PUGET SOUND NEARSHORE
ECOSYSTEM RESTORATION

APPENDIX K

PUGET SOUND NEARSHORE
Sites Proposed for Additional
General Investigation Studies

Integrated Feasibility Report and
Environmental Impact Statement

US Army Corps
of Engineers
Seattle District

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Puget Sound Nearshore Ecosystem Restoration Nine Sites Proposed for Additional Study

Summary

The recommendations contained in the Feasibility Report and Environmental Impact Statement reflect a proposal for construction authorization at three sites across Puget Sound (Duckabush River Estuary, Nooksack River Delta, and North Fork Skagit River Delta). While the recommended plan includes restoration at these three sites, the National Ecosystem Restoration (NER) Plan is a 36-site master plan intended to restore a more diversified scope or projects to be implemented under various restoration authorities and partners. This 36-site plan reasonably maximizes ecosystem restoration benefits and restores over 8,000 acres across all seven Puget Sound sub-basins. The NER Plan includes 16 river delta sites, 10 coastal inlet sites, 6 barrier embayment sites, and 4 beach sites.

Of the 36 sites included in the NER Plan, 12 will be completed without the Corps involvement, 12 will be recommended for authorization under the Continuing Authorities Program or Puget Sound Adjacent Waters Authority, and 9 sites are recommended for additional General Investigation (GI) study. This appendix includes a brief summary of the nine GI projects recommended for additional study. Project summary sheets for each of the nine sites are enclosed as well as estimated total project costs based on best available information.

The nine sites recommended for additional general investigation studies are:

- Big Beef Creek Estuary
- Big Quilcene River
- Chambers Bay
- Dugualla Bay
- Everett Marshland
- Lilliwaup River Estuary
- Tahuya River Estuary
- Snohomish River Estuary
- Telegraph Slough

These nine sites are summarized within this appendix.

Engineering

As part of future feasibility-level design efforts, the Corps will evaluate existing conceptual designs, existing hydraulic, geotechnical, and civil design studies, as well as available survey and geographical information. The Corps will identify additional data needs and analysis to be conducted in the design phase prior to construction. These tasks are anticipated to include site-specific topographic survey and soils testing as well as detailed hydraulic modeling, structural/seismic analysis, and civil design.

Environmental Analysis & Coordination

The Corps will conduct evaluations and public disclosure under NEPA for the additional GI studies. The nine sites are expected to comply with the Programmatic Biological Opinion for Fish Passage and Restoration Projects, with site-specific analysis and response from the Services. National Historic Preservation Act Section 106 compliance will follow a similar path as the Programmatic Agreement that was developed for the first three sites included in the recommended plan for construction authorization. Clean Water Act Section 401 and Coastal Zone Management Act compliance will occur during the design phase prior to construction.

Real Estate

The lands and damages values for the nine sites identified for further study were developed using a combination of Land Cost Estimates and County Assessor's values. Land Cost Estimates were developed for Chambers Bay, Dugualla Bay, Everett Marshland, Telegraph Slough, and Tahuya River Estuary; these Land Cost Estimates were developed by USACE Appraisers in 2012. The land values for Big Beef Creek Estuary, Big Quilcene River, and Lilliwaup River Estuary were developed using 2011 County Assessor's records. Snohomish River Estuary land values were developed using 2016 County Assessor's records.

Cost Estimate

Each cost estimate for the nine sites was prepared at a level commensurate with the early conceptual level of design detail, which should be considered a budget or class IV estimate. A high level District Quality Control review was performed on each cost estimate; however, an Agency Technical Review has not been completed. The cost estimates for the nine sites were developed at different price levels from 2011-2014. In an effort to normalize the estimates, all costs were brought to FY 2016 dollars by updating the labor rates, equipment rates and material pricing. The scope was assumed to remain the same.

Table 1 presents the estimated project cost for each site in FY 2016 dollars as well as the fully funded cost. The project cost consists of the construction cost plus Real Estate, Planning,

Engineering, Design (PED), and Construction Management. The fully funded cost represents the project cost escalated to the mid-point of construction. The study team identified FY2030 as the mid-point of construction for each site.

Preliminary construction schedules for each project were created using durations from the MCACES estimate and logical sequencing of construction features. The study team has not determined the order of construction for the nine sites; thus, all preliminary construction schedules in this appendix have a start date of October 2016. Pre-construction and post-construction activities have not been included in the schedule at this point of design. A more comprehensive project schedule be developed that will identify pre-construction and post-construction activities.

Contingencies were added to the construction costs based on the results of the cost and schedule risk analysis developed for each site. The same contingency was applied to the PED and construction management costs. Real Estate team members developed their own contingencies for Lands and Damages estimates. The cost and schedule risk analyses developed in 2011 to 2014 were updated with the current estimated costs but were not reevaluated. The risk register identifies risks, the cost impact of such risk, and likelihood of occurrence. These projects are at an early conceptual level design so a formal risk analysis was not warranted at this time. Instead, an abbreviated risk analysis was performed that only focused on cost and omitted schedule risks. If any of the nine sites move forward under a GI study, a formal cost and schedule risk analysis will performed to account for construction cost risks, schedule delays, and impact costs.

Table 1: Total Project Cost Summary for Nine Sites Identified for Additional General Investigation Studies

	Project Cost FY 2016 Dollars					Fully Funded FY 2030	
Project Site	**Construction Estimate Total**	**Land and Damages**	**PED & Construction Management**	**Contingency**	**Project Cost Total**	**Escalation**	**Fully Funded Total**
Big Beef Creek Estuary	$ 15,824	$ 200	$ 5,775	58%	$ 34,376	37%	$ 47,082
Big Quilcene River	$ 18,120	$ 1,760	$ 6,613	31%	$ 34,600	36%	$ 47,179
Chambers Bay	$ 130,912	$ 10,577	$ 36,500	66%	$ 295,002	36%	$ 399,886
Dugualla Bay	$ 46,618	$ 6,967	$ 17,014	21%	$ 85,355	36%	$ 116,072
Everett Marshland	$ 183,969	$,600	$ 36,500	29%	$ 293,905	35%	$ 395,655
Lilliwap Creek Estuary	$ 17,556	$ 1,120	$ 6,410	36%	$ 33,994	37%	$ 46,435
Snohomish River Estuary	$ 52,092	$ 23,000	$ 19,014	31%	$ 123,593	35%	$ 166,410
Tahuya River Estuary	$ 15,034	$ 1,115	$ 5,486	26%	$ 27,305	36%	$ 37,262
Telegraph Slough	$ 153,194	$ 15,840	$ 36,500	23%	$ 253124	35%	$ 341,074
Sum Total	**$ 633,319**	**$ 68,179**	**$ 169,812**	**36%**	**$,181,254**	**35%**	**$ 1,597,056**

PUGET SOUND NEARSHORE ECOSYSTEM RESTORATION PROJECT (PSNERP)
SITES FOR ADDITIONAL STUDY

Big Beef Creek Estuary

PUGET SOUND NEARSHORE ECOSYSTEM RESTORATION PROJECT

Big Beef Harbor is located at the north end of Hood Canal on the Kitsap Peninsula just north of the town of Seabeck. This small estuary encompasses 27 acres of tidal wetlands, extensive mudflats, and tidal channels that provide habitat for fish, birds, and invertebrates. Historically, a narrow spit extended halfway across the mouth of the estuary, but today Seabeck Highway extends across the entire estuary mouth on a filled causeway with a 100 foot-long-bridge opening to allow for tidal exchange. The causeway and associated fill reduce tidal flows into and out of the estuary and cause increased sedimentation to the adjacent tidal wetlands. The causeway fill, placed over the historical spit, also degraded the beach ecosystem. Proposed restoration actions would reopen the estuary mouth by elevating the roadway onto a longer bridge which would restore tidal flow, sediment transport, and re-create tidal channels.

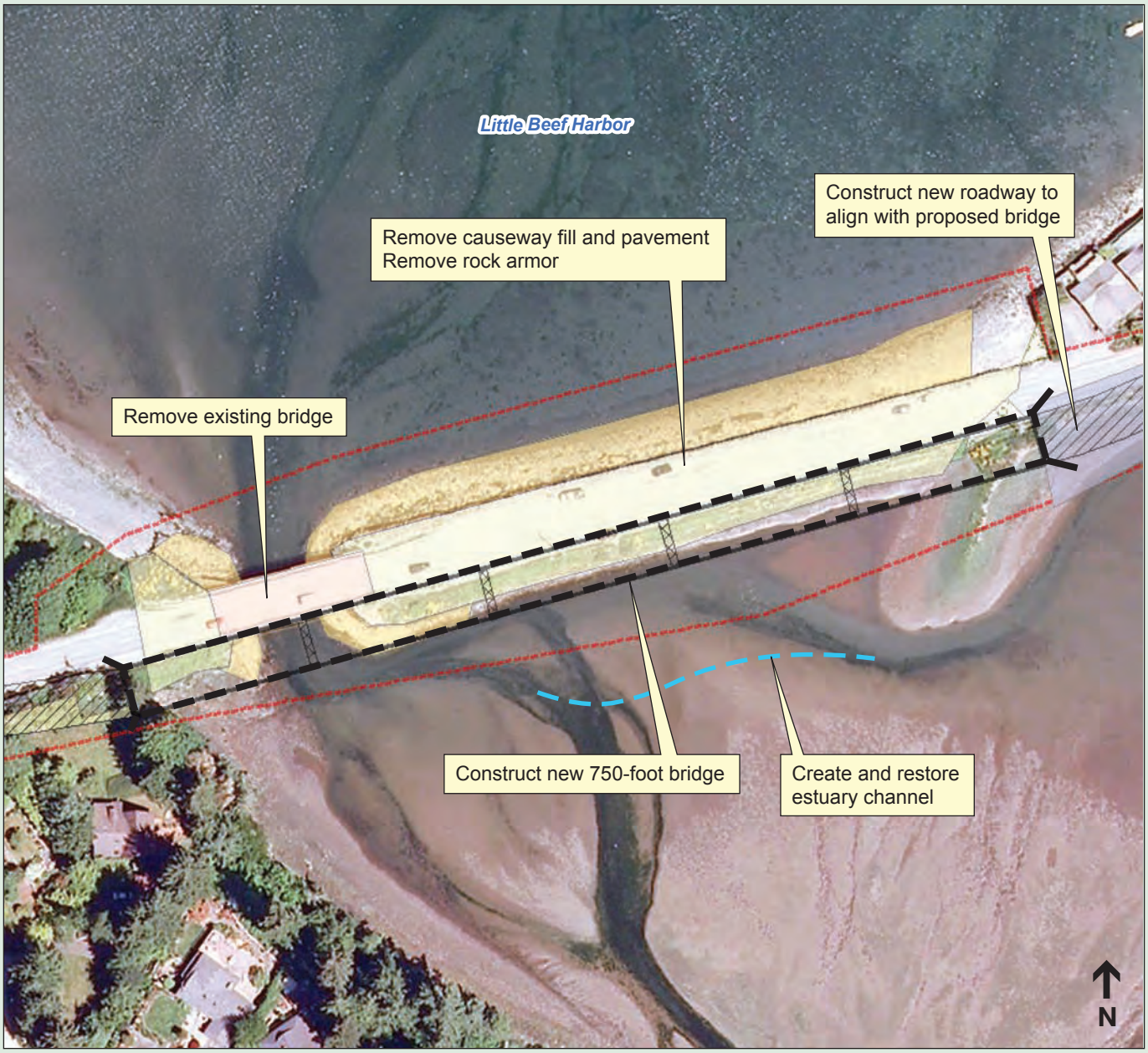
IMAGE: Washington State Department of Ecology (2006)

Processes Restored

- Movement of sand and gravel along shorelines.
- Natural erosion and accretion of beaches.
- Natural formation of tidal channels in estuaries.
- Unrestricted movement of saltwater through tidal channels in estuaries.
- Unrestricted movement and migration of fish and wildlife.

Conditions Improved

- Restored tidal wetlands, which are highly productive habitats that support biodiversity and provide connectivity between the land and sea.
- Restored coastal embayment that provides valuable nursery habitat for threatened species of juvenile salmon such as Chinook, increasing their survival and supporting population recovery in Puget Sound.
- Restored sand and gravel beaches that serve as spawning grounds for forage fish (e.g., surf smelt and Pacific sand lance), which are a key element of the marine food chain.
- Improved quality of the water flowing through the estuary.



SOURCE: ESA (2011); (20)

Image above depicts major project features. See design report for additional details.

Key Design Elements

The restoration proposal would remove the existing highway to include all roadway fill, armoring, bridge and pavement. A new 750-foot-long bridge would be built to span the entire estuary mouth from the right-of-way on the spit to the low bank at the west shore. The new highway bridge would be constructed immediately south of the current highway, which would allow the road to remain open during construction activities. Restoration would also include restoration of tidal channels within the estuary.

Site Summary Statistics

Area of Restored Process:	30 acres
Total Project Cost (Mar 2016 Prices):	$37,376,000
Ecosystem Output Score:	7.9

PUGET SOUND NEARSHORE ECOSYSTEM RESTORATION PROJECT (PSNERP)

SITES FOR ADDITIONAL STUDY

Big Quilcene River

PUGET SOUND NEARSHORE ECOSYSTEM RESTORATION PROJECT

Quilcene Bay is an arm of Dabob Bay on the west side of Hood Canal that contains productive mud flat and salt marshes. This large and complex ecosystem supports many species of fish and wildlife, including threatened Hood Canal summer chum salmon and shellfish. Logging, road construction, dredging, and levee construction for flood protection have damaged the natural processes that sustain the delta system. The Big Quilcene River restoration will build on other recent restoration efforts in this area by rerouting roads and bridges that impede the flow of water, sediment, and organic materials; restoring tidal channels; and setting back dikes to allow the river to migrate and connect to its historic floodplain. The project would improve conditions for migrating adult salmon, shellfish, and marine birds.

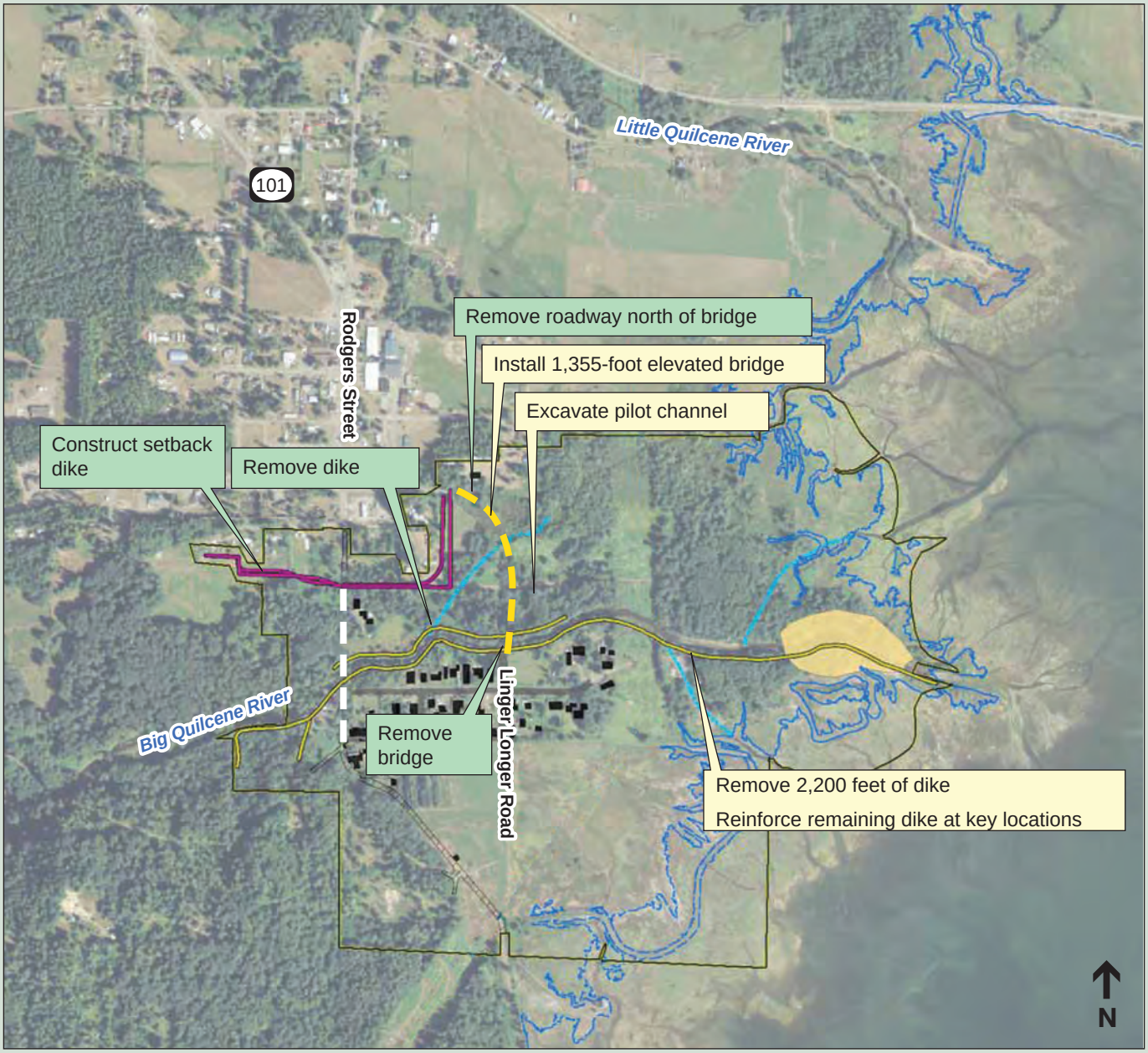
IMAGE: Washington State Department of Ecology (2006)

Processes Restored

- Natural formation of tidal channels in estuaries.
- Unrestricted flow of freshwater rivers and streams into estuaries.
- Unrestricted movement of saltwater through tidal channels in estuaries.
- Accumulation and retention of organic material from plants and aquatic animals.
- Unrestricted movement and migration of fish and wildlife.

Conditions Improved

- Restored large river delta that provides valuable nursery habitat for threatened species of juvenile salmon such as Chinook, increasing their survival and supporting population recovery in Puget Sound.
- Restored intertidal and shallow subtidal areas that are habitat for recreationally and culturally important shellfish such as oysters, mussels, and clams.
- Re-established intertidal and shallow subtidal areas to encourage the growth of kelp and eelgrass, increasing nearshore productivity for fish, birds and other marine species.
- Improved resiliency of the shoreline to respond to changes in the environment such as sea level change and increasing frequency of storm events.



SOURCE: PSNERP (2011); USDA-NAIP (2009)

Image above depicts major project features. See design report for additional details.

Key Design Elements

The project would restore tidal flow and connectivity to the Big Quilcene River by removing the current blockage associated with Linger Longer Road and construction of an elevated bridge. The channel would be excavated to direct river flows. The dike along on the south side of the river would be partially removed and portions would be reinforced.

Site Summary Statistics

Area of Restored Process:	25-76 acres
Total project Cost (Mar 2016 Prices):	$37,600,000
EO Score:	0.6

PUGET SOUND NEARSHORE ECOSYSTEM RESTORATION PROJECT (PSNERP)

SITES FOR ADDITIONAL STUDY

Chambers Bay

PUGET SOUND NEARSHORE ECOSYSTEM RESTORATION PROJECT

The Chambers Bay restoration is designed to improve conditions in the Chambers Bay estuary and in the lower reaches of Chambers Creek. This area has a long history of industrial use; the Bay has been repeatedly dredged for navigation, used as a log storage facility, and has received industrial discharges from nearby mills. A major railroad line runs across the estuary mouth and a marina is located in the southern portion of the inlet. The railroad and the Chambers Creek dam block the free flow of tidal and fresh water, which have dramatically reduced the quality and health of these habitats for fish and wildlife. Restoration will include removal of the dam in the upper estuary; removing culverts to "daylight" two streams; relocating a roadway; extending the railroad trestle to widen the inlet to Puget Sound; and planting native plants in the marsh and riparian area.

IMAGE: Washington State Department of Ecology (2006)

Processes Restored

- Natural formation of tidal channels in estuaries.
- Unrestricted flow of freshwater rivers and streams into estuaries.
- Unrestricted movement of saltwater through tidal channels in estuaries.
- Accumulation and retention of organic material from plants and aquatic animals.
- Unrestricted movement and migration of fish and wildlife.

Conditions Improved

- Restored tidal wetlands, which are highly productive habitats that support biodiversity and provide connectivity between the land and sea.
- Restored coastal embayment that provides valuable nursery habitat for threatened species of juvenile salmon such as Chinook, increasing their survival and supporting population recovery in Puget Sound.
- Improved quality of the water flowing through the estuary.
- Improved connectivity between nearshore and adjacent uplands.
- Increased area, length, and complexity of shoreline.

Image above depicts major project features. See design report for additional details.

Key Design Elements

The restoration would remove the dam in the upper estuary to restore tidal flows. The existing railroad berm at the mouth of the estuary would be removed and the trestle would be extended to span the entire inlet (1,400 feet). The inactive railroad tracks also would be removed and Chambers Creek Road would be relocated to the east. Two culverted streams would be daylighted (Garrison Springs Creek and No Name Creek) within the former mill property. A historic barrier beach (located near the marina) would be restored by removing the armor, fill, and marina docks, boathouses and associated structures. In select tidal marsh and riparian areas, invasive species would be removed and native species would be planted.

Site Summary Statistics

- Area of Restored Process: 91 acres
- Total Project Cost (Mar 2016 Prices): $298, 002,000
- Ecosystem Output Score: 8.5

PUGET SOUND NEARSHORE ECOSYSTEM RESTORATION PROJECT (PSNERP)
SITES FOR ADDITIONAL STUDY

Dugualla Bay

PUGET SOUND NEARSHORE ECOSYSTEM RESTORATION PROJECT

Dugualla Bay is located on northeast Whidbey Island in western Skagit Bay. A former estuary and salt marsh, the area is now separated from Dugualla Bay's marine waters by Dike Road, a causeway that functions as a levee. To create agricultural land, the causeway, a tide gate, and pump station system were built at the historic barrier embayment inlet. This eliminated tidal inundation, converting the estuary into freshwater Dugualla Lake and restricting fish access from Puget Sound. The proposed restoration will remove tidal hydrology barriers in Dugualla Bay, allowing tidal exchange between Dugualla Lake and bay, restoring 572 acres of salt marsh and mudflats. It also improves connection with the surrounding floodplain and allows fish to access the system.

IMAGE: Washington State Department of Ecology (2006)

Ecosystem Restoration Benefits

- Restore coastal embayment that provides valuable nursery habitat for juvenile threatened salmon species increasing their survival and supporting Puget Sound population recovery.
- Restore intertidal and shallow subtidal areas for recreationally- and culturally-important shellfish.
- Increase shoreline area, length and complexity.

Significance

- Provides critical estuary habitat in the Whidbey basin, where about 80 percent of estuary habitat is no longer accessible.
- Included in Puget Sound Chinook Salmon Federal Recovery Plan.
- Site will be used by roughly half of the out-migrating North Fork Skagit juvenile salmon.
- Adds more than five times the shoreline length to existing, available nearshore habitat.

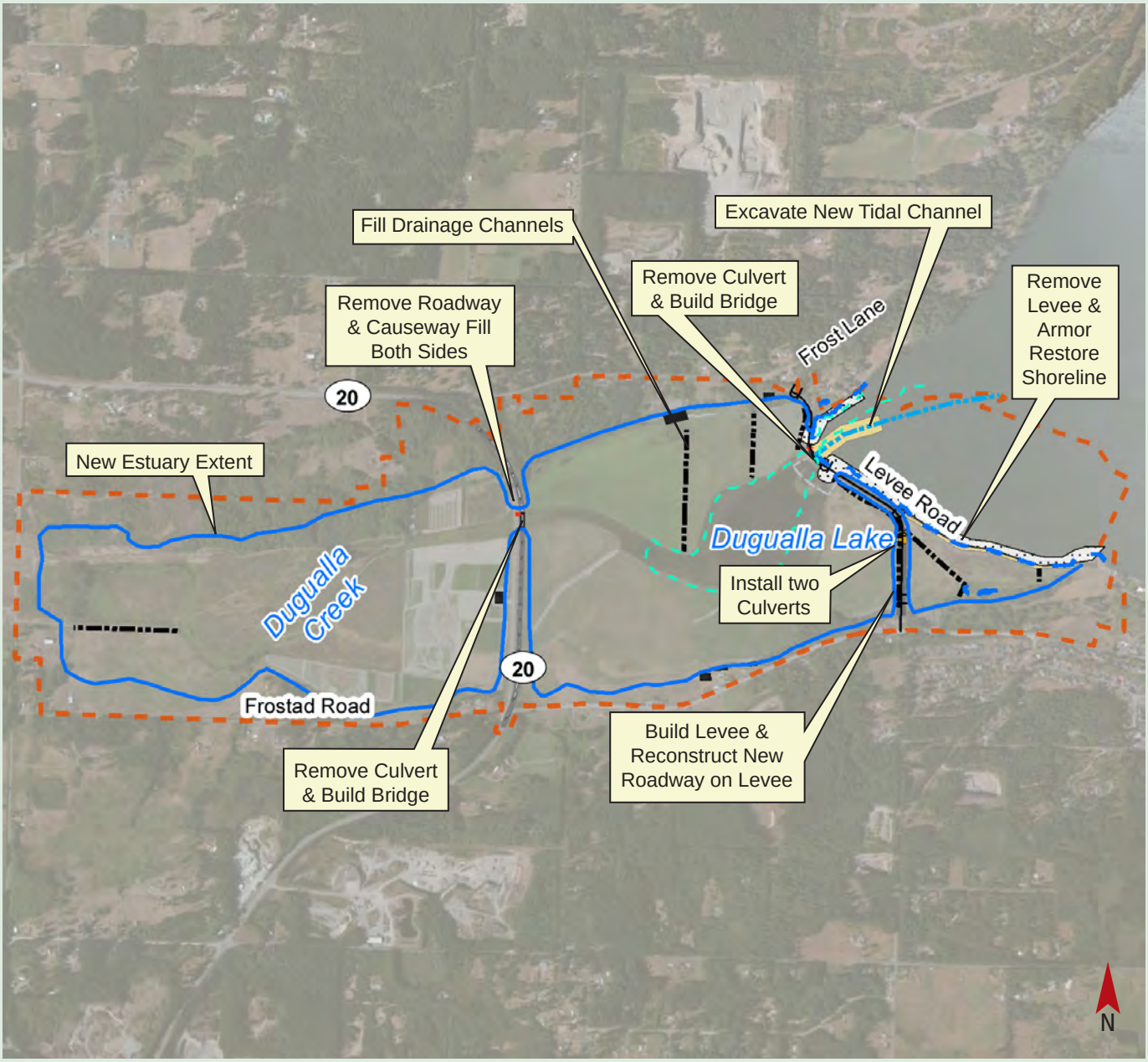


Image above depicts major project features. See design report for additional details.

Key Design Elements

The restoration returns historical tidal inundation to Dugualla Bay by removing the tide gate and pumping system, excavating a starter channel, and allowing tidal flow into the existing lake. Two barrier beaches, historically defining the tidal channel entrance, will be created and a new 750-foot-long bridge will allow vehicle passage along Dike Road. Portions of the road will also be raised out of the newly inundated floodplain. A 200-foot-long bridge will replace a culvert under State Route 20.

Site Summary Statistics

Area of Restored Process:	572 acres
Total Project Cost (Mar 2016 Prices)	$88,355,000
Ecosystem Output Score:	162.6

PUGET SOUND NEARSHORE ECOSYSTEM RESTORATION PROJECT (PSNERP)
SITES FOR ADDITIONAL STUDY

Everett Marshland

PUGET SOUND NEARSHORE ECOSYSTEM RESTORATION PROJECT

The Everett Marshland site is located along Snohomish River's west bank near the Ebey Slough fork. Although in the river's 100-year floodplain, the action area is completely cut off from tidal hydrology by levees and drainage structures installed to support agricultural land use. The area is also bisected by a railroad running generally northwest and southeast, with utility corridors running east and west. This project restores tidal hydrology and channel-forming processes to 829 acres of tidal freshwater wetlands, reconnecting the site to the Snohomish River. This is accomplished by relocating levees and roadways, altering and filling drainage canals, restoring tidal channels, and reconnecting streams to the tidal area.

IMAGE: Google Earth (2010)

Ecosystem Restoration Benefits

- Restore highly productive tidal freshwater wetland habitats that support biodiversity and provide connectivity between land and sea.
- Restore large river delta that provides valuable nursery habitat for juvenile threatened salmon, increasing their survival and supporting Puget Sound population recovery.
- Improve estuary water quality.
- Increase shoreline area, length and complexity.
- Improve resiliency of the shoreline to respond to changes in the environment such as sea level change and increasing storm events.

Significance

- More than 80 percent of the Snohomish estuary is leveed, with only 18 percent of historical wetlands remaining.
- Provides floodplain forest and swamp wetlands, the most absent from the Snohomish system, and critical for out-migrating fish.
- Located on the Snohomish River's mainstem, the site will benefit all out-migrating fish.
- Builds on previous Federal, state, tribal, local and non-government restoration investments, including Corps projects at Qwuloolt and Union Slough.
- Included in Puget Sound Chinook Salmon Federal Recovery Plan.
- Adds more than three times the shoreline length to existing, available nearshore habitat.

