ENVIRONMENTAL ASSESSMENT

Pit 7 Reclamation Plan

TransAlta Centralia Mining LLC
Lewis and Thurston Counties, Washington

Prepared by

TransAlta Centralia Mining LLC
913 Big Hanaford Road
Centralia, Washington 98531

Prepared for

The Office of Surface Mining Reclamation and Enforcement
Western Region
Denver, Colorado

May 2020

Estimated Total Costs Associated with Developing and Producing the EA: $32,481

TABLE OF CONTENTS

LIST OF APPENDICES

LIST OF ACRONYMS

ALCO	Alco Holdings Inc.
CFR	Code of Federal Regulations
cfs	cubic feet per second
CO_2e	carbon dioxide equivalent
Coalview	Coalview Centralia LLC
dBA	Decibels on the A-weighted scale
EA	Environmental Assessment
EPA	U.S. Environmental Protection Agency
FCR	fine coal refuse
FCRec	Fine Coal Recovery
ft asl	feet above sea level
GHG	greenhouse gases
mg/L	milligrams per liter
MSA	Magnuson-Stevens Fishery Conservation and Management Act
msl	mean sea level
MW	Megawatt (1 million watts)
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
OSMRE	Office of Surface Mining, Reclamation and Enforcement
PAP	Centralia Mine Permit Application Package
PHS	Priority Habitats and Species
PMT	post-mining topography
PSD	Prevention of Significant Deterioration
SHPO	Washington State Historic Preservation Office (Officer)
SMCRA	Surface Mining Control and Reclamation Act
TAC	TransAlta Corporation
TCG	TransAlta Centralia Generation LLC
TCM	TransAlta Centralia Mining LLC
TDS	Total Dissolved Solids
USACE	United States Army Corps of Engineers
WDFW	Washington State Department of Fish and Wildlife

A. DESCRIPTION OF PROPOSED ACTION

The Proposed Action is to modify the reclamation plan provided in the previously approved Permit Application Package for the Centralia mine.

A.1. Background

A.1.1. Applicant History

TransAlta Centralia Mining LLC (TCM; the permittee) is permitted to operate a surface coal mine under the Office of Surface Mining, Reclamation and Enforcement (OSMRE) Permit No. WA-0001E, renewed November 21, 2015, pursuant to the Surface Mining Control and Reclamation Act (SMCRA) and the Federal Program for the State of Washington (30 CFR 947). TCM is an operating company of TransAlta Corporation (TAC), a Canadian company with headquarters in Calgary, Alberta, Canada and U.S. offices in Centralia Washington, in addition to many Canadian locations.

TransAlta Corporation also owns power generation assets in the U.S. such as a 144-megawatt (MW) renewable project in Wyoming, a 10-MW hydro facility in Hawaii, and the 1,300-MW Centralia Power Plant in Centralia, adjacent to the TCM mine operation. The Centralia Plant, a coal-fired power plant, is owned by a separate operating company, TransAlta Centralia Generation LLC (TCG) who previously owned a 248-MW gas-fired peaker unit near the coal-fired power plant (not currently in operation). The operation, location, and ownership of these facilities is relevant to the content and approach of this Environmental Assessment (EA) and is discussed here because their combined plans and activities relate to the need to revise the existing mine reclamation plan.

The Washington Irrigation and Development Company, a wholly owned subsidiary of the Washington Water Power Company, operated the Centralia Coal Mine until August 1, 1990, when ownership of the mine operations was transferred entirely to PacifiCorp. On May 4, 2000, ownership of both the mine and the adjacent power plant operations was transferred to TAC and its divisions. TCG operates the power plants; TCM operates the mine and its future reclamation activities. Under TCG ownership, the power plant was powered by coal from the site and supplemented by coal brought in by rail, until a few years ago, when surface mining was discontinued. At present, rail-delivered coal is the primary fuel source for the power plant.

When TCM announced the stoppage of mining operations in 2006 (via an Associated Press News Release, November 27, 2006) TCM ceased active coal removal from the North Hanaford, Central Packwood, Kopiah, and Pit 7 coal pits. Mining was stopped in part because unstable geologic conditions within the mine posed a safety hazard and made continued mining operations impracticable in the pits. Coal continues to be brought in by rail from the Powder River Basin to fuel the power plant. As the owner, operator, and permittee, TCM's main function is to comply with the reclamation plan. Mine reclamation continues under OSMRE permit requirements applicable to TCM, and the power plant continues to operate under TCG, independently of the mine's ongoing reclamation plans.

At present, the coal mine remains closed and TCM has no plans to reopen it. The only related mining activity at the site, besides implementing the reclamation plan, is a fine coal particle recovery (FCRec) operation initiated in 2014. To implement this operation, TCM will reclaim Ponds 3B, 3C, and 3D by

dredging the waste materials from these impoundments and reprocessing the wastes to recover coal fines trapped within the waste (re-mining coal waste). Pond 3E will receive the waste soil, rock, clay, and coal particles from the coal washing operation at TCM. Fine coal recovery in this manner is defined as a surface coal mining operation under OSMRE Regulations (30CFR 701.5). A permit revision was approved by OSMRE on February 23, 2012 to approve the FCRec operations/mining plan. This allowed the re-mining of the coal washing waste [see Section 4.1.3, Fine Coal Recovery, in TCM's May 14, 2014 approved permit].

TCM retained Coalview Centralia LLC (Coalview), a contract mining company specializing in fine coal recovery, to construct and operate the FCRec system at the Centralia Mine. Coalview will re-process the coal waste material and deliver clean coal for use at TCG for as long as it stays open. None of the Coalview activities are related to the reclamation of Pit 7.

A.1.2. The Centralia Plant

Since the closure of the Centralia Coal Mine in 2006, all coal for the power plant has been brought in by rail from the Powder River Basin. As a result of concerns regarding plant emissions, and the costs of required air quality control upgrades, TCG agreed with the State of Washington to close their coal-fired power plant, starting by closing half of the generation by 2020 and completing the closure of the second plant unit by 2025. These combined closures (the first plant unit and the mine) will permanently change land use in the area associated with coal. Coal will not be brought in by rail, nor will it be stored, cleaned, burned, or mined.

There will be no coal-related activities on the sites after completion of the 2025 closure, including Coalview's FCRec operation, except for completing the mine site reclamation. The power plant is scheduled for closure by 2025 and the reclamation plan is scheduled for completion by 2035. At that time, there will be no coal-related activities on site, and the land will revert to private use and ownership.

A.1.3. The Centralia Mine and its Reclamation

The Centralia Coal Mine operation (boundaries of mining activities and reclamation) was first authorized under an operating permit issued to TCM by OSMRE in 1985. This permit included conditions for mining and reclamation, and related activities at the mine site. The mine is located northeast of the City of Centralia, in Lewis and Thurston counties, Washington. The coal-fired power plant and a natural gas generating station are located on adjacent TransAlta lands.

The mine and its supporting features are located on Big Hanaford Road, which provides direct access to I-5 via State Highway 507, which runs through the city of Centralia (**Figure 1**; Appendix C).

Initial development at the Centralia Coal Mine began in 1967 with the construction of necessary infrastructure such as office, shop, and warehouse facilities. The first coal seams were mined in 1971. Mining operations continued from 1971 through November 2006. During this period TCM disturbed approximately 8,591 acres.

After 2000, activities on the site included a coal plant, gas plant, rail operation, electrical transmission, coal washing and storage, and mine site reclamation. TCM closed the active coal mining activities in 2006, after which activities on the permitted land have been primarily related to reclamation. Cessation of

coal removal from the pits significantly changed activities at the Centralia Mine site, including the methods and procedures underway to reclaim the mined area, as determined by the permitting requirements of the OSMRE.

The principal effect of mine closure on reclamation is the elimination of an ongoing source of waste spoils for use in reclamation, including filling of closed mine pits. To date, since the mine closed, TCM has obtained the materials needed to achieve reclamation through grading and/or hauling existing spoil material within each respective pit area. Mine lands must be graded to the approved post-mining topography; vegetation established, lakes completed, and an acceptable environment and habitat must be established before OSMRE will grant final release of the reclamation bond. The proposed Pit 7 Lake is another step toward that completion.

The existing approved reclamation plan for the entire site, the Centralia Mine Permit Application Package, which is referred to as the Permit Application Package (PAP), prescribes restoration of the entire mine site to its approximate original contours, so that it can be returned to private ownership for its previous intended uses, except for specific locations or exceptions reviewed and approved by OSMRE. The Pit 7 Plan is proposed as one of those exceptions for reasons described within. After reclamation, ownership of the 597-acre Pit 7 area will revert to its original ownership, and future use of the land will be decided by those owners. The Pit 7 property is currently owned by TransAlta and by ALCO Holdings Inc. ALCO manages their properties for timber production.

A.1.4. Regulatory Process History

The SMCRA grants OSMRE primary responsibility to administer Federal Programs that regulate surface coal mining in states which do not have a mine regulatory program pursuant to SMCRA. OSMRE implemented the Federal Program for the State of Washington (30 CFR 947) on May 16, 1983. In order to avoid duplication regarding compliance with State and Federal laws in permitting matters, OSMRE entered into a working agreement with Washington State agencies in February 1986. These agencies include the Washington Department of Natural Resources and the Washington State Department of Ecology. The agreement provides for review of mine permits and subsequent amendments.

In September 2009, TCM submitted a significant permit revision proposal to OSMRE to change Section 5 and other portions of the PAP to modify the reclamation plans of the Pit 7 area (TCM 2009). The Proposed PAP Revision is available for public review at OSMRE's Denver, Colorado and Olympia, Washington offices. This submittal, and revisions and clarifications made to it since that date and up through 2012, is the basis for the project described in this EA.

OSMRE regulations require review of any new permit application or significant revision under the National Environmental Policy Act (NEPA) 42 U.S.C. § 4321, et seq. The modification to the Pit 7 reclamation plan is considered a significant revision because of its proposed changes in future land use on 130 of its 597 acres from forestry to permanent impoundment (a lake), and the resultant need to change the probable hydrologic consequences analysis (summarized in Section A.2.1).

Previous NEPA reviews completed on the Centralia Mine include a 2019 EA analyzing a transmission corridor available on OSMRE's website here: https://www.wrcc.osmre.gov/initiatives/centraliaMine/documents/042619-Centralia_Mine_EA.pdf.

Preparation of this EA review has been conducted in accordance with the NEPA and the Council on Environmental Quality (CEQ) Regulations for Implementing the Procedural Provisions of NEPA (40 Code of Federal Regulation [CFR] 1500-1508); the DOI's regulations for implementation of NEPA (43 CFR Part 46); the DOI's Departmental Manual Part 516 (DOI 2004); Secretarial Order 3355; and OSMRE's Directive REG-1, Handbook on Procedures for Implementing the National Environmental Policy Act of 1969 (OSMRE 2019). Information gathered from federal, state, and local agencies, TCM, publicly available literature, and in-house OSMRE sources, such as the TCM Permit Application Package (PAP) revision, was used in the preparation of this EA.

The Proposed PAP Revision (TCM 2009) was amended in 2012 with the Pit 7 Reclamation Plan (the "Plan," Norwest 2012). The Plan is available for public review at OSMRE's Denver, Colorado and Olympia, Washington offices. OSMRE sent the Plan to state agencies for comment. The Washington State Department of Fish and Wildlife (WDFW), and the U.S. Department of Commerce, National Marine Fisheries Service (NMFS) provided comments, which were considered by OSMRE before its determination that the application was technically adequate. The chronology of the Plan application and review process is shown in **Table 1** (Appendix B).

The Pit 7 project is a small portion of the overall reclamation plan for the Centralia Mine. Due to this proposed significant revision to the PAP, OSMRE prepared this EA to support its need to make a decision on whether or not to approve the proposed Revision.

A.2. The Applicant's Proposed Revisions – The Pit 7 Reclamation Plan

The Plan has been proposed and developed by TCM in consultation with the OSMRE, WDFW, and NMFS. It is a proposed revision to the existing reclamation plan. The Plan was developed in response to a loss of fill materials supply as a result of the announced closure of the Centralia Mine in 2006. It is a proposal to reclaim the Pit 7 portion of the PAP, by including a lake as part of the reclamation, instead of filling the pit with spoils material.

Because less material will be available to return the mined area to its approximate original contours, the Proposed Action (represented by the Plan) is to revise part of the current reclamation plan to create a lake at the 597 acre Pit 7 site, rather than returning that portion of the property to its original topography and vegetation. The existing reclamation plan for the Pit 7 area would require millions of yards of fill material that is not available. (See Section B, Need for the Proposed Action and Section C.2, No Action.)

The Plan would instead provide a diverse ecological habitat with a permanent 130-acre lake as its main feature, using water instead of waste spoils to fill Pit 7, yet still reclaim a total of 467 acres of disturbed land (predominantly upland forest) surrounding the lake at a cost of approximately $10 million. Nearly every action and effect from this Plan occurs on the Pit 7 site.

A.2.1. Lake Design and Function

The Pit 7 Lake is proposed as an incised impoundment with a surface area of approximately 130 acres and a capacity of 4,960 acre-feet. The design would replicate natural lake conditions with gradual near-shore slopes and shallow water areas for improved habitat. The lake would have a maximum depth of 67 feet and an average depth of 38 feet. Nearshore areas would be shallow (ranging from shoreline to 7 feet deep)

and sloped to support habitat, aquatic emergent plants, and for safety. The proposed Pit 7 Lake is similar to other lakes in the vicinity and to other lakes in a similar climatic zone in the State of Washington (Norwest 2012).

The post-mining topography for the Plan was developed using a terrace and down-drain approach for most of the area draining to the Pit 7 Lake (**Figure 2**; Appendix C).

TCM proposes to build a permanent outlet at the north end of the lake at an elevation of approximately 231.8 feet above sea level (ft asl). The outlet will be located between the west end of the Sag Lake Arm portion of the Pit 7 Lake and Packwood Creek, as shown in Figure 2 and described in detail in Section E.2.1.1. The outlet structure will be a compound channel comprised of a narrow low-flow channel with sufficient capacity for normal winter and summer outflows from the lake and a wide floodplain adjacent to the low flow channel to convey outflows during large precipitation events.

Lake filling, initial outflows, and permanent outflows will be monitored to ensure that water quality and sediment management goals in the Plan are met. To do this, TCM will construct the outflow with the follow steps:

- Final grading at Pit 7 will move material that is presently separating the Sag Lake Arm from the Pit 7 Lake. This will create a single lake with the rest of Sag Lake Arm intact.

- Initial outflows from the lake will be routed into Ditch 30D (**Figure 3**; Appendix C). This is in the event sediment levels, turbidity or temperatures are not acceptable to discharge into Packwood Creek. Flows from there will enter the Pond 5 sediment management system at Pond 5C. **Figure 4** (Appendix C) shows the interim connection between the Sag Lake Arm and Ditch 30D.

- Once outflow water quality is shown to be in compliance with applicable water quality standards, water will flow through the new permanent outflow channel at the north end of Sag Lake Arm, which will be part of Pit 7 Lake.

Water balance modeling indicates that the amount of time required to fill the lake is expected to be two to four years (Norwest 2012) and will be determined by the amount and intensity of precipitation that occurs during the first few years following construction of the lake. Surface water runoff is expected to initially contribute 65 percent (%) of the inflow to the lake; precipitation is expected to contribute 34%, with minimal (1%) groundwater input. After the lake fills, lake levels are expected to fluctuate seasonally, varying by approximately two feet between elevations 230 and 232 ft asl. During summer, when inflows drop far below the rate of outflows, lake levels may fall below the planned outflow elevation, and outflows from the lake will likely cease.

The Plan includes an analysis of the Probable Hydrologic Consequences for Pit 7 Lake surface water quality.[1] Organic loading, surface flows, and bank erosion may cause turbidity and possibly oxygen demand that would lower oxygen levels until organics settle or are otherwise oxidized in the lake. The amount of turbidity and loading is not expected to be significant, but the lake will be monitored. Initial spring or fall inflows may create warmer conditions until the lake volume is sufficient to maintain cool

[1] The detailed Probable Hydrologic Consequences analysis for the Pit 7 Lake is included in Section 6.1.6 of TCM (2014).

conditions, but outflow will not be directed into Packwood Creek until after the lake is full and outflows meet acceptable water quality parameters for discharge to Packwood Creek. Acid drainage conditions do not exist at Pit 7, as explained below. Also summarized below are the key water quality parameters (dissolved oxygen, turbidity, and temperature) to meet before direct discharge to Packwood Creek.

- Dissolved Oxygen – Some dissolved oxygen sag is expected near the bottom of the lake during normal peak summer stratified conditions. This will not occur in mid-depths of the lake, or near the surface waters that will outflow to the creek. Normal mixing, wind, and biological activity will create healthy dissolved oxygen conditions as soon as stable conditions arise, if not before. Filled reservoirs sometimes have a high productivity effect due to significant organic materials (plants, tree stumps, bushes, thick soils) after inundation. Such conditions do not exist at this site because the filled area is a mine pit with only minor plant growth in place.

- Turbidity – The Lake may be more turbid during its initial filling and soon afterwards because of inflows disturbing sediments, runoff from newly vegetated slopes, steeper slopes at some locations that will eventually become lake bottom, and wave action against non-vegetated shorelines. Filling erosion will cease as soon as terrestrial vegetation is established. Wave-caused turbidity will be reduced considerably, and may cease entirely, after rooted aquatic plants are established along the shoreline.

- Temperature – As discussed in Water Quality (Section E.2.1.1), the Lake is not expected to overflow into its outflow drainage during the summer when surface temperatures are greatest. During infrequent years when/if there is outflow in the summer, the outflow will be cooled slightly by the rain events that are causing the overflow, and will be attenuated by existing flows in Packwood Creek and by surface water in Big Hanaford Creek, where temperatures will be further attenuated before confluence with the Skookumchuck River, approximately four miles away.

- Acid Drainage - An analysis of the potential for acid leaching into the Pit 7 lake was performed (Norwest, 2012) as part of the Pit 7 Reclamation Plan. Spoils samples were collected for laboratory analysis and various analytical methods were applied to the results to predict the potential for acid seepage and its effects on the proposed lake. Of 16 samples, one sample suggested potential acid drainage release and the other 15 suggested alkaline release. The analysis looked at neutralization potential and maximum potential acidity of the spoils and, calculating the neutralization potential/maximum potential acidity ratio, concluded that “spoils from Pit 7 would be expected to result in alkaline water quality for the area.” Thus, there is no acidification impact anticipated with the filling of Pit 7 lake.

A.2.2. Habitat Design

Although a new lake is a central part of the Plan, approximately 75% of the Pit 7 reclamation area (470 acres out of 597) will continue to be established as upland forest as originally planned. The understory of the upland forest area will be planted with a general erosion control seed mixture consisting of grasses such as fescue, ryegrass, and orchard grass, along with clover and a cereal grain. TCM will use a combination of terrace ditches and rock channel down drains to control the surface runoff in the forest

areas. These features will also contribute to the stabilization of the surface soils and will minimize erosion.

Specific habitat and hydrological objectives of this Pit 7 Reclamation Plan include the following:

- Create a permanent impoundment, Pit 7 Lake, in the end-cut area. The lake will provide habitat (lacustrine and shoreline), enhance the overall habitat diversity of the Pit 7 area, and increase water availability for wildlife using the area.

