Jordan Cove Energy Project, LP

Conceptual Closure and Post Closure Plan

North Spit Landfill,
Solid Waste Permit No. 1142

B	31-May-18	Issued for Review	EAS	SKD		
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Page No.	Section	Change Description
	Appendix 1	Revised dates in Table 3

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Reference: 617081

May 31, 2018

Mr. James McCourt, PE, Environmental Engineer
Department of Environmental Quality
Western Regional Eugene Office
165 east 7th Ave., Suite, 100
Eugene, OR 97401

Subject: Final Conceptual Closure and Post Closure Plan, North Spit Landfill, Solid Waste Permit No. 1142

Dear Mr. McCourt:

Please find enclosed the *Final Conceptual Closure and Post Closure Plan, North Spit Landfill* prepared by SHN on behalf of Fort Chicago Holdings II U.S. LLC to fulfill requirements in Solid Waste Permit No. 1142. Fort Chicago appreciates your preliminary review of the draft plan. Following your comments, SHN will prepare and submit a final plan to the Oregon Department of Environmental Quality for review and approval.

Feel free to contact me at 541-266-9890 if you have any questions.

Sincerely,

SHN Engineers & Geologists

Steven K. Donovan, PE
Principal

SKD:dkl

Enclosures: Conceptual Closure and Post Closure Plan

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Reference: 617081

Conceptual Closure and Post Closure Plan, North Spit Landfill

Solid Waste Permit No. 1142

Prepared for:

Fort Chicago Holdings II U.S. LLC
125 W. Central Avenue, Suite 250
Coos Bay, Oregon 97420

REGISTERED PROFESSIONAL ENGINEER
#16,604
OREGON
JULY 20, 1993
STEVEN K. DONOVAN
EXPIRES: 12/31/19

Prepared by:

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May 2018

QA/QC: SKD

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Appendices

Abbreviations and Acronyms

cy	cubic yard
ASB	aeration stabilization basin
DEQ	Oregon Department of Environmental Quality
EMP	Environmental Monitoring Plan
ISWL	industrial solid waste landfill
JCEP	Jordan Cove Energy Project, LP
NFA	no further action
NPDES	National Pollutant Discharge Elimination System
SHN	SHN Engineers & Geologists
WWTS	wastewater treatment system

1.0 Introduction

This Conceptual Closure and Post Closure Plan addresses closure and post closure care for the North Spit Landfill at the former Weyerhaeuser NR Company's (Weyerhaeuser's) Containerboard Packaging facility in North Bend, Oregon (Figure 1 and 3, Appendix 2). Manufacturing operations ceased at the facility on June 30, 2003 and Weyerhaeuser closed the mill on August 15, 2003 and demolished the mill facilities from August to December 2005. When in operation, the mill facilities included the North Spit industrial solid waste landfill (ISWL) and a wastewater treatment system (WWTS). Fort Chicago Holdings II U.S. LLC ("Fort Chicago") purchased the property from Weyerhaeuser including the ISWL in December 2012 and is the property owner. Jordan Cove Energy Project, LP (JCEP) is the operator.

The ISWL is regulated under DEQ Solid Waste Permit Number 1142 (Solid Waste Permit). The WWTS is regulated under National Pollutant Discharge Elimination System (NPDES) permit number 101499 (NPDES Permit). The Solid Waste Permit and NPDES Permit remain active. Copies of the permits are included in Appendices C and D, respectively. The Solid Waste Permit was updated to document the change in ownership of the ISWL from Weyerhaeuser to Fort Chicago, c/o Jordan Cove Energy Project, LP, and the expiration date is August 31, 2021. This Conceptual Closure and Post Closure Plan has been prepared consistent with the requirements of the renewed Solid Waste Permit.

Fort Chicago is preparing a Closure Permit application and Final Engineered Closure and Post Closure Plans for submittal to the Oregon Department of Environmental Quality (DEQ) with a targeted approval date by the end of 2018. Following approval, JCEP is planning to close Cell 2 and remove all of the waste, liner and leachate collection system from Cell 3 by late 2019. Initial Cell 3 waste removal will also be completed under a revised Operations Plan. The revised Operations Plan will be in place until the Closure Permit and Final Engineered Closure and Post Closure Plans are approved by DEQ. JCEP anticipates initiating post closure in 2020.

SHN prepared this Conceptual Closure Plan to address Cell 2 and Cell 3 (Cell 1 has been previously closed). The Conceptual Post Closure Plan includes post closure care for Cells 1, 2, and 3.

2.0 Background

This section provides a description of the South Dunes site, the area previously known as the mill site, the ISWL, the WWTS, and related background information.

2.1 Site and Facility Description

South Dunes site is located on the North Spit of Coos Bay approximately one-half mile west of U. S. Highway 101 (Hwy 101) and approximately two miles north of downtown North Bend (Figure 1, Appendix 2). In addition to the former main mill area that consisted of mill buildings and supporting facilities, the mill included the North Spit ISWL and the WWTS. The former mill area is bordered on the southwest, south, and east by Coos Bay (including Jordan Cove and Haynes inlet), on the northwest by the landfill areas and two settling basins that are part of the WWTS, and on the north by Trans Pacific Parkway. The ISWL is comprised of three landfill cells, designated Cell 1, Cell 2, and Cell 3. The WWTS consists of two gravity settling basins (Basin 1, north and Basin 2, south), an aeration stabilization basin (ASB), and offshore outfall to the Pacific Ocean. A site plan of the former mill area showing existing features including Cell 1, Cell 2, and Cell 3 of the ISWL, and the north and south settling basins is shown in Figure 4. The former wastewater lagoon and ASB are located approximately 2 miles southwest of the former main mill area. The existing features for the ASB area are shown in Figure 4. Features of the ISWL and WWTS are described further below.

The mill site was originally developed as a neutral sulfite semi chemical process pulp and paper mill by the Menasha Wooden Ware Corporation (Menasha) in 1961. Weyerhaeuser acquired the mill from Menasha in 1981. Fort Chicago acquired the mill from Weyerhaeuser on December 14, 2012.

In 1995, Weyerhaeuser ceased pulp mill operations, and the facility was operated as a recycle paper mill until it was closed in 2003. Manufacturing operations ceased at the mill on June 30, 2003 and the mill was closed by Weyerhaeuser on August 15, 2003. Weyerhaeuser demolished the mill during August to December 2005. Approximately 9,820 tons of demolition debris was placed in Cell 3 and covered with sand. Cell 2 was used for the disposal of about 108 cubic yards (cy) of transite (asbestos-cement siding) from demolition of the mill buildings. Leachate from Cell 3 drains by gravity to the settling basins.

When the mill was first developed by Menasha, secondary treatment was accomplished by pumping wastewater from the settling basins to an approximately 270-acre treatment lagoon for passive aeration, evaporation and infiltration. This former wastewater lagoon is referred to as the Deflation Plain in the NPDES Permit. In 1972, the ocean outfall (NPDES Outfall 001) was constructed to compensate for decreased infiltration capacity resulting from reduced infiltration rates in the treatment lagoon. Initially, wastewater effluent was held in the lagoon and discharged to the ocean outfall from July 1 to March 31 only. In 1990, the approximately 30-acre ASB was constructed in the northeast corner of the lagoon to provide active aeration of wastewater before discharge to the lagoon. In 1996, discharge to the lagoon ceased, and instead the discharge was directed through the ocean outfall from the ASB.

Leachate from Cell 3, impacted stormwater runoff from the South Dunes site, and raw water from Coos Bay-North Bend Water Board's water wells are currently the only wastewater stream being discharged through the WWTS. Raw water is added to the WWTS to increase flow through the system to maintain proper function of the diffuser ports.

2.2 Regulatory Background

As part of planning for closure and potential sale of the property, in 2004 Weyerhaeuser had Thiel Engineering (Thiel, 2004) conduct an evaluation of the elements associated with environmental closure of the former mill facilities (Table 1, Appendix 1). Results of the evaluation, which include closure design alternatives with budget-level costs estimates are presented in the report "Technical and Cost Evaluation, Elements of Environmental Closure for the Weyerhaeuser Containerboard Packaging Facility, North Bend, Coos County, Oregon", dated April 2004 (Thiel, 2004). Weyerhaeuser submitted a previous closure plan for the mill facility to DEQ in June 2005 (2005 Closure Plan) that included conceptual closure and remedy alternative components for the ISWL and WWTS. The 2005 Closure Plan "Closure Plan, Weyerhaeuser North Bend Containerboard Facility, Coos County Oregon", dated June 17, 2005, was prepared by Tuppan Consultants LLC (Tuppan, 2005).

The 2005 Closure Plan was specifically submitted as a condition of the NPDES permit, which required Weyerhaeuser to prepare a Closure Plan for the WWTS components and areas including the north and south settling basins, the former wastewater lagoon (Deflation Plain), and the ISWL. At that time, Weyerhaeuser was also demolishing/decommissioning the mill and preparing the entire property for sale. Before this could occur, other parts of the mill facilities, including mill structures and the ISWL, which are overseen by different DEQ programs, needed to be remediated and/or closed. Therefore, the 2005 Closure Plan was developed to address closure of the WWTS, ISWL, and other environmental issues related to historical mill structures and operations.

As part of the mill closure and demolition in 2005 and 2006, Weyerhaeuser conducted assessment and remediation activities to address various environmental impacts related to former mill operations and facilities. The work was done in cooperation with DEQ under the DEQ's Voluntary Cleanup Program. The investigations and cleanup included the former main mill area, which encompasses the property south, and east of the ISWL and settling basins.

Based on the results of the assessment and remediation work, DEQ issued a no further action (NFA) determination for the former mill area in a letter to Weyerhaeuser dated September 15, 2006. The letter states that "this NFA determination does not include the mill's permitted industrial landfill (Solid Waste Disposal Permit #1142) or the mill's permitted industrial wastewater treatment system (NPDES Permit #101499; consisting of two settling basins, an aerated stabilization basin, and a large former lagoon). These facilities will be closed under their respective permits in cooperation with DEQ's Solid Waste and Water Quality Programs".

Weyerhaeuser submitted a revised Conceptual Closure and Post Closure Plan in October 2012 (2012 Closure Plan). The 2012 Closure Plan, dated October 26, 2012, was prepared by PES Environmental, Inc. and was approved by DEQ. The 2012 Closure Plan describes the closure design for Cell 2 and Cell 3, leachate management for Cell 3 and post-closure care for the ISWL and provides budget-level cost estimates for closure and post closure. The budget-level cost estimates in the 2012 Closure Plan have been used as the basis for the annual financial assurance submittals.

3.0 Current Regulatory Status and Permits

This section summarizes the requirements of the Solid Waste Permit No. 1142 and NPDES Permit 101499 along with the related facilities and features. The applicable regulatory authorities are also discussed.

3.1 Solid Waste Permit

The North Spit ISWL is essentially non-operational. The ISWL has not accepted wastes since December 2005 except in 2015 when construction soil from a water line project was placed in Cell 3 and in 2017 when soil from geologic borings and the barrels were placed in Cell 3. Although unused, Cell 2 and Cell 3 have not been administratively closed, but both cells are maintained with vegetative cover. Cell 1 was administratively closed in 1988.

The North Spit ISWL is a non-municipal industrial solid waste landfill subject to closure and post closure requirements. *See* ORS 459 (Solid Waste Management); OAR 340-093 and 095; and Solid Waste Disposal Permit No. 1142 issued by DEQ to Fort Chicago on 3/16/2014. The general terms of closure are in permit Section 11.0. Specific details and requirements for closure and post closure plans are in both DEQ’s rules and guidance documents.

JCEP does not plan to use the ISWL cells for waste disposal in the future. JCEP seeks to clean close Cell 3 and cap Cell 2. If conditions change, this Conceptual Closure and Post Closure Plan will be revised and updated as needed to address the changed conditions.

The Solid Waste Permit also requires groundwater and leachate quality monitoring and reporting. The current monitoring program is contained in the Environmental Monitoring Plan (EMP) for the site, dated September 17, 2012 (PES 2012). The existing EMP groundwater sampling is conducted on a biannual basis with an annual report and the post closure costs were determined based on the existing EMP.

Landfill gas was monitored from 1998 to 2001 and discontinued with the concurrence of DEQ. No landfill gas monitoring or controls are warranted.

3.2 NPDES Permit

NPDES Permit 101499 authorizes Fort Chicago to operate a wastewater, treatment, and disposal system and to discharge to public waters from the discharge points identified below. The NPDES permit's expiration is June 30, 2020. The current monitoring program for the NPDES Permit is contained in the EMP for the site, dated September 17, 2012 (PES 2012).

The waste stream discharge sources regulated by the NPDES Permit include:

- Process wastewater, stormwater, and landfill leachate to Pacific Ocean (Outfall 001a);
- Deflation Plain stormwater to Pacific Ocean (Outfall 001 b);
- Deflation Plain and ASB seepage to groundwater (Outfall 002); and
- North and South Settling Basins seepage to groundwater (Outfall 003)

Monitoring requirements for groundwater seepage are covered under the EMP. The settling basins and leachate sampling location are shown in Figures 2 and 3. Figure 4 shows existing infrastructure and facilities including the ASB and outfall. The following is a description of the WWTS areas and features:

- Settling Basins 1 and 2 - Wastewater from the leachate collection system and stormwater discharges to the two settling basins that are connected in series. The basins are unlined, approximately 14 to 16 feet deep, and each covers an area of approximately one acre. Currently the basins receive stormwater and leachate from Cell 3 (Figure 3). Pumps in the Settling Basin 1 convey accumulated liquids to the ASB. Leachate flows have ranged from approximately 4,300 to 260,000 gallons per day during summer and winter. In recent years, leachate flows have diminished. After Cell 3 is clean closed the Settling Basins will continue to operate under the NPDES Permit without the leachate flow.

3.3 Regulatory Authority

The following regulatory authorities and related administration programs within DEQ are applicable to the site and are related to some aspect of closure.

- Solid Waste Management Rules - OAR 340-093 and 095. The Solid Waste Permit is administered under these rules by the DEQ Solid Waste Program. These rules establish procedures, requirements, limitations and other criteria for solid waste disposal sites. General provisions are described in Division 93 and provisions specifically related to industrial landfills are provided in Division 95.

- Water Quality Rules - OAR 340-041. The NPDES Permit is administered under the DEQ Water Quality Program rules as authorized under the Federal Clean Water Act.

4.0 Conceptual Closure and Alternative Plans

This section discusses conceptual closure alternatives and plans for the ISWL. Each closure element is listed in Table 1 (Appendix 1) along with relevant information and summaries of closure alternatives. An engineer's opinion of costs were developed for the closure of Cell 2 and Cell 3 and 30-year post closure care and maintenance. The budget-level cost estimates have served as the basis for determination of financial assurance amounts that JCEP is required to submit to DEQ on an annual basis. The budget-level estimates are summarized in Table 2 (Appendix 1) and based upon the appropriate level of detail for the purposes of this Conceptual Closure Plan.

4.1 Industrial Solid Waste Land Disposal Units

As discussed above, though the Solid Waste Permit is active, the facility has only accepted minor quantities of construction soils and geologic investigation spoils since 2005. The ISWL consists of three landfill cells but only Cell 2 and Cell 3 are addressed by this plan. Cell 1 was capped and closed in 1988. Cell 2 and Cell 3 have interim soil caps but have not been officially closed.

The Solid Waste Permit describes the landfill closure requirements as consisting of either:

(a) geomembrane overlain by a drainage layer and 12 inches of top soil capable of maintaining a healthy growth of vegetation, or

(b) at least 18 inches of compacted soil having a maximum hydraulic conductivity of 1 x 10-5 cm/s covered by at least 6 inches of topsoil capable of maintaining a healthy growth of vegetation.

4.1.1 Cell 1

Cell 1 covers an area of approximately 2.5 acres, is unlined and was constructed in 1971 and originally received paper, log deck cleanup, salt cake, wire, plastic, and styrofoam. By 1983, salt cake had been eliminated from the waste stream, and paper had been reduced. Closure and capping of Cell 1 was performed in 1988. Cell 1 was capped in place with native soils and its side slopes and top deck vegetated with native plants. No future action is planned for Cell 1 other than post closure maintenance activities. Post closure maintenance costs are lumped together for all the landfill cells and are discussed further below. Cell 1 is administratively closed.

4.1.2 Cell 2

The maximum inventory of wastes ever on-site over the active life of the Cell 2 is estimated to be 70,000 cy. Cell 2 is no longer receiving waste. Therefore, the current in-place volume is its final maximum inventory.

Closure of Cell 2 is proposed to include a geomembrane cover for the top deck of Cell 2. This alternative was selected for the budget-level cost estimate presented in Appendix 5. The top capping cover, from bottom to top, would consist of the following layers as illustrated in Appendix 6, Sheet D-1:

- Sand foundation layer compacted and graded smooth
- A 60 mil linear low density polyethylene (LLDPE) geomembrane liner
- 1 foot thick of on-site sand material
- 1 foot of thick vegetated soil layer

The top deck of Cell 2 would be graded to provide a 5% slope. Berms will be placed on the perimeter to channel storm water to down-drain culverts to convey the storm water from the top deck to the perimeter of Cell 2. The side slopes of Cell 2 are anticipated to be maintained in their current configuration except where additional cover and mulch will be added to any disturbed areas. See Appendix 6 Sheet C-6 for conceptual final grading plan of Cell 2. It is presumed for the estimate that the existing slopes will be adequate with some mulch and vegetative cover placement at completion of the work.

The budget level cost estimate reflecting the cap top deck regrading required for final closure construction of approximately 2 acres of Cell 2 is $700,000 (Table 2).

Long-term post closure maintenance activities will include periodic inspections, repair of vegetation and stormwater controls, and groundwater monitoring. Although a passive gas collection and vent will be installed at the top of the Cell 2 during final closure, no landfill gas monitoring or controls are warranted. As a precautionary measure and as a matter of good practice, a passive land fill vent will be installed to vent any potential gas build up under the HDPE top deck liner. The Cell 2 side slopes are proposed to be unlined and will continue to allow any potential landfill gas to escape. The passive gas vent will be connected to a perforated pipe that runs the length of the crown of the landfill top deck. The perforated pipe will be placed in a trench below the HDPE cap. The trench will be backfilled with native sandy material. The perforated PVC pipe will then be connected to a non-perforated PVC stand pipe at the highest point of the landfill. The stand pipe will pass through the HDPE liner to vent to the surface. At the surface the stand pipe will extend a few feet above. The end of the stand pipe will have a U-shape end to prevent precipitation from entering into the pipe (See Appendix 6 for the passive landfill gas collection piping layout). Landfill gas post closure maintenance expenses are estimated to be very minor.

4.1.3 Cell 3

The final closure design concept for Cell 3 has changed from cap in place to clean closure of Cell 3. As noted above, Fort Chicago and JCEP reserves the right to change the final closure design concept for Cell 3 if conditions change. Cell 3 area is 5.75 acres and contains an estimated 176,000 cy of material. This estimate includes the waste that was placed in the cell (167,000 cy), the operations layer, leachate collection system and interim cover. The estimated interim cover is approximately 10,000 cy. Cell 3 is no longer receiving waste.

Fort Chicago is also updating the Solid Waste Operation Plan (submitted under separate cover) to start to de-inventory waste from the cell. Approximately 40,000 cy of material (between 40,000 – 80,000 cy) are estimated to be removed during the operations phase. Under the Solid Waste Operation Plan, Cell 3 will begin to de-inventory to the proposed grades shown on Sheet C-3, Appendix 6. Waste that will be removed under the Solid Waste Operations Plan will primarily consist of unsaturated material. A dewatering system consisting of a grid of sumps and well points will be installed as part of over wintering that is part of the Cell 3 closure. A temporary cover will also be placed over the cell prior to the 2018/2019 wet season. The Cell 3 Closure Plan will remove the remaining waste in the cell after it has dewatered and includes removal of the temporary cover, dewatering system, the cell floor liner and leachate collection system. See Sheet C-4 Appendix 6, for removal of liner to subgrade of Cell 3. Cell 3 waste will be transferred to an Oregon permitted landfill. Once the area is cleared of waste, leachate collection system, and liner, the new ground surface will be graded to prevent ponding. See Sheet C-6 Appendix 6 for conceptual final grading plan of the clean-closed Cell 3. To establish final grades that prevent ponding, an estimated 6,400 cy of fill material will need to be placed in the landfill floor area after the liner is removed. Fill material used to adjust final grades will consist of onsite native soil.

Upon clean closure of Cell 3 and the complete removal of waste, the cell will no longer generate leachate. Therefore, post closure monitoring of Cell 3 will presumably be limited to the revised EMP and erosion control of the final grading.

The budget-level cost estimate assumes that the entire Cell 3 landfill will be closed. For this clean closure, the budget level estimated cost is $12,750,000 (Appendix 5).

Long-term post closure maintenance will include periodic inspections and possible repair of vegetation.

4.2 Landfill Leachate Management

Regulatory issues related to long-term leachate management are expected to be non-existent with the clean closure of Cell 3 and removal of the leachate collection system by JCEP. Cells 1 and 2 are unlined and do not collect leachate.

The amount of leachate that will be collected after closure is presumed to be zero. Therefore, costs to manage leachate for Cell 1, Cell 2, and Cell 3 are not incorporated in the estimated post closure maintenance costs.

Post closure maintenance costs are lumped together for Cells 1, 2 and 3 and are discussed below.

4.3 Closure Schedule and Logistical Consideration

JCEP has developed a schedule for implementing the final closure of Cell 2 and Cell 3. *See* Appendix 1, Table 3. Logistical and sequencing aspects of implementing the closure may change the proposed schedule.

5.0 Conceptual Post Closure Plan

Plans for post closure activities and budget-level cost estimates were prepared as part of the Conceptual Closure and Post Closure Plan based on the Conceptual Closure Plan. Post closure costs are assumed over a 30-year post closure care period, which is typical for closed solid waste facilities. The principle post closure activities, assumptions, and costs include the following:

- Landfill cover maintenance and repair (vegetation, stormwater controls, erosion, and roads). For the estimate, annual costs are assumed to remain at a consistent level through the post closure care period. It is presumed that 10% of Cells 1 and 2 surfaces will require to be re-vegetated every three years. Some years may require more or less costs dependent on damages to landfill cover, drainage features, or infrastructure. Cell 3 is proposed to be clean closed and will not require cover maintenance.
- Leachate collection and disposal is not included in the post closure costs. Cells 1 and 2 are unlined cells that do not collect leachate. Clean closure of Cell 3 and removal of the leachate collection system eliminates the cost for collection and disposal.
- Landfill gas management and monitoring is not included in the post closure costs. Cell 2 landfill gas emission levels have been determined not to be significant. A passive gas vent on the top deck will be in-place and will require minimal maintenance. The Cell 2 passive gas vent is proposed to

alleviate any possibility of a gas build up under the HDPE cap on the top deck. The Cell 2 side slopes are proposed to be unlined, therefore, any minimal amounts of landfill gas would pass through the side slopes as well as the top deck passive vent.

- Groundwater monitoring. The annual groundwater monitoring costs are estimated at $24,000 based on current monitoring performed by SHN. The annual costs are assumed to remain consistent through the post closure care period. After closure activities are complete and after establishing that groundwater quality has stabilized, JCEP can pursue elimination or reduction of groundwater quality monitoring.
- Miscellaneous site infrastructure and administration. The annual costs were estimated to be $3,420 through the post closure care period. Included in the estimate is a one-time county deed notice for the closed landfill cost of $5,000.
- Through the post closure care period, the landfill site was estimated to be monitored quarterly and produce an annual site evaluation report. The frequency of inspections to the site could shift from monthly inspections for the first year and then to quarterly, to biannual or to yearly during the post closure care period. Inspections to the integrity of the landfill cap would be performed prior to the start of the rain season, after a major storm event, and at the end of rain season in general.

The average annual post closure cost is estimated to be $41,291. The present worth for post closure expenses are based on DEQ excel method (fa-DiscountingWorksheetNonMSWFacilities). See Appendix 5, Table 3. This amount serves as a basis for determining financial assurance requirements for post closure maintenance and monitoring of the ISWL under the Solid Waste Permit.

5.1 Post Closure Land Use

Land use for the post closure period for Cells 1 and 2 will be an open area with no plans for development. Land use for the post closure period after the clean closure of Cell 3 area is planned vegetated to natural state, pending future development.

6.0 Final Closure and Post Closure

Consistent with the requirements and criteria in the Solid Waste Permit (Section 11.0, Closure Construction and Maintenance) and OAR 340-095, JCEP will notify DEQ and receive DEQ approval for any updates or changes to the Conceptual Closure and Post Closure Plan. A final engineered Closure Plan and Post Closure Plan (or plans for specific closure elements) will be submitted to DEQ for review and approval before implementing the final closure activities. The following is a summary of the criteria and timeframes associated with submitting and implementing final closure and post closure plans.

- The permittee must submit for approval detailed engineering plans, specifications, and schedule for closure of any portion of the facility at least six (6) months prior to implementing closure activities. The permittee must close each area on the schedule approved by DEQ;
- Within 30 days of the final closure, the permittee must record the presence of the closed facility in the property deed record with Coos County;
- When closure is completed, a construction certification report must be submitted to DEQ with a written request for closure approval; and
- Upon completion of closure, implement post closure care and maintenance.

7.0 References

CH2M Hill, 1996. Wastewater Lagoon Ecological Risk Assessment, Weyerhaeuser Company, North Bend, Oregon. June 1996.

CH2M Hill, 2001. Hydrogeologic Assessment Report, Weyerhaeuser Company Containerboard Packaging Division, North Bend, Oregon. March 15, 2001.

PES Environmental, Inc., 2012. Environmental Monitoring Plan - North Spit Landfill and Wastewater Treatment System - Weyerhaeuser NR Company Containerboard Packaging Division, North Bend, Oregon. September 17, 2012.

Thiel Engineering, 2004. Technical and Cost Evaluation, Elements of Environmental Closure for the Weyerhaeuser Containerboard Packaging Facility, North Bend, Coos County, Oregon. April2004.

Tuppan Consultants LLC, 2005. Closure Plan, Weyerhaeuser North Bend. Container Board Facility, Coos County, Oregon. June 17, 2005.

Weyerhaeuser, 1996. Hydrogeologic Investigation, North and South Settling Basins, Weyerhaeuser Containerboard Packaging Division, North Bend, Oregon. August 7, 1996.

PES Environmental, Inc. Conceptual Closure and Post Closure Plan, Weyerhaeuser NR Company, North Bend Containerboard Mill, North Spit Industrial Landfill, North Bend, Oregon. October 26, 2012.

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Tables 1-3 1

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Table 1
Closure Elements for Industrial Solid Waste Landfill and Wastewater Treatment System
Conceptual Closure and Post-Closure Plan
Jordan Cove Energy Project, LP, North Spit Industrial Landfill

Area / Closure Element	Application Permit	Issues / Comments	Closure Status	Previous Investigations	Closure Alternative	Additional Evaluation / Comments
Industrial Solid Waste Landfill (ISWL)						
Cell 1	Solid Waste (SW) Permit 1142	Unlined Cell, leachate migration to groundwater. Long term groundwater monitoring. Groundwater quality improving.	Closed with soil cap and vegetation cover.	Hydrogeologic Investigation, 1996. Hydrogeologic Assessment, 2001. Technical Evaluation, 2004. Closure Plan 2005. Ongoing groundwater monitoring results.	Closure completed with soil cap and vegetation cover.	Screening assessment for human health receptors (occupational) may be needed. No risk for fish consumption.
Cell 2	SW Permit 1142	Unlined Cell, leachate migration to groundwater. Long term groundwater monitoring. Groundwater quality improving.	Cell 2 has interim soil cover with vegetation.	(Same as above)	Closure of Cell 2 with final geomembrane cap and vegetative side layers	(Same as above)
Cell 3	SW Permit 1142	Lined Cell, leachate collection system (LCS) drains to north settling basin. Groundwater and leachate monitoring until clean closed of cell.	Cover with interim soil cover. Actively pursuing clean closure.	(Same as above) Ongoing leachate monitoring results.	Clean closure of Cell 3, removal of waste, liner and LCS.	(Same as above)

Table 2
Summary of Budget-Level Closure and Post-Closure Cost Estimates
Conceptual Closure and Post-Closure Plan
Jordan Cove Energy Project, LP, North Spit Industrial Landfill

Selected Closure or Post Closure Element	Estimated Budget Level Cost	Comments
Cell 2 Closure[1]	$700,000	4-acre geomembrane cap with vegetated cover
Cell 3 Closure[1]	$12,739,000	5.75-acre clean closure (removal of waste, liner and leachate collection system)
30-Year Post Closure Maintenance Costs[1]	$1,322,107	Present value (Cells 1, 2, and 3 post closure care costs) determined by using Oregon State Spreadsheet fa-DiscountingWorksheetNonMSWFacilities (1).xls. See attached in Appendix E.

[1] See Appendix E for cost break down for Closure of Cell 2 & 3 and 30-Year Post Closure Maintenance Costs work up.