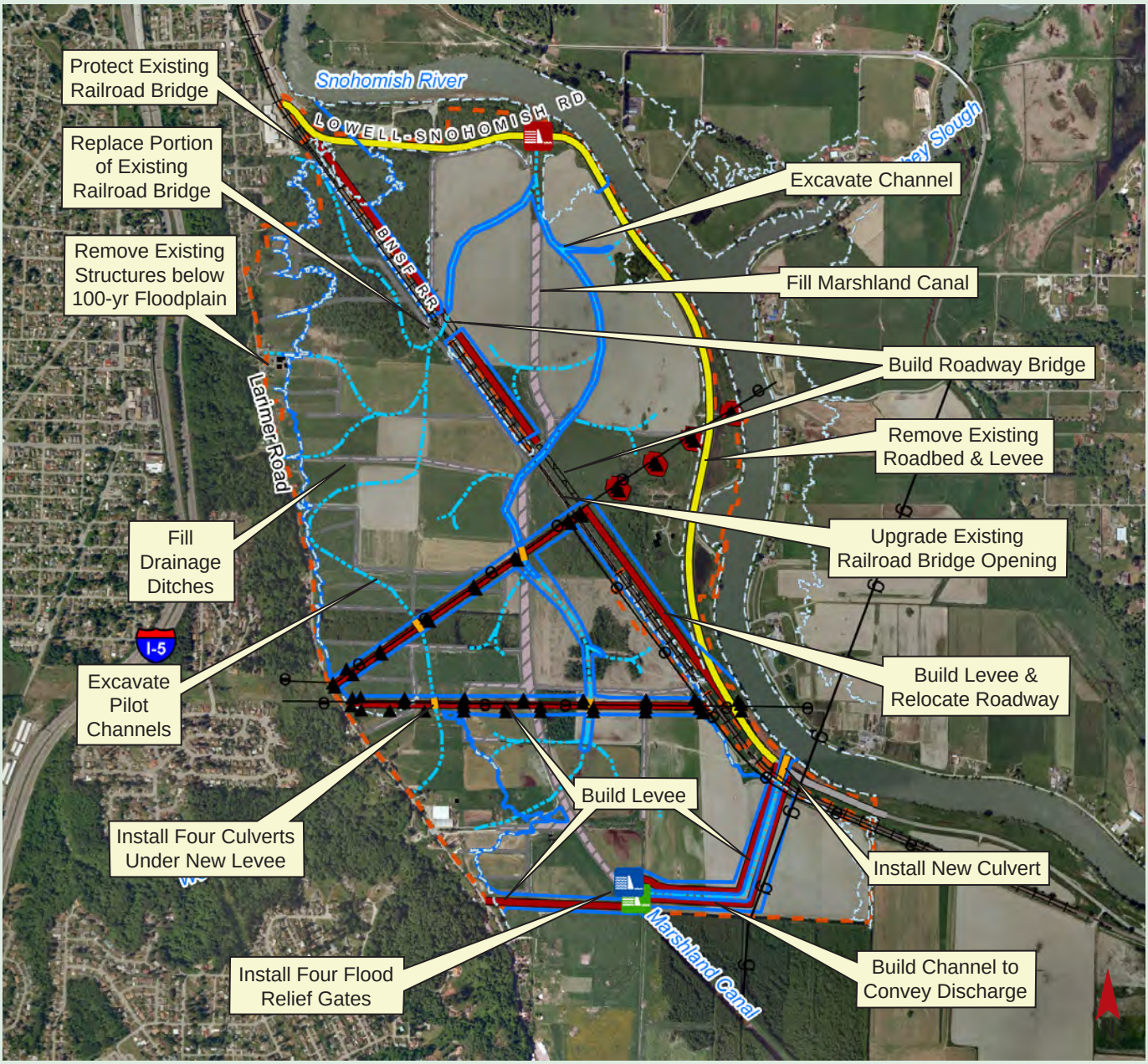


Image above depicts major project features. See design report for additional details.

Key Design Elements

The restoration removes 1.5 miles of levee along the Snohomish River and Lowell-Snohomish River Road, which re-introduces tidal influence to diked farmlands. The road will align with the railroad and multiple new bridges will allow tidal flow beneath the road and railroad embankment. The Marshland Pump Station and flood gates will relocate to the site's south end. Excavation of multiple starter channels in the area will initiate tidal slough channel development. New levees will protect regional transmission lines and gas pipelines west of the railroad line.

Site Summary Statistics

Area of Restored Process:	829 acres
Total Project Cost (Mar 2016 Prices): :	$296,905,000
Ecosystem Output Score:	349.3

PUGET SOUND NEARSHORE ECOSYSTEM RESTORATION PROJECT (PSNERP)

SITES FOR ADDITIONAL STUDY

Lilliwaup River Estuary

PUGET SOUND NEARSHORE ECOSYSTEM RESTORATION PROJECT

Lilliwaup Creek is a relatively large stream system on the western side of Hood Canal. The upper reaches contain significant wetlands and lakes as well as Lilliwaup Falls, while the lower reaches provide important salt marsh and estuary habitat for salmon. The lower floodplain contains extensive gravel and sediment due to large upper watershed landslide events. The Highway 101 bridge constricts tidal flow in the estuary. The restoration would construct a longer bridge to span the entire estuary mouth and allow unrestricted flow of fresh and tidal waters. The gravel and sediment would be removed from the estuary to restore habitat for salmon and tidal channels would be excavated where they were once historically present.

IMAGE: Washington State Department of Ecology (2006)

Processes Restored

- Natural erosion and accretion of beaches.
- Natural formation of tidal channels in estuaries.
- Unrestricted flow of freshwater rivers and streams into estuaries.
- Unrestricted movement of saltwater through tidal channels in estuaries.
- Accumulation and retention of organic material from plants and aquatic animals.
- Unrestricted movement and migration of fish and wildlife.

Conditions Improved

- Re-established historic tidal flat habitats that are important foraging and resting areas for large flocks of shorebirds, such as Dunlin, as well as other marine birds like Great Blue Heron.
- Restored coastal embayment that provides valuable nursery habitat for threatened species of juvenile salmon such as Chinook, increasing their survival and supporting population recovery in Puget Sound.
- Improved connectivity between nearshore and adjacent uplands.
- Improved resiliency of the shoreline to respond to changes in the environment such as sea level change and increasing storm events.

Image above depicts major project features. See design report for additional details.

Key Design Elements

The project would restore tidal flow and connectivity to Lilliwaup Creek by removing the current bloackage associated with Hwy 101 and replacing with a longer span (500ft) bridge. The accumulated gravel and sediment would be removed from the tidal channels. Lilliwaup Street would be rebuilt to meet the new bridge alignment and beach nourishment would be added to the western shore.

Site Summary Statistics

Area of Restored Process:	19 Acres
Total Project Cost (Mar 2016 Prices):	$36,994,000
Ecosystem Output Score:	1.13

PUGET SOUND NEARSHORE ECOSYSTEM RESTORATION PROJECT (PSNERP)

SITES FOR ADDITIONAL STUDY

Snohomish River Estuary

PUGET SOUND NEARSHORE ECOSYSTEM RESTORATION PROJECT

The Snohomish River Estuary is the second largest estuary in Puget Sound, providing critically important spawning and rearing habitat for salmon, steelhead, and trout. The lower estuary historically included numerous tidal channels and extensive intertidal habitats, but diking, filling, and dredge disposal have resulted in the loss of some of these important areas. Estuarine habitat restoration is a cornerstone of the Snohomish Basin salmon recovery strategy. This project will restore and enhance connectivity between the Snohomish River mainstem and side channel habitat by removing fill material and relocating levees. The project includes two sites: a historic distributary channel near Dagmar's Marina, and a blind slough north of Langus Riverfront Park.

IMAGE: Washington State Department of Ecology (2006)

Processes Restored

- Natural formation of tidal channels in estuaries.
- Unrestricted flow of freshwater rivers and streams into estuaries.
- Unrestricted movement of saltwater through tidal channels in estuaries.
- Unrestricted movement and migration of fish and wildlife.

Conditions Improved

- Restored large river delta that provides valuable nursery habitat for threatened species of juvenile salmon such as Chinook, increasing their survival and supporting population recovery in Puget Sound.
- Improved quality of the water flowing through the estuary.
- Improved public access to the shore and recreational opportunities.

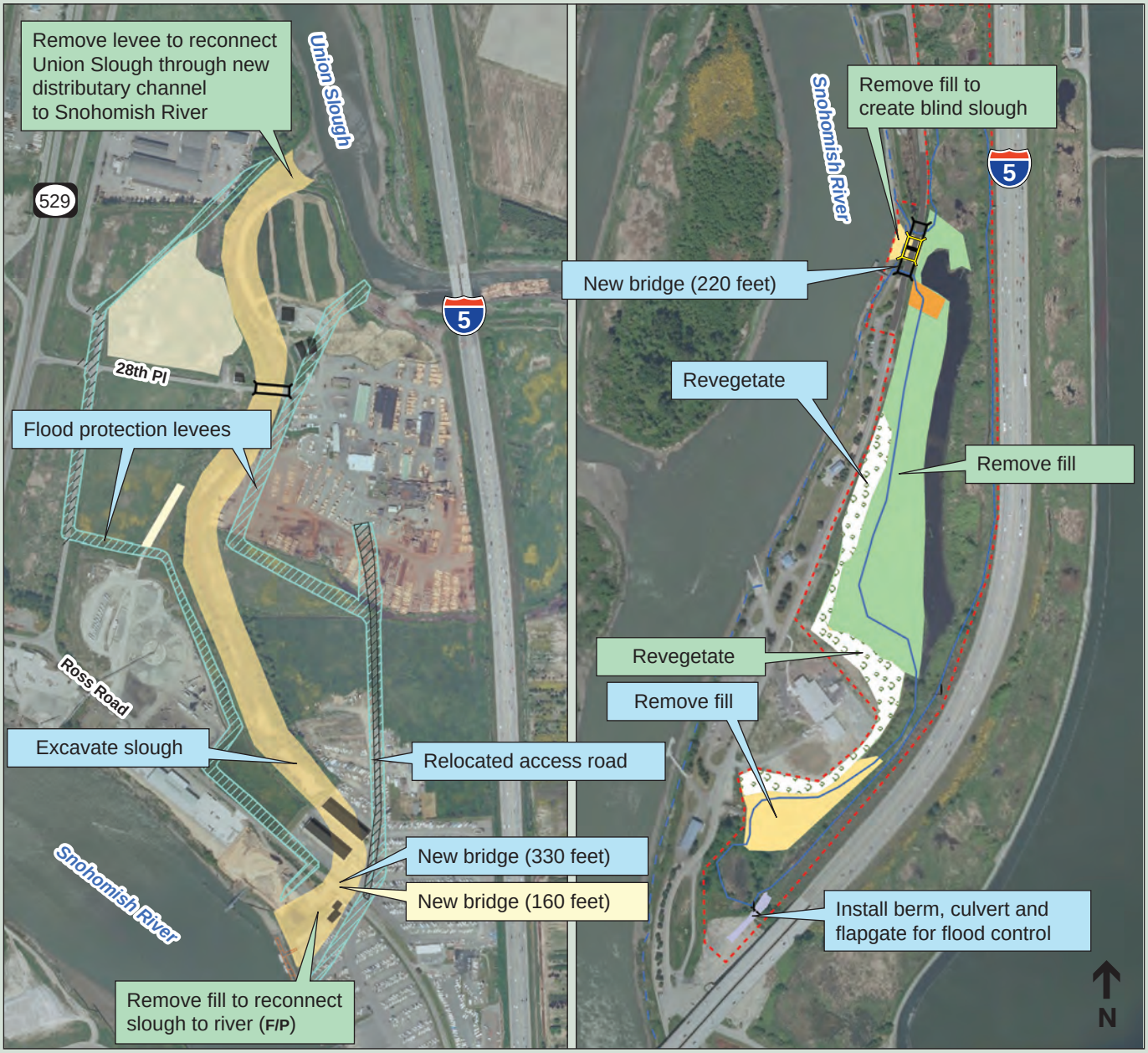


Image above depicts major project features. See design report for additional details.

Key Design Elements

The proposed project alternative would reconnect the distributary channel to Union Slough (at the north end) and the Snohomish River (south end) by removing road fill and the tide gate. Existing levees and additional fill would be removed to allow tidal flows and restore intertidal marsh habitat along the restored channel. An existing access road will be relocated and new levees would be installed along the perimeter of the restored area to protect surrounding areas from fl ooding. At the blind slough site, road fill would be removed from the mouth of the slough to reconnect it to the Snohomish River. A new bridge across the slough would allow continued vehicle access to the south end of Smith Island. Removal of dredge spoils from the slough would encourage reestablishment of a tidal marsh.

A new berm surrounding the restored marsh would protect adjacent properties including the Everett WWTP facilities from fl ooding.

Site Summary Statistics

Area of Restored Process:	67.5 Acres
Total Project Cost (Mar 2016 prices):	$126,593,000
Ecosystem Output Score:	17.73

PUGET SOUND NEARSHORE ECOSYSTEM RESTORATION PROJECT (PSNERP)
SITES FOR ADDITIONAL STUDY

Tahuya River Estuary

PUGET SOUND NEARSHORE ECOSYSTEM RESTORATION PROJECT

The Tahuya River inlet is near the Great Bend of Hood Canal. In the past, the inlet supported a large estuary. To support logging and later a county road, an embankment was constructed across the mouth of the Tahuya River estuary, with only a short bridge where it crosses the Tahuya River channel. The embankment has constrained tidal flows and the formation of tidal channels. In addition, gravel fill material was placed on historic tidelands southwest of the bridge (now used as a helipad for emergency medical transport). The restoration would replace the road embankment with a bridge, allowing tidal flows to resume across the estuary and tidal channel patterns to form. Fill would be removed to restore historic salt marsh habitat. The restoration would improve shellfish productivity in the lower estuary by allowing increased transport of coarse sediments that are beneficial to shellfish.

IMAGE: Washington State Department of Ecology (2006)

Processes Restored

- Natural erosion and accretion of beaches.
- Natural formation of tidal channels in estuaries.
- Unrestricted flow of freshwater rivers and streams into estuaries.
- Unrestricted movement of saltwater through tidal channels in estuaries.

Conditions Improved

- Restored coastal embayment that provides valuable nursery habitat for threatened species of juvenile salmon such as Chinook, increasing their survival and supporting population recovery in Puget Sound.
- Restored intertidal and shallow subtidal areas that are habitat for recreationally and culturally important shellfish such as oysters, mussels, and clams.
- Improved quality of the water flowing through the estuary.

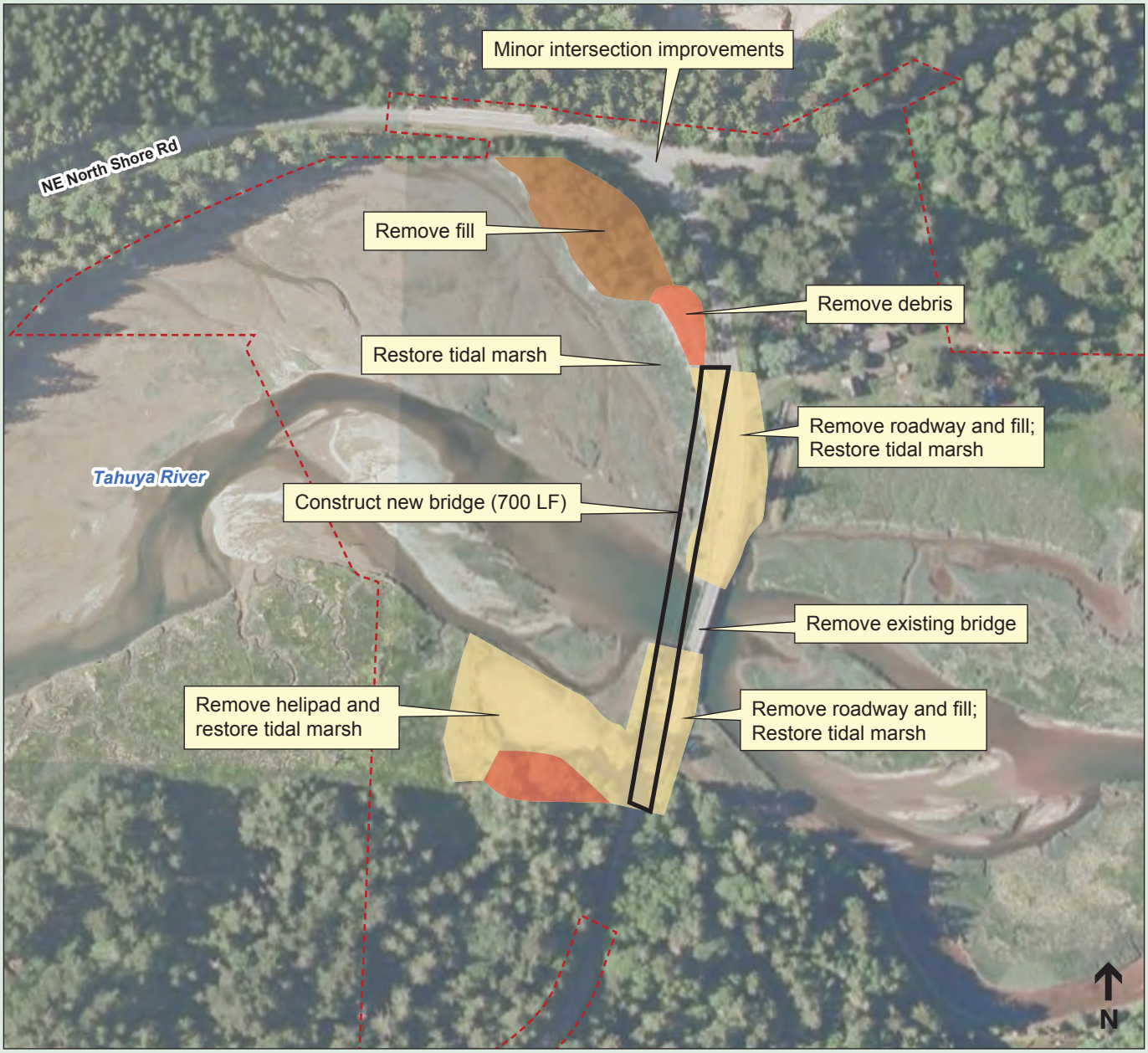


Image above depicts major project features. See design report for additional details.

Key Design Elements

The restoration would remove the entire roadway embankment fill from the estuary, replacing it with a 700-foot-long bridge span. Portions of the NE North Shore Road would be realigned to conform to the new bridge placement. Other fill such as the gravel helipad would also be removed from the intertidal zone. In areas where fill is removed, the marsh would be restored by decompacting the soil and installing native plant species.

Site Summary Statistics

- Area of Restored Process: 29 acres
- Total Project Cost (Mar 2016 Prices): $30,305,000

Ecosystem Output Score: 7.6

PUGET SOUND NEARSHORE ECOSYSTEM RESTORATION PROJECT (PSNERP)

SITES FOR ADDITIONAL STUDY

Telegraph Slough

PUGET SOUND NEARSHORE ECOSYSTEM RESTORATION PROJECT

Telegraph Slough is located in a diked area between Swinomish Channel and Padilla Bay. Major regional road and railway transportation as well as utility infrastructure bisects the site in an east and west direction. Tidal influence, blocked by State Route 20 and adjacent railroad, is limited to a small historical slough remnant north of the highway. South of this highway, Telegraph Slough and three other distributary channels are cutoff from Swinomish Channel and Padilla Bay. A series of tide gates drain the Slough's south portion to the Swinomish Channel. Most of the land outside public road rights-of-way is privately owned and in agricultural use or largely abandoned. Levees turned the area into a freshwater marsh dominated by invasive species in the south and limited salt marsh and mudflat area north of State Route 20. This project aims to restore tidal hydrology and channel-forming processes to historic distributary slough channels connecting Swinomish Channel to Padilla Bay, restore tidal hydrology to diked farmland that was historically estuarine marsh, and increase freshwater inputs to Padilla Bay by constructing bridges at causeway crossings, removing levees and creating and reconnecting channels.

IMAGE: Washington State Department of Ecology (2006)

Ecosystem Restoration Benefits

- Restore large river delta that provides valuable nursery habitat for juvenile threatened salmon species, increasing survival and supporting Puget Sound population recovery.
- Restore sand and gravel beaches that serve as spawning grounds for forage fish, such as surf smelt and Pacific sand lance, key elements of the marine food chain.
- Re-establish intertidal and shallow subtidal areas to encourage kelp and eelgrass growth, increasing nearshore productivity for fish, birds and other marine species.

Significance

- Opens another fish pathway into Padilla Bay, a National Estuarine Research Reserve with the largest existing Puget Sound eelgrass meadow.
- Provides restoration beneficial to fish and wildlife using the North Fork Skagit River, where opportunities are limited.
- Included in the Puget Sound Chinook Salmon Federal Recovery Plan.
- Increases juvenile salmon rearing habitat.
- More than doubles existing nearshore shoreline habitat available.

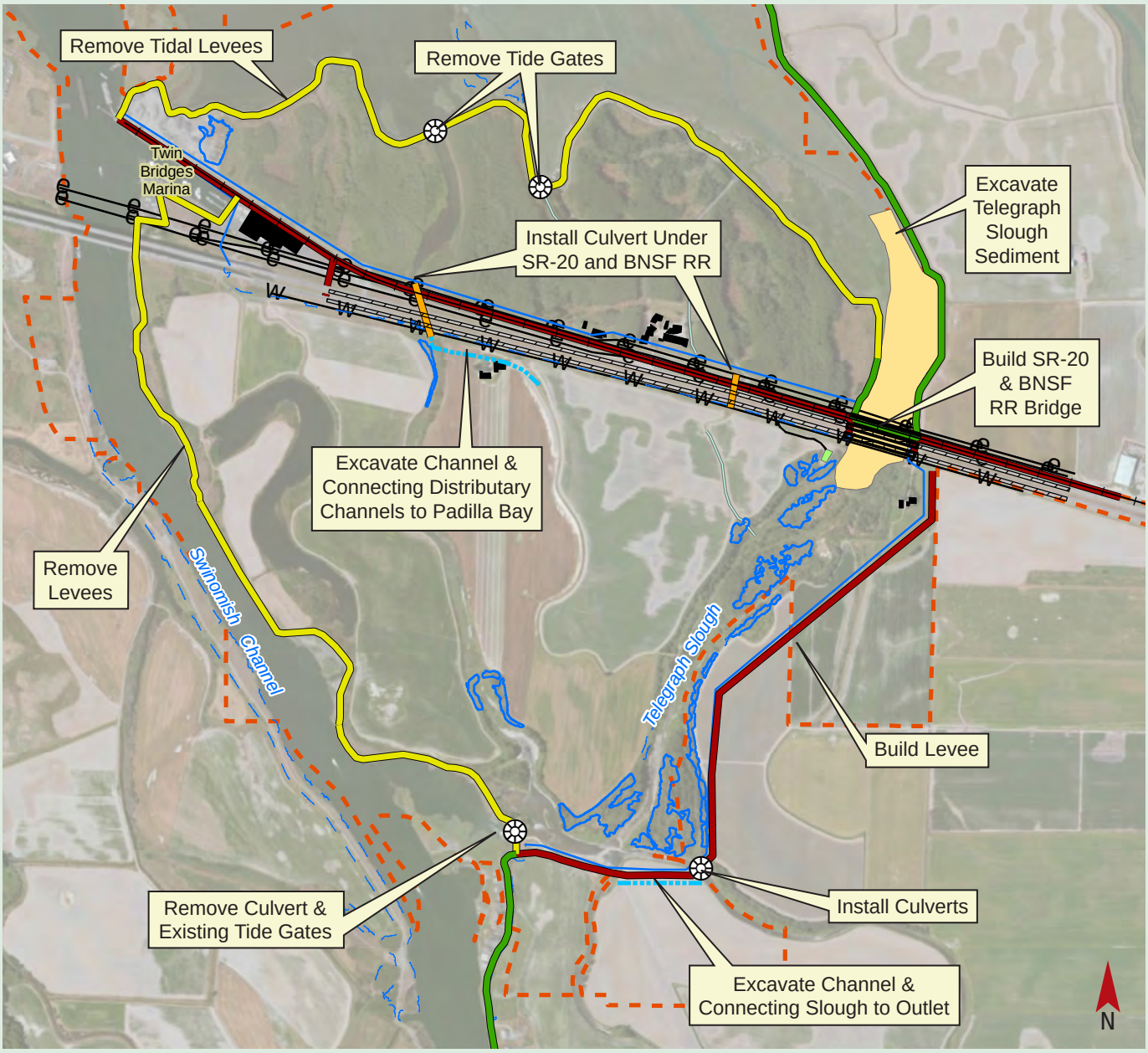


Image above depicts major project features. See design report for additional details.

Key Design Elements

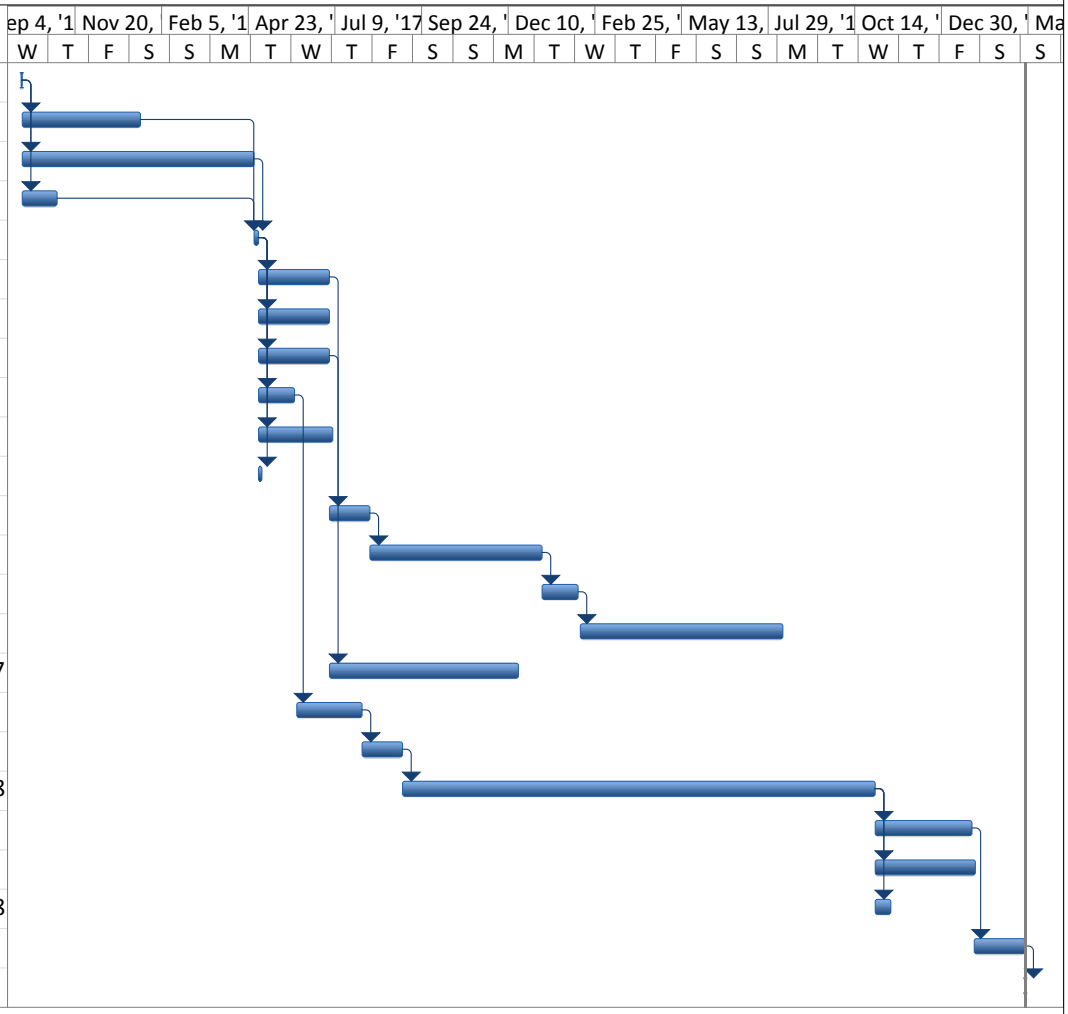
The restoration removes most of the levees along Telegraph Slough, Padilla Bay and eastern Swinomish Channel. Levee removal requires raising the railroad and State Route 20 between Swinomish Channel to Telegraph Slough to keep them above the inundation and wave action limits. The railroad and State Route 20 will cross the Slough on elevated long-span bridges. A new levee along east and south Telegraph Slough will contain flood flows and extreme tides. Levee removal restores about 832 acres of former salt marsh to tidal influence.

