

Columbia County Port Westward Goal 3 Compatibility Analysis

***Riverkeeper III Remand
File No. PA 13-02/ZC 13-01***

Prepared for:
Cable Huston LLP

On behalf of:
Port of Columbia County



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June 24, 2024



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August 19, 2024

VIA FIRST CLASS MAIL AND EMAIL

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**RE: Port of Columbia County – Port Westward Expansion
Applicant's Remand Submittal**

Dear Ms. Dahl:

As you know, this firm represents the Port of Columbia County ("Port"). The Port is the Applicant in Columbia County Application No. PA 13-02/ZC 13-01 ("Application"). On November 4, 2022, the Port notified the County that it desired to have the County proceed with the Application on Remand. Since that time, the Port has been working diligently to develop a comprehensive analysis of the remaining issue in this proceeding. This letter and its attachments comprise the Applicant's Remand Submittal for consideration by the County.

I. Scope of Remand

This matter is before the County on remand from the Land Use Board of Appeals ("LUBA"). The Application seeks a Comprehensive Plan ("Plan") Amendment and Zone Change ("PA/ZC") through a "Goal Exception" to Statewide Planning Goal 3 ("Goal 3"). Although LUBA upheld most components of the Goal 3 Exception, LUBA determined that the Goal 3 Exception cannot be approved until the County evaluates: (1) in sufficient detail the characteristics of the uses allowed by the PA/ZC; (2), the characteristics and/or vulnerabilities of uses in the surrounding area to potential externalities from the proposed uses; and (3) whether any mitigation measures or conditions are necessary to ensure compatibility of the surrounding uses and the proposed uses. The scope of remand in this proceeding is limited to only those issues. All other issues raised as part of the County's consideration of the Application have been resolved, and the record should be opened only as necessary to resolve this final issue.

II. Legal Background for Scope of Remand

The scope of this remand proceeding is informed by the County's prior approvals of the Application and LUBA's review of those decisions.

1. County's Initial Decision and LUBA's Review in *Riverkeeper I*

The County initially approved the Application and Goal 3 Exception through Ordinance No. 2014-01 ("County's Initial Decision"). LUBA remanded that decision based on its conclusion that the approval did not satisfy certain standards relating to the Goal 3 Exception.¹ In doing so, LUBA upheld the County's decision to allow a wide range of uses rather than a specific use as part of the PA/ZC. However, LUBA concluded that a remand was warranted to further address the Goal 3 Exception criteria.

In *Riverkeeper I*, LUBA concluded that the County must further address the following before it could approve the PA/ZC based on a Goal 3 Exception:

(1) The "hazardous/incompatible impacts" language of OAR 660-004-0022(3)(b). The County's Initial Decision relied on that rule language as a reason to justify some of the allowed industrial uses, but LUBA determined the County needed to more specifically identify the types of proposed uses that fit within that reason, as opposed to the proposed uses that might be justified based on different reasons in the same administrative rule.

(2) The "reasonably accommodate" language of OAR 660-004-0020(2)(b). One prong of that rule requires a finding that "areas that do not require a new exception cannot reasonably accommodate the use." LUBA determined that the County's Initial Decision did not adequately demonstrate that a portion of the existing Port Westward site could not reasonably accommodate the proposed uses. LUBA also determined that the County's Initial Decision did not adequately justify the rejection of other sites considered as alternatives to the existing Port Westward site that could also potentially accommodate the proposed uses.

(3) The compatibility standard of OAR 660-04-0020(2)(d). As set forth in that rule, which implements ORS 197.732(2)(c)(D), a Goal Exception must "demonstrate that the proposed use is situated in such a manner as to be compatible with surrounding natural resources and resource management or production practices." LUBA concluded that the County's Initial Decision improperly deferred a determination of compliance with that rule entirely to the time of future development applications rather than as part of the County's Initial Decision itself.

(4) The applicability of Statewide Planning Goal 14 ("Goal 14"). Goal 14 prohibits the establishment of urban uses outside of urban growth boundaries. LUBA conclude that the County's Initial Decision did not adequately address whether any of the proposed uses allowed by the PA/ZC constitute the urban use of land. As a result, LUBA determined that the applicability of Goal 14 remained in question and that remand was necessary to address that issue.

2. County's Second Decision and LUBA's Review in *Riverkeeper II*

Following the outcome of LUBA's review in *Riverkeeper I*, the Port in 2017 modified the request in the Application and initiated remand proceedings at the County. At the conclusion of those proceedings, the County again approved the PA/ZC and Goal 3 Exception through

¹ *Columbia Riverkeeper v. Columbia County*, 70 Or LUBA 171 (2014) ("*Riverkeeper I*").

Ordinance No. 2018-1 (“County’s Second Decision”). That decision, too, was appealed to LUBA.² LUBA denied all of the assignments of error presented to it during that appeal, with one exception. Although LUBA determined most of the Goal 3 Exception criteria were satisfied, it remanded the County’s Second Decision solely to make more detailed findings relating to ORS 197.732(2)(c)(D) and OAR 660-004-0020(2)(d), which require findings relating to the compatibility of the proposed use.

The other issues on which LUBA based its prior remand in *Riverkeeper I* were resolved either as part of the County’s Second Decision, or by LUBA in *Riverkeeper II*, or both.

With respect to the “hazardous/incompatible impacts” language of OAR 660-004-0022(3)(b), the County’s Second Decision no longer relied on that rule language as one of the bases for justifying the Goal 3 Exception. The Port revised the request in the Application such that the PA/ZC would allow only a subset of industrial uses: (1) Forestry and Wood Products processing, production, storage and transportation; (2) Dry Bulk Commodities transfer, storage, production and processing; (3) Liquid Bulk Commodities processing, storage, and transportation; (4) Natural Gas and derivative products, processing, storage, and transportation; and (5) Breakbulk storage, transportation, and processing. The County’s Second Decision determined that these industrial uses justified the Goal 3 Exception only under OAR 660-004-0022(3)(a) because they are dependent upon a unique resource – a deepwater port – located on agricultural or forest land. LUBA’s decision in *Riverkeeper II* affirmed the County’s reasoning.

With respect to the “reasonably accommodate” language of OAR 660-004-0020(2)(b), the County’s Second Decision re-analyzed whether the existing Port Westward site or alternative sites could reasonably accommodate the proposed uses. That analysis reflected the fact that the proposed uses would be limited to the subset of industrial uses and to uses within that subset that are dependent on the deepwater port. LUBA considered and rejected multiple challenges to the County’s findings, concluding that the County’s Second Decision adequately addressed this rule language and that the “reasonably accommodate” criterion of OAR 660-004-0020(2)(b) was satisfied.

Finally, with respect to Goal 14, the County’s Second Decision closely reviewed the five categories of uses that would be allowed under the PA/ZC and determined that none of those uses constitute urban uses. Based on that conclusion, the County’s Second Decision determined the PA/ZC was consistent with Goal 14 and that no Goal 14 Exception was required. Those conclusions were not challenged as part of LUBA’s review in *Riverkeeper II* and, therefore, remain undisturbed.

As part of its review in *Riverkeeper II*, LUBA also considered other challenges to the PA/ZC that were not raised in *Riverkeeper I*. For example, LUBA considered and rejected multiple challenges to the County’s Second Decision based on limits in Statewide Planning Goal 12 (“Goal 12”) relating to transportation. The petitioners in that case also asserted that the County had not adequately justified the 837-acre size of the area that would be subject to the Goal 3 Exception (“Exception Area”). LUBA rejected those challenges and concluded the County’s Second Decision was based on substantial evidence in the record and that the County

² *Columbia Riverkeeper v. Columbia County*, 78 Or LUBA 547 (2018) (“*Riverkeeper II*”).

had appropriately justified the size of the Exception Area. Goal 12 compliance and the size of the Exception Area are therefore no longer at issue in this matter.

The petitioners in *Riverkeeper II* also argued that the Goal 3 Exception was not appropriate because some of the uses allowed by the PA/ZC (e.g. forest products processing) are already allowed on agricultural land and, therefore, are not appropriate to include in a Goal 3 Exception. LUBA rejected this argument, too, noting that the County's authorization of the subset of industrial uses was distinct from the industrial uses that are sometimes allowed on agricultural land.

3. County's Third Decision and LUBA's Review in *Riverkeeper III*

As a result of LUBA's review in *Riverkeeper II*, LUBA remanded the County's Second Decision for the County solely to adopt adequate findings regarding compliance with the compatibility standard set forth in OAR 660-004-0020(2)(d). Following that review, the Port again initiated remand proceedings at the County. As part of those proceedings, the Port submitted additional evidence to the County regarding the compatibility standard (the "Compatibility Report"). Relying on the Compatibility Report, the County approved the Application for a third time through Ordinance No. 2021-3, dated September 29, 2021 ("County's Third Decision"), and that decision was again appealed to LUBA.³

LUBA's decision in *Riverkeeper III* resulted in a third remand (this remand) to the County. As part of its review, LUBA determined that the Compatibility Report had multiple deficiencies. First, the Compatibility Report reviewed the compatibility of the proposed uses only on "adjacent" parcels and parcels within 2,000 feet of the Exception Area. LUBA determined that remand was necessary for the County to identify any natural resources or resource management or production practices that are in the "surrounding" area even if they are not adjacent to or within 2,000 feet of the Exception Area. LUBA also concluded that, with respect to adjacent areas, the County's findings need to address the specific characteristics and vulnerabilities of adjacent uses in the context of the particular impacts of the specific industrial uses that are anticipated.

LUBA also determined that the County's Third Decision did not adequately address the scale and impact characteristics of the proposed industrial uses. Whereas the County's Third Decision concluded anticipated impacts from new development would be similar to the impacts that already occur from existing industrial development at Port Westward, LUBA held that such a comparison ignores potentially significant differences in the scale of development that could occur in the Exception Area. LUBA also concluded that it was not sufficient for the County to rely on state and federal permitting requirements to limit such impacts unless the County better explains the relationship between those requirements and the impacts they address.

Finally, LUBA's decision in *Riverkeeper III* determined that the County continued to rely too heavily on the future County permitting processes for a specific development to determine compatibility. Based on each of the foregoing deficiencies, LUBA held that the Goal 3 Exception

³ *Columbia Riverkeeper v. Columbia County*, -- Or LUBA -- (Final Opinion and Order, LUBA No. 2021-097, May 9, 2022) ("*Riverkeeper III*").

process requires the County to evaluate: (1) in sufficient detail the characteristics of the uses allowed by the PA/ZC; (2) the characteristics and/or vulnerabilities of uses in the surrounding area to potential externalities from industrial uses; and (3) whether any mitigation measures or conditions are necessary to ensure compatibility of the surrounding uses and the industrial uses. While LUBA noted that the County's review of a future development proposal can replicate the compatibility analysis at a finer scale, it concluded the County must initially perform that analysis as part of the Goal 3 Exception process rather than fully deferring the compatibility analysis to a later proceeding.

III. Remand Framework/Context

1. Applicable Rule Language

As described in more detail above, the only issue remaining in this proceeding relates to the application of the compatibility standard set forth in OAR 660-04-0020(2)(d). That rule, which implements ORS 197.732(2)(c)(D), states:

The exception shall describe how the proposed use will be rendered compatible with adjacent land uses. The exception shall demonstrate that the proposed use is situated in such a manner as to be compatible with surrounding natural resources and resource management or production practices. "Compatible" is not intended as an absolute term meaning no interference or adverse impacts of any type with adjacent uses.

The County's decision on remand must apply this rule language. The Applicant's materials being submitted for the County's consideration are intended to demonstrate how the industrial uses the Port proposes are compatible with uses on adjacent lands and with natural resources and resource management or production practices on surrounding lands; or how those uses can be rendered compatible through mitigation and the imposition of conditions of approval.

2. Industrial Development and the Related Levee System Support Agricultural Uses in the Exception Area

Included with this Remand Submittal is a report titled *Port Westward Goal 3 Exception LUBA Remand Analysis* prepared by CSA Planning, Ltd ("CSA's Remand Analysis"). As explained in CSA's Remand Analysis and elsewhere in the record, agricultural uses occurring in the Exception Area are also inside the boundaries of the former Beaver Drainage District, which now operates as the Beaver Drainage Improvement Company ("BDIC"). Those agricultural uses are made possible by BDIC's existing levee, drainage and pumping systems (the "Levee System"). Without the Levee System, this area would be within the Columbia River floodplain, and the primary land use patterns in the Exception Area would be predominantly natural resource (wetland/riparian) in character rather than agricultural in character.

As explained in more detail below, the reliance on BDIC's Levee System to support agriculture presents a somewhat unique scenario when compared to the typical application of the State's land use program in rural areas. That is, the typical application of the State's land use

program in rural areas assumes that protection of farm and forest lands will also serve to protect natural resources and, conversely, that more intensive developments like industrial uses are not compatible with such protections. In the area around Port Westward, however, industrial development has the potential both to support existing agricultural infrastructure and to increase natural resources in the area through wetland mitigation.

In Oregon's land use system, there is a direct tie between the preservation or conservation of natural resources and the application of Statewide Planning Goals 3 and 4. In addition to protecting farm and forest lands, respectively, those Goals are typically assumed to serve an indirect natural resource benefit by preventing alternative land uses that might represent a larger conflict with natural resources in the area. This concept is evident in the language of the Goals themselves – Goal 4 includes specific references to fish and wildlife resources, while Goal 3 includes more general language about meeting needs for open space. The implicit assumption is that Goal 3 and Goal 4 land uses will be more compatible with natural resources than alternative land uses with more intensive physical development. There are numerous examples of Goal 3 and Goal 4 serving to protect natural resources, and the following are just a few:

- Upland agricultural lands protected by Goal 3 used for seasonal cattle grazing in the spring are often the same areas protected as Big Game Winter Range Habitat under Statewide Planning Goal 5. These lands are used by deer and elk in the late fall to early spring and then the wildlife starts to migrate up to higher ground and the land is used as cattle pasture from mid-spring to early summer.
- Streams that pass through private forest lands protected by Goal 4 for forest uses provide natural resource benefits. The forested lands provide shade and support healthy fish habitat for all to enjoy on private and public lands nearby.
- Grass seed farming in the Willamette Valley provides food sources for migratory waterfowl. This dynamic works almost too well. Geese populations have increased significantly over the years and many of the traditional migration routes have been abandoned in favor of the bountiful ribbon of grass seed farms along the Willamette River.

Again, the typical application of the State's land use program in rural areas assumes that protection of farm and forest lands will also serve to protect natural resources and, conversely, that alternative developments like industrial uses are not compatible with such protections. To that end, during the County's prior proceedings, the record included testimony about the potential negative impacts from industrial uses on both agricultural uses and natural resources in the area. That testimony can be summarized as asserting that a major industrial cannot be compatible with surrounding agricultural uses and natural resources.

Compatibility in the context of land uses changes at the comprehensive planning level must acknowledge existing land use conditions and land use designations in the area, and then examine how the proposed changes relate to those conditions. As revealed in CSA's Remand Analysis, the assumptions behind the typical application of the land use system discussed above do not fully hold when applied to the Exception Area. The CSA Remand analysis examines the fundamental

relationships between the existing and future industrial land uses, farm uses, and natural resources in the area; an examination that is necessary before proceeding to the more detailed compatibility analysis.

The CSA Remand Analysis specifically shows that, within BDIC's Levee System, the agricultural uses made possible by the levees, drainage, and dewatering system have displaced the riparian/wetlands areas that would naturally occur in this area. Because of this existing condition, industrial development within the Exception Area, which also relies on the Levee System, supports existing agricultural infrastructure, and it has the potential to increase natural resources in the area through wetland mitigation. To illustrate this point, the County can consider the following scenarios:

- In the first scenario, a very high-value industrial use requires a small amount of land (~50 acres) but also requires high degrees of flood protection and assurance of drainage system operations. The location of the industrial use in this scenario is also one that does not require extensive wetlands mitigation within the leveed area. Under this scenario, the high-value industrial use installs new pumps with additional back-up capacity, and it can provide funds for the maintenance or eventual reengineering or reconstruction of the levees with adequate freeboard to protect the industrial use from a major flood event. In other words, to protect the industrial use, the industrial use provides additional long-term infrastructure or funding for the proper operation and maintenance of the Levee System to ensure the new levees and drainage pumps operate properly and indefinitely. Under this scenario, the long-term protection of the remaining farmland in the leveed area is virtually ensured in perpetuity, and there is no reason to conclude this additional 50-acre industrial use would disrupt the farming land use pattern in the area. Under this scenario, compatibility with existing agricultural land uses in the area is very high, but the area devoted to natural resources will remain more static.
- In a second scenario, no new industrial uses are allowed, the Port eventually closes Port Westward, and the land is donated to an environmental nonprofit in exchange for the nonprofit agreeing to demolish and remove any remaining industrial facility remnants. This scenario likely results in the BDIC becoming unnecessary, or becoming underfunded and unable to adequately maintain the Levee System over time. If a flood event were to then breach the levees, the area devoted to natural resources would increase, but the agricultural land use pattern would be put at risk.

The scenarios above illustrate that, if there is not adequate funding to maintain and repair the Levee System because the higher-value industrial users are no longer present, then the area would be recaptured by the natural hydrology and the agricultural uses Goal 3 is intended to protect could be replaced by floodplain, riparian vegetation and intermixed wetlands instead. The natural resource land use pattern may be enhanced, but at the expense of the agricultural uses in the area.

Under all scenarios of development or non-development, the County can conclude the following:

1. Ill-conceived industrial development can cause pollution that results in adverse outcomes for agriculture uses and natural resource uses in the area.
2. Responsible and well-funded industrial development strengthens the flood protection and drainage systems supporting long-term agricultural development patterns, but such investments will extend the existing land use pattern that displaced the natural resources uses that would otherwise be present.
3. A lack of industrial development increases the risk of diminishing resources for the Levee System such that it increases risk of weakening the Levee System over time. If the Levee System is not adequately maintained over time, then a major flood event could cause catastrophic failure of the Levee. Such an event would benefit the natural resources uses caused by the Columbia River reclaiming the area, but this would occur at the expense of agricultural uses in the same area.

No one, especially the Port who owns the land, desires to have ill-designed industrial development that will result in adverse outcomes for agriculture uses and natural resource uses in the area. But a properly designed, engineered, and managed industrial project should not result in such an outcome, and numerous environmental permitting laws and regulations exist to prevent such a scenario from occurring.

In the proceedings prior to this remand, the Applicant and County relied heavily on the various permitting that is required for industrial uses as a means to demonstrate that the allowed industrial uses will be properly designed, engineered, and managed. While the permitting process is a key component to ensuring such an outcome, that is only one aspect of a compatibility analysis. The compatibility analysis framework presented in the CSA Remand Analysis appropriately assumes those minimum permitting requirements will be met as part of any industrial development, and that they are necessary to ensure compatibility. However, the analysis framework also assumes, while necessary, the minimum permitting requirements may not be sufficient to ensure compatibility. But, in light of the discussion above, neither does that analysis assume that industrial uses in this area are inherently incompatible with agricultural uses in the area, or that allowing agricultural uses instead of industrial uses will necessarily and automatically benefit the natural resources in the area. Instead, given the unique geography and existing conditions of the Exception Area, measures that increase compatibility for agriculture are likely to diminish compatibility with natural resources, while measures that increase compatibility with natural resources are likely to decrease compatibility with agriculture. The Port's approach acknowledges that inherent tension, and the CSA Remand Analysis shows how the County can ensure industrial uses are compatible with both agriculture and natural resources uses.

3. Ordinary vs. Event-Based Risks

To assess the characteristics and/or vulnerabilities of uses in the surrounding area to potential externalities from industrial uses, the County must have some sense of whether an adverse condition is reasonably likely to occur. With respect to guarding against natural hazards in general, Statewide Planning Goal 7 ("Goal 7") is a useful reference, and Goal 7 guides local planning agencies to take into account the frequency and severity of the hazard.

Much of the testimony already in the record identified certain risks that could arise from new industrial development in the Port Westward area. That testimony, however, typically did not describe whether such a risk is “ordinary” – in the sense that it is reasonably likely to occur during the lifespan of a specific development – or whether the risk was extraordinary and tied to a single “event” that, while possible, is unlikely to occur even over a long period of time. An example of the former is a seasonal high water event. An example of the latter is a 500-year flood event.

The appropriate compatibility analysis must acknowledge that distinction by identifying the type of risk each development faces and then properly evaluating low-likelihood but high-consequence events. The CSA Remand Analysis uses that approach.

4. Comprehensive Planning vs. Development Permitting

Any compatibility analysis must include an appropriate level of detail. For a comprehensive plan-level decision, the appropriate level of detail should include findings that a particular “type” of development can be reviewed, and establish some standards or guidance for that review. At a later stage (development permitting), the initial analysis can be “refined” based on the particulars of the project to ensure the specific development is consistent with the types of uses the Plan allows.

IV. Remand Analysis and Summary

The CSA Remand Analysis uses the context presented above to conduct a more complete compatibility analysis than the compatibility analysis considered in the County’s prior proceedings.

Consistent with OAR 660-004-0020(2)(d) and LUBA’s decision in *Riverkeeper III* LUBA, the new analysis more comprehensively identifies uses adjacent to the Exception Area and natural resources in the “surrounding area”. The identification of such uses and natural resources is a critical component to identifying potential compatibility issues with industrial uses proposed for the Exception Area.

1. “Customary Development Form”

A key component of the CSA Remand Analysis is the identification of a “**customary development form**” (“CDF”) for each of the types of industrial uses the PA/ZC would allow. The CDF approach is a direct response to the basis of LUBA’s most recent remand.

LUBA’s decision in *Riverkeeper III* criticized the County’s Third Decision because: (a) the findings did not fully evaluate the likely characteristics of the uses allowed, together with the adverse impacts likely to result from those uses; and (b), the findings did not address any differences in scale or intensity of each of the industrial uses that would be allowed by the PA/ZC. LUBA suggested one way to correct the findings would be for the County to identify the most impact-intensive use within each of the allowed industrial use categories, and to identify express assumptions about the size, design, location, and other characteristics that lead

to those impacts. If such impacts can be mitigated, or otherwise conditioned to make the use compatible, then the County can impose conditions that limit future development to those uses that share the same size, design, location, and other characteristics as those in the Goal 3 Exception analysis, and/or impose the same mitigation measure and conditions that will lead to the same results in the compatibility analysis.

As used in CSA's Remand Analysis, a CDF is a typical development concept for analysis purposes that is neither the most intensive nor the least intensive use that might be sought within each of the five approved general use categories. The selection of a CDF for each use category is based on an actual project in that use category, and functions as a reference development project in the analysis to compare to other uses in the same category that may be of different intensities. The CDF plays a dual role in that it provides a basis on which to analyze the impacts that can be expected from a typical development in each category, and also provides the County with a method for determining if a future proposal is the type of use that was considered as part of this Goal Exception.

CSA's Remand Analysis is consistent with LUBA's suggested approach of initially identifying the "most impact-intensive" use. CSA's Remand analysis still considers high-intensity uses, but it starts with the CDF because the CDF reflects a use intensity likely to occur and, therefore, the most likely type of development the County will review in a future development review process. Further, identifying the "most impact-intensive" use is necessarily a hypothetical exercise, whereas an analysis of a CDF is more concrete and based on facilities that actually exist.

The CDF is based on the design and scale of a typical industrial development in each category. This approach not only allows the County to consider the compatibility of uses that are likely to occur in each category, it responds to LUBA's instruction that the County must have a mechanism for evaluating the scale of future development proposals so that it can determine if the impacts of a future proposal are less than, similar to, or greater than the impacts the County analyzes as part of the PA/ZC process.

Using each CDF, the CSA Remand Analysis analyzes whether the typical use is compatible with adjacent uses and natural resources (and resource management/practices) in the surrounding area. It does so not just by evaluating impacts to the most vulnerable uses or resources, but to all adjacent uses and natural resources. Where the CSA Remand Analysis identifies compatibility issues related to each CDF, it also identifies conditions or other mitigation measures, beyond regulatory permitting, the County can use to ensure compatibility.

In further response to LUBA's guidance, the analysis then considers development in each use category that is more intense than the CDF, as well as development in each use category that is less intense than the CDF. For each of those scenarios, the analysis determines if fewer, similar, or increased mitigation measures are necessary to maintain compatibility with the use. In other words, if the impacts from a specific development will be more intense than the CDF, the analysis shows what additional conditions or measures, if any, can be employed to ensure compatibility of that more intense use.

2. Adjacent and Surrounding Uses

Another key component of the CSA Remand Analysis is that it addresses LUBA's conclusion in *Riverkeeper III* that the County's Third Decision did not identify any natural resources or resource management or production practices in "surrounding" areas.

Despite the significant time and effort spent discussing and analyzing the potential externalities in prior phases of this proceeding, there was not a detailed, cohesive summary of facts relevant to compatibility and the quantities and types of specific farm, forest, natural resource, and other uses in the surrounding area. The CSA Remand Analysis comprehensively identifies all adjacent uses as well as farm, forest, and natural resource uses in the surrounding area. This allows the CSA Remand Analysis to then identify the characteristics associated with natural resource uses and the resource management and practices associated with the farm and forest uses in order to ultimately determine if the proposed industrial uses are compatible with those uses.

3. Permitting Guidance

As a final step, the CDF construct helps bridge the gap between comprehensive planning level compatibility considerations and the specific development actions the County will take in the future. The CSA Remand Analysis does this by establishing various guidance the County can use in the future when it reviews a specific development proposal. This guidance is informed by subject matter expert analyses and opinions in the record for the remand. This approach also addresses the portion of LUBA's decision in *Riverkeeper III* that criticized the extent to which the County had deferred the compatibility analysis.

Specifically, this guidance in the CSA Remand Analysis serves as a blueprint to future County decision makers to ensure development is reviewed in a manner that is consistent with the justification for the PA/ZC. That is, using the CDF as a comparison to a specific development proposal, the County will have a clear way to determine if the specific development proposal is consistent with the County's decision justifying the Goal Exception. The permitting guidance relies in part on the fact that specific development will be subject to federal and state permitting requirements that address natural resource protections, but it allows the County to go beyond that simple analysis to address compatibility measures specific to each type of development. As a result, the CSA Remand Analysis evaluates in sufficient detail whether the Goal Exception criteria are met, and the County can later, at a finer scale and to a greater degree, apply and implement the compatibility determination to a specific development to ensure compatibility.

V. Conclusion

Using the framework presented in CSA's Remand Analysis, the County can demonstrate that the proposed categories of industrial uses are compatible uses on adjacent lands and with surrounding natural resources and resource management or production practices. Further, the County can use that same framework to review future development to ensure only those uses that are compatible will actually be developed.

The Applicant looks forward to the County's review of this approach and any feedback provided by other participants to the proceeding. The Applicant recommends that County Staff and other participants have a 30-day time frame to review and comment on the Applicant's submittal, followed by a 30-day rebuttal period. These time periods can of course be adjusted to allow a complete development of the record. The Applicant then requests a final period to submit a legal argument (with no new evidence) prior to the Board's deliberations on this matter.

If you have any questions about this submittal, the Applicant will make itself available to discuss those questions with you.

Sincerely,



Tommy A. Brooks

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June 24, 2024

Columbia County Board of Commissioners
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**RE: Port Westward Goal 3 Exception LUBA Remand Analysis
Columbia County Land Use File PA 13-02/ZC 13-01**

Dear Commissioners,

On behalf of the Port of Columbia County ("Port"), CSA Planning, Ltd. is providing a land use analysis to demonstrate compatibility for the proposed Port Westward Exception to Statewide Planning Goal 3 ("Goal Exception"). This Goal Exception has been in-process for several years and was most recently remanded from the Land Use Board of Appeals on a narrow issue - to address the Compatibility Criterion in OAR 660 Division 004 for goal exceptions. The Goal Exception would allow port-dependent industrial uses on the land requested for the Goal Exception.

CSA Planning, Ltd. has over 40 years of land use planning expertise in the State of Oregon. While CSA does considerable work in urban areas, CSA's work has a special emphasis on rural development and rural issues. CSA has been involved in numerous projects involving rural land use issues, such as:

- Aggregate mining and hard-rock mining
- Landfills
- Farm and Forest products processing facilities
- Transportation and Utility Facilities siting in rural areas
- Destination Resorts
- Numerous Goal Exceptions throughout the State of Oregon

This analysis, together with proposed conditions of approval, will allow the Board of Commissioners to conclude that a Goal Exception that would allow potential future industrial uses is compatible with surrounding land uses as required by the applicable administrative rules.

Respectfully Submitted,

CSA Planning, Ltd.

A handwritten signature in blue ink, appearing to read 'Jay Harland', is written over a horizontal line.

Jay Harland
President

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ACRONYMS, ABBREVIATIONS AND DEFINITIONS

Acronyms and Abbreviations

ACDP: Air Contaminant Discharge Permit

BDD: Beaver Drainage District

BDIC: Beaver Drainage Improvement Company

CDF: Customary Development Form

CERCLA: Comprehensive Environmental Response, Compensation, and Liability Act

DBC: Dry Bulk Commodities

DOGAMI: Oregon Department of Geology and Mineral Industries

DSL: Oregon Department of State Lands

EHS: Extremely Hazardous Substances

EPA: U.S. Environmental Protection Agency

EPCRA: Emergency Planning and Community Right-to-Know Act

F&WP: Forestry and Wood Products

FEMA: Federal Emergency Management Agency

GIS: Geographic Information System

JPA: Joint Permit Application

LBC: Liquid Bulk Commodities

LNG: Liquefied Natural Gas

NFPA: National Fire Protection Association

NG&DP: Natural Gas and Derivative Products

NPDES: National Pollution Discharge Elimination System

NRCS: Natural Resources Conservation Service

OAR: Oregon Administrative Rules

ODEQ: Oregon Department of Environmental Quality

ODFW: Oregon Department of Fish and Wildlife

ORBIC: Oregon Biodiversity Information Center

ORS: Oregon Revised Statutes

PM: Particulate Matter

RCRA: Resource Conservation and Recovery Act

RIPD: Resource Industrial Planned Development



RQ: Reporting Quantity

SPCC: Spill Prevention and Control Countermeasure Plan

SQEHS: Significant Quantity(ies) of Extremely Hazardous Substances

TPQ: Threshold Planning Quantity

UPUPC: Use Permitted Under Prescribed Conditions

USACE: U.S. Army Corps of Engineers

USFWS: U.S. Fish and Wildlife Service

Definitions

Development Scenario: General term used in the document headings to encompass potential future specific development proposals in the Exception Area.

Extremely Hazardous Substances: Chemicals listed on *EPA List of Lists* (or its equivalent title as may be published in the future).

Significant Quantity(ies) of Extremely Hazardous Substances: A significant quantity(ies) is the presence on the site of substances on the most current published *EPA List of Lists* (or its equivalent title as may be published in the future), where the site will have quantities of material that are five times the Threshold Planning Quantity (TPQ) reporting of Section 302 chemicals or five times the threshold CERCLA Reporting Quantity (RQ), whichever is greater. For chemicals on the *EPA List of Lists* without a stated TPQ or RQ, the SQEHS shall be determined by an expert opinion issued by a professional with a PhD in Chemistry or a registered Professional Chemical Engineer in the State of Oregon that compares the relative risk of that chemical to other chemicals posing similar risks for which a TPQ or RQ is provided.



1 INTRODUCTION

The Port of Columbia County ("Port") engaged CSA Planning, Ltd. to further analyze the compatibility of future industrial land uses in the area proposed for an Exception to Statewide Planning Goal 3 ("Goal Exception") at Port Westward. Specifically, CSA Planning, Ltd. has analyzed the compatibility of those industrial uses with adjacent land uses and surrounding natural resources and resource management or production practices. The analysis is undertaken to demonstrate compliance with OAR 660-004-0020(2)(d) (the "Rule"), which implements state statutes regulating the approval of the Goal Exception, and which states in full:

"The proposed uses are compatible with other adjacent uses or will be so rendered through measures designed to reduce adverse impacts." The exception shall describe how the proposed use will be rendered compatible with adjacent land uses. The exception shall demonstrate that the proposed use is situated in such a manner as to be compatible with surrounding natural resources and resource management or production practices. 'Compatible' is not intended as an absolute term meaning no interference or adverse impacts of any type with adjacent uses."

CSA's analysis relies in part on the legal background and scope of the remand set forth in the remand cover letter prepared by Tommy Brooks, Cable Huston LLP ("Remand Submittal Letter").

CSA concurs with the remand framework and context set forth in the Remand Submittal Letter. CSA's analysis is based upon and flows from this framework and context in the following ways:

- Existing agricultural and industrial land uses in this area occur inside the Beaver Drainage Improvement Company's ("BDIC") levees, which are made possible by BDIC's broader system of levees, ditches and dewatering pumps. This area has an existing balance between agricultural uses and natural resources, which introduces land use compatibility dynamics that are uncommon when also considering industrial uses in the same area.
- To properly apply the Rule's compatibility requirement, it is necessary to distinguish between ordinary land use compatibility issues (those that are typically experienced) and event-based risk compatibility issues (those that are theoretically possible, but either unlikely to occur or of a frequency not typically addressed as part of a planning process).
- Determining land use compatibility at the Comprehensive Plan designation stage should account for the role that future land use and environmental permitting actions will have, properly characterize how those future actions are expected to guide actual development, and consider how those future actions assess whether additional measures are necessary to reduce the potential for adverse impacts, and thereby, ensure compatibility of a specific development consistent with the Comprehensive Plan.

CSA's analysis allows the County to bring a fresh look at the information in the record and, until this remand proceeding, CSA had no prior involvement with this Goal Exception application. At the outset of the analysis, CSA reviewed the record and facts concerning the project. This review revealed the need to add analytic structure to the County's initial compatibility analysis to do the following:



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- ✓ Classify and characterize the land uses on adjacent lands and the natural resources and resource management practices in the surrounding area.
- ✓ Characterize and differentiate the intensity of industrial use categories relative to one another.
- ✓ Characterize and differentiate the intensity of potential industrial uses within each industrial land use category.
- ✓ Engage professional experts to provide analysis and opinion on the key potential externalities that may impact compatibility (“compatibility externalities”):
 - Wetlands and other Natural Resources
 - Water Quality, Groundwater and Drainage
 - Flood Hazards
 - Air Quality
- ✓ Create an analytic structure capable of examining the array of future industrial uses in a manner that relates them to potential compatibility externalities, which can then be used to identify measures necessary to reduce adverse impacts, if any.

Given the need for an analytic structure that accounts for all the above, the analysis is unavoidably complex. While CSA attempted to make the analysis readable and avoid duplication to the extent practicable, the need to maintain a logical and rigorous analytic structure causes some unavoidable repetition. The ultimate objective for the compatibility analysis is to provide an adequate factual basis for the County to ensure that the Goal Exception allows only those future industrial uses that can be developed in a manner that will be compatible with the remaining land use patterns, while also functioning to inform the future land use permitting process so that the review of specific development proposals will be consistent with the Goal Exception.



2 COMPATIBILITY ANALYSIS METHODOLOGY

The compatibility analysis presented in this document examines how future development of the area subject to the proposed Goal Exception ("Exception Area") for industrial uses will be compatible with the land use patterns in the area. The complexity presented by this particular Goal Exception compatibility analysis is that there are a wide range of potential industrial uses that could be sited in the Exception Area, based upon the aspects of the Goal Exception approved in the prior phases of this proceeding.

The use intensity and potential compatibility issues vary both across the five general land use categories justified and approved in previous proceedings, and within each general land use category depending on the scale of any particular development. Moreover, the record up to this point in the proceeding contains myriad potential compatibility externalities associated with the land use change, but the structure of the prior analysis and testimony in that record make it difficult to differentiate which compatibility externalities examined were associated with each specific category of land use or potential uses within a given category.

CSA determined that additional structure was necessary to address these complexities and to create a clearer, more cohesive analytic approach. CSA's analysis introduces the concept of a "Customary Development Form", abbreviated herein as "CDF", as an analytic construct upon which the compatibility analysis and determinations can be evaluated. As used in this analysis, a CDF is a typical development concept for analysis purposes that is neither the most intensive nor the least intensive use that might be sought within each of the five approved general use categories. The identification of a CDF for each use category functions as a reference development project to compare to other uses in the same category that may be of different intensities. The CDF plays a dual role in that it provides a basis on which to analyze the impacts that can be expected from a typical development in each category, and also provides the County with a method for determining if a future proposal is the type of use that was considered as part of this Goal Exception. The process to identify each Customary Development Form is explained in more detail below in Section 2.3.

The compatibility analysis presented in this document and the accompanying atlas of maps analyzes the CDF for compatibility and also analyzes potential primary uses that would be a greater intensity when compared to the CDF and potential primary uses that would be a lower intensity of the CDF. Because this is a comprehensive planning level analysis, the analysis is directed at the primary land use which is the standard way to evaluate land uses at the comprehensive planning level and which the zoning code implements for future specific development applications. As such, the compatibility analysis assumes that accessory uses typically associated with a primary deep-water port dependent use will occur as part of the primary use and compatibility analysis of accessory uses are treated as a function of the primary use itself¹.

¹ With respect to geography, it is possible that a primary use could be located partially within the Goal Exception area and partially within an area previously designated RIPD. Under such a scenario, any ultimate requirements for compatibility in the Goal Exception area should properly be limited to and apply only to the uses in the Goal Exception area. This geographic logic is similarly extended to any accessory uses that might be in the Goal Exception area, but where the primary use is outside the Goal Exception area; in such circumstance, any requirements for compatibility derived from the Goal Exception would properly be limited to the externalities associated with the accessory uses themselves and applied only within the Goal Exception geography that is the subject of the compatibility analysis.



2.1 Methods to Identify Compatibility Fundamentals and Facts

CSA relied upon a number of sources to identify potential compatibility issues that might arise from future industrial development within the Exception Area. For example, CSA reviewed existing environmental impact reports for port-dependent industrial uses, existing permits for port-dependent industrial uses around the region, literature provided by subject matter experts, and public comments made during prior proceedings. In addition, the Applicant worked with industry experts to identify known potential externalities from port-dependent industrial development. These are discussed below in more detail:

Existing LUBA Record – The existing LUBA record is over 2,700 pages in length and includes substantial quantities of testimony from abutting landowners and other participants regarding potential externalities. These landowners provided comments representing a mix of uses, viewpoints, and specific externalities. They have knowledge of the existing conditions and may have informed insight into the potential externalities on the surrounding area. As documented in Section 3, nearby uses include mint farms, pasture for cattle, hay and grass operations, residential uses, a Zen monastery, and natural resources.

Literature - Many of the potential externalities discussed herein are not novel and have significant existing bodies of research. The potential compatibility externalities identified in the record feature many that have been part of other land use proceedings or permits and have often been subject to the discussion of academic experts. For example, the Oregon State Extension office has published volumes on how to profitably run a farm and covers both general externalities to farm practices and crop-specific issues. Another example is the State of Oregon's Department of Geology and Mineral Industries ("DOGAMI"), a leading authority on geological hazards, such as earthquakes, landslides, and tsunamis. DOGAMI has devoted substantial time and effort to discussing and studying the effects of a potential 9.0+ magnitude earthquake caused by the Cascadia Subduction Zone, and it has even performed modeling on the effects of a tsunami on the Columbia River basin. Other experts include state and federal regulatory agencies that set environmental standards and provide reviews of permit applications.

Financial Records - BDIC, the non-profit which operates the levee pump stations and manages the dikes in the Exception Area, is an important institution. Publicly available tax forms provide insight into the capability of the BDIC to maintain the existing levees and pump station.

CSA has also subcontracted with multiple firms that are recognized professionally as leaders in their fields. These include subject matter experts in levee construction and permitting, floodplains, groundwater, air quality, wetlands, and biology. They have made substantial contributions to the understanding of permitting and possible externalities from industrial development in the Exception Area. Their evaluations are fundamental to the following analysis and are included as Appendices B – E.

Finally, CSA spent significant time and effort discussing the project with the Applicant and getting to know the Exception Area. This included a site visit to the existing Port facilities, the Exception Area, and the surrounding area within the drainage district.



2.2 Methods to Determine Surrounding Area

OAR 660-004-0020(2)(d) requires that a Goal Exception shall describe how a proposed use will be rendered compatible with *adjacent lands*. In addition, it requires that the exception “shall demonstrate that the proposed use is situated in such a manner as to be compatible with *surrounding natural resources and resource management or production practices* [emphasis added].”

Therefore, to ensure that compatibility can be adequately addressed, an area broad enough to capture both adjacent uses *and* surrounding natural resources, resource management, and production practices must be determined. It is this broad area, which encompasses adjacent lands, that will be analyzed in this compatibility analysis and will be referred to as the “surrounding area”. Within the surrounding area, the existing land uses and natural resources will be identified with enough specificity to analyze potential externalities that might arise from future industrial development within the Exception Area.

To define the surrounding area, CSA used logical boundaries, either physical or administrative, that capture an appropriately sized area that takes into account the interconnectedness of the BDIC levee system, along with the dispersion of potential compatibility externalities of intense industrial uses.

2.2.1 Methods to Identify Farm and Forestry Uses

After the surrounding area has been determined, the Applicant must then identify uses that are located within the surrounding area. To perform a thorough consideration of compatibility externalities, these specific uses must be identified and explored in sufficient depth to identify typical practices and characteristics associated with each use. To begin identifying land uses, CSA obtained GIS base data from Columbia County and from public agencies such as the Natural Resources Conservation Service (“NRCS”).

Aerial photos from Environmental Systems Research Institute (“ESRI”) and Google Earth were geo-referenced and incorporated into the GIS layers for the Project. As a supplemental data source, CSA used the existing record of remands, which includes comments regarding farm locations and farm practices in the surrounding area.

Additionally, current site-specific inventory data was collected through fieldwork conducted by CSA President Jay Harland and Senior Planner Nathan Emerson (respective resumes are found in Appendix K). This data was collected using a Nikon Coolpix W300, which has an integrated GPS data logger. Photos and field data were collected from the public right-of-way. The data was collected on April 11th and 12th, 2023, which was a calm to light wind day under cloudy skies and sporadic precipitation. Additional data utilized in the farm use identification and classification includes historical aerial photos available on Google Earth. See Page 12 in Appendix A for a map of identified uses.

2.2.2 Methods to Identify Natural Resources

In addition to the methods used to identify farm and forest uses described above, which consisted of examining available maps, reviewing the existing land use record, and conducting site visits, CSA contracted with a subject matter expert with expertise in wildlife habitat assessment and environmental consultation. As part of their work, they were tasked with helping to identify natural resources in the surrounding area.

CSA also conducted a review of available state and federal resources regarding wildlife management plans, existing wetland delineations, and endangered species management.



2.3 Customary Development Form Analysis Framework

The Goal Exception would allow five use categories in the Exception Area. These categories each contain multiple potential industrial uses that may be approved. As such, there is no *specific proposed* development to evaluate for compatibility with the surrounding area. This presents obvious complexities when attempting to determine potential compatibility externalities that might arise from future industrial development within the Exception Area. What potential externalities can be identified or quantified when no specific development is proposed? As suggested by LUBA, one way of doing so, without scrutinizing every possible development type in the universe of possible uses, is to evaluate in greater detail the typical or expected uses that fit within the general use categories.

To anchor the analysis, CSA identified a “customary development form”, which is exactly as it sounds; a form of development that would customarily occur in each of the five approved general use categories. These CDFs are selected because they are port-dependent, industrial uses that are of medium or “typical” intensity for a given use category.

The process to identify and select each Customary Development Form was subjective, but each CDF was chosen based on the following characteristics:

- The CDF should be a use that is typically found at port locations. To identify and find Customary Development Forms, CSA performed a visual search of ports located in the Pacific Northwest and inspected economic studies conducted by ports nationwide to characterize expected demand for differing types of uses. Although there are dozens of ports, CSA primarily examined the Ports of Tacoma, Olympia, Longview, Kalama, Coos Bay and Morrow.
- The CDF should not be a use that was specifically excluded as a use from the general categories of uses in the prior proceedings.
- The CDF was confirmed with Port of Columbia County staff as a use they believed to be potentially viable and appropriate for the Exception Area.

Once a CDF is identified, the CDF can be used to analyze potential compatibility externalities for the general use categories. This can be accomplished by comparing the potential compatibility externalities of a CDF against the existing uses identified in the surrounding area. Where potential compatibility externalities are identified, the CDF provides a development form foundation on which to frame conditions of approval for, and also provides guidance for future land use permitting actions when specific projects are proposed.

The CDF for each general land use category is identified in Section 4, followed by an analysis of potential compatibility issues for each CDF.

2.3.1 CDF Method to Analyze Potential Compatibility Externalities

Based on the use categories that were previously approved for the Exception Area, and the fact that some of the general use categories may involve development that is more intensive than other use categories, CSA identified CDFs that it considered to be a medium intensity use within each general use category. The CDF in the Natural Gas and Derivative Products general use category, for example, is likely to be relatively more intense than the CDF in the Forestry and Wood Products



category. The CDF use identified for each category was therefore one that CSA and the Port considered a likely use to locate within the Exception Area.

Using the CDF as a proxy for the typical development expected in each use category allows the analysis to consider a greater degree of specifics with respect to use characteristics. This, in turn, provides an analytic framework to describe potential compatibility externalities. Working from the CDF within each general use category, the analysis can consider compatibility issues associated with uses that are either more intense or less intense than the CDF. Not only does this structure function to anchor use intensities within each general land use category for compatibility determination purposes, but it will also function as the use type and intensity reference to apply the results of the compatibility determinations to specific industrial development permitting actions when they undergo future land use permitting review by the County. That is, the County will have a clear way to compare a specific development proposal to the uses it considered when it justified the Goal Exception.

Using the CDF construct also proved useful for subject matter experts to conceptualize potential compatibility issues at a comprehensive planning level on key compatibility issues previously identified in the record. This is important because most subject matter experts work on permitting for specific projects within defined locations, and the CDF construct helped bridge the gap between comprehensive planning level compatibility considerations and the specific actions on which those experts are typically engaged.

2.3.2 CDF Analysis Guidance Objective

Another important aspect of the CDF analytic approach is that it functions as a mechanism to create a guidance framework for the future application of conditions, permit requirements, and other processes when the County reviews an application for a specific development within a general use category. The guidance assumes a specific development will be subject to typical state and federal permits relating to compatibility externalities, along with the County's existing permitting processes related to specific development effects and their externalities on farm and forestry uses. In addition to these state, federal, and local requirements, the guidance includes additional universal conditions stipulated to by the Applicant that will apply to all use categories, as well as targeted conditions related to individual use categories, specific uses, and different levels of industrial intensity.

EXISTING REGULATORY FRAMEWORK

Industrial development in the Exception Area will be subject to permits from the state and federal government. State regulations often implement regulatory powers delegated by the Federal government for the management of environmental impacts. A non-exhaustive list of these regulatory permits includes those addressing: impacts to air quality, which are regulated by the ODEQ by an air quality permit; water quality in the form of wetlands permitting from DSL and the USACE; stormwater runoff permitting from ODEQ; and impacts to Endangered Species, which are regulated by the state of Oregon and the federal government.

The County also has existing regulations and permit requirements, specifically a Site Design Review and a Resource Industrial Planned Development (RIPD) Use Permitted Under Prescribed Conditions, which would be applied to any future industrial use in the Exception Area. These permits regulate many typical development externalities, such as light, impact to public services, and consistency with existing plans.



**CONDITIONS DEVELOPED FOR SPECIFIC USE TYPES BASED UPON ANALYSIS
OF POTENTIAL COMPATIBILITY EXTERNALITIES**

In addition to the above permits and universal conditions applicable to the entire Exception Area, the Applicant has developed and will stipulate to a list of conditions to be applied to specific use types, which are tailored to the potential externalities associated with those specific use types. These specific conditions include requirements such as locational and buffering requirements, size requirements, event-based risk mitigation, and financial assurances. The compatibility analysis functions to provide guidance that informs future permitting for specific use types and this will inform the application of the specific conditions for the uses to which those conditions will apply, all of which work together to ensure compatibility.



3 COMPATIBILITY FUNDAMENTALS AND FACTS

As described in more detail in the Remand Submittal Letter, there have been three remands regarding the Goal Exception. Unsurprisingly, this has led to an extensive record which has been built over the course of many years and contains documentation from both proponents and opponents.

Despite the significant time and effort spent discussing and analyzing the potential externalities in prior phases of this proceeding, there has not been a detailed, cohesive summary of facts relevant to compatibility and the quantities and types of specific farm, forest, natural resource, and other uses in the surrounding area.

A proper assessment of the compatibility of the identified CDFs requires that the uses in the surrounding area first be identified and their associated practices, attributes, and character be considered. This Section 3 provides such a summary of facts based on the evidence in the record and the analytic methods outlined above in Section 2.

3.1 Farm and Forestry Uses and Practices

CSA identified farm and forestry uses in the surrounding area and classified approximately 5,800 acres of land. These classifications include only those identified on lands in the surrounding area. Bradbury Slough and the Columbia River are excluded from these acreage totals, although they are identified as natural resources in the surrounding area. The areas being rezoned and the existing industrial uses are also excluded from the surrounding area land use classifications.

The full list of farm and forestry uses, ranked by approximate acreage, is as follows:

1. Pasture - 1,565.0 acres
2. Hybrid Poplar Tree Farms - 1,336.9 acres
3. Forestry and Woodlot - 591.6 acres
4. Berries - 335.1 acres
5. Open Space / Fallow - 227.1 acres
6. Grass Hay and Alfalfa - 224.1 acres
7. Mint - 201.3 acres
8. Barn and Outdoor Storage - 50.6 acres
9. Paddock or Pen - 32.5 acres
10. Flower farm - 5.3 acres
11. Cannabis - 2.8 acres
12. Orchard - 1.2 acres
13. Horse Arena - 0.6 acres

CSA conducted the identification and classification of farm and forestry uses for each tax lot within the surrounding area to develop the use inventory. This identification and classification process requires a certain degree of subjective judgment during the initial assessment and categorization process. In general, the farm use classification assumed the more intensive cultivation when choosing between two or more use classifications that appear to be present or possible on the same location.



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These classification judgments were based in significant part on details shared in the existing record and by the Port, along with CSA's understanding of major crops produced in Columbia County. The information presented in Tables 1 and 2 comes from the 2017 data released by the US Department of Agriculture's Census of Agriculture and is specific to Columbia County.

Table 1 Top Crops in Columbia County

Top Crops in Acres – Columbia County	Acres
Forage (hay/haylage)	6,914
Nursery Stock Crops	(D)
Mint for oil, all	(D)
Cultivated Christmas Trees	271
Wheat for grain	235

(D) indicates data withheld by USDA to avoid disclosing individual farm data

Table 2 Agricultural Products by Sales and Farms By Size

Commodity – Columbia County	Sales (\$1,000)
Total Agricultural Products	\$38,545
Grains, Oilseeds, Dry Beans and Peas	\$165
Vegetables, Melons, Potatoes, Sweet Potatoes	\$245
Fruits and Tree Nuts	\$355
Christmas Trees and Short Rotation Woody Crops	\$149
Other Crops and Hay	(D)
Poultry and Eggs	\$114
Cattle and Calves	\$2,689
Hogs and Pigs	\$98
Sheep, Goats, Mohair, Milk	\$157
Aquaculture	(D)
Horses, Ponies, Mules, Burros, and Donkeys	\$192
Other animals and animal products	(D)
Number of Farms by Size – Columbia County	
1-9 Acres	294
10-49 Acres	304
50-179 Acres	141
180-499 Acres	41
500-999 Acres	5
1000+ Acres	4

(D) indicates data withheld by USDA to avoid disclosing individual farm data



Practices for Identified Farm and Forestry Uses

This following provides an initial summary of accepted farm and forestry practices associated with farm and forestry uses identified in the surrounding area. CSA obtained data and information on practices from published sources where such data was readily available, and also relied upon CSA's extensive experience and knowledge in regard to farm and forestry practices. Many of the farm and forestry practices identified in the analysis occur on an occasional or seasonal basis; farming itself tends to be a highly seasonal enterprise. As indicated in aerial photos, fieldwork, and published data, the farm units in the impact analysis area are dominated by pasture and hybrid poplar plantations, but many different uses total at least a couple of hundred acres.

Pasture / Cattle Grazing: The pasture lands in the surrounding area are assumed to be utilized by cattle for beef production. Based upon the experience of CSA, generally beef cattle farms have the following practices:

- Calving and rearing calves: This may involve selling some stock to other ranches. De-horning, disbudding, castrating males not selected for future bull stock, watering, treating with medications. Some farms use feeding equipment that feeds milk or milk replacers. Others use natural nursing or some combination. At the end of rearing, the calves are weaned.
- Feeding, watering and manure handling is nearly constant.
- Breeding may be necessary to replenish the herd and produce stock for sale or the herd may be replenished by purchasing additional stock.
- All kinds of yard and equipment maintenance must occur such as fencing, tractor repair, repair and maintenance of farm buildings.
- Controlling for rodents and other vermin in pastures and barns.
- Changing bedding and rotating the herd in and out of the barn to nearby pastures as weather and time allow. Different gates, trails and roads will be used as pasture locations are rotated over time.
- Pasture cultivation: Practices for pasture management are similar to the below practices for hay production, except the cows do much of the cutting by grazing and distribute some of the fertilizer themselves. Harrowing in pastures is done to break up manure and increase nutrient reabsorption.



Hybrid Poplar Production: The primary source of information for farm practices on the growing of poplars is the Oregon State University (“OSU”) Extension Service publications² and other northwest resources.³ Hybrid poplars grow best in fertile and productive agricultural soils. Alkaline and excessively acidic soils should be avoided. They can be a low maintenance crop once they have been planted, but they do require significant amounts of water, to the point that they are tolerant of periodic flooding. They grow best in locations with long growing seasons and high amounts of rainfall.

Once established and provided with sufficient moisture, poplar trees are fast growing. The trees grow fastest in the summer, when water needs are highest. According to the OSU extension service, typical irrigation for poplars is around 24 inches of water a year. Harvests are possible after only 8 to 12 years.

Poplars are typically planted in rows, with relatively close spacing. This matches the observations of hybrid poplars being grown in the surrounding area made by CSA when they conducted a site visit in April of 2023. In general, the closer the trees, the smaller they will grow as they compete for resources.

Commercial Forestry: Based upon the experience of CSA, the following are the expected activities commonly associated with commercial forestry:

- Road construction and maintenance: A well designed and constructed forest road system is necessary to the management of forest lands and to ensure access to viable stands of commercial timber. Private landowners will at times find it necessary to cut in roads to access timber and ensure that the resulting harvest can be sold to market. Creating roads requires planning, the clearing of vegetation, rocks, and other obstacles, and grading of the land using heavy equipment. A survey may be required to ensure that all work is done on the correct property.
- Timber harvesting: Different techniques are available to landowners when it comes to harvesting timber. Options include clearcutting, seed tree, shelterwood, selective cutting of individual trees, or group selection. Machinery is typically used to accomplish harvest. The types of machines used to cut down trees can run the gamut from handheld chainsaws to harvesters to feller bunchers. After the trees have been cut, a skidder is typically used to move the logs to a loading area, where a log loader can pile the logs into a truck or storage facility. In steep terrain, cut logs can be moved by a yarder, which uses a system of cables and pulleys to collect the logs. Other equipment used can include log splitters,

²Leavengood, S., & Reeb, J. (1997). EM 8667 - Product and Market Opportunities for Hybrid Poplar Wood in Oregon. Corvallis, OR: Oregon State Extension Service

Feibert, E. (2009, August 4). Poplar tree farming low, not no, maintenance. Retrieved from Oregon State Extension Service: <https://today.oregonstate.edu/archives/1997/scp/poplar-tree-farming-low-not-no-maintenance>

Shock, C., Flock, R. F., Pereira, A., & O'Neill, M. (2013). EM 8902 - Drip Irrigation Guide for Growers. Corvallis, OR: Oregon State Extension Service.

³ Thomas, K., & Comeau, P. B. (2000, March). Extension Note - The Silviculture of Hybrid Poplar Plantations. Retrieved from British Columbia Research Branch : <https://www.for.gov.bc.ca/hfd/pubs/Docs/En/En47.htm>



mulchers, chippers, or forwarders. In very remote locations, helicopters can be used for harvesting as well.

- **Reforestation:** This practice involves the creation of favorable circumstances for seedlings to survive and the replacement of trees removed during harvest. Seedlings may be collected from a nursery or seed orchard. Seedlings are often grown in containers or beds for a year or two before they are ready to be planted. Planting can be done manually by hand or by machine. Plantings typically occur in late fall or early spring when soil moisture levels are higher, and the weather is appropriate. After planting, reforestation sites are typically monitored for establishment and growth. Additional measures may be necessary to enable high quality growth, such as watering, weeding, thinning, pruning, and pest management.
- **Forest Chemicals:** Many forest managers use the application of chemicals to increase yield. Chemicals can include pesticides and fertilizers. Insecticides, for example, can be used to manage infestations from bark beetles and defoliating insects. Weeds competing with seedlings can be controlled via the application of herbicides. Rodenticides can help prevent girdle damage to trees from species such as mice and beavers.
- **Timber Stand Improvement:** This practice involves the removal of lower quality trees to provide more space and resources for high quality specimens to achieve better yields. This can be accomplished through thinning, girdling, or pruning of lower value specimens, and the removal of invasive species.
- **Disposal of Slash:** Logging, or management of lands to reduce fuels, generates woody residual debris, such as small diameter logs, branches, shrubs, and other materials. Sometimes logs can be left as habitat enhancement, but often they are removed, piled, and burned. When done properly, pile burning is an effective and affordable method of reducing fuels. Other options include cutting and scattering of materials, chipping, or hauling away materials to a disposal site.

Woodlot: Based upon the experience of CSA, the following are the expected activities commonly associated with Woodlot use. Trees may be native, or trees may have been planted post prior removal. Irrigation is not typically involved in raising trees for woodlot purposes. Within this part of Columbia County, seasonal precipitation and climate are generally sufficient for the growing of trees. Similarly, nutrients and fertilizers are not generally used due to the presence of relatively deep, rich soils. As trees grow, they are often thinned to achieve optimal growth and overall health. Trees removed during thinning processes are often too small to be profitable or merchantable for lumber and as such are often cut into rounds, split and sold as firewood. Firewood may be transported from the site by the property owner to the home of the purchaser or the purchaser may come to the site for pick up. Trees raised to merchantable size are felled, bucked, loaded and either milled on-site or delivered to a mill. Felling of trees is done either by hand with a chainsaw or with machinery using a feller-buncher. Limbing and bucking trees is done either by hand with a chainsaw or by machinery using a feller-buncher. Logs are loaded onto log trucks with either separate loaders or with a truck that has a self-loader. Limbs and material cut from the logs are often chipped and spread onsite or are piled and burned during wetter months. Sometimes the woody debris is utilized for compost. Sometimes chips are hauled away to be used as fuel.



Blueberry Production: The primary source of information for farm practices on the growing of blueberries is from the OSU Extension Service publications⁴ along with other publicly available resources.⁵ According to OSU, in western Oregon blueberries are typically planted in raised beds or flat ground in rows with space of 3 feet by 10 feet. Sawdust is typically used as a soil amendment before planting.

Blueberries require a more acidic soil than most crops. Planting in soil with a pH that is too high can permanently stunt growth and may require replanting to obtain a uniform and vigorous plant. Soil acidification is usually accomplished by the application of elemental sulfur, either in a single application or split up into multiple smaller applications.

Blueberry plants typically reach full productivity after 6 to 10 years, although crops may be harvested before this period. On the Oregon coast, the harvest period can extend from June to September.

Typical management practices include the following:

- **Weed control:** Control of weeds, especially when establishing new plants before the canopy closes, ensures long-term healthy production. This can be accomplished via herbicides, establishment of cover crops, or more manual methods.
- **Pruning** of both new and established plants. Yearly pruning is essential for stable production of crops. Canes begin to lose productivity as they age, thus removing canes once they approach 8 years of age will improve productivity.
- **Fertilization:** Once established, blueberries typically require fertilizer applications that provide nitrogen. The plant will only take up the ammonium form of nitrogen, not nitrate. In Oregon, potassium and phosphorus deficiencies are less common.
- **Irrigation:** Blueberries typically have shallow root systems and as a result grow best where soils can hold higher amounts of water and daily irrigation is available. However, the plants grow best in moist but not saturated soils. Standing water or waterlogged soil will harm blueberry plants and encourage disease. According to the record, local farmers use drip irrigation. Mulch is typically used to retain moisture and reduce the need for irrigation.
- **Pollination:** Highbush varieties of blueberries are self-fruitful, but cross pollination can improve yields. Local bee populations are often sufficient for smaller crops, but hives may be required for larger farms.
- **Pest control:** Birds can be a serious pest for blueberry crops, consuming significant portions of output. Netting is the most effective method for exclusion but can be quite expensive. Other control devices include auditory control devices or owl or raptor decoys. Deer are also common pests, especially where crops are adjacent to adequate cover. Deer

⁴ Hart, J., Strik, B., White, L., & Yang, W. Q. (2006, November). Nutrient Management for Blueberries. Retrieved from Oregon State University Extension Service: <https://extension.oregonstate.edu/sites/default/files/catalog/auto/EM8918.pdf>

Bouska, C., Dixon, E., & Strik, B. (2018, March). EM9179 - Growing Berries on the Oregon Coast: Blueberries. Retrieved from OSU Extension Service: <https://extension.oregonstate.edu/catalog/pub/em9179>

⁵ Pritts, M. P., Hancock, J. F., Strik, B., Eames-Sheavly, M., & Celentano, D. (1992). Highbush Blueberry Production Guide (NRAES-55). Ithaca: Northeast Regional Agricultural Engineering Service (NRAES). Retrieved from Co: <https://ecommons.cornell.edu/handle/1813/66931>



fencing or other methods of physical exclusion are common methods to control deer damage. A variety of insects can also affect blueberry plants, with control methods varying by individual species, but can commonly include the application of insecticides.

- **Harvesting:** Blueberries have historically been harvested by hand, but mechanical harvesting is possible if the plants have been grown and managed for such a practice, such as adequate spacing and narrower crowns. Harvests can extend from June to September.

Grass Hay or Alfalfa: The Table of Perennial Ryegrass Farm Practices, below, describes practices excerpted from ryegrass plantings establishment publications⁶ developed by OSU Extension Service for seed production in the Willamette Valley. New ryegrass and other grass hayfields in Columbia County would be expected to undergo similar establishment and production. However, some of the practices may be omitted where it is not necessary to undertake such careful and intensive practices for regular hay production for animal feed. For example, the care necessary in seed harvesting is more involved than for standard hay farming where fields are simply swathed into rows, raked, dried, and then baled. Grain production farm practices are like those described below for ryegrass except that planting/establishment is required annually and harvesting typically involves use of a combine for cutting and threshing.

Table 3 Perennial Ryegrass Farm Practices

Practices During Establishment	Production Practices
▪ Soil Sample ▪ Disk (multiple times) ▪ Rip ▪ Plow ▪ Harrow & Roll ▪ Lime ▪ Harrow & Roll ▪ Plant Seed ○ Charcoal ▪ Seedling Weed Control	▪ Fall Fertilizer ○ 16-16-16 LB ▪ Seedling Weed Control ○ Spray Bug60 7 mph ○ Prowl H20 ○ AzimOZ ○ Surfactant--Induce ▪ Slug Control ▪ Fertilize - Spring ○ 33-0-0-12 LB

⁶Eleveld, B., Silberstein, T., Mellbye, M., Young, B., & Lahmann, H. (2010, November). Oregon Agricultural Enterprise Budgets. Retrieved from Oregon State University College of Agricultural Sciences: <https://agsci.oregonstate.edu/sites/agscid7/files/oaeb/pdf/AEB0007.pdf>

Hart, J., Mellbye, M., Young, W., & Silberstein, T. (2011, February). Nutrient Management Guide - Annual Ryegrass Grown for Seed. Retrieved from Oregon State University Extension Service: <https://extension.oregonstate.edu/sites/default/files/documents/em8854.pdf>

Fransen, S., & Hackett, M. (2001). Haymaking on the Westside. Retrieved from Washington State University Extension: <https://pubs.extension.wsu.edu/haymaking-on-the-westsidefarming-west-of-the-cascades-series>



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Practices During Establishment	Production Practices
○ Spray Bug60 7 mph ○ GlyphosateGAL3 ○ Surfactant--Induce ▪ Ditching ▪ Seedling Weed Control ○ Spray Bug60 7 mph ▪ Norton (pt) ▪ Slug Control ▪ Fertilize - Spring ○ 33-0-0-12 LB ○ 46-0-0 Urea LB ▪ Rodent Control ▪ Broadleaf Weed Control ○ Spray Bug60 7 mph ○ 2, 4-D ○ Banvel ▪ Rogue Weed Control ▪ Border Spray ▪ Plant Growth Reg. ○ Spray Bug60 7 mph ○ Apogee (PGR) ▪ Rust Control ○ Spray Bug60 7 mp ○ Quilt/Fungicide ○ Surfactant--Induce ▪ Swath ▪ Flail	○ 46-0-0 Urea LB ▪ Broadleaf Weed Control ○ Spray Bug60 7 mph ○ 2, 4-D ○ Banvel ○ Surfactant--Induce ▪ Rogue Weed Control ▪ Plant Growth Reg. ▪ Spray Bug60 7 mph ▪ Palisade (PGR) ▪ Rust Control ○ Spray Bug60 7 mph ○ Quilt/Fungicide ○ Surfactant--Induce ▪ Swath ▪ Custom Bale ▪ Flail

More generalized farm practices are associated with native hay production where hayfields substantially use native grasses and less intensive management.



Mint Production: The primary source of information for farm practices on the growing of mint was from the OSU Extension Service publications.⁷ These resources were written for peppermint specifically, but it is assumed that they apply to spearmint as well.

Mint is a perennial herb typically grown in locations with well-drained soil and plentiful irrigation. Mint reproduces via rhizomes and stolon, also known as runners, which originate from rootstock in early summer. The crop is typically established by transplanting greenhouse starts in the spring or field grown roots in the fall. The plant spreads aggressively and will fill in rows by the second year. Stands can stay in production for multiple years, ranging from 3 to 15 depending on location and growing conditions. After the plant begins to bloom in summer, it is swathed, chopped and distilled to extract the oils.

Mint consumes a lot of water, with a typical requirement of around 30 to 40 acre-inches per year. Well drained soils are typical and are recommended to have a pH of 6.0–7.5 and high organic matter. Most mint uses up to 250 pounds per acre of nitrogen fertilizer per acre per season, in addition to other nutrients such as phosphorus, sulfur, and potassium.

Mint becomes more susceptible to pests as it reaches maturity. Pests vary by season, but include cutworms, armyworms, symphylans, mint stem borer, spider mites, loopers and mint root borer. In order to manage pests, the application of insecticides is typically a key management tool.

Mint crops are also typically vulnerable to weed infestations, particularly before the plant has reached a level of maturity to provide a closed canopy. Weeds provide both a home for pests and reduce the yield of mint. In order to manage weeds, typical management practices include crop rotation, seedbed and root-stock preparation, and the timely application of herbicides. In some cases, additional farm labor may be used to manage weeds such as common groundsel, pigweed, mayweed, and prickly lettuce. Management of pests and weeds is reliant upon frequent monitoring, early management, and integration of a holistic approach.

Flower Farm: Flower farms practices can share characteristics with other field crops or vegetables, especially when plants are grown in open fields. Soil quality matters greatly for field grown stock. Stock can be grown in open fields, container fields, greenhouses, or tunnels.

- Stock is acquired through several methods. Seeds and bulbs can be collected from existing stock, purchased from other sellers, or collected in the wild. Some stock can also be propagated via cuttings.
- Bulbs, seeds, or cuttings are placed into a proper rooting medium, which varies by plant. Seedbeds and potting mediums must be prepared in advance for each species. Germination may require periods of dormancy or judiciously controlled conditions.
- After germination, stock requires careful supervision to ensure healthy growth. Plants started indoors typically go through a “hardening” process that acclimates them to outdoor conditions. This involves moving stock outdoors for increasingly long periods of time so that they can be gradually introduced to sunshine, outside air, and cooler nights.