- Establish riparian vegetation and aquatic plants around the newly created lake and outlet channel to provide habitat for deer, elk, waterfowl, passerine birds, amphibians, fish and other wildlife species.

- Maintain water quality in the Pit 7 Lake adequate to support aquatic organisms and wildlife and provide outflow water quality that meets applicable water quality criteria in Packwood Creek and downstream.

- Create a stormwater detention benefit with a lake basin capacity and channel design that reduces stormwater peak flows and helps maintain baseflows.

Nearshore areas will be graded to a relatively uniform elevation to allow establishment of shallow zones (from shoreline to seven feet in depth) of emergent vegetation, and zones of submerged aquatic vegetation ranging between 7 and 17 feet in depth. Prior to the lake being filled, 6 to 18 inches of topsoil will be placed in the area designated as the littoral zone in preparation for planting, to provide optimal support for plant establishment.

The lakeshore and wetland planting lists will consist of seed mixtures and individual plants as listed in **Table 2** and **Table 3**, respectively (Appendix B). Typical spacing of individual emergent plants is 18 to 24 inches on center. Plant forms for a given species may include tubers, rhizomes, bare roots, plugs, clump divisions, seeds, or container stock, as appropriate.

The understory of the lowland forest areas is predominantly grasses and cereal grains. These lowland vegetation communities enhance the aquatic environment for fish, waterfowl, and wildlife. Other fish and wildlife enhancement features include log barbs, woody debris, and root wads. These features will be located around the perimeter of the lake in the littoral zone and in the permanent outlet channel.

TCM will make use of root wads and woody debris as wildlife habitat enhancement features around the perimeter of the Pit 7 Lake and Sag Lake Arm. Root wads will have a minimum diameter of 16 inches and be at least 20 feet in length and will be buried or anchored within the bank. Woody debris will consist of a pile (one feature) of five logs, greater than 4 inches in diameter and greater than 6 feet in length. Where spacing allows, log barbs will be placed upstream of channel bends on the outside bank. Log barbs will have a minimum diameter of 16 inches and will be at least 28 feet in length. The flow vector over the log barb will tend to be perpendicular to the alignment of the barb. With the log installed immediately upstream of the channel bend on the outside bank at an upstream angle of about 45 degrees, the flow vector will be in the same direction as the meander bend. This will help to minimize bank erosion and channel meander migration.

The Pit 7 Lake and Sag Lake Arm design provides a littoral zone of approximately 16.8 acres above the 225-foot elevation for emergent vegetation, and approximately 18.9 acres between the 215- and 225-foot elevations for aquatic species. Thus, the lake will provide 36 acres of aquatic macrophyte vegetation growth. TCM will place woody debris and root wads in the littoral zone at a density of one feature per 2,500 square feet. The proportion of root wads and woody debris used as enhancement features within the littoral zone will be distributed at 20% root wads and 80% woody debris. The quantity of enhancement features placed in the permanent outlet channel will be of near equal proportions (59 log barbs and 60 root wads). These features are a wildlife enhancement reclamation success standard specific to the Plan for the Pit 7 Lake and the Sag Lake Arm.

TCM has determined that the success standard requires that TCM establish close to 300 fish and wildlife enhancement features within the 16.8-acre littoral zone area of the Pit 7 Lake and Sag Lake Arm. In the outlet channel, TCM will place the wildlife enhancement features at intervals of less than 100 feet. In the permanent outlet channel, TCM will place 119 enhancement features along the 1,345 foot length. In total, 412 wildlife enhancement features will be placed around the Pit 7 Lake, Sag Lake Arm, and the permanent outlet channel. These designs create topographic diversity necessary for riparian areas between upland forest and open water land uses and ultimately builds upon the existing techniques described in the PAP.

A.2.3. Implementation Considerations

The Plan is consistent with all aspects of the approved post-mining land uses. Implementation of the Plan will allow TransAlta to successfully meet the terrestrial reclamation and water quality requirements of the post-mining land uses and satisfy regulatory requirements of OSMRE and other agencies.

Plan implementation for the entire Pit 7 site will involve the same types of activities and equipment currently being used for reclamation for the rest of the mine site. This includes mobilization and on-site activity of graders, scrapers, trucks and other smaller equipment designed to move and grade dirt and topsoil to its finished contours. Work would be conducted during normal day shifts. If swing shifts were used for any reason, they would end by 10 PM.

Similar to the existing plan, no off-site construction traffic would be required. The only traffic associated with the Plan would be from commuting employees. Commute traffic will not be different from commute traffic associated with the existing plan.

B. PURPOSE AND NEED

As described in 40 CFR § 1502.13, the purpose and need statements briefly specify the purpose and need to which the agency is responding in proposing the alternatives including the Proposed Action.

The purpose of the action is established by SMCRA, which requires the evaluation of TCM's application for the significant permit revision before TCM may continue reclamation activities at the Centralia Mine. OSMRE is the agency responsible for making a decision to approve, disapprove, or approve with conditions the proposed significant permit revision.

The need for this action is to provide TCM the opportunity to develop an alternative to filling Pit 7 as proposed in the existing reclamation plan due to a lack of fill material. OSMRE has a need to prepare this EA to support their decision to approve, deny or condition a significant revision to the existing mine plan.

C. ALTERNATIVES CONSIDERED

C.1. Alternative 1: Proposed Action

Under the Proposed Action, the Manager of the Program Support Division at the OSMRE Western Region would approve the proposed Pit 7 Reclamation Plan (see Section A.2) resulting in a lake with associated riparian and lowland forests, surrounded by upland forests, and an eventual outflow to the local stream system.

The Proposed Action to create a lake at Pit 7 is a significant revision to the PAP. This revision was proposed by TCM because of a changed condition which has made it impracticable to implement the existing reclamation plan as originally prepared by TCM and approved by OSMRE. The changed condition is that the TransAlta coal mine was closed in 2006, and coal and overburden removal from the pits ceased. The mine site is still an active reclamation site, but coal mining ceased. The following discussion explains the events and decisions leading to the need for the Proposed Action.

TAC has owned and operated the Centralia mine and power plant complex since purchasing the combined facilities in 2000. Activities that occur or have occurred over the entire site include a gas-fired peaker power plant (no longer in operation), a 1300-MW coal-fired power plant, a rail system that brings coal in from the Powder River Basin, a coal mine that also provided coal to the power plant, and an ongoing coal mine reclamation process that addresses past, ongoing, and future land disturbance and impacts from the mine. Except for reclamation and a new fine coal recovery operation, coal mining has ceased at the site. The mine and its reclamation plan are under the permitting authority of OSMRE. The current reclamation plan is the basis for ongoing and long-term mine reclamation, scheduled for completion in 2035. Cessation of coal and overburden (waste spoils) removal from the pits in 2006 eventually created the conditions that generated the need to propose a significant revision to the reclamation plan.

The Centralia mine recovered coal located in seams (layers) located far more than 100 feet below the surface. The dirt, rock, and gravel (overburden) from mining was used as cover material, road beds, and various other uses on mine properties, and a principal use of the overburden was backfilling previously mined areas to the approximate original contour. When the mining stopped, the availability of associated overburden did also. Large mine pits still remained to be filled and/or reclaimed, but the ongoing supply of overburden to fill and reclaim them had been eliminated. TransAlta is still obligated under their OSMRE permit to reclaim the entire mine site, but the material supply upon which most of the existing reclamation plan was based was no longer available. Thus, TransAlta had a need to reclaim the existing mine site, including Pit 7, without the availability of a continual supply of mining overburden.

This situation resulted in the need to revise a part of the overall reclamation plan – the Pit 7 area. That proposed revision is referred to herein as the Plan.

C.2. Alternative 2: No Action

Under the No Action alternative (No Action), the Manager of the Program Support Division at the OSMRE Western Region would disapprove TCM's proposed revisions to the existing permit because the Plan did not adequately meet the requirements of the applicable Federal or State laws; or because the

proposal either imposed, or had the potential to impose, unacceptable impacts on the human environment. The Pit 7 Plan would not proceed, and TCM would meet PAP requirements as originally planned with fill materials from another source.

Under the No Action alternative for this EA, TCM would proceed with PAP implementation absent any supply of mining spoils because mining has stopped. TCM has calculated that the approved reclamation plan for the Pit 7 site would require 73 million yards of suitable fill material to fill Pit 7 and bring the 597-acre site back to its similar contour condition, as required by the PAP. This amount is required to fill the pit and to raise the balance of the Pit 7 site by an average of approximately 90 feet to meet the reclamation requirements of the PAP. To accomplish this, fill would need to be acquired in lieu of ongoing mining spoils. The No Action alternative assumes that required fill would be brought in from an offsite location. Use of any on-site materials to supplement this use would result in destroying areas already in reclamation and creating new areas on site to be reclaimed in addition to the 597 acres of Pit 7. No site has been sought or identified to provide such materials to the site to meet the requirements of the PAP, so assumptions have been made about the size of the unknown borrow site, its distance from the site, truck haul requirements, and the effects of transportation to the pit so that environmental comparisons can be made.

If 73 million yards of material were to be brought in from off site, the most likely scenario would be to truck the material in with large capacity dump trucks, assuming there would be enough trucks available. Assuming a maximum 30-yard capacity, for example, transport would require 2,433,333 (2.4 million) truckloads, each way, or approximately 4.8 million trips. Over a 10-year period, (by 2025) this would require approximately 243,000 truckloads per year, each way. The distances or routes travelled are unknown, but to complete the analysis, a nearby site is assumed, only 20 miles away (8 miles from Centralia plus 12 miles from I-5 to the pit). To evaluate site impacts such as fish & wildlife and other factors, a borrow pit size is also assumed, as is the site condition at the site that might be selected to provide the fill. That much volume (approximately 45,000 acre feet), would require a 500-acre pit approximately 100 feet deep. Such a site is not proposed, but is provided here as illustration, and for the purpose of comparing potential impacts of the Pit 7 Plan to this No Action alternative. The following basic assumptions have been made about No Action so that this alternative can be compared with the Proposed Action (the Pit 7 Plan):

- Total material to move: 73,000,000 yards to fill the pit and meet PAP elevations.
- Capacity per truck: 30 yards.
- Number of truck trips: >2,433,000 one way.
- Pit 7 reclamation duration: 10 years, through 2025; 6 months per year; 10 hours/day; 5 days/week.
- Distance from mine pit: 20 miles.
- Size of unknown borrow site supplying 73 million yards of material: 500 acres at 100 feet deep.
- Haul cost: $5-$10 per yard ($365 million to $730 million).

- Unknown factors: borrow site land use, vegetation cover, ownership, slope, habitat, watershed value, ownership; adjacent land uses, etc.

C.3. Alternatives Considered but Eliminated from Detailed Analysis

One other alternative to the Pit 7 Reclamation Plan revision was considered for this EA: the 3D Embankment Alternative., This alternative would use existing stored stockpiles of overburden from the 3D Embankment that have already been contoured as part of reclamation. Under this alternative, overburden material already in place to meet reclamation requirements would be transported to Pit 7 where it would be used to fill the pit sufficiently to create a downward slope for runoff that would flow toward Packwood Creek.

The 3D Embankment is an existing area under reclamation that has already been graded to desired slopes and contours. Using 3D Embankment material to partially fill Pit 7, in lieu of the previously anticipated ongoing mine waste overburden materials, would not result in a lake.

The 3D Embankment is a berm currently being used to retain waste materials. It contains 29.7 million yards of available material. Thus, the 3D Embankment Alternative cannot meet the goals of the approved reclamation plan because it does not contain sufficient material (approximately 40 million yards less than required). Use of this material would result in an outcome that is far different than the existing plan and would destroy an area that is partially reclaimed.

With no other sources of material at the site, the revised goal and outcome from the use of the available 3D Embankment material would be to create a positive drainage at Pit 7, as there isn't sufficient material to achieve the approved post-mine topography. Although Pit 7 would not be filled according to the existing plan, it would create a condition that could manage surface water runoff, with considerably reduced topography. Thus, the 3D Embankment Alternative results in a different outcome than the Proposed Action and does not meet the Need (Section B). Several issues prevent the 3D Embankment Alternative from meeting the purpose and Need (Section B) and being a reasonable alternative. They are listed here in no particular order:

- Cost – Hauling the 16.8 million yards required for positive drainage from the 3D embankment area would cost $43 million to move material around on the site, which is $33 million more than the estimate for the Pit 7 Reclamation Plan itself ($10 million). The resultant contours from this effort would not meet the grading contours required in the existing plan.

- Environmental Impact – The 3D Embankment was considered as an alternative to creating a lake, by addressing Pit 7 reclamation without the availability of a continuous supply of mining overburden. Filling Pit 7 as prescribed in the existing reclamation plan requires 73 million yards of fill. The 3D embankment offers 29.7 million yards of fill, which cannot fill the pit. The area referenced as the 570 Lift, east of the 3D Embankment area, is far along with its environmental restoration. Approximately 140 acres has already been rough graded, and vegetation has been established to varying degrees. Re-grading this area to obtain material to aid the backfilling of Pit 7 would damage reclamation progress achieved to date, generate vehicle emissions and consume fuel, and delay completion of reclamation at the 3D Embankment site. Upon completion, original

contours would not be restored. Therefore, in addition to cost and logistical issues that make it impracticable, this alternative has greater environmental impact than the proposed Plan.

In summary, because the 3D Embankment Alternative would not be economically feasible and would create additional environmental impacts beyond those described under the Proposed Action, this alternative is not a reasonable or practicable alternative, and is eliminated from detailed analysis in this EA.

C.4. Alternatives Summary

Because other action alternatives have been shown to be unreasonable, only the Proposed Action and No Action are considered in this EA. **Table 4** (Appendix B) provides a summary of the two considered alternatives.

A description of the affected environment (Section D), potential impacts from the alternatives (Section E), and cumulative impacts (Section G) are included in this EA.

D. AFFECTED ENVIRONMENT

D.1. General Setting and Baseline Condition

The affected environment in the proposed revision area is similar to that found throughout the existing mine permit area. A county road (Big Hanaford Road) runs through the permit area along the Big Hanaford Valley, serving as the primary transportation mode. The area is rural, with a mixture of wooded hills, reclaimed hillsides, mine pits, and other uses such as a rail line, a gas-fired power plant (not currently in operation), coal-fired power plant and coal pile, and a 1,500-acre portion of the site that has been set aside as a future business park. The area includes a range of land uses from industrial to mine reclamation to natural.

Prior to mining, the Pit 7 area was a private forest. The ridge line lay in a north, north-westerly direction and its peak elevation ranged from 600 feet in the south, southeast to 420 feet to the north, northwest. The topography sloped steeply to the northeast where it plateaued in the Packwood Creek Valley. The forest was predominantly Douglas fir. The area provided shelter and food for local wildlife.

Mineral resources (coal) specific to Pit 7 included the following coal seams: Thompson, Big, Little, and Smith. The area has been disturbed where mining activities have occurred and is currently undergoing reclamation. Reclamation activities are designed to return the area to the approximate appearance and condition that existed prior to disturbance.

The Pit 7 area includes an open pit mine (no longer active), spoils disposal areas, and roads. Almost all vegetation was removed during mining activities. The existing reclamation plan is designed to return the Pit 7 area to a condition similar to its pre-mining condition. It is partially reclaimed. All areas disturbed by mining operations in the pit are currently scheduled to be backfilled and graded by the end of the 2026-2030 permit term (**Figure 5**; Appendix C) to meet requirements of the PAP.

The affected environment under No Action is expanded to include an offsite borrow pit. Although the site and its characteristics are unknown, as No Action is created to provide a qualitative comparison with the Proposed Action, the requirement for 73 million yards of fill can be met with a borrow pit approximately 500 acres in size, allowing for slope and access, and 100 feet deep.

A key element of the reclamation plan includes the connection of the Pit 7 Lake to Packwood Creek, which then flows to Big Hanaford Creek and the Skookumchuck River (Figure 2). This lake will support the river system's ability to support fisheries and fish habitat, as well as wildlife habitat. This element (streamflow) is the only part of the project that goes off site (streamflow off of the permit area and downstream) and it enters an area containing endangered species and for which a 303(d) listing (impaired waters) has been created. (GHG emissions also leave the site, but the lack of their significance and regulatory applicability is documented elsewhere in this EA).

An outlet channel that connects the two water bodies (Packwood Creek and Pit 7 Lake) will be capable of supporting and enhancing fish and wildlife habitat. The outlet channel will be a compound channel with a narrow low-flow element for normal winter and summer outflows from the lake, and with a wider floodplain element, to accommodate outflows during large precipitation events. **Figure 6** (Appendix C) shows the final outlet channel design.

D.2. Resources and Determination of Need for Further Analysis

Elements of the environment specified by statute, regulation, Executive Order, or the Standards for Public Land Health are described and analyzed in this EA. NEPA documents "**must concentrate on the issues that are truly significant to the action in question, rather than amassing needless detail"** (40 CFR 1500.1(b)). OSMRE NEPA Guidance specifies that the EA should "Evaluate impacts only as needed (sic) for the decision maker to determine whether there are significant environmental impacts which may require the preparation of an EIS."

While many issues may arise during scoping, not all of the issues raised warrant analysis in an environmental assessment. Issues are analyzed if the following conditions are met:

- An analysis of the issue is necessary to make a reasoned choice between alternatives, or
- If the issue is associated with a significant direct, indirect, or cumulative impact, or
- Where analysis is necessary to determine the significance of the impacts.

Table 5 (Appendix B) lists the resources considered for this EA, the resources that are not considered and why, and the determination as to whether they require additional analysis in this EA.

D.3. Affected Resources

D.3.1. Topography, Geology, and Soils

In the pre-mine topography, the Pit 7 area rose sharply from the Packwood Creek valley (starting at approximately 260 ft asl) to a long ridge that trended upwards from its northwest end toward the southeast (**Figure 7**; Appendix C). The ridge had some distinct high points with elevations at the southeastern part of the ridge reaching approximately 600 ft asl (in the northwest quarter of Section 4, Township 14 N, Range 1 W). The approved reclamation plan is intending to approximately restore the site topography and soils to this pre-mine condition, with similar elevations, slopes, vegetation and timber.

The local geology is one of the factors that contributed to the cessation of coal mining at the site. Pit 7 has a history of geotechnical issues that were encountered during mining operations. Faults, weak coal seams and other weak layers have been identified as contributors to areas of instability. Two large slides or slumps have occurred in Pit 7. The first occurred along the northeast section of the highwall in 1999. The scale of this movement was such that it trapped water, resulting in a lake (Sag Lake Arm) adjacent to Packwood Creek, and caused significant cracking of the adjacent highwall to the west. The geometry and scale of this movement indicated that it was likely due to a sliding failure along the weak carbonaceous bentonite layer near the bottom of the Big Dirty Seam.

The second slump occurred in the southeast area of the pit during construction of the 570 dump in 2002. This was initiated by the addition of two lifts of waste on the top of the dump. The settlement resulted in the crest of the top lift dropping at least 70 feet, displacing the haul road at the toe of the dump by as much as 40 feet to the north. The extent of this failure affected approximately 1,200 feet of haul road and extended some 2,500 feet from the crest down to the toe. This failure occurred within the waste material

and along the Smith Seam footwall. The failure was likely associated with the existence of several mud cells that were incorporated into the waste material and possibly a softened zone at the footwall and spoil interface.