Site Summary Statistics

Area of Restored Process:	832 acres
Total Project Cost (Mar 2016 Prioces):	$256,124,000
Ecosystem Output Score:	253.9

PSNERP
Dugualla Bay
Construction Schedule

ID	Task Name	Duration	Start	Finish
1	Start	1 day	Mon 10/3/16	Mon 10/3/16
2	Cultural Resources	75 days	Tue 10/4/16	Mon 1/16/17
3	Site Survey	148 days	Tue 10/4/16	Thu 4/27/17
4	Erosion Control	23 days	Tue 10/4/16	Thu 11/3/16
5	Clear and Grub	2 days	Fri 4/28/17	Mon 5/1/17
6	SR-20 Road Berm	45 days	Tue 5/2/17	Mon 7/3/17
7	Building Demo	45 days	Tue 5/2/17	Mon 7/3/17
8	Buildind Utilty Demo	45 days	Tue 5/2/17	Mon 7/3/17
9	Dike Road Pavement Demo	24 days	Tue 5/2/17	Fri 6/2/17
10	Dike Road Utility Demo	48 days	Tue 5/2/17	Thu 7/6/17
11	Demo Tide Gate	3 days	Tue 5/2/17	Thu 5/4/17
12	Rebuild SR-20	26 days	Tue 7/4/17	Tue 8/8/17
13	SR-20 Bridge	109 days	Wed 8/9/17	Mon 1/8/18
14	SR-20 Pavement Demo	24 days	Tue 1/9/18	Fri 2/9/18
15	SR-20 Berm Removal	130 days	Mon 2/12/18	Fri 8/10/18
16	Utility Installation	120 days	Tue 7/4/17	Mon 12/18/17
17	Shoreline Dike (Road Berm)	42 days	Mon 6/5/17	Tue 8/1/17
18	Dike Road Rebuild	26 days	Wed 8/2/17	Wed 9/6/17
19	Dike Road Bridge	300 days	Thu 9/7/17	Wed 10/31/18
20	Revegetation	62 days	Thu 11/1/18	Fri 1/25/19
21	Shoreline Dike Demo	63 days	Thu 11/1/18	Mon 1/28/19
22	Fill Ditches	10 days	Thu 11/1/18	Wed 11/14/18
23	Beach Nourishment	33 days	Mon 1/28/19	Wed 3/13/19
24	Finish	1 day?	Thu 3/14/19	Thu 3/14/19



Project: Dugualla Bay
Date: Fri 3/25/16

Task	External Milestone	Manual Summary Rollup
Split	Inactive Task	Manual Summary
Milestone	Inactive Milestone	Start-only
Summary	Inactive Summary	Finish-only
Project Summary	Manual Task	Deadline
External Tasks	Duration-only	Progress

Risk No.	Risk/Opportunity Event	Concerns	PDT Discussions	Project Cost			Project Schedule		
				Likelihood*	Impact*	Risk Level*	Likelihood*	Impact*	Risk Level*
Contract Risks (Internal Risk Items are those that are generated, caused, or controlled within the PDT's sphere of influence.)									
	PROJECT & PROGRAM MGMT								
PPM-1	Project Scheduling	High volume of projects under the PSNERP authorization may present issues in terms of resource allocation and quality control.	PDT does not believe the volume of project will cause problems. Project will be schedule over years and even decades in order to meet construction goals.	Very Unlikely	Negligible	LOW	Very Unlikely	Negligible	LOW
PPM-2	Staffing Reductions	Both the Seattle District and the WDFW have numerous projects competing for staffing resources. If other projects become a higher priority staff could be pulled from PSNERP.	PSNERP remains a District and WDFW priority and will is less likely than other projects to see staffing reductions. There are minor cost increases due to increases in work being out-sourced to AEs and potential slowdowns is staffing is shifted on short notice.	Unlikely	Marginal	LOW	Very Unlikely	Negligible	LOW
PPM-3	Communication Issues	Excellent communications is necessary in order to successfully complete the project. Both internal issues intra-Corps or intra-WDFW, or issues between the Corps and local sponsors could affect the project timeline.	The project currently has strong communication and trust between the Corps and WDFW, and enjoys high levels of political support both from the Federal and local sponsors. There are other local sponsors (municipalities, tribes, NGOs, etc.) that will be involved once the project moves into PED/CG phase. Communications with these entities may be more fraught and there are likely to be at least some schedule delays because of this.	Very Unlikely	Negligible	LOW	Likely	Marginal	MODERATE
PPM-4	Poor Initial Project Performance	The PSNERP project will be very visible in the Puget Sound area once construction begins. Could an early action that performs poorly (reduced environmental benefits, project neighbors who felt slighted or whose concerns were not fully addressed, etc.) cause the remainder of the project to have increased cost/schedule?	PDT believes its very unlikely that there would be a poorly performing initial project as the earliest projects that proceed to construction are likely to be those whose success is the most assured. Impacts would likely be delays to the start of projects, and costs other than increases due to inflation would be unlikely.	Very Unlikely	Negligible	LOW	Very Unlikely	Marginal	LOW
PPM-5	Authorization at 10% Design	Project is going forward for authorization at a 10% design level. Usually TSP is done at the 35%. Unknown elements may increase cost and schedule.	This is a very likely risk. Contract costs could increase substantially if this project is not awarded until 2020. However, authorized funding is adjusted for inflation, and the impacts due to delay are mitigated somewhat because of this.	Very Likely	Significant	HIGH	Very Likely	Negligible	LOW
Risk No.	**Risk/Opportunity Event**	**Concerns**	**PDT Discussions**	**Project Cost**			**Project Schedule**		
				Likelihood*	**Impact***	**Risk Level***	**Likelihood***	**Impact***	**Risk Level***
	CONTRACT ACQUISITION RISKS								
CA-1	Small Business Markups	The Seattle District has goals for allocating projects to small businesses, women/minority/veteran owned businesses, and other historically underutilized groups and areas. Costs could increase due to a restricted bidding environment and higher contractor markups.	Project size to a certain degree drives whether or not a project will go to restricted bidding. Anything under $20M is very likely to be restricted, over $30M will likely be full and open, and anything in-between could go either way. During the estimating process all contracts were assumed to be advertised to small businesses only. Its possible that projects between $20-30M could see cost reductions, and it's very likely that projects over $40M will see reductions.	Unlikely	Critical	MODERATE	Very Unlikely	Negligible	LOW
CA-2	Inefficient Contractors	The acquisition process may higher inefficient contractors.	PDT believe that this is unlikely. Contracting language and selection processes can be done in a way that can filter out poor performing contractors.	Very Unlikely	Negligible	LOW	Unlikely	Marginal	LOW
				Project Cost			**Project Schedule**		

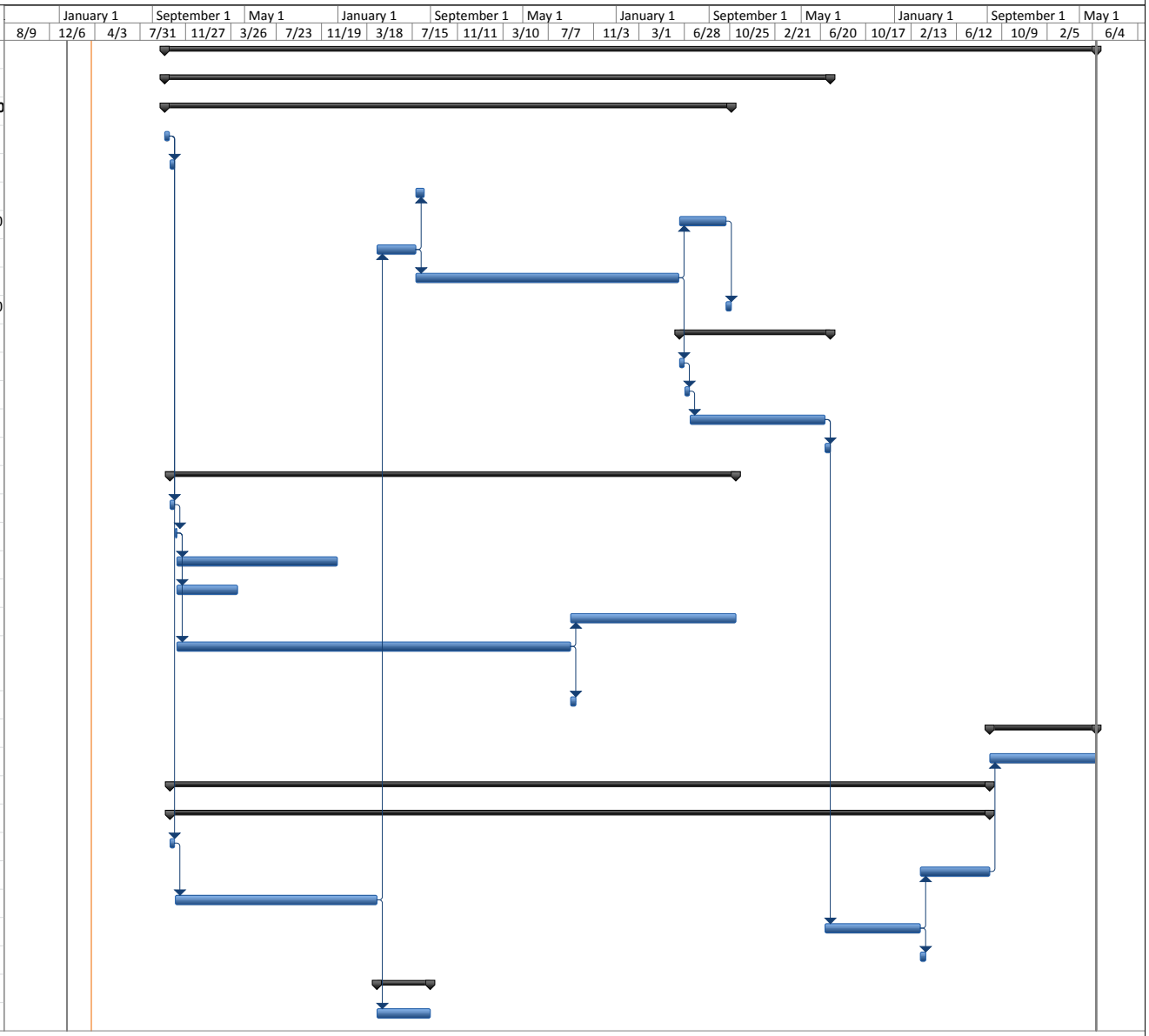
Risk No.	Risk/Opportunity Event	Concerns	PDT Discussions	Likelihood*	Impact*	Risk Level*	Likelihood*	Impact*	Risk Level*
	TECHNICAL RISKS								
TL-1	Changes to levee design	Levee design changes due to limited geotechnical knowledge.	PDT believes that there is a high likelihood of the increased levee scope due to limited knowledge of geotechnical conditions. Levee settlement is the biggest concern. Impact to cost would be significant.	Likely	Significant	HIGH	Likely	Significant	HIGH
TL-2	Levee Settling	Potential of levee elevation change due to settling.	Current levee design does not account for the potential of any levee settling. Area is known to be marsh land and there is high risk of mitigation, substantial redesign, or other work being required to change the berm itself or to fix utilities if the break. Assume an increase in costs to have to go back demo a portion of the roadway, fix the utilities, add fill, and reinstall the road. Potential significant impact on cost. Per NWS Soils, a 30% increase in soil costs is possible.	Very Likely	Significant	HIGH	Very Likely	Critical	HIGH
TL-3	Demo tide gate structure	Conditions at the area are unknown. Estimators assumptions were used to determine production and method.	Since almost everything is unknown about this feature of work, it is very likely there will be increases. Any likely change would have a negligible impact on costs.	Very Likely	Negligible	LOW	Very Unlikely	Negligible	LOW
TL-4	On-Site Borrow	Could on-site borrow be used to fulfill some or all of the levee fill requirements?	The PDT does not believe this is a possible opportunity. The only possible source would be the fill from the existing levees, but the new setback levees must be installed prior to removal of the existing levees.	Very Unlikely	Negligible	LOW	Very Unlikely	Negligible	LOW
TL-5	Additional Drainage Requirements	There are limited drainage features through the levee. Could additional gates be required?	PDT believes this risk is likely. There may be a possible 10% cost adjustment to the levees for additional drainage features.	Likely	Critical	HIGH	Likely	Negligible	LOW
TL-6	Deeper Bridge Piers	Bridge designs were not adjusted for each individual site, but are a common design. Is this appropriate for Dugualla with its more marginal subsurface conditions?	NWS Soils believe piers may need to extend an additional 50' for all bridge items. Additionally, more scour protection could be required at the base of bridge piers.	Very Likely	Significant	HIGH	Very Likely	Marginal	MODERATE
				Project Cost			**Project Schedule**		
Risk No.	**Risk/Opportunity Event**	**Concerns**	**PDT Discussions**	**Likelihood***	**Impact***	**Risk Level***	**Likelihood***	**Impact***	**Risk Level***
	LANDS AND DAMAGES RISKS								
LD-1	Hostile landowners	Unwilling landowners who do not want to sell land or provide easements could drive up costs.	If landowners are unwilling to sell, the action may not move forward. A more likely scenario is that a few landowners are not willing to sell and some mitigation will need to be done in order to protect their property from inundation. PDT believes that there is a high likelihood of unwilling sellers, and the most likely mitigation would be to construct additional dikes. 1000' of additional dike would raise costs into the significant range.	Very Likely	Significant	HIGH	Very Likely	Significant	HIGH
LD-2	Relocations	Is it possible that relocations may not have been completed by the time construction started, potentially delaying projects. Additionally, H&H modelling has not been done for all sites. Could higher calculated water lines affect additional properties?	Relocations not being completed is very unlikely as all projects must have their real estates objectives met prior to construction starting. The potential for increased affected areas is likely and contains significant costs. Primarily this is due to utilities as increased costs for property relocations is captured in the real estate contingency.	Likely	Marginal	MODERATE	Likely	Marginal	MODERATE
LD-3	Vagrancy/Loitering	Could vagrants on the project site slow the project?	Very unlikely. Most sites are well away from large populated areas and are not likely to contain transient populations.	Very Unlikely	Negligible	LOW	Very Unlikely	Negligible	LOW

Risk No.	Risk/Opportunity Event	Concerns	PDT Discussions	Project Cost			Project Schedule		
				Likelihood*	Impact*	Risk Level*	Likelihood*	Impact*	Risk Level*
	REGULATORY AND ENVIRONMENTAL RISKS								
RE-1	Contaminated Drainage Fields	Potential leaking pipes/contaminated drainage fields releasing sanitary waste.	Likely that this would occur, but it would be at low concentrations and volumes. Negligible increase in cost.	Likely	Negligible	LOW	Very Unlikely	Negligible	LOW
RE-2	Building HTRW	Buildings have not been surveyed for HAZMAT materials. As many of the buildings are older there may be a potential for asbestos, lead, or other materials.	PDT believes this is very likely to occur, but there is standard procedures to deal with these problems. Marginal cost increase	Very Likely	Marginal	MODERATE	Unlikely	Marginal	LOW
RE-3	Petroleum Compounds in Road Dikes	Years of driving on existing road berms may have lead to petroleum contamination.	It is very likely that leaking vehicles have contaminated small (relative to total volume) amounts of soil and base course. Material would need to be excavated and disposed of properly. Negligible cost increase for all dikes.	Very Likely	Negligible	LOW	Very Unlikely	Negligible	LOW
RE-4	Contamination from NAS Whidbey	NAS Whidbey is reported to have possibly spilled petroleum in the area.	Very high likelihood of finding low level petroleum contamination. Material would need to be excavated and disposed of properly. Marginal cost increase.	Very Likely	Marginal	MODERATE	Very Unlikely	Negligible	LOW
Risk No.	**Risk/Opportunity Event**	**Concerns**	**PDT Discussions**	**Project Cost**			**Project Schedule**		
				Likelihood*	**Impact***	**Risk Level***	**Likelihood***	**Impact***	**Risk Level***
	CONSTRUCTION RISKS								
CON-1	Building Demolition	Building construction is assumed light frame and foundation. Heavier structures would be more difficult to demolish and remove.	High likelihood of at least some of the buildings on-site being heavier construction than this. A 20% increase in cost due to more complicated building construction would have a negligible impact on total project cost.	Very Likely	Negligible	LOW	Very Likely	Negligible	LOW
CON-2	Equipment Accessibility	Production rate is dependent on soil conditions suitable for equipment travel.	If soil is saturated or has other issues travel in the areas where channels are being excavated will be difficult. While weather days are included in the schedule, rain at any time could so saturate the soil that it is unworkable for time past the actual weather event. Also, if conditions are inherently unsuitable changes in work methods will be required. A 25% production rate slowdown, would have a significant increase on costs.	Likely	Significant	HIGH	Likely	Significant	HIGH
Risk No.	**Risk/Opportunity Event**	**Concerns**	**PDT Discussions**	**Project Cost**			**Project Schedule**		
				Likelihood*	**Impact***	**Risk Level***	**Likelihood***	**Impact***	**Risk Level***
	ESTIMATE AND SCHEDULE RISKS								
EST-1	Earthwork Construction	Site conditions were assumed appropriate to bring in large scale equipment. Changes in this would affect size of equipment and thus production.	If weather and soil conditions are not suitable for large equipment, smaller pieces will need to be brought in, or an access road will need to be built. A 20% slowdown in production will increase levee removal and install costs. This would have a marginal impact on overall cost.	Likely	Critical	HIGH	Likely	Negligible	LOW
EST-2	Fish Windows	In-water work windows control a certain portion of the schedule and may drive overall construction duration.	Existing levee work occurs in or near the river. In-water work is a relatively narrow window. It may not be possible for a contractor to complete all the work necessary in a single season, necessitating multiple mob/demobs and lost efficiency.	Likely	Negligible	LOW	Likely	Crisis	HIGH

EST-3	Fuel Cost Increases	Fuel cost increases above expected rates will contribute to total project costs.	Fuel costs for the machinery and the hauling. An increase of 25% in fuel costs increases the total project cost less than 0.5%.	Likely	Significant	HIGH	Very Unlikely	Negligible	LOW
EST-4	Speculative Earthwork Quantities	Earthwork quantities were entirely developed through aerial surveys. Removal costs may increase	The PDT believes that it is very high likely that there will be additional quantities due to margin of error inherent in aerial surveys. Errors may be present in shoreline dike removal, SR-20 berm removal, Dugualla Lake berm removal, and beach nourishment placement.	Very Likely	Significant	HIGH	Very Likely	Significant	HIGH
EST-5	Beach Fill Haul	It is assumed in the estimate, that trucks will be able to access the area to deposit fill. If this is not possible and material must be unloaded and then reloaded into equipment that can access the site	At present, conditions are expected to allow trucks to access the site, so this risk is unlikely to occur	Unlikely	Marginal	LOW	Unlikely	Marginal	LOW
EST-6	Estimator Assumptions	As the project drawings were only completed to a 10% level, the estimator made a variety of assumptions regarding items such as utility installation, site access points, and overall production. At higher level of detail, these assumptions may be revised.	Assumptions were generally conservative, but there is definitely potential for cost movement on these items. Some manner of cost impact should be considered likely.	Likely	Marginal	MODERATE	Likely	Marginal	MODERATE
				Project Cost			**Project Schedule**		
Risk No.	**Risk/Opportunity Event**	**Concerns**	**PDT Discussions**	**Likelihood***	**Impact***	**Risk Level***	**Likelihood***	**Impact***	**Risk Level***
	Programmatic Risks (External Risk Items are those that are generated, caused, or controlled exclusively outside the PDT's sphere of influence.)								
PR-1	Transmission Utility Demolition	The utilities along Dike Road are generally transmission systems that feed whole communities south of the current road. Could special requirements be placed on their demolition?	It's highly likely that disconnecting the current utilities and attaching them to alternate lines would have to be done at off hours. This costs associated with this would be primarily increased labor rates due to construction at unusual times. Negligible overall impact to project cost.	Very Likely	Negligible	LOW	Very Unlikely	Negligible	LOW
PR-2	Presence of Unknown Utilities	Site has not been analyzed for many utilities. Their presence could increase cost and schedule	High likelihood of additional power lines being present. If found, could be either reinforced or relocated. Negligible effect on cost.	Very Likely	Negligible	LOW	Very Likely	Negligible	LOW
PR-3	Historical Buildings	The state historical preservation office will do an evaluation of all buildings at the site to determine whether any form of preservation will be required.	NWS Built Environment archaeologists believes that there is a high potential that one of the buildings would be significant (listed in the National register). Shouldn't have any delays since it will be done before construction. Avoidance would be the best option, but this could require additional berm construction. 1000' of additional berm would have a significant impact on overall cost.	Likely	Marginal	MODERATE	Likely	Marginal	MODERATE
PR-4	Changing Laws/Regulations	Laws, regulations, and guidelines could change over the life of the project, potentially requiring changes in materials used on sites, adjusted construction methodology, or increased design/study requirements.	In general this risk was viewed to be very unlikely to affect the project. The only exception is that the WA Dept. of Ecology may change its sediment management guidelines. However, these changes are not expected to require more than extremely minor adjustments to TPC.	Unlikely	Negligible	LOW	Very Unlikely	Negligible	LOW
PR-5	Presence of Historical Artifacts	Potential for archaeological finds.	Corps Archeologist reports a moderate (likely) chance of finding cultural artifacts within the action area. They believe costs may be significant if found.	Likely	Significant	MODERATE	Likely	Marginal	MODERATE
PR-6	Changing Laws/Regulations	Laws, regulations, and guidelines could change over the life of the project, potentially requiring changes in materials used on sites, adjusted construction methodology, or increased design/study requirements.	In general this risk was viewed to be very unlikely to affect the project. The only exception is that the WA Dept. of Ecology may change its sediment management guidelines. However, these changes are not expected to require more than extremely minor adjustments to TPC.	Unlikely	Negligible	LOW	Very Unlikely	Negligible	LOW

PSNERP
Everett Marshland
Construction Schedule

ID	Task Name	Duration	Start	Finish
1	**Start**	**1747 days**	**Mon 10/3/16**	**Tue 6/13/23**
2	**Relocations**	**1249 days**	**Mon 10/3/16**	**Thu 7/15/21**
3	**Roads**	**1063 days**	**Mon 10/3/16**	**Wed 10/28/20**
4	Mobilize	10 days	Mon 10/3/16	Fri 10/14/16
5	Survey	10 days	Mon 10/17/16	Fri 10/28/16
6	Road Demo	16 days	Tue 7/24/18	Tue 8/14/18
7	Bridge Demo	88 days	Mon 6/15/20	Wed 10/14/20
8	Road Installation	72 days	Fri 4/13/18	Mon 7/23/18
9	Bridge Installation	494 days	Tue 7/24/18	Fri 6/12/20
10	Demobilization	10 days	Thu 10/15/20	Wed 10/28/20
11	**Railroads**	**284 days**	**Mon 6/15/20**	**Thu 7/15/21**
12	Mobilize	10 days	Mon 6/15/20	Fri 6/26/20
13	Survey	10 days	Mon 6/29/20	Fri 7/10/20
14	Bridge Installation	254 days	Mon 7/13/20	Thu 7/1/21
15	Demobilization	10 days	Fri 7/2/21	Thu 7/15/21
16	**Utilities**	**1061 days**	**Mon 10/17/16**	**Mon 11/9/20**
17	Mobilize	10 days	Mon 10/17/16	Fri 10/28/16
18	Survey	4 days	Mon 10/31/16	Thu 11/3/16
19	Distribution Utilities	301 days	Fri 11/4/16	Fri 12/29/17
20	BPA Transmission Line	113 days	Fri 11/4/16	Tue 4/11/17
21	Pump Station Removal	310 days	Tue 9/3/19	Mon 11/9/20
22	Pump Station Construction	737 days	Fri 11/4/16	Mon 9/2/19
23	Demobilization	10 days	Tue 9/3/19	Mon 9/16/19
24	**Fish & Wildlife**	**200 days**	**Wed 9/7/22**	**Tue 6/13/23**
25	Vegetation	200 days	Wed 9/7/22	Tue 6/13/23
26	**Levees & Floodwalls**	**1537 days**	**Mon 10/17/16**	**Tue 9/6/22**
27	**Levee Installation**	**1537 days**	**Mon 10/17/16**	**Tue 9/6/22**
28	Mobilize	10 days	Mon 10/17/16	Fri 10/28/16
29	Fill Ditches	130 days	Wed 3/9/22	Tue 9/6/22
30	Setback Levess	379 days	Mon 10/31/16	Thu 4/12/18
31	Remove Levees	178 days	Fri 7/2/21	Tue 3/8/22
32	Demobilization	10 days	Wed 3/9/22	Tue 3/22/22
33	**Floodway Control & Diversion**	**100 days**	**Fri 4/13/18**	**Thu 8/30/18**
34	Diversion Structure	100 days	Fri 4/13/18	Thu 8/30/18



Project: Everett Marhsland
Date: Fri 3/25/16

Task	Project Summary	Inactive Milestone	Manual Summary Rollup	Deadline	
Split	External Tasks	Inactive Summary	Manual Summary	Progress	
Milestone	External Milestone	Manual Task	Start-only		
Summary	Inactive Task	Duration-only	Finish-only		

PSNERP
Everett Marshland
Risk Register

March 2016

Risk No.	Risk/Opportunity Event	Concerns	PDT Discussions & Conclusions	Project Cost			Project Schedule		
				Likelihood*	Impact*	Risk Level*	Likelihood*	Impact*	Risk Level*
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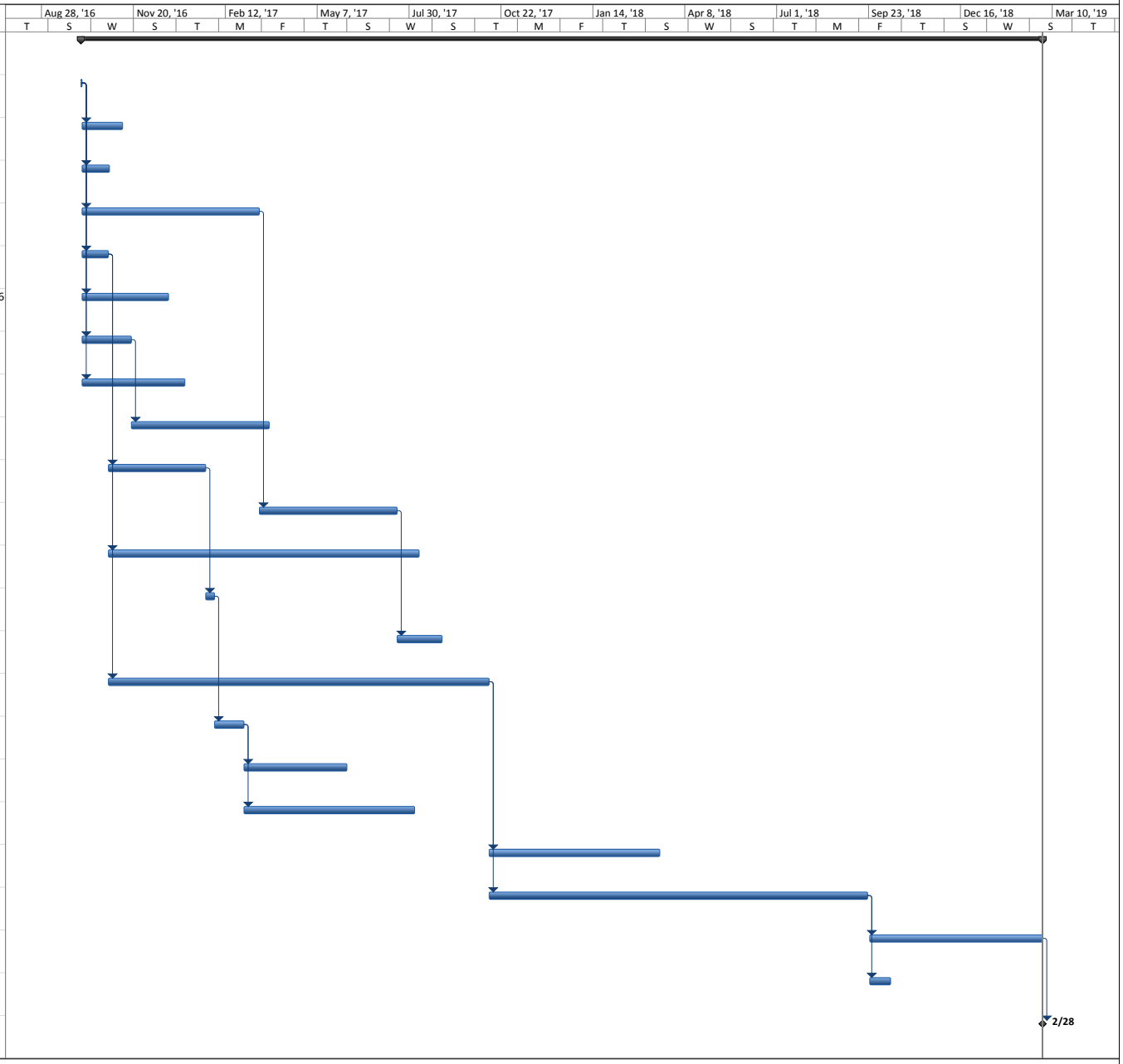
PPM-1	Project Scheduling	High volume of projects under the PSNERP authorization may present issues in terms of resource allocation and quality control.	PDT does not believe the volume of project will cause problems. Project will be schedule over years and even decades in order to meet construction goals.	Very Unlikely	Negligible	LOW	Very Unlikely	Negligible	LOW
PPM-2	Staffing Reductions	Both the Seattle District and the WDFW have numerous projects competing for staffing resources. If other projects become a higher priority staff could be pulled from PSNERP.	PSNERP remains a District and WDFW priority and will is less likely than other projects to see staffing reductions. There are minor cost increases due to increases in work being out-sourced to AEs and potentiall slowdowns is staffing is shifted on short notice.	Very Unlikely	Negligible	LOW	Very Unlikely	Negligible	LOW
PPM-3	Communication Issues	Excellent communications is necessary in order to sucessfully complete the project. Both internal issues intra-Corps or intra-WDFW, or issues between the Corps and local sponsors could affect the project timeline.	The project currently has strong communication and trust between the Corps and WDFW, and enjoys high levels of political support both from the Federal and local sponsors. There are other local sponsors (municipalities, tribes, NGOs, etc) that will be involved once the project moves into PED/CG phase. Communications with these entities may be more fraught and there are likely to be at least some schedule delays because of this.	Very Unlikely	Negligible	LOW	Likely	Marginal	MODERATE
PPM-4	Poor Initial Project Perfomance	The PSNERP project will be very visible in the Puget Sound area once construction begins. Could an early action that performs poorly (reduced environmental benefits, project neighbors who felt slighted or whose concerns were not fully addressed, etc) cause the remainder of the project to have increased cost/schedule?	PDT believes its very unlikely that there would be a poorly performing initial project as the earliest projects that proceed to construction are likely to be those whose success is the most assured. Impacts would likely be delays to the start of projects, and costs other than increases due to inflation would be unlikely.	Very Unlikely	Negligible	LOW	Very Unlikely	Negligible	LOW
Risk No.	**Risk/Opportunity Event**	**Concerns**	**PDT Discussions & Conclusions**	**Project Cost**			**Project Schedule**		
				Likelihood*	**Impact***	**Risk Level***	**Likelihood***	**Impact***	**Risk Level***
	CONTRACT ACQUISITION RISKS								
CA-1	Potenially Could Go Small Business	This estimate assumes SB open acquisition. The prime contractor is doing no work. All the work done is done by subcontractors. This project could be acquired by other methods aside from SB open competition. The size of this project is very large. The project will probably be constructed under multiple acquisitions.	Typically if a project goes very restrictive small business the amount of subcontracting and the overhead rates increase. Subcontracting should not be much of the risk for this project since everything is subbed out. If this went small business the overhead would increase. Other strategies could also increase costs. Given the nature of this work it is felt that it could go small business. Also, other methods may be used as well. It is considered likely that the contracting method could change from what is proposed in the estimate. The impact could be up to 10%.	Very Likely	Significant	HIGH	Very Likely	Significant	HIGH
CA-2	Railroad Bridge Placement Contracting	Uncertainty on who would execute this work. Would it be USACE or the railroad?	If railroad handles the contract there is potential for cost increases.	Likely	Critical	HIGH	Very Unlikely	Negligible	LOW
CA-3	Inefficient Contractors	The acquisition process may higher inefficient contractors.	PDT believe that this is unlikely. Contracting language and selection processes can be done in a way that can filter out poor performing contractors.	Very Unlikely	Negligible	LOW	Very Unlikely	Negligible	LOW
Risk No.	**Risk/Opportunity Event**	**Concerns**	**PDT Discussions & Conclusions**	**Project Cost**			**Project Schedule**		
				Likelihood*	**Impact***	**Risk Level***	**Likelihood***	**Impact***	**Risk Level***
	TECHNICAL RISKS								

TL-1	Earthwork - Lack of Details	Limited work was done to determine the requirements that would be placed on the levees. Additional analysis may increase SOW.	There is the possibility that the areas of excavation and fill could change from what is presented in the draft report. Any increase in quantity will be covered in the Quantity risk element section. The risk here is that the nature of the earthwork may change. There could be additional requirements (not quantities) imposed in the excavation and fill. It is thought to be at least a 50% chance that the scope of the earthwork will change. Any changes in scope could easily increase the cost for this item by 2%. That would translate to 1% increase in TPC.	Likely	Significant	HIGH	Very Likely	Critical	HIGH
TL-2	Pump Station	No information is known for the demolition or installation of the pump station.	The only item used for estimating this item was an aerial photograph for demolition. It is very likely that scope will change for this item because there is currently no scope provided. This item has a critical impact given the potential for cost growth. Pumps, electrical components, SCADA and other components are unknown. PDT mentioned fish passage which increases the requirements of fabrication. There is a very likely risk here. Assume impact is significant.	Very Likely	Significant	HIGH	Very Likely	Significant	HIGH
TL-3	Road Bridge Placement	No design. Same typical section used for all of the bridges. Seismic requirements.	The bridge type is likely to change or some elements of the scope of the proposed bridge. The bridge is approximately under 10% of the construction cost.	Likely	Significant	HIGH	Very Likely	Significant	HIGH
TL-4	Railroad Bridge Placement	No design. Typical section used for estimate development. Seismic requirements and tying into existing bridges.	The bridge type is likely to change or some elements of the scope of the proposed bridge. Currently proposed construction methodology is to replace while under use. This will be extremely problemmatic and will likely require rethinking during PED.	Very Likely	Critical	HIGH	Very Likely	Critical	HIGH
				Project Cost			Project Schedule		
Risk No.	**Risk/Opportunity Event**	**Concerns**	**PDT Discussions & Conclusions**	**Likelihood***	**Impact***	**Risk Level***	**Likelihood***	**Impact***	**Risk Level***
	LANDS AND DAMAGES RISKS								
LD-2	Structure Removal	No details for the structures to be removed.	The PDT noted that there is the possibility of residential relocation. It is as good assumption that it is likely the scope for this item will increase. The impact is assumed to be marginal.	Likely	Marginal	MODERATE	Likely	Marginal	MODERATE
LD-3	Land Acquisition	Land acquisitions and unwilling property owners. Stakeholder involvement.	This has the potential to change the project scope. Risk captured in the scope risk element.	Very Unlikely	Negligible	LOW	Very Unlikely	Negligible	LOW
				Project Cost			Project Schedule		
Risk No.	**Risk/Opportunity Event**	**Concerns**	**PDT Discussions & Conclusions**	**Likelihood***	**Impact***	**Risk Level***	**Likelihood***	**Impact***	**Risk Level***
	REGULATORY AND ENVIRONMENTAL								
RE-2	HTRW - Earthwork	Farming chemicals, containers with residual products.	High potential per PDT meeting. This would require remediation simular to the work in the landfill or creosote facility tasks. Impact could be significant. ---JUNE 2014--- Risk is removed. HTRW issues are a 100% local sponsor responsibility. LERRD creditng is not applicable	Likely	Significant	HIGH	Very Likely	Significant	HIGH
				Project Cost			Project Schedule		
Risk No.	**Risk/Opportunity Event**	**Concerns**	**PDT Discussions & Conclusions**	**Likelihood***	**Impact***	**Risk Level***	**Likelihood***	**Impact***	**Risk Level***
	CONSTRUCTION RISKS								
CON-1	Post-Levee Removal Flooding	Following levee removal work on filling ag ditches will occur. The site will be vulnerable to flooding at that point and there could be slow downs.	This is likely to occur due to the duration required to remove the existing levee and fill the ditches. Likely to affect schedule only	Very Unlikely	Negligible	LOW	Likely	Significant	HIGH

