Solid Waste Management Facility Siting Study

Solid Waste Advisory Committee (SWAC) Meeting

February 20, 2024




Agenda

1. Welcome
2. Review/ Approve October Meeting Minutes
3. Public Comment
4. Final Site Evaluation Preliminary Findings
5. SWAC Discussion
6. Adjourn

Steps to SWAC recommendation

February 2024:
Site Evaluation Findings Overview and Discussion

Introduction and overview for the SWAC to the Site Evaluation Report findings.

March 2024:
Site Evaluation Report Review and Discussion

Opportunity for the SWAC to discuss and provide input on the full Site Evaluation Report.

April 2024:
Finalist SWMF Site Recommendation

The SWAC will vote on recommendation to the BOCC for a preferred SWMF location.

Public Comments

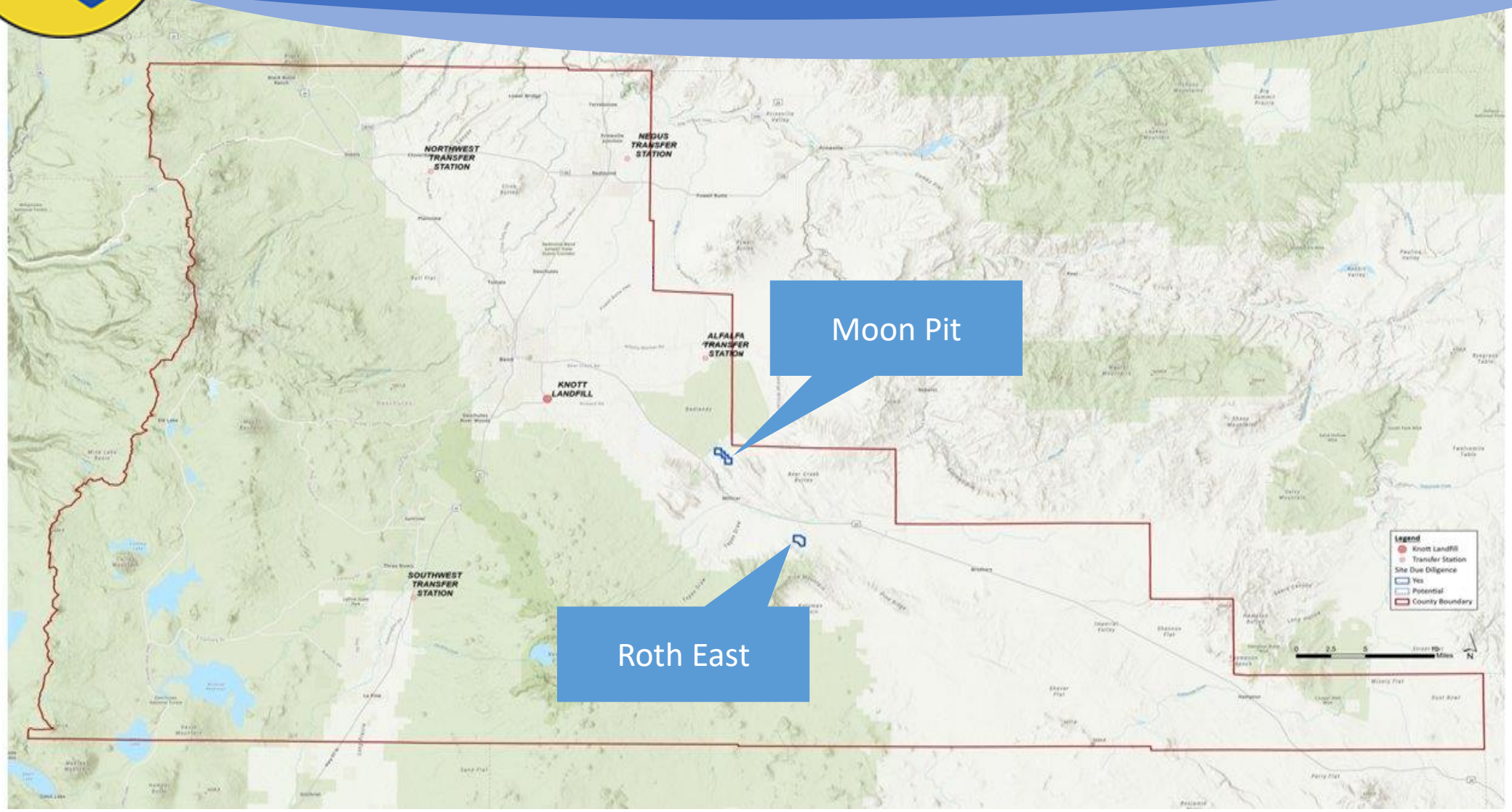
Public Comments

3 minutes per person
Based on number of people wishing to comment

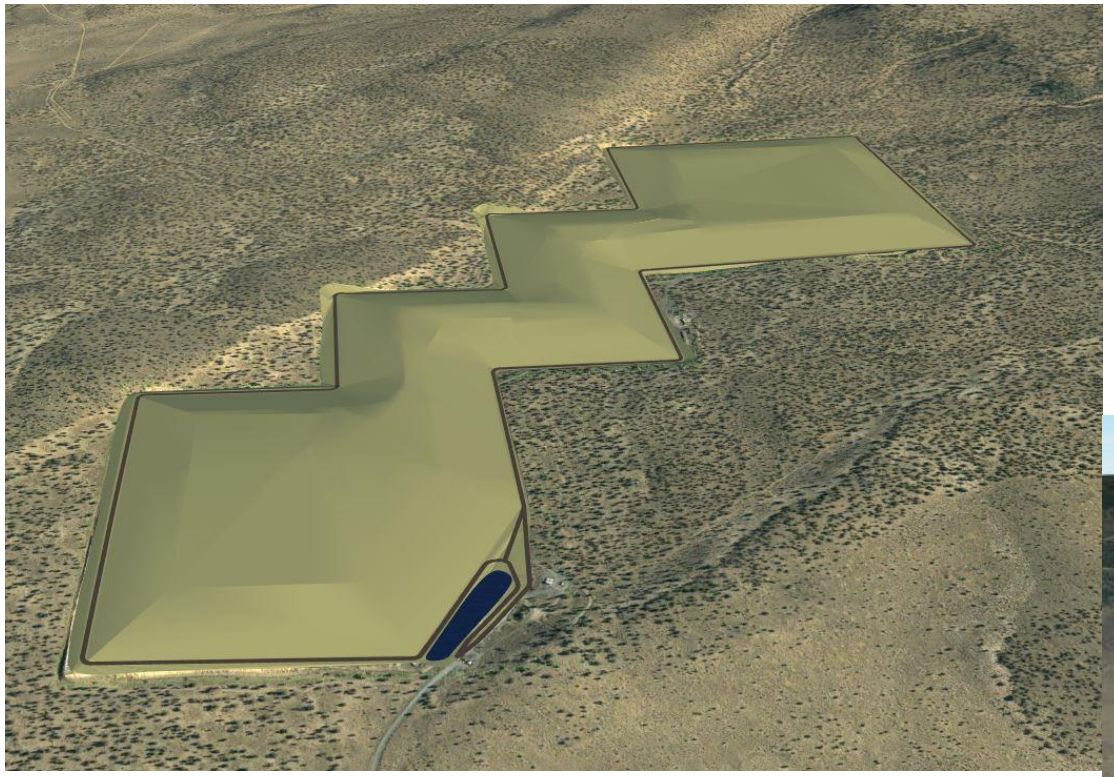
Written comments can also be sent to:
managethefuture@deschutescounty.gov