The proposed Plan includes measures to stabilize these areas for the final post-mining topography. The areas of concern include potential concerns with nearby utilities, potential movements associated with the highwall and footwall, and stability of the spoil disposal area. Material movement is planned in such a way as to provide adequate factors of safety in these areas. For example, the design document for the Plan includes some of the following design measures to enhance stability:

- Designing a buttress along the toe of the west end of the highwall
- Re-grading of the highwall and spoil backfill to meet the required 1.3 factor of safety for closure design.

Soil surveys within the permit area indicate 25 soil mapping units representing 28 soil series. The Melbourne silty clay loam (20-40% slope), Centralia loam (15-30% slope), and Buckpeak silt loam (30-65% slope) dominate the area, collectively accounting for 55% of the disturbance area. About twenty-seven% of the permit area was previously disturbed by coal mining. Soil analyses found that all of these soils are suitable for plant growth. Textures range from heavy clay subsoils to very coarse loamy sands. **Figure 8** (Appendix C) shows the distribution of soils within the Pit 7 area at the time the initial permit was issued.

- The Buckpeak silt loam is a very deep, well-drained soil and is typically found on slopes in the permit area ranging from 30-65%, or on upland hillsides and ridge tops. This unit is used for timber production, wildlife habitat, and watershed. Douglas fir and red alder are the main woodland species on this soil.
- The Centralia loam is a very deep, well-drained soil and typically is on uplands and is delineated on about 13% of the Permit Area. Slopes are generally hilly. The native vegetation is primarily conifers. Most areas of this unit are used for timber and wildlife habitat and as a watershed. Douglas fir and red alder are the main woodland species on this soil.
- Galvin Silt Loam is very deep, somewhat poorly drained soil and typically is on terraces and alluvial fans and is present on less than 1% of the Permit Area. It formed in mixed alluvium weathered from siltstone, micaceous sandstone, and basalt. Slopes are generally rolling (8-15%). The native vegetation is mainly deciduous trees and some mixed conifers.
- Reed Silty Clay Loam is very deep, poorly drained soil and typically is on flood plains. It formed in mixed alluvium and covers 8% of the Permit Area. Slope is 0% to 3%. The native vegetation is mainly deciduous trees, a few mixed conifers, grasses, and sedges.

Most areas of this unit are used for timber and wildlife habitat and as a watershed. Douglas fir and red alder are the main woodland species on this soil. The main limitation for the harvesting of timber is seasonal soil wetness. Many kinds of game and non-game wildlife are on this and adjacent units. Use of forest management practices that create diverse habitat can increase the kinds and populations of wildlife.

Topsoil stockpiles TS-20, -21, -22, -23, -24, -26 and TS-54 are targeted for use in the final reclamation of the Pit 7, 570 Lift and 3D areas. **Figure 9** (Appendix C) shows the locations of most of these topsoil stockpiles and their proximity to Pit 7.

D.3.2. Hydrology

D.3.2.1. General Surface and Groundwater Hydrology

Surface water drainages within the permit and adjacent areas include all or part of the following watersheds:

- Skookumchuck River
    - Big Hanaford Creek;
    - North Hanaford Creek;
    - South Hanaford Creek; and,
    - Packwood Creek.
- Newaukum River
    - North Fork of the Newaukum River; and,
    - Mitchell Creek.

Drainage patterns within these watersheds are generally branched. Big Hanaford Creek and its perennial tributaries (North Hanaford Creek, South Hanaford Creek, and Packwood Creek) all trend west to northwest within the permit area to join the Skookumchuck River about four miles west of the Centralia mine. Mitchell Creek trends south to join the North Fork of the Newaukum River just outside the southern permit boundary. Both the Skookumchuck and the Newaukum Rivers flow west into the Chehalis River near the towns of Centralia and Chehalis, and eventually to Grays Harbor and the Pacific Ocean.

Surface water in and adjacent to the Permit area is classified as Class A waters according to the State of Washington Water Quality Standards (WAC 173-201A). Class A has standards to protect surface waters for aquatic life and recreational use, including primary contact and fishing and boating.

Water supply uses include, but are not limited to domestic, industrial, agricultural, stock water and wildlife habitat. The public is prohibited from such access and use while the mining and reclamation is underway but might have access to the area when it returns to private ownership after reclamation.

The Skookumchuck River is one of the rivers in the upper Chehalis River Basin for which the Washington State Department of Ecology established a Total Maximum Daily Load for factors such as dissolved oxygen, temperature, and other factors. The water quality criterion for the river [18 degrees Celsius (°C)] is exceeded on occasion, and primarily in June and July (Washington State Department of Ecology 2001). The 2001 report included modelled predictions and effects from various activities in the watershed. Of nine factors affecting temperature in the model, the top two were air temperature and

humidity, followed by solar radiation. The least important factors were travel time, groundwater input, and inflow to the river. Temperature and humidity are natural events.

Mining activities within the permit area have encountered only minor amounts of groundwater. Low permeability of the coal and overburden materials limits the amount of available groundwater and its potential for use. The most important aquifer in the area is the Vashon Drift, a surficial glacial deposit of outwash and lacustrine origin located in the Skookumchuck Valley north of the permit area boundary. Groundwater also occurs in the valley sediments of Packwood and Big Hanaford Creeks and in the coal seams of the Skookumchuck Formation. Limited perched groundwater occurs in the remnants of the Logan Hill Formation found in the northern portion of the permit area. The regional groundwater flow typically mirrors that of the surface water in the area. Within the mine Permit area the flow of groundwater and surface water is generally to the northwest.

The use of groundwater in and adjacent to the Permit area is primarily limited to domestic and agricultural uses. Most of the groundwater use within the mine Permit area is limited to the alluvial areas where the wells are at shallow depths.

D.3.2.2. Pit 7 Surface Water Hydrology

In the pre-mine environment, surface water in the Pit 7 area flowed to Packwood Creek, a tributary to Big Hanaford Creek. Surface runoff from land consisting mostly of an upland forest flowed to the northeast before entering the creek. Packwood Creek flow is primarily southeast to northwest as it meanders through the valley. Prior to mining, uses of surface water in the pit area included aquatic life, wildlife habitat, agricultural and possibly stock water.

In the post mining environment, including the existing baseline condition which encompasses various ongoing reclamation activities, surface water drainage in Pit 7 is controlled by a series of diversion ditches and sedimentation ponds. On the south and western side of the pit are a series of road ditches that carry disturbed surface water to either Pond 44, located to the north, northwest of Pit 7, or into the pit itself. To the north of the pit is a disturbed runoff diversion (Ditch 20) that collects disturbed drainage from the highwall on the west side of the pit and diverts the surface runoff towards diversion 30D. On the eastern side of Pit 7, the Pond 19 series collects disturbed runoff from the spoil piles and diversion K85.

D.3.2.3. Pit 7 Groundwater Hydrology

Groundwater within the Pit 7 area is predominately located in the Packwood Valley Alluvium. Minimal presence of groundwater exists within the coal seams and in the Skookumchuck Formation. Within the pit area itself, the low levels of groundwater present flows from all of the hydrogeological units towards Packwood Creek. Groundwater is a minor component of the overall water balance in the pit area.

Geologic and groundwater information is provided in Section 3 of the approved PAP, including groundwater monitoring and well testing, and several groundwater investigations performed by CH2M HILL (Appendix 6.3-3 of the PAP). This data confirms that the entire Pit 7 area has low permeability, with hydraulic conductivities ranging between 0.15 and 26.5 ft/day. Recharge potential for the Packwood Valley alluvium indicate the production of water at a rate of 1 to 5 gallons per minute. There are no known human users of groundwater in the Packwood Valley because the overall quality of the groundwater in this area is poor. Has been found to contain elevated concentrations of Total Dissolved

Solids, chloride, iron and manganese (above state drinking water standards) (Appendix 6.3-3 of the PAP). Potential uses of this groundwater still may include irrigation and livestock watering.

One of the concerns about groundwater or even surface water at or near a mine site is the potential for acid drainage or, in this case, acid inflow into the proposed new lake. The spoils themselves have been tested and found to be suitable for reclamation purposes, exhibiting no acid-forming potential. The potential for acid drainage was evaluated (Norwest Corporation, 2012) and found to have negligible effects on the Pit 7 lake. Existing groundwater is not acidic, and the existing soils and backfill materials that are being used to re-contour the Pit 7 area are not acid forming. Analysis predicted that conditions were expected to be predominantly alkaline.

The Centralia mine has acid drainages located at the North Field area of the mine and in Central Packwood. These drainages are managed and treated by approved treatment systems and are not on the Pit 7 site, not affected by the Proposed Action, and do not contribute to the lake.

D.3.3. Land Use

The upland areas in and around the permit area have historically supported productive commercial forests, while most of the low-gradient valleys have been drained for limited farming and marginal pasturelands. Pre-mine land use in the Pit 7 area was predominately upland forest (used for commercial forestry) with a minor portion being used as lowland forestry (fish and wildlife habitat).

The Centralia Mine is located in the highly productive Douglas fir upland forest of western Washington. Other conifers include western red cedar and western hemlock occurring in dense stands that range from 35 to over 100 years old.

In the Permit and adjacent areas, upland forest cover is generally second and third growth since the area has been logged at least once and in some places twice. Invading hardwoods include 60-year old red cedar. Intervening grazing and burning has prevented natural regeneration on portions of the logged area. Lowland forest occurs along drainages and valley bottoms. These areas, although perhaps previously developed, have been allowed to return to a riparian or lowland forest condition. Because of the amount of precipitation in western Washington and frequent flooding of valleys during winter, areas in the drainages and valley bottoms that are left unmanaged for pastureland or forestry will return to an undeveloped condition.

See **Figure 10** (Appendix C) for the distribution of the pre-mine land uses. Mined land (disturbed by mining) describes areas currently subject to surface mining and reclamation operations, and previously subject to both underground and surface mining operations. A large portion of the lands categorized as "pre-mine" by TCM also falls into the formal category of "previously mined areas" as defined in 30 CFR 947.701.5, as they had been mined for coal prior to August 3, 1977.

About a third of the Pit 7 area was previously disturbed by mining, but based on the pre-mine topography, the majority of that previously disturbed land would have supported an upland forestry and a minor amount of lowland forestry land use. Of the 597 acres of land at Pit 7, 366 acres was upland forest and most of the rest was already disturbed. **Table 6** (Appendix B) summarizes the pre-mine land uses by acre within the disturbed Pit 7 area. The current topography and land use is shown in **Figure 11** (Appendix C).

D.3.4. Vegetation

TCM's predecessor conducted a vegetation survey of the area in 1980 (Norwest 2012). There are four major plant associations within the Permit Area: Douglas fir, red alder, Oregon ash, and sedge-meadow (**Table 7**; Appendix B).

Two of the associations, Douglas fir and red alder, are predominantly forest and occupy approximately 62% of the Permit Area. The Oregon ash association accounts for 4%. The sedge-meadow association is classed as agricultural land, and accounts for 5%. Douglas fir – vine maple and red alder – vine maple have similar taxonomy to their major associations and although they are described, they are too similar to distinguish in **Figure 12** (Appendix C), Pit 7 Vegetation. Both the rough slough sedge – common rush and the meadow fescue – Kentucky bluegrass associations are also shown within the major sedge-meadow association.

As mapped in Figure 12, vegetation within the Pit 7 area prior to mining disturbance is comprised of the Douglas Fir –Sword Fern, Red Alder – Sword Fern, and Oregon Ash – Black Cottonwood – Skunk Cabbage plant associations.

Three shrubs were introduced to the area after mine disturbance and often became dominant in disturbed areas. Ultimately they became troublesome weeds (Scotch broom, Himalayan and Evergreen blackberry). It is common to find Scotch broom, Himalayan blackberry and Evergreen blackberry in the disturbed land of Pit 7.

D.3.5. Fish and Wildlife

In the pre-mine environment, site habitat was dominated by forest. Previous to the operation of the Centralia mine, forest habitat was changed by mining activities and forest practices. Although limited in area, habitat types such as bottomland riparian forests, sedge-meadow pastureland, and wetlands and ponds also occur within the permit area.

Aquatic habitat exists within the ponds, small wetland areas, and along the Big Hanaford, the Packwood, and the North and South Hanaford Creeks. Within the permit area, these are low-gradient, slow-moving streams that have been extensively altered by past land-use practices by early settlers attempting to drain the wetlands of the valley bottoms. This occurred many years before opening and operating the Centralia mine. Because of this past channelization, and the elimination of streamside cover, the creeks have sandy and clayey bottom substrates, and their habitats are low value, with few riffles and pools, few gravel substrates, little shade and bank cover, and few sources for large woody debris.

Sedimentation ponds created during mining activities have expanded the available wetland and pond habitat as the pond perimeters and islands develop typical wetland vegetation. These are used by waterfowl, furbearers, and other wildlife species. Some anadromous Coho salmon do still use these streams to obtain access to headwater breeding areas. Other fish identified in area streams include sticklebacks, mudminnows, dace, and sculpins. Further down the watershed, the Skookumchuck River also supports steelhead and cutthroat.

At least 18 species of mammals, various species of waterfowl, and ubiquitous populations of songbirds have been documented. Black-tailed deer are commonly seen at forest edges, feeding in meadows and

often in newly re-vegetated areas. Other big-game animals, although uncommon, include black bear and mountain lion. Other mammals include Roosevelt elk, raccoons, mink, otters, skunks, beaver, muskrats, hares, deer mice and voles.

More than 40 avian species have been documented in the permit area and an additional 100 species are considered possible inhabitants or transients based on known distributions, habitats and behavior. Conspicuous avian species include red-tailed hawks, marsh hawks, American kestrels, ruffed grouse, blue grouse, and band-tailed pigeons. Common songbirds include crows, starlings, red-winged blackbirds, American robins, downy woodpeckers, hairy woodpeckers, rufous hummingbirds, chickadees, golden-crowned kinglets, winter wrens, dark-eyed juncos, song sparrows and savannah sparrows.

Consultation with the U.S. Fish and Wildlife Service in 2004 and 2020, pursuant to the Endangered Species Act, determined that the following federally threatened or endangered species may occur in the vicinity of the mine:

- threatened bull trout (*Salvelinus confluentus*);
- threatened Canada lynx (*Lynx canadensis*);
- threatened gray wolf (*Canis lupus*);
- threatened grizzly bear (*Ursus arctos*);
- threatened bald eagle (*Haliaeetus leucocoephalus*);
- threatened marbled murrelet (*Brachyramphus marmoratus*);
- threatened northern spotted owl (*Strix occidentalis caurina*);
- candidate streaked horned lark (*Eremophila alpestris strigata*);
- candidate Pacific fisher (*Martes pennanti pacifica*);
- candidate Mazama pocket gopher (*Thomomys mazama spp*.);
- candidate Oregon spotted frog (*Rana pretiosa*);
- candidate mardon skipper (*Polites mardon*);
- candidate whulge (Edith's) checkerspot (*Euphydryas editha taylori*);
- threatened golden paintbrush (*Castilleja levisecta*);
- threatened Kincaid's lupine (*Lupinus sulphureus kinkaidii*); and,
- threatened Nelson's checker-mallow (*Sidalcea nelsoniana*).

Consultation with the Washington Department of Natural Resources (Heritage Information System) and WDFW in 2004, pursuant to the Washington Endangered Species Act, determined that the following State threatened or endangered species may occur in the vicinity of the mine:

- sensitive Olympic mudminnow (*Novumbra hubbsi*); and,
- endangered Pacific pea (*Lathyrus vestitus boldanderi*).

Consultation with NMFS in 2004, pursuant to the Magnuson-Stevens Fishery Conservation and Management Act (MSA), as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), determined that designated Essential Fish Habitat for the following salmon species may occur in the vicinity of the mine:

- Chinook salmon (*Oncorhynchus tshawytscha*); and,
- Coho salmon (*Oncorhynchus kisutch*).

Essential Fish Habitats are "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity" of species managed under a federal Fisheries Management Plan. For the Pacific West Coast (excluding Alaska), there are three Fisheries Management Plans covering groundfish, coastal pelagic species, and Pacific salmon. Essential Fish Habitat for groundfish and coastal pelagic species does not occur within the project action area or anywhere in freshwater. The Pacific Salmon Fisheries Management Plan includes Chinook, Coho, and Puget Sound pink salmon.

In September 2011, TCM accessed the public version of the Washington Department of Fish and Wildlife's Priority Habitats and Species (PHS) Report to review the threatened and endangered species listed for the Centralia Mine area. The PHS identified Coho salmon and cutthroat trout as the only federal listings as "Threatened." TCM contacted WDFW by email on September 12, 2011 with a request to validate its findings. By email dated September 16, 2011, WDFW confirmed TCM's findings on the PHS. WDFW also reviewed its internal version of the PHS and Geographic Information System data and found that the Olympic Mudminnow is listed as a State Sensitive Species. Based on this review, the discussion above is accurate. Copies of the report and email correspondence between TCM and WDFW are included in Appendix A of this EA.

D.3.6. Greenhouse Gases and Climate Change

Prior to mining the land, the Pit 7 area was predominately forested, as noted in Section D.4.3 (Land Use). These forested acres were harvested or otherwise removed by mining and forestry activities. The benefit of trees to the environment (reduction of greenhouse gases, or GHG) was temporarily lost and much of the disturbed areas are still without forest.

Mining and reclamation operations require the use of large diesel engine powered, machinery. Since active mining ceased in 2006, the number of vehicles (77 during active mining versus 36 used for reclamation) and the hours of operations of all vehicles (24-hours a day while actively mining but 16-hours a day during reclamation only) have decreased significantly. Thus, GHG emissions are much lower now than when mining activity was at its peak (e.g., when coal was mined simultaneously from the North Hanaford Pit, the Central Packwood Pit, Pit7 and the Kopiah Pit). This lower emission rate will go even lower when the reclamation is complete, as will the emissions from the existing coal plant which will eliminate 50% of its emissions by 2020, and 100% by 2025. TCM uses low-sulfur diesel fuel for its off-road trucks which helps in reducing sulfur dioxide emissions and resultant ozone concentrations.

GHG emissions are generally not regulated unless they exceed the reporting and permitting limits of the U.S. Environmental Protection Agency (EPA). Such limits apply to major point sources and usually apply to large point sources such as refineries or power plants. By regulation, they do not apply to transportation

activities or mobile sources – so there are no regulatory standards that exist to determine whether the proposed combustion emissions (from vehicles) relate to any applicable emission standards.

For context, existing greenhouse gas emissions criteria for point sources, although they do not apply, are as follows:

- Mandatory reporting for greenhouse gases under EPA regulations is required when GHG emissions exceed 25,000 metric tons or more of carbon dioxide equivalent (CO_2e).
- Prevention of Significant Deterioration (PSD) permitting under the federal program is required for new construction projects that emit GHG emissions of at least 100,000 tons/year of CO_2e.
- PSD permitting is also required for projects involving modifications at existing facilities (already above 100,000 tons/year) that would emit GHGs of at least 75,000 tons/year of CO_2e.
- Title V permitting is required for GHG emissions of 100,000 tons/year of CO_2e.