Table 3
Proposed Closure Schedule
Jordan Cove Energy Project, LP, North Spit Industrial Landfill

Deliverables to DEQ	Due Date	Comments
Fort Chicago Holdings U.S. LLC submits Operations Plan	6/1/2018	Includes plans and specification to remove waste from Cell 3
Fort Chicago Holdings U.S. LLC submits Conceptual C&PCC Plans	6/1/2018	Includes requested changes from DEQ
DEQ approval of Operations and Conceptual C&PCC Plans	7/1/2018	Waste removal can begin to the 30-foot elevation level for demolition debris and unsaturated wastes for Cell 3
Plans, Specs, QA/QC Manual, Final Cell 3 Clsore Plan	7/1/2018	
Fort Chical Holdings U.S. LLC submits Final Engineer Closure Plan for Cell 2	11/30/2018	Plans for Cell 2
Fort Chicago Holdings U.S. LLC submits Final Post Closure Care Plan Cells 1, 2, and 3	12/30/2018	Projected date for Final Engineered Post Closure Care Plan for Cells 1, 2, and 3
DEQ final closure permit	2/28/2019	Includes public comment period estimated to be Sept./Oct. 2018 DEQ issues a permit.
Fort Chicago Holdings U.S. LLC implements closure permit	4/20/2019	Proposed late, 2018 for 2019 construction season
DEQ receives the Construction QA/QC for Cell 3	12/30/2019	Likely mid 2020 with completion of Cell 3 clean closure likely 2019
DEQ receives the Construction QA/QC for Cell 2	12/30/2019	DEQ approval begins the Post Closure Care period likely mid-2020 with completion of closure at Cell 2 likely late 2020

Abbreviations
C&PCC = Closure and Post Closure Care
CQA = Construction Quality Assurance
DEQ = Department of Environmental Quality
QA/QC = Quality Assurance / Quality Control

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Figures 1-4 **2**

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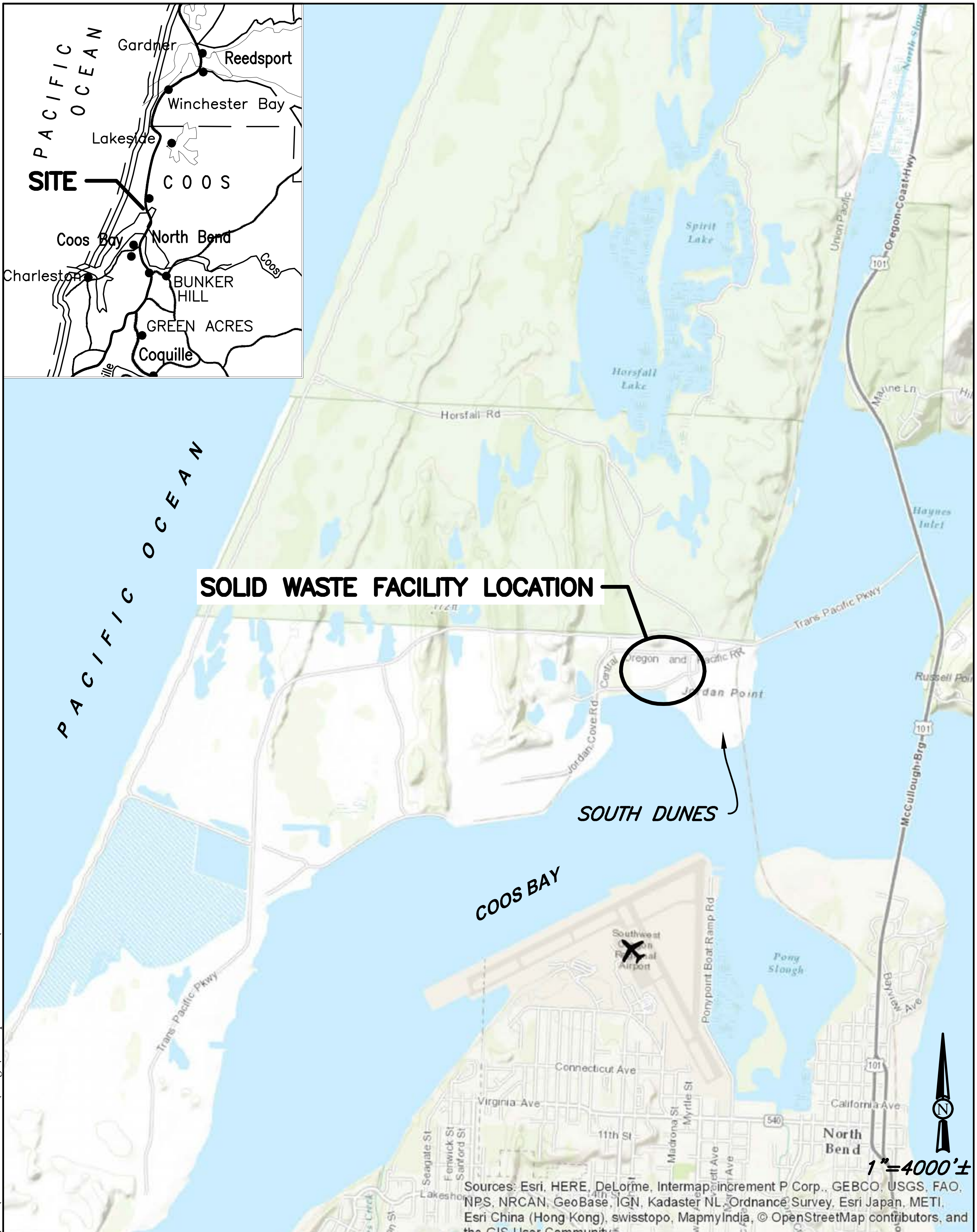

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SHN Consulting Engineers & Geologists, Inc.	Jordan Cove Energy Project, LP Conceptual Post Closure Plan South Dunes ISWL Location Map	REV Description: Issued for Review
		Doc No: J1-000-CIV-MAP-SHN-00006-01
		REV: A — REV Date: 02/28/2018
	SHN 617081 — 617081-NSPT-LNDF-CNCP	Figure 1

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SHN Consulting Engineers & Geologists, Inc.	Jordan Cove Energy Project, LP Conceptual Post Closure Plan South Dunes ISWL Site Plan		REV Description: Issued for Review
			Doc No: J1-000-CIV-MAP-SHN-00006-02
			REV: A — REV Date: 02/28/2018
	SHN 617081 — 617081-NSPT-LNDF-CNCP		Figure 2

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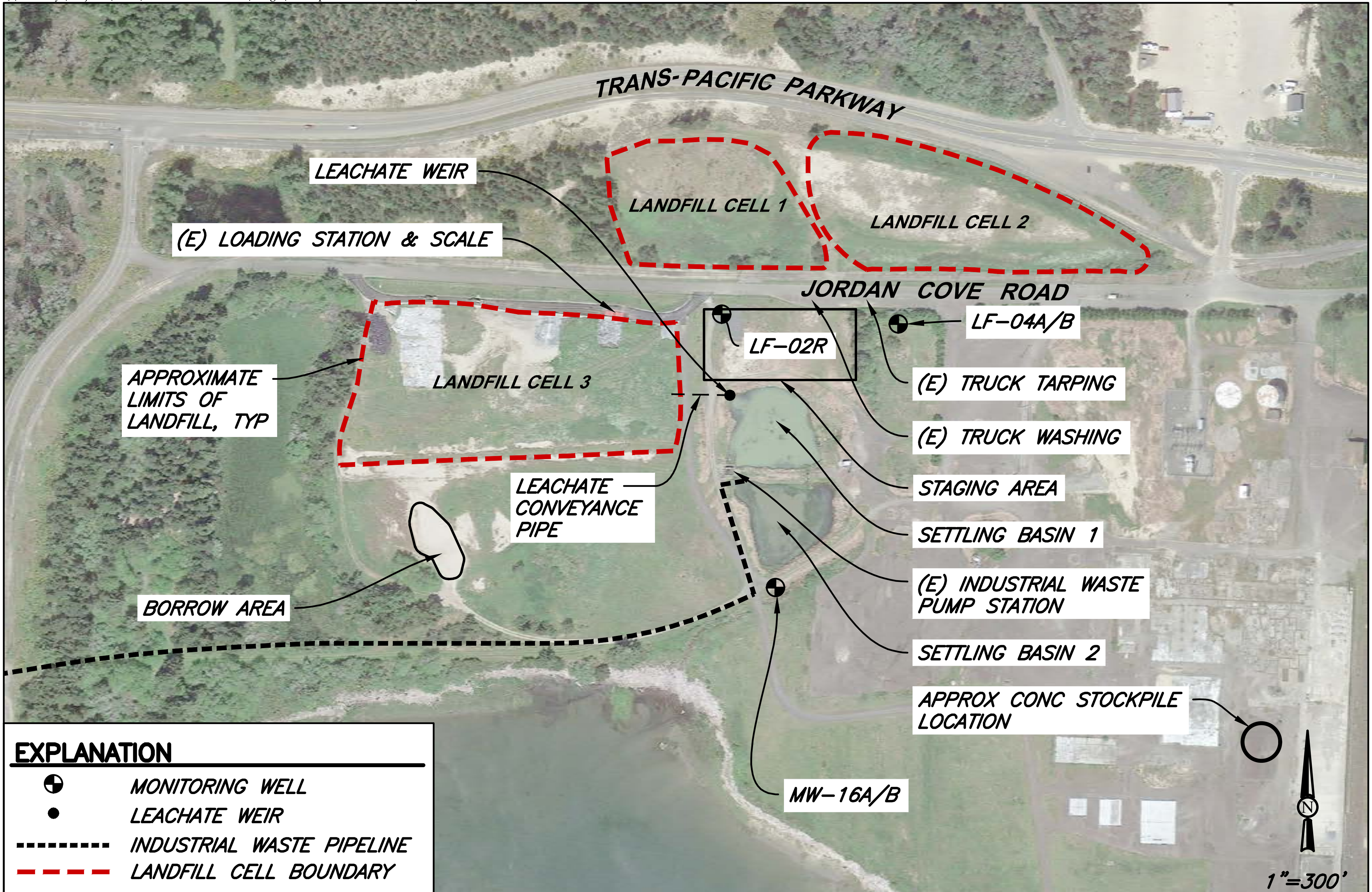

SHN Consulting Engineers & Geologists, Inc.	Jordan Cove Energy Project, LP Conceptual Post Closure Plan South Dunes ISWL Cell 3 Work Areas		REV Description: Issued for Review Doc No: J1-000-CIV-MAP-SHN-00006-03 REV: A REV Date: 02/28/2018
	SHN 617081	617081-NSPT-LNDF-CNCP	Figure 3

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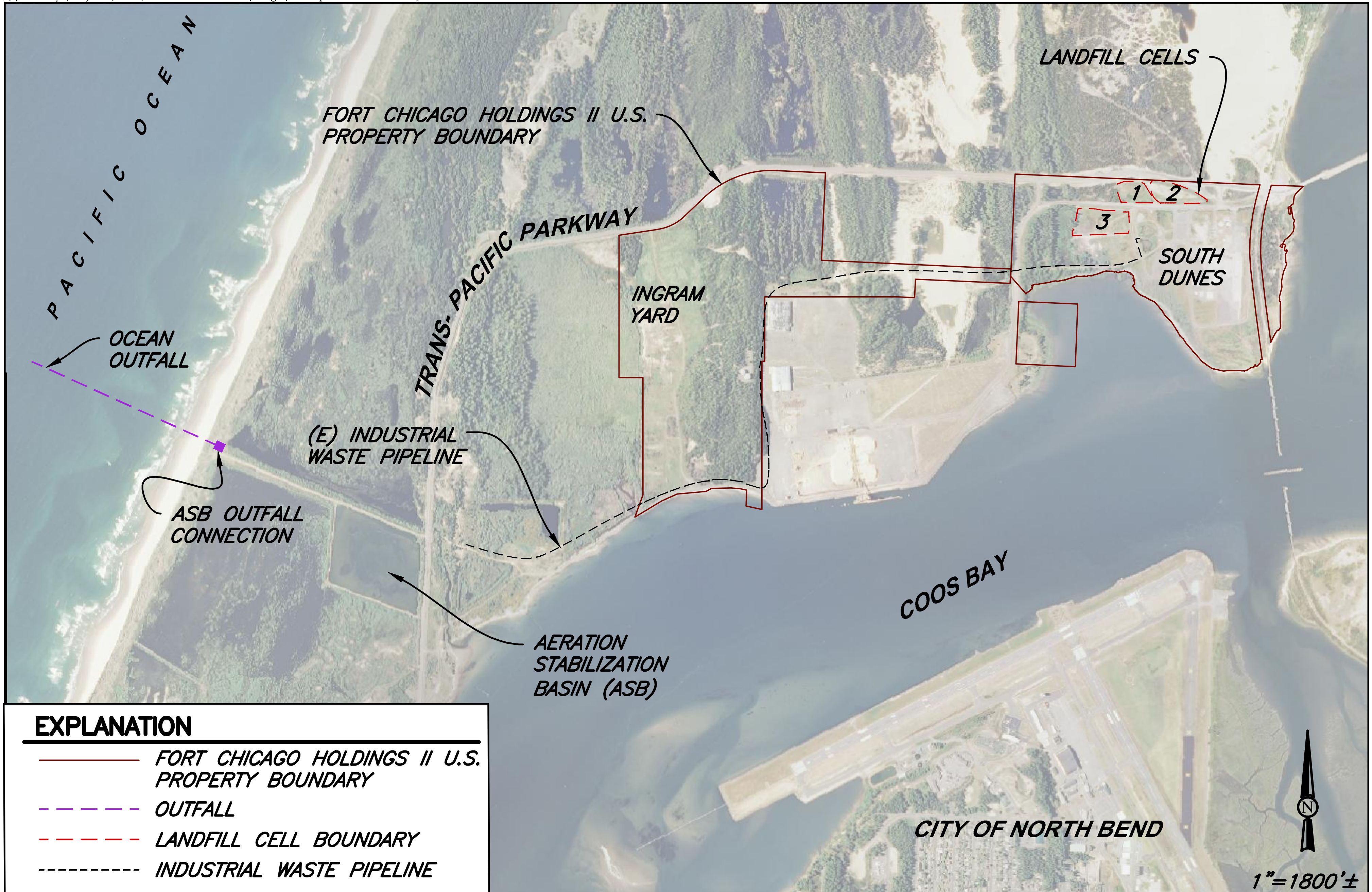

SHN Consulting Engineers & Geologists, Inc.	Jordan Cove Energy Project, LP Conceptual Post Closure Plan ISWL & NPDES Facility Locations		REV Description: Issued for Review Doc No: J1-000-CIV-MAP-SHN-00006-04 REV: A — REV Date: 02/28/2018
	SHN 617081 — 617081-NSPT-LNDF-CNCP		Figure 4

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Solid Waste Permit #1142 3

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STATE OF OREGON 1859

Oregon

John A. Kitzhaber, MD, Governor

Department of Environmental Quality
Western Region Eugene Office
165 East 7th Avenue, Suite 100
Eugene, OR 97401-3049
(541) 686-7838
FAX (541) 686-7551
TTY (541) 687-5603

March 10, 2014

SENT VIA CERTIFIED MAIL
RRR70130600000040577811

Mr. Robert L. Braddock
Vice-President-Project Manager
Jordan Cove Energy Project L.P.
125 Central Avenue, Suite 380
Coos Bay, OR 97420

RE: *Permit Modification-Addendum No. 2*
North Spit Landfill
SW Permit No. 1142, Coos County
DEQ SW Project No. 6656

Dear Mr. Braddock:

The Oregon Department of Environmental Quality (DEQ) in reviewing our files saw that Addendum No. 1 to the Solid Waste Disposal Site Permit (No. 1142) for the North Spit Landfill contained an error. Addendum No. 1 erroneously identified the permit as a "closure" permit. The solid waste permit for your site is for an "operating" industrial waste landfill, which has been specifically noted in Addendum No. 2.

With Addendum No. 2, DEQ has also modified the solid waste permit by changing the due date for the Annual Financial Assurance (FA) Recertification Report from March 31st to May 16th. This modification will put the FA annual submittal due date in line with the date of the initial certification of financial assurance provided by the permittee and subsequently approved by DEQ.

A copy of the Solid Waste Disposal Site Permit No. 1142 and the Permit Addendum No. 2 is enclosed with this letter. The addendum is effective upon receipt.

If you have any questions about this letter, please contact me at (541) 687-7438, or e-mail wong.gene@deq.state.or.us.

Sincerely,

Gene Wong, P.E., Environmental Engineer
Western Region Hazardous and Solid Waste
Permitting and Compliance

Encls: SW Permit No. 1142, Permit Addendum No. 2

Cc: Fran Holman. SW-Salem (w/ encl)
file

x: Solid Waste\SW WR PermitFiles\1142NorthSpitLF\PermitAddendCvrLtr(3-14)

DEQ-DCI

State of Oregon
Department of Environmental Quality

SOLID WASTE DISPOSAL SITE PERMIT:
INDUSTRIAL WASTE LANDFILL

Oregon Department of Environmental Quality
750 Front Street NE, Suite 120
Salem, OR 97301
(503) 378-5047

Issued in accordance with the provisions of ORS Chapter 459.

ISSUED TO:

Jordan Cove Energy Project L.P.
125 Central Avenue, Suite No. 380
Coos Bay, OR 97420
541-266-7510

FACILITY NAME AND LOCATION:

North Spit Landfill
92730 Trans-Pacific Lane
North Bend, OR 97459
Section 4, T25S, R13W, W.M.
Coos County

OWNER:

Fort Chicago Holdings II U.S. LLC
c/o Jordan Cove Energy
125 Central Avenue, Suite No. 380
Coos Bay, OR 97420

OPERATOR:

Jordan Cove Energy Project L.P.
125 Central Avenue, Suite No. 380
Coos Bay, OR 97420
541-266-7510
Robert Braddock (541) 266-7510

ISSUED IN RESPONSE TO:

- Correct of erroneous information shown on Addendum No. 1 (dated January 11, 2013);
- Financial Assurance Annual Recertification Report due date has been modified.

ISSUED BY THE OREGON DEPARTMENT OF ENVIRONMENTAL QUALITY

B. Fuller

Brian Fuller, Manager, Hazardous and Solid Waste
Permitting and Compliance
Western Region

03/06/2014
Date

ADDENDUM NO. 2

In accordance with Oregon Administrative Rules 340-093-0113, Solid Waste Permit No. 1142, is hereby amended as follows:

- Addendum No. 1 (dated January 11, 2013) erroneously identified Solid Waste Permit No. 1142 to be a "closure" permit. Addendum No. 2 confirms that North Spit Landfill has an "operating" industrial waste landfill permit and not a "closure" permit.
- The due date for the submittal of the Annual Financial Assurance Recertification Report has been modified from March 31st of each year to May 16th of each year.

This addendum must be attached to and made part of Solid Waste Disposal Site Permit No. 1142, which has a permit expiration date of August 31, 2021. The addendum is effective upon receipt.

State of Oregon
Department of
Environmental
Quality

SOLID WASTE DISPOSAL SITE PERMIT:
Industrial Landfill

Oregon Department of Environmental Quality
750 Front Street NE, Suite 120
Salem, OR 97301
Telephone: (503) 378-5047

Issued in accordance with the provisions of ORS Chapter 459 and subject to the land use compatibility statement referenced below.

ISSUED TO:

Weyerhaeuser NR Company
33663 Weyerhaeuser Way S
Federal Way, WA 98003

FACILITY NAME AND LOCATION:

North Spit Landfill
Industrial Waste Landfill
Horsfall Beach Road
North Bend, OR 97459
Section 4, T25S, R13W, W.M.
Coos County

OWNER:

Weyerhaeuser NR Company
33663 Weyerhaeuser Way S
Federal Way, WA 98003

OPERATOR:

Weyerhaeuser NR Company
3401 Industrial Way
Longview, WA 98632
Carol Wiseman (360) 414-3911

ISSUED IN RESPONSE TO:

- A solid waste permit application received October 16, 2007;
- A Land Use Compatibility Statement from Coos County Planning Department dated January 21, 1997.

The determination to issue this permit is based on findings and technical information included in the permit record.

ISSUED BY THE OREGON DEPARTMENT OF ENVIRONMENTAL QUALITY

Brian Fuller, Manger, Hazardous and Solid Waste
Permitting and Compliance
Western Region

November 2, 2011
Date

Permitted Activities

Until this permit expires or is modified or revoked, the permittee is authorized to establish, operate, and maintain a solid waste land disposal site in conformance with the requirements, limitations, and conditions set forth in this document, including all attachments.

TABLE OF CONTENTS

Introduction This document is a solid waste permit issued by the Oregon Department of Environmental Quality in accordance with Oregon Revised Statutes (ORS) 459 and Oregon Administrative Rules (OAR), Chapter 340.

PERMIT ADMINISTRATION

1.0 PERMIT ISSUANCE

1.1	**Permittee**	This permit is issued to Weyerhaeuser NR.
1.2	**Permit number**	This permit will be referred to as Solid Waste Permit Number 1142.
1.3	**Permit term**	The permit is issued on the date it is signed. The permit's expiration date is August 31, 2021.
1.4	**Facility type**	The facility is permitted as an industrial landfill.
1.5	**Facility owner/ operator**	The owner of this facility is: Weyerhaeuser NR Company 33663 Weyerhaeuser Way S Federal Way, WA 98003 The operator of this facility is: Weyerhaeuser NR Company 3401 Industrial Way Longview, WA 98632 Carol Wiseman (360) 414-3911
1.6	**Basis for permit issuance**	This permit is issued based upon the following documents submitted by the permittee: • Solid waste permit application received October 16, 2007; and; • Land Use Compatibility Statements from Coos County Planning Department dated January 21, 1997.
1.7	**Definitions**	Unless otherwise specified, all terms are as defined in OAR 340-093-0030.
1.8	**Legal control of property**	The permittee shall at all times maintain legal control of the disposal site property; including maintaining a current permit, contract or agreement that allows the operation of the facility if the site is not owned by the permittee.

2.0 DISCLAIMERS

2.1	**Property rights**	The issuance of this permit does not convey any property rights in either real or personal property, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights.
2.2	**DEQ liability**	The DEQ, its officers, agents, or employees do not sustain any liability on account of the issuance of this permit or on account of the construction, maintenance, or operation of facilities pursuant to this permit.

3.0 AUTHORITY

3.1	**Ten year permit**	This permit is issued for a maximum of ten (10) years as authorized by Oregon Revised Statutes 459.245 (2).
3.2	**Documents superseded**	This document is the primary solid waste permit for the facility, superseding all other solid waste permits issued for Weyerhaeuser NR by DEQ.
3.3	**Permittee responsibility and liability**	Conditions of this permit are binding upon the permittee. The permittee must conduct all facility activities in compliance with the provisions of this permit. The permittee is liable for all acts and omissions of the permittee's contractors and agents in carrying out the operations and other responsibilities pursuant to this permit.
3.4	**Other compliance**	This permit's issuance does not relieve the permittee from the responsibility to comply with all other applicable federal, state, or local laws or regulations, including the following solid waste requirements, and any future updates or additions to these requirements: • Solid waste permit application received; • Oregon Revised Statutes, Chapters 459 and 459A; • Oregon Administrative Rules Chapter 340; and • Any documents submitted by the permittee and approved by DEQ.
3.5	**DEQ access to disposal site**	The permittee shall allow representatives of DEQ access to the disposal facility at all reasonable times for the purpose of making inspections, surveys, collecting samples, obtaining data and carrying out other necessary functions related to this permit. <u>Reference</u>: OAR 340-093-0050(6).
3.6	**Penalties**	Violation of permit conditions will subject the permittee to civil penalties of up to $25,000 for each day of each violation.

4.0 PERMIT MODIFICATION

4.1	**Five year review**	In the permit's 4th to 6th year, DEQ may review the permit and amend it if necessary. DEQ will consider the following factors in making this determination: • Compliance history of the facility; • Changes in volume, waste composition, or operations at the facility; • Changes in state or federal rules which should be incorporated into the permit; • A significant release of leachate or landfill gas to the environment from the facility; • Significant changes to a DEQ-approved site development plan, and/or conceptual design; and • Other significant information or events.
4.2	**Permit modification**	DEQ or the permittee may, at any time during the permit's term, propose to change the permit. Once approved by DEQ any permit-required plans become part of the permit by reference. DEQ may provide notice and opportunity for review of permit-required plans.

4.3	**Modification and revocation by DEQ**	The Director may, at any time before the expiration date, modify, suspend, or revoke this permit in whole or in part, in accordance with Oregon Revised Statutes 459.255, for reasons including but not limited to the following: • Violation of any terms or conditions of this permit or any applicable statute, rule, standard, or order of the Commission; • Obtaining this permit by misrepresentation or failure to disclose fully all relevant facts; or • A significant change in the quantity or character of solid waste received or in the operation of the disposal site.
4.4	**Modification by permittee**	The permittee must apply for a modification to this permit if there is a significant change in facility operations or a deviation from permitted activities.
4.5	**Public participation**	DEQ will issue a public notice to inform the public of any significant changes to the permit.
4.6	**Changes in ownership or address**	At least ten (10) days in advance, the permittee must report to DEQ any change in the facility's ownership or the permittee's or operator's name and/or address.

ALLOWABLE ACTIVITIES

5.0 AUTHORIZATIONS

5.1	**Wastes authorized for receipt**	This permit authorizes the facility to accept the following wastes: • Settling basin solids, construction/demolition/mill clean-up waste generated on-site and dredged sediments may be disposed in the active lined cell, Cell 3. • Asbestos may be disposed of in accordance with an approved asbestos management plan. • Special wastes may be disposed of in accordance with Condition 5.3 • Additional non-hazardous wastes may be disposed of upon receipt of approval of DEQ and permit addendum, if needed.
5.2	**Authorization of other wastes**	DEQ may authorize the permittee to accept other wastes if: • The permittee develops a Special Waste Management Plan (SWMP) and submits it to DEQ for review and approval; • DEQ approves the Special Waste Management Plan (SWMP); and • The permittee can demonstrate that the materials are not hazardous waste, as defined by state and federal regulations, or otherwise a threat to human health or waters of the state.
5.3	**Salvaging and recycling**	This permit authorizes the permittee to conduct salvaging and recycling in a controlled and orderly manner. The permittee must notify DEQ prior to changing salvaging and recycling operations.

6.0 PROHIBITIONS

6.1	**Hazardous waste disposal**	The permittee must not accept any regulated hazardous wastes. <u>Reference</u>: 40 CFR 258.20 (b). In the event discovered wastes are hazardous or suspected to be hazardous, the permittee must, within twenty-four (24) hours, notify DEQ and initiate procedures to identify and remove the waste. Hazardous wastes must be removed within ninety (90) days, unless DEQ approves otherwise. The permittee's temporary storage and transportation practices must comply with DEQ rules.
6.2	**Liquid waste disposal**	The permittee must not accept liquid waste for disposal. <u>Definition</u>: Liquid wastes are wastes that do not pass the paint filter test performed in accordance with EPA Method 9095B.
6.3	**Vehicle disposal**	The permittee must not accept discarded or abandoned motor vehicles, including trailers and mobile homes, for disposal.
6.4	**Used oil disposal**	The permittee must not accept used oil for disposal.
6.5	**Battery disposal**	The permittee must not accept lead-acid batteries for disposal.
6.6	**Tire disposal**	The permittee must not accept waste tires for disposal.
6.7	**Recyclable material disposal**	The permittee must not landfill or dispose of any source-separated recyclable material brought to the disposal site. <u>Exception</u>: If the source-separated material is unusable or not recyclable it may be landfilled. DEQ must agree to such disposal and pre-approve the identified sources of unusable source-separated material prior to its disposal.
6.8	**Open burning**	The permittee must not conduct any open burning at the site.
6.9	**Putrescible waste**	The permittee must not accept putrescible waste for disposal.
6.10	**Electronic waste disposal**	The permittee must not knowingly accept the following covered electronic devices for disposal: • Computer monitors having a viewable area greater than four (4) inches diagonally; • Televisions having a viewable area greater than four (4) inches diagonally; • Desktop computers; or • Portable computers. Reference: Oregon Revised Statutes 459.247 and 459A.300-365.

OPERATIONS AND DESIGN

7.0 OPERATIONS PLAN

7.1	**Operations plan submittal**	Within twelve months (12) of the permit issue date, the permittee must submit an updated Operations Plan (*North Spit Landfill Operations Plan* dated April 10, 1997 and revised October 1998) to reflect current maintenance and landfill operating status for DEQ approval. Upon approval, this plan is incorporated into this permit by reference.

7.2 Plan content The Operations Plan must describe facility operations, including the applicable elements listed below, and demonstrate how the facility will comply with all regulatory and permit requirements:

General Topics	Specific Operating Procedures:
General operations	• Screening procedures for detection of unauthorized wastes; • Handling and removal of unauthorized wastes discovered at the facility; • Management of landfill leachate; • Designing surface water and erosion control structures; and • Responding to non-compliance events or situations.
Disposal operations	• Placement of daily and intermediate cover; • Detecting and preventing the disposal of regulated hazardous wastes, polychlorinated biphenyl wastes, and any other DEQ-prohibited wastes; • Disposal of cleanup materials contaminated with hazardous substances; and • Fill progression and phasing.
Special Waste Management Plan (SWMP)	• Identifying and characterizing special wastes (i.e., wastes that require special management or waste streams not otherwise authorized by the permit); • Identifying the source of all special wastes; • Determining appropriate handling procedures; and • Documenting plan implementation, including waste characterization. References: OAR 340-093-0190, OAR 340-095-0020[3][j]
Ancillary operations	• Waste unloading and handling; • Handling and removal of waste tires; and • Management of transfer containers.
Inspection and maintenance	• Detailed inspection and maintenance procedures and an associated schedule for all facility components that require periodic inspection. • Specific procedures for routine preventative maintenance and repairs and for response to emergency situations. • The preventative inspection and maintenance program should address the following equipment and facilities: personnel safety equipment, operating equipment, support facilities, environmental control systems, environmental monitoring systems, and the transportation system. Maintaining leachate and gas collection systems; and • Maintaining surface water control structures.
Operating record	• Establishing and maintaining the operating record.
Contingency	• Providing fire protection equipment; and • Notifying DEQ about emergencies and fires.

Reference: OAR 340-095-0020 describes requirements for preparing an Operations Plan.

7.3 Plan and manual updates The permittee must update and revise the Operations Plan as necessary to reflect current facility conditions and procedures.

The permittee must submit any associated revisions or updates to DEQ for review and approval.

7.4	**Plan and manual compliance**	The permittee must operate the facility in accordance with the approved Operations Plan and any amendments to these documents.
7.5	**Submittal address**	Send required submittals to: Oregon Department of Environmental Quality Manager, Solid Waste Program 750 Front Street NE, Suite 120 Salem, OR 97301 Telephone: (503) 378-5047

8.0 RECORDKEEPING AND REPORTING - OPERATIONS

8.1	**Non-compliance reporting**	The permittee must take immediate corrective action for any violations of permit conditions or DEQ rules and notify DEQ at: (503) 378-5047 DEQ response: DEQ may investigate the nature and extent of the compliance problem and evaluate the adequacy of the permittee's corrective action plans.
8.2	**Permit display**	The permittee must display this permit where operating personnel can easily find it.
8.3	**Access to records**	DEQ must have access, when requested, to all records and reports related to the permitted facility.
8.4	**Procedure**	The permittee's record keeping and reporting procedures are as follows:

Step	Action
1	Keep the Operating Record at the facility or at another DEQ-approved location.
2	Place information required by 40 CFR 258.29 in the Operating Record.
3	During daily facility operations, record the amount of each waste type received. Record zero (0) if the waste is not received. *Identify the following waste types and categorize them as either in-state or out-of-state wastes:* • Industrial solid waste; • DEQ approved cover materials.
4	Submit the information collected in Step 3 above on the Solid Waste Disposal Report/Fee Calculation form provided by DEQ. Pay solid waste fees as required by OAR 340-097. Date due: the last day of the month following the end of the calendar quarter.
5	Retain copies of all records and reports for ten (10) years after their creation.
6	Update all records to reflect current conditions at the facility.