Final Site Evaluations: Preliminary Findings

Finalist Site Evaluation Overview

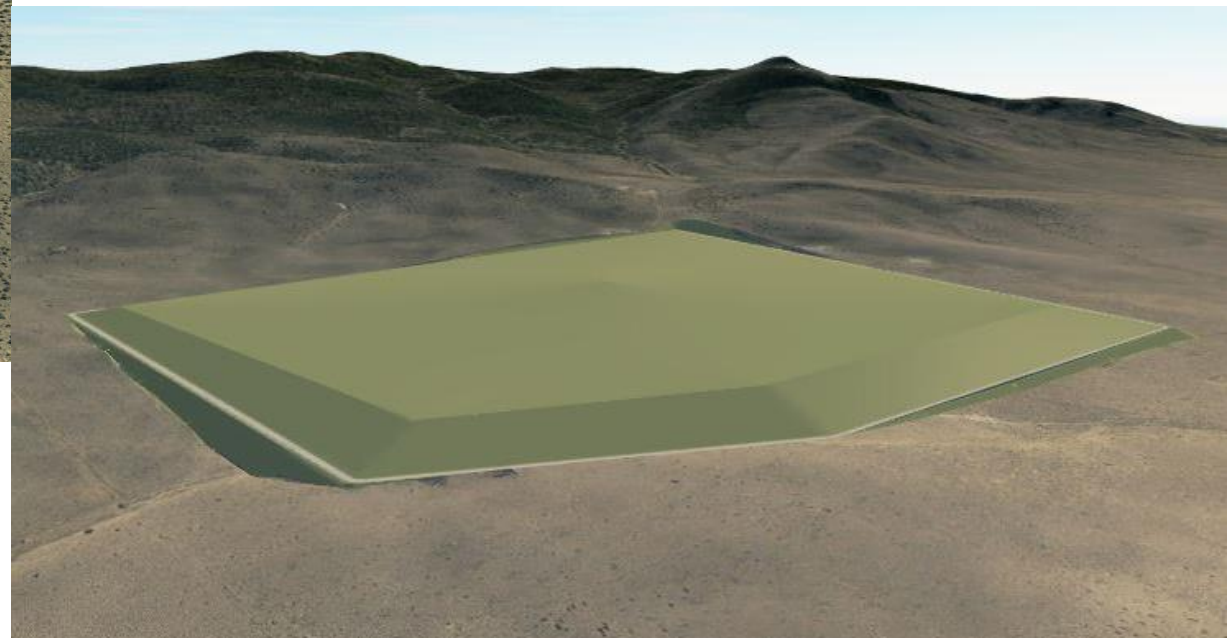


CONCEPTUAL MASTER PLAN



MOON PIT
SITE RENDERING

ROTH EAST
SITE RENDERING



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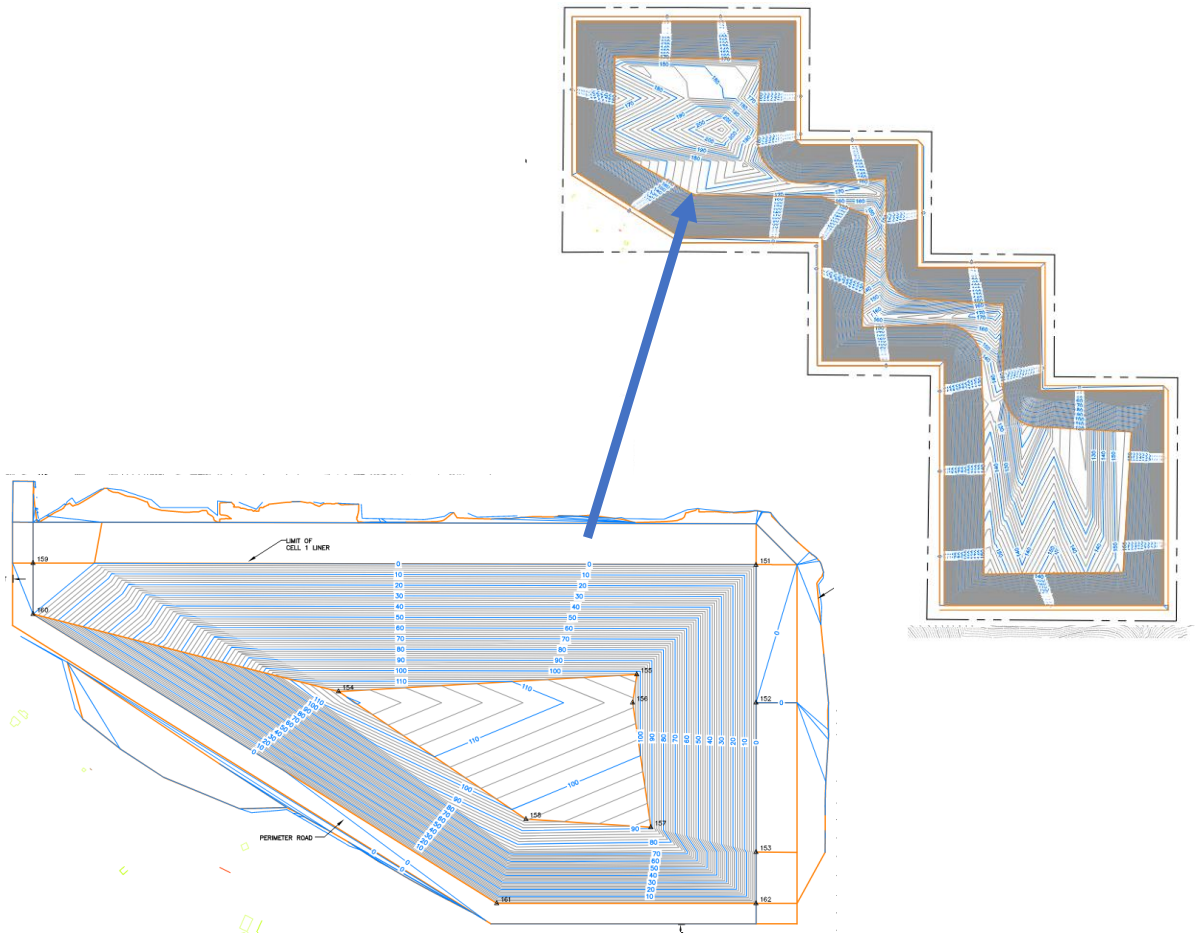

Moon Pit

- Challenges: Unfavorable geometry and rocky conditions
- Disposal Area: 346 acres
- Available airspace: 64,000,000 cubic yards

LANDFILL PHASING SUMMARY – MOON PIT			
PHASE	AIR SPACE AVAILABLE	PROJECTED LIFE	FILL PERIOD
PHASE 1	26,000,000 CY	41 YEARS	2029-2070
PHASE 2	17,000,000 CY	26 YEARS	2070-2096
PHASE 3	21,000,000 CY	33 YEARS	2096-2129
TOTAL	64,000,000 CY	100 YEARS	

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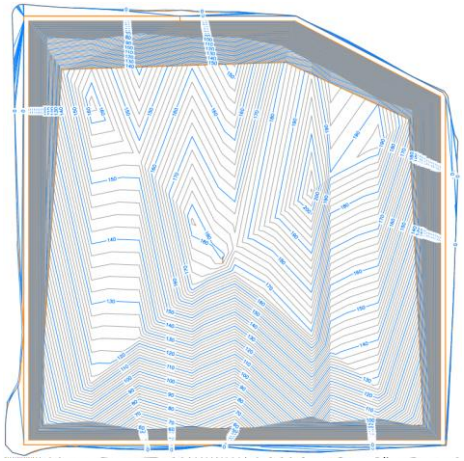
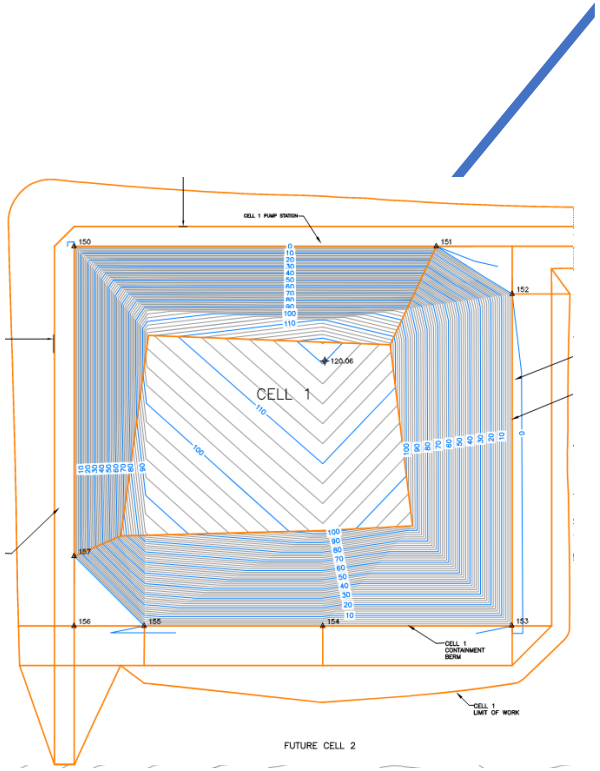
CONCEPTUAL MASTER PLAN





Roth East

- Advantages: Favorable square geometry and suitable soil
- Disposal Area: 387 acres
- Available airspace: 80,000,000 cubic yards

LANDFILL PHASING SUMMARY – ROTH EAST			
PHASE	AIR SPACE AVAILABLE	PROJECTED LIFE	FILL PERIOD
PHASE 1	21,000,000 CY	33 YEARS	2029-2062
PHASE 2	17,000,000 CY	27 YEARS	2062-2089
PHASE 3	22,000,000 CY	30 YEARS	2089-2119
PHASE 4	20,000,000 CY	23 YEARS	2119-2142
TOTAL	80,000,000 CY	113 YEARS	

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SITE ZONING

Moon Pit

- Surface Mining (SM) base zone, with the following overlays:
  - Wildlife Area (WA) combining zone
  - Surface Mining Impact Area (SMIA) combining zone
- Current use: active surface mine
- Surrounding Area
  - Oregon Badlands Wilderness and associated trails/trailheads
  - Public lands

Roth East

- Exclusive Farm Use Horse Ridge (EFUHR) base zone, with the following overlays:
  - Landscape Management (LM) combining zone
  - Sage Grouse Habitat Area – Low Density (SGHA-LOW)
  - Surface Mining Impact Area (SMIA)
  - Wildlife Area Combining Zone (WA)
- Current use: rural undeveloped/grazing
- Surrounding Area:
  - Rural residential properties
  - Millican Valley OHV trails
  - Deschutes National Forest and Pine Mountain Observatory (astronomical observatory)

