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Attachments

Attachment A    Floodplain Impact Assessment Methodology Memorandum
Acronyms and Abbreviations

CDID #1 Consolidated Diking Improvement District No. 1
EIS Environmental Impact Statement
FEMA Federal Emergency Management Agency
FHWA Federal Highway Administration
GSA Alternative Grade-Separated Option A Alternative
PGSB Alternative Partial Grade-Separated Option B Alternative
RCW Revised Code of Washington
SR State Route
WSDOT Washington State Department of Transportation
1.0 INTRODUCTION

The Industrial Way / Oregon Way Intersection Project is located in the industrial area of Longview, Washington at the intersection of Industrial Way (State Route (SR) 432), Oregon Way, and SR 433. This intersection provides a critical connection of two Highways of Statewide Significance that support significant passenger and freight truck movement. The purpose of the project is to develop an affordable long-term solution that:

- Maintains or improves emergency response
- Improves travel reliability for all vehicles
- Accommodates current and future freight truck and passenger vehicle movement through the intersection and across the region and states.

The purpose of this document is to describe the existing floodplain conditions, discuss effects and benefits the project would have on those conditions, and recommend mitigation measures to address adverse effects. The information contained in this technical analysis supports the project’s Environmental Impact Statement (EIS).

Methodology for the analysis contained in this document is presented in the Impact Assessment Methodology memorandum included as Attachment A.

2.0 DESCRIPTION OF ALTERNATIVES

Three alternatives are being evaluated to address the project’s purpose and need: the No Build Alternative, the Grade-Separated Option A Alternative (GSA Alternative), and the Partial Grade-Separated Option B Alternative (PGSB Alternative). Each alternative is described in Chapter 2 of the project’s EIS.

3.0 AFFECTED ENVIRONMENT

The City of Longview and adjacent portions of Cowlitz County are located along the Columbia River, which is a designated floodway (Zone AE) by the Federal Emergency Management Agency (FEMA).

The Consolidated Diking Improvement District No. 1 (CDID #1) is the local special purpose district (pursuant Chapter 85.15 of the Revised Code of Washington [RCW]) responsible for flood protection that includes diking and drainage. The CDID #1 boundary encompasses the greater Longview area, including the floodplain study area for the Industrial Way/Oregon Way project. CDID #1 owns, operates, and maintains approximately 19 miles of levees that provide a significant level of protection against flooding from adjacent river systems. The Columbia River levee system protects Longview from flooding along the Columbia River, and it extends from the western edge of Longview up the Columbia River to the confluence of the Cowlitz River. Much of the area occupied by Longview and West Kelso were developed on a natural floodplain, which in turn causes the levees to trap stormwater while also preventing river floodwaters from inundating the cities. The Columbia River levees are located outside the study area.

CDID #1 maintains approximately 35 miles of sloughs, ditches, and drains that collect and convey stormwater to pump stations. The drainage ditch system is composed of a combination of manmade ditches and improved natural channels. The ditches have a dual function, acting as a conveyance system to transport stormwater to the pumping stations and as a storage reservoir for intense rainfalls that exceed the capacity of the pumps. The Columbia River is the ultimate destination of the drainage water.
CDID #1 also operates seven pump stations with 19 pumps and a combined capacity of 700,000 gallons per minute. These pump stations are located throughout the greater Longview area and are used for removing stormwater and preventing local and area-wide flooding. Within the study area, the CDID #1 operates the Oregon Way Pump Station, located adjacent to Ditch No. 3, just west of the Industrial Way/Oregon Way Intersection. This pump station has a total capacity of 70,000 gallons per minute. Water is pumped a distance of 3/4 mile to the Columbia River and through the levee at the eastern end of the Weyerhaeuser Company site. Water from the Oregon Way Pump Station is piped under Industrial Way to the Weyerhaeuser property within permanent easements owned by CDID #1, a permit agreement from BNSF Railway, and a franchise agreement from Washington State.

The pond on the Weyerhaeuser property discharges into CDID Ditch No. 3 through a culvert under Industrial Way and the Reynolds Lead track. CDID Ditch No. 3 is conveyed under Oregon Way through twin 48-inch concrete pipes. The pond and CDID Ditch No. 3 are the only mapped floodplains (Zone A designated by FEMA) within the study area (Figure 1). Zone A is the flood insurance risk zone that corresponds to the 1-percent-annual-chance floodplains that are determined in the flood insurance study by approximate methods. No detailed hydraulic analyses are performed for Zone A areas.
Figure 1. Floodplains Study Area
4.0 ENVIRONMENTAL CONSEQUENCES

4.1 No Build Alternative

4.1.1 Direct Effects

The current conditions for CDID Ditch No. 3, the Oregon Way Pump Station, the pond on the Weyerhaeuser property, and the pipe that crossed under Industrial Way would not change under the No Build Alternative.

4.1.2 Indirect Effects

There would be no indirect effects to mapped floodplains for this alternative.