⁷ Hart, J., Sullivan, D., Mellbye, M., Hulting, A., Christensen, T., & Gingrich, G. (2010). Peppermint (Western Oregon) Nutrient Management Guide. Retrieved from Oregon State Extension Service: <https://catalog.extension.oregonstate.edu/em9018/viewfile>

Murray, K., Walenta, D., Jepson, P., & Sundlin, I. (2020). Integrated Pest Management for Oregon, Washington, and Idaho Mint Crops. Corvallis, Oregon: Oregon State University.



- Each species has specific needs for water, sunlight, ventilation, and temperature. Some stock can require several years before it has reached a saleable size and condition.
- When used, open field cultivation requires practices like other field crops, such as weeding, pruning, and applying appropriate chemicals such as pesticides, herbicides, and nutrients.
- Irrigation requirements will vary depending on how the stock is grown (i.e., field grown vs. greenhouse vs container). For example, container grown plants are more sensitive to drought damage and require more frequent irrigation than field grown stock.

Cannabis: Cannabis can be grown in three different ways; indoor, outdoor, or in a greenhouse.⁸ The only observed cannabis production in the area appeared to be of a relatively small scale and to occur indoors. Indoor (and greenhouse) production is typically much higher yielding than outdoor production, with 4-6 harvests per year.

As the name suggests, indoor production occurs inside of buildings that typically use artificial lighting and plants grow in soilless media or hydroponically.

Cuttings, or clones, are derived from stock plants and placed into rooting material for a short period of time under high humidity. After rooting, they are transplanted into a propagation mix and a week or so later put into pots. At this point, during propagation, male and female plants are separated to prevent female plants from creating seeds. This phase lasts for several weeks and growth conditions are demanding, with plants requiring 18 to 24 hours of either sun or supplemental light. Temperatures are typically maintained in a narrow band for optimization, between 70 to 80 degrees Fahrenheit. After propagation, the plants are moved into a flowering phase where light is reduced to 12 hours per day. This phase takes between 9 to 12 weeks. Thereafter, the plants are harvested with individual branches removed and flowers separated to be dried. After drying, the flowers are trimmed by manual or mechanical means to remove leaves and other plant materials. The product is sometimes cured after trimming.

Equine Facilities: In CSA's experience, farm practices typically associated with horse stabling include the following:

- Breeding and foaling may occur, although it does not appear the horse stabling operation identified within the impact analysis area is primarily a breeding facility.
- Feeding, watering and manure handling is nearly constant.
- All kinds of yard and equipment maintenance must occur such as fencing, tractor maintenance, and building and equipment repairs.
- Controlling for rodents and other vermin in and around the barns and riding areas.
- Changing bedding and rotating horses in and out of the barn to nearby pastures as weather and time allow.
- Horse washing, grooming, and shoeing.
- Various horse training activities associated with riding instruction.

⁸ Upland Agricultural Consulting. (2019). Commercial Cannabis Production in British Columbia: Best Available Control Technologies and Regulatory Oversight of Environmental Considerations. Retrieved from Government of British Columbia: https://www2.gov.bc.ca/assets/gov/environment/waste-management/industrial-waste/industrial-waste/cannabis-production/cannabis_bacts_report.pdf



3.2 Natural Resources

Using the methodology discussed in Section 2, CSA, in collaboration with Schott and Associates, identified the following natural resources in the surrounding area:

- Endangered Species in the form of Columbia white tailed deer habitat and Salmonids
- Wildlife Refuge located on Crims Island
- Essential Salmonoid Habitat in John Slough, Cries Creek, Columbia River, and Bradbury Slough
- Columbia River
- Open Space
- Wetlands
- Riparian areas

Endangered Species

CSA contracted with a subject matter expert, Schott & Associates, with experience in wildlife habitat evaluation. This expert independently investigated the presence of endangered species in the Exception Area. Their correspondence with USFWS and the Oregon Biodiversity Information Center obtained a list of threatened or endangered species and critical habitat potentially in the area. They identified the presence of threatened and endangered salmonid species and potentially Columbia white-tailed deer onsite. The memo is found at Appendix B.

The most recent 5-year review⁹ of the Columbia River population of Columbia white-tailed deer was completed in November of 2013 by the U.S. Fish and Wildlife Service. Therein, Figure 4 identifies the present-day territory of the deer, which includes the Exception Area and nearby Crims Island. In addition, the 1995 Beak Consultants Map titled "Wildlife Game Habitat" depicts a portion of the Exception Area as "marginal" Columbian white-tailed deer habitat. To the best of CSA's knowledge, the most recent version of the species' recovery plan was revised by the U.S. Fish and Wildlife Service in 1983. According to the 5-year review, "[u]rban, suburban, and agricultural areas now limit population expansion..." Historic loss of habitat is pointed to as a key factor in historical decline of the deer species. This habitat loss includes the conversion of natural areas into agricultural uses.

During a site visit, CSA personnel observed several dozen deer around the existing industrial uses at Port Westward. These deer were generally located near borders where wooded areas met field or open space. Port officials told CSA that the deer are also often sighted in the rail yard, which is located near the Columbia Pacific Bio-Refinery adjacent to the Columbia River.

⁹ Retrieved from U.S. Fish and Wildlife Service website at https://ecos.fws.gov/docs/tess/species_nonpublish/3359.pdf. According to the document, "A 5-year review is a periodic analysis of a species' status conducted to ensure that the listing classification of a species as threatened or endangered on the Federal List of Endangered and Threatened Wildlife and Plants (50 CFR §§ 17.11-17.12) is accurate." The review summarizes and evaluates information provided in the 1983 recovery plan, current scientific research, and surveys.



According to maps provided to Schott & Associates by ORBIC, endangered salmonid habitat includes the Columbia River, Bradbury Slough, John Slough, and a creek on the eastern edge of the surrounding area. The following are endangered salmonid species located in the Columbia River Basin:

- Coho
- Chinook
- Steelhead
- Chum
- Sockeye

Julia Butler Hansen Refuge on Crims and Gull Islands

Crims Island is an island located in the Columbia River near Port Westward. On U.S. Geological Survey (USGS) topographical maps, Crims Island is split into two islands, with a smaller northerly portion being labeled Gull Island.¹⁰ The islands immediately abut and are easily accessible to each other. Given their interconnectedness, it makes more sense, from a compatibility standpoint, to consider the islands as a whole. Therefore, for ease of reference, both islands will be referred to as “Crims Island” unless otherwise specified. Combined, the islands are approximately 2.5 miles long and contain approximately 792 acres of land, or approximately 1.25 square miles.

Portions of Crims Island are located approximately 1,200 feet across the Bradbury Slough from existing uses at the Columbia Pacific Bio-Refinery (See, Appendix A, Page 2). Ownership of the island is split into four different pieces. The westerly tip of the Island is owned by RSG Forest Products. The largest portion of the island is owned by the Department of the Interior, followed by lands owned by the Oregon Department of State Lands. The remainder is split between private landowners John Tennant and Cliff Curtis. Of the 792 acres, approximately 195 are owned by private landowners with the remaining 597 acres owned by public entities. The final comprehensive conservation plan for the Refuge states that the “Crims-Gull Island Complex is dominated by a large reed canary grass meadow in its center with, a 90-acre cottonwood/willow intertidal swamp to the west and an accreted spoil site with cottonwoods on the northern peninsula.”

The portions of the island owned by the Department of the Interior were acquired in 2003 and are part of the Julia Butler Hansen Refuge for Columbian White-Tailed Deer. The Refuge spreads up and down the Columbia River, with the portion on Crims Island being the most easterly. Most of the Refuge is found on Tenasillahe Island in the Columbia River (Tenasillahe Island) and lands immediately across from the Island within the boundaries of the State of Washington.

According to the website for the Refuge,¹¹ it contains over 6,000 acres of “pastures, forested tidal swamps, brushy woodlots, marshes, and sloughs.” This habitat supports Columbian white-tailed deer, along with many other species.

¹⁰ See the 7.5 Minute series “Oak Point” Quadrangle. The topo map referenced was downloaded via the online Topoview tool from USGS, available at <https://ngmdb.usgs.gov/topoview/viewer/>

¹¹ <https://www.fws.gov/refuge/julia-butler-hansen-columbian-white-tailed-deer>



Wetlands and Riparian Areas

CSA engaged a wetlands expert to provide an initial analysis of potential/likely wetlands located within the proposed zoned change area. Their analysis is found at Appendix B. As illustrated on the Preliminary Wetland Determination Map found at Page 8 of Appendix B, they found that approximately half of the proposed zone change area, or ~416 acres, were classified as potential or likely wetlands in preliminary analysis. The highest concentration of wetlands is located on Tax Lot 508 (known colloquially as the Thompson property and located immediately adjacent to the Columbia River) and the lands to the southwest of the existing port facilities.

The 1995 Beak Consultants Map titled “Wildlife Game Habitat” depicts a portion of the Exception Area as Major Waterfowl Habitat. The Columbia County Comprehensive Plan Part XVI – Goal 5 resource management program to achieve Goal 5 relies on Section 404 of the Clean Water Act and the State Fill and Removal Law in wetland areas and relies on riparian protections in the zoning code along streams to limit conflicting uses in waterfowl habitat. Thus, compatibility for the County’s waterfowl habitat resource management planning is analyzed here as a function of compliance with riparian and wetland regulations.

Outside of the Thompson property, most of the wetlands in the area are occurring on property occupied by agricultural uses, such as cattle grazing or mint farming. The potential or likely wetlands in these areas are of a degraded nature, given their use characteristics.

Water Resources

Water resources include such sources as groundwater, surface water, and irrigation water. CwM-H20 examined the water resources within the zone change area. They identified 17 water supply wells that appear to be active within ½ mile of the proposed Exception Area. An additional 8 surface water rights with a place of use were located in the same area. These water rights covered uses such as municipal, quasi-municipal, irrigation, industrial and manufacture, and power development. Surface water sources include the Columbia River and its sloughs, along with creeks located to the south.

As discussed elsewhere in this report, the BDIC was granted a water right in 1979 to appropriate state water, specifically the Columbia River, to irrigate 2,746.4 acres of land. The water appropriated is not to exceed 34.33 cubic feet per second. The permit states that the BDIC has been using water for irrigation purposes since 1914. A memo prepared by CwM-H20 examining water resources and protections is found in Appendix C.

Air Resources

CSA engaged an air quality expert to consider the environmental setting of the Exception Area and the surrounding area. As part of air quality standards, EPA requires the identification of geographic areas that may be air-quality challenged. If a geographic area does not meet the National Ambient Air Quality Standard, an area is designated as “non-attainment” or “maintenance”. The Port Westward area does not fall under either of these air-quality challenged categories, instead being qualified as “attainment.” A memo prepared by SCS Engineers examining air resources and protections is found in Appendix E.

3.3 Other Uses

Non-resource uses exist in the surrounding area; these uses are not farm or forest uses nor are they natural resource management uses. The non-resource management uses that are not adjacent to the



Exception Area do not need to be considered for compatibility under the Rule. The non-resource uses adjacent to the exception area are limited to approximately 4 acres of residential and related residential accessory uses.

The adjacent non-resource residential uses all appear to be associated with adjacent farmland. As such, the compatibility analysis evaluates the farm resource uses and then gives additional considerations to potential impacts that might be experienced by the residential use.

3.4 Beaver Drainage Improvement Company

The Beaver Drainage Improvement Company is the nonprofit corporation in charge of providing drainage and diking service to the landowners within the levees around Port Westward. The levee system operated by BDIC is constructed out of three earthen embankments and has a total length of 11.51 miles. The area within the BDIC levees comprises approximately 6,000 acres and includes most of Port Westward, the area subject to the Goal Exception, and most of the identified surrounding area.

The Beaver Drainage District (the predecessor to the BDIC) was created in 1915 for the purpose of reclaiming land and providing protection against flood water via a drainage system. The drainage and levee system were later improved in the 1930s by the USACE. In 1994, the Beaver Drainage District was dissolved and the BDIC was reorganized to replace it. BDIC maintains the existing levees and operates a pump station along with a system of ditches and sloughs to drain waters. The pump station has a capacity of 120,000 gallons per minute. In addition to providing drainage, the BIDC has a water right¹² to deliver irrigation to almost 2,750 acres in the area.

It is CSA's understanding that future development should be coordinated with BDIC to ensure either no changes to facilities under BDIC authority will occur, or that such changes will be consistent with BDIC facilities and operations.

According to publicly available tax filings, the District had a total revenue of \$142,724 for the tax year ending June 30, 2021. The previous two years were similar, with revenue of approximately \$140,000. Total assets in 2021 were estimated to be \$178,100. See Appendix I for copies of these records.

3.5 Hazards Facts

Seismic: The subject property is located relatively near the Cascadia Subduction Zone, which is a "600-mile fault that runs from northern California up to British Columbia and is about 70-100 miles off the Pacific coast shoreline."¹⁴ According to a book by Robert Yeats, *Living with Earthquakes in the Pacific Northwest*, this subduction zone "has been revealed as a major seismic source, capable of an earthquake of magnitude 9." Shaking could last for multiple minutes and could cause disruption across much of the Pacific Northwest.

The state of Oregon Department of Geology and Mineral Industries publishes an interactive online map of several different types of geohazards. According to this map (titled Oregon HazVu¹⁵), the Port Westward site is expected to experience "severe" shaking in the case of an earthquake caused

¹² State Record of Water Right Certificate numbered 83174

¹⁴ <https://www.oregon.gov/oem/hazardsprep/pages/cascadia-subduction-zone.aspx>

¹⁵ <https://gis.dogami.oregon.gov/maps/hazvu/>



by the Cascadian Subduction Zone. HazVu classifies the Port Westward area as having soils at high risk of liquefaction.

Tsunami: In 2015 DOGAMI issued a study for evaluating updated tsunami modeling on the Columbia River system.¹⁶ The goal was to consider the potential effects of a tsunami on the mouth of the Columbia, along with points further upriver, such as Longview, Vancouver, and Portland. Modeling included local earthquakes in the form of Cascadia subduction zone ruptures. At Wauna, which is located downriver of Port Westward, the report states that modeled currents in a large Cascadian subduction zone earthquake are largely below the 3-knot threshold at which damage is expected. Current conditions are “generally benign by the time the tsunami reaches Longview.” According to an Oregon State University website¹⁷ describing the study, no measurable rise would be expected in the river at river mile 50. The website describes this as near Longview, but it is located downriver of Port Westward according to maps published by the Oregon State Marine Board.

Flood: As discussed elsewhere in this document, nearly all of Port Westward, and its neighboring lands, are within the area protected by BDIC levees. Levees are assessed by the USACE for risk. Risk is a combination of potential for failure and the anticipated consequences when a levee does fail. According to the USACE National Levee Database,¹⁸ the BDIC levee has a history of good performance but has a relatively high likelihood of overtopping. The overtopping exceedance risk is estimated at 2% for any given year, or to put it another way, likely to occur during a 50-year flood event. Because most of the lands behind the levee are agricultural, USACE considers the risk associated with levee segments to be low due to the anticipated low consequences of failure.

The BDIC levee system was given provisional accreditation in 2010 when the County’s Flood Insurance Study was last updated. According to a Phase 1 report,¹⁹ the levee has less than 2 feet of freeboard above the 100-year flood water surface elevations and therefore did not qualify for a Phase 2 evaluation. A Phase 2 evaluation would be required to remove the provisional accreditation status of the levee system. Insufficient freeboard and several other identified deficiencies must be addressed before a Phase 2 evaluation can proceed. According to WEST Consultants, Inc., “it is likely that at some point FEMA will remove the provisional accreditation status” of the BDIC levee system and the area within the levee will be deemed part of a Flood Hazard area. A community is eligible for a Provisional accreditation only once.

Fire: Port Westward is located within the Clatskanie Rural Fire Protection District (“Fire District”). The Fire District has approximately a dozen paid staff and provides services to the City of Clatskanie and approximately 135 square miles of surrounding lands. The Fire District’s primary station is in the City of Clatskanie, approximately 5 to 7 miles from Port Westward, depending on the route taken. The District also has a station located in Quincy, but that station is used only for the pre-positioning of equipment and no staff are based there. The Fire District has mutual aid agreements with other local jurisdictions, including the City of Longview.

¹⁶ https://www.oregongeology.org/pubs/sp/SP-51/SP-51_report.pdf

¹⁷ <https://today.oregonstate.edu/archives/2015/fcb/study-outlines-impact-tsunami-columbia-river>

¹⁸ <https://levees.sec.usace.army.mil/#/>

¹⁹ The report, titled “Phase I Levee System Evaluation for National Flood Insurance Program Accreditation Beaver Drainage District” is dated March 1, 2014. It is found in the most recent LUBA remand record at page 1,642



3.6 Review of Agricultural and Port Industrial Adjacency Land Use Patterns

It is not unusual to find examples of the approved five industrial use categories neighboring or near active farm uses. The most obvious example is located at Port Westward itself. Mint farming occurs within ~250 ft of the Beaver Power Plant. Owned by Portland General Electric, the Beaver Power Plant is a 500-megawatt combined cycle natural gas power plant that began operating in 1976. It operates under a Title V air quality permit from ODEQ.

According to information provided by the Port and as observed on a site visit, mint is grown within a few hundred feet of the Beaver Power Plant site. This arrangement appears to have been operating for at least the past decade according to available Google Earth imagery; according to the Port staff Seely Mint has had an agricultural lease since 2003. A map illustrating this arrangement is found of Page 2 of Appendix A.

CSA researched other examples of farm uses, specifically blueberry and mint crops, being grown near or adjacent to industrial uses in the Pacific Northwest. The result of this research is found in a technical memorandum at Appendix G. Based on that research, it is not uncommon to find these crops in close proximity to industrial or other relatively high intensity uses.

A few highlights from this memo include the following:

- Golden Eagle Farms is a large blueberry farm located in the Skagit Valley. The farm is immediately adjacent to the Skagit River Reman industrial sawmill.
- Minto Island Growers is a mint farm started in the 1970s. It is adjacent to a ready-mix concrete supplier called Wilsonville Concrete Products. According to the company website, they have been in operation since the 1950s and Google Earth confirms that the site has been active since at least 1994.
- Red Barn Berry Farm is a blueberry farm established in 2015. It is adjacent to a landfill processing center called the Valley Landfills Process and Recovery Center.

These and other sites are discussed in Appendix G.

3.7 Determination of Surrounding Area

As noted above, natural resources and resource management or production practices on adjacent lands must be analyzed for compatibility with the use categories approved in the Goal Exception. In addition, surrounding natural resources, resource management, and production practices must also be examined.

To adequately capture surrounding natural resources, resource management, or production practices outside of the BDIC levees, but still within the surrounding area, a one-mile area was added to the Exception Area. This additional area captures nearby natural resources located in the Columbia River, such as Crims Island, and forest lands further to the east that share access roads with Port Westward.

Given the types of potential compatibility externalities that may be expected to occur from development in the Exception Area, such as air quality impacts or stormwater runoff, the intensity of compatibility externalities is expected to be strongest immediately adjacent to the proposed industrial areas. Externalities will diffuse over time and distance, becoming less concentrated as



they travel farther from their point of origin. For example, if the air emissions externalities within one mile from the proposed use are determined to be compatible, it is logical that those farther away will be also found to be compatible to the extent the more distant uses are similar to the more proximal ones.

In addition to lands within one mile of the Exception Area, the record includes assertions that the lands within the BDIC function as an interconnected agricultural unit due to the hydrology of the area. Because many potential externalities concern hydrologic factors, CSA finds that analysis of lands within the BDIC levees for purposes of the compatibility analysis is appropriate even though the potential for externalities would still be expected to diminish as distance from the Exception Area increases.

Therefore, the surrounding area is defined as those lands immediately adjacent to the Exception Area, those within one-mile of the Exception Area, and the land within the levees of the BDIC. The map included at Page 11 of Appendix A displays this surrounding area and serves as the basis for the remainder of the analysis.

3.8 Existing Regulatory Process

The existing remand record correctly points out that there are myriad regulatory processes in place that may address and mitigate many potential compatibility externalities. These regulatory processes are discussed below in greater detail than in previous compatibility analyses. The discussion relies upon the expertise of the subject matter experts contracted by CSA. Their work can be found in the Appendices.

For the analysis conducted below in Section 4 and 5, the regulatory requirements discussed in this section are assumed to be the minimum requirements applied to future development.

3.8.1 Environmental Regulatory Process Summary

Wetlands: Wetlands and waters may be regulated by the Department of State Lands under the Removal-Fill Law, and by the USACE under the Clean Water Act. Jurisdictional and wetland boundaries must be clarified before any project can be constructed in the zone change via a formal wetland delineation report²⁰. A delineation is provided to both DSL for review and approval (concurrence) and the USACE for jurisdictional determination.

After delineation, a Joint Permit Application is submitted to the appropriate regulatory bodies. The JPA pertains to the following permits:

- 1) State Removal/Fill permit issued by DSL
- 2) Federal Section 404 permit issued by the USACE
- 3) Federal Section 401 Water Quality Certification (WQC) issued by the Oregon Department of Environmental Quality (DEQ)

Permits typically take between 6-18 months, depending on the extent of potential externalities and complexity. Both agencies require that the Applicant has demonstrated an attempt to avoid

²⁰ Recent legal proceedings narrowed the scope of federal jurisdiction over wetlands and could affect the federal jurisdiction and federal permitting process for activities in wetlands in the Exception Area.



wetlands to the extent practicable. If wetlands are to be impacted, the agencies have different methods of mitigation.

Depending upon the level of development, there are varying degrees of detail required in the submittal and different levels of public involvement in the process. When the project affects more than half an acre of wetlands, public comment periods of 30 days are standard for both the USACE and DSL.

A detailed discussion of the site, including possible wetlands, and permitting is found in Appendix B. This Appendix was written by Schott and Associates, qualified experts with experience in performing wetland delineations and obtaining the permits discussed above.

Air Quality: The State of Oregon has an existing framework of air quality rules that regulate industrial uses. Permits for industrial uses are issued based upon the intensity of industrial air emissions. Regardless of the type of air permit required, a permit would need to be obtained prior to the start of construction of an air pollutant source. All permits are administered by the State of Oregon Department of Environmental Quality.

There are five main levels of permitting, corresponding to higher levels of intensities. The first three permit levels are Air Contaminant Discharge Permits ("ACDPs"). These are issued as Basic, Simple, and Standard in order of increasing intensity. The proper ACDP is issued based upon threshold levels of contaminants. There is some variation in threshold level depending on the particular contaminant. For example, a Standard ACDP is required if more than 25 tons a year of Volatile Organic Compounds (VOCs) are expected. Any permit, aside from the Basic ACDP, requires an air quality analysis to ensure that NAAQS (National Ambient Air Quality Standards) are protected.

In addition to ACDPs, the State administers Title V and Prevention of Significant Deterioration ("PSD") permits. These last two are for more intense uses with greater potential for contaminant discharges. Any use that emits more than 100 tons of any criteria pollutant is required to obtain a Title V permit. PSD permits are reserved for the largest sources of air emissions.

All air quality permitting includes requirements for public notice and comment.²¹ The public participation is sorted into categories (Categories I through IV) that correspond, more or less, to the different ACDP categories. For example, Basic ACDP permits are Category I and do not require public notice or opportunity for participation. However, the State must maintain a list of all such permits. New permits issued for Simple or Standard ACDPs are designated as a minimum as Category III and require both public notice and the opportunity for a public hearing.

A detailed discussion of the air quality permitting process is found at Appendix E. This Appendix was written by SCS Engineers, qualified experts with experience in performing air quality modeling and obtaining the permits discussed herein above.

²¹ See OAR Chapter 340 Divisions 209 (procedures), 216 (ACDP categorization)



Stormwater and Groundwater: Most rules that protect Oregon water quality are managed by ODEQ. The primary process for stormwater permitting is via a National Pollution Discharge Elimination System permit (NPDES). Industrial stormwater is managed by ODEQ via the 1200-Z Industrial Stormwater Discharge Permit. The permit applies to any point source of pollution, which includes runoff from roads, parking lots, buildings, and other impervious surfaces. Such a permit will be required for stormwater runoff produced within the zone change area from industrial uses.

Related to stormwater, ODEQ regulates the protection of groundwater in the State of Oregon. ODEQ requires a Water Pollution Control Facility Permit ("WPCF") when wastewater is discharged from an industrial or commercial establishment. The application and review process of this program ensures that discharges to the ground do not impact surface water and do not adversely impact groundwater. A monitoring plan is required.

For some of the proposed uses, such as intensive liquid bulk or natural gas uses, a Section 401 Water Quality Certification is likely to be required. To receive Section 401 certification, ODEQ must make the determination that a project can meet Oregon water quality standards before a federal agency can issue a permit. Certification can come with additional conditions for pre-treatment and monitoring.

A detailed discussion of the water quality permitting process is found in Appendix C. This Appendix was written by CWM-H2O, qualified experts with experience in water rights permitting, hydrologic and hydraulic modeling, water quality analysis, groundwater modeling, environmental site assessments, and obtaining the permits discussed herein above.

Seismic Assessment and Risk Mitigation: After the passage of Senate Bill 1537 in 2022, the State of Oregon now requires systematic comprehensive seismic vulnerability assessments for bulk oils or liquid fuels terminals located in Columbia, Multnomah, or Lane County. Rules regarding fuel tank seismic stability have been adopted at OAR Chapter 340, Division 300. ODEQ is seeking to have the assessments complete by June of 2024.

The legislation also requires that owners or operators of such terminals implement a seismic risk mitigation plan approved by ODEQ. The seismic risk mitigation plan must consider a magnitude 9.0 Cascadia Subduction Zone earthquake and, at a minimum, identify actions with timelines to protect public health, life safety and environmental safety within the facility, in areas adjacent, and other areas that may be affected.

Other Environmental Quality Permitting: Depending on the proposed use, other permits are likely to be required. A non-exhaustive list of potential other permits or requirements includes the following:

- **Spill Prevention Control and Countermeasure Plan:** Entities engaged in storing, transferring, or consuming oil and oil products would likely be required to develop a SPCC. These are commonly required for port facilities and related uses.
- **Solid Waste Disposal Permit:** Although the allowed uses at the Port will not include solid waste, accessory or related uses such as an energy recovery facility can require a Solid Waste Disposal Permit.
- **Hazardous Waste Management Permit:** ODEQ is the lead agency in charge of implementing RCRA, which regulates hazardous waste cradle to grave. The Dry Bulk, Liquid Bulk, Natural Gas, and Breakbulk activities proposed at the Exception Area may



require Hazardous Waste Management permitting depending on the specific materials being stored, transported, or processed at the site.

3.8.2 Floodplain Development Process

As noted herein, the proposed zone change area is not within a floodplain because of the provisional accreditation of the BDIC levee system. Therefore, structures within the levee are not currently subject to floodplain development requirements.

However, should it be necessary, the improvement or accreditation of the levee system would require significant time and resources. The BDIC would be integral to any such process, as they are the responsible drainage district.

To receive accreditation, the BDIC levee system would need to meet National Flood Insurance Program (NFIP) minimum design, operation and maintenance requirements. CSA understands that accreditation requires 3 feet of freeboard above the water surface elevation in a 1 in 100 likelihood flood event (often referred to as a 100-year flood event). As discussed above, these requirements do not appear to be currently met. A document developed by FEMA provides a categorized list of items that must be met for accreditation. These categories include Design Criteria, Operation Plan, Interior Drainage Plan, Maintenance Plan, and Certification. Most requirements to obtain certification and accreditation were not met in the most recent system evaluation.

A detailed discussion of the levee accreditation process and flood risk mitigation is found in Appendix D. This Appendix was written by WEST Consultants and Cornforth Consultants, qualified experts with experience in hydrology, hydraulics, river mechanics, geomorphology, dams, levees, and geotechnical engineering.

3.8.3 County Land Use Permit Process

Columbia County has an adopted and acknowledged zoning ordinance that has administrative procedures in place for different land use approval processes. These processes include two that will apply to any proposed industrial development that fits within the five approved use categories. Before starting any physical development in the Exception Area, the proposed development must apply for and obtain a Site Design Review Permit and an RIPD Use Permit Under Prescribed Conditions Permit.

RIPD Use Permitted Under Prescribed Conditions

Previous approvals for the proposed Goal Exception included a requirement that any industrial use in the Exception Area be subject to approval under the RIPD Use Permitted Under Prescribed Conditions.

RIPD Use Permitted Under Prescribed Conditions ("UPUPC") Permits are regulated by Section 683 of the Columbia County Zoning Ordinance. UPUPCs require approval by the Columbia County Planning Commission. Approval of a UPUPC includes discretionary criteria that require consideration of the potential impacts of the use on the surrounding area and existing land uses. A UPUPC review also gages the availability of infrastructure in the form of water, sanitary sewer, transportation, and rural fire protection. It is expected that a UPUPC permit would be considered concurrently with a permit for Site Design Review, discussed below.



Site Design Review:

In addition to a UPUPC permit, Columbia County requires many new uses to obtain a Site Design Review Approval. Specifically, the County requires such an approval from all new development, redevelopment, expansion, or improvement of all community, governmental, institutional, commercial, industrial and multi-family residential (4 or more units) uses. Every conceivable development that fits into the five use categories would fall under this definition. It should be noted, however, that leases for farm uses would be able to continue as is without additional regulation under this provision.

The Site Design Review process adds another layer of review and has specific requirements related to site design externalities that are typical of any industrial development.

Site Design Reviews are split into two categories, Type 1 and Type 2. Any development that consists of 5,000 square feet or more, or that consists of a change of use, is required to have a Type 2 review. Type 2 reviews require a public hearing and are approved by the Columbia County Planning Commission. Type 1 reviews apply to all other proposals.

Subsection 1703 of the Columbia County Zoning Ordinance explains the procedure for an appeal for a land use decision rendered by the Planning Commission. Any decision made by the Planning Commission for which it had original authority may be appealed for a de novo hearing before the County's Board of Commissioners by persons who appeared before the lower decision-making body either in person or in writing.



4 CUSTOMARY DEVELOPMENT FORM ANALYSIS

4.1 *Customary Development Form for Forestry and Wood Products*

As might be expected given its historic dependence on industries tied to lumber, there are several forestry and wood products facilities in the Pacific Northwest and the Columbia River basin that inform the characteristics of the CDF for the Forestry and Wood Products use category.

The following is a description of a “customary development form” for the forestry and wood products industry. This is immediately followed by a description of the forms that are less intense than the CDF and more intense than the CDF, respectively. This provides a fuller description of what a CDF is by contrasting it to uses that are analyzed to be of different intensity scales.

These uses tend to be space intensive (although space intensity does not necessarily equate to increased potential for externalities), with multiple examples exceeding 100 acres. A CDF in this category is expected to be an industrial use that involves significant levels of processing with some externalities such as industrial wastewater or air emissions, but with limited or no use of Extremely Hazardous Substances (“EHS”). A less intense use would have limited or very simple production processes with limited externalities. A more intense use would use Significant Quantities of Extremely Hazardous Substances (“SQEHS”) for processing wood products.

For the subsequent sections evaluating potential compatibility considerations, the CDF serves as the standard upon which those analyses are performed.

4.1.1 Description of F&WP Customary Development Form

Customary Development Form – Wood Pellet Plant: Pellet plants are facilities where wood waste or biomass is compressed into pellets for use as fuel or animal bedding. Wood pellet plants vary in size, with examples commonly between 10 to 50 acres.

Pellets are a form of renewable energy that is often used as a primary heating source in places such as western Europe and as a power source in locations such as Japan. Due to high transportation costs, the raw biomass is often sourced from the region in which it is sourced and produced. Hybrid poplars may be considered a good source of raw material for pellets.²² A local example includes the Lignetics wood pellet plant located in Columbia City. The plant is approximately 10 acres in size and has a dock on the Columbia River.

A pellet plant typically consists of processing stages such as raw material preparation, pelletizing, cooling and screening, and storage and packaging. The raw material is collected, dried, screened, and ground into uniform particles. The particles are fed into a pellet mill that uses heat and pressure to form them into cylindrical pellets. The hot pellets are then cooled and processed to remove fines and dust. The pellets are typically stored in silos or bags for transportation or distribution.

²² www.nrcs.usda.gov/plantmaterials/ldpncn370101.pdf



Use Less Intense than CDF - Log Yard for Export: An example of a use less intense than the CDF would be a log yard. There are multiple examples of log yards around the Pacific Northwest. One specific example is the Weyerhaeuser Log Yard in Longview, Washington. Another Weyerhaeuser log yard located in the Port of Olympia, which is approximately 40 acres, employs approximately 30 people and exported over 140 million board feet in 2016.²³ According to Port of Olympia documentation, all logs exported come from within a 50-mile radius. The Longview log yard is substantially larger, being at least 80 acres in size, but export data for the yard was not easily available.

Use More Intense than CDF - Pulp Mill: An example of a use more intense than the CDF would be a kraft pulp mill, such as the WestRock Paper Mill. It is located directly on the Columbia River near Longview, Washington and occupies approximately 365 acres. According to the Washington Department of Ecology, this mill is a kraft pulp and paper mill and box plant. It employs approximately 1,000 employees and makes approximately 3,600 tons of paper products and 2,800 tons of unbleached pulp per day. The mill uses multiple sources of fiber to make paper. WestRock Longview produces the virgin pulp using the kraft process and the neutral sulfite semi-chemical process.

The kraft process converts wood products into pulp, which can then be used to make the end product of kraft paper. Kraft paper tends to be stronger than other alternatives and is useful for shipping and box making. Typically, the process involves steaming wood chips and then saturating them with white liquor. White liquor is a mixture of sodium hydroxide and sodium sulfide and dissolves lignin and separates cellulose fibers. After saturation, the chips are cooked in the liquor in pressurized digesters. After cooking, there is a recovery process using a boiler to remove liquors and multiple steps to complete the conversion into kraft pulp, including typically blowing, screening, and washing. Byproducts of the process include sulfur compounds, which can cause the distinctive odor sometimes associated with pulp mills, tall oil, and substantial amounts of wastewater requiring treatment.

4.1.2 Identification of Potential Externalities of the F&WP Customary Development Form

The potential externalities identified below are based upon the remand record, a more recent review of literature on externalities from forestry and wood products, available environmental impact studies, and expert opinion, including CSA's own expertise²⁴ when reviewing and analyzing externalities from uses, particularly on farm uses.²⁵

As noted in the preceding section, the CDF is the standard upon which these analyses are performed.

²³ <https://portolympia.com/wp-content/uploads/2021/06/Port-Cargo-Background.pdf>

²⁴ See, Appendix K for resumes of CSA staff and their extensive background in farm impacts analysis amongst other land use experience that deals directly with impacts from uses on resource zoned lands.

²⁵ For readability, the individual sources that resulted in the subsequent analysis are not reproduced here. If more detail and documentation is necessary, these can be provided and expanded upon.



AIRBORNE EMISSIONS

Pellet plants can be a source of airborne emissions. Emissions include particulate matter ("PM"), volatile organic compounds, carbon monoxide, nitrogen oxides, and others. These emissions are generated as the raw biomass is processed into pellets and is dried, pelletized, cooled, and stored. Dust is a typical waste product generated in the production process, which is not uncommon among forestry and wood product uses.

In addition, locomotives, trucks, and ships all have emissions associated with them. Other equipment, such as forklifts or passenger vehicles may also be present. Emissions associated with these different modes of transportation are well known and typically include ammonia, carbon monoxide, nitrogen oxides, sulfur dioxides, VOCs, black carbon, and diesel particulate matter.

WATER QUALITY DEGRADATION

A pellet plant may discharge some wastewater, but the production process is less water dependent and less intense than other forestry and wood products uses, such as a kraft paper mill. In addition to some industrial wastewater, a pellet mill would be expected to generate sanitary wastewater associated with the mill's employees.

STORMWATER/HYDROLOGY:

Any site with impervious surfaces would be expected to generate new stormwater runoff. The quantity of stormwater is a function of the surface area. A new pellet mill located in Lucedale, Mississippi was approximately 50 acres in size.²⁶ Not all of it was impervious, but paved areas, buildings, and other impervious surfaces would all generate runoff.

Retention ponds constructed to accommodate stormwater could create new areas of standing water and the filling of wetlands may alter historical patterns of runoff.

LEEVE EXTERNALITIES & FLOODPLAIN

A wood pellet mill can conceivably impact levees if somehow construction results in a change to the levee prism, unregulated encroachments, settlement, or seepage via inappropriate construction materials or methods.

The Exception Area is not identified as being within a floodplain, as nearly the entirety of the area is protected by a levee operated by the Beaver Drainage Improvement Company. The levee is identified by the USACE as Provisionally Accredited.

According to documentation publicly available from the USACE, the levee system has a relatively high likelihood of overtopping during a 50-year flood event. Were the levees to be overtopped or compromised, materials from a wood pellet mill could become flood debris.

FIRE HAZARD

Wood products are a naturally combustible material, as is evidenced by their use in providing heating. In addition, wood pellet mills create wood dust, which is combustible and can ignite.

²⁶ As identified via measurement taken via Google Earth Pro for the plant located in Lucedale.



SEISMIC HAZARD

Depending on the location's seismic vulnerability and the Oregon Specialty Structural Code classification of the structures, a wood pellet mill may be vulnerable to a Cascadia subduction zone earthquake. According to the DOGAMI hazard maps publicly available, the Goal Exception area is comprised of soils that are of high risk for liquefaction in case of such an earthquake.

NOISE

As an industrial use, a pellet mill would be expected to generate relatively high levels of noise. Wood is processed into pellets, which includes grinding. Noise is generated from various sources, including all machinery used in production. The exact level of noise will depend upon the specifics of the machinery (such as type of drive), size, speed, and layout of the plant.

LIGHT

Industrial uses vary widely in their lighting requirements, but good lighting is necessary for many industrial activities, such as transportation of industrial goods, loading and unloading, and many other activities. A pellet mill would not be expected to be any different from an intensive industrial use in the intensity of lighting.

4.1.3 Analysis of Compatibility Externalities for the F&WP Customary Development Form

The following analysis of potential compatibility externalities assumes that the "minimum" permitting standard is being met, i.e., that the necessary federal, state, and local permits as detailed above in section 3.8.1 and 3.8.3 can be applied for and will ultimately have to be obtained. Although the following list is in no way exhaustive, for the purposes of determining compatibility with the CDF the following permits are treated as consequential:

- Appropriate Air Quality Permit issued by ODEQ
- Appropriate NPDES Stormwater Permit for construction and industrial uses
- State Removal-Fill Permit issued by DSL
- Federal Section 404 permit issued by USACE
- Federal Section 401 Water Quality Certification issued by ODEQ
- Spill Prevention Control and Countermeasure Plan as appropriate
- Hazardous Waste Management Permit issued by ODEQ
- Site Design Review Permit issued by Columbia County
- RIPD Use Permitted Under Prescribed Conditions Permit issued by Columbia County

The ledger size matrix on the next page relates potential compatibility considerations between the *identified uses* in the surrounding area with the identified potential externalities. The matrix analyzes the compatibility according to the sensitive receptors (columns) for relevant externality (rows). For example, the analysis of potential farm use impacts from airborne emissions is examined from perspective of relative externality impacts on farm uses that would be expected to be sensitive to airborne emissions. For example, row crops are expected to be a more sensitive receptor to dust emissions when compared to a cattle pasture, at emissions levels that could obtain emission permitting authorization. The analysis examines the potential for externality impacts for the receptor land uses that would reasonably be expected to be sensitive to the relevant potential externality.



4.1.4 F&WP Customary Development Form Compatibility Analysis Results and Conclusions

Compatibility for F&WP uses must be understood in the context of the unique, existing balance between natural resources and continued land uses dependent on drainage dewatering in the Exception Area. The results indicate the following:

- For airborne emissions, the CDF will likely require a Standard ACDP permit and potentially a Title V permit depending on the size of the wood pellet mill. The air quality permitting process will require a public comment process with opportunity for hearing and air quality modeling to prevent unacceptable negative externalities on the airshed and surrounding properties with toxic air contaminant emissions inventory and to calculate risk by a risk assessment.²⁷
- For groundwater and stormwater, the CDF will be required to obtain NPDES stormwater permits and potentially industrial wastewater permits. The water quality systems and detention systems will be engineered for these permits to prevent discharges that would negatively affect properties offsite. Moreover, the groundwater conditions interact with wetlands. The Schott reconnaissance indicates significant percentages of the Exception Area are degraded wetlands (due to farming and dewatering). It is expected that future industrial development would trigger substantial wetlands mitigation within the Exception Area, resulting in enhanced wetland function and resultant water quality benefits. Site specific hydraulic designs will be required as part of future grading and drainage plans to ensure existing drainage patterns are maintained. Specific locational and scale factors are also a compatibility consideration.
- Under existing levee conditions, the flood hazard risk is elevated due to potential overtopping in a one in 50 chance flood event. However, the nature of a wood pellet mill is not something that would be expected to significantly change the flood hazard risk conditions, especially when additional land is expected to be converted to improved wetland functionality. Specific locational and scale factors are also a compatibility consideration.
- A CDF that is smaller in scale is not expected to present a significant new fire hazard (assuming construction to current Fire Code requirements). As the CDF scale increases and location within the Exception Area, additional fire hazard mitigation measures may be appropriate.
- Because the CDF would not have significant quantities of EHS materials, seismic hazard risk changes appear nominal.
- Noise externalities on surrounding uses would depend on location, scale, and system design of the CDF.
- Lighting externalities on surrounding uses would depend on location, scale, and system design of the CDF.

²⁷ SCS Engineers report Appendix L



4.1.5 F&WP Development Guidance

Based on the compatibility analysis results in the foregoing sections, compatibility for F&WP uses will be advanced by the following guidance, in addition to all standard land use permitting and environmental permitting requirements. During future land use reviews for a specific development proposal:

- F&WP land uses determined to be of similar or less intensity than the CDF should be subject to:
 - Relatively smaller land use separation measures from non-industrial or non-Port owned lands.
 - Additional flood hazard mitigation measures are appropriate for large-scale uses.
- F&WP land uses determined to be of greater intensity than the CDF should be subject to the following:
 - Land use separation measures from non-industrial or non-Port owned lands.
 - Additional flood hazard mitigation measures.
 - Additional seismic protections.
 - Additional firefighting capacity contributions.
 - Evaluation of off-site paving²⁸ benefits as part of air quality modeling.

4.2 Customary Development Form for Dry Bulk Commodities

Dry bulk cargo refers to non-containerized freight that is typically shipped in large quantities, such as grains, coal, ore, and other raw materials. These cargos are shipped in bulk carriers, which are specialized ships designed to carry large amounts of dry bulk cargo. Two thirds of dry bulk cargoes by weight and volume are iron ore, coal, and grain. The largest single category is iron ore, at approximately 30%, with coal closely behind at approximately 24% of global dry bulk trade.²⁹

There are a number of dry bulk commodities facilities located in the Pacific Northwest and the Columbia River that inform the characteristics of the CDF for the Dry Bulk Commodities use category. After reviewing ports throughout the region, it appears that these uses tend to be less space intensive, with multiple examples between 10 and 20 acres.

The following is a description of a “customary development form” for a dry bulk commodities facility. This description is immediately followed up by types of dry bulk commodity uses that are less intense than the CDF and more intense than the CDF, respectively. This provides a fuller and better understanding of what a CDF is by contrasting it to other common development forms of the same industrial category.

For the subsequent sections evaluating potential compatibility considerations, the CDF serves as the standard upon which those analyses are performed.

²⁸ See Appendix F from SCS Engineers

²⁹ <https://www.iea.org/reports/coal-2020/prices-and-costs>



4.2.1 Description of Dry Bulk Commodities Customary Development Form

Customary Development Form - Gypsum Wallboard Plant: Gypsum is a widely used mineral that serves as the primary material for plaster, blackboard, chalk, and drywall. Example facilities are the Georgia Pacific Gypsum wallboard plant located in the Port of Tacoma and the United States Gypsum plant in Rainer, Oregon. The GP facility is approximately 15 acres in size and is used to produce wallboard, or drywall. The US facility is approximately 80 acres in size. Both have access to rail and dock facilities in addition to trucking facilities. Industrial activities include the loading and unloading of dry bulk materials in the form of gypsum ore, outdoor storage, and the processing of ore into wallboard. Broadly speaking, in most plants, a finely ground gypsum ore known as land plaster is fed to a calciner, where it is heated to remove most of the water to form stucco. In the production of wallboard, stucco is mixed with additives such as perlite, starch, fiberglass, or vermiculite and then combined with a water mixture to form a slurry. It is then molded, stiffened, cut, and dried. It is then finished for shipment.

Use Less Intense than CDF – Food Stuff Import or Export: An example of a use less intense than the CDF would be the import of non-EHS materials, such as food stuffs in forms without substantial flammability risks. The United States imports and exports many different types of food stuff commodities, including rice, corn, barley, wheat, and sugar. For example, according to the U.S. Department of Agriculture (USDA),³⁰ the United States is the largest importer of rice in the western hemisphere, with current imports of approximately 1.3 million tons annually. Rice is non-hazardous and biodegradable. Typical activities for food stuff may include loading and unloading from ships, transfer to trucks or trains, bagging or packaging.

Use More Intense than CDF – Import, Export, or Processing of Extremely Hazardous Materials: As noted above, most dry bulk materials shipped globally consists of iron ore, coal, and grain. The remainder, referred to as “minor bulk”, is split between many different commodities, such as fertilizers, steel, cement, petroleum coke, and forest products.

Examples of EHS bulk commodities include items such as lead concentrates, sulfur, and nickel ore. Although the day-to-day processing and handling of these commodities may not look substantially different from the handling of grain or gypsum, the potential compatibility externalities for extremely hazardous dry bulk materials are different. Specifically, should spills occur or cleanup be necessary, the externalities would be expected to be greater for an EHS material. It would be expected that uses in this category would have SQEHS present.

4.2.2 Identification of Potential Externalities of Customary DBC Development Form

AIRBORNE EMISSIONS

The most common airborne emission in gypsum wallboard processing is particulate matter. Particulate matter is generated during processing and can come from a variety of sources such as rotary ore dryers, mills, calciners, sawing, mixing and bagging. This can also occur during loading of ships, unloading of barges, trains, or trucks, and transfer between processing areas.

³⁰ <https://www.ers.usda.gov/topics/crops/rice/trade/>



In addition, locomotives, trucks, and ships all have emissions associated with them. Other equipment, such as forklifts or passenger vehicles may also be present. Emissions associated with these different modes of transportation are well known and typically include ammonia, carbon monoxide, nitrogen oxides, sulfur dioxides, VOCs, black carbon, and diesel particulate matter.

WATER CONTAMINATION

A gypsum wallboard plant uses relatively little water or EHS for production and processing, as most of the processing is related to drying and removing moisture content. Like any use with employees, a gypsum wallboard plant would be expected to generate sanitary wastewater associated with the mill's employees.

STORMWATER/HYDROLOGY

As with any use, the addition of impervious surfaces would add to the amount of stormwater runoff that would need to be managed. The amount of stormwater generated would be in proportion to the amount of impervious surface created. As mentioned, a wallboard plant may be around 15 acres in size. A gypsum wallboard plant may also have piles of raw material stored outside in piles.

Retention ponds constructed to accommodate stormwater could create new areas of standing water and the filling of wetlands may alter historical patterns of runoff.

LEVEE IMPACTS & FLOODPLAIN

A wallboard plant may have an impact on levees if somehow construction results in a change to the levee prism, unregulated encroachments, settlement, or seepage via inappropriate construction materials or methods.

The subject property is not identified as being within a floodplain, as nearly the entirety of the Exception Area is protected by a levee operated by the Beaver Drainage Improvement Company. The levee is identified by the USACE as Provisionally Accredited. According to documentation publicly available from the USACE, the levee system has a relatively high likelihood of overtopping during a 50-year flood event. Were the levees to be overtopped or compromised, materials from a wallboard plant could become flood debris.

FIRE HAZARD

Raw gypsum has minimal flammability, being rated a 0 on the NFPA Fire Diamond.³¹ Finished products include other additives that may improve flammability further, but typically any finished wallboard is at least partially flame resistant. Additional fire hazard would come from typical industrial processes, materials, and uses that may be present in any industrial use.

SEISMIC HAZARD

Depending on the location's seismic vulnerability and the Oregon Specialty Structural Code classification of the structures, a gypsum wallboard plant may be vulnerable to a Cascadia subduction zone earthquake. Hazardous materials are typically limited to standard industrial products, such as oils and solvents, and EHS are not expected to be present in significant quantities.

According to the DOGAMI hazard maps publicly available, the Exception Area is comprised of soils that are of high risk for liquefaction in case of such an earthquake.

³¹ https://en.wikipedia.org/wiki/Gypsum#cite_note-MSDS-33



NOISE

As an industrial use, a gypsum wallboard plant would be expected to generate typical levels of noise. As raw gypsum is processed into wallboard, it is heated, dried, molded, and cut. Noise is generated from various sources, including all machinery used in production. The exact level of noise will depend upon the specifics of the machinery (such as type of drive), size, speed, and layout of the plant.

LIGHT

Industrial uses vary widely in their lighting requirements, but good lighting is necessary for many industrial activities, such as transportation of industrial goods, loading and unloading, and many other activities. A gypsum wallboard plant would not be expected to be any different from an intensive industrial use in the intensity of lighting.

4.2.3 Analysis of Compatibility Issues for Customary DBC Development Form

The following analysis of potential compatibility externalities assumes that the “minimum” permitting standard is being met, i.e. that the necessary federal, state, and local permits as detailed above in sections 3.8.1 and 3.8.3 can be applied for and will ultimately have to be obtained. Although the following list is in no way exhaustive, for the purposes of determining compatibility with the CDF the following permits are treated as consequential:

- Appropriate Air Quality Permit issued by ODEQ
- Appropriate NPDES Stormwater Permit for construction and industrial uses
- State Removal-Fill Permit issued by DSL
- Federal Section 404 Permit issued by USACE
- Federal Section 401 Water Quality Certification issued by ODEQ
- Spill Prevention Control and Countermeasure Plan as appropriate
- Hazardous Waste Management Permit issued by ODEQ
- Site Design Review Permit issued by Columbia County
- RIPD Use Permitted Under Prescribed Conditions Permit issued by Columbia County

The ledger size matrix on the next page relates potential compatibility considerations between the *identified uses* in the surrounding area with the identified potential externalities. The matrix analyzes the compatibility according to the sensitive receptors (columns) for relevant externality (rows). For example, the analysis of potential farm use impacts from airborne emissions is examined from perspective of relative externality impacts on farm uses that would be expected to be sensitive to airborne emissions. For example, row crops are expected to be a more sensitive receptor to dust emissions when compared to a cattle pasture, at emissions levels that could obtain emission permitting authorization. The analysis examines the potential for externality impacts for the receptor land uses that would reasonably be expected to be sensitive to the relevant potential externality.



		Minimum Standards for Required Permitting	CDF vs Vacant Land	CDF vs Ag Use	Sensitive Receptor Analysis Less Intense than CDF		Sensitive Receptor Analysis CDF		Sensitive Receptor Analysis More Intense than CDF	
					Surrounding Land Uses	Natural Resources	Surrounding Land Uses	Natural Resources	Surrounding Land Uses	Natural Resources
Environmental Impacts	Airborne Emissions	ODEQ air quality permits set limits and conditions on the emissions and require monitoring, reporting, and pollution control practices of the facility. Permits are issued to comply with federal and state air quality laws.	Any new uses would be expected to generate net new emissions versus vacant land.	Typical agricultural uses in the region can generate PM such as dust. Discing of fields, fugitive pesticide emissions, and running of farm equipment can all generate emissions.	A use less intense than the CDF is not expected to generate significant off-site airborne emissions when compared to existing agricultural uses. No sensitive receptors externalities are expected.	A use less intense CDF is not expected to generate airborne emissions more intense than existing surrounding uses. No natural resources are expected to be affected.	The CDF may generate airborne emissions equal to or somewhat more intense than that of existing agricultural uses. Dust sensitive uses could experience externalities from PM emissions.	The CDF may generate airborne emissions equal to or somewhat more intense than that of existing agricultural uses. Minimal compatibility considerations are expected on natural resources.	A use more intense than the CDF may generate airborne emissions equal to or somewhat more intense than that of existing agricultural uses. Dust sensitive uses could experience externalities from PM emissions.	A use more intense than the CDF may generate significantly more emissions than a typical agricultural use. No identified externalities on natural resources, provided there are no changes to Ph in localized precipitation.
	Groundwater	Oregon requires wastewater permits for the discharge of wastewater from industrial processes into surface waters or lands and Underground Injection Control permits when fluids, such as stormwater, septic effluent, or treated industrial waste water, are injected below ground.	CDF is not expected to generate substantial groundwater impact.	Permitting for CDF expected to be at least as stringent when compared to many agricultural uses.	A use less intense than the CDF is expected to have very limited chemicals, limited or no processing, and no underground storage tanks. There would be expected to be minimal or no externalities to sensitive receptors.	A use less intense than the CDF is expected to have very limited chemicals, limited or no processing, and no underground storage tanks. There would be expected to be minimal or no externalities to natural resources, except where wetlands are filled.	The CDF is not expected to use significant quantities of EHS, use underground storage tanks, or generate significant quantities of process water.	The CDF is expected to have minimal industrial chemicals and no underground storage tanks.	A use more intense than the CDF may have significant quantities of EHS present, but permitting prohibits any release of such materials.	A use more intense than the CDF may have significant quantities of EHS, but permitting prohibits release of such materials.
	Stormwater	Industrial stormwater permits are required for facilities that discharge stormwater to surface waters or to storm sewers that drain to surface waters. Industrial stormwater permits set limits and conditions on the quality and quantity of stormwater that can be discharged, and require monitoring, reporting, and BMPs.	All impervious surfaces will generate additional onsite stormwater that must be managed, but no new net offsite stormwater in quantity, location, or form is allowed.	Agricultural uses typically have limited stormwater permitting requirements, if any, whereas industrial uses would be required to comply with all development current stormwater control requirements for new industrial uses.	A use less intense than the CDF is expected to have minimal impacts on sensitive receptors in the surrounding area.	A use less intense than the CDF is expected to have minimal externality interaction with natural resources in the surrounding area, except where wetlands are filled or where new standing water for detention and treatment might interact with natural resources.	The CDF is expected to have minimal stormwater impacts on sensitive receptors in the surrounding area.	The CDF is expected to have minimal externality interaction with natural resources in the surrounding area, except where wetlands are filled or where new standing water for detention and treatment might interact with natural resources.	A use more intense than the CDF may generate more stormwater runoff, but existing permitting standards mitigate the potential impacts. Such a use is expected to have minimal stormwater impacts on sensitive receptors in the surrounding area.	A use more intense than the CDF is expected to have minimal externality interaction with natural resources in the surrounding area, except where wetlands are filled or where new standing water for detention and treatment might interact with natural resources.
	Flood Hazard	The zone change area is located behind a levee system which has been provisionally accredited as providing base flood hazard reduction. To receive accreditation, the levee system would need to meet list of requirements set by FEMA, including a minimum of 3 feet of freeboard that corresponds to a 1 percent-annual-chance flood hazard reduction.	Vacant land with significant vegetation and trees versus vacant grasslands will have different flood hazard implications in comparison +C6+D6	Flood hazard will depend on the agricultural use, but it may be either equivalent to vacant land or significantly higher, such as in the case of dairy uses. Relative to the CDF, typical agricultural uses would have somewhat less flood hazard externality risks than the CDF.	A use less intense than the CDF has no expected EHS that would elevate flood hazard externality risks. Other flood hazards would depend on acreage and quantity. For example, a very facility importing bulk food stuff could have a potential flood hazard externalities on sensitive receptors by the sheer quantity of food stuff as flood debris under existing flood conditions.	General flood hazard risks would be expected to outweigh any flood hazard externality risks from a use less intense than the CDF.	The CDF has minimal expected EHS impacts. Other flood hazards would depend on scale and location of CDF operation under existing flood conditions.	General flood hazard impacts would be expected to outweigh any impacts from the CDF use.	A use more intense than the CDF may have elevated flood hazard risk when EHS are present on site and release risk is elevated under existing flood hazard conditions.	A use more intense than the CDF may have elevated flood hazard risk when EHS are present on site and release risk is elevated under existing flood hazard conditions.
Event Impacts	Fire Hazard	Oregon Fire Code addresses hazards related to industrial activities, such as storage and handling of EHS, flammable liquids and gases, combustible dusts and fibers, geothermal facilities, lumber yards, welding and hot work, processing and extraction facilities, and others. The OFC is enforced by the Office of the State Fire Marshal (OSFM) and local fire authorities having jurisdiction (AHJ).	Vacant land is typically not irrigated and is regulated by county nuisance regulations. During the dry season, fire risk externalities would be expected to be somewhat less than the for irrigated vacant land when compared to CDF but with fewer immediate resources available to reduce risks from spreading.	Irrigated agricultural uses would be expected to have minimal fire risk externalities, unirrigated uses will vary by type and intensity.	Fire hazard for a use less intense than the CDF is expected to be low or negligible when surrounding areas are irrigated farm uses and no greater when compared to unirrigated vacant lands.	Fire hazard externality risks for a use less intense than the CDF is expected to be low or negligible on surrounding natural areas, most of which are riparian in nature or separated from the industrial area by waterways.	CDF fire hazards are expected to be low or negligible when surrounding areas are irrigated farm uses. The CDF may have increased fire hazard potential for other sensitive receptors among surrounding uses.	Fire hazard externality risks for the CDF is expected to be low or negligible on surrounding natural areas, most of which are riparian in nature or separated from the industrial area by waterways.	A more intense than the CDF fire hazard are expected to be low or negligible when surrounding areas are irrigated farm uses, unless explosive potential is present in the use. A more intense use may have increased fire hazard potential for other sensitive receptors among surrounding uses.	Fire hazard externality risks for a use more intense than the CDF is expected to be low or negligible on surrounding natural areas, most of which are riparian in nature or separated from the industrial area by waterways.
	Seismic Hazard	Structures must meet the requirements of Oregon OSSC, which includes a seismic design category that is based upon expected site specific factors such as ground motion, soils, and occupancy.	Vacant land by definition does not have structures and therefore has very limited risk of seismic hazard, particularly in the surrounding area, which is generally flat.	Agricultural buildings are generally exempt from building permit requirements in the State of Oregon. Depending on the activities in ag buildings, externality risks when compared to the CDF are expected to be insignificant.	A use less intense than the CDF is expected to have minimal seismic hazard to sensitive receptors in the surrounding area.	A use less intense than the CDF is expected to have minimal seismic hazard to natural resources in the surrounding area.	The CDF is expected to have minimal seismic hazard to surrounding areas, as the usage of EHS and underground storage tanks are expected to be minimal.	The CDF is expected to have minimal seismic hazard to natural resources, as the usage of EHS and underground storage tanks are expected to be minimal.	A use more intense than the CDF may have elevated seismic hazard risk to surrounding sensitive receptors if EHS are used in significant quantities and storage tanks are present and a seismic event could cause an otherwise disallowed release.	A use more intense than the CDF may have elevated seismic hazard risk to surrounding natural resources if EHS are used in significant quantities and storage tanks are present and a seismic event could cause an otherwise disallowed release.
General Development Impacts	Noise	ODEQ has existing noise pollution standards (ODEQ has no dedicated enforcement). The County's existing Noise Control Ordinance exempts both agricultural and industrial activities from its standards.	Louder, varies with Distance and design dependent.	Agricultural and industrial uses are exempt from Noise Control standards per Columbia County's Noise Control Ordinance.	A use less intense than the CDF may be a significant source of noise.	A use less intense than the CDF may be a significant source of noise.	The CDF may be a significant source of noise.	The CDF may be a significant source of noise.	A use more intense than the CDF may be a significant source of noise.	A use more intense than the CDF may be a significant source of noise.
	Light	Lighting standards are up to local jurisdictions. The County's Site Design Review Standards require that lighting be shielded so as not to shine directly on adjacent properties and roads. Lighting intensity is not necessarily coincident with use intensity.	Vacant land by definition does not have lighting present.	Agricultural uses typically have no permitting requirements in regards to lighting for outright allowed uses. Depending on activities, lighting externalities when compared to the CDF are expected to range from small to insignificant.	A use less intense than the CDF would be expected to have minimal externalities on the surrounding area.	A use less intense than the CDF would be expected to have minimal impact to natural resources, but there could be some externalities like insect attractions and extended forage times.	The CDF would be expected to have minimal externalities on the surrounding area.	The CDF would be expected to have minimal impact to natural resources, but there could be some externalities like insect attractions and extended forage times.	A use more intense than the CDF would be expected to have minimal externalities on the surrounding area.	A use more intense than the CDF would be expected to have minimal impact to natural resources, but there could be some externalities like insect attractions and extended forage times.

4.2.4 DBC Customary Development Form Compatibility Analysis Results and Conclusions

Compatibility for DBC uses must be understood in the context of the unique, existing balance between natural resources and continued land uses dependent on drainage dewatering in the Goal Exception Area. The results indicate the following:

- For airborne emissions, the CDF will likely require a Standard ACDP permit and potentially a Title V permit depending on the size of the gypsum wallboard plant. The air quality permitting process will require a public comment process with opportunity for hearing and air quality modeling to prevent negative externalities on the airshed and surrounding properties with toxic air contaminant emissions inventory and to calculate risk by a risk assessment³².
- For groundwater and stormwater, the CDF will be required to obtain NPDES stormwater permits and potentially industrial wastewater permits. The water quality systems and detention systems will be engineered for these permits to prevent discharges that would negatively affect properties offsite. Moreover, the groundwater conditions interact with wetlands. The Schott reconnaissance indicates significant percentages of the Exception Area are degraded wetlands (due to farming and dewatering). It is expected that future industrial development would trigger substantial wetlands mitigation within the Exception Area, resulting in enhanced wetland function and resultant water quality benefits. Site specific hydraulic designs will be required as part of future grading and drainage plans to ensure existing drainage patterns are maintained. Specific locational and scale factors are also a compatibility consideration.
- Under existing levee conditions, flood hazard is elevated due to potential overtopping in a 50-year flood event. However, the nature of a gypsum board plant is not something that would be expected to significantly change the flood hazard risk conditions, especially when additional land is expected to be converted to improved wetland functionality. Specific locational and scale factors are also a compatibility consideration.
- A CDF that is smaller in scale is not expected to present a significant new fire hazard (assuming construction to current Fire Code requirements). As the CDF scale increases and location within the Exception Area, additional fire hazard mitigation measures may be appropriate.
- Because a gypsum board plant CDF is not expected to have SQEHS, seismic hazard risk changes appear nominal.
- Noise externalities on surrounding uses would depend on location, scale, and system design of the CDF.
- Lighting externalities on surrounding uses would depend on location, scale, and system design of the CDF.

³² SCS Engineers report Appendix E



4.2.5 DBC Development Guidance

Based on the compatibility analysis results in the foregoing sections, compatibility for DBC uses will be advanced by the following guidance, in addition to all standard land use permitting and environmental permitting requirements. During future land use reviews for a specific development proposal:

- DBC land uses determined to be of less intensity than the CDF should be subject to:
 - Relatively smaller land use separation measures from non-industrial or non-Port owned lands.
 - Any outdoor storage uses with air emissions potential should require medium or large land use separation and/or control design measures such as scrubbers to ensure that emissions allowed under the applicable air permit will nevertheless be minimal for any nearby agricultural uses sensitive to the relevant emissions – for example – additional separation for dust emissions from crops sensitive to dust.
- DBC land uses determined to be of similar intensity as the CDF should be subject to the following:
 - Relatively smaller land use separation measures from non-industrial or non-port owned lands.
 - Any outdoor storage uses with air emissions potential should require medium or large land use separation and/or control design measures such as scrubbers to ensure that emissions allowed under the applicable air permit will nevertheless be minimal for any nearby agricultural uses sensitive to the relevant emissions – for example – additional separation for dust emissions from crops sensitive to dust.
 - Additional flood hazard mitigation measures for large-scale uses.
- DBC land uses determined to be of greater intensity than the CDF should be subject to the following:
 - Land use separation measures from non-industrial or non-port owned lands for uses without significant outdoor storage with emissions potential and large land use separation measures for uses with significant outdoor storage with emissions potential.
 - Additional flood hazard mitigation measures.
 - Additional seismic protections.
 - Additional firefighting capacity contributions.
 - Evaluation of off-site paving benefits as part of air quality modeling.



4.3 Liquid Bulk Commodities Customary Development Form

Liquid bulk cargo consists of liquids that are transported in large volumes in tanks on ships, cargo planes, or trailer trucks. The carrier vessels transporting these liquids are specially designed and constructed to handle the liquid cargo and sometimes requires specialized equipment to load and unload them safely, and to keep cargoes uncontaminated during transit. Some examples of liquid bulk cargoes include vegetable oils, essential oils (aromatic oils extracted from plants, such as lavender oil, peppermint oil, rose oil), chemicals such as polymers additives, renewable diesel, sustainable aviation fuel, and ethanol.

There are a number of liquid bulk commodities facilities located in the Pacific Northwest and the Columbia River Basin that can inform the characteristics of the CDF for this use category. After reviewing ports throughout the region, it appears that specific developments in this use category tend to be quite varied in terms of space intensity. Petroleum refining uses are very space intensive, while others such as ethanol refining or tank farms can be approximately 20 to 50 acres.

The following is a description of a “customary development form” for a liquid bulk commodities facility. This description is immediately followed up by types of liquid bulk commodity uses that are less intense than the CDF and more intense than the CDF, respectively. This provides a fuller and better understanding of what a CDF is by contrasting it to other common development forms of the same industrial category.

For the subsequent sections evaluating potential compatibility considerations, the CDF serves as the standard upon which those analyses are performed.

4.3.1 Description of Customary LBC Development Form

Customary Development Form – Ethanol Processing Facility: Ethanol (also called ethyl alcohol or grain alcohol) is an alcohol with many uses, including as an antiseptic and as a renewable fuel. Ethanol is created from two different industrial processes, via either ethyl hydration or fermentation of biomass.

The Pacific Ethanol plant located in Port of Morrow in Oregon is an example of the latter. The facility is approximately 25 acres in size. Most of the resulting ethanol is shipped by barge to markets in Portland, Oregon. In addition to ethanol, the plant is used to produce high protein feed, corn oil, and CO₂ for distribution to local markets. Located on the Columbia River, it has access to rail, dock, and trucking facilities. Corn serves as the raw feedstock for fermentation. According to the company’s website,³³ corn is received at the plant by unit train from the Midwest.

A dry-mill plant grinds corn into flour and ferments it into ethanol with co-products of distillers grains and carbon dioxide. A wet-mill plant separates the corn into its components and converts the starch into ethanol with co-products of corn gluten feed, corn gluten meal, and corn oil.

The operations of an ethanol processing plant involve various steps, such as pretreatment, hydrolysis, fermentation, distillation, dehydration, denaturing, and co-product recovery. The pretreatment step prepares the feedstock for hydrolysis by removing impurities and increasing its surface area. The hydrolysis step converts the starch or cellulose into sugars by using enzymes or acids. The fermentation step converts the sugars into ethanol by using yeast or bacteria. The distillation step separates the ethanol from the water and other components by using heat and

³³ <https://www.altoingredients.com/columbia-or/>



pressure. The dehydration step removes the remaining water from the ethanol by using molecular sieves or membranes. The denaturing step adds a small amount of gasoline or other substances to the ethanol to make it unfit for human consumption.

Use Less Intense than CDF – Non-hazardous Liquid Bulk Import and Export: The United States imports and exports many different types of liquid food stuff commodities, including cooking oils, milk, fructose syrup, and juices. These liquid bulk commodities, being edible, are non EHS materials and usually biodegradable. They are often shipped in specialized vessels or “flexitanks”. Typical activities for food stuff may include loading and unloading from ships, transfer to trucks or trains, storage in liquid storage tanks, and packaging.