D.3.7. Recreation

The mine site was private property before mining, and recreational use was up to the property owner. It is not known if any recreational uses occurred on the site before mining began. Possible uses may have been hunting and fishing.

TCM's guiding principle, while mining operations were active and reclamation is ongoing, allows no public hunting or fishing in the permitted area of the Centralia Coal Mine. TCM's property is posted for "No Trespassing" and access to the mine from public roads is secured by locked gates. TCM does not allow public access or recreational uses such as fishing, boating or swimming in the mine area.

TCM does, however, coordinate with the WDFW on guided, handicapped elk hunts each fall. Typically these hunts occur on mature reclaimed lands where such activities would not compromise the success of revegetation; however, TCM has routinely held handicapped hunts in the Pit 7 area. This only occurred when no active mining operations were in process.

General restriction of public access will continue until reclamation is completed, the bond released, and the property turned over to private ownership. It will be up to that owner to decide on the level of public access at that time.

D.3.8. Noise

TCM conducted mining operations in Pit 7 for more than 20 years. During that time several fleets of equipment were used for the movement of overburden and the removal of coal. This included blasting operations which can produce brief periods of loud noise. The local residents were over one mile away from the closest mining activity and the residences were separated from the active mining area by at least one ridge line. While mining activities were in full operation, TCM and OSMRE never received a noise complaint from local residents.

With the mine closed, blasting is no longer being used. Ongoing reclamation activities involve fewer workers, fewer excavation vehicles, and no blasting, so noise emissions are less now than during mining, when noise emissions still met standards (as described in Section E.8).

D.3.9. Public Health and Safety

There were no known public health and safety issues under pre-mine conditions of the Pit 7 area, or the mine as a whole. Once mining operations began at the Centralia Mine, TCM posted its property for "No Trespassing" and limited public access to the mine and its properties with secure, locked gates and the use of security personnel. TCM employs a security service to patrol the mine property and ensure the integrity and security of the mine gates. With the public prohibited from accessing the property, and all on-site facilities permitted under local, state or federal regulations, the mine operation and the Pit 7 area have created no public health or safety issues on the site.

Mine operation has had no effect on public health and safety services available (police, fire, medical) from nearby towns like Bucoda, Centralia, or others, or from the Counties.

D.3.10. Air Quality

Between 2000 and 2009, the air quality index for Centralia has been rated Good (the highest rating, and better than the average of all United States cities). Likewise, Centralia was also lower for background conditions of lead, nitrogen dioxide, ozone, particulate, and other parameters. Carbon monoxide levels have been higher than the United States average, although levels have dropped from 1.2 parts per million to 0.48 parts per million since 2000. The major source of carbon monoxide, nitrogen oxides and sulfate in the area is the steam plant, which will reduce emissions by 50% by 2025 and by 100% by 2030.

The most significant sources of interest for a reclamation plan are vehicle exhaust and fugitive dust emissions from spoils material (dirt) grading and dumping, and from truck tires and wind-blown fugitive emissions from poorly covered trucks.

D.3.11. Transportation and Traffic

The primary transportation route to the site is the Mellen Street or Harrison Avenue exit from Interstate 5 (I-5) through downtown Centralia to Washington State Highway 507 N to Big Hanaford Road, a two lane county arterial, to the mine site. The approximate distance from I-5 to the pit is approximately 12 miles, depending on the route and access point. Other than commute drivers coming to work every day as they do now, there are no transportation routes to discuss, and no traffic conditions to consider at Pit 7, because there are no public roads involved, and no traffic at the site.

D.3.12. Public Services

The only public service topic identified for discussion (Table 5) is highway maintenance. The roads downtown are maintained by the City of Centralia public works department. SR 507 and other state highways in the county are maintained by Washington State DOT. Big Hanaford Road and others in the county are maintained by the Lewis County Road Maintenance Division.

E. ENVIRONMENTAL IMPACTS OF THE PROPOSED ACTION AND ALTERNATIVES

This section contains an analysis of the probable new or additional impacts from implementing the Pit 7 Reclamation Plan revision to the existing reclamation plan for the Centralia Mine. Analysis of the considered alternatives is presented in terms of duration, magnitude, and context of potential adverse impacts, as defined by criteria presented in **Table 8** (Appendix B).

Potential effects of the No Action alternative are discussed in qualitative terms, based on assumptions of the elements of No Action that would be required to complete the Pit 7 reclamation plan under the PAP, but without mine spoils to use for fill.

E.1. Topography, Geology, and Soils

E.1.1. Impacts of the Proposed Action

The post-mining topography after implementation of the Plan will differ from the post-mining topography envisioned in the existing reclamation plan because of the addition of the Pit 7 Lake (see Figure 2). This is a long-term impact to the topography of the Pit 7 restoration plan area because the lake converts approximately 130 acres of potential future upland hillside that would have been created in the post-mining landscape to a lake. The remainder of the 597-acre Pit 7 area (467 acres) will still be graded, raised in elevation, and returned to conditions similar to pre-mine conditions, as envisioned in the existing plan (PAP).

The southern portion of the Pit 7 area was the first area to be mined as part of the Centralia Mine in the early 1980s. This was then used for the placement of spoil material as mining operations progressed towards the northern portion of the pit. The average post-mining elevation in the Pit 7 area Plan will be approximately 380 feet mean sea level (msl). This is approximately 60 feet lower than the goals of the PAP, although the proposed topography and topographic differences vary considerably. For example, the maximum Plan elevation is only about 20 feet lower than the existing PAP goal; the minimum elevation about is about 95 feet lower (although covered with lake water). Thus, the overall Plan elevation will be lower than projected in the PAP and the overall variability in topography less as well. The maximum elevation of the post-mining topography as described in the Plan will be approximately 600 msl and the lake bottom will be approximately at 165 feet msl. Overall, to meet PAP requirements, the PAP would require an average fill over the entire site of approximately 60 feet. When averaging the additional material required to fill the lake, and the 60 feet required to meet the PAP, the combined fill volume is equivalent to an average fill height of about 90 feet for the site, which would require a minimum of 73 million yards of material.

The lake would impact the average elevation in the Pit 7 area because of the lake depth and its displacement of upland forest topography. The final post-mining slopes in the Pit 7 Plan design will range from 9-34%, and average about 19%. These slopes are very similar to those of the existing plan in the same area, which replicated pre-mining topography, and which ranged from 8-34%, averaging around 16%. Overall the impact of the changes to the post-mining topography in the entire existing plan is minor because the changes affect 22% of the Pit 7 area, and far less than 5% of the mine site. The conclusion of

a **minor** change in topography from the Plan compared to the existing plan is because the elevations are still similar to the existing plan, the peak elevation is nearly the same as the existing plan, only 130 acres out of 597 (about 20%) has been removed from land topography, and the balance of the site will still be reclaimed and vegetated as originally envisioned.

E.1.2. Impacts of No Action

No Action would meet the requirements of the PAP by bringing in 73 million yards of fill material from off site. This would fill the pit and fill higher to recreate historical topography as per the PAP, raising the average site elevation approximately 60 feet in addition to filling the proposed lake pit. Impacts to topography, geology and soils at the Pit 7 site would be consistent with the PAP and would be **negligible** to **minor**. Final topography would fully meet PAP requirements.

For purposes of comparison of potential impacts, TCM estimated an approximate size of the borrow pit that would be needed to meet the 73 million yards of fill requirements. Actual borrow pit dimensions are unknown because no such pit has been proposed, and none this size is known to exist in western Washington. If a borrow site were to be dug 100 feet deep to supply 73 million yards of fill material, it would eliminate approximately 500 acres of soils and topography, accounting for slopes, access, etc. If 50 feet deep, the borrow site pit would require 1,000 acres – approximately 1.5 square miles. For purposes of analysis, we have assumed 500 acres.

Although the borrow site location is unknown, typical western Washington land is hilly, forested, and part of the watershed of one or more streams. Much of the area is federal land or owned by timber companies or WDNR for forest practices (timber harvest). Converting any 500-acre site in Western Washington from its current topography, whether hilly or flat, to a 100’ deep hole, is a **major** adverse impact to that topography.

Effects on soils from No Action is **negligible** to **minor** at the site, as soils meeting reclamation goals will be brought in as part of the restoration. Offsite soils impacts are likely to be **major** adverse impacts at the borrow pit site, with the removal of 500 acres of soil which would probably be placed at the Pit 7 site.

Thus, the impacts of No Action would be **negligible** to **minor** at the site by meeting requirements of the PAP. No Action impacts at the source of fill material, however, would be **major** and adverse, with a **major** impact on the topography of the borrow site by elimination all topographic relief and a **major** impact (elimination) on its soils.

Geological impacts are unknown and depend on whether No Action causes issues with slope stability, slumping, release of contaminants, or other geologic impacts.

E.2. Hydrology

E.2.1. Impacts of the Proposed Action

E.2.1.1. Surface Water

The main physical characteristics of the planned Pit 7 Lake are summarized in **Table 9** (Appendix B). The watershed area for the Pit 7 Lake is 597 acres including the 130-acre area of the Pit 7 Lake. Thus the

watershed and lake are approximately 470 acres and 130 acres respectively. A more detailed description of the design of the Pit 7 Lake is located in the Plan (Norwest 2012). The following subsections discuss the impacts of the Plan on surface water hydrology, soil erosion, and water quality.

E.2.1.2. Surface Water Hydrology (Stormwater and Floodflows)

The Pit 7 Lake will include an outlet near the current Sag Lake Arm. The lake outlet will be constructed in two phases. The first phase consists of a segment of the permanent outlet channel that will be constructed concurrent with the grading to connect the Sag Lake Arm with the Pit 7 Lake. This segment is featured in the interim outlet plan presented in Figure 4.

The interim outlet plan has been designed to convey outflows from the Pit 7 Lake into Ditch 30D for temporary sediment control in the Pond 5 System until it can be demonstrated that reclamation standards and water quality discharge criteria have been attained. When this is achieved, routing through the Pond 5 system would no longer be required. Thus, Pit 7 Lake outflows will flow through the Pond 5 System until final reclamation. Ditch 30D and 30E will continue to meet the temporary diversion design criteria and the Pond 5 System will continue to meet the impoundment design criteria, including the additional flow contribution from the Pit 7 Lake.

The interim Pit 7 Lake outflow structure was designed to conform to the final lake outlet and permanent diversion P7-P1 (Figure 2). The interim outlet structure will be a compound channel with a narrow low flow channel segment for normal winter and summer outflows from the lake, and with an adjacent floodplain to accommodate higher lake outflows from large precipitation events. The interim outlet structure is located between the west end of the Sag Lake Arm of the Pit 7 Lake and Ditch 30D.

The second phase of the outlet construction consists of the permanent outlet structure (permanent diversion P7-P1). The outlet structure will be a compound channel comprised of a narrow channel 2 to 3 feet wide and 1.5 to 3 feet deep for low flows; and a wide floodplain adjacent to the low flow channel to accommodate outflows during large precipitation events. The outlet structure serves as a permanent diversion channel and meets the permanent diversion design criteria. TCM incorporated portions of the NMFS recommendations as commitments (Appendix A) including the following:

- All large woody material will be cedar or fir species and will consist of a solid, rot-free core.
- Root wads will have a minimum diameter of 16 inches and be at least 21 feet in length.
- Log barbs will have a minimum diameter of 16 inches and be at least 28 feet in length.
- TCM will measure the diameters of log barbs at the widest diameter of the bole within the banks and will measure root wad diameters at an approximate equivalent location to the breast height as if it were standing.
- Log barbs and root wads will be placed alternately along the length of the outlet channel and, where spacing allows, the log barbs will be placed upstream of the channel bends on the outside bank at an upstream angle of about 45 degrees. Log barbs will be placed such that the flow vector over the barb will tend to be perpendicular to the alignment of the barb. Logs will be anchored in

the bank with a slope toward the middle of the channel; duckbill anchors can also be used to help secure the log.

- Root wads and woody debris will be applied as wildlife habitat enhancement features around the perimeter of the Pit 7 Lake (including the Sag Lake Arm). Woody debris will consist of a pile (one feature) of five logs, greater than 4 inches in diameter and greater than 6 feet in length.

- TCM commits to placing 293 features around the perimeter of the Pit 7 Lake (including the Sag Lake Arm) within the 16.8-acre littoral zone. Of the 293 features placed, 20% will be root wads and 80% will be woody debris piles, or 59 root wads and 234 woody debris piles. All root wads and woody debris placed around the perimeter of the Pit 7 Lake and Sag Lake Arm will be anchored using one of the best practices for anchoring as described in the Washington State Stream Habitat Restoration Guidelines (Cramer 2012).

- TCM commits to placing 119 features along the permanent outlet channel, 50% root wads and 50% log barbs, or 60 root wads and 59 log barbs.

The Plan will detain stormwater flows and, as a result, reduce peak downstream flows, and reduce flooding and erosion potential in both creeks and, to a negligible extent, the Skookumchuck River. Peak runoff flows from the existing planned reclamation vary during storm events. Stormflows are attenuated with the additional storage volume provided by the lake including the 130 acre feet of storage added when outflows are one foot deep.

The 10-year storm generated a 6.6-cfs flow; the 100-year (shorter duration) storm would result in a 3.4-cfs flow from the lake and into Packwood Creek.[2]

This detention and attenuation of flow has many hydrologic benefits. These include reducing potential floodflows downstream and reducing high-flow scour and turbidity. The watershed system is already exhibiting floodflows, scour and turbidity. Thus, such reductions would generally be positive, as is the attenuation of flows that keeps higher, but much less damaging, flows in the system over a greater period of time. This provides opportunities for lower stormflows, less scour, and higher quality water to move downstream.

The majority of run-off from the Pit 7 area will be directed through a series of down drains (P7-S1 through P7-S5) (**Figure 13**; Appendix C).

E.2.1.3. Soil Erosion from Surface Water

Stormwater and floodflows increase erosion, which in turn affects water quality and habitat. Any step that reduces stormwater/flood flows removes or reduces those impacts. If storm and floodwater is detained, the result is a continuous low flow that contributes to the system long after precipitation ends. Reducing stormflow to a maximum outflow of 3.4 to 6.6 cfs when the Pit 7 Lake is full is a **minor** impact, as it would reduce erosion potential on the site, within its drainage, and downstream to Packwood Creek.

[2] The detailed Probable Hydrologic Consequences analysis for the Pit 7 Lake is included in Section 6.1.6 of TCM (2014).

The Plan proposes controlling surface water runoff by constructing a series of terrace ditches and down drains on graded highwall slopes. Additionally, surface water runoff is minimized by revegetating slopes. Once topsoil is placed, TCM will plant an approved seed mixture to establish a ground cover on the reclaimed land. These areas will then be mulched to provide additional protection from erosion. During the reclamation process, the terrace and down-drain structures will maintain drainage and control erosion while the vegetation is establishing on the slopes.

The Pit 7 Lake has been evaluated for its capability to perform as a sediment control structure. There is ample sediment storage capacity within the lake to control sediment while vegetation is being established on the surrounding slopes. The lake also attenuates the velocity and peak flow of surface water prior to discharge.

E.2.1.4. Surface Water Quality

Surface water quality evaluations described in the Plan allow TCM to draw some conclusions on water quality trends. While there are long-term data to support these trends, TCM has committed to future water quality monitoring as part of the proposed action. The monitoring plan is described later in this section.

The establishment of a large lake such as the one proposed is a key change from the previously approved post-mining topography and land use. The lake will take time to fill and lake water quality may not stabilize until after the fill has completed, shoreline erosion has stabilized, and nearshore vegetation has established. Mitigation of temporary surface water impacts will be provided by on-site control measures to reduce turbidity and shoreline erosion as described in the Plan. These include planting of emergent and macrophyte species in the lake, gentle slopes along the shoreline to increase sunlight exposure to aquatic plants, and lake outflow monitoring to ensure water quality is met before release to Packwood Creek. Such turbidity will have no water quality impacts because none of the water will be released to Packwood Creek until it has stabilized.

The Pit 7 Lake is expected to exhibit thermal stratification during the summer, which will break down during the late fall when surface waters cool and when winds get stronger. Both conditions contribute to the breakup of the thermocline and to lake mixing. This will continue throughout the winter. Surface water temperatures during the summer are expected to reach 75 degrees Fahrenheit (°F) (24°C) with temperatures as low as 43°F (6°C) below the thermocline. Dissolved oxygen is expected to be approximately 8 to 10 milligrams per liter (mg/L) during the winter and in the surface waters of the lake during the summer (at or close to saturation). Dissolved oxygen concentrations near the lake bottom during the summer are expected to be at concentrations below 1 mg/L due to oxygen demands from anoxic muds.

Lake water quality modeling was conducted to predict how water quality is likely to evolve over time as the lake fills and after the lake is full. The final results from the lake filling model were used as the initial condition for modeling lake water quality when the lake is full and discharging through the outlet structure. The evolution of water quality in the Pit 7 Lake will be controlled largely by the quality of surface water and, to a minor extent, groundwater entering the lake throughout reclamation operations, and following successful revegetation and reclamation of the areas draining to the lake.

Lake water quality modeling (Norwest 2012) indicates that within the 11- to 12-year period following lake filling, the lake will exhibit healthy water quality parameters, as follows:

- Total Dissolved Solids (TDS) levels in the lake are expected to stabilize at concentrations below 600 mg/L with sulfate at concentrations slightly above 300 mg/L. Nutrients will be at levels similar to other lakes in the area.

- Nutrient concentrations and phosphorus loadings are expected to be at levels that will sustain the lake in a healthy oligotrophic condition (i.e., having a deficiency of plant nutrients that is usually accompanied by an abundance of dissolved oxygen). The possibility of phosphorus release from the sediments was not evaluated, but this condition requires considerable phosphorous in the sediments from stormwater runoff contributions over time, and a significant anoxic layer on the bottom. Neither condition is anticipated.

- During periods of summer stratification, limited circulation in the hypolimnion (bottom waters) are likely to result in dissolved oxygen levels less than 1.0 mg/L near the bottom. This is the result of anaerobic activity in the sediments, which can release hydrogen sulfide. When hydrogen sulfide is released into the water column it can consume oxygen. This process typically happens below the thermocline and doesn't affect the near-surface water of the lake. This is not expected to occur at rates that would allow the gas to accumulate within the lake as hydrogen sulfide is oxidized quickly in the presence of oxygen.

These results indicate that the lake is expected to provide outflow water quality that meets applicable water quality criteria in Packwood Creek. In the very unlikely event that water quality conditions are not met, the lake outflow will continue to be discharged to the site's stormwater collection and treatment system.

The Pit 7 Lake is expected to be comparable to conditions present in Bosworth Lake and Roesiger Lake (south arm) in western Washington, located approximately 135 miles north of the Centralia Mine in Snohomish, Washington (**Table 10**; Appendix B). Thermal stratification in the lake is expected to break down when surface waters cool during the winter and mixing of the lake should occur on a regular (i.e., annual) basis.