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SITE DEVELOPMENT/PERMITTING

Moon Pit

- Three potential options for landfill use:
  - (1) Rezone from SM to MUA10 (Multiple Use Agriculture 10-Acre Minimum
    - Requires showing the protected mineral resource has been exhausted
  - (2) Text amendment in the Deschutes Comprehensive Plan to allow the landfill use as a reclamation plan
    - Requires Coordination with DOGAMI and DLCD
    - Maintains SM zone and SMIA combining zone
    - Requires two separate hearings – hearings officer first followed by Board of Commissioners
  - (3) Create Landfill Overlay for Site
    - Requires text amendment to county code and adoption of overlay to site.
    - County Planning: Overlay should have happened before the siting process and overlays are used to limit uses on properties
- Permits:
  - County Conditional Use Permit
  - County Site Plan Review
  - BLM Environmental Assessment (EA) or Environmental Impact Statement (EIS)
    - may be required for new or assigned BLM ROW for use of access road
  - Natural Resource Permits
  - Oregon DEQ Solid Waste Disposal Permit
  - DOGAMI Permit

Roth East

- Landfill use is a conditional use under EFU zoning
  - For any non-farm use, a Farm Impact Test is required on EFU properties
    - Could lead to LUBA appeals
- Permits:
  - County Conditional Use Permit
  - County Site Plan Review
  - County Landscape Management Review
  - Natural Resource Permits
  - Oregon DEQ Solid Waste Disposal Permit

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TRANSPORTATION – MOON PIT SITE

- 7 employee trips + 35 truck trips per day
- Established site access currently used by heavy vehicles for quarry operations (~1.2 miles long). Currently ~20 mining truck round trips per day, on average.
- Shared access with Badlands
- Current ROW along access road is 30’ wide (28’ wide road) through BLM lands. A NEPA process would be required if additional ROW is needed.
- Enhanced acceleration lane onto US 20 may be beneficial

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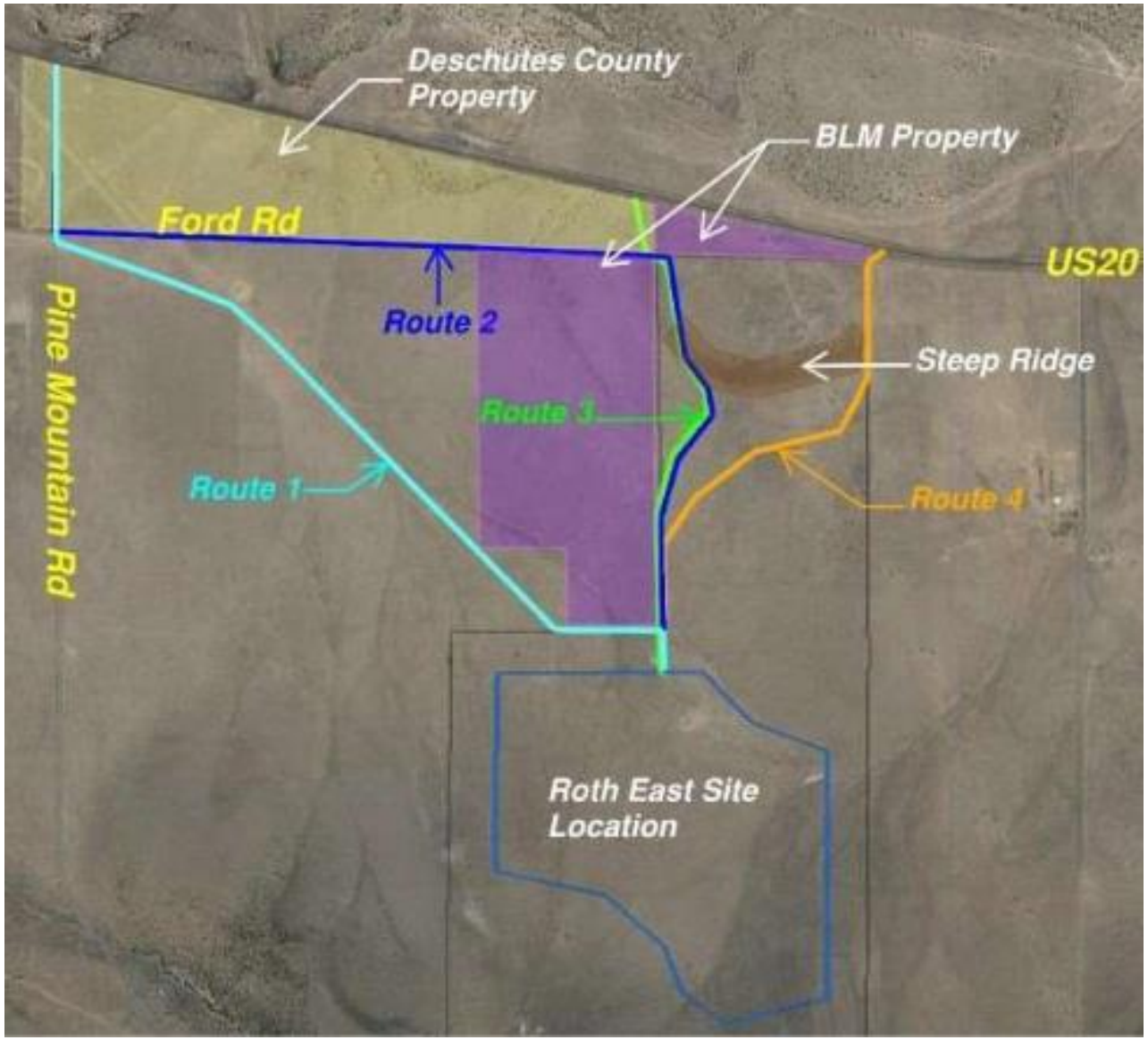
TRANSPORTATION – ROTH SITE

- 7 employee trips + 35 truck trips per day
- Several options for preferred access route to site
- Routes range from:
  - 1.2 – 2.9 miles
  - ~$1.2M - $2.90M to construct
  - Relatively flat, with areas to up to 8-10% grade
- Alternate access points to the east would need to consider available sight distance at US 20.



WATER INFRASTRUCTURE ASSESSMENT – MOON PIT

- Two water supply wells (Wells A and B) located ~186 feet apart near the site's west entrance road.
- Well depths: 931 ft bgs (Well A) and 1135 ft bgs (Well B) with static water level around 851 feet.
- Well A is not in use; Well B is in use, capable of producing 1,000 gpm.
- Well B has water right permit (G-12860) with priority date of 5/16/1994, for dust control and gravel washing with max use rates of 174,505 gpd and 529,978 gpd.
- Beneficial use area encompasses site tax lot boundary.

WATER INFRASTRUCTURE ASSESSMENT – ROTH EAST

- A water supply well (the Powell or Deep Well) located near the southwest corner of the site tax lot ~1.1 miles SW of the proposed development area.
- The Deep Well is 995 ft deep with static water level of 970 feet based on a well completion measurement.
- The Deep Well is currently used to supply a residence and stock watering (reportedly ~ 1 water truck per day). The 1990 well report indicates well was able to produce 50 gpm with no drawdown.
- The are no water rights appurtenant to the Deep Well or the site tax lot. The closest water right is ~2 miles east of the site.
- Several wells identified in the northern area of the site with one possibly located on tax lot. Depth to groundwater and productivity appears to vary.