8.5	**Submittal address**	Send required submittals to: Oregon Department of Environmental Quality Land Quality Solid Waste Program 750 Front Street NE, Suite 120 Salem, OR 97301 503-378-5047

9.0 SPECIFIC OPERATING CONDITIONS

9.1	**Discovery of prohibited waste**	If the permittee discovers prohibited wastes, the permittee must notify DEQ within twenty-four (24) hours and begin to isolate or remove the waste. In addition, the permittee must take digital photos of the prohibited waste to document its quantity, nature, identity and source. Within sixty (60) days, the permittee must transport non-putrescible, non-hazardous prohibited waste to a disposal or recycling facility authorized to accept such waste, unless otherwise approved or restricted by DEQ. The permittee must obtain DEQ's written approval to store putrescible, non-hazardous, prohibited wastes.
9.2	**Spills notification**	Oregon Revised Statue 466.635 and Oil and Hazardous Material Emergency Response Requirements, Chapter 340, Division 142 require <u>immediate</u> notification to Oregon Emergency Response System (OERS) after taking any required emergency actions to protect human health and the environment when oil or hazardous materials are spilled. The spill must be immediately reported to OERS at 1-800-452-0311 if the spill is of a reportable quantity. Reportable quantities include: • *Any* amount of oil spilled to waters of the state; • Oil spills on land in excess of forty-two (42) gallons; • Two hundred (200) pounds (twenty-five (25) gallons) or more of spilled pesticide residue; and/or • Spills of hazardous materials that are equal to, or greater than, the quantity listed in the Code of Federal Regulations, 40 CFR Part 302 (List of Hazardous Substances and Reportable Quantities), and amendments adopted before July 1, 2002. For a complete list of hazardous materials required to be reported, please refer to OAR 340-142-0050.
9.3	**Unloading area**	The area(s) for unloading incoming waste must be clearly defined by signs, fences, barriers or other devices. The width of the unloading area must not exceed two hundred (200) feet at any time.
9.4	**Daily and interim cover**	If applicable, daily cover must be maintained as specified in DEQ-approved design and operations plans.
9.5	**Interim cover**	The permittee must place and maintain interim cover over fill areas that will not receive additional waste for an extended period of time [i.e., greater than one-hundred and eighty (180) days].

9.6	**Soil erosion**	The permittee must minimize and control soil erosion to prevent damage to the intermediate or final cover and sediment transport into off-site surface waters or off-site properties.
9.7	**Surface water structures**	The permittee must maintain all stormwater drainage structures in good functional condition, report to DEQ any significant malfunctions or damage and complete repairs within sixty (60) days of discovering the problem.
9.8	**Leachate management systems**	The permittee must operate the disposal site in a manner that deters leachate production to the maximum extent practicable, and construct, operate and maintain in good functional condition all DEQ-approved leachate containment, collection, detection, removal, storage and treatment systems. The permittee must remove leachate continuously from all landfill leachate collection systems, to minimize fluid buildup on the bottom liner and prevent hydraulic head.
9.9	**Leachate surface impoundments**	The permittee must: 1) completely contain leachate stored within surface impoundments; 2) maintain a minimum dike freeboard of three (3) feet above the maximum leachate level in those impoundments unless otherwise approved by DEQ; 3) fence the impoundments to control public access; and 4) lock all gates when no attendant is on duty. In addition, the permittee must post clearly legible, visible signs that describe the surface impoundment's contents and display the words "no trespassing."
9.10	**Litter control**	The permittee must at all times minimize windblown litter and collect it quickly and effectively to prevent scattering, nuisance conditions and unsightliness.
9.11	**Vector control**	The permittee must minimize vectors in the active disposal area, including insects, rodents, and birds.
9.12	**Air emissions**	The permittee must control air emissions, including dust, malodors, air toxics, etc related to disposal site construction, operation, and other activities, and comply with DEQ air quality standards.
9.13	**Public access/ access control**	The permittee must control public access to the landfill as necessary to prevent unauthorized entry and dumping. The permittee shall insure that the industrial land disposal site has a perimeter barrier or topographic constraints adequate to restrict unauthorized entry.
9.14	**Site screening**	To the extent practical, the permittee shall screen the active non-municipal land disposal site area from public view by trees, shrubbery, fence, stockpiled cover material, earthen berm, or other appropriate means.
9.15	**Fire prevention**	The permittee shall make arrangements with the local fire control agency to immediately acquire their services when needed and shall provide adequate on-site fire protection as determined by the local fire control agency. Fires must be immediately and thoroughly extinguished. The permittee shall be responsible for initiating and continuing appropriate fire-fighting methods until all smoldering, smoking and burning ceases. Fires shall be reported to DEQ within twenty-four (24) hours at: 503-378-5047
9.16	**Water supply**	The permittee must provide water in sufficient quantities for fire protection, dust suppression, establishment of vegetation, and other site operations requiring water.

9.17 Signs

The permittee shall post a clearly visible and legible sign(s) at the entrance to the disposal site specifying:

- Emergency phone number; and
- Site operator's name and contact information.

10.0 SITE DEVELOPMENT AND DESIGN

10.1 In this section

This section describes site development and design requirements for continued use of the landfill, or any landfill expansion or new facility construction, including:
- Site development plan
- Design plans
- Construction requirements
- Construction documents
- Construction report submittal
- Approval to use, and
- Submittal address

10.2 Site Development Plan

Within twelve months (12) months of the permit issue date, the permittee must submit an updated site development plan (*Site Master Plan* dated April 10, 1997, revised October, 1998) to reflect current landfill operating status for DEQ approval. This plan can be submitted as a section in the Operations Plan referenced in Section 7.1 of this permit. Upon approval, this plan is incorporated into this permit by reference.

Reference: The *Solid Waste Landfill Guidance, September 1996*, provides information on applicable elements of a Site Development Plan.

10.3 Design plans

The permittee must submit engineering design plans for new disposal units, closure of existing units, or other ancillary facilities for DEQ review and approval at least six (6) months prior to the anticipated construction date. If the continued operation includes disposal of ash and cinders, a new lined disposal unit may be required including engineering design plans.

The engineering design plans must:
- specify applicable performance criteria, construction material properties and characteristics, dimensions, and slopes, and
- provide all relevant engineering analyses and calculations as a basis for the design

10.4 Construction requirements

The permittee must perform all construction in accordance with approved plans and specifications, including all conditions of approval, and any amendments to those plans and specifications approved in writing by DEQ.

10.5 Construction documents

Prior to construction of the final landfill cover, a new landfill unit disposal unit, or other waste containment unit at the site, the permittee must submit and receive written DEQ approval of complete construction documents for the project to be constructed. The construction documents submitted must:
- define the construction project team
- include construction contract documents specifying material and workmanship requirements to guide how the Constructor is to furnish products and execute work, and
- include a Construction Quality Assurance (CQA) plan, describing the measures taken to monitor that the quality of materials and the work performed by the Constructor complies with project specifications and contract requirements

10.6	**Construction report submittal**	Within 90 days of completing construction of a landfill disposal unit, a final cover system over an existing or new unit, or a major appurtenant facility, the permittee must submit to DEQ a Construction Certification Report, prepared by a qualified independent party, to document and certify that all required components and structures have been constructed in compliance with the permit requirements and approved design specifications.
10.7	**Approval to use**	The permittee must not dispose of solid waste in newly constructed disposal units until DEQ has accepted the Construction Certification. If DEQ does not respond to the Construction Certification Report within 30 days of its receipt, the permittee may place waste in the unit.
10.8	**Submittal address**	All submittals to DEQ under this section must be sent to: Oregon Department of Environmental Quality Manager, Solid Waste Program 750 Front Street NE, Suite 120 Salem, OR 97301 Telephone: (503) 378-5047

SITE CLOSURE

11.0 CLOSURE CONSTRUCTION AND MAINTENANCE

11.1	**In this section**	This section describes requirements for closure construction and maintenance at the facility, including: • Closure permit • Closure plan approval • Closure schedule • Final cover • Vegetation • Surface contour maintenance • Deed record and • Submittal address
11.2	**Worst-case closure plan development**	Within twelve (12) months of permit issuance, the permittee must develop and submit for DEQ review and approval a conceptual "worst-case" closure plan and a conceptual post-closure plan and maintain up-to-date copies of these plans in the facility file. Reference: The plans must comply with OAR 340-095-0060 and OAR 340-095-0065.
11.3	**Closure permit**	In accordance with OAR 340-095-0050, the permittee must apply for a closure permit at least five (5) years prior to the landfill's anticipated final closure.
11.4	**Notification of plan updates**	The permittee must notify DEQ and receive DEQ approval for any changes or updates to the conceptual "worst-case" closure and conceptual post-closure care plans.

11.5	**Closure plan approval**	At least 6 months prior to final closure of any portion of the landfill, the permittee must submit for approval detailed engineering plans, specifications, and a schedule for closure. <u>Reference</u>: The *Solid Waste Landfill Guidance, September 1996,* provides information on applicable elements of a Closure Plan. Following the organizational format provided in the Guidance will expedite DEQ review of the plan
11.6	**Closure schedule**	The permittee must close each area of the landfill on the schedule approved by DEQ.
11.7	**Final cover**	Unless otherwise approved by DEQ, the final landfill cover must be either: • graded to a slope of at least 0.5%, consisting of a flexible membrane not less than 60 mils thick for high density polyethylene nor less than 30 mils thick for other approved membranes, a drainage layer, and at least 12 inches of topsoil capable of sustaining a dense, healthy growth of native vegetation, or • graded to a slope of at least 2%, consisting of at least eighteen inches of compacted earthen material exhibiting a laboratory hydraulic conductivity not greater than $1x10^{-5}$ cm/sec, and at least six inches of topsoil capable of sustaining a dense, healthy growth of native vegetation
11.8	**Vegetation**	The permittee must establish and maintain a dense, healthy growth of native vegetation over the closed areas of the landfill consistent with the proposed final use.
11.9	**Surface contour maintenance**	The permittee must maintain the final surface contours of the landfill cover so that erosion and ponding of water is prevented to the maximum extent practicable. Erosion damage (cuts) must be repaired and seeded so that all waste remains covered. The permittee must refill with soil, grade, and seed all areas that have settled or where water ponds and all areas where the cover soil has been damaged by cracking or erosion. Areas where vegetation has not been fully established must be fertilized, re-seeded, and maintained.
11.10	**Deed record**	Within 30 days after final closure of the disposal site, the permittee must record the presence of the waste in the property deed record on file with the county.
11.11	**Submittal address**	All submittals to DEQ under this section must be sent to: Oregon Department of Environmental Quality Manager, Solid Waste Program 750 Front Street NE, Suite 120 Salem, OR 97301 Telephone: (503) 378-5047

12.0 FINANCIAL ASSURANCE

12.1	**Financial assurance plan**	To confirm that there is adequate financial assurance to provide for the costs of site closure and post-closure care, the permittee must provide the following evidence to DEQ: • A copy of the financial assurance mechanism; and • A written certification that the financial assurance meets all state requirements. Reference: The plan must be prepared in accordance with OAR 340-094-0140. Acceptable mechanisms are described in OAR 340-094-0145. Note: The permittee must review and update financial assurance annually in accordance with OAR 340-094-0140(6)(e). In addition, the permittee must maintain the plan in the facility file.
12.2	**Recertification of financial assurance**	Prior to March 31st of each year, the permittee must submit to DEQ one (1) copy of the Annual Financial Assurance Recertification Report, signed by: • A permittee representative who possesses the requisite authority to commit the permittee to the certification; and • A Professional Engineer, with current Oregon registration (both stamp and signature).
12.3	**Use of financial assurance**	The permittee must not use the financial assurance for any purpose other than to finance the permitted facility's approved closure, post-closure, and corrective action activities or to guarantee that those activities will be completed.
12.4	**Long-term financial responsibility**	The permittee must continuously maintain financial assurance for the facility until the permittee or other person owning or controlling the site is no longer required by DEQ to demonstrate financial responsibility for closure, post-closure care, or corrective action.
12.5	**Submittal address**	Send all required submittals to: Oregon Department of Environmental Quality Manager, Solid Waste Program 750 Front Street NE, Suite 120 Salem, OR 97301 Telephone: (503) 378-5047

ENVIRONMENTAL MONITORING

13.0 ENVIRONMENTAL MONITORING PLAN (EMP)

13.1	**EMP submittal**	Within twelve months (12) of the permit issue date, the permittee must submit an updated Environmental Monitoring Plan (EMP) to DEQ for review and approval. The plan should reflect the streamlined monitoring that has been approved by DEQ over the term of the previous permit. The updated EMP must be prepared and stamped by a Geologist or a Certified Engineering Geologist, with current Oregon registration. Once approved, this EMP will become an integral part of the permit.

13.2	**EMP contents**	The EMP must contain an environmental monitoring program that will characterize any potential facility impacts on the environment. The EMP may consist of the previous approved plan with any subsequent changes or additions (i.e., approved concentration limits, revised parameter lists, revised schedules, new wells, etc).
13.3	**EMP revisions and updates**	The permittee must revise the current EMP as necessary to reflect current and future environmental conditions, facility development and regulatory requirements. A Geologist or Certified Engineering Geologist, with current Oregon registration, must prepare and stamp the EMP revisions and submit two (2) copies (one paper copy, one electronic) to DEQ for review and approval.
13.4	**EMP public comment period**	EMP changes may require a public comment period.
13.5	**Long-term monitoring plan**	After any DEQ approval for additional or revised concentration limits, including Permit-Specific Concentration Limits (PSCLs), Concentration Limit Variances (CLVs), Remedial Action Concentration Limits (RACLs), or Site-Specific Limits (SSLs), the permittee must update the EMP to reflect the long-term monitoring program and submit the updated plan for DEQ review and approval.
13.6	**Additional monitoring points**	The permittee must incorporate any new or replacement monitoring point or device into the Environmental Monitoring Plan (EMP) and submit the updated EMP to DEQ for review and approval.
13.7	**Submittal address**	Send all required submittals to: Oregon Department of Environmental Quality Manager, Solid Waste Program 750 Front Street NE, Suite 120 Salem, OR 97301 Telephone: (503) 378-5047

14.0 ENVIRONMENTAL SAMPLING REQUIREMENTS

14.1	**Notification of sampling events**	The permittee must notify DEQ, in writing, at least ten (10) working days prior to a scheduled sampling event. The notification may be made via email. Send sampling notifications to: Oregon Department of Environmental Quality Manager, Solid Waste Program 750 Front Street NE, Suite 120 Salem, OR 97301 Telephone: (503) 378-5047
14.2	**Split sampling events**	The permittee must split samples with DEQ at its request, and schedule split-sampling events with DEQ's laboratory at least forty-five (45) days ahead of time. **Oregon Department of Environmental Quality** **Laboratory, Groundwater Monitoring Section** **3150 NW 229th, Suite 150** **Hillsboro, OR 97124** **Phone: (503) 693-5700** **Fax: (503) 693-4999**

14.3	**Monitoring schedule**	The permittee must refer to the approved EMP for environmental monitoring procedures.
14.4	**Monitoring after EMP approval**	The permittee must monitor the facility in accordance with: 1) the approved EMP; 2) any conditions of DEQ's approval; and 3) any DEQ-approved amendments and updates.
14.5	**Changes in sampling or split sampling**	The permittee must submit a written request and obtain DEQ's written approval before changing the sampling program, including sampling frequency, parameters, or locations. Approved changes will become an integral part of the EMP. DEQ reserves the right to add to or delete from the list of scheduled sampling events, sampling locations, and sampling parameters, and to conduct unscheduled sampling or split sampling events.

15.0 ESTABLISHING CONCENTRATION LIMITS

15.1	**Gathering data**	The permittee must monitor the designated background wells in accordance with the approved Environmental Monitoring Plan or propose an alternative intrawell approach. Background monitoring must continue until all necessary data sets have been collected, and Permit-Specific Concentration Limits (PSCLs), Remedial Action Concentration Limits (RACLs), and/or Site Specific Limits (SSLs) are proposed for each non-hazardous parameter of concern. The permittee then must demonstrate to DEQ's satisfaction that the selected background-data set is valid and unaffected by facility releases.
15.2	**Future disposal units or cells**	Before using a new landfill unit or cell for waste disposal, the permittee must collect enough samples to determine background groundwater quality.
15.3	**Proposing PSCLs, RACLs, and/or SSLs**	At DEQ's request, the permittee must propose for DEQ's review and approval, a PSCL, RACL, or SSL pursuant to the guidelines specified in OAR 340-040. The proposal must address all required parameters of interest. Once a statistically valid data set (at least nine (9) acceptable data points) are established from the appropriate background well(s), the permittee may generate a PSCL, RACL, or SSL for each designated, long-term monitoring parameter.
15.4	**Changing PSCLs, RACLs, and/or SSLs**	If the permittee demonstrates to DEQ's satisfaction that background groundwater quality has significantly changed since the PSCL, RACL, or SSL was established, and if the change is unrelated to the permitted facility's influence, the permittee can propose to DEQ, a revised level for the affected PSCL(s), RACL(s), or SSL(s). This does not apply to intrawell comparisons, only to interwell methods.
15.5	**Establishing and changing CLVs**	The permittee should refer to the State's Groundwater Quality Protection Rules [OAR 340-040-0030(4)] for guidance in establishing and changing Concentration Limit Variances (CLVs).

16.0 ENVIRONMENTAL MONITORING STANDARDS

16.1	**Applicable regulatory standard**	The permittee must not allow the release of any substance from the landfill into groundwater, surface water, or any other media which will result in a violation of any applicable federal or state air or water limit, drinking water rules, or regulations, beyond the solid waste boundary of the disposal site or an alternative boundary specified by DEQ. Reference: OAR 340-094-0080.
16.2	**Review of results**	The permittee must review the analytical results after each monitoring event according to the protocols established in the most currently approved site-specific Environmental Monitoring Plan. Note: Established Remedial Action Concentration Limits and Permit-Specific Concentration Limits are listed in Attachment 1 of this permit.
16.3	**Resampling results**	Upon receipt of data from resampling, the permittee must review the analytical results according to the protocols established in the most currently approved site-specific Environmental Monitoring Plan.
16.4	**Certified environment-al laboratory data**	To assure the best possible data quality, DEQ suggests that the permittee contract with environmental labs certified under the Oregon Laboratory Accredited Program (ORLAP) or the National Environmental Laboratory Accreditation Program (NELAP). The permittee should include a copy of the lab's certification with every data submittal. Use of an ORLAP or NELAP approved lab will facilitate DEQ's future review of Environmental Monitoring Plan (EMP) or associated updates, the Annual Environmental Monitoring Reports (AEMRs), and any required RI/FS documents. If the permittee chooses to use a non-ORLAP or non-NELAP laboratory, then that lab must provide their Quality Assurance and Control plan to the DEQ laboratory for review and approval. Any analyses from this non-accredited laboratory will need to conform to the conditions of DEQ's approval.

17.0 RECORD KEEPING AND REPORTING

17.1	**Annual Environmental Monitoring Report (AEMR)**	Prior to March 1 of each year, the permittee must submit to DEQ one (1) hard copy and one (1) electronic copy of an annual monitoring report for the past year's monitoring period. The report must conform to the approved EMP format and be prepared and stamped by a Geologist or a Certified Engineering Geologist, with current Oregon registration. Note: Whenever possible, the permittee must submit two-sided copies of all reports and may submit electronic submittals of reports.
17.2	**Statement of compliance**	The AEMR must include a brief (approximately one-page) cover letter that: • Compares the analytical results with the relevant monitoring standards (RBCs, PSCLs, CLVs, ALs, or SSLs); • Documents any exceedances of federal or state standards for relevant media; and • Documents any significant change in water quality, land quality, air quality or methane levels in monitored media.

17.3	**Annual Environmental Monitoring Report (AEMR) contents**	The AEMR must reflect the facility's current conditions, present accurate data that corresponds with the original field and lab data, and include the reporting elements as described in the EMP.
17.4	**Submittal address**	Send all required submittals to: Oregon Department of Environmental Quality Manager, Solid Waste Program 750 Front Street NE, Suite 120 Salem, OR 97301 Telephone: (503) 378-5047
17.5	**Split sampling submittal**	Within ninety (90) days of any split sampling event, the permittee must submit the following information to DEQ's laboratory: • A copy of all information pertinent to the sample collection handling, transport and storage, including field notes; • Copies of all laboratory analytical reports; • Copies of all laboratory QA/QC reports; • A copy of the lab certification (ORLAP or NELAP, see Certified Environmental Lab Data condition above); • Any other data or reports requested by DEQ.
17.6	**Lab address**	Report all required split sampling information to: Oregon Department of Environmental Quality Laboratory, Groundwater Monitoring Section 3150 NW 229th, Suite 150 Hillsboro, OR 97124 Phone: (503) 693-5700 Fax: (503) 693-4999
17.7	**DEQ response to split samples**	If the permittee submits all required split sampling data and requests DEQ's results, DEQ's lab may provide, to the permittee, copies of the following information: • DEQ's analysis of the split sample; • The QA/QC report; • The analytical report; and/or • The field data sheets.

18.0 ENVIRONMENTAL MONITORING NETWORK

18.1	**Monitoring device installation**	For future disposal units or cells, the permittee must install DEQ-approved background and detection and/or compliance wells at least twelve (12) months before refuse disposal occurs in the new cells. A Site Characterization Report (SCR) may also be required for any proposed new cell. DEQ may waive or modify this requirement if the permittee provides adequate justification for an alternative approach.
18.2	**Monitoring stations and equipment**	To ensure that every sample is representative of the site's environmental conditions, the permittee must protect, operate, and maintain all environmental monitoring stations and equipment in accordance with DEQ's requirements.
18.3	**Access to monitoring stations and equipment**	To facilitate sample collection and/or inspection and maintenance activities, the permittee must maintain reasonable all-weather access to all monitoring stations and associated equipment.
18.4	**Reporting equipment damage**	Within fourteen (14) days of discovering any damaged monitoring equipment or station, the permittee must submit to DEQ a report describing the damage, the proposed repair or replacement measures, and the schedule to complete this work. Example: a well's impaired function or altered position/location.
18.5	**Monitoring well construction**	The permittee must complete any monitoring well abandonment (decommissioning), replacement, repair, or installation in a manner that complies with the Water Resources Rules, OAR 690-240.
18.6	**Reporting well construction and repairs**	The permittee must document all monitoring well repair or gas monitoring probe repair and construction activities, including driller's logs, well location information, and construction information in a report prepared and stamped by a Geologist or Certified Engineering Geologist, with current Oregon registration. The permittee must submit the report to DEQ within thirty (30) days of the action and include this documentation in the next Annual Environmental Monitoring Report (AEMR).
18.7	**Well or gas probe decommissioning or replacement**	The permittee must submit a written recommendation to DEQ prior to decommissioning or replacing any well or gas monitoring probe in the monitoring network. After receiving DEQ's approval, the permittee must decommission or replace any well that meets the following criteria: • The well was installed in a borehole that hydraulically intersects two saturated stratas; • The permittee lacks supporting documentation demonstrating that the well was properly installed and constructed; • The well was damaged beyond repair or destroyed; or • Other reasons as determined by either the permittee or DEQ.
18.8	**Submittal address**	Send all required submittals to: Oregon Department of Environmental Quality Manager, Solid Waste Program 750 Front Street NE, Suite 120 Salem, OR 97301 Telephone: (503) 378-5047

COMPLIANCE SCHEDULE

19.0 SUMMARY OF DUE DATES –

19.1 The permittee must comply with the event-driven schedule shown below. This compliance schedule does not apply to many of the routine reporting requirements specified in other sections of the permit.

Due Date	Activity	See section...
Within 12 months of permit issuance	Submit updated Operations Plan	7.1 Operations plan submittal
Within 12 months of permit issuance	Submit updated site development plan	10.2 Site development plan
Within 12 months of permit issuance	Submit conceptual "worst-case" closure and post-closure plans	11.2 Worst-case closure plan development
Within 12 months of permit issuance	Submit updated Environmental Monitoring Plan (EMP)	13.1 EMP submittal
EMERGENCY:		
Immediately	OERS notification of reportable spill	9.2 Spills notification
Within 24 hours of fire	Notify DEQ, immediately and thoroughly extinguish fire	9.15 Fire protection and reporting
Within 24 hours of discovery of hazardous or suspected hazardous waste	Notify DEQ, initiate procedures to identify and remove the hazardous waste	6.1 Hazardous waste disposal
Within 24 hours of discovery of prohibited waste	Notify DEQ of prohibited waste, begin to isolate and remove, take digital photos	9.1 Discovery of prohibited waste
Within 14 days of discovery of monitoring equipment or station damage	Submit report to DEQ	18.4 Reporting equipment damage
Within 60 days of discovery of prohibited waste	Transport prohibited waste to authorized facility	9.1 Discovery of prohibited waste
Within 60 days of discovery of surface water structural damage/malfunction	Notify DEQ and complete repairs	9.7 Surface water structures

NPDES Permit #101499

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NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
WASTE DISCHARGE PERMIT

Department of Environmental Quality
Western Region – Salem Office
750 Front Street NE, Suite 120, Salem, OR 97301-1039
Telephone: (503) 378-8240

Issued pursuant to ORS 468B.050 and The Federal Clean Water Act

ISSUED TO:
Fort Chicago Holdings II U.S. LLC
c/o Veresen Inc., Suite 900 Livingston Place, South Tower
222 3rd Avenue SW
Calgary, AB Canada
T2P 0B4

SOURCES COVERED BY THIS PERMIT:

Type of Waste	Outfall Number	Outfall Location
Landfill leachate, storm water, residual paper mill waste, Miscellaneous wash water	001(a)	Pacific Ocean
Deflation plain storm water	001(b)	Pacific Ocean
Former Aerated Stabilisation Basin/Deflation plain seepage	002	Pacific Ocean and Coos Bay
North and South Pond seepage	003	Coos Bay

FACILITY TYPE AND LOCATION:
Permanently closed non-bleach corrugated paper mill
Jordan Cove Energy Project
92770 Trans Pacific Lane
North Bend, Oregon

RECEIVING STREAM INFORMATION:
Basin: South Coast
Sub-Basin: Coos
Receiving Stream: Pacific Ocean (primary)
Coos Bay (secondary)
LLID: 1240637462558
County: Coos

EPA REFERENCE NO: OR-000211-9

Issued in response to Application No. 972339 received November 21, 2008. This permit is issued based on the land use findings in the permit record.

Ranei Nomura	07/06/2015	07/26/2015
Ranei Nomura, Water Quality Manager Western Region	Signature Date	Effective Date

PERMITTED ACTIVITIES

Until this permit expires or is modified or revoked, the permittee is authorised to construct, install, modify, or operate a wastewater collection, treatment, control and disposal system and discharge to public waters adequately treated wastewaters only from the authorised discharge point or points established in Schedule A and only in conformance with all the requirements, limitations, aud conditions set forth in the attached schedules as follows.

Unless specifically authorised by this permit, by another NPDES or WPCF permit, or by Oregon Administrative Rule, any other direct or indirect discharge to waters of the state is prohibited.

Note: This permit does not contain a *Schedule C* or *Schedule E.*

SCHEDULE A: WASTE DISCHARGE LIMITS

1. Outfall 001(a) – discharge of process water

a. Effluent Limitations

The following effluent limit must be met when discharging through Outfall 001(a):

Parameter	Limitation
pH	Must be within the range of 6.0-10.0 S.U.

2. Outfall 001(b) – discharge from deflation plain

a. Effluent Limitations

The following effluent limits must be met when discharging through Outfall 001(b):

Parameter	Limitation
Oil and Grease	Must not exceed 10 mg/l
Visible Solids	No visible discharge allowed
Debris	No material discharged that will be retained by a 5 mesh screen
pH	Must be within the range of 6.0-9.0 S.U.

3. Outfall 002 and Outfall 003

a. Groundwater

All wastewater and process related residuals must be managed and disposed of iu a manner that prevents:

i. A violation of the Department's Groundwater Quality Protection Rules (OAR 340-040);

ii. A violation of any permit-specific groundwater concentration limit, established pursuant to OAR 340-040-0030, which may be subsequently incorporated into this permit.

4. Regulatory Mixing Zone

No wastes may be discharged or activities conducted that cause or contribute to a violation of water quality standards in OAR 340-041 applicable to the South Coast basin except as provided for in OAR 340-045-0080 and the following regulatory mixing zone:

The mixing zone consists of that portion of the Pacific Ocean extending from the ocean floor to the surface and 500 feet laterally in all directions from the diffuser outfall.

5. Groundwater Protection

No activities may be conducted that could cause an adverse impact on existing or potential beneficial uses of groundwater. All wastewater and process related residuals must be managed and disposed in a manner that will prevent a violation of the Groundwater Quality Protection Rules (OAR 340-040).

6. Re-opener

The Department may reopen this permit, if necessary, to include groundwater parameters, concentration limits, and compliance points based on investigations conducted by the Department's Cleanup Programme.

SCHEDULE B: MINIMUM MONITORING AND REPORTING REQUIREMENTS

REPORTING SUMMARY			
Item	**Frequency**	**Due date**	**Section(s)**
Discharge Monitoring Report	Monthly	By 15th of following month	2

1. Monitoring and Reporting Protocols

a. Test Methods

Test Methods – monitoring must be conducted according to test procedures in 40 CFR Part 136 and 40 CFR 503 for bio-solids or other approved procedures as per Schedule F.

b. Detection and Quantitation Limits

i. Detection Level (DL) – The DL is defined as the minimum measured concentration of a substance that can be distinguished from method blank results with 99% confidence. The DL is derived using the procedure in 40 CFR Part 136 Appendix B and evaluated for reasonableness relative to method blank concentrations to ensure results reported above the DL are not a result of routine background contamination. The DL is also known as the Method Detection Limit (MDL) or Limit of Detection (LOD).

ii. Quantitation Limits (QLs) – The QL is the minimum level, concentration or quantity of a target analyte that can be reported with a specified degree of confidence. It is the lowest level at which the entire analytical system gives a recognisable signal and acceptable calibration for the analyte. It is normally equivalent to the concentration of the lowest calibration standard adjusted for sample weights, volumes, preparation and cleanup procedures employed. The QL as reported by a laboratory is also sometimes referred to as the Method Reporting Limit (MRL) or Limit of Quantitation (LOQ).

c. Quality Assurance and Quality Control (QA/QC)

The permittee must develop and implement a written QA/QC programme to verify the accuracy of sample analysis as specified in 40 CFR Part 136. The QA/QC programme must conform to the requirements of 40 CFR Part 136.7. For additional requirements on proper sampling techniques, test methods and QA/QC procedures, see Schedule F, Sections B.1 and C.

d. Re-analysis, Re-sampling and Reporting of Data if QA/QC Requirements Not Met

If QA/QC requirements are not met for any analysis, the permittee must have the sample re-analysed. If the sample cannot be re-analysed, the permittee must re-sample as soon as possible. If a sample result does not meet QA/QC requirements, the result must be included in the DMR along with a notation explaining how it does not meet QA/QC requirements, but must not be used in any calculation required by the permit.

e. Reporting Sample Results

The permittee must follow the procedures listed below when reporting sampling results.

i. The permittee must report the laboratory DL and QL as defined above for each analyte, with the following exceptions: temperature, BOD, CBOD, TSS, O&G, hardness, alkalinity, fecal coliform, nitrate-nitrite, total phenols and pH. For these parameters, the permittee is only required to report the QL.

ii. The permittee must report the same number of significant digits as the permit limit for a given parameter.

iii. *CAS Numbers*. CAS numbers (where available) must be reported along with monitoring results.

iv. If a sample result is above the DL but below the QL, the permittee must report the result as the DL preceded by DEQ's data code "e". For example, if the DL is 1.0 μg/l, the QL is 3.0 μg/L and the result is estimated to be between the DL and QL, the permittee must report "e1.0 μg/L" on the DMR. This requirement does not apply in the case of parameters for which the DL does not have to be reported.

v. If the sample result is below the DL, the permittee must report the result as less than the specified DL. For example, if the DL is 1.0 μg/L and the result is ND, report "<1.0" on the discharge monitoring report (DMR). This requirement does not apply in the case of parameters for which the DL does not have to be reported.