Water Quality Modeling Methods

The water quality of the surface water entering the lake during operations and reclamation (prior to vegetation establishment) was estimated from samples collected from surface drainage from graded mine backfill. These samples include one sample of surface flows draining to Pit 7 collected on March 11, 2009 and two samples draining the Central Packwood mine backfill that were obtained in December 2007 from Ditch 13. The average of the concentrations from these three samples was used to estimate the chemical constituent concentrations to be expected in surface water flows draining to Pit 7 prior to completion of reclamation.

The water quality of the surface water entering the lake after reclamation was estimated from three surface water samples collected in drainage from recently reclaimed areas. One sample (WP-1) was collected on December 21, 2005 from Ditch S-17 draining a recently reclaimed slope within the West Packwood area. This area was backfilled and graded in summer 2005 and seeded to grass in fall 2005. The other two samples were taken from the S-1 waterway draining established reclaimed land in the North Field. One of these samples was collected on December 21, 2005 while the other sample was collected on March 11, 2009.

The analysis results for all of these samples, disturbed and reclaimed, are provided in **Table 11** (Appendix B). The average of the concentrations of the three reclaimed area samples was used to estimate the concentrations in surface water flows draining to Pit 7 following completion of reclamation. Also shown in Table 11 are the results of mass balance calculations of Pit 7 water quality inflows before (Disturbed) and after (Reclaimed) reclamation, based on estimated flow volumes to the lake.

The 2009 water quality results in samples obtained from Pit 7 were used to verify the use of these average concentrations from samples of surface water drainage from graded mine backfill as estimates for surface water drainage to Pit 7 prior to completion of reclamation. **Table 12** (Appendix B) lists the results of water sample analysis from samples collected in Pit 7 from five feet below the water surface and five feet above the bottom, on two sampling dates. It shows that the lake was well-mixed and both samples were representative of the lake as a whole, which was approximately 55 feet deep at the time these samples were collected. It also shows the expected inflow quality based in the samples shown in Table 11.

This data was collected, and the surface runoff water quality compared to the actual Pit 7 water quality, to determine whether surface water quality could be used to predict future lake water quality. If a correlation could be developed between surface water quality and the water quality of the water trapped in Pit 7, then this same data could be used to estimate the water quality of the future Pit 7 Lake. The first estimate of Pit 7 water quality provided in Table 12 was obtained using the average concentrations from samples of surface water drainage flowing over mine backfill at Central Packwood (Ditch 13) and similar materials at Pit 7 to estimate potential future concentrations of chemical constituents in surface water inflow to Pit 7. The second estimate of Pit 7 water quality provided in the last column of Table 12 was obtained using the single Pit 7 surface inflow sample concentrations as estimates for surface water inflow to Pit 7.

Comparison of these mass balance estimates of Pit 7 water quality with the water quality results obtained from Pit 7 water samples shows that estimates derived from the average concentrations of the three water runoff samples were closer to the observed concentrations in Pit 7.

The mass balance calculations using average values for surface water inflow concentrations provide estimates within 20% of the average value from measured results in Pit 7 samples for calcium (10%), magnesium (14%), sodium (2%), chloride (19%), nitrate (14%), potassium (20%), and TDS (9%). The mass balance calculations using the single Pit 7 inflow surface water concentrations provide estimates within 20% of the average value from measured results in Pit 7 samples for nitrate (0%) and chloride (8%). Therefore, the estimates derived from the average of the 3 samples provides the best overall match with the sodium, calcium, magnesium, potassium, and TDS measurements in Pit 7 water samples.

The mass balance calculations using average values for the surface water inflow concentrations provide an underestimate of the concentrations as compared to Pit 7 samples for more than 50% of the comparable constituents including alkalinity, bicarbonate, carbonate, calcium, chloride, magnesium, nitrate and potassium. Therefore despite the fact that these estimates match the observed Pit 7 data more closely, both estimates are used for comparison

The results of the mass balance model calculations show that modelled estimates derived from the single Pit 7 surface inflow sample results overestimated concentrations for all metals, while estimates derived from the average of the three surface water inflows overestimated the concentrations of iron, manganese and sodium and underestimated the concentrations of calcium, magnesium and potassium. In combination, these results suggest that dissolved metals are potentially reduced by precipitation or co-

precipitation within Pit 7 or that potentially iron, manganese and sodium in all surface water samples are higher than in surface water inflows to Pit 7.

The lake water quality modeling results in Table 11 indicate that the lake water quality is expected to meet all the Washington State water quality criteria for Class A water bodies as specified by the Washington State water quality criteria.

Modeling and Effects of Seasonal Flows

In addition to the stormflow modelling conducted above, which predicted 6-hour and 24-hour events, additional modelling was conducted to predict seasonal outflows from the proposed lake. Predicted low and high flows range from an annual median flow of 1.7 cfs to a maximum predicted flow of 44 cfs. It is possible that flows of these magnitudes might discharge from the lake during the warm weather seasons (predicted to occur every 9 or 10 years). The following discussion describes the potential for warmer water to have an effect on the Skookumchuck River.

The Skookumchuck is listed under section 303(d) of the Clean Water Act as an impaired water body in part due to temperature exceedances. The 303(d) listing analysis concluded that the major causes for the temperature exceedance were air temperature and humidity, followed by loss of shade in the watershed. Regardless of the cause, if the project were to significantly increase the temperature of a 303(d) listed water such as the Skookumchuck River, a significant (major) impact could result. Such increase would be a result of the increased temperature (if any) of the inflow water, and the volume of such inflow compared to the volume of the Skookumchuck River.

Before reaching the Skookumchuck River, lake outflows would enter and flow through Packwood Creek, and then Big Hanaford Creek, and would be influenced by the flows and temperatures of both of these streams. The Skookumchuck itself has an average annual median flow of 355.1 cfs and a maximum flow of 11,300 cfs at Bucoda, not far from the site. If elevated temperature flows were to leave the lake during maximum outflow periods (44 cfs) and enter the Skookumchuck during its maximum flow period (11,300 cfs) the lake outflow would be 0.39% of the flow of the Skookumchuck (four tenths of 1%). Actual flows in the Skookumchuck are low in the summer (30-300 cfs) when little or no outflow would occur from the Lake and follow typical western Washington hydrographs of larger spring/fall flows (200-500 cfs) and peak winter flows in excess of 1,000 cfs. Big Hanaford Creek enters the River below the dam, four miles from Pit 7 Lake, and with a drainage area only 7% of that of the Skookumchuck, with the Pit 7 drainage far less, will not influence the flow or quality of the river.

Put another way, if water left the lake at 75°F during a peak flow period, and was not attenuated or diluted by Packwood and Big Hanaford creeks (which it would be), and the Skookumchuck was 70°F, the Skookumchuck would increase in temperature by 0.02°F. This difference is not likely to occur after passing through Packwood and Big Hanaford creeks, and not likely to be measurable at all. If it was measurable, the impact to the Skookumchuck would be **negligible**.

At low flows, the increase in temperature of the Skookumchuck under the same scenario would also increase by 0.02°F, if there were no effect from passing through both creeks, and the 2/100 of one degree effect was measurable. In both cases, the impact from the project on Skookumchuck temperatures is **negligible**. The conclusion is that temperature impacts from the Plan on the Skookumchuck River are **negligible**.

Overall Impacts to Water Quality

Overall water quality impacts of including a lake in the restoration plan will have a **minor** effect on water quality in the drainage. The lake will significantly attenuate floodflows generated by the Pit 7 drainage area, reducing the potential for flooding and erosion downstream. The lake will also provide a continuous, low-volume flow downstream lasting far longer than the rainfall event because the lake will act as a retention basin by increasing in level and storage during extreme precipitation events, releasing outflows more slowly as the elevated lake recedes. The Pit 7 Lake will not generally release water during the high temperature months when the Skookumchuck River is at its highest potential for exceeding temperature goals, and when it does overflow infrequently, the temperature effect on the Skookumchuck River will be **negligible** because of the relative flows from the lake vs. the Skookumchuck, and because the discharge flows into Packwood Creek and the North Hanaford Creek before entering the Skookumchuck River.

E.2.1.5. Surface Water Mitigation and Monitoring

To mitigate for elevated seasonal surface temperature, TCM's revegetation plans include the planting of trees along the outlet structure of the lake. As these trees mature they will provide shade, which will minimize the effect of sunlight heating the lake water. Although the lake is not expected to discharge during most summers, the shaded areas will help meet compliance during the transition period when the lake begins to discharge in the fall. TCM will construct the final outlet structure so that the vegetation that will mitigate the outflow temperatures will have sufficient time to grow enough to be effective.

As an additional measure to ensure that water quality is not adversely affected, TCM has committed to a surface water monitoring plan specific to the lake filling process, which will take between 2 to 4 years to complete. TCM will monitor the water quality of the Pit 7 Lake, beginning during the lake filling period and continuing until Phase 2 Bond Release is obtained and TCM has demonstrated the lake meets water quality standards. During the lake filling process, the monitoring plan will provide an early detection of any unanticipated water quality issues and an opportunity to mitigate potential long-term problems. None are anticipated.

E.2.1.6. Summary of Surface Water Impacts

In summary, the Pit 7 Lake is expected to have the following impacts to surface water hydrology and quality:

- A **minor** impact to downstream flooding and erosion potential immediately below the lake in Packwood Creek due to a reduction in peak flows off the watershed from ranging from approximately 40 cfs to 360 cfs.

- A **minor** impact to downstream streams by provide more flows at a moderated rate over a longer period of time than an upland watershed where peak and low flows would be more variable.

- A **negligible** temperature effect on the Skookumchuck River based in part on the frequency of this potential occurrence but more so because of the immeasurable difference in temperature increase due to the difference in flows from the lake and the river, and the dilution and attenuation effects of Packwood Creek and North Hanaford Creek.

- Impacts to water quality of all downstream drainages range from **minor** effects due to increased average flows attenuated by lake storage, to **no** impact in the unlikely event that lake water quality is not acceptable; if this event occurs, discharge will be directed to the stormwater treatment system instead of Packwood Creek. The system eventually drains into the Skookumchuck River.

- **No** short-term impacts (life of the mine plan) to downstream water quality will occur from the project because no downstream releases will occur during the life of the mine reclamation plan until lake water quality is acceptable. **No** long-term impacts (post-closure) are expected to occur for the same reason.

E.2.1.7. Groundwater

The Plan provides a detailed assessment and modeling of the lake water balance and lake water quality, including the groundwater inflows to the lake and quality of inflow from the mine spoils, the Big Dirty Coal Seam, and the undifferentiated Skookumchuck Formation. The hydrogeologic assessment and the water balance evaluations show that surface water flows to the lake are the major source of inflow, and that the groundwater contribution is a minor component to the overall lake water balance, and to overall lake water quality. Groundwater flows toward the lake from all hydrogeologic units. Therefore groundwater flow direction does not indicate infiltration of lake water into the groundwater systems.

The water quality of any outflow to the alluvium in Packwood Creek is expected to be similar to the water quality of the lake water; the component of groundwater flow is predicted to be **negligible** relative to the surface water outflows.

E.2.2. Impacts of No Action

Short-term surface water quality flowing from the reclaimed area, whether reclamation includes a lake or not, must be controlled and treated until TCM demonstrates discharge of water from the reclaimed area meets water quality standards. Both alternatives share at least one attribute when evaluating the surface water impacts: all surface drainage eventually reaches Packwood Creek. The No Action Alternative does not attenuate stormflows. Without the lake, stormflow peaks off of the site would far exceed 100 cfs during a 10-year or 100-year storm, based on the modelling done for the PAP. Whether directed to the stormwater system or Packwood Creek, this would exacerbate floodflows and increase turbidity, scour, erosion and downstream sedimentation. Water quality impacts to the creeks as a result would be **minor**.

- No Action would potentially cause an increase in downstream flooding and erosion potential without the lake attenuation and with potentially steeper slopes than shown in the PAP. Without the lake, peak flows across that watershed for the 10-year and 100-year flood events were calculated to be far in excess of 100 cfs (TCM 2014). Depending on location and channelization, such flows could cause scour, erosion, turbidity and potentially exacerbate downstream flooding. The instantaneous 10-year, 24-hour stormflow, for example, was calculated at 326 cfs. This would be a **moderate** impact and could be mitigated by continuing to run surface flows to the Pond 5 sediment management system.

- No Action would not provide the benefit of long-term attenuated flows after storm events.

- No Action should have **no** impacts to downstream temperatures except potentially for "first flush" stormwater flows, which would normally be warmer and carry more sediment in warm weather events. This could be a **minor** to **moderate** impact to the Skookumchuck because much higher warm water flows would enter the river compared to the Plan. Such flows might decrease in the future as vegetation established and recharge increased.

- No Action would likely have more negative impacts to water quality of all downstream drainages, ranging from **minor** to **negligible** effects due to increased stormwater flood flows, with higher potential for scour, turbidity, sediment transport, and flooding. This impact could be mitigated by continuing to run surface flows to the Pond 5 sediment management system.

- Offsite impacts to hydrology depend on the site selected and whether it is an existing and permitted borrow pit. Assuming the borrow site is 20 miles from the Pit 7 area, it would likely be a new site in forested hillsides supporting fish-bearing streams, or drainages feeding fish-bearing streams. Hydrological impacts could negatively affect surface flows, temperature and turbidity, nearby wells, runoff rates and recharge. Any such effects measurably affecting a nearby 3-d listed stream or exceeding water quality standards would be a **major** impact.

E.3. Land Use

E.3.1. Impacts of the Proposed Action

The post-mining land uses proposed for the reclaimed lands of Pit 7 include Upland Forestry, Lowland Forestry, and Impoundments of Water (see Figure 2). **Table 13** (Appendix B) identifies the proposed acreage changes of each post-mining land use for the Pit 7 Plan.

Permanent access and on-site haul roads have been proposed in the proposed significant permit revision for the Pit 7 Reclamation Plan to support the post-mining land uses. TCM will need to maintain these permanent roads, appurtenant culverts and down drains beyond the construction through the time that reclamation success has been demonstrated and bond has been released. TCM's construction practices for these types of structures (as evidenced by similar facilities on pre-law land in the North Field, which has been reclaimed for many years) minimize the need for long-term maintenance.

The proposed post-mining upland forest land use would decrease by 111 acres. This is mostly due to the reclamation of the areas designated as impoundments of water. Similarly, the proposed lowland forest land use decreases to 38 acres as this area is being converted to areas designated as impoundments of water. The Proposed Action provides for the addition of a 130-acre lake, which adds to the diversity of the landform with more fish and wildlife habitat (discussed in Section E.5.1). The forests provide habitat for wildlife in contrast to the disturbed, open land that exists today

The creation of a 130-acre lake in the western portion of Lewis County provides an aquatic environment for fish, waterfowl and wildlife not commonly found in the community. This habitat provides diversity that complements the surrounding forested areas and creates a **minor** land use impact.

TCM, as the primary landowner of the disturbed area where the Pit 7 Lake will be formed in Pit 7, supports the changes in land use within the pit. The land use change is further supported by the Lewis

County Community Development Department as noted in its letter to OSMRE dated June 29, 2009. A copy of this letter is attached as Appendix A.

E.3.2. Impacts of No Action

The land uses identified under No Action meet all the requirements of the PAP at the Pit 7 site and are similar to that of the Proposed Action, although there is no permanent impoundment of water. The similar land uses include upland and lowland forestry and comprise the majority of the landscape. Besides not having a lake, the biggest change from No Action at the site is an additional 111 acres of designated timberlands.

No Action could cause **major** land use changes at the unknown borrow site – approximately 500 acres of land use changed from its current use to an open pit. If the required materials were available from a permitted and operating borrow site, without expanding the permitted area, impacts would be **minor**. No such quarry has been identified. Overall, land use impacts from the No Action Alternative range from **minor** to **major**, depending on the permitted status of the borrow site.

E.4. Vegetation

E.4.1. Impacts of the Proposed Action

Vegetation will be re-established within the reclaimed areas of the Pit 7 area according to the specified land use. Figure 2, Pit 7 Reclamation Plan, Post-Mining Topography identifies the proposed vegetation and land uses in the Pit 7 area as Upland Forest, Lowland Forest/Riparian, and permanent impoundment of water. The Plan will meet the same requirements as the existing PAP. Upland Forest areas will be planted with Douglas fir and red alder trees. The lowland forest areas form a transition zone between upland forests and wetlands / riparian forests. Wetland vegetation will be established in the littoral zone of the lake and riparian vegetation will be established near the perimeter of the lake and the outlet channel. Wetland and riparian planting areas are included in the lowland forestry land use but have unique species and reclamation success factors. Typical tree and shrub species of lowland forests will include Oregon ash, Douglas spirea, red osier dogwood, and willow. Lowland forest is typically a mosaic of dense woody vegetation (trees/shrubs) and open grassland areas.

The proposed post-mining upland forest land use will decrease by 111 acres as compared to the PAP (No Action alternative). Riparian/wetland plant species will be planted in the littoral zone within the shallow waters of the lake and within the permanent outlet channel. The seed mixtures and tree and shrub species to be planted in these areas are shown in Tables 2 and 3.

The Washington State Department of Ecology and the WDFW provided concurrence for the plant and seed species approved for use in areas reclaimed for lowland forestry and wetlands. The already approved standards for diversity for these land uses will ensure that a diversely vegetated environment is established (rather than the monoculture necessary for upland or commercial forestry). To implement the Pit 7 Plan, TCM will follow the same general management practices included in the original PAP to ensure that the growth and sustainability of the re-vegetated land will be used to determine reclamation success. This includes TCM's ongoing short-term management practices including mulching and soil stabilization, pH and nutrient management, pest and disease control, and noxious weed control.

With the fluctuating lake levels, nearshore wetlands may also be created. These will also provide the valuable functions of nutrient removal, habitat, erosion reduction, flood storage, and water quality enhancement.

The Pit 7 Plan would re-establish the Pit 7 area as upland forest and lowland forest post-mining land uses, except for the 130-acre lake, which does not represent much loss of upland and lowland forest. Approximately 111 acres of the lake site was previously forested. This is replaced in part by shallow rooted and nearshore aquatic vegetation, although net terrestrial vegetation is reduced by the Plan.

Because all of the upland vegetation in the Plan is to be established consistent with the existing plan for the 597-acre site, and the only area where it is changed from the PAP is associated with the 130-acre lake, the Plan results in a 22% reduction in terrestrial vegetation acreage and a slight increase in aquatic vegetation, the vegetation impacts of this project are **minor**.

E.4.2. Impacts of No Action

Under No Action there would be no lake, and the vegetation plan would meet all the requirements of the PAP. Approximately 130 more acres of land would be available for uses such as timberland, although some might be open space. Impacts at the site would be **negligible** to **minor,** as vegetation was restored and re-established over the time required to develop mature forest. Offsite, at the unknown borrow site providing the 73,000,000 yards of fill material, impacts to vegetation would be **minor**, if the site was already permitted for such removal, or **major**, if new undisturbed lands (e.g. 500 acres) were developed. Overall vegetation loss from No Action would be **minor** to **major**, depending on whether a new materials source (borrow site) needed to be developed.

No Action fails to offer related enhancements for fish and wildlife but does offer upland and lowland forestry in site. It would not provide aquatic plants, which can be of value to waterfowl, and would not provide nearshore riparian plants. It provides no wetlands. It has the potential to destroy more upland and lowland forestry offsite than that saved at the site via the PAP without a lake.

