Impacts

**Water volume use from landfill operations will not change**

- One well for the landfill.
- One well for scale house near HWY 99.
- Operations and construction water is supplied by Adair Village.

**Production at private wells on adjoining properties will not be affected**

- The water bearing zone is from basalt bedrock.
- Flow rate and volume is limited by local rainfall, which is affected by climate cycles.
- Low permeability and poor fractured flow qualities of the basalt bedrock aquifer limit well production.







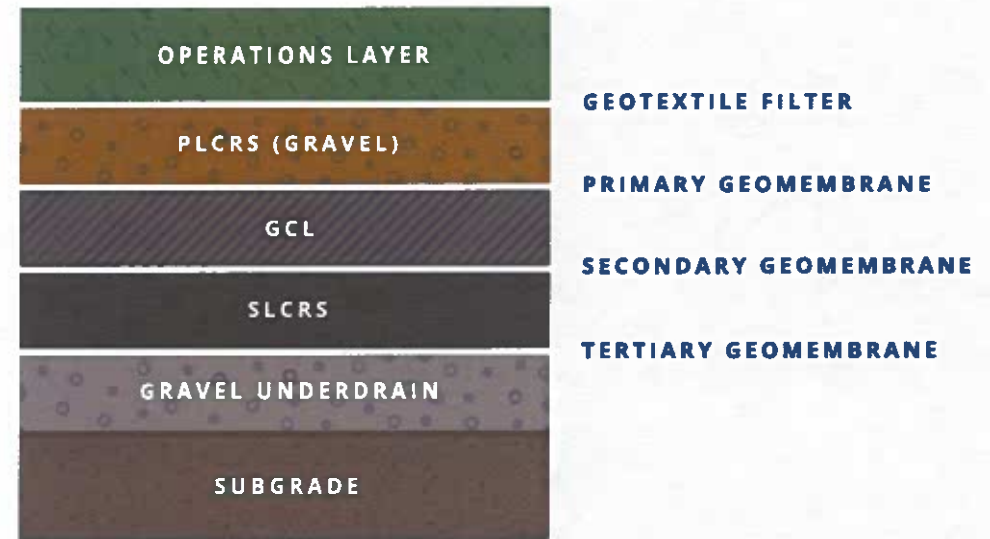
**The expansion as proposed will have no measurable impact on groundwater flowing near adjacent or nearby properties and operations will not place an undue burden on any public facility or service.