Use More Intense than CDF – Petroleum Storage and Refining: Oregon lacks any oil refining capacity and imports all petroleum products from other locations, primarily from refineries located on the Puget Sound.³⁴ Refineries are typically quite space intensive. For example, the US Oil Refinery located in the Port of Tacoma is over 125 acres in size.

According to the Statement of Basis³⁵ for the US Oil facility’s air quality permit,³⁶ final products include liquid butane (or LPG), gasoline, jet fuels, diesel, heating oils, fuel oils, asphalts and liquid sulfur. All the raw products are received via ship and there is enough storage capacity to hold approximately 1.6 million barrels of crude oil and 1.2 million barrels of refined products.

Generally, the oil refining process consists of the following broad steps:

- **Separation:** Crude oil is heated and separated into different fractions based on their boiling points. The lightest fractions, such as liquefied petroleum gas (LPG) and gasoline, rise to the top of the distillation tower, while the heaviest fractions, such as fuel oil and asphalt, settle at the bottom.
- **Conversion:** The heavier fractions are further processed into lighter and more valuable products by using methods such as cracking, reforming, alkylation, and isomerization. These methods break down or rearrange the hydrocarbon molecules in the oil using heat, pressure, catalysts, or hydrogen.
- **Treatment:** The final products are purified and blended to meet specifications for quality and performance. Some of the treatment processes include desulfurization, hydrotreating, sweetening, and stabilizing. These processes remove impurities such as sulfur, nitrogen, oxygen, metals, and water from the oil products.

Once the products are finished, they are generally trucked to their final destinations. The US Oil facility also ships some products via barge and has a direct pipeline for jet fuel to an airbase.

³⁴ [https://en.wikipedia.org/wiki/Petroleum_refining_in_Washington_\(state\)](https://en.wikipedia.org/wiki/Petroleum_refining_in_Washington_(state))

³⁵ <https://psccleanair.gov/DocumentCenter/View/290/Statement-of-Basis-PDF?bidId=>

³⁶ <https://psccleanair.gov/DocumentCenter/View/292/Air-Operating-Permit-PDF?bidId=>



4.3.2 Identification of Potential Externalities of LBC Customary Development Form

AIRBORNE EMISSIONS

The fermentation method of creating ethanol produces several types of airborne emissions, including VOCs, PM, and Nitrogen Oxides (NOx). These emissions are both a natural product of ethanol and a result of the production process, which can include milling of biomass and the burning of carbon fuel sources to provide heat to fermentation.

In addition, most locomotives, trucks, and ships all have emissions associated with them. Other equipment, such as forklifts or passenger vehicles may also be present. Emissions associated with these different modes of transportation are well known and typically include ammonia, carbon monoxide, nitrogen oxides, sulfur dioxides, VOCs, black carbon, and diesel particulate matter.

WATER QUALITY DEGRADATION

An ethanol production plant does create some industrial wastewater during the production process. For example, during the initial processing of corn, it is ground and mixed with water and enzymes to make a mash. Some EHS materials are also typically stored on site. For example, tanks of aqueous ammonia, sodium Hydroxide, and urea were all expected as part of the industrial process.³⁷

Like any use with employees, an ethanol production plant would be expected to generate sanitary wastewater associated with employees.

STORMWATER/HYDROLOGY

As with any use, the addition of impervious surfaces would add to the amount of stormwater runoff that would need to be managed. The amount of stormwater generated would be in proportion to the amount of impervious surface created. As mentioned, an ethanol plant may be around 25 acres or more in size.

Retention ponds constructed to accommodate stormwater could create new areas of standing water and the filling of wetlands may alter historical patterns of runoff.

LEVEE EXTERNALITIES & FLOODPLAIN

An ethanol plant may have an impact on levees if somehow construction results in a change to the levee prism, unregulated encroachments, settlement, or seepage via inappropriate construction materials or methods.

Most of the Exception Area is not identified as being within a floodplain, as nearly the entirety of the area is protected by a levee operated by the Beaver Drainage Improvement Company. The levee is identified by the USACE as Provisionally Accredited. According to documentation publicly available from the USACE, the levee system has a relatively high likelihood of overtopping. Were the levees to be overtopped or compromised, materials from an ethanol plant could become flood debris.

³⁷ Individual EHS on site at the Boardman facility may exceed the SQEHS threshold, but it is expected that any new facility may be designed in such a manner to have tankage capacities less than the SQEHS threshold which would render it more intense than the CDF.



FIRE HAZARD

Ethanol is a highly flammable liquid that can easily catch fire or explode when exposed to heat, sparks, or open flames. Ethanol vapors can form ignitable and explosive mixtures with air at normal room temperatures.

SEISMIC HAZARD

Depending on the location's seismic vulnerability and the Oregon Specialty Structural Code classification of the structures, an ethanol production plant may be vulnerable to a Cascadia subduction zone earthquake. Present EHS materials may include aqueous ammonia, sodium Hydroxide, and urea as well as standard industrial products, such as oils and solvents.

According to the DOGAMI hazard maps publicly available, the Exception Area is comprised of soils that are of high risk for liquefaction in case of such an earthquake.

NOISE

As an industrial use, an ethanol production plant would be expected to generate typical levels of noise. As raw biomass is processed, it undergoes numerous industrial processes, including grinding and heating. Noise is generated from various sources, including all machinery used in production. The exact level of noise will depend upon the specifics of the machinery (such as type of drive), size, speed, and layout of the plant.

LIGHT

Industrial uses vary widely in their lighting requirements, but good lighting is necessary for many industrial activities, such as transportation of industrial goods, loading and unloading, and many other activities. An ethanol plant would not be expected to be any different from an intensive industrial use in the intensity of lighting.

4.3.3 Analysis of Compatibility Issues for LBC Customary Development Form

The following analysis of potential compatibility externalities assumes that the "minimum" permitting standard is being met, i.e., that the necessary federal, state, and local permits as detailed herein above in sections 3.8.1 and 3.8.3 can be applied for and will ultimately have to be obtained. Although the following list is in no way exhaustive, for the purposes of determining compatibility with the CDF the following permits are treated as consequential:

- Appropriate Air Quality Permit issued by ODEQ
- Appropriate NPDES Stormwater Permit for construction and industrial uses
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- Federal Section 401 Water Quality Certification issued by ODEQ
- Spill Prevention Control and Countermeasure Plan as appropriate
- Hazardous Waste Management Permit issued by ODEQ
- Site Design Review Permit issued by Columbia County
- RIPD Use Permitted Under Prescribed Conditions Permit issued by Columbia County



The ledger size matrix on the next page relates potential compatibility considerations between the *identified uses* in the surrounding area with the identified potential externalities. The matrix analyzes the compatibility according to the sensitive receptors (columns) for relevant externality (rows). For example, the analysis of potential farm use impacts from airborne emissions is examined from perspective of relative externality impacts on farm uses that would be expected to be sensitive to airborne emissions. For example, row crops are expected to be a more sensitive receptor to dust emissions when compared to a cattle pasture, at emissions levels that could obtain emission permitting authorization. The analysis examines the potential for externality impacts for the receptor land uses that would reasonably be expected to be sensitive to the relevant potential externality.



		Minimum Standards for Required Permitting	CDF vs Vacant land	CDF vs Ag Use	Sensitive Receptor Analysis Less Intense than CDF		Sensitive Receptor Analysis CDF		Sensitive Receptor Analysis More Intense than CDF	
					Surrounding Land Uses	Natural Resources	Surrounding Land Uses	Natural Resources	Surrounding Land Uses	Natural Resources
Environmental Impacts	Airborne Emissions	ODEQ air quality permits set limits and conditions on the emissions and require monitoring, reporting, and pollution control practices of the facility. Permits are issued to comply with federal and state air quality laws.	Any new uses would be expected to generate net new emissions versus vacant land.	Typical agricultural uses in the region can generate PM such as dust. Discing of fields, fugitive pesticide emissions, and running of farm equipment can all generate emissions.	Use less intense than the CDF is not expected to generate significant off-site airborne emissions when compared to existing agricultural uses. No sensitive receptors externalities are expected.	Use less intense CDF is not expected to generate airborne emissions more intense than existing surrounding uses. No natural resources are expected to be affected.	The CDF may generate airborne emissions equal to or somewhat more intense than that of existing agricultural uses. Dust sensitive uses could experience externalities from PM emissions.	The CDF may generate airborne emissions equal to or somewhat more intense than that of existing agricultural uses. Minimal compatibility considerations are expected on natural resources.	Use more intense than the CDF may generate significantly more emissions than a typical agricultural use. Abutting sensitive uses could experience externalities from PM emissions.	Use more intense than the CDF may generate significantly more emissions than a typical agricultural use. No identified externalities on natural resources, provided there are no changes to Ph in localized precipitation.
	Groundwater	Oregon requires wastewater permits for the discharge of wastewater from industrial processes into surface waters or lands and Underground Injection Control permits when fluids, such as stormwater, septic effluent, or treated industrial waste water, are injected below ground.	CDF is not expected to generate substantial groundwater impact.	Permitting for CDF expected to be at least as stringent when compared to many agricultural uses.	Use less intense than the CDF is expected to have very limited chemicals, limited or no processing, and no underground storage tanks. There would be expected to be minimal or no externalities to sensitive receptors.	Use less intense than the CDF is expected to have very limited chemicals, limited or no processing, and no underground storage tanks. There would be expected to be minimal or no externalities to natural resources, except where wetlands are filled.	The CDF is expected to use and have present some quantities of EHS such as urea and aqueous ammonia and is expected to generate some industrial process water, but permitting prohibits release of such materials.	The CDF is expected to use and have present some quantities of EHS as urea and aqueous ammonia and is expected to generate some industrial process water, but permitting prohibits release of such materials.	Use more intense than the CDF may have significant quantities of EHS present, but permitting prohibits any release of such materials.	Use more intense than the CDF may have significant quantities of EHS, but permitting prohibits release of such materials.
	Stormwater	Industrial stormwater permits are required for facilities that discharge stormwater to surface waters or to storm sewers that drain to surface waters. Industrial stormwater permits set limits and conditions on the quality and quantity of stormwater that can be discharged, and require monitoring, reporting, and BMPs.	All impervious surfaces will generate additional onsite stormwater that must be managed, but no new net offsite stormwater in quantity, location, or form is allowed.	Agricultural uses typically have limited stormwater permitting requirements, if any, whereas industrial uses would be required to comply with all development current stormwater control requirements for new industrial uses.	Use less intense than the CDF is expected to have minimal impacts on sensitive receptors in the surrounding area.	Use less intense than the CDF is expected to have minimal impacts on sensitive receptors in the surrounding area.	The CDF is expected to have minimal externality interaction with natural resources in the surrounding area, except where wetlands are filled or where new standing water for detention and treatment might interact with natural resources.	The CDF is expected to have minimal stormwater impacts on sensitive receptors in the surrounding area.	Use more intense than the CDF may generate more stormwater runoff, but existing permitting standards mitigate potential impacts. Such a use is expected to have minimal stormwater impacts on sensitive receptors in the surrounding area.	Use more intense than the CDF is expected to have minimal externality interaction with natural resources in the surrounding area, except where wetlands are filled or where new standing water for detention and treatment might interact with natural resources.
Event Impacts	Flood Hazard	The zone change area is located behind a levee system which has been provisionally accredited as providing base flood hazard reduction. To receive accreditation, the levee system would need to meet list of requirements set by FEMA, including a minimum of 3 feet of freeboard that corresponds to a 1 percent-annual-chance flood hazard reduction.	Vacant land with significant vegetation and trees versus vacant grasslands will have different flood hazard implications in comparison to the CDF for relative flood hazard risks.	Flood hazard will depend on the agricultural use, but it may be either equivalent to vacant land or significantly higher, such as in the case of dairy uses. Relative to the CDF, typical agricultural uses would have somewhat less flood hazard externality risks than the CDF.	Use less intense than the CDF has no expected EHS that would elevate flood hazard externality risks. Other flood hazards would depend on acreage and quantity. For example, a very large log yard could have a potential flood hazard externalities on sensitive receptors by the sheer quantity of logs as flood debris under existing flood conditions.	General flood hazard risks would be expected to outweigh any flood hazard externality risks from a use less intense than the CDF.	The CDF may have elevated flood hazard risk when EHS are present on site and release risk is elevated under existing flood hazard conditions.	The CDF may have elevated flood hazard risk when EHS are present on site and release risk is elevated under existing flood hazard conditions.	Use more intense than the CDF may have elevated flood hazard risk when EHS are present on site and release risk is elevated under existing flood hazard conditions.	Use more intense than the CDF may have elevated flood hazard risk when EHS are present on site and release risk is elevated under existing flood hazard conditions.
	Fire Hazard	Oregon Fire Code addresses hazards related to industrial activities, such as storage and handling of EHS, flammable liquids and gases, combustible dusts and fibers, geothermal facilities, lumber yards, welding and hot work, processing and extraction facilities, and others. The OFC is enforced by the Office of the State Fire Marshal (OSFM) and local fire authorities having jurisdiction (AHJ).	Vacant land is typically not irrigated and is regulated by county nuisance regulations. During the dry season, fire risk externalities would be expected to be somewhat less than the for unirrigated vacant land when compared to CDF but with fewer immediate resources available to reduce risks from spreading.	Irrigated agricultural uses would be expected to have minimal fire risk externalities, unirrigated uses will vary by type and intensity.	Fire hazard for a use less intense than the CDF is expected to be low or negligible when surrounding areas are irrigated farm uses and no greater when compared to unirrigated vacant lands.	Fire hazard externality risks for a use less intense than the CDF is expected to be low or negligible on surrounding natural areas, most of which are riparian in nature or separated from the industrial area by waterways.	The CDF is expected to have increased fire hazard externalities as the CDF produces a highly flammable product that is potentially explosive.	Fire hazard externality risks for the CDF is expected to be low or negligible on surrounding natural areas, most of which are riparian in nature or separated from the industrial area by waterways.	Use more intense than CDF is expected to have increased fire hazard externalities as the CDF produces a highly flammable product that is potentially explosive.	Fire hazard externality risks for a use more intense than the CDF is expected to be low or negligible on surrounding natural areas, most of which are riparian in nature or separated from the industrial area by waterways.
	Seismic Hazard	Structures must meet the requirements of Oregon OSSC, which includes a seismic design category that is based upon expected site specific factors such as ground motion, soils, and occupancy.	Vacant land by definition does not have structures and therefore has very limited risk of seismic hazard, particularly in the surrounding area, which is generally flat.	Agricultural buildings are generally exempt from building permit requirements in the State of Oregon. Depending on the activities in ag buildings, externality risks when compared to the CDF are expected to be insignificant.	Use less intense than the CDF is expected to have minimal seismic hazard to sensitive receptors in the surrounding area.	Use less intense than the CDF is expected to have minimal seismic hazard to natural resources in the surrounding area.	The CDF may have seismic hazard compatibility concerns to surrounding sensitive receptors, as the usage of EHS and hazardous material storage tanks are expected to be present.	The CDF may have compatibility concerns to surrounding natural resources, as the usage of EHS and hazardous material storage tanks are expected to be present.	Use more intense than the CDF is expected to have potentially high levels of seismic hazard compatibility concerns to surrounding sensitive receptors, as the usage of EHS and hazardous material storage tanks are expected to be present.	Use more intense than the CDF is expected to have seismic hazard compatibility concerns to surrounding natural resources, as the usage of EHS and hazardous material storage tanks are expected to be present.
General Development Impacts	Noise	ODEQ has existing noise pollution standards (ODEQ has no dedicated enforcement). The County's existing Noise Control ordinance exempts both agricultural and industrial activities from its standards.	Louder, varies with Distance and design dependent.	Agricultural and Industrial uses are exempt from Noise Control standards per Columbia County's Noise Control Ordinance.	Use less intense than the CDF may be a significant source of noise.	Use less intense than the CDF may be a significant source of noise.	The CDF may be a significant source of noise.	The CDF may be a significant source of noise.	Use more intense than the CDF may be a significant source of noise.	Use more intense than the CDF may be a significant source of noise.
	Light	Lighting standards are up to local jurisdictions. The County's Site Design Review Standards require that lighting be shielded so as not to shine directly on adjacent properties and roads. Lighting intensity is not necessarily coincident with use intensity.	Vacant land by definition does not have lighting present.	Agricultural uses typically have no permitting requirements in regards to lighting for outright allowed uses. Depending on activities, lighting externalities when compared to the CDF are expected to range from small to insignificant.	Use less intense than the CDF would be expected to have minimal externalities on the surrounding area.	Use less intense than the CDF would be expected to have minimal impact to natural resources, but there could be some externalities like insect attractions and extended forage times.	The CDF would be expected to have minimal externalities on the surrounding area.	The CDF would be expected to have minimal impact to natural resources, but there could be some externalities like insect attractions and extended forage times.	Use more intense than the CDF would be expected to have minimal externalities on the surrounding area.	Use more intense than the CDF would be expected to have minimal impact to natural resources, but there could be some externalities like insect attractions and extended forage times.

4.3.4 LBC Customary Development Form Compatibility Analysis Results and Conclusions

Compatibility for LBC uses must be understood in the context of the unique, existing balance between natural resources and continued land uses dependent on drainage dewatering in the Exception Area. The results indicate the following:

- For airborne emissions, the CDF will likely require either a Standard ACDP permit or a Title V permit depending on the size, capacity, and specific manufacturing processes. The air quality permitting process will require a public comment process with opportunity for hearing and air quality modeling to prevent negative externalities on the airshed and surrounding properties with toxic air contaminant emissions inventory and to calculate risk by a risk assessment.³⁸ The types of emissions from an ethanol plant that would result once required air permitting is obtained would not be of a type that would typically negatively affect crop production, cattle grazing, blueberry production, or other farm uses identified in the area nor would they be likely to negatively affect the riparian or riverine resources in the area.
- For groundwater and stormwater, the CDF will be required to obtain NPDES stormwater permits and potentially industrial wastewater permits. The water quality systems and detention systems will be engineered for these permits to prevent discharges that would negatively affect properties offsite. Moreover, the groundwater conditions interact with wetlands. The Schott reconnaissance indicates significant percentages of the Exception Area are degraded wetlands (due to farming and dewatering). It is expected that future industrial development would trigger substantial wetlands mitigation within the Exception Area, resulting in enhanced wetland function and resultant water quality benefits. Site specific hydraulic designs will be required as part of future grading and drainage plans to ensure existing drainage patterns are maintained. Specific locational and scale factors are also a compatibility consideration.
- Under existing levee conditions, flood hazard is elevated due to potential overtopping in a 50-year flood event. However, the nature of an ethanol plant is not something that would be expected to significantly change the flood hazard risk conditions, especially when additional land is expected to be converted to improved wetland functionality. Specific locational and scale factors are also a compatibility consideration.
- Ethanol is highly flammable. In addition to compliance with Fire Code requirements, assurances of CDF scale increases and location within the Exception Area, additional fire hazard mitigation measures may be appropriate.
- Because an Ethanol Plant CDF would not be expected to have SQEHS, seismic hazard risks are relatively low for a smaller plant. As a plant gets larger, then the interaction between flammability risk and seismic event increases, making additional seismic protections advisable.

³⁸ SCS Engineers report Appendix E



- Noise externalities on surrounding uses would depend on location, scale, and system design of the CDF.

4.3.5 LBC Development Guidance

Based on the compatibility analysis results in the foregoing sections, compatibility for LBC uses will be advanced by the following guidance, in addition to all standard land use permitting and environmental permitting requirements. During future land use reviews for a specific development proposal:

- LBC land uses determined to be of less intensity than the CDF should be subject to:
 - Relatively smaller land use separation measures from non-industrial or non-port owned lands. Some LBC uses of even less intensity than the CDF may still present some flammable commodities that would warrant additional firefighting capacity contributions.
- LBC land uses determined to be of similar to the CDF should be subject to the following:
 - Land use separation measures from non-industrial or non-Port owned lands.
 - Additional flood hazard mitigation measures for large-scale uses.
 - Additional seismic protections for large-scale uses.
 - Additional firefighting capacity contributions.
- LBC land uses determined to be of greater intensity than the CDF should be subject to the following:
 - Relatively larger land use separation measures from non-industrial or non-Port owned lands.
 - Significant additional flood hazard mitigation measures.
 - Additional seismic protections.
 - Significant firefighting capacity contributions to significantly expand local capacity.
 - Evaluation of off-site paving benefits as part of air quality modeling.

4.4 Natural Gas and Derivative Products Customary Development Form

Natural gas, and its derivative products such as ethane, butane, and propane, comprise a large and important sector of modern economies. Industrial processes are heavily reliant on natural gas and it is a primary energy source for many nations. The United States is one of the top producers and exporters of natural gas. Natural gas is also a chemical feedstock used as an input to many different products such as plastics, synthetic fibers, solvents, detergents, and more.

The following is a description of a “customary development form” for natural gas and derivative products use. This description is immediately followed up by types of natural gas and derivative products uses that are less intense than the CDF and more intense than the CDF, respectively. This provides a fuller and better understanding of what a CDF is by contrasting it to other common development forms of the same industrial category.

For the subsequent sections evaluating potential compatibility considerations, the CDF serves as the standard upon which those analyses are performed.



4.4.1 Description of Customary NG&DP Form

Customary Development Form – Liquefied Natural Gas (“LNG”) Facility: LNG is natural gas that has been cooled from a gaseous to a liquid state at approximately -260 degrees Fahrenheit. An example LNG facility is the LNG Facility at the Port of Tacoma. At approximately 30 acres in size, this facility provides fuel to ships and LNG to residential and commercial customers.

LNG serves many uses, from supplying natural gas reserves for utilities, powering vehicles, or for export. LNG typically requires specialized equipment to handle both the pressure and temperature, such as cryogenic tanks, vaporizers, refrigerants, and specialized loading systems. An enclosed ground flare would be used to burn off fugitive leakage or captured impurities. An LNG vaporizer may also be used, which could provide power to the facility.

Broadly speaking, an LNG facility receives natural gas via a pipeline, removes impurities from the gas, and liquefies the gas for storage or export. When the gas first arrives, it must be purified to remove materials such as water, carbon dioxide, sulfur compounds, and other materials. After the removal of impurities, the natural gas will consist of primarily methane and some ethane. This purified gas is then cooled to -260 degrees Fahrenheit in a heat exchanger using a mixed refrigerant. By cooling the gas, it is converted into a liquid form that is much more compact. This now liquified natural gas can be stored in specialized cryogenic tanks and exported or transported to other internal markets.

Use Less Intense than CDF – Utility Peaker Plant: Port Westward Industrial Park is home to three power generation facilities operated by PGE that run on natural gas. PGE’s Beaver Power Plant (built in the 1970s), Westward 1 (built in 2007) and Port Westward 2 (built in 2014) combine to generate nearly 1,200 megawatts of electricity. According to the Oregon Energy Facility Siting Council, Beaver Power Plant and Port Westward 1 are combined cycle power plants, while Port Westward 2 is natural gas fired and used for non-base loads. A battery storage facility has since been approved at the Port Westward Generating Project. The facilities are fed by two pipelines. One pipeline directly from the Mist Underground Storage Reservoir, which is located approximately 13 miles to the SW of the Port as well as the Kelso-Beaver natural gas pipeline that interconnects with the Williams Northwest Pipeline near Kelso, Washington.

A combined cycle power plant uses both a gas turbine and a steam turbine to produce electricity from the same source of heat, which increases the efficiency and output. Waste heat from a gas turbine is captured by a heat recover system, which is then used to generate steam. A combined cycle plant can create 50% more electricity than just a gas fired facility.

Use More Intense than CDF – Ammonium Nitrate Fertilizer Plant: Natural gas is an important component of ammonium production, as it is the primary source of hydrogen that is necessary to produce ammonia. Nitrogen based fertilizers are a critical input in modern agriculture and widely used the world over. According to the EPA,³⁹ in 1991 there were 58 plants in the United States producing ammonium nitrate. Approximately 4/5ths of the production was used for fertilizers, with the other 1/5 used to produce explosives.

³⁹ https://www.epa.gov/sites/default/files/2020-09/documents/8.3_ammonium_nitrate.pdf

Ammonium nitrate is created by neutralizing nitric acid with ammonia.⁴⁰ All ammonium nitrate plants produce an aqueous ammonium nitrate solution through the reaction of ammonia and nitric acid in a neutralizer. Most of this ends up as a solid product, which can be created via multiple methods, such as prilling, granulation, pastillation, or crystallization.

Ammonium nitrate is flammable, potentially explosive, can produce large quantities of heat, gas, and pressure when decomposed, and a strong oxidizer.

4.4.2 Identification of Potential Externalities from NG&DP Customary Development Form

AIRBORNE EMISSIONS

An LNG facility would likely have some airborne emissions, and the quantity would vary based upon the size of the facility. According to an application for an LNG facility in Tacoma, an LNG facility would be expected to generate some quantities of PM, sulfur dioxide, nitrous oxides, carbon monoxide, and VOCs.⁴¹ These emissions would originate primarily from a vaporizer and an enclosed ground flare. A small quantity of VOCs would be expected as fugitive emissions from valves. The total emissions were expected to be below the threshold at which a facility is classified as a major new source of emissions in the State of Washington.

In addition, locomotives, trucks, and ships all have emissions associated with them. Other equipment, such as forklifts or passenger vehicles may also be present. Emissions associated with these different modes of transportation are well known and typically include ammonia, carbon monoxide, nitrogen oxides, sulfur dioxides, VOCs, black carbon, and diesel particulate matter.

WATER QUALITY DEGRADATION

LNG requires significant cooling to maintain a liquid state. Once it rises above its stored temperature, such as during a spill, it quickly undergoes a phase change and reverts to a gas, escaping into the atmosphere.

The process of cooling LNG does typically generate industrial wastewater. For example, the following processes may create wastewater⁴²:

- High-purity makeup water for the power- and steam-production units. A water-cooled thermal oxidizer may also be present to destroy some organics.
- Makeup water for the amine solution for acid-gas scrubbing.
- Recovered water from the dehydration unit.
- Returned condensate from other unit processes, including heavy-hydrocarbon recovery.
- Makeup water for a possible cooling tower.

⁴⁰ Ibid

⁴¹ See Notice of Construction Application here: <https://pscleanair.gov/DocumentCenter/View/2684/PSE-TacomaLNG-NOCAApplication?bidId=>

⁴²

https://go.gale.com/ps/i.do?id=GALE%7CA383047368&sid=googleScholar&v=2.1&it=r&linkaccess=abs&issn=00092460&p=AONE&sw=w&userGroupName=oregon_oweb&isGeoAuthType=true



Other compatibility externalities may arise from EHS materials present on site, such as glycol necessary for the cooling process.

STORMWATER/HYDROLOGY

As with any use, the addition of impervious surfaces would add to the amount of stormwater runoff that would need to be managed. The amount of stormwater generated would be in proportion to the amount of impervious surface created. As mentioned, the proposed LNG facility in Tacoma is around 30 acres in size.

Retention ponds constructed to accommodate stormwater could create new areas of standing water and the filling of wetlands may alter historical patterns of runoff.

LEVEE EXTERNALITIES & FLOODPLAIN

An LNG facility may have an impact on levees if somehow construction results in a change to the levee prism, unregulated encroachments, settlement, or seepage via inappropriate construction materials or methods.

Most of the Goal Exception Area is not identified as being within a floodplain, as nearly the entirety of the area is protected by a levee operated by the Beaver Drainage Improvement Company. The levee is identified by the USACE as Provisionally Accredited. According to documentation publicly available from the USACE, the levee system has a relatively high likelihood of overtopping. Were the levees to be overtopped or compromised, materials from an LNG facility could become flood debris.

FIRE HAZARD

LNG is very flammable. If LNG is spilled and allowed to pool as an aerosol, it could also be explosive. Additional fire hazard would come from typical industrial processes, materials, and uses that may be present in any industrial use.

SEISMIC HAZARD

Depending on the location's seismic vulnerability and the Oregon Specialty Structural Code classification of the structures, an LNG facility may be vulnerable to a Cascadia subduction zone earthquake. As mentioned herein above, LNG is flammable and can be an explosive risk if allowed to pool as a gas.

According to the DOGAMI hazard maps publicly available, the Exception Area is comprised of soils that are of high risk for liquefaction in case of such an earthquake.

NOISE

LNG facilities are very complex. One of the most critical processes is the cooling of natural gas to -260 degrees via heat exchange. This often involves many fans, which may be a significant source of noise. The compressors needed to move enough refrigerant are also typically quite large, with horsepower ratings in the tens of thousands. Like fans, these are expected to be a source of noise. Pumps required to move LNG can also be quite numerous and loud. Additional sources of noise may include flares, valves, and backup power generation equipment. The exact level of noise will depend upon the specifics of the machinery (such as type of drive), size, speed, and layout of the plant.



LIGHT

Industrial uses vary widely in their lighting requirements, but good lighting is necessary for many industrial activities, such as transportation of industrial goods, loading and unloading, and many other activities. An LNG facility would not be expected to be any different from most large-scale industrial uses from a lighting standpoint.

4.4.3 Analysis of Compatibility Issues for NG&DP Customary Development Form

The following analysis of potential compatibility externalities assumes that the “minimum” permitting standard is being met, i.e. that the necessary federal, state, and local permits as detailed herein above in sections 3.8.1 and 3.8.3 can be applied for and will ultimately have to be obtained. Although the following list is in no way exhaustive, for the purposes of determining compatibility with the CDF the following permits are treated as consequential:

- Appropriate Air Quality Permit issued by ODEQ.
- Appropriate NPDES Stormwater Permit for construction and industrial uses.
- State Removal-Fill Permit issued by DSL.
- Federal Section 404 Permit issued by USACE.
- Federal Section 401 Water Quality Certification issued by ODEQ.
- Spill Prevention Control and Countermeasure Plan as appropriate.
- Hazardous Waste Management Permit issued by ODEQ.
- Site Design Review Permit issued by Columbia County.
- RIPD Use Permitted Under Prescribed Conditions Permit issued by Columbia County.

The ledger size matrix on the next page relates potential compatibility considerations between the *identified uses* in the surrounding area with the identified potential externalities. The matrix analyzes the compatibility according to the sensitive receptors (columns) for relevant externality (rows). For example, the analysis of potential farm use impacts from airborne emissions is examined from perspective of relative externality impacts on farm uses that would be expected to be sensitive to airborne emissions. For example, row crops are expected to be a more sensitive receptor to dust emissions when compared to a cattle pasture, at emissions levels that could obtain emission permitting authorization. The analysis examines the potential for externality impacts for the receptor land uses that would reasonably be expected to be sensitive to the relevant potential externality.



	Minimum Standards for Required Permitting	CDF vs Vacant land	CDF vs Ag Use	Sensitive Receptor Analysis Less Intense than CDF		Sensitive Receptor Analysis CDF		Sensitive Receptor Analysis More Intense than CDF		
				Surrounding Land Uses	Natural Resources	Surrounding Land Uses	Natural Resources	Surrounding Land Uses	Natural Resources	
Environmental Impacts	Airborne Emissions	ODEQ air quality permits set limits and conditions on the emissions and require monitoring, reporting, and pollution control practices of the facility. Permits are issued to comply with federal and state air quality laws.	Any new uses would be expected to generate net new emissions versus vacant land.	Typical agricultural uses in the region can generate PM such as dust. Discing of fields, fugitive pesticide emissions, and running of farm equipment can all generate emissions. CDF would have potential externalities compared to typical agricultural uses.	A use less intense than the CDF still has the potential to generate significant off-site airborne emissions when compared to existing agricultural uses.	A use less intense than the CDF still has the potential to generate significant off-site airborne emissions when compared to existing agricultural uses.	The CDF still has the potential to generate significant off-site airborne emissions when compared to existing agricultural uses.	The CDF still has the potential to generate significant off-site airborne emissions when compared to existing agricultural uses.	A more intense than the CDF may generate significantly more emissions than a typical agricultural use. Dust sensitive uses could experience externalities from PM emissions.	A more intense than the CDF may generate significantly more emissions than a typical agricultural use. No identified externalities on natural resources, provided there are no changes to Ph in localized precipitation.
	Groundwater	Oregon requires wastewater permits for the discharge of wastewater from industrial processes into surface waters or lands and Underground Injection Control permits when fluids, such as stormwater, septic effluent, or treated industrial waste water, are injected below ground.	CDF is not expected to generate substantial groundwater impact.	Permitting for CDF expected to be at least as stringent when compared to many agricultural uses.	Pipeline or tank leaks are not permitted, but a non-permitted leak could affect groundwater and cause externalities.	Pipeline or tank leaks are not permitted, but a non-permitted leak could affect groundwater and cause externalities.	Pipeline or tank leaks are not permitted, but a non-permitted leak could affect groundwater and cause externalities.	Pipeline or tank leaks are not permitted, but a non-permitted leak could affect groundwater and cause externalities.	A use more intense than the CDF may have significant quantities of EHS present, but permitting prohibits any release of such materials.	A use more intense than the CDF may have significant quantities of EHS, but permitting prohibits release of such materials.
	Stormwater	Industrial stormwater permits are required for facilities that discharge stormwater to surface waters or to storm sewers that drain to surface waters. Industrial stormwater permits set limits and conditions on the quality and quantity of stormwater that can be discharged, and require monitoring, reporting, and BMPs.	All impervious surfaces will generate additional onsite stormwater that must be managed, but no new net offsite stormwater in quantity, location, or form is allowed.	Agricultural uses typically have limited stormwater permitting requirements, if any, whereas industrial uses would be required to comply with all current stormwater control requirements for new industrial uses.	A use less intense than the CDF is expected to have minimal impacts on sensitive receptors in the surrounding area.	A use less intense than the CDF is expected to have minimal externality interaction with natural resources in the surrounding area, except where wetlands are filled or where new standing water for detention and treatment might interact with natural resources.	The CDF is expected to have minimal stormwater impacts on sensitive receptors in the surrounding area.	The CDF is expected to have minimal externality interaction with natural resources in the surrounding area, except where wetlands are filled or where new standing water for detention and treatment might interact with natural resources.	A use more intense than the CDF may generate more stormwater runoff, but existing permitting standards mitigate potential impacts. Such a use is expected to have minimal stormwater impacts on sensitive receptors in the surrounding area.	A use more intense than the CDF is expected to have minimal externality interaction with natural resources in the surrounding area, except where wetlands are filled or where new standing water for detention and treatment might interact with natural resources.
	Flood Hazard	The zone change area is located behind a levee system which has been provisionally accredited as providing base flood hazard reduction. To receive accreditation, the levee system would need to meet list of requirements set by FEMA, including a minimum of 3 feet of freeboard that corresponds to a 1 percent-annual-chance flood hazard reduction.	Vacant land with significant vegetation and trees versus vacant grasslands will have different flood hazard implications in comparison to the CDF for relative flood hazard risks.	Flood hazard will depend on the agricultural use, but it may be either equivalent to vacant land or significantly higher, such as in the case of dairy uses. Relative to the CDF, typical agricultural uses would have less flood hazard externality risks than the CDF.	A use less intense than the CDF is still expected to have elevated flood hazard externality risks compared to typical ag use under existing flood hazard conditions due to tank damage or pipeline disruption.	A use less intense than the CDF is still expected to have elevated flood hazard externality risks compared to typical ag use under existing flood hazard conditions due to tank damage or pipeline disruption.	The CDF would be expected to introduce elevated flood hazard externality risks compared to typical ag use under existing flood hazard conditions due to tank damage or pipeline disruption.	The CDF would be expected to introduce an elevated flood hazard externality risks compared to typical ag use under existing flood hazard conditions due to tank damage or pipeline disruption.	A use more intense than the CDF would be expected to introduce elevated flood hazard externality risks compared to typical ag use under existing flood hazard conditions due to tank damage or pipeline disruption.	A use more intense than the CDF would be expected to introduce an elevated flood hazard externality risks compared to typical ag use under existing flood hazard conditions due to tank damage or pipeline disruption.
	Fire Hazard	Oregon Fire Code addresses hazards related to industrial activities, such as storage and handling of EHS, flammable liquids and gases, combustible dusts and fibers, geothermal facilities, lumber yards, welding and hot work, processing and extraction facilities, and others. The OFC is enforced by the Office of the State Fire Marshal (OSFM) and local fire authorities having jurisdiction (AHJ).	Vacant land is typically not irrigated and is regulated by county nuisance regulations. During the dry season, fire risk externalities would be expected to be less for unirrigated vacant land when compared to CDF.	Irrigated agricultural uses would be expected to have minimal fire risk externalities, unirrigated uses will vary by type and intensity. When compared to the CDF, fire hazard is greater for the CDF.	A use less intense than the CDF is still expected to have elevated fire hazard externality risks compared to typical ag use due to explosive nature of methane caused by any accidental ignition.	A use less intense than the CDF is still expected to have elevated fire hazard externality risks compared to typical ag use due to explosive nature of methane caused by any accidental ignition.	The CDF is still expected to have elevated fire hazard externality risks compared to typical ag use due to explosive nature of methane caused by any accidental ignition.	The CDF is still expected to have elevated fire hazard externality risks compared to typical ag use due to explosive nature of methane caused by any accidental ignition.	A use more intense than the CDF is still expected to have elevated fire hazard externality risks compared to typical ag use due to explosive nature of methane caused by any accidental ignition.	A use more intense than the CDF is still expected to have elevated fire hazard externality risks compared to typical ag use due to explosive nature of methane caused by any accidental ignition.
	Seismic Hazard	Must meet applicable building code.	Vacant land by definition does not have structures and therefore has very limited risk of seismic hazard, particularly in the surrounding area, which is generally flat.	Agricultural buildings are generally exempt from building permit requirements in the State of Oregon. Depending on the activities in ag buildings, externality risks when compared to the CDF can still be significant.	The seismic hazard externalities are interrelated with fire, surface water and groundwater impacts. A use less intense than the CDF still introduces seismic hazard risks from a pipeline or tank ignition or rupture causing non-permitted leakage into ground or surface waters or explosive fire that could impact surrounding sensitive receptor uses.	The seismic hazard externalities are interrelated with fire, surface water and groundwater impacts. A use less intense than the CDF still introduces seismic hazard risks from a pipeline or tank ignition or rupture causing non-permitted leakage into ground or surface waters or explosive fire that could impact surrounding natural resources.	The seismic hazard externalities are interrelated with fire, surface water and groundwater impacts. the CDF still introduces seismic hazard risks from a pipeline or tank ignition or rupture causing non-permitted leakage into ground or surface waters or explosive fire that could impact surrounding sensitive receptor uses.	The seismic hazard externalities are interrelated with fire, surface water and groundwater impacts. the CDF still introduces seismic hazard risks from a pipeline or tank ignition or rupture causing non-permitted leakage into ground or surface waters or explosive fire that could impact surrounding natural resources.	The seismic hazard externalities are interrelated with fire, surface water and groundwater impacts. A use more intense than the CDF still introduces seismic hazard risks from a pipeline or tank ignition or rupture causing non-permitted leakage into ground or surface waters or explosive fire that could impact surrounding sensitive receptor uses.	The seismic hazard externalities are interrelated with fire, surface water and groundwater impacts. A use more intense than the CDF still introduces seismic hazard risks from a pipeline or tank ignition or rupture causing non-permitted leakage into ground or surface waters or explosive fire that could impact surrounding natural resources.
	Noise	DEQ has existing noise pollution standards (ODEQ has no dedicated enforcement). The County's existing Noise Control ordinance exempts both agricultural and industrial activities from its standards.	Louder, varies with distance and design dependent	Agricultural and industrial uses are exempt from Noise Control standards per Columbia County's Noise Control Ordinance.	A use less intense than the CDF may be a significant source of noise.	A use less intense than the CDF may be a significant source of noise.	The CDF may be a significant source of noise.	The CDF may be a significant source of noise.	A use more intense than the CDF may be a significant source of noise.	A use more intense than the CDF may be a significant source of noise.
	Light	Lighting standards are up to local jurisdictions. The County's Site Design Review Standards require that lighting be shielded so as not to shine directly on adjacent properties and roads. Lighting intensity is not necessarily coincident with use intensity.	Vacant land by definition does not have lighting present.	Agricultural uses typically have no permitting requirements in regards to lighting for outright allowed uses. Depending on activities, lighting externalities when compared to the CDF are expected to range from small to insignificant.	A use less intense than the CDF would be expected to have minimal externalities on the surrounding area.	A use less intense than the CDF would be expected to have minimal impact to natural resources, but there could be some externalities like insect attractions and extended forage times.	The CDF would be expected to have minimal externalities on the surrounding area.	The CDF would be expected to have minimal impact to natural resources, but there could be some externalities like insect attractions and extended forage times.	A use more intense than the CDF would be expected to have minimal externalities on the surrounding area.	A use more intense than the CDF would be expected to have minimal impact to natural resources, but there could be some externalities like insect attractions and extended forage times.
General Development Impacts										

4.4.4 Analysis Results and Conclusions

Compatibility for NG&DP uses must be understood in the context of the unique, existing balance between natural resources and continued land uses dependent on drainage dewatering in the Exception Area. The results indicate the following:

- For airborne emissions, the LNG CDF will likely require either a Standard ACDP permit or a Title V permit. If the proposed capacity were large enough, a PSD permit may be required. The air quality permitting process will require a public comment process with opportunity for hearing and air quality modeling to prevent negative externalities on the airshed and surrounding properties with toxic air contaminant emissions inventory and to calculate risk by a risk assessment.⁴³ The types of emissions from an LNG plant that would result once required air permitting is obtained would not be of a type that would typically negatively affect crop production, cattle grazing, blueberry production, or other farm uses identified in the area nor would they be likely to negatively affect the riparian or riverine resources in the area.
- For groundwater and stormwater, the CDF will be required to obtain NPDES stormwater permits and potentially industrial wastewater permits. The water quality systems and detention systems will be engineered for these permits to prevent discharges that would negatively affect properties offsite. Moreover, the groundwater conditions interact with wetlands. The Schott reconnaissance indicates significant percentages of the Exception Area are degraded wetlands (due to farming and dewatering). It is expected that future industrial development would trigger substantial wetlands mitigation within the Exception Area, resulting in enhanced wetland function and resultant water quality benefits. Site specific hydraulic designs will be required as part of future grading and drainage plans to ensure existing drainage patterns are maintained. Given the types and levels of chemicals present in an LNG CDF, additional spatial separation from other uses is advisable even when all the required groundwater protection permitting measures are in place.
- Under existing levee conditions, flood hazard is elevated due to potential overtopping in a 50-year flood event. However, the nature of an LNG plant is such that overtopping in a 50-year event would be an unacceptable risk with significant potential compatibility externalities. Future siting of an LNG should require completion of the levee certification process with the minimum 3 feet of freeboard required for accreditation. Specific locational and scale factors are also a compatibility consideration.
- LNG is highly flammable. In addition to compliance with Fire Code requirements, additional fire hazard mitigation measures are appropriate.
- LNG CDF would have significant quantities of flammable materials, making minimum seismic hazard risk mitigation important.

⁴³ SCS Engineers report Appendix F



- Noise and lighting externalities on surrounding uses would depend on location, scale, and system design of the CDF.

4.4.5 NG&DP Development Guidance

Based on the compatibility analysis results in the foregoing sections, compatibility for NG&DP uses will be advanced by the following guidance, in addition to all standard land use permitting and environmental permitting requirements. During future land use reviews for a specific development proposal:

- NG&DP land uses determined to be less intense than the CDF should be subject to the following:
 - Land use separation measures from non-industrial or non-port owned lands.
 - Additional flood hazard mitigation measures for large-scale uses.
 - Additional seismic protections for large-scale uses.
 - Additional firefighting capacity contributions for large-scale uses.
- NG&DP land uses determined to be the greater or similar intensity to the LNG CDF should be subject to the following:
 - Relatively larger land use separation measures from non-industrial or non-Port owned lands.
 - Significant additional flood hazard mitigation measures.
 - Additional seismic protections.
 - Significant firefighting capacity contributions to significantly expand local capacity.
 - Evaluation of off-site paving benefits as part of air quality modeling.

4.5 Breakbulk Storage Customary Development Form

Breakbulk cargo refers to non-containerized freight that is typically composed of unitized items that need to be loaded and unloaded by hand or sometimes with specialized equipment. Breakbulk cargo is usually shipped on smaller vessels compared to dry bulk cargo. Examples of breakbulk includes wind turbines, metal products such as coils or girders, bales of paper, vehicles, barrels, drums or casks, or boxes of fruit. It can even be items that might otherwise be shipped as dry bulk, such as bags of rice, wheat, or sugar.

The following is a description of a “customary development form” for a breakbulk storage facility. This description is immediately followed up by types of breakbulk storage uses that are less intense than the CDF and more intense than the CDF, respectively. This provides a fuller and better understanding of what a CDF is by contrasting it to other common development forms of the same industrial category.

For the subsequent sections evaluating potential compatibility considerations, the CDF serves as the standard upon which those analyses are performed.



4.5.1 Description of Breakbulk Storage Customary Development Form

Customary Development Form – Breakbulk Imports with additional processing: An example of a breakbulk CDF would be a facility that imports industrial products and conducts additional processing. An example of such a facility is SteelScape located at the Port of Kalama. The facility is approximately 90 acres in size and has access to both rail facilities and a dock. Like other breakbulk uses, the company imports a breakbulk product, in this case steel coils. Thereafter it performs additional treatment to create coated metal products. The steps include a pickle line, cold rolling, metallic coating and painting. Cold rolling is a process performed at room temperature by passing steel through rollers that apply mechanical stress and cause strain hardening. A pickle line is a part of the finishing process of flat rolled steel in which oxides and scale are removed from the surface by an acid bath. According to the company's website, the metallic coating used at SteelScape is a mixture of aluminum and zinc. The final product is shipped via either truck or rail.

Use Less Intense than CDF – Non-Hazardous Import Facility: An example of a use less intense than the CDF would be the import or handling of a non EHS and non-flammable material with minimal additional processing. An example of such a facility is the MacMillan Piper Taylor Way Facility located at the Port of Tacoma. Located on approximately 10 acres, the facility features a 100,000 square foot warehouse with facilities for rail and trucks and has the capability to handle food grade items. They include transloading as a service. The facility can handle products such as lumber, unitized cargo, palletized items, automobiles, billets, project cargo, loose cargo, and machinery.

Use More Intense than CDF – Extremely Hazardous or Explosive Materials Handling: Port Westward's history provides an example of a use that would be considered more intense than the CDF. The Beaver Ammunition Storage Depot Point was established on the present location of Port Westward when a terminal and dock at Port Westward were constructed in 1942.⁴⁴ The depot served as a shipping point for ammunition needed in both the Second World War and the Korean War. Products included both TNT and chemical ammunition. After the Second World War, unused ammunition was unloaded at the Depot and distributed across the country. Other potentially EHS containing items include things such as batteries, bleach, or explosive materials.

4.5.2 Identification of Potential Externalities of Breakbulk Storage Customary Development Form

AIRBORNE EMISSIONS

A breakbulk facility may be expected to generate some airborne emissions, such as dust and particulate matter from the loading and unloading of cargos. At the CDF facility, fugitive emissions from metal coating or VOCs from painting may be generated. The pickle line, which relies upon an acid solution to remove oxide scale, emits hydrochloric acid as a byproduct. The capture and reuse of hydrochloric acid, if done onsite, would also emit chlorine as a byproduct.

In addition, locomotives, trucks, and ships all have emissions associated with them. Other equipment, such as forklifts or passenger vehicles may also be present. Emissions associated with

⁴⁴ https://www.oregonencyclopedia.org/articles/beaver_army_terminal_dock/#.ZC8AA3bMKUn

these different modes of transportation are well known and typically include ammonia, carbon monoxide, nitrogen oxides, sulfur dioxides, VOCs, black carbon, and diesel particulate matter.

Overall, the level of emissions for the Breakbulk CDF would be expected to be low and could likely be approved with a standard permit.

WATER CONTAMINATION

A breakbulk facility with additional processing may use some water for industrial processes. SteelScape, for example, generates wastewater in each of its primary production steps, which consist of a pickle line, cold rolling, metal coating, and painting. Cold rolling, for example, uses lubrication and emulsions. The pickle line applies hydrochloric or sulfuric acid to metals to clean a metal's surface and remove impurities.

Like any use with employees, a breakbulk facility would be expected to generate sanitary wastewater associated with the mill's employees.

STORMWATER/HYDROLOGY

As with any use, the addition of impervious surfaces would add to the amount of stormwater runoff that would need to be managed. The amount of stormwater generated would be in proportion to the amount of impervious surface created. As mentioned, the SteelScape facility is approximately 90 acres in size. A breakbulk facility may also store some products outdoors.

Retention ponds constructed to accommodate stormwater could create new areas of standing water and the filling of wetlands during the course of development may alter historical patterns of runoff.

LEEVE EXTERNALITIES & FLOODPLAIN

A breakbulk facility may have an impact on levees if somehow construction results in a change to the levee prism, unregulated encroachments, settlement, or seepage via inappropriate construction materials or methods.

The subject property is not identified as being within a floodplain, as nearly the entirety of the zone change area is protected by a levee operated by the Beaver Drainage Improvement Company. The levee is identified by the USACE as Provisionally Accredited. According to documentation publicly available from the USACE, the levee system has a relatively high likelihood of overtopping. Were the levees to be overtopped or compromised, materials from the breakbulk facility could become flood debris.

FIRE HAZARD

A breakbulk facility such as SteelScape would likely have some flammable materials present on site, such as paint. The primary product, coated steel, would be expected to have minimal flammability. Other breakbulk facilities may import or export flammable materials, such as lumber or paper. Additional fire hazard would come from typical industrial processes, materials, and uses that may be present in any industrial use.



SEISMIC HAZARD

Depending on the location's seismic vulnerability and the Oregon Specialty Structural Code classification of the structures, a breakbulk facility such as SteelScape may be vulnerable to a Cascadia subduction zone earthquake. EHS materials at the CDF would typically be limited to standard industrial products, such as oils and solvents, and are not expected to be present in large quantities.

According to the DOGAMI hazard maps publicly available, the goal Exception Area is comprised of soils that are of high risk for liquefaction in case of such an earthquake.

NOISE

As an industrial use, a breakbulk facility such as SteelScape would be expected to generate typical levels of noise. Cold rolling involves mechanical stress on steel and would thus be expected to be a source of noise. Other sources of noise would include machines for cutting or trimming. The exact level of noise will depend upon the specifics of the machinery (such as type of drive), size, speed, and layout of the plant.

LIGHT

Industrial uses vary widely in their lighting requirements, but good lighting is necessary for many industrial activities, such as transportation of industrial goods, loading and unloading, and many other activities. A breakbulk facility would not be expected to be any different from an intensive industrial use in the intensity of lighting.

4.5.3 Analysis of Compatibility Issues for Customary of Breakbulk Storage Development Form

The following analysis of potential compatibility externalities assumes that the "minimum" permitting standard is being met, i.e., that the necessary federal, state, and local permits as detailed herein above in sections 3.8.1 and 3.8.3 can be applied for and will ultimately have to be obtained. Although the following list is in no way exhaustive, for the purposes of determining compatibility with the CDF, the following permits are treated as consequential:

- Appropriate Air Quality Permit issued by ODEQ.
- Appropriate NPDES Stormwater Permit for construction and industrial uses.
- State Removal-Fill Permit issued by DSL.
- Federal Section 404 permit issued by USACE.
- Federal Section 401 Water Quality Certification issued by ODEQ.
- Spill Prevention Control and Countermeasure Plan as appropriate.
- Hazardous Waste Management Permit issued by ODEQ.
- Site Design Review Permit issued by Columbia County.
- RIPD Use Permitted Under Prescribed Conditions Permit issued by Columbia County.



Goal 3 Exception Compatibility Analysis

File No. PA 13-02/ZC 13-01

The ledger size matrix on the next page relates potential compatibility considerations between the *identified uses* in the surrounding area with the identified potential externalities. The matrix analyzes the compatibility according to the sensitive receptors (columns) for relevant externality (rows). For example, the analysis of potential farm use impacts from airborne emissions is examined from perspective of relative externality impacts on farm uses that would be expected to be sensitive to airborne emissions. For example, row crops are expected to be a more sensitive receptor to dust emissions when compared to a cattle pasture, at emissions levels that could obtain emission permitting authorization. The analysis examines the potential for externality impacts for the receptor land uses that would reasonably be expected to be sensitive to the relevant potential externality.



		Minimum Standards for Required Permitting	CDF vs Vacant land	CDF vs Ag Use	Sensitive Receptor Analysis Less Intense than CDF		Sensitive Receptor Analysis CDF		Sensitive Receptor Analysis More Intense than CDF	
					Surrounding Land Uses	Natural Resources	Surrounding Land Uses	Natural Resources	Surrounding Land Uses	Natural Resources
Environmental Impacts	Airborne Emissions	ODEQ air quality permits set limits and conditions on the emissions and require monitoring, reporting, and pollution control practices of the facility. Permits are issued to comply with federal and state air quality laws.	Any new uses would be expected to generate net new emissions versus vacant land.	Typical agricultural uses in the region can generate PM such as dust. Discing of fields, fugitive pesticide emissions, and running of farm equipment can all generate emissions.	A use less intense than the CDF is not expected to generate significant off-site airborne emissions when compared to existing agricultural uses. No sensitive receptors externalities are expected.	A use less intense CDF is not expected to generate airborne emissions more intense than existing surrounding uses. No natural resources are expected to be affected.	The CDF may generate airborne emissions equal to or somewhat more intense than that of existing agricultural uses. Dust sensitive uses could experience externalities from PM emissions.	The CDF may generate airborne emissions equal to or somewhat more intense than that of existing agricultural uses. Minimal compatibility considerations are expected on natural resources.	A use more intense than the CDF may generate airborne emissions equal to or somewhat more intense than that of existing agricultural uses. Dust sensitive uses could experience externalities from PM emissions.	A use more intense than the CDF may generate significantly more emissions than a typical agricultural use. No identified externalities on natural resources, provided there are no changes to Ph in localized precipitation.
	Groundwater	Oregon requires wastewater permits for the discharge of wastewater from industrial processes into surface waters or lands and Underground Injection Control permits when fluids, such as stormwater, septic effluent, or treated industrial waste water, are injected below ground.	CDF is not expected to generate substantial groundwater impact.	Permitting for CDF expected to be at least as stringent when compared to many agricultural uses.	A use less intense than the CDF is expected to have very limited chemicals, limited or no processing, and no underground storage tanks. There would be expected to be minimal or no externalities to sensitive receptors.	A use less intense than the CDF is expected to have very limited chemicals, limited or no processing, and no underground storage tanks. There would be expected to be minimal or no externalities to natural resources, except where wetlands are filled.	The CDF is not expected to use significant quantities of EHS, use underground storage tanks, or generate significant quantities of process water.	The CDF is expected to have minimal industrial chemicals and no underground storage tanks.	A use more intense than the CDF may have significant quantities of EHS present, but permitting prohibits any release of such materials.	A use more intense than the CDF may have significant quantities of EHS, but permitting prohibits release of such materials.
	Stormwater	Industrial stormwater permits are required for facilities that discharge stormwater to surface waters or to storm sewers that drain to surface waters. Industrial stormwater permits set limits and conditions on the quality and quantity of stormwater that can be discharged, and require monitoring, reporting, and BMPs.	All impervious surfaces will generate additional onsite stormwater that must be managed, but no new net offsite stormwater in quantity, location, or form is allowed.	Agricultural uses typically have limited stormwater permitting requirements, if any, whereas industrial uses would be required to comply with all development current stormwater control requirements for new industrial uses.	A use less intense than the CDF is expected to have minimal impacts on sensitive receptors in the surrounding area.	A use less intense than the CDF is expected to have minimal externality interaction with natural resources in the surrounding area, except where wetlands are filled or where new standing water for detention and treatment might interact with natural resources.	The CDF is expected to have minimal stormwater impacts on sensitive receptors in the surrounding area.	The CDF is expected to have minimal externality interaction with natural resources in the surrounding area, except where wetlands are filled or where new standing water for detention and treatment might interact with natural resources.	A use more intense than the CDF may generate more stormwater runoff, but existing permitting standards mitigate potential impacts. Such a use is expected to have minimal stormwater impacts on sensitive receptors in the surrounding area.	A use more intense than the CDF is expected to have minimal externality interaction with natural resources in the surrounding area, except where wetlands are filled or where new standing water for detention and treatment might interact with natural resources.
	Flood Hazard	The zone change area is located behind a levee system which has been provisionally accredited as providing base flood hazard reduction. To receive accreditation, the levee system would need to meet list of requirements set by FEMA, including a minimum of 3 feet of freeboard that corresponds to a 1 percent annual-chance flood hazard reduction.	Vacant land with significant vegetation and trees versus vacant grasslands will have different flood hazard implications in comparison to the CDF for relative flood hazard risks.	Flood hazard will depend on the agricultural use, but it may be either equivalent to vacant land or significantly higher, such as in the case of dairy uses. Relative to the CDF, typical agricultural uses would have somewhat less flood hazard externalities risks than the CDF.	A use less intense than the CDF has no expected EHS that would elevate flood hazard externalities risks. Other flood hazards would depend on acreage and quantity. For example, a break bulk facility importing food stuff could have a potential flood hazard externalities on sensitive receptors by the sheer quantity of food stuff as flood debris under existing flood conditions.	General flood hazard risks would be expected to outweigh any flood hazard externalities risks from a use less intense than the CDF.	The CDF has minimal expected EHS impacts. Other flood hazards would depend on scale and location of CDF operation under existing flood conditions.	General flood hazard impacts would be expected to outweigh any impacts from the CDF use.	A use more intense than the CDF may have elevated flood hazard risk when EHS are present on site and release risk is elevated under existing flood hazard conditions.	A use more intense than the CDF may have elevated flood hazard risk when EHS are present on site and release risk is elevated under existing flood hazard conditions.
Event Impacts	Fire Hazard	Oregon Fire Code addresses hazards related to industrial activities, such as storage and handling of EHS, flammable liquids and gases, combustible dusts and fibers, geothermal facilities, lumber yards, welding and hot work, processing and extraction facilities, and others. The OFC is enforced by the Office of the State Fire Marshal (OSFM) and local fire authorities having jurisdiction (AHJ).	Vacant land is typically not irrigated and is regulated by county nuisance regulations. During the dry season, fire risk externalities would be expected to be somewhat less than the for unirrigated vacant land when compared to CDF but with fewer immediate resources available to reduce risks from spreading.	Irrigated agricultural uses would be expected to have minimal fire risk externalities, unirrigated uses will vary by type and intensity.	Fire hazard for a use less intense than the CDF is expected to be low or negligible when surrounding areas are irrigated farm uses and no greater when compared to unirrigated vacant lands.	Fire hazard externalities risks for a use less intense than the CDF is expected to be low or negligible on surrounding natural areas, most of which are riparian in nature or separated from the industrial area by waterways.	CDF fire hazards are expected to be low or negligible when surrounding areas are irrigated farm uses. The CDF may have increased fire hazard potential for other sensitive receptors among surrounding uses.	Fire hazard externalities risks for the CDF is expected to be low or negligible on surrounding natural areas, most of which are riparian in nature or separated from the industrial area by waterways.	A more intense use than CDF introduces fire hazard risks which are elevated for materials with flammable or explosive potential. A more intense use may have increased fire hazard potential for other sensitive receptors among surrounding uses.	A more intense use than CDF introduces fire hazard risks which are elevated for materials with flammable or explosive potential. A more intense use may have increased fire hazard potential for surrounding natural resources.
	Seismic Hazard	Structures must meet the requirements of Oregon OSSC, which includes a seismic design category that is based upon expected site specific factors such as ground motion, soils, and occupancy.	Vacant land by definition does not have structures and therefore has very limited risk of seismic hazard, particularly in the surrounding area, which is generally flat.	Agricultural buildings are generally exempt from building permit requirements in the State of Oregon. Depending on the activities in ag buildings, externality risks when compared to the CDF are expected to be insignificant.	A use less intense than the CDF is expected to have minimal seismic hazard to sensitive receptors in the surrounding area.	A use less intense than the CDF is expected to have minimal seismic hazard to natural resources in the surrounding area.	The CDF is expected to have minimal seismic hazard to surrounding areas, as the usage of EHS and underground storage tanks are expected to be minimal.	The CDF is expected to have minimal seismic hazard to natural resources, as the usage of EHS and underground storage tanks are expected to be minimal.	A use more intense than CDF may have elevated seismic hazard risk to surrounding natural resources if EHS are used in significant quantities and storage tanks are present and a seismic event could cause an otherwise disallowed release.	A use more intense than CDF may have elevated seismic hazard risk to surrounding natural resources if EHS are used in significant quantities and storage tanks are present and a seismic event could cause an otherwise disallowed release.
General Development Impacts	Noise	ODEQ has existing noise pollution standards (ODEQ has no dedicated enforcement). The County's existing Noise Control ordinance exempts both agricultural and industrial activities from its standards.	Louder, varies with Distance and design dependent.	Agricultural and Industrial uses are exempt from Noise Control standards per Columbia County's Noise Control Ordinance.	A use less intense than the CDF may be a significant source of noise.	A use less intense than the CDF may be a significant source of noise.	The CDF may be a significant source of noise.	The CDF may be a significant source of noise.	A use more intense than the CDF may be a significant source of noise.	A use more intense than the CDF may be a significant source of noise.
	Light	Lighting standards are up to local jurisdictions. The County's Site Design Review Standards require that lighting be shielded so as not to shine directly on adjacent properties and roads. Lighting intensity is not necessarily coincident with use intensity.	Vacant land by definition does not have lighting present.	Agricultural uses typically have no permitting requirements in regards to lighting for outright allowed uses. Depending on activities, lighting externalities when compared to the CDF are expected to range from small to insignificant.	A use less intense than the CDF would be expected to have minimal externalities on the surrounding area.	A use less intense than the CDF would be expected to have minimal impact to natural resources, but there could be some externalities like insect attractions and extended forage times.	The CDF would be expected to have minimal externalities on the surrounding area.	The CDF would be expected to have minimal impact to natural resources, but there could be some externalities like insect attractions and extended forage times.	A use more intense than the CDF would be expected to have minimal externalities on the surrounding area.	A use more intense than the CDF would be expected to have minimal impact to natural resources, but there could be some externalities like insect attractions and extended forage times.

4.5.4 Breakbulk Storage Development Form Compatibility Analysis Results and Conclusions

Compatibility for Breakbulk uses must be understood in the context of the unique, existing balance between natural resources and continued land uses dependent on drainage dewatering in the Exception Area. The results indicate the following:

- For airborne emissions, the Breakbulk Storage CDF is likely to generate emissions that qualify as “de minimis” with no permitting required. The actual permit required will depend upon materials and processing. Should a permit be required, the air quality permitting process may require a public comment process with opportunity for hearing and air quality modeling to prevent negative externalities on the airshed and surrounding properties with toxic air contaminant emissions inventory and to calculate risk by a risk assessment for uses with emissions⁴⁵.
- For groundwater and stormwater, the CDF will be required to obtain NPDES stormwater permits and potentially industrial wastewater permits. The water quality systems and detention systems will be engineered for these permits to prevent discharges that would negatively affect properties offsite. Moreover, the groundwater conditions interact with wetlands. The Schott reconnaissance indicates significant percentages of the Exception Area are degraded wetlands (due to farming and dewatering). It is expected that future industrial development would trigger substantial wetlands mitigation within the Exception Area, resulting in enhanced wetland function and resultant water quality benefits. Site specific hydraulic designs will be required as part of future grading and drainage plans to ensure existing drainage patterns are maintained. Specific locational and scale factors are also a compatibility consideration.
- Under existing levee conditions, flood hazard is elevated due to potential overtopping in a 50-year flood event. However, the nature of a Breakbulk Storage Facility is not something that would be expected to significantly change the flood hazard risk conditions, especially when additional land is expected to be converted to improved wetland functionality. Specific locational and scale factors are also a compatibility consideration.
- The Breakbulk CDF that is smaller in scale is not expected to present a significant new fire hazard (assuming construction to current Fire Code requirements). As the CDF scale increases and location within the Exception Area, additional fire hazard mitigation measures may be appropriate depending on the processes conducted on-site.
- The Breakbulk CDF would not be expected to have SQEHS, seismic hazard risk changes appear nominal.
- Noise externalities on surrounding uses would depend on location, scale, and system design of the CDF.
- Lighting externalities on surrounding uses would depend on location, scale, and system design of the CDF.

⁴⁵ SCS Engineers report Appendix E



4.5.5 Breakbulk Storage Development Guidance

Based on the compatibility analysis results in the foregoing sections, compatibility for Breakbulk uses will be advanced by the following guidance, in addition to all standard land use permitting and environmental permitting requirements. During future land use reviews for a specific development proposal:

- During future land use reviews for Breakbulk land uses determined to be of similar or less intense than the CDF should be subject to the following:
 - Relatively smaller land use separation measures from non-industrial or non-Port owned lands.
 - Additional flood hazard mitigation measures for large-scale uses.
- During future land use reviews for Breakbulk land uses determined to be more intense than the CDF should be subject to the following:
 - Relatively larger land use separation measures from non-industrial or non-Port owned lands depending on the nature of materials being handled from a hazardous, flammable, and scale standpoint.
 - Additional flood hazard mitigation measures.
 - Additional seismic protections.
 - Contributions to significantly expand local firefighting capacity.



5 GUIDANCE FOR APPLICATION TO SPECIFIC DEVELOPMENT SCENARIOS

5.1 Federal, State Requirements for Permitting for all Uses

As discussed above in Section 3, there are myriad state and federal permits required for the proposed uses within the Exception Area. These differ from specific use to specific use. The permit requirements, and their effects, have already been discussed in more detail in Section 3.8 and as such will not be reproduced here in full.

To summarize that discussion, the following permits are typical and place the following limits on use externalities:

Wetlands and Riparian: Wetland alteration, modification, or replacement requires a permit from both DSL and likely the USACE. Approvals require a wetland delineation, avoidance of wetlands where possible, consultation with the federal government regarding endangered species, the meeting of Standard Local Operating Procedures for Endangered Species (SLOPES) criteria for stormwater management, and mitigation via methods such as wetland creation, restoration, or enhancement.

Water Quality: Groundwater is protected in Oregon, primarily by ODEQ. ODEQ requires permits for underground injection, discharge of industrial wastewater, stormwater management of industrial uses, during construction, and as part of hazardous waste management. As discussed in Appendix C, Oregon has some of the strictest regulations of stormwater and groundwater resources in the country.

Floodplain: Nearly the entire Exception Area is within the Beaver Drainage Improvement Company levee system and is not considered to be within a 100-year floodplain. Changes to the levee, drainage system, or levee accreditation would either be completed under BDIC leadership or require its approval.

Air Quality: The State of Oregon has an existing framework of air quality rules that regulate industrial uses. Permits for industrial uses are issued based upon the intensity of industrial air emissions. Regardless of the type of air permit required, a permit would need to be obtained prior to the start of construction of an air pollutant source. All permits are administered by the State of Oregon Department of Environmental Quality.

5.2 County RIPD Use Permitted Under Prescribed Conditions Criteria for all Uses

Columbia County's RIPD zoning includes criteria for "Uses Permitted Under Prescribed Conditions" ("UPUPC"). As a previously agreed to condition of approval, any future industrial developments of the five approved use categories in the Exception Area will be subject to these criteria. The guidance below demonstrates how the County will be able to apply the UPUPC criteria in a manner consistent with the Goal Exception.



In order to approve a UPUPC, the Columbia County Planning Commission is the approving body and shall evaluate the request against the following established criteria:

- A. The requested use conforms with the goals and policies of the Comprehensive Plan – specifically those policies regarding rural industrial development and exceptions to the rural resource land goals and policies.

Guidance: The proposed uses will be occurring in an area approved by the Columbia County for RIPD zoning that has included appropriate findings and conclusions of law demonstrating such zoning as being in conformance with the County's Comprehensive Plan.