E.5. Fish and Wildlife

E.5.1. Impacts of the Proposed Action

The proposed Pit 7 Lake offers 30 acres of lowland forestry (fish and wildlife habitat) land use (see Figure 2) not found in the PAP. The lake and its shoreline, outflow channel, and habitat enhancements will create additional fish and wildlife habitat (lowland forest) that was not present in the pre-mining topography and would not be created under the existing restoration plan.

The Pit 7 Lake's design provides safe access and egress for wildlife. In particular, rearing, resting and feeding waterfowl will be able to use the lake without disturbance or threat from hunters or development activities. The creation of a 130-acre lake will provide an aquatic environment for fish, waterfowl and wildlife not commonly found in the area. This habitat will provide diversity and biological productivity that complements the surrounding forested areas. The shallow shoreline of the lake will provide a refuge and feeding area for juvenile fish, a source of forage fish for larger fish, aquatic and emergent plant habitat to support small mollusks and crustaceans, and cover from raptors such as osprey and eagles.

The Sag Lake Arm is designed to be almost entirely comprised of littoral zone features. The width of this ledge along the northeastern edge of the lake (near the inlet to the Sag Lake Arm) ranges from 140 to 410 feet. The depth of the water in the littoral zone ranges from 0 to 17 feet, making the lake suitable for fish and wildlife use.

Fish will benefit from the outflow channel and the littoral zone of the lake. The permanent outlet channel that will connect the lake to Packwood Creek will create a path for fish migration off-channel; this will allow fish to relocate into the lake over the winter or permanently. The littoral zone surrounding the majority of the perimeter of the lake will be graded to form a shallow ledge averaging 100 feet wide. The project's benefits to resident and anadromous fish include a resting and rearing area off Packwood Creek, a source of nutrients and insect larva food for downstream and resident fish, and increased flows for longer periods after stormflows, which increases habitat capacity downstream and reduces sedimentation and bank erosion from floodflows. These benefits apply to all listed and candidate fish species under the ESA as well.

The planned littoral zone and its enhancements will further support fish and other aquatic species and a diverse shoreline that will provide habitat for amphibians, waterfowl, shorebirds and mammals. The enhancement features consist of log barbs, woody debris, and rootwads. A total of 293 fish and wildlife enhancement features will be placed within the 16.8-acre littoral zone area around the shoreline of the lake. In the outlet channel, TCM will place 119 wildlife enhancement features along the 1,345-foot length.

In total, 412 wildlife enhancement features will be placed around the Pit 7 Lake, Sag Lake Arm, and the permanent outlet channel (Section 4.9.2.3 of the Plan provides specific details about these measures). All are intended to either provide fish habitat, stabilize shorelines to reduce wave erosion, create habitat for amphibians and aquatic plants used for amphibian reproduction and rearing, create habitat for invertebrates (crayfish, snails, shellfish) that can provide food for water-oriented mammals (raccoon, fox, mountain beaver, fisher) and even birds (heron, loon, gulls, shorebirds). All of these impacts are **minor,** and none would be created with just forest habitat alone. Restoring the land to a productive land use will also restore food sources and natural shelter for the wildlife previously displaced by the mining activities.

In 2010 and 2011, OSMRE consulted WDFW and NMFS concerning the Pit 7 Reclamation Plan. WDFW has approved the revegetation success standards, species and sampling techniques that will be used to demonstrate reclamation success of areas with a fish and wildlife habitat. By letter dated November 3, 2010, NMFS responded to OSMRE's request for consultation on the Pit 7 Lake significant revision. NMFS offered Essential Fish Habitat conservation recommendations for the proposed lake (see Appendix A of this EA). By email dated August 19, 2011 NMFS provided additional comments from the site visit conducted at the Centralia Mine on August 11, 2011. OSMRE confirmed in May 2020 there would be no additional impact from the consultation completed in 2011 and there are no new species to be consulted on using FWS Information for Planning and Consultation website.

The United States Army Corps of Engineers' (USACE) policy concerning the Centralia Mine, after the November 2005 permit renewal application, was to be involved in regulation of new disturbance during active mining with requirements for mitigation of disturbed wetlands. This policy came about because, until that time, the USACE regulated the mine under a nationwide permit system. After that time, the USACE issued individual permits for projects involving areas never before disturbed by mining activities.

The USACE was consulted on the reclamation plans for Pit 7. The USACE responded by email dated March 3, 2010 and a copy of their comments is included in Appendix A of this EA.

Overall the reclamation plan has a minor long-term effect on fish and wildlife. The Plan provides an overall **minor** impact for fish and fish habitat and a **minor** impact for wildlife and wildlife habitat.

E.5.2. Impacts of No Action

No Action preserves the monoculture at the Pit 7 site and does not provide enhancement to the fish and wildlife resources It provides 130 acres more potential forest land than the Plan. Offsite impacts at the unknown borrow site would be **minor** if a borrow site was identified that was already permitted to remove the hundreds of acres of land cover required to meet fill demands. If the borrow site were undeveloped, potential fish and wildlife habitat loss would approach the size of the entire Pit 7 site. For example, the materials required would require a pit 100 feet deep over 500 acres. This potential habitat loss is more than three times greater than the Plan and would be a **major** impact (loss) to habitat. Fish and wildlife habitat impacts from the No Action alternative therefore would be **minor** to **major**.

E.6. Greenhouse Gases and Climate Change

E.6.1. Impacts of the Proposed Action

EPA has set standards limiting GHG emissions for point sources such as gas turbines, power plants, and other major gas and coal combustion sources. It applies to new construction for projects that emit more than 100,000 tons per year of carbon dioxide equivalent or modifications to such sources that add an additional 75,000 tons. These standards do not apply to transportation (cars, trucks, trains). The standards include a reporting standard of 25,000 tons/per year which is not a regulated standard, only a reporting threshold. The combined emissions of all the trucks, equipment, and cars for the Plan are far below any compliance threshold and even below any reporting threshold. Therefore, EPA's GHG regulations and standards do not apply to this project.

Reclamation operations require the use of diesel engine powered machinery to excavate, grade, fill and transport soils, plants, equipment and workers. This requires equipment such as back hoes, graders, dump trucks, excavators and commuter vehicles. This type of equipment is currently working at the mine site to fulfill its reclamation obligations at Pit 7, and they would continue to operate to construct the Pit 7 Lake as discussed in the Plan. The Proposed Action requires the use of these vehicles and equipment for construction and implementation, just as required in the PAP. Essentially no such equipment use will be occurring once reclamation is complete.

If the source of mine spoils had not been interrupted, and the Pit 7 area was filled according to the mine reclamation plan (PAP), these same types of equipment would be operating at the same site and involved with the same types of activities. The main difference is that the Plan does not require the relocation of approximately 73 million yards of material to fill the pit. Instead, the Plan requires approximately three million yards of material for all the re-grading necessary, including connections to the Sag Lake Arm and drainage revisions.

This reduction of material to be moved results in a reduction of combustion emissions from equipment. Although grading will be needed to construct drainages, outflows and a connection to the Sag Lake Arm, the Proposed Action will move 95% less material than the existing plan, resulting in a significant reduction in overall equipment emissions. Therefore, the Pit 7 reclamation plan reduces the generation of carbon dioxide and related greenhouse gases (GHG).

The Plan has no proposed point source emissions, no power generation or co-generation, no boilers and no proposed stationary sources. The only emissions would be from up to 36 construction vehicles on site. If these vehicles were to operate for 16 hours per day, 5 days per week, for a year, and assuming an average of 200 pounds per hour of CO_2e each, the emission rate would be approximately 14,000 metric tons of CO_2e per year. This lies below the reporting threshold of EPA's GHG regulations, which regulates stationary sources and doesn't apply to mobile sources. More significantly, the emissions are far less than whatever they might have been from the existing plan.

One goal of the reclamation of Pit 7 as well as the entire mine area is to re-establish the primary land use of upland forest, which in turn will help reduce GHG with the planting and growth of forest land. Post-reclamation conditions will provide the same GHG-trapping vegetation as the existing plan, with the exception of the 130-acre lake; the lake will trap less carbon than forest lands, but the aquatic plants in the lake will still be consuming carbon dioxide, converting CO_2 to organic matter which will settle and be locked up in lake sediments, and generating oxygen, consuming more GHG than it emits.

The future of forest harvest is uncertain; there will be 470 acres of forest land after reclamation, yet only 20% of it (94 acres) is owned by a timber company, making forest practices slightly less likely if its small size makes tree harvest inefficient. In any case, it is not known whether the project will affect forest practices at the site.

Because emissions from the Proposed Action are excluded from regulation by EPA, and do not meet the level of reporting requirements to EPA, and because mobile sources such as those included here are not subject to such regulation, the GHG impacts from the Proposed Action are **negligible.**

Furthermore, because construction emissions from the Plan are projected to reflect a 95% reduction in GHG emissions compared to the existing plan due to reduced transportation requirements, there is a reduction in GHG emissions from the Plan during reclamation compared to No Action and the GHG emissions are reduced significantly, resulting in a **negligible** GHG impacts. Because 130 acres of the 597-acre site will be a lake instead of forest, and the lake may have less carbon capture and storage potential, and future forest practices at the site are highly uncertain, it is possible that long term carbon capture and storage potential at the site might be reduced, but this is unknown.

In conclusion the change in long-term GHG emissions from the project is not subject to regulation, falls below reporting thresholds, is significantly less than No Action during the reclamation phase, and GHG impacts are therefore **negligible.**

E.6.2. Impacts of No Action

GHG gas emissions from No Action would be greater than the Proposed Action because of the need for hauling 73 million yards of material to fill the pit. No Action may offer more long-term carbon capture

potential than the Plan on site because more forest or grassland might be created in lieu of a lake, yet less forest may be planted if slopes are too steep for forest production.

However, offsite capture from forest or grassland would be much less with No Action, with the potential to lose hundreds of acres of trees from a new borrow pit. Overall GHG emissions would be much greater and sequestration potential much less from No Action.

E.7. Recreation

E.7.1 Impacts of the Proposed Action

Recreation activities at and near the Pit 7 area will not change from implementing the Pit 7 Plan. There are no allowed recreational uses now, with the exception of one annual hunting event, and there are no plans to open the area for future recreational use (after OSMRE's termination of regulatory jurisdiction).

The entire mine site has been closed to public access and recreational use during its operation, including the Pit 7 area. This condition will not change during implementation of the Plan, or for as long as TCM has control over the property. The sole exception is possible continued access to the area for annual handicapped hunter events; the continuation of these events will be up to the new property managers. After reclamation is complete and the site closed and turned over to private property managers, including TransAlta, the decision as to whether there would be future public assess is unknown.

Because no recreational use, other than the annual handicapped hunter event, has occurred on the property since TCM had control over the site, and because none will occur during construction or as long as TCM has control of the site, the Pit 7 lake proposal has no effect on recreational use during the reclamation period or afterwards. Access would be prohibited with or without the Proposed Action. After land transfer, the possibility of future recreational use is unknown and any assumptions about such use are speculative. Therefore, the Proposed Action has no known effect on current or future plans for recreational use of the site.

The proposed new lake at the site would create the potential for recreational uses such as swimming, fishing, or boating, but whether this will happen is unknown. If the lake offers resting and feeding opportunities for waterfowl and/or wildlife game animals that enhance populations that are subject to hunting and fishing harvest at off-site locations, the lake would contribute indirectly to minor improvements in recreational waterfowl hunting opportunities off site.

Because no recreation currently exists at the site, none will occur during the life of the Proposed Action, and future recreational use is unknown and may not occur, the Proposed Action has **no** impacts on recreation.

E.7.1. Impacts of No Action

Because no recreation currently exists at the site, except for one day out of the year, and none is proposed as part of the existing reclamation plan, and future recreational use is unknown at the site, No Action will not affect recreation during the life of the project and has **no** impacts on recreation. Impacts at the unknown borrow site are unknown and would depend on whether the borrow site could be identified that

is already permitted to remove the hundreds of acres of land cover required to meet fill demands, or if the site is undeveloped and has recreational uses.

Without the Pit 7 Lake, the possibility of future recreational use of this aquatic resource at the site will be eliminated, as will the potential recreational fishing opportunities supported by the Plan, in the lake and potentially downstream. Whether this possibility will occur is unknown.

E.8. Noise

E.8.1. Impacts of the Proposed Action

TCM evaluated the potential for increased noise impacts from Plan implementation. Although large equipment will be operated during the Pit 7 Plan reclamation, noise emissions will be essentially the same in emission rate but much less in duration than the existing plan at the Pit 7 site because the same types of construction equipment will be used at the same locations, but over a shorter period of time. Another difference that reduces noise emissions is that approximately 73 million less yards of dirt will be moved; thus, the noise associated with loading, trucking and grading that material will not occur. The types and level of activity required at the site will be the same or very similar to the equipment required with the existing plan. Thus, the Plan creates no increase in noise emissions and actually results in a minor decrease in noise emissions.

The active areas of the Pit 7 and the Sag Lake Arm area are on average greater than one mile from occupied dwellings, all of which are located outside of the permit boundary (**Figure 14**; Appendix C). Although construction activity is likely to be heard at various times, it will be similar to past activities and the ongoing activities already approved by OSMRE in the PAP.

The Central Packwood ridge provides a physical barrier between Pit 7 and the closest occupied dwelling. That location reduces the amount of construction noise. This distance and barrier allows the impact of noise to attenuate before reaching the residents in the Hanaford Valley. No blasting operations will be conducted during reclamation; therefore, the brief, loud noise associated with blasting operations will not occur. TCM's existing plan does not exceed the local noise standards established by the State of Washington, and the Proposed Action will result in noise similar to the existing plan.

To further evaluate these assumptions, TCM reviewed a noise and vibration impact analysis conducted in 2001 for the Central Packwood Pit (Michael Minor & Associates 2001). The Central Packwood Pit lies between the residential land uses to the North and the Pit 7 area. Thus, all noise emissions and impacts to the most sensitive receptor—residential—from identical activities at Central Packwood would be greater than those from reclamation of Pit 7. In the noise analysis, which included field measurements of equipment and background conditions, and modelled results, no daytime violations of Washington State noise criteria occurred. One criteria exceedance occurred at night, when the noise criterion drops 10 decibels (dBA), at the closest location to one of the access roads. The greatest exceedance of standards was when nighttime noise was 4.6 dBA above the 50 dBA nighttime standard, which is in effect after 10 P.M. The Plan will not involve any construction after 10 P.M. so the nighttime standard does not apply.

Over the long-term, if timber operations are started at the site after reclamation and land transfer to its former owners, noise associated with timber harvesting including logging trucks, may be generated. Following initial planting, for example, it is typical to perform a pre-commercial thinning of a forested area after 10 to 15 years of growth when the area has a tree density of 300 trees or greater per acre. This 10 to 15 year period would be the first occurrence of noise generated by timber harvesting, if land owners decide to conduct timber operations. The next occurrence would not take place until the tree plantation has reached full growth, approximately 30-50 years following the initial planting, depending on the market and silviculture management practices at the time. If this were to occur, timber harvest would be subject to permitting and authorizations under the Washington State Forest Practices Act, administered by the Washington Department of Natural Resources.

It is not known if the reclaimed site will ever be used for forest practices, the level of activity if it is used, or the associated cutting rotation, number of trucks, or haul routes. Thus any prediction of noise from future timber harvest is remote and speculative.

In conclusion, because the noise levels of implementing the Pit 7 Plan are likely to be less than levels from similar ongoing activities, and not in excess of standards, the noise impacts from the project are **negligible**.

E.8.2. Impacts of No Action

Noise impacts associated with No Action will be similar to the Proposed Action for the grading activity itself. Under both scenarios, TCM would use a similar fleet of equipment to reclaim Pit 7 and operations would be conducted during the same hours of the day. The primary difference is that No Action would require hundreds of thousands of dump truck trips, and the main route from I-5 is through the City of Centralia. Although the size, frequency, operating ours and truck size are unknown, that many trucks for the extended period required to haul 73 million yards from offsite will increase noise levels along highways within the City of Centralia, and is a **major** noise impact.

E.9. Public Health and Safety

E.9.1. Impacts of the Proposed Action

During reclamation, TCM's property continues to be posted for "No Trespassing" and access to the mine site from public roads is presented by locked gates. The posted signs will be maintained until closure of the site is complete and any bonds are released. The design of the Pit 7 Lake provides for safe access and egress. Specifically, the littoral zone surrounding the perimeter of the lake will be graded to establish a shallow ledge averaging 100 feet wide. Along the north eastern edge of the lake near the Sag Lake Arm, this ledge ranges from 140 to 410 feet wide. The depth of the water in the littoral zone ranges from 0 to 17 feet.

Due to the reclamation of part of Pit 7 to an upland/commercial forestry ownership, logging of the area may increase once the reforested area matures to the point where tree harvesting is practicable. This might result in an increase in logging truck traffic for the same reasons explained in Section E.8.1 (Noise). Timber harvesting or tree thinning might occur between 10 to 15 years following the initial planting, and again approximately 30 years after initial planting, once the trees are fully grown. The fatality rate for

logging workers is more than 20 times higher than the average of other industries,[3] and although it is impossible to determine if reducing merchantable timberlands will reduce logging fatalities, it shouldn't increase them. However, the possibility, frequency, and location of logging in the future are currently unknown and speculative.

An impact to humans from fish or game consumption out of the Pit 7 lake or area is impossible to quantify, as any such prediction would be uncertain and speculative. There are no conditions on the site that would suggest toxicity uptake from arsenic, heavy metals, pesticides, or other toxins. None have been found on the site. As discussed in Section E.7.1, no recreation (with the exception of one annual hunting activity) currently exists at the site, none is proposed during the life of the Proposed Action, and future recreational use is unknown and may not occur.

No public access is proposed, no swimming is proposed, and there is no evidence that this will change in the future, leaving the potential for drowning events unlikely and speculative. With the alternative use of the site for logging in lieu of a lake, an industry with one of the highest fatality rates in the United States, it is unknown whether the presence of a lake will increase or actually decrease health & safety risks, but it may decrease them, even without public access. This same uncertainty exists when considering the risk of hunting on the 130 acres, instead of fishing; hiking in forest lands vs. sitting by the shoreline, and other uses. Thus, determining risks associated with a Pit 7 lake would largely be speculative. Impact would likely be negligible for public health and safety. A much clearer difference in health and safety risk is shown in the discussion of No Action.

E.9.2. Impacts of No Action

Health and safety risks from No Action are similar to the Pit 7 Plan at the Pit 7 site, except that it would eliminate the slight risk of drowning from swimming and perhaps increase risks of injury or fatality from logging. Neither is proposed. Under No Action, a permanent impoundment of water is not left as part of the final landscape. Instead the site would be designed to meet OSMRE requirements and replicating existing topography. Pit 7 is on private land and there are no recreational or other public uses planned for this area. No attempt has been made to quantify other added risks from eliminating the lake (such as hunting accidents or logging accidents).

Under No Action, a new 500 acre borrow pit approximately 100 feet deep would be required. Unless public access were prohibited at the borrow site just as it is for the lake under the Plan, there would be risks to the public from a new excavation of this size and depth, including drowning if it were to trap rainfall or groundwater.

