BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

Klamath River Renewal Corporation **Project Nos. 14803-001;**
PacifiCorp **2082-063**

AMENDED APPLICATION FOR SURRENDER OF LICENSE FOR MAJOR PROJECT AND REMOVAL OF PROJECT WORKS

EXHIBIT B
Construction Management Plan

KLAMATH RIVER RENEWAL CORPORATION

Lower Klamath Project
FERC Project No. 14803

Construction Management Plan

Klamath River Renewal Corporation
2001 Addison Street, Suite 317
Berkeley, CA 94704

February 2021

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1.0 Introduction

The Lower Klamath Project (Project) (FERC No. 14803) consists of four hydroelectric developments on the Klamath River: J.C. Boyle, Copco No. 1, Copco No. 2, and Iron Gate (Figure 1-1). Specifically, the reach between J.C. Boyle dam and Iron Gate dam is known as the Hydroelectric Reach. In September of 2016, the Renewal Corporation filed an *Application for Surrender of License for Major Project and Removal of Project Works,* FERC Project Nos. 2082-063 & 14803-001 (License Surrender). The Renewal Corporation filed the License Surrender application as the dam removal entity for the purpose of implementing the Klamath River Hydroelectric Settlement (KHSA). In November of 2020, the Renewal Corporation filed its Definite Decommissioning Plan (DDP) as Exhibits A-1 and A-2 to its amended License Surrender application. The DDP is the Renewal Corporation's comprehensive plan to physically remove the Lower Klamath Project and achieve a free-flowing condition and volitional fish passage, site remediation and restoration, and avoidance of adverse downstream impacts (Proposed Action). The Limits of Work is a geographic area that encompasses dam removal related activities in the Proposed Action and may or may not expand beyond the FERC boundary associated with the Lower Klamath Project.

The Proposed Action includes the deconstruction of the J.C. Boyle Dam and Powerhouse (Figure 1-2), Copco No. 1 Dam and Powerhouse (Figure 1-3), Copco No. 2 Dam and Powerhouse (Figure 1-4), and Iron Gate Dam and Powerhouse (Figure 1-5), as well as associated features. Associated features vary by development, but generally include powerhouse intake structures, embankments, and sidewalls, penstocks and supports, decks, piers, gatehouses, fish ladders and holding facilities, pipes and pipe cradles, spillway gates and structures, diversion control structures, aprons, sills, tailrace channels, footbridges, powerhouse equipment, distribution lines, transmission lines, switchyards, original cofferdam, portions of the Iron Gate Fish Hatchery, residential facilities, and warehouses. Facility removal will be completed within an approximately 20-month period.

This Construction Management Plan describes measures the Renewal Corporation will implement as part of the Proposed Action construction phase, specifically, measures related to traffic management and emergency response. The Renewal Corporation has prepared 16 Management Plans for FERC's review and approval as conditions of a license surrender order. These Management Plans were developed in consultation with federal, state and county governments and tribes.

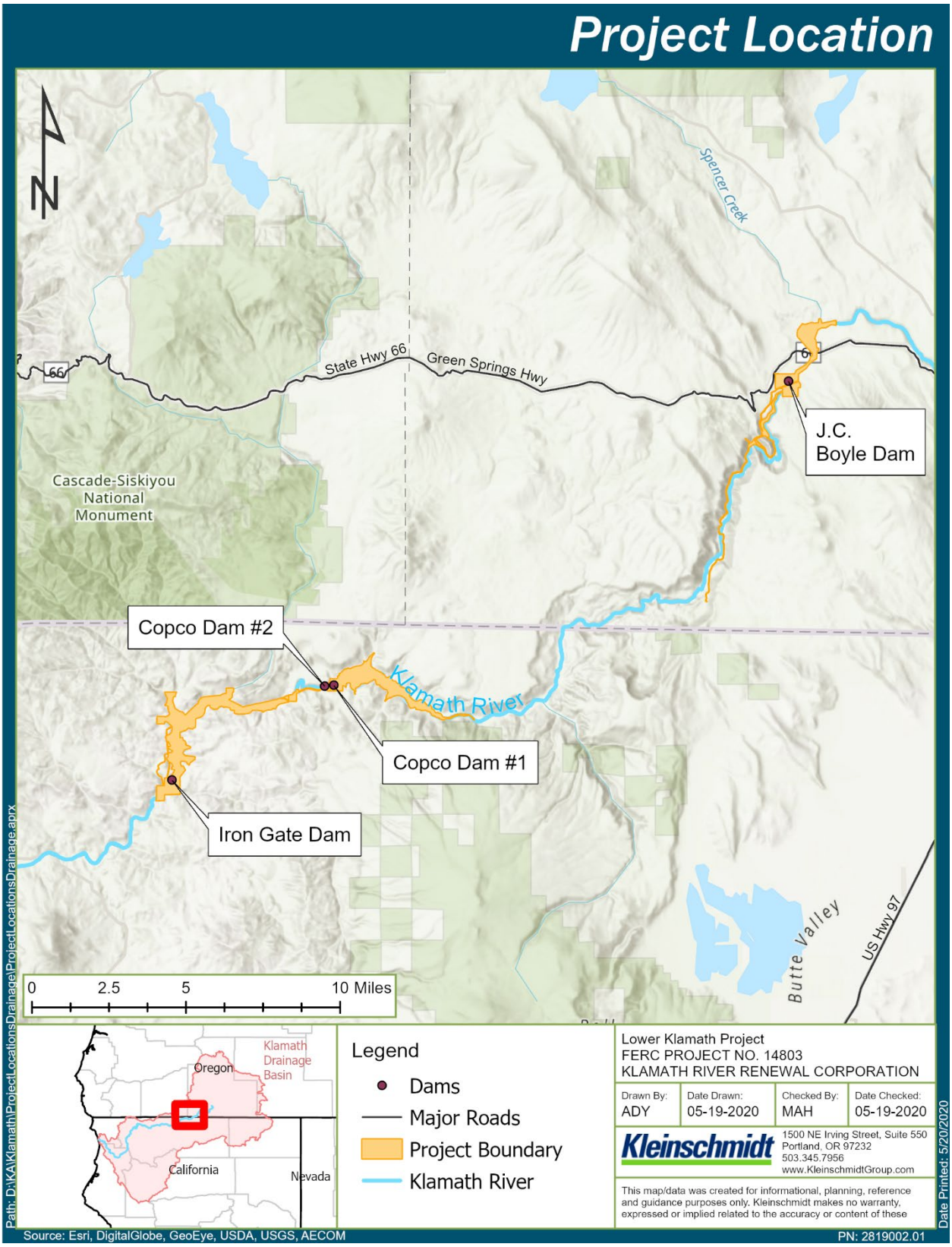

Figure 1-1. Lower Klamath Project Location

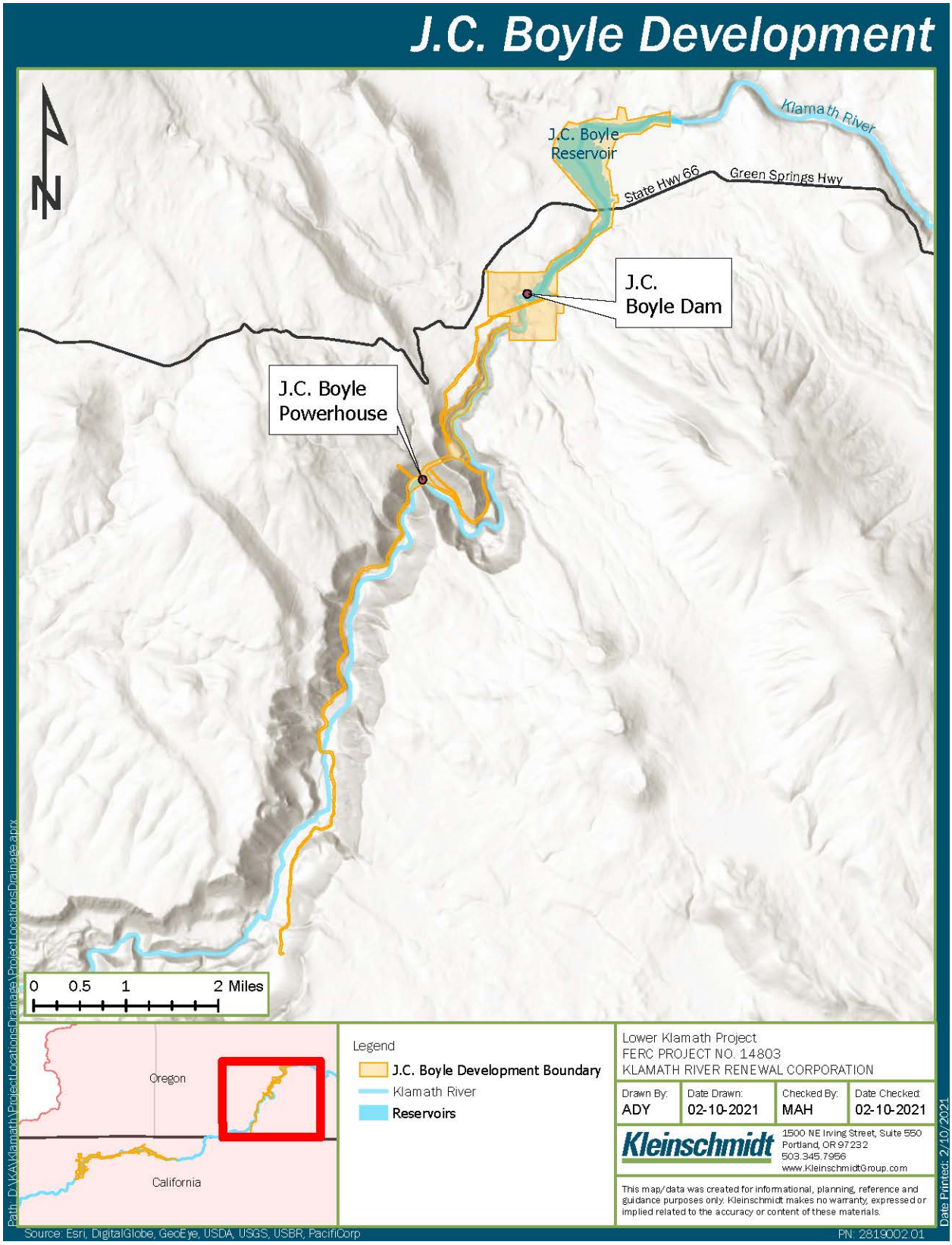

Figure 1-2. J.C. Boyle Development Facility Details

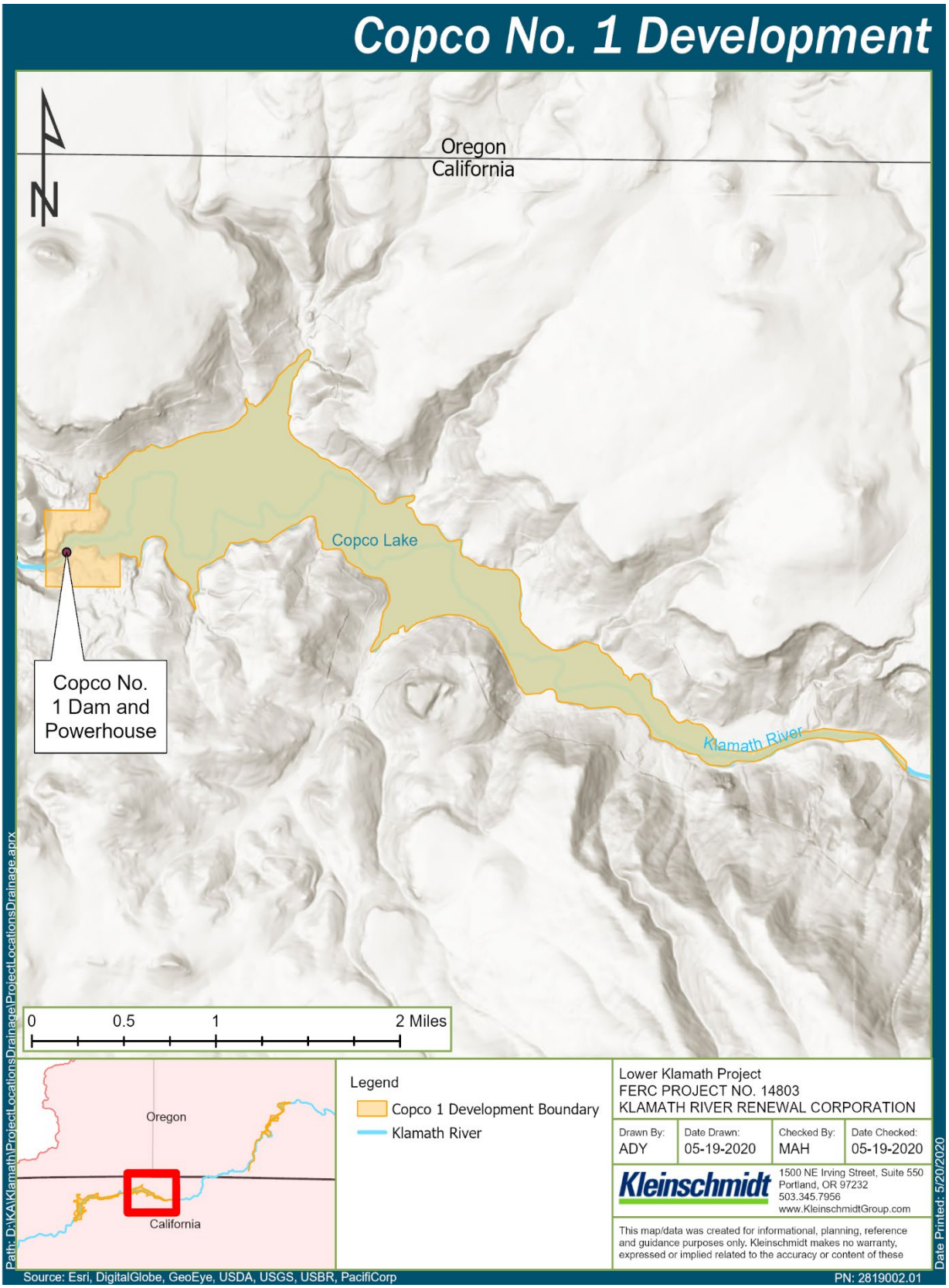

Figure 1-3. Copco No.1 Development Facility Details

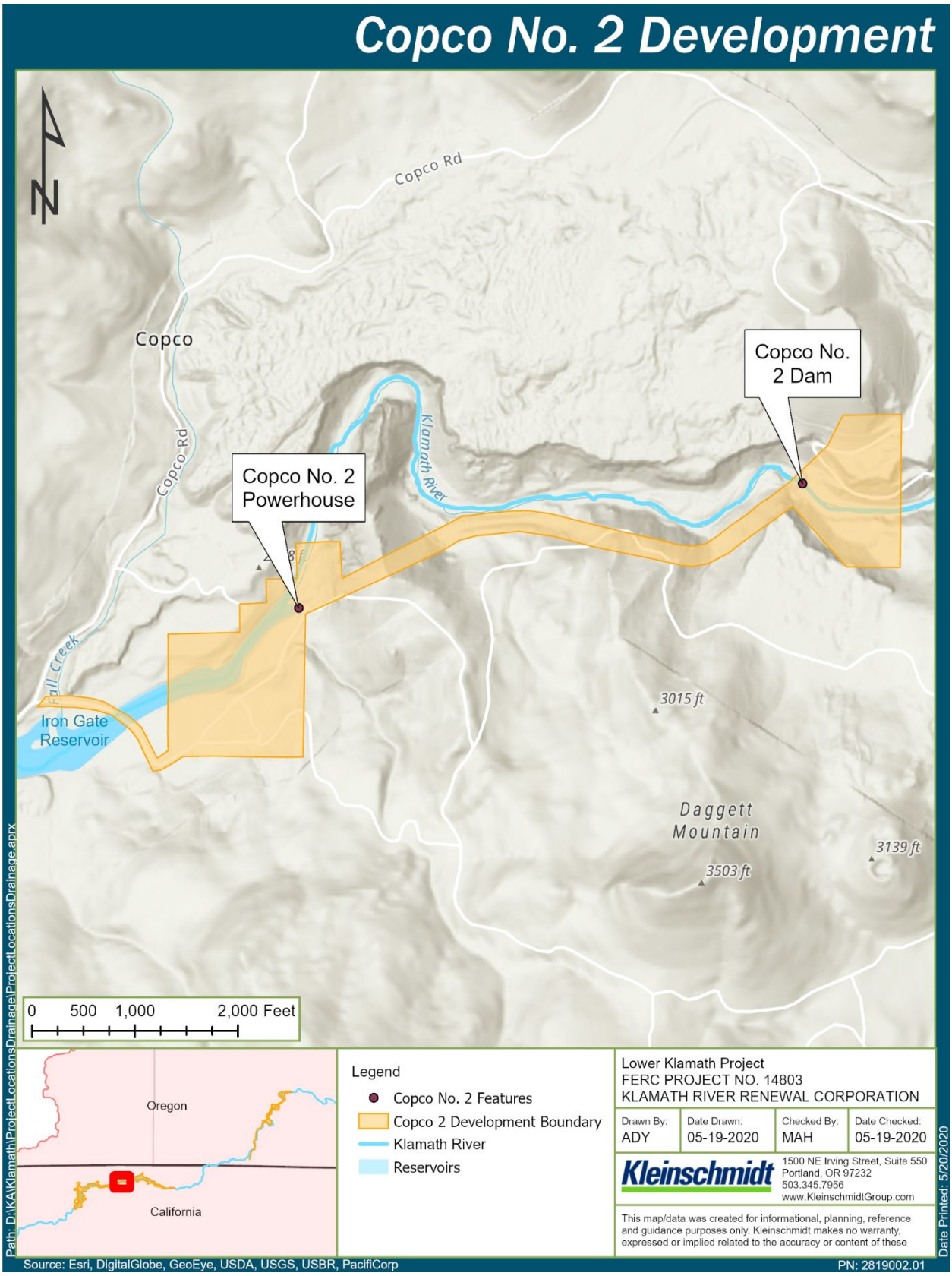

Figure 1-4. Copco No.2 Development Facility Details

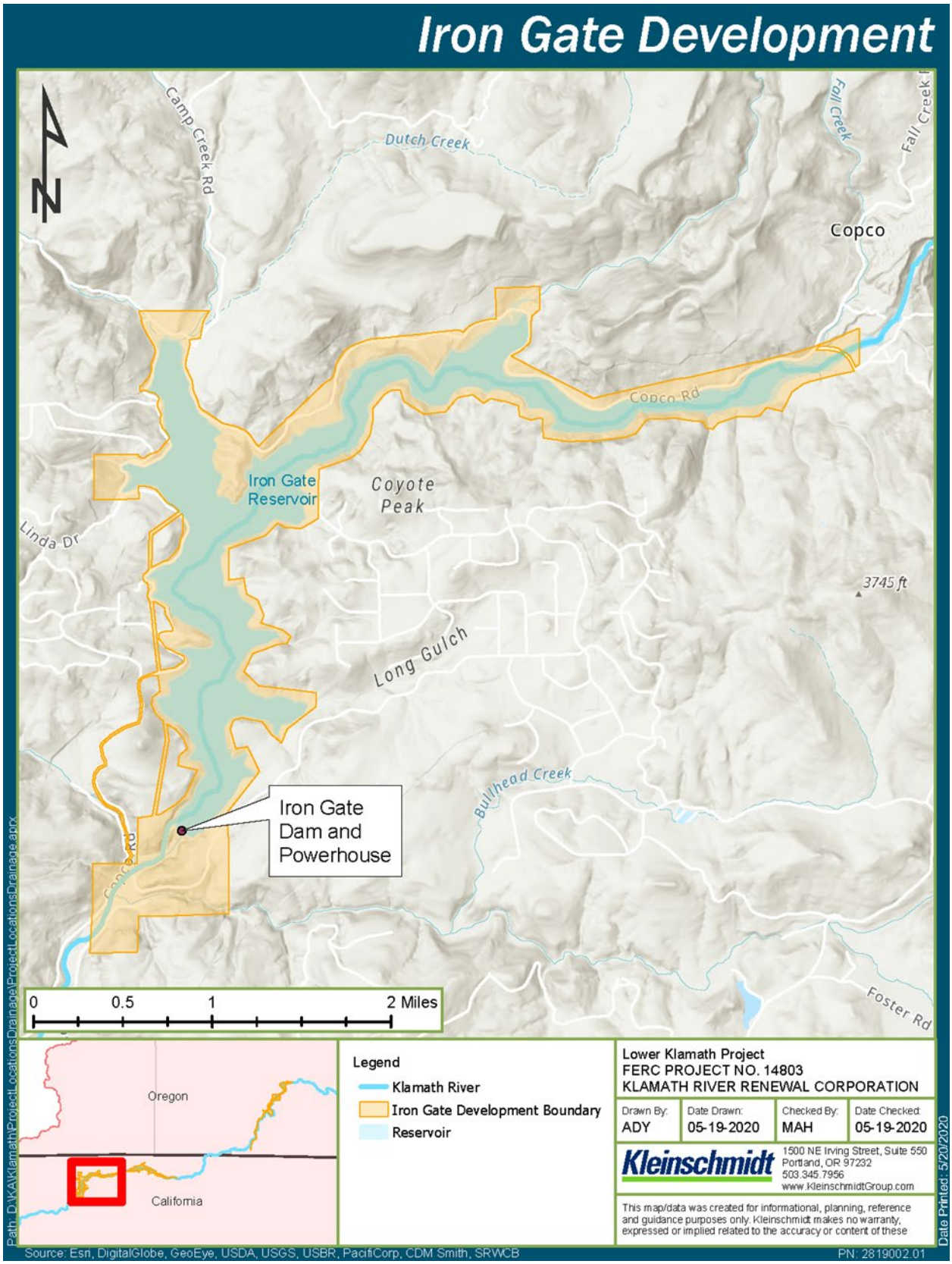

Figure 1-5. Iron Gate Development Facility Details

2.0 Regulatory Context

The Construction Management Plan is one of 16 Management Plans implementing the DDP.

Table 2-1. Lower Klamath River Management Plans

1. Aquatic Resources Management Plan	9. Remaining Facilities Plan
2. Construction Management Plan	10. Reservoir Area Management Plan
3. Erosion and Sediment Control Plan	11. Reservoir Drawdown and Diversion Plan
4. Hatcheries Management and Operations Plan	12. Sediment Deposit Remediation Plan
5. Health and Safety Plan	13. Terrestrial and Wildlife Management Plan
6. Historic Properties Management Plan	14. Waste Disposal and Hazardous Materials Plan
7. Interim Hydropower Operations Plan	15. Water Quality Monitoring Management Plan
8. Recreation Facilities Plan	16. Water Supply Management Plan

2.1 Organization Structure

This Construction Management Plan describes measures the Renewal Corporation will implement as part of the Proposed Action construction phase, specifically, measures related to traffic management and emergency response. The Construction Management Plan includes the following sub-plans:

- Appendix A: Oregon Traffic Management Plan
- Appendix B: California Traffic Management Plan
- Appendix C: Emergency Response Plan

2.2 Specific Regulatory Interests

The Renewal Corporation considered the following regulatory interests in the development of the Construction Management Plan:

- Klamath County Memorandum of Understanding
- California Department of Fish and Wildlife MOU
- Draft Siskiyou County MOU
- California Environmental Quality Act, Final Environmental Impact Report

2.3 Regulatory Review Process

The Renewal Corporation will implement the Construction Management Plan upon FERC approval, including any changes required in the FERC License Surrender Order. A consultation record for the Construction Management Plan is included as Appendix D.

2.4 Reporting

The Renewal Corporation will prepare and submit an Annual Report by February 15th of each year which will include information pertaining to implementation of the Construction Management Plan.

Appendix A

Oregon Traffic Management Plan

KLAMATH RIVER RENEWAL CORPORATION

Lower Klamath Project
FERC Project No. 14803

Oregon Traffic Management Plan

Klamath River Renewal Corporation
2001 Addison Street, Suite 317
Berkeley, CA 94704

Prepared by:
Knight Piesold
LKRP Project Office
4650 Business Center Drive
Fairfield, CA 94534

February 2021

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1.0 Introduction

The Oregon Traffic Management Plan described herein is a subplan of the Construction Management Plan that will be implemented as part of the Proposed Action for the Lower Klamath Project (Project).

1.1 Purpose of Oregon Traffic Management Plan

The purpose of the Oregon Traffic Management Plan is to describe the measures the Renewal Corporation will implement to maintain efficient and safe movement of vehicles throughout the construction zones and construction activities at the J.C. Boyle facility. This Oregon Traffic Management Plan will prevent unreasonable traffic delays and maintain acceptable levels of service, traffic circulation, and safety on state, county, and private roadways used during construction at the J.C. Boyle facility.

2.0 Work Activities

2.1 Implementation

Renewal Corporation construction personnel at the J.C. Boyle facility will receive an initial orientation describing the details of this Oregon Traffic Management Plan. All related training will be documented by the Kiewit safety adviser. Personnel will be given a copy of the vehicle movement plan related to their role in the construction area and a copy of each vehicle movement plan will be posted and available at each entry gate and area for review.

The Oregon Traffic Management Plan will be updated as needed if additional risk areas are encountered or to improve best management practices.

2.2 Reporting

Inspection and reporting procedures will be followed consistent with the Renewal Corporation's discussions with Klamath County.

The Renewal Corporation will investigate public roads that may be potentially impacted by the Proposed Action. The Renewal Corporation will prepare and provide the County with a summary report of existing conditions of such public roads and identify repairs that are needed to maintain the efficient and safe movement of construction traffic.

The condition of existing road(s) that may be impacted by construction traffic will be inspected bi-annually by the Renewal Corporation (spring and fall) and a report will be completed. Following construction, the Renewal Corporation will complete a final road condition inspection and report which will be used to determine the need for tail end repairs.

2.3 ESAL Calculations

Based on Equivalent Single Axle Load (ESAL) calculations, an estimate of degradation to Klamath County rural, state highways, and interstate highways associated with the J.C. Boyle area is shown in Table 2-1. A calculation summary sheet is provided in Appendix A.

Table 2-1. ESAL Comparisons for Klamath County Roads

ROAD TYPE	EXISTING ESALS	ESALS DURING CONSTRUCTION	INCREASE IN NORMAL LOADING (%)
Rural Roads	29,439	63,626	116
State Highways (Hwy 66)	72,486	106,673	47
Interstate Highway (Hwy 97)	6,220,885	6,255,072	1

3.0 Site Access and Traffic

3.1 Construction Access Improvements

The Renewal Corporation will provide adequate access and haul routes associated with the J.C. Boyle construction. An Overview Map is presented at Figure B1, Appendix B. Proposed improvements will be completed by the Renewal Corporation prior to drawdown. Access routes to access the dam for pre-drawdown improvements, dam removal, and channel restoration are provided in Table 3-1 below. The temporary access improvements in Table 3-1 are necessary to provide access to multiple portions of the Proposed Action area.

Table 3-1. Potential Roadway and Access Improvements

LOCATION	IMPROVEMENTS	CONSTRUCTION ACCESS	POST-DRAWDOWN EFFECTS[1]	ROAD REHABILITATION
Green Springs Highway (OR 66)	Potential pavement rehabilitation during or post-Proposed Action			X
Spencer Bridge	Monitor post-drawdown for a 2- year period for potential erosion or scour at the bridge embankments and intermediate piers		X	
Keno Worden Road	Potential pavement rehabilitation during or post-Proposed Action			X

LOCATION	IMPROVEMENTS	CONSTRUCTION ACCESS	POST-DRAWDOWN EFFECTS[1]	ROAD REHABILITATION
Keno Access Road	None			
Topsy Grade Road	Potential road surface rehabilitation during or post-Proposed Action			X
J.C. Boyle Dam Access Road from OR 66	Regrading uneven or rutted areas	X		
Junction of OR 66 and J.C. Boyle Dam Access Road	Intersection widening	X		
	Tree removal	X		
	Signage	X		
J.C. Boyle Powerhouse Access Road (Spring Island Road)	Cut back of west slope to relocate the road away from scour hole	X		X
Timber Bridge at Klamath River	Remove post-Proposed Action completion	X		
J.C. Boyle Power Canal Access Road	None			
J.C. Boyle Disposal Access Road	Regrading Minor widening	X		

Notes:

Source: KRRC, 2020

1. Sediment and erosion control measures for public access roads are defined in the Erosion and Sediment Control Subplan for the J.C. Boyle facilities (Knight Piésold, 2020A)

3.2 Access to Site

Figure B2 in Appendix B shows access roadways to the J.C. Boyle site and Table 3-2 distinguishes between public and private roadways. The two staging areas for construction works at the J.C. Boyle Dam will be accessed from the South. From the South, access, mobilization, and material hauling for the J.C. Boyle facility will occur via the J.C. Boyle Dam Access Road regionally accessed through Topsy Grade Road. The Proposed Action will not affect the culvert on Topsy Grade Road at unnamed creek therefore no monitoring is expected to be required. A left abutment access road will be built and connected to Topsy Grade Road to be used to convey excavated embankment fill to the left bank disposal area. From the North, construction access to the J.C. Boyle Dam site will be via the Access Road from OR 66 to the J.C. Boyle Facility. This roadway connects with the J.C. Boyle Disposal Access Roadway, which will also be used for material hauling during construction.

The J.C. Boyle Powerhouse Access Road (Spring Island Road) is the primary access route to the powerhouse area and the staging area adjacent to the powerhouse. The J.C. Boyle Power Canal Access Road is the primary access route to the power canal and the two staging areas adjacent to the forebay area. These two roads are accessed via OR 66. Both roads will require temporary maintenance during construction to ensure accessibility and both roads will be left in place after construction. The J.C. Boyle Power Canal Access Road will be used for construction access until the power canal work has been complete. At the powerhouse and penstock area of the J.C. Boyle facility, Kiewit will improve temporary access roads for construction access to the penstock and penstock anchor block and the roads will be left in place after the work is complete.

Table 3-2. Roadway Jurisdiction

ROAD	PUBLIC	PRIVATE
I-5	X	
OR 66	X	
Topsy Grade Road	X	
J.C. Boyle Dam Access Road		X
Access Road from OR 66 to J.C. Boyle Dam		X
J.C. Boyle Disposal Access Roadway		X
J.C. Boyle Powerhouse Access Road (Spring Island Road)		X
J.C. Boyle Power Canal Access Road		X

3.3 Existing Site Road and Traffic Characteristics

Consistent with the Renewal Corporation's discussions with Klamath County, the Renewal Corporation will perform an existing conditions assessment of roads to be utilized. In July 2019, a visual inspection of the roads in the J.C. Boyle area and continuous areas was completed (Knight Piésold, 2020B). The road inspection covered surface types, the frequency and severity of distresses, and listed the road conditions either as good (e.g., like new, structurally sound, and functionally adequate), fair (e.g., some deterioration, but structurally sound and functionally adequate) or poor (e.g., significant deterioration, requiring maintenance or repair).

OR 66 was inspected from I-5 in the west to US 97 to the east. The road surface is asphalt, in good condition, and areas of tight turns through steep terrain are common. Some rockfall protection measures are in place and pullouts are frequent. Keno Worden Road from OR 66 to US 97 has an asphalt road surface and is in good condition. The Topsy Grade Road from OR 66 to the J.C. Boyle Dam Road is in good condition and has an aggregate base

road surface with a small portion being hot mix asphalt near the Topsy Campground. The J.C. Boyle Access Road, J.C. Boyle Power Canal Road, and J.C. Boyle Powerhouse Access Road (Spring Island Road) have an aggregate base road surface. These roads are in fair to good condition and have areas of nearby vegetation, steep slopes, and tight turns.

The J.C. Boyle facility is located in a rural area and roadways have low traffic volumes. Estimated traffic counts for existing roads in the regional area from Oregon Department of Transportation and Caltrans are provided in Table 3-3. Construction related traffic counts per lane direction on Topsy Grade Road, OR 66, and US 97 in Oregon are provided in Table 3-4.

Table 3-3. Estimated Traffic Counts for Existing Conditions

ROAD SEGMENT	AADT	AADT DISTRIBUTION (%)[1]			AADT DISTRIBUTION			PHT DISTRIBUTION[3]			PHT DISTRIBUTION FOR EACH DIRECTION[4]		
		AUTO[2]	MEDIUM TRUCKS[2]	HEAVY TRUCKS[2]	AUTO	MEDIUM TRUCKS	HEAVY TRUCKS	AUTO	MEDIUM TRUCKS	HEAVY TRUCKS	AUTO	MEDIUM TRUCKS	HEAVY TRUCKS
Topsy Grade Rd[5]	200	58.82	34.85	6.33	118	70	13	12	7	2	6	4	1
OR 666	500	58.82	34.85	6.33	294	174	32	29	17	3	15	9	2
US 977	6,300	33.55	28.34	38.11	2,114	1,785	2,401	211	179	240	106	90	120

Notes:

Source: US DOI and CDFW, 2012

1. AADT distribution percentage provided by transportation engineers (J. Key, personal communication, December 13, 2010).
2. TNM vehicle classification: Auto = cars and light duty trucks, Medium Trucks = cargo vehicles with two axles and six tires; Heavy trucks - cargo vehicles with three or more axles. 3 PHT assumed to be 10% of AADT based on a review of published Caltrans and ODOT traffic counts (ODOT, 2010; Caltrans, 2010).
3. PHT for each direction assumed to be the same in both direction of traffic.
4. Traffic count estimated from field observations (CDM, field observations, October 17, 2010). 6 AADT at MP 48.73, 0.02 mile east of Hamaker Mountain Road (ODOT, 2010).
5. AADT at MP 273.92, 0.30 mile south of Nevada Avenue Interchange (ODOT, 2010).

Table 3-4. Estimated Peak Hour Traffic Counts per Direction

ROAD SEGMENT	DIRECTION	EXISTING CONDITIONS[1]			DURING CONSTRUCTION		
		Auto[2]	Medium Trucks[2]	Heavy Trucks[2]	Auto	Medium Trucks	Heavy Trucks[3]
Topsy Grade Road[4]	North	6	4	1	6	4	5
	South	6	4	1	51	4	1
OR 66[4]	East	15	9	2	15	9	6
	West	15	9	2	60	9	2
sUS 97[4]	North	106	90	120	106	90	124
	South	106	90	120	151	90	120

Notes:

Source: Information provided by KRRC (2020)

1. See Existing Conditions table for PHT distribution references.
2. TNM vehicle classification: Auto = cars and light duty trucks, Medium Trucks = all cargo vehicles with two axles and six tires; Heavy trucks - all cargo vehicles with three or more axles.
3. All haul trucks assumed to be Heavy Trucks (3 axles or more).
4. Workers for J.C. Boyle assumed to travel from Klamath Falls. Maximum number of construction workers for J.C. Boyle added to the Auto category for Topsy Grade Road, OR 66, and US 97

3.4 Construction Work Hours

Activities at the J.C. Boyle facility, including the arrival and departure of vehicles delivering or removing materials from or to the site, will be 24 hours a day, seven days a week.

3.5 Traffic Control Site Manager

At the J.C. Boyle facility, the Traffic Control Site Manager is the Kiewit Project Director. The Traffic Control Site Manager will be responsible for:

- Ensuring all traffic control measures are being carried out effectively and are in accordance with the approved plans,
- Conducting routine inspections and auditing traffic control measures,
- Revisiting the traffic control plans and adapting new measures in consultation with the County as the work progresses,
- Monitoring and determining if any additional road improvements are needed or if modifications to traffic management operations are needed, implement such improvements or modification in consultation with the County. The Renewal Corporation will monitor and make necessary improvements and/or repairs to roadway issues that pose site access and or safety concerns. The Renewal Corporation will consult with the County with regard to these repairs, as per the agreed to Memorandum of Understanding.

- Maintaining communication with all appropriate agencies, including but not limited to the Klamath County Police and Klamath County on traffic control measures for the J.C. Boyle facility, and
- Implementing traffic control awareness and conducted safety and logistics toolbox talks to personnel.

3.6 Roads Authority

The roads authority for non-private roads in the Proposed Action area is Oregon Department of Transportation (ODOT), Klamath County, and the Bureau of Land Management (BLM). This Oregon Traffic Management Plan meets applicable regulatory requirements, state, and local ordinances, as well as ODOT, Klamath County, and BLM requirements.

3.7 Access Points and Site Security

The J.C. Boyle dam area is protected on all sides by a chain link fence with barbed wire. Road access to the facility will be controlled by manned guard shacks with pipe gates and unmanned pipe gates as shown in Figure B3 in Appendix B.

3.8 J.C. Boyle Facility Users

An average workforce of 135 people is needed by the Renewal Corporation for the pre- and post-reservoir drawdown construction activities at the J.C. Boyle facility. The peak workforce required during excavation may reach 165 people. The estimated equipment that will be used for the removal of the dam and other facilities pre- and post-drawdown at the J.C. Boyle facility are shown in Table 3-5.