**

## PROTECTION OF GROUNDWATER RESOURCES – LANDFILL LINER SYSTEM

Coffin Butte Landfill has many environmental controls in place to protect and monitor the groundwater.

### Primary Landfill Design

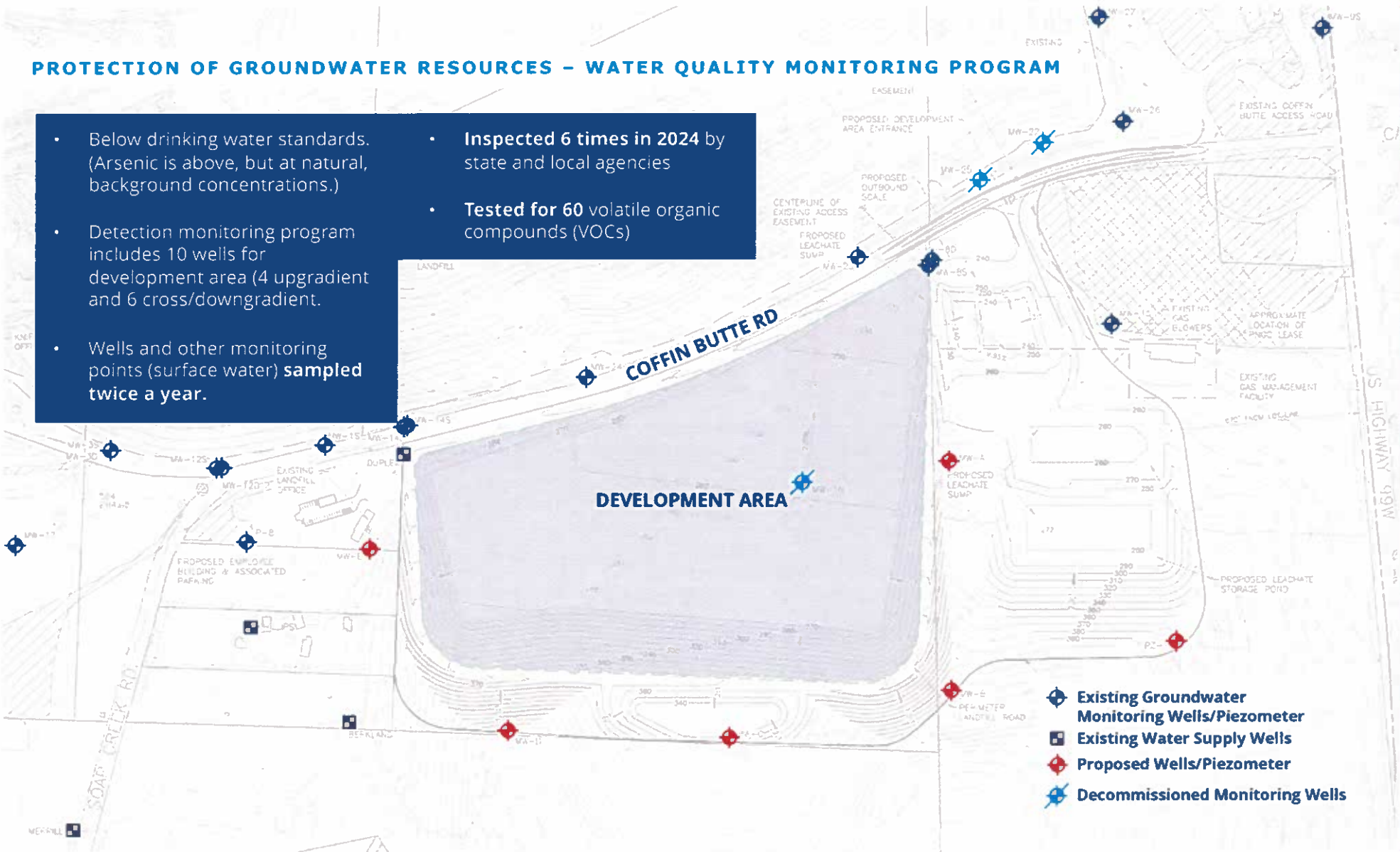
-  Bottom composite liner to contain leachate generated during waste decomposition.
-  Secondary collection system underneath the bottom liner to collect additional fluids.
-  Interim and final cover systems to limit precipitation and stormwater from coming into contact with waste.
-  A leachate collection and recovery system that transports liquids for treatment at a nearby wastewater treatment plant.