4.2 Grade-Separated Option A (GSA) Alternative

4.2.1 Effects during Construction

Construction of the GSA Alternative would occur within the mapped floodplain of CDID Ditch No. 3, as the culverts that cross under Oregon Way would either be replaced or extended (Figure 2). A temporary easement of approximately 0.7 acres would be required from parcels owned by CDID #1 in which CDID Ditch No. 3 is located. Modifications to the western leg of the Industrial Way/Oregon Way intersection and the realignment of the Reynolds Lead would result in additional fill within the pond on the Weyerhaeuser property. Flow into and within CDID Ditch No. 3 would be maintained during construction. Construction would avoid the Oregon Way Pump Station, and the pump station would continue to operate as usual during construction. Access to the Oregon Way Pump Station would be maintained and associated utilities for the pump station, including the conveyance pipe under Industrial Way, would be protected or relocated during construction. Any work within the CDID #1’s areas of ownership and easements would require an encroachment review and permit prior to beginning construction.

4.2.2 Direct Effects

The GSA Alternative would require acquisition of approximately 1.2 acres from properties owned by CDID #1 in which CDID Ditch No. 3 is located. Conveyance for CDID Ditch No. 3 under Oregon Way and conveyance from the pond on the Weyerhaeuser property into CDID Ditch No. 3 under Industrial Way would be maintained either through culvert replacement or by lengthening the existing culverts. The conveyance pipe that runs from CDID Ditch No. 3, across Industrial Way, and south through the Weyerhaeuser property would either be maintained, replaced, or slightly relocated. Piers for the elevated portion of Oregon Way over CDID Ditch No.3 would avoid the CDID #1 facilities. Access to the Oregon Way Pump Station would be maintained from the surface portion of Oregon Way. Fill embankment for the elevated portion of Industrial Way west of the intersection would be designed to allow access to the CDID #1 easement and conveyance pipe from the Oregon Way Pump Station and across to the Weyerhaeuser property. The GSA Alternative would avoid impacts to the mapped floodplain in CDID Ditch No. 3 and the Oregon Way Pump Station but would require a minor amount of fill in the pond on the Weyerhaeuser property to accommodate the realignment of the Reynolds Lead. No net rise in the floodplain due to the culvert modifications in CDID Ditch No. 3 or to the fill in the pond on the Weyerhaeuser property would be anticipated. However, if any rise in the floodplain is expected based on subsequent design efforts, coordination with the City of Longview, Cowlitz County, and FEMA would occur.
4.2.3 Indirect Effects
There would be no indirect effects to mapped floodplains for the GSA Alternative.

4.3 Partial Grade-Separated Option B (PGSB) Alternative

4.3.1 Effects during Construction
The effects during construction for the PGSB Alternative (Figure 3) would be the same as presented for the GSA Alternative in Section 4.2.1 except that the temporary construction easement on CDID #1 parcels would be approximately 0.6 acre.

4.3.2 Direct Effects
The PGSB Alternative would require acquisition of 0.1 acre from the CDID #1 parcels in which CDID Ditch No. 3 is located. The direct effects for the PGSB Alternative would be the same as presented for the GSA Alternative in Section 4.2.2, except that fill in the pond on the Weyerhaeuser property would result from widening of the Industrial Way roadway west of the intersection with Oregon Way. The amount of fill in the pond would be less than for the GSA Alternative.

4.3.3 Indirect Effects
There would be no indirect effects to mapped floodplains for the PGSB Alternative.
5.0 MEASURES TO AVOID OR MINIMIZE PROJECT EFFECTS

There are no practicable design alternatives that would avoid the need to replace or extended the culverts for CDID Ditch No. 3 and therefore avoid development in the floodplain. For both the GSA and PGSB Alternatives, measures to avoid or minimize construction impacts include:

- Maintain the flow through the existing CDID Ditch No. 3 during and after construction.
- Maintain access to the Oregon Way Pump Station during and after construction.
- Comply with WSDOT standard specification (Sections 1-07.15 and 8-01) requirements and special provisions for temporary water pollution control and erosion control during construction.
- Protect the existing CDID Ditch No. 3 from sediment-laden runoff during construction.

6.0 REFERENCES


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Attachment A: Floodplain Impact Assessment Methodology Memorandum
1. Methodology Introduction

This memorandum presents the methodology used to analyze potential effects of the proposed Industrial Way/Oregon Way Intersection Project on floodplains. This analysis is included Appendix H (Floodplain Technical Analysis) of the environmental impact statement (EIS) prepared for the project.