The No Action Alternative would have **negligible** impacts to public health and safety at the site and even less if public access was not allowed. However, the potential health and safety impacts from offsite trucking of fill will increase health and safety risks considerably, based on the increased risks of injuries and fatalities due to trucking. A summary of NTSB truck traffic safety data (Miller 2015) reported that 2013 truck fatalities and injuries were 1.441 and 34.5 per 100 million miles respectively, in the year 2013. If the borrow source site were located 20 miles away, for example, the 2.43 million round trips would cover 97.2 million miles. This means there is a likelihood of one truck accident fatality and 35 injuries

[3] *Forbes* online (2009). http://www.forbes.com/2009/08/25/america-deadliest-jobs-leadership-fatalities.html

from truck haul accidents predicted for No Action. The fatalities, using this very rough comparison, might be similar between the Proposed Action and No Action, based on the swimming risk, but only if the assumptions made above are appropriate.

It appears that the number of traffic-related injuries from No Action would far exceed those for the Proposed Action. Because no public access for swimming is proposed for the Plan, and trucking is a requirement and a certainty for No Action, the increase in health and safety risk from No Action is a **major** impact to overall health and safety risk.

E.10. Air Quality

E.10.1. Impacts of the Proposed Action

No quantitative emissions calculations have been made for the Plan because equipment use on site would be less than required for the PAP, due to the reduction in earth moving requirements. Air quality emissions from the Plan are a reduction in emissions from vehicle exhaust and potential fugitive particulates, and are **minor** to **negligible** as a result.

E.10.2. Impacts of No Action

On-site vehicle exhaust and particulate emissions are greater than, but similar to, emissions from the Plan from moving earth materials to achieve the design requirements of the PAP. Offsite vehicle emissions, however, would be much greater, resulting from combustion of at least 20 million gallons of diesel fuel that would otherwise not be consumed under the Plan. This fuel estimate assumes that a borrow site could be found as close as 8 miles away from Centralia, resulting is a 20-mile trip from the pit to the borrow site. If such a site were as much as 28 miles from Centralia, these fuel combustion emissions would double. Although these emissions are far greater than any emissions that would be generated under the Plan because they would be spread over 10 years, the air quality emissions of No Action are **moderate**.

E.11. Transportation and Traffic

E.11.1. Impacts of the Proposed Action

The Proposed Action would be no additional traffic on city, county, or Federal highways, and would have **no** impact on transportation.

E.11.2. Impacts of No Action

The No Action Alternative is likely to have Major impacts on transportation and traffic between I-5 and the site. Section C.2 described a potential fill material transportation requirement of approximately 2.4 million truckloads, each way, or 4.8 million trips. Over a 10-year period, (by 2025) this would require approximately 243,000 truckloads per year, each way. While a Level of Service (LOS) analysis has not been conducted due to the unknown route and frequency of truck traffic, it is assumed that I-5 can accommodate the traffic. However, the transport trucks would likely have a negative impact on roadway condition (see Section E.12) and traffic of state and county highways and surface streets in Centralia along the 12 mile route to the site.

Assuming the haul operation operated 6 months per year to avoid wet weather months, 10 hours per day, on weekdays, this would generate 173 trips per hour each way. Although traffic modelling has not been done, due to the uncertainties about schedule without a project proposal, this level of truck traffic through Centralia is likely to result in a drop in level of service (LOS) at key intersections. If so, transportation and traffic impacts could be **major** under No Action.

Put another way, assuming it takes 6 minutes to get through the 3 mile section from I-5 through town, there could be approximately 36 trucks a day traversing downtown Centralia.

E.12. Public Services

E.12.1. Impacts of the Proposed Action

The Proposed Action would have **no** impacts to road maintenance.

E.12.2. Impacts of No Action

Road maintenance is very likely to increase when considering the 73 million tons of heavy load truck trips required on I-5, through city streets and county roads to the site. It is impossible to estimate the damage and amount of repair, but it will be much greater than the Proposed Action, which will require no maintenance costs.

F. UNAVOIDABLE ADVERSE IMPACTS

Unavoidable adverse impacts are the effects caused by the Proposed Action and the action alternatives that would remain if the Plan creates adverse impacts and if those impacts cannot be avoided by applying the proposed mitigation measures. **Negligible** unavoidable adverse impacts are anticipated by implementing the Proposed Action (the Pit 7 Reclamation Plan).

No Action will cause unavoidable adverse impacts than the Proposed Action. Although in most cases the impact analysis is qualitative or based on assumptions, the following unavoidable adverse impacts are likely to occur from No Action:

- Unavoidable adverse impacts to soils and topography from the creation of a new pit at the as-yet unknown borrow site for fill material, equivalent to a 500-acre pit 100 feet deep.
- Unavoidable adverse impacts to any stream course if the borrow site is located in a small to medium size watershed.
- Unavoidable impacts to land use as the 500-acre (for example) borrow site will be unusable for most land uses.
- Unavoidable impacts to vegetation and wildlife at the borrow site, as it may be difficult to impossible to recreate vegetation or habitat there might have been when forest or prairie, for example, is converted to a 100 foot deep pit.
- GHG emissions from truck exhaust associated with hauling 73 million yards of material from an unknown borrow site to the Pit 7 area will be unavoidable.
- Unavoidable adverse impacts from noise, dust, and truck exhaust emissions in local neighborhoods between I-5 and the mine, and potentially near the unknown borrow site.

G. CUMULATIVE IMPACTS

This section discusses the potential cumulative impacts from the Plan. Cumulative impacts are impacts from the Proposed Action added to impacts from past, present and reasonably foreseeable future projects and activities. This includes activities whose impacts overlap, temporally or spatially.

In general, the impacts from past and present activities at the site, and within the influence of actions related to the Pit 7 Plan, are included in the affected environment. The affected environment reflects past mining and timber harvest activities, some of which occurred before the Centralia Mine was opened, as well as ongoing reclamation activities. As a result, much of the cumulative impact discussion focuses on reasonably foreseeable future activities that might have impacts that would be cumulative to impacts specific to the Proposed Action.

There are four ongoing activities and three potential new activities near the Pit 7 site with ongoing and potential future impacts that warrant examination for their potential to create cumulative impacts. They are described in Sections G.1 and G.2, and their impact potential and effect is described under each element of the environment in Section G.3. Where impacts from the Plan overlap with impacts from other activities (whether mine-related or not), such impacts are cumulative. The following discussion describes reasonably foreseeable future activities that might contribute to cumulative impacts from the projects. Past and present activities are already incorporated into the affected environment.

G.1. Ongoing Activities

G.1.1. 1,300-MW Coal-Fired Power Plant

A 1,300-MW coal-fired power plant is located approximately three miles from Pit 7. It has air emissions and a cooling water discharge that flows through cooling towers and then into the site's stormwater collection and treatment system which detains it until it eventually discharges as a natural stream into Big Hanaford Creek. As a result of discussions between the State of Washington and TransAlta, the coal plant is scheduled to shut down and eliminate its GHG emissions and other emissions. The coal-fired power plant will be closed and inoperable at the end of 2030. It will no longer be functioning when mine reclamation is complete.

The potential cumulative impacts from this plant are due to air and water emissions. The air emissions from the Plan implementation are similar to and almost indistinguishable from No Action and create no new cumulative impacts. The air emissions from the coal plant (CO_2e) are extensive, such that they almost mask the Plan impacts, and the cumulative impacts from the plant and the Pit 7 Plan are indistinguishable from the plant itself. Over the long term (after 2030) there will be no cumulative air impacts from the plant and Pit 7 because the plant will be closed, and Pit 7 Reclamation will be complete. Therefore, the cumulative impacts from the Plan in conjunction with the coal plant are minor and almost non-existent during operation and are none when reclamation is complete.

Water flows to the stormwater system from the coal plant average 3.73 cfs. Those from the Pit 7 Lake range from zero in most summers to as high as 44 cfs in the winter months, averaging 1.7 cfs annually. Both the coal plant and the Pit 7 site's water flows drain toward the Skookumchuck River with minimum and maximum flows totaling approximately 355 and 11,300 cfs, respectively. Therefore, the combined

flows from both sources, when added together, and when entering the Skookumchuck, are minor and insignificant.

G.1.2. 400-MW Gas Plant

The 400-MW gas plant was sold by TransAlta and is not currently in operation but has been included in this discussion because a new owner could make the decision to resume operations. The 400-MW gas plant was occasionally used to meet peak power demands during winter cold spells. It was not very efficient and for that reason was not used in recent years. When operating, the plant could have air and noise emissions, but is located next to the highway in an industrial area. Plans for its future use are uncertain.

There are no cumulative noise impacts from the gas plant and the Pit 7 Plan because the two facilities are too far from each other to create perceptible additive noise emissions. Both are in industrial areas, the gas plant was designed as a peaker plant and would therefore run sporadically, and the Pit 7 Lake reclamation is only temporary. Transportation vehicles and reclamation (construction) activity at Pit 7 is not subject to noise regulation. Cumulative air emissions are similar to the coal plant analysis. The gas plant emissions, when operating, would be so sporadic that cumulative emissions are infrequent, and so much greater than Pit 7 construction emissions when the plant is operating that combined construction emissions would be overshadowed by the gas plant. Therefore, cumulative impacts from the Plan in conjunction with the gas plant are minor or imperceptible and temporary.

G.1.3. Mine Reclamation

Reclamation is ongoing at the mine site in a number of areas already assessed and permitted by OSMRE. Many of these conditions are already documented by the affected environment discussion of this EA and are expected to be similar in the future. The reasonably foreseeable future environmental impacts of reclamation are the same as those of today, including the fact that all such activities will be complete by 2035. Under No Action, reclamation from the existing plan would create nearly identical impacts to those discussed in the EA for the Proposed Action. The impacts of the Proposed Action already take into account other activities and emissions from other ongoing reclamation in the evaluation of the existing plan. Therefore there are no cumulative emissions impacts from the Pit 7 project and mine reclamation that are not already accounted for in the overall plan.

G.1.4. Rail Line

The Burlington Northern rail line provides coal to the coal-fired power plant and has the capacity to haul large equipment, generators, or scrap onto or off of the site. Plans for its use after the power plant is closed are uncertain, but it might serve the business park (discussed below). Rail line activities will decrease in 2020, when half of the generating capacity of the power plant is eliminated and are likely to decrease significantly after 2025 when it stops bringing coal to the plant. Its use at the business park depends on development there, which is unknown. Until 2025, rail line emissions and impacts are limited to air and noise. As a result of air and noise impacts that are not close to Pit 7, and a plan to decrease rail operations and their associated air and noise emissions significantly in 2020 and possibly permanently in 2025, the cumulative impacts of rail operations and those of Pit 7 are negligible.

G.2. New Activities

G.2.1. Business Park

A public/private partnership is establishing the infrastructure for a potential commercial/light industrial business park within the mine permit boundary. Up to 1,000 acres of land might be available for development, including road and rail access, and required utilities. This project, if developed, would begin to make up for the lost employment from the mine shutdown, but it has not yet occurred. Operational impacts might include commuter traffic and road and rail traffic to haul products and supplies, but these are unknown and only speculative at this time. Although the site is being marketed, no developers have constructed facilities and it is not known when this will occur, or what emissions and impacts they may have at some unknown time in the future. As a result, the business park emissions are not reasonably foreseeable and not considered a cumulative impact.

G.2.2. Fine Coal Particle Recovery System

A new FCRec system is permitted and operating within the permit area and adjacent to the coal-fired power plant. It will be operating while the Pit 7 Plan is under construction and will involve removal of waste slurry materials to recover coal particles for potential use at the plant. Because this FCRec operation will rely on pipelines from slurry pits 3B, 3C, and 3D to pump the coal processing wastes to the processing site at the mine. The recovered coal is then transported to the plant via covered conveyors. All construction activity for Pit 7 will be at the Pit 7 site with no transport to or from the plant area, there are no expected cumulative impacts from the combined operations.

Wastewater from the FCRec system will be routed to impoundment 3E most of the year, where the water will be naturally cleared and settled through detention and then be routed through TCM's Pond 20 System providing additional detention and flow through aquatic plants, ponds and wetlands. During warmer water periods, water is sent to Pond 3E, where it stays until it reaches suitable temperature and is then pumped to the Pond 20 system. This system discharges to North Hanaford Creek. As a result, there are no cumulative temperature release impacts anticipated for this effort and no other water quality effects anticipated to the Skookumchuck watershed. With no cumulative air and noise effects either, there are no cumulative effects on the Plan from the fine coal particle collection system.

G.2.3. Future Reclamation Plans (Revisions)

Since the November 2006 decision to close the mining operations at the Centralia Mine, all mining-related activities have been focused on revising the various reclamation plan(s) comprising the PAP. TCM has submitted revised plans for the reclamation of the Central Packwood Pit, Pit 7, the Pond 3 Series (Fine Coal Refuse Impoundments), the North Hanaford Pit and the Kopiah Pit. Each plan has been prepared to ensure reclamation is completed as contemporaneously as practicable. These are discussed below:

Central Packwood Reclamation Plan – OSMRE approved the Central Packwood Reclamation Plan in October 2012. Reclamation activities there are underway. The post-mining topography (PMT) designed for the Central Packwood Reclamation Plan is intended to provide a diverse ecological habitat, also with a permanent lake as its main feature, reclaiming approximately 1,000 acres of disturbed land. The Plan is

based upon the grading plan change along the Smith Seam footwall to stabilize the southern pit slope and the findings of field and laboratory studies that have been used to characterize the geochemistry of the Central Packwood spoils as well as the water quality that will be generated from spoils run-off. The PMT was developed using a terrace and down-drain approach for most of the area, draining to the Central Packwood Lake. A geomorphic and structural design approach has been used to design a portion of the drainage in the vicinity of the permanent road CPAR-8 on the northwest side of the east spoil pile. Ponds 38B2 and 38C2 have been modified to establish an inlet channel and wetland system between Ditch 13 and the Central Packwood Lake. The resultant PMT and supporting geotechnical analysis meet the reclamation objectives of the Permit Application Package and satisfy regulatory requirements of OSMRE.

A principal feature of the reclamation plan is the establishment of a permanent lake in the final Central Packwood Pit referred to as the Central Packwood Lake, a permanent lake of approximately 217 acres. Laboratory studies have been used to characterize the geochemistry of the Central Packwood spoils as well as the water quality that will be generated from spoils run-off. The geochemical characteristics of the spoils predict that the lake water quality will be suitable for meeting the needs of aquatic environments and meeting applicable discharge limits at the time of bond release. Most surface water that flows into the lake is routed through a developed wetland. Although the predicted water quality is anticipated to be suitable for fish and other aquatic species, the wetland habitat was added as a "polishing" feature for the lake water.

Kopiah Reclamation Plan – Proposed reclamation plans for the Kopiah Pit were submitted in mid-2012. The Kopiah Reclamation Plan focuses on re-grading the Kopiah Pit located in the South Field of the Centralia Mine. The proposed plans for the Kopiah Pit return the disturbed area to topography and land uses similar to the pre-mine undisturbed environment. Elements of this plan include the re-grading of the highwall and the mine spoils to generate a PMT that is intended to provide a free-draining, stable landform with a central channel as its main feature. The Kopiah pit area includes approximately 1,865 acres that require re-grading for final reclamation. The PMT incorporates a gradient terrace and down-drain approach for most of the areas draining west into the South Hanaford Creek watershed, north into the Packwood Creek watershed and east into the Mitchell Creek watershed. The highwall areas will be graded to a 3:1 slope or shallower and incorporate the drainage design. The PMT facilitates the successful reclamation of both upland and lowland vegetation communities and establishes riparian zones within the specific drainages.

Pond 3 Series Reclamation Plan – The proposed reclamation plan for Ponds 3A, 3B, 3C, and 3D (Pond 3 Series) has been developed to remove these impound structures and to provide stable slopes and a reclamation drainage plan for the reclaimed pond locations that meets permit requirements and supports the post-mining land use. The proposed plan for the Pond 3 Series coal mine waste impoundments returns the disturbed area to similar pre-mine topography and land uses. The PMT and drainage for the reclaimed ponds includes the construction of a permanent drainage channel through a breach in the embankment for each structure.

Impoundments 3A, 3B, 3C and 3D contain coal particles remaining from the original coal cleaning operation, which is referred to as fine coal refuse (FCR). The FCR material will be removed from impoundments 3B, 3C and 3D, and reprocessed for coal recovery. The waste from this reprocessing will be placed in the North Hanaford pit (Pond 3E). The water in Pond 3A will be removed and either used in the dredging process or treated and discharged through the Pond 6 system. FCR material remaining in

Pond 3A will be capped with the material removed during the construction of the channel and the breach of the Pond 3B embankment. After removal of the FCR, the surface material within the former impounding structures 3B, 3C and 3D will be tested, and unsuitable material will be removed or covered with at least 4-feet of suitable material. The reclamation plan incorporates a gradient terrace and down-drain approach for the remaining portions of the embankments and for the areas within the former impounding structures. The resultant PMT and supporting geotechnical analysis meet the reclamation objectives of the PAP.

The Pond 3 Series Plan involves the removal and reprocessing of over 44 million cubic yards of FCR material from Ponds 3B, 3C and 3D. The removal will be performed by a dredge operation that will, at times, require additional water, and at other times removal of excess water, to support dredging operations. TCM plans to reprocess the FCR to extract coal that can either be blended with the fuel source utilized by the adjacent Centralia Steam-Electric power plant or sold externally. The FCR waste from re-processing will be treated by a thickener process. A clear supernatant from the thickener process will be recycled for use in the flocculation and thickener process.

Waste water that can't be recycled will be discharged to Pond 3E along with any excess water from dredging operations. This waste water discharge, and the FCR waste placement and direct precipitation and runoff to Pond 3E, are expected to generate water in excess of evaporation and make-up water use losses from Pond 3E. Pumping of excess water from Pond 3E will be directed to the Pond 20 System until Ponds 3B, 3C and 3D are empty and Pond 3E is reclaimed with flow through drainage.

The key components of upland and lowland forests and riparian habitat will be incorporated into the PMT at appropriate slope positions and aspects. The Plan confirms that all applicable safety, regulatory and environmental issues are addressed thoroughly and properly. Implementation of the Plan will allow TransAlta to successfully meet the terrestrial reclamation and water quality requirements of the post-mining land uses in the Pond 3 Series area.

North Field/Pond 3E Reclamation Plan – The North Hanaford (Pond 3E) reclamation plan is considered a significant revision for the purpose of SMCRA review because it includes a change in land use by creating permanent lakes as permanent impoundments for fish and wildlife habitat. The North Hanaford reclamation plan has been developed with a permanent lake as a major feature. The North Hanaford Pit (Pond 3E) has served as a disposal site for coal processing wastes from the coal processing plant, which operated until November 2006. Additional FCR from Pond 3D was pumped to Pond 3E, starting in 2008 and discontinued in 2009. The plans for disposal of the reject material from the FCRec project in this area are described in PAP Section 4.1.3 Coal Removal, under subheading Waste Treatment (TCM 2014). Over the course of reprocessing the fine coal waste material approximately 29,136 acre-feet of waste material will be disposed of in Pond 3E. Management of the water and FCRec processing wastes in Pond 3E is essential to prevent Pond 3E from discharging until the North Field Reclamation plans are approved, compliance with water quality standards is demonstrated and the outlet structure is constructed. The Pond 3E water balance is currently being updated.