2. Effluent Monitoring and Reporting Requirements: Outfall 001(a) – process wastewater

The following monitoring is required when discharging through Outfall 001(a). The sample location for pH is the discharge control gate of the ASB. The sample location for the composite samples is the sample building housing the effluent flow meter.

Parameter	**Minimum Frequency**	**Type of Sample**	**Report** (See Note B.2)
Flow	Daily (See Note B.1)	Measurement	Daily values Maximum daily value Minimum daily value Monthly average
Biochemical Oxygen Demand (BOD_5)	1/Month	24-hour composite	Daily value(s) Maximum daily value Minimum daily value Monthly Average
Total Suspended Solids (TSS)	1/Month	24-hour composite	Daily value(s) Maximum daily value Minimum daily value Monthly average
pH	2/Month	Grab	Daily values Maximum daily value Minimum daily value

3. Effluent Monitoring and Reporting Requirements: Outfall 001(b) – deflation plain

The following monitoring is required when discharging through Outfall 001(b):

Parameter	**Minimum Frequency**	**Type of Sample**	**Report** (See Note B.2)
Oil & Grease	Weekly (when discharging)	Grab	Daily value(s) Maximum daily value Minimum daily value Monthly average

Parameter	Minimum Frequency	Type of Sample	Report (See Note B.2)
Visible Solids	Weekly (when discharging)	Visual Observation	Observe and record
Debris	Weekly (when discharging)	Visual Observation	Observe and record
Biochemical Oxygen Demand (BOD_5)	Weekly (when discharging)	Grab	Daily value(s) Maximum daily value Minimum daily value Monthly Average
Total Suspended Solids (TSS)	Weekly (when discharging)	Grab	Daily value(s) Maximum daily value Minimum daily value Monthly average
pH	Weekly (when discharging)	Grab	Daily value(s) Maximum daily value Minimum daily value

4. Effluent Monitoring and Reporting Requirements: Outfall 002 and 003 (Seepage from former Aerated Stabilisation Basin and North and South ponds)

Monitoring for these outfalls is covered under the existing site groundwater monitoring plan, and will be updated as necessary by the Department's Cleanup section. Discharges from these outfall are regulated as state-only discharges under Oregon's groundwater protection rules and ORS 468B.050, not the Federal Clean Water Act.

5. Reporting Requirements

The permittee must meet the following conditions:

a. The permittee must report the results of monitoring required for Outfall 001(a) and Outfall 001(b) on Department-approved Discharge Monitoring Report (DMR) forms. The reporting period is the calendar month. DMRs must be submitted to the appropriate Department office by the 15th day of the following month.

b. The permittee must report the results of monitoring required for Outfall 002 and Outfall 003 as specified in the groundwater monitoring plan approved by the Department's Cleanup section.

c. Monitoring reports shall be complete and include the name of the facility, file number, and all monitoring results. Monitoring reports must have copies of the lab data sheets attached.

Schedule B Notes:

B.1 In the event that the flow measurement system fails, permittee must notify the Department within 48 hours of discovery. Flow must then be estimated daily based on leachate flow, pond levels and rainfall records until the system has been repaired. The flow measurement system must be fixed within 30 days of the failure being discovered.

B.2 For Oil & Grease, BOD_5, TSS and pH reporting, if only one sample is taken in a given month, then that single value is reported for the daily value, maximum daily value, minimum daily value and monthly average.

SCHEDULE D: SPECIAL CONDITIONS

1. Emergency Response and Public Notification Plan

The permittee must develop and maintain an Emergency Response and Public Notification Plan (the Plan) per Schedule F, Section B. The permit holder must develop the plan within six months of permit issuance and update the Plan annually to ensure that telephone and email contact information for applicable public agencies are current and accurate. An updated copy of the plan must be kept on file at the facility for Department review. The latest plan revision date must be listed on the Plan cover along with the reviewer's initials or signature.

2. Spill/Emergency Response Plan

The permittee must have an up-to-date spill response plan available for review during inspection, for prevention and handling of spills and unplanned discharges. The spill response plan must include all of the following:

a. A description of the reporting system that will be used to alert responsible managers and legal authorities in the event of a spill.

b. A description of preventive measures and facilities (including an overall facility plot showing drainage patterns) to prevent, contain, or treat spills of these materials.

c. A description of the permittee's training program to ensure that employees are properly trained at all times to respond to unplanned and emergency incidents.

d. A description of the applicable reporting requirements. These must be consistent with the reporting requirements found in Schedule F, condition D.5.

3. Sanitary Wastes

Sanitary wastes must be disposed of to a septic tank and subsurface disposal system (or by other approved means) which is installed, operated and maintained in accordance with the requirements of the Department and the local health department. Wastes must be managed in a manner that will prevent sanitary wastewater from entering any waters of the state or from becoming a nuisance or health hazard.

4. Malfunction notification

The permittee must notify the Department of any plant malfunctions that may cause environmental or health impacts so corrective action(s) can be coordinated between the permittee and the Department. Notification must be to the DEQ Coos Bay office (541-269-2721) during regular office hours and OERS (800-452-0311) at other times.

5. Environmental Supervisor

An environmental supervisor must be designated to co-ordinate and carry out all necessary functions related to maintenance and operation of waste collection, treatment, and disposal facilities. This person must have access to all information pertaining to the generation of wastes in the various process areas.

6. Management and Maintenance of Groundwater Monitoring Wells

The permittee must protect and maintain each groundwater monitoring well so that samples collected are representative of actual conditions. Groundwater monitoring wells must be managed in accordance with the requirements of the groundwater monitoring plan developed for the site.

SCHEDULE F: NPDES GENERAL CONDITIONS – INDUSTRIAL FACILITIES

July 1, 2015 version

SECTION A. STANDARD CONDITIONS

A1. Duty to Comply with Permit

The permittee must comply with all conditions of this permit. Failure to comply with any permit condition is a violation of Oregon Revised Statutes (ORS) 468B.025 and the federal Clean Water Act and is grounds for an enforcement action. Failure to comply is also grounds for DEQ to terminate, modify and reissue, revoke, or deny renewal of a permit.

A2. Penalties for Water Pollution and Permit Condition Violations

The permit is enforceable by DEQ or EPA, and in some circumstances also by third-parties under the citizen suit provisions of 33 USC § 1365. DEQ enforcement is generally based on provisions of state statutes and Environmental Quality Commission (EQC) rules, and EPA enforcement is generally based on provisions of federal statutes and EPA regulations.

ORS 468.140 allows DEQ to impose civil penalties up to $25,000 per day for violation of a term, condition, or requirement of a permit. The federal Clean Water Act provides for civil penalties not to exceed $37,500 and administrative penalties not to exceed $16,000 per day for each violation of any condition or limitation of this permit.

Under ORS 468.943, unlawful water pollution in the second degree, is a Class A misdemeanor and is punishable by a fine of up to $25,000, imprisonment for not more than one year, or both. Each day on which a violation occurs or continues is a separately punishable offense. The federal Clean Water Act provides for criminal penalties of not more than $50,000 per day of violation, or imprisonment of not more than 2 years, or both for second or subsequent negligent violations of this permit.

Under ORS 468.946, unlawful water pollution in the first degree is a Class B felony and is punishable by a fine up to $250,000, imprisonment for not more than 10 years or both. The federal Clean Water Act provides for criminal penalties of $5,000 to $50,000 per day of violation, or imprisonment of not more than 3 years, or both for knowing violations of the permit. In the case of a second or subsequent conviction for knowing violation, a person is subject to criminal penalties of not more than $100,000 per day of violation, or imprisonment of not more than 6 years, or both.

A3. Duty to Mitigate

The permittee must take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of this permit. In addition, upon request of DEQ, the permittee must correct any adverse impact on the environment or human health resulting from noncompliance with this permit, including such accelerated or additional monitoring as necessary to determine the nature and impact of the noncomplying discharge.

A4. Duty to Reapply

If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee must apply for and have the permit renewed. The application must be submitted at least 180 days before the expiration date of this permit.

DEQ may grant permission to submit an application less than 180 days in advance but no later than the permit expiration date.

A5. Permit Actions

This permit may be modified, revoked and reissued, or terminated for cause including, but not limited to, the following:

a. Violation of any term, condition, or requirement of this permit, a rule, or a statute.
b. Obtaining this permit by misrepresentation or failure to disclose fully all material facts.
c. A change in any condition that requires either a temporary or permanent reduction or elimination of the authorized discharge.
d. The permittee is identified as a Designated Management Agency or allocated a wasteload under a total maximum daily load (TMDL).
e. New information or regulations.
f. Modification of compliance schedules.
g. Requirements of permit reopener conditions.
h. Correction of technical mistakes made in determining permit conditions.
i. Determination that the permitted activity endangers human health or the environment.
j. Other causes as specified in 40 CFR §§ 122.62, 122.64, and 124.5.

The filing of a request by the permittee for a permit modification, revocation or reissuance, termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

A6. Toxic Pollutants
The permittee must comply with any applicable effluent standards or prohibitions established under Oregon Administrative Rules (OAR) 340-041-0033 and 307(a) of the federal Clean Water Act for toxic pollutants and with standards for sewage sludge use or disposal established under section 405(d) of the federal Clean Water Act within the time provided in the regulations that establish those standards or prohibitions, even if the permit has not yet been modified to incorporate the requirement.

A7. Property Rights and Other Legal Requirements
The issuance of this permit does not convey any property rights of any sort, or any exclusive privilege, or authorize any injury to persons or property or invasion of any other private rights, or any infringement of federal, tribal, state, or local laws or regulations.

A8. Permit References
Except for effluent standards or prohibitions established under section 307(a) of the federal Clean Water Act and OAR 340-041-0033 for toxic pollutants, and standards for sewage sludge use or disposal established under section 405(d) of the federal Clean Water Act, all rules and statutes referred to in this permit are those in effect on the date this permit is issued.

A9. Permit Fees
The permittee must pay the fees required by OAR.

SECTION B. OPERATION AND MAINTENANCE OF POLLUTION CONTROLS

B1. Proper Operation and Maintenance
The permittee must at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) that are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems that are installed by a permittee only when the operation is necessary to achieve compliance with the conditions of the permit.

B2. Need to Halt or Reduce Activity Not a Defense
For industrial or commercial facilities, upon reduction, loss, or failure of the treatment facility, the permittee must, to the extent necessary to maintain compliance with its permit, control production or all discharges or both until the facility is restored or an alternative method of treatment is provided. This requirement applies, for example, when the primary source of power of the treatment facility fails or is reduced or lost. It is not a

defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

B3. Bypass of Treatment Facilities

a. Definitions
   (1) "Bypass" means intentional diversion of waste streams from any portion of the treatment facility. The permittee may allow any bypass to occur which does not cause effluent limitations to be exceeded, provided the diversion is to allow essential maintenance to assure efficient operation. These bypasses are not subject to the provisions of paragraphs b and c of this section.
   (2) "Severe property damage" means substantial physical damage to property, damage to the treatment facilities which causes them to become inoperable, or substantial and permanent loss of natural resources that can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.

b. Prohibition of bypass.
   (1) Bypass is prohibited and DEQ may take enforcement action against a permittee for bypass unless:
      i. Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage;
      ii. There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate backup equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass that occurred during normal periods of equipment downtime or preventative maintenance; and
      iii. The permittee submitted notices and requests as required under General Condition B3.c.
   (2) DEQ may approve an anticipated bypass, after considering its adverse effects and any alternatives to bypassing, when DEQ determines that it will meet the three conditions listed above in General Condition B3.b(1).

c. Notice and request for bypass.
   (1) Anticipated bypass. If the permittee knows in advance of the need for a bypass, a written notice must be submitted to DEQ at least ten days before the date of the bypass.
   (2) Unanticipated bypass. The permittee must submit notice of an unanticipated bypass as required in General Condition D5.

B4. Upset

a. Definition. "Upset" means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the permittee. An upset does not include noncompliance to the extent caused by operation error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventative maintenance, or careless or improper operation.

b. Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology-based permit effluent limitations if the requirements of General Condition B4.c are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.

c. Conditions necessary for a demonstration of upset. A permittee who wishes to establish the affirmative defense of upset must demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence that:
   (1) An upset occurred and that the permittee can identify the causes(s) of the upset;
   (2) The permitted facility was at the time being properly operated;
   (3) The permittee submitted notice of the upset as required in General Condition D5, hereof (24-hour notice); and
   (4) The permittee complied with any remedial measures required under General Condition A3 hereof.

d. Burden of proof. In any enforcement proceeding the permittee seeking to establish the occurrence of an upset has the burden of proof.

B5. Treatment of Single Operational Upset

For purposes of this permit, a single operational upset that leads to simultaneous violations of more than one pollutant parameter will be treated as a single violation. A single operational upset is an exceptional incident that causes simultaneous, unintentional, unknowing (not the result of a knowing act or omission), temporary noncompliance with more than one federal Clean Water Act effluent discharge pollutant parameter. A single operational upset does not include federal Clean Water Act violations involving discharge without a NPDES permit or noncompliance to the extent caused by improperly designed or inadequate treatment facilities. Each day of a single operational upset is a violation.

B6. Public Notification of Effluent Violation

If effluent limitations specified in this permit are exceeded or an overflow occurs that threatens public health, the permittee must take such steps as are necessary to alert the public, health agencies and other affected entities (for example, public water systems) about the extent and nature of the discharge in accordance with the notification procedures developed under General Condition B7. Such steps may include, but are not limited to, posting of the river at access points and other places, news releases, and paid announcements on radio and television.

B7. Emergency Response and Public Notification Plan

The permittee must develop and implement an emergency response and public notification plan that identifies measures to protect public health from bypasses or upsets that may endanger public health. At a minimum the plan must include mechanisms to:

a. Ensure that the permittee is aware (to the greatest extent possible) of such events;
b. Ensure notification of appropriate personnel and ensure that they are immediately dispatched for investigation and response;
c. Ensure immediate notification to the public, health agencies, and other affected entities (including public water systems). The response plan must identify the public health and other officials who will receive immediate notification;
d. Ensure that appropriate personnel are aware of and follow the plan and are appropriately trained;
e. Provide emergency operations; and
f. Ensure that DEQ is notified of the public notification steps taken.

B8. Removed Substances

Solids, sludges, filter backwash, or other pollutants removed in the course of treatment or control of wastewaters must be disposed of in such a manner as to prevent any pollutant from such materials from entering waters of the state, causing nuisance conditions, or creating a public health hazard.

SECTION C. MONITORING AND RECORDS

C1. Representative Sampling

Sampling and measurements taken as required herein must be representative of the volume and nature of the monitored discharge. All samples must be taken at the monitoring points specified in this permit, and must be taken, unless otherwise specified, before the effluent joins or is diluted by any other waste stream, body of water, or substance. Monitoring points must not be changed without notification to and the approval of DEQ. Samples must be collected in accordance with requirements in 40 CFR part 122.21 and 40 CFR part 403 Appendix E.

C2. Flow Measurements

Appropriate flow measurement devices and methods consistent with accepted scientific practices must be selected and used to ensure the accuracy and reliability of measurements of the volume of monitored discharges. The devices must be installed, calibrated and maintained to insure that the accuracy of the measurements is consistent with the accepted capability of that type of device. Devices selected must be capable of measuring flows with a maximum deviation of less than ± 10 percent from true discharge rates throughout the range of expected discharge volumes.

C3. Monitoring Procedures
Monitoring must be conducted according to test procedures approved under 40 CFR part 136 or, in the case of sludge (biosolids) use and disposal, approved under 40 CFR part 503 unless other test procedures have been specified in this permit.

For monitoring of recycled water with no discharge to waters of the state, monitoring must be conducted according to test procedures approved under 40 CFR part 136 or as specified in the most recent edition of Standard Methods for the Examination of Water and Wastewater unless other test procedures have been specified in this permit or approved in writing by the Department.

C4. Penalties of Tampering
The federal Clean Water Act provides that any person who falsifies, tampers with, or knowingly renders inaccurate any monitoring device or method required to be maintained under this permit may, upon conviction, be punished by a fine of not more than $10,000 per violation, imprisonment for not more than two years, or both. If a conviction of a person is for a violation committed after a first conviction of such person, punishment is a fine not more than $20,000 per day of violation, or by imprisonment of not more than four years, or both.

C5. Reporting of Monitoring Results
Monitoring results must be summarized each month on a discharge monitoring report form approved by DEQ. The reports must be submitted monthly and are to be mailed, delivered or otherwise transmitted by the 15th day of the following month unless specifically approved otherwise in Schedule B of this permit.

C6. Additional Monitoring by the Permittee
If the permittee monitors any pollutant more frequently than required by this permit, using test procedures approved under 40 CFR part 136 or, in the case of sludge (biosolids) use and disposal, approved under 40 CFR part 503 or as specified in this permit, the results of this monitoring must be included in the calculation and reporting of the data submitted in the discharge monitoring report. Such increased frequency must also be indicated. For a pollutant parameter that may be sampled more than once per day (for example, total residual chlorine), only the average daily value must be recorded unless otherwise specified in this permit.

C7. Averaging of Measurements
Calculations for all limitations that require averaging of measurements must utilize an arithmetic mean, except for bacteria which must be averaged as specified in this permit.

C8. Retention of Records
Records of monitoring information required by this permit related to the permittee's sewage sludge use and disposal activities must be retained for a period of at least 5 years (or longer as required by 40 CFR part 503). Records of all monitoring information including all calibration and maintenance records, all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this permit and records of all data used to complete the application for this permit must be retained for a period of at least 3 years from the date of the sample, measurement, report, or application. This period may be extended by request of DEQ at any time.

C9. Records Contents
Records of monitoring information must include:

a. The date, exact place, time, and methods of sampling or measurements;
b. The individual(s) who performed the sampling or measurements;
c. The date(s) analyses were performed;

d. The individual(s) who performed the analyses;
e. The analytical techniques or methods used; and
f. The results of such analyses.

C10. Inspection and Entry
The permittee must allow DEQ or EPA upon the presentation of credentials to:
a. Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept nnder the conditions of this permit;
b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;
c. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and
d. Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by state law, any substances or parameters at any location.

C11. Confidentiality of Information
Any information relating to this permit that is submitted to or obtained by DEQ is available to the public unless classified as confidential by the Director of DEQ under ORS 468.095. The permittee may request that information be classified as confidential if it is a trade secret as defined by that statute. The name and address of the permittee, permit applications, permits, effluent data, and information required by NPDES application forms under 40 CFR § 122.21 are not classified as confidential [40 CFR § 122.7(b)].

SECTION D. REPORTING REQUIREMENTS

D1. Planned Changes
The permittee must comply with OAR 340-052, "Review of Plans and Specifications" and 40 CFR § 122.41(l)(1). Except where exempted under OAR 340-052, no construction, installation, or modification involving disposal systems, treatment works, sewerage systems, or common sewers may be commenced until the plans and specifications are submitted to and approved by DEQ. The permittee must give notice to DEQ as soon as possible of any plamed physical alternations or additions to the permitted facility.

D2. Anticipated Noncompliance
The permittee must give advance notice to DEQ of any planned changes in the permitted facility or activity that/may result in noncompliance with permit requirements.

D3. Transfers
This permit may be transferred to a new permittee provided the transferee acquires a property interest in the permitted activity and agrees in writing to fully comply with all the terms and conditions of the permit and EQC rules. No permit may be transferred to a third party without prior written approval from DEQ. DEQ may require modification or revocation and reissuance of the permit to change the name of the permittee and incorporate such other requirements as may be necessary under 40 CFR § 122.61. The permittee must notify DEQ when a transfer of property interest takes place.

D4. Compliance Schedule
Reports of compliance or noncompliance with, or any progress reports on interim and final requirements contained in any compliance schedule of this permit must be submitted no later than 14 days following each schedule date. Any reports of noncompliance must include the cause of noncompliance, any remedial actions taken, and the probability of meeting the next scheduled requirements.

D5. Twenty-Four Hour Reporting
The permittee must report any noncompliance that may endanger health or the environment. Any information must be provided orally (by telephone) within 24 hours from the time the permittee becomes aware of the

circumstances, unless a shorter time is specified in the permit. During normal business hours, the DEQ regional office must be called. Outside of normal business hours, DEQ must be contacted at 1-800-452-0311 (Oregon Emergency Response System).

The following must be included as information that must be reported within 24 hours under this paragraph:

a. Any unanticipated bypass that exceeds any effluent limitation in this permit;
b. Any upset that exceeds any effluent limitation in this permit;
c. Violation of maximum daily discharge limitation for any of the pollutants listed by DEQ in this permit; and
d. Any noncompliance that may endanger human health or the environment.

A written submission must also be provided within 5 days of the time the permittee becomes aware of the circumstances. The written submission must contain:

e. A description of noncompliance and its cause;
f. The period of noncompliance, including exact dates and times;
g. The estimated time noncompliance is expected to continue if it has not been corrected;
h. Steps taken or planned to reduce, eliminate and prevent reoccurrence of the noncompliance; and
i. Public notification steps taken, pursuant to General Condition B7.

DEQ may waive the written report on a case-by-case basis if the oral report has been received within 24 hours.

D6. Other Noncompliance

The permittee must report all instances of noncompliance not reported under General Condition D4 or D5, at the time monitoring reports are submitted. The reports must contain:

a. A description of the noncompliance and its cause;
b. The period of noncompliance, including exact dates and times;
c. The estimated time noncompliance is expected to continue if it has not been corrected; and
d. Steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.

D7. Duty to Provide Information

The permittee must furnish to DEQ within a reasonable time any information that DEQ may request to determine compliance with the permit or to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit. The permittee must also furnish to DEQ, upon request, copies of records required to be kept by this permit.

Other Information: When the permittee becomes aware that it has failed to submit any relevant facts or has submitted incorrect information in a permit application or any report to DEQ, it must promptly submit such facts or information.

D8. Signatory Requirements

All applications, reports or information submitted to DEQ must be signed and certified in accordance with 40 CFR § 122.22.

D9. Falsification of Information

Under ORS 468.953, any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or noncompliance, is subject to a Class C felony punishable by a fine not to exceed $125,000 per violation and up to 5 years in prison per ORS chapter 161. Additionally, according to 40 CFR § 122.41(k)(2), any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit including monitoring reports or reports of compliance or non-compliance will, upon conviction, be punished by a federal civil penalty not to exceed $10,000 per violation, or by imprisonment for not more than 6 months per violation, or by both.

D10. Changes to Discharges of Toxic Pollutant

The permittee must notify DEQ as soon as it knows or has reason to believe the following:

a. That any activity has occurred or will occur that would result in the discharge, on a routine or frequent basis, of any toxic pollutant that is not limited in the permit, if that discharge will exceed the highest of the following "notification levels:
   (1) One hundred micrograms per liter (100 μg/l);
   (2) Two hundred micrograms per liter (200 μg/l) for acrolein and acrylonitrile; five hundred micrograms per liter (500 μg/l) for 2,4-dinitrophenol and for 2-methyl-4,6-dinitrophenol; and one milligram per liter (1 mg/l) for antimony;
   (3) Five (5) times the maximum concentration value reported for that pollutant in the permit application in accordance with 40 CFR § 122.21(g)(7); or
   (4) The level established by DEQ in accordance with 40 CFR § 122.44(f).
b. That any activity has occurred or will occur that would result in any discharge, on a non-routine or infrequent basis, of a toxic pollutant that is not limited in the permit, if that discharge will exceed the highest of the following "notification levels":
   (1) Five hundred micrograms per liter (500 μg/l);
   (2) One milligram per liter (1 mg/l) for antimony;
   (3) Ten (10) times the maximum concentration value reported for that pollutant in the permit application in accordance with 40 CFR § 122.21(g)(7); or
   (4) The level established by DEQ in accordance with 40 CFR § 122.44(f).

SECTION E. DEFINITIONS

E1. *BOD or BOD_5* means five-day biochemical oxygen demand.
E2. *CBOD or $CBOD_5$* means five-day carbonaceous biochemical oxygen demand.
E3. *TSS* means total suspended solids.
E4. *Bacteria* means but is not limited to fecal coliform bacteria, total coliform bacteria, *Escherichia coli* (*E. coli*) bacteria, and *Enterococcus* bacteria.
E5. *FC* means fecal coliform bacteria.
E6. *Total residual chlorine* means combined chlorine forms plus free residual chlorine
E7. *Technology based permit effluent limitations* means technology-based treatment requirements as defined in 40 CFR § 125.3, and concentration and mass load effluent limitations that are based on minimum design criteria specified in OAR 340-041.
E8. *mg/l* means milligrams per liter.
E9. *μg/l* means microgram per liter.
E10. *kg* means kilograms.
E11. *m^3/d* means cubic meters per day.
E12. *MGD* means million gallons per day.
E13. *Average monthly effluent limitation* as defined at 40 CFR § 122.2 means the highest allowable average of daily discharges over a calendar month, calculated as the sum of all daily discharges measured during a calendar month divided by the number of daily discharges measured during that month.
E14. *Average weekly effluent limitation* as defined at 40 CFR § 122.2 means the highest allowable average of daily discharges over a calendar week, calculated as the sum of all daily discharges measured during a calendar week divided by the number of daily discharges measured during that week.
E15. *Daily discharge* as defined at 40 CFR § 122.2 means the discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. For pollutants with limitations expressed in units of mass, the daily discharge must be calculated as the total mass of the pollutant discharged over the day. For pollutants with limitations expressed in other units of measurement, the daily discharge must be calculated as the average measurement of the pollutant over the day.

E16. *24-hour composite sample* means a sample formed by collecting and mixing discrete samples taken periodically and based on time or flow.

E17. *Grab sample* means an individual discrete sample collected over a period of time not to exceed 15 minutes.

E18. *Quarter* means January through March, April through June, July through September, or October through December.

E19. *Month* means calendar month.

E20. *Week* means a calendar week of Sunday through Saturday.

Cells 2 & 3 Closure, and Post Closure Cells 1, 2, and 3 Cost Estimates

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Appendix 5 Table 1
Jordan Cove Energy Project, LP
North Spit landfill
Cell 2 Closure Cost Estimate
Geomembrane Cap In-place
Prepared by SHN on 2/26/2018

Area of Cell 2	4	acres	174,240	sqft
Top deck Area	1.9	acres	82,764	sqft
Side slope Area	2.1	acres	91,476	sqft

#	Task	Quantity	Unit	Unit Cost	Cost
1	Mobilization	1	LS	$ 48,000	$ 48,000
2	Fill material (excavate and place)	6000	CY	$ 10	$ 60,000
3	Clear and grub	4	acre	$ 3,000	$ 12,000
4	Prepare foundation layer (interim cover)	82,764	sqft	$ 0.35	$ 28,967
5	Geomembrane 60 mil LLDPE	82,764	sqft	$ 0.90	$ 74,488
6	Drainage geocomposite	100,624	sqft	$ 1.30	$ 130,811
7	1' native soil cover	3,065	CY	$ 3	$ 9,196
8	1' vegetative cover	3,065	CY	$ 8	$ 24,523
9	Passive Gas Vent	1	LS	$ 6,000	$ 6,000
10	All weather 12' wide access road	350	LF	$ 60	$ 21,000
11	Hydroseed	1.9	Acre	$ 4,000	$ 7,600
	Sub Total Cap				$ 422,584
	Drainage				
12	Rock Slope Protection	100	CY	$ 35	$ 3,500
13	24" Dia. down drain culvert	200	LF	$ 68	$ 13,600
14	Perimeter channel	1,470	LF	$ 15	$ 22,050
15	Drainage ditch	300	LF	$ 15	$ 4,500
	Sub Total Drainage				$ 43,650
	Total Construction Cost				$ 466,234
	Construction Documents and CQA				
14	Engineering of Closure Plans, Specs and bid documents	1	LS	$ 26,000	$ 26,000
15	CQA Plan	1	LS	$ 10,000	$ 10,000
16	CQA Third Party	1	LS	$ 70,000	$ 40,000
17	CQA testing of materials and soils	1	LS	$ 15,000	$ 15,000
18	CQA Report	1	LS	$ 15,000	$ 15,000
	Total Construction Documents and CQA				$ 106,000
	Subtotal				$ 572,234
	20% Contingency				$ 114,447
	Total Closure Cost Cell 2				**$ 686,681**

Abbreviations
CY = Cubic Yard
LF = Liner Foot
LS = Lump Sum

Appendix 5 Table 2
Jordan Cove Energy Project, LP
North Spit landfill
Cell 3 Closure Cost Estimate
Clean Closure - Removal of Waste
Prepared by SHN on 3/20/2018

Area of Cell 3	5.75	acres	250,470	sqft
Area of Borrow	2	acres	87,120	sqft

#	Task	Quantity	Unit	Unit Cost	Cost
1	Mobilization	1	LS	$ 81,000	$ 81,000
2	Fill material (excavate and place)	6,400	CY	$ 10	$ 64,000
3	Excavation, Processing, and Disposal of Solid Waste for Cell 3[1]	141,400	CY	$ 72.62	$ 10,268,447
4	Removal & Disposal of Liner	250,470	sqft	$ 0.10	$ 25,047
5	Hydroseed (Cell 3 + Borrow Area)	7.75	acre	$ 4,000	$ 31,000
	Total Construction				$ 10,469,494

Construction Documents and CQA

#	Task	Quantity	Unit	Unit Cost	Cost
6	Engineering of Closure Plans, Specs and bid documents	1	LS	$ 26,000	$ 26,000
7	CQA Plan	1	LS	$ 10,000	$ 10,000
8	CQA Third Party	1	LS	$ 80,000	$ 80,000
9	CQA testing of materials and soils	1	LS	$ 15,000	$ 15,000
10	CQA Report	1	LS	$ 15,000	$ 15,000
	Total Construction Documents and CQA				$ 146,000

Subtotal	$ 10,615,494
20% Contingency	$ 2,123,099
Total Closure Cost Cell 3	**$ 12,738,593**

Abbreviations
CY = Cubic Yard
LF = Liner Feet
LS = Lump Sum
sqft = Square Feet (ft^2)

Notes:

[1] Volume has been reduced from currrent in place volume of 176,000 CY due to the projected removal of waste (-38,000 CY) during de-inventory as proposed in the Solid Waste Operations Plan and placement of 1' thick interim cover over disturbed area (+3,400 CY)

The excavation, processing and disposal of solid waste from Cell 3 volume includes in-place waste removal, interim cover, and leachate collection system.