CON-2	Earthwork - Settlement issues	Potential settlement issues and potential additional lifts to be added for levee construction.	Would like need to so stage construction where levees are constructed and then wait a year for settlement and then return to complete the work. Assume likely with significant impacts.	Likely	Significant	HIGH	Likely	Significant	HIGH
CON-3	Pump Station - site access	This item has the potential for complex construction issues.	Site access, demolition, and installation may present needs for unique cosntruciton techniques. Assume likely with significant impact.	Likely	Significant	HIGH	Unlikely	Significant	MODERATE
				Project Cost			**Project Schedule**		
Risk No.	**Risk/Opportunity Event**	**Concerns**	**PDT Discussions & Conclusions**	**Likelihood***	**Impact***	**Risk Level***	**Likelihood***	**Impact***	**Risk Level***
	ESTIMATE AND SCHEDULE RISKS								
EST-1	Earthwork Quantities	Very few cross sections, just typical sections used in quantity development. Additionally the level of detail from LIDAR work is limited.	More information will be obtained as design progresses. It is likely that there will be a change in the quantities. Assume Significant impact. Large cost item.	Likely	Significant	HIGH	Likely	Significant	HIGH
EST-2	Pump station - Quantities	No information is known for the demolition or installation of the pump station.	Quantities developed were very rough estimates. Very likely for the quantities to change. Impact is large, assume critical.	Very Likely	Critical	HIGH	Very Likely	Significant	HIGH
EST-4	Landfill & Creosote Facility Quantities	Assumed depth of removal and percentage of area needing removal.	No basis for cost engineer's assumptions. Very Likely the quantities will change. Impact could double costs and are critical. ---JUNE 2014--- Risk is removed. HTRW issues are a 100% local sponsor responsibility. LERRD creditng is not applicable	Very Likely	Critical	HIGH	Very Likely	Significant	HIGH
				Project Cost			**Project Schedule**		
Risk No.	**Risk/Opportunity Event**	**Concerns**	**PDT Discussions & Conclusions**	**Likelihood***	**Impact***	**Risk Level***	**Likelihood***	**Impact***	**Risk Level***
	ECONOMICS RISKS								
FL-1	Fuel	Fuel prices are volatile and will probably go up	A 25% increase in fuel could contribute to up to a 3% increase in total construction costs. How likely is it that gasoline will reach $5.00/gal? Depends on who you ask. For the purposes of this risk analysis, assume that it is unlikely.	Unlikely	Marginal	LOW	Very Unlikely	Negligible	LOW
FL-2	Asphalt	Asphalt is a petroleum product and subject to fluctuation.	Assume likely and marginal.	Likely	Marginal	MODERATE	Very Unlikely	Negligible	LOW
FL-3	Concrete & Steel		Cost of steel and other metals are subject to market conditions. It is believed that there is at least a 50% chance of fluctuation upward. The impact is considered to increase the total project costs no more than 1%	Likely	Marginal	MODERATE	Very Unlikely	Negligible	LOW
				Project Cost			**Project Schedule**		
Risk No.	**Risk/Opportunity Event**	**Concerns**	**PDT Discussions & Conclusions**	**Likelihood***	**Impact***	**Risk Level***	**Likelihood***	**Impact***	**Risk Level***
	Programmatic Risks	(External Risk Items are those that are generated, caused, or controlled exclusively outside the PDT's sphere of influence.)							
PR-1	Changing Laws/Regulations	Laws, regulations, and guidelines could change over the life of the project, potentially requiring changes in materials used on sites, adjusted construction methodology, or increased design/study requirements.	In general this risk was viewed to be very unlikely to affect the project. The only exception is that the WA Dept of Ecology may change its sediment management guidelines. However, these changes are not expected to require more than extremely minor adjustments to TPC.	Very Unlikely	Negligible	LOW	Very Likely	Negligible	LOW

PSNERP
Telegraph Slough
Construction Schedule

ID	Task Mode	Task Name	Duration	Start	Finish
1		**Telegraph Slough Full Restoration**	**629 days**	**Mon 10/3/16**	**Thu 2/28/19**
2		Start	1 day	Mon 10/3/16	Mon 10/3/16
3		Demo Marina & Piers	27 days	Tue 10/4/16	Wed 11/9/16
4		Construct (2) 6'x6 Box Culverts	19 days	Tue 10/4/16	Fri 10/28/16
5		Construct Railroad Embankment	116 days	Tue 10/4/16	Tue 3/14/17
6		Excavate Sediment Filled Channel	18 days	Tue 10/4/16	Thu 10/27/16
7		Construct Temporary Traffic Controls	57 days	Tue 10/4/16	Wed 12/21/16
8		Relocate Overhead Transmission	33 days	Tue 10/4/16	Thu 11/17/16
9		Demo Site Wide Structures	68 days	Tue 10/4/16	Thu 1/5/17
10		Demo Site Utilities/Septic	90 days	Fri 11/18/16	Thu 3/23/17
11		Construct Setback Dike	63 days	Fri 10/28/16	Tue 1/24/17
12		Construct New Railroad	90 days	Wed 3/15/17	Tue 7/18/17
13		Construct Railroad Bridge	202 days	Fri 10/28/16	Mon 8/7/17
14		Excavate Channel	6 days	Wed 1/25/17	Wed 2/1/17
15		Demo Existing Railroad	29 days	Wed 7/19/17	Mon 8/28/17
16		Construct West Bound SR-20 Bridge	248 days	Fri 10/28/16	Tue 10/10/17
17		Construct 10' Culvert	19 days	Thu 2/2/17	Tue 2/28/17
18		Lower Existing Utilities	68 days	Wed 3/1/17	Fri 6/2/17
19		Raise SR-20 West Bound	112 days	Wed 3/1/17	Thu 8/3/17
20		Raise SR-20 East Bound	112 days	Wed 10/11/17	Thu 3/15/18
21		Construct East Bound SR-20 Bridge	248 days	Wed 10/11/17	Fri 9/21/18
22		Remove Existing Dikes	114 days	Mon 9/24/18	Thu 2/28/19
23		Remove Tidal Gates	15 days	Mon 9/24/18	Fri 10/12/18
24		Finish	0 days	Thu 2/28/19	Thu 2/28/19



Project: Telegraph Slough
Date: Fri 3/25/16

Task	Summary	External Milestone	Inactive Summary	Manual Summary Rollup	Finish-only				
Split	Project Summary	Inactive Task	Manual Task	Manual Summary	Deadline				
Milestone	External Tasks	Inactive Milestone	Duration-only	Start-only	Progress				

PSNERP
Telegraph Slough
Risk Register

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Risk No.	Risk/Opportunity Event	Concerns	PDT Discussions	Project Cost			Project Schedule		
				Likelihood*	Impact*	Risk Level*	Likelihood*	Impact*	Risk Level*
Contract Risks (Internal Risk Items are those that are generated, caused, or controlled within the PDT's sphere of influence.)									
	PROJECT & PROGRAM MGMT								
PPM-1	Potential for scope reduction	As this project is a very large and diverse environmental restoration effort with multiple features there is the potential that project elements will be descoped to move forward with the project.	This is a tier 2 project encompassing a large array of features. This project is also one of the higher estimated projects and it is very likely that features will be descoped. Which specific features is unknown at this time.	Likely	Significant	HIGH	Likely	Significant	HIGH
PPM-2	Long delay before anticipated award date	This project award date has been set to 2034 as of July 2014. This is an extreme amount of time from project inception to award.	Contract costs could increase substantially if this project is not awarded until 2034. However, authorized funding is adjusted for inflation, and the impacts due to delay are mitigated somewhat because of this.	Very Likely	Significant	HIGH	Very Unlikely	Negligible	LOW
PPM-3	Authorization at 10% Design	Project is going forward for authorization at a 10% design level. Usually TSP is done at the 35%. Unknown elements may increase cost and schedule.	This impact was discussed while deciding to go down this path. This action is fairly well defined as is, and the potential for scope increases are accounted for in the evaluations of individual elements. This risk is to capture the potential for scope creep and added features that were not originally considered.	Unlikely	Significant	MODERATE	Unlikely	Negligible	LOW
PPM-4	Project Scheduling	High volume of projects under the PSNERP authorization may present issues in terms of resource allocation and quality control.	PDT does not believe the volume of project will cause problems. Project will be schedule over years and even decades in order to meet construction goals.	Very Unlikely	Negligible	LOW	Very Unlikely	Negligible	LOW
PPM-5	Staffing Reductions	Both the Seattle District and the WDFW have numerous projects competing for staffing resources. If other projects become a higher priority staff could be pulled from PSNERP.	PSNERP remains a District and WDFW priority and will is less likely than other projects to see staffing reductions. There are minor cost increases due to increases in work being out-sourced to AEs and potential slowdowns is staffing is shifted on short notice.	Very Unlikely	Negligible	LOW	Likely	Marginal	MODERATE
PPM-6	Communication Issues	Excellent communications is necessary in order to successfully complete the project. Both internal issues intra-Corps or intra-WDFW, or issues between the Corps and local sponsors could affect the project timeline.	The project currently has strong communication and trust between the Corps and WDFW, and enjoys high levels of political support both from the Federal and local sponsors. There are other local sponsors (municipalities, tribes, NGOs, etc.) that will be involved once the project moves into PED/CG phase. This is not expected to be a cost risk.	Very Unlikely	Negligible	LOW	Likely	Marginal	MODERATE
PPM-7	Poor Initial Project Performance	The PSNERP project will be very visible in the Puget Sound area once construction begins. Could an early action that performs poorly (reduced environmental benefits, project neighbors who felt slighted or whose concerns were not fully addressed, etc.) cause the remainder of the project to have increased cost/schedule?	PDT believes its very unlikely that there would be a poorly performing initial project as the earliest projects that proceed to construction are likely to be those whose success is the most assured. Impacts would likely be delays to the start of projects, and costs other than increases due to inflation would be unlikely.	Very Unlikely	Marginal	LOW	Very Unlikely	Negligible	LOW
PPM-8	Multi-year contract award	This project has an extremely large estimate construction cost. There is a risk that the project will be broken into multiple contract phases and awarded separately over multiple Fiscal Years	PDT believes its like that this project will be broken up into smaller contract solicitations due to the large estimated construction cost. It is unknown how the project would be broken up at this time, and what the cost impacts of this would be.	Likely	Negligible	LOW	Very Unlikely	Negligible	LOW
Risk No.	Risk/Opportunity Event	Concerns	PDT Discussions	Project Cost			Project Schedule		
				Likelihood*	Impact*	Risk Level*	Likelihood*	Impact*	Risk Level*
	CONTRACT ACQUISITION RISKS								

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CA-1	Acquisition strategy has not been determined	Acquisition strategy is currently not defined. This estimate assumes full and open acquisition. For this level of estimate, with so much uncertainty, all work has been assumed to be subcontracted out.	Typically if a project goes small business the amount of subcontracting and the overhead rates increase. Subcontracting should not be much of the risk for this project since everything is subbed out. If this went out to a large well equipped contractor the costs could be reduced by less subcontracting. Subbing out 20% of the work results in approximately a 5% reduction in total cost.	Unlikely	Marginal	LOW	Very Unlikely	Negligible	LOW
				Project Cost			Project Schedule		
Risk No.	**Risk/Opportunity Event**	**Concerns**	**PDT Discussions**	**Likelihood***	**Impact***	**Risk Level***	**Likelihood***	**Impact***	**Risk Level***
	TECHNICAL RISKS								
TL-1	Temporary Traffic Crossovers	Unknowns in how the traffic will be managed during demolition of the existing bridge and construction of new bridge.	Without preliminary design there is potential for scope change regarding traffic management	Likely	Marginal	MODERATE	Unlikely	Negligible	LOW
TL-2	Plans are incomplete	Drawings that are available are conceptual in nature and may contain errors or not fully match the site	Very likely that there is some level of data missing from the current design reports and plans. This risk to capture the potential for cost driving errors in construction features that were identified but limited data was available and assumptions were used; such as bridge piles, bridge profile, utility locations and types.	Very Likely	Significant	HIGH	Very Likely	Significant	HIGH
				Project Cost			Project Schedule		
Risk No.	**Risk/Opportunity Event**	**Concerns**	**PDT Discussions**	**Likelihood***	**Impact***	**Risk Level***	**Likelihood***	**Impact***	**Risk Level***
	LANDS AND DAMAGES RISKS								
LD-1	Demolition of Misc. Buildings (Marina Boat Storage Facility)	The Marina has not been contacted about any restoration actions affecting their property.	The Marina would need to be acquired because of the modification to the berms. If it is not acquired, there would be a change to the project features (dike alignment), but the project could continue.	Very Likely	Significant	HIGH	Very Likely	Significant	HIGH
LD-2	Railroad Right-of-Entry	Right of entry will be required at all sites with rail roads. Could negotiations with the rail roads extend project timelines?	It's very unlikely to affect an individual project schedule since all real estate items must be negotiated prior to construction beginning. However, it's possible that the right of entry negotiations could contain restrictions as to how work is conducted at the site (e.g., rail operations must be allowed to continue uninterrupted), and these may affect project cost.	Very Unlikely	Marginal	LOW	Unlikely	Marginal	LOW
				Project Cost			Project Schedule		
Risk No.	**Risk/Opportunity Event**	**Concerns**	**PDT Discussions**	**Likelihood***	**Impact***	**Risk Level***	**Likelihood***	**Impact***	**Risk Level***
	REGULATORY AND ENVIRONMENTAL RISKS								
RE-1	Cultural Resource Preservation	Discovery of an archaeological site of significance.	While there has been no previous surveys done within the project APE, there is a known archaeological site within a half mile radius of the project area. The entire APE will need to be surveyed, and if any archaeological resources are found, they will need to be tested and evaluated for the NRHP.	Likely	Marginal	MODERATE	Likely	Significant	HIGH

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RE-2	Building Demolition HTRW	Presence of contaminants at the building sites	Soils and sediments may be contaminated with petroleum hydrocarbons, heavy metals, creosote timbers, and paint containing TBT. Recommend Level I and II surveys be conducted to document extent of contamination. Dredged material may need to be hauled to an appropriate dump site depending on contamination chemical concentrations. Parcels may have stored petroleum products and pesticides, lead-based paint, and asbestos. Recommend Level I and II surveys to document presence/absence of contaminants. (JULY 2014: Risk is removed. HTRW issues are a 100% local sponsor responsibility. LERRD crediting is not applicable)	Very Likely	Marginal	MODERATE	Very Likely	Significant	HIGH
RE-3	Earthwork contamination HTRW	Presence of contaminants for the major earthwork excavations.	Sediments may contain debris and contamination. Recommend Level II survey be conducted to determine presence/absence of contamination. If contamination is documented, dredged material may need to be hauled to an appropriate dump site. Reuse of dike materials may contain contaminated soils since original soil origin unknown. Soil may contain petroleum hydrocarbons. (July 2014: Risk is removed. HTRW issues are a 100% local sponsor responsibility. LERRD crediting is not applicable)	Likely	Significant	HIGH	Likely	Significant	HIGH
				Project Cost			Project Schedule		
Risk No.	**Risk/Opportunity Event**	**Concerns**	**PDT Discussions**	**Likelihood***	**Impact***	**Risk Level***	**Likelihood***	**Impact***	**Risk Level***
	CONSTRUCTION RISKS								
CON-1	No project grading details for earthwork	Preliminary planning stages, insufficient LiDar data and no grading details known for the extensive earthwork outlined for this project.	There could be additional requirements imposed in the excavation and fill. It is thought to be at least a 50% chance that the scope of the earthwork will change.	Likely	Crisis	HIGH	Likely	Critical	HIGH
CON-2	Site Access Issues	There is the potential that excavators will not be sufficient for some excavation work and barging will be need. Also the possible requirement for access haul roads for excavators.	If marine dredging and barge access is required there could be a significant cost increase compared to hydraulic excavation. If excavation is used, there is still the chance that additional haul roads may be needed	Likely	Significant	HIGH	Likely	Marginal	MODERATE
CON-3	Unknown Marina Site conditions	Potential for constructability issues with this site due to lack of information about the existing conditions	Without further information the scope of this work is unknown at this time and could differ from the assumptions initially made.	Unlikely	Marginal	LOW	Unlikely	Marginal	LOW
CON-4	Embankment Settlement	settle	the proposed levee will need to settle in order to bring it up	Likely	Critical	HIGH	Likely	Significant	HIGH
CON-5	Berm Settlement	Possibility that the new rail berm will settle	Without geotechnical information, it is unknown whether the proposed berm will need to settle in order to bring it up to full elevation. The berm is extensive so it is assume that additional settlement will be localized occurrences only	Unlikely	Significant	MODERATE	Unlikely	Significant	MODERATE
CON-6	Equipment access	Site conditions were assumed appropriate to bring in large equipment. Changes in this would affect size of equipment and thus production.	If weather and soil conditions are not suitable for large equipment, smaller pieces will need to be brought in. A 20% slowdown in production will increase levee removal and install costs. This would have a critical impact on overall cost.	Likely	Crisis	HIGH	Likely	Crisis	HIGH
				Project Cost			Project Schedule		
Risk No.	**Risk/Opportunity Event**	**Concerns**	**PDT Discussions**	**Likelihood***	**Impact***	**Risk Level***	**Likelihood***	**Impact***	**Risk Level***
	ESTIMATE AND SCHEDULE RISKS								
EST-1	No recycled construction waste estimated	Opportunity for recycling construction waste from earthwork and pavement demolition at a reduced cost	Potential for cost savings	Unlikely	Significant	MODERATE	Very Unlikely	Negligible	LOW

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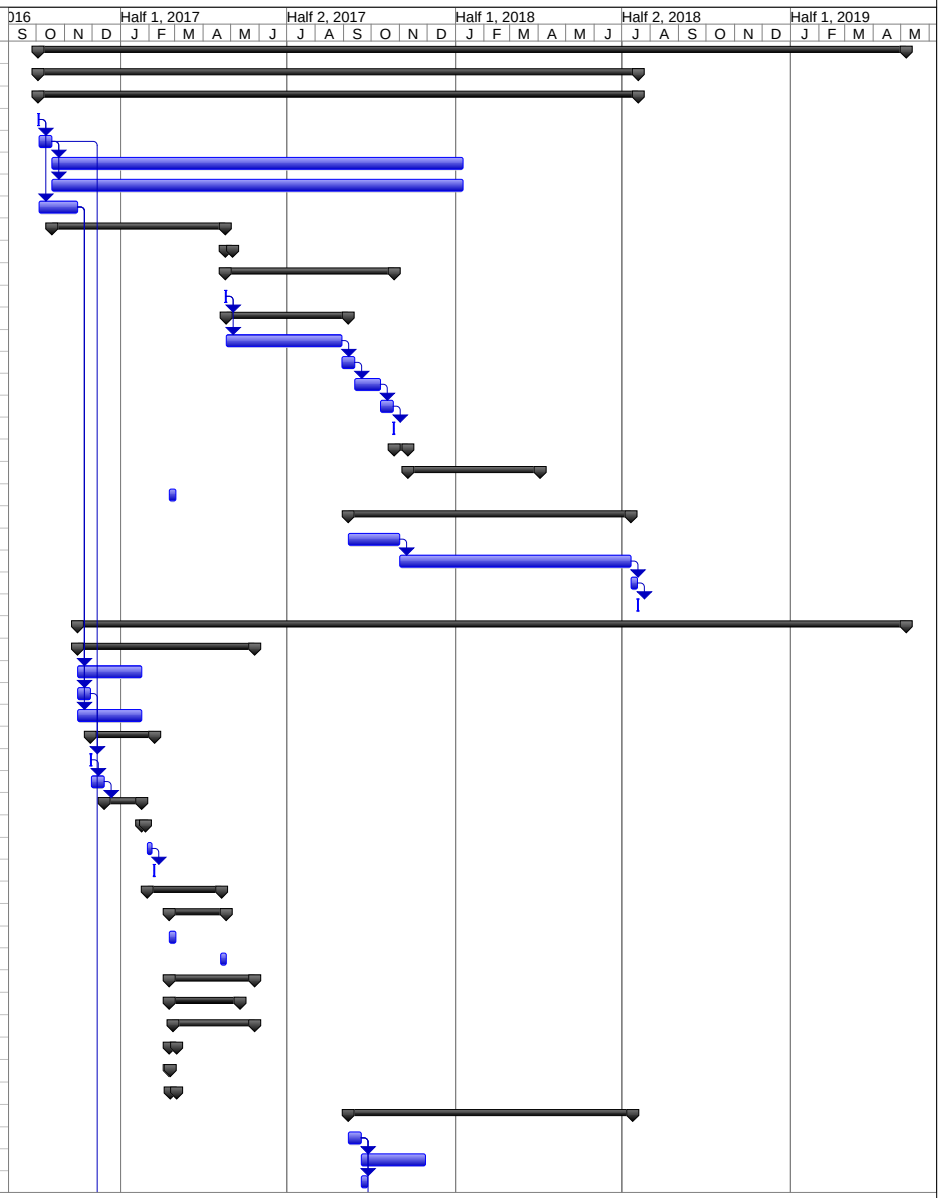
EST-2	Utility scope assumptions	This item is for overhead electric, over head communication, underground petroleum and underground water pipelines. Preliminary planning stage. Very little information provided. Many assumptions made.	There is a very likely chance that the scope of this work will change. There could be requirements to this work by the utility owners. There may be additional upgrades to the system needed. There could be additional utilities not identified and in other areas of the project.	Likely	Marginal	MODERATE	Likely	Marginal	MODERATE
EST-3	Bridge Design Assumptions	No designs were produced at this level of design. Typical section used for the estimate.	The bridge time is likely to change or some elements of the scope of the prosed bridges. The bridges are approximately 20% of the TPC.	Likely	Significant	HIGH	Likely	Critical	HIGH
EST-4	Fuel Cost increasing	Large equipment makes fuel cost increase a potential cost concern	Fuel costs for the machinery and the hauling. An increase of 25% in fuel costs increases the total project cost by approximately 2%	Unlikely	Significant	MODERATE	Very Unlikely	Negligible	LOW
EST-5	Steel cost increasing	amounts of steel.	conditions. It is believed that there is at least a 50%	Likely	Significant	HIGH	Very Unlikely	Negligible	LOW
EST-6	Market considerations	A competitive market may not occur at the time the project is out for bid. If this occurs, project costs may rise.	Estimate was created assuming small business bidding with relatively high contractor markups, and limited self-performed work. It is unlikely that even in a very robust market that prices would rise substantially beyond this.	Very Unlikely	Critical	LOW	Very Unlikely	Negligible	LOW
				Project Cost			**Project Schedule**		
Risk No.	**Risk/Opportunity Event**	**Concerns**	**PDT Discussions**	**Likelihood***	**Impact***	**Risk Level***	**Likelihood***	**Impact***	**Risk Level***
Programmatic Risks (External Risk Items are those that are generated, caused, or controlled exclusively outside the PDT's sphere of influence.)									
PR-1	Political considerations	Federal, state, and local priorities may shift changing project priorities.	Opposition to the project is not expected, since this does not impact property owners and is considered to add benefits to the area. If political considerations due come into play, the project may be cancelled outright, but it is unlikely to play a role in cost or schedule.	Unlikely	Negligible	LOW	Unlikely	Negligible	LOW
PR-2	Changing Laws/Regulations	Laws, regulations, and guidelines could change over the life of the project, potentially requiring changes in materials used on sites, adjusted construction methodology, or increased design/study requirements.	In general this risk was viewed to be very unlikely to affect the project. The only exception is that the WA Dept. of Ecology may change its sediment management guidelines. However, these changes are not expected to require more than extremely minor adjustments to TPC.	Unlikely	Negligible	LOW	Very Unlikely	Negligible	LOW

PSNERP
Chambers Bay Estuary
Construction Schedule

ID	Task Name	Duration	Start	Finish	Predecessors
1	**Chambers Bay Full Alt**	**676 days**	**Mon 10/3/16**	**Mon 5/6/19**	
2	**[06] Fish and Wildlife Facilities**	**468 days**	**Mon 10/3/16**	**Wed 7/18/18**	
3	**[06 03] Wildlife Facilities and Sanctuaries**	**468 days**	**Mon 10/3/16**	**Wed 7/18/18**	
4	Mobilization	1 day	Mon 10/3/16	Mon 10/3/16	
5	Survey	10 days	Tue 10/4/16	Mon 10/17/16	4
6	Traffic Control Flaggers	320 days	Tue 10/18/16	Mon 1/8/18	5
7	Street Cleaning	320 days	Tue 10/18/16	Mon 1/8/18	5
8	Silt Fence	30 days	Tue 10/4/16	Mon 11/14/16	4
9	**Excavation**	**135 days**	**Tue 10/18/16**	**Mon 4/24/17**	
15	**Fill**	**6 days**	**Tue 4/25/17**	**Tue 5/2/17**	
17	**Demolition**	**132 days**	**Tue 4/25/17**	**Wed 10/25/17**	
18	Mobilization	1 day	Tue 4/25/17	Tue 4/25/17	14
19	**Dam**	**95 days**	**Wed 4/26/17**	**Tue 9/5/17**	**18**
22	Buildings	90 days	Wed 4/26/17	Tue 8/29/17	18
23	Bulkhead	10 days	Wed 8/30/17	Tue 9/12/17	22
24	Marina	20 days	Wed 9/13/17	Tue 10/10/17	23
25	Misc Pile Removal	10 days	Wed 10/11/17	Tue 10/24/17	24
26	Demobilization	1 day	Wed 10/25/17	Wed 10/25/17	25
27	**Dredging and Placement**	**11 days**	**Thu 10/26/17**	**Thu 11/9/17**	
31	**Vegetation**	**102 days**	**Fri 11/10/17**	**Mon 4/2/18**	
36	Utilities	5 days	Thu 2/23/17	Wed 3/1/17	61
37	**Fish Hatchery**	**220 days**	**Wed 9/6/17**	**Tue 7/10/18**	
38	Demolition	2 mons	Wed 9/6/17	Tue 10/31/17	21
39	Installation	9 mons	Wed 11/1/17	Tue 7/10/18	38
40	Post Construction Survey	5 days	Wed 7/11/18	Tue 7/17/18	39
41	Demobilization	1 day	Wed 7/18/18	Wed 7/18/18	40
42	**[08] Roads, Railroads, and Bridges**	**645 days**	**Tue 11/15/16**	**Mon 5/6/19**	
43	**[08 01] Roads**	**139 days**	**Tue 11/15/16**	**Fri 5/26/17**	
44	Traffic Control	50 days	Tue 11/15/16	Mon 1/23/17	8
45	Silt Fence	10 days	Tue 11/15/16	Mon 11/28/16	8
46	Street Cleaning	50 days	Tue 11/15/16	Mon 1/23/17	8
47	**Earthwork**	**50 days**	**Tue 11/29/16**	**Mon 2/6/17**	
48	Mobilization	1 day	Tue 11/29/16	Tue 11/29/16	45
49	Pre Construction Survey	10 days	Wed 11/30/16	Tue 12/13/16	48
50	**Excavation**	**29 days**	**Wed 12/14/16**	**Mon 1/23/17**	**49**
53	**Fill**	**4 days**	**Tue 1/24/17**	**Fri 1/27/17**	
55	Post Construction Survey	5 days	Mon 1/30/17	Fri 2/3/17	54
56	Demobilization	1 day	Mon 2/6/17	Mon 2/6/17	55
57	**Pavement**	**59 days**	**Mon 1/30/17**	**Thu 4/20/17**	
66	**Guard Rail**	**44 days**	**Thu 2/23/17**	**Tue 4/25/17**	
67	Demolition	5 days	Thu 2/23/17	Wed 3/1/17	61
68	Installation	4 days	Thu 4/20/17	Tue 4/25/17	64
69	**Utilities**	**67 days**	**Thu 2/23/17**	**Fri 5/26/17**	
70	**Demolition**	**55 days**	**Thu 2/23/17**	**Wed 5/10/17**	
79	**Installation**	**65 days**	**Mon 2/27/17**	**Fri 5/26/17**	
87	**Drainage**	**6 days**	**Thu 2/23/17**	**Thu 3/2/17**	
88	**Demolition**	**1 day**	**Thu 2/23/17**	**Thu 2/23/17**	
91	**Installation**	**5 days**	**Fri 2/24/17**	**Thu 3/2/17**	
93	**Bridge**	**222 days**	**Wed 9/6/17**	**Thu 7/12/18**	
94	Precontstruction Survey	10 days	Wed 9/6/17	Tue 9/19/17	21
95	Traffic Control	50 days	Wed 9/20/17	Tue 11/28/17	94
96	Silt Fence	5 days	Wed 9/20/17	Tue 9/26/17	94