Table 3-5. Estimated Equipment at the J.C. Boyle Facility

EQUIPMENT TYPE
Crawler-mounted lattice boom crane, 100 to 120 ton or 150 to 200 ton, 160- to 200-foot boom
Rough terrain hydraulic crane, 35 to 75 ton
Hydraulic track excavators, 65,000 to 120,000 lb, with Cat H120 hoe-ram, thumb, and sheer attachments
Cat 966 (52,000-lb, 5-cy bucket) or Cat 988 (65,000-lb, 6-cy bucket) articulated wheel-loaders
Cat 725, Cat 730, or Cat 740 articulated rear dump trucks, 30 ton (22 cy)
D-6, D-7, D-8, or D-9 standard crawler dozers
Front-end wheel loader, integrated tool carrier, 25,000 lb
Cat TL943 rough terrain telescoping forklift
Rough terrain telescoping manlift

EQUIPMENT TYPE
Truck-mounted seed sprayer, 2,500 gallons
On-highway, light duty diesel pickup trucks, ½-ton and 1-ton crew
On-highway flatbed truck with boom crane, 16,000 lb
On-highway truck tractors, 45,000 lb
Off-highway water tanker, 5,000 gallons
Engine generators, 6.5 kW to 40 kW, diesel or gasoline
Air compressors, 100 psi, 185 to 600 cfm, diesel
Hand-held drilling, cutting, and demolition equipment
Portable welders and acetylene torches
4-inch submersible trash pumps, electric

Notes: Source: Information provided by KRRC (2020)

3.8.1 Construction Users

Construction personnel at the J.C. Boyle facility will arrive on site at approximately the same times every workday to maintain efficiency and reduce unexpected traffic. Construction personnel will arrive at the staging area and are permitted to be at site during the construction hours. An estimated 135 to 165 vehicles associated with construction personnel will be on site daily and all vehicles must be parked in the designated parking locations within the staging areas.

Vehicle trips will be required to transport waste material from the J.C. Boyle facility for on-site and off- site disposal. Estimated quantities of materials generated during removal of J.C. Boyle Dam and Powerhouse, numbers of truck trips, and approximate haul distances for waste disposal are shown in Table 3-6.

Table 3-6. Estimated Volume of Waste Material from Removal of J.C. Boyle Facilities

WASTE MATERIAL	IN-SITU QUANTITY	BULK QUANTITY	DISPOSAL SITE	QUANTITY PER TRIP	TOTAL TRIPS
Dam Embankment - Earth	135,800CY	163,000CY	On-site - left and right banks upstream of the dam	40CY/Trip (unpaved road)	4,100 Trips (1- miles RT)
Powerhouse Tailrace - Earth	11,000CY	13,000CY	On-site powerhouse tailrace	N/A	On-site disposal

WASTE MATERIAL	IN-SITU QUANTITY	BULK QUANTITY	DISPOSAL SITE	QUANTITY PER TRIP	TOTAL TRIPS
Dam - Concrete	3,440 CY	4,470 CY	On-site scour hole	40CY/Trip (unpaved road)	110 trips(4 miles RT to scour hole)
Power Canal and Forebay Concrete (Option 1)	23,000CY	29,900CY	On-site scour hole		750 trips(2 miles RT)
Powerhouse and Miscellaneous foundation concrete	400 CY	520 CY	On-site tailrace		On-site Disposal
Dam Mech/Elec	440 tons		Salvaged, or landfill near Klamath Falls, or alternative permitted site	25 tons/trip (via Highway 66)	20 trips(44 miles RT)
Power Canal Mech/Elec	270 tons	--			10 trips(48 miles RT)
Powerhouse Mech/Elec	11,210 tons				50 trips(52 miles RT)
Timber Bridge	60 CY		Rock disposed on site; sheet piles, treated wood disposed off-site at permitted site	40CY/Trip (unpaved road)	2 trips (up to 52 miles RT)
Building Material Debris	10 buildings 17,300 ft^2		Landfill near Klamath Falls or alternative permitted site	25 tons/trip (Highway 66)	20 trips (44 miles RT)
Power Lines	2.9 miles of 12-kV and 230 kV lines				

Notes:

Source: Information provided by KRRC (2020) CY – Cubic yards
RT – Round trip

3.8.2 Reservoir Operational Staff and Contractors

Reservoir operational staff and contractors will access the J.C. Boyle facility from the South via Topsy Grade Road. The J.C. Boyle powerhouse will be accessed through the J.C. Boyle Powerhouse Access Road. Two to six PacifiCorp personnel will be on site, depending on substation and transmission related activities.

3.8.3 Oversized and Heavy Vehicle Access

Drivers of oversized and heavy vehicles will be required to exercise conservative and defensive driving and follow all vehicle movement plans and site traffic rules. Drivers that do not comply with these rules will be dismissed. Oversized and heavy vehicles will access the J.C. Boyle facility from the South via Topsy Grade Road and will access the facility from the North via the Access Road from OR 66 to J.C. Boyle Dam. Oversized and heavy vehicles will travel on the J.C. Boyle Powerhouse Access Road (Spring Island Road) and the J.C. Boyle Power Canal Access Road. Oversized and heavy vehicles will not use the Timber Bridge on the private road (located just downstream of the J.C. Boyle dam) at Klamath River. A map showing access roads at the J.C. Boyle Facility is provided in Figure B2 in Appendix B.

3.9 Adjoining Private Property Access

Access to and from private property will be maintained at all times. If access to private property need to be temporarily limited, the Renewal Corporation will make these arrangements in advance with the effected private property owner. The Renewal Corporation will coordinate improvements property at the intersection of OR 66 and the access road to J.C. Boyle dam with Green Diamond Resource Company. There are no school zones within the work area. Renewal Corporation personnel will not use Topsy Grade Road beyond the J.C. Boyle facility access point.

3.10 Roadway Closures

There are no planned roadway closures during construction at the J.C. Boyle facility.

3.11 Temporary Roadways and Works

The Renewal Corporation will provide roadway maintenance on Topsy Grade Road including aggregate base, vegetation management, noxious weed control, replacing signs, dust control, pothole repair, snow plowing, and drainage/culvert repairs. The roadway will be left in place after construction. The Renewal Corporation will provide minor widening and tree removal at the intersection OR 66 and the access road to JC Boyle Dam to improve sight distance and accommodate truck turning. The Renewal Corporation will provide temporary advance warning signs at this intersection to notify the public of trucks entering/exiting OR 66 at the intersection. The Renewal Corporation will widen, regrade, and realign the J.C. Boyle Disposal Access Road to its pre-construction condition. No temporary traffic control will be used during construction and the road will be left in place post-construction.

The J.C. Boyle Powerhouse Access Road (Spring Island Road) and the J.C. Boyle Power Canal Access Road are the primary construction access routes to the J. C. Boyle powerhouse, penstock, and power canal facilities. The Renewal Corporation will realign the J.C. Boyle Powerhouse Access Road around the existing scour hole. These roads are accessed via OR 66. The Renewal Corporation will provide temporary maintenance of both roads during construction to maintain accessibility during construction and both roads will be left in place after construction. These two roads will be bi-annually (spring and fall) inspected by the Renewal Corporation for maintenance and construction improvements. At the powerhouse and penstock

area of the J.C. Boyle facility, four short access roads will be rehabilitated by the Renewal Corporation as needed for construction access to the penstock area. They will be left in place after construction.

3.12 Traffic Control Personnel

The Renewal Corporation will require that flaggers are a Certified Flagger in Oregon. All traffic control personnel will be required to follow the applicable requirements in the ODOT Oregon Standard Specifications for Construction (2021 - https://www.oregon.gov/ODOT/Business/Pages/Standard_Specifications.aspx). The Renewal Corporation's contractor will confirm that flaggers are able to satisfactorily demonstrate the following abilities:

- Ability to receive and communicate specific instructions clearly, firmly, and courteously,
- Ability to move and maneuver quickly to avoid danger from errant vehicles,
- Ability to control signaling devices (such as STOP/SLOW paddles) to provide clear and positive guidance to drivers approaching a work zone in frequently changing situations,
- Ability to understand and apply safe traffic control practices, sometimes in stressful or emergency situations,
- Ability to recognize dangerous traffic situations and warn workers in sufficient time to avoid injury, and
- Flaggers will be 18 years of age or older.

3.13 Signage

The Renewal Corporation will implement the following measures with respect to signage. Roadway signs will be used to inform the public where any road changes from construction works. Advanced warning signs (e.g., road work ahead, shoulder work, workers, etc.) will be used to indicate the type of work or activity the driver can expect. Sign spacing and placement will be in accordance with Oregon state law; spacing requirements per posted road speed are shown in Table 3-7. Signboards and variable message signs will be used as needed and will be placed at each end of access road used.

Table 3-7. Sign Spacing

POSTED SPEED (MPH)	SPACING BETWEEN SIGNS (FEET)
20	100
25	
30	
35	350
40	
45	500
50	
55	

Notes:

Source: ODOT, 2011
Adjust spacing as field conditions require; Small adjustments to sign spacing may be made to fit field conditions, but spacing will not exceed 1.5 times the dimensions shown.
If sign spacing needs to be adjusted, keep all the sign spacing distances similar to maintain driver expectancy

3.14 Monitoring of Traffic Control Measures

During each stage of construction at the J.C. Boyle facility, the Renewal Corporation will check daily all signs and required traffic control measures for compliance with the Oregon Traffic Management Plan.

3.15 Road Design

The Renewal Corporation will implement the following measures with respect to road design. All road designs will account for current traffic configuration, road safety, and traffic network impacts. All road designs will meet applicable safety, engineering, and design guidelines. The following road design criteria will be used for the design of temporary access roadways:

- Single-lane road, 15 ft wide with one 3-ft-wide safety berm,
- Safety berm when road segment is exposed to side slope,
- 35-foot minimum curve radius,
- 15% maximum road grade, and

An exception was made for portions of the lower penstock access road in which the maximum road grade was increased in some sections to minimize slope cuts.

4.0 Traffic Control Locations

Areas of traffic control have been identified for the Iron Gate Facility as shown in Figure B2 in Appendix B. Traffic control measures to be provided by the Renewal Corporation in these areas are discussed below and will be updated as required.

The Renewal Corporation will provide temporary traffic control and warning signs to notify the public of construction works and flaggers equipped with warning signs for the removal of the Pioneer Park West and Pioneer Park East.

5.0 Site Traffic Rules

5.1 Site Speed Limits

The Renewal Corporation will implement the following measures with respect to speed limits. Signage indicating the appropriate speed limits will be posted on all roadways and all personnel are required to follow the speed limits at the J.C. Boyle facility. The speed limit of OR 66 is 35 to 45 mph, 15 mph on Topsy Grade Road, 35 mph on Keno Worden Road, and I-5 has a speed limit of 70 mph. On all other roads in the J.C. Boyle area, the speed limit is 15 mph unless

otherwise posted. Speed limits will be evaluated for effectiveness and adjusted to maintain and prioritize safety during construction works.

5.2 Access Roads/Haul Roads

The Renewal Corporation will implement the following measures with respect to access and haul roads. All personnel on site will be instructed to only use the access and haul roads and avoid traveling off the existing roadways, or on the shoulders of the road. Roadways will be delineated with markings such as windrows, bunting, or flagging. Haul roads will be constructed with the following design:

- Appropriate geotechnical materials will be used for all road construction,
- Bends, corners, and turns will be constructed to maintain equipment stability during regular use, and
- Haul roads will comply with Kiewit requirements and recommendations and will be inspected regularly.

5.3 Maximum Loads

The Renewal Corporation will implement the following measures with respect to maximum loads. Trucks will be loaded with a safe load distribution to avoid spillage and will follow weight restrictions: ORS 810.030. The driver must be in the vehicle throughout the loading process. Oversized, heavy vehicles, and vehicles with large loads will not cross the Timber Bridge at Klamath River.

5.4 Parking

The Renewal Corporation will implement the following measures with respect to parking. Parking will be restricted to specific designated areas as determined as the work progresses and will be chosen to avoid close proximity to existing waterways. All construction personnel will park in designated staging areas as shown in Figure B2 in Appendix B.

Private vehicles will be allowed to park only in designated parking areas and are not allowed on the construction site unless approved by the Kiewit Project Manager. If approved on site, private vehicles will adhere to all instructions and safety requirements designated in the Oregon Traffic Management Plan. If traveling through or to any operational areas, private vehicles will be escorted.

There are public access roads adjacent to the J.C. Boyle construction site. Public access will be maintained on these access roads.

6.0 Requirements for Site Access

6.1 Personnel

All personnel entering the J.C. Boyle facility are required to attend and complete an Induction (see Section 9.2). These Inductions must be scheduled in advance and will not be available on demand. Visitor inductions can always be arranged but require an inducted escort when at the site. Access to the site during non-regular hours can be gained through contact with Kiewit.

6.2 Light Vehicles

All light vehicles will follow all rules and regulations of this Oregon Traffic Management Plan. Light vehicles entering the Construction Works area are required to have a reversing alarm and while on haul roads have a flashing light.

7.0 Training and Awareness

7.1 Training, Awareness, and Competency

The Renewal Corporation will require training for all personnel prior to commencing on site. The level of training will be commensurate with the level of individual risk their works are likely to entail. Trainings will include (as appropriate):

- Environmental and safety policies, site management plans as well as environmental roles and responsibilities,
- The significance of environmental impacts caused by individual roles and activities,
- Incident management, and
- Potential consequences of non-conformance.

7.2 Inductions

The Renewal Corporation will require all personnel to undergo inductions to cover the key requirements of the Workplace Safety Management Plan and Oregon Traffic Management Plan.

7.2.1 Inductions

The Renewal Corporation will implement a program of Induction that covers safety, environment, community, and overview. This program will reinforce the responsibility of all personnel to adhere to the safety and traffic requirements of the Proposed Action. The Induction will include:

- Overview of the site Oregon Traffic Management Plan,
- PPE requirements,
- Contact details,
- Incident management and notification,
- Hours of work,

- Safety policies,
- Designated parking areas,
- Speed limits,
- Community protocol,
- Timetabled public transport and school bus, if applicable, and
- Emergency detour plans.

7.2.2 Visitor Inductions

The Renewal Corporation will require visitors to undergo a visitor's induction and their host is responsible for all actions and conduct of the visitor. During all times, visitors will be accompanied by personnel who have previously undergone Induction and safety training.

7.3 Toolbox Talks

Toolbox talks will be conducted regularly by the Renewal Corporation to improve on safety, health, quality, and environmental issues. Talks will focus on the current or most upcoming work and will highlight specific safety aspects and actions being undertaken as part of ongoing management, training, and development. In general, toolbox talks will cover:

- An overview of current works,
- Traffic and access,
- Entry/exit point locations,
- Parking areas,
- If other persons are required to enter site that day, and
- Incidents, or potential incidents and possible implications.

8.0 References

Federal Energy Regulatory Commission (FERC). 2018. Order Amending License and Deferring Consideration of Transfer Application FERC Project Nos. 2082-062 and 14803-000. 162 FERC ¶ 61,236. Washington, DC, Federal Energy Regulatory Commission, Office of Energy Projects, Division of Hydropower Licensing.

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Appendix A

ESAL Calculations Summary Sheet

VA103-00640/01 August 14, 2020

Calculation Summary Sheet

Project Name: Klamath River Renewal
Project No.: VA103-00640/01
Task No.: 1103.0010: Klamath MOU Traffic Management Plan & Other Compliance Documents
Title: Klamath County Road Usage Supporting Calculations
Calc. Rev. No.: A

Description of Calculation:

This calculation estimates the potential impacts of the Klamath River Renewal Project (Project) on roads in Klamath County, Oregon. Due to increased Project-related loading on the roads this calculation aims to differentiate road usage occurring due to normal operating conditions vs. the projected construction period. As stated, in the Project Memorandum of Understanding (MOU) with Klamath County, the Project will be responsible for making any repairs due to construction-related activities.

Attachments and supplementary material:

Table 1	Estimated Existing Traffic
Table 2	Estimated Construction Haulage
Table 3	Total Trips from Construction ESALs Compared to Material Haulage Loads
Table 4	ESALs Rural Roads
Table 5	ESALs State Highways
Table 6	ESALs Interstate
Attachment 1	ODOT Traffic Volumes on State Highways

Calculation by: Kevin Howard	Date: August 14, 2020
Reviewed by: Cynthia Parnow	
Results included in (Deliverable): KRRP Traffic Management Plan – Klamath County, Oregon	
Or Superseded by (Calculation File): N/A	

1.0 EXISTING TRAFFIC - KLAMATH COUNTY

Baseflow average annual daily traffic (AADT) counts for highways were available for highways OR 66 and US 97 from the Oregon Department of Transportation (ODOT) in the Klamath Facilities Removal Final Environmental Impact Statement/Environmental Impact Report (US DOI & CDFW, 2012). In addition, traffic counts on Topsy Grade Road were performed in 2010 (US DOI & CDFW, 2012), which have been found to still be applicable by comparing these counts with surrounding road data available from ODOT between 2010 and 2020. Traffic count data for Topsy Grade Road was used for J.C. Boyle Powerhouse Road (Spring Island Road) as they are similar-sized rural collector/principal arterial roads.

Vehicle size distribution data were obtained from a Klamath County road analysis traffic noise model (USDOI and CDFW, 2012). The vehicle size classifications defined by the traffic noise model vary slightly from the inputs required for Equivalent Single Axle Loads (ESAL) calculations (discussed in Section 3.0).

2.0 CONSTRUCTION TRAFFIC AND MATERIAL HAULAGE

Increased traffic loadings were developed using construction traffic projections developed for the Copco Road Pavement Design (KP, 2020) and from estimated material haulage quantities developed for the currently planned dam removal activities at the J.C. Boyle Facility (KRRC, 2020). The current construction traffic includes a variety of vehicle types each with different loading factors with the goal of overestimating the increased traffic associated with the project.

These construction traffic loading calculations have been calculated with substantial conservatism. Table 3 shows the difference between the trips projected based on material quantities and the total trips based on construction loading calculated. It should also be noted that this table doesn't include the other vehicles estimate for the construction ESALs, which is another indication that construction loads have been developed very conservatively.

Local loads (those not utilizing highways) were split between the primary access roads, Topsy Grade Road and J.C. Boyle Powerhouse Road. However, to build in another level of conservatism it has been assumed that all materials will be applied to the ESAL calculation for each load.

3.0 PREDICTED NUMBER OF 18,000 LB ESALS

The 1993 AASHTO Flexible Pavement Structural Design method was used for guidance to develop a standard road degradation measurements equivalent single axel load (ESAL) anticipated over the construction period.

The predicted number of Equivalent Single Axle Loads (ESALs) is calculated for the existing traffic discussed in Section 2.0 and the additional construction traffic discussed in Section 3.0.

In addition to the base flow, a construction flow of average daily traffic over a 2.5-year construction period was estimated for the duration of the project, with an assumed construction heavy haul traffic of one Triple 16 trailer per day, several concrete trucks, dump trucks, and 18-wheel Tractor Semi Trailer Trucks. The pavement designs presented in this calculation use assumed loading at the maximum loads typically permitted by the state of California for heavy haul and oversize loads for the Triple 16 trailer. Assumed Annual Average Daily Traffic for cars and heavy vehicles are presented in the table below. Load Factors were calculated for each vehicle from the AASHTO 1993 guidelines, and ESALs were calculated for each vehicle using the following equation:

$$ESAL = AADT \times 365 \times GF \times TF$$

Where:

ESAL = Equivalent Single Axle Loads
AADT = Annual Average Daily Traffic
365 = Days in a year
GF = Growth Factor (Assumed to be 24.3, based on a 2% growth rate over 20 years)
TF = Truck Factor, or Load Factor for each vehicle type

4.0 RESULTS

As shown in Table 5.0, the additional loadings on rural county roads is expected to be roughly 116% percent of the normal loading, thus increasing the frequency of repairs required. The likely repairs and maintenance on these county roads will likely consist of regrading the aggregate base courses. The additional loadings on State Highways is expected to be roughly 47% percent of the normal loading, thus slightly increasing the frequency of repairs required. The additional loadings on the Interstate is expected to be only 1% percent of the normal loading, thus having a negligible effect on the expected degradation on the road.

Table 5.0 ESAL Comparisons for Klamath County Roads

Road Type	Existing ESALs	Construction Vehicle ESALs	Increase in Normal Loading (%)
Rural Roads	29,439	34,187	116
State Highways	72,486	34,187	47
Interstate	6,220,885	34,187	1

References

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Tables

Table 1
Estimated Existing Traffic

Road Segment	AADT	AADT Distribution (%) [1]			AADT [2]		
		Auto	Medium Trucks	Heavy Trucks	Auto	Medium Trucks	Heavy Trucks
Topsy Grade Road [3]	200	58.82	34.85	6.33	118	70	13
JC Boyle Powerhouse Road [4] (Spring Island Road)	200	58.82	34.85	6.33	118	70	13
OR 66 [5]	500	58.82	34.85	6.33	294	174	32
US 97 [6]	7400	33.55	28.34	38.11	2483	2097	2820

Notes:
1. AADT Distribution Estimates (US DOI & CDFW, 2012) using vehicle classifications based on the FHWA TNM: Auto = cars and light duty trucks, Medium Trucks = cargo vehicles with two axles and six tires; Heavy trucks - cargo vehicles with three or more axles.
2. Vehicle classifications have been converted from TNM classifications to the vehicles with loading factors identified in the ESAL calculation, where Auto = Passenger Cars, Medium Trucks = Panel & Pickup Trucks, and Heavy Trucks = Tractor Semi Trailer Trucks
3. Traffic count estimated from field observations from 2010 (US DOI & CDFW, 2012). These values are not expected to have increase as the ODOT traffic estimates from 2010-2020 (ODOT 2010 & ODOT 2018) on OR 66, which serves as the primary acces to Topsy Grade Road, have not increased over this time period.
4. It is assumed that traffic on JC Boyle Powerhouse Road is similar to Topsy Grade Road.
5. AADT at MP 48.73, 0.02 mile east of Hamaker Mountain Road (ODOT, 2018).
6. AADT at MP 273.92, 0.30 mile south of Nevada Avenue Interchange (ODOT, 2018).

Table 2
Estimated Construction Haulage

Waste Material	In-Situ Quantity [1]	Bulk Quantity [1]	Disposal Site [1]	Quantity per Trip [1]	Total Trips [1]	Road Usage [2]	Vehicle Type
Dam Embankment - Earth	135,800 CY	163,000 CY	On-site - Left and Right Banks Upstream of the Dam	40 CY/Trip (unpaved road)	4,100 Trips (1-miles RT)	Rural County	Dump Truck
Powerhouse Tailrace - Earth	*11,000 CY*	*13,000 CY*	*On-Site Powerhouse Tailrace*	*N/A*	*On-site disposal*	*NA*	*NA*
Dam - Concrete	3,440 CY	4,470 CY	On-site Scour Hole	40 CY/Trip (unpaved road)	110 trips (4 miles RT to scour hole)	Rural County	Dump Truck
Power Canal and Forebay Concrete (Option 1)	23,000 CY	29,900 CY	On-site Scour Hole		750 trips (2 miles RT)	Rural County	Dump Truck
Powerhouse and Micellaneous foundation concrete	*400 CY*	*520 CY*	*On-Site Tailrace*		*On Site Disposal*	*NA*	*NA*
Dam Mech/Elec	440 tons	--	Salvaged, or landfill near Klamath Falls, or alternative permitted site	25 tons/trip (via Highway 66)	20 trips (44 miles RT)	Highway and Rural County	Triple 16
Power Canal Mech/Elec	270 tons				10 trips (48 miles RT)	Highway and Rural County	Triple 16
Powerhouse Mech/Elec	11,210 tons				50 trips (52 miles RT)	Highway and Rural County	Triple 16
Timber Bridge	60 CY		Rock disposed on site; sheet piles, treated wood disposed off-site at permitted site	40 CY/Trip (unpaved road)	2 trips (up to 52 miles RT)	Highway and Rural County	Tractor Semi Trailer Truck
Building Material Debris	10 buildings 17,300 ft^2		Landfill near Klamath Falls or alternative permitted site	25 tons/trip (Highway 66)	20 trips (44 miles RT)	Highway and Rural County	Tractor Semi Trailer Truck
Power Lines	2.9 miles of 12-kV and 230-kV lines					Highway and Rural County	Tractor Semi Trailer Truck

Notes:
1. Material quantities, disposal sites and calculcated trips were taken from the Administrative Draft Biological Assessment (KRRC 2020)
2. Hauling routes were estimated from the routes shown on the J.C. Boyle Facility Contrustion Access Key Map and J.C. Boyle Facility Contrustion Access Reservoir Area Roads (Drawings C1500 and C1501, respectively) include with the 90% Design Report (KP 2020b)

Table 3
Total Trips from Construction ESALs Compared to Material Haulage Loads

Vehicle	ADT	Total trips from vehicles estimated	Counts specific to Material Haulage	Remaining trips assumed after Material Haulage loads
Rural County Construction Traffic:				
Dump Trucks:	6	5,475	4,960	515
Tractor Semi Trailer Trucks:	10	9,125	42	9,083
Triple 16 Trailer - maximum permit weight	1	913	80	833
State Highway and Interstate Construction Traffic:				
Dump Trucks:	2	1,825	496	1,329
Tractor Semi Trailer Trucks:	2	1,825	80	1,745
Triple 16 Trailer - maximum permit weight	1	913	42	871

Table 4
Estimated ESALs
for Rural Roads in Klamath County, Oregon
Pavement Section Design Location: KRRP, Klamath County, Oregon

Average Daily Traffic Count: 402 All Lanes & Both Directions
Construction Period: 2.5 Years

Calculation of Design 18 kip ESALs

	Daily Traffic	Growth Rate	Load Factors	Design ESAL's
Existing Traffic:				
Passenger Cars:	118	2.0%	0.0008	87
Panel & Pickup Trucks:	70	2.0%	0.0122	791
Tractor Semi Trailer Trucks:	13	2.0%	2.3719	28,560
Average Daily Traffic in Design Lane:	201			
Existing Traffic 18 kip ESAL's:	**29,439**			
Construction Traffic:				
Panel & Pickup Trucks:	30	2.0%	0.0122	339
Concrete Trucks:	1	2.0%	4.4800	4,150
Dump Trucks:	2	2.0%	3.6300	6,724
Tractor Semi Trailer Trucks:	2	2.0%	2.3719	4,394
Double Trailer Trucks	2	2.0%	2.3187	4,295
Triple 16 Trailer - maximum permit weight	1	0.0%	15.6540	14,284
Average Daily Traffic in Design Lane:	38			
Construction Traffic 18 kip ESAL's:	**34,187**			

Table 5
Estimated ESALs
for State Highways in Klamath County, Oregon
Pavement Section Design Location: KRRP, Klamath County, Oregon

Average Daily Traffic Count: 1,000 All Lanes & Both Directions
Construction Period: 2.5 Years

Calculation of Design 18 kip ESALs

	Daily Traffic	Growth Rate	Load Factors	Design ESAL's
Existing Traffic:				
Passenger Cars:	294	2.0%	0.0008	218
Panel & Pickup Trucks:	174	2.0%	0.0122	1,966
Tractor Semi Trailer Trucks:	32	2.0%	2.3719	70,302
Average Daily Traffic in Design Lane:	500			
Exsiting Traffic 18 kip ESAL's:	**72,486**			
Construction Traffic:				
Panel & Pickup Trucks:	30	2.0%	0.0122	339
Concrete Trucks:	1	2.0%	4.4800	4,150
Dump Trucks:	2	2.0%	3.6300	6,724
Tractor Semi Trailer Trucks:	2	2.0%	2.3719	4,394
Double Trailer Trucks	2	2.0%	2.3187	4,295
Triple 16 Trailer - maximum permit weight	1	0.0%	15.6540	14,284
Average Daily Traffic in Design Lane:	38			
Construction Traffic 18 kip ESAL's:	**34,187**			

Table 6
Estimated ESALs
for Interstate in Klamath County, Oregon
Pavement Section Design Location: KRRP, Klamath County, Oregon

Average Daily Traffic Count: 14,800 All Lanes & Both Directions
Construction Period: 2.5 Years

Calculation of Design 18 kip ESALs

	Daily Traffic	Growth Rate	Load Factors	Design ESAL's
Existing Traffic:				
Passenger Cars:	2,483	2.0%	0.0008	1,840
Panel & Pickup Trucks:	2,097	2.0%	0.0122	23,696
Tractor Semi Trailer Trucks:	2,820	2.0%	2.3719	6,195,348
Average Daily Traffic in Design Lane:	7,400			
Exsiting Traffic 18 kip ESAL's:	**6,220,885**			
Construction Traffic:				
Panel & Pickup Trucks:	30	2.0%	0.0122	339
Concrete Trucks:	1	2.0%	4.4800	4,150
Dump Trucks:	2	2.0%	3.6300	6,724
Tractor Semi Trailer Trucks:	2	2.0%	2.3719	4,394
Double Trailer Trucks	2	2.0%	2.3187	4,295
Triple 16 Trailer - maximum permit weight	1	0.0%	15.6540	14,284
Average Daily Traffic in Design Lane:	38			
Construction Traffic 18 kip ESAL's:	**34,187**			

Knight Piésold CONSULTING

Attachment 1

ODOT – 2018 Traffic Volumes on State Highways

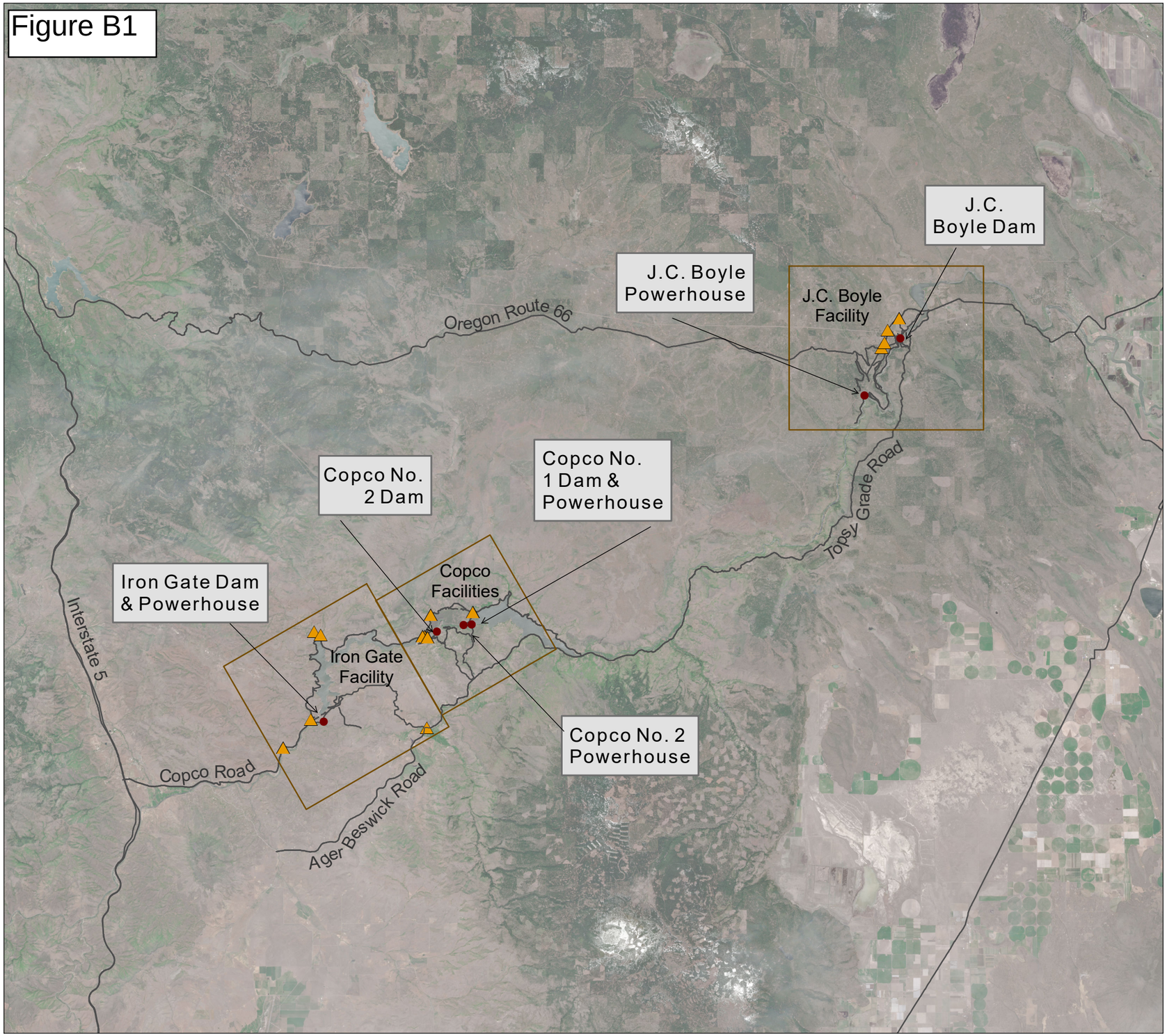
Milepoint	2018 AADT All Vehicles	ATR AVC	Location Description
			THE DALLES-CALIFORNIA HIGHWAY NO. 4 (Continued)
138.60	*40000*		0.15 mile north of SE Truman Avenue
138.90	*41300*		0.27 mile north of Reed Market Road Interchange
139.61	*29700*		0.44 mile south of Reed Market Road Interchange
139.80	*29600*		0.17 mile north of Powers Road Interchange
140.22	*22400*		0.08 mile north of Badger Road
140.45	*21800*	*	Bend-Pinebrook Automatic Traffic Recorder, Sta. 09-025, 0.07 mile north of Pinebrook Boulevard
140.65	*16800*		0.13 mile south of Pinebrook Boulevard
			Equation: MP 141.12 BK = MP 141.86 AH
142.41	*26500*	*	Lava Butte Automatic Traffic Recorder, Sta. 09-003, 0.17 mile south of China Hat Road
144.20	*18900*		0.75 mile south of Galen Baker Road
153.83	*12000*		0.75 mile south of South Century Drive
155.60	*11000*		0.10 mile south of Vandevert Road
161.84	*9900*		0.10 mile south of Paulina Lake Road
167.48	*9900*		0.02 mile north of 1st Street in La Pine
169.58	*8200*		0.10 mile north of Fremont Highway (OR31)
169.88	*6200*		0.20 mile south of Fremont Highway (OR31)
183.84	*5500*		0.20 mile north of Mississippi Drive at Gilchrist
185.35	*5800*		0.02 mile north of Jones Street
194.75	*4300*		0.40 mile north of Willamette Highway (OR58)
195.55	*5200*		0.40 mile south of Willamette Highway (OR58)
204.65	*6000*	*	Chemult Automatic Vehicle Classifier, Sta. 18-006, 0.40 mile south of Chemult Dump Road
212.79	*5200*		0.30 mile north of North Umpqua Highway (OR138)
213.29	*4700*		0.20 mile south of North Umpqua Highway (OR138)
231.91	*6200*		0.02 mile north of Fuego Road
243.22	*4700*	*	Chiloquin Automatic Traffic Recorder, Sta. 18-023, 4.32 miles north of Chiloquin Highway No. 422
247.04	*6300*		0.50 mile north of Chiloquin Highway (North Jct.)
248.98	*5800*		0.10 mile north of Chiloquin Highway (South Jct.)
249.18	*6200*		0.10 mile south of Chiloquin Highway (South Jct.)
254.30	*6600*	*	Modoc Point Automatic Traffic Recorder, Sta. 18-022, 3.53 miles north of Modoc Point Road
258.03	*6600*		0.20 mile south of Old Modoc Point Road
265.76	*6900*		0.10 mile south of Algoma Road
268.95	*7000*		0.10 mile south of Shady Pine Road
271.27	*7400*		0.02 mile south of Wocus Road
272.28	*9400*		0.30 mile north of Klamath Falls-Malin Highway (OR39/US97 Bus./Crater Lake Parkway)
273.08	*6000*		0.50 mile south of Klamath Falls-Malin Highway (OR39/US97 Bus./Crater Lake Parkway)
273.92	*7400*		0.30 mile south of Nevada Avenue Interchange
276.48	*8700*		0.40 mile north of Green Springs Highway (OR66) and South Klamath Falls Highway (OR140)
277.43	*6500*		0.30 mile south of Green Springs Highway (OR66) and South Klamath Falls Highway (OR140)
			Equation: MP 277.61 BK = MP 278.03 AH
278.69	*5100*		On Klamath River Bridge
280.06	*5100*		0.10 mile north of Miller Island Road
282.82	*5300*		0.05 mile north of Cross Road
289.44	*4300*	*	Midland Automatic Vehicle Classifier, Sta. 18-019, 2.30 miles north of the Oregon-California State Line

Milepoint	2018 AADT All Vehicles	ATR AVC	Location Description
			KLAMATH FALLS-LAKEVIEW HIGHWAY NO. 20 (Continued)
70.73	*700*		4.00 miles southeast of Quartz Mountain Pass Summit
88.96	*1000*		0.10 mile west of Tunnel Hill Road
89.16	*1200*		0.10 mile east of Tunnel Hill Road
92.43	*1500*		0.70 mile east of Westside Road at Maddock Corner
93.88	*1900*		0.02 mile west of road to Airport
95.39	*2100*		0.02 mile east of Roberta Avenue
95.72	*2600*		0.02 mile east of N "R" Street
			West city limits of Lakeview
96.03	*3300*		0.02 mile west of "L" Street
96.35	*3600*		0.02 mile west of Fremont Highway (US395)
			GREEN SPRINGS HIGHWAY NO. 21
			Milepoint indicates distance from OR99, in Ashland
1.02	*12300*		0.02 mile west of Tolman Creek Road
1.22	*13400*		0.12 mile west of Pacific Highway (I-5)
1.42	*6600*		0.08 mile east of Pacific Highway (I-5)
1.80	*7300*		0.07 mile east of E Main Street
2.04	*5400*		0.06 mile southeast of Dead Indian Memorial Road
2.49	*4100*		0.04 mile southeast of Crowson Road
4.61	*2300*		0.02 mile southeast Emigrant Lake Road
6.44	*1500*		0.02 mile northwest of Siskiyou Highway
6.61	*1100*	*	Siskiyou Junction Automatic Traffic Recorder, Sta. 15-007, 0.15 mile east of Siskiyou Highway No. 273 (OR273)
9.28	*580*		0.10 mile east of Buckhorn Spring Road
			Equation: MP 13.66 BK = MP Z13.00 AH
17.51	*440*		0.02 mile east of Eastside Hyatt Lake access road
23.42	*340*		On Jenny Creek Bridge
			Jackson - Klamath County Line, MP 27.87
48.73	*500*		0.02 mile east of Hamaker Mountain Road
49.89	*1500*		0.02 mile west of Keno-Worden Road (to US97)
49.93	*2400*		0.02 mile east of Keno-Worden Road (to US97)
50.68	*3000*		0.02 mile east of Clover Creek Road
54.46	*5000*		0.02 mile east of Round Lake Road
56.64	*4400*		0.10 mile southwest of Weyerhaeuser Corporation Road
56.79	*5100*		0.05 mile northeast of Weyerhaeuser Corporation Road
58.17	*5700*		0.10 mile west of Granite Street
58.84	*7200*		0.02 mile west of Lake of the Woods Highway (OR140)
			CRATER LAKE HIGHWAY NO. 22
			Milepoint indicates distance from Rogue Valley Highway (OR99), in Medford
0.20	*35600*		0.15 mile north of Rogue Valley Highway (OR99), Siskyou Boulevard
0.84	*31800*		0.05 mile west of Poplar Drive
1.11	*43300*	*	North Medford Automatic Traffic Recorder, Sta. 15-017, 0.64 mile east of Pacific Highway No. 1 (I-5)
1.38	*39200*		0.02 mile southwest of Whittle Avenue
2.02	*24200*		0.15 mile south of Owen Drive
3.63	*31700*		0.02 mile south of East Vilas Road
3.67	*29300*		0.02 mile north of East Vilas Road
5.41	*20000*		Equation: MP 29.18 BK = MP Z29.16 AH