Appendix 5 Table 3

Jordan Cove Energy Project, LP

North Spit landfill

Cells 1, 2, & 3 Post Closure Care Monitoring and Maintenance Cost Estimate

Prepared by SHN on 3/20/2018

Area of Cell 1	2.7	acres
Area of Cell 2	4.1	acres
Area of Cell 3	0	acres

#	Task	Quantity	Unit	# of times per 30 yrs	Unit Cost	Cost6
1	Groundwater Monitoring[1]	1	lump sum	30	$ 24,000	$ 720,000
2	Area to be re-vegetated[2]	0.7	acres	10	$ 4,000	$ 27,200
3	Drainage maintenance activities	1	lump sum	30	$ 2,000	$ 60,000
4	Inspection (quarterly)	4	each	30	$ 1,000	$ 120,000
5	Miscellaneous site infrastructure and administration[3]	1	lump sum	30	$ 3,420	$ 102,600
6	Passive gas vent on Cell 2 maintenance[4]	1	lump sum	30	$ 1,000	$ 30,000
7	Security Fencing[5]	4,940	liner feet	1	$ 18	$ 88,920
8	Annual Site Evaluation Reporting	1	lump sum	30	$ 3,000	$ 90,000
	Total 30 Year Cell 2 & Cell 3 Post Closure Monitoring and Maintenance					**$ 1,238,720**
	Average Annual Cell 2 and Cell 3 Post Closure Monitoring and Maintenance					**$ 41,291**
	Present Value[7]					**$ 1,322,107**

[1] SHN performs monitoring of North Spit Landfill - price based on 2016 cost for monitoring, lab work, reports and reporting. The proposed Environmental Monitoring Plan (EMP) has a reduced 10 years of monitoring. See revised EMP.

[2] Assume that 10% of the vegetated area (6.8 acres x 10% = 0.7 acres) will need to be landfill every 3 years.

[3] Includes onetime cost county deed notice for the closed landfill of $5,000

[4] Post Closure no gas monitoring will be performed of the landfill. The passive gas vent installed during construction of the Cap on Cell 2 will not be monitored for gas emissions. The passive gas vent will stay in place during the life of the landfill and will require minimal maintenance.

[5] Chain Link Fencing to be installed around Cell 1 and Cell 2. Annual maintenance of fence is included in Task 5.

[6] Cost = Quantity x # of time per 30 yrs x Unit Cost

[7] Present Value determined by using Oregon State Spreadsheet fa-DiscountingWorksheetNonMSWFacilities (1).xls. See attached.

Appendix 5 Table 4
Jordan Cove Energy Project, LP

North Spit landfill
Present Worth of Closure and Post Closure
Prepared by SHN on 3/20/2017
Oregon State Spreadsheet = fa-DiscountingWorksheetNonMSWFacilities (1).xls

This year:	2018		inputs
Rates		Basis	
Inflation	2.40%	http://www.bea.gov/scb/pdf/2011/06%20June/D%20Pages/0611dpg_a.pdf	See Page D-4, Table 1.1.7, GDP for 2018-I
Discount	2.00%	Click here to find 5-Yr rate for this week	

Year #	Year	Closure Costs			Post-Closure Costs			Total		
		Current $	Inflated$	Pres Val$	Current $	Inflated$	Pres Val$	Current $	Inflated$	Pres Val$
	Totals	$13,425,681	$13,764,773	$13,481,034	$1,238,720	$1,874,691	$1,322,107	$14,664,401	$15,639,464	$14,803,141
0	2018									
1	2019	12,739,000	13,044,736	12,788,957				12,739,000	13,044,736	12,788,957
2	2020	686,681	720,037	692,077				686,681	720,037	692,077
3	2021				126,340	135,657	127,833	126,340	135,657	127,833
4	2022				37,420	41,144	38,011	37,420	41,144	38,011
5	2023				40,140	45,194	40,934	40,140	45,194	40,934
6	2024				37,420	43,142	38,309	37,420	43,142	38,309
7	2025				37,420	44,178	38,460	37,420	44,178	38,460
8	2026				40,140	48,526	41,416	40,140	48,526	41,416
9	2027				37,420	46,324	38,762	37,420	46,324	38,762
10	2028				37,420	47,435	38,913	37,420	47,435	38,913
11	2029				40,140	52,105	41,906	40,140	52,105	41,906
12	2030				37,420	49,740	39,220	37,420	49,740	39,220
13	2031				37,420	50,933	39,373	37,420	50,933	39,373
14	2032				40,140	55,947	42,401	40,140	55,947	42,401
15	2033				37,420	53,408	39,683	37,420	53,408	39,683
16	2034				37,420	54,689	39,838	37,420	54,689	39,838
17	2035				40,140	60,073	42,902	40,140	60,073	42,902
18	2036				37,420	57,346	40,151	37,420	57,346	40,151
19	2037				37,420	58,722	40,309	37,420	58,722	40,309
20	2038				40,140	64,502	43,408	40,140	64,502	43,408
21	2039				37,420	61,575	40,626	37,420	61,575	40,626
22	2040				37,420	63,053	40,785	37,420	63,053	40,785
23	2041				40,140	69,259	43,921	40,140	69,259	43,921
24	2042				37,420	66,115	41,105	37,420	66,115	41,105
25	2043				37,420	67,702	41,266	37,420	67,702	41,266
26	2044				40,140	74,366	44,440	40,140	74,366	44,440
27	2045				37,420	70,991	41,591	37,420	70,991	41,591
28	2046				37,420	72,695	41,754	37,420	72,695	41,754
29	2047				40,140	79,850	44,965	40,140	79,850	44,965
30	2048				37,420	76,226	42,082	37,420	76,226	42,082
31	2049				37,420	78,055	42,247	37,420	78,055	42,247
32	2050				40,140	85,739	45,496	40,140	85,739	45,496
33	2051									
34	2052									
35	2053									
36	2054									

Cell 2 Conceptual Closure Plans/Cell 3 Closure Plans

6

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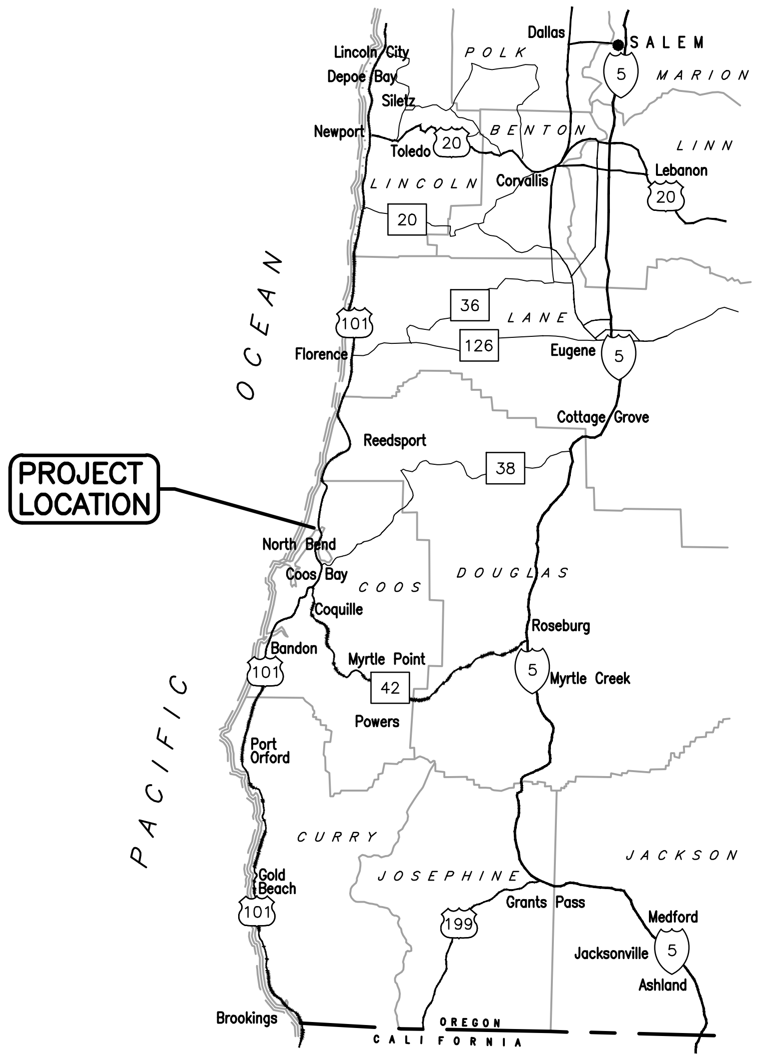
JORDAN COVE ENERGY PROJECT
CONCEPTUAL CLOSURE PLAN CELL 2
COOS COUNTY, OREGON



LOCATION MAP
NTS

PREPARED BY:

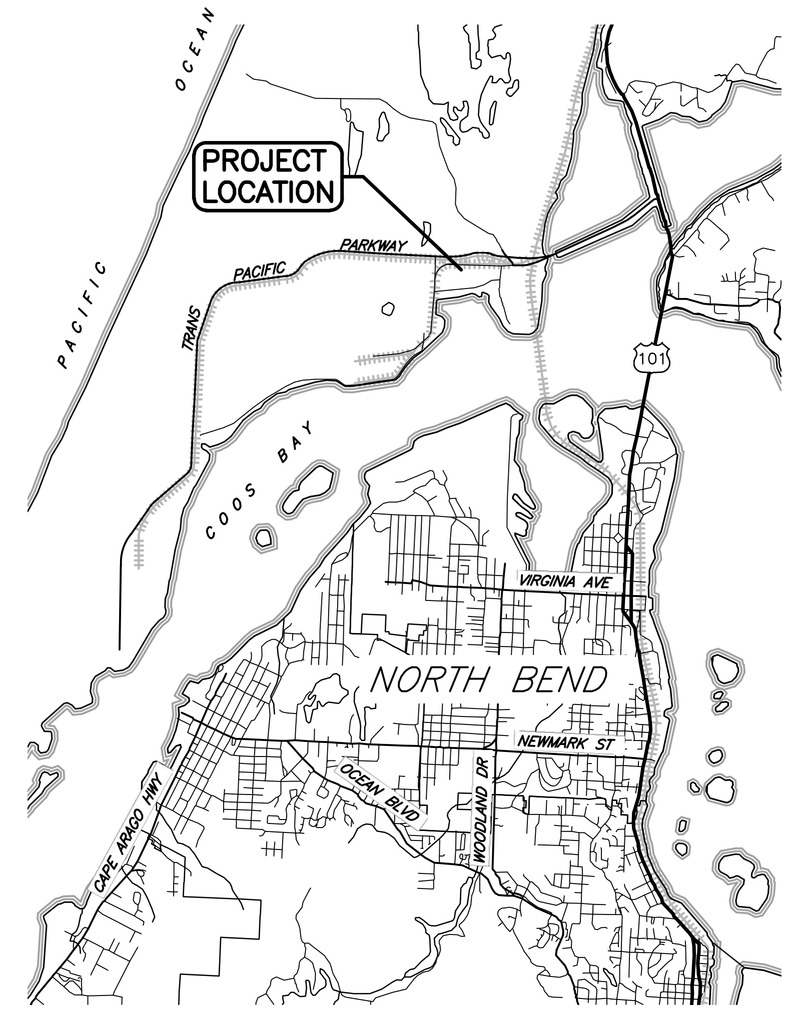
SHN

APRIL 2018

APPROVALS

RFP: ______________________ DATE

DEQ: ______________________ DATE



VICINITY MAP
NTS

INDEX OF SHEETS

SEQ	SHT	TITLE
1	G–1	COVER
2	C–1	EXISTING SITE PLAN
3	C–2	EXISTING TOPOGRAPHY
4	C–3	FINAL GRADING PLAN
5	C–4	PROFILES
6	D–1	DETAILS

REGISTERED PROFESSIONAL
ENGINEER
16,604
PRELIMINARY
OREGON
JULY 20, 1993
STEVEN K DONOVAN
EXPIRES 12/31/19

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REV: A REV Date: 02/28/2018

DSGN	EAS	CHK	SKD
DR	DSR	APVD	

Jordan Cove LNG

JORDAN COVE ENERGY PROJECT
CONCEPTUAL CLOSURE PLAN CELLS 2
COOS COUNTY, OREGON

COVER

SHEET G–1
SEQ
DATE 04/2018
PROJ. NO. 617081

SAVED: 4/27/2018 4:17 PM DREED, PLOTTED: 4/27/2018 4:24 PM DAWN REED
\\CoosBay\Projects\2017\617081-Cell2Closure\Dwgs\Conceptual Closure Cell 2\617081-CNCP-CP-COVR.dwg

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PLAN
1"=100'

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DR	DSR	APVD	

JORDAN COVE ENERGY PROJECT
CONCEPTUAL CLOSURE PLAN CELLS 2
COOS COUNTY, OREGON

EXISTING SITE PLAN

SHEET C-1
SEQ
DATE 04/2018
PROJ. NO. 617081

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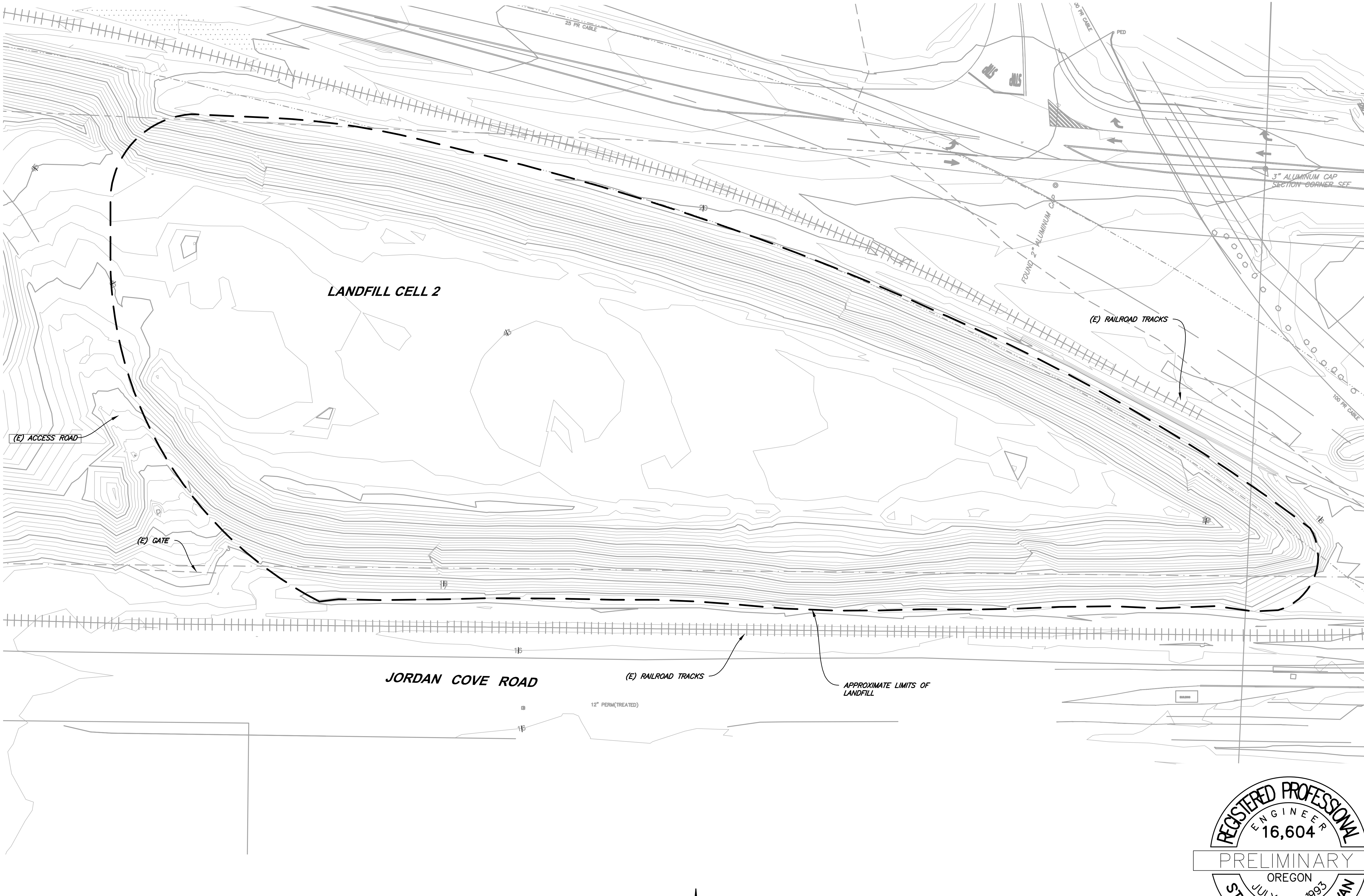

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OREGON
JULY 20, 1993
STEVEN K DONOVAN
EXPIRES 12/31/19

NOTE:
DATUM: NAVD 88

PLAN
1"=30'

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JORDAN COVE ENERGY PROJECT
CONCEPTUAL CLOSURE PLAN CELLS 2
COOS COUNTY, OREGON

EXISTING TOPOGRAPHY

SHEET C-2
SEQ
DATE 04/2018
PROJ. NO. 617081

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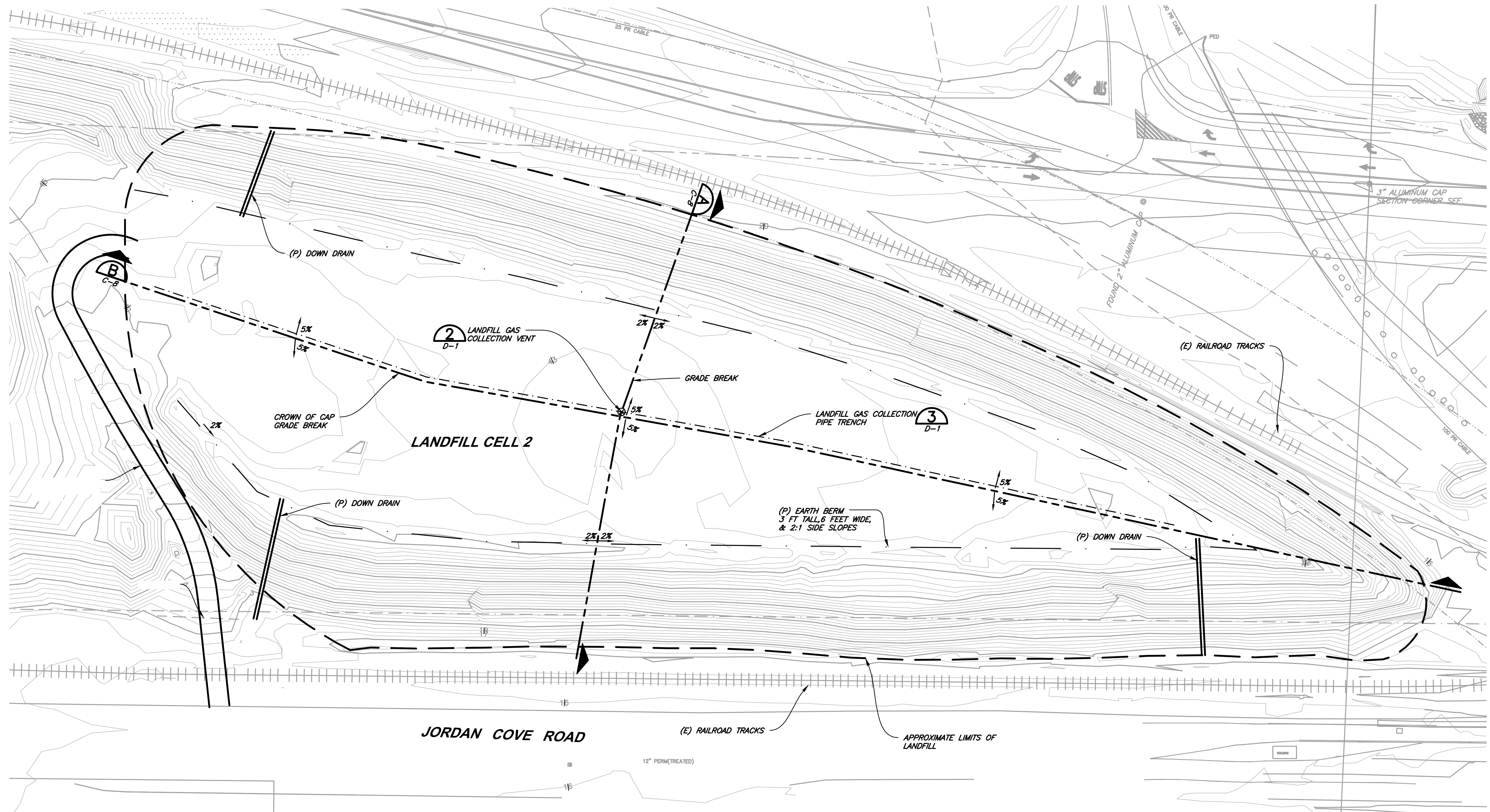

PLAN
1"=30'

NOTE:
DATUM: NAVD 88

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JORDAN COVE ENERGY PROJECT
CONCEPTUAL CLOSURE PLAN CELLS 2
COOS COUNTY, OREGON

FINAL GRADING PLAN

SHEET C-3
SEQ
DATE 04/2018
PROJ. NO. 617081

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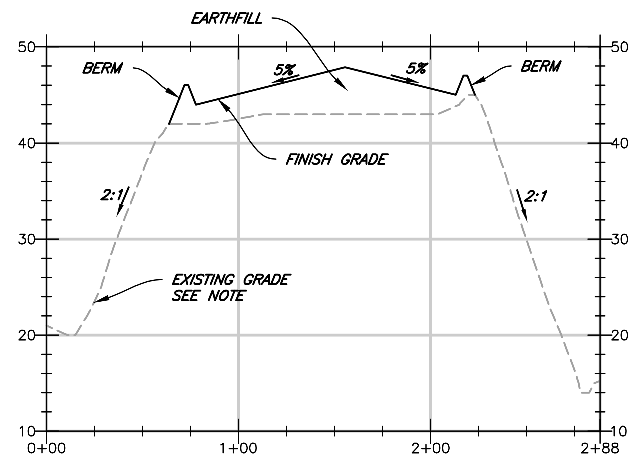
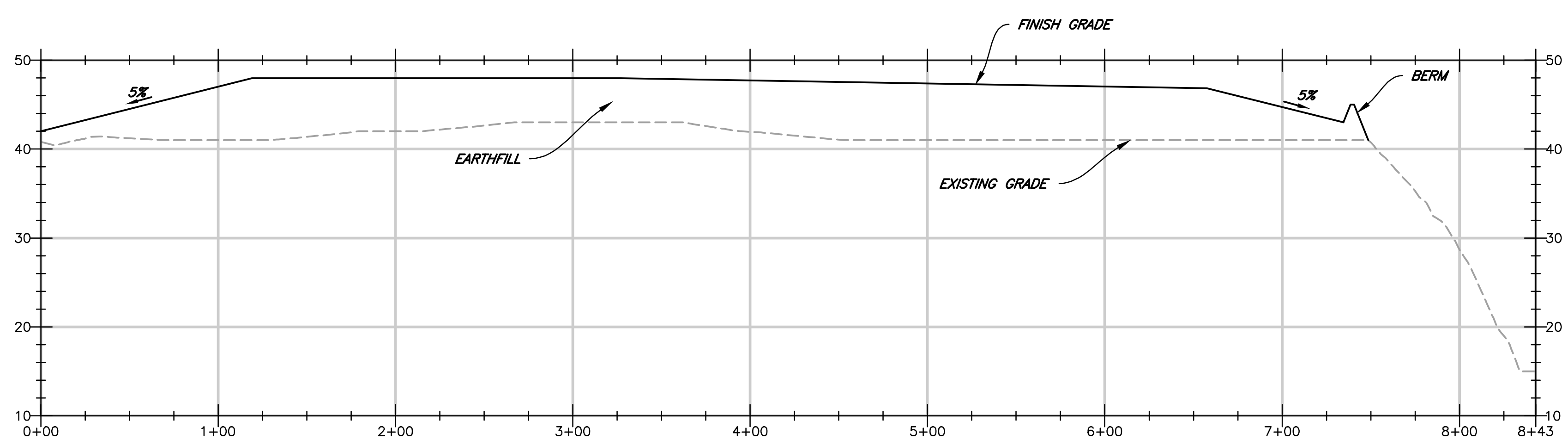


CELL 2 PROFILE A

SCALE: 1"=50' H
1"=10' V

NOTE:

EXISTING SIDE SLOPES ARE PROPOSED TO BE THE FINAL CLOSURE SLOPES.



CELL 2 PROFILE B

SCALE: 1"=50' H
1"=10' V

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JORDAN COVE ENERGY PROJECT
CONCEPTUAL CLOSURE PLAN CELLS 2
COOS COUNTY, OREGON

PROFILES

SHEET C-4
SEQ
DATE 04/2018
PROJ. NO. 617081

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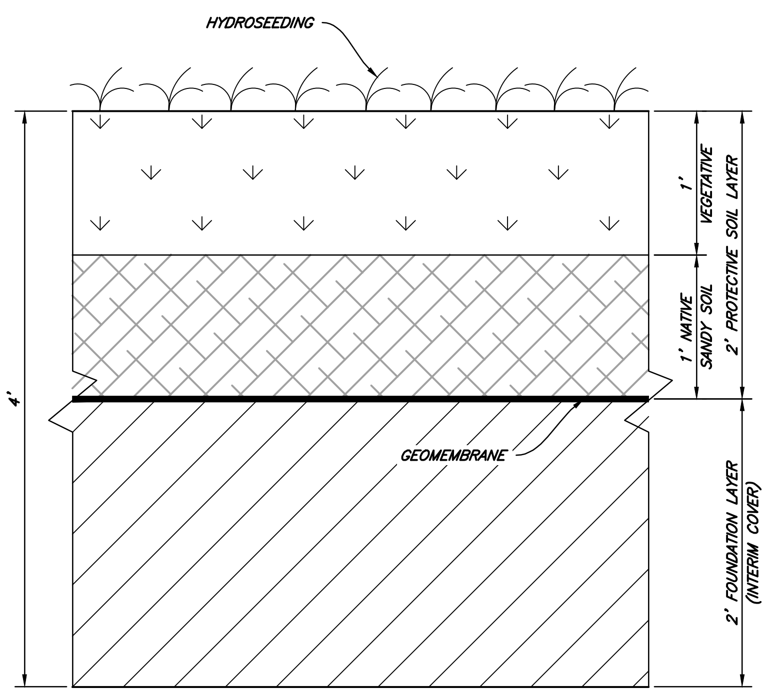
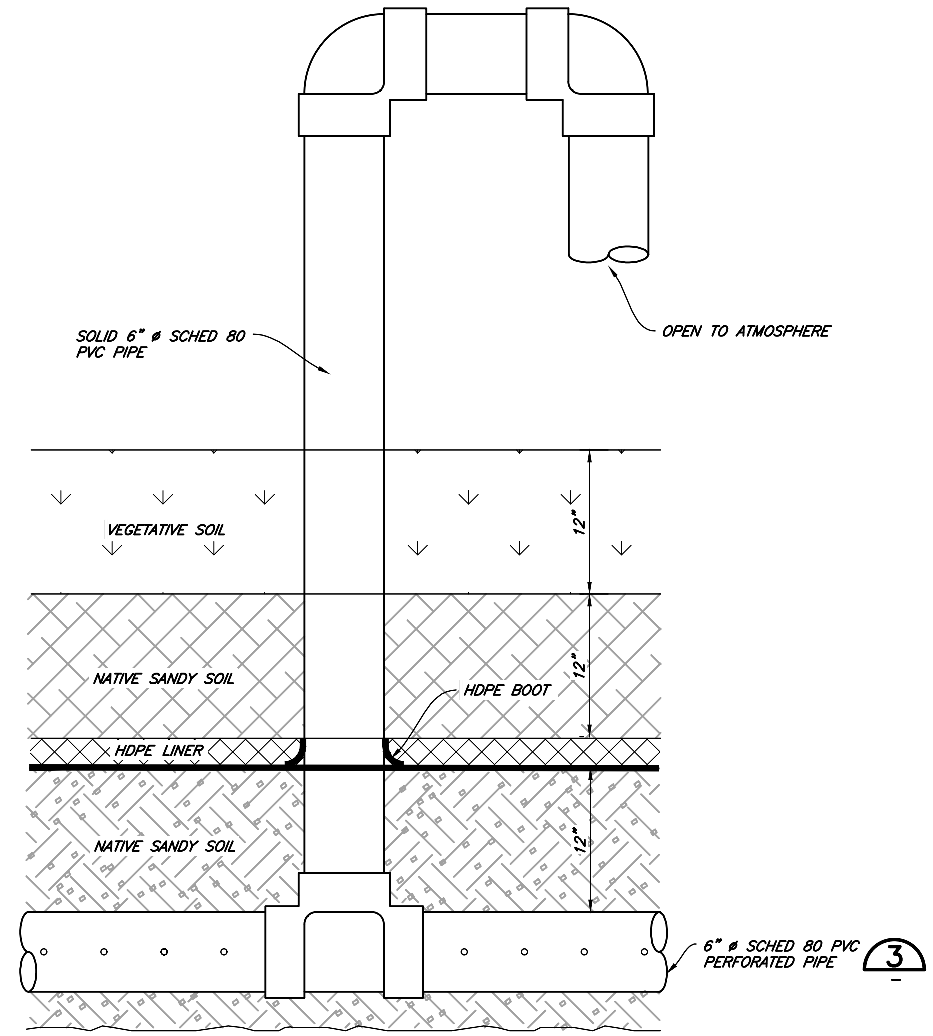
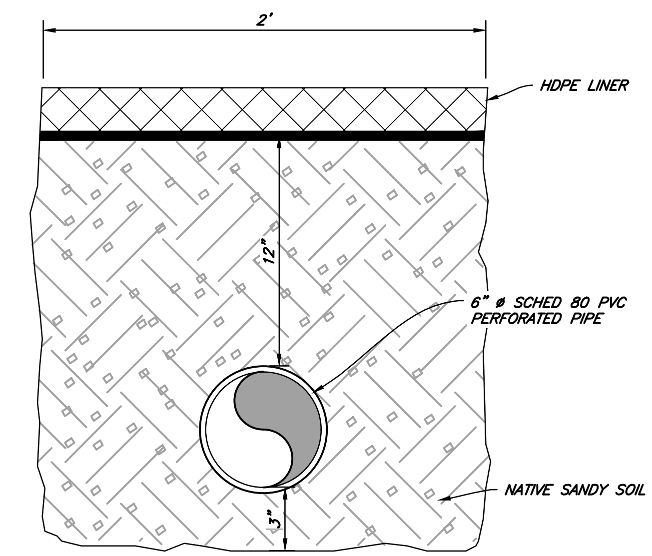