## PROTECTION OF GROUNDWATER RESOURCES – WATER QUALITY MONITORING PROGRAM

- Below drinking water standards. (Arsenic is above, but at natural, background concentrations.)
- Detection monitoring program includes 10 wells for development area (4 upgradient and 6 cross/downgradient).
- Wells and other monitoring points (surface water) **sampled twice a year.**
- Inspected 6 times in 2024** by state and local agencies
- Tested for 60** volatile organic compounds (VOCs)



- Existing Groundwater Monitoring Wells/Piezometer
- Existing Water Supply Wells
- Proposed Wells/Piezometer
- Decommissioned Monitoring Wells



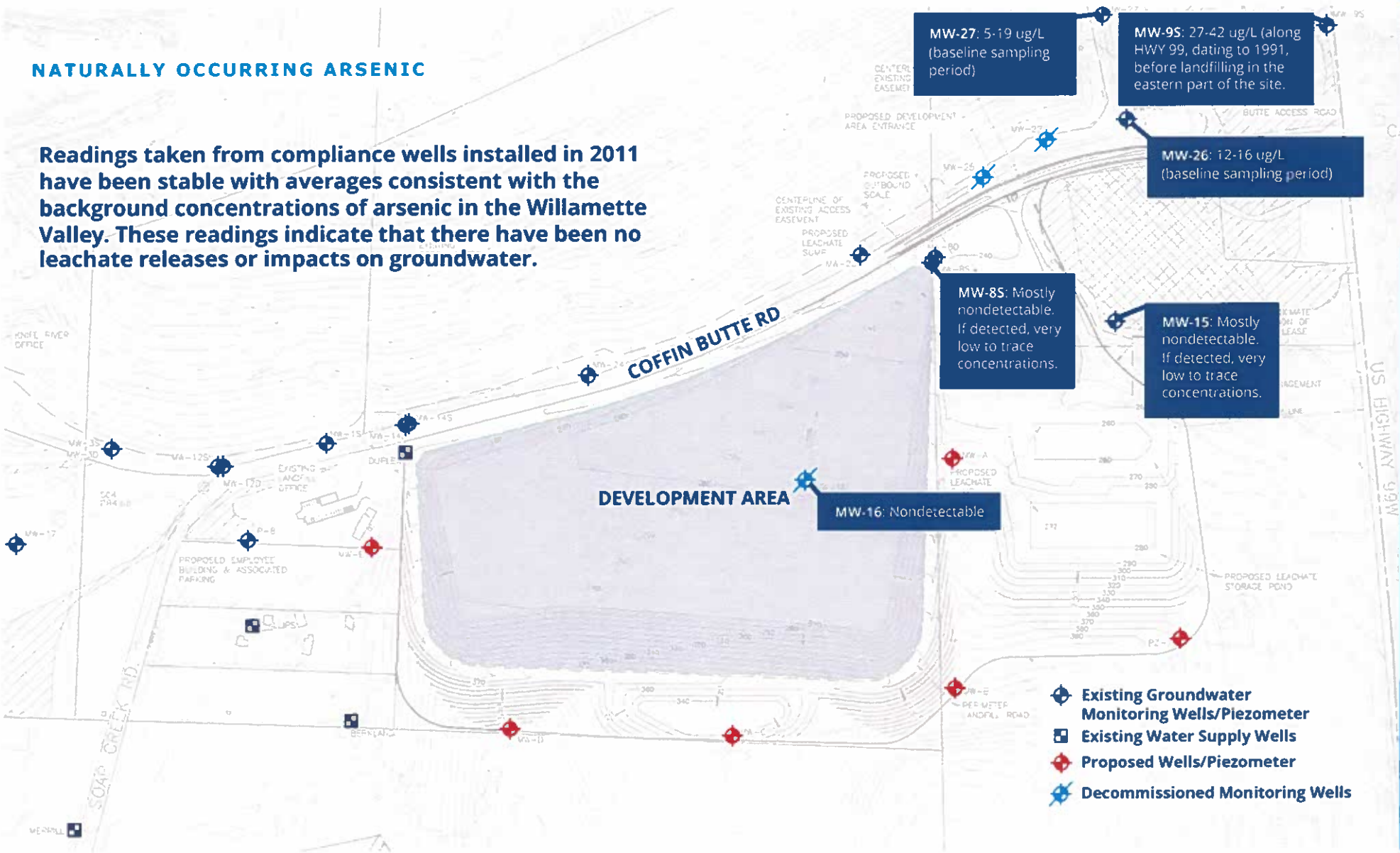
## NATURALLY OCCURRING ARSENIC

The U.S. Geological Survey found that there are regional patterns of arsenic concentrations in the groundwater in the Willamette Basin and these patterns reflect primarily natural sources.

- Oregon DEQ established background concentrations for arsenic in soil in the Willamette Valley at 18 mg/Kg for the Cascade Range and 19 mg/Kg.
- Portland-area background concentrations are set at 8.8 mg/L.
- Arsenic is associated with the volcanic soils of this region.
- Arsenic is typically bound up in iron oxides (rusty red color in rocks) or absorbed on clay materials.
- Low oxygen conditions cause iron oxides to dissolve; arsenic is then released into the groundwater.
- Groundwater on the east side of the landfill (in locations unaffected by landfill activities) has naturally occurring arsenic.

## NATURALLY OCCURRING ARSENIC

Readings taken from compliance wells installed in 2011 have been stable with averages consistent with the background concentrations of arsenic in the Willamette Valley. These readings indicate that there have been no leachate releases or impacts on groundwater.





## UNDERSTANDING AND MANAGING LEACHATE & PFAS

Coffin Butte Landfill is engineered with highly regulated, ODEQ-approved liners that prevent leachate from entering the groundwater. Leachate from the landfill is treated and disposed of in accordance with all local, state and federal regulations.

### Facts About PFAS

- Per-and polyfluoroalkyl substances (PFAS) constitute a group of thousands of compounds that have been used in many products since the 1950s.
- Human exposure occurs primarily through diet, dust, indoor air, personal products and drinking water.
- Coffin Butte Landfill is not a producer of leachate; it is a receiver.

### By The Numbers

# 20M

Total gallons of leachate sent to the Corvallis' wastewater treatment plant and Salem's wastewater treatment plant in 2024 (respectively).