2. Study Area

The study area for floodplains is shown in Figure A-1 below. The study area encompasses the area for direct and indirect impacts to floodplains resulting from the project.
Figure A-1. Study Area for Floodplains
3. Regulations, Standards, or Guidelines

Federal, state, and local regulations apply to floodplain development and floodplain encroachments. Local ordinances are often the key regulatory instrument governing floodplain management. Applicable regulations and ordinances include:

- Presidential Executive Order 11988 *Floodplain Management* (May 24, 1977) directs federal agencies to avoid to the extent possible adverse impacts associated with floodplains and to avoid direct or indirect support of development in the floodplain

- FHWA Technical Advisory T 6640.8A (October 1987) gives guidelines for preparing environmental documents, including specifically the section on floodplains

- Federal Project levees regulated by the U.S. Army Corps of Engineers (USACE) under Section 14 of the Rivers and Harbors Act of 1899 (33 United States Code [USC] 408, also referred to as "Section 408")

- The Flood Control Management Act of 1935, RCW 89, is the primary statutory authority regulating state flood control jurisdictions, which include flood control districts, counties and zone districts

- Cowlitz County Floodplain Management Ordinance. [Ord. 09-065, 4-7-09.]; codified in Chapter 16.25 of the Cowlitz County Code

- Cowlitz County Critical Areas Ordinance, Chapter 19.15 of the Cowlitz County Code

- City of Longview Municipal Code, Chapter 17.24, Flood Damage Protection

- City of Longview Municipal Code, Chapter 17.10, Critical Area Ordinance

- Consolidated Diking Improvement District No. 1 (CDID #1) is a special purpose district pursuant to Chapter 85.15 of the Revised Code of Washington (RCW).

4. Sources of Existing Data

Existing base (100-year) floodplain data sources, CDID #1 facilities and frequently flooded areas used in the analysis include:

- Federal Emergency Management Agency (FEMA) flood insurance rate maps for the study area

- CDID#1 infrastructure map and right-of-way shape files

- Maps that identify the frequently flooded areas and the requirements of the critical areas ordinances of Cowlitz County and the City of Longview relative to these frequently flooded areas.
5. Data Gathering or Development

Online sources including the City of Longview digital flood rate insurance maps, updated in March 2014 from the Washington State Department of Ecology and FEMA websites. CDID#1 infrastructure map and right-of-way shape files are available from the CDID #1 website. Cowlitz County and the City of Longview Critical Area mapping from County and City websites.

6. Analytical Techniques and Models

6.1. Construction Impacts

Temporary impacts were evaluated relative to the overall construction footprint within the floodplain and relative to CDID #1 facilities. The overall construction footprint would include construction staging as well as any temporary shoring of grade separated structures that may be considered during alternative screening. The location, type, and size of these activities was evaluated relative to the location of the mapped base floodplain, to the location of CDID #1 facilities, and to the frequently flooded areas.

6.2. Direct Impacts

Direct impacts were evaluated to determine whether the proposed action would encroach upon the base floodplain. The evaluation of direct impacts includes assessing the risk to or resulting from the proposed action on natural and beneficial floodplain values and floodplain storage. It is assumed that project impacts to the Columbia River floodplain or floodway would be minimal and would not exceed the threshold that would require a FEMA map revision. As the project design is refined, the project team will re-evaluate this assumption to determine whether a FEMA map revision will be required.

If direct impacts to the floodplain or floodway are expected to occur, then a hydraulic and hydrologic analysis will be performed after the NEPA phase in order to demonstrate that the proposed development would not increase the water surface elevation of the base flood more than one foot. The process for complying with the Cowlitz County Floodplain Management Ordinance is defined in the EIS.

6.3. Indirect Impacts

Indirect impacts were evaluated for degree to which the proposed action provides direct or indirect support for further development in the base floodplain.

7. Summary of Potential Impacts and Mitigation

The following is a brief summary of the types of benefits and adverse impacts that may result from the project. This section also includes mitigation measures that could be considered to reduce or eliminate adverse impacts.

7.1. Potential Benefits

Through project design, the project could remove some existing infrastructure that is within the base floodplain, which could restore and preserve the natural and beneficial floodplain values.
7.2. Potential Adverse Impacts

The proposed action could encroach upon the base floodplain. The proposed action could encroach on facilities, rights-of-way and easements of the CDID #1, either temporarily during construction or permanently.

7.3. Potential Mitigation

If the project encroaches on the base floodplain, mitigation measures will be identified to minimize floodplain impacts and restore and preserve the natural and beneficial floodplain values. A determination of whether compensatory flood storage mitigation or other mitigation will be required will be based on local floodplain development regulations (Cowlitz County and City of Longview), state, and federal regulations.

8. Limitations and Constraints

It is assumed that the project will not impact or alter federal project levees regulated by the U.S. Army Corps of Engineers (USACE) under Section 408. Due to the preliminary nature of the conceptual design and the likelihood of avoiding impacts to the floodplain, no hydraulic analysis was conducted or calculation of floodway impacts will be conducted. Determination of flood storage or other mitigation measures during the EIS phase were qualitative in nature and are not intended to satisfy floodplain permit requirements. If a FEMA conditional map revision or map revision package (CLOMR-F or LOMR-F) is required, these revisions will be prepared during the final design phase.