Appendix B

Access and Security Maps

Figure B1



KLAMATH RIVER RENEWAL CORPORATION

Klamath River Restoration Project

Traffic Management Plan Overview Map

November 13, 2020

(At original document size of 11x17)
1:230,000

N

0 1.5 3 4.5 6 7.5 Miles

PRELIMINARY DESIGN (NOT FOR CONSTRUCTION)

- Figure Extents
- Temporary Traffic Management
- Project Features
- Access Routes

Notes

1. *Coordinate System: NAD 1983 2011 StatePlane California I FIPS 0401 Ft US*

2. *Data Sources:*
Project Features: McMillen-Jacobs; Access Routes 100 Design: McMillen-Jacobs; Temporary Traffic Management: Knight Piesold;

3. *Background Imagery: Copernical Sentinel data 2020, processed by ESA*

4. *Inset Background Imagery: National Geographic, Esri, Garmin, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, increment P Corp.*

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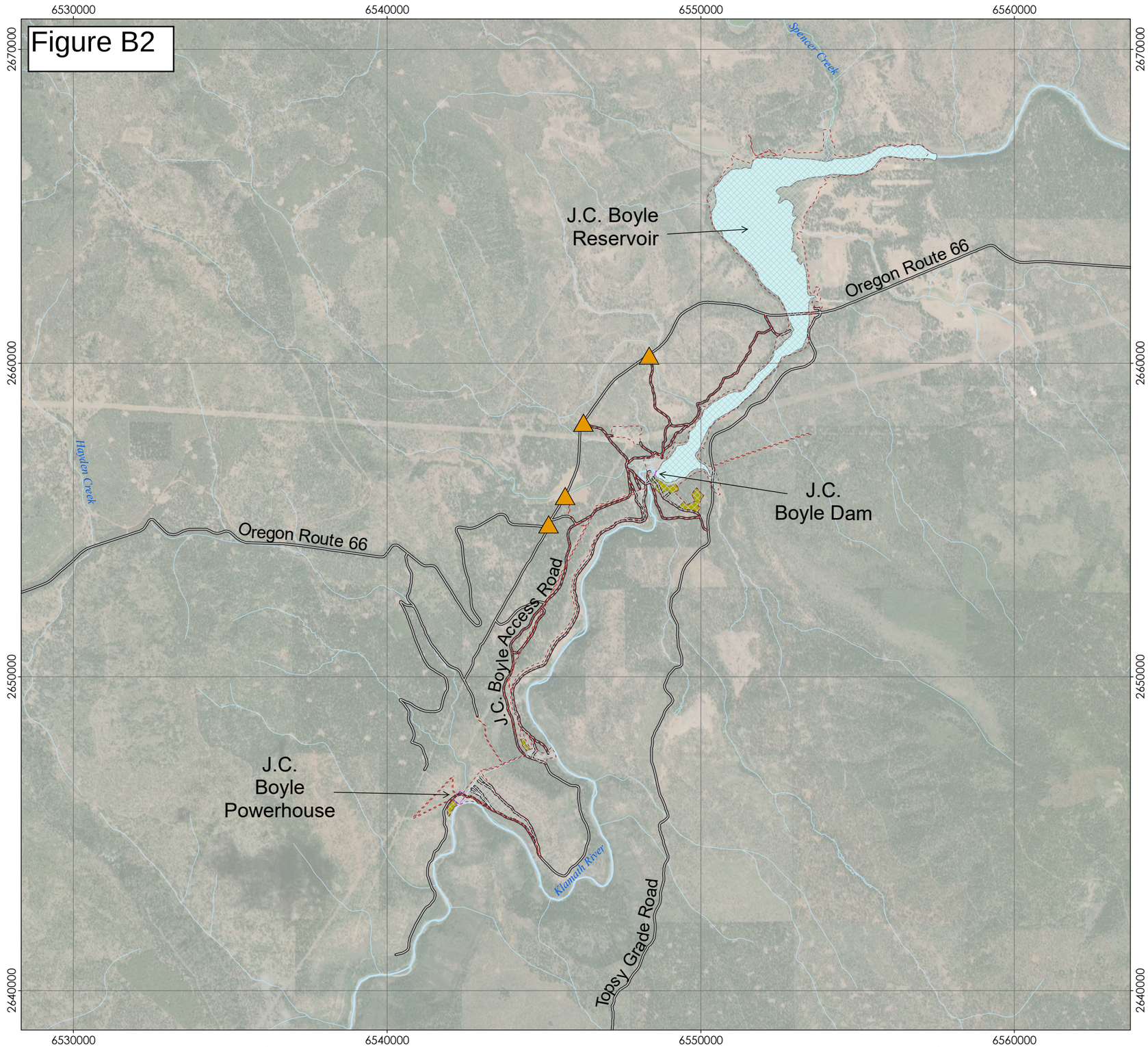
Figure B2



KLAMATH RIVER RENEWAL CORPORATION

Klamath River Restoration Project

Access Map

J.C. Boyle Facility

November 12, 2020

(At original document size of 11x17)

1:39,660

N

0 0.25 0.5 0.75 1 1.25 Miles

PRELIMINARY DESIGN
(NOT FOR CONSTRUCTION)

- Temporary Traffic Management
- Limits of Work
- Project Features
- Staging Areas
- Access Routes
- Reservoir Boundaries
- Streams

Notes

1. *Coordinate System: NAD 1983 2011 StatePlane California I FIPS 0401 Ft US*

2. *Data Sources:*
Temporay Traffic Management: Knight Piesold; Limits of Work: McMillen-Jacobs, CAD 90 Design draft; Access Routes: Knight Piesold, 100 Design Drawings; Staging Areas: CDM, 60 Design; Streams and Reservoir: NHD.
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

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Figure B3

KLAMATH RIVER RENEWAL CORPORATION

Klamath River Restoration Project

Security Map

J.C. Boyle Facility

November 13, 2020

(At original document size of 11x17)
1:39,700

N

0 0.25 0.5 0.75 1 1.25 Miles

PRELIMINARY DESIGN
(NOT FOR CONSTRUCTION)

Legend

- Security Pipe Gate and Guard Shack
- Security Unmanned Pipe Gate
- Access Routes
- Project Features
- Reservoir Boundaries
- Streams

Notes

1. *Coordinate System: NAD 1983 2011 StatePlane California I FIPS 0401 Ft US*

2. *Data Sources:*
Security Locations: Knight Piesold; Access Routes: Knight Piesold, 100 Design Drawings; Streams and Reservoir: NHD.
Background Imagery: Copernicus Sentinel data Nov. 5 2020, processed by ESA

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Appendix B

California Traffic Management Plan

KLAMATH RIVER RENEWAL CORPORATION

Lower Klamath Project
FERC Project No. 14803

California Traffic Management Plan

Klamath River Renewal Corporation
2001 Addison Street, Suite 317
Berkeley, CA 94704

Prepared by:
Knight Piesold
LKRP Project Office
4650 Business Center Drive
Fairfield, CA 94534

February 2021

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Table of Contents

List of Tables

Appendices

1.0 Introduction

The California Traffic Management Plan described herein is a subplan of the Construction Management Plan to be implemented as part of the Proposed Action for the Lower Klamath River Project (Project).

1.1 Purpose of California Traffic Management Plan

The purpose of the California Traffic Management Plan is to describe the measures the Renewal Corporation will implement to maintain efficient and safe movement of vehicles throughout the construction zones and construction activities at the Project construction works. This California Traffic Management Plan will prevent unreasonable traffic delays and maintain acceptable levels of service, traffic circulation, and safety on state, county, and private roadways.

The Renewal Corporation has negotiated a draft Memorandum of Understanding (MOU) with the County of Siskiyou which addresses the County's regulatory interests with respect to traffic control, roadway alignment and maintenance, and related topics. The Renewal Corporation and County are in correspondence to execute a final MOU

2.0 Work Activities

2.1 Implementation

Renewal Corporation construction personnel at the will receive an initial orientation describing the details of this California Traffic Management Plan. All related training will be documented by the Kiewit safety adviser. Personnel will be given a copy of the vehicle movement plan related to their role in the construction area and a copy of each vehicle movement plan will be posted and available at each entry gate and area for review.

The California Traffic Management Plan will be updated as needed if additional risk areas are encountered or to improve best management practices.

2.1 Reporting

Inspection procedures will be followed consistent with the Renewal Corporation's discussions with Siskiyou County.

The Renewal Corporation will investigate public roads that may be potentially impacted by the Proposed Action. The Renewal Corporation will prepare and provide the County with a summary report of existing conditions of such public roads and identify repairs that are needed to maintain the efficient and safe movement of construction traffic.

The condition of existing road(s) that may be impacted by construction traffic will be inspected by the Renewal Corporation and a report will be completed. Following construction, the Renewal Corporation will complete a final road condition inspection and report which will be used to determine the need for tail end repairs.

3.0 Site Access and Traffic

3.1 Access to Site

3.1.1 Preconstruction Activities

The Renewal Corporation will provide adequate access and haul routes associated with the Proposed Action. Proposed improvements will be completed by the Renewal Corporation prior to the start of reservoir drawdown. Access routes in the dam sites to access the dams for pre-drawdown improvements, dam removal, and channel restoration are provided in Table 3-1. These temporary access improvements are necessary to provide access to multiple portions of the Proposed Action area. The Renewal Corporation will return roads used by project-related vehicles to the respective owners and users in a state that equals or exceeds existing condition/function.

Table 3-1. Proposed Roadway and Access Improvements

LOCATION	IMPROVEMENTS	CONSTRUCTION ACCESS	POST-DRAWDOWN EFFECTS[1]	ROAD REHABILITATION
Copco Road (I-5 to Ager Road)	Potential pavement rehabilitation during or post Proposed Action.			X
Copco Road (Ager Road to Lakeview Road)	Potential pavement rehabilitation during or post Proposed Action.			X
Dry Creek Bridge	Design a temporary bridge strengthening system to allow the existing bridge to accommodate the anticipated live loads.	X		
Copco Road (Lakeview Road to Daggett Road)	Pavement maintenance during construction. Potential pavement rehabilitation during or post Proposed Action.	X		X
Scotch Creek and Camp Creek Culvert	Existing culvert will be removed and replaced with a new concrete box culvert; for fish passage purposes only.	X		

LOCATION	IMPROVEMENTS	CONSTRUCTION ACCESS	POST-DRAWDOWN EFFECTS[1]	ROAD REHABILITATION
Copco Road (Daggett Road to Copco Access Road)	Potential road surface maintenance during or post Proposed Action.			X
Fall Creek Bridge at Copco Road	Design a temporary bridge strengthening system to allow the existing bridge to accommodate the anticipated live loads.	X		
Copco Road Bridge (near the Copco Lake Fire Department on the eastern side of Copco Reservoir)	Monitor post-drawdown for a 2-year period for potential erosion or scour at the bridge embankments and intermediate piers. Potential abutment erosion protection.		X	
Copco Access Road	Clear, grub, and regrade. Minor widening into hillside if possible.	X		
Ager Beswick Road	Potential pavement rehabilitation during or post Proposed Action.			X
Mallard Cove Boat Ramp Access	Minor works to enable barge mobilization.	X		
Daggett Road	Minor grading improvements Potential road surface maintenance during or post Proposed Action.	X		X
Fall Creek Crossing at Daggett Road	Existing culvert will be removed and replaced with a new arch culvert	X		
Daggett Road Bridge	Construct temporary bridge upstream of existing bridge. No change to existing bridge.	X		

Notes:

Source: KRRC, 2020

1. The extent of repairs carried out will be determined on an as-needed basis with the Siskiyou County as per the Draft MOU.

In addition to the improvements listed in Table 3-1, construction improvement details for Copco Road are shown in Table 3-2. Copco Road will serve as the access route to construction activities for Copco No. 1 and Copco No. 2 facilities. Some degradation of the existing Copco Road from Highway 5 to Copco Access Road is expected due to the increased amount of use projected throughout the construction period.

Several bridges on Copco Road are not engineered for the projected loads, and construction improvements are required. Table 3-3 provides the existing bridge loading capacities and proposed actions for improvement, if necessary.

Table 3-2. Detailed Copco Road Potential Construction Improvements

TYPE	CONSTRUCTION TIME PERIOD	NAME	STRUCTURE PURPOSE	POTENTIAL IMPROVEMENTS[1]	NOTES
Road	Pre, during, and post construction	Copco Road	Will serve as the access route to construction activities Copco No. 1 and Copco No. 2 facilities	Mill and overlay road repair, asphalt and base course replacements, and pull- off location construction.	Preliminary review of GPR and road coring data suggests some of the existing asphaltic concrete is placed directly on the subgrade, with little-to no base course; will require pavement rehabilitation.
Road	Pre, during, and post construction	Copco Road from Ager Road to Lakeview Road	Used for haul and access	Improvements such as mill and overlay or asphalt and base course replacement will be performed by KRRC	Copco Road from Ager Road to Lakeview Road is classified as a minor collector. The pavement is in poor condition. KRRC will may improve this roadway for mobilization and hauling. KRRC will use temporary traffic control for any pavement rehabilitation.
Road	Pre, during, and post construction	Copco Road from Lakeview Road to Daggett Road	Used for haul and access	Improvements such as mill and overlay or asphalt and base course replacement will be performed by KRRC.	Pavement condition along this stretch is poor and may require pavement maintenance during construction. KRRC will may improve this roadway for mobilization and hauling. KRRC's contactor will use temporary traffic control for any pavement rehabilitation. This portion of Copco Road includes Brush Creek Bridge (Caltrans No.2C0280) and Jenny Creek Bridge (Caltrans No.2C0280).
Road	Pre, during and post construction	Copco Road from Daggett Road to Copco Access Road	Used for haul and access	Improvements of the asphalt sections will include mill and overlay and base course replacement. Portions of the aggregate base road will be improved by adding vehicle pull-out locations	The surface starts out as asphalt and transitions to aggregate base 1.2 miles east of the Daggett Road intersection and has very low traffic volume. KRRC may improve the portions of this roadway for mobilization and hauling. This portion of Copco Road includes Fall Creek Bridge (Caltrans Bridge No.2C0198).

TYPE	CONSTRUCTION TIME PERIOD	NAME	STRUCTURE PURPOSE	POTENTIAL IMPROVEMENTS[1]	NOTES
Road	Post-construction	Copco Road from Copco Access Road to Copco Road Bridge	KRRC's contractor will not use this portion of Copco Road for dam or powerhouse removal but will use it for construction access to various post-drawdown construction activities, such as culvert replacements, restoration work, and installing rock slope protection.	KRRC will not be improving or upgrading this road for mobilization or hauling.	The road surface is primarily dirt and has very low traffic volume. No temporary traffic control will be required.
Bridge	Pre-construction	Fall Creek Bridge (Copco Road)	Bridge on Copco road - used for haul and access	Temporary strengthening structure will be installed at the existing bridge to accommodate anticipated projected vehicle loads	Current bridge is timber - will not withstand projected vehicle loads. Traffic volumes are low at Fall Creek bridge, with most of the traffic comprised of PacifiCorp staff. Construction will require temporary traffic control
Bridge	Pre-construction	Dry Creek Bridge (Copco Road)	Bridge on Copco road - used for haul and access	Temporary strengthening structure will be installed at the existing bridge to accommodate anticipated projected vehicle loads.	Current bridge is timber - will not withstand projected vehicle loads. Construction will require temporary traffic control
Bridge	Post-drawdown	Jenny Creek Bridge (Copco Road)	Bridge on Copco road - used for haul and access	Monitor existing bridge for post-drawdown erosion at abutments.	No work planned. KRRC will provide post-drawdown monitoring.
Bridge	Post- drawdown	Scotch Creek Bridge (Copco Road)	Bridge on Copco road - used for haul and access	Existing Scotch Creek culvert will be replaced by a concrete box culvert.	Construction improvement will require temporary traffic control.

TYPE	CONSTRUCTION TIME PERIOD	NAME	STRUCTURE PURPOSE	POTENTIAL IMPROVEMENTS[1]	NOTES
Bridge	Post-drawdown	Camp Creek Bridge (Copco Road)	Bridge on Copco road - used for haul and access	Existing Camp Creek culvert will be replaced by a concrete box culvert.	Construction improvement will require temporary traffic control.

Notes:

Source: Knight Piésold, 2020a

1. The extent of repairs carried out will be determined on an as-needed basis with the Siskiyou County as per the communications with Siskiyou County.

Table 3-3. Existing Bridge Status and Proposed Actions

EXISTING BRIDGE	BRIDGE LOAD RATING ACCORDING TO AS-BUILT INFORMATION	ACTION
Lakeview Road Bridge	40 Ton, 4-axle truck	No modifications planned. Proposed Action-related traffic exceeding the posted load limits will be routed to alternate access route via Ager Beswick/Lakeview private roads.
Daggett Road Bridge	17 Ton Load Limit for double axle27 Ton Load limit for triple axle29 Ton Load limit for 4-axle	Construct temporary modular steel truss bridge upstream of existing bridge. Remove following completion of the Proposed Action.
Dry Creek Bridge	No Rating Specified. Knight Piésold inspection deemed this bridge insufficient for anticipated projected loads.	Construct temporary strengthening structure to support existing bridge. Remove following completion of the Proposed Action.
Fall Creek Bridge at Copco Road	No Rating Specified. Knight Piésold inspection deemed this bridge insufficient for anticipated projected loads.	Construct temporary strengthening structure to support existing bridge. Remove following completion of the Proposed Action.
Copco Road Bridge	HS20-44Alternate Design Load Permit Design Load	No modification required.
Jenny Creek Bridge	HL-93Permit Design Load	No modification required.

Brush Creek Bridge	HS20-44Alternate Design Load	No modification required.
Cottonwood Creek Bridge	HS20-44Permit Design Load	No modification required.
Bogus Creek Bridge	HS20-44	No modification required. Visual inspection noted some cracks in the concrete deck and that RSP requires maintenance.
Willow Creek Bridge	HS20-44	No modification required.
Klamath on River Bridge	HS20-44 (National Bridge Inventory ([NBI]).	Not used for Construction Access Loads. Visual inspection noted cracking and excessive deflection in main central span.

NOTES:

HS20-44 = Vehicle with a front tractor axle weighing 4 tons, rear tractor axle weighing 16 tons, and semi- trailer axle weighing 16 tons (36 tons total).
AASHTO HL-93 vehicular live load is a combination of three different loads:

- HL-93 Design Truck = 32.7 tons
- HL-93 Design Tandem = 25 tons
- Design Lane Load = 0.95 tons/m uniformly distributed in the longitudinal direction

Data for bridge load capacities were taken from posted load limits, as-built drawings, and the Federal Highway Administrations' NBI Annual Inspection Reports.
This table was developed from publicly available data and should not be considered a comprehensive structural assessment for all project bridge load ratings.

Consistent with the Renewal Corporation's discussions with Siskiyou County, the Copco Road may be temporarily closed for up to 48 hours at Dry Creek and 72 hours at Fall Creek during construction activities. The intention is to not close these roads for any extended length of time, because most work will be conducted under the bridges. If closure is needed for short periods of time, flaggers will be used to direct traffic. If closure is required for a long period of time, a detour via Ager Road and Ager Beswick Road will be utilized to redirect traffic. These closures could occur twice at each location, once for preconstruction activities and once at the end of dam removal activities. The Renewal Corporation will provide signage and advanced notification prior to these works, and these closures will occur prior to May 1st of each calendar year. In addition, if the Renewal Corporation removes existing bridge railings and other conflicting features to allow adequate room for temporary bridge improvements, the Renewal Corporation will re-install existing bridge railings to the pre-existing condition. Removing bridge railings or other existing features will not constitute a need to rebuild or reinstall the railings or any other portion of the bridges to any updated code or standard.

At the Scotch Creek and Camp Creek culvert construction improvements, the Renewal Corporation will perform all legal and right-of-way transfer and mapping for the new alignment as required. The Renewal Corporation will construct a temporary shoefly detour immediately adjacent to the existing roadway as per discussions with Siskiyou County. This detour will be of sufficient width to pass at least one lane of traffic at all times through the creek crossing construction area. Detour embankments will be capped with temporary gravel surfacing and a 100-foot maintenance easement at both upstream and downstream of new Scotch Creek and Camp Creek right of way alignments will be developed. This will allow the County to trim and cut any vegetation interrupting flow in the new roadway and structure locations.

During construction improvements on Copco Road, the Renewal Corporation will provide temporary traffic control as needed, including but not limited to the following measures:

- Temporary advance warning signs to notify the public of construction improvements,
- Flaggers equipped with warning signs,
- Temporary construction personnel directing traffic safely through the construction improvement zone.

3.1.2 ESAL Calculations

Flexible pavement design for Copco Road was developed by the Renewal Corporation using an Equivalent Single Axle Load (ESAL) variable calculation to estimate the required structural pavement required for road repairs associated with the Proposed Action traffic. Three pavement sections were designed for subgrade of varying California Bearing Ratio (CBR) values anticipated to be encountered on Copco Road; CBR values of 3, 10, and 30. Results of these ESAL calculations were used to evaluate pavement design required for road pavement rehabilitation improvements associated with Project construction traffic. These calculations are shown in Appendix A. After construction, the Renewal Corporation will return roads used by to the respective owners and users in a state that equals or exceeds existing condition/function.

3.1.3 Copco No. 1 Facility Access

The Copco No. 1 facility will be accessed through Copco Access Road, which is regionally accessed via Copco Road to the North as shown in Figure C1 in Appendix B. Table 3-4 distinguishes between public and private roadways.

3.1.4 Copco No. 2 Facility Access

The Copco No. 2 dam area will be accessed by Copco Access Road, which is regionally accessed via Copco Road to the North as shown in Figure C1 in Appendix B. Table 3-4 distinguishes between public and private roadways.

Access to Copco No. 2 powerhouse facilities and the Copco Village will be via Daggett Road. Daggett Road is regionally accessed via Copco Road. Daggett Road Bridge crosses the Klamath River just downstream of the Copco No. 2 powerhouse facilities. The culvert located at Fall Creek at Daggett Road requires construction improvements. At this location, the Renewal Corporation will remove the existing culvert and replace it with a new arch culvert; road and embankment design improvements will be made by the Renewal Corporation to support the new arch culvert.

The existing Daggett Road Bridge is not engineered for the Proposed Action loads. A new temporary single-span steel truss bridge will be constructed by the Renewal Corporation upstream of the existing Daggett Road Bridge to provide construction access to the Copco No. 2 powerhouse facilities. This bridge will be removed by the Renewal Corporation upon completion of dam removal activities. The north approach to the construction access bridge at Daggett Road will include a shoe-fly type detour which will direct construction vehicles to the temporary construction access bridge, located upstream of the existing Daggett Road Bridge. The approach geometry provides the turning space required to accommodate a low-boy type vehicle to line up with the temporary bridge. Approach road surfaces will be gravel base and appropriate signage will be posted to clearly designate the temporary bridge for construction vehicles only. The new Daggett Road Bridge will not encroach on wetlands area to the west. PacifiCorp personnel and regular traffic will continue to use the existing Daggett Road Bridge.

3.1.5 Iron Gate Facility Access

Construction access to Iron Gate facility will be taken through Ager Beswick Road and Lakeview Road and a network of private roads as shown in Figure C2 in Appendix B. Table 3-4 distinguishes between public and private roadways. Lakeview Road via Ager Beswick Road provides access to the site on the south bank of the Klamath River. The Renewal Corporation will coordinate with local landowners to maintain and modify the private roads, as required between Ager Beswick Road/Crest Lane intersection and the Iron Gate Dam facility. This portion of the route includes approximately 5.8 miles of private gravel road. The Renewal Corporation will perform temporary traffic control as needed during potential Lakeview Road construction access improvements and pavement rehabilitation. Figure C2 provided in Appendix B shows the general route map to the Iron Gate facility. Potential improvement actions along this route include:

- Gravel re-surfacing as needed in preparation for construction vehicles (approx. length of unsurfaced road = 4.35 miles).
- Widening of tighter turns.
- Potential replacement of some culverts noted as being in poor condition.
- Some sections of Ager Beswick Road showed evidence of differential settlement, indicating weak subgrade conditions.

Private vehicles and construction vehicles with small loads will also access the Iron Gate facility through Lakeview Road via Copco Road. This route will not be used by construction vehicles with large loads because the Lakeview Road Bridge is not designed to withstand heavier loads.

Table 3-4. Roadway Jurisdiction

ROAD	PUBLIC	PRIVATE
I-5	X	
Copco Road	X	
Ager Beswick Road	X	
Ager Road	X	
Daggett Road	X	
Lakeview Road	X	
Crest Lane		X
Copco Access Road		X

3.2 Existing Site Traffic Characteristics

In July 2019, a visual inspection of the roads in the Proposed Action area was completed (Knight Piésold, 2020b). The road inspection evaluated surface types, the frequency and severity of distresses, and listed the road conditions either as good (e.g., like new, structurally sound, and functionally adequate), fair (e.g., some deterioration, but structurally sound and functionally adequate) or poor (e.g., significant deterioration, requiring maintenance or repair).

In spring 2021, prior to mobilization and construction activites, the Renewal Corporation will document existing condition of Ager Road, Copco Road, and Ager Beswick Road using a video survey and associated plan markup documentation. This survey and documentation will serve as the base roadway condition.

Copco Road was inspected from I-5 to the intersection of Copco Road and Ager Beswick Road. The road has varying conditions from good to poor, and has multiple surface types, distresses, lane widths, shoulder availability, and levels of previous repair. The road is generally winding in nature and narrow areas are frequent. For Copco Road construction access improvements, refer to Table 3-2.

Ager Road from Copco Road to the intersection of Ager Beswick Road has an asphalt pavement surface and is in good condition. Ager Beswick Road from Ager Road to Copco Road also has an asphalt pavement surface and is in good condition. Lakeview Road from Copco Road to the end of the public roadway is composed of aggregate base and is in good condition. Copco Access Road has an aggregate base pavement surface and is in fair condition. Areas of nearby vegetation, steep slopes and tight turns exist on Copco Access Road.

Roadways for site access are primarily low-trafficked roads in a rural setting. Estimated traffic counts for existing roads in the regional area from Oregon Department of Transportation and Caltrans are provided in Table 3-5. Estimated peak hour traffic counts per direction for existing conditions as well as during construction activities are provided in Table 3-6.

Table 3-5. Estimated Traffic Counts for Existing Conditions

ROAD SEGMENT	AADT	AADT DISTRIBUTION (%) [1]			AADT DISTRIBUTION			PHT DISTRIBUTION[3]			PHT DISTRIBUTION FOR EACH DIRECTION[4]		
		AUTO 2	MEDIUM TRUCKS 2	HEAVY TRUCKS[2]	AUTO	MEDIUM TRUCKS	HEAVY TRUCKS	AUTO	MEDIUM TRUCKS	HEAVY TRUCKS	AUTO	MEDIUM TRUCKS	HEAVY TRUCKS
Ager- Beswick Rd[6]	200	58.82	34.85	6.33	117.64	69.7	12.66	12	7	2	6	4	1
Copco Rd[5]	250	71.34	0	28.66	178	0	72	18	0	7	9	0	4

Notes:

Source: US DOI and CDFW, 2012 AADT: Average Annual Daily Traffic PHT: Peak Hour Traffic

1. AADT distribution percentage provided by transportation engineers (J. Key, personal communication, December 13, 2010).
2. TNM vehicle classification: Auto = cars and light duty trucks, Medium Trucks = cargo vehicles with two axles and six tires; Heavy trucks - cargo vehicles with three or more axles.
3. PHT assumed to be 10% of AADT based on a review of published Caltrans and ODOT traffic counts (ODOT, 2010; Caltrans, 2010).
4. PHT for each direction assumed to be the same in both direction of traffic.
5. Traffic count estimated from field observations (CDM, field observations, October 17, 2010).
6. Assume Ager-Beswick Rd is similar to Topsy Grade Rd in Oregon (J. Key, personal communication, February 8, 2011).

Table 3-6. Estimated Peak Hour Traffic Counts per Direction

ROAD SEGMENT	DIRECTION	EXISTING CONDITIONS[1]			DURING CONSTRUCTION ESTIMATES		
		AUTO[2]	MEDIUM TRUCKS[2]	HEAVY TRUCKS[2]	AUTO	MEDIUM TRUCKS	HEAVY TRUCKS[3]
Ager Rd	North	6	4	1	6	4	1
	South	6	4	1	6	4	2
Copco Rd[4]	East	9	0	4	125	0	4
	West	9	0	4	9	0	13

Notes:

Source: US DOI and CDFW, 2012

1. See Existing Conditions table for PHT distribution references.
2. TNM vehicle classification: Auto = cars and light duty trucks, Medium Trucks = all cargo vehicles with two axles and six ti res; Heavy trucks - all cargo vehicles with three or more axles.
3. All haul trucks assumed to be Heavy Trucks (3 axles or more).
4. Workers for Copco No. 1, Copco No. 2, and Iron Gate assumed to travel from Medford or Yreka. Maximum number of construction workers for the three facilities added to the Auto category for Copco Rd and I-5.
   Construction workers are double counted in the California segment of I-5 for conservative estimate.

3.3 Construction Work Hours

All activities at the Copco No. 1, Copco No. 2, and Iron Gate facilities, including the arrival and departure of vehicles delivering or removing materials from or to the site, will be carried out 24 hours a day, seven days a week.

3.4 Roads Authority

The roads authority for non-private roads in the Proposed Action area is Siskiyou County. The private network of roads leading to the Iron Gate facility via Ager Beswick Road have a private roads authority. Iron Gate Estates manages and maintains the private roads located within the route through Ager Road, Ager Beswick Road, and Lakeview Road, as well as other local private roads. The Renewal Corporation is currently working with the private authority for this network of roads and consulting them while conducting a construction improvement review of these roadways. This California Traffic Management Plan meets applicable regulatory permit requirements, state and local ordinances, and Siskiyou County requirements.

3.5 Site Security

The Renewal Corporation will implement the following measures with respect to site security. All security guardhouses are shown in Figure C4 and C5 in Appendix B. At the Copco No. 1, Copco No. 2, and Iron Gate facilities, temporary fences and gates will be installed and maintained at all times.

Barbed wire fences will be installed around the perimeter of the construction areas to surround staging areas/construction entrances and protect mobile offices, fuel tanks, equipment, and supplies.

3.5.1 Copco No. 1 Facility

Construction access to the Copco No. 1 facility is shown in Figure C2 in Appendix B. Access is through Copco Access Road, which is regionally accessed via Copco Road, located north of the facility. A guard shack and security pipe gate will be temporary installed on Copco Access Road to prevent unauthorized access to site.

3.5.2 Copco No. 2 Facility

Copco No. 2 facility access points are divided into dam access and powerhouse access. Copco No. 2 dam access will be through Copco Access Road regionally access via Copco Road from the north, similar to Copco No. 1 facility (Section 4.6.2). In addition, the dam will be accessed via a temporary spillway apron access track to be built during construction. A guard shack and security pipe gate will be installed on Copco Access Road to prevent unauthorized access to site.

Copco No. 2 powerhouse facilities will be accessed through Daggett Road, which is regionally accessed via Copco Road. A guard shack and security pipe gate and a will be installed on Daggett Road at the intersection of Copco Road and Daggett Road to prevent unauthorized access to site. In addition, an unmanned pipe gate will be installed on Daggett Road southeast of the site to prevent unauthorized access.

3.5.3 Iron Gate Facility

Construction access at the Iron Gate facility is shown in Figure C3 in Appendix B. Construction access is through Lakeview Road accessed via Ager Beswick Road southeast of the facility. Construction access will not be available from Lakeview Road via Copco Road for vehicles with heavy loads. Several unmanned security pipe gates will be installed on Lakeview Road to prevent unauthorized access to the facility. In addition, a guard shack and security pipe gate will be installed between Lakeview Road Bridge and Copco Road to prevent unauthorized access to site.

PacifiCorp reservoir operational staff and contractors will access the Iron Gate Facility from Lakeview Road via Copco Road using the Lakeview Road Bridge.

3.6 Facility Users

A workforce of 105 people is needed by the Renewal Corporation for the pre- and post-reservoir drawdown construction activities at the Copco No. 1, Copco No. 2, and Iron Gate facilities. The peak workforce required during excavation of the dams may reach 165 people at each facility, depending on subcontractor and the Renewal Corporation personnel requirements. The

estimated equipment that will be used by the Renewal Corporation for the removal of the dams and other facilities pre- and post-drawdown are shown in Table 3-7.

Table 3-7. Estimated Equipment at Copco No. 1, Copco No. 2, and Iron Gate Facilities

NAME OF EQUIPMENT	IRON GATE	COPCO NO. 1	COPCO NO. 2
Crawler-mounted lattice boom crane, 100 to 120 ton or 150 to 200 ton, 160- to 200-foot boom	X	X	X
Rough terrain hydraulic crane, 35 to 75 ton	X	X	X
Hitachi hydraulic excavator, 180,000 to 240,000 lb, 6- to 8-cy bucket	X		
Mid-size hydraulic excavator, 28,000 to 60,000 lb, 1- to 2-cy bucket		X	X
Cat 336 hydraulic track excavator, 80,000-lb, 3.5-cy bucket	X	X	X
Hydraulic track excavators, 65,000 to 120,000 lb, with Cat H120 hoe-ram, thumb, and sheer attachments	X	X	X
Cat 966 (52,000-lb, 5-cy bucket) or Cat 988 (65,000-lb, 6-cy bucket) articulated wheel-loaders	X	X	X
Cat 725, Cat 730, or Cat 740 articulated rear dump trucks, 30 ton (22 cy)	X	X	X
D-6, D-7, D-8, or D-9 standard crawler dozers	X	X	X
Front-end wheel loader, integrated tool carrier, 25,000 lb	X	X	X
D-8 support and knockdown dozer	X		
Cat TL943 rough terrain telescoping forklift	X	X	X
Rough terrain telescoping manlift	X	X	X
Cat 140, 14, or 16 motor-grader	X	X	
Flexifloat sectional barges	X	X	
Truck-mounted seed sprayer, 2,500 gallons	X	X	
On-highway, light duty diesel pickup trucks, ½-ton, and 1-ton crew	X	X	X
On-highway flatbed truck with boom crane, 16,000 lb	X	X	X
On-highway truck tractors, 45,000 lb	X	X	X
Off-highway water tanker, 5,000 gallons	X	X	X
On-highway water truck, 4,000 gallons		X	X

NAME OF EQUIPMENT	IRON GATE	COPCO NO. 1	COPCO NO. 2
Wheel-mounted asphalt paver	X		
Self-propelled rubber tire and drum vibratory compactor, 5 to 15 ton	X		
Engine generators, 6.5 kW to 40 kW, diesel or gasoline	X	X	X
Air compressors, 100 psi, 185 to 600 cfm, diesel	X	X	X
Airtrack drill or hydraulic track drill		X	X
Hand-held drilling, cutting, and demolition equipment	X	X	X
Portable welders and acetylene torches	X	X	X
4-inch submersible trash pumps, electric	X	X	X
Light plants, 2,000 to 6,000 watt, 10 to 25 hp, diesel	X	X	

Notes:

Source: Information provided by KRRC (2020).t

3.6.1 Copco No. 1 Facility

The estimated number of vehicle trips (VT), bulk quantity and load quantity per trip at the Copco No. 1 facility during construction are shown in Table 3-8.

Table 3-8. Copco No. 1 Facility Vehicle Trip Estimation Summary

WASTE MATERIAL	IN SITU QUANTITY	BULK QUANTITY[1]	DISPOSAL SITE	QUANTITY PER TRIP	TOTAL TRIPS[2]
Dam & Powerhouse Concrete	53,000 cy	69,000 cy	On-site	40 cy/trip (unpaved road)	1,750 trips (2 miles RT)[3]
Dam & Powerhouse Mechanical/electrical	1,175 tons	--	Transfer station near Yreka	25 ton/trip (Copco Road)	50 trips (62 miles RT)
Building Material Debris	2 buildings 5,000 SF	--	Transfer station near Yreka	25 ton/trip (Copco Road)	5 trips (62 miles RT)
Power lines[2]	2.7 miles of 12-kV and 69-kV	--	Transfer station near Yreka	--	--

Notes:

Source: Information provided by KRRC (2020).