DETAIL 1
NTS
(TYPICAL FINAL COVER)



DETAIL 2
NTS C-6
(LANDFILL PASSIVE GAS VENT)



DETAIL 3
NTS C-6, D-1
(LANDFILL GAS COLLECTION PIPE TRENCH)

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DR	DSR	APVD	

JORDAN COVE ENERGY PROJECT
CONCEPTUAL CLOSURE PLAN CELLS 2
COOS COUNTY, OREGON

DETAILS

SHEET D-1
SEQ
DATE 04/2018
PROJ. NO. 617081

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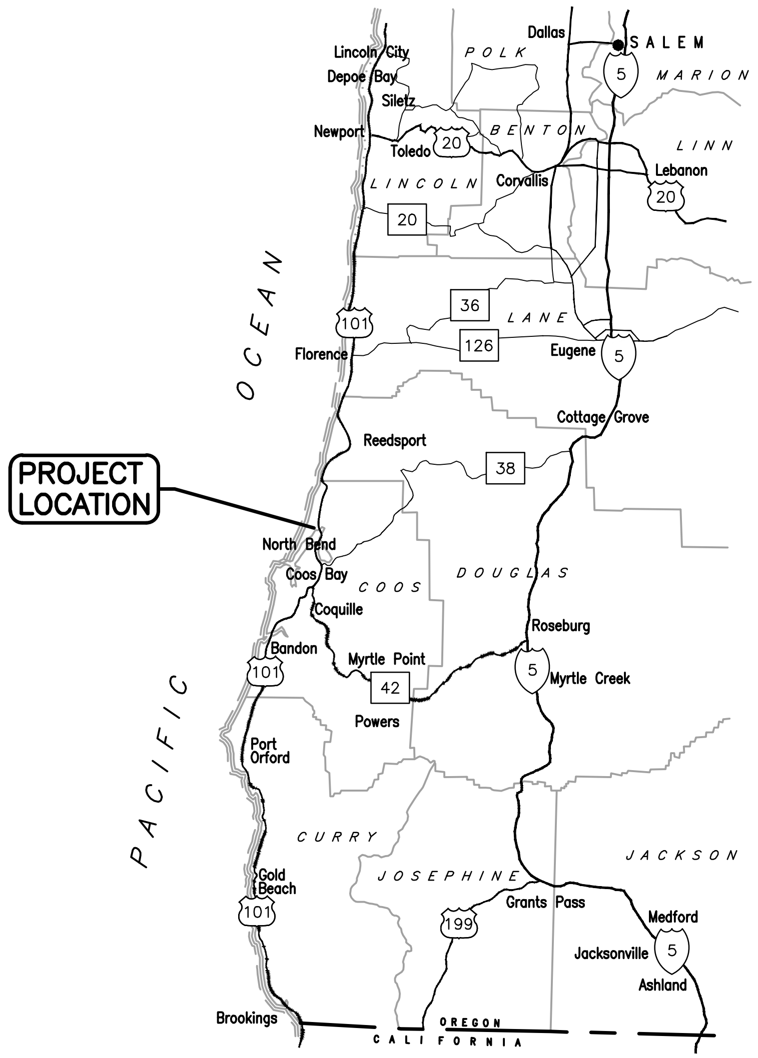
JORDAN COVE ENERGY PROJECT
FINAL CLOSURE PLAN CELL 3
COOS COUNTY, OREGON

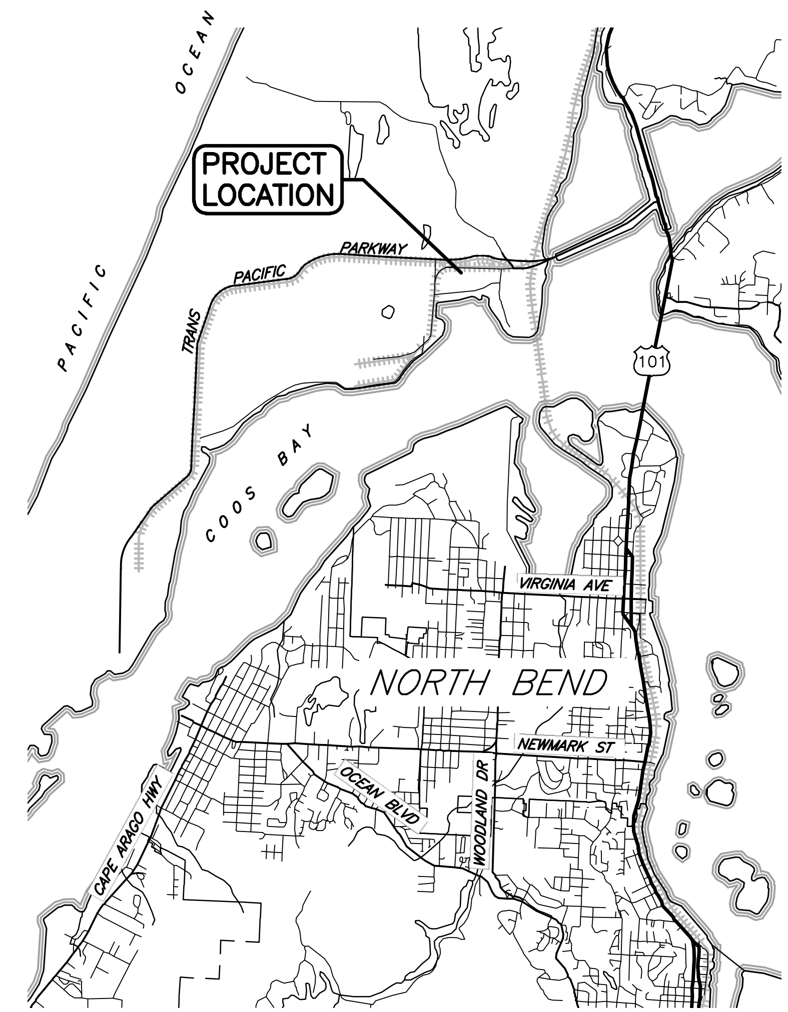


LOCATION MAP
NTS

PREPARED BY:

SHN

APRIL 2018



VICINITY MAP
NTS

APPROVALS

RFP: ______________________________ DATE

DEQ: ______________________________ DATE

NOTES:

1. THIS PROJECT IS INTENDED TO REMOVE ALL WASTE MATERIALS FROM THE SITE DESIGNATED CELL 3.
2. THE REMOVAL SHALL ACCOMPLISH "CLEAN CLOSURE" FOR THE CELL.
3. THE PROJECT WILL BE PERFORMED THROUGH AN INITIAL REMOVAL (PHASE 1, DE–INVENTORY) TO AN ELEVATION OF WHAT IS ESTIMATED TO BE DRY MATERIALS, (SHEET C–3).
4. AFTER PHASE 1, DEI–INVENTORY, REMAINING WASTE MATERIALS SHALL BE CHARACTERIZED AND DEPTH OF CELL VERIFIED THROUGH CONTRACTOR SUPPLIED "POT–HOLING" AT A MAXIMUM OF 8 LOCATIONS.
5. IF DETERMINED NECESSARY, INSTALLATION OF DEWATERING TRENCHES, A WELL POINT DEWATERING SYSTEM, AND AN IMPERMEABLE CAP SHALL BE INSTALLED, (SHEET C–4), ALLOWING THE LOWER SECTION TO DEWATER OVER THE WET WEATHER PERIOD.
6. ONCE THE MATERIALS HAVE BEEN DETERMINED TO BE SUFFICIENTLY DEWATERED, FINAL REMOVAL TO CLEAN CLOSURE SHALL BE PERFORMED.

INDEX OF SHEETS

REGISTERED PROFESSIONAL ENGINEER
16,604
PRELIMINARY
OREGON
JULY 20, 1993
STEVEN K DONOVAN
EXPIRES 12/31/19

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REV: A REV Date: 04/01/2018

DSGN	EAS	CHK	SKD
DR	DSR	APVD	

Jordan Cove LNG

JORDAN COVE ENERGY PROJECT
FINAL CLOSURE PLAN CELL 3
COOS COUNTY, OREGON

COVER

SHEET G–1
SEQ
DATE 04/2018
PROJ. NO. 617081

SAVED: 4/20/2018 9:17 AM DREED, PLOTTED: 4/27/2018 2:44 PM DAWN REED
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ABBREVIATIONS

A

- ABN — ABANDON
- ABS — ACRYLONITRILE–BUTADIENE–STYRENE
- AB — ANCHOR BOLT, AGGREGATE BASE
- AC — ASPHALTIC CONCRETE
- ACP — ASBESTOS CEMENT PIPE
- ACI — AMERICAN CONCRETE INSTITUTE
- ADJ — ADJUSTABLE
- AGGR — AGGREGATE
- AISC — AMERICAN INSTITUTE OF STEEL CONSTRUCTION
- AL — ALUMINUM
- ALT — ALTERNATE
- AP — ANGLE POINT
- APPROX — APPROXIMATELY
- ARCH — ARCHITECTURAL
- ASTM — AMERICAN SOCIETY FOR TESTING & MATERIALS
- AUTO — AUTOMATIC
- AUX — AUXILIARY
- @ — AT

B

- BC — BEGIN CURVE
- BCR — BEGIN CURB RETURN
- BD — BOARD
- BF — BLIND FLANGE
- BFV — BUTTERFLY VALVE
- BK — BOOK OR BACK
- BLDG — BUILDING
- BM — BENCH MARK, BEAM
- BMP — BEST MANAGEMENT PRACTICE
- BO — BLOW OFF
- BOT — BOTTOM
- BRG — BEARING
- BTWN — BETWEEN
- BV — BALL VALVE
- BVC — BEGINNING OF VERTICAL CURVE
- BW — BACK OF WALK
- BWV — BACKWATER VALVE

C

- C — CHANNEL (STRUCTURAL SHAPE)
- CARV — COMBINATION AIR AND VACUUM RELEASE VALVE
- CATV — CABLE TELEVISION
- CB — CATCH BASIN
- CEIL — CEILING
- CFM — CUBIC FEET PER MINUTE
- CFS — CUBIC FEET PER SECOND
- CHEM — CHEMICAL
- CI — CAST IRON
- CIP — CAST IRON PIPE
- C.I.P. — CAST IN PLACE
- CJ — CONSTRUCTION JOINT
- CLR — CLEAR
- ℄ — CENTERLINE
- CMP — CORRUGATED METAL PIPE
- CMU — CONCRETE MASONRY UNIT
- CTSK — COUNTERSINK
- CO — CLEANOUT
- COL — COLUMN
- CONC — CONCRETE
- CONT — CONTINUOUS OR CONTINUED
- COORD — COORDINATE
- CPLG — COUPLING
- CRS — COLD ROLLED STEEL
- CTR — CENTER
- CTS — COPPER TUBE SIZE
- CU — CUBIC
- CU FT — CUBIC FEET
- CV — CHECK VALVE
- CW — COLD WATER
- CY — CUBIC YARD

D

- ° — DEGREE (ANGLE)
- d — PENNY (NAIL SIZE)
- D — STORM DRAIN
- DB — DISTRIBUTION BOX
- DBL — DOUBLE
- DF — DOUGLAS FIR
- DI — DROP INLET OR DUCTILE IRON
- DIA — DIAMETER
- DIAG — DIAGONAL
- DIM — DIMENSION
- DIMJ — DUCTILE IRON MECHANICAL JOINT
- DIP — DUCTILE IRON PIPE
- DR — DRAIN
- DWG — DRAWING
- DW — DRIVEWAY

E

- (E) — EXISTING
- E — EASTING OR EAST
- EA — EACH
- EC — END CURVE
- ECR — END CURB RETURN
- EF — EACH FACE
- EFL — EFFLUENT
- EG — EXISTING GRADE/GROUND
- EL — ELBOW
- ELEC — ELECTRIC OR ELECTRICAL
- ELEV — ELEVATION
- ENGR — ENGINEER
- EP — EDGE OF PAVING
- EQ — EQUAL
- EQUIP — EQUIPMENT
- ER — EDGE OF ROAD
- EVC — END OF VERTICAL CURVE
- EW — EACH WAY
- EWEF — EACH WAY, EACH FACE
- EXC — EXCAVATE
- EXP — EXPOSED OR EXPANSION
- EXP JT — EXPANSION JOINT
- EXST — EXISTING
- EXT — EXTERIOR

F

- F — FLANGE
- FC — FLEXIBLE COUPLING OR FACE OF CURB
- FCA — FLANGED COUPLING ADAPTER
- FD — FLOOR DRAIN
- FDC — FIRE DEPARTMENT CONNECTION
- FDN — FOUNDATION
- FF — FINISH FLOOR
- FG — FINISHED GRADE
- FH — FIRE HYDRANT
- FIG — FIGURE
- FIN — FINISH
- FIP — FEMALE IRON PIPE
- FL — FLOW LINE
- FLG — FLANGE
- FLR — FLOOR
- FLTR — FILTER
- FO — FIBER OPTIC
- FOC — FACE OF CONCRETE
- FT — FOOT OR FEET
- FT^2 — SQUARE FEET
- FT^3 — CUBIC FEET
- FTG — FOOTING
- FUT — FUTURE

G

- G — GAS
- GA — GAGE
- GALV — GALVANIZED
- GIP — GALVANIZED IRON PIPE
- GM — GAS METER
- GPD — GALLONS PER DAY
- GPH — GALLONS PER HOUR
- GPM — GALLONS PER MINUTE
- GRD — GRADE OR GROUND
- GSP — GALVANIZED STEEL PIPE
- GV — GATE VALVE
- GYP — GYPSUM

H

- HB — HOSE BIBB
- HDPE — HIGH DENSITY POLYETHYLENE
- HDR — HEADER
- HDW — HARDWARE
- HMA — HOT MIX ASPHALT
- HOR — HORIZONTAL
- HP — HORSEPOWER, HIGH POINT
- HR — HOUR
- HT — HEIGHT
- HW — HOT WATER
- HWR — HOT WATER RETURN
- HWS — HOT WATER SUPPLY

I

- ID — INSIDE DIAMETER
- IN — INCH
- INFL — INFLUENT
- INSUL — INSULATE OR INSULATION
- INT — INTERIOR
- INV — INVERT
- IPS — IRON PIPE SIZE

J

- JT — JOINT
- JP — JOINT POLE

K

- KIP — THOUSAND POUNDS
- KW — KILOWATT

L

- ∡ — ANGLE (DEGREES)
- L — ANGLE (STRUCTURAL SHAPE)
- LAT — LATERAL
- LB — POUND
- LF — LINEAR FEET
- LG — LONG
- LH — LEFT HAND
- LONG — LONGITUDINAL
- LP — LOW POINT
- LPG — LIQUIFIED PETROLEUM GAS
- LRP — LEGALLY RESPONSIBLE PARTY
- LR — LONG RADIUS
- LT — LEFT
- LVC — LENGTH OF VERTICAL CURVE

M

- MATL — MATERIAL
- MAX — MAXIMUM
- MECH — MECHANICAL
- MF — MEGA–FLANGE PIPE JOINT
- MFR — MANUFACTURER
- MGD — MILLION GALLONS PER DAY
- MH — MANHOLE
- MIN — MINIMUM OR MINUTE
- MIP — MALE IRON PIPE
- MISC — MISCELLANEOUS
- MJ — MECHANICAL JOINT
- MNPT — MALE NATIONAL PIPE THREAD
- MTL — METAL
- MWS — MAXIMUM WATER SURFACE

N

- (N) — NEW
- N — NORTHING OR NORTH
- NC — NORMALLY CLOSED
- NIC — NOT IN CONTRACT
- NF — NON–FREEZE
- NO — NUMBER OR NORMALLY OPEN
- NOM — NOMINAL
- NP — NEW PAVEMENT
- NPT — NATIONAL PIPE THREAD
- NTS — NOT TO SCALE
- # — NUMBER

O

- OC — ON CENTER
- OD — OUTSIDE DIAMETER
- OG — ORIGINAL GROUND
- OVFL — OVERFLOW
- OZ — OUNCE
- OH — OVERHEAD

P

- PC — POINT OF CURVE
- PCC — PORTLAND CEMENT CONCRETE
- PCF — POUNDS PER CUBIC FOOT
- PE — PLAIN END
- PERF — PERFORATED
- PEP — POLYETHELENE PIPE
- PI — POINT OF INTERSECTION
- PL — PLATE
- ℙ — PROPERTY LINE
- PLCS — PLACES
- PLYWD — PLYWOOD
- PMP — PERFORATED METAL PIPE
- POC — POINT ON CURVE
- POT — POINT OF TANGENT
- PP — POWER POLE
- PRC — POINT OF REVERSE CURVE
- PREFAB — PREFABRICATED
- PRELIM — PRELIMINARY
- PRESS — PRESSURE
- PROP — PROPERTY
- PSF — POUNDS PER SQUARE FOOT
- PSI — POUNDS PER SQUARE INCH
- PSIG — POUNDS PER SQUARE INCH, GAUGE
- PT — POINT OF TANGENCY, POINT
- PUE — PUBLIC UTILITY EASEMENT
- PV — PLUG VALVE
- PVC — POLYVINYL CHLORIDE PLASTIC
- PVI — POINT OF VERTICAL INTERSECTION
- PVMT — PAVEMENT

Q

- QTY — QUANTITY

R

- R — RADIUS
- RC — RELATIVE COMPACTION
- RCP — REINFORCED CONCRETE PIPE
- RD — ROAD
- RDCR — REDUCER
- RWD — REDWOOD
- REF — REFER OR REFERENCE
- REINF — REINFORCED, REINFORCING OR REINFORCE
- REQD — REQUIRED
- RET — RETURN
- RH — RIGHT HAND
- RM — ROOM
- RO — ROUGH OPENING
- RSP — ROCK SLOPE PROTECTION
- RT — RIGHT OR RING TIGHT
- R/W — RIGHT OF WAY
- RWL — RAIN WATER LEADER

S

- S — SEWER
- SL — SLOPE
- SCHED — SCHEDULE
- SD — STORM DRAIN
- SDMH — STORM DRAIN MANHOLE
- SECT — SECTION
- SF — SQUARE FOOT/FEET
- SHT — SHEET
- SIM — SIMILAR
- SP — SPACE OR SPACES
- SPEC — SPECIFICATIONS
- SQ — SQUARE
- SQ FT — SQUARE FOOT
- SQ IN — SQUARE INCH
- SS — SANITARY SEWER
- SSCO — SANITARY SEWER CLEAN OUT
- SSMH — SANITARY SEWER MANHOLE
- SST — STAINLESS STEEL
- STA — STATION
- STD — STANDARD
- STL — STEEL
- STR — STRUCTURAL
- STRM — STORM
- STRUCT — STRUCTURE
- SUSP — SUSPENDED
- SW — SIDEWALK
- SSWR — SANITARY SEWER
- SVC — SERVICE
- SWPPP — STORM WATER POLLUTION PREVENTION PLAN
- SYMM — SYMMETRICAL

T

- TAN — TANGENT
- T&B — TOP AND BOTTOM
- T&G — TONGUE AND GROOVE
- TBC — TOP BACK CURB
- TBM — TEMPORARY BENCH MARK
- TBW — TOP BACK WALK
- TC — TOP OF CURB
- TCE — TEMPORARY CONSTRUCTION EASEMENT
- TEL — TELEPHONE
- TELEM — TELEMETRY
- TEMP — TEMPERATURE OR TEMPORARY
- TFC — TOP FACE CURB
- THD — THREAD
- TOC — TOP OF CONCRETE
- TOG — TOP OF GRATE
- TOS — TOWN OF SCOTIA
- TOW — TOP OF WALL
- TP — TURNING POINT, TOP OF PAVEMENT OR TELEPHONE POLE
- TRANSV — TRANSVERSE
- TS — TUBE, STRUCTURAL
- TYP — TYPICAL

U

- UBC — UNIFORM BUILDING CODE
- UOS — UNLESS OTHERWISE SPECIFIED
- UG — UNDERGROUND
- UTIL — UTILITY

V

- V — VOLT
- VAC — VACUUM
- VAR — VARIES
- VC — VERTICAL CURVE
- VCP — VITRIFIED CLAY PIPE
- VERT — VERTICAL
- VG — VALLEY GUTTER
- VPI — VERTICAL POINT OF INTERSECTION

W

- W — WATER OR WIDE FLANGE
- W/ — WITH
- W/O — WITHOUT
- WM — WATER METER
- WP — WORK POINT
- WS — WATER SURFACE, WATER STOP
- WWF — WELDED WIRE FABRIC

X

- XFMR — TRANSFORMER

Y

- YD — YARD
- YD^2 — SQUARE YARD
- YD^3 — CUBIC YARD

CURVE DATA

R (RADIUS)
L (LENGTH)
Δ (DELTA)
T (TANGENT)

UTILITIES LEGEND

PROPOSED	EXISTING	
		GATE VALVE
	PV	PLUG VALVE
	BV	BALL VALVE
	BFV	BUTTERFLY VALVE
P	P	AUTOMATICALLY OPERATED VALVE (P= PNEUMATIC, E= ELECTRIC, S= SOLENOID, H= HYDRAULIC, D= DIAPHRAGM ACTUATOR)
		3–WAY VALVE
		GLOBE VALVE
		ANGLE VALVE
		PRESSURE REGULATING VALVE
		PRESSURE RELIEF VALVE
		CHECK VALVE
		AIR OR VACUUM RELEASE VALVE
AV	AV	AIR AND VACUUM VALVE
CA	CA	COMBINATION AIR VALVE
		FLOW METER
	NF	HOSE BIBB (NF= NON–FREEZE)
		REDUCER
		FIRE HYDRANT
		DROP INLET
		MANHOLE
		SEWER CLEAN OUT OR SEWER LATERAL
E	E	UNDERGROUND ELECTRICAL
OH E	OH E	OVERHEAD ELECTRICAL
FO	FO	FIBER OPTIC LINE
TV	TV	CABLE TELEVISION
J	J	JOINT UTILITIES
TM	TM	UNDERGROUND TELEMETRY LINE
OH TM	OH TM	OVERHEAD TELEMETRY LINE
T	T	UNDERGROUND TELEPHONE LINE
OH T	OH T	OVERHEAD TELEPHONE LINE
FW	FW	FIRE WATER LINE
ST	ST	STEAM LINE
W	W	WATER LINE
SS	SS	SANITARY SEWER LINE
SD	SD	STORM DRAIN LINE
G	G	GAS LINE
FM	FM	FORCE MAIN AND DIRECTION OF FLOW
		CULVERT
		POLE MOUNTED ROADWAY LUMINAIRE
	NOT USED	ITEM TO BE REMOVED
		ITEM TO BE ABANDONED IN PLACE
		WATER SERVICE– WM–1= SINGLE WM–2= DUAL
3	PB	PULL BOX AND DESIGNATION
R4–4		SIGN AND DESIGNATION

SIZE AND MATERIAL OF EXISTING PIPING MAY BE SHOWN WHEN KNOWN.

SIZE AND MATERIAL OF NEW PIPING MAY BE SHOWN ON PLAN OR IN PROFILE.

NOTES

1. CONTACT THE ENGINEER FOR SYMBOLS NOT LISTED.
2. THIS IS A STANDARD SHEET, THEREFORE, SOME SYMBOLS OR ABBREVIATIONS MAY APPEAR ON THIS SHEET WHICH DO NOT APPEAR ON THE PLANS.
3. SITE AND UTILITY SYMBOLS SHOWN ON THIS SHEET ARE NOT INTENDED TO REPRESENT THE PHYSICAL SCALE OR SHAPE OF ANY ITEMS. WHERE LARGE–SCALE PLANS ARE PRESENTED, THE SYMBOLS SHOWN HEREON MAY BE REPLACED BY DETAILS MORE SUITED TO THE DRAWING SCALE.

TOPOGRAPHIC LEGEND

PROPOSED	EXISTING	
		P.I. (POINT OF INTERSECTION)
NOT USED		TEMPORARY BENCH MARK
47.55	NOT USED	FINISH GRADE ELEVATON
NOT USED	42.6	ELEVATION OF ORIGINAL GROUND
		RADIAL POINT
		FLOW LINE AND DIRECTION
		TOP OF CUT
		TOP OF FILL
		TOE OF CUT OR FILL
200	180	CONTOUR LINE
		CONCRETE (IN PLAN)
		CONCRETE (IN SECTION)
		PAVEMENT
NOT USED		ROCKS
NOT USED		STUMPS
		TREES
		ROADS
	TP	UTILITY POLE (PP=POWER POLE, TP= TEL POLE, JP=JOINT POLE)
		GUY WIRE
		CHAIN LINK FENCE
		WOOD FENCE
		CENTERLINE
NOT USED		MARSH
		WETLAND
NOT USED		SPRING
TP–4	TP–4	TEST PIT AND DESIGNATION
		EXPLORATION BORE HOLE
		PROPERTY CORNER
		SURVEY MONUMENT
		CONTROL POINT
		DRIVEWAY

DETAIL AND SECTION DESIGNATION

SECTION (LETTER) OR DETAIL (NUMERAL) DESIGNATION — A

INDICATES SECTION OR DETAIL TAKEN AND SHOWN ON SAME SHEET — C–5

ON DRAWING WHERE SECTION OR DETAIL IS TAKEN: SHEET NUMBER WHERE SHOWN

ON DRAWING WHERE SECTION OR DETAIL IS SHOWN: SHEET NUMBER WHERE TAKEN

STANDARD DETAIL NUMBER (DETAIL MAY BE SHOWN ON ANY SHEET WITHIN THE DRAWING SET) — 006

REGISTERED PROFESSIONAL ENGINEER
16,604
PRELIMINARY
OREGON
JULY 20, 1993
STEVEN K DONOVAN
EXPIRES 12/31/19

VERIFY SCALES
BAR IS ONE INCH ON ORIGINAL DRAWING
0 1"
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Doc. No.:J1–000–CV–SPC–SHN–00004–02
REV: A REV Date:04/01/2018
DSGN EAS | CHK SKD
DR DSR | APVD

Jordan Cove LNG

JORDAN COVE ENERGY PROJECT
FINAL CLOSURE PLAN CELL 3
COOS COUNTY, OREGON

STANDARD ABBREVIATIONS AND LEGENDS

SHEET G–2
SEQ
DATE 04/2018
PROJ. NO. 617081

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PLAN
1"=100'

NOTES:

1. CONTRACTOR STAGING AREA, BORROW AREA, MATERIALS SALVAGE AREA LOCATIONS ARE PROPOSED AND MAY BE ADJUSTED WITH OWNER APPROVAL TO BETTER ACCOMMODATE THE PROJECT.