The incised coal mine waste impoundment will be partially filled with FCR materials and will be reclaimed as a final permanent lake (North Hanaford Lake) of approximately 341 acres. The high wall and surrounding areas to the east side of Pond 3E are being re-contoured to develop the post-mining topography using a terrace and down-drain approach for most of the area draining to the North Hanford Lake. Pond 32 is planned to be breached to create an inlet channel to the Lake. Water will flow from Pond

32B (a permanent impoundment) into the newly created inlet channel (which will include grass lined swales and small wetland areas). A permanent diversion of North Hanaford Creek will be constructed for the channel segment through the former location of Pond 32. The resultant PMT and supporting geotechnical analysis meet the reclamation objectives of the Permit Application Package by adding key components of upland and lowland forests including riparian habitat into the PMT at appropriate slope positions and aspects. The inclusion of North Hanaford Lake enhances the Reclamation Plan by adding a potential fish and wildlife habitat component. The geochemical characteristics of the spoils predict that the lake water quality will be suitable for meeting the needs of aquatic environments and meeting applicable discharge limits at the time of bond release.

G.3. Cumulative Impacts

G.3.1. Cumulative Impacts of the Proposed Action

The potential cumulative impact area (temporal and spatial areas of impact that might impinge on other impacts) of the Pit 7 Plan is limited to the mine site with the exception of stream-related impacts and GHG emissions that actually leave the Pit 7 reclamation area. Most other impacts are limited to an even smaller area: the immediate vicinity of Pit 7 and Sag Lake Arm. For example, if an impact is negligible, its cumulative impact added to other reasonably foreseeable future impacts is also negligible. And if a negligible impact on a resource does not leave the site, other impacts off the site are not cumulative.

Many of the impacts from the Proposed Action are similar to the on-site impacts of No Action, so they do not create cumulative impacts that would not otherwise occur or are already occurring as part of the baseline condition, and which have already been reviewed and approved by the OSMRE NEPA process. Because of the location of this project, and the lack of other projects in this remote area, , there are very few cumulative impacts from this project.

G.3.2. Cumulative Impacts of No Action

No Action would contribute to cumulative impacts offsite due to the need for millions of yards of fill material. It is not possible to quantify such impacts without knowing the location, distance, characteristics, and current condition (undeveloped land or operating fill supplier) of the unknown borrow site, and therefore cumulative impacts are only discussed in qualitative terms.

G.3.3. Topography, Geology, and Soils

G.3.3.1. Cumulative Impacts of the Proposed Action

In each of the proposed reclamation plans for the pit areas, including the Central Packwood plan, which is already in process, large volumes of earth will be moved. However, each reclamation area involves its own grading and fill activity and does not overlap, or require fill, from other areas. Thus, none of the topographic changes at other reclamation sites create cumulative topographic impacts when added to those proposed in the Pit 7 Plan as none of these independent changes are additive. All are included in the overall reclamation plan for the Centralia mine. Overall, the Plan would have **no** cumulative impacts on topography, geology, or soils.

G.3.3.2. Cumulative Impacts of No Action

There are no known activities associated under No Action or with the unknown borrow site that would contribute to cumulative impacts to topography, geology or soils.

G.3.4. Hydrology

G.3.4.1. Cumulative Impacts of the Proposed Action

Pre-mining surface water drainages within the permit and adjacent areas including all or part of the following watersheds are shown in **Figures 15a, b, and c** (North, Central and South Field Drainage Basins in and Adjacent to the Mine Permit Area, respectively) (Appendix C):

- Big Hanaford Creek,
- North Hanaford Creek,
- Packwood Creek,
- South Hanaford Creek,
- North Fork of the Newaukum River, and
- Skookumchuck River

The drainage patterns are generally dendritic, trending west to northwest within the permit area to join the Skookumchuck River, or south to join the Newaukum River. No naturally occurring lakes are present within the permit area. However there are low and flat areas such as valley bottoms that are marshy and prone to extended periods of flooding during the wet winter season.

TCM's approved permit currently identifies the Pit 20 area, the Pond 32 System and the Central Packwood Lake as permanent impoundments of water. The proposed new reclamation plans for two mine areas, North Hanaford and Pit 7, include permanent impoundments of water. These water bodies will be new features to the landscape of the permitted mine area. The North Hanaford Lake has not been approved, and the Pit 7 Lake is the Proposed Action of this EA.

The Central Packwood Lake offers long-term benefit to Big Hanaford Creek hydrology by connecting to the creek and allowing floodflows to attenuate and extending baseflows as a result, similar to the proposed Plan. The Central Packwood Lake will serve as a sedimentation control structure, as it detains the drainage from an approximate 1,010-acre area before it reaches the creek. This will reduce sedimentation and turbidity loading to the creek.

The Central Packwood Lake will have a short-term effect on the flow of surface water reaching Big Hanaford Creek during the period of time it takes for the lake to fill. This temporary effect is minimal because the disrupted drainage area accounts for only 8.4% of the total watershed draining into Big Hanaford Creek upstream of the existing Pond 38 outfall. Once the Central Packwood Lake is full, normal flow quantities to the creek will be re-established.

The Pit 7 Lake offers long-term benefit to the hydrologic scheme of Packwood Creek by connecting the lake to the creek. It will serve as a sedimentation control structure as it collects the drainage from an approximate 600-acre area before the water reaches the creek, which will reduce downstream sedimentation and turbidity. The lake will also attenuate floodflows, reducing flooding potential and downstream erosion, and will provide flow enhancement during much of the year. The Pit 7 Lake will also reduce peak flows reaching Packwood Creek and to a lesser degree, because of the relative flows, the Skookumchuck River. If similar 75°F water leaves the Central Packwood lake and eventually enters the Skookumchuck River, cumulative impacts would essentially be the same as the project. The 44 cfs outflow from Pit 7, for example, had less than a 0.02°F temperature effect on the Skookumchuck. The predicted maximum monthly average flow from Central Packwood Lake (18 cfs) would have less than half of that effect on the Skookumchuck River, and when combined with other creeks before entering the Skookumchuck, would have a negligible impact. Because the temperature effects from the Plan on the Skookumchuck River are negligible, the project has a negligible effect when added to any other lake overflows.

The Pit 7 Lake will have a short-term effect on the flow of surface water reaching Packwood Creek during the period of time it takes for the lake to fill. This temporary effect is considered negligible because the disrupted drainage area accounts for only 25% of the total watershed draining into Packwood Creek upstream of the existing Pond 19 outfall, which, in turn, is a small part of the entire Packwood Creek watershed. It is also negligible because it is already occurring today and will not be returned to normal conditions until reclamation is complete. Once the lake is full, discharge from the Pit 7 Lake will be routed through the Pond 5 system until water quality criteria are met. Because the lake has been filling slowly, this criteria might be met immediately, or it may have to await the establishment of more shoreline vegetation to reduce wave-induced shoreline turbidity. Once TCM demonstrates water quality criteria are met and Diversions 20, 21, 30C, 30D, and 30E are eligible for reclamation, normal flow quantities to the creek via the permanent outlet channel will be re-established.

The timing of the construction and completion of the reclamation plans for the Central Packwood and Pit 7 lakes are scheduled in a way that ensures that the drainage from the Central Packwood Lake (2016-2020) will occur at least one permit term prior to the drainage from the Pit 7 Lake (2026-2030).

Overall, the Pit 7 Lake will have a **minor** cumulative impact on the mine-wide hydrologic flow pattern.

G.3.4.2. Cumulative Impacts of No Action

Cumulative impacts from No Action will result in a greater rate of runoff than the Plan and this is accounted for in the Central Packwood Lake approval with no cumulative impacts. Although one or more additional lakes may be proposed for the site, such as North Hanaford Lake, there is not enough information available on that concept to evaluate impacts.

G.3.5. Land Use

G.3.5.1. Cumulative Impacts of the Proposed Action

Land use changes under the Plan are limited to the plan site. They do not affect off-site land use, or land uses at other reclamation sites; nor do those off-site land use changes affect uses planned for Pit 7. Other

site plans involving lakes create additional changes in land use by converting forest and potential timber lands to lake use; and reducing forest and potential timber lands as a result.

The cumulative total lake acreage from other known plans, which is also the cumulative total reduction in forest or meadow from the restoration plans, is 688 acres, compared to the total Centralia Mine reclamation acreage of approximately 7,252_acres. Possible timber land that would be replaced with the North Hanaford, Central Packwood, and Pit 7 lakes represents 253 acres, 203 acres, and 111 acres, respectively, equivalent to approximately 3.4%, 2.8%, and 1.5% (respectively) of the total Centralia Mine reclamation area.

This is a **minor** cumulative land use impact from the benefits of lake attributes. Minor cumulative wildlife and recreation impacts also occur and are addressed in Section G.3.5 and G.3.7. Impacts to future timber production is negligible to minor as the lost acreage is minor and it is unknown whether these sites will be used for timber production in the future. If all the trees on site were to be used for timber production, the cumulative impact of all three lakes would be 7.7% of the potential timber production at the site.

G.3.5.2. Cumulative Impacts of No Action

Cumulative land use changes from No Action would range from moderate to major. The lowest impact would probably result in the expansion of an existing gravel off-site borrow pit by 500 acres. A **major** impact would occur if new lands were developed for the off-site borrow pit, resulting in a loss of up to 500 acres of lands that might be suitable for other beneficial purposes.

G.3.6. Vegetation

G.3.6.1. Cumulative Impacts of the Proposed Action

The Proposed Action/plan proposes vegetation reclamation consistent with historical uses, avoiding noxious weeds and planting trees, aquatic vegetation and plants as discussed herein and approved by OSMRE. All plans include revegetation and reclamation consistent with OSMRE and state requirements to return the sites to acceptable post mining conditions. With the exception of the lakes, cumulative impacts on vegetation from reclaiming mining lands at Pit 7 are **minor**, and manage the same vegetation types as described in the Vegetation section of this EA.

G.3.6.2. Cumulative Impacts of No Action

Cumulative vegetation impacts from No Action range from **minor** at the mine site, where most of the Pit 7 site and the other sites under reclamation are meeting their plan goals, except for the lakes as previously discussed. Offsite reclamation impacts would range from **moderate** to **major**, as permanent vegetation losses would occur from expanding or developing a new borrow site, eliminating a property for this reclamation that is larger than the non-lake portion of the Pit 7 site itself.

G.3.7. Fish and Wildlife

G.3.7.1. Cumulative Impacts of the Proposed Action

As noted above, the proposed new reclamation plans for North Hanaford and Pit 7 both include permanent impoundments of water. These water bodies will be new features to the landscape of the permitted mine area. The addition of these lakes will create long-term, **minor** effects on fish and wildlife habitat. Establishment of additional fish and wildlife habitat within the Central Packwood Lake and Pit 7 Lake offers over-wintering protection to fish. Because such impacts are long term and affect off-site aquatic locations (Packwood Creek; Skookumchuck River) and still involve less than 10% of the mine reclamation site, the cumulative fish and wildlife impacts of the project are **minor**.

G.3.7.2. Cumulative Impacts of No Action

There would be no cumulative effects from combined lake effects on fish & wildlife if the No Action alternative was implemented. It does not include a lake. The cumulative impacts offsite from the unknown borrow site development would be adverse, but the extent of the cumulative impact would depend on the selected site. Removing 500 acres from a small watershed could be a **moderate** to **major** effect on water quality and flows, and a similar removal from a productive wildlife habitat would be similarly negative.

G.3.8. Greenhouse Gases and Climate Change

G.3.8.1. Cumulative Impacts of the Proposed Action

The Pit 7 GHG emissions fall below all reporting and permitting thresholds, are not subject to such thresholds, are similar to the planned emissions in the existing PAP and are likely a reduction in overall emissions during construction because they avoid the movement of approximately 73 million yards of material. Because the GHG gas emissions of this Plan are negligible, the combined impacts of all plan implementations are also **negligible**, including No Action. Permanent loss of forest will reduce the potential for GHG sequestration from tree growth, but lake creation increase the potential for GHG consumption from aquatic plants.

Because the change in total future GHG consumption from cumulative forest reduction alone is far less than 10% of the total reclamation acreage of the entire mine site, and all emissions are below reportable thresholds, cumulative GHG emissions from the project are **negligible** to **minor**.

G.3.8.2. Cumulative Impacts of No Action

The cumulative GHG emissions from No Action are likewise not subject to regulation because they come from a transportation source; however, they far exceed the emissions of all other combined projects at the site. TCM has not calculated the actual GHG emissions from trucks, because their horsepower and distance travelled is unknown, as are the emissions required to mine the materials. But, assuming 30 yards per truck, the 4.8 million truck round-trips required to bring fill to the site from an unknown offsite location would generate significant emissions between now and 2025. Although TCM does not know where the material might come from, if it were 20 miles away and trucks operated at 5 miles per gallon,

these activities would burn 3.7 million gallons of diesel fuel per year, resulting in a **major** impact that would remain **major** when combined with other GHG sources.

G.3.9. Recreation

G.3.9.1. Cumulative Impacts of the Proposed Action

Neither the Pit 7 project nor any other portion of the mine reclamation plans has any negative effect on recreation. To the extent that the lakes may be used for public recreation in the future, they may offer a possible recreational impact. If not, there are **no** cumulative impacts to recreation.

G.3.9.2. Cumulative Impacts of No Action

No Action would have **no** cumulative recreation impacts at the site, and offsite impacts would depend on the characteristics of the unknown fill material borrow site. Because this is unknown, cumulative recreation impacts from No Action are unknown.

G.3.10. Noise

G.3.10.1. Cumulative Impacts of the Proposed Action

Noise impacts, if they exist, are not cumulative unless they overlap one another in time or location or separately affect the same resource. The most sensitive resource of concern at this site is the residential use boundary to the north. The Central Packwood project lies between the Plan area and the residential use boundary to the north and shows no violation of noise standards, thus there are no noise impacts from Central Packwood and even less potential impacts from the Plan. Therefore, there are **no** cumulative noise impacts to residents from the Plan.

G.3.10.2. Cumulative Impacts of No Action

No Action has similar cumulative impacts on site. Offsite, although not subject to state regulation, the noise impacts from 10 years of heavy truck traffic would be **moderate** to **major** to those living or working along the truck route and would be cumulative to other traffic along I-5 and in Centralia.

G.3.11. Public Health and Safety

G.3.11.1. Cumulative Impacts of the Proposed Action

Future site activities are unknown. They could range from recreation to timber harvest to hunting, hiking, housing or a natural area. Because there are no reasonably foreseeable activities that would create additional health and safety risks, there are no cumulative health & safety impacts from the Plan. Cumulative health and safety impacts from the Pit 7 Plan are **negligible.**

G.3.11.2. Cumulative Impacts of No Action

Cumulative health and safety impacts from the on-site portion of No Action are similar to the Proposed Action: **negligible**. Off the site, as a result of materials hauling, the No Action alternative, may result in

one fatality and 35 injuries. Because there are no other foreseeable impacts identified, there are no additional cumulative impacts from No Action.

G.3.12. Air Quality

G.3.12.1. Cumulative Impacts of the Proposed Action

The Plan has less exhaust and dust emissions than the original PAP because there won't be a need to move 73 million yards of fill material. Whatever air emissions might also be occurring on the site from other activities approved by OSMRE, in combination with Plan activities, will be less than the original plan, resulting in a reduction of cumulative impacts that might otherwise occur.

G.3.12.2. Cumulative Impacts of No Action

The exhaust and fugitive dust emissions from No Action are the only impacts identified. No other foreseeable projects have been identified and there are no additional cumulative impacts for other existing or foreseeable projects.

G.3.13. Transportation and Traffic

G.3.13.1. Cumulative Impacts of the Proposed Action

There are no transportation impacts from the Plan. Therefore there are no cumulative transportation or traffic impacts when added to other existing and foreseeable projects or impacts.

G.3.13.2. Cumulative Impacts of No Action

No new or ongoing projects or activities have been identified that would generate more traffic than whatever is existing between the site and I-5. The cumulative impacts from the project are the same as from the project itself – potential congestion through Centralia leading to a possible drop in Level of Service (LOS).

G.3.14. Public Services

G.3.14.1. Cumulative Impacts of the Proposed Action

There are no public services impacts from the Plan. Therefore there are no cumulative impacts when added to other foreseeable impacts from other actions.

G.3.14.2. Cumulative Impacts of No Action

The increased maintenance costs from the No Action alternative are the only impacts identified. No other existing or foreseeable projects have been identified that would contribute to cumulative impacts.

H. PREPARER(S)

This section provides persons and agencies contacted to assist in the preparation of the Environmental Assessment.

The OSMRE contact for the Proposed Action	
Marcelo Calle, Manager	Program Support Division (Western Region)
Any other person or agency directly involved in the Proposed Action	
Robert A. Johnson	Lewis County Community Development
John Storm	Washington State Department of Ecology
Scott Brummer	Washington Department of Fish & Wildlife
Tim Rymer, William W. Stelle, Jr.	National Marine Fisheries Service
Robert Whitlam, Ph.D.	Washington Department of Archaeology & Historic Preservation
Barbara Bowerman, Paul Clark, Roberta Martinez-Hernandez, Alex Birchfield, Karen Jass, Gretchen Pinkham, and Flynn Dickinson	Office of Surface Mining Reclamation and Enforcement (Western Region)
Any other person or agency providing information for the Environmental Assessment	
Peggy Miller	Washington Department of Fish & Wildlife
Dennis Morr, Senior Environmental Specialist	TransAlta Centralia Mining LLC
Ken Johnson, Supervisor of Engineering and Environment	TransAlta Centralia Mining LLC
Tony Briggs, Manager of Operations and Engineering	TransAlta Centralia Mining LLC
Art O'Hayre, Calvin Boese, Fran Amendola, Paul Kos, Doug Moore, Michael Graham	Norwest Corporation
Grant Bailey, Principal	Golder Associates Inc.
Kara Warner, PhD, Environmental Scientist	Golder Associates Inc.

I. REFERENCES

Cramer, Michelle L. (managing editor). 2012. Stream Habitat Restoration Guidelines. Co-published by the Washington Departments of Fish and Wildlife, Natural Resources, Transportation and Ecology, Washington State Recreation and Conservation Office, Puget Sound Partnership, and the U.S. Fish and Wildlife Service. Olympia, Washington.

Xu, Jiaquan. 2014. Unintentional Drowning Deaths in the United States, 1999-2010. NCHS Data Brief No. 149, April 2014.

Michael Minor & Associates. 2001. Noise and Vibration Impact Analysis, Central Packwood Pit. Prepared for TransAlta Centralia Mining, LLC, Centralia, WA, August 2001.

Miller, Eric. 2015. Crash Death Rate Declines. Transport Topics, February 9, 2015.

Norwest Corporation (Norwest). 2012. TransAlta Centralia Mine Central Field: Pit 7 Reclamation Plan.

TransAlta Centralia Mining LLC (TCM). 2014. Proposed Permit Application Package Revision for the Pit 7 Reclamation Plan.

Washington Department of Ecology. 2001. Upper Chehalis River Basin; Temperature Total Maximum Daily Load. Publication No. 99-52, July 2001.