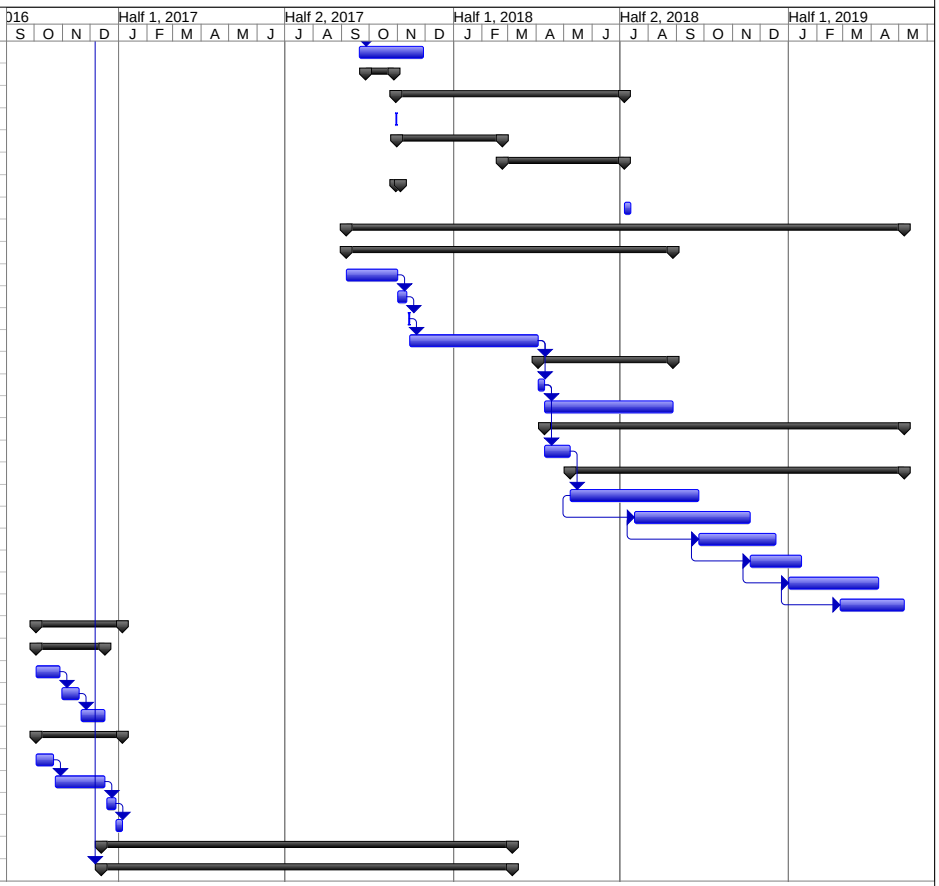


Project: Chambers Bay Estuary
Date: Fri 3/25/16

Task	Project Summary	Inactive Milestone	Manual Summary Rollup	Progress
Split	External Tasks	Inactive Summary	Manual Summary	Deadline
Milestone	External Milestone	Manual Task	Start-only	
Summary	Inactive Task	Duration-only	Finish-only	

PSNERP
Chambers Bay Estuary
Construction Schedule

ID	Task Name	Duration	Start	Finish	Predecessors
97	Street Clearing	50 days	Wed 9/20/17	Tue 11/28/17	94
98	**Demolition**	**23 days**	**Wed 9/27/17**	**Fri 10/27/17**	
106	**Placement**	**179 days**	**Mon 10/30/17**	**Thu 7/5/18**	
107	Mobilization	1 day	Mon 10/30/17	Mon 10/30/17	105
108	**New Bridge North**	**83 days**	**Tue 10/31/17**	**Thu 2/22/18**	
122	**New Bridge South**	**95 days**	**Fri 2/23/18**	**Thu 7/5/18**	
136	**Utilities**	**5 days**	**Mon 10/30/17**	**Fri 11/3/17**	
142	Post Construction Survey	5 days	Fri 7/6/18	Thu 7/12/18	135
143	**Railroads**	**434 days**	**Wed 9/6/17**	**Mon 5/6/19**	
144	**Demolition**	**254 days**	**Wed 9/6/17**	**Mon 8/27/18**	
145	Cut & Prep Concrete Counterweights	40 days	Wed 9/6/17	Tue 10/31/17	21
146	Pick & Remove Concrete Counterweight Sections [8ea]	8 days	Wed 11/1/17	Fri 11/10/17	145
147	Rail Removal	1 day	Mon 11/13/17	Mon 11/13/17	146
148	Railroad Bridge Demolition [steel truss]	100 days	Tue 11/14/17	Mon 4/2/18	147
149	**Concrete Piers - Demolition**	**105 days**	**Tue 4/3/18**	**Mon 8/27/18**	**148**
150	Cofferdam Installation	5 days	Tue 4/3/18	Mon 4/9/18	148
151	Concrete Pier Demolition	100 days	Tue 4/10/18	Mon 8/27/18	150
152	**Installation**	**280 days**	**Tue 4/10/18**	**Mon 5/6/19**	
153	Rail Transition	20 days	Tue 4/10/18	Mon 5/7/18	150
154	**New Trestle Railroad Bridge**	**260 days**	**Tue 5/8/18**	**Mon 5/6/19**	
155	Drilled Cassion Composite Pile Assembly (Shafts)	100 days	Tue 5/8/18	Mon 9/24/18	153
156	Composite Pile Assembly - Upper	90 days	Tue 7/17/18	Mon 11/19/18	155SS+50 days
157	Pile Caps	60 days	Tue 9/25/18	Mon 12/17/18	156SS+50 days
158	Bridge Beams	40 days	Tue 11/20/18	Mon 1/14/19	157SS+40 days
159	Deck	70 days	Tue 1/1/19	Mon 4/8/19	158SS+30 days
160	Parapet Wall Steel Rail	50 days	Tue 2/26/19	Mon 5/6/19	159SS+40 days
161	**[18] Cultural Resource Preservation**	**68 days**	**Mon 10/3/16**	**Wed 1/4/17**	
162	**[18 00] Cultural Resource Preservation**	**55 days**	**Mon 10/3/16**	**Fri 12/16/16**	
163	Cultural Resource Survey	20 days	Mon 10/3/16	Fri 10/28/16	
164	Cultural Resource Report and Consultation	15 days	Mon 10/31/16	Fri 11/18/16	163
165	Potential NRHP Evaluation	20 days	Mon 11/21/16	Fri 12/16/16	164
166	**Built Environment**	**68 days**	**Mon 10/3/16**	**Wed 1/4/17**	
167	Inventory	15 days	Mon 10/3/16	Fri 10/21/16	
168	Site from and report preparation	40 days	Mon 10/24/16	Fri 12/16/16	167
169	Determination of effects	8 days	Mon 12/19/16	Wed 12/28/16	168
170	Consultation	5 days	Thu 12/29/16	Wed 1/4/17	169
171	**[32] HTRW**	**320 days**	**Tue 12/13/16**	**Mon 3/5/18**	
172	**Treat-Wastes/Contaminated Soil & Water**	**320 days**	**Tue 12/13/16**	**Mon 3/5/18**	**5**



Project: Chambers Bay Estuary
Date: Fri 3/25/16

Task	Project Summary	Inactive Milestone	Manual Summary Rollup	Progress
Split	External Tasks	Inactive Summary	Manual Summary	Deadline
Milestone	External Milestone	Manual Task	Start-only	
Summary	Inactive Task	Duration-only	Finish-only	

Chambers Bay Estuarine and Riparian Enhancement

Preliminary Budget Estimate Level
Abbreviated Risk Analysis

Risk Level

	Negligible	Marginal	Significant	Critical	Crisis
Very Likely	2	3	4	5	5
Likely	1	2	4	5	5
Unlikely	0	1	3	3	4
Very Unlikely	0	0	1	2	4

Risk Element	Potential Risk Areas	Concerns	PDT Discussions & Conclusions (Include logic & justification for choice of Likelihood & Impact)	Likelihood	Impact	Risk Level
Project Scope						
PS-1	06 Earthwork	This item includes excavation of abutment fill southwest of the dam, excavation of fill associated with the mill site, rock armoring along Chambers Creek Road, excavation of the marina, and excavation of the peninsula northeast of the marina. Preliminary planning stages and no grading details known.	Very few cross sections for excavation. No details of area, just large scale aerial views. There is the possibility that the areas of excavation and fill could change from what is presented in the draft report. Any increase in quantity will be covered in the Quantity risk element section. The risk here is that the nature of the earthwork may change. There could be additional requirements (not quantities) imposed in the excavation and fill. It is thought to be at least a 50% chance that the scope of the earthwork will change. Changes to the current perceived scope are definitely expected to increase TPC by at least 1%.	Very LIKELY	Significant	4
PS-2	Demolition	This item is for the demolition and disposal of the dam, buildings, bulkhead, marina, and miscellaneous pile removal. No details for this work. No as-builts.	No details of area, just large scale aerial views. See PS-1 for description of quantities. The risk here is that not all of the scope is captured; there is a very likely chance that more work/tasks are needed to perform this demolition. Changes to the current perceived scope are definitely expected to increase TPC by at least 1%.	Very LIKELY	Significant	4
PS-3	Fish Hatchery	No information. No scope for this work.	Very likely scope will change since there is currently no scope. See PS-1 for discussion of quantities. Assume critical impact.	Very LIKELY	Critical	5
PS-4	Vegetation	This item is for the planting of riparian and marsh/wetland areas at the Deschutes Parkway where dredged material will be placed. There is no specific information in the report regarding this work aside from where and the quantity of surface area.	See PS-1 for a description of the quantities. The risk here is that not all of the scope is captured; there is a very likely chance that more work/tasks are needed to perform this work These could include soil treatment, guaranteed growth clauses, etc.. Changes to the current perceived scope are definitely expected to increase TPC by at least 1%.	Very LIKELY	Significant	4
PS-5	08 Pavement	Preliminary stage of project planning. Assumed landfill disposal. There could be a potential opportunity in recycling the asphalt for a reduced disposal fee.	This risk analysis does no account for opportunities (cost savings). However it should be noted in the Risk Register. There are risks in the quantities, but that will be covered in the Quantity risk element. No other concerns with this item.	Unlikely	Negligible	0
PS-6	08 Utilities	Preliminary planning stage. Very little information provided. Many assumptions made.	There is a very likely chance that the scope of this work will change. There could be requirements to this work by the utility owners. There may be additional upgrades to the system needed. There could be additional utilities not identified and in other areas of the project. See PS-1 for a description of Utilities the quantities. The impact could add more than 1% to the TPC.	Very LIKELY	Significant	4
PS-7	Bridge Placement - North & South Bridge	Preliminary planning stage. No typical section. Very little information provided Many assumptions made.	Assume that the governing agency will accept what is proposed. The bridge type is likely to change or some elements of the scope of the proposed bridge. The bridge is approximately 10% of the construction cost.	LIKELY	Significant	4
PS-8	Remove Draw Bridge	No details for this work. No as-builts.	No details of area, just large scale aerial views. See PS-1 for description of quantities. The risk here is that not all of the scope is captured; there is a very likely chance that more work/tasks are needed to perform this demolition. Changes to the current perceived scope are definitely expected to increase TPC by at least 1%.	Very LIKELY	Significant	4
PS-9	New Trestle Railroad Bridge	See PS-7	The bridge is approximately 30% of the TPC.	Very LIKELY	Critical	5

PS-10	Cultural Resources Preservation	Per Ashley Dailide, NWS lead Archeologist: "There is a high potential for this project to impact archaeological resources within the project area." Per Mary McCormick, NWS: "The Chambers Bay project's APE has a comparatively well developed built environment, dominated by industrial- and transportation-related properties."	"There are four archaeological sites within the project APE that will need to be tested and evaluated for the NRHP. If these sites are found to be eligible, they must be avoided or mitigated prior to project construction. Furthermore, any uninvestigated portions of the APE must be surveyed and any further archaeological resources that may be found must also be evaluated." "Inventory work at Chambers Bay is expected to fully record and evaluate all of the properties listed above (in another document), including the BNSF causeway. The causeway bridge will still need to be inspected to determine if it has sustained modifications since listing in the National Register. Extant buildings and structures (if any) at the 1920s paper mill will need to be recorded and evaluated, and/or the locale investigated for its archaeological values. Otherwise, no more than three additional historic-age properties are presumed to exist in the APE. State and local historic preservation entities likely will have considerable concerns about adverse impacts to the railroad bridge and other properties determined eligible for listing, resulting in a lengthy consultation process. The risk that that avoidance and/or mitigations costs will incur on this project is high."	LIKELY	Critical	5
PS-11	HTRW Fill Associated with Mill Site	Preliminary planning stage. See PS-1.	Likely there will be scope change. Impact is assumed Significant.	LIKELY	Significant	4
PS-12	Remaining Construction Items	This is busy proposed site with many different elements of work. Given the number of tasks and location of the work, there were not many details provided and the project could be approached in manner different manners based upon the current level of project development. There are many unknowns and additional tasks involved in the project that could be captured in this risk area.	It is very likely that the items covered in this risk area could have a change in scope and definitely that scope would be added. The impact could exceed 1% of the TPC.	Very LIKELY	Significant	4
Risk Element	**Potential Risk Areas**	**Concerns**	**PDT Discussions & Conclusions (Include logic & justification for choice of Likelihood & Impact)**	**Likelihood**	**Impact**	**Risk Level**
Acquisition Strategy						
AS-1	06 Earthwork	This estimate assumes full and open acquisition. However, the prime contractor is doing no work. All the work done is done by subcontractors. This project could be acquired by other methods aside from IFB full competition. The size of this project is very large. The project will probably be constructed under multiple acquisitions.	Typically if a project goes small business the amount of subcontracting and the overhead rates increase. Subcontracting should not be much of the risk for this project since everything is subbed out. If this went small business the overhead would increase. Other strategies could also increase costs. Given the nature of this work it is felt that it could go small business. Also, other methods may be used as well. It is considered likely that the contracting method could change from what is proposed in the estimate. The impact could be over 5%.	Very LIKELY	Critical	5
AS-2	Demolition	See AS-1	Lesser impact given item percentage to TPC.	Very LIKELY	Significant	4
AS-3	Fish Hatchery	See AS-1	Lesser impact given item percentage to TPC.	Very LIKELY	Significant	4
AS-4	Vegetation	See AS-1	Lesser impact given item percentage to TPC.	Very LIKELY	Significant	4
AS-5	08 Pavement	See AS-1	Lesser impact given item percentage to TPC.	Very LIKELY	Significant	4
AS-6	08 Utilities	See AS-1. Possibility of utility owners performing the work which could be a cost increase.	Lesser impact given item percentage to TPC.	Very LIKELY	Significant	4
AS-7	Bridge Placement - North & South Bridge	See AS-1	Lesser impact given item percentage to TPC.	Very LIKELY	Significant	4
AS-8	Remove Draw Bridge	See AS-1. Possibility of railroad owners performing the work which could be a cost increase.		Very LIKELY	Critical	5
AS-9	New Trestle Railroad Bridge	See AS-1. Possibility of railroad owners performing the work which could be a cost increase.		Very LIKELY	Critical	5
AS-10	Cultural Resources Preservation	Not applicable		Very Unlikely	Negligible	0
AS-11	HTRW Fill Associated with Mill Site	See AS-1	Lesser impact given item percentage to TPC.	Very LIKELY	Significant	4
AS-12	Remaining Construction Items	See AS-1	Lesser impact given item percentage to TPC.	Very LIKELY	Significant	4
Risk Element	**Potential Risk Areas**	**Concerns**	**PDT Discussions & Conclusions (Include logic & justification for choice of Likelihood & Impact)**	**Likelihood**	**Impact**	**Risk Level**

Risk Element	Potential Risk Areas	Concerns	PDT Discussions & Conclusions (Include logic & justification for choice of Likelihood & Impact)	Likelihood	Impact	Risk Level
Construction Complexity						
CC-1	06 Earthwork	No significant concerns. General location could pose some challenges.	Assume unlikely and marginal impact.	Unlikely	Marginal	1
CC-2	Demolition	Many unknowns.	There are always uncertainties with demolition of existing structures. Particularly in this case given the level of project	LIKELY	Significant	4
CC-3	Fish Hatchery	Many unknowns.	Assume unlikely and marginal impact.	Unlikely	Marginal	1
CC-4	Vegetation	No concerns.		Unlikely	Negligible	0
CC-5	08 Pavement	No concerns.		Unlikely	Negligible	0
CC-6	08 Utilities	No concerns.		Very Unlikely	Negligible	0
CC-7	Bridge Placement - North & South Bridge	No concerns. A competent bridge contractor should be able to perform this work.		Very Unlikely	Negligible	0
CC-8	Remove Draw Bridge	Large overhead structure with restricted access.	Unique demolition. Unknowns and methods required not fully vetted.	LIKELY	Significant	4
CC-9	New Trestle Railroad Bridge	See CC-1		Unlikely	Marginal	1
CC-10	Cultural Resources Preservation	No concerns		Very Unlikely	Negligible	0
CC-11	HTRW Fill Associated with Mill Site	HTRW work can present some constructability issues.	There are currently unknowns since the requirements of this work has not been established. Assume likely and significant.	LIKELY	Significant	4
CC-12	Remaining Construction Items	No concerns at this time.		Unlikely	Negligible	0
Risk Element	**Potential Risk Areas**	**Concerns**	**PDT Discussions & Conclusions (Include logic & justification for choice of Likelihood & Impact)**	**Likelihood**	**Impact**	**Risk Level**
Volatile Commodities						
VC-1	06 Earthwork	Fuel prices.	A 25% increase in fuel could contribute to up to a 1.5% increase in total construction costs. How likely is it that gasoline will reach $5.00/gal? Depends on who you ask. For the purposes of this risk analysis, assume that it is unlikely. Impact is significant.	Unlikely	Significant	3
VC-2	Demolition	No concerns.		Unlikely	Negligible	0
VC-3	Fish Hatchery	Concrete, Steel.	Cost of steel and other metals are subject to market conditions. It is believed that there is at least a 50% chance of fluctuation upward. The impact is considered to increase the total project costs no more than 1%	LIKELY	Marginal	2
VC-4	Vegetation	No concerns.		Unlikely	Negligible	0
VC-5	08 Pavement	Asphalt	Asphalt is a petroleum product and subject to market conditions. Assume likely and negligible.	LIKELY	Negligible	1
VC-6	08 Utilities	See VC-6. Pipe costs.	Assume likely and negligible.	LIKELY	Negligible	1
VC-7	Bridge Placement - North & South Bridge	See VC-3		LIKELY	Marginal	2
VC-8	Remove Draw Bridge	No concerns		Very Unlikely	Negligible	0
VC-9	New Trestle Railroad Bridge	See VC-3		LIKELY	Marginal	2
VC-10	Cultural Resources Preservation	No concerns.		Very Unlikely	Negligible	0
VC-11	HTRW Fill Associated with Mill Site	No concerns at this time.		Very Unlikely	Negligible	0
VC-12	Remaining Construction Items	No concerns at this time.		Unlikely	Negligible	0
Risk Element	**Potential Risk Areas**	**Concerns**	**PDT Discussions & Conclusions (Include logic & justification for choice of Likelihood & Impact)**	**Likelihood**	**Impact**	**Risk Level**
Quantities						
Q-1	06 Earthwork	Very few cross sections for fill, just typical sections used in quantity development. No cross sections for excavation.	No earthwork balance has been calculated or evaluated. More information will be obtained as design progresses. It is very likely that there will be a change in the quantities. Assume Critical impact. Large cost item.	Very LIKELY	Critical	5
Q-2	Demolition	No information. Quantities subject to change. Many assumptions made in developing quantities.	Likely that the quantities will significantly change. Impact could be at least a 1% increase to the TPC.	LIKELY	Significant	4
Q-3	Fish Hatchery	See PS-3	Likely that the quantities will significantly change. Impact could be at least a 1% increase to the TPC.	LIKELY	Significant	4

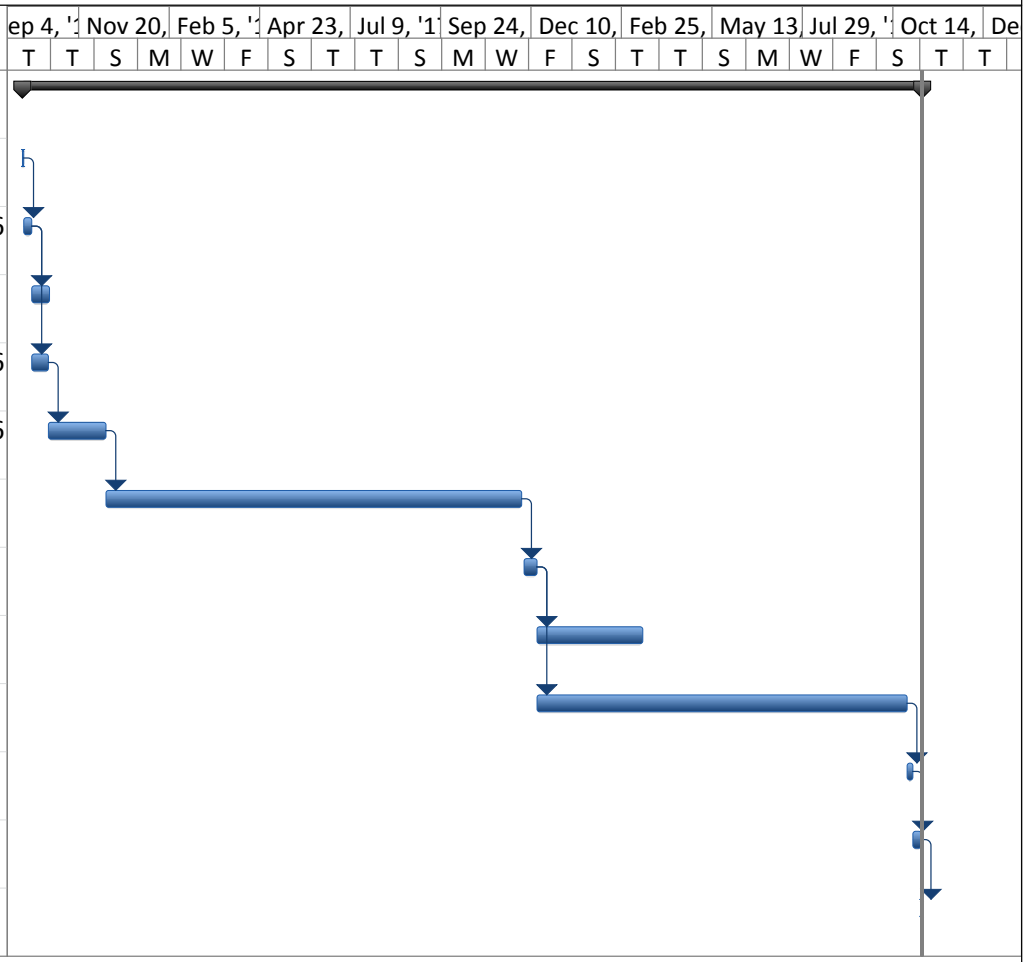
Q-4	Vegetation	Assumed a density and type of material to be placed.	This is very likely to change. The impact is unknown. Assume marginal.	Very LIKELY	Marginal	3
Q-5	08 Pavement	Assumed depth of removal. Asphalt placement design subject to change.	Likely to change. Impact is difficult to evaluate since disposal fees are the largest cost in demolition. Changes in asphalt placement could increase costs.	LIKELY	Marginal	2
Q-6	08 Utilities	See PS-6.	Size, material, and lengths estimated. There is a very likely potential that any or all of these three will change. New alignments with the bridge and roadway could cause the utility adjustments to extend beyond what is originally planned in the report. Impact could increase TPC by at least 1%.	Very LIKELY	Significant	4
Q-7	Bridge Placement - North & South Bridge	Used a typical section for the quantity development.	Conservative in the caisson depth. Many assumptions were made. It is likely that the quantities will change. The impact could easily be over 1%.	LIKELY	Significant	4
Q-8	Remove Draw Bridge	Many unknowns and assumptions made. See PS-8.	Very likely quantities will change. Assume critical impact.	Very LIKELY	Critical	5
Q-9	New Trestle Railroad Bridge	See Q-7.		LIKELY	Significant	4
Q-10	Cultural Resources Preservation	Time spent on study is an estimate.	Findings could lead to more time being required.	LIKELY	Negligible	1
Q-11	HTRW Fill Associated with Mill Site	See Q-1		Very LIKELY	Critical	5
Q-12	Remaining Construction Items	Preliminary information and no design.	Quantities were large in part just estimates. Most of the quantities in the Remaining Construction items were very roughly estimated. It is very likely that these quantities will increase. The impact could increase the TPC by 1%.	Very LIKELY	Significant	4
Risk Element	**Potential Risk Areas**	**Concerns**	**PDT Discussions & Conclusions (Include logic & justification for choice of Likelihood & Impact)**	**Likelihood**	**Impact**	**Risk Level**
Fabrication & Project Installed Equipment						
FI-1	06 Earthwork	No concerns at this time.		Very Unlikely	Negligible	0
FI-2	Demolition	No concerns at this time.		Very Unlikely	Negligible	0
FI-3	Fish Hatchery	No design. Many unknowns.	Pumps, filters, electrical components, etc.	LIKELY	Significant	4
FI-4	Vegetation	No concerns.		Very Unlikely	Negligible	0
FI-5	08 Pavement	No concerns,		Very Unlikely	Negligible	0
FI-6	08 Utilities	No concerns at this time.		Very Unlikely	Negligible	0
FI-7	Bridge Placement - North & South Bridge	No concerns at this time.		Very Unlikely	Negligible	0
FI-8	Remove Draw Bridge	No concerns at this time.		Very Unlikely	Negligible	0
FI-9	New Trestle Railroad Bridge	No concerns at this time.		Very Unlikely	Negligible	0
FI-10	Cultural Resources Preservation	No applicable.		Very Unlikely	Negligible	0
FI-11	HTRW Fill Associated with Mill Site	No concerns at this time.		Very Unlikely	Negligible	0
FI-12	Remaining Construction Items	No concerns at this time.		Very Unlikely	Negligible	0
Risk Element	**Potential Risk Areas**	**Concerns**	**PDT Discussions & Conclusions (Include logic & justification for choice of Likelihood & Impact)**	**Likelihood**	**Impact**	**Risk Level**
Cost Estimating Method						
CE-1	06 Earthwork	Lack of time to be able to spend on the estimate.	Unlikely there would be significant changes. Impacts assumed marginal.	Unlikely	Marginal	1
CE-2	Demolition	Many assumptions made. See CE-1.	Likely there will be changes to the methodology in the cost estimate. Impact assumed marginal.	LIKELY	Marginal	2
CE-3	Fish Hatchery	Used a previous cost estimate. See CE-1.	Validity may be in question. See CE-2.	LIKELY	Marginal	2
CE-4	Vegetation	No concerns at this time.		Very Unlikely	Negligible	0
CE-5	08 Pavement	No concerns at this time.		Very Unlikely	Negligible	0

CE-6	08 Utilities	Used many cost book items. Used many assumptions.	Cost book items and assumptions may not be entirely accurate or applicable to the project.	LIKELY	Marginal	2
CE-7	Bridge Placement - North & South Bridge	See CE-6	Greater impact.	LIKELY	Significant	4
CE-8	Remove Draw Bridge	See CE-7		LIKELY	Significant	4
CE-9	New Trestle Railroad Bridge	See CE-7		LIKELY	Critical	5
CE-10	Cultural Resources Preservation	Made assumptions.	Assumptions may not be valid.	LIKELY	Negligible	1
CE-11	HTRW Fill Associated with Mill Site	No concerns for items covered in the estimate. Concern is for items not covered in the estimate. That concern is covered in the scope risk element.		Very Unlikely	Negligible	0
CE-12	Remaining Construction Items	Concerns covered in other risk elements.		Very Unlikely	Negligible	0
Risk Element	**Potential Risk Areas**	**Concerns**	**PDT Discussions & Conclusions (Include logic & justification for choice of Likelihood & Impact)**	**Likelihood**	**Impact**	**Risk Level**
External Project Risks						
EX-1	06 Earthwork	Land ownership. Water rights. Stakeholder support.	The mill site is currently for sale. Willingness of other property owners is in question. It is likely that there will be affects to the project from the noted concerns. It is a safe assumption that the impact is critical.	LIKELY	Critical	5
EX-2	Demolition	See EX-1	Lesser impact given item percentage to TPC.	LIKELY	Significant	4
EX-3	Fish Hatchery	See EX-1	Lesser impact given item percentage to TPC.	LIKELY	Significant	4
EX-4	Vegetation	No concerns		Very Unlikely	Negligible	0
EX-5	08 Pavement	No concerns at this time.		Very Unlikely	Negligible	0
EX-6	08 Utilities	Stakeholders.	See EX-1. Working with utility owners. Likely there will be an impact to the project. Impact assumed marginal.	LIKELY	Marginal	2
EX-7	Bridge Placement - North & South Bridge	See EX-2		LIKELY	Significant	4
EX-8	Remove Draw Bridge	Working with the railroad company.	It is likely that there will be affects to the project from the noted concerns. It is a safe assumption that the impact is significant.	LIKELY	Significant	4
EX-9	New Trestle Railroad Bridge	See EX-8		LIKELY	Significant	4
EX-10	Cultural Resources Preservation	No concerns at this time.		Very Unlikely	Negligible	0
EX-11	HTRW Fill Associated with Mill Site	No concerns at this time.		Very Unlikely	Negligible	0
EX-12	Remaining Construction Items	See EX-1	Lesser impact given item percentage to TPC.	LIKELY	Significant	4
Risk Element	**Potential Risk Areas**	**Concerns**	**PDT Discussions & Conclusions (Include logic & justification for choice of Likelihood & Impact)**	**Likelihood**	**Impact**	**Risk Level**
HTRW						
HTRW-1	06 Earthwork	Per John Kill Eagle on 6/21/2011 : Quantities of potentially contaminated sediment behind dam could vary significantly from the estimated total sediment of 7,300 CY.	The Level I report estimates 50% to be contaminated. A more conservative estimate of 100% should be used to estimate the contaminated sediment that must be disposed of in landfill.	LIKELY	Marginal	2
HTRW-2	Demolition	Per John Kill Eagle on 6/21/2011 : 7,300 square feet of buildings at dam abutments (fish hatchery, support building, and water intake building) and 46,700 square feet of buildings at the marina are likely to have hazardous waste associated with demolition. Surveys of LBP and asbestos building material should be conducted to determine the presents of this hazardous waste that must be disposed of at a licensed landfill.	Hazardous waste can be estimated through percentage of square feet of building spa	Very Unlikely	Significant	1
HTRW-3	Fish Hatchery	No concerns at this time.		Very Unlikely	Negligible	0
HTRW-4	Vegetation	No concerns.		Unlikely	Negligible	0
HTRW-5	08 Pavement	No concerns.		Very Unlikely	Negligible	0
HTRW-6	08 Utilities	No concerns at this time.		Very Unlikely	Negligible	0
HTRW-7	Bridge Placement - North & South Bridge	No concerns at this time.		Very Unlikely	Negligible	0
HTRW-8	Remove Draw Bridge	Material could have contaminates associated with it (lead paint, etc.)	Assume likely due to the age of the bridge with marginal impacts.	LIKELY	Marginal	2

HTRW-9	New Trestle Railroad Bridge	No concerns at this time.		Very Unlikely	Negligible	0
HTRW-10	Cultural Resources Preservation	Not applicable		Very Unlikely	Negligible	0
HTRW-11	HTRW Fill Associated with Mill Site	Concerns covered by in other risk elements since this is a project item.		Very Unlikely	Negligible	0
HTRW-12	Remaining Construction Items	No concerns at this time.		Unlikely	Negligible	0
HTRW-13	Planning, Engineering, & Design			Very Unlikely	Negligible	0
HTRW-14	Construction Management			Very Unlikely	Negligible	0