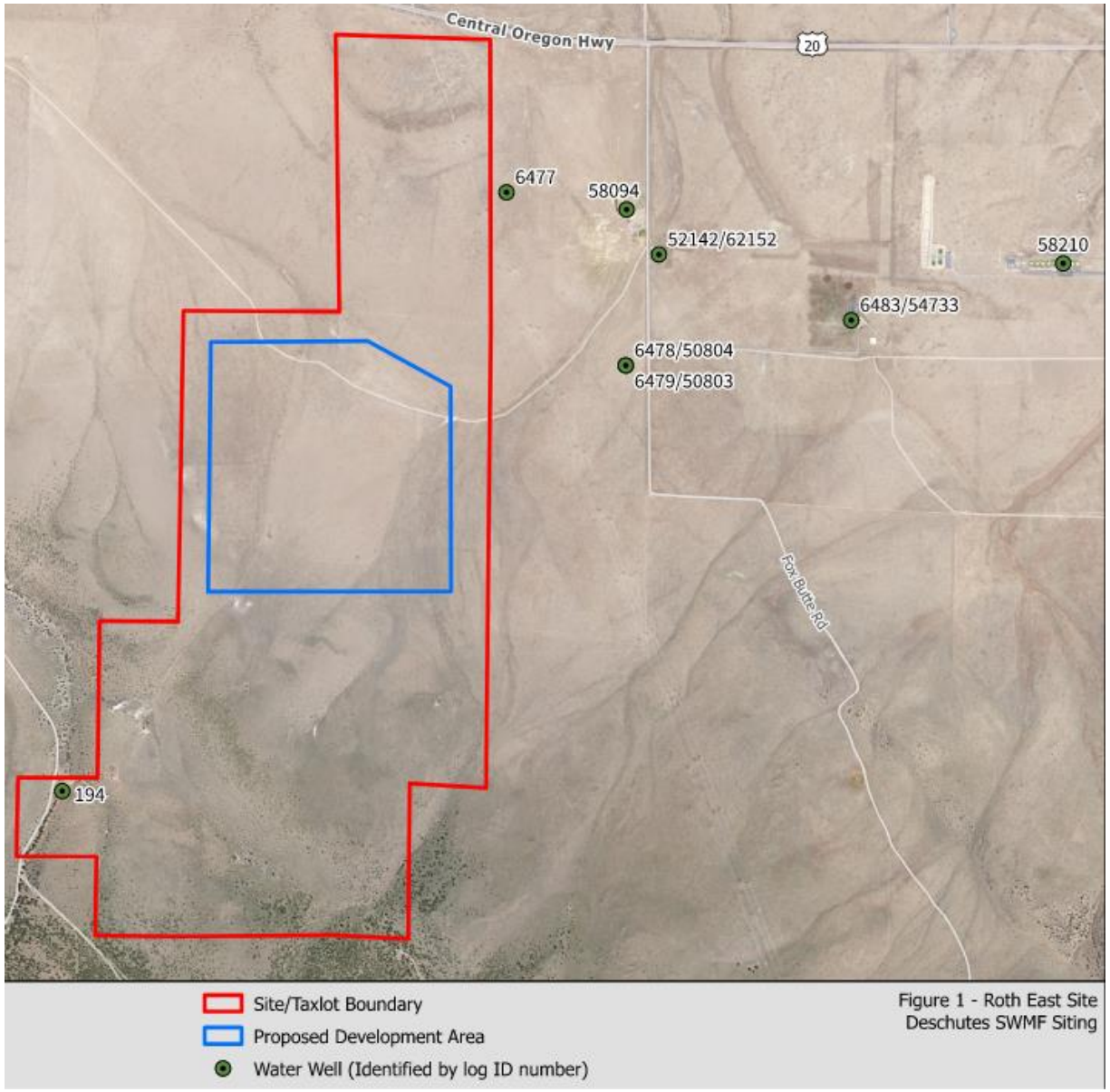
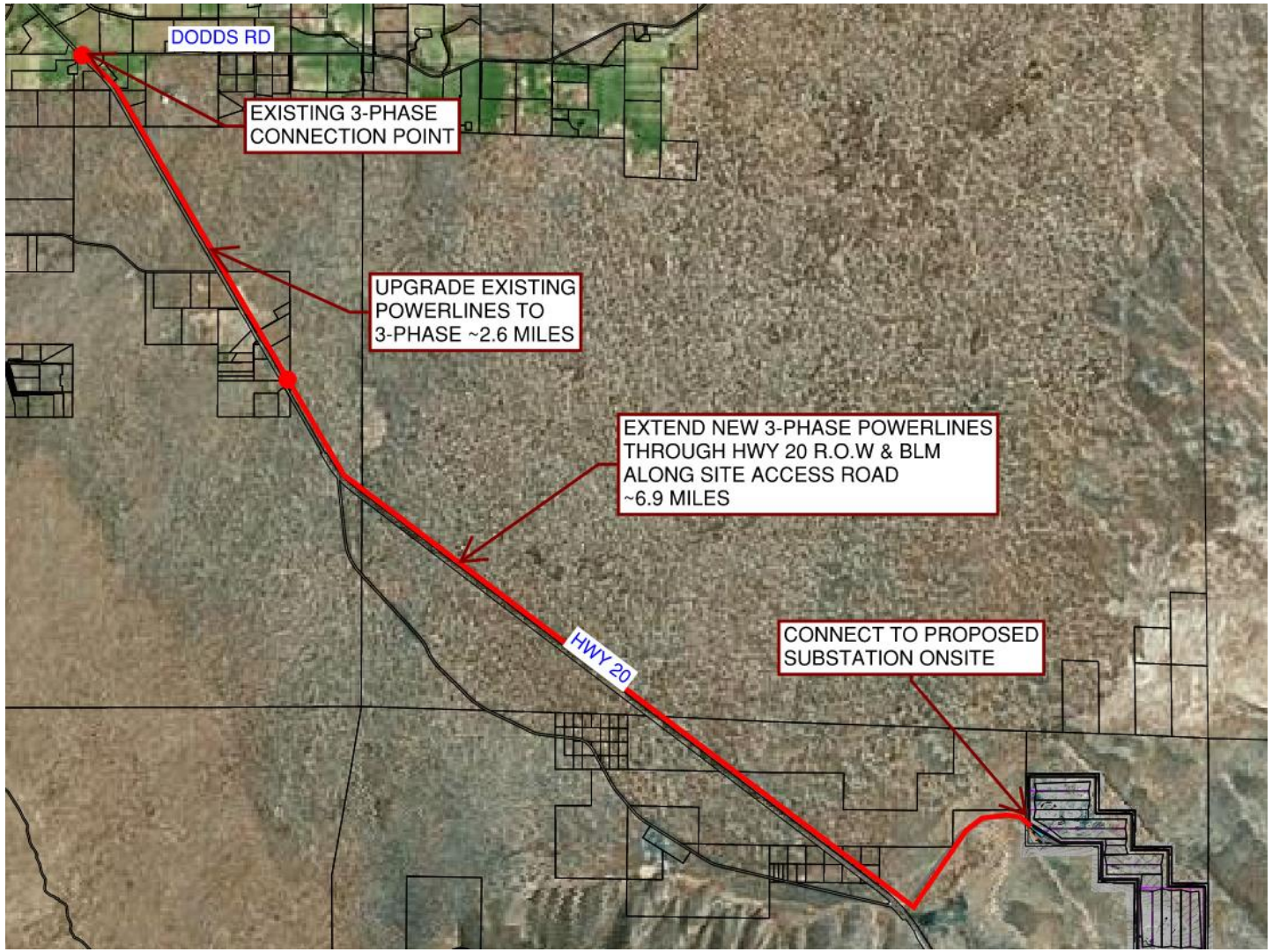


Figure 1 - Roth East Site
Deschutes SWMF Siting

ELECTRICAL– MOON PIT



Electrical Requirements

- 3-phase electrical connection
- Capacity for up to 5 MW power generation
- Onsite substation

Power Infrastructure Needs:

Extension of 3-phase power ~9.5 miles from existing overhead power lines

*easements required through BLM property

*50-60 week lead time for materials

Estimate of Probable Cost : (verified with CEC)

~$2,000,000

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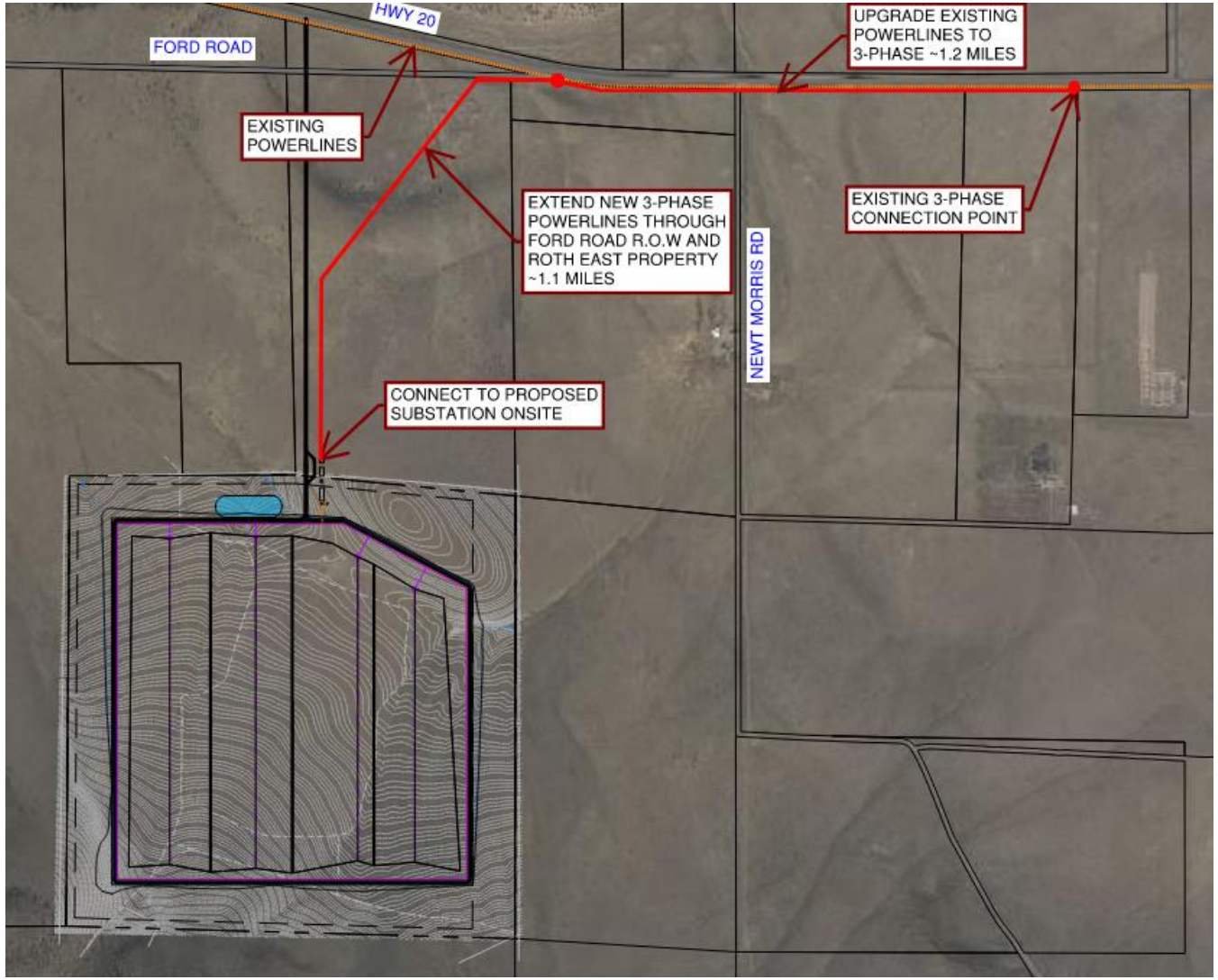
ELECTRICAL– ROTH EAST