# 30M

Gallons treated each day at Salem WWTP during summer months

# 220M

Gallons treated each day at Salem WWTP during winter months

# 4B

Gallons treated annually At Corvallis WWTP

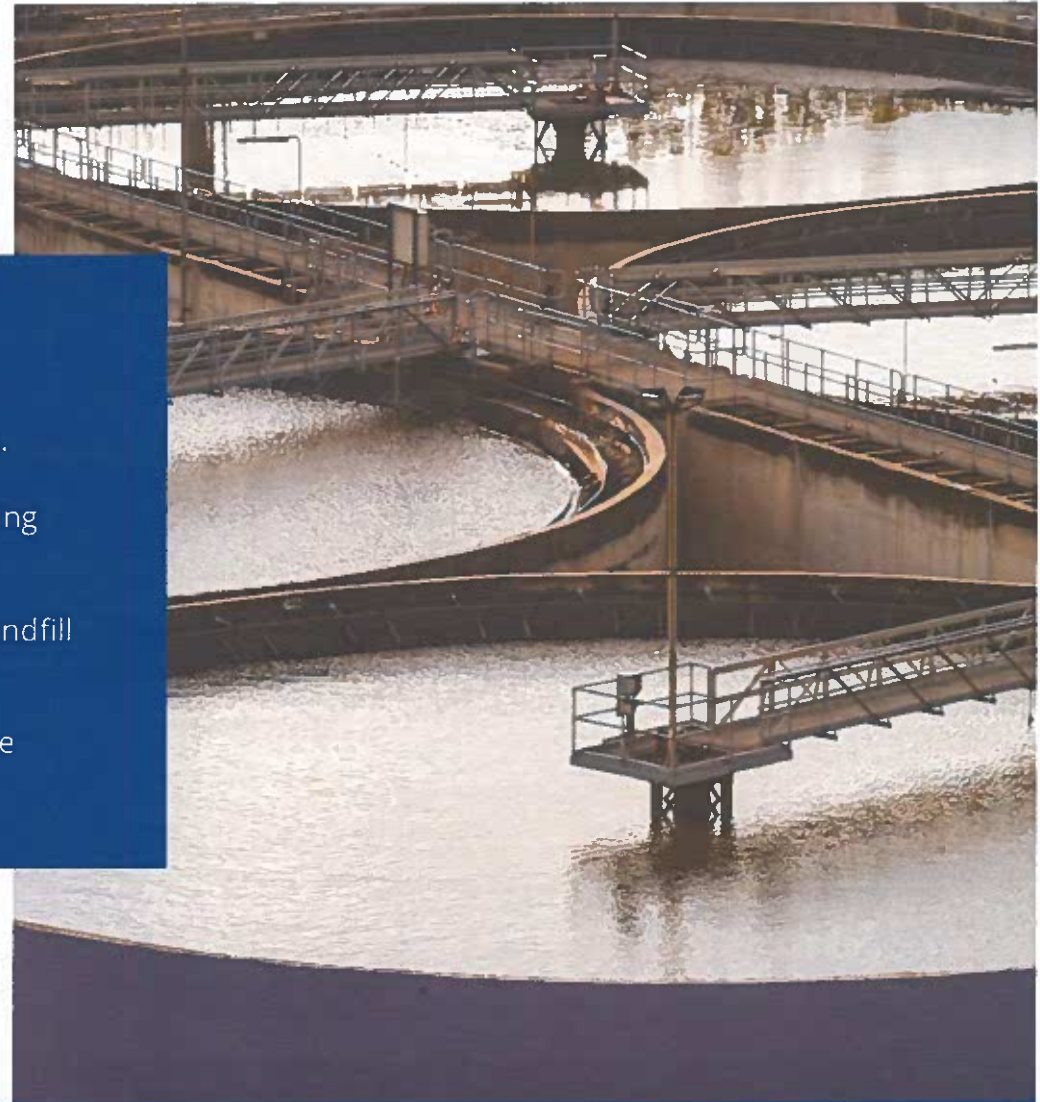
# .005%

Coffin Butte leachate volume compared to overall daily treatment volume at Corvallis WWTP

## LEACHATE & PFAS SUMMARY

### In Summary

- Coffin Butte's leachate represents a very small fraction of the wastewater treated each day by the Corvallis and Salem facilities.
- Coffin Butte has commitments (options) from other facilities willing to treat leachate, but has not finalized contracts or next steps.
- Coffin Butte's main focus is on managing PFAS through proper landfill operations and partnering with the DEQ to ensure compliance.
- Landfills like Coffin Butte are part of the solution to safely confine PFAS in an effort to effectively remove it from the environment.





05

# Visual & Screening



## SCREENING & VEGETATION

### How We'll Reduce Visual Impact



Screening limits visibility from most public sightlines.

80'

Maximum proposed height is 80 feet lower than previous proposal.



Lighting plan will minimize light and glare.