1. Volumes increased 30 percent for concrete rubble, 20 percent for loose earth materials.
2. Total trips of concrete assume off-highway articulated trucks with a nominal load capacity of 40 cy. Total trips for hauling mechanical and electrical items and building material debris using truck tractor-trailers is based on 25 tons per trip. Truck trips for concrete disposal will only travel on project lands and private roads.
3. These trips will not occur on public roads

3.6.1.1 Construction Users

Construction personnel at the Copco No. 1 facility will arrive on site at approximately the same times every workday to maintain efficiency and reduce unexpected traffic. Construction personnel will arrive at the staging area and are permitted to be at site during the construction hours. A total of 105 vehicles associated with construction personnel will be on site daily, with up to 165 vehicles during peak construction.

3.6.1.2 Reservoir Operational Staff and Contractors

Reservoir operational staff and contractors will access Copco No. 1 through Copco Access Road via Copco Rd from the north. Two to four PacifiCorp personnel will be on site daily.

3.6.1.3 Oversized and Heavy Vehicle Access

Oversized and heavy vehicles will access the Copco No. 1 facility through Copco Access Road via Copco Road. Oversized and heavy vehicle access will not use roadways at the Copco No. 1 facility. An access map for the Copco No. 1 facility is provided in Figure C2 in Appendix B.

3.6.2 Copco No. 2 Facility

The estimated number of vehicle trips (VT), bulk quantity and load quantity per trip at the Copco No. 2 facility during construction are shown in Table 3-9.

Table 3-9. Copco No. 2 Facility Vehicle Trip Estimation Summary

WASTE MATERIAL	IN SITU QUANTITY	BULK QUANTITY[1]	DISPOSAL SITE	QUANTITY PER TRIP	TOTAL TRIPS[2]
Dam Embankment Earth	8,840 cy	9,650 cy	On-site disposal area	40 cy/trip (unpaved road)	240 trips (2 miles RT)[3]
Dam Concrete	4,800 cy	6,240 cy	On-site disposal area		160 trips (2 miles RT)[3]
Powerhouse Concrete	1,850 cy	2,405 cy	On-site tailrace area	Dispose at site (no hauling)	0
Dam & Powerhouse Mechanical/ Electrical	260 tons 1,120 tons	--	Transfer station near Yreka	25 ton/trips (Copco Road)	6 trips (62 miles RT) 45 trips (56 miles RT)
Building Material Debris	9 residential buildings 26,400 SF	--	Transfer station near Yreka	20 cy/trips (Copco Road)	20 trips (56 miles RT)

WASTE MATERIAL	IN SITU QUANTITY	BULK QUANTITY[1]	DISPOSAL SITE	QUANTITY PER TRIP	TOTAL TRIPS[2]
Treated wood (wood- stave penstock)	550 tons	--	Landfill near Anderson, CA	20 cy/trip (Interstate 5)	55 trips (140 miles RT)
Power lines[2]	1.6 miles of 12-kV and 69-kV lines	--	Transfer station near Yreka	--	--

Notes:

Source: Information provided by KRRC (2020)

1. Volumes increased 30 percent for concrete rubble, 20 percent for loose earth materials.
2. Total trips of earth fill or concrete assume off-highway articulated trucks with a nominal load capacity of 40 cy. Total trips for hauling mechanical and electrical items using truck tractor-trailers is based on 25 tons per trip. Truck trips for earth and concrete disposal will only travel on project lands and private roads.
3. These trips will not occur on public roads.

3.6.2.1 Construction Users

Construction personnel at the Copco No. 2 facilities will arrive on site at approximately the same times every workday to maintain efficiency and reduce unexpected traffic. Construction personnel will arrive at the staging area and are permitted to be at site during the construction hours. A total of 105 vehicles associated with construction personnel will be on site daily, with up to 165 vehicles during peak construction.

3.6.2.2 Reservoir Operational Staff and Contractors

Reservoir operational staff and contractors will access Copco No. 2 dam through Copco No. 2 Access Road via Copco Access Road and Copco Road from the north.

Reservoir operational staff and contractors will access the Copco No. 2 powerhouse facilities by Daggett Road via Copco Road. Two to six PacifiCorp personnel will be on site, depending on substation and transmission related activities.

3.6.2.3 Oversized and Heavy Vehicle Access

Oversized and heavy vehicles will access the Copco No. 2 dam through Copco No. 2 Access Road via Copco Access Road and Copco Road. In addition, oversized and heavy vehicles will access the construction site at Copco No. 2 dam via a temporary spillway apron access track. For the diversion dam, access will be through Copco Road via Copco No. 1 Village. An access map for the Copco No. 2 facility is provided in Figure C2 in Appendix B.

Oversized and heavy vehicles will access the Copco No. 2 powerhouse facilities via Daggett Road. This route includes traveling across the newly constructed Daggett Road Bridge which will be strengthened for heavy loads.

3.6.3 Iron Gate Facility

The estimated number of vehicle trips (VT), bulk quantity and load quantity per trip at the Iron Gate facility during construction are shown in Table 3-10.

Table 3-10. Iron Gate Facility Vehicle Trip Estimation Summary

WASTE MATERIAL	IN-SITU QUANTITY	BULK QUANTITY[1]	DISPOSAL SITE	QUANTITY PER TRIP	TOTAL TRIPS[2]
Dam Embankment Earth	193,000 cy	232,000 cy	On-site spillway	60 cy/ trip (unpaved road)	3,900 trips(0.5 mile RT)[3]
Dam Embankment Earth	916,000 cy	1,100,000 cy	On-site disposal area	20 cy/ trip (unpaved road)	18,300 trips(2 miles RT)[3]
Concrete	6,500 cy	7,800 cy	On-site disposal area	20 cy/trip (unpaved road)	390 trips (2 miles RT)
Mechanical/ Electrical	1,200 tons	--	Transfer station near Yreka, CA	25 ton/trip (Copco Road)	50 trips (54 miles RT)
Building Material Debris	4 buildings 2,700 SF	--			10 trips (54 miles RT)
Power lines	7.2 miles of 12-kV and 69- kV line			--	--

Notes:

Source: Information provided by KRRC (2020).

1. Volumes increased 30 percent for concrete rubble, 20 percent for loose earth materials.
2. Peak daily trips for each site are based on the number of vehicles (units) shown, operating in one 10-hour shift.
3. Total trips of earth fill assume off-highway articulated trucks with a nominal load capacity of 60 cy. Total trips of concrete assume off-highway articulated trucks with a nominal load capacity of 20 cy. Total trips for hauling mechanical and electrical items using truck tractor-trailers is based on 25 tons per trip.

3.6.3.1 Construction Users

Construction personnel at the Iron Gate facility will arrive on site at approximately the same times every workday to maintain efficiency and reduce unexpected traffic. Construction personnel will arrive at the staging area and are permitted to be at site during the construction hours. A total of 105 vehicles associated with construction personnel will be on site daily, with up to 165 vehicles during peak construction.

3.6.3.2 Reservoir Operational Staff and Contractors

Reservoir operational staff and contractors will access the Iron Gate facility through Lakeview Road via Copco Road. Two to four PacifiCorp personnel will be on site daily, with up to 12 depending on fish related activities.

3.6.3.3 Oversized and Heavy Vehicle Access

Oversized and heavy vehicles will access the Iron Gate facility through Lakeview Road via Ager Beswick Road. Oversized and heavy vehicles will not travel across the Lakeview Road Bridge at Klamath River. An access map for the Iron Gate facility is provided in Figure C2 in Appendix B.

3.7 Adjoining Private Property Access

Access to and from private property will be maintained at all times. If access to private property need to be limited on be temporarily basis, the Renewal Corporation will make these arrangements in advance with the effected private property owner.

3.8 Roadway Closures

The Renewal Corporation may close Copco Road during construction improvements at the bridges and culverts (Table 3-2). These closures, if necessary, will be of limited duration. Prior to road closure there will be a 72-hour public notice.

3.9 Temporary Roadways and Works

3.9.1 Copco No. 1 Facility

At the Copco. No. 1 facility, Copco Access Road is a dirt road with a hairpin bend. The lower side of access road is very steep with no barrier protection. The Renewal Corporation will re-grade the Copco Access Road by clearing and grubbing the available space between the toe of the higher hillside and the existing edge of the dirt/gravel road to provide a wider road section for construction and hauling trucks. The access road will be limited to one-way traffic with turnouts. Turnarounds for haul trucks will be provided at the staging areas for the powerhouse and the disposal site.

Ager Beswick Road at the Copco No. 1 site may be used by the Renewal Corporation for barge access to the reservoir. The road is not anticipated to be used for hauling but may be used for mobilization of a barge existing boat ramp at Mallard Cove on the southern shore. Access to the boat ramp is likely to require minor improvements by the Renewal Corporation to Ager Beswick Road. This may require the Cove to be temporarily closed for a few days for specific hours for dredging access to enable placing a barge mounted crane in the reservoir.

3.9.2 Copco No. 2 Facility

At the Copco No. 2 facility, Copco Access Road will be improved by the Renewal Corporation as described in Section 4.2. In addition, the Renewal Corporation will construct a temporary spillway apron access track that will provide access to a temporary work platform during construction at Copco No. 2 dam.

Mobilization and hauling at the Copco No. 2 powerhouse facilities will be through Daggett Road, which will have two construction improvements for access and haul purposes. The first improvement includes improving the culvert at Fall Creek. Knight Piesold is currently developing

an open bottom, steel-plate arch culvert concept for NOAA's review for fish passage at this location. The second improvement on Daggett Road includes constructing a temporary access bridge at the current location of the Daggett Road Bridge.

3.9.3 Iron Gate Facility

No temporary roadways or works are required at the Iron Gate facility. The Renewal Corporation will maintain and modify Lakeview Road and the network of private roads that connect the Iron Gate facility to Ager Beswick Road.

3.10 Traffic Control Personnel

The Renewal Corporation will require that all traffic control personnel at the Copco No. 1, Copco No. 2, and Iron Gate facilities will be trained in the proper fundamentals of flagging. Signaling directions used by flaggers will conform to the specifications provided in the California Code of Regulations Title 8, Division 1, Chapter 4, Subchapter 4, Article 11, Section 1599 – Flaggers. the Renewal Corporation will require traffic control personnel to follow specifications in the California Manual on Uniform Traffic Control Devices. The training and instructions will be based on the work site conditions and include the following:

- Flagger equipment which must be used,
- Layout of the work zone and flagging station,
- Methods to signal traffic to stop, proceed or slow down,
- Methods of one-way traffic control,
- Trainee demonstration of proper flagging methodology and operations,
- Emergency vehicles traveling through the work zone,
- Handling emergency situations,
- Methods of dealing with hostile drivers,
- Flagging procedures when a single flagger is used (when applicable).

Documentation of the training will be maintained consistent with Section 3203 of the California Code of Regulations, Injury Illness and Prevention Program of the General Industry Safety Orders. Flaggers will be trained by persons with the qualifications and experience necessary to effectively instruct the employee in the proper fundamentals of flagging moving traffic.

3.11 Signage

The Renewal Corporation will implement the following measures with respect to signage. Roadway signs will be used to inform the public where any road changes from construction works. Advanced warning signs (e.g., road work ahead, shoulder work, workers, etc.) will be used to indicate the type of work or activity the driver can expect. Signboards and variable message signs will be used as needed and will be placed at each end of access road used. If road closures are needed at Copco Road at Dry Creek and Fall Creek during construction activities, the Renewal Corporation will provide notification to residential traffic and emergency services at least two weeks prior to the initiation of work.

3.12 Monitoring of Traffic Control Measures

During each stage of construction at the Copco No. 1, Copco No. 2, and Iron Gate facilities, the Renewal Corporation will check all signs and required traffic control measures for compliance with the California Traffic Management Plan.

3.13 Road Design

The Renewal Corporation will implement the following measures with respect to road design. All road designs will account for current traffic configuration, road safety, and traffic network impacts. All road designs will meet applicable safety, engineering, and design guidelines (i.e., AASHTO design standards).

The following road design criteria will be used for the design of temporary access roadways:

- Single-lane road, 15 ft wide with one 3-ft-wide safety berm.
- Safety berm when road segment is exposed to side slope.
- 35-foot minimum curve radius.
- 15% maximum road grade.

4.0 Traffic Control Locations

Areas of traffic control have been identified for each facility. Traffic control measures in these areas to be provided by the Renewal Corporation are discussed below and will be updated as required. The Renewal Corporation will provide temporary traffic control measures and warning signs to notify the public of construction works and flaggers equipped with warning signs for the removal of recreation sites adjacent to the Iron Gate and Copco Reservoirs.

Table 4-1. California Recreation Site Demolition Summary

RECREATION SITE	RESERVOIR	ROAD
Overlook Point	Iron Gate Reservoir	Copco Road
Mirror Cove	Iron Gate Reservoir	Copco Road
Juniper Point	Iron Gate Reservoir	Copco Road
Camp Creek	Iron Gate Reservoir	Copco Road
Wanaka Springs	Iron Gate Reservoir	Copco Road
Jenny Creek	Iron Gate Reservoir	Copco Road
Fall Creek	Iron Gate Reservoir	Copco Road
Copco Cove	Copco Lake	Copco Road

Note: This is not a complete list of all recreation sites to be removed. This list only includes recreations sites where minor temporary traffic control may be needed.

4.1 Copco No. 1 and No. 2 Facility

Areas of traffic control at the Copco No. 1 and Copco No. 2 facilities have been identified and are shown in Figure C2 in Appendix B.

4.2 Iron Gate Facility

Areas of traffic control at the Iron Gate facility have been identified and are shown in Figure C3 in Appendix B.

5.0 Site Traffic Rules

The Renewal Corporation will implement the following site traffic rules. During mobilization and hauling activities throughout the Proposed Action area all personnel will be required to follow the appropriate speed limits. Copco Road from I-5 to Daggett Road has a speed limit of 35 mph and the stretch from Daggett Road to Ager Beswick Road has a speed limit of 20 mph, unless otherwise posted. Speed limits will be reinforced at the site induction.

5.1 Copco No. 1 Facility

5.1.1 Site Speed Limits

Signage indicating the appropriate speeds will be posted on all roadways and all personnel are always required to follow the speed limits at the Copco No. 1 facility. The speed limit is 15 mph on all roads at the Copco No. 1 facility unless otherwise posted. Speed limits will be evaluated for effectiveness and adjusted to maintain and prioritize safety during construction works.

5.1.2 Access Roads/Haul Roads

All personnel on site will be instructed to only use the access and haul roads and avoid traveling off the existing roadways, or on the shoulders of the road. Roadways will be delineated with markings such as windrows, bunting, or flagging. Haul roads will be constructed with the following design:

- Appropriate geotechnical materials will be used for all road construction,
- Bends, corners, and turns will be constructed to maintain equipment stability during regular use, and
- Haul roads will comply with the Renewal Corporation and Kiewit requirements and recommendations and will be inspected regularly.

5.1.3 Maximum Loads

Trucks will be loaded with a safe load distribution to avoid spillage. The driver must be in the vehicle throughout the loading process.

5.1.4 Parking

Parking will be restricted to specific designated areas as determined as work progresses and will be chosen to avoid close proximity to existing waterways. When entering the staging areas for parking, all personnel will follow all site traffic rules provided in this California Traffic Management Plan and in the Proposed Action Induction (Section 8.2).

5.1.5 Private Vehicles

Private vehicles will be allowed to park only in designated parking areas as determined as the work progresses and are not allowed on the construction site unless approved by the Kiewit Project Manager. If approved on site, private vehicles will adhere to all instructions and safety requirements designated in the California Traffic Management Plan. Private vehicles will be escorted if traveling through or to any operational areas.

There are public access roads adjacent to the Copco No. 1 construction site. Public access will be maintained on these access roads.

5.2 Copco No. 2 Facility

5.2.1 Site Speed Limits

Signage indicating the appropriate speeds will be posted on all roadways and all personnel are always required to follow the speed limits at the Copco No. 2 facility. The speed limit of Copco Road from Ager Road to Daggett Road (14.6 miles) is 35 mph. The speed limit is 15 mph on all roads at the Copco No. 2 facility unless otherwise posted. Speed limits will be evaluated for effectiveness and adjusted to maintain and prioritize safety during construction works.

5.2.2 Access Roads/Haul Roads

All personnel on site will be instructed to only use the access and haul roads and avoid traveling off the existing roadways, or on the shoulders of the road. Roadways will be delineated with markings such as windrows, bunting, or flagging. Haul roads will be constructed with the following design:

- Appropriate geotechnical materials will be used for all road construction,
- Bends, corners, and turns will be constructed to maintain equipment stability during regular use, and
- Haul roads will comply with PacifiCorp and Kiewit requirements and recommendations and will be inspected regularly.

5.2.3 Maximum Loads

Trucks will be loaded with a safe distribution to avoid spillage. The driver must be in the vehicle throughout the loading.

5.2.4 Parking

Parking will be restricted to specific designated areas as determined as the work progresses and will be chosen to avoid close proximity to existing waterways. When entering the staging areas for parking, personnel will follow all site traffic rules provided in this California Traffic Management Plan and in the Proposed Action induction (Section 8.2).

5.2.5 Private Vehicles

Private vehicles will be allowed to park only in designated parking areas and are not allowed on the construction site unless approved by the Kiewit Project Manager. If approved on site, private vehicles will adhere to all instructions and safety requirements designated in the California Traffic Management Plan. If traveling through or to any operational areas, private vehicles will be escorted.

5.3 Iron Gate Facility

5.3.1 Site Speed Limits

Signage indicating the appropriate speeds will be posted on all roadways and all personnel are always required to follow the speed limits at the Iron Gate facility. The speed limit on Ager Beswick Road is 25 mph. The speed limit is 15 mph on all roads, including Lakeview Road, at the Iron Gate facility unless otherwise posted. Speed limits will be evaluated for effectiveness and adjusted to maintain and prioritize safety during construction works.

5.3.2 Access Roads/Haul Roads

All personnel on site will be instructed to only use the access and haul roads and avoid traveling off the existing roadways, or on the shoulders of the road. Roadways will be delineated with markings such as windrows, bunting, or flagging. Haul roads will be constructed with the following design:

- Appropriate geotechnical materials will be used for all road construction,
- Bends, corners, and turns will be constructed to maintain equipment stability during regular use, and
- Haul roads will comply with the Renewal Corporation and Kiewit requirements and recommendations and will be inspected regularly.

5.3.3 Maximum Loads

Trucks will be loaded with a safe distribution to avoid spillage. The driver must be in the vehicle throughout the loading.

5.3.4 Parking

Parking will be restricted to specific designated areas as determined as the work progresses and will be chosen to avoid close proximity to existing waterways. When entering the Brush Creek Avenue and Lakeview Road staging areas for parking, personnel will follow all site traffic

rules provided in this California Traffic Management Plan and in the Proposed Action induction (Section 8.2).

5.3.5 Private Vehicles

Private vehicles will be allowed to park only in designated parking areas and are not allowed on the construction site unless approved by the Kiewit Project Manager. If approved on site, private vehicles will adhere to all instructions and safety requirements designated in the California Traffic Management Plan. If traveling through or to any operational areas, private vehicles will be escorted.

6.0 Requirements for Site Access

6.1 Personnel

The Renewal Corporation will require all personnel entering the Copco No. 1, Copco No. 2, and Iron Gate facilities to attend and complete a Proposed Action Induction. Visitor inductions will be arranged but require an inducted escort when at the site. Access to the site during non-regular hours must be arranged in advance with The Kiewit Project Manager.

6.2 Light Vehicles

All light vehicles on site are required to have reversing alarms. Flashing lights are required on light vehicles when traveling on haul roads.

7.0 Training and Awareness

7.1 Training, Awareness, and Competency

The Renewal Corporation will require training for all personnel prior to commencing work within the Limits of Work. The level of training will be commensurate with the level of individual risk their responsibilities are likely to entail. Trainings will include (as appropriate):

- Environmental and Safety policies and site Management Plans as well as environmental roles and responsibilities,
- The significance of environmental impacts caused by individual roles and activities,
- Incident management, and
- Potential consequences of non-conformance.

This plan will be discussed at orientation and will be updated as needed.

7.2 Inductions

7.2.1 Proposed Action Inductions

The Renewal Corporation will require all personnel to undergo an Induction to cover the key requirements of the Workplace Safety Management Plan and California Traffic Management Plan. The Induction will also cover safety, environment, community, and an overview of this Plan and reinforce it is the responsibility of all personnel to adhere to the safety and traffic requirements. The Induction will include:

- Overview of the site California Traffic Management Plan,
- PPE requirements,
- Contact details,
- Incident management and notification,
- Hours of work,
- Safety policies,
- Designated parking areas,
- Speed limits,
- Community protocol, and
- Emergency detour plans.

7.2.2 Visitor Inductions

The Renewal Corporation will require visitors to undergo a visitor's induction and their host is responsible for all actions and conduct of the visitor. During all times, visitors will be accompanied by personnel who have previously undergone Induction and safety training.

7.3 Toolbox Talks

Toolbox talks will be conducted regularly by the Renewal Corporation to improve on safety, health, quality, and environmental issues. Talks will focus on the current or upcoming work and will highlight specific safety aspects and actions being undertaken as part of ongoing management, training, and development. In general, toolbox talks will cover:

- An overview of current works,
- Traffic and access,
- Entry/exit point locations,
- Parking areas,
- If other persons are required to enter site that day, and
- Incidents, or potential incidents and possible implications.

8.0 References

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Appendix A

Preconstruction Improvements

Calculation Summary Sheet

Project Name: Klamath River Renewal

Project No.: VA103-00640/01

Task No.: 601.005: Roads, Bridges, Culverts

Title: Flexible Pavement Design

Calc. Rev. No.: 0

Description of Calculation:
This calculation estimates the required structural pavement requirements for road repairs associated with the Klamath River Renewal Project (Project). The Project considers constructing improvements and repairs to the existing roads identified for hauling equipment to construction sites and those repairs/improvements will utilize the pavement structure presented herein. Three pavement sections have been designed for subgrades of varying California Bearing Ratio (CBR) values anticipated to be encountered; CBR values of 3, 10, and 30. The methodology is detailed in the following sections.

Attachments and supplementary material:

Figure F2.1-1	Flexible Pavement Design
Attachment 1	Flexible Pavement Design Calculations
Attachment 2	Soils Classification
Attachment 3	Borehole Information
Drawings C6700-C6721	Supplemental Information

Calculation by: Kevin Howard	Date: February 7, 2020
Reviewed by: Jared Bray	
Results included in (Deliverable): 60% Design Report	
Or Superseded by (Calculation File): 30% Design Report	

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1993 AASHTO Flexible Pavement Structural Design

The 1993 AASHTO Flexible Pavement Structural Design method was used to estimate design pavement and subbase cross-sectional depths. The equation is solved based on a design equivalent single axel load (ESAL) anticipated over the desired life of pavement.

1.0 DESIGN EQUATION FOR FLEXIBLE PAVEMENTS

The design equation for flexible pavements can be found below. The equation is solved for the Structural Number (SN) through an iterative process.

$$\log_{10}(W_{10}) = Z_R \times S_O + 9.36 \times \log_{10}(SN+1) - 0.2 + \frac{\log_{10}\left(\frac{\Delta PSI}{4.2-1.5}\right)}{0.40 + \frac{1094}{(SN+1)^{5.19}}} + 2.32 \times \log_{10}(M_R) - 8.07$$

Where:

W_{10} = predicted number of 80 kN (18,000 lb.) ESALs
Z_R = standard normal deviate
S_0 = combined standard error of the traffic prediction and performance prediction
SN = Structural Number (an index that is indicative of the total pavement thickness required)
= $a_1D_1 + a_2D_2M_2 + a_3D_3M_3 + \ldots a_i$ = i^{th} layer structural coefficient:
D_i = i^{th} layer thickness (inches): M_i = i^{th} layer drainage coefficient
ΔPSI = difference between the initial design serviceability index, p_o, and the design terminal serviceability index, p_t
M_R = subgrade resilient modulus (in psi)

1.1 Predicted Number of 18,000 lb ESALs

The predicted number of Equivalent Single Axle Loads (ESALs) is based on base flow of average daily traffic over a 5-year time period. A base flow of 2000 vehicles was provided by Siskiyou County. In addition to the base flow, a construction flow of average daily traffic over a 2.5-year construction period was estimated for the duration of the project, with an assumed construction heavy haul traffic of one Triple 16 trailer per day, several concrete trucks, dump trucks, and 18-wheel Tractor Semi Trailer Trucks. The pavement designs presented in this calculation use assumed loading at the maximum loads typically permitted by the state of California for heavy haul and oversize loads for the Triple 16 trailer. Assumed Annual Average Daily Traffic for cars and heavy vehicles are presented in the table below. Load Factors were calculated for each vehicle from the AASHTO 1993 guidelines, and ESALs were calculated for each vehicle using the following equation:

$$ESAL = AADT \times 365 \times GF \times TF$$

Where:
ESAL = Equivalent Single Axle Loads
AADT = Annual Average Daily Traffic
365 = Days in a year
GF = Growth Factor (Assumed to be 24.3, based on a 2% growth rate over 20 years)
TF = Truck Factor, or Load Factor for each vehicle type

Calculation of Design 18 kip ESALs

	Daily Traffic	Growth Rate	Load Factors	Design ESAL's
Design Life:				
Passenger Cars:	1,982	2.0%	0.0008	3,012
Buses:	0	2.0%	0.6806	0
Panel & Pickup Trucks:	10	2.0%	0.0122	232
2 Axle, 6 Tire Trucks:	0	2.0%	0.1890	0
Concrete Trucks:	2	2.0%	4.4800	17,019
Dump Trucks:	4	2.0%	3.6300	27,580
Tractor Semi Trailer Trucks:	2	2.0%	2.3719	9,011
Double Trailer Trucks	0	2.0%	2.3187	0
Triple 16 Trailer - maximum permit weight	0	0.0%	15.6540	0
Average Daily Traffic in Design Lane:	2,000			
Construction Period:				
Passenger Cars:	0	2.0%	0.0008	0
Buses:	0	2.0%	0.6806	0
Panel & Pickup Trucks:	50	2.0%	0.0122	565
2 Axle, 6 Tire Trucks:	0	2.0%	0.1890	0
Concrete Trucks:	10	2.0%	4.4800	41,495
Dump Trucks:	10	2.0%	3.6300	33,622
Tractor Semi Trailer Trucks:	20	2.0%	2.3719	43,939
Double Trailer Trucks	10	2.0%	2.3187	21,477
Triple 16 Trailer - maximum permit weight	1	0.0%	15.6540	14,284
Average Daily Traffic in Design Lane:	2,101			
Total Design Life 18 kip ESAL's:				212,236

1.2 Standard Normal Deviate (Z_R):

The Standard Normal Deviate (Z_R) can be selected from Table 4.1 (from AASHTO, 1993), based on the desired level of reliability

Table 4.1. Standard Normal Deviate (Z_R) Values Corresponding to Selected Levels of Reliability

Reliability, R (percent)	Standard Normal Deviate, Z_R
50	−0 000
60	−0 253
70	−0 524
75	−0 674
80	−0 841
85	−1 037
90	−1 282
91	−1 340
92	−1 405
93	−1 476
94	−1 555
95	−1 645
96	−1 751
97	−1 881
98	−2 054
99	−2 327
99 9	−3 090
99 99	−3 750

Suggested Levels of Reliability for Various Functional Classifications (from AASHTO, 1993)

Functional Classification	Recommended Level of Reliability	
	Urban	Rural
Interstate and Other Freeways	85 – 99.9	80 – 99.9
Principal Arterials	80 – 99	75 – 95
Collectors	80 – 95	75 – 95
Local	50 – 80	50 – 80

A level of Reliability of 80% has been selected for this project considering a mid-range reliability for rural collectors and principal arterials. The corresponding Z_R is -0.841.

1.3 Combined Standard Error (S_0):

Typical S_0 values used are 0.40 to 0.50 for flexible pavements and 0.35 to 0.40 for rigid pavements. A S_0 value of 0.45 was selected for this design.

1.4 Structural Number (SN)

Structural numbers were calculated for each design subgrade by an iterative process whereby the desired element depth is multiplied by the structural and drainage coefficients. The Calculated SN is the sum of the SN for each cross-sectional design element. Commonly accepted structural and drainage coefficients were used for pavement for the pavement cross-sectional elements as follow:

	Structural Coefficient	Drainage Coefficient
Asphaltic Concrete:	0.42	n/a
Asphalt Treated Base:	0.25	n/a
Cement Treated Base:	0.17	n/a
Crushed Aggregate Base:	0.14	1.0
Engineered Fill:	0.10	1.0
Geotextile Subgrade Reinforcement:	12.00	1.2

1.5 Present Serviceability Index (PSI)

The serviceability index is a parameter developed to estimate the “ride quality” rating of flexible pavement. The difference between the initial design serviceability index, p_o, and the design terminal serviceability index, p_t, is a function used in the AASHTO flexible pavement design equation. It is commonly accepted as an industry standard that p_o for typical construction is 4.2. From visual observation and driving on the road, the p_t (which represents wearing of the surface sufficient to constitute failure) is estimated to be 2.5. For this calculation, the ΔPSI used is 1.7.

1.6 Subgrade Resilient Modulus (M_R)

The Subgrade Resilient (M_R) can be correlated from California Bearing Ratio (CBR) tests considering the following equations:

Selected Subgrade Strength/Stiffness Correlation Equations

Equation	Origin	Limitations
M_R = (1500)(CBR)	Heukelom & Klomp (1962)	Only for fine-grained non-expansive soils with a soaked CBR of 10 or less.
M_R = 1,000 + (555)(R-value)	1993 AASHTO Guide	Only for fine-grained non-expansive soils with R-values of 20 or less.
M_R = 2555 x CBR0.64	AASHTO 2002 Design Guide	A fair conversion over a wide range of values.

AASHTO Soil Classification

AAHSTO Symbol	Typical CBR Range	M_R Range (ksi)	M_R Default (ksi)
A-7-6	1 – 5	2.5 – 7	4
A-7-5	2 – 8	4 – 9.5	6
A-6	5 – 15	7 – 14	9
A-5	8 – 16	9 – 15	11
A-4	10 – 20	12 – 18	14
A-3	15 – 35	14 – 25	18
A-2-7	10 – 20	12 – 17	14
A-2-6	10 – 25	12 – 20	15
A-2-5	15 – 30	14 – 22	17
A-2-4	20 – 40	17 – 28	21
A-1-b	35 – 60	25 – 35	29
A-1-a	60 – 80	30 – 42	38

For this Design, the AASHTO 2002 equation was used to estimate the M_R. However, in cases where this equation yielded a M_R value greater than 40,000 psi, 40,000 psi was used. Knight Piésold used three scenarios, one with an assumed CBR of 3 for the entire Project, one with an assumed CBR of 10 for the entire Project, and one that with an assumed CBR of 30 for the entire project. The estimated subgrade CBR were correlated using the United States Department of Agriculture AASHTO soil classifications from the National Resources Conservation Service's web-based soil survey and the Guide for Mechanistic-Empirical Design of New and Rehabilitated Pavement Structures. Knight Piésold also referred to soil information from drilled boreholes along Copco Road. A correlation, based on Livneh 1989, was used to estimate CBR values from standard penetrating test (SPT) blow counts at depths less than 10-feet, following the equation:

$$logCBR = -5.13 + 6.55(logSPT)^{-0.26}$$

Where:

CBR = California Bearing Ratio
SPT = mm/blow

1.7 Results

The inputs described above were input to a calculation worksheet to assess the thicknesses of pavements for two road surfacing cross section options and three assumed subgrade CBRs. The following table summarizes the results of the calculations:

Estimated Subgrade CBR	Pavement Design	Required Thickness
3	Asphalt with Base Course	3” Asphaltic Concrete
		12” Base Course
	Aggregate only	21” Gravel (total)
10	Asphalt with Base Course	3” Asphaltic Concrete
		6” Base Course
	Aggregate only	15” Gravel (total)
30	Asphalt with Base Course	3” Asphaltic Concrete
		3” Base Course
	Aggregate only	9” Gravel (total)

References

"1993 AASHTO Flexible Pavement Structural Design" 14 March 2008. http://www.pavementinteractive.org <http://www.pavementinteractive.org/article/1993-aashto-flexible-pavement-structural-design/> 20 July 2015

AASHTO Guide for Design of Pavement Structures 1993. American Association of State Highway and Transportation Officials. Washington, D.C

Guide for Mechanistic-Empirical Design of New and Rehabilitated Pavement Structures
Appendix CC-1: Correlation of CBR Values with Soil Index Properties
National Cooperative Highway Research Program, Transportation Research Board, National Research Council.

Livneh, M. (1989). Validation of Correlations between a Number of Penetration Tests and In-situ California Bearing Ratio Tests.