Electrical Requirements

- 3-phase electrical connection
- Capacity for up to 5 MW power generation
- Onsite substation

Power Infrastructure Needs:

Extension of 3-phase power ~2.3 miles from existing overhead power lines

*easements required through private property for extensions

*50-60 week lead time for materials

Estimate of Probable Cost: (verified with CEC)

~$700,000

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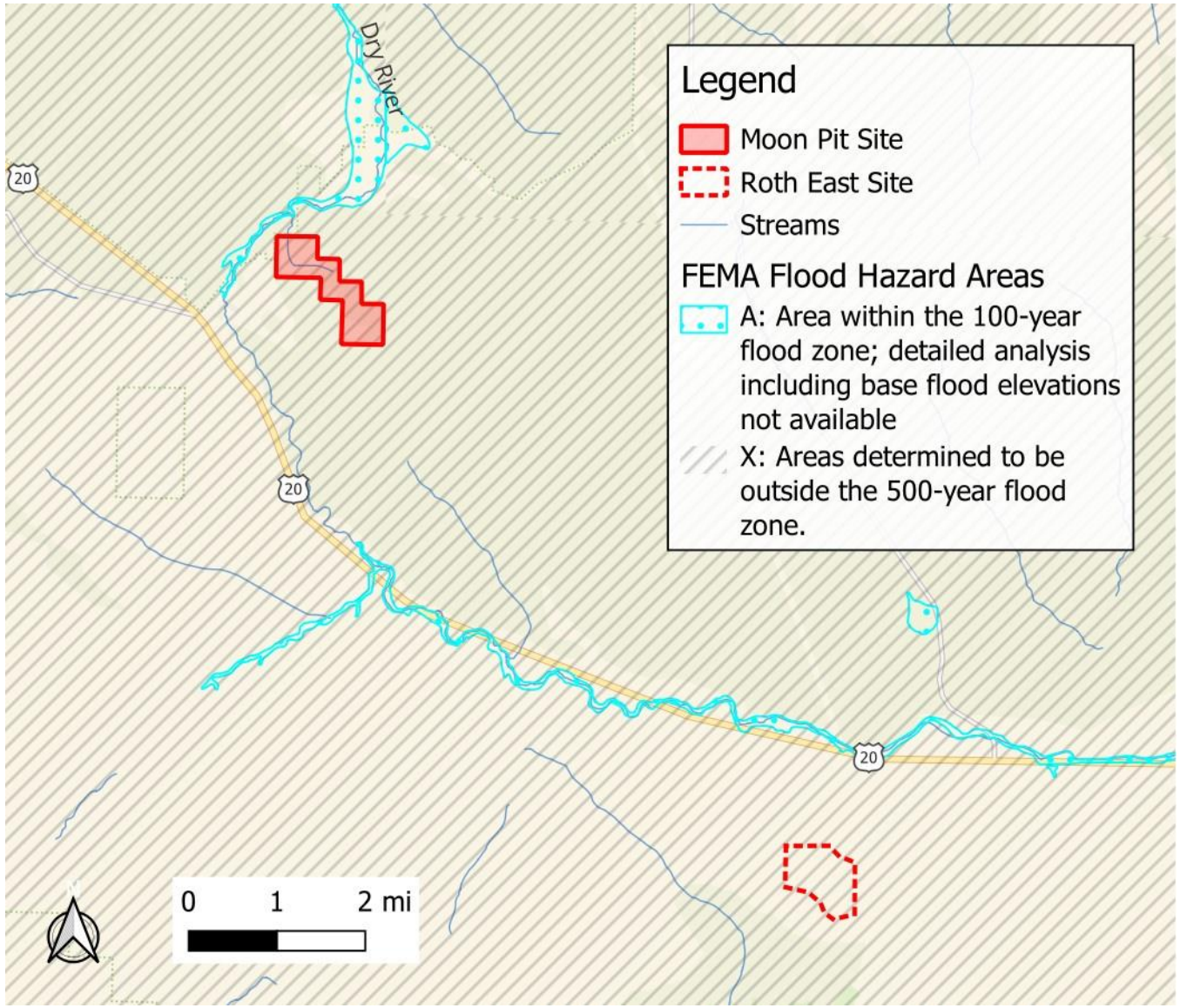
FLOOD RISK DESKTOP ASSESSMENT



Floodplain Mapping

- Moon Pit site is 800 feet from 100-year floodplain
  - Flood Zone is "approximate" with detailed analysis unavailable
- Roth East site is not near floodplain
- Highway 20 is within the floodplain

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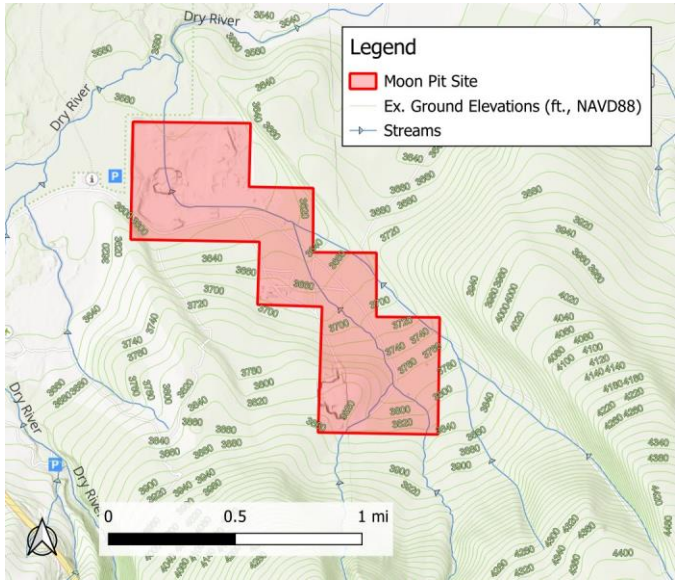
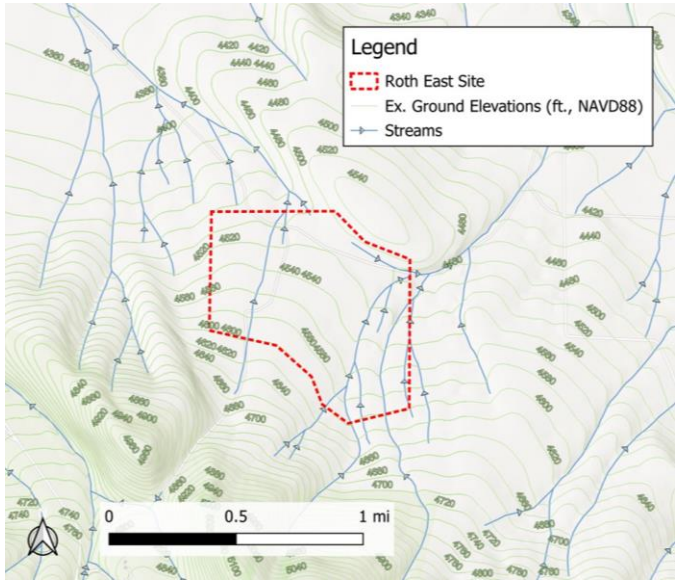
FLOOD RISK DESKTOP ASSESSMENT





Moon Pit Site

- Characterized by flat topography near Dry River
- Bisected by mapped stream channel
- Significant upgradient, high slope drainage area

Roth East Site

- Contains mapped stream channels
- Drains a smaller but still high slope drainage area

Conclusion: There are manageable risks of flash flooding at both sites, slightly higher at Moon Pit

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GEOLOGY/GROUNDWATER –MOON PIT

- Shallow Depth to Bedrock
- Located within Fault-bounded (pre-Holocene) Valley
- Regional GW about 850 ft bgs
- Onsite Well has Very Good Yield
- Water Quality Analysis also Good - Only 1 parameter (dissolved iron) slightly exceeds reference level
- Low risk of groundwater contamination