- B. The potential impact upon the area resulting from the proposed use has been addressed and any adverse impact will be able to be mitigated considering the following factors:
 1. Physiological characteristics of the site (i.e., topography, drainage, etc.) and the suitability of the site for the particular land use and improvements;

Guidance: This criterion is difficult to apply universally to all categories of approved uses and potential levels of intensities of those uses. The analysis contained in this Compatibility Analysis has resulted in specific conditions that will apply to specific use categories and levels of intensity for matters which include: requirements for flood protections, seismic improvement standards, buffer distances via minimum land use separation, fire/life safety emergency response measures, and air quality protections as set out below. Using those conditions, the County will be better able to consider the physiological characteristics of the site in a manner that is consistent with the Goal Exception.

2. Existing land uses and both private and public facilities and services in the area;

Guidance: As with the criterion above, this criterion is difficult to apply universally to all categories of approved uses and levels of intensities of those uses. The analysis contained in this Compatibility Analysis has resulted in specific conditions that will apply to specific use categories and levels of intensity in order to render them compatible with the surrounding area and ensure that there will be no substantial limitation, impairment, or preclusion of the surrounding properties for the primary uses listed in the underlying district. As a result, the County will be better able to consider existing land uses in a manner that is consistent with the Goal Exception. In addition, Port Westward is served by public facilities and services. Several of the proposed uses may affect some of these services, such as fire/life safety resources or road capacity. Specific conditions, such as trip caps and the requirement to have industrial fire brigades, have been identified and will be applied to the appropriate categories and intensities of uses in order to ameliorate these externalities, as discussed below.

3. The demonstrated need for the proposed use is best met at the requested site considering all factors of the rural industrial element of the Comprehensive Plan;

Guidance: As concluded in previous considerations of the application for a Goal Exception, Columbia County has demonstrated a need for five approved use categories that are dependent upon the existing deepwater port and dock on the lands subject to the goal exception.



C. The requested use can be shown to comply with the following standards for available services:

1. Water shall be provided by an on-site source of sufficient capacity to serve the proposed use, or a public or community water system capable of serving the proposed use.
2. Sewage will be treated by a subsurface sewage system, or a community or public sewer system, approved by the County Sanitarian and/or the State DEQ.
3. Access will be provided to a public right-of-way constructed to standards capable of supporting the proposed use considering the existing level of service and the externalities caused by the planned development.
4. The property is within, and is capable of being served by, a rural fire district; or, the proponents will provide on-site fire suppression facilities capable of serving the proposed use. On-site facilities shall be approved by either the State or local Fire Marshall.

Guidance: These criteria are standard conditions of development, appropriately applied at the time of a development application. No further guidance is necessary for the County to apply this criterion to be consistent with the Goal Exception.

5.3 Site Design Review for all Uses

In addition to a UPUPC permit, Columbia County requires that all new development, redevelopment, expansion, or improvement of industrial uses obtain Site Design Review approval. Site Design Review adds another layer of review and has specific requirements related to site design externalities that are typical of any industrial development.

Site Design reviews are split into two categories, Type 1 and Type 2. Any development that consists of 5,000 square feet or more or consists of a change of use is required to have a Type 2 review. Type 2 reviews require a public hearing and are approved by the Columbia County Planning Commission.

The County has the following established criteria for Site Design Review:

- A. Flood Hazard Areas: See CCZO §1100, Flood Hazard Overlay Zone. All development in Flood Hazard Areas must comply with State and Federal Guidelines.

Guidance: The proposed Exception Area is almost entirely outside of a mapped Flood Hazard Area, as it is behind the Beaver Drainage Improvement Company's provisionally accredited levee, as discussed herein above in Section 3. Conditions of approval are being proposed that will ensure certain types of uses at certain levels of intensity will require improvements to the levee or floodproofing measures or both. These measures will enhance the flood resiliency of the Exception Area and the entirety of the area behind the Beaver Drainage Improvement Company's levee system.



- B. Wetlands and Riparian Areas:** Alteration of wetlands and riparian areas shall be in compliance with State and Federal laws.

Guidance: All proposed development in the Exception Area shall be required to receive all permits necessary from the State and Federal governments. In addition, conditions of approval have been proposed that will require the development of significant buffers on goal exception lands, enhancing the wetland and riparian habitat near Port Westward.

- C. Natural Areas and Features:** To the greatest practical extent possible, natural areas and features of the site shall be preserved.

Guidance: All proposed development in the Goal Exception areas shall be required to adhere to buffer requirements and receive the permits necessary from the State and Federal governments. The lands in the Exception Area are almost all presently farmland that was originally habitat before the construction of the levees.

- D. Historic and Cultural sites and structures:** All historic and culturally significant sites and structures identified in the 1984 Comprehensive Plan, or identified for inclusion in the County Periodic Review, shall be protected if they still exist.

Guidance: To the best of the Applicant's knowledge, no historic or culturally significant sites or structures have been identified in the Goal Exception area⁴⁶.

- E. Lighting:** All outdoor lights shall be shielded so as to not shine directly on adjacent properties and roads.

Guidance: This requirement is an important step towards ensuring compatibility with the surrounding area, and this standard can be applied to all proposed development at the time of site plan review.

- F. Energy Conservation:** Buildings should be oriented to take advantage of natural energy saving elements such as the sun, landscaping and landforms.

Guidance: Although laudable, this site plan criterion is encouraged but not required. Many of the industrial buildings that may be likely to be constructed for the prescribed uses are unlikely to have significantly varying energy consumption based upon building orientation alone. Other elements, such as compatibility with surrounding uses, avoidance of natural features, or transportation needs are likely to have precedence.

⁴⁶ CSA's understanding is that in the public record for a land use modification application made by NEXT Renewable Fuels to Columbia County, found at File No. CU 23-11 & DR 21-03 MOD, a letter was introduced that refers to the potential discovery of cultural artifacts in the area in October of 2023. The staff of the Port of Columbia County indicates this discovery was not made on lands within the Goal Exception area.



- G. **Transportation Facilities:** Off-site auto and pedestrian facilities may be required by the Planning Commission, Planning Director or Public Works Director consistent with the Columbia County Road Standards and the Columbia County Transportation Systems Plan.

Guidance: Transportation planning is an important element that is considered as part of any land use application. The County has an adopted Transportation System Plan and road standards that will provide guidance for any required transportation improvements. In addition, a universal condition has been adopted that limits PM Peak hour trips.

In addition to the above criterion, a Site Design Review has buffering requirements. The standard Site Design Review buffers are up to 10 feet in width. As will be discussed herein below, all approved use categories proposed in the Exception Area shall have special buffering requirements of 150 to 600 feet depending on the intensity of the use that will substantially exceed the minimums otherwise required by the Site Design Review process.

5.4 Additional Universal Conditions

In addition to the existing regulatory programs and requirements at the Federal, State, and County level, the Applicants have agreed to stipulate to the following set of conditions that will apply to the Exception Area:

1. Prior to an application for a building or development for a new use, the applicant/developer shall submit a Site Design Review and an RIPD Use Permitted Under Prescribed Conditions as required by the Columbia County Zoning Ordinance.
2. To ensure adequate transportation operation, proposed developments and expansions requiring site design review or Use Permitted Under Prescribed Conditions shall not produce more than 332 PM peak-hour trips for the entire subject property without conducting a new Traffic Impact Analysis ("TIA") with recommendations for operational or safety mitigation consistent with the Oregon Transportation Planning Rule 660-012-0060.
3. A traffic study shall be prepared for each proposed future development within the subject property to determine the number of trips generated, likely travel routes, impacts on both passenger car and heavy truck traffic and to ensure that County roadways are improved as needed to adequately serve future development. These TIA reports would also be used to ensure that the number of trips generated and accumulative trips do not exceed the trip cap.
4. To ensure compatibility with adjoining agricultural uses, the applicant/developer of new industrial uses shall comply with the following:
 - a. The habitat of threatened and endangered species shall be evaluated and protected as required by law.
 - b. Alterations of important natural features, including placement of structures, shall maintain the overall values of the feature.
 - c. All development adjacent to land zoned PA-80 shall include buffers that are established and maintained between the industrial uses and adjacent land uses on PA-80 zoned land, including natural vegetation and where appropriate, fences,



- landscaped areas and other similar types of buffers, see also specific land use separation conditions for individual use categories and intensities.
- d. When possible, the area of the site that is not developed for industrial uses or support shall be left in a natural condition or in resource (farm) production.
 - e. Controls, including suppression and requiring hard surfaces, shall be employed as needed to be determined by the County to mitigate dust caused by industrial uses that may emanate from the site and traffic to the site.
 - f. Site run-off shall be controlled and any harmful sediment shall be contained or otherwise treated before being released to ensure potential impacts to irrigation equipment and area water quality (both ground and surface) are controlled.
 - g. The industrial use impact on the water table and sloughs shall be monitored for water quality and surface water elevations to ensure that the area water can be maintained and managed for existing uses.
 - h. Railroad crossings shall be managed consistently with federal law regulating crossing to reduce crossing delays. Any proposed use that includes transportation to or from the subject property by rail shall submit a rail plan identifying the number and frequency of trains to the subject property and impacts to rail movements, safety, noise or other identified impacts along the rail corridor supporting the County's transportation system. The plan shall propose mitigation to identified impacts.
 - i. Development applications shall include an agricultural impact assessment report that shall analyze adjacent agricultural uses and practices and demonstrate that impacts from the proposed use are mitigated. The report shall include a description of the type and nature of the agricultural uses and farming practices, if any, which presently occur on adjacent lands zoned for farm use, type of agricultural equipment customarily used on the property, and wind pattern information. The report shall include a mitigation plan for any negative impacts identified.
5. The types of industrial uses for the subject Plan Amendment shall be limited to only those uses that are substantially dependent on a deepwater port and have demonstrated access rights to the dock, and those uses with employment densities, public facilities and activities justified in the exception, specifically:
 - a. Forestry and wood processing, production, storage, and transportation;
 - b. Dry bulk commodities transfer, storage, production, and processing;
 - c. Liquid bulk commodities processing, storage, and transportation;
 - d. Natural gas and derivative products, processing, storage, and transportation; and
 - e. Breakbulk storage, transportation, and processing.
 6. The storage, loading and unloading of coal is specifically not justified in this exception. Such uses shall not be allowed on the subject property without a separate approved exception to Goal 3.
 7. The Port (applicant) shall institute a plan and ongoing program for sampling ground and surface water quality to establish baseline measurements for a range of contaminants at the



re-zone site and down-gradient. The program should be designed and managed for assurance that future industrial wastewater discharges are treated to prevent pollution to the watershed environment. The program shall be designed to detect leaking tanks.

8. The Port (applicant) shall prepare a response plan and clean-up plan for a hazardous material spill event. The plan shall include appropriate government agencies and private companies engaged in such clean-up activities.
9. Prior to the Occupancy of any future industrial facility, the applicant shall submit written confirmation to the County that they have obtained all necessary Permits from the applicable Federal, State and Local Regulatory Agencies.

After feedback from subject matter experts, analysis by CSA Planning, and a review of previous compatibility analyses, the Applicant is proposing the following general conditions in addition to the list above.

10. At the time of the proposed industrial development the Applicant will be required to provide a noise study that projects the built out industrial development can feasibly comply with ODEQ noise standards and shall project L₅₀ noise levels will be no greater than 50 dBA at external property lines for neighboring properties not owned by the Port of Columbia County or developed with industrial uses.
11. At the time of the proposed industrial development, the Applicant shall provide a Fire Protection Plan from a registered professional Fire Protection Engineer in the State of Oregon.

5.5 Forestry and Wood Product Development Scenarios

5.5.1 F&WP Guidance for Use Intensity Determination

As discussed above in Section 4, the Forestry and Wood Product uses are split into three different subcategories. The CDF is used as the baseline for the externalities analysis, with any individual use then classified as either of similar intensity to the CDF, less intense, or more intense. Relative intensity for these subcategories varies for each of the five use categories, as some use categories are judged to be relatively more intense by their essential operating characteristics. For example, any of the Natural Gas production uses is relatively intense in comparison to most Forestry or Wood Products uses. This relative intensity is reflected in the compatibility measures that are deemed appropriate for each category as discussed below.

For Forestry and Wood Products, the Planner should examine the use and then evaluate if the specific development proposal is less intense than the CDF, similar to the CDF, or more intense than the CDF.

A wood pellet mill was used as the Forestry and Wood Products CDF in the analysis in Section 4. Such a use will typically occupy 10 acres or more and have relatively complicated processing methods for creating a final industrial product. These processing methods will not rely upon substantial quantities of chemicals classified as EHS or other products that create potentially substantial compatibility externalities, such as explosive materials. Other potential CDFs would be a sawmill or wood flooring manufacturer.



A use less intense than the CDF would have limited or no EHS chemical processing and only simple mechanical processing. A log yard or a wood chip facility that exports or creates chips onsite would be typical for such a lower-intensity use.

A more intense use than the CDF would be of a larger scale and require the use of SQEHS materials. An example of such a use is a kraft pulp mill or a utility pole manufacturer, both of which typically have substantial quantities of chemicals classified as EHS as by products or as part of the manufacturing process.

After determining the relative intensity of the use in comparison to the F&WP CDF, the Planner should determine which specific conditions of approval are applicable.

5.5.2 F&WP Use-Specific Conditions or Criteria

CONDITIONS DEVELOPED FOR SPECIFIC USE TYPES BASED UPON ANALYSIS OF POTENTIAL COMPATIBILITY ISSUES

Conditions of Approval for Uses less intense than F&WP CDF:

When a F&WP use is deemed to be less intense than the CDF, the following conditions of approval will be applied to ensure compatibility:

- **Land Use Separation:** A 150-foot buffer shall be provided between all developed areas and adjoining lands that are not zoned RIPD or not otherwise owned by the Port of Columbia County, *see* CSA Tech Memo at Appendix F. Road transportation facilities, utilities, rail facilities, and similar linear features are allowed in the land use separation areas in addition to any uses allowed in the PA-80 zone.

Uses comparable to F&WP CDF:

When a F&WP use is as intense as the CDF, the following compatibility measures have been determined to be necessary:

- **Land Use Separation:** A 150-foot buffer shall be provided between all developed areas and adjoining lands that are not zoned RIPD and not owned by the Port of Columbia County, *see* CSA Tech Memo at Appendix F. Road transportation facilities, utilities, rail facilities, and similar linear features are allowed in the land use separation areas in addition to any uses allowed in the PA-80 zone.
- **Air Quality:** If Air Quality Modeling is required for air quality permit, in addition to all the required air permit modeling for the proposed use, the modeling shall evaluate the mobile source emissions air quality benefits from paving Hermo Road/Collins Road North/Erickson Dike Road and internal Port circulation roads and the benefits from periodic street sweeping. The County may impose a condition of approval through the Site Design Review and RIPD UPUPC land use applications that requires future industrial development in the Exception Area to pave and/or street sweep roads recommended by ODEQ (as part of the air permit or the land use review process).



Uses more intense than F&WP CDF:

When a F&WP use is more intense than the CDF, the following compatibility measures have been determined to be necessary:

- **BDIC Levee System Accreditation:** Prior to permits for construction of the project, levee construction drawings designed to achieve accreditation shall be completed by the project engineer of record. Prior to SQEHS being delivered to the site, the BDIC levee shall be accredited by FEMA as providing protection from the 1-percent annual chance flood event.
- **Floodproofing:** Floodproofing measures intended to limit the potential hazard of the development shall be required in accordance with Federal Emergency Management Agency (FEMA), Floodproofing Non-Residential Buildings, FEMA P-936, July 2013 (or the most current published standard from FEMA). At minimum, all facilities that will contain EHS will be floodproofed.
- **Seismic Improvement Standards:** All facilities that will contain EHS, and any structures determined by the County to be necessary to protect public health through the site review process, will be constructed to withstand a magnitude 9 earthquake expected from a Cascadian subduction zone earthquake.
- **Land Use Separation:** A 600-foot buffer shall be provided between all developed areas and adjoining lands that are not zoned RIPD or are not otherwise owned by the Port of Columbia County, *see* CSA Tech Memo at Appendix F. Road transportation facilities, utilities, rail facilities, and similar linear features are allowed in the land use separation areas in addition to any uses allowed in the PA-80 zone.
- **Fire/Life Safety Emergency Response Financing:** The development shall forego participation in the Strategic Investment Program or equivalent program that provides a property tax break that would reduce expected property tax revenue to the Fire District. In the alternative, an agreement shall be reached to backfill the otherwise expected tax revenue for the local Fire District that has jurisdiction over the development.
- **Fire/Life Safety Bridge Financing:** The development shall agree to provide the equivalent of the Fire District's first year's projected tax revenue at the start of vertical construction in order to provide bridge financing to the District.
- **Industrial Fire Brigade:** The Development shall provide an onsite industrial fire brigade.
- **Air Quality:** If Air Quality Modeling is required for air quality permit, in addition to all the required air permit modeling for the proposed use, the modeling shall evaluate the mobile source emissions air quality benefits from paving Hermo Road/Collins Road North/Erickson Dike Road and internal Port circulation roads and the benefits from periodic street sweeping. The County may impose a condition of approval through the Site Design Review and RIPD UPUPC land use applications that requires future industrial development in the Exception Area to pave and/or street sweep roads recommended by ODEQ (as part of the air permit or the land use review process).



5.5.3 F&WP Compatibility Determination

The compatibility of the F&WP uses must be understood in context of the unique balance within the Beaver Drainage Improvement Company levees that exists between natural resources and continued land uses dependent on drainage dewatering. Agriculture occupies lands that were formerly riparian habitat and can directly compete with natural resources, including land clearing for cultivation or the application of pest management measures taken to prevent crop loss from birds and foragers. Measures taken to improve natural habitat can likewise have negative consequences for farm uses, by either taking away lands available for farms to expand into or placing flora and fauna in closer proximity to established farm practices. The most dramatic measure to improve habitat, for example, would be the removal of the existing levees. This would render farming in the area virtually impossible but would create substantial swathes of new habitat.

The existing natural resources and farm practices facts are set forth in Section 3. The potential impacts and compatibility externalities of F&WP uses are analyzed in Section 4 which results in guidance to address potential compatibility externalities. Section 4 translates the compatibility analysis results and guidance from Section 4 into conditions of approval. This framework of analysis leading to the development of specific conditions of approval addresses potential compatibility externalities by doing the following:

- The conditions of approval are specific to the F&WP category of uses. This synchs the conditions of approval to the type of potential compatibility externalities presented by F&WP type industrial uses.
- By anchoring the conditions of approval in relation to the F&WP CDF, the conditions of approval have been planned to vary with the intensity of the use F&WP use. This framework does two things. First, it provides Comprehensive Planning level basis for future planning actions to compare a specific development proposal to the documented exception and determine which conditions of approval should apply to the proposal based upon the intensity of the use. Then it imposes specific conditions of approval, set forth in the prior section, to address potential compatibility externalities.

Adjacent non-resource uses, being limited to residential uses associated with farmland, are set forth in Section 3.3. Although the compatibility analysis results and conditions of approval of Section 4 apply to these uses, these non-resource uses may be expected to be more sensitive receptors to light and noise impacts. The impacts of light and noise are specifically addressed by the general requirements of the existing Site Design Review standards and the additional universal conditions discussed in Sections 5.3 and 5.4 respectively to ensure compatibility for uses that create new light or noise sources.

It is CSA's professional opinion that the F&WP CDF framework and associated conditions of approval, in combination with all standard local land use permitting and State and Federal permitting, will ensure compatibility for the following reasons:

- Uses of similar or less intensity than the F&WP CDF are not demonstrably more intensive, and do not present significantly more potential externalities than many other uses that could be allowed without a Goal Exception. Large F&WP uses of similar or lower intensity than the CDF were found to require additional conditions of approval to address potential compatibility externalities, as set forth in Section 5 above, but



otherwise, the standard permitting process and the few conditions of approval set forth above will be adequate to ensure compatibility.

- Uses of more intensity than the F&WP CDF are more intensive, and present significantly more potential externalities, than many other uses that could be allowed without a Goal Exception. For this reason, these uses were found to require additional conditions of approval to ensure compatibility, as set forth in Section 5 above. If a F&WP use that is more intensive than the F&WP CDF is located in the Exception Area, then compatibility can be ensured through compliance with all the standard County, State and Federal permitting and through specific conditions of approval intended to address the following compatibility externalities:
 - Beaver Drainage Improvement Company Levee certification by FEMA demonstrating at least 3 feet of freeboard for the 100-year flood event. This action would ensure compatibility by significantly reducing the risk of flooding for farmland throughout the district and help to ensure the continued viability of the district.
 - Construction to withstand a Cascadia subduction zone magnitude 9 earthquake event to minimize potential offsite disaster externalities from the use in the event of a major seismic event.
 - Enhanced firefighting resources for the fire district which will have a broad benefit to natural resources and farming uses throughout the fire district over time, as well as an on-site industrial fire brigade to minimize the demands on district-wide resources from the use.
 - Land use separation and locational constraints will ensure that physical separation of over 600 feet will exist between the proposed uses and surrounding farm uses. It is expected that much of this “buffer area” will be occupied by wetlands enhancements necessary to permit projects in this area. This physical separation will enhance natural resources within the area while also functioning to provide setback separation from farm uses in the area.
 - For uses that require air permits that require air-quality modeling, additional benefits to reduce mobile source emissions will be modeled and conditions of approval requiring paving and/or sweeping may be imposed for airshed benefits.



5.6 Dry Bulk Commodities Development Scenarios

5.6.1 DBC Guidance for Use Intensity Determination

As discussed above in Section 4, the Dry Bulk Commodities uses are split into three different subcategories. The CDF is used as the baseline for the externalities analysis, with any individual use then classified as either of similar intensity to the CDF, less intense, or more intense. Relative intensity for these subcategories varies for each of the five use categories, as some use categories are judged to be relatively more intense by their essential operating characteristics. This relative intensity is reflected in the compatibility measures that are deemed appropriate for each category as discussed below.

For Dry Bulk Commodities, the Planner would examine the use and then determine if it was less intense than the CDF, similar to the CDF, or more intense than the CDF.

A gypsum wallboard plant was used as the CDF in analysis in Section 4. Such a use will typically occupy 10 acres or more and have relatively complicated processing methods for creating a final industrial product. These processing methods will not rely upon SQEHS or other products that create potentially substantial compatibility externalities, such as explosive materials. Other potential CDFs would be a hydrated lime or a garnet processing plant.

A use less intense than the CDF would have no chemical processing and only simple mechanical processing. Food stuff import or export with minimal processing would be typical for such a use.

A more intense use than the CDF would be of larger scale or involve SQEHS materials. An example of such a use is the import, export, and processing of EHS materials, such as lead concentrates, sulfur, and nickel ore.

After determining the relative intensity of the use in comparison to the DBC CDF, the Planner will be able to determine which additional conditions of approval will apply. These conditions of approval, as set forth in this section, will address key compatibility issues that the universal permitting and universal County criteria could potentially leave unresolved for DBC uses.

5.6.2 DBC Guidance for Application of Use-Specific Conditions and Criteria

CONDITIONS DEVELOPED FOR SPECIFIC USE TYPES BASED UPON ANALYSIS OF POTENTIAL COMPATIBILITY ISSUES

Conditions of Approval for Uses less intense than the DBC CDF:

When a use is deemed to be less intense than the Dry Bulk Commodities CDF, the following conditions of approval will be applied to ensure compatibility:

- **Land Use Separation:** A 150-foot buffer shall be provided between all developed areas and adjoining lands that are not zoned RIPD and not owned by the Port of Columbia County, *see* CSA Tceh Memo at Appendix F. When the proposed dry bulk use is likely to create fugitive dust, such as sand, gypsum, or flour, or any other dry good that has a combination of fine particles, low moisture content, high surface area, or high wind erosion potential, a 300-foot buffer shall be provided between all developed areas and adjoining lands that are not zoned RIPD and not owned by the Port of Columbia County. Road



transportation facilities, utilities, rail facilities, and similar linear features are allowed in the land use separation areas in addition to any uses allowed in the PA-80 zone.

- **Air Quality:** If Air Quality Modeling is required for air quality permit, in addition to all the required air permit modeling for the proposed use, the modeling shall evaluate the mobile source emissions air quality benefits from paving Hermo Road/Collins Road North/Erickson Dike Road and internal Port circulation roads and the benefits from periodic street sweeping. The County may impose a condition of approval through the Site Design Review and RIPD UPUPC land use applications that requires future industrial development in the Exception Area to pave and/or street sweep roads recommended by ODEQ (as part of the air permit or the land use review process).

Uses comparable to DBC CDF:

When a Dry Bulk Commodities use is as intense as the CDF, the following compatibility measures have been determined to be necessary:

- **Land Use Separation:** A 300-foot buffer shall be provided between all developed areas and adjoining lands that are not zoned RIPD and not owned by the Port of Columbia County, *see* CSA Tech Memo at Appendix F. When the proposed dry bulk use is likely to create fugitive dust, such as sand, gypsum, or flour, or any other dry good that has a combination of fine particles, low moisture content, high surface area, or high wind erosion potential, a 600-foot buffer shall be provided between all developed areas and adjoining lands that are not zoned RIPD and not owned by the Port of Columbia County. Road transportation facilities, utilities, rail facilities, and similar linear features are allowed in the land use separation areas in addition to any uses allowed in the PA-80 zone.
- **Air Quality:** If Air Quality Modeling is required for air quality permit, in addition to all the required air permit modeling for the proposed use, the modeling shall evaluate the mobile source emissions air quality benefits from paving Hermo Road/Collins Road North/Erickson Dike Road and internal Port circulation roads and the benefits from periodic street sweeping. The County may impose a condition of approval through the Site Design Review and RIPD UPUPC land use applications that requires future industrial development in the Exception Area to pave and/or street sweep roads recommended by ODEQ (as part of the air permit or the land use review process).

Uses more intense than DBC CDF:

When a use is more intense than the CDF, the following compatibility measures have been determined to be necessary:

- **BDIC Levee System Accreditation:** Prior to permits for construction of the project, levee construction drawings designed to achieve accreditation shall be completed by the project engineer of record. Prior to SQEHS being delivered to the site, the BDIC levee shall be accredited by FEMA as providing protection from the 1-percent annual chance flood event.
- **Floodproofing:** Floodproofing measures intended to limit the potential hazard of the development shall be required in accordance with Federal Emergency Management



Agency (FEMA), Floodproofing Non-Residential Buildings, FEMA P-936, July 2013 (or the most current published standard from FEMA). At minimum, all facilities that will contain EHS will be floodproofed.

- **Seismic Improvement Standards:** All facilities that will contain EHS, and any structures determined by the County to be necessary to protect public health through the site review process, will be constructed to withstand a magnitude 9 earthquake expected from a Cascadian subduction zone earthquake.
- **Land Use Separation:** A 600-foot buffer shall be provided between all developed areas and adjoining lands that are not zoned RIPD and not owned by the Port of Columbia County, *see* CSA Tech Memo at Appendix F. Road transportation facilities, utilities, rail facilities, and similar linear features are allowed in the land use separation areas in addition to any uses allowed in the PA-80 zone.
- **Fire/Life Safety Emergency Response Financing:** The development shall forego participation in the Strategic Investment Program or equivalent program that provides a property tax break that would reduce expected property tax revenue to the Fire District. In the alternative, an agreement shall be reached to backfill the otherwise expected tax revenue for the local Fire District that has jurisdiction over the development.
- **Fire/Life Safety Bridge Financing:** The development shall agree to provide the equivalent of the Fire District's first year's projected tax revenue at the start of vertical construction in order to provide bridge financing to the District.
- **Industrial Fire Brigade:** The Development shall provide an onsite industrial fire brigade if the development is greater than 50 acres or if requested by the Fire Chief.
- **Air Quality:** If Air Quality Modeling is required for air quality permit, in addition to all the required air permit modeling for the proposed use, the modeling shall evaluate the mobile source emissions air quality benefits from paving Herno Road/Collins Road North/Erickson Dike Road and internal Port circulation roads and the benefits from periodic street sweeping. The County may impose a condition of approval through the Site Design Review and RIPD UPUPC land use applications that requires future industrial development in the Exception Area to pave and/or street sweep roads recommended by ODEQ (as part of the air permit or the land use review process).

5.6.3 DBC Compatibility Determination

The compatibility of the DBC uses must be understood in context of the unique *a priori* balance within the Beaver Drainage Improvement Company levees that exists between natural resources and continued land uses dependent on drainage dewatering. Agriculture occupies lands that were formerly riparian habitat and can directly compete with natural resources, including land clearing for cultivation or the application of pest management measures taken to prevent crop loss from birds and foragers. Measures taken to improve natural habitat can likewise have negative consequences for farm uses, by either taking away lands available for farms to expand into or placing flora and fauna in closer proximity to established farm practices. The most dramatic measure to improve habitat, for example, would be the removal of the existing levees. This would render farming in the area virtually impossible but would create substantial swathes of new habitat.



The existing natural resources and farm practices facts are set forth in Section 3. The potential impacts and compatibility externalities of DBC uses are analyzed in Section 4 which results in guidance to address potential compatibility externalities. Section 5 translates the compatibility analysis results and guidance from Section 4 into conditions of approval. This framework of analysis leading to the development of specific conditions of approval to prevent incompatible adverse impacts by doing the following:

- The conditions of approval are specific to the DBC category of uses. This synchs the conditions of approval to the type of potential compatibility externalities presented by DBC type industrial uses.
- By anchoring the conditions of approval in relation to the DBC CDF, the conditions of approval have been planned to vary with the intensity of the use DBC use. This framework does two things. First, it provides Comprehensive Planning level basis for future planning actions to compare a specific development proposal to the documented exception and determine which conditions of approval should apply to the proposal based upon the intensity of the use. Then it imposes specific conditions of approval, set forth in the prior section, to prevent incompatible adverse impacts.

Adjacent non-resource uses, being limited to residential uses associated with farmland, are set forth in Section 3.3. Although the compatibility analysis results and conditions of approval of Section 4 apply to these uses, these non-resource uses may be expected to be more sensitive receptors to light and noise impacts. The impacts of light and noise are specifically addressed by the general requirements of the existing Site Design Review standards and the additional universal conditions discussed in Sections 5.3 and 5.4 respectively to ensure compatibility for uses that create new light or noise sources.

It is CSA's professional opinion that the DBC CDF framework and associated conditions of approval, in combination with all standard local land use permitting and State and Federal permitting, will ensure compatibility for the following reasons:

- Uses of less intensity than the DBC CDF are not demonstrably more intensive, and do not present significantly more potential externalities, than many other uses that could be allowed without an exception. If a DBC use that is less intensive than the DBC CDF is located in the Exception Area, then compatibility can be ensured through compliance with all the standard County, State and Federal permitting and through specific conditions of approval intended to prevent incompatible adverse impacts:
 - Land use separation and locational constraints will ensure that physical separation of over 300 feet will exist between the proposed uses and surrounding farm uses when the proposed DBC use is likely to be a source of fugitive dust emissions. It is expected that much of this "buffer area" will be occupied by wetlands enhancements necessary to permit projects in this area. This physical separation will enhance natural resources within the area while also functioning to provide setback separation from farm uses in the area.



- For uses that require air permits that require air-quality modeling, additional benefits to reduce mobile source emissions will be modeled and conditions of approval requiring paving and/or sweeping may be imposed for airshed benefits.
- Uses of similar intensity to the DBC CDF are not demonstrably more intensive, and do not present significantly more potential externalities than many other uses that could be allowed without an exception. If a DBC use of similar intensity to CDF is located in the Exception Area, then compatibility can be ensured through compliance with all the standard County, State and Federal permitting and through specific conditions of approval intended to prevent incompatible adverse impacts:
 - Land use separation and locational constraints will ensure that physical separation of over 600 feet will exist between the proposed uses and surrounding farm uses when the proposed DBC use is likely to be source of fugitive dust emissions. It is expected that much of this “buffer area” will be occupied by wetlands enhancements necessary to permit projects in this area. This physical separation will enhance natural resources within the area while also functioning to provide setback separation from farm uses in the area.
 - For uses that require air permits that require air-quality modeling, additional benefits to reduce mobile source emissions will be modeled and conditions of approval requiring paving and/or sweeping may be imposed for airshed benefits.
- Uses of more intensity than the DBC CDF are more intensive, and present significantly more potential externalities, than many other uses that could be allowed without an exception. For this reason, these uses were found to require additional conditions of approval to ensure compatibility, as set forth in Section 5 above. If a DBC use that is more intensive than the DBC CDF is located in the Exception Area, then compatibility can be ensured through compliance with all the standard County, State and Federal permitting and through specific conditions of approval intended to prevent incompatible adverse impacts:
 - Beaver Drainage Improvement Company Levee certification by FEMA demonstrating at least 3 feet of freeboard for the 100-year flood event. This action would ensure compatibility by significantly reducing the risk of flooding for farmland throughout the district and help to ensure the continued viability of the district.
 - Floodproofing of industrial development will provide additional protection from flood water inundation to minimize potential offsite disaster externalities from the use in the event of a major flood event and the failure or exceedance of the accredited levee.
 - Construction to withstand a Cascadia subduction zone magnitude 9 earthquake event to minimize potential offsite disaster externalities from the use in the event of a major seismic event.
 - Enhanced firefighting resources for the fire district which will have a broad benefit to natural resources and farming uses throughout the fire district over time, as well as an on-site industrial fire brigade to minimize the demands on district-wide resources from the use.



- Land use separation and locational constraints will ensure that physical separation of over 600 feet will exist between the proposed uses and surrounding farm uses. It is expected that much of this “buffer area” will be occupied by wetlands enhancements necessary to permit projects in this area. This physical separation will enhance natural resources within the area while also functioning to provide setback separation from farm uses in the area.
- For uses that require air permits that require air-quality modeling, additional benefits to reduce mobile source emissions will be modeled and conditions of approval requiring paving and/or sweeping may be imposed for airshed benefits.

5.7 Liquid Bulk Commodities Development Scenarios

5.7.1 LBC Guidance for Use Intensity Determination

As discussed above in Section 4, the Liquid Bulk Commodities uses are split into three different subcategories. The CDF is used as the baseline for the externalities analysis, with any individual use then classified as either of similar intensity to the CDF, less intense, or more intense. Relative intensity for these subcategories varies for each of the five use categories, as some use categories are judged to be relatively more intense by their essential operating characteristics. For example, LBC uses with SQEHS is relatively intense in comparison to Forestry or Wood Products uses. This relatively intensity is reflected in the compatibility measures that are deemed appropriate for each category as discussed below.

For Liquid Bulk Commodities, the Planner would examine the use and then determine if it was less intense than the CDF, similar to the CDF, or more intense than the CDF.

An ethanol processing facility was used as the CDF in analysis in Section 4. Such a use will typically occupy 20 acres or more and have relatively complicated processing methods for creating a final industrial product. These processing methods may involve some EHS or other products that create potential compatibility impacts.

A use less intense than the CDF would have limited or no EHS and only simple mechanical processing. The import, export, or limited processing of liquid bulk materials, such as cooking oils, milk, or juice would be examples of this category.

A more intense use than the CDF would be of larger scale and require SQEHS. An example of such a use is petroleum storage and refining, which involves substantial quantities of chemicals classified as EHS or explosive.

After determining the relative intensity of the use in comparison to the Liquid Bulk Commodities CDF, the Planner will be able to determine which additional conditions of approval will apply. These conditions of approval, as set forth in this section, will address key compatibility issues that the universal permitting and universal County criteria could potentially leave unresolved for LBC uses.

5.7.2 LBC Guidance for Application of Use-Specific Conditions and Criteria

CONDITIONS DEVELOPED FOR SPECIFIC USE TYPES BASED UPON ANALYSIS OF POTENTIAL COMPATIBILITY ISSUES

Conditions of Approval for Uses less intense than LBC CDF:

When a use is deemed to be less intense than the CDF, the following conditions of approval will be applied to ensure compatibility:

- **Floodproofing:** Floodproofing measures intended to limit the potential hazard of the development shall be required in accordance with Federal Emergency Management Agency (FEMA), Floodproofing Non-Residential Buildings, FEMA P-936, July 2013 (or the most current published standard from FEMA). At minimum, all facilities that will contain EHS will be floodproofed.



- **Seismic Improvement Standards:** When the proposed development has the capacity to store 100 million gallons of liquid bulk materials, the proposed development shall construct structures to meet a magnitude 9 earthquake expected from a Cascadian subduction zone earthquake. All facilities that will contain EHS, and any other structures determined by the County to be necessary to protect public health through the site review process, will be constructed to withstand a magnitude 9 earthquake expected from a Cascadian subduction zone earthquake⁴⁷.
- **Land Use Separation:** A 150-foot buffer shall be provided between all developed areas and adjoining lands that are not zoned RIPD and not owned by the Port of Columbia County, *see* CSA Tech Memo at Appendix F. Road transportation facilities, utilities, rail facilities, and similar linear features are allowed in the land use separation areas in addition to any uses allowed in the PA-80 zone.

Uses comparable to LBC CDF:

When a use is as intense as the CDF, the following compatibility measures have been determined to be necessary:

- **Floodproofing:** Floodproofing measures intended to limit the potential hazard of the development shall be required in accordance with Federal Emergency Management Agency (FEMA), Floodproofing Non-Residential Buildings, FEMA P-936, July 2013 (or the most current published standard from FEMA). At minimum, all facilities that will contain EHS will be floodproofed.
- **Seismic Improvement Standards:** When the proposed development has the capacity to store 10 million gallons of liquid bulk materials, the proposed development shall construct structures to meet a magnitude 9 earthquake expected from a Cascadian subduction zone earthquake. All facilities that will contain EHS, and any structures determined by the County to be necessary to protect public health through the site review process, will be constructed to withstand a magnitude 9 earthquake expected from a Cascadian subduction zone earthquake⁴⁸.
- **Land Use Separation:** A 300-foot buffer shall be provided between all developed areas and adjoining lands that are not zoned RIPD and not owned by the Port of Columbia County, *see* CSA Tech Memo at Appendix F. Road transportation facilities, utilities, rail facilities, and similar linear features are allowed in the land use separation areas in addition to any uses allowed in the PA-80 zone.

⁴⁷ Uses subject to SB 1537 – 2022 and its rule at OAR 340, Division 300 may rely on seismic design and permitting requirements to satisfy this condition of approval. However, the County may impose additional seismic requirements to satisfy the condition as part of the site plan review process for the proposed specific use.

⁴⁸ Uses subject to SB 1537 – 2022 and its rule at OAR 340, Division 300 may rely on seismic design and permitting requirements to satisfy this condition of approval. However, the County may impose additional seismic requirements to satisfy the condition as part of the site plan review process for the proposed specific use.



- **Fire/Life Safety Emergency Response Financing:** The development shall forego participation in the Strategic Investment Program or equivalent program that provides a property tax break that would reduce expected property tax revenue to the Fire District if it is greater than 50 acres in size. In the alternative, an agreement shall be reached to backfill the otherwise expected tax revenue for the local Fire District that has jurisdiction over the development.
- **Fire/Life Safety Bridge Financing:** The development shall agree to provide the equivalent of the Fire District's first year's projected tax revenue at the start of vertical construction in order to provide bridge financing to the District if it is greater than 50 acres in size.
- **Industrial Fire Brigade:** The Development shall provide an onsite industrial fire brigade if requested by the Fire Chief.
- **Air Quality:** If Air Quality Modeling is required for air quality permit, in addition to all the required air permit modeling for the proposed use, the modeling shall evaluate the mobile source emissions air quality benefits from paving Hermo Road/Collins Road North/Erickson Dike Road and internal Port circulation roads and the benefits from periodic street sweeping. The County may impose a condition of approval through the Site Design Review and RIPD UPUPC land use applications that requires future industrial development in the Exception Area to pave and/or street sweep roads recommended by ODEQ (as part of the air permit or the land use review process).

Uses more intense than LBC CDF:

When a use is more intense than the CDF, the following compatibility measures have been determined to be necessary:

- **BDIC Levee System Accreditation:** Prior to permits for construction of the project, levee construction drawings designed to achieve accreditation shall be completed by the project engineer of record. Prior to SQEHS being delivered to the site, the BDIC levee shall be accredited by FEMA as providing protection from the 1-percent annual chance flood event.
- **Floodproofing:** Floodproofing measures intended to limit the potential hazard of the development shall be required in accordance with Federal Emergency Management Agency (FEMA), Floodproofing Non-Residential Buildings, FEMA P-936, July 2013 (or the most current published standard from FEMA). At minimum, all facilities that will contain EHS will be floodproofed.
- **Seismic Improvement Standards:** All facilities that will contain EHS, and any structures determined by the County to be necessary to protect public health through the site review process, will be constructed to withstand a magnitude 9 earthquake expected from a Cascadian subduction zone earthquake⁴⁹.

⁴⁹ Uses subject to SB 1537 – 2022 and its rule at OAR 340. Division 300 may rely on seismic design and permitting requirements to satisfy this condition of approval. However, the County may impose additional seismic requirements to satisfy the condition as part of the site plan review process for the proposed specific use.



- **Land Use Separation:** A 600-foot buffer shall be provided between all developed areas and adjoining lands that are not zoned RIPD and not owned by the Port of Columbia County, *see* CSA Tech Memo at Appendix F. An additional separation of 400 feet (for a total of 1000-feet) shall be required from occupied structures on adjoining lands that are not zoned RIPD and not owned by the Port of Columbia County. Road transportation facilities, utilities, rail facilities, and similar linear features are allowed in the land use separation areas in addition to any uses allowed in the PA-80 zone.
- **Fire/Life Safety Emergency Response Financing:** The development shall forego participation in the Strategic Investment Program or equivalent program that provides a property tax break that would reduce expected property tax revenue to the Fire District. In the alternative, an agreement shall be reached to hackfill the otherwise expected tax revenue for the local Fire District that has jurisdiction over the development.
- **Fire/Life Safety Bridge Financing:** The development shall agree to provide the equivalent of the Fire District's first year's projected tax revenue at the start of vertical construction in order to provide bridge financing to the District.
- **Industrial Fire Brigade:** The Development shall provide an onsite industrial fire brigade.
- **Air Quality:** If Air Quality Modeling is required for air quality permit, in addition to all the required air permit modeling for the proposed use, the modeling shall evaluate the mobile source emissions air quality benefits from paving Hermo Road/Collins Road North/Erickson Dike Road and internal Port circulation roads and the benefits from periodic street sweeping. The County may impose a condition of approval through the Site Design Review and RIPD Use Permitted Under Prescribed Conditions land use applications that requires future industrial development in the Exception Area to pave and/or street sweep roads recommended by ODEQ (as part of the air permit or the land use review process).

5.7.3 LBC Compatibility Determination

The compatibility of the LBC uses must be understood in context of the unique *a priori* balance within the Beaver Drainage Improvement Company levees that exists between natural resources and continued land uses dependent on drainage dewatering. Agriculture occupies lands that were formerly riparian habitat and can directly compete with natural resources, including land clearing for cultivation or the application of pest management measures taken to prevent crop loss from birds and foragers. Measures taken to improve natural habitat can likewise have negative consequences for farm uses, by either taking away lands available for farms to expand into or placing flora and fauna in closer proximity to established farm practices. The most dramatic measure to improve habitat, for example, would be the removal of the existing levees. This would render farming in the area virtually impossible but would create substantial swathes of new habitat.



The existing natural resources and farm practices facts are set forth in Section 3. The potential impacts and compatibility externalities of LBC uses are analyzed in Section 4 which results in guidance to address potential compatibility externalities. Section 5 translates the compatibility analysis results and guidance from Section 4 into conditions of approval. This framework of analysis leading to the development of specific conditions of approval prevent incompatible adverse impacts by doing the following:

- The conditions of approval are specific to the LBC category of uses. This synchs the conditions of approval to the type of potential compatibility externalities presented by LBC type industrial uses.
- By anchoring the conditions of approval in relation to the LBC CDF, the conditions of approval have been planned to vary with the intensity of the LBC use. This framework does two things. First, it provides Comprehensive Planning level basis for future planning actions to compare a specific development proposal to the documented exception and determine which conditions of approval should apply to the proposal based upon the intensity of the use. Then it imposes specific conditions of approval, set forth in the prior section, to address potential compatibility externalities.

Adjacent non-resource uses, being limited to residential uses associated with farmland, are set forth in Section 3.3. Although the compatibility analysis results and conditions of approval of Section 4 apply to these uses, these non-resource uses may be expected to be more sensitive receptors to light and noise impacts. The impacts of light and noise are specifically addressed by the general requirements of the existing Site Design Review standards and the additional universal conditions discussed in Sections 5.3 and 5.4 respectively to ensure compatibility for uses that create new light or noise sources.

It is CSA's professional opinion that the LBC CDF framework and associated conditions of approval, in combination with all standard local land use permitting and State and Federal permitting, will ensure compatibility for the following reasons:

- Uses of less intensity than the LBC CDF are not demonstrably more intensive, and do not present significantly more potential externalities, than many other uses that could be allowed without an exception. If an LBC use that is less intensive than the LBC CDF is located in the Exception Area, then compatibility can be ensured through compliance with all the standard County, State and Federal permitting and through specific conditions of approval intended to address the following compatibility externalities:
 - Land use separation and locational constraints will ensure that physical separation of over 150 feet will exist between the proposed uses. It is expected that much of this "buffer area" will be occupied by wetlands enhancements necessary to permit projects in this area. This physical separation will enhance natural resources within the area while also functioning to provide setback separation from farm uses in the area.



- Requiring uses with 100 million gallons or more of tankage capacity to provide additional seismic construction protections will minimize the potential for even these relatively benign liquid materials from leaving the site in the event where significant quantities would be present due to scale.
- Requiring floodproof construction will be important to ensure tanks will resist buoyancy and stay in place during a flood event which is protective of surrounding properties and natural resources.
- Uses of similar intensity to the LBC CDF are more intensive, and present more potential externalities, than many other uses that could be allowed without an exception. If an LBC use of similar intensity to CDF is located in the Exception Area, then compatibility can be ensured through compliance with all the standard County, State and Federal permitting and through specific conditions of approval intended to prevent incompatible adverse impacts:
 - Land use separation and locational constraints will ensure that physical separation of over 300 feet will exist between the proposed uses and surrounding farm uses. It is expected that much of this “buffer area” will be occupied by wetlands enhancements necessary to permit projects in this area. This physical separation will enhance natural resources within the area while also functioning to provide setback separation from farm uses in the area.
 - Requiring uses with 10 million gallons or more of tankage capacity to provide additional seismic construction protections will minimize the potential for even these non-hazardous liquid materials from leaving the site in the event where significant quantities would be present due to scale.
 - Requiring floodproof construction will be important to ensure tanks will resist buoyancy and stay in place during a flood event which is protective of surrounding properties and natural resources.
 - Enhanced firefighting resources for the fire district which will have a broad benefit to natural resources and farming uses throughout the fire district over time, as well as an on-site industrial fire brigade if requested by the Fire Chief, to minimize the demands on district-wide resources from the use.
 - For uses that require air permits that require air-quality modeling, additional benefits to reduce mobile source emissions will be modeled and conditions of approval requiring paving and/or sweeping may be imposed for airshed benefits.



- Uses of more intensity than the LBC CDF are more intensive, and present significantly more potential externalities than many other uses that could be allowed without an exception. For this reason, these uses were found to require additional conditions of approval to ensure compatibility, as set forth in Section 5 above. If an LBC use that is more intensive than the LBC CDF is located in the Exception Area, then compatibility can be ensured through compliance with all the standard County, State and Federal permitting and through specific conditions of approval intended to address the following compatibility externalities:
 - Beaver Drainage Improvement Company Levee certification by FEMA demonstrating at least sufficient freeboard for the 100-year flood event. This action would ensure compatibility by significantly reducing the risk of flooding for farmland throughout the district and help to ensure the continued viability of the district.
 - Floodproofing of industrial development will provide additional protection from flood water inundation to minimize potential offsite disaster externalities from the use in the event of a major flood event and the failure or exceedance of the accredited levee.
 - Construction to withstand a Cascadia subduction zone magnitude 9 earthquake event to minimize potential offsite disaster externalities from the use in the event of a major seismic event.
 - Land use separation and locational constraints will ensure that physical separation of over 600 feet will exist between the proposed uses and surrounding farm uses. An additional 400 feet of physical separation will be required between the use and any occupied farm structures and the use; the additional 400 feet of physical separation functions to further ensure compatibility with adjacent residential uses. It is expected that much of this “buffer area” will be occupied by wetlands enhancements necessary to permit projects in this area. This physical separation will enhance natural resources within the area while also functioning to provide setback separation from farm uses in the area.
 - Enhanced firefighting resources for the fire district which will have a broad benefit to natural resources and farming uses throughout the fire district over time, as well as an on-site industrial fire brigade to minimize the demands on district-wide resources from the use.
 - For uses that require air permits that require air-quality modeling, additional benefits to reduce mobile source emissions will be modeled and conditions of approval requiring paving and/or sweeping may be imposed for airshed benefits.



5.8 Natural Gas and Derivative Products Development Scenarios

5.8.1 NG&DP Guidance for Use Intensity Determination

As discussed above in Section 4, the Natural Gas and Derivative Products uses are split into three different subcategories. The CDF is used as the baseline for the externalities analysis, with any individual use then classified as either of similar intensity to the CDF, less intense, or more intense. Relative intensity for these subcategories varies for each of the five use categories, as some use categories are judged to be relatively more intense by their essential operating characteristics. For example, any of the Natural Gas production uses are relatively intense in comparison to most Forestry or Wood Products use. This relative intensity is reflected in the compatibility measures that are deemed appropriate for each category as discussed below.

For NG&DP, the Planner would examine the use and then determine if it was less intense than the CDF, similar to the CDF, or more intense than the CDF.

A liquified natural gas facility was used as the CDF in analysis in Section 4. Such a use will typically occupy large areas, being closer to hundreds of acres than tens of acres, and requires complicated processing methods to create a final industrial product. These processing methods involve products that create potentially substantial compatibility externalities, such as explosive materials.

A use less intense than the CDF would include a utility peaker plant, such as the two facilities that are already in operation at Port Westward.

A more intense use than the CDF would be an ammonium nitrate fertilizer plant. Ammonium nitrate is flammable, potentially explosive, can produce large quantities of heat, gas, and pressure when decomposed, and a strong oxidizer.

After determining the relative intensity of the use in comparison to the NG&DP CDF, the Planner will be able to determine which additional conditions of approval will apply. These conditions of approval, as set forth in this section, will address key compatibility issues that the universal permitting and universal County criteria could potentially leave unresolved for NG&DP uses.

5.8.2 NG&DP Guidance for Application of Use-Specific Conditions and Criteria

CONDITIONS DEVELOPED FOR SPECIFIC USE TYPES BASED UPON ANALYSIS OF POTENTIAL COMPATIBILITY ISSUES

Conditions of Approval for Uses less intense than NG&DP CDF:

When a use is deemed to be less intense than the CDF, the following conditions of approval will be applied to ensure compatibility:

- **Floodproofing:** Floodproofing measures intended to limit the potential hazard of the development shall be required in accordance with Federal Emergency Management Agency (FEMA), Floodproofing Non-Residential Buildings, FEMA P-936, July 2013 (or the most current published standard from FEMA). At minimum, all facilities that will contain EHS will be floodproofed.



- **Seismic Improvement Standards:** All facilities that will contain EHS, and any structures determined by the County to be necessary to protect public health through the site review process, will be constructed to withstand a magnitude 9 earthquake expected from a Cascadian subduction zone earthquake⁵⁰.
- **Land Use Separation:** A 300-foot buffer shall be provided between all developed areas and adjoining lands that are not zoned RIPD and not owned by the Port of Columbia County, *see* CSA Tech Memo at Appendix F. Road transportation facilities, utilities, rail facilities, and similar linear features are allowed in the land use separation areas in addition to any uses allowed in the PA-80 zone.
- **Fire/Life Safety Emergency Response Financing:** The development shall forego participation in the Strategic Investment Program or equivalent program that provides a property tax break that would reduce expected property tax revenue to the Fire District. In the alternative, an agreement shall be reached to backfill the otherwise expected tax revenue for the local Fire District that has jurisdiction over the development.
- **Industrial Fire Brigade:** The Development shall provide an onsite industrial fire brigade if requested by the Fire Chief.
- **Air Quality:** If Air Quality Modeling is required for air quality permit, in addition to all the required air permit modeling for the proposed use, the modeling shall evaluate the mobile source emissions air quality benefits from paving Hermo Road/Collins Road North/Erickson Dike Road and internal Port circulation roads and the benefits from periodic street sweeping. The County may impose a condition of approval through the Site Design Review and RIPD UPUPC land use applications that requires future industrial development in the Exception Area to pave and/or street sweep roads recommended by ODEQ (as part of the air permit or the land use review process).

Uses comparable to NG&DP CDF:

When a use is as intense as the CDF, the following compatibility measures have been determined to be necessary:

- **BDIC Levee System Accreditation:** Prior to permits for construction of the project, levee construction drawings designed to achieve accreditation shall be completed by the project engineer of record. Prior to SQEHS being delivered to the site, the BDIC levee shall be accredited by FEMA as providing protection from the 1-percent annual chance flood event.
- **Floodproofing:** Floodproofing measures intended to limit the potential hazard of the development shall be required in accordance with Federal Emergency Management Agency (FEMA), Floodproofing Non-Residential Buildings, FEMA P-936, July 2013 (or the most current published standard from FEMA). At minimum, all facilities that will contain EHS will be floodproofed.

⁵⁰ Uses subject to SB 1537 – 2022 and its rule at OAR 340, Division 300 may rely on seismic design and permitting requirements to satisfy this condition of approval. However, the County may impose additional seismic requirements to satisfy the condition as part of the site plan review process for the proposed specific use.



- **Seismic Improvement Standards:** All facilities that will contain EHS, and any structures determined by the County to be necessary to protect public health through the site review process, will be constructed to withstand a magnitude 9 earthquake expected from a Cascadian subduction zone earthquake⁵¹.
- **Land Use Separation:** A 600-foot buffer shall be provided between all developed areas and adjoining lands that are not zoned RIPD and not owned by the Port of Columbia County, *see* CSA Tech Memo at Appendix F. Road transportation facilities, utilities, rail facilities, and similar linear features are allowed in the land use separation areas in addition to any uses allowed in the PA-80 zone.
- **Fire/Life Safety Emergency Response Financing:** The development shall forego participation in the Strategic Investment Program or equivalent program that provides a property tax break that would reduce expected property tax revenue to the Fire District. In the alternative, an agreement shall be reached to backfill the otherwise expected tax revenue for the local Fire District that has jurisdiction over the development.
- **Fire/Life Safety Bridge Financing:** The development shall agree to provide the equivalent of the Fire District's first year's projected tax revenue at the start of vertical construction in order to provide bridge financing to the District.
- **Industrial Fire Brigade:** The Development shall provide an onsite industrial fire brigade.
- **Air Quality:** If Air Quality Modeling is required for air quality permit, in addition to all the required air permit modeling for the proposed use, the modeling shall evaluate the mobile source emissions air quality benefits from paving Herno Road/Collins Road North/Erickson Dike Road and internal Port circulation roads and the benefits from periodic street sweeping. The County may impose a condition of approval through the Site Design Review and RIPD UPUPC land use applications that requires future industrial development in the Exception Area to pave and/or street sweep roads recommended by ODEQ (as part of the air permit or the land use review process).

Uses more intense than NG&DP CDF:

When a use is more intense than the CDF, the following compatibility measures have been determined to be necessary:

- **BDIC Levee System Accreditation:** Prior to permits for construction of the project, levee construction drawings designed to achieve accreditation shall be completed by the project engineer of record. Prior to SQEHS being delivered to the site, the BDIC levee shall be accredited by FEMA as providing protection from the 1-percent annual chance flood event.
- **Floodproofing:** Floodproofing measures intended to limit the potential hazard of the development shall be required in accordance with Federal Emergency Management Agency (FEMA), Floodproofing Non-Residential Buildings, FEMA P-936, July 2013 (or

⁵¹ Uses subject to SB 1537 – 2022 and its rule at OAR 340. Division 300 may rely on seismic design and permitting requirements to satisfy this condition of approval. However, the County may impose additional seismic requirements to satisfy the condition as part of the site plan review process for the proposed specific use.



the most current published standard from FEMA). At minimum, all facilities that will contain EHS will be floodproofed.

- **Seismic Improvement Standards:** All facilities that will contain EHS, and any structures determined by the County to be necessary to protect public health through the site review process, will be constructed to withstand a magnitude 9 earthquake expected from a Cascadian subduction zone earthquake⁵².
- **Land Use Separation:** A 600-foot land use separation shall be provided between all developed areas and adjoining lands that are not zoned RIPD or not owned by the Port of Columbia County, *see* CSA Tech Memo at Appendix F. An additional separation of 400 feet (for a total of 1000-feet) shall be required from occupied structures on adjoining lands that are not zoned RIPD and not owned by the Port of Columbia County. Road transportation facilities, utilities, rail facilities, and similar linear features are allowed in the land use separation areas in addition to any uses allowed in the PA-80 zone.
- **Fire/Life Safety Emergency Response Financing:** The development shall forego participation in the Strategic Investment Program or equivalent program that provides a property tax break that would reduce expected property tax revenue to the Fire District. In the alternative, an agreement shall be reached to backfill the otherwise expected tax revenue for the local Fire District that has jurisdiction over the development. By agreement, contract for services for 24/7 staffing of Quincy Fire Station (or its successor).
- **Quincy Fire Station:** Reconstruct Quincy Fire Station to add capacity for one additional fire engine and one additional fire truck.
- **Fire/Life Safety Bridge Financing:** The development shall agree to provide the equivalent of the Fire District's first year's projected tax revenue at the start of vertical construction in order to provide bridge financing to the District.
- **Industrial Fire Brigade:** The Development shall provide an onsite fire brigade.
- **Air Quality:** If Air Quality Modeling is required for air quality permit, in addition to all the required air permit modeling for the proposed use, the modeling shall evaluate the mobile source emissions air quality benefits from paving Hermo Road/Collins Road North/Erickson Dike Road and internal Port circulation roads and the benefits from periodic street sweeping. The County may impose a condition of approval through the Site Design Review and RIPD Use Permitted Under Prescribed Conditions land use applications that requires future industrial development in the Exception Area to pave and/or street sweep roads recommended by ODEQ (as part of the air permit or the land use review process).

⁵² Uses subject to SB 1537 – 2022 and its rule at OAR 340. Division 300 may rely on seismic design and permitting requirements to satisfy this condition of approval. However, the County may impose additional seismic requirements to satisfy the condition as part of the site plan review process for the proposed specific use.



5.8.3 NG&DP Compatibility Determination

The compatibility of the NG&DP uses must be understood in context of the unique *a priori* balance within the Beaver Drainage Improvement Company levees that exists between natural resources and continued land uses dependent on drainage dewatering. Agriculture occupies lands that were formerly riparian habitat and can directly compete with natural resources, including land clearing for cultivation or the application of pest management measures taken to prevent crop loss from birds and foragers. Measures taken to improve natural habitat can likewise have negative consequences for farm uses, by either taking away lands available for farms to expand into or placing flora and fauna in closer proximity to established farm practices. The most dramatic measure to improve habitat, for example, would be the removal of the existing levees. This would render farming in the area virtually impossible but would create substantial swathes of new habitat.

The existing natural resources and farm practices facts are set forth in Section 4. The potential impacts and compatibility externalities of NG&DP uses are analyzed in Section 4 which results in guidance to address potential compatibility externalities. Section 5 translates the compatibility analysis results and guidance from Section 4 into conditions of approval. This framework of analysis leading to the development of specific conditions of approval addresses potential compatibility externalities by doing the following:

- The conditions of approval are specific to the NG&DP category of uses. This synchs the conditions of approval to the type of potential compatibility externalities presented by NG&DP type industrial uses.
- By anchoring the conditions of approval in relation to the NG&DP CDF, the conditions of approval have been planned to vary with the intensity of the use NG&DP use. This framework does two things. First, it provides Comprehensive Planning level basis for future planning actions to compare a specific development proposal to the documented exception and determine which conditions of approval should apply to the proposal based upon the intensity of the use. Then it imposes specific conditions of approval, set forth in the prior section, to address potential compatibility externalities.

Adjacent non-resource uses, being limited to residential uses associated with farmland, are set forth in Section 3.3. Although the compatibility analysis results and conditions of approval of Section 4 apply to these uses, these non-resource uses may be expected to be more sensitive receptors to light and noise impacts. The impacts of light and noise are specifically addressed by the general requirements of the existing Site Design Review standards and the additional universal conditions discussed in Sections 5.3 and 5.4 respectively to ensure compatibility for uses that create new light or noise sources.



It is CSA's professional opinion that the NG&DP CDF framework and associated conditions of approval, in combination with all standard local land use permitting and State and Federal permitting, will ensure compatibility for the following reasons:

- Uses of less intensity than the NG&DP CDF are relatively more intensive, and present more potential externalities, than many other uses that could be allowed without an exception. If an NG&DP use that is less intensive than the NG&DP CDF is located in the Exception Area, then compatibility can be ensured through compliance with all the standard County, State and Federal permitting and through specific conditions of approval intended to address the following compatibility externalities:
 - Floodproofing of industrial development will provide additional protection from flood water inundation to minimize potential offsite disaster externalities from the use in the event of a major flood event and the failure or exceedance of the accredited levee.
 - Land use separation and locational constraints will ensure that physical separation of over 300 feet will exist between the proposed uses. It is expected that much of this "buffer area" will be occupied by wetlands enhancements necessary to permit projects in this area. This physical separation will enhance natural resources within the area while also functioning to provide setback separation from farm uses in the area.
 - Construction to withstand a Cascadia subduction zone magnitude 9 earthquake event to minimize potential offsite disaster externalities from the use in the event of a major seismic event.
 - Enhanced firefighting resources for the fire district which will have a broad benefit to natural resources and farming uses throughout the fire district over time, as well as an on-site industrial fire brigade if requested by the Fire Chief, to minimize the demands on district-wide resources from the use.
 - For uses that require air permits that require air-quality modeling, additional benefits to reduce mobile source emissions will be modeled and conditions of approval requiring paving and/or sweeping may be imposed for airshed benefits.
- Uses of similar intensity to the NG&DP CDF are substantially more intensive, and present more potential externalities, than many other uses that could be allowed without an exception. For this reason, these uses were found to require additional conditions of approval to ensure compatibility, as set forth in Section 5 above. If an NG&DP use of similar intensity to CDF is located in the Exception Area, then compatibility can be ensured through compliance with all the standard County, State and Federal permitting and through specific conditions of approval intended to address the following compatibility externalities:
 - Beaver Drainage Improvement Company Levee certification by FEMA demonstrating at least 3 feet of freeboard for the 100-year flood event. This action would ensure compatibility by significantly reducing the risk of flooding for farmland throughout the district and help to ensure the continued viability of the district.



- Floodproofing of industrial development will provide additional protection from flood water inundation to minimize potential offsite disaster externalities from the use in the event of a major flood event and the failure or exceedance of the accredited levee.
- Construction to withstand a Cascadia subduction zone magnitude 9 earthquake event to minimize potential offsite disaster externalities from the use in the event of a major seismic event.
- Enhanced firefighting resources for the fire district which will have a broad benefit to natural resources and farming uses throughout the fire district over time, as well as an on-site industrial fire brigade to minimize the demands on district-wide resources from the use.
- Land use separation and locational constraints will ensure that physical separation of over 600 feet will exist between the proposed uses and surrounding farm uses. It is expected that much of this “buffer area” will be occupied by wetlands enhancements necessary to permit projects in this area. This physical separation will enhance natural resources within the area while also functioning to provide setback separation from farm uses in the area.
- For uses that require air permits that require air-quality modeling, additional benefits to reduce mobile source emissions will be modeled and conditions of approval requiring paving and/or sweeping may be imposed for airshed benefits.
- Uses of more intensity than the NG&DP CDF are considerably more intensive, and present significantly more potential externalities, than many other uses that could be allowed without an exception. For this reason, these uses were found to require additional conditions of approval to ensure compatibility, as set forth in Section 5 above. If an NG&DP use that is more intensive than the NG&DP CDF is located in the Exception Area, then compatibility can be ensured through compliance with all the standard County, State and Federal permitting and through specific conditions of approval intended to address the following compatibility externalities:
 - Beaver Drainage Improvement Company Levee certification by FEMA demonstrating at least 3 feet of freeboard for the 100-year flood event. This action would ensure compatibility by significantly reducing the risk of flooding for farmland throughout the district and help to ensure the continued viability of the district.
 - Floodproofing of industrial development will provide additional protection from flood water inundation to minimize potential offsite disaster externalities from the use in the event of a major flood event and the failure or exceedance of the accredited levee.
 - Construction to withstand a Cascadia subduction zone magnitude 9 earthquake event to minimize potential offsite disaster externalities from the use in the event of a major seismic event.
 - Enhanced firefighting resources for the fire district, including funding for additional staff and the reconstruction of the nearest fire station, will have a broad benefit to natural resources and farming uses throughout the fire district over time, as well as an



on-site industrial fire brigade to minimize the demands on district-wide resources from the use.

- Land use separation and locational constraints will ensure that physical separation of over 600 feet will exist between the proposed uses and surrounding farm uses. An additional 400 feet of physical separation will be required between the use and any occupied farm structures and the use; the additional 400 feet of physical separation functions to further ensure compatibility with adjacent residential uses. It is expected that much of this “buffer area” will be occupied by wetlands enhancements necessary to permit projects in this area. This physical separation will enhance natural resources within the area while also functioning to provide setback separation from farm uses in the area.
- For uses that require air permits that require air-quality modeling, additional benefits to reduce mobile source emissions will be modeled and conditions of approval requiring paving and/or sweeping may be imposed for airshed benefits.

5.9 Breakbulk Storage Development Scenarios

5.9.1 Breakbulk Storage Guidance Application of Universal Conditions and Criteria

As discussed herein above in Section 4, the Breakbulk Storage uses are split into three different subcategories. The CDF is used as the baseline for the externalities analysis, with any individual use then classified as either similar to the CDF, less intense, or more intense. Relative intensity for these subcategories varies for each of the five use categories, as some use categories are judged to be relatively more intense by their essential operating characteristics. This relative intensity is reflected in the compatibility measures that are deemed appropriate for each category as discussed below.

For Breakbulk Storage uses, the Planner would examine the use and then determine if it was less intense than the CDF, similar to the CDF, or more intense than the CDF.

A breakbulk import facility with additional processing, such as SteelScape, was used as the CDF in analysis in Section 4. Such a use will typically occupy more than 10 acres or more and have relatively complicated processing methods for creating a final industrial product. These processing methods will not rely upon SQEHS or other products that create potentially substantial compatibility externalities, such as explosive materials.

A use less intense than the CDF would be a non-EHS import facility with minimal additional processing. This would include the import of such items as lumber, unitized cargo, automobiles, and machinery.

A more intense use than the CDF would be bulk EHS or explosive materials handling. An example of such a use is found in Port Westward’s history in the form of the Beaver Ammunition Storage Depot. Other potentially EHS containing materials would include items such as batteries, bleach, or other explosives.



After determining the relative intensity of the use in comparison to the Breakbulk Storage CDF, the Planner will be able to determine which additional conditions of approval will apply. These conditions of approval, as set forth in this section, will address key compatibility issues that the universal permitting and universal County criteria could potentially leave unresolved for Breakbulk Storage uses.

5.9.2 Breakbulk Storage Guidance for Application of Use-Specific Conditions and Criteria

CONDITIONS DEVELOPED FOR SPECIFIC USE TYPES BASED UPON ANALYSIS OF POTENTIAL COMPATIBILITY ISSUES

Conditions of Approval for Uses less intense than Breakbulk Storage CDF:

When a use is deemed to be less intense than the CDF, the following conditions of approval will be applied to ensure compatibility:

- **Land Use Separation:** A 150-foot buffer shall be provided between all developed areas and adjoining lands that are not zoned RIPD and not owned by the Port of Columbia County, *see* CSA Tech Memo at Appendix F. Road transportation facilities, utilities, rail facilities, and similar linear features are allowed in the land use separation areas in addition to any uses allowed in the PA-80 zone.