"Subgrade" 2 April 2009. http://www.pavementinteractive.org
<http://www.pavementinteractive.org/article/subgrade/> 20 July 2015

USDA soil information and NRCS Onle Web Soil Survey
https://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/survey/

Figures

Attachment 1

Flexible Pavement Design Calculations

Paved Roadway Surface Design
for a Subgrade CBR Value of 3

Pavement Section Design Location: Klamath Project

Average Daily Traffic Count:	4,000	All Lanes & Both Directions
Design Life:	5	Years
Construction Period:	2.5	Years
Initial Seviceability Index (P_0):	4.2	
Terminal Seviceability Index (P_t):	2.5	
Level of Reliability:	80	
Subgrade CBR Value:	3	**Subgrade M_R:** 4,906 psi

Calculation of Design 18 kip ESALs

	Daily Traffic	Growth Rate	Load Factors	Design ESAL's
Design Life:				
Passenger Cars:	1,982	2.0%	0.0008	3,012
Buses:	0	2.0%	0.6806	0
Panel & Pickup Trucks:	10	2.0%	0.0122	232
2 Axle, 6 Tire Trucks:	0	2.0%	0.1890	0
Concrete Trucks:	2	2.0%	4.4800	17,019
Dump Trucks:	4	2.0%	3.6300	27,580
Tractor Semi Trailer Trucks:	2	2.0%	2.3719	9,011
Double Trailer Trucks	0	2.0%	2.3187	0
Triple 16 Trailer - maximum permit weight	0	0.0%	15.6540	0
Average Daily Traffic in Design Lane:	2,000			
Construction Period:				
Passenger Cars:	0	2.0%	0.0008	0
Buses:	0	2.0%	0.6806	0
Panel & Pickup Trucks:	50	2.0%	0.0122	565
2 Axle, 6 Tire Trucks:	0	2.0%	0.1890	0
Concrete Trucks:	10	2.0%	4.4800	41,495
Dump Trucks:	10	2.0%	3.6300	33,622
Tractor Semi Trailer Trucks:	20	2.0%	2.3719	43,939
Double Trailer Trucks	10	2.0%	2.3187	21,477
Triple 16 Trailer - maximum permit weight	1	0.0%	15.6540	14,284
Average Daily Traffic in Design Lane:	101			

Total Design Life 18 kip ESAL's: 212,236

Actual Log (ESAL's): 5.327

Trial SN: 2.93

Trial Log (ESAL's): 5.327 This must be equal to or greater than the Actual Log (ESAL's)

Pavement Section Design SN: This Number must be equal to or greater than the trial SN

Asphaltic Concrete with Base = 2.94

Gravel = 2.94

Base+Asphaltic Design	**Design Depth Inches**	**Structural Coefficient**	**Drainage Coefficient**	**SN**	
Asphaltic Concrete:	3.00	0.42	n/a	1.26	
Crushed Aggregate Base:	9.00	0.14	1.0	1.26	
Existing Gravel Base (assumed):	3.00	0.14	1.0	0.42	(Indicates 3" of existing gravel surfacing is assumed)
				2.94	

Aggregate Base Only Design	**Design Depth Inches**	**Structural Coefficient**	**Drainage Coefficient**	**SN**	
Crushed Aggregate Base:	18.00	0.14	1.0	2.52	
Existing Gravel Base (assumed):	3.00	0.14	1.0	0.42	(Indicates 3" of existing gravel surfacing is assumed)
				2.94	

Paved Roadway Surface Design for a Subgrade CBR Value of 10

Pavement Section Design Location: Klamath Project

Average Daily Traffic Count:	4,000	All Lanes & Both Directions
Design Life:	5	Years
Construction Period:	2.5	Years
Initial Seviceability Index (P_0):	4.2	
Terminal Seviceability Index (P_t):	2.5	
Level of Reliability:	80	
Subgrade CBR Value:	10	**Subgrade M_R:** 16,352 psi

Calculation of Design 18 kip ESALs

	Daily Traffic	Growth Rate	Load Factors	Design ESAL's
Design Life:				
Passenger Cars:	1,982	2.0%	0.0008	3,012
Buses:	0	2.0%	0.6806	0
Panel & Pickup Trucks:	10	2.0%	0.0122	232
2 Axle, 6 Tire Trucks:	0	2.0%	0.1890	0
Concrete Trucks:	2	2.0%	4.4800	17,019
Dump Trucks:	4	2.0%	3.6300	27,580
Tractor Semi Trailer Trucks:	2	2.0%	2.3719	9,011
Double Trailer Trucks	0	2.0%	2.3187	0
Triple 16 Trailer - maximum permit weight	0	0.0%	15.6540	0
Average Daily Traffic in Design Lane:	2,000			
Construction Period:				
Passenger Cars:	0	2.0%	0.0008	0
Buses:	0	2.0%	0.6806	0
Panel & Pickup Trucks:	50	2.0%	0.0122	565
2 Axle, 6 Tire Trucks:	0	2.0%	0.1890	0
Concrete Trucks:	10	2.0%	4.4800	41,495
Dump Trucks:	10	2.0%	3.6300	33,622
Tractor Semi Trailer Trucks:	20	2.0%	2.3719	43,939
Double Trailer Trucks	10	2.0%	2.3187	21,477
Triple 16 Trailer - maximum permit weight	1	0.0%	15.6540	14,284
Average Daily Traffic in Design Lane:	101			

Total Design Life 18 kip ESAL's: 212,236

Actual Log (ESAL's): 5.327

Trial SN: 1.84

Trial Log (ESAL's): 5.327 This must be equal to or greater than the Actual Log (ESAL's)

Pavement Section Design SN: This Number must be equal to or greater than the trial SN

Asphaltic Concrete with Base = 2.10

Gravel = 2.10

Base+Asphaltic Design	**Design Depth Inches**	**Structural Coefficient**	**Drainage Coefficient**	**SN**	
Asphaltic Concrete:	3.00	0.42	n/a	1.26	
Crushed Aggregate Base:	3.00	0.14	1.0	0.42	
Existing Gravel Base (assumed):	3.00	0.14	1.0	0.42	(Indicates 3" of existing gravel surfacing is assumed)
				2.10	

Aggregate Base Only Design	**Design Depth Inches**	**Structural Coefficient**	**Drainage Coefficient**	**SN**	
Crushed Aggregate Base:	12.00	0.14	1.0	1.68	
Existing Gravel Base (assumed):	3.00	0.14	1.0	0.42	(Indicates 3" of existing gravel surfacing is assumed)
				2.10	

Paved Roadway Surface Design
for a Subgrade CBR Value of 30

Pavement Section Design Location: Klamath Project

Average Daily Traffic Count:	4,000	All Lanes & Both Directions
Design Life:	5	Years
Construction Period:	2.5	Years
Initial Seviceability Index (P_0):	4.2	
Terminal Seviceability Index (P_t):	2.5	
Level of Reliability:	80	
Subgrade CBR Value:	30	**Subgrade M_R:** 40,000 psi

Calculation of Design 18 kip ESALs

	Daily Traffic	Growth Rate	Load Factors	Design ESAL's
Design Life:				
Passenger Cars:	1,982	2.0%	0.0008	3,012
Buses:	0	2.0%	0.6806	0
Panel & Pickup Trucks:	10	2.0%	0.0122	232
2 Axle, 6 Tire Trucks:	0	2.0%	0.1890	0
Concrete Trucks:	2	2.0%	4.4800	17,019
Dump Trucks:	4	2.0%	3.6300	27,580
Tractor Semi Trailer Trucks:	2	2.0%	2.3719	9,011
Double Trailer Trucks	0	2.0%	2.3187	0
Triple 16 Trailer - maximum permit weight	0	0.0%	15.6540	0
Average Daily Traffic in Design Lane:	2,000			
Construction Period:				
Passenger Cars:	0	2.0%	0.0008	0
Buses:	0	2.0%	0.6806	0
Panel & Pickup Trucks:	50	2.0%	0.0122	565
2 Axle, 6 Tire Trucks:	0	2.0%	0.1890	0
Concrete Trucks:	10	2.0%	4.4800	41,495
Dump Trucks:	10	2.0%	3.6300	33,622
Tractor Semi Trailer Trucks:	20	2.0%	2.3719	43,939
Double Trailer Trucks	10	2.0%	2.3187	21,477
Triple 16 Trailer - maximum permit weight	1	0.0%	15.6540	14,284
Average Daily Traffic in Design Lane:	101			

Total Design Life 18 kip ESAL's: 212,236

Actual Log (ESAL's): 5.327

Trial SN: 1.26

Trial Log (ESAL's): 5.327 This must be equal to or greater than the Actual Log (ESAL's)

Pavement Section Design SN: This Number must be equal to or greater than the trial SN

Asphaltic Concrete with Base = 1.68

Gravel = 1.26

Base+Asphaltic Design

	Depth Inches	Structural Coefficient	Drainage Coefficient	SN	
Asphaltic Concrete:	3.00	0.42	n/a	1.26	
Crushed Aggregate Base:	0.00	0.14	1.0	0	
Existing Gravel Base (assumed):	3.00	0.14	1.0	0.42	(Indicates 3" of existing gravel surfacing is assumed)
				1.68	

Aggregate Base Only Design

	Depth Inches	Structural Coefficient	Drainage Coefficient	SN	
Crushed Aggregate Base:	6.00	0.14	1.0	0.84	
Existing Gravel Base (assumed):	3.00	0.14	1.0	0.42	(Indicates 3" of existing gravel surfacing is assumed)
				1.26	

Attachment 2

Soil Classifications

Knight Piésold CONSULTING

Table A2.1
Kiewit Infrastructure West Co.
Klamath River Renewal Project

AASHTO Soil Classification for Copco Road
Stationing Summary

Start Station	End Station	AASHTO Classification	CBR Value
00+00	17+00	A-4	10
17+00	32+50	A-6	10
32+50	41+00	A-6	10
41+00	51+00	A-2	30
51+00	60+00	A-4	10
60+00	80+00	A-6	10
80+00	177+00	A-7	3
177+00	211+00	A-7	3
211+00	244+00	A-7	3
244+00	264+50	A-7	3
264+50	303+75	A-7	3
303+75	434+00	A-7	3
434+00	598+75	A-7	3
598+75	1002+00	A-7	3
1002+00	1015+25	A-1	30
1015+25	1067+00	A-7	3
1067+00	1080+00	A-1	30
1080+00	1189+50	A-7	3
1189+50	1212+75	A-6	10
1212+75	1225+25	A-6	10
1225+25	1233+00	A-7	3
1233+00	1238+25	A-6	10
1238+25	1255+50	A-6	10
1255+50	1258+00	A-7	3
1258+00	1264+00	A-6	10
1264+00	1270+75	A-7	3
1270+75	1274+00	A-6	10
1274+00	1275+50	A-7	3
1275+50	1286+00	A-6	10
1286+00	1324+75	A-7	3
1324+75	1330+50	A-6	10
1330+50	1332+50	A-7	3
1332+50	1334+00	A-6	10
1334+00	1338+50	A-7	3
1338+50	1343+50	A-7	3
1343+50	1363+00	A-6	10
1363+00	1393+75	A-6	10
1393+75	1397+00	A-7	3

M:\Denver\Projects\103\00640.01\Data Info\Calculations\60 Percent Design\Roads\PavementDesign\Rev0\Attachment2-Soils\[TableF2.2-NRCS_Stationing.xlsx]Table_8x11-P

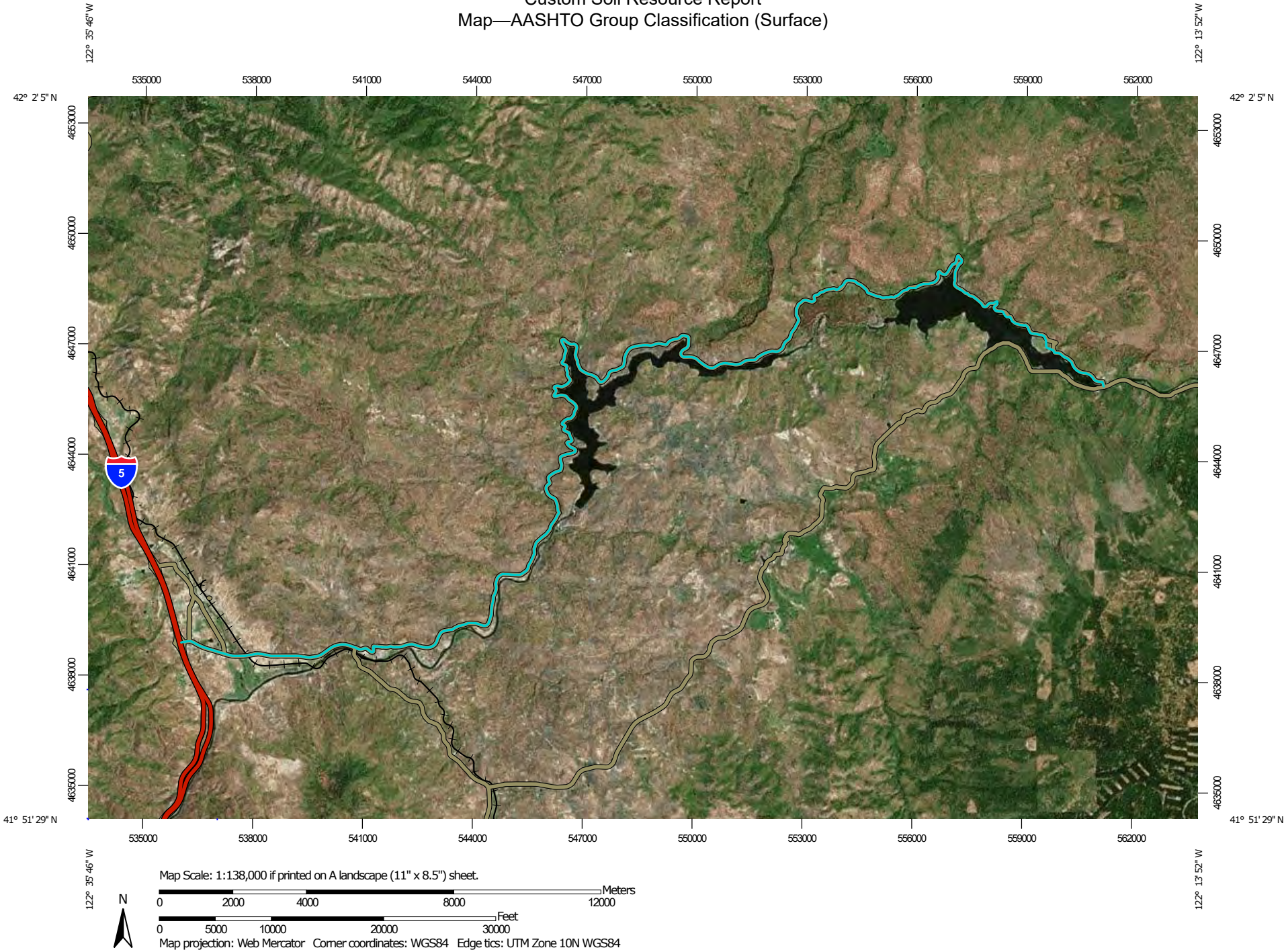
NOTES:

1. All stations are approximations based on values taken from the NRCS Custom Soil Resource Report.

2. CBR values assumed to be 3, 10, or 30 for the given AASHTO Classification.

REV	DATE	DESCRIPTION	PREP'D	RVW'D
0	7-Feb-2020	ISSUED WITH REPORT VA103-640/01-6	DG	JB

Custom Soil Resource Report
Map—AASHTO Group Classification (Surface)



MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

Soil Rating Polygons

- A-1
- A-1-a
- A-1-b
- A-2
- A-2-4
- A-2-5
- A-2-6
- A-2-7
- A-3
- A-4
- A-5
- A-6
- A-7
- A-7-5
- A-7-6
- A-8
- Not rated or not available

Soil Rating Lines

- A-1
- A-1-a
- A-1-b
- A-2
- A-2-4
- A-2-5
- A-2-6
- A-2-7
- A-3
- A-4
- A-5
- A-6
- A-7
- A-7-5
- A-7-6
- A-8
- Not rated or not available

Soil Rating Points

- A-1
- A-1-a
- A-1-b
- A-2
- A-2-4
- A-2-5
- A-2-6
- A-2-7
- A-3
- A-4
- A-5
- A-6
- A-7
- A-7-5
- A-7-6
- A-8
- Not rated or not available

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Siskiyou County, California, Central Part
Survey Area Data: Version 10, Sep 13, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jan 1, 1999—Dec 31, 2003

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Table—AASHTO Group Classification (Surface)

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
140	Dotta loam, 2 to 9 percent slopes	A-4	0.4	0.4%
142	Dotta gravelly loam, 2 to 5 percent slopes	A-2	0.7	0.7%
145	Dumps		1.2	1.2%
155	Hilt sandy loam, 2 to 15 percent slopes	A-4	0.3	0.3%
158	Hilt-Rock outcrop complex, 2 to 50 percent slopes		0.1	0.1%
160	Jenny clay, 2 to 15 percent slopes	A-7	1.0	1.0%
161	Jenny cobbly clay, 0 to 15 percent slopes	A-7	2.1	2.1%
168	Kuck clay loam, 9 to 15 percent slopes	A-6	0.6	0.6%
169	Lassen clay, 2 to 9 percent slopes	A-7	1.7	1.7%
170	Lassen clay, 9 to 15 percent slopes	A-7	2.4	2.4%
171	Lassen cobbly clay, 2 to 15 percent slopes	A-7	6.4	6.2%
172	Lassen-Kuck complex, 15 to 50 percent slopes	A-7	3.5	3.4%
173	Lassen-Kuck complex, stony, 2 to 50 percent slopes		34.3	33.5%
174	Lassen-Rock outcrop-Kuck complex, 2 to 50 percent slopes		21.8	21.4%
175	Lava flows	A-1	1.9	1.8%
177	Lithic Haploxerolls-Rock outcrop complex, 0 to 65 percent slopes*		0.5	0.5%
188	Mary-Rock outcrop complex, 2 to 50 percent slopes		6.9	6.8%
190	Medford clay loam, cool, 2 to 5 percent slopes	A-6	3.5	3.4%
191	Medford clay loam, cool, 5 to 15 percent slopes	A-6	5.0	4.9%
212	Riverwash		0.2	0.2%
216	Rock outcrop		2.4	2.4%
233	Terwilliger silty clay loam, 9 to 15 percent slopes	A-6	2.6	2.6%

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
234	Terwilliger silty clay loam, 15 to 50 percent slopes	A-6	0.3	0.2%
239	Water		2.3	2.2%
Totals for Area of Interest			**102.2**	**100.0%**

Rating Options—AASHTO Group Classification (Surface)

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Lower

Layer Options (Horizon Aggregation Method): Surface Layer (Not applicable)

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Attachment 3

Borehole Information

Knight Piésold CONSULTING

TABLE A3.1

KIEWIT INFRASTRUCTURE WEST CO.
KLAMATH RIVER RENEWAL PROJECT

GEOTECHNICAL DATA SUMMARY
PENETRATION TEST SUMMARY

Drillhole ID	Approx. Stationing	Test Type	Material	Depth From (ft)	Depth To (ft)	Hammer Blow Counts			N-Value	CBR (derived from N-Value)
						Interval 1 (6")	Interval 2 (6")	Interval 3 (6")		
B-01	~680+00	ModCal	Alluvium	5.00	6.50	6	7	8	15	10
B-01	~680+00	SPT	Alluvium	6.50	8.00	6	7	8	15	10
B-04	~820+00	ModCal	Fill	5.00	6.50	15	13	11	24	18
B-05	~820+00	ModCal	Fill	5.00	6.50	5	4	9	13	8
B-05	~820+00	SPT	Alluvium	7.50	9.00	32	12	7	19	13
B-14	~820+00	ModCal	Alluvium	6.40	7.90	8	17	17	34	33
B-19	~660+00	ModCal	Fill	5.00	6.50	9	8	10	18	12
B-20	~680+00	ModCal	Fill	5.00	6.50	3	5	6	11	7
B-205	~950+00	ModCal	Colluvium	5.00	6.50	9	22	29	51	76
B-207	~950+00	ModCal	Colluvium	5.00	6.50	9	7	2	9	6
BC-01	~1155+00	ModCal	Lacustrine	0.00	1.50	1	1	0	2	2
BC-01	~1155+00	ModCal	Lacustrine	6.50	8.00	4	3	4	7	4

M:\Denver\Projects\103\00640.01\Data Info\Calculations\60 Percent Design\Roads\PavementDesign\Rev0\Attachment2-Soils\[Tables_RoadInvestigationReview_Rev0.xlsx]A1.2 SPTs

NOTES:

1. SPTS COMPLETED DURING DRILLING AND OVERSEEN BY AECOM PERSONNEL.

REV	DATE	DESCRIPTION	PREP'D	RVW'D
0	16DEC'19	ISSUED WITH REPORT VA103-640/01-6	DG	JB

Print Feb/07/20 10:37:17

Project: Klamath River Dam Removal Project
Project Location: Klamath River
Project Number: 60537920

Key to Log of Soil Boring

Elevation feet	Depth, feet	SAMPLES: Type	SAMPLES: Number	Sampling Resistance blows/6-in.	Recovery (inches)	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Dry Unit Weight (pcf)	Fines Content (% <200 Sieve)	REMARKS AND OTHER TESTS
1	2	3	4	5	6	7	8	9	10	11	12

COLUMN DESCRIPTIONS

1 **Elevation:** Elevation in feet referenced to specified datum.

2 **Depth:** Depth in feet below the ground surface.

3 **Sample Type:** Type of soil sample collected at depth interval shown; sampler symbols are explained below.

4 **Sample Number:** Sample identification number.

5 **Sampling Resistance:** Number of blows required to advance driven sampler 12 inches beyond first 6-inch interval, or distance noted, using a 140-lb hammer with a 30-inch drop; or down-pressure for pushed sampler.

6 **Recovery:** Percentage of driven or pushed sample length recovered; "NA" indicates data not recorded.

7 **Graphic Log:** Graphic depiction of subsurface material encountered; typical symbols are explained below.

8 **Material Description:** Description of material encountered; may include density/consistency, moisture, color, and grain size.

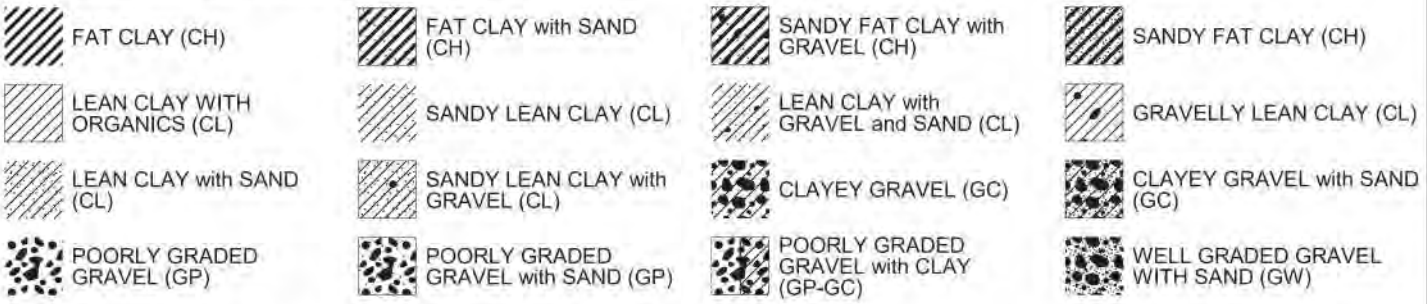
9 **Water Content:** Water content of soil sample measured in laboratory, expressed as percentage of dry weight of specimen.

10 **Dry Unit Weight:** Density of soil as measured in the laboratory, in pounds per cubic foot

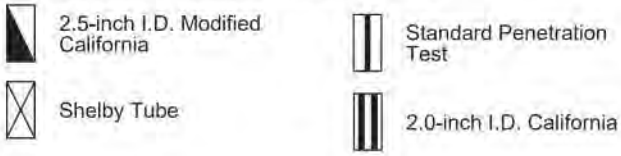
11 **Fines Content** Percentage passing the #200 sieve as measured in the laboratory

12 **Remarks and Other Tests:** Comments and observations regarding drilling or sampling made by driller or field personnel.

TYPICAL MATERIAL GRAPHIC SYMBOLS



TYPICAL SAMPLER GRAPHIC SYMBOLS



GENERAL NOTES

-**Check By:** Soil and core samples reviewed in-person by Project Geologist.

-**Reviewed By:** Soil and core samples reviewed via run photos or core box photos in office by Project Engineer.

Report: GEO_10B1_OAK_KEY; File: BORING LOGS.GPJ; 6/26/2018 BC-01

Project: Klamath River Renewal Project
Project Location: Copco and Iron Gate Reservoirs
Project Number: 60537920

Key to Log of Soil and Core Boring

Elevation, feet / Depth, feet	ROCK CORE: Run No.	Box No.	Recovery, %	Fractures per Foot	R Q D, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	SOIL SAMPLES: Type Number	Blows / 6 in.	Recovery, %	Drill Time [Rate, ft/hr]	FIELD NOTES AND TEST RESULTS
1 2	3	4	5	6	7	8	9 10	11	12 13	14	15	16	17

COLUMN DESCRIPTIONS

1 **Elevation:** Elevation (in feet) referenced to North American Vertical Datum of 1988 (NAVD88).

2 **Depth:** Distance (in feet) below the collar of the borehole.

3 **Run No.:** Number of the individual coring interval.

4 **Box No.:** Number of the core box which contains core from the corresponding runs.

5 **Recovery:** Amount in percent of core recovered from coring interval; calculated as length of core recovered divided by length of run.

6 **Fractures per Foot:** (Fracture Frequency) The number of naturally occurring fractures in each foot of core; does not include mechanical breaks (induced by drilling) or healed fractures. "NA" indicates not applicable due to lack of core recovery or soil-like nature of rock.

7 **R Q D:** (Rock Quality Designation) Amount (in percent) of intact core (pieces of sound core greater than 4 inches in length) in each coring interval; calculated as the sum of lengths of intact core divided by length of core run.

8 **Fracture Drawing:** Sketch of the naturally occurring fractures and mechanical breaks, showing the angle of the fractures relative to the cross-sectional axis of the core. "NR" indicates no recovery.

9 **Fracture Number:** Location of each naturally occurring fracture (numbered) and mechanical break (labeled "M"). Naturally occurring fractures are described in Column 11 (keyed by number) using descriptive terms defined on Sheet 2 (Items a through g).

10 **Lithology:** Graphic depiction of subsurface material encountered, typical symbols are explained below

11 **Description:** Lithologic description in this order: rock type, color, grain size, texture, weathering, strength, and other features; descriptive terms are defined on Sheet 2. Also, abbreviated description of fractures numbered in Column 9 using terms defined on Sheet 2.

12 **Sample Type:** Type of soil sample collected at depth interval shown; sampler symbols are explained below.

13 **Sample Number:** Sample identification number.

14 **Blows / 6 in.:** Number of blows to advance driven sampler each 6-inch drive interval, or distance noted, using a 140-lb hammer with a 30-inch drop (unless otherwise noted).

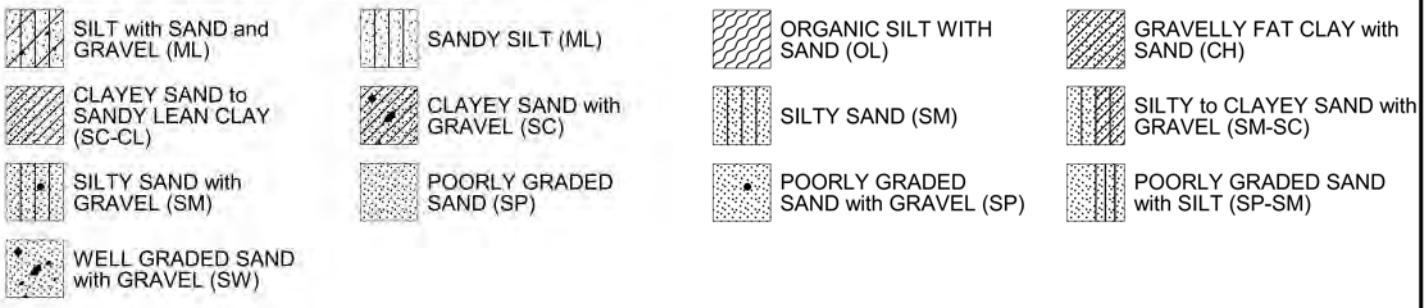
15 **Recovery:** Actual soil recovery in driven sampler as a percentage of the sampler penetration.

16 **Drill Time [Rate]:** Time (in 24-hour clock) marking start and finish of each run; drill rate (in feet per hour) is reported in brackets.

17 **Field Notes and Tests Results:** Comments and observations regarding drilling or sampling made by driller or field personnel.

OTHER GRAPHIC SYMBOLS

TYPICAL MATERIAL GRAPHIC SYMBOLS



Report: GEO_CORE+SOIL_NO PACK_WITH LITH_KEY; File: ROCK CORES.GPJ; 10/24/2018 KEY 3

Project: Klamath River Renewal Project
Project Location: Copco and Iron Gate Reservoirs
Project Number: 60537920

Key to Log of Core Boring

Elevation, feet	Depth, feet	ROCK CORE: Run No.	Box No.	Recovery, %	Fractures per Foot	R Q D, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Drill Time, 24-hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
1	2	3	4	5	6	7	8	9	10	11	13	14

COLUMN DESCRIPTIONS

1 **Elevation:** Elevation (in feet) referenced to mean sea level (MSL).

2 **Depth:** Distance (in feet) below the collar of the borehole.

3 **Run No.:** Number of the individual coring interval.

4 **Box No.:** Number of the core box which contains core from the corresponding run.

5 **Recovery:** Amount (in percent) of core recovered from the coring interval; calculated as length of core recovered divided by run length.

6 **Fractures per Foot:** (Fracture Frequency) The number of naturally occurring fractures in each foot of core; does not include mechanical breaks (induced by drilling) or healed fractures. "NA" indicates not applicable due to lack of core recovery.

7 **R Q D:** (Rock Quality Designation) Amount (in percent) of intact core (pieces of sound core greater than 4 inches in length) in the coring interval; calculated as the sum of lengths of intact core divided by the run length. RQD value with "*" indicates moderately weathered / altered rock that does not meet soundness requirements, but provides an indication of rock quality with respect to degree of fracturing.

8 **Fracture Drawing:** Sketch of the naturally occurring fractures and mechanical breaks, showing the angle of the fractures relative to the cross-sectional axis of the core. "NR" indicates no recovery.

9 **Fracture Number:** Location of each naturally occurring fracture (numbered) and mechanical break (labeled "M"). Naturally occurring fractures are described in Column 11 (keyed by number) using descriptive terms defined on Sheet 2 (Items a through g).

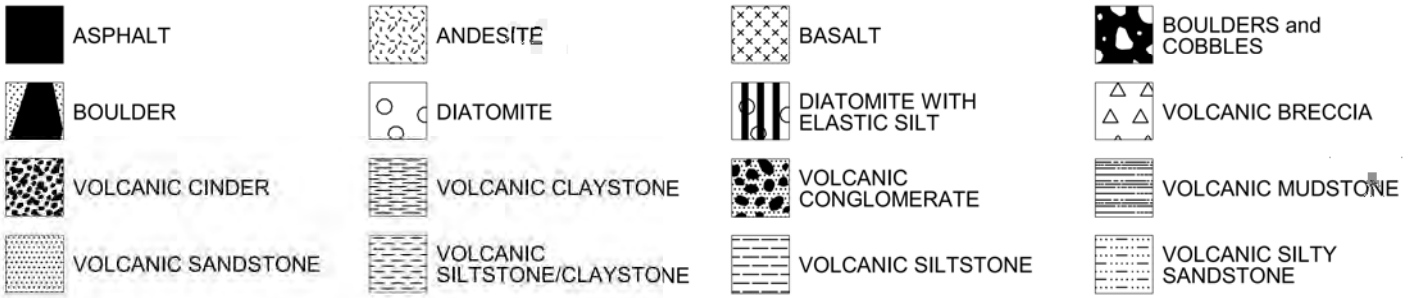
10 **Lithology:** A graphic log of material encountered using symbols to represent differing soil and rock types; symbols are explained below.

11 **Description:** Lithologic description in this order: rock type, color, texture, grain size, weathering, strength, and other features; descriptive terms are defined on Sheet 2. A detailed description of overburden material is not necessarily provided. Also, abbreviated description of fractures numbered in Column 9 using terms defined on Sheet 2.

12 **Drill Time [Rate]:** Time (in 24-hour clock) marking start and finish of each run; drill rate (in feet per hour) is reported in brackets.

13 **Field Notes and Other Tests:** Comments regarding drilling and sampling made by driller or field personnel. Tested rock specimen intervals and a record of tests performed using the abbreviations listed below.

TYPICAL MATERIAL GRAPHIC SYMBOLS



OTHER GRAPHIC SYMBOLS

- Static Water Level
- First water encountered at time of drilling
- Inferred or transitional contact
- Change in material properties within a stratum

LABORATORY TEST ABBREVIATIONS

PL: Point Load Index Test (psi)
UC: Unconfined Compressive Strength test (psi)

Material descriptions and stratum lines are interpretive; field descriptions may have been modified to reflect lab test results. Descriptions on these logs apply only at the specific boring locations and at the time the borings were advanced, and are not warranted to be representative of subsurface conditions at other locations or times.

Report: GEO_CORE_OAK_CKEY:: File: ROCK CORES.GPJ: 10/23/2018 KEY 1

Project: Klamath River Dam Removal Project Project Location: Copco and Iron Gate Reservoirs Project Number: 60537920	Key to Log of Boring Sheet 4 of 4

KEY TO DESCRIPTIVE TERMS USED ON CORE LOGS

DISCONTINUITY DESCRIPTORS

a Dip of discontinuity, measured relative to a plane normal to the core axis.

b **Discontinuity Type:**

- F - Fault
- J - Joint
- Sh - Shear
- Fo - Foliation
- V - Vein
- B - Bedding

c **Aperture (inches):**

- W - Wide (0.5-2.0)
- MW - Moderately Wide (0.1-0.5)
- N - Narrow (0.05-0.1)
- VN - Very Narrow (<0.05)
- T - Tight (0)

d **Type of Infilling:**

- Bi - Biotite
- Cl - Clay
- Ca - Calcite
- Ch - Chlorite
- Ep - Epidote
- Fe - Iron Oxide
- H - Healed
- My - Mylonite
- CR - Crushed Rock
- Mn - Manganese
- No - None
- Py - Pyrite
- Qz - Quartz
- Sd - Sand
- Se - Serpentine
- Si - Silty
- Uk - Unknown

e **Amount of Infilling:**

- Su - Surface Stain
- Sp - Spotty
- Pa - Partially Filled
- Fi - Filled
- No - None

f **Surface Shape of Joint:**

- Pl - Planar
- Wa - Wavy
- St - Stepped
- Ir - Irregular

g **Roughness of Surface:**

- Slk - Slickensided [surface has smooth, glassy finish with visual evidence of striations]
- S - Smooth [surface appears smooth and feels so to the touch]
- SR - Slightly Rough [asperities on discontinuity surfaces are distinguishable and can be felt]
- R - Rough [ridges and side-angle steps are evident; asperities are clearly visible; surface feels very abrasive]
- VR - Very Rough [near-vertical steps and ridges occur on discontinuity surface]

ROCK FRACTURING

Description	Recognition
Intensely Fractured	Fractures spaced less than 2 inches apart
Highly Fractured	Fractures spaced 2 inches to 1 foot apart
Moderately Fractured	Fractures spaced 1 foot to 3 feet apart
Slightly Fractured	Fractures spaced 3 feet to 10 feet apart
Massive	Fracture spacing greater than 10 feet

ROCK WEATHERING / ALTERATION

Description	Recognition
Residual Soil	Original minerals of rock have been entirely decomposed to secondary minerals, and original rock fabric is not apparent; material can be easily broken by hand
Completely Weathered/Altered	Original minerals of rock have been almost entirely decomposed to secondary minerals, although original fabric may be intact; material can be granulated by hand
Highly Weathered/Altered	More than half of the rock is decomposed; rock is weakened so that a minimum 2-inch-diameter sample can be broken readily by hand across rock fabric
Moderately Weathered/Altered	Rock is discolored and noticeably weakened, but less than half is decomposed; a minimum 2-inch-diameter sample cannot be broken readily by hand across rock fabric
Slightly Weathered/Altered	Rock is slightly discolored, but not noticeably lower in strength than fresh rock
Fresh/Unweathered	Rock shows no discoloration, loss of strength, or other effect of weathering/alteration

ROCK STRENGTH

Description	Recognition	Approximate Uniaxial Compressive Strength (psi)
Extremely Weak Rock	Can be indented by thumbnail	35 - 150
Very Weak Rock	Can be peeled by pocket knife	150 - 700
Weak Rock	Can be peeled with difficulty by pocket knife	700 - 3,600
Moderately Strong Rock	Can be indented 5 mm with sharp end of pick	3,600 - 7,200
Strong Rock	Requires one hammer blow to fracture	7,200 - 14,500
Very Strong Rock	Requires many hammer blows to fracture	14,500 - 36,000
Extremely Strong Rock	Can only be chipped with hammer blows	>36,000

Project: Klamath River Renewal Project
Project Location: Copco and Iron Gate Reservoirs
Project Number: 60537920

Log of Soil and Core Boring B-01

Sheet 1 of 2

Date(s) Drilled	**9/27/2018**	Logged By	**S. Janowski**	Reviewed By	**B. Aldridge**
Drilling Method	**Hollow Stem Auger, HQ-3 Rock Core**	Drill Bit Size/Type	**6-inch flight auger, HQ-3 wireline diamond bit**	Total Depth of Borehole	**25.5 feet**
Drill Rig Type	**Truck Mounted Mobile B-53**	Drilling Contractor	**Gregg Drilling**	NAVD 88 Ground Surface Elevation	**2346 feet**
Groundwater Level	**Not encountered before rotary wash drilling**	Sampling Methods	**2.5-inch ID ModCal; SPT; HQ Core Barrel**	Hammer Data	**Automatic hammer; 140 lbs, 30-inch drop**
Borehole Backfill	**Cement grout to ground surface**	Borehole Location	**Camp Creek Bridge**	Coordinate Location	**N 2602866 E 6443027**

Elevation, feet	Depth, feet	ROCK CORE: Run No.	Box No.	Recovery, %	Fractures per Foot	R Q D, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	SOIL SAMPLES: Type	Number	Blows / 6 in.	Recovery, %	Drill Time [Rate, ft/hr]	FIELD NOTES AND TEST RESULTS
	0								2-inches GRAVEL roadway						Start 9:00 9/27/2018; hang auger 0.0-5.0ft.
	1								CLAYEY GRAVEL (GC); very stiff; yellowish brown (10YR 5/6); 60% subangular GRAVEL to 1-inch; 30% low plasticity FINES; 10% fine grained SAND; moist --ROAD FILL--						
2344	2														
	3														
2342	4														
	5														pp = 2.75 tsf
									LEAN CLAY with GRAVEL and SAND (CL); very stiff; dark yellowish brown (10YR 4/4); 80% medium plasticity FINES; 10% fine grained SAND; 10% subangular GRAVEL to 1/2-inch; moist --ALLUVIUM--			6			Hollow stem auger 5.0ft. to 9.0ft.
2340	6										S-01	7	0		pp = 2.25 tsf
												8			
	7											6			
											S-02	7	0		
2338	8											8			
	9								GRAVEL and COBBLES in a SANDY LEAN CLAY matrix; GRAVEL and COBBLES are subrounded Basalt						
			1									19		1014	Auger refusal at 9.0ft.; advance 4.5-inch casing to 9.0ft. and switch to rotary wash drilling with 3 7/8-inch tricone bit.
2336	10	1		80	NA	NA					S-03	17	11	[13]	
					NA							10		1021	
	11	2		100		NA								1037 [9] 1044	
2334					NA		m							1056	
	12						NR								75% fluid circulation
		3		60	NA	NA								[25]	
	13														

Report: GEO_CORE+SOIL_NO PACK_WITH LITH; File: KLAMATH_MASTER.GPJ; 6/20/2019 B-01

Project: Klamath River Renewal Project
Project Location: Copco and Iron Gate Reservoirs
Project Number: 60537920

Log of Soil Boring B-02

Sheet 1 of 2

Date(s) Drilled	**10/12/2018**	Logged By	**P. Respess**	Reviewed By	**B. Aldridge**
Drilling Method	**Hollow Stem Auger**	Drill Bit Size/Type	**6-inch flight auger**	Total Depth of Borehole	**31.4 feet**
Drill Rig Type	**Truck Mounted Mobile B-53**	Drilling Contractor	**Gregg Drilling**	NAVD 88 Ground Surface Elevation	**2340 feet**
Groundwater Level(s)	**13.5 feet below ground surface 10/12/2018**	Sampling Method(s)	**SPT**	Hammer Data	**Automatic hammer; 140 lbs, 30-inch drop**
Borehole Backfill	**Cement grout to ground surface**	Borehole Location	**Camp Creek Bridge**	Coordinate Location	**N 2602747 E 6443180**

Elevation feet	Depth, feet	SAMPLES Type	SAMPLES Number	Sampling Resistance	Recovery (feet)	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Plasticity Index	Fines Content (%<#200 Sieve)	REMARKS AND OTHER TESTS
2340	0						2-inches GRAVEL roadway POORLY GRADED GRAVEL (GP); dense; fine to coarse GRAVEL and COBBLES; fine to corase grained SAND; little no plasticity FINES; moist --FILL--				Start 9:00 9/27/2018; hollow stem auger 0-31ft.
							LEAN CLAY (CL); medium stiff; brown; medium plasticity FINES; trace fine grained SAND; occasional GRAVEL and COBBLE				
2335	5										Logged from auger cuttings and rig chatter
2330	10						▽				
2325	15										
2320	20						POORLY GRADED GRAVEL with SAND (GP); medium dense to dense; fine to coarse GRAVEL to BOULDERS; fine to coarse grained SAND; some no plasticity FINES --ALLUVIUM-- BOULDER, basalt				Rig chatter indicated rocky layer
2315	25						BOULDER, basalt				
	30		S-01	14 14 44	100		SILTY SAND with GRAVEL (SM); very dense; GRAVEL up to 1-inch; fine to coarse grained SAND; no plasticity FINES --ALLUVIUM--	14		15	SA: G=32%; S=53%; F=15%