PSNERP
Big Beef Creek Estuary
Construction Schedule

ID	Task Name	Duration	Start	Finish
1	**Big Beef Causeway**	**548 days**	**Mon 10/3/16**	**Wed 11/7/18**
2	Start	1 day	Mon 10/3/16	Mon 10/3/16
3	Mobilize	5 days	Tue 10/4/16	Mon 10/10/16
4	Road Approach Fill	11 days	Tue 10/11/16	Tue 10/25/16
5	Pier Demo	10 days	Tue 10/11/16	Mon 10/24/16
6	Finger Pier Construction	35 days	Tue 10/25/16	Mon 12/12/16
7	Bridge Construction	254 days	Tue 12/13/16	Fri 12/1/17
8	Relocate Utilities	9 days	Mon 12/4/17	Thu 12/14/17
9	Remove Causeway	64 days	Fri 12/15/17	Wed 3/14/18
10	Demo Existing Bridge	225 days	Fri 12/15/17	Thu 10/25/18
11	Planting	3 days	Fri 10/26/18	Tue 10/30/18
12	Demobilize	5 days	Wed 10/31/18	Tue 11/6/18
13	Finish	1 day	Wed 11/7/18	Wed 11/7/18



Project: Big Beef Creek Estuary
Date: Fri 3/25/16

Task
Split
Milestone
Summary
Project Summary
External Tasks
External Milestone
Inactive Task
Inactive Milestone
Inactive Summary
Manual Task
Duration-only
Manual Summary Rollup
Manual Summary
Start-only
Finish-only
Deadline
Progress

Big Beef Creek Estuary
Preliminary Budget Estimate Level
Abbreviated Risk Analysis

Risk Level

	Negligible	Marginal	Significant	Critical	Crisis
Very Likely	2	3	4	5	5
Likely	1	2	4	5	5
Unlikely	0	1	3	3	4
Very Unlikely	0	0	1	2	4

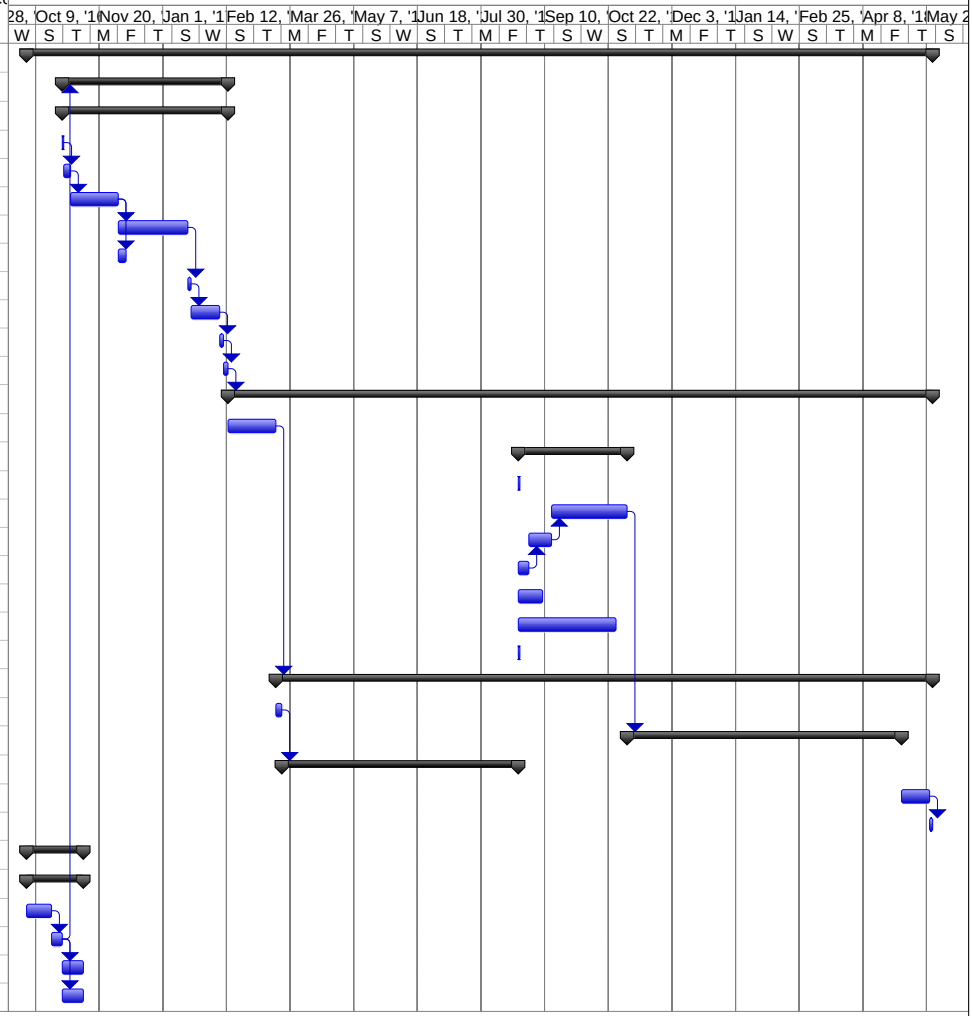
Risk Element	Potential Risk Areas	Concerns	PDT Discussions & Conclusions (Include logic & justification for choice of Likelihood & Impact)	Likelihood	Impact	Risk Level
Project Scope						
PS-1	06 Earthwork	No subsurface geotechnical exploration. Possibility for soil contamination? Preliminary planning stages and no grading details known. Care and Diversion of water.		LIKELY	Critical	5
PS-2	06 Demolition	Increased erosion following causeway removal could impact homes? Greater sediment outfall from the harbor disturbing native fishing grounds? Mitigation/compensation?		LIKELY	Critical	5
PS-4	08 Earthwork	No subsurface geotechnical exploration. Preliminary planning stages and no grading details known. Risk of excavated soil contamination or unsuitable soil for reuse as fill for roadway section.		LIKELY	Crisis	5
PS-5	08 Pavement	Assumed landfill disposal. There could be a potential opportunity in recycling the asphalt for a reduced disposal fee.		Very Unlikely	Negligible	0
PS-6	08 Utilities	Unknowns in all subsurface work. There may be more utilities than what is currently identified in the report. If utilities are discovered there may be challenges with causeway removal, and utility relocation?		LIKELY	Critical	5
PS-7	08 Traffic Control	Local authority desires that the existing road remain open during construction. Risk of the entire road needing to be shut down for the duration of construction for staging and construction operations?		Very Unlikely	Negligible	0
PS-8	08 Bridge	Are there concerns/risk of scour around bridge columns as a result of increased tidal flows after removal of the causeway. Will there be a risk of increased embedment depth, revised column number or design?		LIKELY	Crisis	5
PS-10	18 Cultural Resources Preservation	What happens if Cultural Resources are discovered?		Very Unlikely	Negligible	0
PS-12	Remaining Construction Items	No specific concerns aside from level of detail in scope and design.		LIKELY	Significant	4
Risk Element	**Potential Risk Areas**	**Concerns**	**PDT Discussions & Conclusions (Include logic & justification for choice of Likelihood & Impact)**	**Likelihood**	**Impact**	**Risk Level**
Acquisition Strategy						
AS-1	06 Earthwork	This estimate assumes full and open acquisition. However, the prime contractor is doing no work. All the work done is done by subcontractors. This project could be acquired by other methods aside from IFB full competition.		LIKELY	Critical	5
AS-2	06 Demolition	See AS-2		LIKELY	Critical	5
AS-4	08 Earthwork	See AS-2		LIKELY	Critical	5
AS-5	08 Pavement	See AS-2		LIKELY	Critical	5
AS-6	08 Utilities	Typically utility companies perform the relocations of their own utilities. The acquisition strategy may not have an impact on this work.		Very Unlikely	Critical	2
AS-7	08 Traffic Control	See AS-2		Very Unlikely	Negligible	0
AS-8	08 Bridge	See AS-2		Very Unlikely	Negligible	0
AS-10	18 Cultural Resources Preservation	See AS-2		Very Unlikely	Negligible	0

AS-12	Remaining Construction Items	See AS-2		LIKELY	Critical	5
Risk Element	**Potential Risk Areas**	**Concerns**	**PDT Discussions & Conclusions (Include logic & justification for choice of Likelihood & Impact)**	**Likelihood**	**Impact**	**Risk Level**
Construction Complexity						
CC-1	06 Earthwork	Care and diversion of water. Stockpile locations requiring additional easements for excavated earth for reuse.		LIKELY	Marginal	2
CC-2	06 Demolition	See CC-1		LIKELY	Marginal	2
CC-4	08 Earthwork	See CC-1		LIKELY	Marginal	2
CC-5	08 Pavement	No concerns.		Very Unlikely	Negligible	0
CC-6	08 Utilities	See CC-5		Very Unlikely	Negligible	0
CC-7	08 Traffic Control	Can the new bridge be constructed without significant closures to the entire roadway. Is a 15ft wide staging area enough for construction opperations? Additional traffic control required for full closures, how many full closures?		Very Unlikely	Negligible	0
CC-8	08 Bridge	Construction of bridge columns using temporary finger piers off of existing roadway.		LIKELY	Significant	4
CC-10	18 Cultural Resources Preservation			Very Unlikely	Negligible	0
CC-12	Remaining Construction Items	See CC-1		LIKELY	Marginal	2
Risk Element	**Potential Risk Areas**	**Concerns**	**PDT Discussions & Conclusions (Include logic & justification for choice of Likelihood & Impact)**	**Likelihood**	**Impact**	**Risk Level**
Volatile Commodities						
VC-1	06 Earthwork	Fuel prices.		LIKELY	Negligible	1
VC-2	06 Demolition	See VC-1.		LIKELY	Negligible	1
VC-4	08 Earthwork	See VC-1.		LIKELY	Negligible	1
VC-5	08 Pavement	Fuel and Asphalt prices		LIKELY	Negligible	1
VC-6	08 Utilities	Cost increase in the material (conductor, lines, mains, etc.).		LIKELY	Marginal	2
VC-7	08 Traffic Control			Very Unlikely	Negligible	0
VC-8	08 Bridge	Concrete prices		Very Unlikely	Negligible	0
VC-10	18 Cultural Resources Preservation			Very Unlikely	Negligible	0
VC-12	Remaining Construction Items	See VC-1.		LIKELY	Negligible	1
Risk Element	**Potential Risk Areas**	**Concerns**	**PDT Discussions & Conclusions (Include logic & justification for choice of Likelihood & Impact)**	**Likelihood**	**Impact**	**Risk Level**
Quantities						
Q-1	06 Earthwork	Very few cross sections, just typical sections used in quantity development.		LIKELY	Critical	5
Q-2	06 Demolition	No cross sections or details on the causeway. Material of the causeway unknown. The assumptions used for quantifying these items could be off.		LIKELY	Marginal	2
Q-4	08 Earthwork	Unknowing how much, if any, excavated material will be suitable for reuse.		LIKELY	Significant	4
Q-5	08 Pavement	Assumed depth.		Unlikely	Negligible	0
Q-6	08 Utilities	Unknown if there are additional underground utilities		LIKELY	Significant	4
Q-7	08 Traffic Control			Very Unlikely	Negligible	0
Q-8	08 Bridge	Existing bridge design is unknown, column embedment depth, height, number, diameter were all assumed.		LIKELY	Significant	4
Q-10	18 Cultural Resources Preservation	Time spent on study is an estimate. Findings could lead to more time being required.		Very Unlikely	Negligible	0

Q-12	Remaining Construction Items			LIKELY	Significant	4
Risk Element	**Potential Risk Areas**	**Concerns**	**PDT Discussions & Conclusions (Include logic & justification for choice of Likelihood & Impact)**	**Likelihood**	**Impact**	**Risk Level**
Fabrication & Project Installed Equipment						
FI-1	06 Earthwork	No concerns.		Very Unlikely	Negligible	0
FI-2	06 Demolition	No concerns.		Very Unlikely	Negligible	0
FI-4	08 Earthwork	No concerns.		Very Unlikely	Negligible	0
FI-5	08 Pavement	No concerns.		Very Unlikely	Negligible	0
FI-6	08 Utilities	No concerns.		Very Unlikely	Negligible	0
FI-7	08 Traffic Control			Very Unlikely	Negligible	0
FI-8	08 Bridge	Temporary finger pier construction platforms for new bridge construction.		Very Unlikely	Negligible	0
FI-10	18 Cultural Resources Preservation			Very Unlikely	Negligible	0
FI-12	Remaining Construction Items			Very Unlikely	Negligible	0
Risk Element	**Potential Risk Areas**	**Concerns**	**PDT Discussions & Conclusions (Include logic & justification for choice of Likelihood & Impact)**	**Likelihood**	**Impact**	**Risk Level**
Cost Estimating Method						
CE-1	06 Earthwork	No concerns.		Very Unlikely	Negligible	0
CE-2	06 Demolition	No concerns.		LIKELY	Negligible	1
CE-4	08 Earthwork	No concerns.		Very Unlikely	Negligible	0
CE-5	08 Pavement	The quantity of reused fill 6,615 CY. Dependent on suitability of unknown causeway material.		Very Unlikely	Negligible	0
CE-6	08 Utilities	No concerns.		LIKELY	Significant	4
CE-7	08 Traffic Control	Estimate assumes no significant closures of the roadway; temporary construction traffic signal to facilitate one way road during construction.		Very Unlikely	Negligible	0
CE-8	08 Bridge	Production rate of installing temporary piers, and production rate for construciton of columns from temporary piers.		LIKELY	Significant	4
CE-10	18 Cultural Resources Preservation			Very Unlikely	Negligible	0
CE-12	Remaining Construction Items	There could be an increase in items covered and addition of items not covered.		LIKELY	Significant	4
Risk Element	**Potential Risk Areas**	**Concerns**	**PDT Discussions & Conclusions (Include logic & justification for choice of Likelihood & Impact)**	**Likelihood**	**Impact**	**Risk Level**
HTRW						
HTRW-1	06 Earthwork	Potential for soil contamination due to roadway runoff.		LIKELY	Crisis	5
HTRW-2	06 Demolition	Creosote hazard for demolition of the old pier.		LIKELY	Significant	4
HTRW-4	08 Earthwork	See HTRW-1		LIKELY	Crisis	5
HTRW-5	08 Pavement	No Concerns.		Very Unlikely	Negligible	0
HTRW-6	08 Utilities	No Concerns.		Very Unlikely	Negligible	0
HTRW-7	08 Traffic Control			Very Unlikely	Negligible	0
HTRW-8	08 Bridge			Very Unlikely	Negligible	0
HTRW-10	18 Cultural Resources Preservation			Very Unlikely	Negligible	0
HTRW-12	Remaining Construction Items	No specific concerns at this time. There may be some impact here.		LIKELY	Marginal	2

PSNERP
Tahuya River Estuary
Construction Schedule

ID	Task Name	Duration	Start	Finish	Predec
1	**ahuya Full Alternative Restoration**	**428 days**	**Mon 10/3/16**	**Thu 5/24/18**	
2	**[06] Fish and Wildlife Facilities**	**77.5 days**	**Wed 10/26/16**	**Mon 2/13/17**	**46**
3	**[06 03] Wildlife Facilities and Sanctuaries**	**77.5 days**	**Wed 10/26/16**	**Mon 2/13/17**	
4	Mobilization	8 hrs	Wed 10/26/16	Thu 10/27/16	
5	Preconstruction Survey	20 hrs	Thu 10/27/16	Tue 11/1/16	4
6	Erosion & Sediment Control Measures - Install Silt Fence	188 hrs	Tue 11/1/16	Fri 12/2/16	5
7	Earthwork	255 hrs	Fri 12/2/16	Tue 1/17/17	6
8	Demolition	27 hrs	Fri 12/2/16	Wed 12/7/16	6
9	Vegetation	20 hrs	Tue 1/17/17	Thu 1/19/17	7
10	Erosion & Sediment Control Measures - Remove silt fenc	101 hrs	Thu 1/19/17	Tue 2/7/17	9
11	Post Construction Survey	20 hrs	Tue 2/7/17	Fri 2/10/17	10
12	Demobilization	8 hrs	Fri 2/10/17	Mon 2/13/17	11
13	**[08] Roads, Railroads, and Bridges**	**333 days**	**Mon 2/13/17**	**Thu 5/24/18**	**12**
14	Erosion & Sediment Control Measures - Install Silt Fence	188 hrs	Mon 2/13/17	Thu 3/16/17	
15	**[08 01] Roads**	**51.63 days**	**Wed 8/23/17**	**Fri 11/3/17**	**40**
16	Mobilization	8 hrs	Wed 8/23/17	Thu 8/24/17	
17	Earthwork	286 hrs	Thu 9/14/17	Fri 11/3/17	18
18	Pavement	87 hrs	Wed 8/30/17	Thu 9/14/17	19
19	Parapet Wall	40 hrs	Wed 8/23/17	Wed 8/30/17	
20	Utilities	97 hrs	Wed 8/23/17	Fri 9/8/17	
21	Traffic Control	372 hrs	Wed 8/23/17	Fri 10/27/17	
22	Demobilization	8 hrs	Wed 8/23/17	Thu 8/24/17	
23	**Bridges**	**309.5 days**	**Thu 3/16/17**	**Thu 5/24/18**	**14**
24	Mobilization	16 hrs	Thu 3/16/17	Mon 3/20/17	
25	**Bridge Installation**	**129.25 days**	**Fri 11/3/17**	**Thu 5/3/18**	**17**
34	**Bridge Removal**	**112 days**	**Mon 3/20/17**	**Wed 8/23/17**	**24**
41	Erosion & Sediment Control Measures - Remove Silt Fen	101 hrs	Thu 5/3/18	Tue 5/22/18	32
42	Demobilization	16 hrs	Tue 5/22/18	Thu 5/24/18	41
43	**[18] Cultural Resource Preservation**	**27.5 days**	**Mon 10/3/16**	**Wed 11/9/16**	
44	**[18 00] Cultural Resource Preservation**	**27.5 days**	**Mon 10/3/16**	**Wed 11/9/16**	
45	Survey	100 hrs	Mon 10/3/16	Wed 10/19/16	
46	Report	40 hrs	Wed 10/19/16	Wed 10/26/16	45
47	Consultation	80 hrs	Wed 10/26/16	Wed 11/9/16	46
48	Potential NRHP Evaluation	80 hrs	Wed 10/26/16	Wed 11/9/16	46



Project: Tahuya River Estuary
Date: Fri 3/25/16

Task	External Tasks	Manual Task	Finish-only
Split	External Milestone	Duration-only	Progress
Milestone	Inactive Task	Manual Summary Rollup	Deadline
Summary	Inactive Milestone	Manual Summary	
Project Summary	Inactive Summary	Start-only	

PNSREP
Tahuya River Estuary
Risk Register

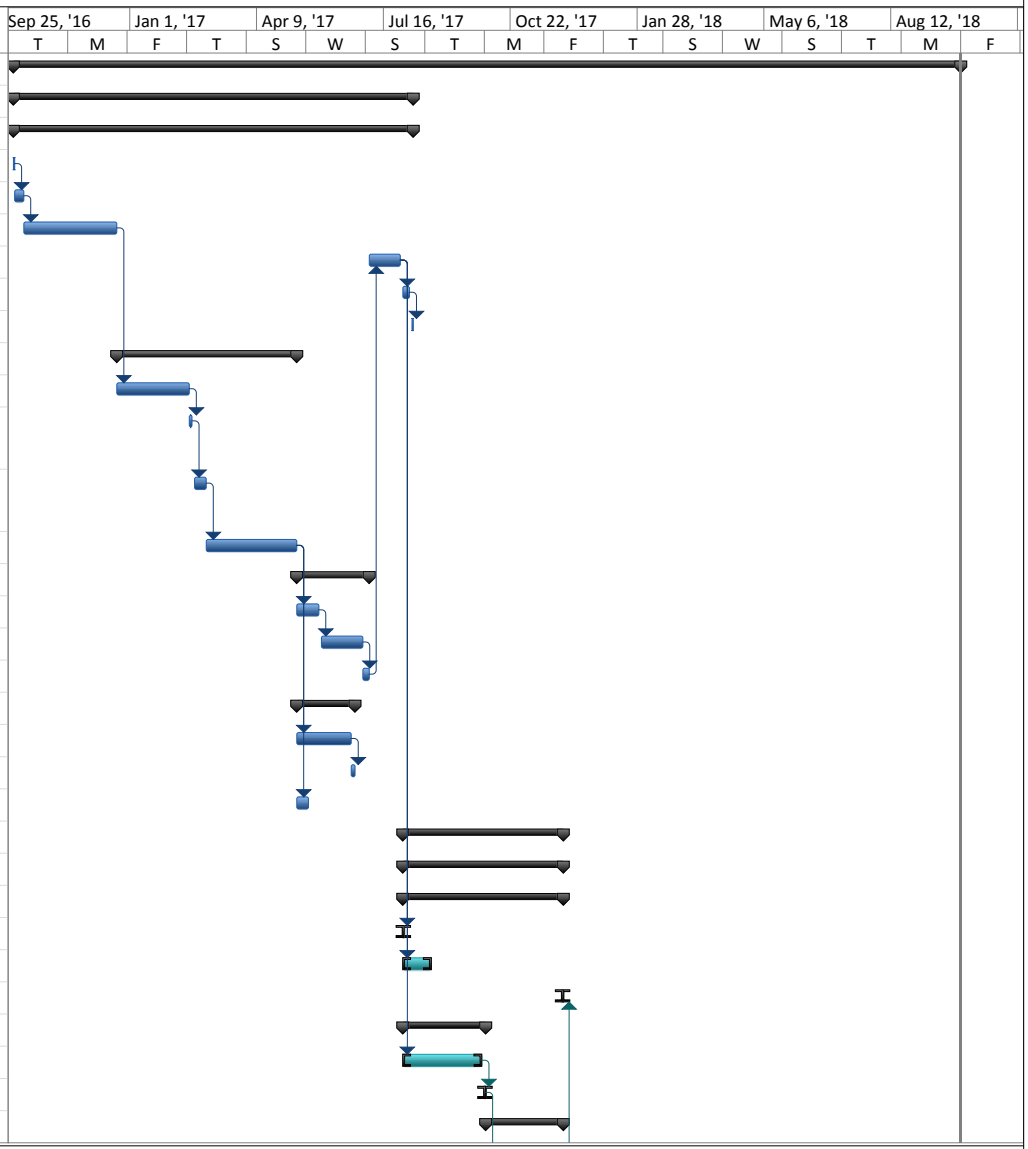
March 2016

Risk No.	Risk/Opportunity Event	Concerns	PDT Discussions & Conclusions	Project Cost			Project Schedule		
				Likelihood*	Impact*	Risk Level*	Likelihood*	Impact*	Risk Level*
Contract Risks (Internal Risk Items are those that are generated, caused, or controlled within the PDT's sphere of influence.)									
	PROJECT & PROGRAM MGMT								
PPM-1	Project Scheduling	High volume of projects under the PSNERP authorization may present issues in terms of resource allocation and quality control.	PDT does not believe the volume of project will cause problems. Project will be schedule over years and even decades in order to meet construction goals.	Very Unlikely	Negligible	LOW	Very Unlikely	Negligible	LOW
PPM-2	Staffing Reductions	Both the Seattle District and the WDFW have numerous projects competing for staffing resources. If other projects become a higher priority staff could be pulled from PSNERP.	PSNERP remains a District and WDFW priority and will is less likely than other projects to see staffing reductions. There are minor cost increases due to increases in work being out-sourced to AEs and potentiall slowdowns is staffing is shifted on short notice.	Very Unlikely	Negligible	LOW	Very Unlikely	Negligible	LOW
PPM-3	Communication Issues	Excellent communications is necessary in order to sucessfully complete the project. Both internal issues intra-Corps or intra-WDFW, or issues between the Corps and local sponsors could affect the project timeline.	The project currently has strong communication and trust between the Corps and WDFW, and enjoys high levels of political support both from the Federal and local sponsors. There are other local sponsors (municipalities, tribes, NGOs, etc) that will be involved once the project moves into PED/CG phase. Communications with these entities may be more fraught and there are likely to be at least some schedule delays because of this.	Very Unlikely	Negligible	LOW	Likely	Marginal	MODERATE
PPM-4	Poor Initial Project Perfomance	The PSNERP project will be very visible in the Puget Sound area once construction begins. Could an early action that performs poorly (reduced environmental benefits, project neighbors who felt slighted or whose concerns were not fully addressed, etc) cause the remainder of the project to have increased cost/schedule?	PDT believes its very unlikely that there would be a poorly performing initial project as the earliest projects that proceed to construction are likely to be those whose success is the most assured. Impacts would likely be delays to the start of projects, and costs other than increases due to inflation would be unlikely.	Very Unlikely	Negligible	LOW	Very Unlikely	Negligible	LOW
	CONTRACT ACQUISITION RISKS								
CA-1	Potenially Could Go Small Business	This estimate assumes full and open acquisition. However, the prime contractor is doing no work. All the work done is done by subcontractors. This project could be acquired by other methods aside from IFB full competition.	Typically if a project goes small business the amount of subcontracting and the overhead rates increase. Subcontracting should not be much of the risk for this project since everything is subbed out. If this went small business the overhead would increase. Other strategies could also increase costs. Given the nature of this work it is felt that it could go small business. Also, other methods may be used as well. It is considered likely that the contracting method could change from what is proposed in the estimate.	Very Likely	Critical	HIGH	Very Likely	Critical	HIGH
CA-3	Inefficient Contractors	The acquisition process may higher inefficient contractors.	PDT believe that this is unlikely. Contracting language and selection processes can be done in a way that can filter out poor performing contractors.	Very Unlikely	Negligible	LOW	Very Unlikely	Negligible	LOW
Risk No.	Risk/Opportunity Event	Concerns	PDT Discussions & Conclusions	Project Cost			Project Schedule		
				Likelihood*	Impact*	Risk Level*	Likelihood*	Impact*	Risk Level*
	TECHNICAL RISKS								
TL-1	Earthwork	Preliminary planning stages and no grading details known. Helipad relocation location not yet identified.	There is the possibility that the areas of excavation and fill could change from what is presented in the draft report. Any increase in quantity will be covered in the Quantity risk element section. The risk here is that the nature of the earthwork may change. There could be additional requirements (not quantities) imposed in the excavation and fill. It is thought to be at least a 50% chance that the scope of the earthwork will change.	Likely	Significant	HIGH	Very Likely	Critical	HIGH

TL-2	Bridge work	No design for new bridge and no as-builts for existing bridge.	The bridge type is likely to change or some elements of the scope of the proposed bridge. The bridge construction is approximately 50% of the construction cost	Likely	Critical	HIGH	Very Likely	Significant	HIGH
				Project Cost			Project Schedule		
Risk No.	**Risk/Opportunity Event**	**Concerns**	**PDT Discussions & Conclusions**	**Likelihood***	**Impact***	**Risk Level***	**Likelihood***	**Impact***	**Risk Level***
	REGULATORY AND ENVIRONMENTAL								
RE-1	Cultural Resources	Per Ashley Dailide, NWS lead Archeologist: "There is a moderate potential for archaeological resources to exist within the project area. " Per Mary McCormick, NWS: "No previously recorded historic-age buildings or structures exist within the APE for the Tahuya Estuary."	"While there has been no previous surveys done within the project APE, there is a known archaeological site within a one mile radius of the project area. The entire APE will need to be surveyed, and if any archaeological resources are found, they will need to be tested and evaluated for the NRHP." "Consulted sources identified only one potential property, a bridge on the causeway which carries the NE North Shore Road across the estuary. The construction era of this county bridge is unknown. Other probable properties in the APE are small dikes, canal or other mundane structures associated with agricultural activities."	Unlikely	Marginal	LOW	Unlikely	Marginal	LOW
RE-2	Soil Contamination	Quantities of contaminated soil requiring excavation could vary significantly.	Extent and characterization of potential contamination has not been delineated yet. Impact will be significant since contaminated soil will have to trucked to an offsite landfill for disposal.	Likely	Marginal	MODERATE	Very Likely	Significant	HIGH
	CONSTRUCTION RISKS								
CON-4	Bridge Removal	Method of bridge demolition.	There could be different ways to perform this work. Without more information on the existing bridge, it is difficult to understand the full impact of this task. It could be much more cumbersome of a task than currently perceived.	Likely	Significant	HIGH	Very Unlikely	Negligible	LOW
	ESTIMATE AND SCHEDULE RISKS								
EST-1	Quantities	Many of the features have limited information, few cross-sections for earthwork, etc.	More information will be obtained as design progresses. It is likely that there will be a change in the quantities. Assume Significant impact.	Likely	Significant	HIGH	Likely	Significant	HIGH
EST-2	Cost book items	Many cost book items used for utilities and bridges.	Cost book items do not always reflect the site-conditions or do not represent the actual work required. Production rates are usually optimistic and material cost may be outdated.	Likely	Significant	HIGH	Very Likely	Significant	HIGH
	ECONOMICS RISKS								
FL-1	Fuel	Fuel prices are volatile and will probably go up	A 25% increase in fuel could contribute to up to a 2% increase in total construction costs. How likely is it that gasoline will reach $5.00/gal? Depends on who you ask. For the purposes of this risk analysis, assume that it is unlikely. Impact is significant.	Unlikely	Significant	MODERATE	Very Unlikely	Negligible	LOW
FL-2	Asphalt	Asphalt is a petroleum product and subject to fluctuation.	Assume likely and marginal.	Likely	Marginal	MODERATE	Very Unlikely	Negligible	LOW
FL-3	Concrete & Steel		These material costs are subject to market conditions. It is likely these will increase. The impact is considered to be negligible.	Likely	Negligible	LOW	Very Unlikely	Negligible	LOW