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FINAL CLOSURE PLAN CELL 3
COOS COUNTY, OREGON

OVERALL SITE & TRAFFIC PLAN

SHEET C-1
SEQ
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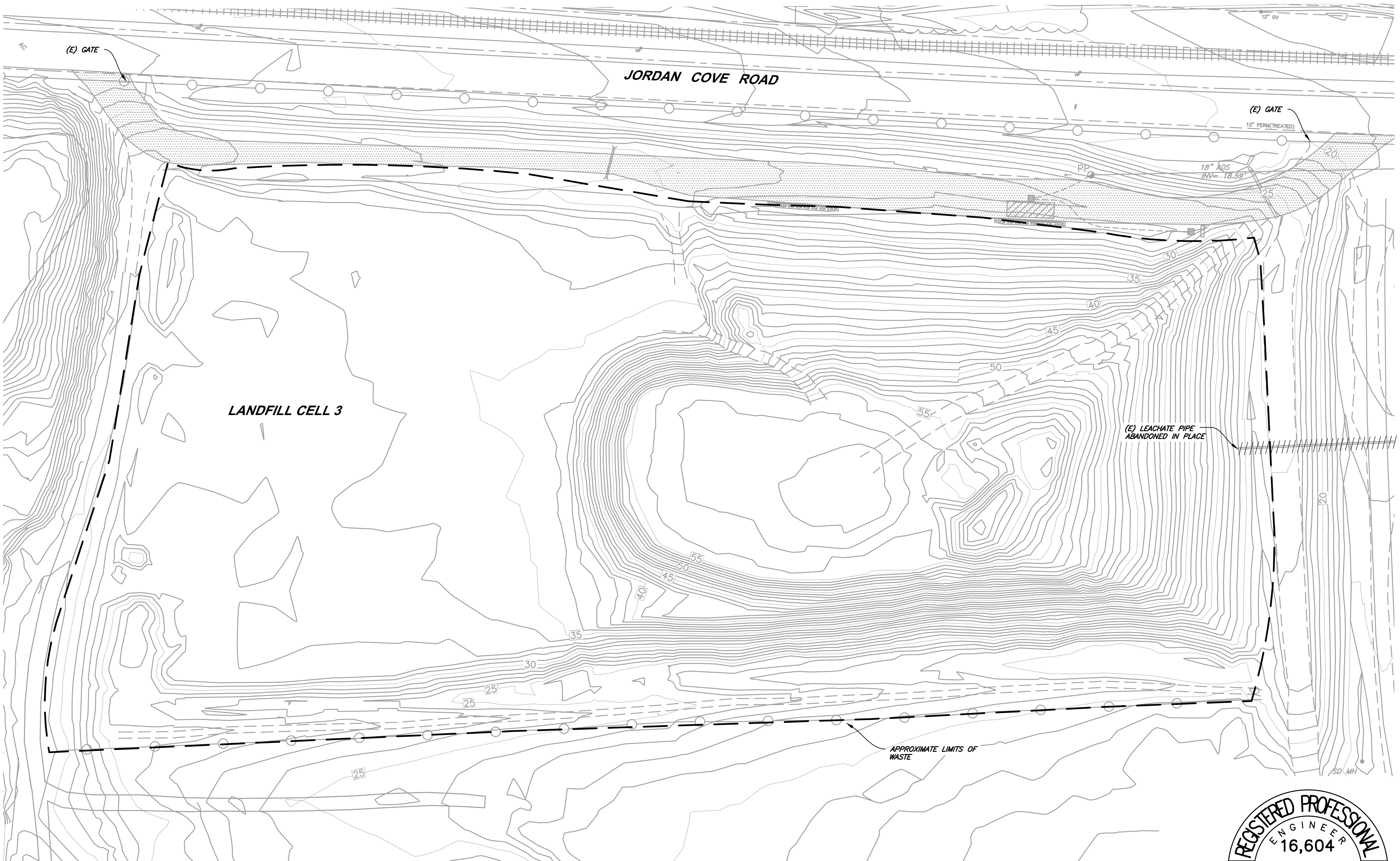

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PLAN
1"=30'

NOTE:
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DR	DSR	APVD	

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JORDAN COVE ENERGY PROJECT
FINAL CLOSURE PLAN CELL 3
COOS COUNTY, OREGON

EXISTING TOPOGRAPHY

SHEET C-2
SEQ
DATE 04/2018
PROJ. NO. 617081

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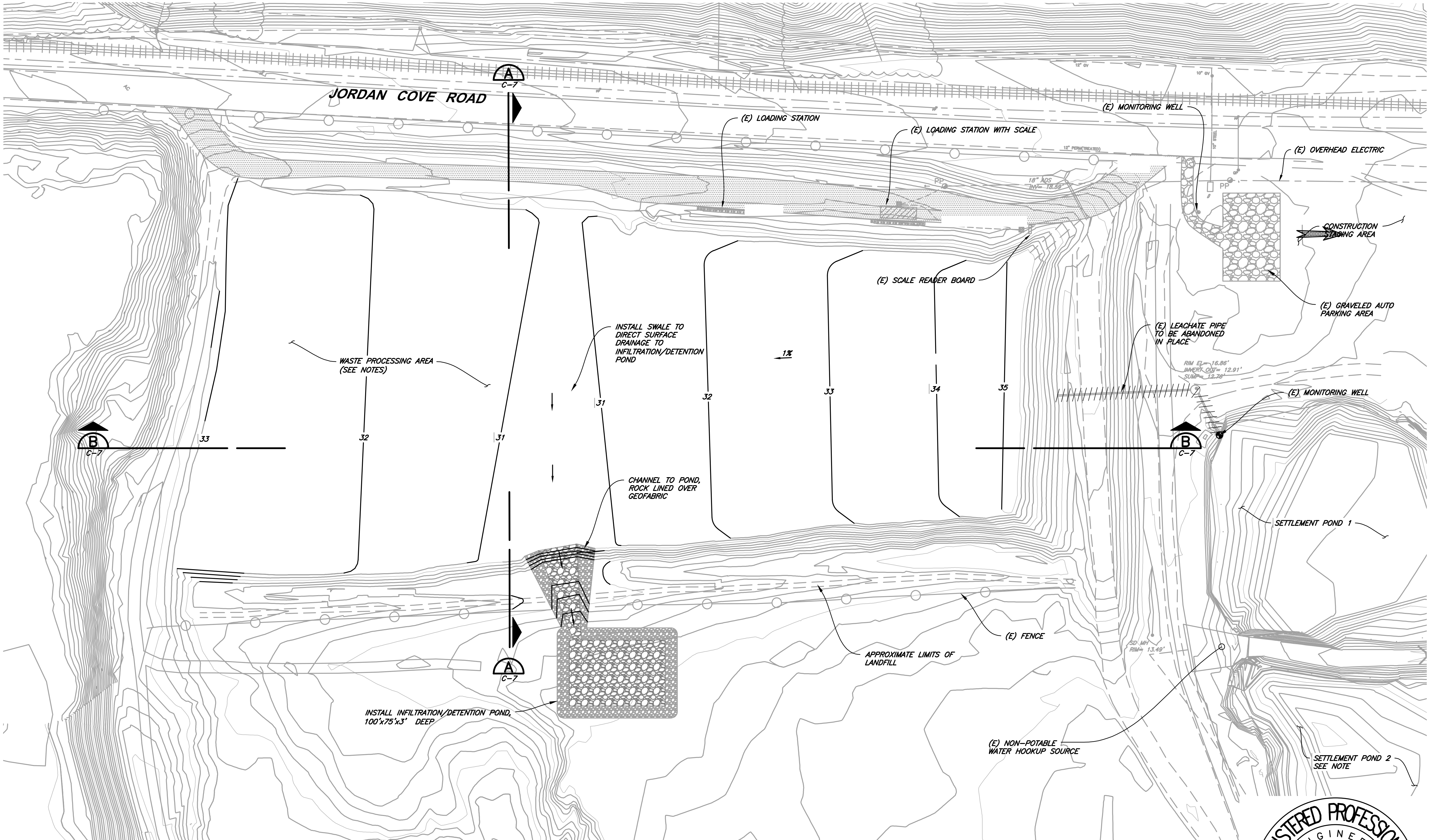

PLAN
1"=40'

NOTES:

1. WEST HALF OF CELL 3 TO BE DE-INVENTORIED FIRST, THEN 6-8" OF CLEAN BORROW MATERIAL OR AGGREGATE, AS DETERMINED BY CONTRACTOR, SHALL BE PLACED, COMPACTED AND GRADED.
2. AFTER DE-INVENTORY AND SURFACE TREATMENT, WEST HALF OF CELL 3 MAY BE USED FOR PROCESSING WASTE (I.E. STOCKPILES, MATERIALS SEGREGATION, ETC.) FROM EAST HALF OF CELL 3.

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FINAL CLOSURE PLAN CELL 3
COOS COUNTY, OREGON

PHASE 1 DEINVENTORY

SHEET C-3
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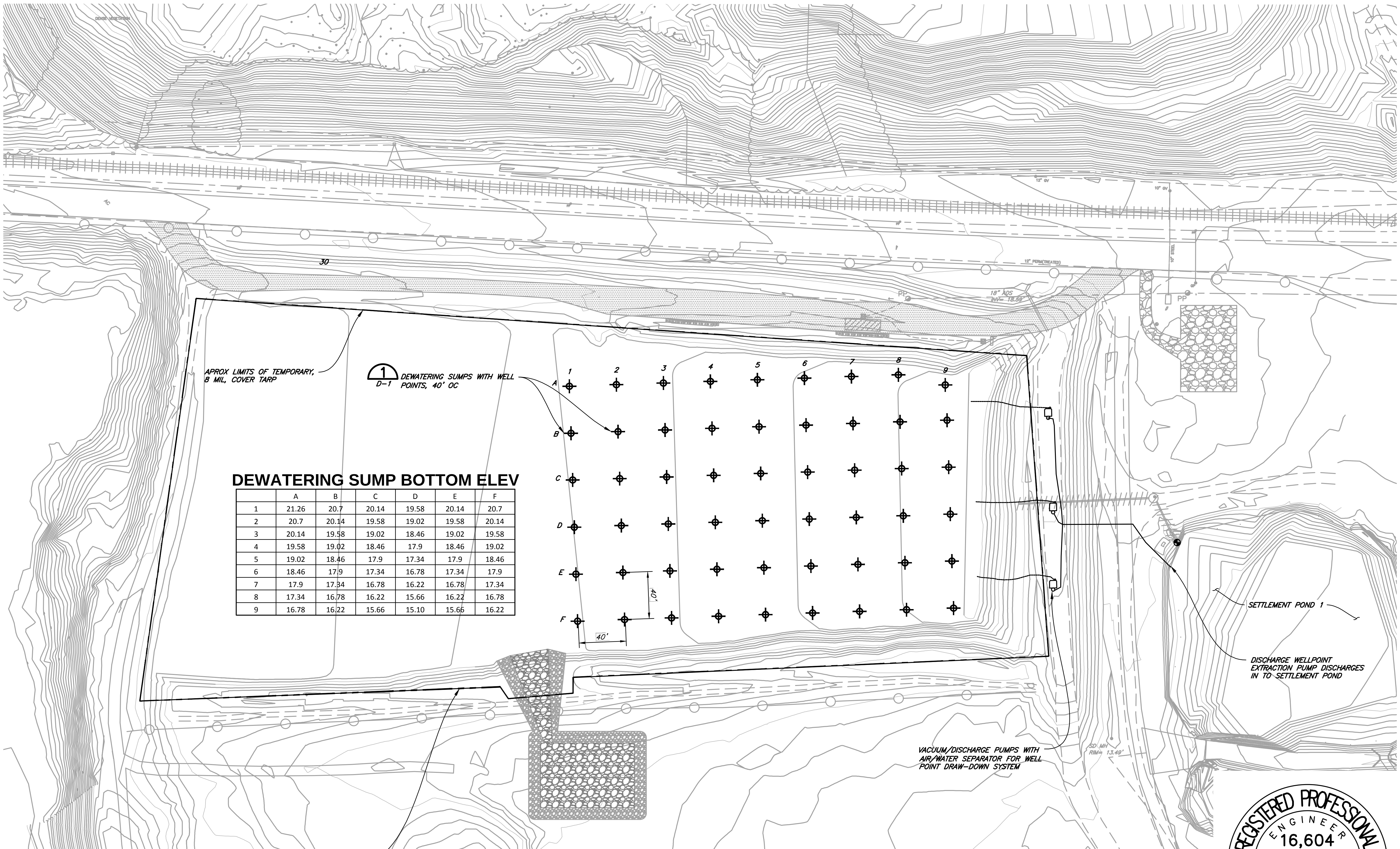

DEWATERING SUMP BOTTOM ELEV

	A	B	C	D	E	F
1	21.26	20.7	20.14	19.58	20.14	20.7
2	20.7	20.14	19.58	19.02	19.58	20.14
3	20.14	19.58	19.02	18.46	19.02	19.58
4	19.58	19.02	18.46	17.9	18.46	19.02
5	19.02	18.46	17.9	17.34	17.9	18.46
6	18.46	17.9	17.34	16.78	17.34	17.9
7	17.9	17.34	16.78	16.22	16.78	17.34
8	17.34	16.78	16.22	15.66	16.22	16.78
9	16.78	16.22	15.66	15.10	15.66	16.22

INSTALL COVER TARP, SHAPED TO FIT SWALE, TO FACILITATE SURFACE DRAINAGE INTO INFILTRATION/DETENTION POND

PLAN
1"=40'

NOTES:

1. SUMPS TO BE 40' ON CENTER WITH ENDS LOCATED APPROX 20' FROM TOP OF SLOPE.
2. BOTTOM ELEVATIONS OF SUMPS INDICATED IN TABLE ARE APPROXIMATE ONLY, SUMP EXCAVATION SHALL VERIFY LOCATION/DEPTH OF (E) GEOLINER.
3. CONTRACTOR TO SUBMIT FOR REVIEW AND APPROVAL, FINAL DEWATERING PLAN.
4. FINAL DEWATERING PLAN SHALL BE BASED UPON WASTE CHARACTERIZATION TO BE PERFORMED AFTER PHASE 1, DE-INVENTORY.

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OREGON
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STEVEN K DONOVAN
EXPIRES 12/31/19

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JORDAN COVE ENERGY PROJECT
FINAL CLOSURE PLAN CELL 3
COOS COUNTY, OREGON

DEWATERING PLAN

SHEET C-4
SEQ
DATE 04/2018
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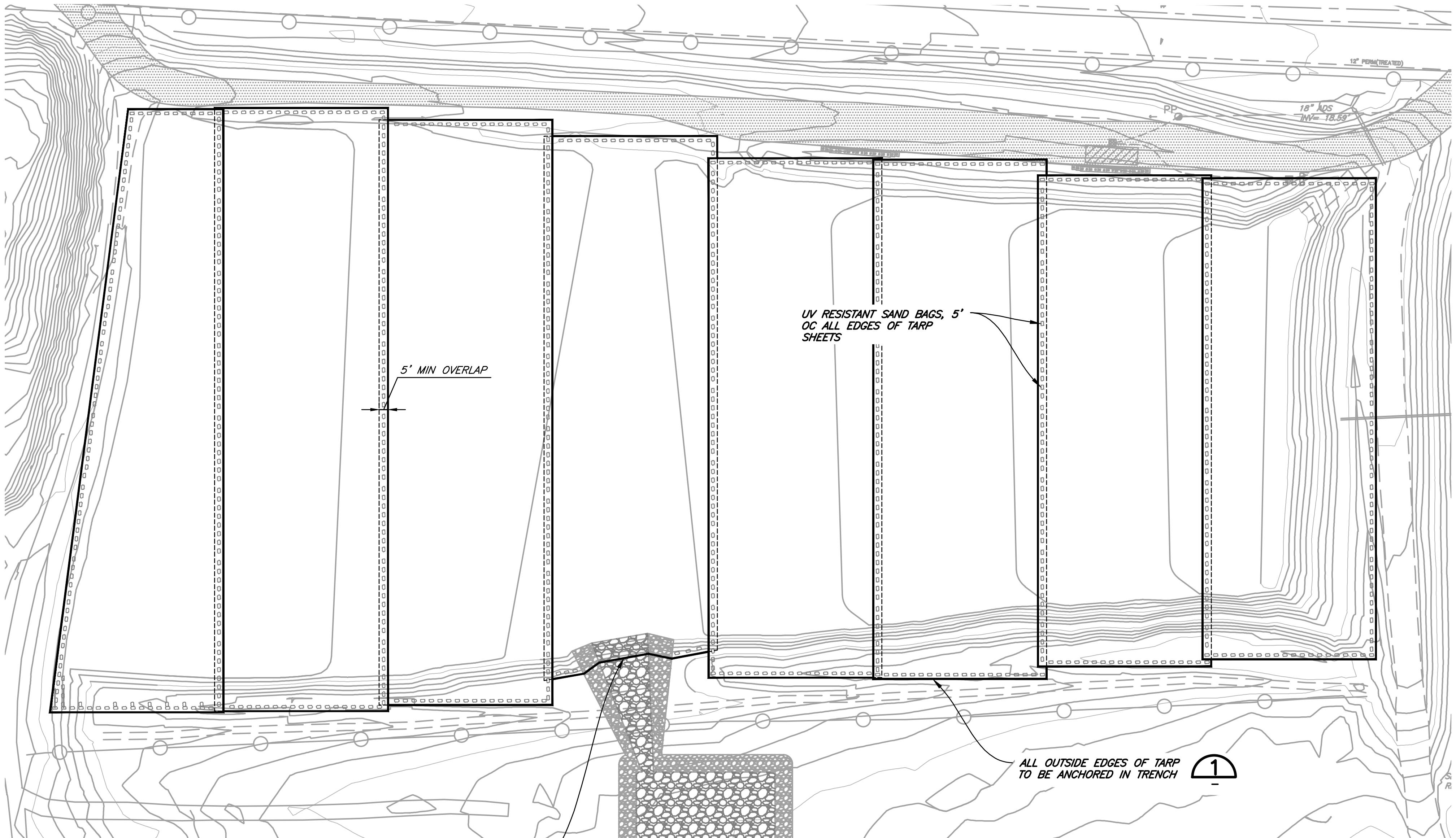
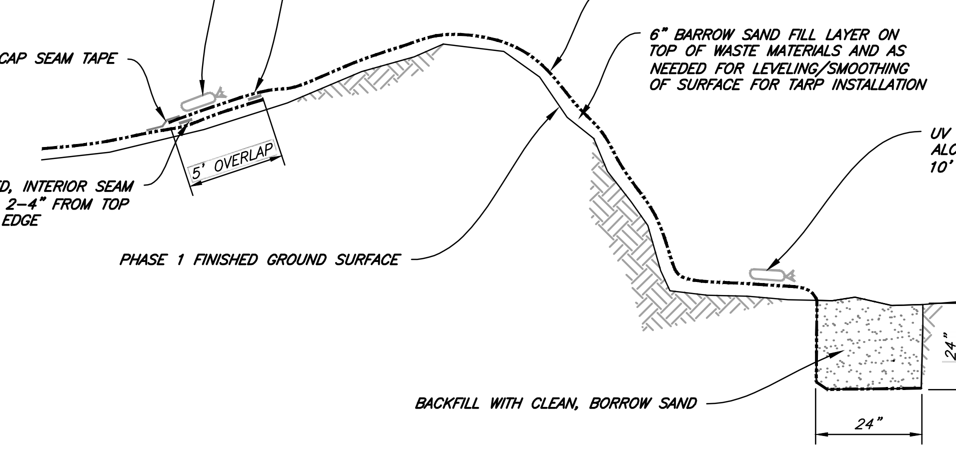


INSTALL TARP TO SWALE INLET, OVERLAP WITH ROCK, GRADE TO FACILITATE SURFACE DRAINAGE INTO INFILTRATION/DETENTION POND

PLAN
1"=40'

NOTES:

1. INSTALL STRING-REINFORCED LLDPE TARP 8 MIL SMOOTH WHITE SURFACE, ONE SIDE.
2. TARPS SHALL BE IN 100'X400' ROLLS, UNLESS APPROVED OTHERWISE, LAID OUT AND TRIMMED TO FIT COVER LIMITS.
3. "UP GRADE" TARP SHALL OVERLAP ON TOP OF "DOWN GRADE" TARP TO CREATE WATER SHEDDING "SHINGLE" EFFECT.
4. LINERS SHALL BE ANCHORED BY UV RESISTANCE SAND BAGS 5' OC ALONG ALL EDGES AND SEAMS AND 10' OC IN FIELD.
5. OUTSIDE EDGES OF LINERS SHALL BE EMBEDDED IN AN ANCHOR TRENCH. THE TRENCH SHALL BE EXCAVATED ACCORDING TO A DAILY SCHEDULE FOR COVER INSTALLATION. IT SHALL BE BACKFILLED INCREMENTALLY AS NEEDED. BACKFILL SOIL SHALL BE COMPACTED BY ROLLING WITH RUBBER-TIRED EQUIPMENT OR A MANUALLY DIRECTED POWER TAMPER TO PROVIDE A STABLE ANCHOR TRENCH FOR THE TARP.



DETAIL 1
NTS

TEMPORARY COVER ANCHORING SYSTEM

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JULY 20, 1993
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REV: A	REV Date: 04/01/2018
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DR DSR	APVD
Jordan Cove LNG™	
JORDAN COVE ENERGY PROJECT FINAL CLOSURE PLAN CELL 3 COOS COUNTY, OREGON	TEMPORARY CAP LINER PLAN
SHEET	C-5
SEQ	
DATE	04/2018
PROJ. NO.	617081

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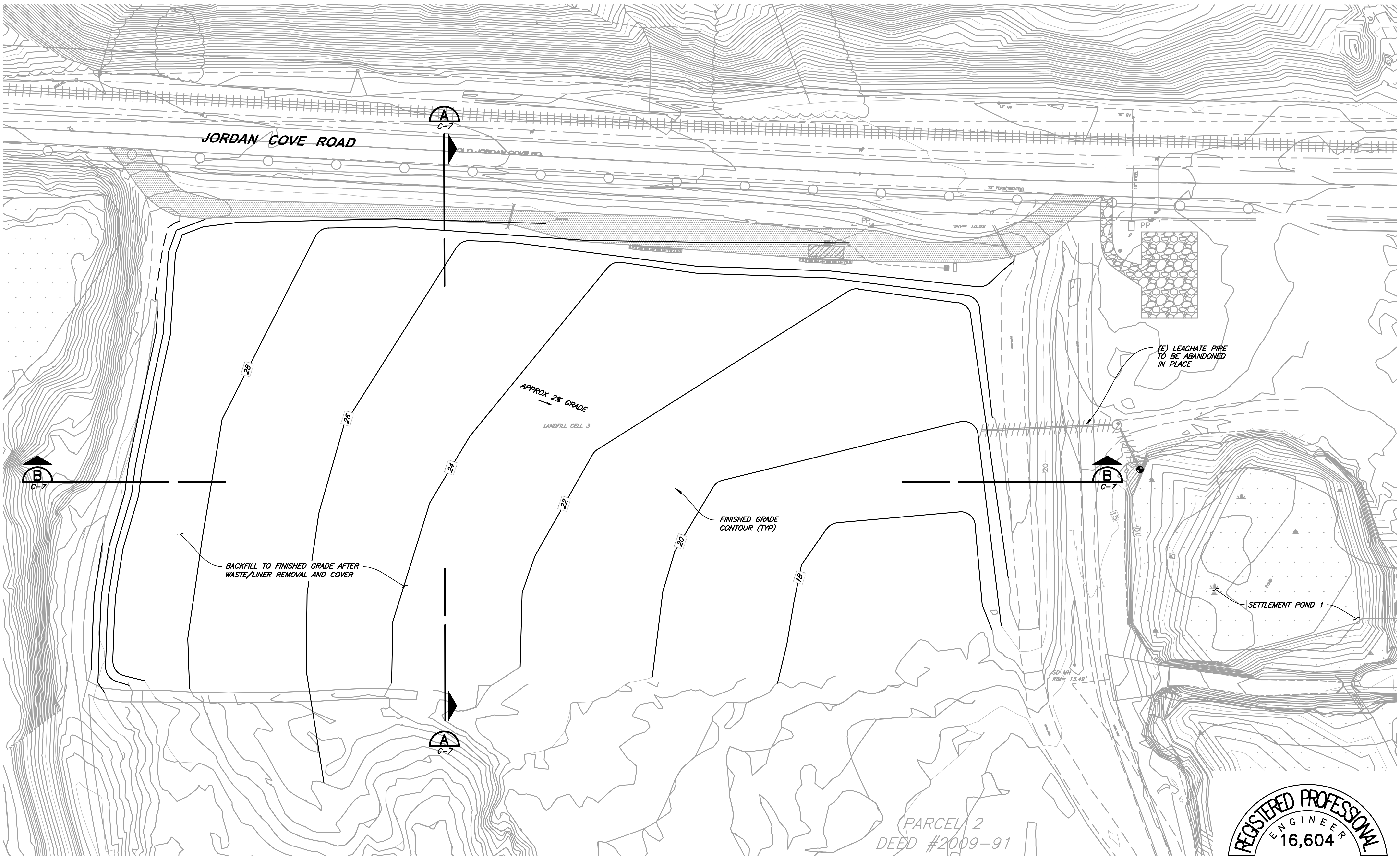

PLAN
1"=40'

NOTES:

1. ASBUILTS SHOW 3.5:1 SIDE SLOPE.
2. DESIGN SHOW 3.0:1 ON SIDE SLOPE.
3. USED 3.5:1 SIDE SLOPE IN CELL 3A AND 3:1 IN CELL 3B.
4. SUBGRADE CONTOURS ARE BASED ON CELL 3 RECORD DRAWINGS.

REGISTERED PROFESSIONAL ENGINEER
16,604
PRELIMINARY
OREGON
JULY 20, 1993
STEVEN K DONOVAN
EXPIRES 12/31/19

VERIFY SCALES
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DR DSR APVD

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JORDAN COVE ENERGY PROJECT
FINAL CLOSURE PLAN CELL 3
COOS COUNTY, OREGON

CLEAN CLOSURE FINISH GRADE

SHEET C-6
SEQ
DATE 04/2018
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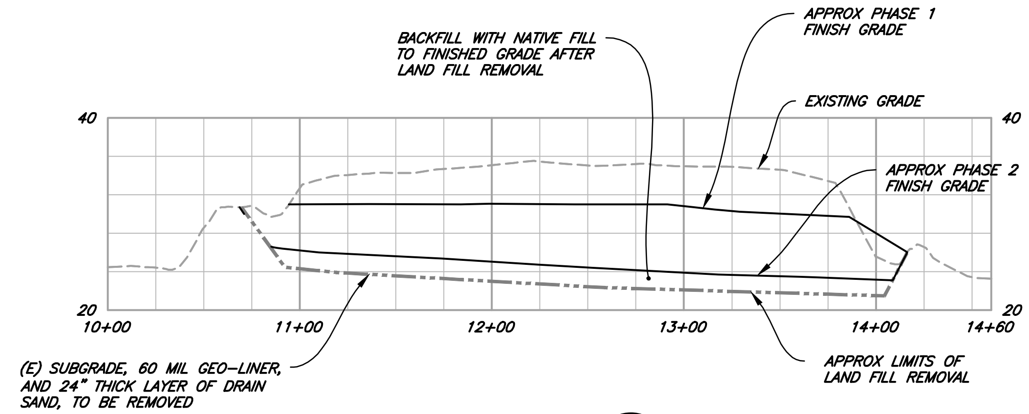
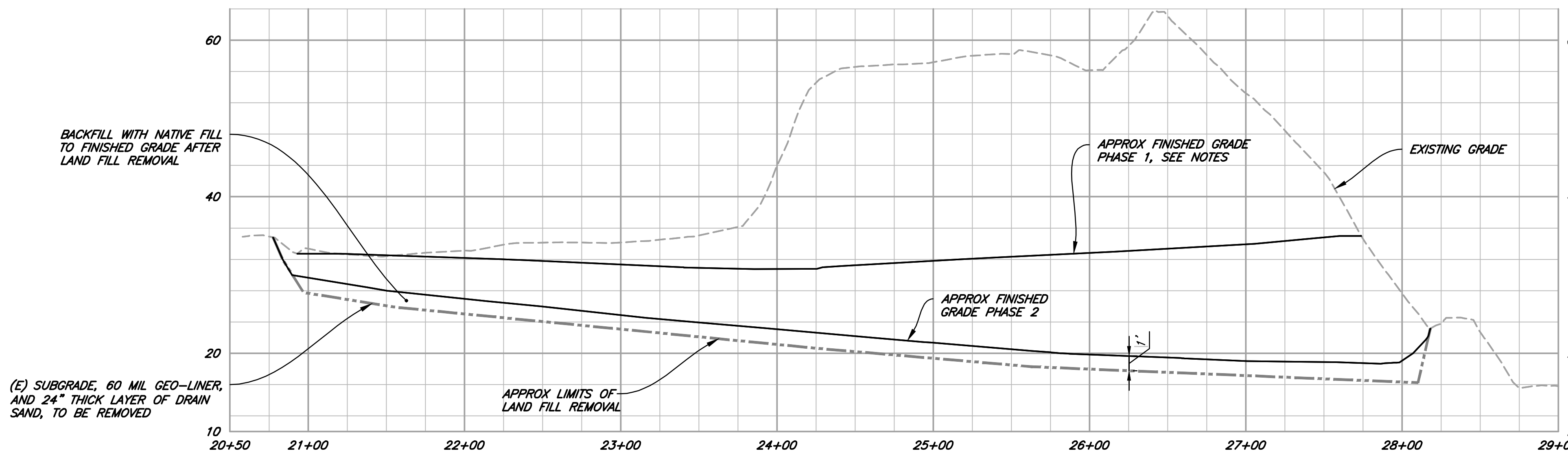


PROFILE (A) C-5
SCALE: 1"=50' H
1"=10' V



PROFILE (B) C-5
SCALE: 1"=50' H
1"=10' V

NOTES:

1. IT IS INTENDED TO REMOVE AS MUCH DRY WASTE MATERIALS AS POSSIBLE DURING PHASE 1 PRIOR TO WEATHER OR GROUNDWATER STOPPAGE.
2. REMOVAL LIMITS PRESENTED FOR PHASE 1 ARE APPROXIMATE, ENGINEER/GEOLOGIST TO DETERMINE FINAL LIMITS, ON-SITE, DURING CONSTRUCTION.
3. INTEGRITY OF EXISTING 60 MIL GEOLINER, AT BASE OF LANDFILL, SHALL BE MAINTAINED AT ALL TIMES DURING REMOVAL OPERATIONS. GEOLINER SHALL BE REMOVED UPON COMPLETION OF FILL MATERIALS REMOVAL.
4. PHASE 1 IS "OPERATIONS" WORK, PHASE 2 IS "CLEAN CLOSURE" WORK

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16,604
PRELIMINARY
OREGON
JULY 20, 1993
STEVEN K DONOVAN
EXPIRES 12/31/19

VERIFY SCALES
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Doc. No: J1-000-CIV-SPC-SHN-00004-09
REV: A REV Date: 04/01/2018
DSGN EAS CHK SKD
DR DSR APVD

Jordan Cove LNG

JORDAN COVE ENERGY PROJECT
FINAL CLOSURE PLAN CELL 3
COOS COUNTY, OREGON

PROFILES

SHEET C-7
SEQ
DATE 04/2018
PROJ. NO. 617081

SAVED: 4/27/2018 2:42 PM DREED, PLOTTED: 4/27/2018 2:45 PM DAWN REED
\\CoosBay\Projects\2017\617081-Cell2Closure\Dwgs\Final Closure Cell 3\617081-CP-GRDG.dwg

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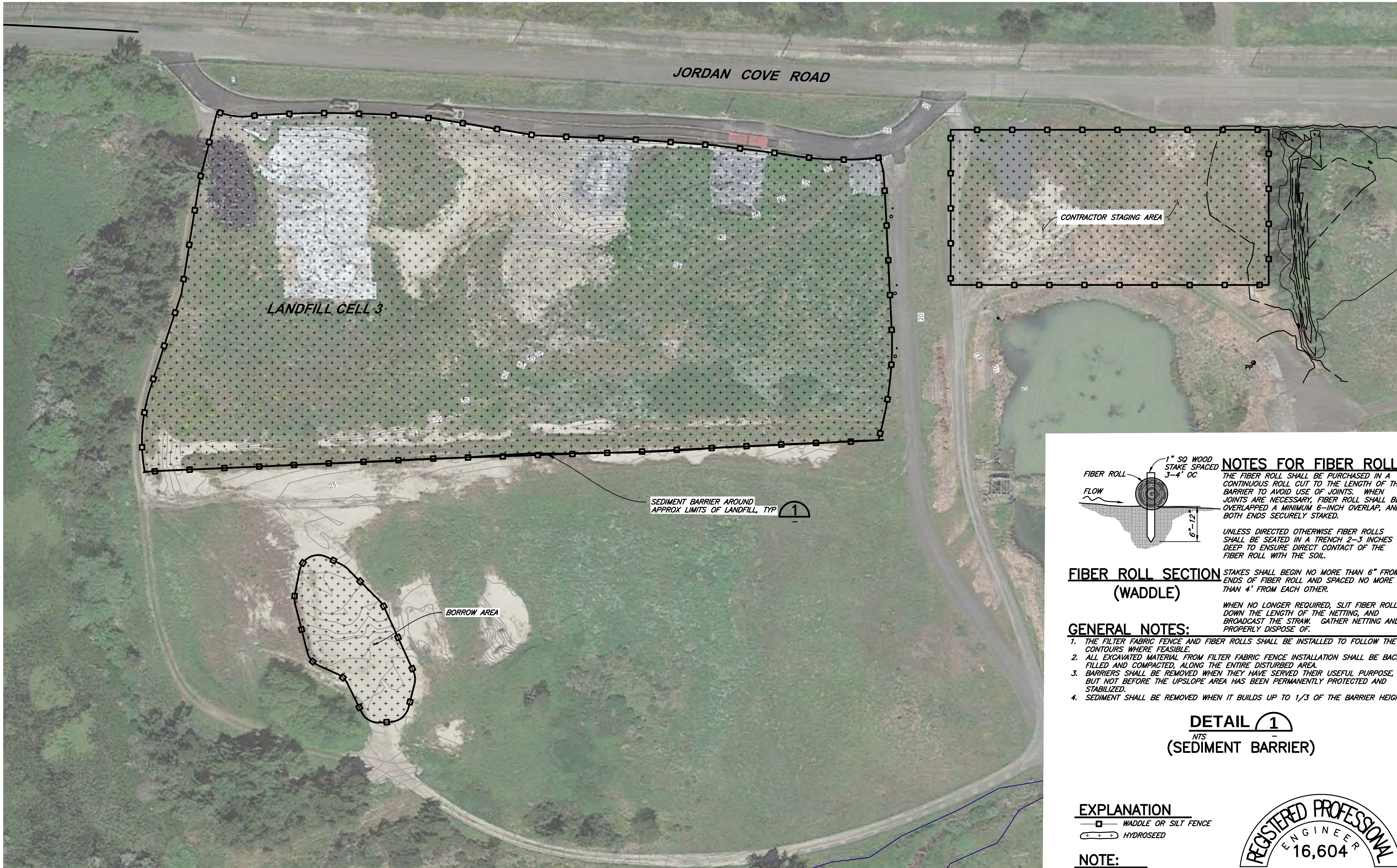

PLAN
1"=50'

1" SQ WOOD STAKE SPACED 3–4' OC
FIBER ROLL
FLOW
6"–12"

FIBER ROLL SECTION
(WADDLE)

NOTES FOR FIBER ROLL:

THE FIBER ROLL SHALL BE PURCHASED IN A CONTINUOUS ROLL CUT TO THE LENGTH OF THE BARRIER TO AVOID USE OF JOINTS. WHEN JOINTS ARE NECESSARY, FIBER ROLL SHALL BE OVERLAPPED A MINIMUM 6–INCH OVERLAP, AND BOTH ENDS SECURELY STAKED.