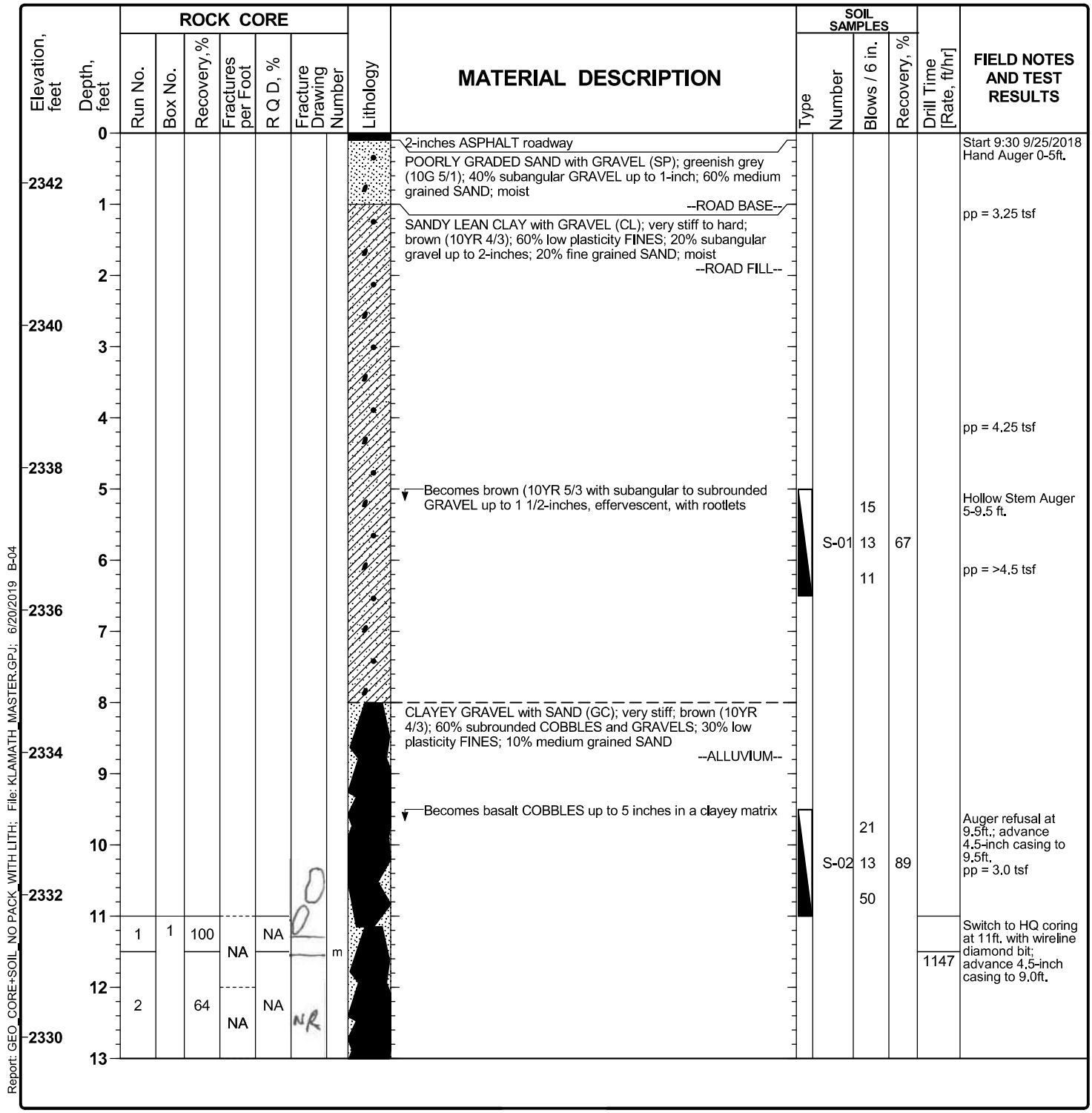
Report: GEO_10B1_OAK; File: KLAMATH_MASTER.GPJ; 6/20/2019 B-02

Project: Klamath River Renewal Project
Project Location: Copco and Iron Gate Reservoirs
Project Number: 60537920

Log of Soil and Core Boring B-04

Sheet 1 of 3

Date(s) Drilled	**9/25/2018**	Logged By	**S. Janowski**	Reviewed By	**B. Aldridge**
Drilling Method	**Hollow Stem Auger, HQ-3 Rock Core**	Drill Bit Size/Type	**6-inch flight auger, HQ-3 wireline diamond bit**	Total Depth of Borehole	**31.5 feet**
Drill Rig Type	**Truck Mounted Mobile B-53**	Drilling Contractor	**Gregg Drilling**	NAVD 88 Ground Surface Elevation	**2343 feet**
Groundwater Level	**Not encountered before rotary wash drilling**	Sampling Methods	**2.5-inch ID Mod Cal, HQ Core Barrel**	Hammer Data	**Automatic hammer; 140 lbs, 30-inch drop**
Borehole Backfill	**Cement grout to ground surface**	Borehole Location	**Jenny Creek Bridge**	Coordinate Location	**N 2603560 E 6452773**



Report: GEO_CORE+SOIL_NO PACK_WITH LITH; File: KLAMATH_MASTER.GPJ; 6/20/2019 B-04

Project: Klamath River Renewal Project
Project Location: Copco and Iron Gate Reservoirs
Project Number: 60537920

Log of Soil and Core Boring B-05

Sheet 1 of 4

Date(s) Drilled	**9/26/2018**	Logged By	**S. Janowski**	Reviewed By	**B. Aldridge**
Drilling Method	**Hollow Stem Auger, HQ-3 Rock Core**	Drill Bit Size/Type	**6-inch flight auger, HQ-3 wireline diamond bit**	Total Depth of Borehole	**50.0 feet**
Drill Rig Type	**Truck Mounted Mobile B-53**	Drilling Contractor	**Gregg Drilling**	NAVD 88 Ground Surface Elevation	**2342 feet**
Groundwater Level	**Not encountered before rotary wash drilling**	Sampling Methods	**2.5-inch ID ModCal; SPT; HQ Core Barrel**	Hammer Data	**Automatic hammer; 140 lbs, 30-inch drop**
Borehole Backfill	**Cement grout to ground surface**	Borehole Location	**Jenny Creek Bridge**	Coordinate Location	**N 2603527 E 6452997**

Elevation, feet	Depth, feet	ROCK CORE: Run No.	Box No.	Recovery, %	Fractures per Foot	R Q D, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	SOIL SAMPLES: Type	Number	Blows / 6 in.	Recovery, %	Drill Time [Rate, ft/hr]	FIELD NOTES AND TEST RESULTS
2342	0								2-inches ASPHALT roadway						Start 8:30 9/26/2018 hand auger 0-5ft.
									POORLY GRADED SAND with GRAVEL (SP); greenish grey (10G 5/1); 60% medium grained SAND; 40% subangular GRAVEL up to 1-inch; moist						
	1								--ROAD BASE-7						
									SANDY LEAN CLAY (CL); very stiff; brown (10YR 1/3); low plasticity FINES; fine to medium grained SAND; subangular GRAVEL up to 2-inches; moist						
									--ROAD FILL--						
2340	2														Pocket Pen = 3.5 tsf
	3														
	4														
2338															
	5								Becomes dark yellowish brown (10YR 4/4); dry to moist			5			Hollow stem auger 5-7.5 ft. SA: G=7%; S=25%; F=68%
									LEAN CLAY with GRAVEL (CL); stiff; brown (10YR 4/3); 75% medium plasticity FINES; 15% subangular to subrounded GRAVEL up to 3/4-inch; 10% fine grained SAND; moist; with rootlets		S-01	4	72		pp = 1.5 tsf
2336	6								--ALLUVIUM--			9			
	7		1		NA				With pulverized GRAVEL (from drive sampler); increased GRAVEL to 25% up to 1-inch					1019	
												32			Auger refusal at 7.5ft.
2334	8				NA		NR				S-02	12	72		pp = 2.75 tsf
		1		15		NA						7		[48]	
	9				NA				With greyish black (N2), aphanitic basalt COBBLES and GRAVELS in a washed-out CLAY matrix						Advance 4.5-inch casing to 7.5 ft.; switch to HQ coring at 7.5ft. with wireline diamond bit
2332	10				NA		NR								
	11													1024	
					NA							4		1104	pp = 1.5 tsf
	12	2		20		NA	NR				S-03	8	39		
2330					NA							4			
	13														

Report: GEO_CORE+SOIL_NO PACK_WITH LITH; File: KLAMATH_MASTER.GPJ; 6/20/2019 B-05

Project: Klamath River Renewal Project
Project Location: Copco and Iron Gate Reservoirs
Project Number: 60537920

Log of Core Boring B-13

Sheet 1 of 2

Date(s) Drilled	**10/3/2018**	Logged By	**B. Kozlowicz**	Reviewed By	**B. Aldridge**
Drilling Method	**HQ-3 Rock Core**	Drill Bit Size/Type	**3 3/4-inch diamond core bit**	Total Depth of Borehole	**21.1 feet**
Drill Rig Type	**Truck Mounted Mobile B-53**	Drilling Contractor	**Gregg Drilling**	NAVD 88 Ground Surface Elevation	**2494 feet**
Groundwater Level	**Not encountered before HQ rock coring**	Sampling Methods	**HQ Core Barrel**	Inclination from Horizontal/True North Bearing	**Vertical**
Borehole Completion	**Bentonite cement grout to ground surface**	Location	**Fall Creek**	Coordinate Location	**N 2606346 E 6463221**

Elevation, feet	Depth, feet	ROCK CORE: Run No.	Box No.	Recovery, %	Fractures per Foot	R Q D, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	Packer Test Intervals	Drill Time, 24-hr [Drill Rate, ft/hr]	FIELD NOTES AND OTHER TESTS
2494	0								1-inch ASPHALT			Start 12:00 10/3/2018 hand auger 0-3.5ft.
	1								WELL GRADED SAND with GRAVEL (SW); medium dense to dense; dark yellowish brown (10YR 4/4); fine to coarse grained SAND; angular to rounded GRAVEL up to 2-inches			
	2								--ROAD BASE--			
2492		1	1						BASALT; very dark grey to black; slightly to moderately weathered; strong; highly fractured with iron staining along fracture surfaces; porphyritic; vesicular; with plagioclase phenocrysts up to 1/4-inch and irregular vesicles up to 1/2-inch		1252	
	3			60	NA	0	NR		--TERTIARY to QUATERNARY INTRUSIVE BASALT--		[23]	
					>6						1256	
2490	4				NA				Becomes dark yellowish brown, locally highly weathered with CLAYEY SAND, with rootlets		1324	Auger refusal at 3.5ft.; switch to HQ rock coring with 3 3/4-inch diamond bit
	5	2		28		0	NR				[29]	0% fluid return
	6				NA							
2488					NA				Becomes highly to locally completely weathered to a CLAYEY SAND/SANDY CLAY with trace small gravel and strong, slightly weathered corestones of BASALT		1330	
	7										1338	
					>6				CLAYEY SAND/SANDY CLAY			
2486	8											
					>6							
	9	3		66		0					[20]	
					NA							
	10											
2484					NA		NR					
	11										1353	
					NA						1405	
	12											
2482		4		68		19						
					>6				highly fractured with SANDY CLAY infilling			
	13											

Report: GEO_CORE_OAK_C; File: KLAMATH_MASTER.GPJ; 6/20/2019 B-13

Project: Klamath River Renewal Project
Project Location: Copco and Iron Gate Reservoirs
Project Number: 60537920

Log of Soil and Core Boring B-14

Sheet 1 of 2

Date(s) Drilled	**10/4/2018**	Logged By	**B. Kozlowicz**	Reviewed By	**B. Aldridge**
Drilling Method	**HQ-3 Rock Core**	Drill Bit Size/Type	**6-inch flight auger, 3 3/4-inch diamond coring bit**	Total Depth of Borehole	**28.6 feet**
Drill Rig Type	**Truck Mounted Mobile B-53**	Drilling Contractor	**Gregg Drilling**	NAVD 88 Ground Surface Elevation	**2494 feet**
Groundwater Level	**Not encountered before HQ rock coring**	Sampling Methods	**2.5-inch ID ModCal, HQ Core Barrel**	Hammer Data	**Automatic hammer; 140 lbs, 30-inch drop**
Borehole Backfill	**Bentonite cement grout to ground surface**	Borehole Location	**Fall Creek**	Coordinate Location	**N 2606321 E 6463161**

Elevation, feet	Depth, feet	ROCK CORE: Run No.	Box No.	Recovery, %	Fractures per Foot	R Q D, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	SOIL SAMPLES: Type	Number	Blows / 6 in.	Recovery, %	Drill Time [Rate, ft/hr]	FIELD NOTES AND TEST RESULTS
2494	0								WELL GRADED GRAVEL with SAND (GW); loose to medium dense; dark yellowish brown (10YR 4/4); angular to subangular GRAVEL up to 3-inches; fine to coarse grained SAND; trace no plasticity FINES --ROAD FILL--						Start 9:00 10/4/2018 hand auger 0-2ft.
	1														
2492	2								SANDY LEAN CLAY (CL); stiff; very dark brown (7.5YR 2.5/3); 60% low plasticity FINES; 40% fine to medium grained SAND; trace angular, coarse grained SAND; trace fine GRAVEL --ALLUVIUM/COLLUVIUM?-- At 2.3ft.: Cored 4-inch cobble of dark grey, VOLCANIC SANDSTONE, fine to medium grained, with dark yellowish brown SANDY CLAY and 1-inch root					0920	Auger refusal at 2.3ft.; switch to HQ rock coring with 3 3/4-inch diamond bit
	3	1			NA										
2490	4	1		12	NA	0	NR							[27]	Run 1 bagged
	5				NA										
2488	6				NA									0929	
	7				NA				FAT CLAY with SAND (CH); very stiff; dark brown (7.5YR 3/3); medium plasticity FINES; fine to medium SAND; rare angular GRAVEL		S-01	8 17 17	60		SA: G=1%; S=29%; F=70% LL=62; PL=22 Two liners retained
2486	8	2		40	NA	0	NR		COBBLES and BOULDERS with CLAYEY SAND and GRAVEL; dark greenish grey and olive to reddish brown; slightly weathered, moderately strong volcanic sandstone COBBLES --CHANNEL ALLUVIUM--					1026 [18]	
	9								Becomes grey, volcanic sandstone COBBLE with rounded upper terminus					1031	
2484	10	3		60	NA	25	NR		COBBLES and BOULDERS become dusky red, fine grained, slightly weathered, very strong intrusive volcanic					1040 [13]	80-100% fluid return
	11				NA									1049	
2482	12	4		7	NA	0								1058 [18]	Coarse grained SAND in cuttings
	13													1103	

Report: GEO_CORE+SOIL_NO PACK_WITH LITH; File: KLAMATH_MASTER.GPJ; 6/20/2019 B-14

Project: Klamath River Renewal Project
Project Location: Copco and Iron Gate Reservoirs
Project Number: 60537920

Log of Soil Boring B-18

Sheet 1 of 1

Date(s) Drilled	**10/11/2018**	Logged By	**P. Respess**	Reviewed By	**B. Aldridge**
Drilling Method	**Hollow Stem Auger**	Drill Bit Size/Type	**6-inch flight auger**	Total Depth of Borehole	**28.3 feet**
Drill Rig Type	**Truck Mounted Mobile B-53**	Drilling Contractor	**Gregg Drilling**	NAVD 88 Ground Surface Elevation	**2347 feet**
Groundwater Level(s)	**15.0 feet below ground surface (10/11/2018)**	Sampling Method(s)	**2.5-inch ID ModCal, SPT**	Hammer Data	**Automatic hammer; 140 lbs, 30-inch drop**
Borehole Backfill	**Cement grout to ground surface**	Borehole Location	**Scotch Creek**	Coordinate Location	**N 2603250 E 6441988**

Elevation feet	Depth, feet	SAMPLES Type	SAMPLES Number	Sampling Resistance	Recovery (feet)	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Plasticity Index	Fines Content (%<#200 Sieve)	REMARKS AND OTHER TESTS
2345	0						2.5-inches ASPHALT roadway GRAVEL SANDY LEAN CLAY (CL); medium stiff to stiff; reddish brown; 80-90% medium plasticity FINES; 10-20% fine to coarse grained SAND; occasional GRAVEL and COBBLE --FILL--				Start 10/11/2018; hollow stem auger 0-28ft. Smooth drilling
2340	5						GRAVEL				Rig chatter Return to smooth drilling to 13ft.
2335	10										
2330	15						POORLY GRADED GRAVEL with SAND (GP); medium dense; varied dark grey with purple, red, and yellowish brown; fine to coarse angular GRAVEL, COBBLES, and BOULDERS; fine to coarse grained SAND --FILL--*(continued)*				Rig chatter
2325	20						BOULDER ALLUVIUM				Driller indicates hard rock at 18ft. Driller indicates smooth, consistent drilling 22-25ft.
2320	25	S-01 S-02	50/3 100/4	0			BOULDER, basalt				
		S-03	100/4				VOLCANIC SILTSTONE; reddish purple; slightly weathered to fresh; weak to moderately strong; very thinly laminated --TERTIARY VOLCANICS (BOGUS MOUNTAIN BEDS)?-- **TOTAL DEPTH = 28.3 FEET**				
	30										

Report: GEO_10B1_OAK; File: KLAMATH_MASTER.GPJ; 6/20/2019 B-18

Project: Klamath River Renewal Project
Project Location: Copco and Iron Gate Reservoirs
Project Number: 60537920

Log of Soil and Core Boring B-19

Sheet 1 of 3

Date(s) Drilled	**10/11/2018**	Logged By	**P. Respess**	Reviewed By	**B. Aldridge**
Drilling Method	**Hollow Stem Auger, Rotary Wash, HQ-3 Rock Core**	Drill Bit Size/Type	**3 7/8-inch tricone; 3 7/8-inch #6 HQ bit**	Total Depth of Borehole	**37.5 feet**
Drill Rig Type	**Truck Mounted Mobile B-53**	Drilling Contractor	**Gregg Drilling**	NAVD 88 Ground Surface Elevation	**2346 feet**
Groundwater Level	**15.0 feet below ground surface (10/11/2018)**	Sampling Methods	**2.5-inch ID ModCal, SPT, HQ Core Barrel**	Hammer Data	**Automatic hammer; 140 lbs, 30-inch drop**
Borehole Backfill	**Cement grout to ground surface**	Borehole Location	**Scotch Creek**	Coordinate Location	**N 2603261 E 6442042**

Elevation, feet	Depth, feet	ROCK CORE: Run No.	Box No.	Recovery, %	Fractures per Foot	R Q D, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	SOIL SAMPLES: Type	Number	Blows / 6 in.	Recovery, %	Drill Time [Rate, ft/hr]	FIELD NOTES AND TEST RESULTS
2346	0								2.5-inches ASPHALT roadway						Start 10/11/2018; hollow stem auger 0-23ft.
									GRAVEL						
									--ROAD BASE--						
	1								SANDY LEAN CLAY (CL); medium stiff to stiff; reddish brown; 80-90% medium plasticity FINES; 10-20% fine to coarse grained SAND; occasional GRAVEL and COBBLE						
									--FILL--						
2344	2														
	3														
	4														
2342	5								SANDY SILT (ML); stiff; light reddish brown; non to medium plasticity FINES; fine to medium grained SAND			9			S-01 One liner retained (6-6.5ft.) SA: S=30%; F=70%
									--FILL--		S01	8			
	6											10			
2340	7														
	8														
2338	9														
	10								FAT CLAY with SAND (CH); medium stiff; light reddish brown; high plasticity FINES; fine to medium grained SAND			9			S-02 One liner retained (11-11.5ft.) LL=54; PL=22
2336									--FILL--		S02	7			
	11											7			
	12														
2334	13														

Report: GEO_CORE+SOIL_NO PACK_WITH LITH; File: KLAMATH_MASTER.GPJ; 6/20/2019 B-19

Project: Klamath River Renewal Project
Project Location: Copco and Iron Gate Reservoirs
Project Number: 60537920

Log of Soil and Core Boring B-20

Sheet 1 of 4

Date(s) Drilled	**10/10/2018**	Logged By	**P. Respess**	Reviewed By	**B. Aldridge**
Drilling Method	**Hollow Stem Auger, Rotary Wash, HQ-3 Rock Core**	Drill Bit Size/Type	**3 7/8-inch tricone; 3 7/8-inch #6 HQ bit**	Total Depth of Borehole	**47.0 feet**
Drill Rig Type	**Truck Mounted Mobile B-53**	Drilling Contractor	**Gregg Drilling**	NAVD 88 Ground Surface Elevation	**2340 feet**
Groundwater Level	**14.5 feet below ground surface 10/10/2018**	Sampling Methods	**2.5-inch ID ModCal, SPT, HQ Core Barrel**	Hammer Data	**Automatic hammer; 140 lbs, 30-inch drop**
Borehole Backfill	**Cement grout to ground surface**	Borehole Location	**Camp Creek**	Coordinate Location	**N 2602768 E 6443160**

Elevation, feet	Depth, feet	ROCK CORE: Run No.	Box No.	Recovery, %	Fractures per Foot	R Q D, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	SOIL SAMPLES: Type	Number	Blows / 6 in.	Recovery, %	Drill Time [Rate, ft/hr]	FIELD NOTES AND TEST RESULTS
2340	0								2.5-inches Aggregate base POORLY GRADED GRAVEL (GP); dense; fine to coarse GRAVEL and COBBLES, little no plasticity FINES; moist --FILL--						Start 9:00 10/10/2018; hollow stem auger 0-28ft.
	1														
	2														
2338	3								FAT CLAY (CH); medium stiff; brown; medium plasticity FINES; trace fine grained SAND; occasional GRAVEL and COBBLES; moist						
	4														
2336	5											3			S-01 One liner retained (5.5-6ft.) LL=87; PL=24
	6										S01	5			
2334												6			
	7														
	8														
2332	9														
	10								SANDY LEAN CLAY (CL); medium stiff; brown; medium plasticity FINES; fine to coarse grained SAND; rare GRAVEL; moist			4			S-02 One liner retained (10.5-11ft.) SA: G=3%; S=33%; F=64%
2330	11										S02	4			
												6			
	12														
2328	13														

Report: GEO_CORE+SOIL_NO PACK_WITH LITH; File: KLAMATH_MASTER.GPJ; 6/20/2019 B-20

Project: Klamath River Renewal Project
Project Location: Copco and Iron Gate Reservoirs
Project Number: 60537920

Log of Soil and Core Boring B-205

Sheet 1 of 5

Date(s) Drilled	9/12/2018	Logged By	K. Zeiger	Checked By	P. Respess
Drilling Method	Rotary Wash, HQ-3 Rock Core	Drill Bit Size/Type	3 7/8-inch PDC drag bit, 3 3/4-inch carbide tooth bit	Total Depth of Borehole	62.0 feet
Drill Rig Type	Truck Mounted Mobile B-53	Drilling Contractor	Gregg Drilling	NAVD 88 Ground Surface Elevation	2359 feet
Groundwater Level	21.7 feet bgs 9/13/2018	Sampling Methods	2.5-inch ID ModCal; HQ Core Barrel	Hammer Data	Automatic hammer; 140 lbs, 30-inch drop
Borehole Backfill	Cement grout to ground surface	Borehole Location	Iron Gate Reservoir along Copco Road	Coordinate Location	N 2602659 E 6461881

Elevation, feet	Depth, feet	ROCK CORE: Run No.	Box No.	Recovery, %	Fractures per Foot	R Q D, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	SOIL SAMPLES: Type	Number	Blows / 6 in.	Recovery, %	Drill Time [Rate, ft/hr]	FIELD NOTES AND TEST RESULTS
	0								CLAYEY GRAVEL (GC); dense; dark brown (10YR 3/2); 70% angular GRAVEL up to 1-inch; 25% low plasticity FINES; 5% organics; dry; GRAVEL is volcanic --COLLUVIUM--						Hollow stem auger to 0 to 19ft.
2358	1								Boulder (fragments)						
	2								Boulder (fragments)						
2356	3														
	4														
2354	5											9			One liner retained (5.8-6.3ft.)
	6										S01	22	87		
2352	7											29			
	8								CLAYEY GRAVEL with SAND (GC); medium dense; dark brown (7.5YR 3/2); 35% high plasticity FINES; 40% subangular GRAVEL up to 1-inch; 25% fine grained SAND; dry; cohesive; gravel is chert and rhyolite --COLLUVIUM/RESIDUAL SOIL--						Lithology transition logged from cuttings
2350	9								▼ At 9ft., becomes moist						
	10								▼ With gravel up to 2.5-inches			19			One liner retained (11-11.5ft.) LL=61; PL=22 SA: G=38.4% S=25.7%; F=34.9%
2348	11										S02	14	100		
	12								GRAVELLY FAT CLAY (CH); hard; dark brown (7.5 YR 3/2); 65% high plasticity FINES; 35% subangular GRAVEL to 1-inch; moist; cohesive			21			
2346	13														

Report: GEO_CORE+SOIL_NO PACK_WITH LITH; File: KLAMATH_MASTER.GPJ; 6/20/2019 B-205

Project: Klamath River Renewal Project
Project Location: Copco and Iron Gate Reservoirs
Project Number: 60537920

Log of Soil and Core Boring B-207

Sheet 1 of 6

Date(s) Drilled	9/13/2018-9/18/2018	Logged By	K. Zeiger/B. Kozlowicz	Checked By	P. Respess
Drilling Method	Rotary Wash, HQ-3 Rock Core	Drill Bit Size/Type	2 7/8-inch ID HQ Bit	Total Depth of Borehole	81.1 feet
Drill Rig Type	Truck Mounted Mobile B-53	Drilling Contractor	Gregg Drilling	NAVD 88 Ground Surface Elevation	2359 feet
Groundwater Level	23.1 feet bgs 9/14/2018	Sampling Methods	2.5-inch ID ModCal, HQ Core Barrel	Hammer Data	Automatic hammer; 140 lbs, 30-inch drop
Borehole Backfill	Cement grout to ground surface	Borehole Location	Iron Gate Reservoir along Copco Road	Coordinate Location	N 2602272 E 6461618

Elevation, feet	Depth, feet	ROCK CORE: Run No.	Box No.	Recovery, %	Fractures per Foot	R Q D, %	Fracture Drawing Number	Lithology	MATERIAL DESCRIPTION	SOIL SAMPLES: Type	Number	Blows / 6 in.	Recovery, %	Drill Time [Rate, ft/hr]	FIELD NOTES AND TEST RESULTS
	0								CLAYEY GRAVEL (GC); loose; brown (7.5YR 4/3); 70% angular to rounded GRAVEL up to 2 inches; 30% low plasticity FINES; dry; gravel is chert, rhyolite, and other volcanics; abundant roots						Start 12:00 9/13/2018 with Hollow Stem Auger to 15.2ft.; K. Zeiger logging
2358	1								--ROAD FILL--						
	2														
2356	3														
	4														
2354	5								GRAVELLY LEAN CLAY (CL); medium stiff; brown (10YR 4/3); 60% low plasticity FINES; 40% angular GRAVEL up to 1 inch; dry; with roots and rootlets			9			
	6								--COLLUVIUM/RESIDUAL SOIL--		S-01	7	100		
2352	7											2			
	8														
2350	9														
	10								SANDY LEAN CLAY with GRAVEL (CL); stiff; brown (10YR 4/3); 55% low plasticity FINES; 25% angular GRAVEL; 25% fine grained SAND; dry; gravel is highly weathered; with rootlets			8			One liner retained (11.0-11.5ft.)
2348	11								--COMPLETELY WEATHERED VOLCANIC BRECCIA--		S-02	10	100		
	12											8			
2346	13														

Report: GEO_CORE+SOIL_NO PACK_WITH LITH; File: KLAMATH_MASTER.GPJ; 6/20/2019 B-207

Project: Klamath River Renewal Project
Project Location: Copco and Iron Gate Reservoirs
Project Number: 60537920

Log of Soil Boring BC-01

Sheet 1 of 2

Date(s) Drilled	2/5/2018 - 2/6/2018	Logged By	B. Kozlowicz	Checked By	D. Simpson
Drilling Method	Rotary Wash	Drill Bit Size/Type	4-inch Tricone	Total Depth of Borehole	30.4 feet
Drill Rig Type	Barge Mounted CME-45	Drilling Contractor	Taber Drilling	NAVD 88 Ground Surface Elevation	2597 feet
Groundwater Level(s)	12.3 feet above ground surface (2/5 at 15:15)	Sampling Method(s)	2.5-inch ID ModCal, SPT	Hammer Data	Automatic hammer; 140 lbs, 30-inch drop
Borehole Backfill	Bentonite cement grout to 10 feet bgs	Borehole Location	Copco Reservoir	Coordinate Location	N 2608898 E 6476516

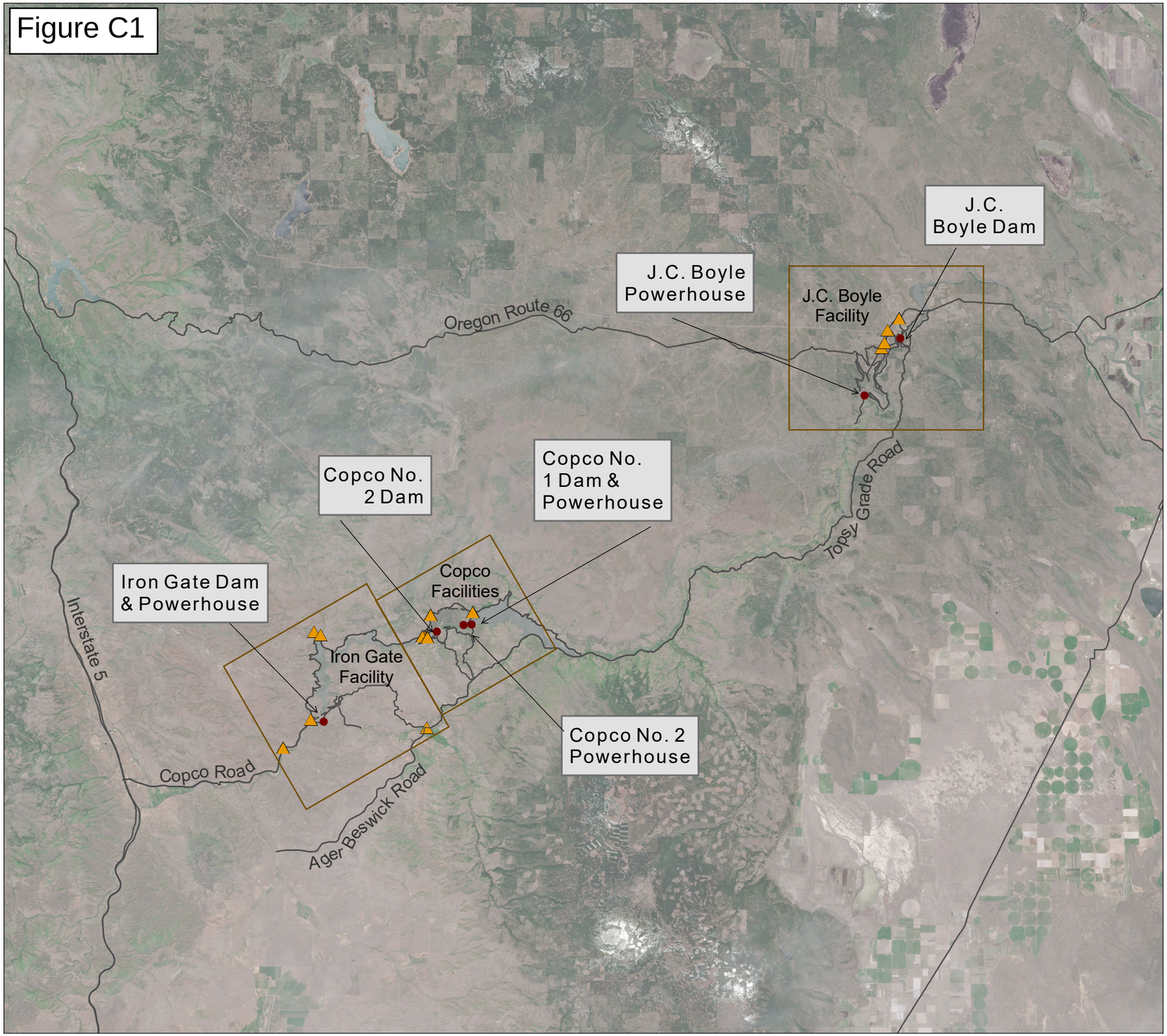
Elevation feet	Depth, feet	SAMPLES Type	SAMPLES Number	Sampling Resistance	Recovery (feet)	Graphic Log	MATERIAL DESCRIPTION	Water Content, %	Plasticity Index	Fines Content (%<#200 Sieve)	REMARKS AND OTHER TESTS
2595	0		S01	1 1 0	100		SILT with SAND and GRAVEL (ML); very soft; very dark gray to black (2.5Y 3/1 to 2.5/1); fine to coarse grained SAND; subangular to rounded GRAVEL; sand and gravel consist of diatomite clasts --RECENT LAKE SEDIMENT--				Sampler fell 18 inches on last blow Advance 6-inch casing to 6 feet with hammer (hard/stiff at about 3.5 feet)
2590	5		S02	4 3 4	100		Becomes soft; dark olive brown (2.5Y 3/3) to very dark grayish brown (2.5Y 3/2) with trace gravel	43	8		Advance 6-inch casing to 8 feet with hammer LL=33; PL=25
2585	10		S03	7 6 6	80		DIATOMITE; light olive brown (2.5Y 5/4); highly weathered; extremely weak; highly fractured; friable --LACUSTRINE DIATOMACEOUS TERRACE (Ql)--	99			End of day 16:45,Begin day 08:30 Advance 6-inch casing to 11 feet with hammer
2580	15										
2575	20		S04	3 2 5	93		Becomes soft with iron staining on irregular subvertical fractures	93	34	99	LL=85; PL=51 SA: G=0%; S=1%; F=99%
2570	25										
	30		S05	31 50/6"	60		BASALT; black (10Y 2.5/1); highly to completely weathered; friable --TERTIARY to QUATERNARY INTRUSIVE BASALT--				Cuttings become dark greenish gray sandy clay; slower drilling

Report: GEO_10B1_OAK; File: KLAMATH_MASTER.GPJ; 6/20/2019 BC-01

Appendix B

Access and Security Maps

Figure C1



KLAMATH RIVER RENEWAL CORPORATION

Klamath River Restoration Project

Traffic Management Plan Overview Map

November 13, 2020

(At original document size of 11x17)
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0 1.5 3 4.5 6 7.5 Miles

PRELIMINARY DESIGN
(NOT FOR CONSTRUCTION)

- Figure Extents
- Temporary Traffic Management
- Project Features
- Access Routes

Notes

1. *Coordinate System: NAD 1983 2011 StatePlane California I FIPS 0401 Ft US*

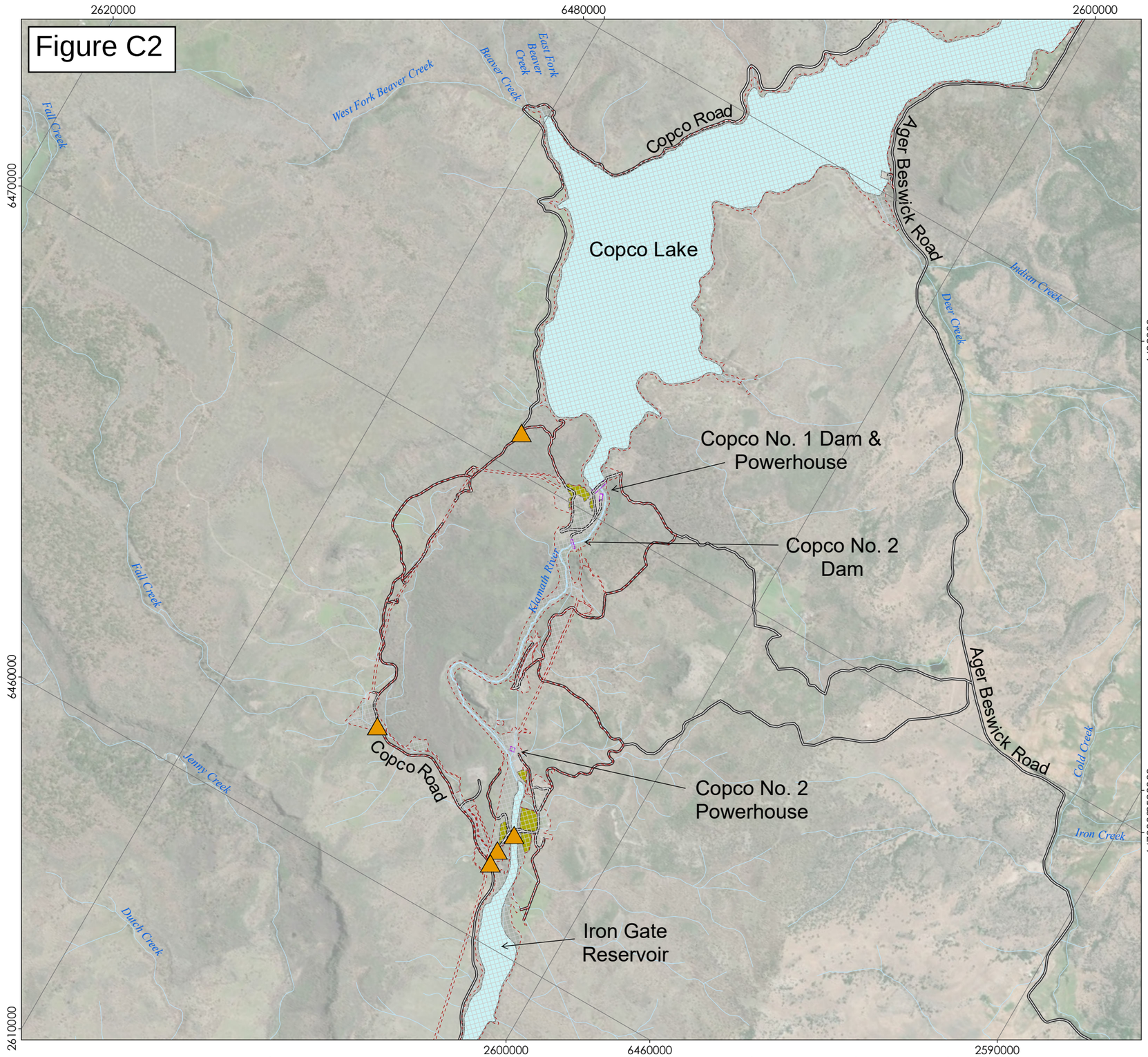
2. *Data Sources:*
Project Features: McMillen-Jacobs; Access Routes 100 Design: McMillen-Jacobs; Temporary Traffic Management: Knight Piesold;