06

# Fire Risk Assessment

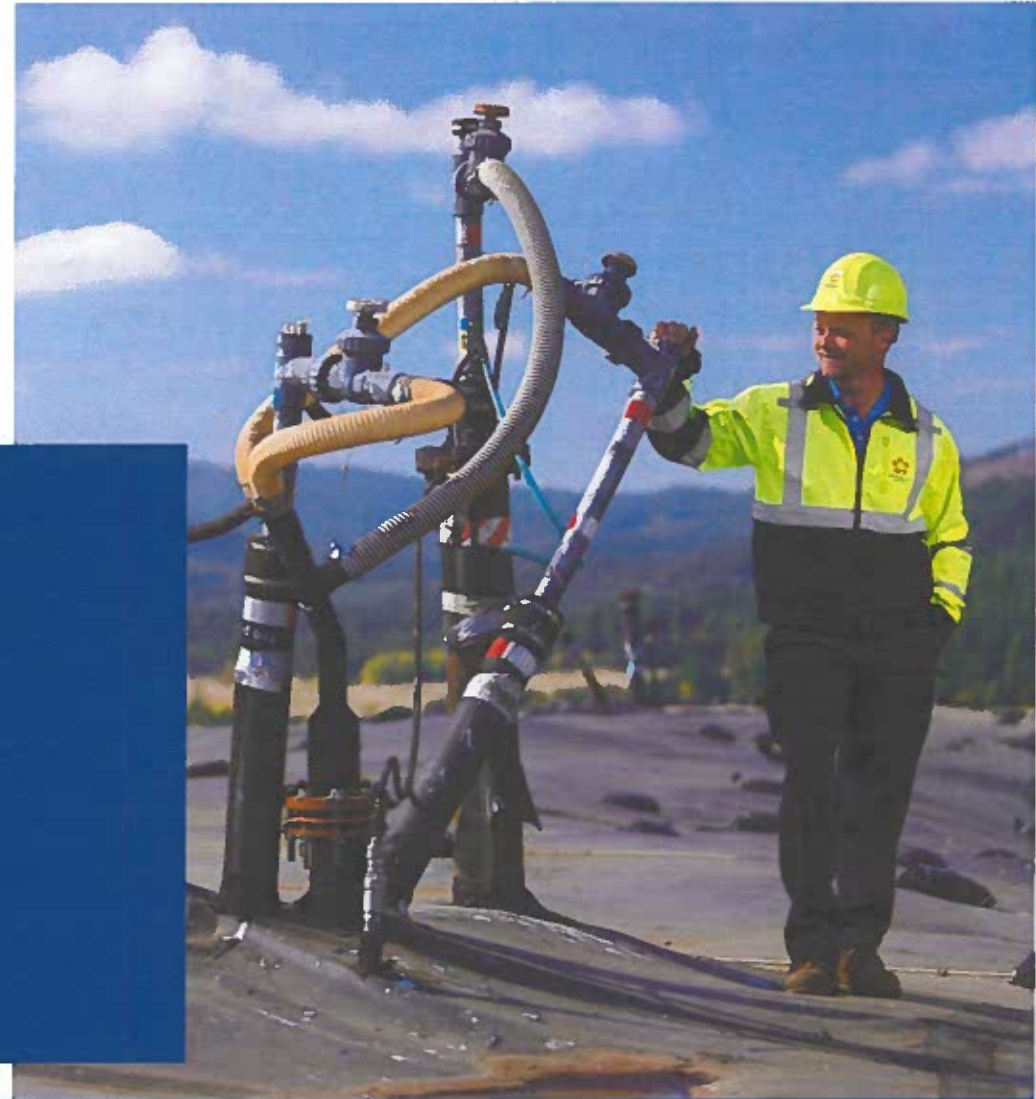
## ASSESSMENT SCOPE

SCS Engineers was tasked with identifying potential fire scenarios and sources, the likelihood that they would occur, what control measures are in place, and the potential impact on the surrounding community or the environment.



### About Coffin Butte Landfill

- Accepts only municipal solid waste.
- Does not accept hazardous waste (no reactives or ignitables).
- Oregon DEQ approved the waste types accepted at the landfill.
- Robust waste approval checks in place.
- Waste disposal limited to a small (1/2 acre) working face.
- Daily cover applied at the close of each business day.





## FIRE CONTROLS & SCENARIOS

### EXISTING FIRE CONTROLS

Fire mitigation controls in place including best-in-class standard operating procedures and highly-trained staff. Other measures include:

- U-shaped soil stockpile at working face.
- Additional soil stockpiles for working face and gas well fires.
- On-site water truck and water storage for fast delivery.
- Adair Fire support (as needed).

### PLAUSIBLE FIRE SCENARIOS

Our analysis considered all typical or common fire types and ignition points, including:

- Working face fire.
- Grassed area fire.
- Gas well fire.





## FIRE MITIGATION & PREVENTION

### 1 Working Face

- Limit waste types received.
- Keep size of daily working face small and confined (1/2 acre or less).
- Apply daily cover to working face at the close of business each day.
- Ensure there is a U-shaped soil stockpile adjacent to the working face.
- Keep additional soil stockpiles near by.
- Utilize on-site staff as first line-of-defense.
- Notify Adair Fire support if needed.

### 2 Grass Fires

- Keep on-site vehicles off grassy areas.
- Use site roads and other non-grassed surfaces as buffers.
- Train on-site staff to quickly identify and triage small fires.
- Deploy water from on-site truck and storage facility as needed.
- Notify Adair Fire support if needed.

### 3 Gas Well Fires

- Avoid well over-draw.
- Closely monitor gas well results.
- If fire develops – adjust well down or turn off.
- Seal off surface air intrusion.
- Ensure on-site staff is trained and empowered to handle situation.

## FIRE SUMMARY

- 1 Landfill fires can occur:
  - At the working face (some history).
  - In grassy areas (limited history).
  - In subsurface areas around a gas well (no history).
- 2 Republic Services has the plans, standard operation procedures, contingencies, and training in-place to prevent fires and quickly control them if they develop.
- 3 **There is no significant risk to the public or the environment** from landfill fires.