Uses comparable to Breakbulk Storage CDF:

When a use is as intense as the CDF, the following compatibility measures have been determined to be necessary:

- **Floodproofing:** When the proposed development includes buoyant commodities or contains containers that may be buoyant, floodproofing measures intended to limit the potential hazard of the development shall be required in accordance with Federal Emergency Management Agency (FEMA), Floodproofing Non-Residential Buildings, FEMA P-936, July 2013 (or the most current published standard from FEMA). At minimum, all facilities that will contain EHS will be floodproofed.
- **Land Use Separation:** When the proposed development is less than 50 acres, a 150-foot buffer shall be provided between all developed areas and adjoining lands that are not zoned RIPD or not owned by the Port of Columbia County, *see* CSA Tech Memo at Appendix F. When the proposed development is greater than 50 acres, a 300-foot buffer shall be provided between all developed areas and adjoining lands that are not zoned RIPD or not owned by the Port of Columbia County. Road transportation facilities, utilities, rail facilities, and similar linear features are allowed in the land use separation areas in addition to any uses allowed in the PA-80 zone.



Uses more intense than Breakbulk Storage CDF:

When a use is more intense than the CDF, the following compatibility measures have been determined to be necessary:

- **BDIC Levee System Accreditation:** If the development is greater than 20 acres in size and has SQEHS, prior to permits for construction of the project levee construction drawings designed to achieve accreditation shall be completed by the project engineer of record. Prior to SQEHS being delivered to the site, the BDIC levee shall be accredited by FEMA as providing protection from the 1-percent annual chance flood event.
- **Floodproofing:** Floodproofing measures intended to limit the potential hazard of the development shall be required in accordance with Federal Emergency Management Agency (FEMA), Floodproofing Non-Residential Buildings, FEMA P-936, July 2013 (or the most current published standard from FEMA). At minimum, all facilities that will contain EHS will be floodproofed.
- **Seismic Improvement Standards:** When the proposed development proposes storage of more than 20 acres of SQEHS or explosive materials or is greater than 100 acres in size, the proposed development shall construct structures to meet a magnitude 9 earthquake expected from a Cascadian subduction zone earthquake. All facilities that will contain EHS, and any other structures determined by the County to be necessary to protect public health through the site review process, will be constructed to withstand a magnitude 9 earthquake expected from a Cascadian subduction zone earthquake.
- **Land Use Separation:** A 600-foot buffer shall be provided between all developed areas and adjoining lands that are not zoned RIPD and not owned by the Port of Columbia County, *see* CSA Tech Memo at Appendix F. An additional separation of 400 feet (for a total of 1000-feet) shall be required from occupied structures on adjoining lands that are not zoned RIPD and not owned by the Port of Columbia County. Road transportation facilities, utilities, rail facilities, and similar linear features are allowed in the land use separation areas in addition to any uses allowed in the PA-80 zone.
- **Fire/Life Safety Emergency Response Financing:** The development shall forego participation in the Strategic Investment Program or equivalent program that provides a property tax break that would reduce expected property tax revenue to the Fire District. In the alternative, an agreement shall be reached to backfill the otherwise expected tax revenue for the local Fire District that has jurisdiction over the development. When the development is more than 100 acres, then by agreement, contract for services for 24/7 staffing of Quincy Fire Station (or its successor).
- **Quincy Fire Station:** When the development is more than 100 acres, reconstruct Quincy Fire Station to add capacity for one additional fire engine and one additional fire truck.
- **Fire/Life Safety Bridge Financing:** The development shall agree to provide the equivalent of the Fire District's first year's projected tax revenue at the start of vertical construction in order to provide bridge financing to the District.
- **Industrial Fire Brigade:** The Development shall provide an onsite industrial fire brigade.



- **Air Quality:** If Air Quality Modeling is required for air quality permit, in addition to all the required air permit modeling for the proposed use, the modeling shall evaluate the mobile source emissions air quality benefits from paving Herro Road/Collins Road North/Erickson Dike Road and internal Port circulation roads and the benefits from periodic street sweeping. The County may impose a condition of approval through the Site Design Review and RIPD UPUPC land use applications that requires future industrial development in the Exception Area to pave and/or street sweep roads recommended by ODEQ (as part of the air permit or the land use review process).

5.9.3 Breakbulk Storage Compatibility Determination

The compatibility of the Breakbulk Storage uses must be understood in context of the unique *a priori* balance within the Beaver Drainage Improvement Company levees that exists between natural resources and continued land uses dependent on drainage dewatering. Agriculture occupies lands that were formerly riparian habitat and can directly compete with natural resources, including land clearing for cultivation or the application of pest management measures taken to prevent crop loss from birds and foragers. Measures taken to improve natural habitat can likewise have negative consequences for farm uses, by either taking away lands available for farms to expand into or placing flora and fauna in closer proximity to established farm practices. The most dramatic measure to improve habitat, for example, would be the removal of the existing levees. This would render farming in the area virtually impossible but would create substantial swathes of new habitat.

The existing natural resources and farm practices facts are set forth in Section 3. The potential impacts and compatibility externalities of Breakbulk Storage uses are analyzed in Section 4 which results in guidance to address potential compatibility externalities. Section 5 translates the compatibility analysis results and guidance from Section 4 into conditions of approval. This framework of analysis leading to the development of specific conditions of approval addresses potential compatibility externalities by doing the following:

- The conditions of approval are specific to the Breakbulk Storage category of uses. This synchs the conditions of approval to the type of potential compatibility externalities presented by Breakbulk Storage type industrial uses.
- By anchoring the conditions of approval in relation to the Breakbulk Storage CDF, the conditions of approval have been planned to vary with the intensity of the Breakbulk Storage use. This framework does two things. First, it provides Comprehensive Planning level basis for future planning actions to compare a specific development proposal to the documented exception and determine which conditions of approval should apply to the proposal based upon the intensity of the use. Then it imposes specific conditions of approval, set forth in the prior section, to address potential compatibility externalities.

Adjacent non-resource uses, being limited to residential uses associated with farmland, are set forth in Section 3.3. Although the compatibility analysis results and conditions of approval of Section 4 apply to these uses, these non-resource uses may be expected to be more sensitive receptors to light and noise impacts. The impacts of light and noise are specifically addressed by the general requirements of the existing Site Design Review standards and the additional universal conditions discussed in Sections 5.3 and 5.4 respectively to ensure compatibility for uses that create new light or noise sources.



It is CSA's professional opinion that the Breakbulk Storage CDF framework and associated conditions of approval, in combination with all standard local land use permitting and State and Federal permitting, will ensure compatibility for the following reasons:

- Uses of less intensity than the Breakbulk Storage CDF are not demonstrably more intensive, and do not present significantly more potential externalities than many other uses that could be allowed without an exception. Accordingly, these uses were found to require only the 150-foot land use separation to prevent adverse impacts.
- Uses of similar intensity to the Breakbulk Storage CDF have the potential for adverse impacts as the scale of the use increases, so particular conditions are triggered with additional scale to prevent adverse impacts and compatibility can be ensured through compliance with all the standard County, State and Federal permitting and through specific conditions of approval intended to address the following compatibility externalities:
 - Floodproofing of industrial development will provide additional protection from flood water inundation to minimize potential offsite disaster externalities from the use in the event of a major flood event and the failure or exceedance of the accredited levee, if the proposed breakbulk commodities are buoyant.
 - Breakbulk Storage uses that are larger than 50 acres will be required to increase the land use separation to 300 feet to provide some additional separation from adjacent agricultural uses.
- Uses of more intensity than the Breakbulk Storage CDF are more intensive, and present significantly more potential externalities, than many other uses that could be allowed without an exception. For this reason, these uses were found to require additional conditions of approval to ensure compatibility, as set forth in Section 5 above. If a Breakbulk Storage use that is more intensive than the Breakbulk Storage CDF is located in the Exception Area, then compatibility can be ensured through compliance with all the standard County, State and Federal permitting and through specific conditions of approval intended to address the following compatibility externalities:
 - Beaver Drainage Improvement Company Levee certification by FEMA demonstrating at least 3 feet of freeboard for the 100-year flood event for industrial development larger than 20 acres with significant quantities of EHS or explosive materials. This action would ensure compatibility by significantly reducing the risk of flooding for farmland throughout the district and help to ensure the continued viability of the district.
 - Floodproofing of industrial development will provide additional protection from flood water inundation to minimize potential offsite disaster externalities from the use in the event of a major flood event and the failure or exceedance of the accredited levee.
 - Construction to withstand a Cascadia subduction zone magnitude 9 earthquake event to minimize potential offsite disaster externalities from the use in the event of a major seismic event.



- Enhanced firefighting resources for the fire district which will have a broad benefit to natural resources and farming uses throughout the fire district over time, as well as an on-site industrial fire brigade to minimize the demands on district-wide resources from the use. Reconstruction of the Quincy Fire Station will also be required for industrial uses larger than 100 acres to ensure firefighting is conducted out of an appropriate station to support a larger use of this type.
- Land use separation and locational constraints will ensure that physical separation of over 600 feet will exist between the proposed uses and surrounding farm uses. An additional 400 feet of physical separation will be required between the use and any occupied farm structures and the use; the additional 400 feet of physical separation functions to further ensure compatibility with adjacent residential uses. It is expected that much of this “buffer area” will be occupied by wetlands enhancements necessary to permit projects in this area. This physical separation will enhance natural resources within the area while also functioning to provide setback separation from farm uses in the area.
- For uses that require air permits that require air-quality modeling, additional benefits to reduce mobile source emissions will be modeled and conditions of approval requiring paving and/or sweeping may be imposed for airshed benefits.



6 OVERALL COMPATIBILITY DETERMINATIONS

CSA evaluated land use compatibility consistent with the direction provided by the Land Use Board of Appeals in LUBA No. 2021-097. The analysis is grounded on land use fundamentals unique to this Goal Exception:

- Once acknowledged, the Goal Exception would allow five general categories of industrial port-dependent land uses that would be permitted under the County's RPID zoning district. The intensity of future land uses under the goal exception could vary significantly across land use categories as well as within the five general land use categories.
- Except for the "Thompson" property, the Goal Exception Area is located behind the Beaver Drainage Improvement Company levees. The area behind the Beaver Drainage Improvement Company levee system is an area where the existing agricultural uses are made possible by man-made drainage and levee systems combined with pumps that de-water the District.
- Natural resources that likely existed in this area have been displaced by agricultural uses which are made possible by the Beaver Drainage Improvement Company facilities and its operations.

In accordance with the above fundamentals, CSA Planning, Ltd. analyzed the potential for compatibility externalities to cause adverse impacts on adjacent land uses and surrounding natural resources and resource management or production practices. Based upon the foregoing analysis, CSA determined that conditions of approval are required to ensure specific future development proposals will be compatible with adjacent uses and surrounding natural resources and natural resource management or production practices. With the Applicant's proposed conditions of approval, CSA's ultimate professional opinion is that the future specific land uses that would be allowed in the Exception Area are compatible with adjacent uses and surrounding natural resources and resource management and production practices for the following reasons:

1. With respect to water resources and water resource management, the professional opinion of CwM-H2O is that industrial uses that would be allowed in the Exception Area could meet applicable water quality and water supply requirements. These State and Federal requirements exist to prevent negative impacts to water resources and water dependent resources such as fish and many bird species. State and Federal regulations also serve to protect agricultural uses that rely on water irrigation resources. Additionally, this permitting process would require any changes to BDIC facilities or hydrologic function to be reviewed and approved by BDIC. Accordingly, CSA determines that, under normal permitting review and on-going operating circumstances, the future industrial uses that would be allowed under the Goal Exception will be compatible with water resources and water resource management and adjacent land uses' relationships to the water resources.



However, CSA did identify some potential uses where an emergency event may have potential to cause adverse impacts. To reduce the potential for adverse impacts from an emergency event, conditions of approval will require specified land use intensities to undertake specific additional measures to ensure compatibility, as follows:

- a) Engineer facilities to withstand a magnitude 9 Cascadia subduction zone earthquake event.
- b) Floodproof non-residential structures as if the structures were within the 100-year floodplain.
- c) For the most intensive land uses, work with the BDIC to provide technical and construction resources so the District can obtain FEMA levee accreditation with incipient overtopping risk for the .01 likelihood flood event or less.
- d) Measures that will require adequate firefighting and emergency response equipment and personnel are available.

With the general conditions for all uses and the specific in place for the most intensive industrial uses, it is CSA's opinion that future industrial uses can be sited in a manner that is consistent with the water resources and water resource management for the area. This opinion assumes that all required water quality and quantity permitting will be obtained and properly implemented, the BDIC would approve any hydrologic changes over which it has authority, additional event specific safety measures will be taken, and that the effectiveness of all these measures immediately near the site would function to provide water resource protection for waters more distant from the site.

2. With respect to wetland and riparian resources and wetland and riparian resource management, CSA engaged Schott and Associates to examine wetland and related riparian conditions in the zone change area. The Exception Area contains significant amounts of degraded wetlands. The area behind the Beaver Drainage Improvement Company levee system is a large floodplain area that has been leveed off and de-watered for agriculture. These historic actions displaced what was likely a large functioning wetlands and riparian natural resource area. Conversion from agricultural uses to industrial uses would be expected to trigger wetlands permitting for most major industrial projects in the Exception Area which would be expected to require wetlands mitigation measures that would include some combination of wetlands creation and enhancement.

Wetland mitigation measures would need to be implemented in coordination with the BDIC to ensure the fundamental hydrology of the District would not be negatively impacted in a way that would adversely affect remaining agricultural lands. When implemented in a manner that does not negatively affect the balance of the BDIC system, the industrial development triggered wetland mitigation measures would have the effect of expanding natural wetland resources within the leveed area. Moreover, the most intensive land uses have the largest required land use separation conditions of approval that would create 600-foot-wide corridors where wetland mitigation areas could also function to separate land uses with improved natural resource elements. These additional wetland areas have the potential to expand habitat for Columbian White-Tailed Deer as well as bird species that utilize the general area.



CSA's professional opinion is that future industrial uses in the Exception Area, if properly designed and permitted and subject to BDIC approval where it has authority, and subject to compliance with the conditions of approval set forth herein, should function to balance natural resources and agricultural uses in ways that are compatible with one another. Less intensive industrial uses are not expected to present significant externalities and would have siting options that could reduce the amount of wetland impacts. More intensive industrial uses are likely to require more wetland mitigation, but such uses will also require close work with BDIC on additional flood control measures and hydrologic evaluations which should benefit the remaining agricultural lands over time by providing resources for improved flood control and drainage facilities within the District. For these reasons, it is CSA's professional determination that future industrial development of the Exception Area will occur in a manner that is compatible with wetland natural resources and agricultural uses in the area, given the inherent conflicts between those two uses in the existing conditions.

3. With respect to the Crims Island wildlife management area, the vast majority of the proposed Exception Area is on the far side of the major existing industrial development from the Bradbury Slough channel that separates the Port from Crims Island. During our site visit, all the white-tailed deer that CSA observed were in and around the industrial area (not scientifically counted but they were numerous). No deer were observed in the agricultural areas. The deer appeared very tolerant of the industrial development patterns. Given the physical separation between most of the Exception Area with further separation by Bradbury Slough and prevalence of deer in and around the existing industrial uses, direct negative impacts from development of the Exception Area on Crims Island wildlife management area appears low. Indirect impacts would come from water quality impacts, which are addressed elsewhere in this determination. For the foregoing reasons, CSA's professional determination is that the exception is compatible with natural resources and resource management on Crims Island.
4. With respect to air resources, CSA engaged SCS Engineers to provide analysis and expert opinion on air quality permitting that would be required for a future industrial use. SCS explains that air quality permitting is a use-specific process that models the specific emissions for a particular use. However, Oregon's air quality permitting for new industrial point sources is among the most stringent in the Country, whereas agricultural emissions are largely mobile source emissions that are not subject to air quality permitting. Notwithstanding that the change in land use would move potential emissions from an unregulated category to a highly regulated category, CSA worked with SCS to identify conditions of approval that could further reduce the potential for air quality impacts. The proposed conditions of approval would require modeling the benefits of additional road paving and street sweeping which are forms of mobile source emissions as part of the review for the most intensive land uses. This modeling will provide the basis for either ODEQ through the air quality permitting process or Columbia County through the land use process to impose specific paving and/or street sweeping measures to further reduce potential emissions impacts. The conditions of approval for land use separation will also serve to separate emissions sources from adjacent uses. And finally, the most intensive land uses will also require conditions of approval to directly expand firefighting capacity and capabilities in the area. The capacity and capability enhancements can have benefits throughout the broader airshed because the expanded firefighting capacity can also be



available to aid in wildland firefighting which is another potential air quality impact source. With the various measures taken together, CSA's professional determination is that future industrial uses could be sited in a manner that is compatible with existing natural resources and adjacent uses from an air quality perspective.

5. With respect to compatibility with adjacent land uses, many of the farm uses in the area have coexisted with heavy industrial uses for years. For example, mint farms lease land that is actually industrially designated now and the mint farming occurs essentially right next to existing liquid bulk storage facilities. CSA conducted a locational survey and found similar farm uses are located near to other industrial areas elsewhere in the Pacific Northwest. Nevertheless, the Applicant is proposing land use separations to further ensure compatibility. The width of the required land use separation varies with the scale and intensity of future industrial land uses. The Applicant is also proposing conditions that will require the most intensive land uses to provide additional public and environmental safety measures in the form of firefighting capacity enhancements, levee accreditation, flood proofing, and seismic protections. With the various measures taken together, CSA's professional determination is that future industrial uses could be sited in a manner that is compatible with existing natural resources and adjacent uses from a land use arrangement standpoint.

In sum, CSA's analysis adheres to LUBA's direction to the Applicant, vis-à-vis the Remand to the County, to evaluate the compatibility issues in more depth and taking into consideration the scale of uses that may be allowed under the Goal Exception. This evaluation has resulted in a significantly more robust set of conditions of approval to ensure compatibility, with clearer guidance for the County to determine whether future development proposals are consistent with the Goal Exception. The analysis itself functions as a framework to properly assess the levels of intensity of the proposed uses and ensure the appropriate conditions are applied. Moreover, the analysis and resulting conditions of approval are structured to be appropriate for the Comprehensive Planning level analysis and decision making for a Goal Exception.

The above conclusions are reached according to each potential externality. Additionally, the conditions are synergistic and mutually protective of adjacent uses in many instances, and they work in combination to further ensure compatibility across the potential externalities. Below are some examples of how the proposed conditions for individual externalities will further reduce the potential for incompatible land uses:

- The land use separation requirements will have the effect of ameliorating multiple potential negative externalities. A large buffer not only provides distance and visual screening between a use and the surrounding area, it will also attenuate potential noise and light impacts. It is also expected that the buffers will provide a habitat for wildlife in many areas that are presently devoted to agricultural uses. The land use separation also provides additional space, and associated increased emergency services response times, to reduce the potential spread of fire from a given industrial use in the exception area to adjoining properties or vice versa from a fire started on adjoining properties.



- As discussed elsewhere, the requirement to certify the levee will provide safety benefits to any user vulnerable to floodwaters within the levee, whether they are an industrial user, a residence, or an agricultural operation. In addition, certification of the levee, for the use categories with development intensities requires that trigger it, will provide additional funds to ensure the long term viability of the BDIC, which is beneficial to all the land uses in the BDIC that rely on the levee system.
- For those use categories with intensities that would trigger enhanced firefighting resources, the expanded emergency services capacity would be available during a seismic event or a flood event, neither of which may involve response to fire activity within the exception area.

7 TECHNICAL APPENDICES

This section will include any technical appendices that support specific elements of the alternatives and compatibility analyses.



APPENDIX A

Atlas of Maps

1. General Vicinity
2. Existing Facilities Site Plan
3. Current Zoning
4. Current Zoning Aerial
5. Proposed Zoning
6. Proposed Zoning Aerial
7. Ownership Map
8. Flood Hazard
9. Flood Hazard Map on Aerial
10. Map of Leases
11. Surrounding Area Map
12. Surrounding Area Inventory of Uses
13. Soils
14. 150 ft Land Use Separation Map
15. 300 ft Land Use Separation Map
16. 600 ft Land Use Separation Map
17. Liquefaction Susceptibility Map
18. Columbia County Clatskanie Wildlife Game Habitat Map
19. Historic 1951 Aerial Map USGS
20. Historic 1951 Aerial Map USGS - Port Westward



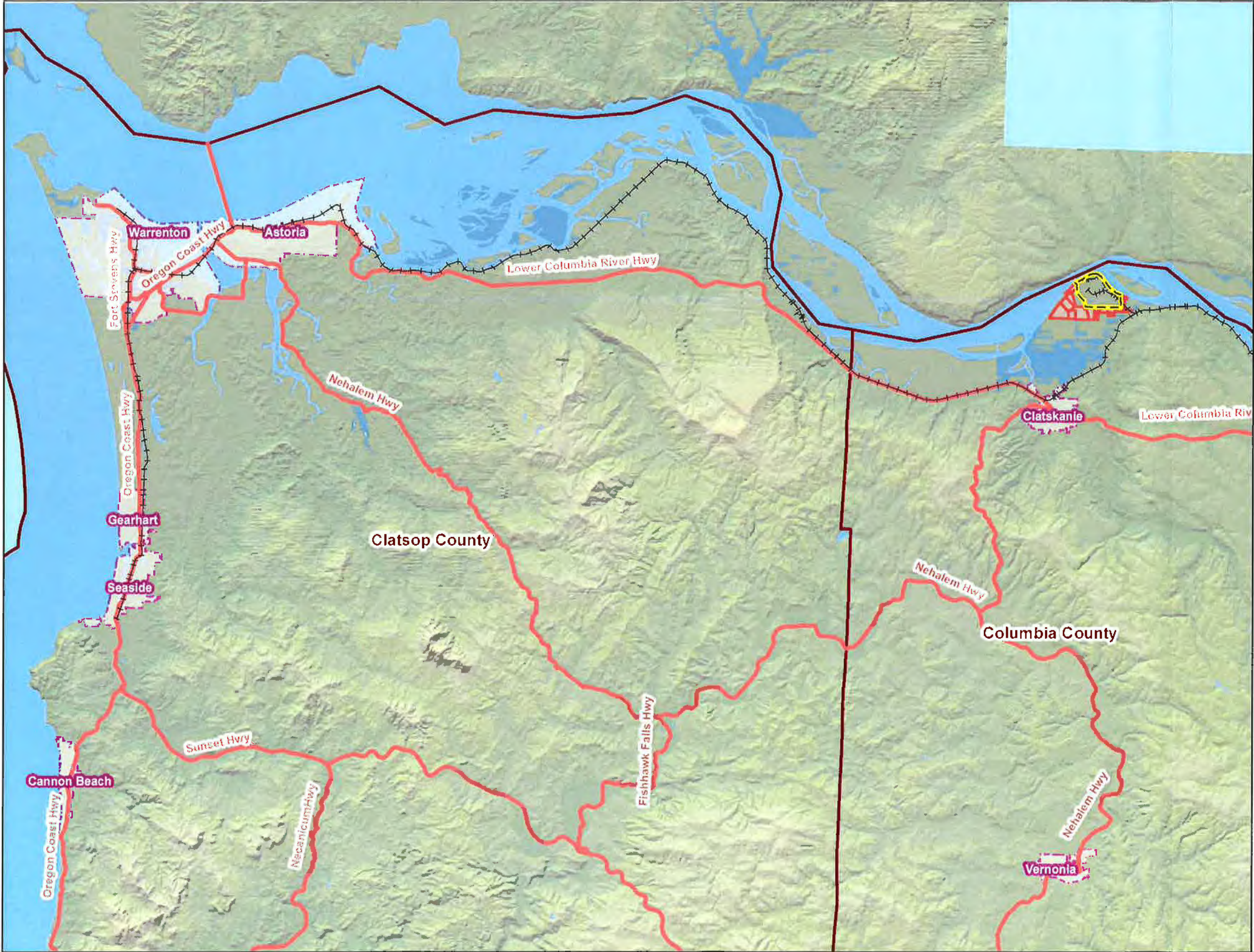
Columbia County, Oregon

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Port of Columbia County Goal Exception

General Vicinity Map

- Existing RIPD Zoned Areas
- Railroads
- Highways
- Urban Growth Boundaries
- County Boundaries
- Exception / Zone Change Area



0 2 4 8 Miles



Port of Columbia County Goal Exception

Existing Facilities



- Existing RIPD Zoned Areas
- Taxlots
- Levee
- Railroads
- Local Roads

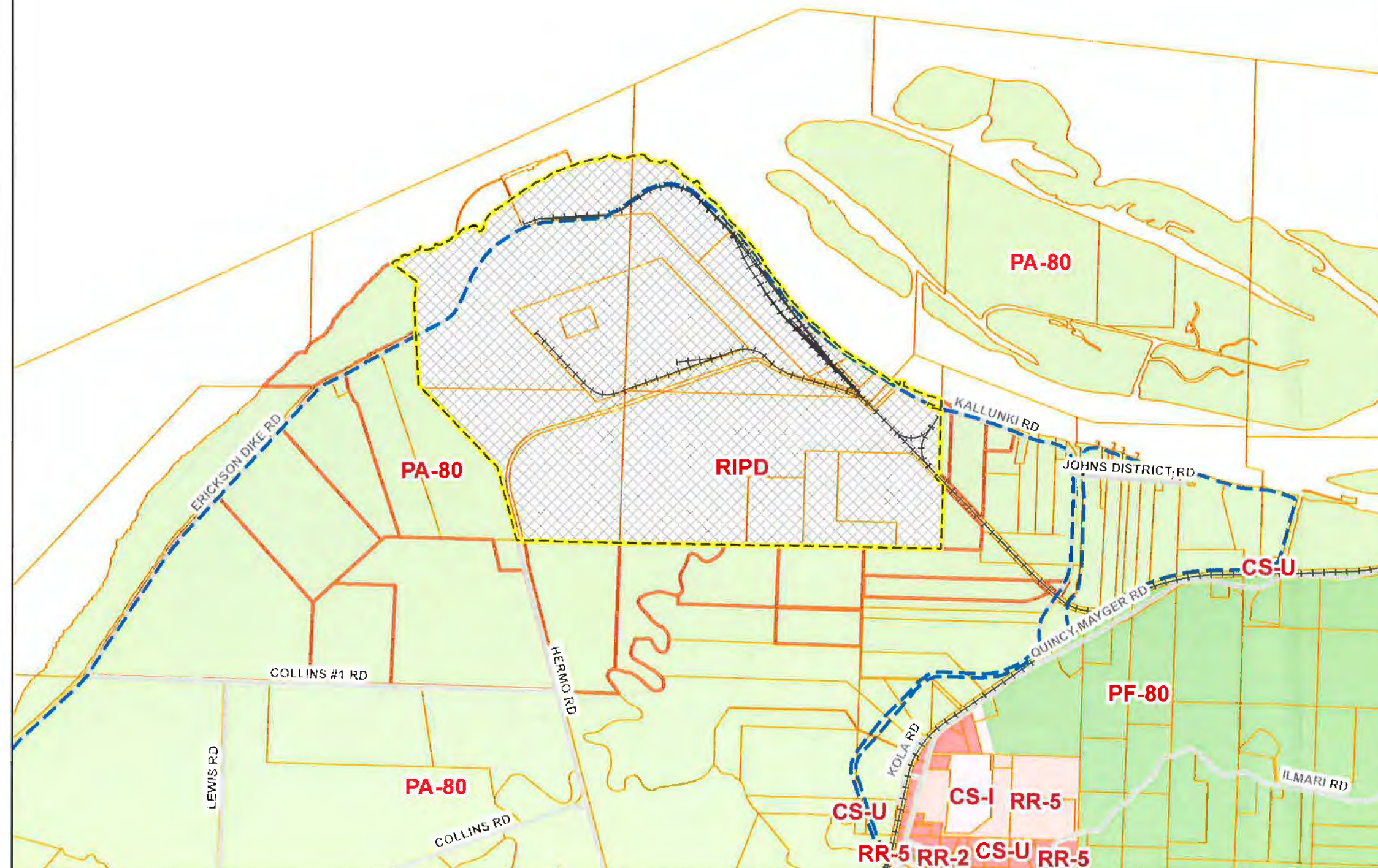
0 500 1,000 2,000 Feet



Port of Columbia County Goal Exception

Current Zoning

-  Existing RIPD Zoned Areas
 -  Taxlots
 -  Levee
 -  Railroads
 -  Local Roads
 -  Exception / Zone Change Area
- Zoning - Columbia County**
-  CS-I
 -  CS-U
 -  PA-80
 -  PF-80
 -  RIPD
 -  RR-5
 -  RR-2

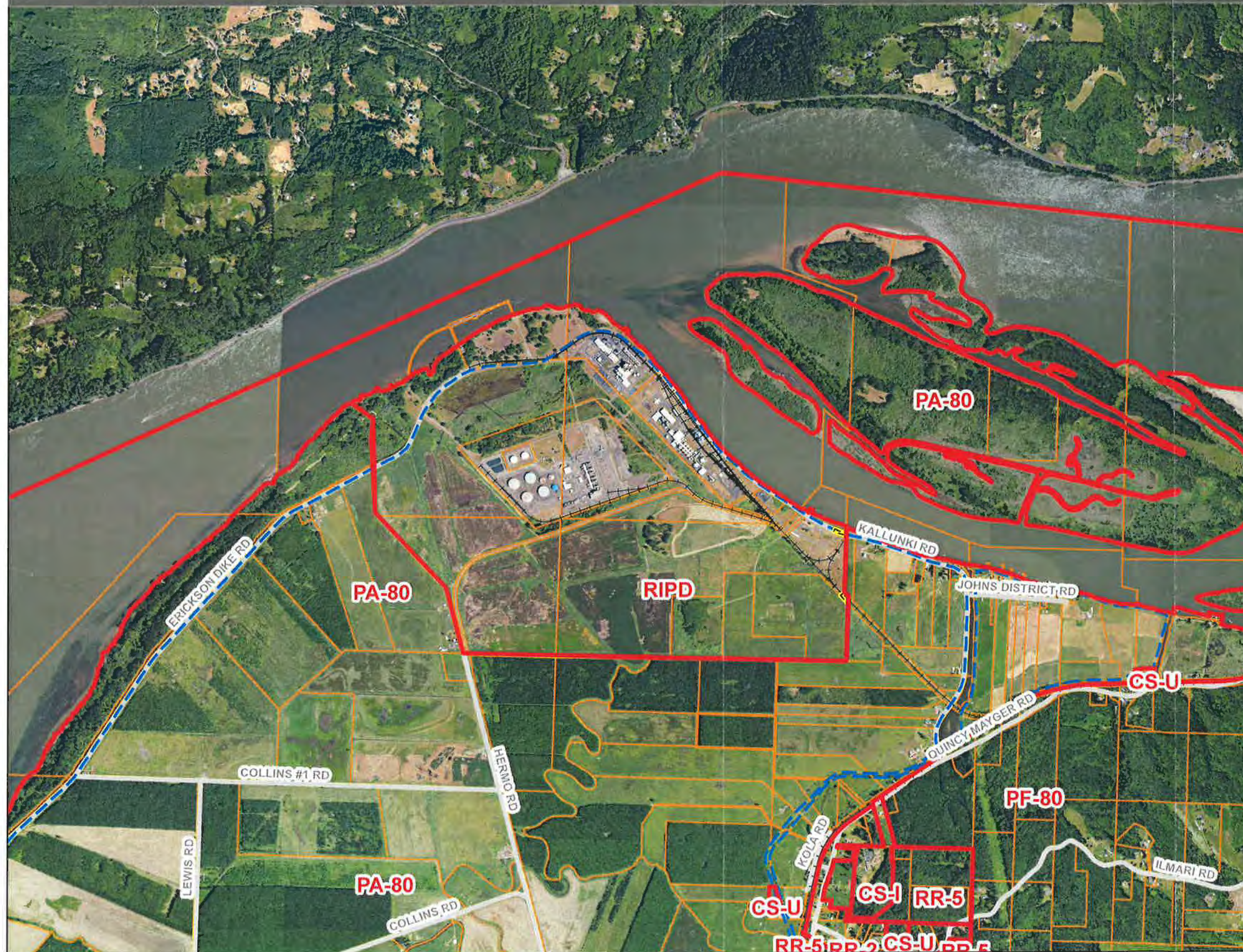


0 1,000 2,000 4,000 Feet

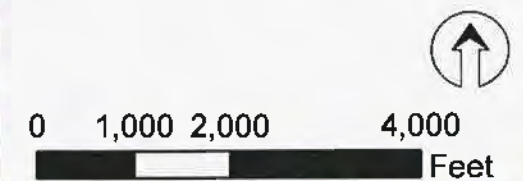


Port of Columbia County Goal Exception

Current Zoning Aerial

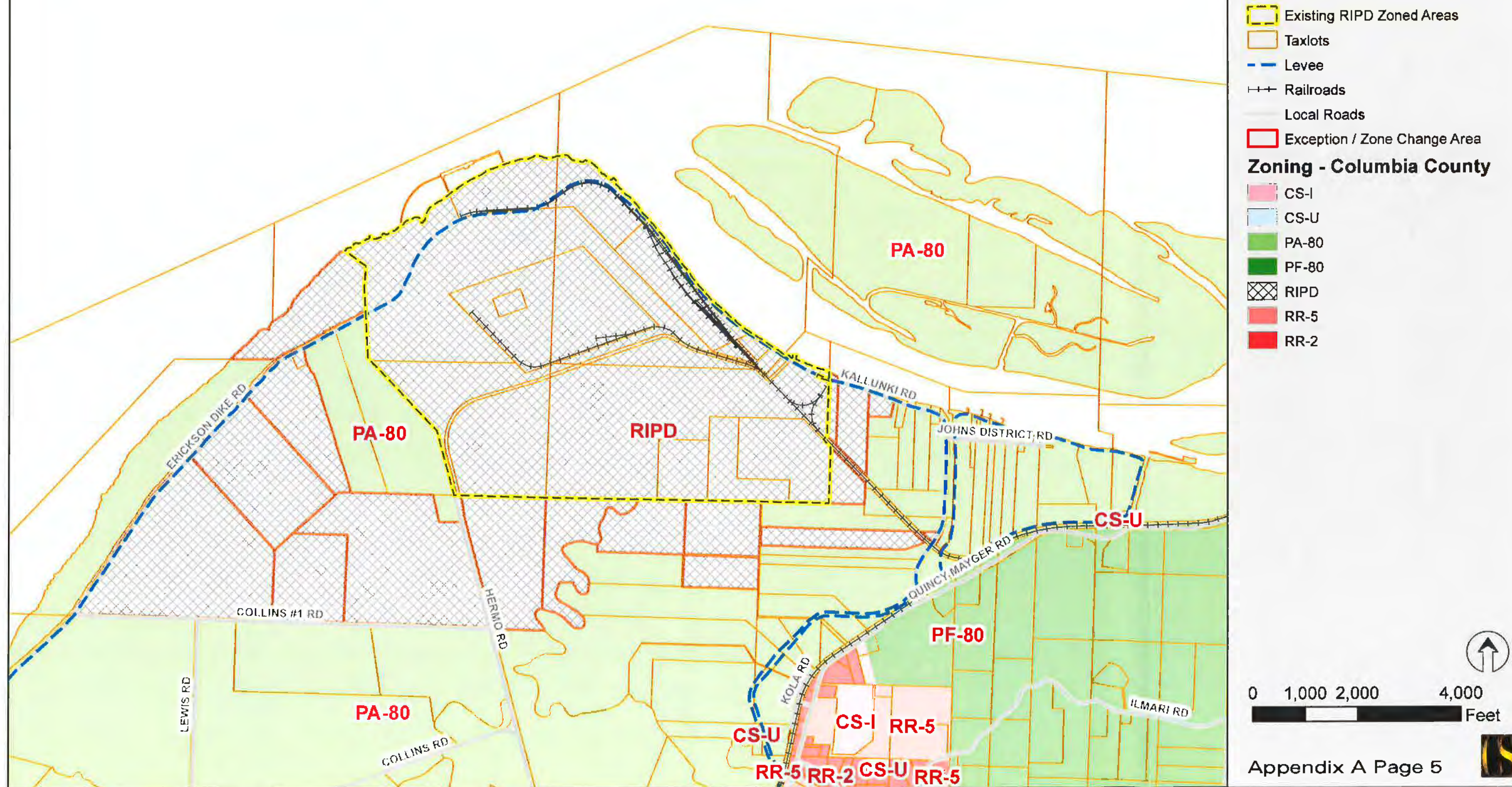


- Existing RIPD Zoned Areas
- Taxlots
- Levee
- Railroads
- Local Roads
- Current Zoning



Port of Columbia County Goal Exception

Proposed Zoning

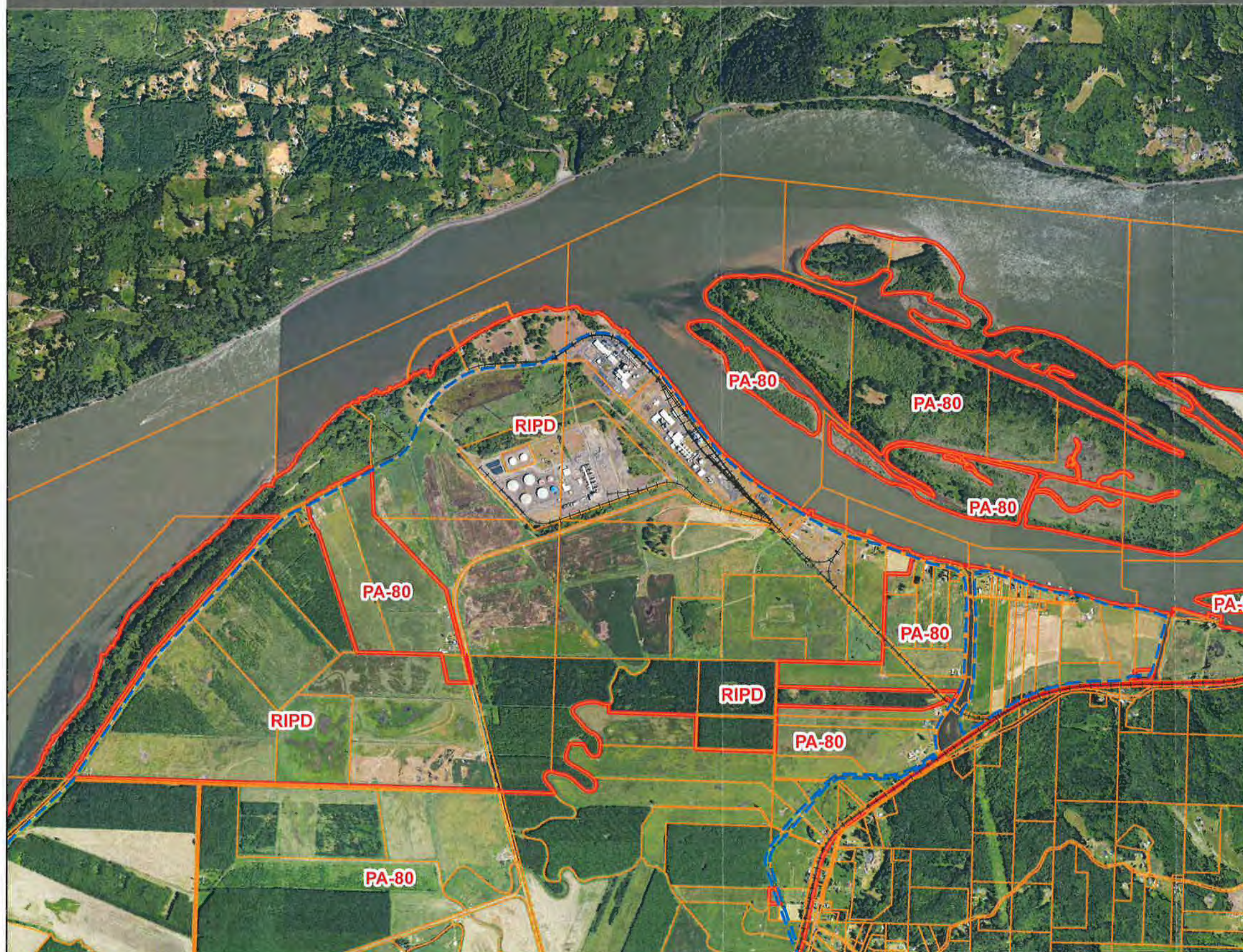


Port of Columbia County Goal Exception

Proposed Zoning on Aerial

Zoning - Columbia County

-  Zoning - Columbia County
-  Taxlots
-  Levee
-  Railroads

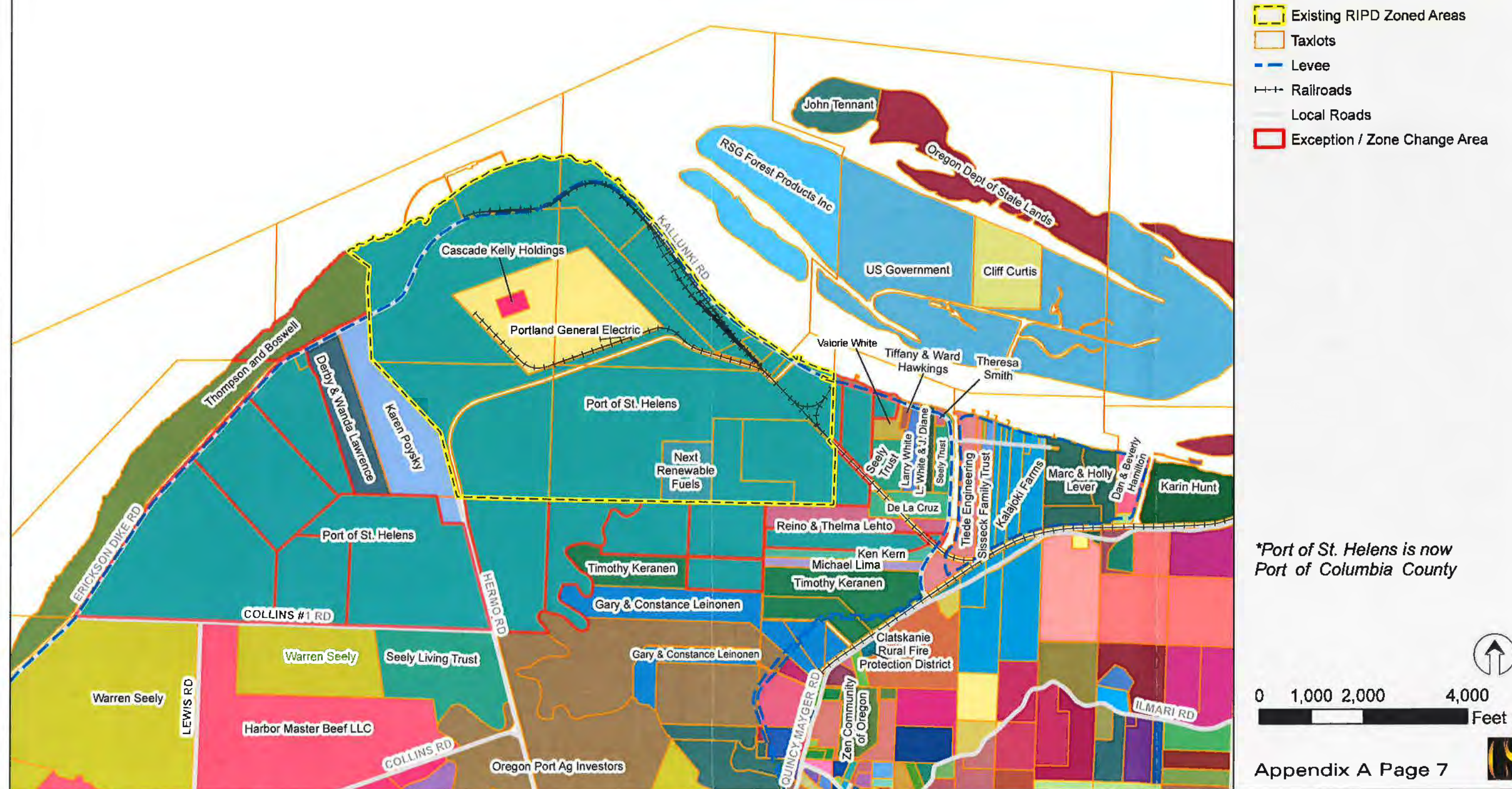


0 1,000 2,000 4,000
Feet



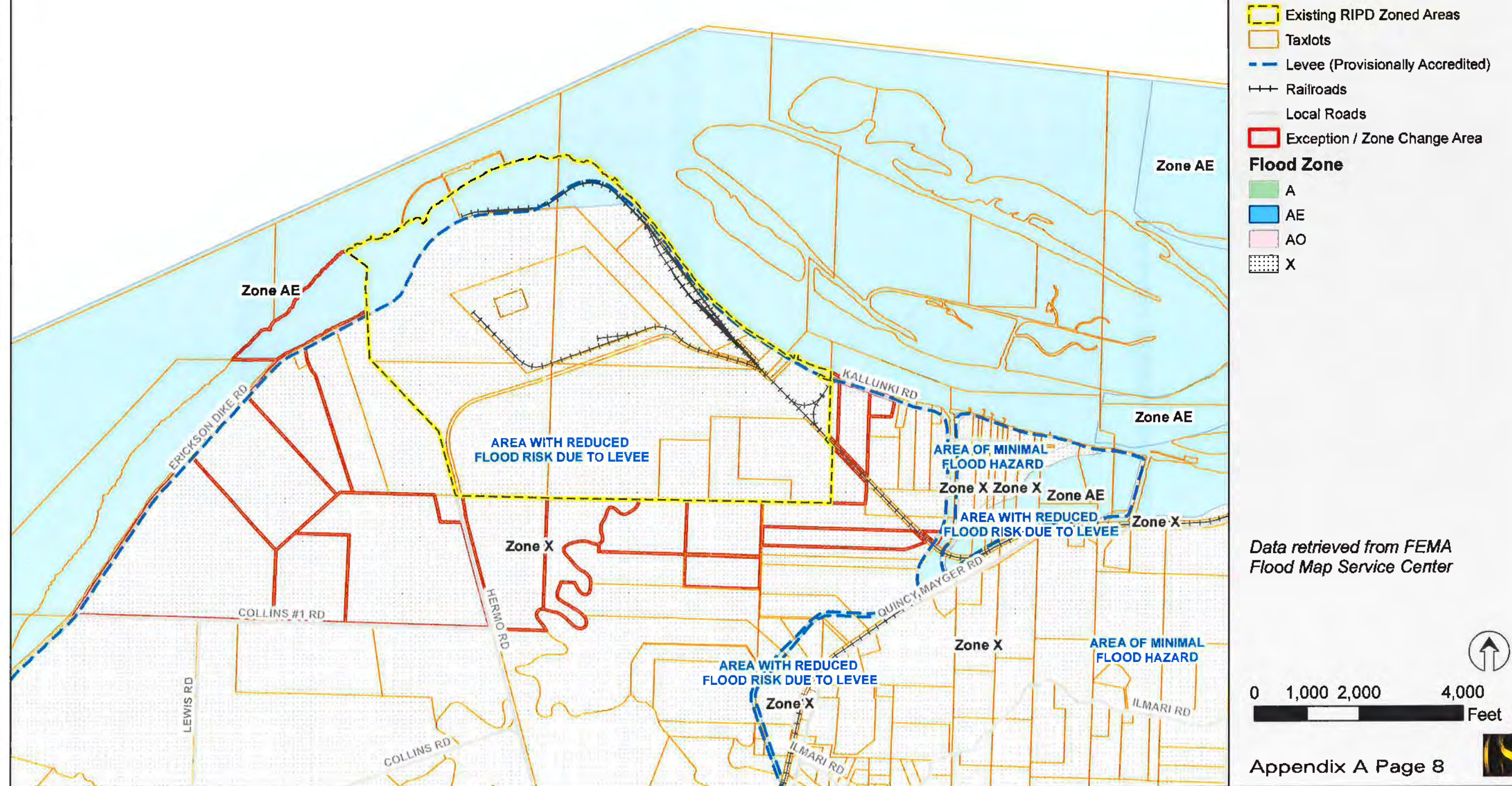
Port of Columbia County Goal Exception

Ownership Map



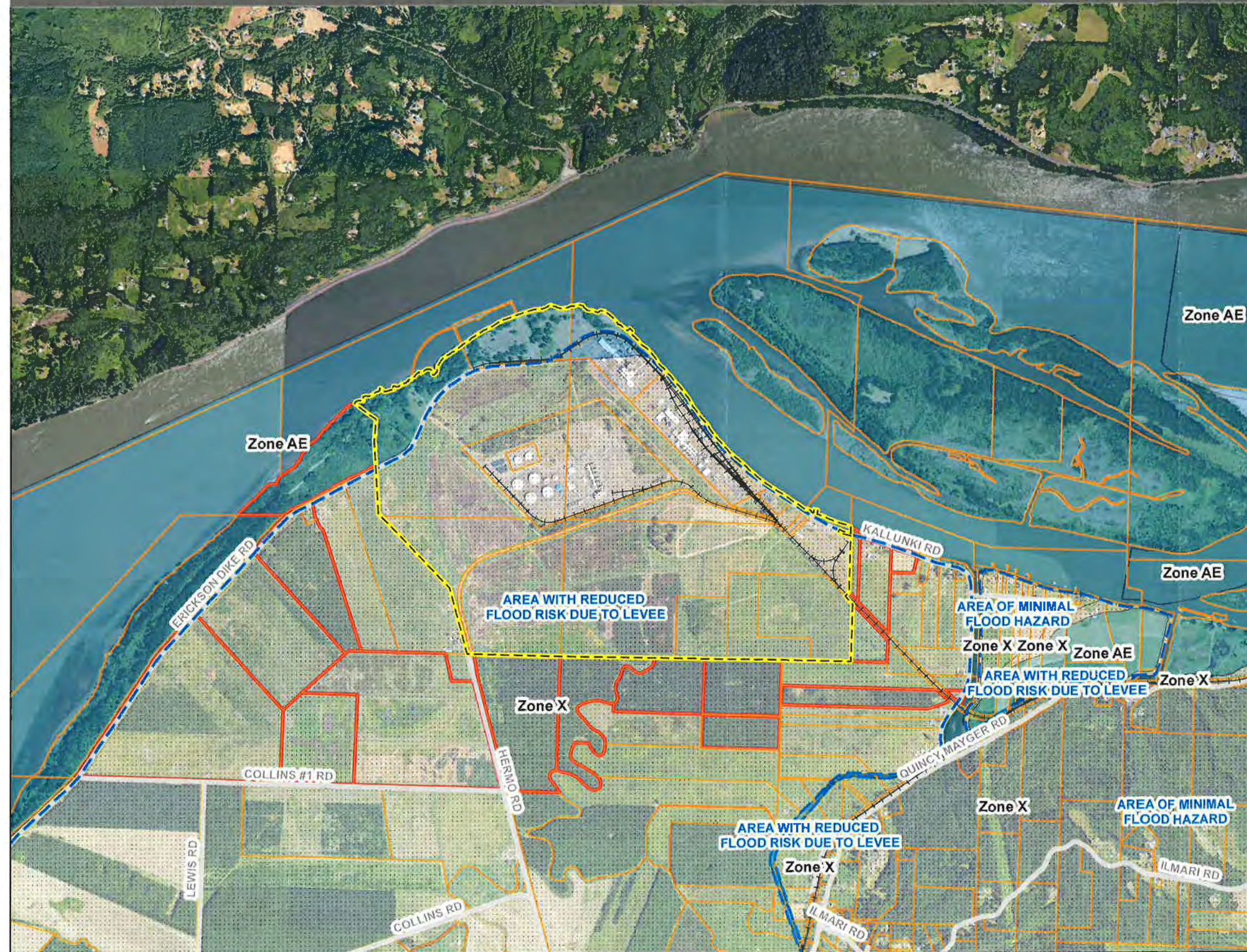
Port of Columbia County Goal Exception

Flood Hazard



Port of Columbia County Goal Exception

Flood Hazard



- Existing RIPD Zoned Areas
 - Taxlots
 - Levee (Provisionally Accredited)
 - Railroads
 - Local Roads
 - Exception / Zone Change Area
- Flood Zone**
- A
 - AE
 - AO
 - X

Data retrieved from FEMA
Flood Map Service Center

0 1,000 2,000 4,000
Feet



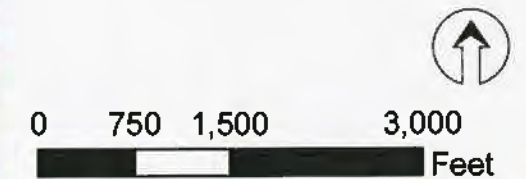
Port of Columbia County Goal Exception

Active Port Lease Map

- Existing RIPD Zoned Areas
 - Taxlots
 - Levee
 - Railroads
 - Local Roads
 - Exception / Zone Change Area
- Active Port Leases**
- Seely Mint
 - Seely Mint Sublease from PGE
 - CRR License (Next Renewable Fuels)
 - CRR



Lease data provided by Port of Columbia Staff in April of 2023

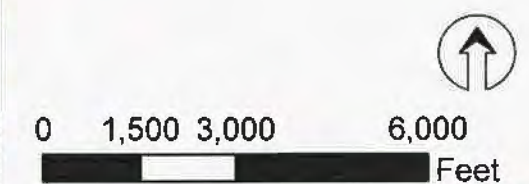


Port of Columbia County Goal Exception



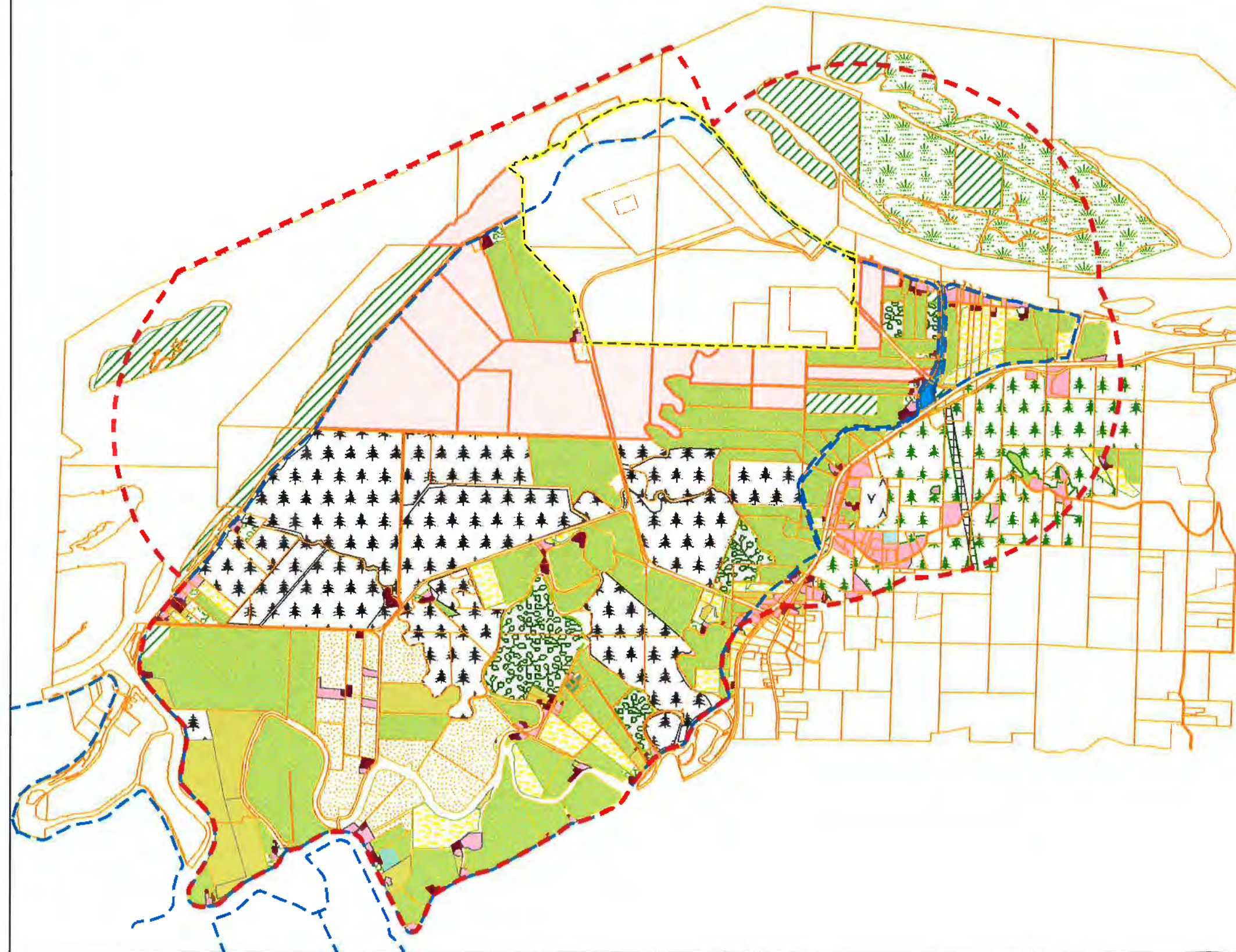
Surrounding Area

- One Mile Buffer
- Surrounding Area
- Existing RIPD Zoned Areas
- Railroads
- Highways
- Local Roads
- County Boundary
- Exception / Zone Change Area
- Levees**
 - Other Levees
 - BDD Levee



Port of Columbia County Goal Exception

Surrounding Area Use Inventory



- Surrounding Area
- Existing RIPD Zoned Areas
- Taxlots
- Levee
- Exception / Zone Change Area

Use

- Convenience Store
- Paddock or Pen
- Barn and Outdoor Storage
- Berries
- Cannabis
- Essential Salmonoid Habitat
- Flower farm
- Forestry
- Grass Hay and Alfalfa
- Greenhouse
- Horse Arena
- Mint
- Open Space
- Open Space / Fallow
- Orchard
- Pasture
- Pump Station
- Quincy Water Facility
- Residence and Res Open Space
- Small plot garden
- Tree Farm
- Unknown
- Untitled Polygon
- Utility Corridor
- Wildlife Refuge
- Zen Monastery

0 0.25 0.5 1
Miles



Port of Columbia County Goal Exception

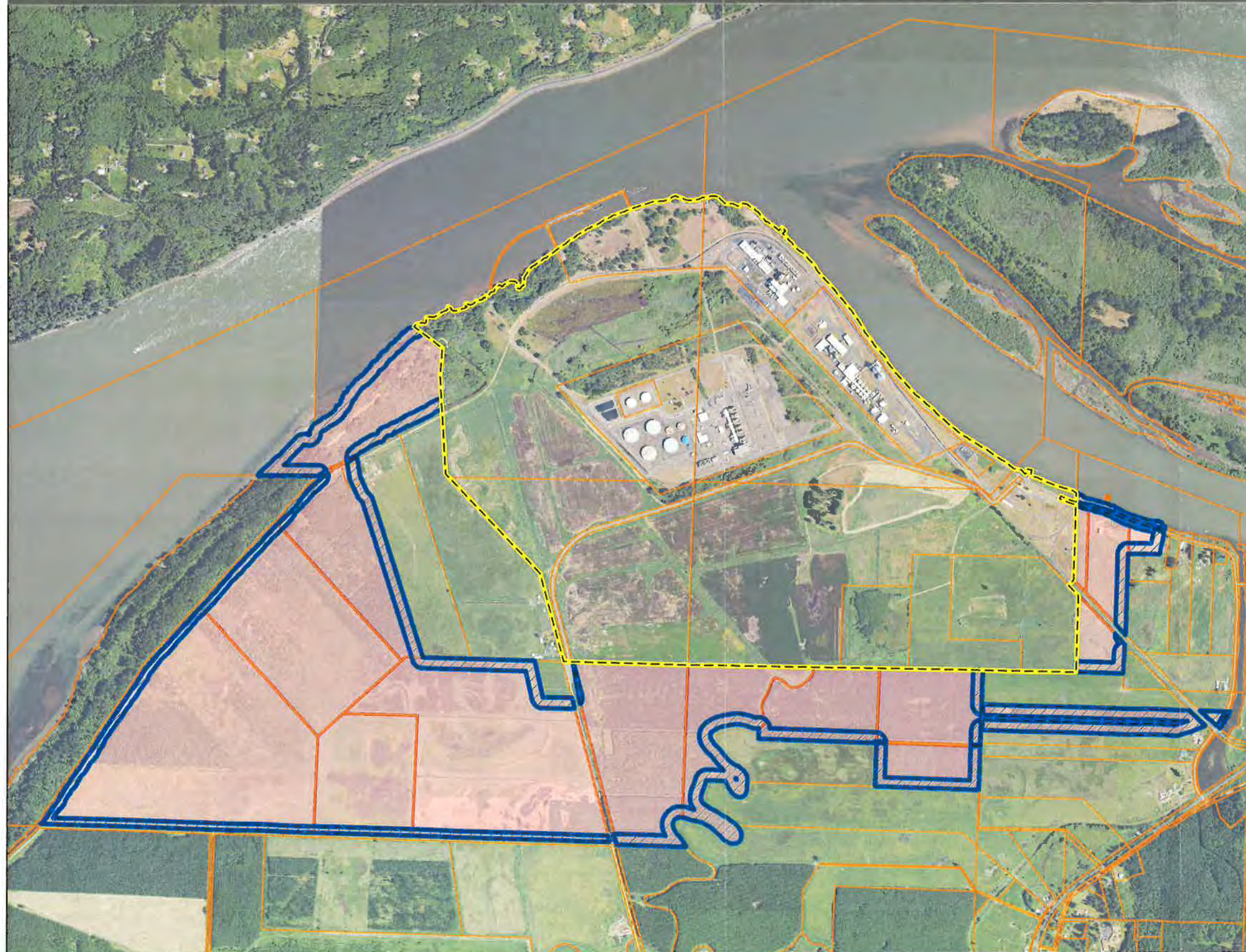
Soils Map



Port of Columbia County Goal Exception

150 Foot Land Use Separation

- Existing RIPD Zoned Areas
- Taxlots
- Exception / Zone Change Area
- 150 Ft Land Use Separation Area



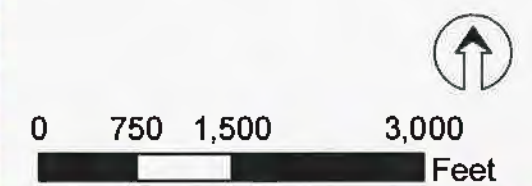
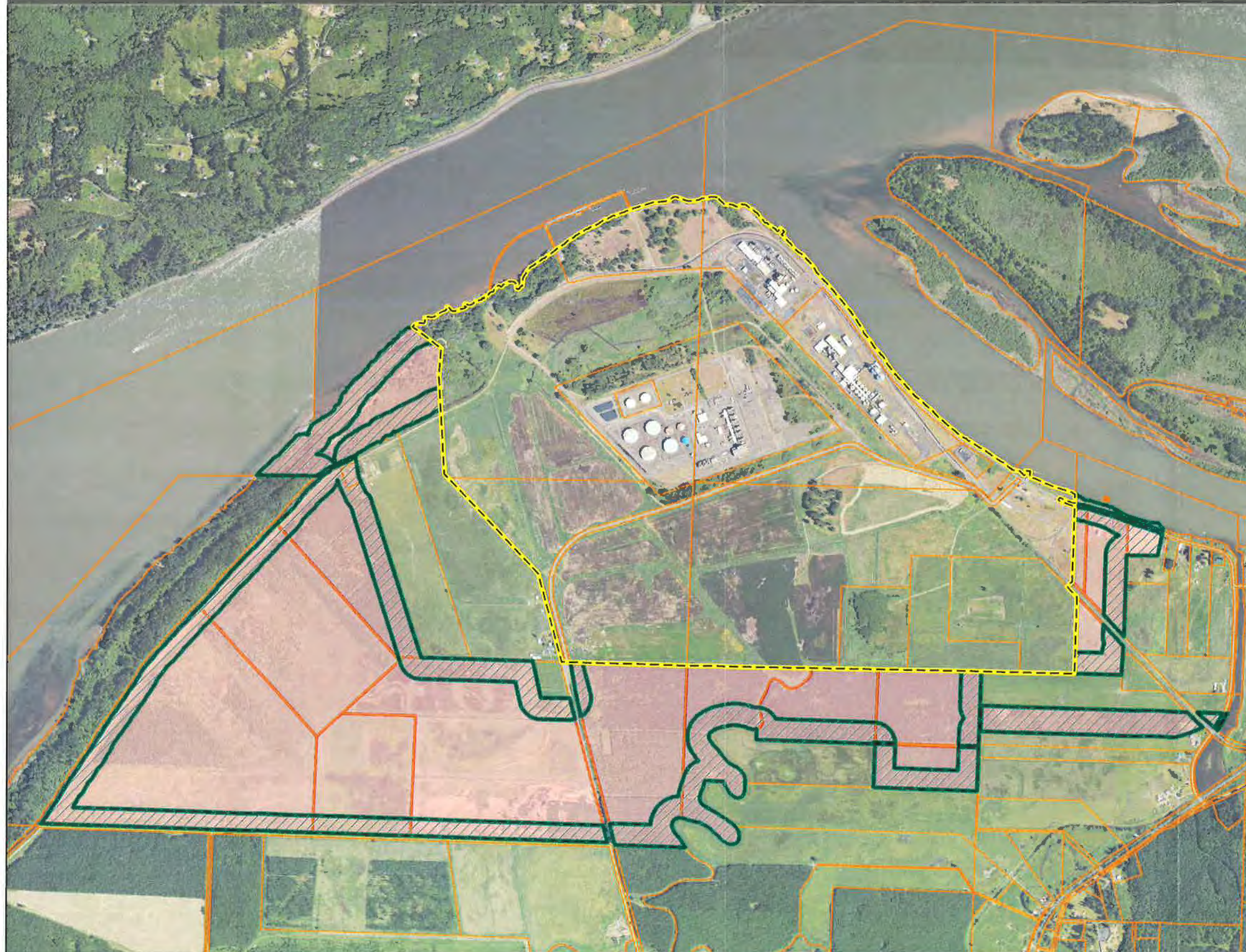
0 750 1,500 3,000
Feet



Port of Columbia County Goal Exception

300 Foot Land Use Separation

- Existing RIPD Zoned Areas
- Taxlots
- Exception / Zone Change Area
- 300 Ft Land Use Separation Area



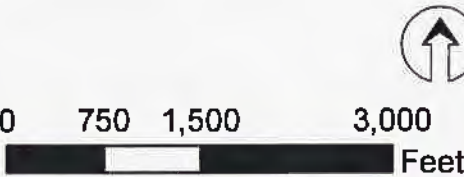
Port of Columbia County Goal Exception

600 Foot Land Use Separation

- Existing RIPD Zoned Areas
- Taxlots
- Exception / Zone Change Area
- 600 Ft Land Use Separation Area
- Buildings Presumed Habitable
- 1000 Ft Buffer Adjacent Bldgs

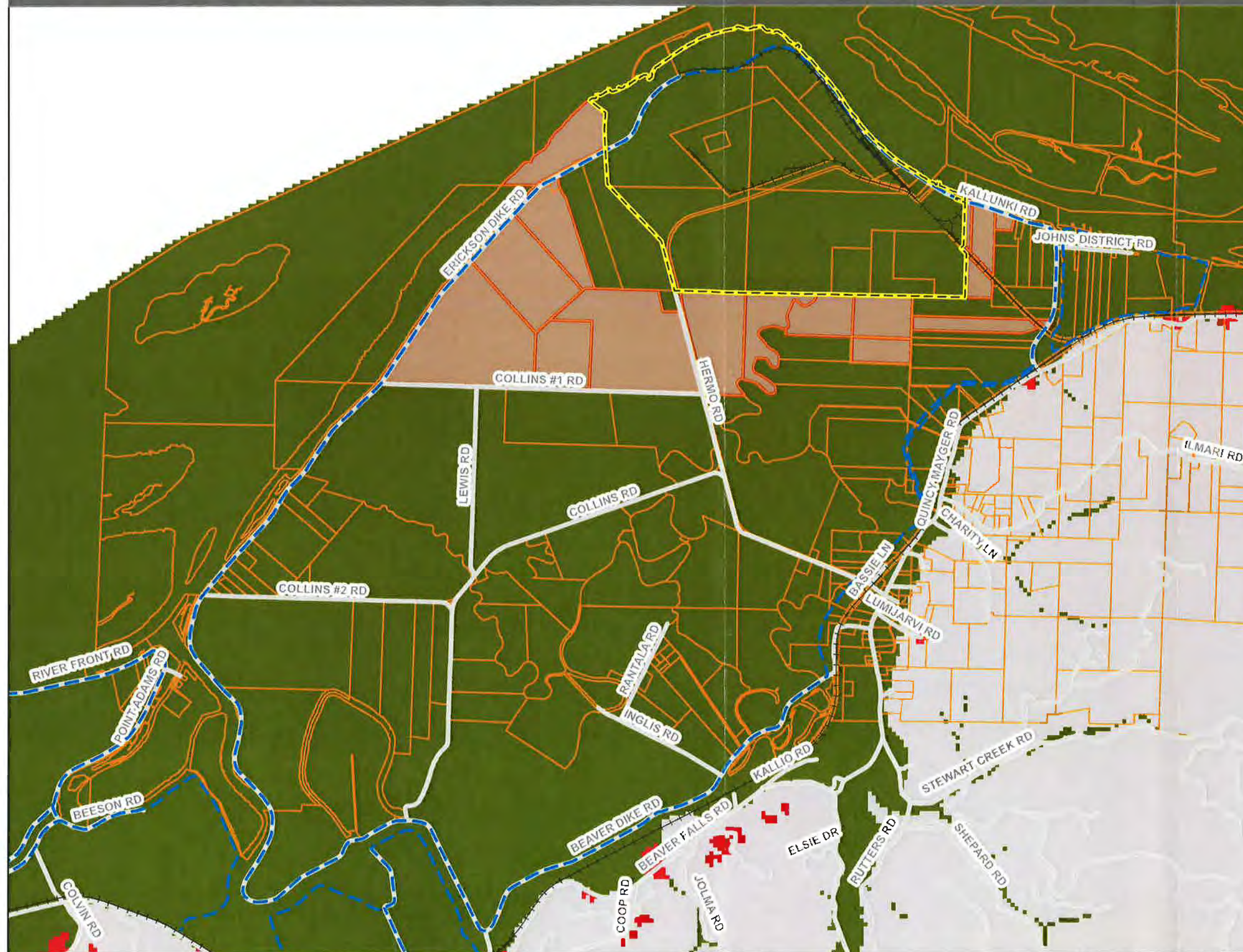
*1,000 ft buffer required from occupied structures for certain uses, see Compatibility Document for list

Building locations from DOGAMI inventory of buildings named Statewide Building Footprints for Oregon



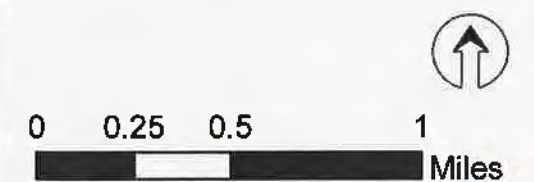
Port of Columbia County Goal Exception

Liquefaction Susceptibility Map



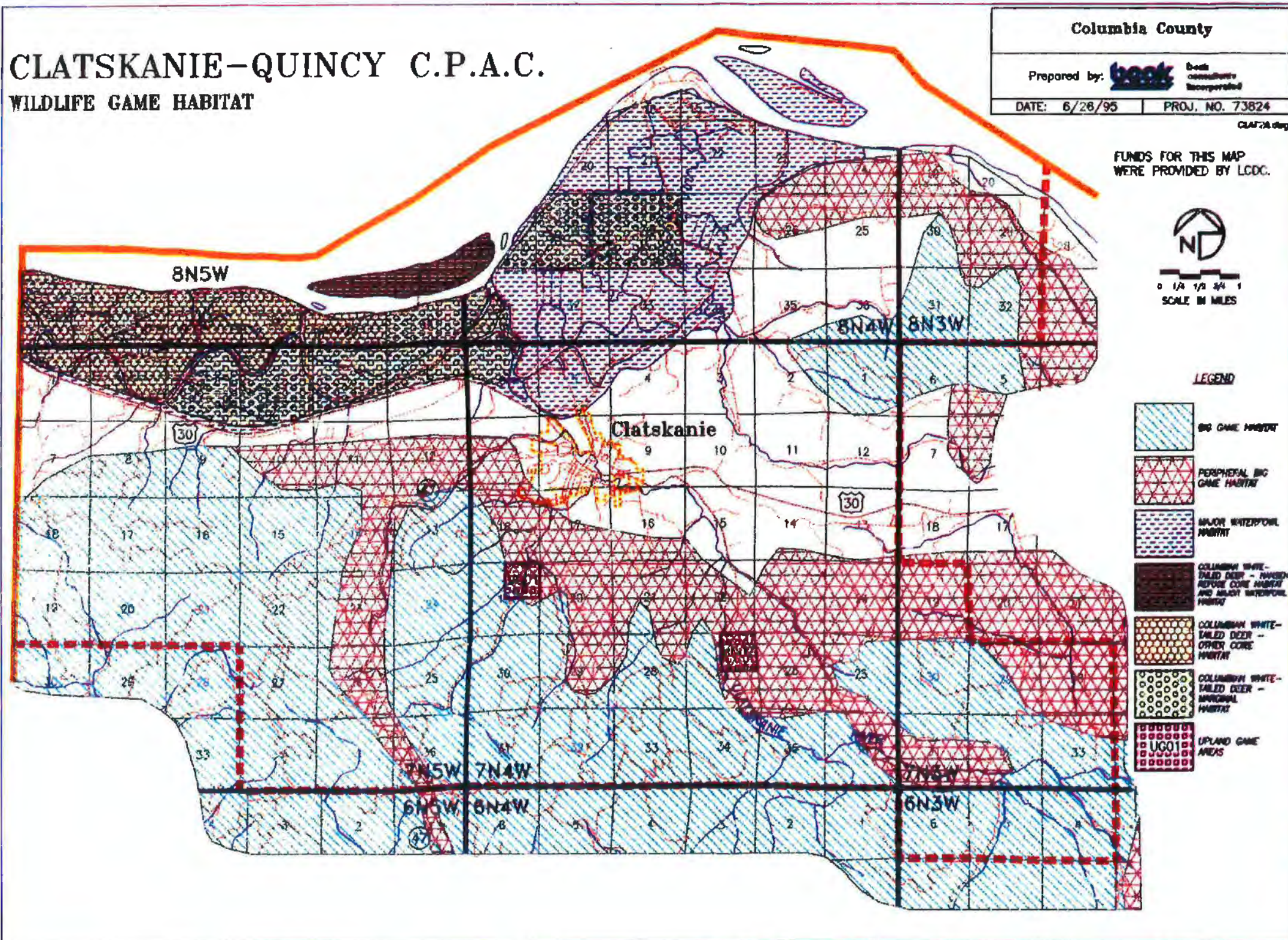
- Existing RIPD Zoned Areas
 - Taxlots
 - Levee
 - + + Railroads
 - Local Roads
 - Exception / Zone Change Area
- Liquefaction Susceptibility**
- None
 - Very Low
 - Low
 - Moderate
 - High
 - Very High

Data for liquefaction comes from the Oregon Department of Geology and Mineral Industries Digital Data Series



Port of Columbia County Goal Exception

CLATSKANIE-QUINCY C.P.A.C. WILDLIFE GAME HABITAT



Clatskanie Wildlife Map

Map is image
taken from Web



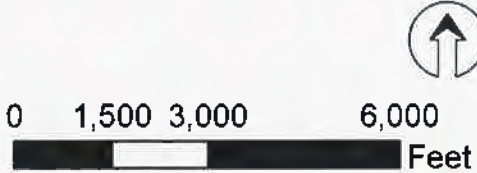
Port of Columbia County Goal Exception



Historic Aerial
1951 USGS of
Surrounding Area

- Present Day RIPD Zoned Areas
- Levees
 - Other Levees
 - BDD Levee

Historic aerial georeferenced
using ArcGIS Software and
should not be assumed to have
survey level accuracy



Port of Columbia County Goal Exception



Historic Aerial 1951 USGS of RIPD Area

-  Present Day RIPD Zoned Areas
-  Levee

Historic aerial georeferenced
using ArcGIS Software and
should not be assumed to have
survey level accuracy

0 500 1,000 2,000
Feet



APPENDIX B

Technical Memorandum: Wetland Determination and Feasibility Study for Port of Columbia County Property - Schott & Associates



Columbia County, Oregon

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SCHOTT & ASSOCIATES
Ecologists & Wetlands Specialists

21018 NE Hwy 99E • P.O. Box 589 • Aurora, OR 97002 • (503) 678-6007 • FAX: (503) 678-6011

July 18, 2023

Jay Harland
CSA Planning Ltd.
4497 Brownridge Terrace, Suite 101
Medford, Oregon 97504
(541) 779-0569
jay@csaplanning.com

Re: Wetland determination and feasibility study for Port of Columbia County property, Columbia County, Oregon (T8N, R4W, Section 16, Tax Lot 500; Section 20, Tax Lots 200, 300; Section 21, Tax Lots 300, 301, 400, 500, 600; Section 22, Tax Lots 400, 500, 600, 700; Section 23, Tax Lot 900; Section 23B, Tax Lots 400, 500, 600, 700)

Introduction

Schott & Associates (S&A) was contracted to complete a wetland determination and feasibility study for the above-referenced project site. Wetlands and waters may be regulated by the Oregon Department of State Lands (DSL) under the Removal-Fill Law and by the Army Corps of Engineers (Corps) under the Clean Water Act. Boundaries must be identified and verified by these agencies.