3. *Background Imagery: Copernical Sentinel data 2020, processed by ESA*

4. *Inset Background Imagery: National Geographic, Esri, Garmin, HERE, UNEP-WCMC, USGS, NASA, ESA, METI, NRCAN, GEBCO, NOAA, increment P Corp.*

C:\Users\uhlmannBox\GIS\Project_Based\Klamath_River_Renewal_MJA\GIS_Request_Tracking\GIS_Requests_Management_Plans\KnightPiesold_MPs\traffic_MP\traffic_MP_v3\Security_Overview_MP_KP_v3.mxd Revised: 2020-11-13 By: uhlmann

Figure C2



KLAMATH RIVER RENEWAL CORPORATION

Klamath River Restoration Project

Access Map

Copco No.1 and No. 2 Facilities

November 12, 2020

(At original document size of 11x17)

1:29,530

N

0 0.25 0.5 0.75 1 Miles

PRELIMINARY DESIGN
(NOT FOR CONSTRUCTION)

- Temporary Traffic Management
- Limits of Work
- Project Features
- Staging Areas
- Access Routes
- Reservoir Boundaries
- Streams

Notes

1. *Coordinate System: NAD 1983 2011 StatePlane California I FIPS 0401 Ft US*

2. *Data Sources:*
Temporay Traffic Management: Knight Piesold; Limits of Work: McMillen-Jacobs, CAD 90 Design draft; Access Routes: Knight Piesold, 100 Design Drawings; Staging Areas: CDM, 60 Design; Streams and Reservoir: NHD.
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

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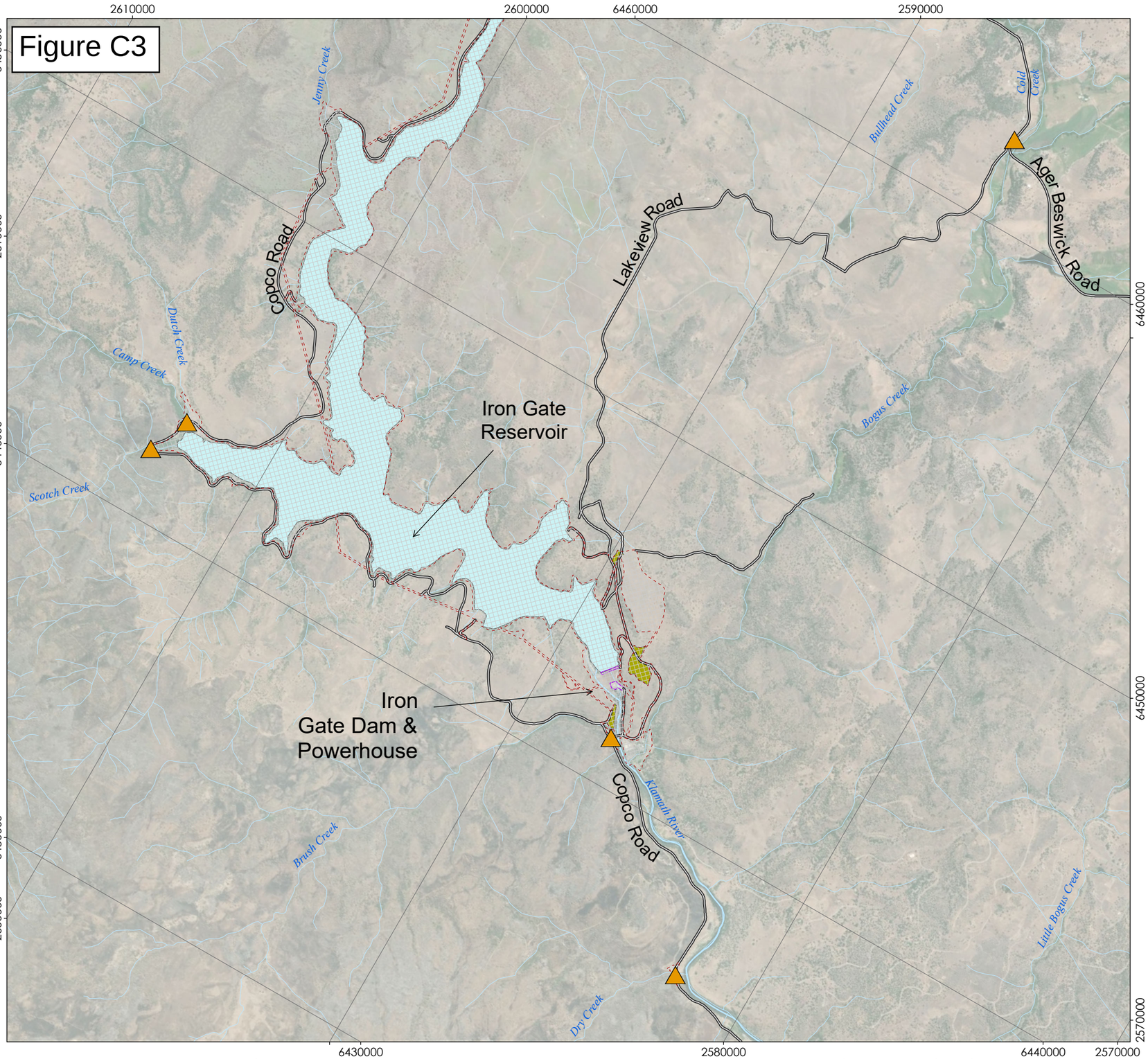
Figure C3



KLAMATH RIVER RENEWAL CORPORATION

Klamath River Restoration Project

Access Map

Iron Gate Facility

November 12, 2020

(At original document size of 11x17)

1:36,920

N

0 0.25 0.5 0.75 1 1.25 Miles

PRELIMINARY DESIGN (NOT FOR CONSTRUCTION)

- Temporary Traffic Management
- Limits of Work
- Project Features
- Staging Areas
- Access Routes
- Reservoir Boundaries
- Streams

Notes

1. *Coordinate System: NAD 1983 2011 StatePlane California I FIPS 0401 Ft US*

2. *Data Sources:*
Temporay Traffic Management: Knight Piesold; Limits of Work: McMillen-Jacobs, CAD 90 Design draft; Access Routes: Knight Piesold, 100 Design Drawings; Staging Areas: CDM, 60 Design; Streams and Reservoir: NHD.
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

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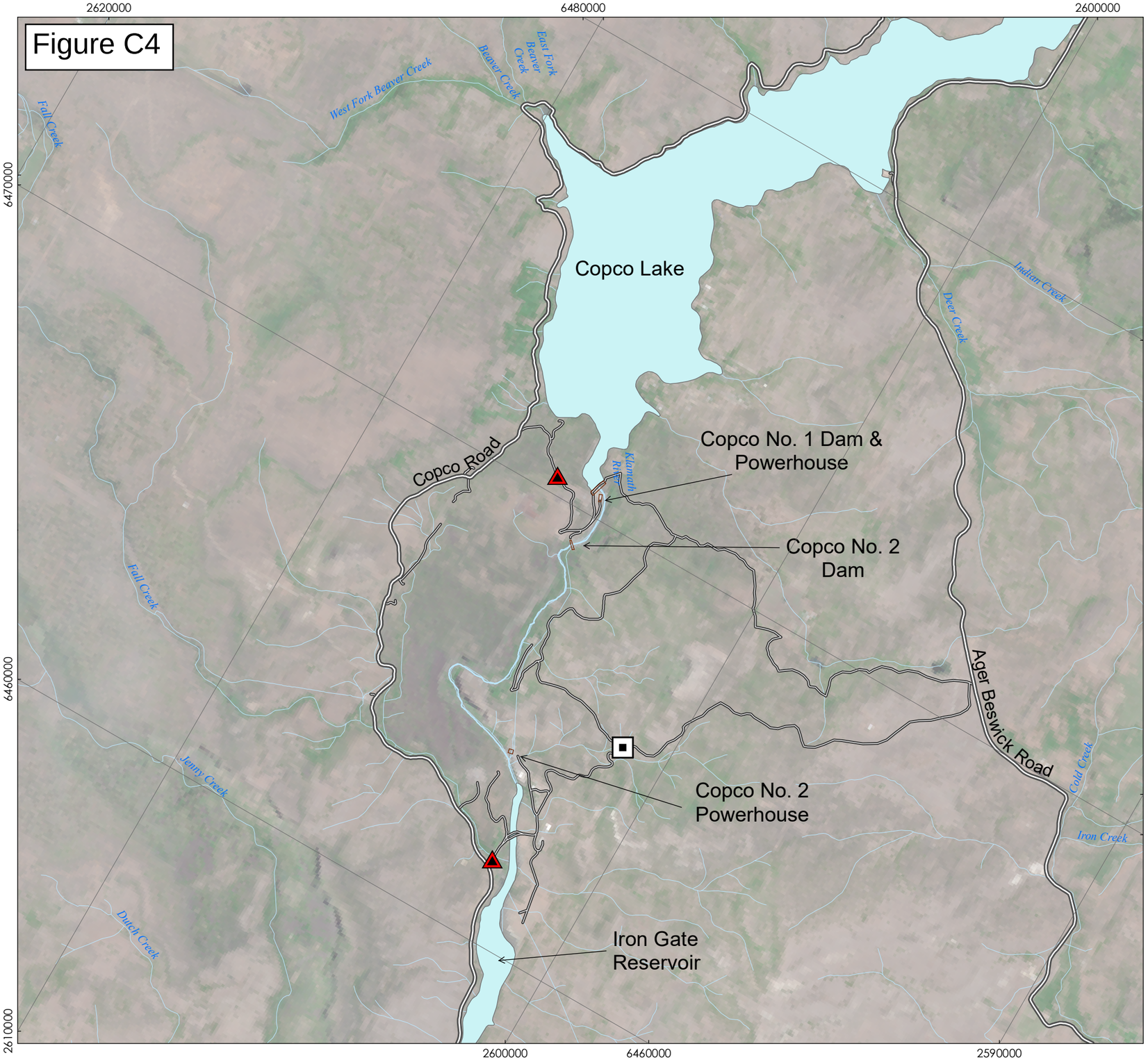
Figure C4



KLAMATH RIVER RENEWAL CORPORATION

Klamath River Restoration Project

Security Map

Copco No.1 and No. 2 Facilities

November 13, 2020

(At original document size of 11x17)
1:29,510

N

0 0.25 0.5 0.75 1 Miles

PRELIMINARY DESIGN
(NOT FOR CONSTRUCTION)

Legend

- Security Pipe Gate and Guard Shack
- Security Unmanned Pipe Gate
- Access Routes
- Project Features
- Reservoir Boundaries
- Streams

Notes

1. *Coordinate System: NAD 1983 2011 StatePlane California I FIPS 0401 Ft US*

2. *Data Sources:*
Security Locations: Knight Piesold; Access Routes: Knight Piesold, 100 Design Drawings; Streams and Reservoir: NHD.
Background Imagery: Copernicus Sentinel data Nov. 5 2020, processed by ESA

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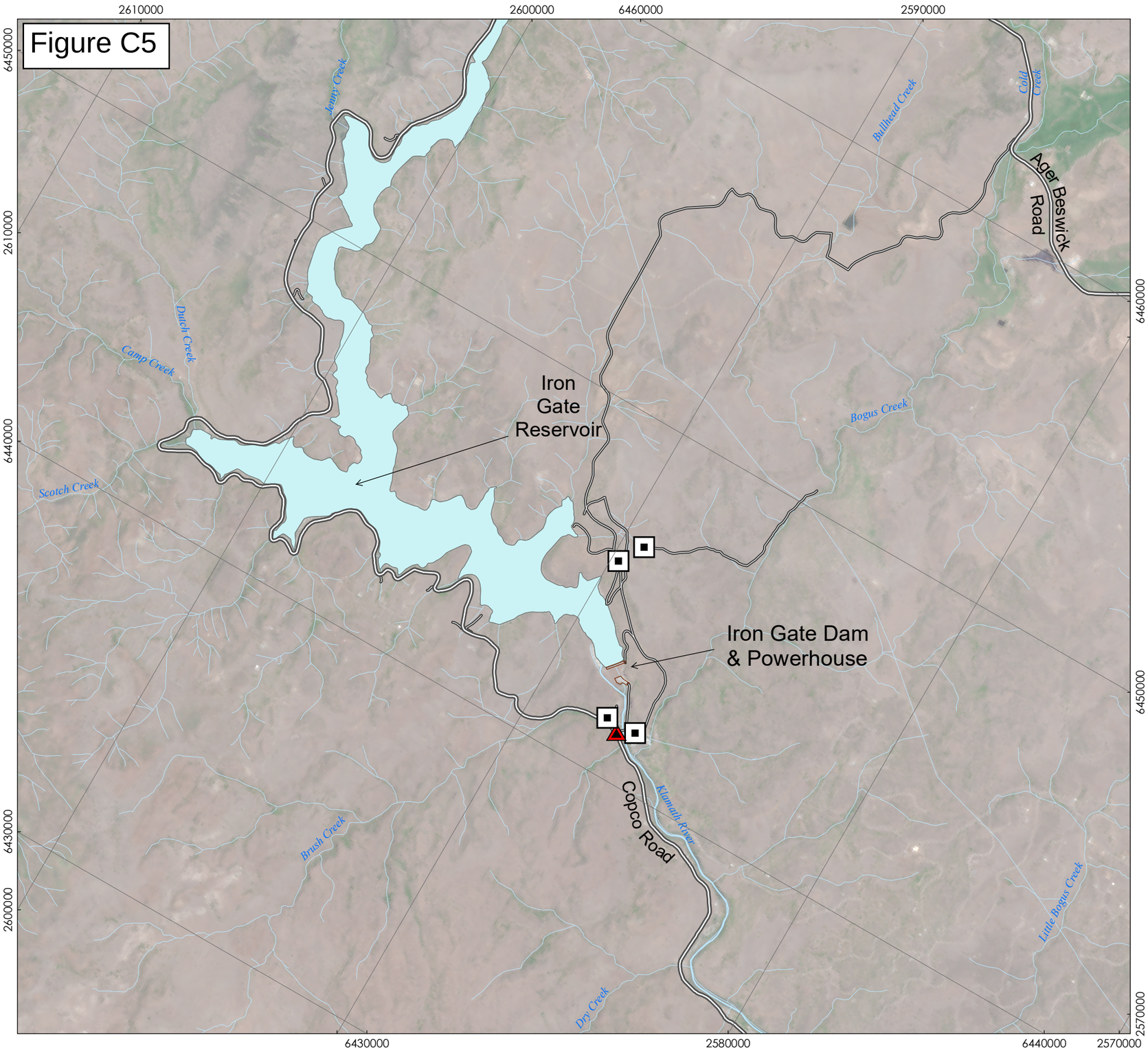
Figure C5



KLAMATH RIVER RENEWAL CORPORATION

Klamath River Restoration Project

Security Map

Iron Gate Facility

November 13, 2020

(At original document size of 11x17)
1:36,890

N

0 0.25 0.5 0.75 1 1.25 Miles

PRELIMINARY DESIGN
(NOT FOR CONSTRUCTION)

Legend

- Security Pipe Gate and Guard Shack
- Security Unmanned Pipe Gate
- Access Routes
- Project Features
- Reservoir Boundaries
- Streams

Notes

1. *Coordinate System: NAD 1983 2011 StatePlane California I FIPS 0401 Ft US*

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Appendix C

Emergency Response Plan

KLAMATH RIVER RENEWAL CORPORATION

Lower Klamath Project
FERC Project No. 14803

Emergency Response Plan

Klamath River Renewal Corporation
2001 Addison Street, Suite 317
Berkeley, CA 94704

Prepared by:
RES
1210 G Street
Sacramento, CA 95814

Kiewit Infrastructure West
4650 Business Center Drive
Fairfield, CA 94534

February 2021

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List of Tables

Appendices

1.0 Introduction

The Emergency Response Plan described herein is a subplan of the Construction Management Plan that will be implemented as part of the Proposed Action for the Lower Klamath Project (Project).

1.1 Purpose of Management Plan

This purpose of the Emergency Response Plan is to define roles, responsibilities and procedures to be followed in the event of an emergency during implementation of the Proposed Action. This Plan will minimize hazards to employees, the public or the environment from fires, explosions, or any unplanned sudden or non-sudden release of hazardous materials, hazardous waste or hazardous constituents to air, soil, surface water or ground water. This Plan is designed to incorporate flexibility to tailor an appropriate response to meet a particular emergency.

This Plan pertains to work that the Renewal Corporation and its subcontractors Kiewit and RES (Renewal Corporation) will conduct in support of the Proposed Action. The Renewal Corporation will maintain on-site safety staff that will be on-site when active work is being conducted. At times when all companies are working on the site concurrently, representative safety personnel will coordinate and collaborate to maintain a safe working environment for all employees. This Emergency Response Plan, therefore, outlines procedures that all companies will follow throughout the duration of work to respond to emergencies and minimize hazards to on-site workers and the public.

1.2 Relationship to Other Management Plans

The Emergency Response Plan is supported by elements of the following management plans for effective implementation: Water Supply Management Plan, Waste Disposal and Hazardous Materials Management Plan, Construction Management Plan (sub-plans), and Health and Safety Plan. So as to not duplicate information, elements from these other management plans are not repeated herein but are, where appropriate, referred to in this Emergency Response Plan.

2.0 Emergency Response Plan Measures

2.1 Process

Every employee on the project site will be trained on and familiar with the measures detailed in this Plan. In addition to this, the project Safety Director or Project Director will be tasked with assessing an emergency and making sure the correct action plan and steps are followed. General emergency procedure steps and documentation examples are in Appendix A.

The following items should be considered in assessing the emergency:

- Time of emergency
- Location of emergency
- Nature of emergency
- Duration of emergency
- Personnel exposures
- Equipment involved
- Root cause of emergency
- Fire
- Weather
- Life hazard
- Additional assistance required/available
- Notification needed, including those to offsite and/or regulatory agencies

2.1.1 Identification, Evaluation, and Emergency Level Classification

Either the Safety Director or Director will classify the emergency. The classification system for the Emergency Response Plan is based on three emergency incident classes: (1) UNUSUAL EVENT for a Minor Incident, (2) SITE EMERGENCY or (3) GENERAL EMERGENCY for a Major Incident. The classes determine the steps to be taken by facility personnel and the actions which are taken by offsite support organizations. An emergency class is an indicator of conditions at the site. Inputs to the emergency classification system include the status of the site and systems, hazardous materials in the area, release of hazardous materials, fires, natural phenomenon, medical emergencies and other hazards affecting both site personnel and the public.

The emergency classes are also used by offsite authorities to determine what level of response is required by their respective organizations. Protective actions taken on behalf of members of the public are the responsibility of local/state governments. Protective actions taken by local/state governments are based on projected or potential hazards to the public. The projected or potential hazards are based on considerations such as stability of site/equipment, source of chemical/hazardous spill, chemicals/hazardous substances released, emission rates, concentration, or meteorological conditions.

MINOR - UNUSUAL EVENT is normally an emergency capable of being managed solely by the site staff. This class also could be an early notification of events that could lead to more serious consequences or might indicate more serious conditions that have not yet fully developed. This class also includes events of potential public concern. An UNUSUAL EVENT is also used to denote certain events that require notification of appropriate site/Corporate personnel so that regulatory reporting requirements may be addressed.

MAJOR - SITE EMERGENCY reflects conditions in which significant hazardous conditions are occurring or are likely to occur, but do not necessarily have a direct impact on the public. In this situation, offsite emergency response personnel may or may not be required.

MAJOR - GENERAL EMERGENCY involves an actual or imminent hazardous condition which has a direct impact on the public and/or requires offsite support.

Emergency class descriptions are provided below. Also included are the basic actions to be carried out by personnel for each emergency class.

2.1.1.1 Minor - Unusual Event

2.1.1.1.1 Class Description:

Incidents are in progress or have occurred which indicate a potential degradation of the level of safety, health or the environment of the site, or the public has notified local/state agencies of an incident. No hazardous conditions or release of hazardous material requiring offsite response or monitoring are expected unless further degradation of safety, health and environment occurs.

2.1.1.1.2 Personnel Actions

- Assess and Respond
- Make immediate notifications, if applicable
- Augment personnel resources, as needed
- Escalate to a more severe class or close out with a verbal summary to those organizations initially notified, as appropriate

2.1.1.1.3 Initiating Conditions for Minor Event

- **Fire**
  - On-site fire lasting less than ten (10) minutes
- **Hazardous Materials**
  - Hazardous material release less than Federal reporting quantities, but reportable to State, posing no safety or health threat
- **Loss of Environmental Control**
  - Unusual release of site materials to the environment, or
  - Flammable gas or liquid release with no ignition, or
  - Non-hazardous odor released off-site
- **Natural Phenomenon**
  - Severe weather condition (tornado, hurricane, strong winds, etc.) predicted for site within twelve (12) hours
  - Offsite wildlife encroachment

- **Unusual Operations and Other Hazards**
  - Medical emergency requiring transport, or
  - Security (bomb) threat, or
  - Explosion (unidentified), or
  - Loss of telephone communications, or
  - Unauthorized site entry
  - Protests and Demonstrations
  - Vehicle Collisions
- **Equipment Failure**
  - Equipment failure affecting emergency response or firefighting capability, or
  - Loss of electrically powered auxiliaries

2.1.1.2 Major - Site Emergency

2.1.1.2.1 Class Description

Events are in progress or have occurred which involve actual or likely major failures of site functions needed for protection of site personnel or the public. Hazardous material releases contained within the site boundary are not expected to exceed EPA reportable quantities, except in the site or within the area controlled by the Facility.

2.1.1.2.2 Proposed Action Personnel Actions

- Assess and Respond
- Immediately inform appropriate site Management, local/state agencies and emergency response organizations of the site emergency and the reasons for the declaration
- Augment resources, as needed
- Provide release and exposure estimates to offsite authorities for actual hazardous conditions
- Provide projections based on available conditions and information for foreseeable contingencies
- Escalate to GENERAL EMERGENCY, reduce emergency class or close out and brief appropriate personnel, as appropriate

2.1.1.2.3 Initiating Conditions for a Major Site Emergency

- **Fire**
  - On-site fire lasting more than ten (10) but less than thirty (30) minutes, or
  - Requiring outside assistance, or
  - Affecting unit operations
- **Hazardous Materials Release**
  - Hazardous materials release exceeding EPA reportable quantities, or
  - Hazardous material explosion
- **Loss of Environmental Control**
  - Flammable gas or liquid release greater than reportable quantity with potential for ignition, or

- Potential/Actual release of hazardous odors, or
- Pollution control equipment failure

- **Natural Phenomenon**
  - Flooding of site access or egress, or
  - Actual major storm damage (tornado, hurricane, high winds, etc.)
- **Unusual Operations and Other Hazards**
  - Medical emergency involving multiple injuries/fatalities, or
  - Security alert (bomb search, civil disturbance, hostage or unauthorized personnel on-site etc.), or
  - Explosion affecting unit operation

2.1.1.3 MAJOR - GENERAL EMERGENCY

2.1.1.3.1 Class Description

Events are in progress or have occurred which involve actual or imminent substantial safety, health and environmental concerns. Hazardous materials releases can be reasonably expected to exceed EPA reportable quantities offsite.

2.1.1.3.2 Proposed Action Personnel Actions

- Assess and Respond
- Immediately inform site Management and local/state agencies of the General Emergency and the reason for the declaration
- Provide protective action recommendations to local/state authorities
- Augment resources, as needed
- Provide release and exposure estimates to offsite authorities for actual hazardous conditions
- Provide projections based on available conditions and information for foreseeable contingencies
- Close out/de-escalate emergency class by briefing appropriate site personnel and local/state personnel

2.1.1.3.3 Initiating Conditions for Major General Emergency

- **Fire**
  - Fire lasting more than thirty (30) minutes, or
  - Requiring off-site response
- **Hazardous Materials**
  - Hazardous material releases exceeding EPA reportable quantities and leaving the site
- **Loss of Environmental Control**
  - Flammable gas or liquid release greater than reportable quantities for thirty (30) minutes, or
  - Ignition of that release
  - Failure of water containment/uncontrolled release of impounded water
- **Natural Phenomenon**

  - High wind condition, heavy rain with major flooding of site facilities causing damage to major site systems, earthquakes
- **Unusual Operations and Other Hazard**
  - No events in this classification

2.1.2 Emergency Communications/Notifications

This section describes the methods used for notification of site emergency response personnel, and local, State, and Federal Emergency Response Centers.

Any emergency or incident observed should be immediately communicated to the employee's direct supervisor, and once it is safe to do so, all supervisors will report up to the Safety Director or Director. The Safety Director or Director is then responsible for communicating additional emergency protocols to employees, classifying an event in the appropriate emergency class and then notifying any additional outside personnel as needed.

Each dam site has an existing alarm system in place that will sound to alert all employees in nearby areas of a danger. Radios will be used as the preferred method of communication since cell phone reception is not reliable. Radios will include the existing PacifiCorp repeater and relay system, sharing of channel and frequency information with all site personnel, and coordination on contact methods for local emergency first responders.

Any visitors to the site and operational areas are assigned to a Renewal Corporation representative. This individual is responsible for informing the visitors of emergencies when they occur, and for taking protective action as necessary. All visitors to site will also participate in a project orientation with an overview of the emergency procedures.

Site personnel are trained on actions to be taken in an emergency prior to their work assignments. Otherwise, an individual who has been trained in emergency response procedures must escort them. The training includes instructions on the methods of notification and the required actions in the event of an emergency.

The Safety Director or Director is responsible for contacting Kiewit Corporate and Regional personnel and RES Corporate and Regional personnel for all types of emergencies, including major events. Specific details on notification of Company Corporate and Regional personnel are covered in the appropriate notification procedures. Corporate Kiewit Office Number (402) 342-2052, RES Corporate Office Number (713) 520-5400.

The Safety Director or Director are also responsible for proper notifications of Siskiyou or Klamath counties if needed. Kiewit and RES have spokespersons for all notifications to the public.

Some Emergency Contact Information is included below with a full list included in Appendix B.

Table 2-1. Contacts in the Event of Emergency

CONTACT	CONTACT INFORMATION
Kiewit On Site Safety Director	TBD
Kiewit Project Director	TBD
RES On Site Safety Manager	TBD
RES On Site Project Manager	TBD
KRRC Representative	TBD
Pacificorp Representative	TBD
Plant Operations	TBD
Klamath County Sheriff's Office	541-883-5130
Siskiyou County Sheriff Office	530-841-2900
Cal Fire	530-842-3516
Copco Lake Fire Department	530-459-0434
Keno Fire Department	541-883-3062
Hornbrook Fire Station	530-475-3582
California Highway Patrol	530-841-6000
Sky Lakes Medical Center	541-882-6311
Fairchild Medical Clinic	541-842-4121

2.2 Emergency Procedures

Specific emergency response procedures to various emergency situations are detailed below.

2.2.1 Site Evacuation and Muster Points

In the event of a stop work situation where a work site or project site evacuation occurs specific muster points have been identified for each dam shown in Appendix C. It is the responsibility for each crew foreman or supervisor to take head counts of all employees at muster points and report to the Safety Director or Project Director. In the event of a site-wide evacuation, offsite locations will be identified for crews to meet at and the crew foreman or supervisor will take account for all employees and report any missing employees to the Safety Director or Director. Driving conditions on these identified routes may change with weather conditions and should be monitored. All employees will stay at the designated evacuation spot until an all clear is called and it is safe to return to work.

2.2.2 Adverse Weather/Natural Disaster

Weather conditions for the day shall be discussed as part of morning toolbox meetings with each crew and will be monitored closely throughout the shift as conditions change. Work will be amended based on the changing weather conditions and necessary precautions will be taken. The Director or Safety Director will oversee determining when to activate storm procedures. General storm precautions are outlined below:

2.2.2.1 Pre-Storm Preparation

When the Weather Forecast indicates the possibility of severe weather affecting the area the Director or Safety Director will activate the Winter Weather/Severe Storm Preparation Procedure. The Procedure includes performing the following steps:

- Ensure that the construction office is outfitted with a portable, battery operated weather band radio and extra batteries.
- Develop, maintain, and distribute a list of emergency telephone numbers and email addresses for employees and authorities.
- Organize a Damage Survey and Repair Team. This team will be the first on the site to assess damage after the storm and make the site safe enough for the return of the entire workforce.
- Prepare a system to inform employees of when to return to work. (A company call-in number, website with a bulletin or discussion board, etc.)
- Identify and avoid long-term material storage in areas prone to flooding.
- Identify vulnerable work in-progress and determine how to best protect it from damage; boarding up windows, sand bags, capping pipes, buried incomplete underground, etc.
- Develop a list, procure and store supplies necessary for preparing the site for a storm.
- Keep the Proposed Action area free from an accumulation of debris and scrap material that can become windblown hazards. This will reduce the amount of time necessary to complete preparations on the jobsite in the event of an anticipated storm.
- Ensure that fuel supplies, de-watering pumps and generators are adequate for repairs after the storm.
- Be prepared to anchor or restrain everything that could blow away with netting for dumpsters, banding and banding tools for lumber, form work, scaffold planks, portable toilets, etc. Look to see what might fly away, then restrain it.
- Be alert to job conditions that require advance attention or special materials to reduce emergency preparation time.
- Ensure that all loose scrap material is gathered up and disposed of in the dumpsters.
- Ensure that the dumpsters are emptied. If the dumpster service is unable to pull the dumpsters, they shall be securely covered with nets to prevent the debris in them from becoming windblown hazards.
- Ensure that all loose forming materials are neatly stacked and banded.
- Ensure that all materials, tools, sheds, gang boxes, and small equipment that can be damaged by rising water are removed from excavations and low areas prone to flooding.

- Ensure that continuous berms are installed at excavations. Remove any non-essential barricades. Anchor essential barricades.
- Ensure that all equipment is relocated out of excavations. Lower crane booms.
- Raise the hook, trolley in and allow tower cranes to weathervane.
- Top off the fuel tanks of all equipment and ensure fill caps are properly secured.
- Ensure dewatering, standby, and diesel-powered equipment are ready to operate. Operate equipment as conditions warrant.
- Identify vulnerable material and work-in-progress and determine how to best protect it from the effects of flooding.
- Ensure that all electronic equipment in storage is protected from rising water. Ensure backup electrical generator power is available, as required.

2.2.2.2 Post Storm Recovery

Following implementation of the Winter Weather/Severe Storm Preparation Procedure. The following steps will be conducted:

- A damage survey team will inspect the job site, identify and document the damage, prioritize repairs, complete a Job Hazard Analysis and Safe Plans of Action, and then initiate repairs with a skeleton remobilization crew of skilled tradespersons.
- Do not touch loose or dangling wires. Report such damages to the electrical Contractor, the utility company or police officers.
- Complete preparations for the return of the full workforce. Implement the system to inform employees to return to work.

2.2.2.3 Specific Natural Disaster Incident Responses

The appropriate responses to specific natural disasters are detailed below:

2.2.2.3.1 Severe Thunderstorms

Thunderstorms may occur anytime of the year. High winds and lightning are very possible during these events. The following steps will be conducted if severe thunderstorms are identified:

- Project personnel will monitor the storm progress toward the location of the site.
- Personnel will be informed to abandon man-lifts, scaffolding, form work, cranes and other elevated work surfaces when lightning is detected within 8 miles. For workers on the ground the alert will be broadcast when lighting is detected within 3 miles. The Construction Manager will inform superintendents when they may return to work.
- Daily clean-up and proper bundling and stabilization of stored material will be maintained to minimize the possibility of debris and materials becoming airborne

2.2.2.3.2 Tornados

Though tornados are rare, they may occur with little to no warning. The following steps will be conducted if tornado is identified in the surrounding vicinity:

- Ensure personnel take refuge in a designated sheltering structure on-site to avoid window and door openings.
- Advise personnell against seeking shelter in vehicles, conexes or trailers.
- Operations of mobile cranes and other elevated platforms will be suspended. Booms will laid down if time permits or the load line hooked to the structure at some low point. The equipment will be left, and refuge taken in a shelter.
- If the site is hit by a tornado, the Damage Survey and Repair Team members will survey the site for damage before authorization to return to work is given. The Director or Safety Director will determine how and who will initiate repairs before the general workforce returns to their stations.

2.2.2.3.3 Earthquake Preparation

The magnitude of the earthquake, combined with the epicenter and the ground conditions, determine how severe the affects will be at the Proposed Action area. In preparation for such an event the following steps will be taken.

- Ensure shelves will be securely fastened to walls.
- Ensure heavy objects will be placed on lower shelves and not stored above individual's heads in workspaces.
- Ensure breakable items will be stored in low, closed cabinets.
- Identify safe places in each room (under sturdy furniture, against inside walls, away from glass) during New Employee Orientation.
- Identify safe places outdoors (away from buildings, trees, electrical lines, and bridges) during New Employee Orientation.
- Ensure disaster supplies will be maintained on site (flashlight and extra batteries, battery operated radio, first aid kit with manual, and drinking water).

During an earthquake (indoors)

- Ensure personnel take cover beneath a sturdy piece of furniture or against an indoor wall away from glass that might break.
- Ensure personnel stay inside.

During an earthquake (outdoors)

- Facilitate gathering all employees in the immediate area and direct personnel to higher ground.
- Ensure personnel do not gather underneath any overhead power or other structures.

During an earthquake (in a moving vehicle)

- Ensure personnel find a clear area away from buildings, trees, overpasses, and overhead wires.
- Once the shaking has stopped, personnel will proceed with caution. Roads may have been damaged during the shaking.

After the earthquake

- Personnel will be prepared for aftershocks. They may cause additional damage for hours to months after the main shock.
- Help injured or trapped persons within the limits of your abilities.
- Listen to a battery-operated radio or television for emergency information. Stay out of damaged buildings!
- Use the telephone only for emergency calls. Clean up spilled materials.
- Open cabinet and closet doors cautiously.
- Check utilities for damage. If you smell gas, turn off the gas and do not use electrical devices (including telephones). Stay away from broken electrical wires and turn off the main fuse box or circuit breaker. If water pipes are damaged, do not use the toilet and avoid tap water for drinking.
- Inspect all cranes and equipment before use to ensure they are safe to operate.
- All materials/equipment that is suspended/installed using temporary methods (rigging, etc.) must be inspected to ensure attachments are secure.
- All temporary structures must be inspected to ensure their integrity. If the event caused damage to any temporary embankments/secant pile wall or the dam itself, all employees shall gather at the identified dam muster point.

2.2.3 Dam or Tunnel Failure

An emergency alarm will be sounded if any worker sees a breach of the dam facility or a failure and radio/phone communication will alert all workers located in the immediate work area or downstream from the breach and all will be evacuated to the dam site's muster point and head counts will be taken. The Safety Director or Director will make the necessary agency notifications in the event of a dam breach/failure.

Tunneling Work will be conducted at each of the four facilities. All confined space procedures outlined in the Health and Safety Plan will be followed during this work. In the event of a tunnel failure, emergency services will immediately be called and all work will be stopped. The Safety Director or Director will direct emergency services, so they are able to promptly arrive at the tunnel location.

2.2.4 Downstream Flooding/Water Emergencies

A notification to the National Weather Service River Forecast Center will need to be made of any major hydraulic change that could potentially affect the timing and magnitude of flooding below Iron Gate.

In the event of an emergency occurring to employees conducting marine work a water rescue procedure will be implemented. Workers will immediately deploy lifting rings and a skiff/push boat will assist in the rescue. In the case of a potential drowning emergency, 911 will be called and the boat will transport the injured personnel to the nearest ramp and wait for emergency services to arrive. If the employee is conscious and fit for duty the Safety Director will be called for an evaluation.

2.2.5 Medical Emergency

In the event of an employee injury, the first responder will evaluate if the danger still exists and move the affected person out of harm's way if possible. First aid will be administered, and offsite first responders called if necessary. If necessary, the employee will be transferred offsite for medical care. A map of hospital locations is included in Appendix D. A supervisor should immediately be called and will investigate what occurred. Other medical emergencies to be trained on include heat exhaustion, allergic reactions, and diabetic reactions. Specific individual procedures are detailed in the project's Health and Safety Plan.

2.2.6 Fire Management

All onsite equipment, vehicles, and work trailers will have a fire extinguisher. Regular inspections are conducted of the equipment. Hot work permits are filled out and followed before any activities that could cause fire or sparks. This process is described in detail in the Health and Safety Management Plan. Any larger fire or one that lasts longer than 10 minutes is classified as a major emergency and workers shall evacuate the area and contact the necessary fire management personnel to address the emergency. Specific fire management procedures are detailed in the Fire Management Plan.

2.2.7 Traffic/Equipment Incident

Any traffic incident that involves an injury should immediately contact 911 so proper medical care can be given. A supervisor should also be immediately notified, and an incident report filled out and police may be called in an applicable situation. A California and Oregon Traffic Management Plan has been prepared to minimize impacts to bicycle and pedestrian traffic.

2.2.8 Hazardous Material Spill

An Oregon Spill Prevention, Control, and Countermeasure Plan (SPCC) and a California Hazardous Waste Materials Plan has been developed for the project to outline formal prevention procedures and documentation/notification for any spills on the jobsite within each state. Only employees qualified, certified, or trained in dealing with hazardous material will be allowed to clean up a material spill.