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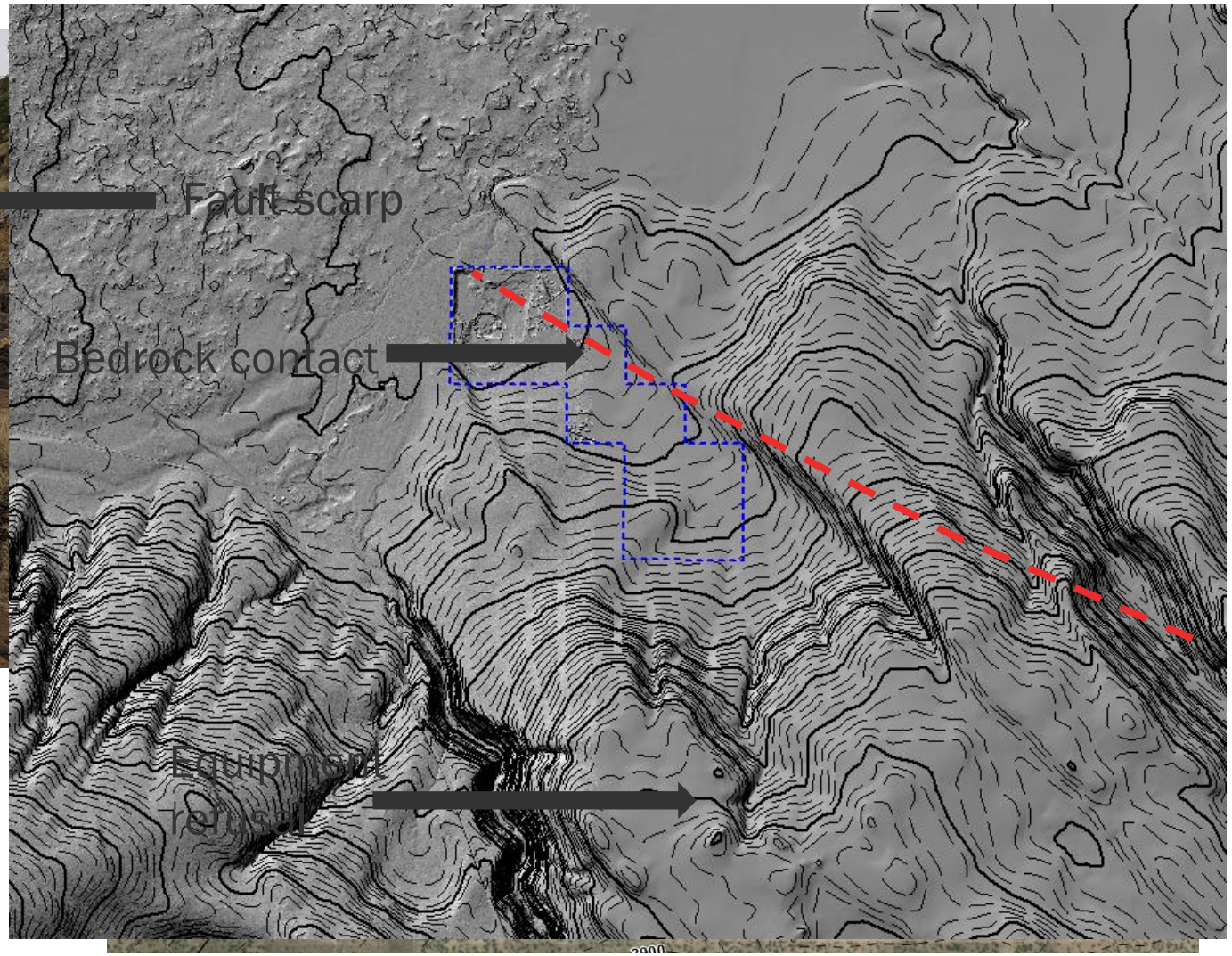
GEOLOGY/GROUNDWATER –ROTH EAST

- 300+ Ft of Alluvial Deposits overlie Bedrock (lots of cover material!)
- Limited Potential for Low Permeability Zones above Bedrock
- Regional GW Expected at 450+ ft
- Uncertainty if a shallower aquifer extends under site
- GW Quality of onsite well (Powell Deep Well 1+ mi SW of site) is Very Good
- Yield of Regional Aquifer is not fully known (Onsite well - 50 gpm)

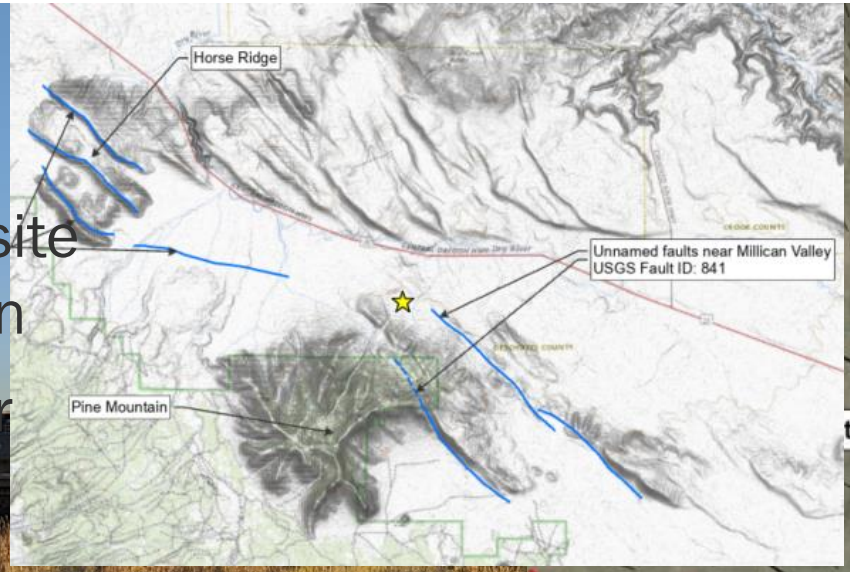
DELVE UNDERGROUND: PRELIMINARY GEOTECHNICAL ENGINEERING – MOON PIT

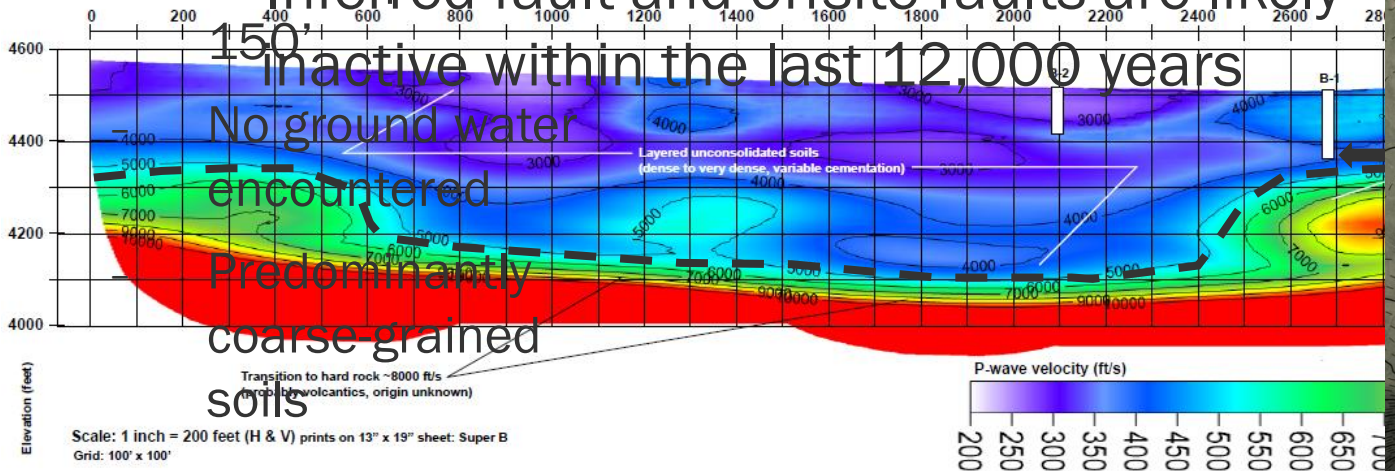
- Shallow bedrock conditions are persistent throughout the site
- 12 test pits excavated
- Blasting will be required
- Shallow bedrock excavations will persist through the site



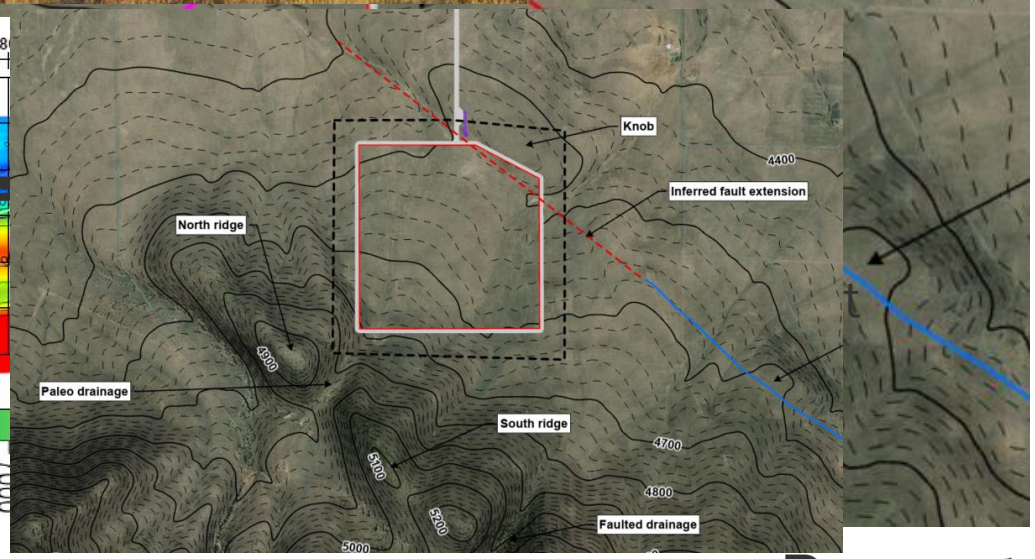
DELVE UNDERGROUND: PRELIMINARY GEOTECHNICAL ENGINEERING –ROTH EAST

- Site is underlain by approximately 400-feet of sediments consisting of an alluvial fan
  - Approximately 400-feet of sediments underlying the site; primarily gravels
- Two geophysical profiles
  - Compressional and shear wave velocity profiles
- Three geotechnical borings
  - Conventional excavation and mass grading equipment is anticipated for development pending further investigation
  - Total depth 100’ – 150’
  - No ground water encountered
  - Predominantly coarse-grained soils





- Inferred fault and offsite faults are likely inactive within the last 12,000 years



DELVE underground

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PHASE I ENVIRONMENTAL SITE ASSESSMENT – MOON PIT

- Gravel mining operation began in 1994, prior land use was cattle ranch.
- Asphalt plant operated on the subject property briefly in the 90s during work on Highway 20; some waste asphalt still located on the property.
- Listed on Oregon DEQ Environmental Cleanup Site Information database, for tracking purposes only. No documented releases.
- Boneyard and diesel ASTs (in use) located on the property; some surface staining noted (de minimis).
- Original ranch house dates from the 1980s and could contain hazardous building materials.
- No Recognized Environmental Conditions (as defined by ASTM 1527-21) and no further environmental investigation recommended.