Professional Credentials

Schott & Associates' staff is comprised of well-qualified and experienced individuals. All have been through wetland delineation training and are proficient in performing wetland delineations and habitat assessments. Jodi Forgione and Kim Cartwright conducted wetland determination fieldwork and prepared the feasibility study.

Jodi Forgione, Principle in Charge, owner, and wetland biologist joined S&A in March 2014. She received her Bachelor's degree from Oregon State University in Fisheries and Wildlife. Jodi became principle-in-charge of the company in 2020 and has nine years of experience in environmental consultation and agency negotiations including wetland delineation, wetland functions assessment, wetland mitigation monitoring, and wildlife habitat assessment. She is familiar with wetland ordinance and permitting requirements for many local jurisdictions throughout Oregon and Washington, as well as state and federal wetland regulations.

Kim Cartwright is a senior wetland scientist and GIS analyst who joined Schott & Associates in April 2018. She received her Bachelor's degree from Portland State University in Environmental Science and Management. Kim contributes 12 years of experience in wetland delineation and reporting, permitting, field data collection and analysis, and GIS applications to the company. Kim has worked largely in the lower Columbia River region and has a foundation in Pacific Northwest ecology with

expertise in lowland and montane rainforest, and tidal estuarine and freshwater wetland habitats. She is versed in general ecological survey and data analysis methods, as well as protocols specific to wetland delineation, estuarine habitat restoration, mitigation site monitoring, and wetland functions assessment. She is familiar with wetland ordinance and permitting requirements for many local jurisdictions throughout Oregon and Washington, as well as state and federal wetland regulations.

S&A's role in permitting any future Port development would include wetland delineation reporting to state and federal standards, wildlife and habitat surveys, and assistance in wetland removal/fill permitting on state and federal levels, including mitigation plan development and biological assessment, if necessary.

Site Description

S&A conducted a site walkover identifying potential/likely wetland locations on May 3, 2023. S&A walked as much of the site as possible, using aerial, topographical, USDA soil survey, and National Wetland Inventory (NWI) maps to guide the field inspection. S&A inspected vegetation, soils, and hydrology in multiple areas to corroborate field observations. S&A created a sketch map of potential or likely wetland areas within the site. The site is currently in agricultural use including cattle grazing and poplar tree and mint cultivation. Canals/ditches, dikes, culverts, access roads, and historical agricultural use have affected site hydrology and the distribution of wetlands throughout the site.

NWI palustrine emergent and forested wetlands are mapped over tax lots 84W16-500, 84W23B-500, and 84W23B-400 along the Columbia River, while riverine aquatic habitat is mapped corresponding to ditches and canals throughout the site. Soils are generally Wauna-Locoda or Crims silt loams, protected. These soil series are very poorly drained, predominantly hydric (94-99% hydric inclusions), and are subject to rare occurrences of flooding or ponding.

S&A estimated wetland covers approximately 419 acres within the 834-acre project site, roughly 50% of the area (Attachment 1).

Wildlife Presence

S&A obtained a list of threatened and endangered species and critical habitat potentially within the site or within the vicinity from the Oregon Biodiversity Information Center (ORBIC). The ORBIC database shows four listed species within the proposed project site and many more in the Columbia River adjacent to the site (Attachment 2). The four species are as follows:

1. Columbian white-tailed deer (*Odocoileus virginianus leucurus*): This deer species is mapped as present throughout the entire project site. It is listed as federally Threatened along the lower Columbia River. The observations in the ORBIC data were historical, with the last recorded observations of the animals occurring in 1990.
2. Purple martin (*Progne subis arboricola*): One occurrence of this bird species was mapped in the northeastern portion of the project site along the Columbia River, with two other occurrences mapped in the vicinity. This species is listed federally as a Species of Concern and

state listed as Sensitive. The last recorded observations were in 1998 according to the ORBIC database.

3. The fall run of Lower Columbia River Chinook salmon (*Oncorhynchus tshawytscha* pop. 22): This fish species was mapped within the Columbia River and the ditch/canal just east of the site, within the levee. This fish species is listed as federally Threatened. The last recorded observation was in 2009.
4. Bald eagle (*Haliaeetus leucocephalus*): Two occurrences of this bird species were mapped in the western portion of the site along the Columbia River. The occurrences were categorized as breeding sites. The bald eagle has been federally delisted but is protected by the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act.

The listed species within the Columbia River include several federally listed threatened and endangered fish species including Chum salmon, coastal cutthroat trout, Coho salmon, steelhead trout, Pacific lamprey, green sturgeon, and eulachon. The presence of federally listed threatened and endangered species within the project site or within the vicinity will require consultation under the Endangered Species Act (ESA). If state or federal agencies consider that the project may affect listed species or habitat, a Biological Assessment and/or additional wildlife surveys and reporting may be required to comprehensively evaluate potential effects.

Permitting Procedure Outline

Wetlands and waters may be regulated by DSL under the Removal-Fill Law, and by the Corps under the Clean Water Act. For any project to proceed on the Port property, a formal wetland delineation report will need to be prepared and submitted to DSL for review and approval (concurrence) and the Corps for jurisdictional determination (JD). The purpose of this review is to establish the jurisdictional boundary of wetlands or waters and inform the permitting process. DSL has a 120-day initial review timeline. DSL may require additional data, site visits, or report/mapping revisions prior to approval. Delineation reports can be submitted to the Corps for a JD if there is a question as to whether a wetland or water is federally jurisdictional; however, the Corps has no timeline for issuing JDs and it may take a year or more for the Corps to review the report and issue the JD. Many developers assume federal jurisdiction of wetlands to avoid the protracted and uncertain review timeline. At this point, following the recent Sackett v. EPA Supreme Court decision the Corps has paused all JD reviews until further guidance is received. Both DSL concurrence and Corps approved JDs expire after 5 years.

Development within wetland areas may require wetland removal/fill permitting on state and/or federal levels (and, potentially local levels). State and federal permitting is completed through submittal of a Joint Permit Application (JPA) to the appropriate regulatory bodies. The JPA pertains to the following permits:

- 1) State Removal/Fill permit issued by DSL
- 2) Federal Section 404 permit issued by the Corps
- 3) Federal Section 401 Water Quality Certification (WQC) issued by the Oregon Department of Environmental Quality (DEQ).

The state/federal permitting process may take 6-18 months or longer depending on the magnitude of wetland impacts, project complexity, and jurisdictions involved. The agencies require demonstration of **avoidance** of jurisdictional wetlands and waters to the extent practicable first. If wetland impacts must occur to meet project objectives, impacts must be **minimized** as demonstrated through the alternatives analysis process. Finally, all wetland impacts must be **mitigated** according to state and federal standards. The permitting process disallows the filling of large areas of wetland by design. Depending on the extent of wetland impacts, the project may qualify for a streamlined review process (A General Permit from DSL or a Nationwide Permit from the Corps) or an Individual Permit. The streamlined processes generally apply to projects proposing wetland impacts of less than 0.5 acre.

General permitting requirements are as outlined below and are shown in a flow chart in Attachment 3:

- Submission of Pre-Filing Meeting Request with DEQ 30 days prior to request for certification (submission of JPA to DEQ)
- Project description, including project purpose and need
- Summary of impacts to wetlands including area and volume of each temporary, permanent, indirect, and direct impact
- Construction methods and measures to minimize impacts to wetlands including erosion and sediment control plans
- Project objectives with alternatives analysis that include both alternative site design configurations as well as alternative sites where the project could be developed with less impact to wetlands/waters
- Compensatory mitigation plan – No mitigation bank is available in the area, so credit purchase is not an option. Mitigation must take place through permittee-responsible mitigation. Mitigation must replace the functions and values of the impacted wetlands/waters as demonstrated through functional analysis of both impacted wetlands/waters and expected conditions of the mitigation site. Mitigation site development is discussed in more detail below
- Endangered Species Act (ESA) Consultation required for federal permits due to the presence of threatened and endangered species in the vicinity. The Corps initiates consultation with US Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS), as well as Oregon Fish and Wildlife (ODFW).
 - If adverse effects are determined to be possible, a Biological Assessment is required that comprehensively evaluates the potential effects to listed species and habitat.
 - Stormwater management for the project must meet Standard Local Operating Procedures of Endangered Species (SLOPES) criteria, which is standardized design and construction criteria that minimizes impacts to listed species and habitat based on a Programmatic Biological Opinion from the NMFS
- Section 106/Cultural Resources Consultation required for federal permits to ensure no cultural or historical resources will be disturbed due to the project. Early coordination with local Tribes/State Historic Preservation Office (SHPO)/Corps archeologist is highly recommended to determine whether an archaeological survey will be required.

- Based on the project site's location along the Columbia River, it is likely that an archaeological survey will be required, and an Inadvertent Discovery Plan (IDP) prepared.
- Neighboring jurisdiction determination from the Environmental Protection Agency (EPA): Corps initiates consultation with EPA to determine whether project will impact water quality standards in neighboring state or tribal jurisdiction.
- Post-Construction Stormwater Management Plan is required for 401 WQC. The Stormwater Management Plan must meet DEQ and SLOPES water quality criteria and standards.
- Construction drawings that meet all applicable DSL and Corps standards
- A signed land use compatibility affidavit from local planning officials

Completeness Review and Public Comment Periods

Completeness review (CR) and public comment periods (PRPs) are associated with review by each agency including DSL, Corps, and DEQ. Length of CR and PRP is dependent on the type of permit issued, whether the streamlined version or individual permits. CRs and PRPs timelines are as follows:

- DSL and Corps:
 - CR: 15 days for General/Nationwide Permits; 30 days for Individual Permits
 - PRP: 15 days for General/Nationwide Permits; 30 days for Individual Permits
- DEQ
 - CR: no standard timeline
 - PRP: 35 days

Mitigation Options

Permittee-responsible mitigation will be the only mitigation option that is accepted by both DSL and the Corps since there is no mitigation bank within the local watershed. Mitigation can be provided in the following forms with the following base mitigation:impact ratios:

- Wetland Creation; 1.5:1
 - conversion of upland to wetland
- Wetland Restoration; 2:1
 - restoration of wetland hydrology to existing disturbed wetland through breaching of dikes, filling of ditches, removal of drain tiles and tide gates, culvert replacements, discontinuing farming practices, etc.
- Wetland Enhancement; 3:1
 - invasive species removal and establishment of native wetland plant communities
- Wetland Preservation: 12:1
 - Use of conservation easement or other protection instrument to preserve a locally significant wetland, rare/unique wetland type, important wildlife habitat, or other wetland of special concern

Mitigation can include a combination of forms but must include either restoration or creation in order to achieve "no net loss" of wetlands as required by policy.

Mitigation ratios for each form can vary and are informed by the type and extent of wetland/water impacts and the ability of the proposed mitigation to replace the functions and values lost at the impact site. Base mitigation ratios may be increased up to 150% based on the eligibility of the proposed mitigation site to adequately compensate for the proposed impact. Some factors that affect the ratios are as follows:

- Match of hydrogeomorphic classes and Cowardin classes between impact site and mitigation site.
- Match or exceedance of ecological functions and values between impact site and mitigation site.
- Factors of temporal loss (time lapse between impact and mitigation site development) including impacts to forested wetland, upland soils at mitigation site, disturbed hydric soils at mitigation site, or impacts to emergent wetland.
- Level of site protection and stewardship proposed for the mitigation site.

Due to the large area of the project site, significant extent of existing and historical wetlands, and long history of agricultural disturbance and conversion of wetlands to uplands via ditching and diking on the project site, there are many opportunities for onsite mitigation that could include a combination of all the above forms; however, creation and restoration are generally the most successful and generate the best return.

Compensatory wetland mitigation sites must be approved by DSL and the Corps and are subject to annual monitoring and reporting requirements for 5+ years depending on the type of wetland/water impacted. Mitigation sites must meet performance standard criteria to achieve release from the monitoring requirements. Mitigation sites require a long-term maintenance financial endowment and must be protected in perpetuity from development by a conservation easement or other protection instrument.

Conclusion

The Port zone change site is estimated to have significant wetland area, covering roughly 50% of the zone change area. Future development of the zone change site will have to contend with these environmental constraints. Permitting wetland removal/fill can be costly and time-consuming and avoidance and minimization should be considered. Based upon the initial reconnaissance for this scope of work, there may be areas of contiguous upland onsite that could potentially be developed with minimal impacts to wetlands. The upland areas are almost entirely in poplar tree cultivation use currently and the absence of wetland criteria would be determined through the formal delineation process.

Based on a history of wetland disturbance through levee installation, agricultural practices and conversion of historical wetland to upland, minor-to-moderate impacts to wetlands could be readily mitigated. The mitigation measures would require the onsite permittee to provide compensatory mitigation site development using a combination of acceptable forms including creation, restoration, enhancement, and preservation. Given the degraded nature of the existing lands that would be

expected to meet wetland criteria through the formal delineation process, these compensatory environmental actions may accrue natural resource benefits versus current agricultural land uses.

Sincerely,

Jodi Forgone

Kim Cartwright & Jodi Forgone

Wetland Ecologists

kim@schottandassociates.com

Jodi@schottandassociates.com

503-678-6028 (Kim)

503-678-6007 (Jodi)

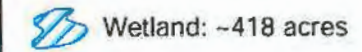
Attachments:

Preliminary Wetland Determination Map

National Wetland Inventory Map

Threatened, Endangered, and Sensitive Wildlife Species Data (ORBIC)

State/Federal Wetland Permitting Flow Chart



Legend

Study Site Tax Lot Boundaries:
833.98 acres

ORBIC Data

- Bald eagle
- Chinook salmon (Lower Columbia River ESU, fall run)

- Chum salmon (Columbia River ESU)
- Coastal cutthroat trout (Southwestern Washington/Columbia River ESU)

- Coho salmon (Lower Columbia River ESU)
- Columbian white-tailed deer
- Eulachon
- Green sturgeon

- Pacific lamprey
- Purple martin
- Steelhead (Southwest Washington ESU, winter run)



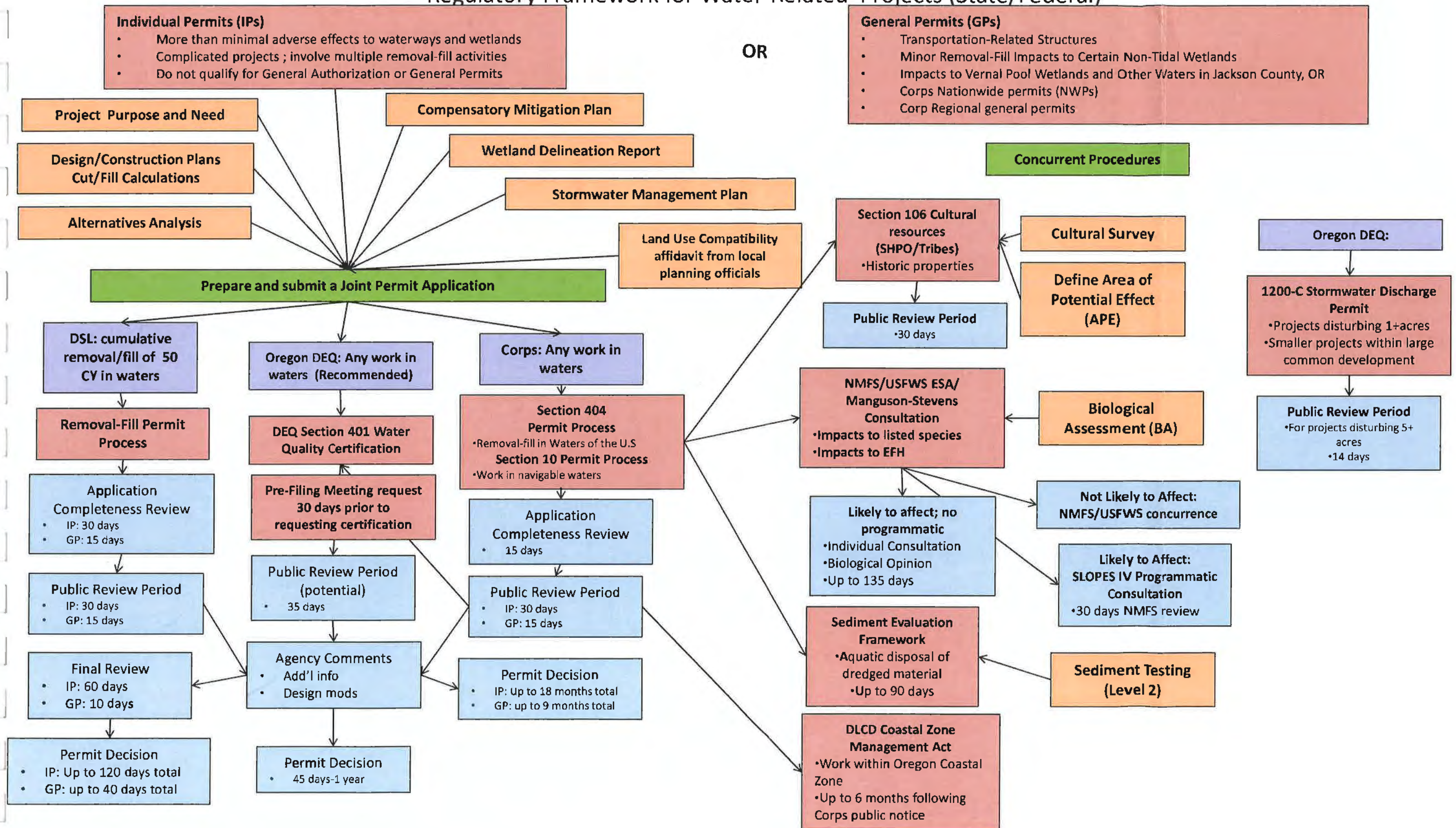
Date: 6/22/2023

Data Source: ESRI, 2023; Columbia
County GIS Dept., 2023; ORBIC 2023

Threatened, Endangered, and Sensitive Wildlife Species Data (ORBIC)

Port of Columbia County

Regulatory Framework for Water-Related Projects (State/Federal)



General Authorizations (GAs): Process for 9 specific removal-fill activities

- Certain Minimal Disturbance Activities in ESH
- Piling Placement and Removal within ESH
- Temporary Impacts to Non-Tidal Wetlands
- Waterway Bank Stabilization
- Transportation Related Activities
- Removing/Disposing of Sediment Behind Tidegates and within Hydraulically Closed Perimeters
- Waterway Habitat Restoration
- Wetland Ecosystem Restoration
- Recreational Placer Mining

Prepare a wetland delineation/determination report

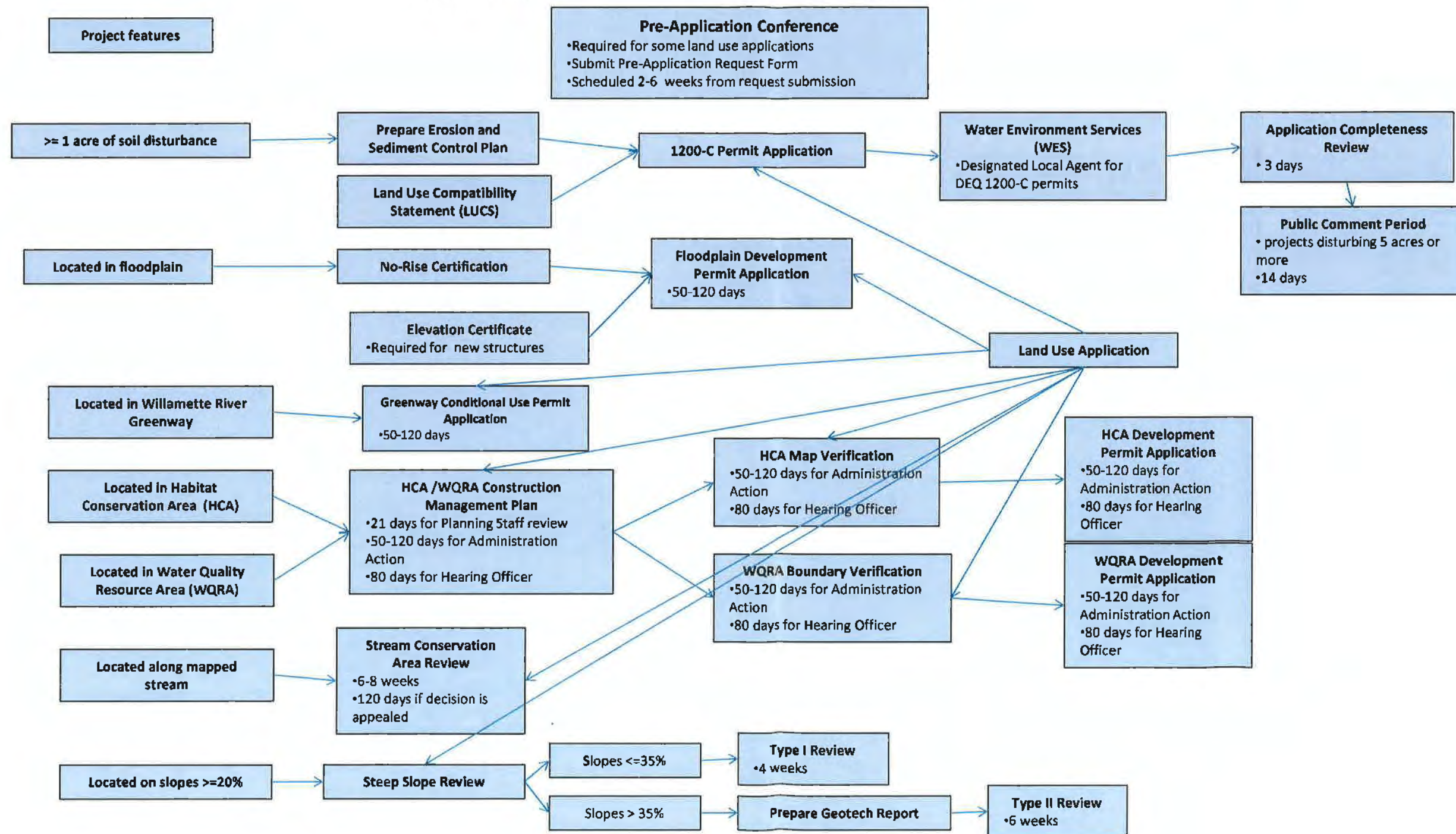
Prepare and submit a General Authorization Notification Form

DSL

30 day completeness review

Permit valid for 3 years

Clackamas County Regulatory Timeframe



APPENDIX C

Technical Memorandum: Surrounding Natural Resources (Water) - CwM-H20



Columbia County, Oregon

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August 3, 2023

Project No. 2310001

Jay Harland, *President*
CSA Planning, LTD.
4497 Brownridge Terrace, Suite 101
Medford, OR 97504

RE: RESPONSE TO LUBA NO. 2021-097: A. SURROUNDING NATURAL RESOURCES (WATER)

Dear Mr. Harland,

CwM-H2O (CwM) presents this technical memorandum in support of land use planning processes by CSA Planning, LTD (CSA) associated with the Port Westward Industrial Park (PWIP). The purpose of this memorandum is to address comments from the Land Use Board of Appeals (LUBA) remand No. 2021-097, specifically comments regarding the potential impacts to groundwater, water resources, and water quality from the proposed rezoning and expansion at the PWIP development.

This memorandum first presents background information on the types of water use, their extents, and the water sources in the lands surrounding PWIP and the proposed rezoning area. The memorandum then discusses how compliance with state and federal water use and water quality regulations are protective of natural resources and human health in the area surrounding PWIP in the context of the proposed development and rezoning of agricultural lands.

Background Information

The Port of Columbia County (Port), formerly known as the Port of St. Helens, operates the PWIP facility found along the Columbia River north of the City of Clatskanie, OR. PWIP includes approximately 905 acres of land that is zoned as Rural Industrial Planned Development (RIPD). This RIPD land includes uses such as power generation, fuel shipping, and renewable biofuel generation through leases with various industrial tenants.

Starting in 2013, the Port began the process of rezoning additional acreage surrounding PWIP in order to expand the lands eligible for RIPD-related activities. The proposed expansion included the rezoning of 837 acres of adjacent land from Primary Agricultural use (PA-80) to RIPD (Figure 1). The Port limited the scope of the proposed expansion to include only five industrial land use types that are congruent with current PWIP operations and that are directly dependent on the 1,500-ft long deep-water Beaver Dock facility on site:

- (1) Forestry and wood products processing, production, storage, and transportation;
- (2) Dry bulk commodities transfer, storage, production, and processing;
- (3) Liquid bulk commodities processing, storage, and transportation;
- (4) Natural gas and derivative products, processing, storage, and transportation; and
- (5) Breakbulk storage, transportation, and processing.

The proposed expansion and rezoning for PWIP has been approved by the Columbia County Board of Commissioners multiple times, but LUBA has remanded the decision back to the County for more information. Specifically, LUBA found that the Port did not present sufficient evidence to conclude that state and federal regulations in place related to the proposed industrial uses, which are protective of the environment and natural resources, are also protective of the adjacent agricultural, forestry, and residential land uses.

Current and Proposed Water Uses

This memorandum evaluates the relationship between the proposed industrial uses and surrounding agricultural, forestry, and residential uses from the perspective of groundwater, water resources, and water quality. To do this, the existing water uses and water sources for PWIP and the surrounding area must be characterized.

Groundwater Uses in the Area

CwM reviewed the Oregon Water Resources Department (OWRD) water well database to identify wells within 0.5 miles of PWIP, including both the current and proposed RIPD lands. The OWRD records well construction logs in a spatial database. Locations of wells are based on coordinates or addresses listed on the well logs, when available. When site specific locations are not available, the OWRD records the well to the nearest Section or Quarter-Quarter Section, whichever is most accurately known.

In total, the OWRD database includes 538 individual well logs within a 0.5-mile radius of PWIP lands, including wells within those lands. A well log does not necessarily represent an individual well, as a well log is also submitted when a well is modified or abandoned. Of these 538 well logs, 210 of them (39%) are for geotechnical boreholes or groundwater monitoring wells. Another 310 (58%) of the well logs are for dewatering wells associated with the PWIP facilities or the Beaver Drainage District. Of these 310 well logs, approximately half are logs for abandonment of a well.

Only 18 (3%) of the 538 well logs within 0.5 miles of the RIPD and proposed RIPD lands are for water supply wells (Figure 2, Attachment 1). One of these is an abandonment log (Portland General Electric well COLU-54484) and four are for industrial wells associated with the Port Westward facilities. The remaining wells are comprised of 12 domestic supply wells and one community supply well (COLU-343 for Columbia County School District 5J).

A review of the Oregon Water Resources Department (OWRD) water rights database identified four groundwater rights with their places of use (POUs) within 0.5 miles of PWIP lands (Figure 3). One of these rights (Permit G-16301) is for municipal uses by the Port (Attachment 2). Two of the groundwater rights (Certificates 86445 and 88638) are for quasi-municipal uses by the Quincy Water Association. The last of the four groundwater rights (Certificate 57850) is held by Columbia County School District 5J and is used for irrigation of the school grounds and general school uses

(Attachment 2). The remaining domestic wells identified above are presumed to operate under exempt use rules (ORS 537.545).

Groundwater Sources in the Area

CwM reviewed the well logs for the 17 water supply wells that appear to be active (not abandoned) within 0.5 miles of the RIPD and proposed RIPD lands. Of these wells, ten appear to produce water from the alluvial deposits of the Columbia River, while the remaining seven wells produce water from the underlying Columbia River Basalt Group (CRBG) (Attachment 1).

Surface Water Use and Sources in the Area

The OWRD water rights database includes eight surface water rights with their place of use (all or a portion) within a 0.5-mile radius of the PWIP lands (Figure 4, Attachment 2). These water rights cover an array of uses including municipal and quasi-municipal (5), irrigation (4), industrial and manufacturing (2), and power development (1). Sources of surface water include the Columbia River and its sloughs (Dobbins Slough and John Slough), as well as creeks that flow into the Columbia River from the foothills to the south of PWIP (Beaver Creek and Stewart Creek).

Water Uses by Land Use Type

Water well use types and corresponding water right use classifications (municipal, irrigation, industrial, etc.) are less specific than the land uses allowed under various zoning. Many of the specific water uses are the same or similar based on the permitted activities in agricultural and industrial lands. Although the Port's proposal has limited the use of the proposed RIPD lands to five uses (Forestry and Wood Products, Dry Bulk Commodities, Liquid Bulk Commodities, Natural Gas, and Breakbulk), uses such as irrigation and crop processing from PA-80 lands are still included under the first category of Forestry and Wood Products processing and production.

Many of the water uses for agricultural lands exhibit high consumptive use percentages, or the proportion of diverted or pumped water that is consumed (not returned to the ground/surface water) during the use (Table 1). In comparison, many of the water uses that characterize RIPD land use exhibit low average consumptive use. High consumptive use types are most likely to have adverse impacts on groundwater resource sustainability, as they typically require higher rates and larger volumes of pumping. Low consumptive use types, such as cooling and industrial processing water, often include recirculation or recycling systems to utilize water more than once.

Table 1 – Water Use Types by Land Use

Water Use Type	Ag. Lands (PA-80)	Res./ Community (RR-2/CS-I)	Forest Lands (PF-80)	Rural Industrial Lands (RIPD)	Estimated Consumptive Use (%)
Livestock watering	X	X			80-100% ²
Agricultural irrigation (crop/forest products)	X	X	X	X	45-100% ^{1,2}
Chemigation/chemical application	X		X	X	45-100% ^{1,2}
Non-ag irrigation	X	X		X	45-100% ^{1,2}
Crop/product processing	X			X	5-15% ²
Dust control/suppression	X			X	-
Industrial cooling	X			X	0-5% ²
Mineral exploration	X		X		Negligible use
Domestic supply	X	X	X	X	10-15% ²
Natural gas/fuel production				X	10-15% ²
Bulk commodity processing				X	0-10% ²
Commodity storage/transport				X	Negligible use
Fire suppression				X	-

1. USDA, 1962
2. Shaffer & Runkle, 2007

Risks to Groundwater and Water Quality

All water use types have the potential for adverse impacts to land uses and water resources if improperly managed and regulated (Table 2). As discussed previously, many of the water uses allowed on PA-80 agricultural lands and RIPD industrial lands are the same or similar (Table 1). The PWIP facilities may use water for various purposes, such as producing and processing natural gas and fuel, cooling industrial equipment, and storing, processing, and transporting materials. However, the exact usage breakdown for the Port is not yet determined. The surrounding PA-80 lands will primarily use water for irrigation, chemical application, and crop product processing.

Table 2 – Risks to Groundwater and Water Quality by Land Use Activity

Land Use Activity	Risk to Groundwater / Water Quality
Irrigation (crop/forest)	Groundwater level declines or reduction of surface water flows, nutrient contamination from stormwater runoff, non-point source pollution, discharge of agricultural wastewater
Chemical application	Herbicide/pesticide contamination
Livestock	Nutrient and pathogen contamination from stormwater runoff, non-point source pollution, discharge of agricultural wastewater
Domestic supply	<i>Limited</i>
Crop/forest product processing	Contamination from stormwater runoff, leaky above- or under-ground storage tank contamination, contamination from industrial wastewater discharge
Industrial cooling	Contamination from industrial cooling water discharge
Natural gas processing	Petroleum-related contamination, contamination from stormwater runoff, leaky above- or under-ground storage tank contamination, contamination from industrial wastewater discharge
Commodity storage/transport	

Wetland Impacts and Mitigation

A portion of the proposed RIPD area consists of degraded wetland environments located within the Beaver Drainage District levee system (see Figure 1). As part of the proposed developments for the PWIP project, on-site wetland mitigation may take place over these degraded wetlands within the RIPD area. Mitigation efforts would involve the restoration or enhancement of the degraded wetlands already on site. Work may include lowering of the surface elevation, roughening of the land surface to support vegetative diversity, filling in existing drainage canals and replacing them with dendritic flow channels, and creating upland buffer zones. Much of the existing PWIP site and the proposed RIPD areas were historically located within the Columbia River floodplain.

The advent of Beaver Drainage District, under the authority provided by ORS 547.005, and construction levee system in the early 20th century was aimed at reducing flood risk in these low-lying areas and providing irrigation water for agricultural land uses there. A network of drainage channels and pumps is utilized to control the groundwater table within the levee area. In the winter and spring rainy season, water is pumped out of the District to prevent flooding of the land surface. In the summer production season, pumps are turned off to raise the water table closer to the surface as a method of subsurface irrigation.

With appropriate site study and characterization, it is possible to plan and implement wetland restoration of the nature described above that is compatible with area agricultural land uses. Wetlands do not need to be inundated at the surface year-round. By definition, an area can be

classified as a wetland if the soils are saturated at a frequency and interval adequate for sustaining obligate or facultative wetland vegetation (Heimlich et al., 1998), which can be as little as three to four months out of the year. The maintenance of such conditions also supports the development of animal communities that are dependent on wetlands for breeding, such as amphibians and bird species.

The proposed lowering of the land surface and the excavation of dendritic channels would create opportunities for saturated near-surface soils and/or inundation over the production season, leading to conditions necessary for supporting wetland vegetation. Critically, this could potentially be done without a significant change to the pumping schedule operated by the District. The continuation of District pumping during the wet season may not lead to sustained wetland conditions throughout the year, though this is not necessarily required for a functional wetland habitat.

The proposed wetland mitigation actions are not anticipated to have a negative impact on groundwater quality in the alluvial aquifer. There are many examples of wetlands improving water quality and acting as sinks for nutrients, sediment, and other pollutants (EPA, 2023). Wetlands in agricultural landscapes have been shown to help protect shallow groundwater and surface waters from water quality impacts from agricultural land uses (Matsuzaki et al., 2019).

State and Federal Regulations Protective of Water Quality

This section outlines the responsibility of three state agencies and the federal Environmental Protection Agency (EPA) that oversee the protection of Oregon's natural water resources as they relate to potential adverse water quality due to the development of the PWIP. The state agencies include OWRD, Oregon Department of Environmental Quality (ODEQ) and Oregon Department of Forestry (ODF).

Oregon Water Resource Regulations ORS Chapter 690

The State of Oregon has a strong regulatory framework associated with water resources and water quality protection from industrial activities. Some of these regulatory programs are Oregon specific, while others are administered by the State through authority bestowed by the federal government. The water-related regulatory framework can be divided into programs controlling water usage and those controlling water quality. Water usage is governed by the State's water rights system, which limits and monitors the use of water for any non-exempt (domestic, small commercial, etc.) purpose. Water quality programs are administered by the State and federal government and address water use and disposal particular to industrial sites.

Water Usage Monitoring and Limitation

Any industrial or agricultural use of groundwater or surface water in Oregon requires a water right issued by the Oregon Water Resources Department (OWRD). The water right specifies the

type of use allowed, the source of the water, the period of use allowed, and the rate and/or volume of water allowed for that use. The OWRD can include conditions on the water right for the installation of meters to measure water use. The OWRD can require monthly or annual reporting of water usage to track resource utilization.

The Oregon water rights system has measures in place that allow the OWRD to restrict or stop water usage if the resource is at risk. For example, junior water rights are restricted in instances when surface water availability decreases. This prevents the overdraft of water from surface water bodies and therefore protects the natural resource and environment, as well as neighboring water uses with senior water rights.

Groundwater rights can be monitoring using the same metering and reporting conditions. Groundwater rights can also define the limits of allowable groundwater supply impacts before OWRD can restrict or stop water use. A common condition is a maximum of 15 ft of interference with a neighboring well or 3 ft or more of annual water level decline in the source well. The water rights framework provides the State with multiple ways to monitor and regulate water resource usage.

All of the industrial activities proposed for the PWIP expansion that require water must operate under an existing Port water right, or the Port must acquire a new water right through an application or through transfer. The Port currently holds municipal groundwater use Permit G-16301 for up to 17.824 cfs (8,000 gpm) within the service area of the Port. This water right contains measurement, recording, and reporting conditions including:

- Installation of totalizing flow meters on all permitted source wells,
- Maintenance of flow meters in working order,
- Annual reporting of monthly water use by source,
- Reporting of the place and nature of water use upon request by the OWRD,
- Maintaining continuous access by the Watermaster to all source wells for inspection and water level data collection,
- Discontinuation of all water use if substantial interference is experienced at a senior water right well,
- Maintenance of water level measuring devices and access ports on all wells.

Oregon Department of Environmental Quality OAR Chapter 340

The majority of the rules that protect Oregon's groundwater and surface water quality are overseen by ODEQ through various preventive measures, required plans and permit conditions.

Groundwater and Surface Water Quality Regulatory Framework

The State of Oregon currently administers the several permitting and regulatory programs for the protection of water resources and water quality related to industrial activities. Most of these

activities are overseen by ODEQ under OAR Chapter 340. This list captures the most likely regulations related to the proposed port land use.

Groundwater Quality Protection (OAR 340, Division 40):

The rules within this division establish the mandatory minimum groundwater quality protection requirements for federal and state agencies, cities, counties, industries, and citizens. Other federal, state, and local programs may contain additional or more stringent ground-water quality protection requirements. Unless specifically exempted by statute, groundwater quality protection requirements must meet or be equivalent to the rules promulgated within this Chapter 340.

Underground Injection Control (UIC) Permits (OAR 340, Division 44):

- ODEQ was given the authority to regulate UIC systems by EPA under the 1974 Safe Drinking Water Act. The program protects groundwater resources from contamination due to infiltration or subsurface injection of fluids (stormwater, effluent, treated wastewater or drinking water).
- ODEQ issues permits to UIC operators and enforces permit conditions and regulations.
- The OAR 340, Division 44 rules include provisions of the Groundwater Act which prohibit the contamination of groundwater. This is done by ensuring any UIC discharge meets background groundwater quality.
- The ODEQ has the authority to require pre-treatment, sampling and monitoring programs, and can close a UIC system to prevent potential groundwater contamination.

Water Pollution Control Facility (WPCF) Permits (OAR 340, Division 45):

- WPCF permits regulate the discharge of wastewater from any industrial or commercial establishment to the ground to prevent direct discharge to surface waters and to protect groundwater from contamination. Infiltration ponds, infiltration galleries, drywells, and other features specifically designed for the percolation of wastewater are regulated by this program.
- The application and review processes for this program ensure that discharges to the ground do not impact surface water and do not have adverse impacts on groundwater resources. The WPCF permit defines the maximum contaminant levels allowed at the point of discharge and at the groundwater compliance point, specified by the permit.
- The WPCF program requires a Groundwater Monitoring Plan approved by the Oregon Department of Environmental Quality (ODEQ.)
- The Port will require a WPCF or UIC permit if the proposed industrial activities involve the discharge of municipal, industrial or forestry-activity wastewater to the ground or subsurface.

National Pollution Discharge Elimination System (NPDES) Stormwater Permits (OAR 340, Division 45):

- The Industrial Stormwater Discharge Permitting (No. 1200-Z) program is administered by the ODEQ. The 1200-Z permit and permitting process has been updated and renewed as of August 2022.
- The NPDES program protects surface water from contamination due to stormwater discharge from industrial sites.
- The requirements for NPDES apply to any point source of pollution, which includes roadways and logging roads associated with manufacturing, processing, or storage of raw materials. Point sources also include captured and channelized stormwater runoff from parking lots, large industrial buildings, and other impervious surfaces.
- The Port will require NPDES permits for stormwater runoff produced from industrial and forestry areas in the PWIP facilities.

Section 401 Water Quality Certification (OAR 340, Division 45):

- Section 401 of the Clean Water Act gives ODEQ the authority to make the determination that a project can meet Oregon water quality standards before federal agencies can issue a license or permit for the project.
- ODEQ issues Water Quality Certifications if this determination can be made.
- Section 401 applies to any discharge of water potentially containing pollutants to surface water or to the ground.
- Certification may come with conditions for pre-treatment and/or monitoring of water quality.
- There will likely be requirements for a 401 Certification related to the Liquid Bulk and Natural Gas activities which could be allowed at the PWIP site.

Solid Waste Disposal Permits (OAR 340, Division 97):

- Uses related to solid waste would be accessory in nature or limited to uses such as composting or industrial materials recovery facilities.
- This permit is required for any municipal or non-municipal operation that is a land disposal site, energy recovery facility, incinerator, composting facility, sludge disposal, land application disposal site, transfer station, material recovery site, solid waste treatment site, or any other site related to solid waste.

Hazardous Waste Management Permits (OAR 340, Divisions 100-108 and 120):

- The EPA's Resource Conservation and Recovery Act (RCRA) regulates the generation, transport, treatment, storage, and disposal of hazardous waste and non-hazardous solid waste.
- ODEQ is the lead regulatory agency in charge of implementing RCRA in the State.

- RCRA Treatment, Storage and Disposal Facility Permits stringently regulate all facilities dealing with hazardous waste.
- The Dry Bulk, Liquid Bulk, Natural Gas, and Breakbulk activities proposed at the PWIP site may require Hazardous Waste Management permitting depending on the specific materials being stored, transported, or processed at the site.

Water Reuse Program (OAR 340, Division 55):

Oregon encourages the use of recycled water for domestic, agricultural, industrial, recreational, and other beneficial purposes in a manner which protects public health and the environment of the state. The use of recycled water for beneficial purposes can improve water quality by reducing discharge of treated effluent to surface waters, reduce the demand on drinking water sources for uses not requiring potable water, and may conserve stream flows by reducing withdrawal for out-of-stream use.

- Reuse of industrial wastewater is regulated by the ODEQ Water Quality Program.
- Approval from ODEQ for industrial water reuse requires evidence that the reuse provides a resource value and that the reuse is protective of public health and the environment.
- Water reuse will require ODEQ approval of a water reuse permit and operations plan if industrial water is reused for purposes outside of the primary industrial use. Groundwater and surface water monitoring may also be required by permit.

Oil Contingency Planning and Fees (OAR 340, Division 141):

This chapter and division include spill prevention plan requirements, reporting, and emergency response to oil and hazardous materials spills.

Oil and Hazardous Material Emergency Response (340-142-0040)

- Reporting is required if the amount of oil or hazardous material spilled or released, or threatening to spill or release, exceeds the reportable quantity established in ORS 466.605 or listed in OAR 340-142-0050, or will exceed a reportable quantity in any 24-hour period. Immediately report the spill or release or threatened spill or release to the Oregon Emergency Management Division's Oregon Emergency Response System (OERS) by calling 1-800-452-0311.

Oregon DEQ Emergency Response for Petroleum Spills

- The Oregon Department of Environmental Quality prevents, plans for, and responds to spills of oil and hazardous materials. Spills can occur during transportation, transfer and storage of oil and other hazardous materials and pose a threat to public health and the environment. Once spilled into water, quick-moving currents and tides can cause the oil or other hazardous material to spread rapidly, impacting drinking water and air quality as well as animals and their habitats.

Oil Spill Contingency Planning

- The Oil Spill Contingency Planning program reviews required plans from petroleum facilities, pipelines, commercial ships larger than 300 gross tons and high hazard railways for an approval period of five years. When a plan has been reviewed it is posted on the DEQ website for public comment for 30 days.

Oregon Department of Forestry OAR Chapter 629

Forestry Practices Act (FPA) Regulations (OAR 629, Divisions 635, 642, 650, 655, and 660):

- This program is administered by the Oregon Department of Forestry.
- The FPA contains elements aimed at protecting water resources in areas with commercial forestry practices.
- Regulations require forested and vegetated buffers to be left along streams, wetlands, and lakes to protect water quality and habitat, provide shade to maintain water temperature, and reduce nutrient and sediment input to waters.
- The FPA regulates the construction of roadways and water crossings to reduce impacts to natural resources and habitat, which also benefits water quality. The program also limits chemical application and timber harvesting along water bodies to reduce contamination potential.
- Any forestry activities performed within PWIP lands will have to comply with the rules and regulations of the FPA program.

Environmental Protection Agency- Title 40 Code of Federal Regulations (CFR) Part 112**Spill Prevention Control and Countermeasure (SPCC) Plan**

The purpose of developing a SPCC Plan is to establish procedures, methods, equipment, and other measures to prevent, control, and counter the discharge of harmful quantities of oil into or upon the navigable waters of the United States of America or their tributaries.

40 CFR Part 112 requires an SPCC Plan for owners or operators of non-transportation-related onshore facilities that are engaged in storing, transferring, or consuming oil and oil products; that, because of their location, could reasonably be expected to discharge oil in harmful quantities into or upon navigable waters; and that meet one of the following conditions:

- The aggregate aboveground storage capacity of the facility exceeds 1,320 gallons. Only containers with a capacity of 55 gallons or more are counted.
- Underground oil-storage capacity exceeds 42,000 gallons, unless the underground tanks are subject to all of the technical requirements of 40 CFR 280, or a state program approved under 40 CFR 281.

The SPCC requirements are applicable to any facility where the total aboveground storage capacity is greater than 1,320 gallons. As defined by 40 CFR Part 112, oil includes all grades of motor oil, hydraulic oil, lube oil, fuel oil, gasoline and diesel, automatic transmission fluid, waste oil, and transformer mineral oil. The definition of oil also includes nonpetroleum oils such as animal and vegetable oils and synthetic oils.

A SPCC Plan is a common requirement for port facilities and specific developments on port properties.

Summary and Conclusions

The purpose of this memorandum is to address comments from the Land Use Board of Appeals (LUBA) remand No. 2021-097, specifically comments about the potential impacts to groundwater, water resources, and water quality from the proposed rezoning and expansion at the PWIP development. A summary matrix of the land uses proposed, potential list of likely permits needed, and the public involvement required for each potential port facility are presented in Attachment 3 – Land Use Matrix. The matrix does not include all permits potentially required.

- Based on the water use analysis and comparison between agricultural use and rural industrial use, both uses appear compatible in the area of the PWIP. The demands for water by both agricultural and rural industrial can be met in the area of the proposed port expansion. Expanded rural industrial water use will not impair the operation of the nearby agricultural water users.
- Based on the presented requirements of three state agencies; OWRD, ODEQ, ODF, and the federal EPA, the natural surface water and groundwater resources of Oregon are well protected for development of new rural industrial facilities and do not threaten the continued use of groundwater in the area for agricultural purposes.
- This professional opinion assumes that the Port's proposed requirements for seismic standards and 100-year flood hazard protection will be imposed as conditions of approval.

If you have any questions, please contact the undersigned at 503-799-0304.

Sincerely,

CwM-H2O, L.L.C.



Robert Long, RG, LHG, CWRE
Principal Consultant

Figures:

Figure 1 – Site Map and Current Land Use Zoning

Figure 2 – Water Supply Wells within 0.5-miles

Figure 3 – Groundwater Right Places of Use (POUs) within 0.5-miles

Figure 4 – Surface Water Right Places of Use (POUs) within 0.5-miles

Attachments:

Attachment 1 – Water Supply Wells within 0.5-miles

Attachment 2 – Water Rights within 0.5-miles

Attachment 3 – Land Use Matrix

References:

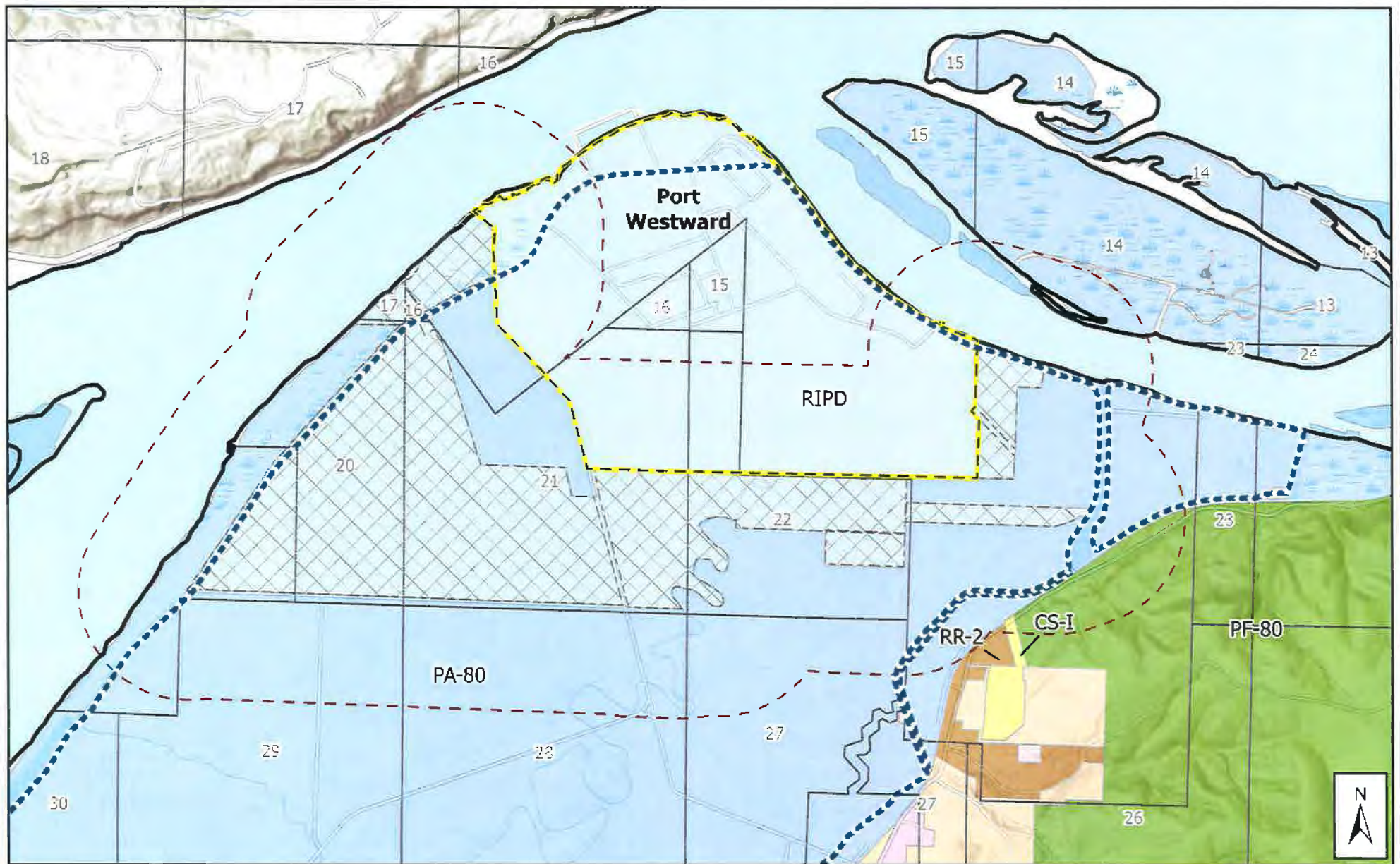
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Figure 1
Site Map and Current Land Use Zoning

1	DATE	AUTH	DRAFT
No.	Date	By	Revisions

0 1,250 2,500 5,000 ft

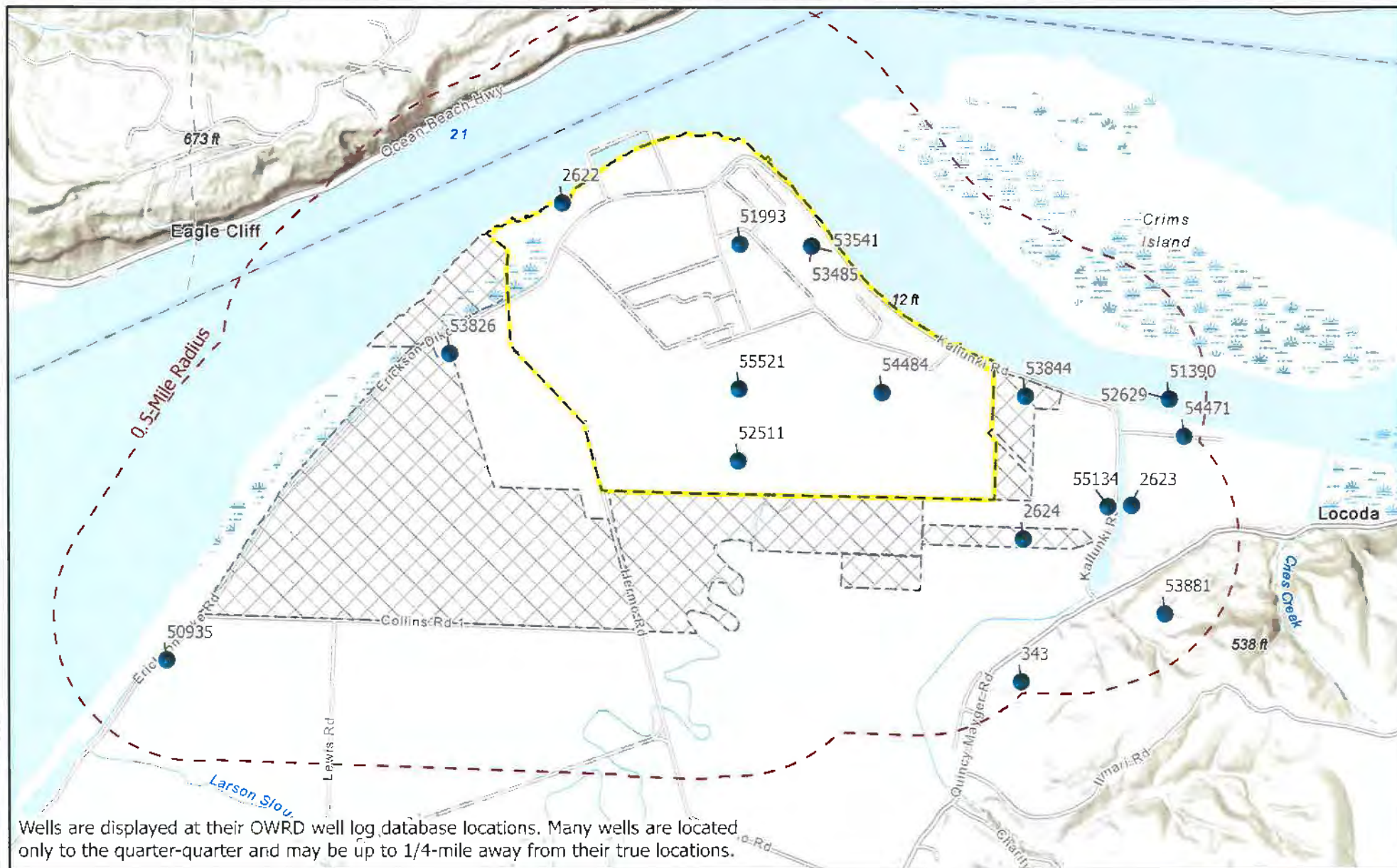


Scale: 1" = 2,500'

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- Existing Industrial Zoned Area
- Proposed RIPD Rezone Area
- 2,000-ft Proposed RIPD Buffer
- Levees



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Figure 2
Water Supply Wells within 0.5-miles

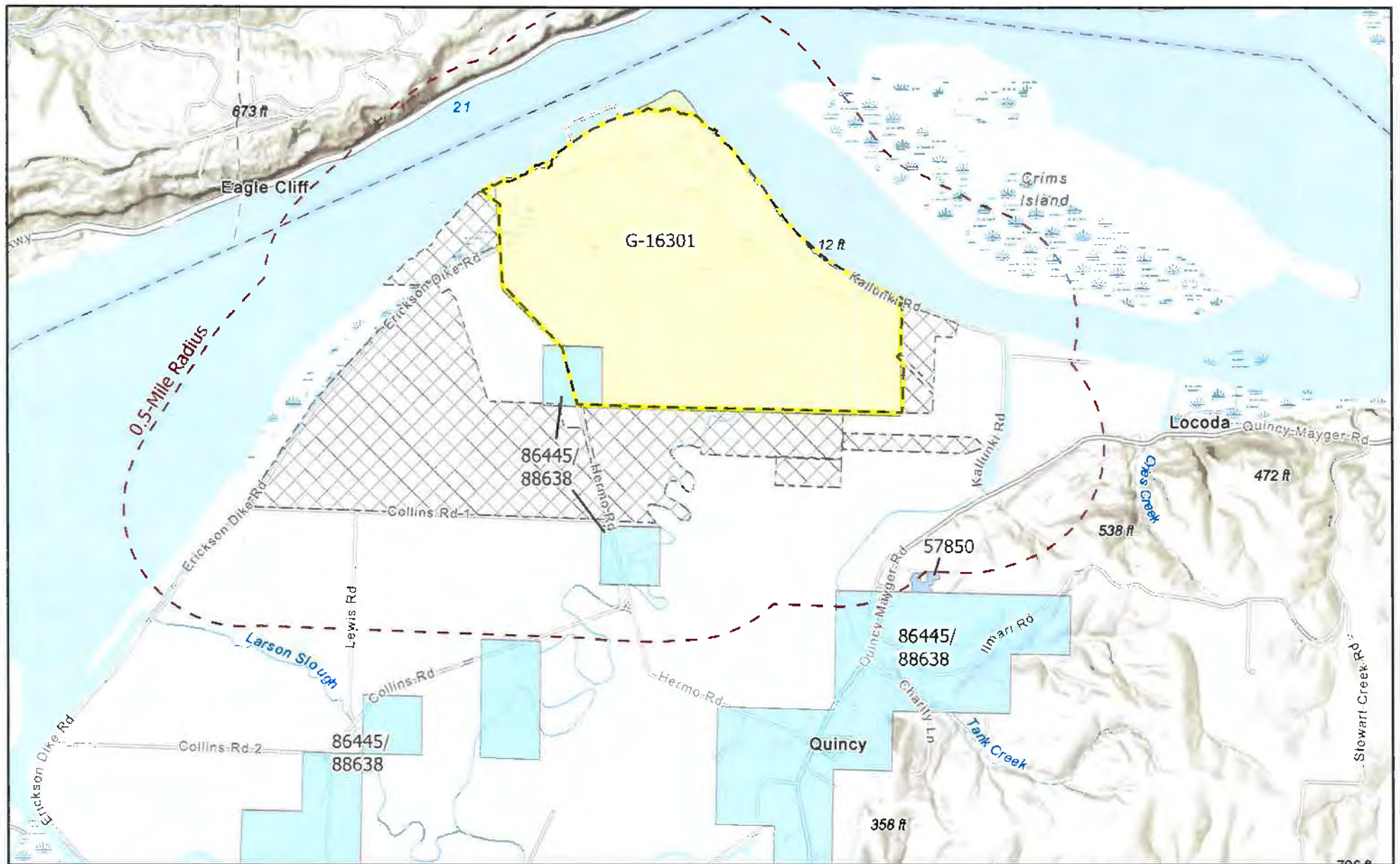
1	DATE	AUTH	DRAFT
No.	Date	By	Revisions

0 1,250 2,500 5,000 ft
Scale: 1" = 2,500'