07

# Wildlife Habitat Assessments

*Conducted by Turnstone Environmental Consultants  
between 2022 and 2024*

## GREAT BLUE HERON ROOKERIES ASSESSMENT

Turnstone Environmental Consultants conducted three consecutive years of surveys (2022-2024) of the two Rookeries.

### Western Rookery

- Inside the proposed expansion area.
- No active nesting during 2022-2024; Officially abandoned, no longer a protective site.

### Eastern Rookery

- Outside the proposed expansion area.
- Great Blue Herons actively nesting in Spring 2022; but colony had failed by June.
- No Great Blue Heron activity in 2023; Red-Tailed Hawks observed in abandoned stick nest.
- All 13 Great Blue Heron nests inactive in 2024; Red-Tailed Hawks observed in abandoned stick nests.



**We will continue to monitor the Eastern Rookery throughout 2025 based on feedback received from the Oregon Department of Fish and Wildlife.**



## BALD EAGLE MONITORING

Biologists did not observe any nesting by adult or juvenile Bald Eagles during the survey period. It is unlikely Bald Eagles are nesting in the Coffin Butte Landfill Expansion Project area.

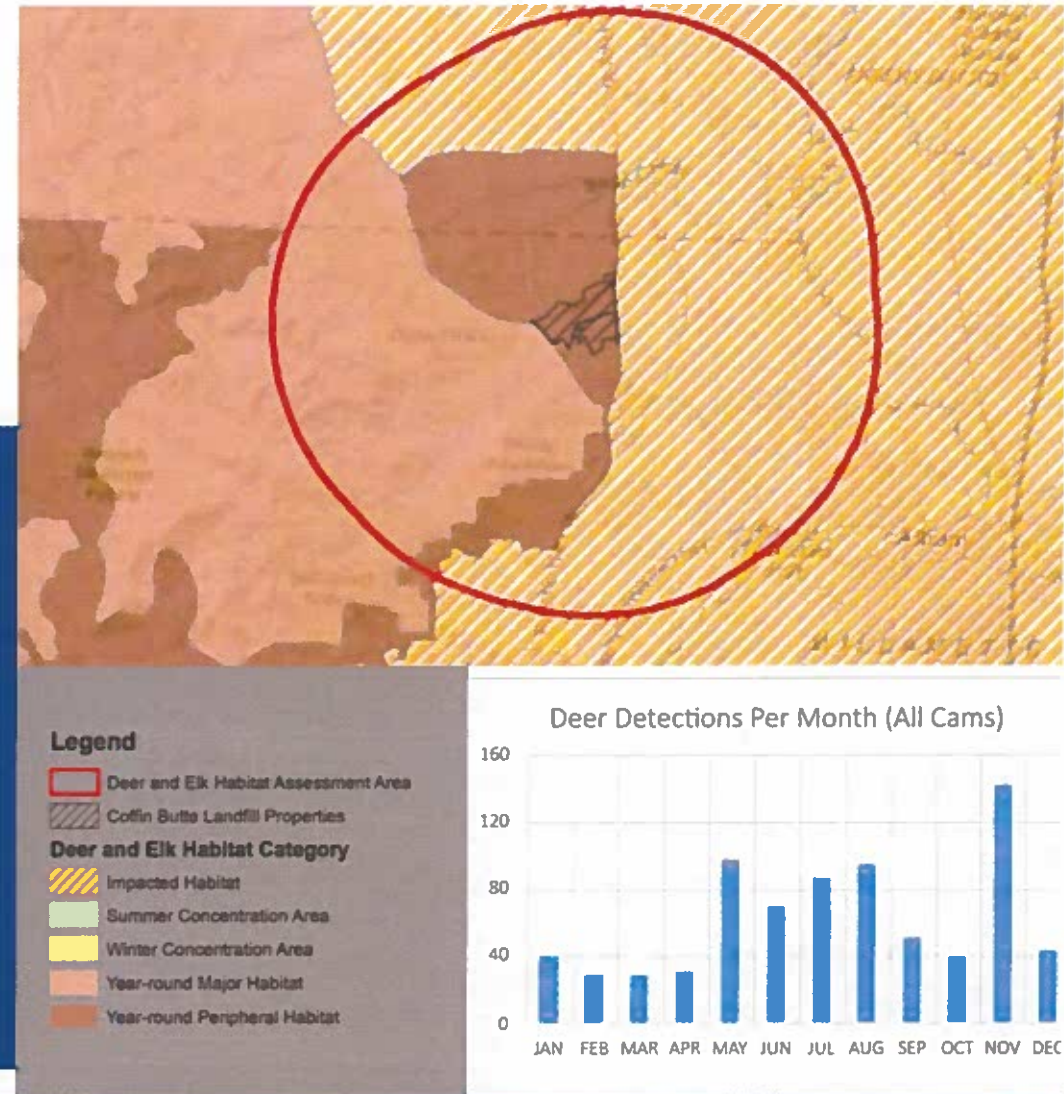
- Monitored during breeding period monthly (February-August).
- Observations recorded for two consecutive years (2022 and 2023).
- Each observation period was two hours long.
- Recorded greatest numbers of juveniles and adults.
  - In 2022, 11 juveniles and 6 adults observed at one time.
  - In 2023, 4 juveniles and 6 adults observed at one time.
- Behaviors documented included soaring, roosting and foraging in landfill.
- No nesting behavior or nest trees seen.