PSNERP
Lilliwaup Causeway
Construction Schedule

ID	Task Name	Duration	Start	Finish	Predecessors
1	**Lillwaup Causeway Replacement**	**524 days**	**Mon 10/3/16**	**Thu 10/4/18**	
2	**Fish and Wildlife**	**221 days**	**Mon 10/3/16**	**Mon 8/7/17**	
3	**General**	**221 days**	**Mon 10/3/16**	**Mon 8/7/17**	
4	Mobilize	1 day	Mon 10/3/16	Mon 10/3/16	
5	Pre Survey	5 days	Tue 10/4/16	Mon 10/10/16	4
6	Place Silt Fence	52 days	Tue 10/11/16	Wed 12/21/16	5
7	Remove Silt Fence	18 days	Wed 7/5/17	Fri 7/28/17	18
8	Post Survey	5 days	Mon 7/31/17	Fri 8/4/17	7
9	Demob	1 day	Mon 8/7/17	Mon 8/7/17	8
10	**Earthwork**	**99 days**	**Thu 12/22/16**	**Tue 5/9/17**	
11	Excavate Tidal Channel	40 days	Thu 12/22/16	Wed 2/15/17	6
12	Excavate Rock & Concrete Debris	2 days	Thu 2/16/17	Fri 2/17/17	11
13	Excavate Roadway & Lillwaup Creek Embankment	7 days	Mon 2/20/17	Tue 2/28/17	12
14	Fill - Gravel	50 days	Wed 3/1/17	Tue 5/9/17	13
15	**Demolition**	**40 days**	**Wed 5/10/17**	**Tue 7/4/17**	
16	Bulkheads	13 days	Wed 5/10/17	Fri 5/26/17	14
17	Buildings (Three)	24 days	Mon 5/29/17	Thu 6/29/17	16
18	Utilties	3 days	Fri 6/30/17	Tue 7/4/17	17
19	**Vegeatation**	**33 days**	**Wed 5/10/17**	**Fri 6/23/17**	
20	Plantings	30 days	Wed 5/10/17	Tue 6/20/17	14
21	LWD	3 days	Wed 6/21/17	Fri 6/23/17	20
22	Dust Control	7 days	Wed 5/10/17	Thu 5/18/17	14
23	**Roads, Railroads, Bridges**	**90 days**	**Mon 7/31/17**	**Fri 12/1/17**	
24	**Roads**	**90 days**	**Mon 7/31/17**	**Fri 12/1/17**	
25	**General**	**90 days**	**Mon 7/31/17**	**Fri 12/1/17**	
26	Mobilize	1 day	Mon 7/31/17	Mon 7/31/17	7
27	Street Cleaning	16 days	Mon 7/31/17	Mon 8/21/17	7
28	Demob	1 day	Fri 12/1/17	Fri 12/1/17	36
29	**Earthwork**	**46 days**	**Mon 7/31/17**	**Mon 10/2/17**	
30	Excavate Highway 101	45 days	Mon 7/31/17	Fri 9/29/17	7
31	Fill - Highway 101	1 day	Mon 10/2/17	Mon 10/2/17	30
32	**Pavement**	**44 days**	**Tue 10/3/17**	**Fri 12/1/17**	

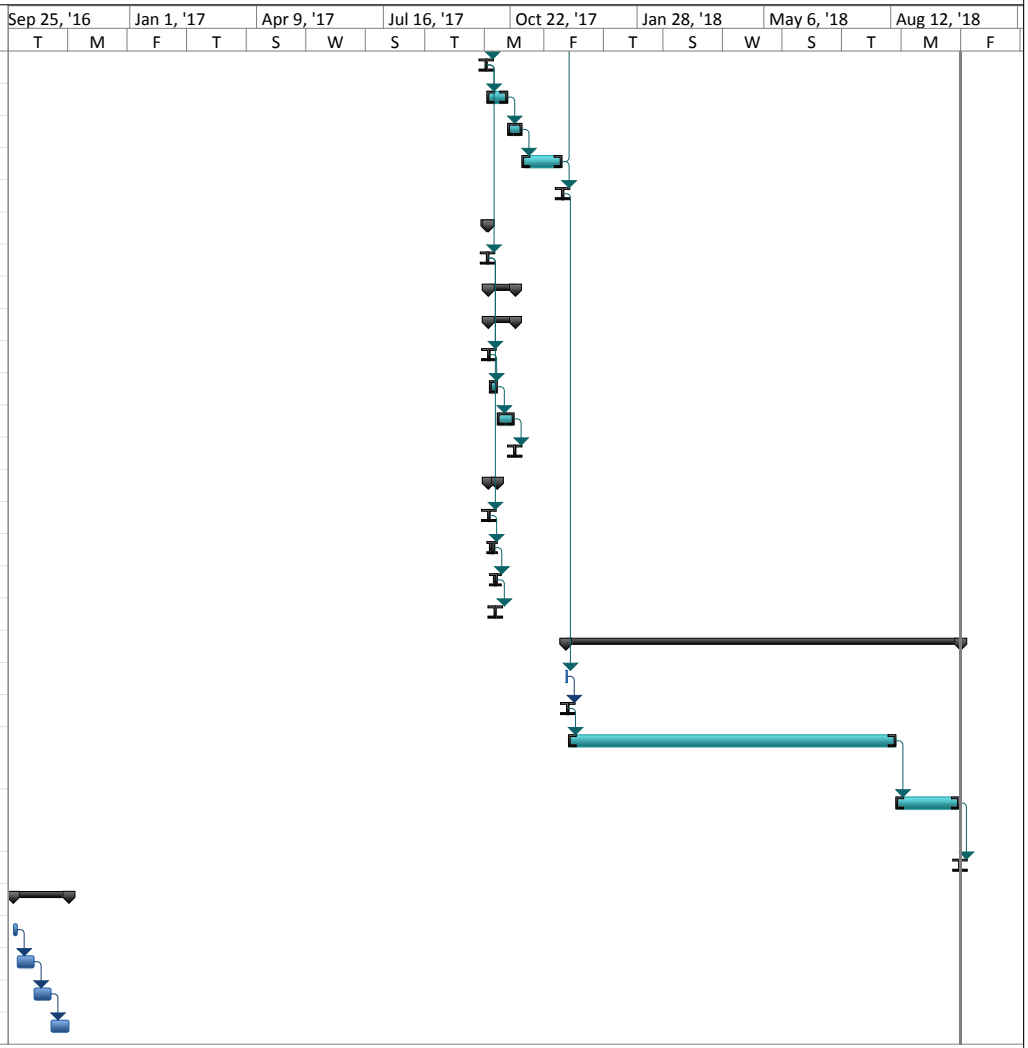


Project: Lilliwaup Causeway
Date: Fri 3/25/16

Task	External Tasks	Manual Task	Finish-only		
Split	External Milestone	Duration-only	Deadline		
Milestone	Inactive Task	Manual Summary Rollup	Progress		
Summary	Inactive Milestone	Manual Summary			
Project Summary	Inactive Summary	Start-only			

PSNERP
Lilliwaup Causeway
Construction Schedule

ID	Task Name	Duration	Start	Finish	Predecessors
33	Mobilize	1 day	Tue 10/3/17	Tue 10/3/17	31
34	Demolition	12 days	Wed 10/4/17	Thu 10/19/17	33
35	Place Highway 101	7 days	Fri 10/20/17	Mon 10/30/17	34
36	Place Lillwaup Road	23 days	Tue 10/31/17	Thu 11/30/17	35
37	Demobilize	1 day	Fri 12/1/17	Fri 12/1/17	36
38	**Drainage**	**1 day**	**Wed 10/4/17**	**Wed 10/4/17**	
39	Demo	1 day	Wed 10/4/17	Wed 10/4/17	33
40	**Relocate Utilties**	**15 days**	**Thu 10/5/17**	**Wed 10/25/17**	
41	**Power**	**15 days**	**Thu 10/5/17**	**Wed 10/25/17**	
42	Mobilize	1 day	Thu 10/5/17	Thu 10/5/17	39
43	Demo Power	4 days	Fri 10/6/17	Wed 10/11/17	42
44	Install New Power	9 days	Thu 10/12/17	Tue 10/24/17	43
45	Demobilze	1 day	Wed 10/25/17	Wed 10/25/17	44
46	**Telecommunications**	**5 days**	**Thu 10/5/17**	**Wed 10/11/17**	
47	Mobilize	1 day	Thu 10/5/17	Thu 10/5/17	39
48	Demo Telecom	2 days	Fri 10/6/17	Mon 10/9/17	47
49	Install New Telecom	3 days	Mon 10/9/17	Wed 10/11/17	48
50	Demobilze	1 day	Tue 10/10/17	Tue 10/10/17	49
51	**Bridge**	**219 days**	**Mon 12/4/17**	**Thu 10/4/18**	
52	Mobilize	1 day	Mon 12/4/17	Mon 12/4/17	37
53	Crane Testing	1 day	Tue 12/5/17	Tue 12/5/17	52
54	Placement of New Highway 101	181 days	Wed 12/6/17	Wed 8/15/18	53
55	Demolition of Old Highway 101	35 days	Thu 8/16/18	Wed 10/3/18	54
56	Demobilze	1 day	Thu 10/4/18	Thu 10/4/18	55
57	**Cultural Resource Preservation**	**31 days**	**Mon 10/3/16**	**Mon 11/14/16**	
58	Survey	3 days	Mon 10/3/16	Wed 10/5/16	
59	Report	9 days	Thu 10/6/16	Tue 10/18/16	58
60	Consultation	9 days	Wed 10/19/16	Mon 10/31/16	59
61	Potential NRHP-Evaluation	10 days	Tue 11/1/16	Mon 11/14/16	60



Project: Lilliwaup Causeway
Date: Fri 3/25/16

Task	External Tasks	Manual Task	Finish-only		
Split	External Milestone	Duration-only	Deadline		
Milestone	Inactive Task	Manual Summary Rollup	Progress		
Summary	Inactive Milestone	Manual Summary			
Project Summary	Inactive Summary	Start-only			

Lilliwaup Creek Estuary
Preliminary Budget Estimate Level
Abbreviated Risk Analysis

Risk Level

	Negligible	Marginal	Significant	Critical	Crisis
Very Likely	2	3	4	5	5
Likely	1	2	4	5	5
Unlikely	0	1	3	3	4
Very Unlikely	0	0	1	2	4

Risk Element	Potential Risk Areas	Concerns	PDT Discussions & Conclusions (Include logic & justification for choice of Likelihood & Impact)	Likelihood	Impact	Risk Level
Project Scope						
PS-1	06 Earthwork	Preliminary planning stages and no grading details known.	There is the possibility that the areas of excavation and fill could change from what is presented in the draft report. Any increase in quantity will be covered in the Quantity risk element section. The risk here is that the nature of the earthwork may change. There could be additional requirements (not quantities) imposed in the excavation and fill. It is thought to be at least a 50% chance that the scope of the earthwork will change. Impact is assumed to be marginal.	LIKELY	Marginal	2
PS-2	06 Demolition	No specific information is known about the structures to be removed.	Possibility for some scope change due to unknowns. Likely for scope to change. Impact assumed to be negligible.	LIKELY	Negligible	1
PS-4	08 Earthwork	See PS-1. Interchange design of Lilliwaup Street and Hwy 101 may not meet standards.	See Ps-1. Assume likely risk to occur with an assumed significant impact.	LIKELY	Significant	4
PS-5	Pavement	Preliminary stage of project planning. Assumed landfill disposal. There could be a potential opportunity in recycling the asphalt for a reduced disposal fee.	This risk analysis does no account for opportunities (cost savings). However it should be noted in the Risk Register. There are risks in the quantities, but that will be covered in the Quantity risk element. No other concerns with this item.	Unlikely	Negligible	0
PS-6	Bridge Removal	See PS-5. No as-built drawings.		Unlikely	Negligible	0
PS-7	Bridge Installation	No design. Same typical section used for all of the bridges.	The bridge type is likely to change or some elements of the scope of the proposed bridge. The bridge is approximately 37% of the construction cost. Curvature in bridge may present design differing from what is proposed. Could easily increase TPC over 5%.	LIKELY	Critical	5
PS-8	18 Cultural Resources Preservation	Per Ashley Dailide, NWS lead Archeologist: "While there has been no previous work done in this area, based on the landforms, there is a moderate potential for archaeological resources to exist within the project area."	"The entire APE will need to be surveyed, and if any archaeological resources are found, they will need to be tested and evaluated for the NRHP".	Unlikely	Marginal	1
PS-12	Remaining Construction Items	No specific concerns aside from level of detail in scope and design.	Likely unknowns at this point in all aspects of the work. Impact could have between a 1% and 5% increase to project costs.	LIKELY	Significant	4
Risk Element	**Potential Risk Areas**	**Concerns**	**PDT Discussions & Conclusions (Include logic & justification for choice of Likelihood & Impact)**	**Likelihood**	**Impact**	**Risk Level**
Acquisition Strategy						
AS-1	06 Earthwork	This estimate assumes full and open acquisition. However, the prime contractor is doing no work. All the work done is done by subcontractors. This project could be acquired by other methods aside from IFB full competition.	Typically if a project goes small business the amount of subcontracting and the overhead rates increase. Subcontracting should not be much of the risk for this project since everything is subbed out. If this went small business the overhead would increase. Other strategies could also increase costs. Given the nature of this work it is felt that it could go small business. Also, other methods may be used as well. It is considered likely that the contracting method could change from what is proposed in the estimate. The impact could be up to 10%.	LIKELY	Critical	5
AS-2	06 Demolition	See AS-1		LIKELY	Critical	5
AS-4	08 Earthwork	See AS-1		LIKELY	Critical	5
AS-5	Pavement	See AS-1		LIKELY	Critical	5
AS-6	Bridge Removal	See AS-1		LIKELY	Critical	5
AS-7	Bridge Installation	See AS-1		LIKELY	Critical	5

AS-8	18 Cultural Resources Preservation	Not applicable		Very LIKELY	Critical	5
AS-12	Remaining Construction Items	See AS-1		LIKELY	Critical	5
Risk Element	**Potential Risk Areas**	**Concerns**	**PDT Discussions & Conclusions (Include logic & justification for choice of Likelihood & Impact)**	**Likelihood**	**Impact**	**Risk Level**
Construction Complexity						
CC-1	06 Earthwork	No concerns at this time.		Unlikely	Negligible	0
CC-2	06 Demolition			Unlikely	Negligible	0
CC-4	08 Earthwork			Unlikely	Negligible	0
CC-5	Pavement			Unlikely	Negligible	0
CC-6	Bridge Removal	Method of bridge demolition.	There could be different ways to perform this work. Without more information on the existing bridge, it is difficult to understand the full impact of this task. It could be much more cumbersome of a task than currently perceived.	Unlikely	Marginal	1
CC-7	Bridge Installation	Pretty standard cross section.	If scope of work adheres to what is presented in the report, this is pretty straight forward bridge work. Assume unlikely and marginal.	Unlikely	Marginal	1
CC-8	18 Cultural Resources Preservation	No concerns at this time.		Very Unlikely	Negligible	0
CC-12	Remaining Construction Items	No concerns at this time.		Unlikely	Negligible	0
Risk Element	**Potential Risk Areas**	**Concerns**	**PDT Discussions & Conclusions (Include logic & justification for choice of Likelihood & Impact)**	**Likelihood**	**Impact**	**Risk Level**
Volatile Commodities						
VC-1	06 Earthwork	Fuel prices.	A 25% increase in fuel could contribute to up to a 3% increase in total construction costs. How likely is it that gasoline will reach $5.00/gal? Depends on who you ask. For the purposes of this risk analysis, assume that it is unlikely. Impact is significant.	Unlikely	Significant	3
VC-2	06 Demolition	See VC-1	Assume negligible.	Unlikely	Negligible	0
VC-4	08 Earthwork	See VC-1		Unlikely	Significant	3
VC-5	Pavement	Fuel prices. Asphalt.	Asphalt is a petroleum product and subject to fluctuation. Assume likely and marginal.	LIKELY	Marginal	2
VC-6	Bridge Removal	See VC-1		Unlikely	Significant	3
VC-7	Bridge Installation	Concrete, steel.	These material costs are subject to market conditions. It is likely these will increase. The impact is considered to be negligible.	LIKELY	Negligible	1
VC-8	18 Cultural Resources Preservation	No concerns at this time.		Very Unlikely	Negligible	0
VC-12	Remaining Construction Items	No concerns at this time.		Unlikely	Negligible	0
Risk Element	**Potential Risk Areas**	**Concerns**	**PDT Discussions & Conclusions (Include logic & justification for choice of Likelihood & Impact)**	**Likelihood**	**Impact**	**Risk Level**
Quantities						
Q-1	06 Earthwork	Very few cross sections, just typical sections used in quantity development.	More information will be obtained as design progresses. It is likely that there will be a change in the quantities. Likely a change in quantities and it could cause the estimate to increase by 1%.	LIKELY	Marginal	2
Q-2	06 Demolition	No specific information is known about the structures to be removed.	Likely quantities will increase and impact is assumed negligible.	LIKELY	Negligible	1
Q-4	08 Earthwork	See Q-1		LIKELY	Marginal	2
Q-5	Pavement	Assumed depth of removal. Asphalt placement design subject to change.	Likely to change. Impact is difficult to evaluate since disposal fees are the largest cost in demolition. Changes in asphalt placement could increase costs.	LIKELY	Marginal	2

Q-6	Bridge Removal	Many assumptions made.	Clarification will only occur as design progresses. Potential here for more material to be removed from the site and disposed of. It is believed this is likely to occur and assumed to have a marginal impact.	LIKELY	Marginal	2
Q-7	Bridge Installation	Used a typical section for the quantity development.	Conservative in the caisson depth. Many assumptions were made. It is likely that the quantities will change. The impact is though to have the potential to raise the TPC by up to 5%.	LIKELY	Significant	4
Q-8	18 Cultural Resources Preservation	Time spent on study is an estimate.	Findings could lead to more time being required.	LIKELY	Significant	4
Q-12	Remaining Construction Items	Preliminary design and early planning stage.	Potential here for more quantities needed.	LIKELY	Marginal	2
Risk Element	**Potential Risk Areas**	**Concerns**	**PDT Discussions & Conclusions (Include logic & justification for choice of Likelihood & Impact)**	**Likelihood**	**Impact**	**Risk Level**
Fabrication & Project Installed Equipment						
FI-1	06 Earthwork	No concerns at this time.		Very Unlikely	Negligible	0
FI-2	06 Demolition	No concerns at this time.		Very Unlikely	Negligible	0
FI-4	08 Earthwork	No concerns at this time.		Very Unlikely	Negligible	0
FI-5	Pavement	No concerns at this time.		Very Unlikely	Negligible	0
FI-6	Bridge Removal	No concerns at this time.		Very Unlikely	Negligible	0
FI-7	Bridge Installation	No concerns at this time.		Very Unlikely	Negligible	0
FI-8	18 Cultural Resources Preservation	No concerns at this time.		Very Unlikely	Negligible	0
FI-12	Remaining Construction Items	No concerns at this time.		Very Unlikely	Negligible	0
Risk Element	**Potential Risk Areas**	**Concerns**	**PDT Discussions & Conclusions (Include logic & justification for choice of Likelihood & Impact)**	**Likelihood**	**Impact**	**Risk Level**
Cost Estimating Method						
CE-1	06 Earthwork	No concerns at this time.		Very Unlikely	Negligible	0
CE-2	06 Demolition	No concerns at this time.		LIKELY	Marginal	2
CE-4	08 Earthwork	No concerns at this time.		Very Unlikely	Negligible	0
CE-5	Pavement	No concerns at this time.		Very Unlikely	Negligible	0
CE-6	Bridge Removal	Made assumptions.	Assumptions may not be valid.	LIKELY	Marginal	2
CE-7	Bridge Installation	Used many cost book items. Used many assumptions.	Cost book items and assumptions may not be entirely accurate or applicable to the project. It is likely there will be changes to cost model for the bridge as the	LIKELY	Significant	4
CE-8	18 Cultural Resources Preservation	Made assumptions.	Assumptions may not be valid.	LIKELY	Significant	4
CE-12	Remaining Construction Items			Very Unlikely	Negligible	0
Risk Element	**Potential Risk Areas**	**Concerns**	**PDT Discussions & Conclusions (Include logic & justification for choice of Likelihood & Impact)**	**Likelihood**	**Impact**	**Risk Level**
External Project Risks						
EX-1	06 Earthwork	No concerns at this time.		Unlikely	Negligible	0
EX-2	06 Demolition	No concerns at this time.		Very Unlikely	Negligible	0
EX-4	08 Earthwork	No concerns at this time.		Very Unlikely	Negligible	0
EX-5	Pavement	No concerns at this time.		Very Unlikely	Negligible	0
EX-6	Bridge Removal	No concerns at this time.		Very Unlikely	Negligible	0
EX-7	Bridge Installation	No concerns at this time.		Very Unlikely	Negligible	0
EX-8	18 Cultural Resources Preservation	No concerns at this time.		Very Unlikely	Negligible	0
EX-12	Remaining Construction Items	No concerns at this time.		Very Unlikely	Negligible	0

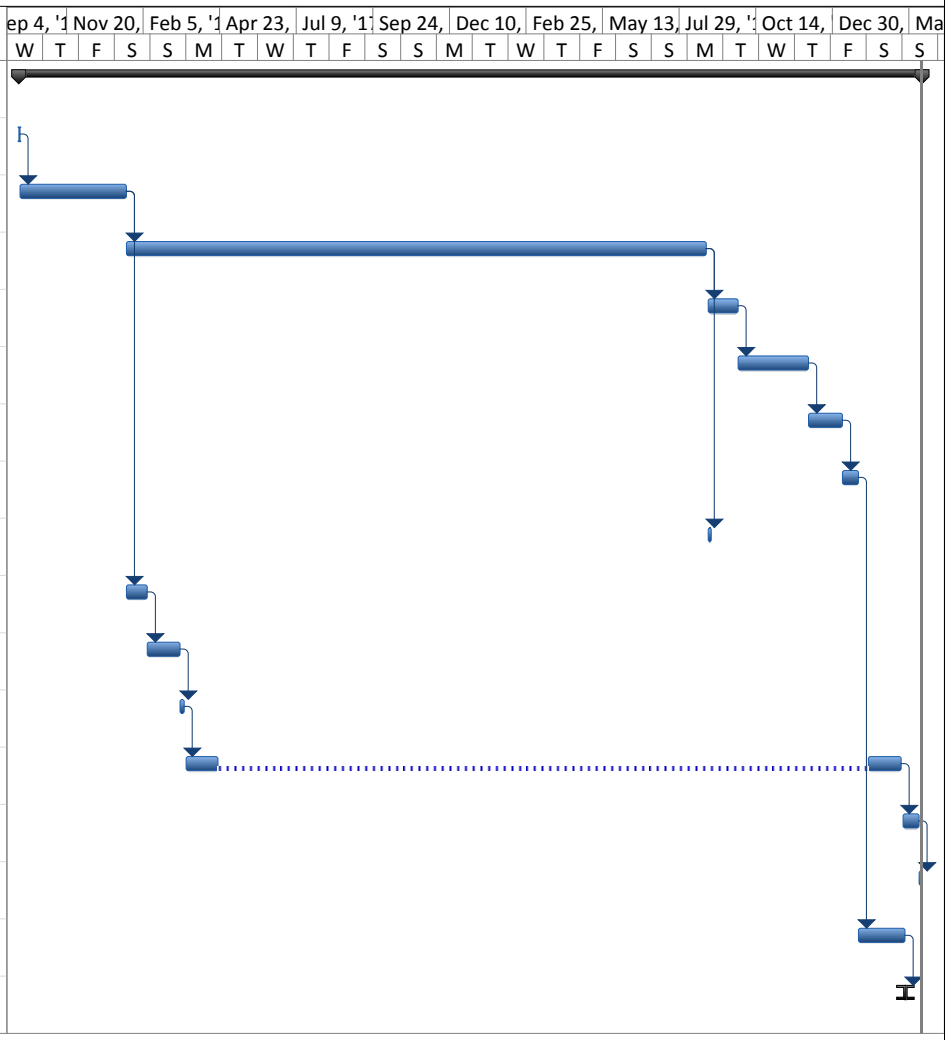
PSNERP
Lilliwaup Creek Estuary
Risk Register

March 2016

Risk Element	Potential Risk Areas	Concerns	PDT Discussions & Conclusions (Include logic & justification for choice of Likelihood & Impact)	Likelihood	Impact	Risk Level
HTRW						
HTRW-1	06 Earthwork	No concerns at this time.		Very Unlikely	Negligible	0
HTRW-2	06 Demolition	Potential for asbestos material in some of the structures proposed for removal. Potential for underground storage tanks (USTs) associated with the structures.	Individual structures were not assessed in the Phase I survey, and additional investigation is needed to characterize potential asbestos/lead contamination on the structures proposed for removal.	LIKELY	Marginal	2
HTRW-4	08 Earthwork	No concerns at this time.		Unlikely	Negligible	0
HTRW-5	Pavement	No concerns at this time.		Very Unlikely	Negligible	0
HTRW-6	Bridge Removal	No concerns at this time.		Very Unlikely	Negligible	0
HTRW-7	Bridge Installation	No concerns at this time.		Very Unlikely	Negligible	0
HTRW-8	18 Cultural Resources Preservation	Not applicable		Very Unlikely	Negligible	0
HTRW-12	Remaining Construction Items	No concerns at this time.		Unlikely	Negligible	0

PSNERP
Big Quilcene River
Construction Schedule

ID	Task Name	Duration	Start	Finish	Predecessors
1	**Bug Quilcene Delta**	**650 days**	**Mon 10/3/16**	**Fri 3/29/19**	
2	Start	1 day	Mon 10/3/16	Mon 10/3/16	
3	Site Prep	77 days	Tue 10/4/16	Wed 1/18/17	2
4	New LL Road Bridge	417 days	Thu 1/19/17	Fri 8/24/18	3
5	Build New LL Road	22 days	Mon 8/27/18	Tue 9/25/18	4
6	Remove LL Bridge	51 days	Wed 9/26/18	Wed 12/5/18	5
7	Demo LL Road	24 days	Thu 12/6/18	Tue 1/8/19	6
8	Other Road Demo	12 days	Wed 1/9/19	Thu 1/24/19	7
9	Pilot Channel	3 days	Mon 8/27/18	Wed 8/29/18	4
10	Demo Buildings	15 days	Thu 1/19/17	Wed 2/8/17	3
11	Demo Utility	23 days	Thu 2/9/17	Mon 3/13/17	10
12	Build Setback Levee	4 days	Tue 3/14/17	Fri 3/17/17	11
13	Remove South Dike	49 days	Mon 3/20/17	Fri 3/8/19	12
14	Remove North Dike	12 days	Mon 3/11/19	Tue 3/26/19	13
15	Reinforce South Dike	3 days	Wed 3/27/19	Fri 3/29/19	14
16	Revegetate	33 days	Fri 1/25/19	Tue 3/12/19	8
17	Finish	1 day	Wed 3/13/19	Wed 3/13/19	16



Project: Big Quilcene River
Date: Fri 3/25/16

Task	External Milestone	Manual Summary Rollup
Split	Inactive Task	Manual Summary
Milestone	Inactive Milestone	Start-only
Summary	Inactive Summary	Finish-only
Project Summary	Manual Task	Deadline
External Tasks	Duration-only	Progress

Big Quilcene River

Preliminary Budget Estimate Level
Abbreviated Risk Analysis

Risk Level

	Negligible	Marginal	Significant	Critical	Crisis
Very Likely	2	3	4	5	5
Likely	1	2	4	5	5
Unlikely	0	1	3	3	4
Very Unlikely	0	0	1	2	4

Risk Element	Potential Risk Areas	Concerns	PDT Discussions & Conclusions (Include logic & justification for choice of Likelihood & Impact)	Likelihood	Impact	Risk Level
Project Scope						
PS-1	Demo Buildings	Buildings are not well defined.	Report does not establish a great deal of detail regarding buildings types, sizes, or features. It was assumed that all buildings are single story, wood frame, with relatively simple foundations. It is very likely that there would be some variation in this. A 10% increase in this cost would be a negligible impact overall.	Very LIKELY	Negligible	2
PS-2	Roads	Bridge design is based on a section used among all PSNERP sites.	PDT believes bridge design is fairly conservative for this site. Very unlikely that there would be substantial changes. However, even a small change could have a significant total project impact given the cost of the bridge relative to the all the other aspects of work.	Very Unlikely	Significant	1
PS-3	Create Pilot Channel	No concerns		Very Unlikely	Negligible	0
PS-4	Levees	Levee settlement	Geotechnical investigations have not been conducted at this site and it is possible that substantial settlement would occur. PDT believes this is very likely and that material for the levee could increase by 50%. This could increase project cost by 1.3%.	Very LIKELY	Significant	4
PS-8	Cultural Resource Preservation	A prehistoric battleground is present.	Very likely something of significance would be found. Cultural Resource team member believes there would be marginal overall cost and schedule impacts.	Very LIKELY	Marginal	3
PS-9	Built Environment Analysis	Risks due to on-site buildings and dikes.	PDT believes the following: Very likely that there is some national register eligible projects (dikes - less likely, buildings, bridge). In some cases, construction has stopped, but hard to tell now. Marginal costs.	Very LIKELY	Marginal	3
PS-12	Remaining Construction Items	Preliminary design.	There are likely elements of the other associated work that are not included in the project. Elements that are included in the work are likely to change as well. These impacts are unlikely to exceed 1.0% of total cost.	LIKELY	Marginal	2
Risk Element	**Potential Risk Areas**	**Concerns**	**PDT Discussions & Conclusions (Include logic & justification for choice of Likelihood & Impact)**	**Likelihood**	**Impact**	**Risk Level**
Acquisition Strategy						
AS-1	Demo Buildings	Acquisition strategy is currently not defined. This estimate assumes full and open acquisition. However, the prime contractor is doing no work. All the work done is done by subcontractors. This project could be acquired by other methods aside from full and open competition.	Typically if a project goes small business the amount of subcontracting and the overhead rates increase. Subcontracting should not be much of the risk for this project since everything is subbed out. If this went small business the overhead would increase. Other strategies could also increase costs. This project, given the complicated nature of bridge construction is unlikely to go small business and increase feature cost by 10% due to increased markups. Total cost impacts based on this feature would be under 0.5%	Unlikely	Negligible	0
AS-2	Roads	See AS-1	Typically if a project goes small business the amount of subcontracting and the overhead rates increase. Subcontracting should not be much of the risk for this project since everything is subbed out. If this went small business the overhead would increase. Other strategies could also increase costs. This project, given the complicated nature of bridge construction is unlikely to go small business and increase feature cost by 10% due to increased markups. Total cost impacts based on this feature would be 8.9%	Unlikely	Critical	3