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-  Existing Industrial Zoned Area
-  Proposed RIPD Rezone Area
-  0.5-mile Radius
-  Supply Wells

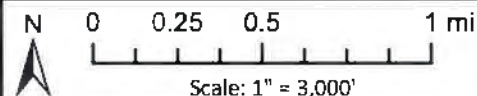


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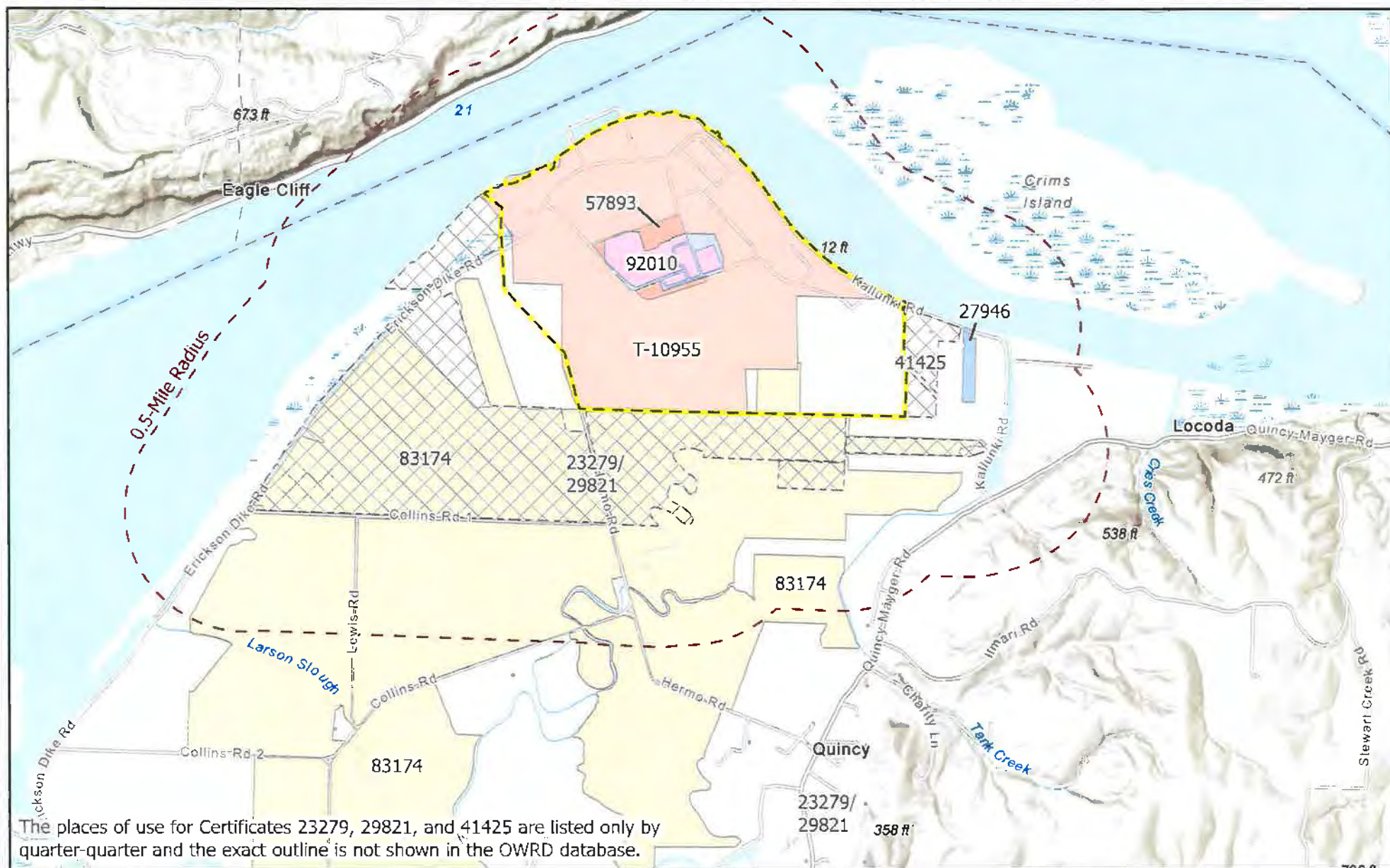
Figure 3
Groundwater Right Places of Use
(POUs) within 0.5 Miles

1	DATE	AUTH	DRAFT
No.	Date	By	Revisions



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-  Existing Industrial Zoned Area
-  Proposed RIPD Rezone Area

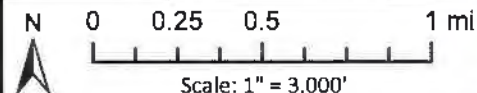


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Figure 4
Surface Water Right Places of Use
(POUs) within 0.5 Miles

1	DATE	AUTH	DRAFT
No.	Date	By	Revisions



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-  Existing Industrial Zoned Area
-  Proposed RIPD Rezone Area

ATTACHMENT 1 - WATER SUPPLY WELLS WITHIN 0.5-MILES

Well Name	Well Type	Use Type	Owner Name	Aquifer	Total Depth (ft)	Well Diameter (in)	Depth to First Water (ft)	Post SWL (ft)	Yield (gpm)	New Well	Alteration	Abandon.	PLSS Location
COLU 2624	Water Well	Domestic	RONALD L MARTIN	Alluvial Deposits	306	6		9	48	1	0	0	WM8.00N4.00W23NWSW
COLU 51390	Water Well	Domestic	REBECCA LEHTO	Alluvial Deposits	80	6	19	19	1	1	0	0	WM8.00N4.00W23NWNE
COLU 52629	Water Well	Domestic	YANKTON LAND AND CATTLE INC.	Alluvial Deposits	226	5	173	6	50	1	0	0	WM8.00N4.00W23NWNE
COLU 55134	Water Well	Domestic	BOBBY DE LA CRUZ	Alluvial Deposits	180	6	165	5	5	1	0	0	WM8.00N4.00W23NESW
COLU 55521	Water Well	Domestic	KARIN IRISH	Alluvial Deposits	162	6	40	1	75	1	0	0	WM8.00N4.00W22NWNW
COLU 53826	Water Well	Domestic	LAWRENCE N. & WANDA DERBY	Alluvial Deposits	157	6	6	5.5	150	1	0	0	WM8.00N4.00W21NWNW
COLU 53844	Water Well	Domestic	REBECCA LEHTO	Alluvial Deposits	25	6	25	19	3	0	1	0	WM8.00N4.00W23NWNW
COLU 50995	Water Well	Domestic	TERRY RIGGS	CRBG Basalt	480		380	380	10	0	1	0	WM8.00N4.00W29NWNW
COLU 2623	Water Well	Domestic	FRED RICE	CRBG Basalt	182	6		30	24	1	0	0	
COLU 2622	Water Well	Domestic	ROSE NORMAN	CRBG Basalt	71	6	0	40	7	1	0	0	
COLU 53881	Water Well	Domestic	MICHAEL KERANEN	CRBG Basalt	120	6	100	90	10	1	0	0	WM8.00N4.00W23SWSE
COLU 54471	Water Well	Domestic	REBECCA LEHTO	CRBG Basalt	100	6	95	36	30	1	0	0	WM8.00N4.00W26NWSE
COLU 52511	Water Well	Industrial	PORT OF SAINT HELENS	Alluvial Deposits	163	12	42	5	620	1	0	0	WM8.00N4.00W22SWNW
COLU 51993	Water Well	Industrial	PORT OF SAINT HELENS	Alluvial Deposits	105	10	47	13	600	1	0	0	WM8.00N4.00W15NWSW
COLU 53485	Water Well	Industrial	PORT OF SAINT HELENS	Alluvial Deposits	159	12	26	11.5	667.5	1	0	0	WM8.00N4.00W15NESW
COLU 53541	Water Well	Industrial	PORT OF SAINT HELENS	CRBG Basalt	701	8	677	28	50	1	0	0	WM8.00N4.00W15NESW
COLU 343	Water Well	Community	COLUMBIA COUNTY ADMIN SCHOOL DIST SJ	CRBG Basalt	301	6	199	113	15	1	0	0	WM8.00N4.00W26NWNW

ATTACHMENT 2 - WATER RIGHTS WITHIN 0.5-MILES

Permit No.	Certificate No.	Transfer No.	Type	Water Right Holder	Water Right Use	Source	Priority Date
S 23333	23279		SW	QUINCY WATER ASSOCIATION	MUNICIPAL USES	Stewart Creek	9/3/54
S 23178	27946		SW	JOHN & DAISY WILMARTH	IRRIGATION	Columbia River	9/2/54
S 24582	29821		SW	QUINCY WATER ASSOCIATION	MUNICIPAL USES	Beaver Creek	11/16/56
S 36434	41425		SW	RONALD MARTIN	IRRIGATION	Dobbins Slough	8/6/71
S 41506	57893		SW	PORTLAND GENERAL ELECTRIC CO.	POWER DEVELOPMENT	Dobbins Slough	3/24/77
S 44086	83174		SW	BEAVER DRAINAGE DISTRICT	IRRIGATION	John Slough	4/26/79
S 34940		T 10955	SW	PORTLAND GENERAL ELECTRIC CO.	INDUSTRIAL/MANUFACTURING USES	Columbia River	8/3/70
S 34940	92010		SW	PORTLAND GENERAL ELECTRIC CO.	INDUSTRIAL/MANUFACTURING USES	Columbia River	8/3/70
G 6456	57850		GW	COLUMBIA COUNTY SCHOOL DISTRICT 5 J	IRRIGATION	CRBG Aquifer	5/9/75
G 16301			GW	PORT OF SAINT HELENS	MUNICIPAL USES	Alluvial Aquifer	5/1/07
G 7711	86445		GW	QUINCY WATER ASSOCIATION	QUASI-MUNICIPAL USES	CRBG Aquifer	12/7/77
G 7711	88638		GW	QUINCY WATER ASSOCIATION	QUASI-MUNICIPAL USES	CRBG Aquifer	12/7/77

Attachment 3 - Land Use Matrix

Sample Use		Expected Water-Related Permit Required	Public Process for Permitting
Forestry & Wood Products	Less Intense - Log Yard	Permit to Use Water or Certificated Water Right, NPDES Stormwater Permit, possible WPCF or water reuse permit.	A new permit or modification of an existing permit requires public notice period by primary agency during which citizens can comment on the permit and request standing or protest as part of public hearing. Other agency reviews may also be required including Oregon Department of Fish and Wildlife.
	Customary Development Form - Wood Pellet Mill	Permit to Use Water or Certificated Water Right, NPDES Permit, 401 Certification, potentially a UIC or WPCF Permit for discharge to the ground, other permits to vary depending on activities	
	More Intense than CDF - Kraft Pulp Mill	Permit to Use Water or Certificated Water Right, NPDES Permit, 401 Certification, potentially a UIC or WPCF Permit for discharge to the ground, potential Water Reuse Program Approval	
Dry Bulk	Less Intense - Bulk food import/export such as rice, corn, wheat	No Permit for water use or disposal. Potential modification existing NPDES Stormwater Permit.	A new permit or modification of an existing permit requires public notice period by primary agency during which citizens can comment on the permit and request standing or protest as part of public hearing. Other agency reviews may also be required including Oregon Department of Fish and Wildlife.
	Customary Development Form - Gypsum Wallboard Plant	Permit to Use Water or Certificated Water Right, NPDES Permit, 401 Certification, potentially a UIC or WPCF Permit for discharge to the ground, other permits to vary depending on activities	
	More Intense than CDF - Import / export hazardous materials, such as lead concentrate, sulfur, nickel	Permit to Use Water or Certificated Water Right, NPDES Permit, 401 Certification, potentially a UIC or WPCF Permit for discharge to the ground, potential Water Reuse Program Approval	
Liquid Bulk	Less Intense - food stuff import /export such as cooking oil, fructose, etc.	Potential modification of a NPDES Permit	A new permit or modification of an existing permit requires public notice period by primary agency during which citizens can comment on the permit and request standing or protest as part of public hearing. Other agency reviews may also be required including Oregon Department of Fish and Wildlife.
	Customary Development Form - Ethanol Processing Facility	Permit to Use Water or Certificated Water Right, NPDES Permit, 401 Certification, potentially a UIC or WPCF Permit for discharge to the ground, other permits to vary depending on activities	
	More Intense than CDF - Petroleum storage and refining	Permit to Use Water or Certificated Water Right, NPDES Permit, 401 Certification, SPCC Plan, other permits to vary depending on activities	
Natural Gas	Less Intense - Natural Gas Peaker Plant	Permit to Use Water or Certificated Water Right, NPDES Stormwater Permit. Potentially Oregon Energy Facility Siting Council (EFSC) Site Certificate.	A new permit or modification of an existing permit requires public notice period by primary agency during which citizens can comment on the permit and request standing or protest as part of public hearing. Potential additional multi-agency reviews and permits, public outreach, public scoping meetings will be required for Federal National Environmental Policy Act (NEPA) on LNG import or export
	Customary Development Form - LNG Facility	Permit to Use Water or Certificated Water Right, NPDES Permit modification, 401 Certification, other permits to vary depending on activities. Additional Federal Energy Regulatory Commission (FERC) Permit.	
	More Intense than CDF - Ammonium Nitrate Fertilizer plant	Permit to Use Water or Certificated Water Right, NPDES Permit, 401 Certification, Hazardous Waste Management Permits, other permits to vary depending on activities	
Break Bulk	Less Intense - Non-hazardous import facility, such as clay, lumber, autos, machinery	New or modification of NPDES Stormwater Permit	A new permit or modification of an existing permit requires public notice period by primary agency during which citizens can comment on the permit and request standing or protest as part of public hearing. Other agency reviews may also require review and approval.
	Customary Development Form - Breakbulk import with processing	Permit to Use Water or Certificated Water Right, potentially a NPDES Permit, other various permits depending on activities. Potential SPCC Plan or modification.	
	More Intense than CDF - Hazardous or explosive materials, such as ammunition, explosives, batteries, bleach	Permit to Use Water or Certificated Water Right, NPDES Permit, 401 Certification, Hazardous Waste Management Permits, other permits to vary depending on activities	



Robert E. Long, Senior Hydrogeologist – Portland, OR

- Education:** B.A., Geology, State University of New York at Buffalo, 1986
SUNY School of Environmental Science and Forestry, 1987
Syracuse University, LC Smith School of Engineering, Hydrogeology 1988-92
- Certifications:** Registered Professional Geologist, Oregon G1735
Registered Professional Geologist and Hydrogeologist, Washington #1999
Certified Water Rights Examiner, Oregon 71101CWRE
- Project Role:** Senior Water Resources Planner, Certified Water Right Examiner, Senior Hydrogeologist
- Responsibilities:** Project management, water system planning, surface and groundwater right planning, water right portfolio strategy, integrated surface water and groundwater source management, ASR, production well design and installation, water right transactions, water use conservation planning.

SELECTED PROJECTS

Columbia Basin Conservation Inventory and Demand Forecast, Oregon, Washington

Provided strategy and senior review for the approach to gathering water rights data on the Colombia River in Washington and Oregon.

Dam Drawdown Impacts to Groundwater Supply, U.S. Army Corps of Engineers (Portland District)

Conducted an evaluation of potential impacts to publicly owned wells in Washington and Oregon resulting from planned John Day Dam minimum pool drawdowns.

Groundwater Infrastructure Management Plan, City of Portland, Oregon.

This planning document evaluated the reliable capacity of the Columbia South Shore Well Field.

Groundwater Infrastructure Assessment and Consolidation Plan, City of Wilsonville, Oregon

CwM was hired to assess water rights across the supply well portfolio and to assess the condition and value of each pumping facility based on historical pumping, maintenance records, and input from City operators.

Water Rights Master Plan, Clackamas River Water Providers, Oregon

Evaluated all municipal water rights that divert water from the Clackamas River. The resulting Water Rights Master Plan presented each municipality with a strategy for strengthening water use claims on the river.

Water Rights Master Plan, City of Dallas, Oregon

Provided expert assistance in developing a strategy to retain existing water right permits and to certify the use of surface water and reservoir permits held by the City.

Portland Production Well Installations, Portland Water Bureau, Portland, Oregon

Project manager for design and installation of the final two production wells in the City's South Shore Columbia Wellfield.

Water Management and Conservation Plan, Salmon Valley Water Company, Clackamas County, Oregon

CwM completed a required Water Management and Conservation Plan for Salmon Valley Water Company.

Water Management and Conservation Plan and Update, Banks, Oregon

Mr. Long led the City's Water Management and Conservation Plan in 2010 and the update in 2020.

APPENDIX D

Technical Memorandum: Flood Risk Mitigation - WEST Consultants



Columbia County, Oregon

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TECHNICAL MEMORANDUM



WEST Consultants, Inc.

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(503) 485-5491 Fax
www.westconsultants.com

To: Jay Harland, President
Company: CSA Planning Ltd.
Date: 8/8/2023
From: Hans Hadley, PE, CFM, WEST Consultants, Inc.
Michael Meyer, PE, Cornforth Consultants, Inc.
Subject: Flood risk mitigation strategies related to Port Westward Industrial Park zone change request

Introduction

The purpose of this memorandum is to address petitioners' concerns with regard to flood risk as it relates to the requested zone change, for the area protected by the Beaver Drainage Improvement Company (BDIC) Levee system, from Primary Agriculture (PA-80) to Resource Industrial Planned Development (RPID). Petitioners believe that the current BDIC levee system is inadequate to prevent flooding from the Columbia River and that flooding of the existing and any future industrial facilities would result in damage to the agriculture and local economy if contaminants were to become entrained in the floodwaters.

This memorandum will show how compliance with FEMA levee accreditation requirements, when applied to moderate intensity land use, and when combined with additional flood proofing measures for high intensity land use, are protective of the environment as it relates to flooding from the Columbia River, both generally and in the context of development of the proposed Port Westward Industrial Park expansion.

Facts in Brief

The 905-acre Port Westward Industrial Park is owned by Port of Columbia County (the Port) and is located behind the BDIC levee system. The Port wishes to expand Port Westward to include 837 acres of additional adjacent property, mostly located behind the levee system. The expansion requires a land use exception to Statewide Goal 3 and a zone change from PA-80 to RPID. The Port limited the application for expansion to permit only five categories of industrial uses that are dependent on the Port's deep-water facilities: (1) forestry and wood products processing, production, storage, and transportation; (2) dry bulk commodities transfer, storage, production, and processing; (3) liquid bulk commodities processing, storage, and transportation; (4) natural gas and derivative products, processing, storage, and transportation; and (5) breakbulk storage, transportation, and processing.

Beaver Drainage Improvement Company Levee System

The BDIC levee system is a federally authorized and non-federally operated and maintained rural flood damage reduction system that is managed by the Beaver Drainage Improvement Company (BDIC), formerly known as the Beaver Drainage District. The project is located in Columbia County, Oregon, near the town of Clatskanie, between Columbia River Mile (RM) 49.7 and 55.4 and bounded on the north by the Columbia River, on the east by Bradbury Slough, and on the west by Beaver Slough. U.S. Highway 30 is located just southwest of BDIC's western boundary, and the BNSF Railroad parallels BDIC's southern and eastern boundaries. A map of the BDIC levee system is provided in **Figure 1**.

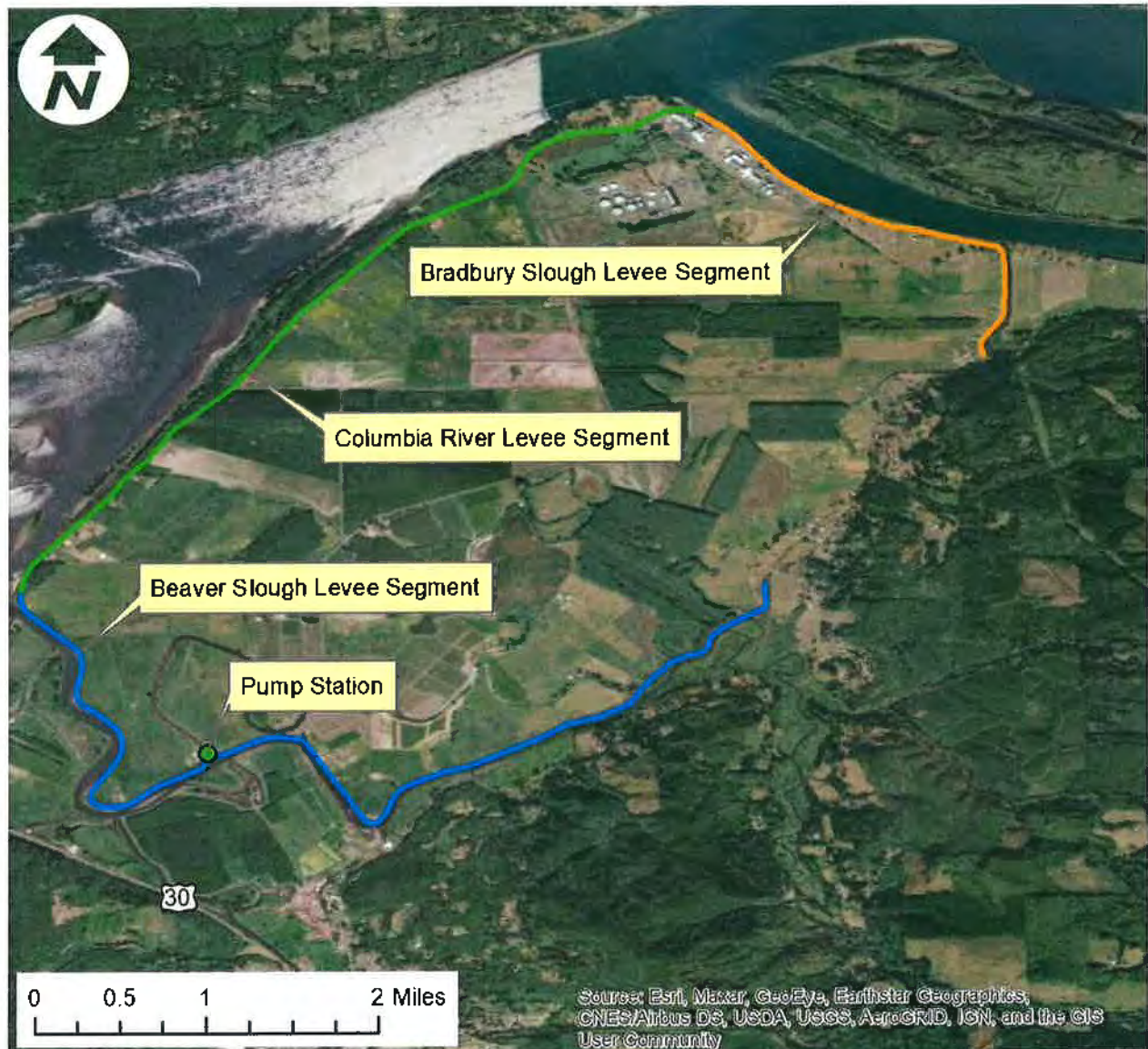


Figure 1 – Map of Beaver Drainage Improvement Company Levee System

The BDIC levee system was originally constructed in 1915 by local interests and later upgraded in the late 1930's by the U.S. Army Corps of Engineers (USACE). The levee system has a total length of 11.51 miles

and a protected area of 9.14 square miles of mostly agricultural land. However, there are several large natural gas-fired power generation facilities, a grain-ethanol production facility, and associated railroad lines that service the industrial area within the BDIC system (USACE, 2014). These facilities are located within the Port Westward Industrial Park.

The BDIC levee is composed of three earthen embankment systems: Bradbury Slough along the east side, Columbia River along the north side, and Beaver Slough along the west and south sides. There is one pump station located at the west end along Beaver Slough with 120,000 gallon per minute (gpm) pumping capacity. Following the initial levee rehabilitation and upgrade work by the USACE, emergency repairs were made following the 1948 flood event. Additional bank protection work was conducted in 1956 and 1962 and a new single pump station was constructed in 1978 to replace the original two pump stations. In late 2004 to early 2005, an approximate 2,000-foot section of the levee near the north end of BDIC was realigned by Portland General Electric to accommodate the Port Westward Generating Facility (Cornforth Consultants, 2005). In 2007, a portion of the levee alignment was altered by a railroad encroachment (USACE, 2014).

USACE Risk Assessment

Risk is a function of expected consequence of levee failure combined with the likelihood that the levee may fail. According to the USACE National Levee Database (<https://levees.sec.usace.army.mil/#/>), the levee has shown a history of good performance over the full range of flood loading, but there is a relatively high likelihood of overtopping. The incipient overtopping exceedance probability is 0.02 (50-year recurrence interval). Relatively shallow inundation depths could be expected. The area behind the levee is currently primarily agricultural with some residential and industrial properties. Based on 2016 land use information, USACE considers the risk associated with the BDIC levee segments to be low due to the anticipated low consequences of failure. However, the specific consequences associated with flooding of the existing industrial facilities do not appear to be specifically addressed by the USACE.

Accreditation Status

The BDIC levee system was given the provisionally accredited levee (PAL) status by FEMA when the Flood Insurance Study for Columbia County was most recently updated on November 26, 2010. In 2014, the Portland District of the Corps of Engineers conducted a Phase 1 Levee System Evaluation for the National Flood Insurance Program (NFIP) Accreditation (USACE, 2014). According to the Phase 1 report, the levee system has less than 2 feet of freeboard above the 100-year flood water surface elevations, as well as other deficiencies, and therefore does not meet the Corps' requirements for a Phase 2 evaluation. During their site visit, they noted unpermitted encroachments and pipelines into the levee prism, unpermitted terracing of the levee prism, settlement, slope instability, and damage by animals. The Corps also noted that a significant number of compacted stone columns were constructed adjacent to the levee for the foundations of the Portland General Electric (PGE) natural gas plants Port Westward Units I and II. The impacts of the stone columns on seepage have not been analyzed. Also, no interior drainage analysis has been conducted. These are all considered to be deficiencies that must be addressed by BDIC before proceeding further with the NFIP levee system accreditation process. FEMA's requirements for levee accreditation are discussed in more detail in later sections of this document. Given the levee system's current condition, it is likely that at some point FEMA will remove the provisional accreditation status for the

BDIC levee system, and the levee protected area will be incorporated into the Special Flood Hazard Area (SFHA) for the Columbia River.

Comparison with other Levee Systems Protecting Industrial Lands

The **Consolidated Diking Improvement District No. 1** (CDID#1) Levee System provides protection for the Port of Longview and other industrial users. The levee system is provisionally accredited by FEMA. The incipient overtopping exceedance probability is 0.001 (1,000-year recurrence interval). The minimum freeboard above the 100-year flood elevation is 3.0 feet. USACE classifies the risk for this levee system as moderate based on the consequences of failure more so than the likelihood of failure.

The **Multnomah County Drainage District #1** (MCDD#1) Levee System provides protection for the Port of Portland, Portland International Airport, and other Industrial users. The levee system is accredited by FEMA. The incipient overtopping exceedance probability is 0.001 (1,000-year recurrence interval). The minimum freeboard above the 100-year flood elevation is 4.3 feet. USACE classifies the risk for this levee system as moderate based on the consequences of failure more so than the likelihood of failure.

The **Sandy Drainage Improvement Company** (SDIC) levee system provides protection for Troutdale Airport, Port of Portland, and other industrial users. The levee system is accredited by FEMA. The incipient overtopping exceedance probability is 0.002 (500-year recurrence interval). The minimum freeboard above the 100-year flood elevation is 5.5 feet. USACE classifies the risk for this levee system as moderate based on moderate consequences of failure and moderate likelihood of failure.

The **Washougal Flood Damage Reduction** (FDR) levee system provides protection for the Port of Camas and other industrial users. The levee system is accredited by FEMA. The incipient overtopping exceedance probability is 0.002 (500-year recurrence interval). The minimum freeboard above the 100-year flood elevation is 3.5 feet. USACE classifies the risk for this levee system as low based on both low consequences of failure (due to high level of evacuation planning, community awareness, and flood warning effectiveness) and low likelihood of failure.

FEMA Levee Accreditation Requirements

The following is from a Federal Emergency Management Agency (FEMA) fact sheet "How -To Guide for Floodplain Managers and Engineers" It provides a comprehensive overview of the requirements for a levee to be accredited by FEMA as providing protection from the 1-percent annual chance (100-yr recurrence interval) flood event.

The National Flood Insurance Program (NFIP) defines a levee system in Title 44, Chapter 1, Section 59.1 of the Code of Federal Regulations ([44 CFR 59.1](#)) as a flood risk reduction system that consists of a levee, or levees, and associated structures, such as closure and drainage devices, which are constructed and operated in accordance with sound engineering practices to protect a hydraulically distinct area. Within the NFIP, a levee is a manmade structure, usually an earthen embankment, designed and constructed in accordance with sound engineering practices to contain, control, or divert the flow of water so as to provide protection from temporary flooding.

As part of the flood mapping process, the Federal Emergency Management Agency (FEMA), and its State and local mapping partners, review and evaluate levee system data and documentation. Any community and/or other party seeking recognition or continued recognition of a levee system on a Flood Insurance Rate Map (FIRM) must provide FEMA with data and documentation, certified by a registered professional engineer, showing that the levee system is expected to provide 1-percent-annual-chance (base) flood risk reduction.

To be mapped on a FIRM as providing base flood risk reduction, levee systems must meet and continue to meet the NFIP minimum design, operation, and maintenance requirements described in Title 44, Chapter 1, Section 65.10 of the Code of Federal Regulations (44 CFR 65.10). FEMA has posted several guidance documents related to levee accreditation, mapping, and other topics. Please access the Levee Resources Library for updated guidance documents. To help clarify the responsibilities of community officials, levee owners, or other parties seeking recognition of a levee system identified during a study/mapping project, FEMA has posted several guidance documents related to levee accreditation, mapping, and other related topics.

How Levee Systems are Mapped by FEMA

FEMA mapping requirements are designed to provide accurate, up-to-date flood hazard and risk information to people living and working landward of levee systems so that they may make wise decisions to minimize loss of life and damage to property due to flooding. FEMA does not evaluate the performance of a levee system—this is the responsibility of the levee owner. FEMA is responsible for establishing levee system evaluation and mapping standards, determining flood insurance risk zones, and reflecting these determinations on FIRMs.

FEMA accreditation of a levee system does not guarantee that the levee will provide flood hazard reduction to properties from flooding; therefore, FEMA has included a note on related FIRM panels that overtopping, or failure of an accredited levee system is possible. To mitigate flood risk in residual risk areas, property owners and residents are encouraged to consider flood insurance and floodproofing or other protective measures.

Provisionally Accredited Levee System

The Provisionally Accredited Levee (PAL) designation may be used for a levee system that FEMA has previously accredited as providing base flood hazard reduction on an effective FIRM, and for which FEMA is awaiting data and/or documentation that will show the levee system is compliant with 44 CFR 65.10. Before FEMA will apply the PAL designation to a levee system, the community or levee owner needs to sign and return an agreement indicating that the data and documentation required for compliance with 44 CFR 65.10 will be provided within a specified timeframe. Where PAL requirements are met, the impacted area landward of a PAL system on the updated FIRM is shown as a moderate-hazard area, labeled Zone X (shaded) and a PAL note is added. Therefore, flood insurance is not mandatory for insurable structures in the area landward of a levee system with a PAL designation. A community is eligible to receive a PAL designation for a levee system only once.

Accredited Levee System

An accredited levee system is a system that FEMA has determined to meet the design, data, and documentation requirements of 44 CFR 65.10; it therefore can be shown on a FIRM as reducing the base flood hazard. This determination is based on a submittal, by or on behalf of a community, which includes 44 CFR 65.10—compliant data and documentation, certified by a registered professional engineer. The area landward of an accredited levee system is shown on the FIRM as a moderate-hazard area, labeled Zone X (shaded), except for areas of interior drainage flooding such as ponding areas, which will be shown as high-hazard areas, called Special Flood Hazard Areas (SFHAs). Flood insurance is not mandatory in Zone X (shaded) areas, but it is mandatory in SFHAs.

Levee System Accreditation Checklist

The checklist provided below was developed by FEMA to assist local community officials and levee owners in gathering the 44 CFR 65.10 – compliant data and documentation required for FEMA to recognize a levee system with 1-percent-annual-chance flood hazard reduction on the community's FIRM (accreditation).

Design Criteria – NFIP Regulations Section 65.10(b)	
Description: For levee systems to be recognized (i.e., accredited) by FEMA, evidence that adequate design and operation and maintenance systems are in place to provide reasonable assurance that protection from the base flood exists must be provided.	
Checklist for Design Criteria	
☐	Freeboard. The minimum freeboard required is 3 feet above the Base Flood Elevation (BFE) all along the length of the levee, with an additional 1 foot within 100 feet of structures (such as bridges) of wherever flow is restricted, and an additional 0.5 foot at the upstream end of a levee. Levees impacted by coastal flooding have special freeboard requirements (see Paragraphs 65.10(b)(1)(iii) and (iv)).
☐	Closures. All openings must be provided with closure devices that are structural parts of the system during operation and designed according to sound engineering practice.
☐	Embankment Protection. Engineering analyses must be submitted that demonstrate that no appreciable erosion of the levee embankment can be expected during the base flood, as a result of either currents or waves, and that anticipated erosion will not result in failure of the levee embankment or foundation directly or indirectly through reduction of seepage path and subsequent instability.
☐	Embankment and Foundation Stability Awareness. Engineering analyses that evaluate levee embankment stability must be submitted. The analyses provided must evaluate expected seepage during loading conditions associated with the base flood and must demonstrate that seepage into or through the levee foundation and embankment will not

	jeopardize embankment or foundation stability. An alternative analysis demonstrating that the levee is designed and constructed for stability against loading conditions for Case IV as defined in the U.S. Army Corps of Engineers (USACE) Engineer Manual 1110-2-1913, <i>Design and Construction of Levees</i> , (Chapter 6, Section II), may be used.
☐	Settlement Analysis. Engineering analyses must be submitted that assess the potential and magnitude of future losses of freeboard as a result of levee settlement and demonstrate that freeboard will be maintained. This analysis must address embankment loads, compressibility of embankment soils, compressibility of foundation soils, age of the levee system, and construction compaction methods. In addition, detailed settlement analysis using procedures such as those described in USACE Engineer Manual 1110-1-1904, <i>Soil Mechanics Design—Settlement Analysis</i> , must be submitted.
☐	Interior Drainage. An analysis must be submitted that identifies the source(s) of such flooding, the extent of the flooded area, and, if the average depth is greater than 1 foot, the water-surface elevation(s) of the base flood. This analysis must be based on the joint probability of interior and exterior flooding and the capacity of facilities (such as drainage lines and pumps) for evacuating interior floodwaters, as described in USACE Engineer Manual 1110-2-1914, <i>Hydrologic Analysis of Interior Areas</i> .

Operation Plan – NFIP Regulations Section 65.10(c)(1)

Description: For a levee system to be accredited, the operational criteria described below must be provided. All closure devices or mechanical systems for internal drainage, whether manual or automatic, must be operated in accordance with an officially adopted operation manual, a copy of which must be provided to FEMA by the operator when levee or drainage system recognition is being sought or when the manual for a previously recognized system is revised in any manner. All operations must be under the jurisdiction of a Federal or State agency, an agency created by Federal or State law, or an agency of a community participating in the NFIP.

Checklist for Operation Plan

☐	Flood Warning System. Documentation of the flood warning system, under the jurisdiction of Federal, State, or community officials that will be used to trigger emergency operation activities; and demonstration that sufficient flood warning time exists for the completed operation of all closure structures, including necessary sealing, before floodwaters reach the base of the closure.
☐	Plan of Operation. A formal plan of operation including specific actions and assignments of responsibility by individual name or title.
☐	Periodic Operation of Closures. Provisions for periodic operation, at not less than 1-year intervals, of the closure structure for testing and training purposes.

Interior Drainage Plan – NFIP Regulations 65.10(c)(2)

Description: Interior drainage systems associated with levee systems usually include storage areas, gravity outlets, pumping stations, or a combination thereof. These drainage systems will be recognized by FEMA on NFIP maps for flood risk reduction purposes only if the following minimum criteria are included in the operation plan.

Checklist for Interior Drainage Plan:

☐	Flood Warning System. Documentation of the flood warning system, under the jurisdiction of Federal, State, or community officials that will be used to trigger emergency operation activities; and demonstration that sufficient flood warning time exists to permit activation of mechanized portions of the drainage system.
☐	Plan of Operation. A formal plan of operation including specific actions and assignments of responsibility by individual name or title.
☐	Manual Backup. Provision for manual backup for the activation of automatic systems.
☐	Periodic Inspection. Provisions for periodic inspection of interior drainage systems and periodic operation of any mechanized portions for testing and training purposes. No more than 1 year shall elapse between either the inspections or the operations.

Maintenance Plan – NFIP Regulations 65.10(d)

Description: For levee systems to be recognized as accredited by FEMA, the maintenance criteria must be as described herein.

Checklist for Maintenance Plan:

☐	Levee systems must be maintained in accordance with an officially adopted maintenance plan, and a copy of this plan must be provided to FEMA by the owner of the levee system when recognition is sought or when the plan for a previously recognized system is revised in any manner.
☐	All maintenance activities must be under the jurisdiction of a Federal or State agency, an agency created by Federal or State law, or an agency of a community participating in the NFIP which must assume ultimate responsibility for maintenance.
☐	This plan must document the formal procedure that ensures that the stability, height, and overall integrity of the levee and its associated structures and systems are maintained. At a minimum, the plan shall specify the maintenance activities to be performed, the

	frequency of their performance, and the person by name or title responsible for their performance.
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Certification – NFIP Regulations 65.10(e)

Description: Data submitted to support that a given levee system complies with the structural requirements set forth in "Design Criteria" (Paragraphs 65.10(b)(1) through (7) of the regulations) must be certified by a Registered Professional Engineer. Certifications are subject to the definition given in Section 65.2 of the NFIP regulations. In lieu of these structural requirements, a Federal agency with responsibility for levee design may certify that the levee has been adequately designed and constructed to provide protection from the base flood.

Checklist for Certification Requirement:

☐	All data submitted is certified by a professional Engineer or by a Federal agency.
☐	Certified as-built levee plans are included in the submittal.

A graphic illustrating the various requirements of the levee certification process is provided in **Figure 2**. According to the USACE Phase 1 System Evaluation (USACE, 2014), except for the freeboard analysis, the remaining requirements for the BDIC levee system to obtain certification and subsequent accreditation by FEMA have not been addressed. Similarly, the interior drainage study and maintenance plan still need to be completed.

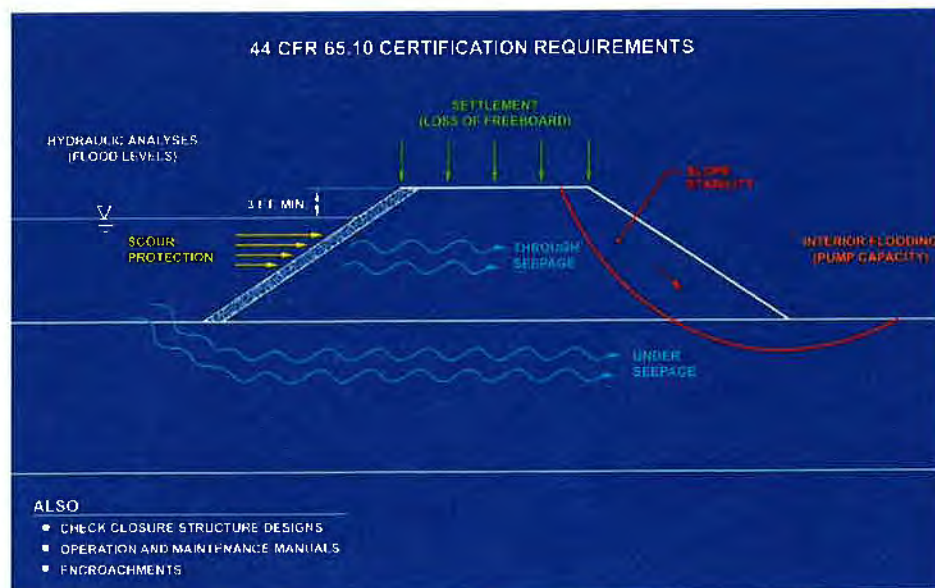


Figure 2 – Graphic illustration of 44 CFR 65.10 certification requirements

In general, the accreditation process requires subsurface investigations to collect soil samples and laboratory testing to evaluate the engineering properties for the levee embankment and foundation. This information is necessary to perform the settlement, seepage, and slope stability analyses illustrated above. USACE guidelines for levee design/safety studies suggest a series of three

boreholes performed every 1,000 feet along the levee alignment. The borings are typically located at the river side toe, the levee centerline, and the landward side toe. Considering the levee's 11.51-mile length, roughly 180 borings would be necessary to meet the USACE guidelines. Additional borings may be necessary to analyze the effects of encroachments such as buildings constructed within the levee prism. Based on the relatively low height of the BDIC levee, most of the boring depths could be kept relatively shallow, on the order of 25 to 50 feet. Occasional deeper borings on the order of 100 feet would be necessary to check for soft, compressible soil layers and/or highly permeable zones.

General Recommendations

Given the current uses that are occurring within the BDIC levee protected area, it is recommended that the Port or a developer coordinate with BDIC to address the existing levee system deficiencies identified by the USACE and that the levee system be upgraded as resources permit to achieve certification and accreditation by FEMA. This will provide an increased level of flood protection for existing landowners and remove the potential for the levee to have its provisional accreditation removed by FEMA, which would in turn require landowners to purchase flood insurance for all structures with federally backed mortgages and structures/personal property that are used to secure farm credit services loans. The borehole program summarized above would require planning and coordination with the USACE Portland District to help assure regulatory concurrence. For planning purposes, we anticipate the drilling work would require 4 to 6 months to plan and execute. The engineering analyses would follow the drilling stage, which we expect would take another 6 to 10 months.

Recommended Conditions of Approval for Change of Land Use

It is recommended that the conditions of approval for various land use categories be based on the consequences that would result from flooding. For example, less intense land uses that do not involve hazardous materials or are unlikely to result in significant environmental impacts should be required to follow the standard land use process for approval, based on the FEMA flood hazard mapping in effect at the time of approval. Whereas, the most intensive land uses that involve hazardous chemicals and/or could cause significant environmental harm without adequate safety measures in place should require the BDIC levee system to be upgraded as necessary and obtain certification and accreditation by FEMA. Also, appropriate flood proofing of facilities should be conducted to prevent significant harm in the event that the accredited levee system is not able to prevent flooding of the proposed facility. For moderately intense land uses that do not involve hazardous chemicals but could cause some amount environmental harm, it is recommended that, at a minimum, floodproofing of the facility be required. A matrix of example land uses and associated flood risk mitigation recommendations is provided in **Table 1**.

Table 1 – Example uses and associated risk mitigation recommendations

	Sample Use	Risk Mitigation	Process for Accreditation
Forestry & Wood Products	Less Intense - Log Yard	Standard land use process	N/A
	Customary Development Form - Wood Pellet Mill	Standard land use process	N/A
	More Intense than CDF - Kraft Pulp Mill	Levee Accreditation & Flood Proofing	BDIC Agreement
Dry Bulk	Less Intense - Bulk food import/ export such as rice, corn, wheat	Standard land use process	N/A
	Customary Development Form - Gypsum Wallboard Plant	Standard land use process	N/A
	More Intense than CDF - Import / export hazardous materials, such as lead concentrate, sulfur, nickel, etc.	Levee Accreditation & Flood Proofing	BDIC Agreement
Liquid Bulk	Less Intense - food stuff import /export such as cooking oil, fructose, etc.	Flood Proofing	N/A
	Customary Development Form - Ethanol Processing Facility	Flood Proofing	N/A
	More Intense than CDF - Petroleum storage and refining	Levee Accreditation & Flood Proofing	BDIC Agreement
Natural Gas	Less Intense - Natural Gas Peaker Plant	Flood Proofing	N/A
	Customary Development Form - LNG Facility	Levee Accreditation & Flood Proofing	BDIC Agreement
	More Intense than CDF - Ammonium Nitrate Fertilizer plant	Levee Accreditation & Flood Proofing	BDIC Agreement
Break Bulk	Less Intense -Non-hazardous import facility, such as clay, lumber, autos, machinery	Standard land use process	N/A
	Customary Development Form – Break bulk import with processing	Standard land use process for non-buoyant commodities or containers, flood proofing for buoyant commodities or containers	N/A
	More Intense than CDF - Hazardous or explosive materials, such as ammunition, explosives, batteries, bleach	Levee Accreditation & Flood Proofing	BDIC Agreement

Examples of floodproofing include but are not limited to reinforcement of walls to withstand pressures from flood waters, using sealants and membranes to reduce seepage through walls, using watertight shields for windows and doors, using backflow prevention valves, anchoring critical components that are buoyant to prevent flotation, elevating critical facility components above the BFE, and using floodwalls to protect critical areas. Specific details regarding floodproofing of non-residential structures are provided in the publication "Floodproofing Non-Residential Structures" (FEMA, 2013). Design

requirements for dry floodproofing can be found in the publication "Requirements for the Design and Certification of Dry Floodproofed Non-Residential and Mixed-Use Buildings" (FEMA, 2021). Floodproofing requirements should comply with local building codes.

References

Federal Emergency Management Agency (FEMA), Requirements for the Design and Certification of Dry Floodproofed Non-Residential and Mixed-Use Buildings, NFIP Technical Bulletin 3, January 2021.

Federal Emergency Management Agency (FEMA), Floodproofing Non-Residential Buildings, FEMA P-936, July 2013.

U.S. Army Corps of Engineers (USACE), Phase 1 Levee System Evaluation for the National Flood Insurance Program Accreditation – Beaver Drainage District, March 19, 2014

Cornforth Consultants, Construction Summary Report, Port Westward Generating Plant Levee Relocation, Clatskanie, Oregon, February 2005



Mr. Hadley is a vice president, senior hydraulic engineer, and senior geomorphologist with WEST Consultants (WEST). He manages WEST's Salem, Oregon, office and has 28 years of experience in hydrology, hydraulics, river mechanics, geomorphology, and sediment transport. He is a registered Professional Engineer in the states of Oregon and Washington and a Licensed Geologist in the state of Washington. His work at WEST includes stormwater designs, stormwater needs assessments, sediment transport studies, geomorphic assessments, boat ramp hydraulic assessments, and bridge/culvert hydraulic designs.

Project experience includes over 100 bridge hydraulic and scour evaluations for bridge replacements in Oregon and Washington; numerous boat ramp replacement project for the Oregon State Marine Board and several local governments, a geomorphic assessment and mitigation alternatives analysis for the City of Salem's Geren Island water intake and treatment facility; a geomorphic study and geomorphic monitoring for the U.S. Army Corps of Engineers (USACE)—St. Paul District Fargo-Moorhead Flood Risk Management Project; Sandy River channel realignment needed to reconstruct Lolo Pass Road after the January 2011 flood for Clackamas County, OR; a cumulative impacts study of the Upper Mississippi River for USACE—Rock Island District; a geomorphic analysis of the East Fork Lewis River in conjunction with an Environmental Impact Statement and Habitat Conservation Plan (HCP) for a proposed gravel mining operation in Clark County, WA; a HEC-6T sediment transport study on the Greenbrier River in Marlinton, WV, for USACE—Huntington District; an unsteady hydrodynamic model (MIKE 11) of the Tillamook, Trask, and Wilson Rivers near Tillamook, OR; water control manuals (WCMs) for Howard Hanson and Hungry Horse Dams for USACE—Seattle District; and WCMs for 12 Locks and Dams on the Upper Mississippi River for USACE—St. Paul District.

He conducted a sediment transport study of the N. F. Toutle and Cowlitz Rivers for USACE—Portland District that includes erosion of the debris avalanche from the Mount St. Helens eruption, sediment deposition behind the sediment retention structure built by USACE, and sediment transport in the Lower Cowlitz River.

Mr. Hadley was the lead project engineer for the development of a revised Federal Emergency Management Agency (FEMA) Flood Insurance Study that includes over 116 stream miles along 20 streams near the City of Vancouver in Clark County, WA. The results of the study will be used to create a new Digital Flood Insurance Rate Map (DFIRM) for Clark County.

Mr. Hadley is proficient in the use of software such as HEC-RAS, CHECK-RAS, RASPLOT, HEC-6, HEC-6T, MIKE 11, SAM, ArcGIS, GeoRAS, and PHABSIM.

SELECTED EXPERIENCE

BRIDGE HYDRAULIC DESIGN AND SCOUR ASSESSMENTS

Pudding River (Hazelgreen Road) Bridge Replacement for Marion County Public Works, Marion County, OR
Mill Creek (Mill Creek Road) Bridge Replacement for Marion County Public Works, Marion County, OR

Years of Experience: 28 Years with WEST: 26

Education

- MS (Civil Engineering) Oregon State University, 1997
- BS (Geology) Oregon State University, 1992

Registrations

- Professional Engineer: OR 77018PE; WA 43922
- Licensed Professional Geologist: WA 2370
- Certified Floodplain Manager: ASFPM US-06-01988

Professional Affiliations

- American Society of Civil Engineers
- American Geophysical Union
- Geological Society of America
- Association of State Floodplain Managers

Abiqua Creek (Meridian Road) Bridge Scour Mitigation for Marion County Public Works, Marion County, OR
Butte Creek (Scotts Mills Road) Bridge Replacement for Marion County Public Works, Marion County, OR
Senecal Creek (LeBrun Road) Bridge Hydraulic Design for Port of Willamette, Marion County, OR
Fanno Creek Trail Improvements Project for City of Tigard, Washington County, OR
Clackamas River (Trolley Trail) Pedestrian Bridge for City of Gladstone, Clackamas County, OR
Bull Run River (Bull Run Road) Bridge Replacement for Clackamas County Department of Transportation and Development, Clackamas County, OR
G-Bar-W Ranch (Williamson River) Bridge Replacement for U.S. Department of Agriculture (USDA) Natural Resource Conservation Service, Klamath County, OR
Rock Creek (NW 227th Ave) Bridge Replacement for Washington County Department of Transportation, Washington County, OR
Salmon River (Elk Park Road) Bridge Replacement Project for Clackamas County Department of Transportation and Development, Clackamas County, OR
Little Pudding River (Silverton Road) Bridge Replacement Project for Marion County Public Works, Marion County, OR
North Santiam River (Stayton-Scio Road) Bridge Scour Mitigation Design, Linn County, OR
Perrin Irrigation Canal (Wipper Road) Bridge Replacement Hydraulics and Scour Mitigation Design, Marion County, OR
Trask Slough (Wyss Road) Bridge Replacement Hydraulics and Scour Mitigation Design, Tillamook County, OR
Dunawi Creek (53rd Street railroad (RR) Overcrossing) Bridge Hydraulics and Scour Mitigation Design, Benton County, OR
Pudding River (Whiskey Hill Road) Bridge Replacement for Clackamas County Department of Transportation and Development, Clackamas County, OR
Hydraulic Engineering Support for Zig Zag River Bridge (Lolo Pass Road) Flood Emergency Repair, Clackamas County, OR
Sandy River (I-84) Bridge Replacement Hydraulics and Scour Design, Multnomah County, OR
Eilertsen Creek (Hwy 30) Bridge Replacement Hydraulics and Scour Design, Columbia County, OR
Joe Hall Creek (Hwy 230) Bridge Replacement Hydraulics and Scour Design, Douglas County, OR
Elk Creek to Hardscrabble Creek Design-Build Bridge Replacement Hydraulics and Scour Design for 5 bridges, Douglas County, OR
Newland Creek (Advance Road) Bridge Replacement Hydraulics and Scour Design, Clackamas County, OR
Beaver Creek (N. Bank Lane) Bridge Replacement Hydraulics and Scour Design, Coos County, OR
Fish Trap Creek (Lampa Lane) Bridge Replacement Hydraulics and Scour Design, Coos County, OR
Elkhead Road to Knowles Creek Design-Build Bridge Replacement Hydraulics and Scour Design and stormwater design for six bridges, Lane & Douglas Counties, OR
Summers Creek (Kalama River Road) Bridge Replacement Hydraulics and Scour Design, Cowlitz County, WA

North Fork Skokomish River (Lake Cushman) Bridge Repair, Olympic National Forest, Mason County, Washington

Sourgrass Creek (Hwy 22) Fish Passage Improvement Bridge Design Project, Yamhill County, OR

Fall Creek (Hwy 26) Fish Passage Improvement Bridge Design Project, Tillamook County, OR

Tualatin River Pedestrian Bridge Hydraulics and Scour Design, Tualatin, OR

Central Oregon Highway Design-Build Bridge Replacement Hydraulics and Scour Design for 16 bridges, Malheur & Harney Counties, OR

Mill Creek (I-5) Bridge Replacement Hydraulics and Scour Design, Marion County, OR

Mill Creek (State Street) Bridge Replacement Hydraulics and Scour Design, Salem, OR

Zig Zag River (Hwy 26) Bridge Replacement Hydraulics and Scour Design, Clackamas County, OR

GEOMORPHOLOGY AND SEDIMENT TRANSPORT

South Santiam River Municipal Water Intake Design, City of Lebanon, OR

Willamette River Municipal Water Intake Feasibility Study, McMinnville Water and Light

Geren Island North Channel Geomorphic Assessment and Mitigations Alternatives Analysis, City of Salem Public Works, OR

Geomorphic study of the Fargo, ND / Moorhead, MN Flood Risk Management Project, USACE—St. Paul District
Hydraulic Engineering Support for Zig Zag River Bridge Lolo Pass Road Flood Emergency Repair, Clackamas County Engineering Division, OR

Geomorphic evaluation of the E.F. Lewis River in Washington State for development of a HCP, J.L. Storedahl & Sons, Clark County, WA

Hydrologic and Geomorphic Assessments for eight watersheds, Clark County, WA

Watershed recovery assessment and sediment transport study for the N.F. Toutle and Cowlitz Rivers, USACE—Portland District

Geomorphic evaluation and assessment of cumulative impacts on the Upper Mississippi River, USACE—Rock Island District

Spawning gravel nourishment study for the Green River in Washington State, USACE—Seattle District

Identification of river restoration opportunities along the Satsop River in Washington State, USACE—Seattle District

HEC-6T sediment transport study for the Greenbrier River in Marlinton, West Virginia, USACE—Huntington District

Sandy River (I-84) Replacement Bridge Hydraulics and Scour Design and Geomorphic Evaluation, Oregon Department of Transportation

Over 100 bridge hydraulic, scour, and geomorphic evaluations for bridge replacements in Oregon and Washington, Oregon Department of Transportation (ODOT), WSDOT, and Local Agencies

STORMWATER

Mosquito Creek (Historic Columbia River Highway) Landslide Emergency Repair, ODOT
City of Salem Stormwater Master Plan Update, Salem, OR
Stormwater modeling and design review for proposed state prison and hospital facilities, Junction City, OR
Hydrologic and hydraulic analysis of Sandy Drainage Improvement Company's stormwater conveyance system using XP-SWMM, Troutdale, OR
Elkhead Road to Knowles Creek - Bundle 508 stormwater designs for six bridges, Lane and Douglas Counties, OR
Independent review of S. Umpqua River storm drain retrofit, Douglas County, OR
Stormwater needs assessments for eight watersheds, Clark County, WA
Multiple culvert designs for Hawthorne Avenue – Hyacinth Street Corridor Improvements Project, Salem, OR
Norway Street storm system hydrologic and hydraulic design using XP-SWMM, Salem, OR.
Riviera Drive storm system hydrologic and hydraulic design using XP-SWMM and unsteady HEC-RAS, Salem, OR.
Salem Industrial Drive storm system hydrologic and hydraulic analyses using XP-SWMM, Salem, OR.
Hydrologic and hydraulic analyses for Green Street Swale Design using XP-SWMM, Gresham, OR.

BOAT RAMP HYDRAULIC DESIGN

Siletz River (Old Mill Park) Hydraulic Modeling and Boat Ramp Siting, Siletz, OR
North Santiam River (Packsaddle Park) Hydraulic Modeling and Boat Ramp Siting, Marion County, OR
Rogue River (Upper Rogue Region Park) Boating Facilities Improvement Project, Shady Cove, OR
McKenzie River (Forest Glen Landing) Hydraulic Modeling and Boat Ramp Siting, Blue River, OR
Columbia River (Rooster Rock State Park) Boat Ramp Replacement Hydraulics and Feasibility Study, Corbett, OR
Rogue River (Chinook Park) Hydraulic Modeling and Boat Ramp Siting, Grants Pass, OR
Rogue River (Lathrop Landing) Hydraulic Modeling and Boat Ramp Siting, Grants Pass, OR
Coos Bay (Empire Boat Launch) Debris Boom Environmental Loadings, Coos Bay, OR
Westport Slough (Columbia River) Boating Facilities Improvement Project, Westport, OR
Willamette River (Buena Vista Park) Recreational Boating Facility Improvements Project, Buena Vista, OR
Cowlitz River (Al Halenberg) Boat Launch Velocity Reduction Structure Hydraulic Design, Castle Rock, WA
Yamhill River (Dayton Landing) Recreational Boating Facility Repair and Improvement Project, Dayton, OR
Alsea River (Don Lindley Park) Recreational Boating Facility Improvements Project, Waldport, OR
Rogue River (Galice Boat Ramp) Hydraulic Impact Assessment for Vault Toilet, Josephine County, OR
North Santiam River (Stayton Bridge) Boat Launch Replacement Project, Stayton, OR
North Santiam River (Buell Miller Park) Geomorphic and Hydraulic Engineering Assessment, Marion County, OR

Klaskanine River Recreational Boating Facility Improvements Project, Clatsop County, OR
Clackamas River (Clackamette Park) Boat Launch Repair and Replacement Project, Oregon City, OR
McKenzie River (Hendrick's Bridge Wayside) Boat Ramp Hydraulic Design, Lane County, OR
Santiam River (I-5 Rest Area) Recreational Boating Facility Improvements Project, Linn County, OR

FEMA

Physical Map Revision for City of Turner, OR
Upper Sandy River Basin Flood Insurance Study – Clackamas County, OR
Letter of Map Revision for Willamette River – City of Independence, OR
Letter of Map Revision for Sauvie Island Drainage Improvement Company
Internal Drainage Analysis for Rainier Drainage Improvement Company
Letter of Map Revision for Lone Pine Creek – Medford, OR
Physical Map Revision for seventeen streams – City of Gresham, OR
Letter of Map Revision for Mary's River – Philomath, OR
Flood Insurance Studies for sixteen counties in Oregon and Idaho – FEMA Region 10
Conditional Letter of Map Revision for Mary's River – City of Philomath, OR
Letter of Map Revision for Sandy Drainage Improvement Company
Flood Insurance Study for twenty streams in Clark County, WA – FEMA Region 10

PUBLICATIONS

Howard Hanson Dam Water Control Manual, Seattle District Corps of Engineers, 2011
Sedimentation Engineering, American Society of Civil Engineers Engineering Manual 110, Appendix Chapter 19, 2008
Soil Cement Guide for Water Resources Applications, Portland Cement Association, 2006
Lock and Dam No. 10 Water Control Manual, Mississippi River, St. Paul District Corps of Engineers, 2003
Lock and Dam No. 9 Water Control Manual, Mississippi River, St. Paul District Corps of Engineers, 2003
Lock and Dam No. 3 Water Control Manual, Mississippi River, St. Paul District Corps of Engineers, 2003
Lock and Dam No. 2 Water Control Manual, Mississippi River, St. Paul District Corps of Engineers, 2003
Lock and Dam No. 1 Water Control Manual, Mississippi River, St. Paul District Corps of Engineers, 2003
Saint Anthony Falls Upper Lock and Lower Lock and Dam Water Control Manual, Mississippi River, St. Paul District Corps of Engineers, 2003
Lock and Dam No. 8 Water Control Manual, Mississippi River, St. Paul District Corps of Engineers, 2002
Lock and Dam No. 7 Water Control Manual, Mississippi River, St. Paul District Corps of Engineers, 2002
Lock and Dam No. 5A Water Control Manual, Mississippi River, St. Paul District Corps of Engineers, 2002
Lock and Dam No. 5 Water Control Manual, Mississippi River, St. Paul District Corps of Engineers, 2002
Lock and Dam No. 4 Water Control Manual, Mississippi River, St. Paul District Corps of Engineers, 2002

Hungry Horse Dam Water Control Manual, Seattle District Corps of Engineers, 2002

CONFERENCE PROCEEDINGS AND PRESENTATIONS

Grindeland, T.R., **Hadley, H.R.**, "Floodplain Gravel Mining in the Pacific Northwest: Peril or Opportunity?", Proceedings of the American Society of Civil Engineers (ASCE), Environmental and Water Resources Institute (EWRI) World Water and Environmental Resources Congress, June 23-26, 2003, Philadelphia, PA.

Bradley, J.B., Grindeland, T.R., and **Hadley, H.R.**, "Sediment Supply from Mount St. Helens – 20 Years Later," Proceedings of the Seventh Interagency Sedimentation Conference, March 25-29, 2001, Reno, NV.

Grindeland, T.R., **Hadley, H.R.**, A. Raman. 2000, "Dam Removal Sedimentation Evaluation," Proceedings of the ASCE Joint Conference on Water Resources Engineering and Water Resources Planning & Management, Minneapolis, MN.

Gardarsson, S.M., Knox, J.C., Grindeland, T.R., **Hadley, H.R.**, "Geomorphic Analysis of the Upper Mississippi River Basin," 1999, Proceedings of the ASCE International Water Resources Engineering Conference, Seattle, WA.

INSTRUCTIONAL EXPERIENCE

Streambank Stabilization for Restoration and Flood Control Projects, ASCE

TRAINING

Principals of Streambank Analysis and Stabilization, Portland State University

XP-SWMM Training Workshop, XP-SWIMM, Inc.

FLO-2D Refresher Workshop, FLO-2D Software, Inc.

FEMA Flood Hazard Mapping Workshop, FEMA Region X

HEC-HMS Certification Class, WEST Consultants, Inc.

HEC-6 and HEC-6T Certification Classes, WEST Consultants, Inc.

HEC-RAS and Advanced HEC-RAS Certification Classes, ASCE

ArcView GIS Class, ESRI

MIKE 11 Unsteady Flow Hydrodynamic Modeling Class, DHI

LITIGATION SUPPORT/EXPERT WITNESS

Stormwater Trespass, Parker v. Genaro, Marion County, OR

Bridge Failure (Wrongful Death), Ludwig v. United States

Stormwater Trespass, Boyce/McCoy v. Koslin, Portland, OR

Stormwater Trespass, Stepaniants v. Murphy, Issaquah, WA

Slope Failure, Lloyd D. Whaley v. ODOT, Curry County, OR

Flood Risk Assessment, AWT, LLC v. Westech Engineering, Inc., McMinnville, OR

Flood Impact Assessment, Raymond Washington v. Leon Eichler and ODOT, Yamhill County, OR

HANS HADLEY, PE, LG, CFM

Stormwater System Replacement, Stephen R. Topaz v. City of St. Helens, OR

Lewis Family Housing SEPA Appeal #SEPA2007-5, City of Centralia, WA

Ellsworth Commons Stormwater System Deficiencies Investigation, Ellsworth on the Park Condominium Association v. Ellsworth on the Park, LLC, Clark County, WA

Taylor Creek Sedimentation, Litchfield Family, LLC v. City of Seattle, WA

Auburn Farms Development Infiltration Swale Failure Forensic Evaluation and Infiltration Well Design Review, Centex Homes v. Sisul Engineering, Canby, OR

Coos-Douglas Natural Gas Pipeline Clean Water Act Violations, United States v. Mastec Inc.

MIKE MEYER, PE, GE SENIOR ASSOCIATE ENGINEER



Key Areas of Expertise

- Levee Condition Assessments
- Encroachment Analyses
- Levee Modifications
- New Levee Design
- Geotechnical Investigation
- Stability Analysis
- Alternatives Analysis
- Plans & Specifications
- Construction Phase Services

Education

- M.S. in Geotechnical Engineering, Washington State University
- B.S. in Geological Engineering, Washington State University

Professional Registration

- Civil Engineer – Oregon (License No. 15644), Washington, California, Idaho, Alaska
- Geotechnical Engineer – Oregon (License No. 15644), California
- FERC-recognized Part 12 Independent Consultant

Societies

- Past President, American Council of Engineering Companies – Oregon

Mike has 35 years of geotechnical engineering experience in the Pacific Northwest and has provided senior engineering review on numerous projects involving levee design, habitat restoration, shoreline stabilization, damage and safety assessments, and levee repairs and rehabilitation. He has successfully managed multiple levee engineering studies in the region. Representative projects include the following:

Port Westward Levee Realignment

Portland General Electric – Clatskanie, Oregon

Senior Geotechnical Engineer responsible for review of design analyses and plans for the realignment of a levee in the Beaver Drainage District adjacent to a new gas-fired generating facility. The new generating facility required that the levee be relocated and constructed to modern US Army Corps of Engineers (USACE) design standards.

Beaver Power Plant and Bradbury Slough Levee Protection

Portland General Electric – Clatskanie, Oregon

Senior Geotechnical Engineer for two separate projects along the Columbia River in the Beaver Drainage District which required shoreline protection measures to prevent progressive slope failure along the banks of the river and the adjacent slough. Evaluated shoreline erosion and slope stability along the levee. Developed remedial options to repair the bank. Prepared contract drawings and technical specifications and provided construction control observations for stabilization measures including rock revetment.

Levee Safety Engineering Studies for FEMA Certification

Multnomah County Drainage District (MCDD) – Portland, Oregon

Mike is the Project Manager for this multi-year contract with MCDD to provide levee safety evaluations and condition assessments for four diking districts and 27 miles of federally-authorized levees. Mike's work tasks included review and tabulation of data from archives; inspecting culverts and tide gates; obtaining access and work permits for subsurface explorations through the levees; coordination with the USACE Portland District (NWP) on RIP program objectives; completing over-water and land-based subsurface investigations; overseeing laboratory testing programs; and supervision of engineering analyses that included freeboard, scour protection, seepage, slope stability, and settlement. Mike also performed a detailed analysis of levee encroachments to determine their impacts on seepage and levee stability. He provided multiple presentations to local agencies and neighborhood associations.

Levee Encroachment Analyses and Risk Catalog

Multnomah County Drainage District (MCDD) – Portland, Oregon

In conjunction with MCDD's FEMA Levee Engineering Studies, Mike provided senior engineering review for a detailed assessment of existing encroachments (both permitted and unpermitted) into the levee embankments. The work evaluated the encroachments' influence on seepage paths and embankment stability. Encroachments include structural foundations, bridges, access roads, parking areas and utilities. Mike provided senior QA/QC for the investigation and analysis, and for the development of technical reports submitted to MCDD, the USACE Portland District, the public, and property owners with encroachments. After reviewing CCI's comprehensive investigation and analysis, The USACE Portland District permitted the encroachments as "Legacy Encroachments," and the Agency has since adapted our method for assessing the level of risk posed by existing encroachments.