## DEER & ELK

Biologists conducted field investigations and used aerial photographs and spatial data, as well as GIS analysis of deer and elk habitat mapping from the Oregon Department of Fish & Wildlife in their assessment.

- The 5-mile assessment area encompasses 67,577 acres.
- Core deer and elk study area is 804-acres.
- Five trail cameras were placed in the core study area.
- Those cameras detected less than one deer per day (.76) on average.
- Cameras detected elk on three occasions.
  - August/September: 2
  - November: 16
  - January: 46
- Cameras also noted bobcat, cougar, coyote, raccoon, and striped skunk.





08




# DEQ & State Regulatory Issues



## SEISMIC STABILITY

The U.S. Environmental Protection Agency outlines procedures for evaluating a landfill's seismic slope stability under RCRA, Subtitle D (258). The U.S. Geological Society's "Earthquake Hazard Toolbox" provides information about seismic forces and how to incorporate them into stability models, based on past seismic events.

### How We Did Our Modeling

-  Perform engineering analyses to evaluate how the landfill slope will react to horizontal acceleration at the site.
-  Assume earthquake magnitudes that have a probability to occur once every 2,475 years.\*
-  Use site-specific properties and seismic motion parameters culled from publicly available sources, to determine a "Factor of Safety." This is a measure of the forces resisting failure compared to forces driving failure.

*\*The International Building Code and the U.S. Army Corp of Engineering also use this standard when designing buildings and dams.*





## SEISMIC STABILITY REQUIREMENTS

- 1 FS (Factor of Safety) target greater than **1.0 is ideal scenario**. It indicates that the forces resisting movement are greater than the forces driving movement.

**Result: No permanent deformation of the liner system.**

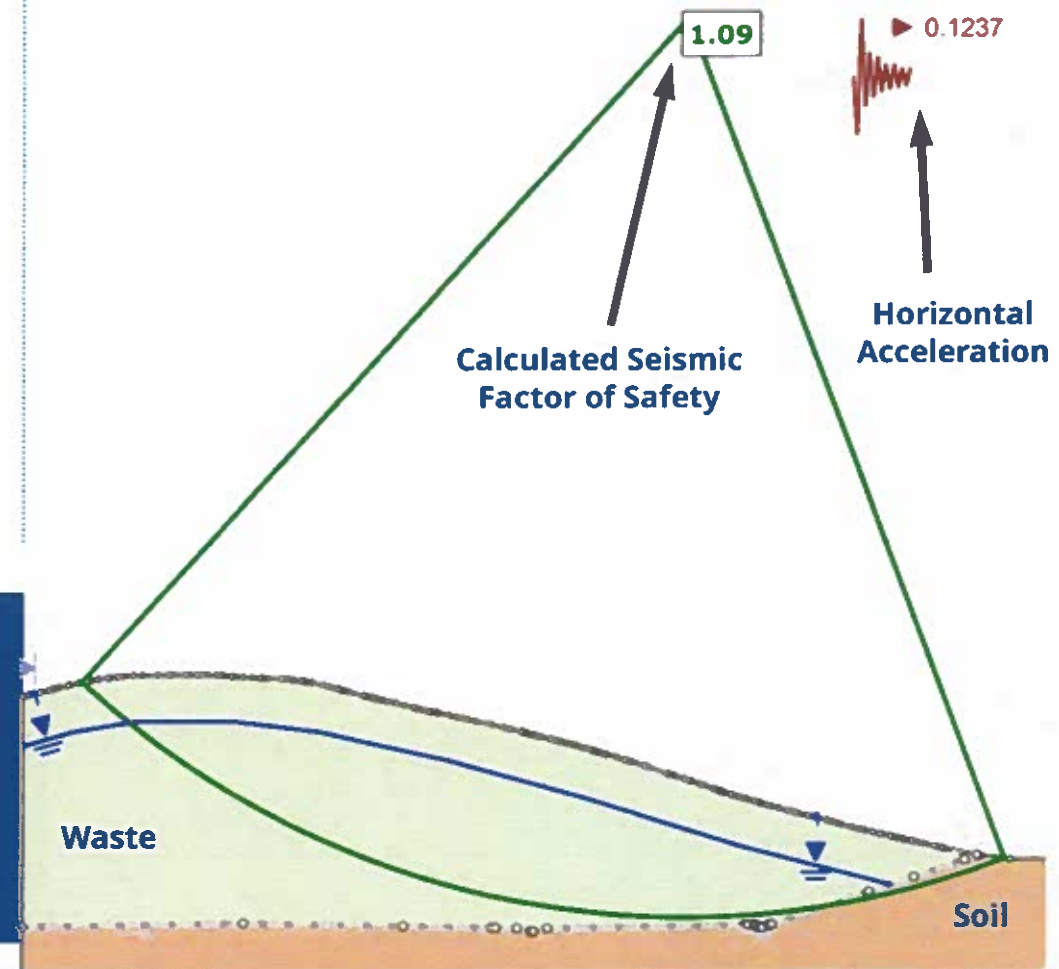
- 2 FS (Factor of Safety) target less than 1.0 requires a deformation analysis to estimate the displacement of the liner system.