PHASE I ENVIRONMENTAL SITE ASSESSMENT – ROTH EAST

- Only prior land use is as a cattle ranch.
- Lower portion of parcel where landfill would be sited is undeveloped aside from dirt roads.
- Site is not listed in any environmental databases.
- Two fuel ASTs are located on the upper portion of the subject property in proximity to other ranch related infrastructure. No staining or other indications of contamination.
- Existing ranch house dates from the 1990s and is unlikely to contain hazardous building materials.
- No Recognized Environmental Conditions (as defined by ASTM 1527-21) and no further environmental investigation recommended.

AIR QUALITY AND WEATHER SUMMARY

- Prevailing winds are from SSE and NW (Redmond Airport).
- Average annual precipitation of less than 12 inches (Bend), more than half falls between November and February.
- The vicinity of the subject property has a risk score for lightning susceptibility of 20.7 (relatively low).
- Air quality data from Prineville indicates PM2.5 and ozone peaks of 518 micrograms per cubic meter (9/12/20) and 39 parts per billion (also 9/12/20) respectively (related to the Labor Day fires of 2020).
- No local (within 3 miles) permitted air quality facilities or sensitive receptors identified.
- Because of the local topography, the Roth East site is more exposed and likely more susceptible to high winds causing operations issues.

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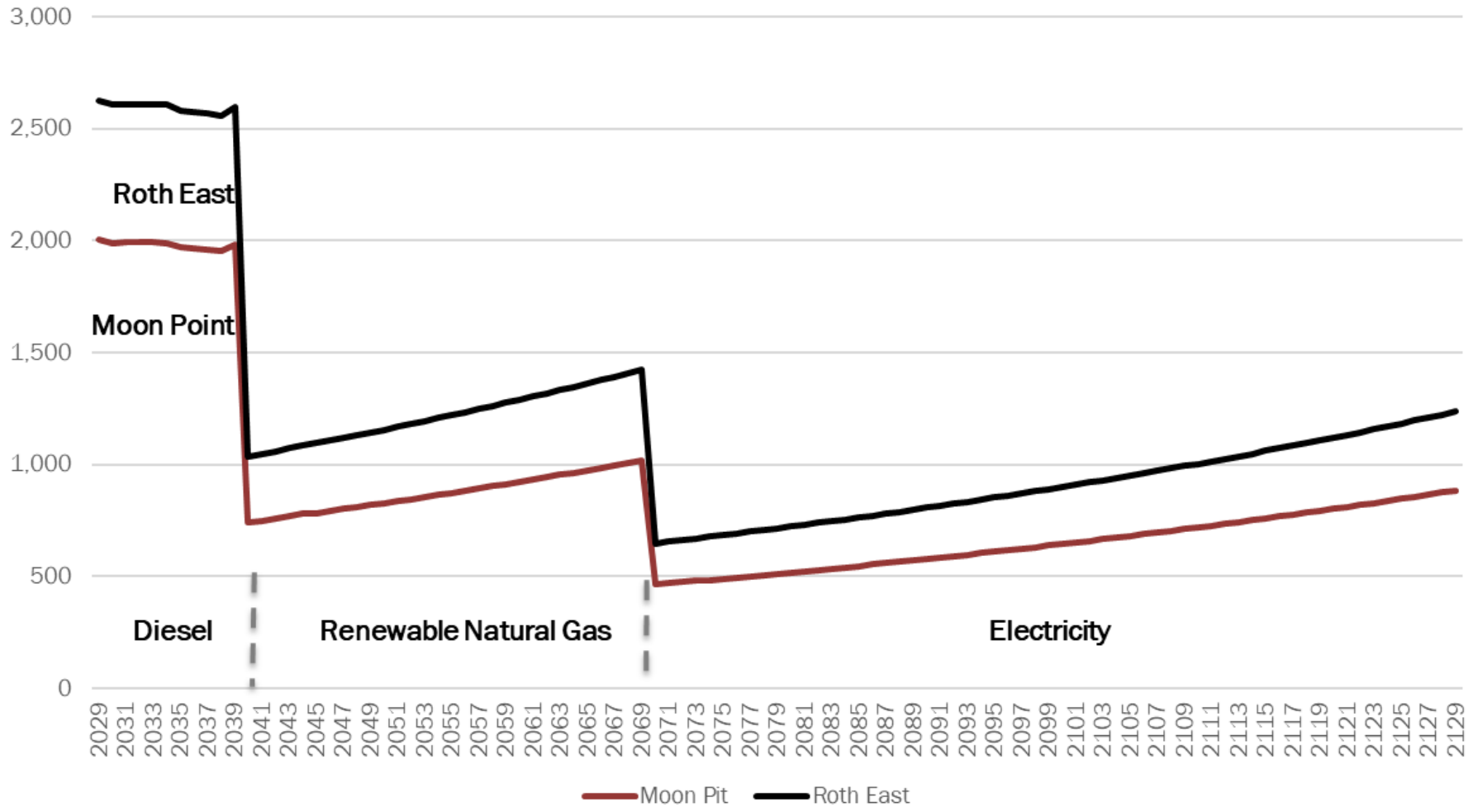
AIR QUALITY AND WEATHER SUMMARY

Waste Hauling Greenhouse Gas Emissions Profiles by Landfill Location and Energy Source



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NATURAL RESOURCE ASSESSMENT

Roth East

309.3 acres intact sage brush steppe

Moon Pit

177.8 acres disturbed juniper woodland

Resources

- No waters or jurisdictional wetland on Roth East or Moon Pit sites
- No ESA-listed species are likely to occur on Roth East or Moon Pit sites
- Golden eagle nest within 2 miles of Moon Pit
  - USFWS Incidental Take Permit
- Wildlife Combining Zone:
  - Both sites are in a wildlife combining zone (County).
  - No mitigation requirements for this designation; to be addressed with land use permitting

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NATURAL RESOURCE ASSESSMENT

Big Game Category 2 Habitat

- The Big 3: Elk, Mule, and Pronghorn
- Mitigation: Land acquisition for conservation and enhancement
    - Similar costs between sites

Sage-grouse Habitat

Mitigation:

- In-lieu fee, mitigation bank
- Permittee-responsible: Land acquisition or conservation agreement
    - Moon Pit: 10–26 acres
    - Roth East: 221–560 acres

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CULTURAL RESOURCES – MOON PIT

Reconnaissance Survey Results

- Surveyed 100 of the approximately 560 project acres.
- Identified 5 archaeological resources – 3 precontact sites and 2 historic isolates.
- All areas not impacted by mining/quarry activities have a moderate to high probability for archaeological resources.
- However, since much of the area is disturbed by mining/quarry activities, the potential for archaeological resources is reduced.

Recommendations

- Conduct formal systematic survey of all areas not directly impacted by mining/quarry activities to identify archaeological resources.
- If a resource will be impacted by the project, the resource's significance must be formally evaluated under Oregon state law. Evaluation will require an Oregon SHPO archaeological permit.

Considerations for Timeline

- SHPO permits take 30 days to process.
- If a resource is determined significant, it must be avoided or mitigated.
- SHPO review and SHPO concurrence take time.

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CULTURAL RESOURCES – ROTH EAST

Reconnaissance Survey Results

- Surveyed 128 of the approximately 645 project acres.
- Identified 12 archaeological resources – 6 sites and 6 isolates, majority precontact.
- Entire Roth East parcel has a high probability for archaeological resources.
- Roth East is largely undisturbed, therefore the potential for discovery of intact archaeological resources is great.

Recommendations

- Conduct formal systematic archaeological survey of the entire project area.
- If a resource will be impacted by the project, the resource's significance must be formally evaluated under Oregon state law. Evaluation will require an Oregon SHPO archaeological permit.

Considerations for Timeline

- SHPO permits take 30 days to process.
- If a resource is determined significant, it must be avoided or mitigated.
- SHPO review and SHPO concurrence take time.