If possible, the source of the spill should be located and controlled with necessary alarms raised. A supervisor should be contacted, and the Safety Director or Director will make the necessary agency notifications.

2.2.9 Blasting and Explosives

When blasting or explosives are to be used in demolitions during the Proposed Action, only employees directly involved in the blasting operations will be allowed in the work area. The work area will be blocked off and proper notifications are to be made to give employees notice of the blasting activities. No employees shall be directly downstream from the dam when explosives are to be used in the case of an uncontrolled release. If an adverse reaction to blasting occurs (i.e. faulty dynamite, delayed blasting, etc.) all work in the area will be stopped and local emergency services will be called and the safety director will be called. Blasting professionals will be called to handle materials if needed.

2.2.10 Security Threats

If a security threat is determined on the work site or in the community nearby, an alert, ideally with text, radio, or email, will notify workers in the area with directions to stop work and shelter in place or to evacuate the jobsite. If directly confronted with a threat, all employees should remain calm and signal for help if they are unable to escape the situation. In an active shooter situation, the RUN, HIDE, FIGHT procedure shall be followed. If a terrorist or bomb threat occurs, all employees shall meet at the site muster points and a headcount conducted. Law enforcement will be called to address the threat.

2.3 Termination, Follow-Up, and Revisions

The objectives following any emergency declaration will be to alleviate the consequences of the event and to take those steps described in the Emergency Response Plan to minimize any effects on the health and safety of the workers and public. Once the emergency has ended, the goal will be to restore to normal operating status. For some situations, such as an UNUSUAL EVENT involving a natural phenomenon that has no effect on the site operation, the emergency may not require any change from normal operations. Therefore, no formal transition will be required. In other circumstances that may involve suspected or actual damage to the faculties a transition will be appropriate.

The Safety Director or Director will determine when the Recovery phase begins or is necessary. The following guidelines, as applicable to the specific situation, will be observed prior to ending the emergency:

- The affected equipment is in a stable condition and can be maintained in that condition indefinitely.
- Releases of hazardous materials to the environment have ceased.
- Fire or similar emergency conditions no longer constitute a hazard to equipment or personnel.

Proper documentation and reporting of any incident will be conducted by the Safety Director or Director and relayed to all employees. Reconstructive efforts will begin if necessary and discussions on how to prevent the incident in the future will happen with employees. This Plan

will be updated and revised if new emergency procedures are decided and those updates will be circulated to all employees during additional safety trainings.

2.4 Training

During orientation all employees will be trained on the emergency procedures contained in this Plan. Additional smaller trainings will be conducted as part of a drill or a tool box meeting. A copy of this Plan as well as the Health and Safety Plan will be kept in every accident investigation kit and in the project offices.

3.0 References

Federal Energy Regulatory Commission (FERC). 2018 Order Amending License and Deferring Consideration of Transfer Application FERC Project Nos. 2082-062 and 14803-000. 162 FERC 61,236. Washington, DC, Federal Energy Regulatory Commission, Office of Energy Projects, Division of Hydropower Licensing.

PacifiCorp (PacifiCorp). 2004. Environmental Report. Final License Application, Volume 2, Exhibit E. Klamath Hydroelectric Project (FERC Project No. 2082).

Stillwater Sciences. 2018. Draft Environmental Impact Report for the Lower Klamath Project License Surrender, Volume I. December 2018.

Appendix A

Emergency Procedure Checklist & Medical Plan

Project Name:	
Job Number:	
Job Address:	
Job Phone:	Job Fax:

EMERGENCY MEDICAL PLAN

Prior to work on the project, communications must be established with emergency service providers. This includes: Medical Providers, Medical Transportation, Fire & Rescue. These contacts should be by the project superintendent. Arrangements should be made to have emergency providers tour the project to pre-plan for emergency conditions.

Contact should be made with a representative of the medical facility that will be directly involved in emergency and stabilization care. The representative must be aware of and provide for Drug Testing and Modified Work Programs.

FIRST AID

FIRST AID & AED TRAINED PERSONS: _____
FIRST AID KIT LOCATED:
AED LOCATED: _____

PRIMARY PHYSICIAN

DOCTOR: _____
LOCATION: _____
PHONE: _____

IN THE EVENT OF A SERIOUS ACCIDENT OR INJURY

HOSPITAL: _____
LOCATION: _____
CONTACT PERSON: _____
PHONE: _____
DIRECTIONS: _____

EMERGENCY MEDICAL TRANSPORTATION PROVIDER:

NAME: _____
LOCATION/PHONE: _____

EMERGENCY FIRE & RESCUE PROVIDER:

NAME: _____
LOCATION/PHONE: _____

EMERGENCY ACCESS TO THE PROJECT:

DIRECTIONS: _____

THIS PLAN MUST BE POSTED IN THE PROJECT OFFICE

THINK SAFETY

Rev: 01/12

Chapter 12: Emergency Medical Plan

EMERGENCY RESPONSE CHECKLIST

STEP ONE – SENIOR PERSON ON-SITE

___ Contact emergency services.
___ Notify the crisis management team leader.
___ Contact the safety manager.
___ Initiate site control and determine if the site should be shut down.
___ Make certain that all employees are accounted for.
___ Do not move anything that could be classified as evidence.
___ Ensure telephone coverage at the site.
___ Inform site personnel to direct requests for info. from outside groups to you.
___ Post workers to restrict entry to the site.
___ Establish a command center.
___ Select a temporary spokesperson with the assistance of the team leader

___ Notify the owner/developer of the project.
___ Advise team leader of findings from investigation if Safety Manager has not already done so.

STEP TWO - TEAM LEADER

FROM INITIAL & ON GOING DISCUSSIONS WITH SENIOR PERSON ON-SITE

___ Determine what happened, when/where it happened, and who is involved.
___ Verify the current status of the site (shut down?).
___ Determine whether you and/or spokesperson are needed on site.
___ Notify management and operations manager.
___ Advise the corporate team administrator and receptionist how to route calls.
___ Identify potential spin-off crises.
___ Notify **ACIG (Insurance broker/company)**
___ Designate someone to stay with the injured worker(s) at the hospital until family members arrive.
___ Notify outside counsel (give him/her Safety Manager's phone number to contact)
___ If necessary, initiate a post accident drug/alcohol test (check with legal counsel).
___ Initiate a third party investigation team to work in tandem w/ authorities at the direction of legal counsel.
___ Union/craft contact – Determine if union business agent should be notified.

STEP THREE - SAFETY MANAGER

___ Gather number/names of injured and/or fatalities and obtain phone number(s) of the spouse(s)/family(ies). Contact the team leader to determine who should notify the spouse(s)/family(ies).

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Chapter 13: Abbreviated Crisis Management Program

EMERGENCY RESPONSE CHECKLIST

___ Debrief workers who witnessed the accident.
___ If appropriate, notify the applicable governmental agency (i.e. OSHA).
___ Document the incident in writing and on film.
___ Work with third party investigator that is designated by legal counsel.
___ Advise team leader of findings from investigation if Senior Person On-site has not already done so.

STEP FOUR - TEAM LEADER

___ If there is an employee injury/fatality, determine who will notify spouse(s)/family(ies). A fatality may require a personal visit.
___ If the injury/fatality is a subcontractor's employee, it is the subcontractors responsibility to notify the spouse/family.
___ If a non-employee is hurt/killed, allow the authorities to make the notification and contact your insurance broker/company.
___ Inform any surrounding areas that may be affected by the incident.
___ Instruct personnel at the accident site to contact their families to let them know they are OK.

STEP FIVE - SPOKESPERSON

___ Write, and get clearance for, all statements and releases.
___ Designate someone to screen your calls from the news media.
___ Complete the media log sheets.
___ Anticipate media questions. If possible, role-play a media interview with a colleague before going live.
___ Assemble necessary background information and literature.
___ If you elect to give the media a tour, make certain that the area is safe and a company representative escorts them. Issue safety equipment and require a hold-harmless agreement be signed, if necessary.
___ Instruct reporters on your safety procedures before going on-site. If they violate any of the procedures, you have the right to ask them to leave.
___ Advise reporters of a time and place for future updates.
___ Follow-up on additional media inquiries.

STEP SIX - TEAM LEADER/SPOKESPERSON/LEGAL DEPARTMENT

___ Identify the audiences that need to be contacted for update purposes.
___ Gather details on past negative issues which the media may refer to.
___ Fax/e-mail/voicemail all employees and job sites to notify them of the incident and tell them to whom they should direct media/general information calls. Provide on-going updates.
___ Establish an emergency message mailbox for personnel to access if office operations have been impacted.
___ Track all media coverage via a monitoring service and the Internet.
___ Secure and offer critical-incident stress counseling for personnel who witnessed the accident (if deemed necessary).

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Chapter 13: Abbreviated Crisis Management Program

Appendix B

Project Emergency Contacts

Contacts in the Event of Emergency

Kiewit Safety Manager

Kiewit Director

KRRC Representative

Pacificorp Representative

RES Representative

Plant Operations:

National Weather Service – OR Forecast Office: 541-773-1067

National Weather Service – CA forecast Office: 707-443-4162

Klamath County Sheriff's Office:

541-883-5130

Siskiyou County Sheriff Office:

530-841-2900

Cal Fire: 530-842-3516

Copco Lake Fire Department: 530-459-0434

Keno Fire Department: 541-883-3062

Hornbrook Fire Station: 530-475-3582

Oregon Department of Forestry:

503-945-7200

Oregon Emergency Response System:

800-452-0311

California Highway Patrol: 530-841-6000

Emergency Response: 911

Ashland Community Hospital:

541-201-4000

Sky Lakes Medical Center: 541-882-6311

Basin Immediate Care: 541-883-2337

Fairchild Medical Center: 541-842-4121

Kiewit Corporate Office: 402-342-2052

RES Corporate Office: 713-520-5400

Local Utility Companies

PacifiCorp: 888-221-7070

Copco Lake Mutual Water Co:

530-459-5159

Yreka Water Department: 530-841-2386

Government Agencies/Offices

OSHA: Occupational Safety & Health Administration

1-800-321-OSHA (6742)

EPA: Environmental Protective Agency

1-800-424-8802

HazMat: Hazardous Materials

1-800-HMR-4922

California Office of Emergency Management, Dam Safety:

916-845-8911

California Department Water Resources, Dam Safety: 916-574-2619

Oregon Water Resources Department, Dam Safety: 503-580-3970

California Spill Hotline: 717-878-5017

Oregon Department of Forestry:

503-945-7200

Appendix C

Site Evacuation and Muster Points

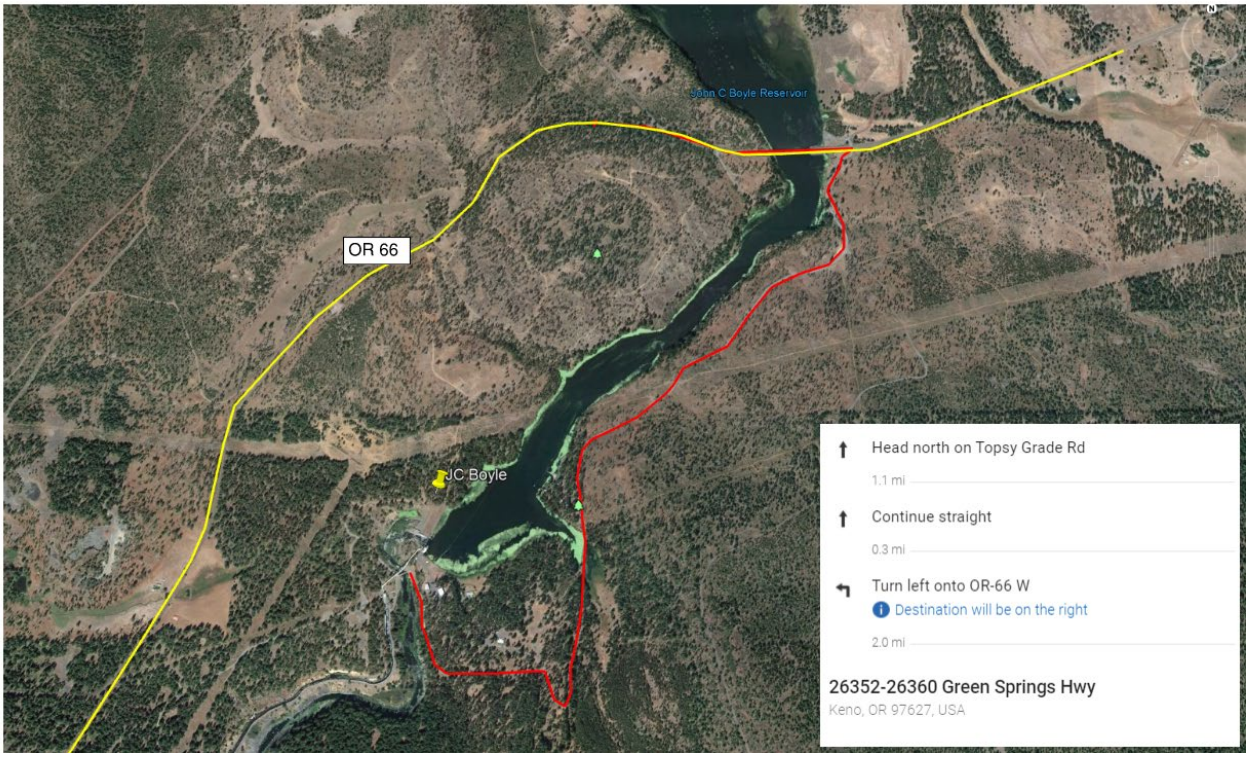

Figure C-1. J.C. Boyle Site Evacuation

Take JC Boyle Site Access Road and Green Springs Highway (OR 66) (10 minutes, 1 mile)

1. Head southwest on the JC Boyle Site Access Road (0.8 Miles)
2. Turn right onto JC Boyle Access Road (.2 miles)
3. Merge to the left for Green Springs Highway (OR 66)

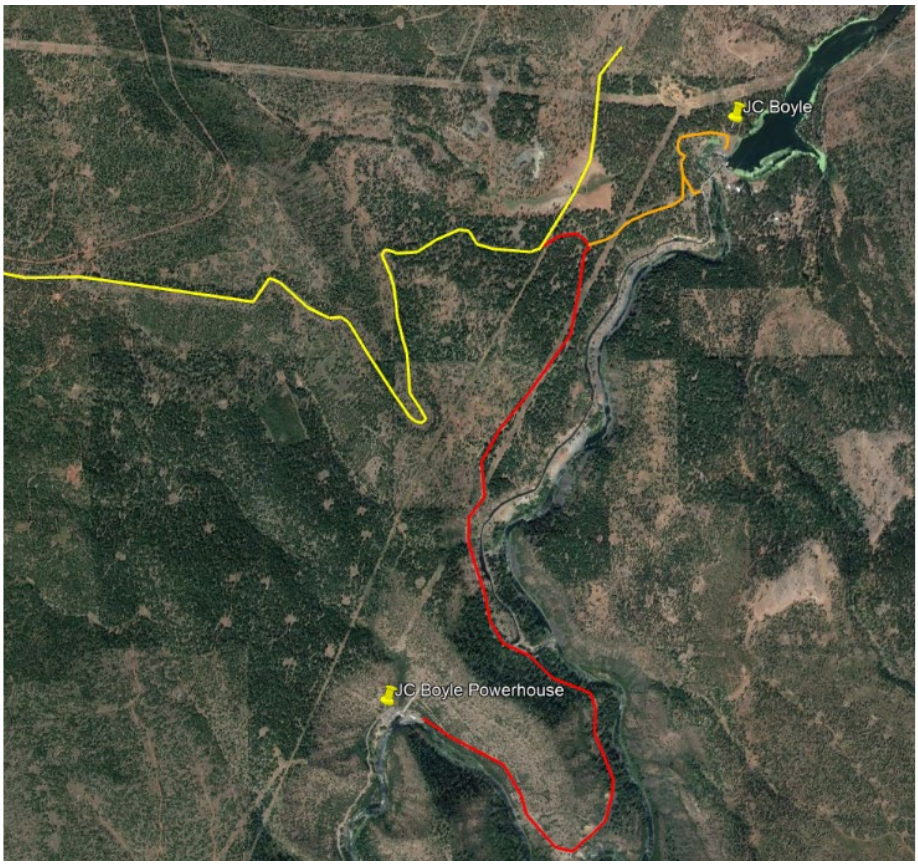

Figure C-2. J.C. Boyle Powerhouse Evacuation

Take JC Boyle Powerhouse Access Road and Green Springs Highway (OR 66) (28 minutes, 3.5 miles)

1. Head North on the JC Boyle Powerhouse Access Road (3.3 Miles)
2. Keep left onto JC Boyle Access Road (.2 miles)
3. Merge to the left for Green Springs Highway (OR 66)

Figure C-3. Copco Dam Site Evacuation

Take Copco Road and Ager Beswick Road to Ager Road/Hornbrook Ager Road (34 minutes, 17 miles)

4. Head southwest on Copco Road toward Iron Gate Lake Road. (3.6 miles)
5. Turn left onto Daggett Road. (0.3 miles)
6. Turn left to stay on Daggett Road.(446 feet)
7. Turn right to stay on Daggett Road. (0.7 miles)
8. Turn right. (1.8 miles)
9. Turn right onto Ager Beswick Road.(10.5 miles)

Follow Ager Road and Montague Grenada Road to 99-97 cutoff (20 minutes, 17.3 miles)

10. Turn left onto Ager Road/Hornbrook Ager Road. (10.1 miles)
    Continue to follow Ager Road.
11. Continue onto N. 11th Street/Montague Ager Roger Road. (0.8 miles)
    Continue to follow N. 11th Street.
12. Continue straight onto S. 11th Street/Montague Grenada Road. (5.7 miles)
    Continue to follow Montague Grenada Road.
13. Turn right onto 99-97 Cutoff. Destination will be on the left.

Figure C-4. Copco Dam Site Evacuation

Follow Copco Dam to Hornbrook. (50 minutes, 21.3 miles)

1. Head southwest on Copco Road toward Iron Gate Lake Road. (10.2 miles)
2. Sharp right onto Linda Drive. (0.1 miles)
3. Slight left onto Mountain. (0.9 miles)
4. Turn right onto Copco Road/Iron Gate Lake Road. (9.1 miles)
   Continue to follow Copco Road.
5. Turn right onto Hornbrook Road/Oregon Slough. (0.8 miles)
6. Turn right onto Henley Hornbrook Road. (0.2 mile)
7. Turn left onto Front Street. (69 feet)

Figure C-5. Iron Gate Site Evacuation

Take Copco Road to Ager Road (12 minutes, 6.1 miles).

1. Head southeast toward Lakeview Road (0.3 miles)
2. Continue straight onto Lakeview Road (0.8 miles)
3. Turn left onto Copco Road/Iron Gate Road (5.0 miles)
   Continue to follow Copco Road.
4. Turn left onto Ager Road (0.1 miles)

Follow Klamathon Road to CA-96 E (21 minutes, 5.2 miles)

5. Turn right onto Klamathon Road. (2.3 miles)
6. Turn right onto Anderson Grade Road/Klamathon Road. (2.7 miles)
7. Continue onto Anderson Grade Road. (0.2 miles)

Drive to I-5 N. (3 minutes, 2.4 miles)

8. Turn right onto CA-96 E (signs for Portland/Interstate 5 N) (0.6 miles)
9. Merge onto I-5 N. (1.8 miles)

Figure C-6. JC Boyle Site Muster Points

Figure C-7. JC Boyle Power House Muster Points

Figure C-8. Copco No. 1 and Copco No. 2 Muster Points

Figure C-9. Copco No. 2 Muster Points

Figure C-10. Iron Gate Muster Points

Appendix D

Map of Hospital Locations

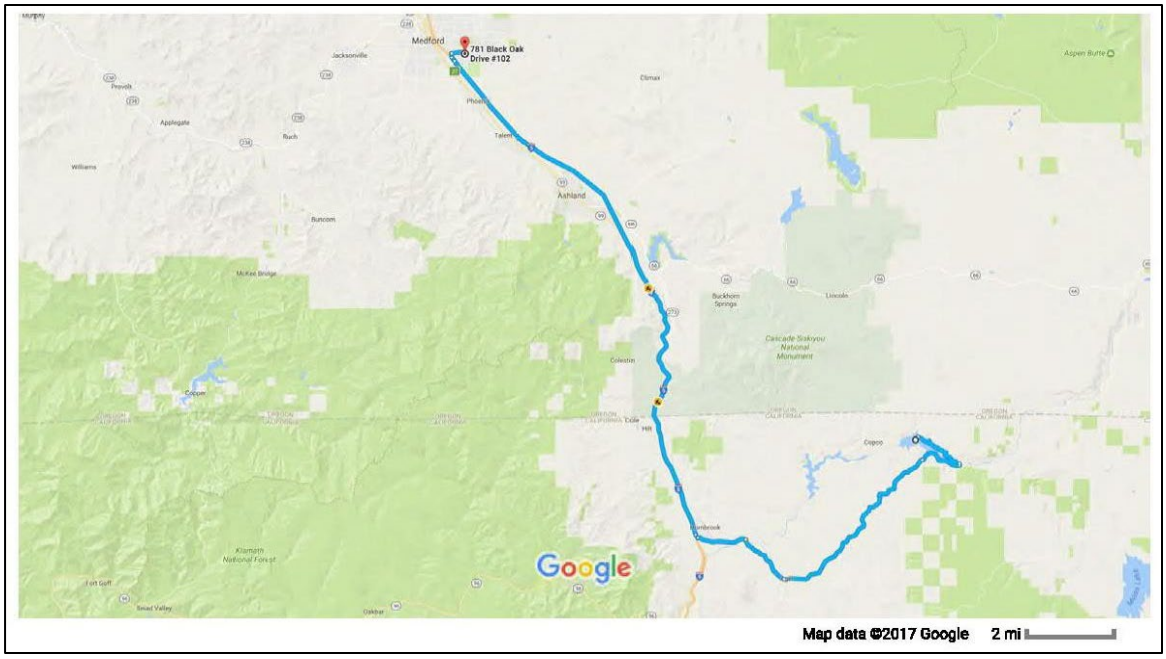

Figure D-1. Route to Asante Work Health

Get on I-5 N in Hornbrook from Ager Beswick Road. (48 minutes, 25.7 miles)

1. Head southeast on Copco Road toward Teal Road (3.5 miles)
2. Turn right to stay on Copco Road. (0.1 miles)
3. Turn right on Ager Beswick Road. (2.8 miles)
4. Turn left to stay on Ager Beswick Road. (12.6 miles)
5. Turn right onto Ager Road/Hornbrook Ager Road. (3.5 miles)
   Continue too follow Ager Road.
6. Turn left onto Ager Road/Copco Road/Juniper Road. (2.0 miles)
   Continue to follow Copco Road.
7. Turn right to merge onto I-5 N. (0.2 miles)

Follow I-5 N to Highland Drive in Medford. Take exit 27 from I-5 N. (34 minutes, 34.7 miles)

8. Merge onto I-5 N. (34.5 miles)
   Entering Oregon.
9. Take exit 27 toward OR-99 S/Medford. (0.3 miles)

Take E Barnett Road to Black Oak Drive. (3 minutes, 1.1 miles)

10. Turn right onto Highland Drive (signs for Barnett Road). (0.3 miles)
11. Turn right at the first cross street onto E. Barnett Road. (0.7 miles)
12. Turn right onto Black Oak Drive. (0.1 miles)

781 Black Oak Drive. #102
Medford, OR 97504

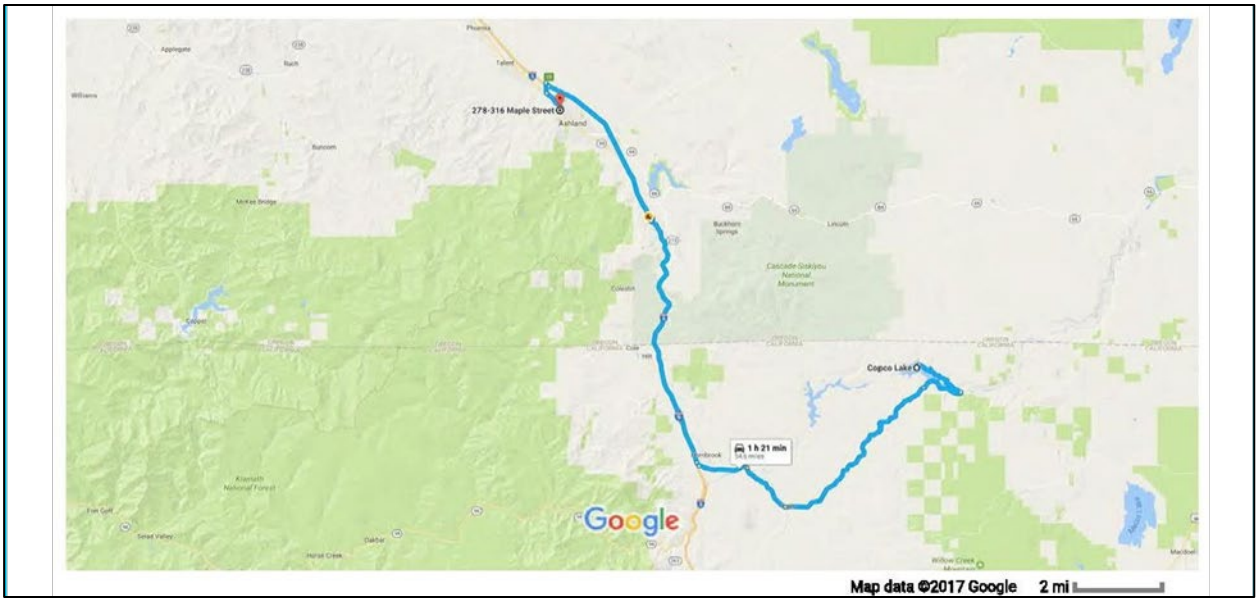

Figure D-2. Route to Asante Ashland County Hospital

Get on I-5 N in Hornbrook from Ager Beswick Road. (48 minutes, 25.7 miles)

1. Head southeast on Copco Road toward Teal Road. (3.5 miles)
2. Turn right to stay on Copco Road. (0.1 miles)
3. Turn right on Ager Beswick Road. (2.8 miles)
4. Turn left to stay on Ager Beswick Road. (12.6 miles)
5. Turn right on Ager Road/Hornbrook Ager Road. (3.5 miles)
   Continue to follow Ager Road.
6. Turn left onto Ager Road/Copco Road/Juniper Road. (3.0 miles)
   Continue to follow Copco Road.
7. Turn right to merge onto I-5 N. (0.3 miles)

Follow I-5 N to Maple Street in Ashland. (31 minutes, 28.7 miles)

8. Merge onto I-5 N. (26.5 miles)
   Entering Oregon.
9. Take exit 19 for Valley View Road toward Ashland. (0.2 miles)
10. Turn left on S. Valley View Road toward Ashland. (0.6 miles)
11. Turn left onto OR-22 S. (1.4 miles)
12. Turn right onto Maple Street. Destination will be on the left. (0.2 miles)

278-316 Maple Street
Ashland, OR 97520

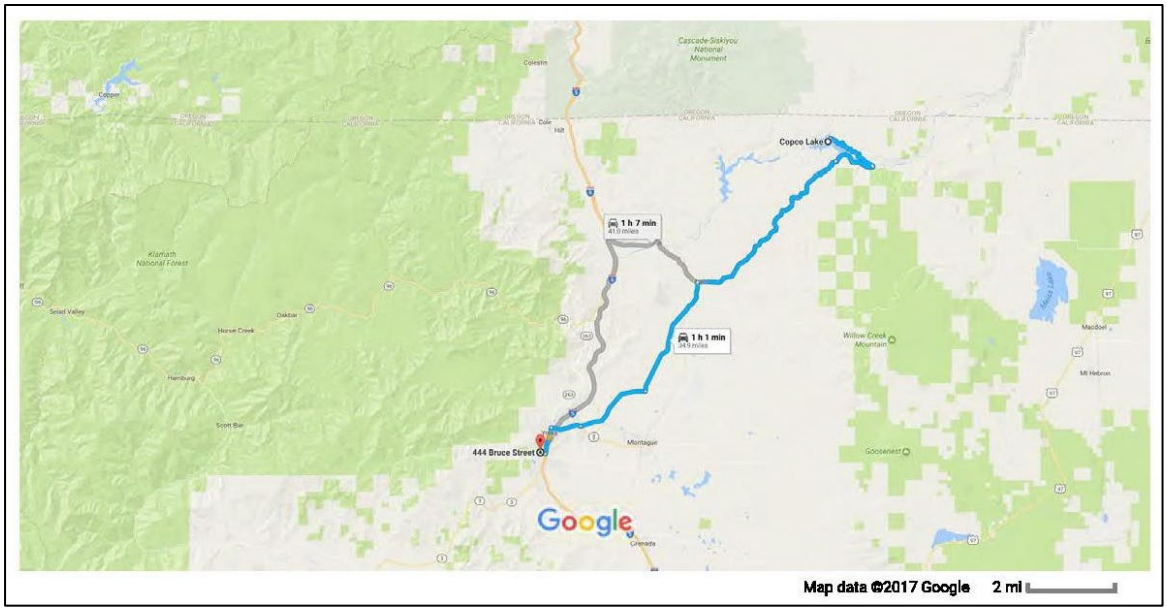

Figure D-3. Route to Fairchild Medical Center

Take Ager Beswick Road to Ager/Hornbrook Road. (39 minutes, 19.0 miles)

1. Head southeast on Copco Road toward Teal Road. (3.5 miles)
2. Turn right to stay on Copco Road. (0.1 miles)
3. Turn right onto Ager Beswick Road. (2.8 miles)
4. Turn left to stay on Ager Road. (12.6 miles)

Continue on Ager Road. Take Yreka Ager Road to Bruce Street in Yreka. (21 minutes, 15.7 miles)

5. Turn left onto Ager Road/Hornbrook Road. (7.5 miles)
   Continue to follow Ager Road.
6. Turn right on Yreka Ager Road. (4.7 miles)
7. Turn right into Montague Road. (1.8 miles)
8. Turn left onto N Main Street. (1.6 miles)
9. Turn right onto Bruce Street. Destination will be on the right. (0.3 miles)

444 Bruce Street
Yreka, CA 96097

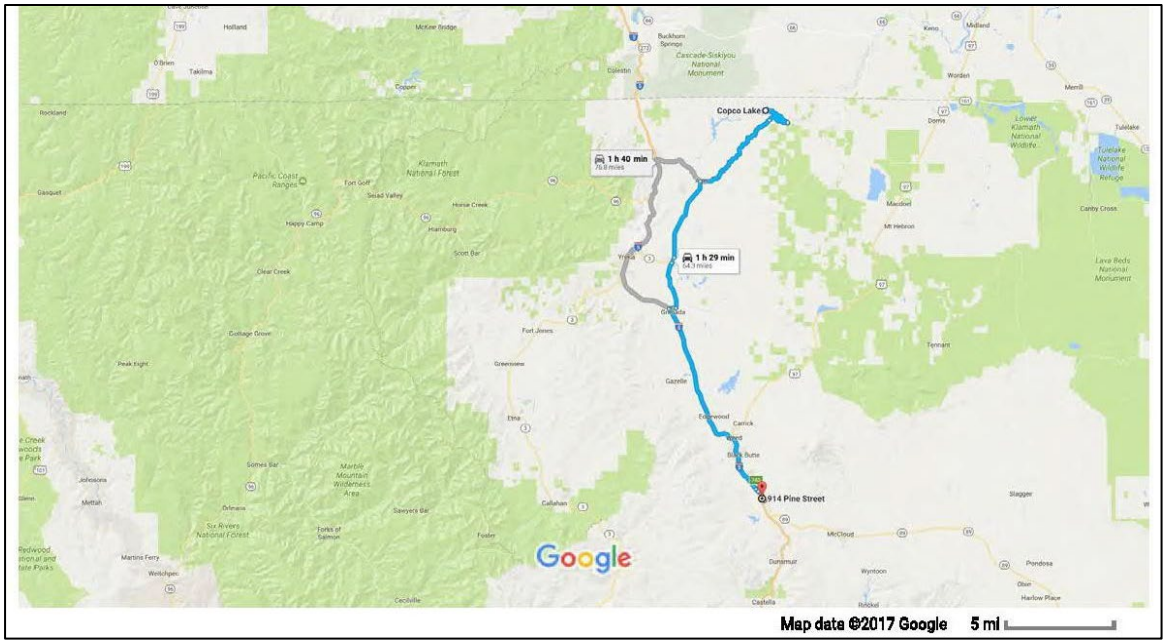

Figure D-4. Route to Mercy Medical Center

Take Ager Beswick Road to Ager/Hornbrook Road. (39 minutes, 19.0 miles)

1. Head southeast on Copco Road toward Teal Road. (3.5 miles)
2. Turn right to stay on Copco Road. (0.1 miles)
3. Turn right onto Ager Beswick Road. (2.8 miles)
4. Turn left to stay on Ager Road. (12.6 miles)

Continue on Ager Road, Montague Grenada Road and I-5 S to E Alma Street in Mount Shasta. (48 minutes. 44.8 miles)

5. Turn left onto Ager Road/Hornbrook Ager Road. (10.1 miles)
   Continue to follow Ager Road.
6. Continue onto N 11th Street/Montague Ager Road. (0.8 miles)
   Continue to follow N 11th Street.
7. Continue straight onto S. 11th Street/Montague Grenada Road. (5.7 miles)
   Continue to follow Montague Grenada Road.
8. Turn right into 99-97 Cutoff. (0.9 miles)
9. Turn left to merge onto I-5 S. (25.5 miles)
10. Take exit 740 toward I-5/Mount Shasta Boulevard. (1.4 miles)
11. Continue on Mount Shasta Boulevard. (1.4 miles)

Drive to Pine Street. (2 minutes, 0.5 miles))

12. Turn right onto E Alma Street. (0.1 miles)
13. Turn right onto Pine Street. Destination will be on the right. (0.4 miles)

914 Pine Street
Mt. Shasta, CA, 96067

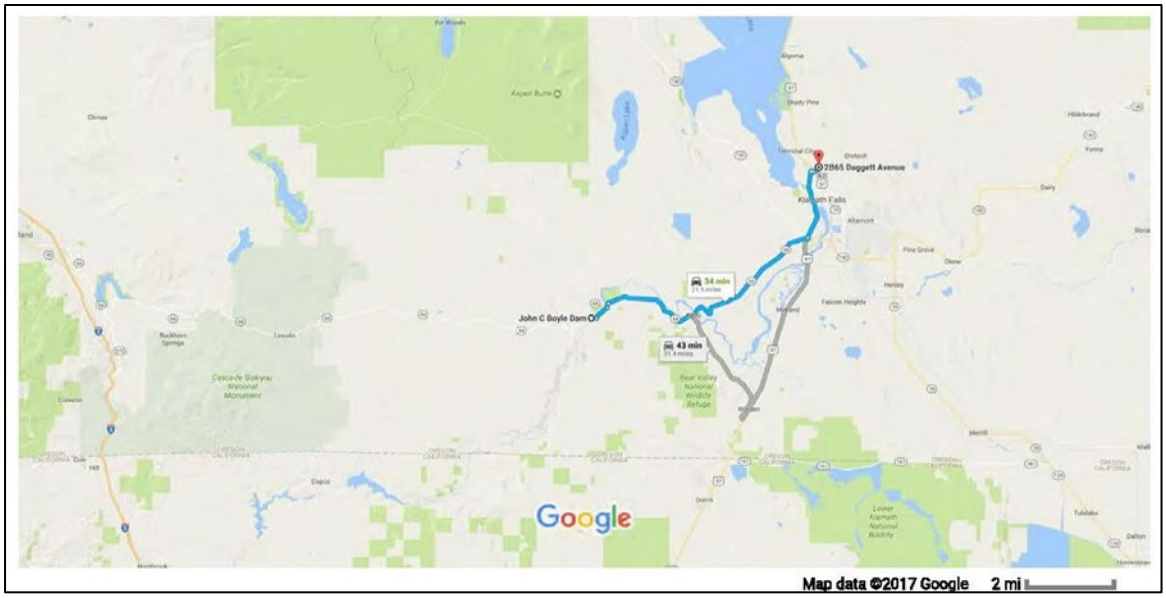

Figure D-5. Route to Sky Lakes Medical Center

Take Topsy Grade Road to OR-66 E. (4 minutes, 1.2 miles)

1. Head north on Topsy Grade Road. (0.9 miles)
2. Continue straight. (0.5 miles)

Follow OR-66 E and US-97 N to Campus Drive in Klamath Falls. (26 minutes, 19.7 miles)

3. Turn right onto OR-66 E. (15.0 miles)
4. Turn right to merge onto US-97 N. (4.4 miles)
5. Take the State 39 S/US-97 S exit toward Winema N.F. Headquarters/Oregon Institute of Technology. (0.1 miles)
6. Merge onto to US-97 BUS S/State 39 S. (0.1 miles)

Continue on Campus Drive. Drive to Daggett Avenue. (3 minutes, 0.5 miles)

7. Turn left onto Campus Drive. (0.3 miles)
8. Turn right toward Daggett Avenue. (371 feet)
9. Turn left onto Daggett Avenue. (0.2 miles)

2865 Daggett Avenue.
Klamath Falls, OR 97601

Appendix D

Consultation Record

Consultation Record

Construction Management Plan				
Sub-Plan	**Agency**	**Date of Agency Plan Submittal**	**Agency Comments Received Date**	**Date of Call to Resolve Agency Comments**
Oregon Traffic Management Plan	Klamath County Public Works and Planning Department	February 3, 2021	Pending	February 10, 2021