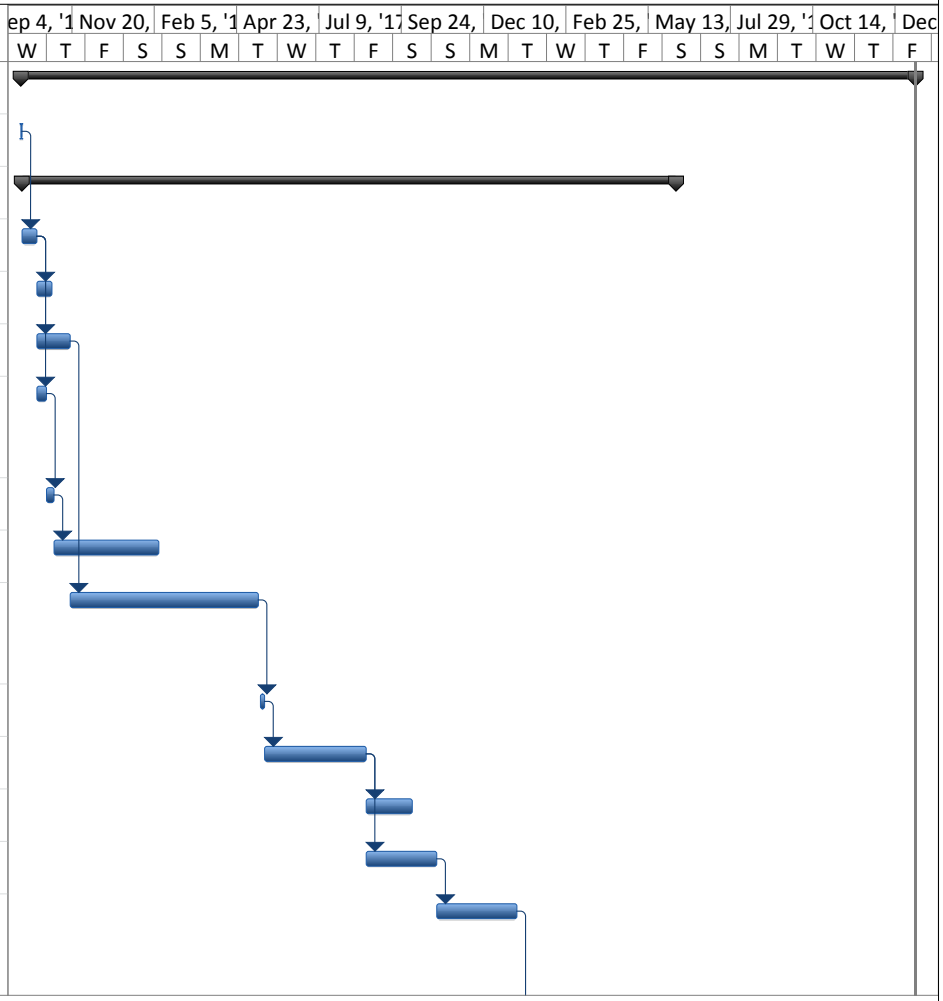
AS-3	Create Pilot Channel	See AS-1	Typically if a project goes small business the amount of subcontracting and the overhead rates increase. Subcontracting should not be much of the risk for this project since everything is subbed out. If this went small business the overhead would increase. Other strategies could also increase costs. This project, given the complicated nature of bridge construction is unlikely to go small business and increase feature cost by 10% due to increased markups. Total cost impacts based on this feature would be under 0.5%	Unlikely	Negligible	0
AS-4	Levees	See AS-1	Typically if a project goes small business the amount of subcontracting and the overhead rates increase. Subcontracting should not be much of the risk for this project since everything is subbed out. If this went small business the overhead would increase. Other strategies could also increase costs. This project, given its relatively simple scope could go small business and increase feature cost by 10% due to increased markups. Total cost impacts based on this feature would be 0.6%	Unlikely	Marginal	1
AS-8	Cultural Resource Preservation	See AS-1	Typically if a project goes small business the amount of subcontracting and the overhead rates increase. Subcontracting should not be much of the risk for this project since everything is subbed out. If this went small business the overhead would increase. Other strategies could also increase costs. This project, given the complicated nature of bridge construction is unlikely to go small business and increase feature cost by 10% due to increased markups. Total cost impacts based on this feature would be under 0.5%	Unlikely	Negligible	0
AS-9	Built Environment Analysis	See AS-1	Typically if a project goes small business the amount of subcontracting and the overhead rates increase. Subcontracting should not be much of the risk for this project since everything is subbed out. If this went small business the overhead would increase. Other strategies could also increase costs. This project, given the complicated nature of bridge construction is unlikely to go small business and increase feature cost by 10% due to increased markups. Total cost impacts based on this feature would be under 0.5%	Unlikely	Negligible	0
AS-12	Remaining Construction Items	See AS-1	Typically if a project goes small business the amount of subcontracting and the overhead rates increase. Subcontracting should not be much of the risk for this project since everything is subbed out. If this went small business the overhead would increase. Other strategies could also increase costs. This project, given the complicated nature of bridge construction is unlikely to go small business and increase feature cost by 10% due to increased markups. Total cost impacts based on this feature would be under 0.5%	Unlikely	Negligible	0
Risk Element	**Potential Risk Areas**	**Concerns**	**PDT Discussions & Conclusions (Include logic & justification for choice of Likelihood & Impact)**	**Likelihood**	**Impact**	**Risk Level**
Construction Complexity						
CC-1	Demo Buildings	No concerns		Very Unlikely	Negligible	0
CC-2	Roads	Bridge is assumed to be constructible from land.	Construction of Linger Longer Rd Bridge is assumed to be conducted from the land surrounding the bridge. If this is not possible due to soil conditions or property owner limitations, there could be higher costs to complete this work. This is not believed to be likely, however a 10% increase in bridge costs would increase the total project cost by 8%.	Unlikely	Critical	3
CC-3	Create Pilot Channel	Area where work is occurring is assumed to be open to equipment.	It was assumed that the entire area where the channel is being dug would be accessible to tracked equipment. If soil conditions are not suitable, or if the area where the vehicles can operate is constrained by biological elements, productivity will slow. A 10% slowdown will cause a negligible increase in cost.	LIKELY	Negligible	1
CC-4	Levees	Area where work is occurring is assumed to be open to equipment.	Conditions were assumed to be suitable for the use of large tracked equipment. If this is found to be otherwise, there could be cost increases. Given the large area where levees are being removed and installed, and their proximity to the river, some level of slowdown is likely. A 10% slowdown would cause a 0.52% cost increase to the project.	LIKELY	Marginal	2
CC-8	Cultural Resource Preservation	No concerns		Very Unlikely	Negligible	0

CC-9	Built Environment Analysis	No concerns		Very Unlikely	Negligible	0
CC-12	Remaining Construction Items	No concerns.		Very Unlikely	Negligible	0
Risk Element	**Potential Risk Areas**	**Concerns**	**PDT Discussions & Conclusions (Include logic & justification for choice of Likelihood & Impact)**	**Likelihood**	**Impact**	**Risk Level**
Volatile Commodities						
VC-1	Demo Buildings	No concerns		Very Unlikely	Negligible	0
VC-2	Roads	Concrete price increases.	Since this is a large concrete bridge, it is vulnerable to increases in the price of pre-cast and ready-mix concrete. Given that the construction industry is in a relative slump, it is likely that material prices will increase as the industry turns around in the future. A 15% increase in concrete based materials would cause an overall cost impact of 2%.	LIKELY	Significant	4
VC-3	Create Pilot Channel	Fuel cost increases.	Fuel costs for the equipment and the hauling. An increase of 25% in fuel costs increases the total project cost less than 0.5%.	LIKELY	Negligible	1
VC-4	Levees	Imported fill material could increase in cost.	A 10% increase in material cost would have a 0.23% impact on total cost. A cost increase of this size is considered likely, due to the fact that current material prices were obtained in a period of construction industry slump. Prices are likely to increase once the industry regains strength.	LIKELY	Negligible	1
VC-8	Cultural Resource Preservation	No concerns		Very Unlikely	Negligible	0
VC-9	Built Environment Analysis	No concerns		Very Unlikely	Negligible	0
VC-12	Remaining Construction Items	No concerns.		Very Unlikely	Negligible	0
Risk Element	**Potential Risk Areas**	**Concerns**	**PDT Discussions & Conclusions (Include logic & justification for choice of Likelihood & Impact)**	**Likelihood**	**Impact**	**Risk Level**
Quantities						
Q-1	Demo Buildings	Potential for additional houses being removed.	PDT believes there is a very high chance that additional houses will need to be removed. If the current number of houses increases from 5 to 10, the impact on the total project cost would be 2.9%.	Very LIKELY	Significant	4
Q-2	Roads	Numerous quantity assumptions made for road removal quantities.	Several roads were noted in the PDR as being removed but no independent calculation of their quantities was possible, and quantities were note provided in the report itself. Assumptions were made regarding the amount of road being removed, but it is very likely that there will be some sort of difference. A 20% increase in the quantity of roadway being demolished would cause a 0.4% increase in total project cost.	Very LIKELY	Negligible	2
Q-3	Create Pilot Channel	No concerns		Very Unlikely	Negligible	0
Q-4	Levees	Levee slope changes	Current levee slopes are 2:1. It is likely that slopes will increase to 2.5:1 or 3:1. This would substantially increase material required for import since not only would the levee footprint be larger, but additional material would be required to account for the increased settlement. This could potentially double the amount of material required. Total cost impact would be 2.7%.	LIKELY	Significant	4
Q-8	Cultural Resource Preservation			Very Unlikely	Negligible	0
Q-9	Built Environment Analysis			Very Unlikely	Negligible	0
Q-12	Remaining Construction Items	Preliminary design. Quantities subject to change.	be marginal.	Very LIKELY	Marginal	3
Risk Element	**Potential Risk Areas**	**Concerns**	**PDT Discussions & Conclusions (Include logic & justification for choice of Likelihood & Impact)**	**Likelihood**	**Impact**	**Risk Level**
Fabrication & Project Installed Equipment						
FI-1	Demo Buildings	No concerns.		Very Unlikely	Negligible	0
FI-2	Roads	No concerns.		Very Unlikely	Negligible	0
FI-3	Create Pilot Channel	No concerns.		Very Unlikely	Negligible	0
FI-4	Levees	No concerns.		Very Unlikely	Negligible	0
FI-8	Cultural Resource Preservation	No concerns.		Very Unlikely	Negligible	0
FI-9	Built Environment Analysis	No concerns.		Very Unlikely	Negligible	0
FI-12	Remaining Construction Items	No concerns.		Very Unlikely	Negligible	0
Risk	**Potential Risk Areas**	**Concerns**	**PDT Discussions & Conclusions**	**Likelihood**	**Impact**	**Risk**

Element	Potential Risk Areas	Concerns	(Include logic & justification for choice of Likelihood & Impact)	Likelihood	Impact	Level
Cost Estimating Method						
CE-1	Demo Buildings	No concerns	Methodology is conservative.	Very Unlikely	Negligible	0
CE-2	Roads	No concerns	Methodology is conservative.	Very Unlikely	Negligible	0
CE-3	Create Pilot Channel	Sidecasting of excavated soil was assumed	Material was assumed to be sidecast next to the channel and not hauled offsite for disposal. It is unlikely that this would not be acceptable, but if offsite disposal is necessary there will be increased costs. Double handling of material and disposal costs will be added to the cost of doing the work. Overall cost increase would be marginal.	Unlikely	Marginal	1
CE-4	Levees	Stockpiling of material was assumed to occur at no additional cost.	No site has been identified yet for stockpiling material. PDT believes this is very unlikely to be an issue since there is Jefferson County land nearby that should be available for no additional charge.	Very Unlikely	Marginal	0
CE-8	Cultural Resource Preservation	No concerns	Used Archaeologist provided data.	Very Unlikely	Negligible	0
CE-9	Built Environment Analysis	No concerns	Used Archaeologist provided data.	Very Unlikely	Negligible	0
CE-12	Remaining Construction Items	Many assumptions made.	Could increase costs would be marginal.	LIKELY	Marginal	2
Risk Element	**Potential Risk Areas**	**Concerns**	**PDT Discussions & Conclusions (Include logic & justification for choice of Likelihood & Impact)**	**Likelihood**	**Impact**	**Risk Level**
External Project Risks						
EX-1	Demo Buildings	No concerns	Risk of buildings being declared historical was discussed elsewhere.	Very Unlikely	Negligible	0
EX-2	Roads	Existing bridge will be used as a point to assemble new bridge.	County will require road to be open at all times. PDT believes it is very unlikely that the proposed method can't be used. If bridge needs to be assembled through barging, there would be a marginal cost increase.	Very Unlikely	Marginal	0
EX-3	Create Pilot Channel	No concerns		Very Unlikely	Negligible	0
EX-4	Levees	Removing levees exposes BPA transmission towers to potential flooding.	PDT believes it's very likely that some level of reinforcement would be required for the towers. Most likely this would be to create berms around the towers. This could be a significant cost.	Very LIKELY	Significant	4
EX-8	Cultural Resource Preservation	No concerns		Very Unlikely	Negligible	0
EX-9	Built Environment Analysis	No concerns		Very Unlikely	Negligible	0
EX-12	Remaining Construction Items	No concerns		Very Unlikely	Negligible	0
Risk Element	**Potential Risk Areas**	**Concerns**	**PDT Discussions & Conclusions (Include logic & justification for choice of Likelihood & Impact)**	**Likelihood**	**Impact**	**Risk Level**
HTRW						
HTRW-1	Demo Buildings	Potential for asbestos, lead paint, etc.	HTRW team member believes buildings are likely to contain standard building contaminants. Marginal overall impact.	Very LIKELY	Marginal	3
HTRW-2	Roads	Potential for petroleum contamination from vehicles.	HTRW team member does not believe this to be a concern. Unlikely contamination would be at a level that would require removal.	Very Unlikely	Negligible	0
HTRW-3	Create Pilot Channel	Possible soil contamination from human habitation.	PDT believes this is unlikely to occur. If it does, costs would be marginal due to the small size of the soil being removed.	Unlikely	Marginal	1
HTRW-4	Levees	Potential soil related contamination.	HTRW report mentions it is likely that some contamination will be found in soils. If soil must be removed, there could be significant cost impacts.	LIKELY	Significant	4
HTRW-8	Cultural Resource Preservation	No concerns.		Very Unlikely	Negligible	0
HTRW-9	Built Environment Analysis	No concerns.		Very Unlikely	Negligible	0
HTRW-12	Remaining Construction Items	A variety of minor site features being demoed could contain HTRW substances.	Likely that something would be encountered, but disposal would be straightforward and relatively inexpensive. Marginal cost impacts due to minor nature of expected finds.	LIKELY	Marginal	2

PSNERP
Snohomish Estuary
Construction Schedule

ID	Task Name	Duration	Start	Finish	Predecessors
1	**Snohomish River Estuary**	**599 days**	**Mon 10/3/16**	**Thu 1/17/19**	
2	Start	1 day	Mon 10/3/16	Mon 10/3/16	
3	**Distribution Channel**	**438 days**	**Tue 10/4/16**	**Thu 6/7/18**	
4	Mobilize	10 days	Tue 10/4/16	Mon 10/17/16	2
5	Survey	10 days	Tue 10/18/16	Mon 10/31/16	4
6	Clear and Grub	23 days	Tue 10/18/16	Thu 11/17/16	4
7	Build Temporary Roadway	7 days	Tue 10/18/16	Wed 10/26/16	4
8	Demo Boat Ramp	5 days	Thu 10/27/16	Wed 11/2/16	7
9	Demo Buildings	70 days	Thu 11/3/16	Wed 2/8/17	8
10	Distribution Channel Excavation	126 days	Fri 11/18/16	Fri 5/12/17	6
11	Culvert Installation	4 days	Mon 5/15/17	Thu 5/18/17	10
12	Levee Construction	67 days	Fri 5/19/17	Mon 8/21/17	11
13	Eroision Protection	31 days	Tue 8/22/17	Tue 10/3/17	12
14	Road Demo	48 days	Tue 8/22/17	Thu 10/26/17	12
15	New Road Construction	53 days	Fri 10/27/17	Tue 1/9/18	14



Project: Snohomish Estuary
Date: Fri 3/25/16

Task	External Milestone	Manual Summary Rollup
Split	Inactive Task	Manual Summary
Milestone	Inactive Milestone	Start-only
Summary	Inactive Summary	Finish-only
Project Summary	Manual Task	Deadline
External Tasks	Duration-only	Progress

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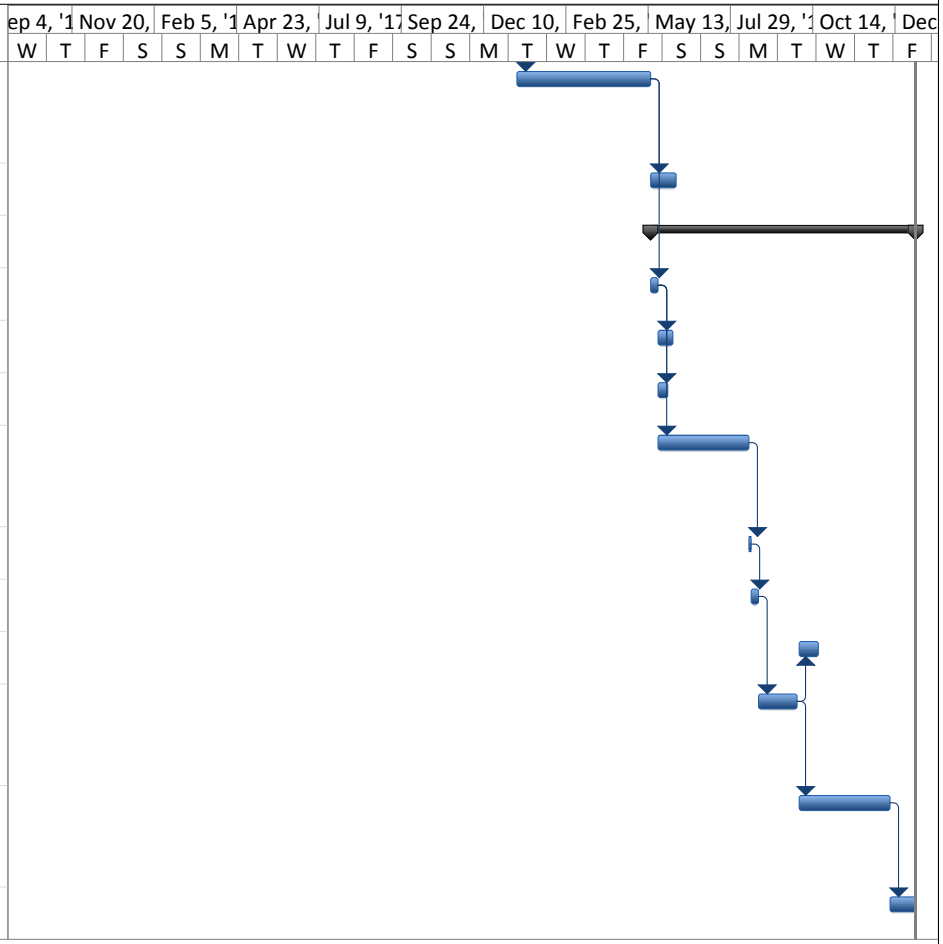
Snohomish Estuary
Construction Schedule

ID	Task Name	Duration	Start	Finish	Predecessors
16	New Bridge Construction	89 days	Wed 1/10/18	Mon 5/14/18	15
17	Vegetation	18 days	Tue 5/15/18	Thu 6/7/18	16
18	**Blind Channel**	**178 days**	**Tue 5/15/18**	**Thu 1/17/19**	
19	Mobilize	5 days	Tue 5/15/18	Mon 5/21/18	16
20	Survey	10 days	Tue 5/22/18	Mon 6/4/18	19
21	Clear and Grub	7 days	Tue 5/22/18	Wed 5/30/18	19
22	Blind Channel Excavation	61 days	Tue 5/22/18	Tue 8/14/18	19
23	Culvert Installation	2 days	Wed 8/15/18	Thu 8/16/18	22
24	Berm Construction	5 days	Fri 8/17/18	Thu 8/23/18	23
25	Road Demo	14 days	Mon 10/1/18	Thu 10/18/18	26
26	New Road Construction	26 days	Fri 8/24/18	Fri 9/28/18	24
27	New Bridge Construction	61 days	Mon 10/1/18	Mon 12/24/18	26
28	Vegetation	18 days	Tue 12/25/18	Thu 1/17/19	27



Project: Snohomish Estuary
Date: Fri 3/25/16

Task	External Milestone	Manual Summary Rollup	
Split	Inactive Task	Manual Summary	
Milestone	Inactive Milestone	Start-only	
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Project Summary	Manual Task	Deadline	
External Tasks	Duration-only	Progress	

PSNERP
Snohomish River Estuary
Risk Register

March 2016

Risk No.	Risk/Opportunity Event	Concerns	PDT Discussions & Conclusions	Project Cost			Project Schedule		
				Likelihood*	Impact*	Risk Level*	Likelihood*	Impact*	Risk Level*
Contract Risks (Internal Risk Items are those that are generated, caused, or controlled within the PDT's sphere of influence.)									
	PROJECT & PROGRAM MGMT								
PPM-1	Project Scheduling	High volume of projects under the PSNERP authorization may present issues in terms of resource allocation and quality control.	PDT does not believe the volume of project will cause problems. Project will be schedule over years and even decades in order to meet construction goals.	Very Unlikely	Negligible	LOW	Very Unlikely	Negligible	LOW
PPM-2	Staffing Reductions	Both the Seattle District and the WDFW have numerous projects competing for staffing resources. If other projects become a higher priority staff could be pulled from PSNERP.	PSNERP remains a District and WDFW priority and will is less likely than other projects to see staffing reductions. There are minor cost increases due to increases in work being out-sourced to AEs and potential slowdowns is staffing is shifted on short notice.	Very Unlikely	Negligible	LOW	Very Unlikely	Negligible	LOW
PPM-3	Communication Issues	Excellent communications is necessary in order to successfully complete the project. Both internal issues intra-Corps or intra-WDFW, or issues between the Corps and local sponsors could affect the project timeline.	The project currently has strong communication and trust between the Corps and WDFW, and enjoys high levels of political support both from the Federal and local sponsors. There are other local sponsors (municipalities, tribes, NGOs, etc.) that will be involved once the project moves into PED/CG phase. Communications with these entities may be more fraught and there are likely to be at least some schedule delays because of this.	Unlikely	Negligible	LOW	Likely	Marginal	MODERATE
PPM-4	Poor Initial Project Performance	The PSNERP project will be very visible in the Puget Sound area once construction begins. Could an early action that performs poorly (reduced environmental benefits, project neighbors who felt slighted or whose concerns were not fully addressed, etc.) cause the remainder of the project to have increased cost/schedule?	PDT believes its very unlikely that there would be a poorly performing initial project as the earliest projects that proceed to construction are likely to be those whose success is the most assured. Impacts would likely be delays to the start of projects, and costs other than increases due to inflation would be unlikely.	Very Unlikely	Negligible	LOW	Very Unlikely	Negligible	LOW
Risk No.	**Risk/Opportunity Event**	**Concerns**	**PDT Discussions & Conclusions**	**Project Cost**			**Project Schedule**		
				Likelihood*	**Impact***	**Risk Level***	**Likelihood***	**Impact***	**Risk Level***
	CONTRACT ACQUISITION RISKS								
CA-1	Potentially Could Go Small Business	This estimate assumes SB open acquisition. The prime contractor is doing no work. All the work done is done by subcontractors. This project could be acquired by other methods aside from SB open competition. The size of this project is very large. The project will probably be constructed under multiple acquisitions.	Typically if a project goes very restrictive small business the amount of subcontracting and the overhead rates increase. Subcontracting should not be much of the risk for this project since everything is subbed out. If this went small business the overhead would increase. Other strategies could also increase costs. Given the nature of this work it is felt that it could go small business. Also, other methods may be used as well. It is considered likely that the contracting method could change from what is proposed in the estimate. The impact could be up to 10%.	Likely	Critical	HIGH	Likely	Marginal	MODERATE
CA-3	Inefficient Contractors	The acquisition process may higher inefficient contractors.	PDT believe that this is unlikely. Contracting language and selection processes can be done in a way that can filter out poor performing contractors.	Unlikely	Negligible	LOW	Unlikely	Marginal	LOW
Risk No.	**Risk/Opportunity Event**	**Concerns**	**PDT Discussions & Conclusions**	**Project Cost**			**Project Schedule**		
				Likelihood*	**Impact***	**Risk Level***	**Likelihood***	**Impact***	**Risk Level***
	TECHNICAL RISKS								
TL-1	Earthwork - Blind Slough	Unanticipated ground conditions	Based on the small area unlikely, but if there were some the impact would be small	Very Likely	Significant	HIGH	Likely	Marginal	MODERATE
TL-2	Earthwork - Distributary Channel	Unanticipated ground conditions	Based on cleaning and widening an existing channel unlikely, but if there were some, the impact would be small	Very Likely	Critical	HIGH	Likely	Critical	HIGH

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TL-3	Bridge Placement	No design. Same typical section used for all of the bridges. Seismic requirements.	The bridge type is likely to change or some elements of the scope of the proposed bridge. The bridge is approximately under 10% of the construction cost.	Very Likely	Marginal	MODERATE	Very Likely	Marginal	MODERATE
TL-4	Earthwork Distributary Channel Levee	Unanticipated ground conditions	Even with good exploration, difficult ground conditions can be encountered, may need a dragline to complete this effort is there is a lot of water on site.	Likely	Marginal	MODERATE	Likely	Marginal	MODERATE
				Project Cost			Project Schedule		
Risk No.	**Risk/Opportunity Event**	**Concerns**	**PDT Discussions & Conclusions**	**Likelihood***	**Impact***	**Risk Level***	**Likelihood***	**Impact***	**Risk Level***
	LANDS AND DAMAGES RISKS								
LD-2	Structure Removal	No details for the structures to be removed.	The PDT noted that there is the possibility of commercial relocation. It is as good assumption that it is likely the scope for this item will increase. The impact is assumed to be marginal.	Very Likely	Marginal	MODERATE	Likely	Marginal	MODERATE
LD-3	Land Acquisition	Land acquisitions and unwilling property owners. Stakeholder involvement.	This has the potential to change the project scope. Risk captured in the scope risk element.	Very Unlikely	Negligible	LOW	Very Unlikely	Negligible	LOW
LD-4	Utilities	sewer, telecommunications and road relocations may be applicable. Possible gas line on western edge of mainland.	There is one location near the new bridge where new or relocated utilities can be expected. This should be a small marginal cots.	Very Likely	Marginal	MODERATE	Unlikely	Marginal	LOW
				Project Cost			Project Schedule		
Risk No.	**Risk/Opportunity Event**	**Concerns**	**PDT Discussions & Conclusions**	**Likelihood***	**Impact***	**Risk Level***	**Likelihood***	**Impact***	**Risk Level***
	REGULATORY AND ENVIRONMENTAL								
RE-2	Industrial Contamination	Possible prior industrial/agriculture activity and dumping.	David Clark Please Fill Out	Very Likely	Crisis	HIGH	Likely	Significant	HIGH
RE-5	Creosote Pilings	Risk that we will encounter creosote pilings the cost and effort to dispose	David Clark Please Fill Out	Unlikely	Negligible	LOW	Very Unlikely	Negligible	LOW
RE-6	Cultural Resources	Extremely high probability for unidentified cultural resources to be found with in project area. Previously recorded archaeological sites and historic structures known to be located both in the project footprint and within close proximity. The majority of these resources remain unevaluated to the National Register of Historic Places. The cultural resources survey could identify additional cultural resources within the project footprint.	If any archaeological sites and/or historic structures (both known and unknown) are determined eligible to the National Register they must either be avoid or the adverse effect be mitigated. Unevaluated site/structures need to be evaluated for the National Register. Due the large number of currently known archaeological sites and historic structures and the possibility for additional resources to be identified by the cultural resource survey there is a concerns that avoidance may not be feasible in some situations and mitigation will need to occur. The project area will need to be surveyed and archaeological monitoring will likely be necessary during construction.	Likely	Marginal	MODERATE	Likely	Marginal	MODERATE
				Project Cost			Project Schedule		
Risk No.	**Risk/Opportunity Event**	**Concerns**	**PDT Discussions & Conclusions**	**Likelihood***	**Impact***	**Risk Level***	**Likelihood***	**Impact***	**Risk Level***
	CONSTRUCTION RISKS								
CON-1	Post-Levee Removal Flooding	Following levee removal work on filling ag ditches will occur. The site will be vulnerable to flooding at that point and there could be slow downs.	This is very unlikely to occur. Likely to affect schedule only	Very Unlikely	Negligible	LOW	Very Unlikely	Negligible	LOW
CON-2	Construction Mods	There is always the risk for construction mods.	Earthwork projects often have differing site conditions that will make construction more challenging for the contractor. Typically no more than 10%.	Very Likely	Critical	HIGH	Likely	Significant	HIGH
CON-3	Bridge Placement	Construction methods may be different than what was assumed in the cost estimate	A different method of construction could affect the crew sizes and production rates and durations.	Very Likely	Significant	HIGH	Likely	Significant	HIGH
				Project Cost			Project Schedule		
Risk No.	**Risk/Opportunity Event**	**Concerns**	**PDT Discussions & Conclusions**	**Likelihood***	**Impact***	**Risk Level***	**Likelihood***	**Impact***	**Risk Level***

PSNERP
Snohomish River Estuary
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	ESTIMATE AND SCHEDULE RISKS								
EST-1	Earthwork Quantities	See TL-1/2 Risk & Con-2	See TL-1/2 Risk & Con-2	Very Unlikely	Negligible	LOW	Very Likely	Negligible	LOW
EST-2	LWD & Plantings	The scope is very limited and quantities are broad	Scope and quantities are very likely to change since no known quantities.	Likely	Negligible	LOW	Likely	Negligible	LOW
EST-4	Bridge Cost Model	Used many cost book items. Used many assumptions.	Cost book items and assumptions may not be entirely accurate or applicable to the project. It is likely there will be changes to cost model for the bridge as the design progresses. The impact could be significant given the % of costs for the numerous bridges to the TPC.	Very Likely	Significant	HIGH	Likely	Marginal	MODERATE
EST-5	Flooding and Work Windows	Project takes places over many years and there are likely to be weather issues, possible flooding, and other issues that occur during this time.	There is a high likelihood that there will be schedule impacts because of this. Cost impacts would be relatively marginal.	Unlikely	Marginal	LOW	Likely	Negligible	LOW
				Project Cost			**Project Schedule**		
Risk No.	**Risk/Opportunity Event**	**Concerns**	**PDT Discussions & Conclusions**	**Likelihood***	**Impact***	**Risk Level***	**Likelihood***	**Impact***	**Risk Level***
	ECONOMICS RISKS								
FL-1	Fuel	Fuel prices are volatile and will probably go up	A 25% increase in fuel could contribute to up to a 3% increase in total construction costs. How likely is it that gasoline will reach $5.00/gal? Depends on who you ask. For the purposes of this risk analysis, assume that it is unlikely.	Likely	Marginal	MODERATE	Very Unlikely	Negligible	LOW
FL-2	Asphalt	Asphalt is a petroleum product and subject to fluctuation.	Assume likely and marginal.	Likely	Negligible	LOW	Very Unlikely	Negligible	LOW
FL-3	Concrete & Steel		Cost of steel and other metals are subject to market conditions. It is believed that there is at least a 50% chance of fluctuation upward. The impact is considered to increase the total project costs no more than 1%	Likely	Negligible	LOW	Very Unlikely	Negligible	LOW
				Project Cost			**Project Schedule**		
Risk No.	**Risk/Opportunity Event**	**Concerns**	**PDT Discussions & Conclusions**	**Likelihood***	**Impact***	**Risk Level***	**Likelihood***	**Impact***	**Risk Level***
	Programmatic Risks	(External Risk Items are those that are generated, caused, or controlled exclusively outside the PDT's sphere of influence.)							
PR-1	Changing Laws/Regulations	Laws, regulations, and guidelines could change over the life of the project, potentially requiring changes in materials used on sites, adjusted construction methodology, or increased design/study requirements.	In general this risk was viewed to be very unlikely to affect the project. The only exception is that the WA Dept. of Ecology may change its sediment management guidelines. However, these changes are not expected to require more than extremely minor adjustments to TPC.	Very Unlikely	Negligible	LOW	Very Likely	Negligible	LOW