**A deformation of less than 12 inches is acceptable.**

### How Factor of Safety impacts Landfill Liners

Modern polyethylene geomembranes are able to elongate, due to their flexible nature, by about 13 percent before yielding occurs. Based on industry research, the liner systems for landfills should remain intact and functional if there's less than 12 inches (300 mm) of permanent deformation.

## TYPICAL SEISMIC SLOPE STABILITY EVALUATION OUTPUT

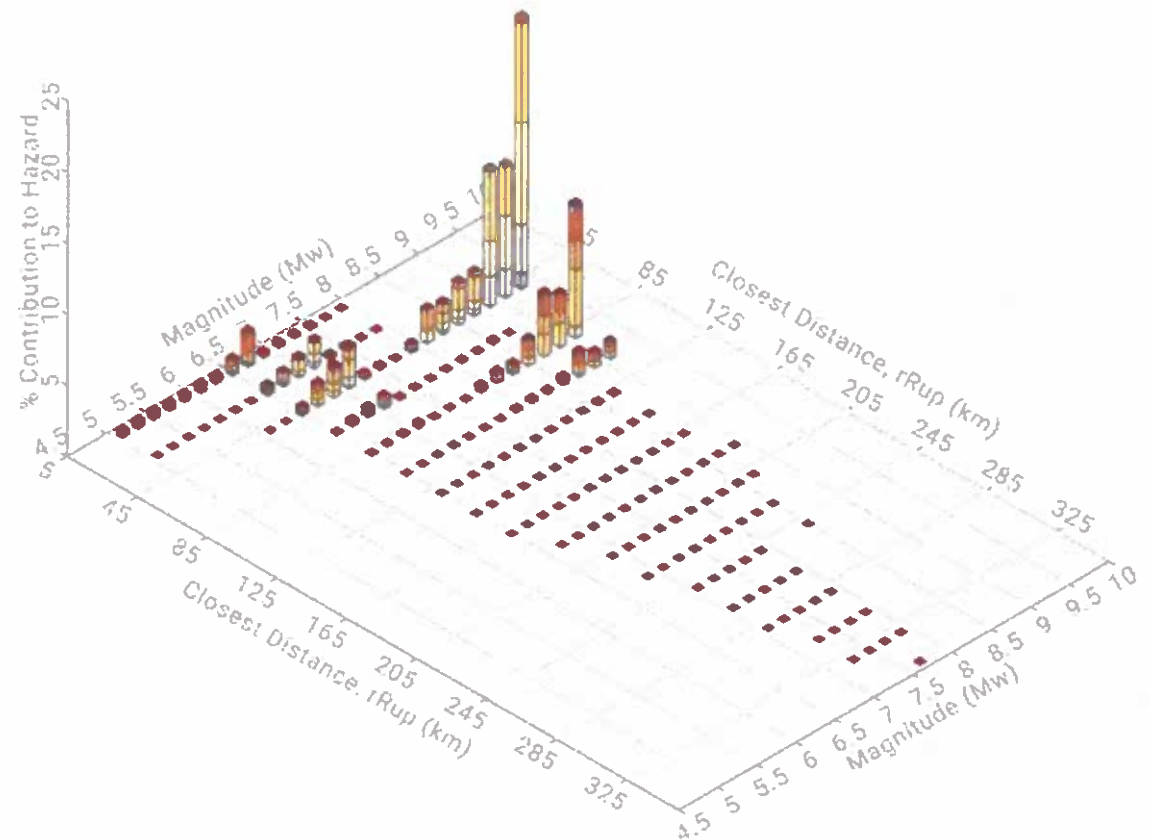


## MODELING A LARGE EARTHQUAKE EVENT - UP TO 9.28 MAGNITUDE

Our analysis used historical data from a number of earthquakes of varying magnitude and distance from Coffin Butte Landfill.

A 9.12 magnitude earthquake with an epicenter 51 km from the site has the potential to cause the most damage, according to our model.

**Coffin Butte Landfill meets the Factor of Safety target even in this worst case scenario.**



09

# Final Thoughts and Q&A