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COMMUNITY CONSIDERATIONS – MOON PIT

Interested Parties

- Recreation users, including hikers and bikers
- Badlands Wilderness, Bureau of Land Management
- Additional environment, wildlife, and other interests

Concerns & Opportunities

Expressed concerns:

- Traffic and shared access safety
- Disruption to habitat and wildlife

Expressed opportunities:

- Less populated area of County
- Buffered by public lands, potential visual screening from topography
- Comparatively less change from current use, potential for reclamation

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COMMUNITY CONSIDERATIONS – ROTH EAST

Interested Parties

- Millican Valley residents
- Pine Mountain Observatory and University of Oregon
- Recreation users, especially paragliders, bikers, hikers, OHV
- Additional environment, wildlife, and other interests

Concerns & Opportunities

Expressed concerns:

- Dust, litter, odor + wind
- Groundwater contamination
- Potential cultural artifacts/sites
- Disruption to habitat and wildlife

Expressed opportunities:

- Less populated area of County
- Use of adjacent property for mitigation

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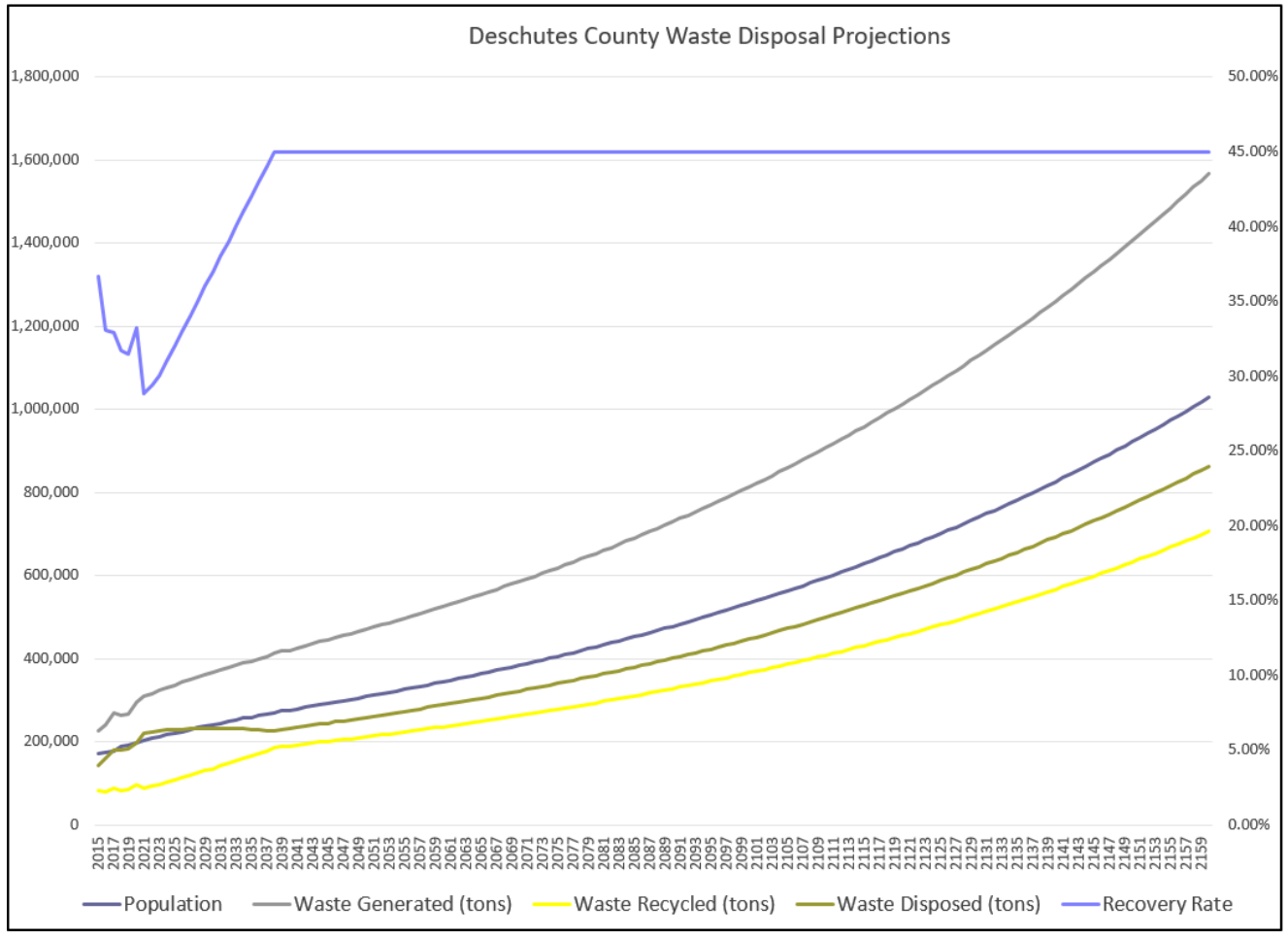
COST ESTIMATES



Sources:

- Deschutes County Solid Waste Management Plan (2019)
- PSU 2020 Annual Population Report Tables (for 2018-2019 population)
- Coordinated Population Forecast for Deschutes County (2022-2072) by Portland State University Population Research Center
- 2018-2021 Material Recovery and Waste Generation Rates Report
- 2022 Knott Landfill Tonnage Analysis provided by DCSW

Assumptions:

- Continuation of 1.1% Average Annual Growth Rate (AAGR) from 2072
- Recovery Rate will increase from 29% in 2022 at a rate of 1% per year, up to 45% in 2038, and then remain at 45%
- Current (2021) Per capita waste generation of 3,050 lbs/capita will remain steady through planning period

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COST ESTIMATES

	MOON PIT	ROTH EAST
INITIAL SITE ACQUISITION COST	$15,370,000-$15,870,000	$5,500,000
INITIAL DEVELOPMENT COST	$50-$64 M (2024-2029)	$36 M (2024-2029)
CELL DEVELOPMENT COST PER ACRE	$705,000-$1,075,000/acre	$393,000/acre
OPERATIONAL COST	$7.6 M/ year	$8.4 M/year
ANNUAL HAUL COST	$2.5 M/year	$3.3 M/year
Avg Cost/Ton (over lifespan)	$43-48/ton	$45/ton

Assumptions:

- Landfill density – 1400 lbs per cubic yard air space consumed
- Cover to Refuse airspace Ratio – 20%
- Two thirds of cell excavation would occur as a part of daily cover borrow operations at Roth East
- 90% of excavation at Moon Pit would require rock drilling, blasting, and processing at a cost of $12/ton by County, or a discounted cost of $4/ton as a part of aggregate mining

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Key Findings Summary

Moon Pit

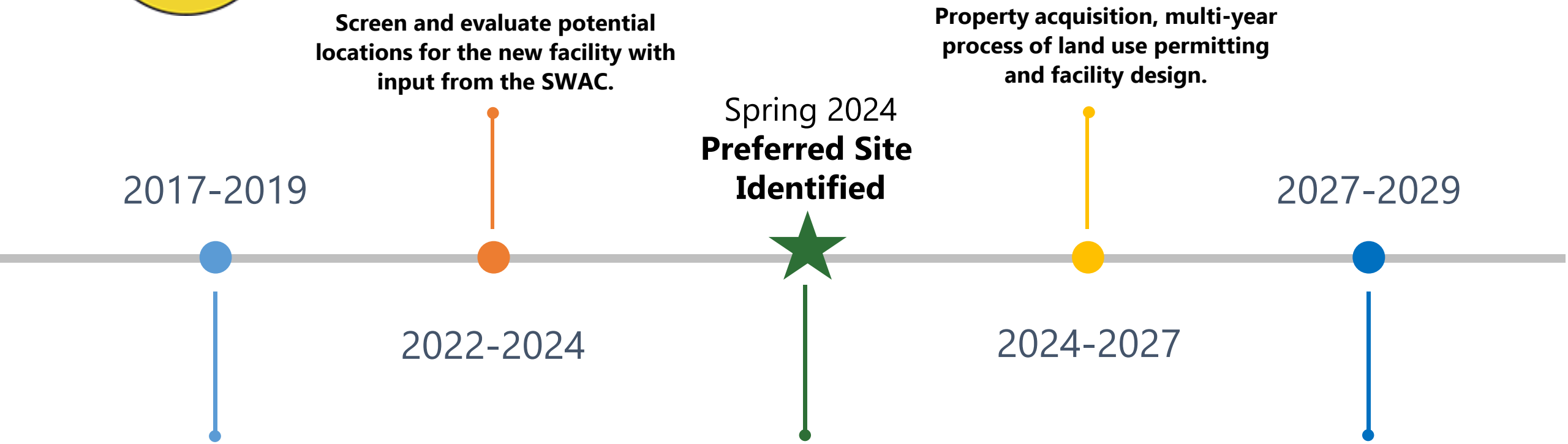
- **Costs:** Higher acquisition and development costs, but lower annual operational costs
- **Infrastructure:** More electrical infrastructure needed, but less water and roadway infrastructure needed.
- **Environmental Impact:** Concerns about cultural resource loss, wildlife, and recreation disruption.
- **Public Concerns:** less concern with visual and residential impacts, but concerns about wildlife and Badlands Wilderness area impacts
- **Risks:** Potential delays and conflicts due to land use approvals and NEPA processes, economic feasibility of aggregate mining to offset rock excavation costs

Roth East

- **Costs:** Lower acquisition and development costs, but higher annual operational costs, largely due to longer haul distance
- **Infrastructure:** More water and road infrastructure needed, but less electrical infrastructure needed
- **Environmental Impact:** Concerns about impacts to cultural resources, groundwater, and wildlife – particularly sage grouse
- **Public Concerns:** more concern with visual and residential impacts, similar concerns about habitat and wildlife
- **Risks:** Potential delays and appeals due to Farm Impacts Test, and higher susceptibility to high winds

SWAC Discussion

Roadmap to opening in 2029



What happens next…

- **Continued briefings/outreach to interested parties**
- **SWAC Meetings:**
  - **March 19, 2024, 9am-noon**: report review and discussion
    - March 12: receive full report
    - March 26: report feedback due
  - **April 16, 2024, 9-11 am**: finalist site recommendation
- **Board of County Commissioners Approval Process:**
  - May and June 2024 (tentative): public hearing(s) prior to BOCC decision

Adjourn