UNLESS DIRECTED OTHERWISE FIBER ROLLS SHALL BE SEATED IN A TRENCH 2–3 INCHES DEEP TO ENSURE DIRECT CONTACT OF THE FIBER ROLL WITH THE SOIL.

STAKES SHALL BEGIN NO MORE THAN 6" FROM ENDS OF FIBER ROLL AND SPACED NO MORE THAN 4' FROM EACH OTHER.

WHEN NO LONGER REQUIRED, SLIT FIBER ROLLS DOWN THE LENGTH OF THE NETTING, AND BROADCAST THE STRAW. GATHER NETTING AND PROPERLY DISPOSE OF.

GENERAL NOTES:

1. *THE FILTER FABRIC FENCE AND FIBER ROLLS SHALL BE INSTALLED TO FOLLOW THE CONTOURS WHERE FEASIBLE.*
2. *ALL EXCAVATED MATERIAL FROM FILTER FABRIC FENCE INSTALLATION SHALL BE BACK FILLED AND COMPACTED, ALONG THE ENTIRE DISTURBED AREA.*
3. *BARRIERS SHALL BE REMOVED WHEN THEY HAVE SERVED THEIR USEFUL PURPOSE, BUT NOT BEFORE THE UPSLOPE AREA HAS BEEN PERMANENTLY PROTECTED AND STABILIZED.*
4. *SEDIMENT SHALL BE REMOVED WHEN IT BUILDS UP TO 1/3 OF THE BARRIER HEIGHT.*

DETAIL 1
NTS
(SEDIMENT BARRIER)

EXPLANATION

WADDLE OR SILT FENCE
HYDROSEED

NOTE:

DATUM: NAVD 88

REGISTERED PROFESSIONAL ENGINEER
16,604
PRELIMINARY
OREGON
JULY 20, 1993
STEVEN K DONOVAN
EXPIRES 12/31/19

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JORDAN COVE ENERGY PROJECT
FINAL CLOSURE PLAN CELL 3
COOS COUNTY, OREGON

EROSION CONTROL PLAN AND DETAIL

SHEET C–8
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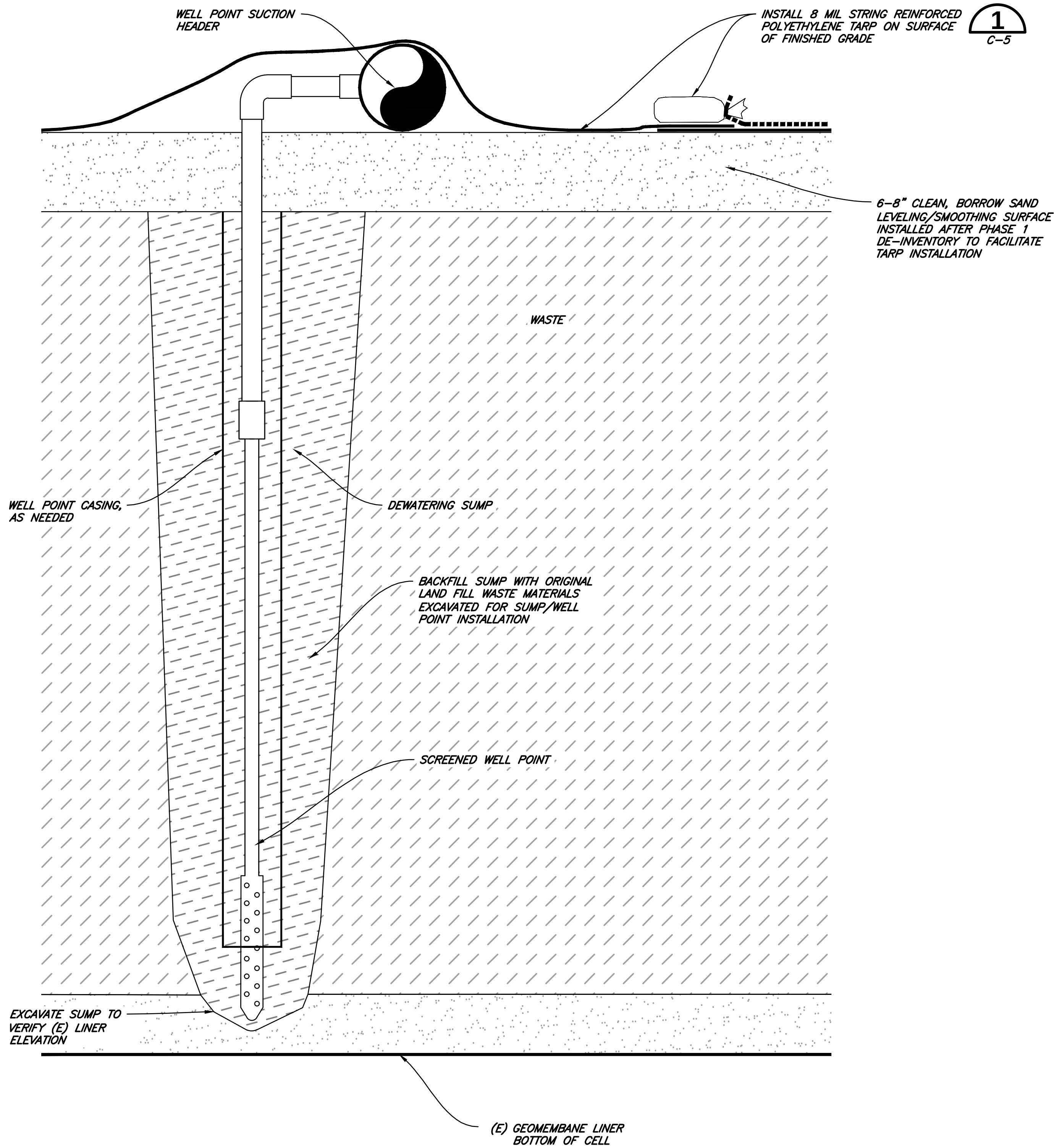
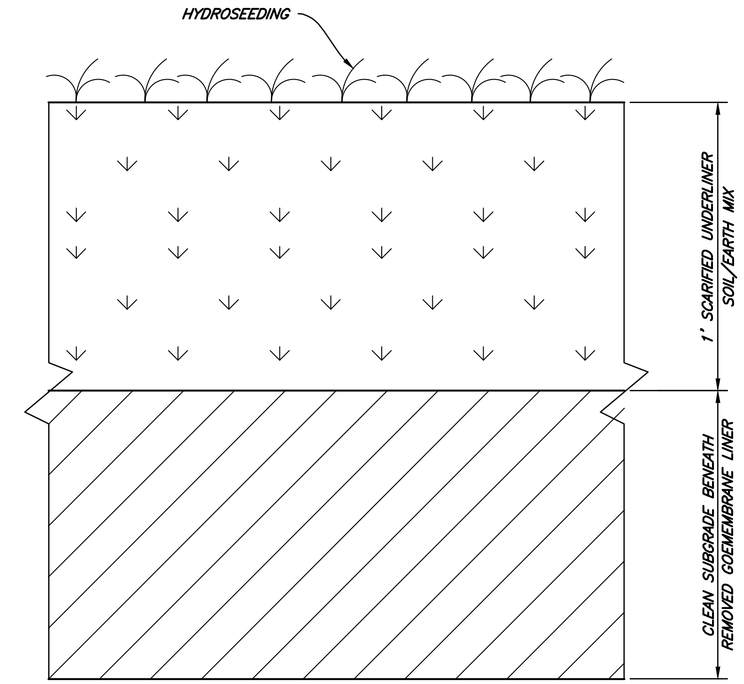


NOTES:

1. DEWATERING SUMPS TO BE LOCATE IN GRID PATTERN AS DEPICTED ON DRAWING SHEETS.
2. WELL POINTS IN SUMPS PENETRATE THE EXISTING LEACHATE DRAIN SYSTEM SAND LAYER APPROXIMATELY 6-10".
3. WELL POINTS SHALL HAVE SEMI-BLUNT POINTS AND SHALL NOT PENETRATE EXISTING GEOMEMBRANE, LOCATED AT BOTTOM OF LAND FILL.

DETAIL 1
NTS C-4
(TYPICAL DEWATERING SUMP/WELL POINT)



DETAIL 3
NTS C-6
(TYPICAL FINAL COVER)

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JORDAN COVE ENERGY PROJECT
FINAL CLOSURE PLAN CELL 3
COOS COUNTY, OREGON

DETAILS

REGISTERED PROFESSIONAL ENGINEER
16,604
PRELIMINARY
OREGON
JULY 20, 1993
STEVEN K DONOVAN
EXPIRES 12/31/19

SHEET D-1
SEQ
DATE 04/2018
PROJ. NO. 617081

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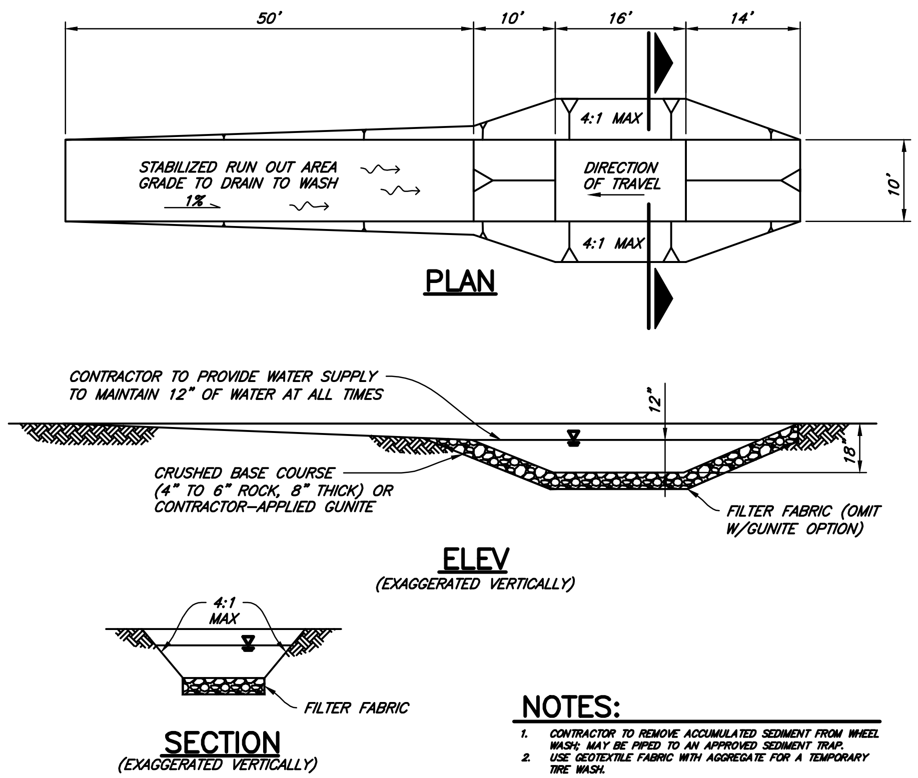
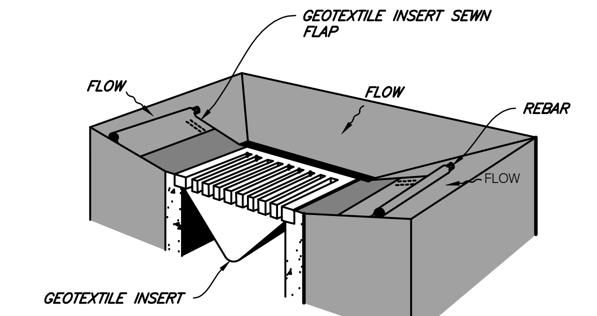
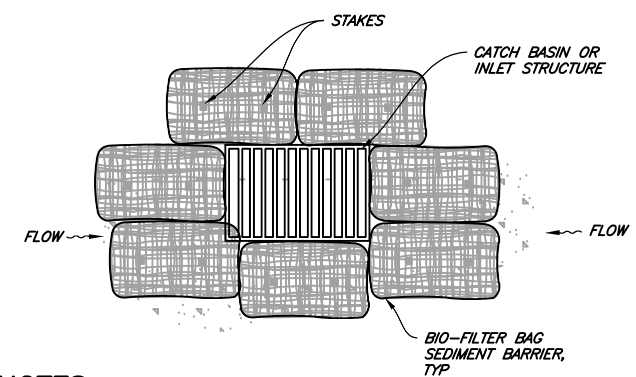


NOTES:

1. CONTRACTOR TO REMOVE ACCUMULATED SEDIMENT FROM WHEEL WASH; MAY BE PIPED TO AN APPROVED SEDIMENT TRAP.
2. USE GEOTEXTILE FABRIC WITH AGGREGATE FOR A TEMPORARY TIRE WASH.

DETAIL 1
NTS C-1
(WHEEL WASH)

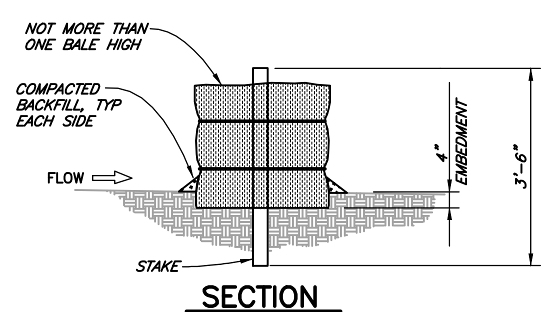


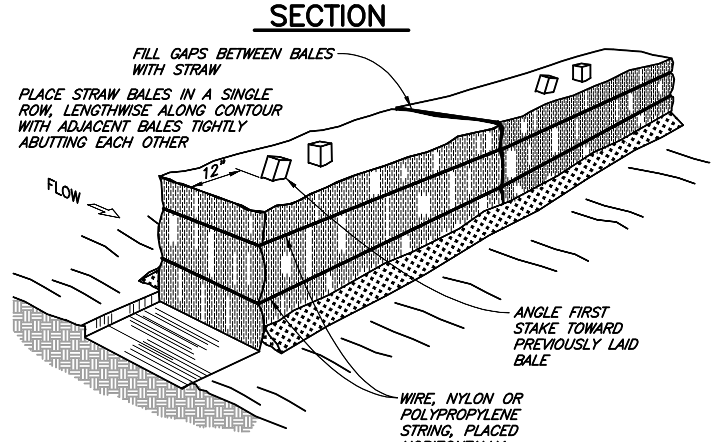


NOTES:

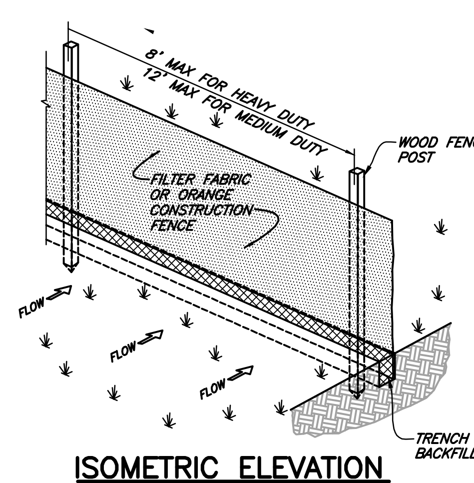
1. REMOVE SEDIMENT FROM INSERT BEFORE IT REACHES 50% CAPACITY.
2. BOTH GEOTEXTILE INSERT AND BIO-FILTER BAG SEDIMENT BARRIER TO BE USED ON ALL DESIGNATED INLETS.

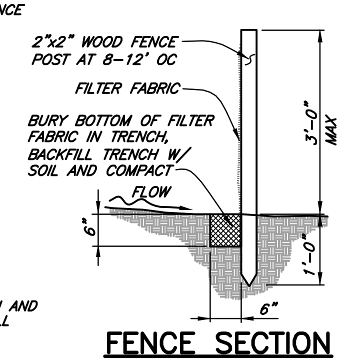
DETAIL 2
NTS –
(INLET PROTECTION)





DETAIL 3
NTS –
(STRAW BALE BARRIER)





NOTES FOR SILT FENCE:

1. THE FILTER FABRIC SHALL BE PURCHASED IN A CONTINUOUS ROLL CUT TO THE LENGTH OF THE BARRIER TO AVOID USE OF JOINTS. WHEN JOINTS ARE NECESSARY, FILTER CLOTH SHALL BE SPLICED TOGETHER ONLY AT A SUPPORT POST, WITH A MINIMUM 6-INCH OVERLAP, AND BOTH ENDS SECURELY FASTENED TO THE POST.
2. THE FILTER FABRIC SHALL HAVE A MINIMUM VERTICAL BURIAL OF 6 INCHES.
3. STANDARD OR HEAVY DUTY FILTER FABRIC FENCE SHALL HAVE MANUFACTURED STITCHED LOOPS FOR 2-INCH x 2-INCH POST INSTALLATIONS. STITCHED LOOPS SHALL BE INSTALLED ON THE UP HILL SIDE OF THE SLOPED AREA.
4. WHEN NO LONGER REQUIRED, FILTER FABRIC FENCES SHALL BE REMOVED AND PROPERLY DISPOSED OF.

DETAIL 4
NTS –
(SILT FENCE OR ORANGE CONSTRUCTION FENCE)

ESCP DRAWING STANDARD NOTES:

1. HOLD A PRE-CONSTRUCTION MEETING OF PROJECT CONSTRUCTION PERSONNEL THAT INCLUDES THE INSPECTOR TO DISCUSS EROSION AND SEDIMENT CONTROL MEASURES AND CONSTRUCTION LIMITS.
2. ALL PERMIT REGISTRANTS MUST IMPLEMENT THE ESCP. FAILURE TO IMPLEMENT ANY OF THE CONTROL MEASURES OR PRACTICES DESCRIBED IN THE ESCP IS A VIOLATION OF THE PERMIT.
3. RETAIN A COPY OF THE ESCP AND ALL REVISIONS ON SITE AND MAKE IT AVAILABLE ON REQUEST TO DEQ, AGENT, OR THE LOCAL MUNICIPALITY. DURING INACTIVE PERIODS OF GREATER THAN SEVEN (7) CONSECUTIVE CALENDAR DAYS, RETAIN THE ESCP AT THE CONSTRUCTION SITE OR AT ANOTHER LOCATION.
4. THE ESCP MEASURES SHOWN ON THIS PLAN ARE MINIMUM REQUIREMENTS FOR ANTICIPATED SITE CONDITIONS. DURING THE CONSTRUCTION PERIOD, UPGRADE THESE MEASURES AS NEEDED TO COMPLY WITH ALL APPLICABLE LOCAL, STATE, AND FEDERAL EROSION AND SEDIMENT CONTROL REGULATIONS.
5. SUBMISSION OF ALL ESCP REVISIONS IS NOT REQUIRED. SUBMITTAL OF THE ESCP REVISIONS IS ONLY UNDER SPECIFIC CONDITIONS.
6. PHASE CLEARING AND GRADING TO THE MAXIMUM EXTENT PRACTICAL TO PREVENT EXPOSED INACTIVE AREAS FROM BECOMING A SOURCE OF EROSION.
7. IDENTIFY, MARK, AND PROTECT (BY FENCING OFF OR OTHER MEANS) CRITICAL RIPARIAN AREAS AND VEGETATION INCLUDING IMPORTANT TREES AND ASSOCIATED ROOTING ZONES, AND VEGETATION AREAS TO BE PRESERVED. IDENTIFY VEGETATIVE BUFFER ZONES BETWEEN THE SITE AND SENSITIVE AREAS (E.G., WETLANDS), AND OTHER AREAS TO BE PRESERVED, ESPECIALLY IN PERIMETER AREAS.
8. PRESERVE EXISTING VEGETATION AND RE-VEGETATE OPEN AREAS WHEN PRACTICABLE BEFORE AND AFTER GRADING OR CONSTRUCTION.
9. EROSION AND SEDIMENT CONTROL MEASURES INCLUDING PERIMETER SEDIMENT CONTROL MUST BE IN PLACE BEFORE VEGETATION IS DISTURBED AND MUST REMAIN IN PLACE AND BE MAINTAINED, REPAIRED, AND PROMPTLY IMPLEMENTED FOLLOWING PROCEDURES ESTABLISHED FOR THE DURATION OF CONSTRUCTION, INCLUDING PROTECTION FOR ACTIVE STORM DRAIN INLETS AND CATCH BASINS AND APPROPRIATE NON-STORMWATER POLLUTION CONTROLS.
10. ESTABLISH TRUCK AND OTHER EQUIPMENT WASHOUT AREAS BEFORE BEGINNING CONCRETE WORK.
11. APPLY TEMPORARY AND/OR PERMANENT SOIL STABILIZATION MEASURES IMMEDIATELY ON ALL DISTURBED AREAS AS GRADING PROGRESSES AND FOR ALL ROADWAYS INCLUDING GRAVEL ROADWAYS.
12. ESTABLISH MATERIAL AND WASTE STORAGE AREAS, AND OTHER NON-STORMWATER CONTROLS.
13. PREVENT TRACKING OF SEDIMENT ONTO PUBLIC OR PRIVATE ROADS USING BMPS SUCH AS: GRAVELED (OR PAVED) EXITS AND PARKING AREAS, GRAVEL ALL UNPAVED ROADS LOCATED ONSITE, OR USE AN EXIT TIRE WASH. THESE BMPS MUST BE IN PLACE PRIOR TO LAND-DISTURBING ACTIVITIES.
14. 14. WHEN TRUCKING SATURATED SOILS FROM THE SITE, EITHER USE WATER-TIGHT TRUCKS OR DRAIN LOADS ON SITE. (SCHEDULE A.7.D.II. (3ONCE EVERY TWO (2) WEEKS DURING INACTIVE PERIODS GREATER THAN SEVEN (7) CONSECUTIVE CALENDAR DAYS.
15. USE BMPS TO PREVENT OR MINIMIZE STORMWATER EXPOSURE TO POLLUTANTS FROM SPILLS; VEHICLE AND EQUIPMENT FUELING, MAINTENANCE, AND STORAGE; OTHER CLEANING AND MAINTENANCE ACTIVITIES; AND WASTE HANDLING ACTIVITIES. THESE POLLUTANTS INCLUDE FUEL, HYDRAULIC FLUID, AND OTHER OILS FROM VEHICLES AND MACHINERY, AS WELL AS DEBRIS, LEFTOVER PAINTS, SOLVENTS, AND GLUES FROM CONSTRUCTION OPERATIONS.
16. WATER OR USE A SOIL-BINDING AGENT OR OTHER DUST CONTROL TECHNIQUE AS NEEDED TO AVOID WIND-BLOWN SOIL.
17. HE APPLICATION RATE OF FERTILIZERS USED TO REESTABLISH VEGETATION MUST FOLLOW MANUFACTURER'S RECOMMENDATIONS TO MINIMIZE NUTRIENT RELEASES TO SURFACE WATERS. EXERCISE CAUTION WHEN USING TIME-RELEASE FERTILIZERS WITHIN ANY WATERWAY RIPARIAN ZONE.
18. IF A STORMWATER TREATMENT SYSTEM (FOR EXAMPLE, ELECTRO-COAGULATION, FLOCCULATION, FILTRATION, ETC.) FOR SEDIMENT OR OTHER POLLUTANT REMOVAL IS EMPLOYED, SUBMIT AN OPERATION AND MAINTENANCE PLAN (INCLUDING SYSTEM SCHEMATIC, LOCATION OF SYSTEM, LOCATION OF INLET, LOCATION OF DISCHARGE, DISCHARGE DISPERSION DEVICE DESIGN, AND A SAMPLING PLAN AND FREQUENCY) BEFORE OPERATING THE TREATMENT SYSTEM. OBTAIN PLAN APPROVAL BEFORE OPERATING THE TREATMENT SYSTEM. OPERATE AND MAINTAIN THE TREATMENT SYSTEM ACCORDING TO MANUFACTURER'S SPECIFICATIONS.
19. TEMPORARILY STABILIZE SOILS AT THE END OF THE SHIFT BEFORE HOLIDAYS AND WEEKENDS, IF NEEDED. THE REGISTRANT IS RESPONSIBLE FOR ENSURING THAT SOILS ARE STABLE DURING RAIN EVENTS AT ALL TIMES OF THE YEAR.
20. CONSTRUCTION ACTIVITIES MUST AVOID OR MINIMIZE EXCAVATION AND CREATION OF BARE GROUND DURING WET WEATHER.
21. SEDIMENT FENCE: REMOVE TRAPPED SEDIMENT BEFORE IT REACHES ONE THIRD OF THE ABOVE GROUND FENCE HEIGHT AND BEFORE FENCE REMOVAL.
22. OTHER SEDIMENT BARRIERS (SUCH AS BIOBAGS): REMOVE SEDIMENT BEFORE IT REACHES TWO INCHES DEPTH ABOVE GROUND HEIGHT. AND BEFORE BMP REMOVAL.
23. SEDIMENT BASINS AND SEDIMENT TRAPS: REMOVE TRAPPED SEDIMENTS BEFORE DESIGN CAPACITY HAS BEEN REDUCED BY FIFTY PERCENT AND AT COMPLETION OF PROJECT.
24. WITHIN 24 HOURS, SIGNIFICANT SEDIMENT THAT HAS LEFT THE CONSTRUCTION SITE, MUST BE REMEDIATED. INVESTIGATE THE CAUSE OF THE SEDIMENT RELEASE AND IMPLEMENT STEPS TO PREVENT A RECURRENCE OF THE DISCHARGE WITHIN THE SAME 24 HOURS. ANY IN-STREAM CLEAN UP OF SEDIMENT SHALL BE PERFORMED ACCORDING TO THE OREGON DIVISION OF STATE LANDS REQUIRED TIMEFRAME.
25. THE INTENTIONAL WASHING OF SEDIMENT INTO STORM SEWERS OR DRAINAGE WAYS MUST NOT OCCUR. VACUUMING OR DRY SWEEPING AND MATERIAL PICKUP MUST BE USED TO CLEANUP RELEASED SEDIMENTS.
26. THE ENTIRE SITE MUST BE TEMPORARILY STABILIZED USING VEGETATION OR A HEAVY MULCH LAYER, TEMPORARY SEEDING, OR OTHER METHOD SHOULD ALL CONSTRUCTION ACTIVITIES CEASE FOR 30 DAYS OR MORE.
27. PROVIDE TEMPORARY STABILIZATION FOR THAT PORTION OF THE SITE WHERE CONSTRUCTION ACTIVITIES CEASE FOR 14 DAYS OR MORE WITH A COVERING OF BLOWN STRAW AND A TACKIFIER, LOOSE STRAW, OR AN ADEQUATE COVERING OF COMPOST MULCH UNTIL WORK RESUMES ON THAT PORTION OF THE SITE.
28. THE DESIGNATED EROSION AND SEDIMENT CONTROL INSPECTOR MUST PERFORM DAILY INSPECTIONS OF THE BMPS AND DISCHARGE OUTFALLS WHEN RAINFALL AND RUNOFF OCCUR. RECORD THE INSPECTIONS AND OBSERVATIONS IN A LOG THAT IS ON SITE. (SCHEDULE B.1.B(1))
29. ALL ESCP CONTROLS AND PRACTICES MUST BE INSPECTED VISUALLY ONCE TO ENSURE THAT BMPS ARE IN WORKING ORDER PRIOR TO THE SITE BECOMING INACTIVE OR IN ANTICIPATION OF SITE INACCESSIBILITY AND MUST BE INSPECTED VISUALLY
30. IF PRACTICAL, INSPECTIONS MUST OCCUR DAILY AT A RELEVANT AND ACCESSIBLE DISCHARGE POINT OR DOWNSTREAM LOCATION DURING PERIODS IN WHICH THE SITE IS INACCESSIBLE DUE TO INCLEMENT WEATHER.
31. DO NOT REMOVE TEMPORARY SEDIMENT CONTROL PRACTICES UNTIL PERMANENT VEGETATION OR OTHER COVER OF EXPOSED AREAS IS ESTABLISHED. IDENTIFY THE TYPE OF VEGETATIVE SEED MIX USED.
32. PROVIDE PERMANENT EROSION CONTROL MEASURES ON ALL EXPOSED AREAS. REMOVE ALL TEMPORARY EROSION CONTROL MEASURES AS EXPOSED AREAS BECOME STABILIZED, UNLESS DOING SO CONFLICTS WITH LOCAL REQUIREMENTS. PROPERLY DISPOSE OF CONSTRUCTION MATERIALS AND WASTE, INCLUDING SEDIMENT RETAINED BY TEMPORARY BMPS.

INSPECTION FREQUENCY

SITE CONDITION	MINIMUM FREQUENCY
1. ACTIVE PERIOD	DAILY WHEN STORMWATER RUNOFF IS OCCURING. AT LEAST ONCE EVERY TWO WEEKS REGARDLESS OF WHETHER OR NOT RUNOFF IS OCCURING
2. PRIOR TO THE SITE BECOMING INACTIVE OR IN ANTICIPATION OF SITE INACCESSIBILITY	ONCE TO ENSURE THAT EROSION AND SEDIMENT CONTROL MEASURES ARE IN WORKING ORDER. ANY NECESSARY MAINTENANCE AND REPAIR MUST BE MADE PRIOR TO LEAVING THE SITE
3. INACTIVE PERIODS GREATER THAN FOURTEEN CALENDAR DAYS	ONCE EVERY TWO WEEKS
4. PERIODS DURING WHICH THE SITE IS INACCESSIBLE DUE TO INCLEMENT WEATHER	IF PRACTICAL, INSPECTIONS MUST OCCUR DAILY AT A RELEVANT AND ACCESSIBLE DISCHARGE POINT OR DOWNSTREAM LOCATION

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FINAL CLOSURE PLAN CELL 3
COOS COUNTY, OREGON

DETAILS, STORMWATER BMPS

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