Emergency Levee Rehabilitation PIR and E&D Documents

USACE, Seattle District (NWS) – Washington, Idaho, and Montana

Project Manager and multi-discipline Team Leader assisting NWS with levee safety investigation to develop repairs for 36 storm-damaged sites. Coordinated and oversaw geotechnical explorations; materials sampling & testing; mapping of levee and channel

Societies

- Past President, American Society of Civil Engineers, Geotechnical Engineering Group, Oregon
- U.S. Society on Dams (USSD)
- Association of State Dam Safety Officials (ASDSO)
- Society of American Military Engineers (SAME)

Years of Experience

- With Cornforth: 32
- Total: 35

damage; evaluating repair options; tabulating cost estimates, environmental and real estate impacts; creating Project Information Reports (PIRs); and developing engineering and design (E&D) documents for construction. Completed foundation designs for culvert wing walls, tide gates, and flood walls. Developed details to accommodate underground utility crossings and existing roads/parking lots. Detailed embankment design details including scour protection.

Steigerwald Setback Levee Design and Section 408 Permitting**Lower Columbia Estuary Partnership (LCEP) – Washougal, Washington**

Lead Geotechnical Engineer for large civil works project involving floodplain restoration & levee safety investigation for a USACE-authorized project. Executed large subsurface exploration program consisting of 45 borings and 60 test pits and instrumentation program including vibrating wire settlement sensors and piezometers. Directed materials sampling & laboratory testing. Supervised levee embankment design and analyses including seepage, slope stability, and settlement studies. Oversaw foundation design and embankment detailing for floodwalls, closure structures, and new bridge. Provided recommendations for underground utilities to withstand anticipated embankment settlements. Also reviewed geotechnical design recommendations for access roads and parking areas. Oversaw permitting efforts with WSDOT, Washington DOE, and USFWS to meet access and regulatory requirements for subsurface explorations. Coordinated with NWP on 408 permitting, design review, and constructability for different borrow source staging. Oversaw construction engineering support during grading operations.

Turner Levee Improvements**City of Turner – Turner, Oregon**

Senior Geotechnical Engineer assisting the City of Turner with levee safety engineering studies and conceptual improvement designs for FEMA accreditation in multiple phases. Phase I work tasks included geologic site reconnaissance, development of topographic survey from available LiDAR data, creation of a levee centerline alignment, and review of existing levee design and construction documentation and O&M manuals. Phase II work tasks included subsurface exploration, materials sampling & laboratory testing programs to satisfy FEMA accreditation requirements. Phase III work is ongoing and includes embankment design of a levee raise with multiple closure structures, including seepage and stability analysis of the modified levee design.

Tukwila Levee Rehabilitation Engineering & Design**USACE, Seattle District (NWS) – Tukwila, Washington**

Senior Geotechnical Engineer on project for levee safety investigation & upgrades at three sites on the Green River. Coordinated permits for drill rig access and geotechnical subsurface explorations through levee prism. Responsible for materials sampling and testing to characterize shear strength and compressibility of levee & foundation. Scoped geotechnical instrumentation locations and depths. Directed development of concept designs. Developed details for underground utilities passing through levee, and a retaining wall where realigned levee encroached on parking area. Supervised foundation engineering and embankment design efforts including design for floodwalls, embankment and retaining structures, slope stability & seepage analyses, and preparation of plans & specifications.

St. Johns Biotechnical Levee Restoration**Metro – Portland, Oregon**

Mike was the Project Manager and Lead Geotechnical Engineer for the restoration of a levee surrounding a major landfill facility located along the Columbia Slough in Portland, Oregon. Mike's work tasks included a geotechnical reconnaissance of eroded levee sections, exploratory drilling to assess subsurface conditions, laboratory testing, and slope stability analyses to evaluate levee stabilization options. Mike developed a design to reconstruct the levee with a combination of rock revetment to prevent scour, and biotechnical methods to provide wildlife habitat. He also designed a cement-

bentonite slurry wall to minimize seepage through the levee. Mike prepared plans & specifications and provided technical oversight to field staff during construction.

**Routine Levee Inspections and Condition Assessments for Multiple Sites
USACE, Seattle District (NWS) – Washington and Idaho**

Mike is serving as the Project Manager and multi-disciplinary Team Leader assisting NWS with routine levee inspections and condition assessments at numerous diking districts located across North-Central Washington State. The project scope involves inspections with a team comprised of a geotechnical engineer, a civil and hydraulic engineer, and a NWS levee safety engineer. The inspections are recorded on a GPS-enabled tool to facilitate quick data collection. The results are then summarized in reports prepared in accordance with USACE standards and guidelines. Mike's duties have also included management of a subconsultant firm providing a habitat management plan for five levee sites located along the Skagit River, and quality assurance review of final deliverables.

**Camas-Washougal Levee Condition Assessment and FEMA Recertification
Port of Camas-Washougal – Washougal, Washington**

Mike was the Project Manager and Lead Geotechnical Engineer for levee safety evaluations and condition assessments necessary for recertification under the Federal Code of Regulations 44 CFR 65.10. Mike coordinated efforts of other team member firms including H&H engineers and surveyors and served as the main liaison with the USACE Portland District. Mike coordinated and oversaw field and laboratory investigation plans, which included drilling 64 borings. He provided oversight on in-situ field permeability tests, and supervised office engineering studies including levee stability, seepage/piping potential, and settlement. Mike prepared a geotechnical summary report and provided responses to regulatory review questions.

Castle Rock Levee Recertification, Phase 1 and 2, Castle Rock, Washington.

Project Manager and Consultant Team Leader, responsible for detailed review of existing documentation pertinent to levee recertification, and subsequent technical analyses to meet FEMA guidelines. Assisted the client with the compilation of the recertification submittal package to FEMA and responded to technical questions during the regulatory review period.

Scappoose Levee Phase 1 Certification Evaluation, Scappoose, Oregon. Project Manager and Lead Geotechnical Engineer responsible for performing a review of existing documentation for the Scappoose Drainage Improvement Company (SDIC). Available documentation was collected and reviewed for compliance with FEMA levee certification under 44 CFR 65.10.

Warrenton Diking District No. 1 Levee Certification, Phase 1 Evaluation, Warrenton, Oregon. Project Manager responsible for providing geotechnical engineering services related to obtaining FEMA levee certification for Warrenton Diking District No. 1. Work tasks included: collecting and researching available levee information and discussing its usefulness in satisfying FEMA certification requirements; coordinating a meeting with Diking District No. 1, FEMA and the Corps of Engineers regarding certification requirements; and preparing a summary of the design, operation and maintenance information tasks that FEMA requires for compliance with 44 CFR 65.10. A summary report and recommendations were provided to the City.

Lewis River Shoreline Stabilization, Woodland, Washington. Project Manager responsible for investigation and remedial design to stabilize a shoreline embankment located along the Lewis River in rural, southwest Washington State. Developed field and laboratory testing programs, evaluated remedial options, and provided conceptual cost estimates. Coordinated with a specialty contractor in the design layout to stabilize the slope using launched soil nails. Provided a second opinion review on the contractor's design calculations, and prepared construction drawings. Supervised a staff of field engineers during the installation of launched soil nails.

APPENDIX E

Technical Memorandum: Scale of Proposed Industrial Uses and Impacts (Air Quality) - SCS Engineers



Columbia County, Oregon

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August 23, 2023
File No. 04223025.00

MEMORANDUM

TO: Jay Harland, CSA Planning

FROM: Shane Latimer, PhD
VP/Senior Environmental Planner

Rafe Christopherson, PE
National Air Quality Permitting Lead

SUBJECT: Response to LUBA No. 2021-097
RE: Remand Second Assignment of Error
A. Scale of Proposed Industrial Uses and Impacts (Air Quality)

The purpose of this memorandum is to address the Second Assignment of Error of Land Use Board of Appeals (LUBA) No. 2021-097, specifically, "A. Scale of Proposed Industrial Uses and Impacts" with particular regard to Air Quality.

This memorandum will show how compliance with applicable state and federal air quality regulations are protective of the environment and human health, both generally and in the context of development of the proposed Port Westward Industrial Park expansion.

Facts in Brief

The 905-acre Port Westward Industrial Park is owned by Port of Columbia County (the Port). The Port wishes to expand Port Westward to include 837 acres of additional, adjacent property. The expansion requires a land use exception to Statewide Goal 3 and a zone change from Primary Agriculture (AP-80) to Rural Industrial Planned Development (RIPD). The Port limited the application for expansion to permit only five categories of industrial uses that are dependent on the Port's deep-water facilities: (1) forestry and wood products processing, production, storage, and transportation; (2) dry bulk commodities transfer, storage, production, and processing; (3) liquid bulk commodities processing, storage, and transportation; (4) natural gas and derivative products, processing, storage, and transportation; and (5) breakbulk storage, transportation, and processing.

As part of the LUBA appeals process, the Port argued that *"... the county is not required to evaluate the scale or intensity of the potential adverse impacts of the proposed industrial uses on the existing adjacent uses because most of the proposed industrial uses will be regulated by state and federal entities, including regulations designed to prevent or mitigate environmental impacts caused by chemical spills."*

However, LUBA found that the Port did "... not explain why potential future application of state and federal regulations to some or all of the proposed industrial uses obviates the need to evaluate the



scale or intensity of the industrial uses, and their potential adverse impacts, to satisfy the required compatibility analysis. The state and federal regulations to which the Port refers are intended to reduce the likelihood or severity of certain adverse impacts on the environment. The Port presumes that such reductions in environmental impacts might also reduce impacts on adjacent agricultural, forestry, or residential uses. However, nothing cited in the findings and evidence establishes that connection. For example, petitioners point out that the findings do not attempt to explain how state air quality standards are protective of sensitive crops."[Emphasis added]

Summary - Oregon Air Quality Regulatory Framework

The current plan designation is agricultural land and the property is zoned PA-80, which is considered an Exclusive Farm Use zoning district. Air emissions from farm uses are typically mobile source emissions, which are not subject to air quality permitting.

The State of Oregon arguably has some of, if not the most stringent industrial air quality rules in the nation. Built into these rules is a framework that recognizes particular industrial uses and associated air quality challenges. The regulatory basis of the rules is a set of permits that are issued based on the intensity of industrial air emissions discharge.

There are five main levels of air quality permitting for an industrial facility, each successive level addressing higher use intensities and potential discharges. The first three of these are Air Contaminant Discharge Permits (ACDPs), which are administered by the Oregon Department of Environmental Quality (DEQ). These include Basic, Simple, and Standard ACDPs. Two additional permit types, (1) Title V¹ and (2) Prevention of Significant Deterioration (PSD) permits are required by the U.S. Environmental Protection Agency (EPA) for facilities with larger potential air contaminate discharges. These two permits are also administered by DEQ with full delegation by EPA. A full breakdown of air quality permitting levels in Oregon, including examples of industrial uses typical of each, may be found in Attachment A (DEQ²).

If a facility's expected or known emissions are below all *de minimis* levels (see Table 1, below), a permit may not be required since there will be no, or very little air emissions from the source.

Air Contaminant Discharge Permits

The type of ACDP permit required (Basic, Simple, and Standard) is based on the Activities and Sources List defined in Oregon Administrative Rule (OAR) 340-216-8010, Table 1, Part A (Attachment A).

The threshold for determining if only a Basic ACDP is required is based on the facility category. Attachment B details small natural gas boilers and small grain silos as examples that could pertain to the industrial classification requested at the Port Westward location. The Simple and Standard ACDP examples in Attachment A are more significant industrial sources including larger fuel-burning

¹ Title V of the 1990 Federal Clean Air Act requires each state to develop a comprehensive operating permit program for major industrial sources of air pollution. The program clarifies the environmental obligations of a business by organizing in one document all of a business' air pollution control requirements. (Oregon DEQ)

² <https://secure.sos.state.or.us/oard/viewSingleRule.action?ruleVrsnRsn=296149>
<https://secure.sos.state.or.us/oard/viewAttachment.action?ruleVrsnRsn=296149> (PDF of Table)
(Cited 5/5/25).

equipment, large grain silos, millwork manufacturing, and pulp and paper mills. These types of sources require higher permitting fees and more compliance requirements. The determination as to whether a Simple or Standard ACDP will be required is based on whether emissions exceed a significant emission rate (SER), as shown in Table 2, below.

Many of the industries proposed for the Port Westward Industrial Park expansion will likely meet the criteria for being permitted via an ACDP.

Table 1: *De minimis* air contaminate emissions levels not requiring an air quality permit.

Pollutant	De minimis (tons/year)
Greenhouse Gases (GHG)	2,756 CO ₂ e
Carbon monoxide (CO)	1
Nitrogen oxides (NO _x)	1
Sulfur dioxide (SO ₂)	1
Volatile organic compounds (VOC)	1
Particulate matter (PM)	1
Particulate matter less than or equal to a nominal 10 micrometers (PM ₁₀)	1
Particulate matter less than or equal to a nominal 2.5 micrometers (PM _{2.5})	1

Table 2: Significant emission rates (SERs), above which a Standard ACDP is required.

Pollutant	SER (tons/year)
Greenhouse Gases (GHG)	75,000 CO ₂ e
Carbon monoxide (CO)	100
Nitrogen oxides (NO _x)	40
Sulfur dioxide (SO ₂)	40
Volatile organic compounds (VOC)	40
Particulate matter (PM)	25
Particulate matter less than or equal to a nominal 10 micrometers (PM ₁₀)	15
Particulate matter less than or equal to a nominal 2.5 micrometers (PM _{2.5})	10

Title V / PSD

Once emissions exceed 100 tons per year of any criteria pollutant (each pollutant noted in Table 2, with the exception of greenhouse gases), a Title V permit must be obtained. This process typically involves EPA and DEQ involvement. Permitting fees are higher and require more compliance requirements and associated reporting, depending on the industry.

PSD permits are an entirely more complicated process that is reserved for only the largest sources of air emissions located in an area that is in attainment with National Ambient Air Quality Standards (NAAQS). A large (major) source that would trigger PSD permitting review is any source that has emissions of 250 tons per year, or 100 tons per year if the facility is considered one of the listed 28 source categories (e.g., petroleum refineries, Kraft pulp mills, etc.). A PSD permit requires the installation of Best Available Control Technology (BACT) in addition to a very detailed air quality analysis.

Summary

Regardless of what type of air permit would be required for a proposed source, a permit would need to be obtained prior to the commencement of construction of an emissions unit. This new source review process includes the submittal of an air permit application to DEQ with subsequent review by DEQ and if approved, issuance of an air permit. If the source is required to obtain a permit other than a Basic ACDP, an air quality analysis is required to be performed as part of the application to ensure that the NAAQS are protected³. EPA establishes these NAAQS standards to provide public health protection, including protecting the health of "sensitive" populations such as asthmatics, children,

³ Oregon DEQ Short-Term 1-Hour and 24-Hour NAAQS Requirements website:
<https://www.oregon.gov/deq/air/aqPermits/Pages/NAAQS-Requirements.aspx>

and the elderly. NAAQS standards also provide welfare protection, including protection against decreased visibility and damage to animals, crops, vegetation, and buildings⁴. The Clean Air Act also requires that EPA periodically review the NAAQS standards and revise them, as appropriate. These reviews are completed via an Integrated Science Assessment, which is a comprehensive review and evaluation of the most relevant and current science to inform the analysis that either the current standard or potentially a new proposed standard is protective of human health and protective of welfare, including protection of animals and crops. In addition to the required air quality analysis, any source applying for a Simple or Standard ACDP will be required to submit a toxic air contaminant emissions inventory and once the inventory is approved, will be required to calculate risk from the toxic air contaminants emitted via a risk assessment.

Air Quality Analysis

If an Air Quality Analysis must be performed based on the type of permit required, the analysis will include a study of the proposed project emissions, along with the current background concentrations of the same pollutants and those from any other existing nearby, typically within 50 km, industrial sources. The proposed project emissions in conjunction with the release parameters of those emissions (release/stack height, temperature, flow rate) are input into an air dispersion model developed and maintained by the US EPA. Along with the project information, local meteorological, topographical, and land-use data are also utilized within the air dispersion model. The output of this model is predicted ground-level concentrations of each modeled pollutant surrounding the proposed project utilizing receptor grids that extend up to 50 km from the proposed source. Since this receptor grid will extend up to 50 km in all directions of the proposed source, it will predict the project's impact on various land use types (agricultural, residential, commercial, etc.). The combined impacts (background + existing sources + proposed project) will then be compared to applicable standards, including the short-term and annual NAAQS standards. This analysis would be part of the air permit application submitted to DEQ for review and approval if accepted.

In addition to the point-source industrial permitting analysis, SCS has been involved in projects that also consider fugitive emissions from roads within the air quality analysis. The amount of fugitive emissions and therefore the impact on the airshed can vary depending on if the roads are paved or unpaved and if there are engineering controls implemented. Significant air quality benefits can be achieved by paving existing unpaved roads and/or regular street sweeping of paved roads. Modeling the particular circumstances to account for such measures can provide an additional particulate matter emissions management tool.

Criteria Air Pollutants

Both EPA and DEQ have established air pollution standards in an effort to protect human health and the environment. The main form of protection involves identifying primary air contaminants and safe levels for each. EPA has defined Criteria Air Pollutants (CAPs) as those for which acceptable levels of exposure can be determined and for which an ambient air quality standard has been set. CAPs include ozone, carbon monoxide, lead, nitrogen dioxide, sulfur dioxide, and particles of various sizes; the latter three of these having various associated exposure types or levels.

EPA also requires the identification of geographic areas that may be air quality challenged. Such areas are designated "non-attainment" or Maintenance if the applicable National Ambient Air Quality

⁴ US EPA NAAQS Table: <https://www.epa.gov/criteria-air-pollutants/naaqs-table>

Standards (NAAQS) are not met. The Port Westward area is designated as attainment⁵, which means that local/regional air quality currently meets or is cleaner than the national standard.

Summary

Compliance with applicable state and federal air quality regulations is considered to be protective of the environment and human health. Air quality regulations must be and are supported by the best available science, including a wealth of existing literature and ongoing empirical data collection. Air emissions by their nature are very specific to the industrial process proposed, thus, each project must be individually assessed based on its site-specific characteristics; expansion of the Port Westward Industrial Park would be no exception.

⁵ https://www3.epa.gov/airquality/greenbook/anayo_or.html (No nonattainment or maintenance areas listed for Columbia County.

SHANE LATIMER, PhD

Vice President, Senior Environmental Planner

Education

Postdoctoral Fellow, Environmental Toxicology,
Tulane University, 1994–1995

PhD, Ecology, Tulane University, 1994

BS, Biology (Botany), Southern Oregon State College, 1989

**Specialty Certifications**

HAZWOPER 40-Hour

Professional Affiliations

Solid Waste Association of North America (SWANA)
- Beaver Chapter, Board Member (Local Chapter)

Ecological Society of America

Professional Experience

Dr. Shane Latimer is an environmental planner, ecologist, and toxicologist with over 30 years of experience in environmental assessment, planning, permitting, and implementation. His specialty is developing projects that challenge the interface between the built and natural environment, such as solid waste facilities, oil and gas infrastructure, mines, sewage treatment facilities, and similar developments. These projects often require careful assessments of alternatives, impacts, and opportunities to successfully navigate the applicable public regulatory processes (e.g., NEPA, local land use, etc.) and ensure environmental integrity. Dr. Latimer has a thorough understanding of engineering concepts and practices and is adept at working collaboratively with engineers and other professionals to ensure an optimum balance between environmental and engineering constraints.

In this capacity, Dr. Latimer serves as an expert witness for clients in legal and administrative proceeding. These mainly include lawsuits, land use matters (up to state Supreme Court level), and similar proceedings. Supported topics generally include rendering opinions with regard to the likelihood or significance of impacts to human health and the environment.

Dr. Latimer's work during the last 28 years has mainly been focused on planning, permitting, and environmental compliance for solid waste and other industrial facilities. Main areas of expertise include water quality management and regulation (wetlands, stormwater, and surface water), land use planning as it relates to environmental issues (land quality, air quality, wildlife, and Endangered Species Act), floodplain management and regulation (community and FEMA coordination), ecological risk assessment, and environmental site assessment and cleanup, chemical fate and transport (particularly metals), various cultural resource acts (historic and pre-historic), and wildlife hazard management (e.g., airport conflicts, nuisance wildlife, etc.), and forest management.

Dr. Latimer is an adjunct professor at Portland State University, where he develops and teaches environmental permitting and project management workshops for professionals. Dr. Latimer has also served on state and local technical advisory committees.

SELECT PROJECT EXPERIENCE

The following is a short list of recent projects selected from a larger catalog to show variety and depth of work across Dr. Latimer's practice areas, with emphasis on expert testimony. Additional project descriptions may be provided, on request.

Expert Witness Consulting

Confidential Client. Landfill and Industrial Site Integrity. Oregon. Ongoing.

Expert witness, Project Manager. Providing law firm with expert support regarding extent and likelihood of an historic landfill affecting an adjacent residential use, including a drinking water well. Property was owned by an entity that allegedly did not disclose presence of the landfill or associated activities that may have occurred on the residential property during subsequent sale.

Confidential Client. Composting Facility NPDES Compliance. Portland, Oregon. Ongoing.

Expert witness, Project Manager. Providing law firm with expert support regarding compliance with National Pollutant Discharge Elimination System (NPDES) regulation. The client is suing the Oregon Department of Environmental Quality (DEQ) because DEQ insists client has the potential to discharge stormwater to a receiving water and intends to force client to obtain general permit coverage. Client maintains the site as a non-discharging facility and argues a permit is therefore, not required. Client is also challenging DEQ's apparent attempt to designate stormwater sheet flow as a point-source discharge.

Confidential Client. Illegal Dumping of Food Waste. Oregon. Settled.

Expert witness, Project Manager. Provided client (lawyer with outside counsel) with expert support regarding the illegal dumping of food waste by two large manufacturers of prepared foods on nearby farmland at rates above agronomic level. Client damages consisted of intense odors; inundation of insects, vermin, and other wildlife; and detrimental affects to property values. Ancillary issues included NPDES compliance and land use regulations.

Confidential Client. Industrial NPDES (Tier II) Compliance. Portland, Oregon. Settled.

Expert witness, Project Manager. Provided client with outside forensic stormwater discharge system and reporting evaluation that enabled client to avoid costly Tier II stormwater system upgrades and additional monitoring.

Waste Management, Inc., Riverbend Landfill Expansion, McMinnville, Oregon. Project Manager.

Assisting Waste Management with expansion and management of their McMinnville facility. Assisted in several land use processes, most recently to obtain a comprehensive plan amendment and zone change approval to convert approximately 90 acres from Public Works Safety (PWS) to Exclusive Farm Use (EFU) to accommodate landfill expansion. Included site design, comprehensive evaluation of regional alternative disposal sites and methods, permit application narratives, and preparation and provision of all floodplain development planning and permitting (CLOMR/LOMR). Included expert testimony at multiple hearings, at community meetings, and in Land Use Board of Appeals and court filings (includes Oregon State Supreme Court).

Recent Publications

Latimer, S. 2018. Integrated planning and permitting enables project success. *Natural Gas & Electricity* 34/10, ©2018 Wiley Periodicals, Inc. May 2018.

RAFE CHRISTOPHERSON, P.E.

Education

BS – Chemical Engineering, South Dakota School of Mines and Technology, 1998

Professional Licenses

Professional Engineer – Washington State

Professional Affiliations

Air and Waste Management Association (A&WMA); Director, Oregon Chapter



Professional Experience

Mr. Christopherson has over 25 years of experience in the area of environmental engineering, specializing in air permitting and air compliance as a consultant, regulator, and within regulated industries. He has worked in a wide variety of industries including semiconductors, biofuels, oil and gas, power generation, pulp and paper, hardwoods, and other general manufacturing facilities. As a Project Director, Mr. Christopherson is responsible for leading SCS's client services within the Industrial Clean Air Act initiative.

Mr. Christopherson has also been involved in very high-visibility projects that included significant public comments and public meetings where he has been the company's technical representative. He has also participated in several industrial coalitions during environmental rulemaking to influence the development of more workable and realistic rules applicable to regulated sources.

Notable projects that Mr. Christopherson has been involved in are described below.

New Source Review Air Permitting

Intel Corporation, Ohio, Prevention of Significant Deterioration (PSD) Air Permit. Project manager responsible for the development of a PSD air permit application including detailed emission inventory, regulatory applicability analysis, Best Available Control Technology (BACT) assessment, toxic air contaminant assessment, air dispersion modeling assessment including National Ambient Air Quality Standard, PSD Increment, and Class 1 area assessments. Lead a pre-application meeting with Ohio EPA introducing the project and the semiconductor manufacturing process and the typical air emissions profile as this was the first semiconductor manufacturing source permitted by Ohio EPA. Represented Intel at public meetings and through the EPA Region 5 comment period.

The project required very aggressive permitting timelines that were achieved. PSD permit was issued 8 months after the initial pre-application meeting with Ohio EPA.

Intel Corporation, Oregon, Type 4 Notice of Construction Application. Oregon air program owner responsible for the development of a Type 4 NOC application including detailed emission inventory, regulatory applicability analysis, BACT and retro-BACT assessments, air dispersion modeling assessment demonstrating compliance with NAAQS standards, and a Mutual Agreement and Order

(MAO) requirement demonstrating compliance with applicable ground-level concentration limits for Fluorides and Hydrogen Fluoride (HF).

POET Design & Construction, South Dakota, Iowa, Minnesota, Michigan, Missouri, Indiana, and Ohio. Air program owner responsible for obtaining the necessary construction and operating air permits for all expansion, greenfield, acquisition, and modification projects at 27 operating ethanol facilities in 7 different states. Represented POET for all regulatory agency meetings and public meetings during permitting comment periods. Performed or managed required air dispersion modeling assessments associated with applicable construction permit applications.

Lakeside Industries, Durgin Road Asphalt Plant, Lacey WA, Notice of Construction (NOC) Application. Lead a project team in the generation of a NOC application submitted to the Olympic Region Clean Air Agency (ORCAA) for an asphalt batch plant. The application included a detailed emission inventory, regulatory applicability analysis, and dispersion modeling analyses for criteria and toxic air pollutants.

Service Rock Products, Lucerne Valley California, Permit to Construct (PTC) Application. Completed and submitted a PTC application to Mojave Desert AQMD for a greenfield rock plant. The PTC application included a detailed emission inventory of point sources and fugitive emissions in addition to a detailed BACT analysis.

Proposed Electric Utility, Hermiston, Oregon, Prevention of Significant Deterioration Permit Application. Prepared and supervised an extensive PSD permit application for a greenfield power generation facility on Tribal Lands permitted directly through EPA Region 10. The project included regulatory applicability analysis, criteria and toxic pollutant emissions inventories, Best Available Control Technology (BACT) analysis, and facility-wide dispersion modeling utilizing the AERMOD and a refined Class I modeling analysis utilizing the CALPUFF dispersion model and MM5 meteorological data. The project included multiple pre- and post-application meetings at EPA Region 10. Assisted in public information meetings to discuss the project and address public concerns.

Potlatch Corporation, Lewiston Pulp Mill, Lewiston, Idaho. Assisted client with a preconstruction permit for an alternative fuels project at its Lewiston pulp mill. The application considered an operational proposal that utilized alternative fuels in two of their lime kilns. A detailed estimate of potential emissions along with an air dispersion modeling analysis was utilized to demonstrate compliance with state toxic pollutant ambient standards utilizing five years of on-site meteorological data.

Wood Products Manufacturing Facility, Leavenworth, Washington. Led an extensive dispersion modeling analysis for a proposed fuel oil-fired auxiliary boiler for a log mill. This dispersion modeling analysis included a Class I area deposition analysis utilizing the CALPUFF dispersion model and a nearfield criteria and toxics modeling analysis utilizing AERMOD.

Natural Gas Transmission Station, Lincoln County, Wyoming. Prepared PSD permit application for the installation of two natural gas turbines at a natural gas transmission station. The project included a detailed regulatory applicability analysis, criteria and toxic pollutant emissions inventories, Best Available Control Technology (BACT) analysis, and facility-wide near-field and Class I dispersion modeling.

Proposed Natural Gas Combined Cycle Electric Generation Facility, Terre Haute, Indiana. Prepared extensive PSD permit application for a greenfield power generation facility. The project included regulatory applicability analysis, criteria and toxic pollutant emissions inventories, Best Available Control Technology (BACT) analysis, and facility-wide dispersion modeling. Initial work also included

a pre-application feasibility study for the proposed power plant and a preliminary report detailing future regulatory applicability.

Air Permit Compliance Projects

Intel Corporation, Oregon, Stack Testing Program Management. Managed multiple stack testing programs consisting of testing of acid and ammonia scrubbers, rotary concentrator thermal oxidizer systems, and other fab support systems. These testing programs involved the testing and reporting of numerous regulated pollutants (NOx, CO, VOCs, HF, Total Fluorides, PM10/2.5, hazardous air pollutants, and toxic air contaminants) requiring traditional and modified test methods at various test durations, up to 8-hour test durations. Management of stack testing vendors during testing programs and hosting of regulators and interested members of the public to witness the testing events.

Intel Corporation, Oregon, Annual ACDP Compliance and Emission Inventory Reports. Responsible for the generation of comprehensive annual permit compliance certification reports that required partnership with multiple business and engineering groups to determine continuous or intermittent compliance with all air permit conditions. Developed the 12-month rolling emission inventories for all regulated pollutants to demonstrate compliance with applicable plant-site emission limits (PSELs). Generated full report and senior management review presentation to obtain the required signature of the responsible official prior to submittal to Oregon DEQ.

Intel Corporation, Global Air Program Manager. Responsible for maintaining Intel's Global Air Program Standard as part of Intel's Environmental Management System required for ISO certification. Served as subject matter expert related to stack testing and air permitting and reporting across all global manufacturing operations across the United States, European Union, Costa Rica, India, China, Malaysia, and Israel.

Intel Corporation, Greenhouse Gas Mandatory Reporting Rule. Responsible for Oregon site Scope 1 GHG emissions inventories while managing the Oregon site air program and later responsible for leading the cross-site GHG emissions inventories at operations in Oregon, California, Arizona, and New Mexico.

Intel Corporation, HFC Phasedown Program Manager. Responsible for semi-annual reporting uses of application-specific HFC within the semiconductor manufacturing process for etching operations. Partnered with supply chain and HFC suppliers to confer the necessary application-specific allowances to ensure that the necessary HFCs were available either through domestic producers or international production through importation. Also maintained annual tracking and requests to EPA for the necessary application-specific HFC allowances to ensure maximum operational flexibility for Intel.

POET Plant Management, Stack Testing Program Management, Multiple Sites in SD, IA, MN, MO, MI, OH, and IN. Provided support to the Site Engineering or Plant Manager throughout any air permit required or engineering stack testing programs. This included on-site visits during testing programs of multiple regulated emission units (RTOs, scrubbers, baghouse, boilers, etc.) to ensure proper oversight of testing and ensuring plant operations were representative of normal operations. Served as subject matter expert in the review of draft stack testing reports prior to submittal to the applicable regulatory authority.

POET Plant Management, Environmental Manager. Provided guidance and support to 27 operating bioethanol plants in 7 different states related to air permitting and compliance reporting activities.

This also included the internal compliance audit activities to ensure ongoing compliance programs demonstrated continuous compliance with all applicable permit and regulatory requirements.

Ash Grove Cement, Durkee Oregon & Inkom Idaho Facilities, Extensive Facility-Wide Emission Inventory. Generated and updated facility-wide emission inventory for both the Durkee, Oregon, and Inkom, Idaho Portland cement facilities for current and future year emission inventories.

Western States Petroleum Association, Washington State Refineries, Custom Title V Compliance Tracking Database. Lead a project team in the planning and development of a Title V compliance tracking database. This database was developed to assist all 5 Washington State refineries with tracking and demonstrating compliance with individual permit terms with recently issued Title V permits. Two separate databases were developed, one desktop application, and one web-based application. The desktop application was designed with a visual basic user interface that had a Microsoft Access database. The web-based application was tied to a SQL Server database. This project included on-site installation and training at each of the 5 refineries.

Other Projects

Intel Corporation, Oregon, Settlement Agreement and Good Neighbor Agreement Technical Representative to Neighborhood Groups. Served as Intel's technical representative at all public meetings to discuss air permit applications, emissions inventories, stack testing programs, and any other required information to share with the interested public contained within a Settlement Agreement and subsequent Good Neighbor Agreement. The Settlement Agreement required various stack testing programs to be performed and required a full-site Health Risk Assessment utilizing California's AB-2588 HRA program that requires a detailed air dispersion modeling analysis to be performed using AERMOD followed by health risks calculated using the HARP database. All publicly available information under the GNA is available at www.oragac.com.

Various Companies and Clients, Regulatory Development Support. Supported various companies and interests, both as a private employee and as a consultant during regulatory development processes at both the state and federal levels. Ensured understanding of the client's position to represent needs to enable workable regulations, to the extent possible, that allows for the protection of the environment and public while at the same time allowing for the maximum operational flexibility and capability for future expansion of operations.

Confidential Secondary Aluminum Smelter, Southern California, Emission Reduction Credit (ERC) Application. Lead technical contact in generating a detailed historical emission inventory. This inventory was completed utilizing numerous sources of emission factors in addition to US EPA's AP-42 to develop as comprehensive an emission inventory as possible. A BACT analysis was also completed to determine if current operations complied with current BACT determinations to justify the validity of the emission reduction credits.

Goldendale Energy Center, Goldendale, WA, Initial Title V Application. Completed and submitted an initial Title V Application for a combined cycle power plant. A detailed potential to emit emission inventory was included within the application along with an extensive regulatory applicability analysis.

Confidential Attorney-Client, Southern California, Hazardous Chemical Release Modeling Analysis. Lead modeler in estimating the potential exposure duration and concentration of a hazardous chemical release. The estimate was performed utilizing EPA's SLAB dispersion model along with actual meteorological data from the date and time of the release.

Western Washington Sawmill, Title V Application. Prepared a belated Title V air operating permit application on behalf of the new owners of a sawmill in western Washington. Worked with the local air pollution control agency to ensure the new owners have the protection of a permit shield as soon as possible after the acquisition was completed.

Meat Packing Plant, Pasco, Washington. Supervised and assisted in the development of an extensive emission inventory for the entire beef processing facility for all regulated pollutants. Determined applicability to Title V due to a newly promulgated attainment re-designation. Prepared initial Title V operating permit for submittal to Washington Department of Ecology.

Petroleum Refinery, Toledo, Ohio. Performed an on-site analysis of significant downwash structures over the entire refinery. Digitized stack locations, building locations, and building parameters to determine downwash parameters for each stack in support of requested information.

Confidential Client, St. Paul, Minnesota. Performed dispersion modeling for air toxics for multiple operational scenarios to demonstrate compliance with applicable standards in support of possible future plant expansion projects.

Automotive Manufacturing Facility, Norfolk, Virginia. Performed dispersion modeling for 42 air toxics to demonstrate compliance with applicable standards in support of approved Title V permit.

Cement Facilities, Cape Girardeau, MO, and Greencastle, IN. Prepared Hazard Assessment analysis for multiple regulated toxic chemicals. Modeled worst and alternative cases using PHAST, DEGADIS, AFTOX, RMP Offsite Consequence Analysis, and RMP*Comp. Analyzed affected populations using LANDVIEW III software and county-specific data.

Automotive Support Facility, Ossian, Indiana. Prepared a complete Risk Management Plan (RMP) in compliance with 40 CFR Part 68 Program 2. Reviewed all applicable facility documentation to determine deficiencies and developed missing sections to the RMP. Prepared RMPSubmit database for submission to the USEPA.

Glue Manufacturing Facilities, Riverton, New Jersey, and Tyler, Texas. Developed Risk Management Plans (RMP) and arranged RMP Public Meetings for local communities. Prepared Emergency Response Plans including chemical-specific response procedures for a hazardous chemical stored on-site.

Selected Awards, Publications, and Presentations

Intel Corporate Services Annual Excellence Awards

- EXSC WESP Implementation, 2020
- Oregon Environmental Response Team, 2015

Intel Manufacturing and Supply Chain Operations (MSO) Group Recognition Award

- Enabling Eagle Construction Start – Eagle Air Permit (Ocotillo, AZ Campus), 2021

Intel Cardinal (New Albany, Ohio) Employee of the Month, October 2022

2019 Intel Environmental Excellence Award, Silver

- Advancing Intel's Position as an Environmental Leader through the Innovative Application of WESPs to Scrubbed Exhaust

Intel Division Recognition Awards (DRAs)

- Expedited Cardinal (New Albany, Ohio) Air Permit, Q4 2022
- Expedited Lynx Air Permit (Chandler, Arizona), Q2 2022
- Protecting Site Growth Through Policy Influencing – Oregon Climate Protection Program, Q1 2022
- Pelican (Malaysia) Environmental Taskforce, Q1 2022
- Automating Emissions Data Management (Implementation of EQUIS), Q1 2022
 - The solution achieved estimated efficiency gain of 17k hours & ~\$2m/year
- Eagle (Ocotillo, Arizona) Non-Attainment NSR Air Permit Application Team, Q4 2021
- Hedgehog (Rio Rancho, New Mexico) Project, Q3, 2019
- Lark Project (Ronler Acres Campus, Oregon), Enabling Stretch Groundbreaking Goal, Q2 2019
- Cleaner Air Oregon, Regulation Influencing, Q2 2018
- Completion of the Successful Health Risk Assessment, Q1 2016
- Driving Leadership in Environmental Transparency through ExploreIntel.com, Q1 2016
- RCTO Operations and Environmental Optimization Project, Q4 2014

2-week AERMOD Fundamentals and Modeling Case Study Training Course

- U.S. Aid Funded Cairo Air Improvement Project: Cairo, Egypt, July 2022

“An Introduction to Advance Dispersion Models.” Training Courses; Kirkland, WA; Calgary, Canada; and Olympia, WA. 2003.

“Development and Implementation of a Successful Title V Environmental Compliance Management System – A Case Study.” Presented at NPRA: National Environmental and Safety Conference, New Orleans, 2003.

“A Guide on Current Methods and Regulatory Guidance for Class I Area Impact Dispersion Modeling Analyses.” Presented at Power-Gen International: Annual Conference, Orlando, Florida, 2002.

“Shrewd Selection and Use of Ambient Air Quality Dispersion Models.” Presented at NCASI: West Coast Regional Meeting, Portland, Oregon, 2002.

Awards - “Significance of a CALPUFF Near-Field Analysis.” Russell O. Blosser Memorial Award for the Best Paper – Air Quality Category Technical Association for the Pulp and Paper Industry (TAPPI) National Conference. 2003

APPENDIX F

Technical Memorandum: Land Use Separation - CSA Planning, Ltd.



Columbia County, Oregon

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Technical Memorandum

Date: December 29, 2023

Subject: Port Westward Goal Exception
Land Use Separation Analysis

CSA Planning, Ltd

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Medford, OR 97504

Telephone 541.779.0588
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BACKGROUND

CSA's compatibility analysis began with the applicable administrative rule which contains the following language for a compatibility determination:

- **adjacent** land uses
- **surrounding** natural resources and resource management or production practices

The rule language recognizes the importance of industrial land use proximity and other land uses to which the exception must be found to be compatible. Implicit in this rule language is that spatial separation between land uses is an inherent consideration for compatibility. Accordingly, CSA included land use separation measures as a means to address compatibility.

ANALYTIC DISCUSSION

For the proposed Port Westward Goal Exception, CSA examined land use patterns in the Port Westward area. CSA also examined a variety of rural industrial land use patterns generally, and port uses specifically, in the Pacific Northwest, see Appendix G, a Technical Memorandum analyzing Agricultural and Port Industrial Adjacency Land Use Patterns.

In addition to these land pattern analyses, CSA has over 40 years of professional land use planning experience in the State of Oregon. In our experience, spatial separation between land uses often functions as a measure to reduce potential land use conflicts. The extent of the land use separation measures varies directly with the potential for land use conflicts. In other words, the greater the potential for land use conflicts the greater the land use separation measures that are typically applied. Examples of such separation measures include but are not limited to the following:

- Where potential land use conflicts are nominal, simple structural setbacks within single-family residential developments function to separate houses and accessory structures from each other within single-family residential subdivision developments. Typical setbacks in urban residential subdivision developments are 4-6 feet on the side yards, 4-20 feet in the rear yards, and 10-20 feet in the front yards.
- Development codes in the State typically require additional setbacks for conditional uses that are located in residential areas. Sections 10.816 and 10.817 of the City of Medford Land Development Code, for example, requires a special 30-foot side-yard and rear-yard setback for most all non-residential uses within a residential zone. These setbacks are 26' to 18' greater than the side yard and rear yard setbacks that would typically be applied to other types of structural development within a residential zone in the City of Medford.
- Where more intensive land uses are proposed, the Oregon Department of Environmental Quality has administrative rules that require spatial separation measures. For example, Subtitle C landfills, which are landfills authorized to accept and store many types of extremely hazardous materials, are required to maintain a setback from adjacent properties of at least 1,000 feet and have larger separation requirements from urban areas.

In CSA's experience, spatial separation of land uses is a measure that can reduce the potential for land use conflicts. Using spatial separation is a standard practice in land use planning generally, and in Oregon specifically. For intensive land uses, spatial separation is often one measure, among a suite of permitting and regulatory requirements, that work in harmony to ensure future land uses will be compatible with other land uses in the area.

LAND USE SEPARATION MEASURES FOR PORT WESTWARD

Based upon CSA's analysis of:

- Potential industrial uses within the Port Westward Goal Exception area and the surrounding land use patterns, and
- Analysis of the spatial relationship of rural industrial uses - and especially port-dependent uses - to non-industrial uses in the Columbia Basin and greater Pacific Northwest region, and

Based upon CSA's 40-plus years of Oregon land use planning experience, CSA developed a set of recommended land use separation measures to be applied to future industrial projects within the Port Westward Goal Exception area. The separation measures vary directly with the intensity of industrial land uses; the more intensive the industrial use the greater the required land use separation. The proposed separation measures are set forth below along with the rationale for the recommended separation distances:

150-foot Separation

The smallest separation measure is recommended to be 150-feet. This is half the length of football field. This separation would apply to the lowest intensity industrial use that could potentially be located in the exception area. These uses are not significantly more intensive, if at all, than many agricultural uses allowed in the EFU zone. For this reason, CSA's opinion is that a 150 feet of separation from these uses is more than adequate to ensure compatibility when combined with the additional land use and environmental permitting that would occur as part of siting a future use.

300-foot Separation

The 300-foot separation measure is recommended for the moderate intensity industrial uses. This is the entire length of a length of football field on all sides. This distance would leave room for substantial buffering components (like hybrid poplar farm reinvestments or wetland mitigation areas) that would attenuate noise, minimize lighting impacts, separate air emission sources from potential receptors, and similar benefits.

The industrial uses that would be subject to the 300-foot separation measure are ones where an additional 150-feet of separation will meaningfully reduce the potential for land use conflicts. CSA's opinion is that 300-feet of separation from these uses is more than adequate to ensure compatibility when combined with the additional land use and environmental permitting that would occur as part of siting a future use.

600-foot Separation

The 600-foot separation measure is recommended for most intensive industrial uses that would be permitted within the Port Westward Exception Area. This is the entire length of a length of two football fields on any side not zoned for industrial use or otherwise owned by the Port of Columbia County. This distance would leave room for substantial buffering components (like hybrid poplar farm reinvestments or wetland mitigation areas) that would attenuate noise, minimize lighting impacts, separate air emission sources from potential receptors, and similar benefits.

The industrial uses that would be subject to the 600-foot separation measure are ones where such a separation begins to rise to the level of whether other lands not owned by the Port or zoned industrial are even really "adjacent land uses" with that level of separation. For example, consider a 600-foot by 2,000-foot parcel of land owned by the Port that is located between the industrial use and nearest adjacent use not owned by the Port or zoned industrial. That parcel would be 27 acres, which is a large enough



parcel to support meaningful Port-controlled farm uses between the industrial project and other farmland uses not owned and operated by the Port. For this reason, CSA's opinion is that 600-feet of separation from these uses is more than adequate to ensure compatibility when combined with the additional land use and environmental permitting that would occur as part of siting one of the highest intensity industrial uses that would be permitted in the exception area in the future.

400-foot Additional Separation

Where the 600 foot land use separation applies to the most intensive uses, an additional 400 feet of separation from habitable structures functions to create 1,000 feet of total separation from human occupied structures. This additional separation is similar to separation measures applied to batch plants and other intensive mining operations from residential development in many counties in Oregon, such as Jackson County.

In summary, CSA's professional opinion is that the proposed land use separation measures can be relied upon to ensure compatibility when combined with the additional land use and environmental permitting that is required for future industrial development. Moreover, the land use separation measures being incorporated into the Goal Exception represent the minimum separations by use intensity. The future County permitting actions and/or ODEQ requirements for an actual use may result in additional separation for specific parts of an actual industrial development project.

CSA Planning, Ltd.

A handwritten signature in blue ink, appearing to read 'Jay Harland', is written over a horizontal line.

Jay Harland
President

APPENDIX G

Technical Memorandum: Agricultural and Port Industrial Adjacency Land Use Patterns - CSA Planning, Ltd.



Columbia County, Oregon

© CSA Planning, Ltd. 2024



Technical Memorandum

Date: 8/29/2023

Subject: Development of Farmland Adjacent to Industrial Uses

CSA Planning, Ltd

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Medford, OR 97504

Telephone 541.779.0569
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Christian@CSAplanning.com

Methods of Measurement:

The following geospatial analysis was conducted using Google Earth imaging software and measurement tools available on Google Earth, as well as crop coverage data from online USDA Crop Coverage Maps.

Research on farm ownership was conducted utilizing research from online interactive county maps utilizing GIS software.

Measurements of crop plots were conducted using a cross comparative method of analyzing USDA Crop Coverage Maps from 2022 and measuring the located plots using Google Earth measurement tools.

The history of farm and industrial existences were sourced from various online websites and resources linked to each farm entry, as well as Google Earth historical imagery records.

Research and Analysis of Farms Adjacent to Industrial Uses

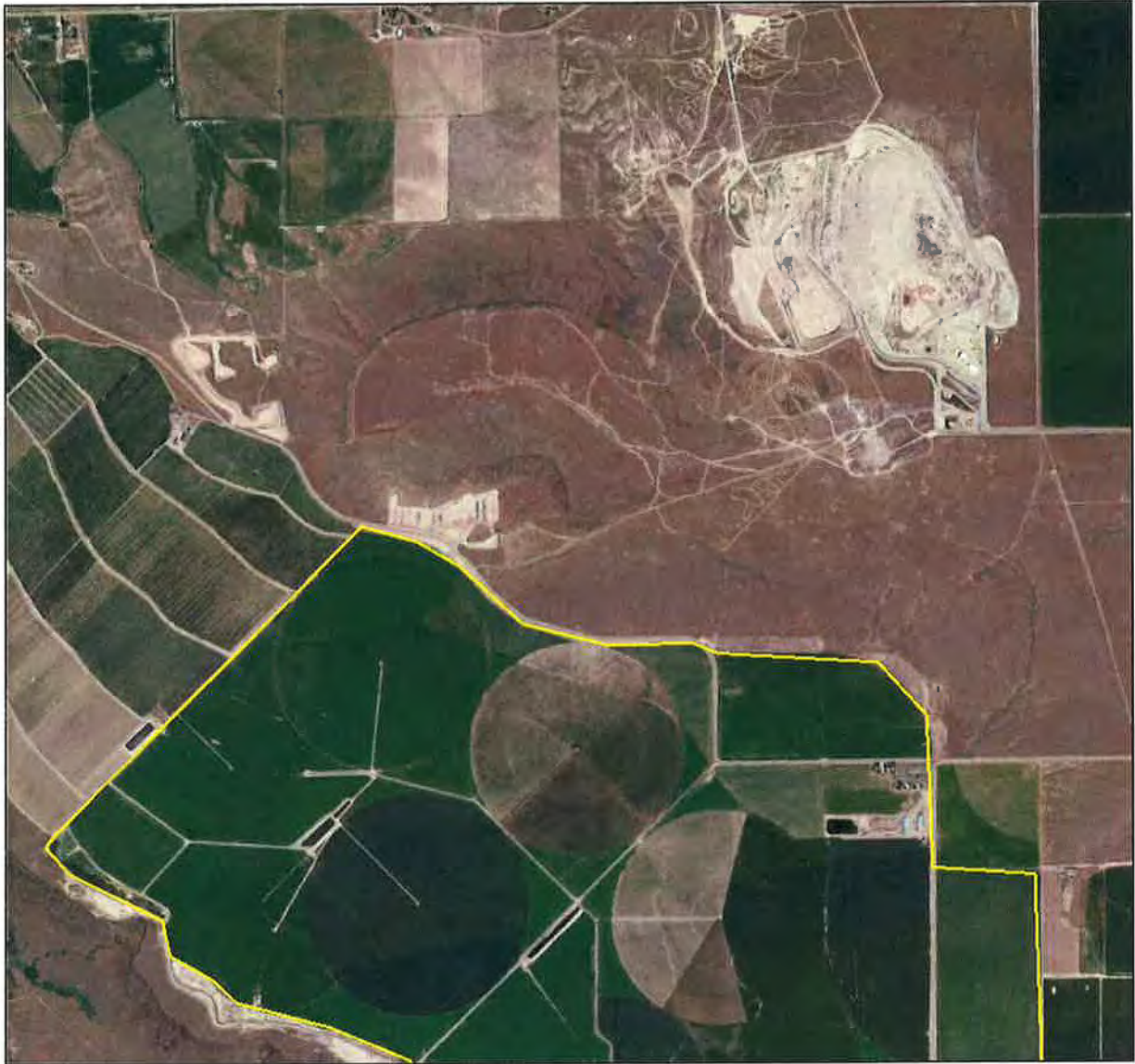
- **Endurance Holdings LLC (11637 Linden Rd Caldwell ID)**

Endurance Holdings LLC owns a large mint farm with about 77 acres of active mint plots. The farm has about 147 acres of total farmland. To the southwest of this mint farm lies Caldwell Industrial Airport. The closest mint plot lies about 0.55 miles from Caldwell Industrial Airport. The [City of Caldwell's website](#) states that the airport itself began planning construction in the 1970s. Endurance Holdings LLC's owned farmland has existed since at least 1992.



- **Farm Development Corp (15605 Ross Ln, Nampa, ID 83686)**

Farm Development Corp owns a large amount of farmed land in Nampa, Idaho, with over 3,000 total acres of owned land. About 739 acres of this land is active mint farmland. To the north of this mint farm lies Canyon County Landfill, a garbage dump site. The closest mint plot lies about 1.50 miles from Canyon County Landfill. The dump and the farmland have existed since at least 1992.



- **Golden Eagle Farms (33399 Snider Rd, Sedro-Woolley, WA 98284)**

Golden Eagle Farms owns a large blueberry farm in the Skagit Valley. The farm has about 859 acres of farmland. The farmland has existed since at least 1998. In between two plots of farmland to the north lies an industrial sawmill known as Skagit River Reman. Skagit River Reman lies in between two blueberry crop plots. Skagit River Reman has been operating for about 10 years according to a website called [Buzzfile](#), but the industrial lot itself has existed since at least 1998.



- **Jake Maberry Packing Inc (6300 Lawrence Rd, Everson, WA)**

Jake Maberry Packing owns a large blueberry farm in Everson, Washington. The farm has about 166 acres of active blueberry farmland. To the northeast of this blueberry farm lies Miles Sand & Gravel, a large industrial sand and gravel mining and distributing business. The closest blueberry plot lies about 0.50 miles from Miles Sand & Gravel. [Miles Sand and Gravel's official website](#) states that the business has been around since 1943. This farm plot owned by Jake Maberry Packing has undergone many changes to the facilities and outline of the crop plots since at least 1998.



- **M & A Farms (29859 OR-213, Molalla, OR, 97038)**

M & A Farms is a blueberry farm that has existed since at least June of 1994 according to recorded maps. The farm itself is about 87 acres. Adjacent to the farm towards the north-east is an industrial lumber mill called Oregon Lumber Works. Oregon Lumber Works lies adjacent to M & A Farms to the north. Oregon Lumber Works has been in business for about 12 years according to the [Yellow Pages](#).



- **Minto Island Growers** (3394 Brown Island Rd S, Salem, OR, 97302)

Minto Island Growers is a company that owns a mint farm that has existed since the 1970s according to [their official website](#), being used to produce large quantities of mint oil. The farm itself is about 291 acres. Adjacent to the farm is an industrial lot housing a ready-mix concrete supplier called Wilsonville Concrete Products. The company has been in operation since the 1950s according to [their website](#). The lot itself historically has existed since at least 1994 using Google Earth.



- **Mutiny Bay Blues** (5486 Cameron Rd, Freeland, WA, 98249)

Mutiny Bay Blues is a blueberry farm that began growing berries in 2011 according to [their official website](#). The farm itself is about 111 acres. Adjacent to the farm to the northeast is an industrial boat building facility known as the Nichols Brothers Boat Builders. The closest blueberry plot lies about 0.50 miles from Nichols Brothers Boat Builders. Nichols Brothers Boat Builders have been operating in Freeland WA since 1964 according to [their website](#).



- **Red Barn Berry Farm** (30129 Camp Adair Rd, Monmouth, OR, 97361)

Rad Barn Berry Farm is a blueberry farm that was established in 2015 according to [Manta's online marketing agency](#). The farm itself has about 147 acres of active blueberry farmland. Adjacent to the farm to its west is a landfill processing center called Valley Landfills Process & Recovery Center. The facility has existed since at least May of 1994.



- **Rodriguez Farm Holdings LLC (3990 Clark Boulevard, Ontario, OR)**

Rodriguez Farm Holdings LLC has farmland just south of a municipal airport. The farm has about 59 acres of active mint, and 153 acres of total farmland. To the northeast of this mint farm lies Ontario Municipal Airport. The closest mint plot lies about 1.10 miles from Ontario Municipal Airport. AirNacv.com states that the airport has been in operation since 1947. The unnamed farm has existed since at least 1994.



- **The Blue Nickol Blueberries U-Pick (158 NE Atlantic St, McMinnville, OR 97128)**

The Blue Nickol Blueberries U-Pick is a blueberry farm that was converted from a walnut farm sometime in the late 1980s to early 1990s according to [their website](#). Adjacent to the 2-acre farm to the east is an industrial lot that houses CalPortland, a concrete contractor, and Forest Glen Repair, a diesel engine repair shop. The industrial lot adjacent to the farm property has existed since at least June of 1994.



CSA Planning Ltd.


Christian Seavage
Associate


Nathan Emerson
Associate

APPENDIX H

Technical Memorandum: GIS Methods and Data Sources, CSA Planning, Ltd.



Columbia County, Oregon

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Technical Memorandum

Date: August 30, 2023

Subject: **Port Westward Goal Exception GIS Project and Sources**

CSA Planning, Ltd

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Telephone 541.779.0589
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Nathan@CSAplanning.net

CSA conducted geographic analysis in support of the Goal Exception remand application on behalf of Port Westward. The results of this analysis were used to inform the Compatibility Analysis to which this Tech Memo is an appendix. The resulting work is depicted graphically in Appendix A.

DATA SOURCES AND GEOGRAPHIC INFORMATION SYSTEMS

CSA created a "GIS Project" and compiled the data layers necessary for the analysis. ArcGIS 10 is an industry standard Geographic Information System (GIS) and was chosen as the primary mechanism for compiling data, analyzing the surrounding area, and creating the Maps in Appendix B. GIS is a strong spatial analysis tool that supports rigorous database development and analysis. The work utilized GIS and land use planning professional best practices in all analytic procedures.

Below is a list of project data sources used by CSA for the analysis. Any layers not named here that were used in the analysis were not intentionally omitted and CSA believes this list captures those most important to the analysis.

1. The Columbia County Assessor's office provided the following data:
 - a. A shapefile of Tax Lot polygons with attributed assessment info, including ownership, was used as a fundamental base layer.
 - b. A Zoning layer that contained the basic zoning information for Port Westward and the surrounding area
2. CSA created several layers that were key to the analysis. These were used creating the "buffering" tool within ArcGis. Among these layers were the following:
 - a. 150 foot, 300 foot, and 600 foot setback layers to demonstrate proposed conditions of approval
 - b. A 1 mile buffer around the proposed goal exception area, which was used to create the Surrounding Area layer (which includes the 1 mile buffer and lands within the Beaver Drainage District
 - c. An inventory of uses in the Surrounding Area. This was created using aerial imagery, data from site visits, and the existing record.
3. A map providing generalized lease information was provided to CSA from the Port of Columbia County.
4. A 2022 aerial image was retrieved from the National Agriculture Imagery Program, along with visual inspections of Google Earth Pro mapping software; the combined formed the primary aerial images used for analysis of existing natural, resource, and other uses in the surrounding area.
5. The online database of levees maintained by the US Army Corps of Engineers provided the shapefiles for the Beaver Drainage District and other adjacent levees.
6. Floodplain data was retrieved from the online FEMA Flood Map Service Center.

7. The State of Oregon Spatial Data Library¹ provided the bulk of the remainder of the layers. Among them were
 - a. Soils class data, which according to the Spatial Data Library originates from the Natural Resources Conservation Service.
 - b. State Highways line file
 - c. Township, Range, and Section
 - d. Rivers and Streams line file
 - e. Railroad line file
 - f. City Limits
 - g. UGB Limits
 - h. Utility Transmission Lines
 - i. County boundaries
8. The Oregon Department of Geology and Mineral Industries Digital Data Series² provided layers related to seismic hazards, such as liquefaction and shaking.
9. Appendix A Page 18 contains the Columbia County Clatskanie Wildlife Game Habitat Map. This map is part of the Columbia County Comprehensive Plan and was retrieved from the web³.
10. A 1951 historic image (photo ID 1QP0000020171) taken by the United States Geological Survey of the goal exception area and surrounds was retrieved from historical imagery available via the online web portal Earth Explorer.

CSA Planning, Ltd.



Nathan Emerson
Associate

¹ Found at <https://spatialdata.oregonexplorer.info/geoportal/>

² <https://pubs.oregon.gov/digitaldata/p-QS11D-1.htm>

³ https://www.co.columbia.or.us/files/kds/planning/Wildlife%20and%20Sensitive%20Lands%20Maps/Clatskanie_Wildlife.pdf

APPENDIX I

Publicly Available Tax Records of Beaver Drainage Improvement Company



Columbia County, Oregon

© CSA Planning, Ltd. 2024

Form **990-EZ****Short Form****Return of Organization Exempt From Income Tax**

Under section 501(c), 527, or 4947(a)(1) of the Internal Revenue Code (except private foundations)

OMB No. 1545-1150

2015**Open to Public Inspection**Department of the Treasury
Internal Revenue Service

▶ Do not enter social security numbers on this form as it may be made public.

▶ Information about Form 990-EZ and its instructions is at www.irs.gov/form990.

A For the 2015 calendar year, or tax year beginning July 01, 2015, and ending June 30, 2016

B Check if applicable:
☐ Address change
☐ Name change
☐ Initial return
☐ Final return/terminated
☐ Amended return
☐ Application pending

C Name of organization
Beaver Drainage Improvement Company, Inc.
 Number and street (or P.O. box, if mail is not delivered to street address) Room/suite
P.O. Box 201
 City or town, state or province, country, and ZIP or foreign postal code
Clatskanie, OR 97016

D Employer identification number
93-1146109

E Telephone number
360-751-8778

F Group Exemption Number ▶

G Accounting Method: ☐ Cash ☐ Accrual Other (specify) ▶

H Check ☐ if the organization is not required to attach Schedule B (Form 990, 990-EZ, or 990-PF).

I Website: ▶

J Tax-exempt status (check only one) - ☐ 501(c)(3) ☒ 501(c) (5) ◀ (insert no.) ☐ 4947(a)(1) or ☐ 527

K Form of organization: ☒ Corporation ☐ Trust ☐ Association ☐ Other

L Add lines 5b, 6c, and 7b to line 9 to determine gross receipts. If gross receipts are \$200,000 or more, or if total assets (Part II, column (B) below) are \$500,000 or more, file Form 990 instead of Form 990-EZ. ▶ \$

Part I Revenue, Expenses, and Changes in Net Assets or Fund Balances (see the instructions for Part I)Check if the organization used Schedule O to respond to any question in this Part I ☒

Line	Description	Amount
1	Contributions, gifts, grants, and similar amounts received	
2	Program service revenue including government fees and contracts	
3	Membership dues and assessments	45140
4	Investment income	1279
5a	Gross amount from sale of assets other than inventory	5a
5b	Less: cost or other basis and sales expenses	5b
5c	Gain or (loss) from sale of assets other than inventory (Subtract line 5b from line 5a)	5c
6	Gaming and fundraising events	
6a	Gross income from gaming (attach Schedule G if greater than \$15,000)	6a
6b	Gross income from fundraising events (not including \$ of contributions from fundraising events reported on line 1) (attach Schedule G if the sum of such gross income and contributions exceeds \$15,000)	6b
6c	Less: direct expenses from gaming and fundraising events	6c
6d	Net income or (loss) from gaming and fundraising events (add lines 6a and 6b and subtract line 6c)	6d
7a	Gross sales of inventory, less returns and allowances	7a
7b	Less: cost of goods sold	7b
7c	Gross profit or (loss) from sales of inventory (Subtract line 7b from line 7a)	7c
8	Other revenue (describe in Schedule O)	267
9	Total revenue. Add lines 1, 2, 3, 4, 5c, 6d, 7c, and 8	46686
10	Grants and similar amounts paid (list in Schedule O)	
11	Benefits paid to or for members	
12	Salaries, other compensation, and employee benefits	3300
13	Professional fees and other payments to independent contractors	24428
14	Occupancy, rent, utilities, and maintenance	45320
15	Printing, publications, postage, and shipping	134
16	Other expenses (describe in Schedule O)	5445
17	Total expenses. Add lines 10 through 16	78627
18	Excess or (deficit) for the year (Subtract line 17 from line 9)	(31941)
19	Net assets or fund balances at beginning of year (from line 27, column (A)) (must agree with end-of-year figure reported on prior year's return)	219699
20	Other changes in net assets or fund balances (explain in Schedule O)	
21	Net assets or fund balances at end of year. Combine lines 18 through 20	187758

For Paperwork Reduction Act Notice, see the separate instructions.

Cat No. 106421

Form **990-EZ** (2015)

Check if the organization used Schedule O to respond to any question in this Part II ☐**Part III Statement of Program Service Accomplishments** (see the instructions for Part III)

Check if the organization used Schedule O to respond to any question in this Part III . . . ☐

What is the organization's primary exempt purpose? Provide drainage and diking service for over 5700 acres.

Describe the organization's program service accomplishments for each of its three largest program services, as measured by expenses. In a clear and concise manner, describe the services provided, the number of persons benefited, and other relevant information for each program title.

Expenses
(Required for section
501(c)(3) and 501(c)(4)
organizations; optional for
others.)

Part IV List of Officers, Directors, Trustees, and Key Employees (list each one even if not compensated — see the instructions for Part IV)

Check if the organization used Schedule O to respond to any question in this Part IV ☒

Part V Other Information (Note the Schedule A and personal benefit contract statement requirements in the instructions for Part V) Check if the organization used Schedule O to respond to any question in this Part V ☐

	Yes	No
33 Did the organization engage in any significant activity not previously reported to the IRS? If "Yes," provide a detailed description of each activity in Schedule O	33	☒
34 Were any significant changes made to the organizing or governing documents? If "Yes," attach a conformed copy of the amended documents if they reflect a change to the organization's name. Otherwise, explain the change on Schedule O (see instructions)	34	☒
35a Did the organization have unrelated business gross income of \$1,000 or more during the year from business activities (such as those reported on lines 2, 6a, and 7a, among others)?	35a	☒
b If "Yes," to line 35a, has the organization filed a Form 990-T for the year? If "No," provide an explanation in Schedule O	35b	
c Was the organization a section 501(c)(4), 501(c)(5), or 501(c)(6) organization subject to section 6033(e) notice, reporting, and proxy tax requirements during the year? If "Yes," complete Schedule C, Part III	35c	☒
36 Did the organization undergo a liquidation, dissolution, termination, or significant disposition of net assets during the year? If "Yes," complete applicable parts of Schedule N	36	☒
37a Enter amount of political expenditures, direct or indirect, as described in the instructions 37a 0		
b Did the organization file Form 1120-POL for this year?	37b	☒
38a Did the organization borrow from, or make any loans to, any officer, director, trustee, or key employee or were any such loans made in a prior year and still outstanding at the end of the tax year covered by this return?	38a	☒
b If "Yes," complete Schedule L, Part II and enter the total amount involved 38b		
39 Section 501(c)(7) organizations. Enter:		
a Initiation fees and capital contributions included on line 9 39a		
b Gross receipts, included on line 9, for public use of club facilities 39b		
40a Section 501(c)(3) organizations. Enter amount of tax imposed on the organization during the year under: section 4911 40a ; section 4912 40a ; section 4955 40a		
b Section 501(c)(3), 501(c)(4), and 501(c)(29) organizations. Did the organization engage in any section 4958 excess benefit transaction during the year, or did it engage in an excess benefit transaction in a prior year that has not been reported on any of its prior Forms 990 or 990-EZ? If "Yes," complete Schedule L, Part I	40b	☒
c Section 501(c)(3), 501(c)(4), and 501(c)(29) organizations. Enter amount of tax imposed on organization managers or disqualified persons during the year under sections 4912, 4955, and 4958 40c 0		
d Section 501(c)(3), 501(c)(4), and 501(c)(29) organizations. Enter amount of tax on line 40c reimbursed by the organization 40d		
e All organizations. At any time during the tax year, was the organization a party to a prohibited tax shelter transaction? If "Yes," complete Form 8888-T 40e		☒
41 List the states with which a copy of this return is filed 41		
42a The organization's books are in care of 42a Telephone no. 42a Located at 42a ZIP + 4 42a		
b At any time during the calendar year, did the organization have an interest in or a signature or other authority over a financial account in a foreign country (such as a bank account, securities account, or other financial account)? If "Yes," enter the name of the foreign country: 42b See the instructions for exceptions and filing requirements for FinCEN Form 114, Report of Foreign Bank and Financial Accounts (FBAR).	42b	☒
c At any time during the calendar year, did the organization maintain an office outside the U.S.? If "Yes," enter the name of the foreign country: 42c	42c	☒
43 Section 4947(a)(1) nonexempt charitable trusts filing Form 990-EZ in lieu of Form 1041—Check here 43 and enter the amount of tax-exempt interest received or accrued during the tax year 43		☐
44a Did the organization maintain any donor advised funds during the year? If "Yes," Form 990 must be completed instead of Form 990-EZ 44a	44a	☒
b Did the organization operate one or more hospital facilities during the year? If "Yes," Form 990 must be completed instead of Form 990-EZ 44b	44b	☒
c Did the organization receive any payments for indoor tanning services during the year? 44c	44c	☒
d If "Yes" to line 44c, has the organization filed a Form 720 to report these payments? If "No," provide an explanation in Schedule O 44d	44d	
45a Did the organization have a controlled entity within the meaning of section 512(b)(13)? 45a	45a	☒
b Did the organization receive any payment from or engage in any transaction with a controlled entity within the meaning of section 512(b)(13)? If "Yes," Form 990 and Schedule R may need to be completed instead of Form 990-EZ (see instructions) 45b	45b	☒

46 Did the organization engage, directly or indirectly, in political campaign activities on behalf of or in opposition to candidates for public office? If "Yes," complete Schedule C, Part I

	Yes	No
46		☒

Part VI Section 501(c)(3) organizations only

All section 501(c)(3) organizations must answer questions 47-49b and 52, and complete the tables for lines 50 and 51.

Check if the organization used Schedule O to respond to any question in this Part VI ☐

47 Did the organization engage in lobbying activities or have a section 501(h) election in effect during the tax year? If "Yes," complete Schedule C, Part II

	Yes	No
47		

48 Is the organization a school as described in section 170(b)(1)(A)(ii)? If "Yes," complete Schedule E

48		
----	--	--

49a Did the organization make any transfers to an exempt non-charitable related organization?

49a		
-----	--	--

b If "Yes," was the related organization a section 527 organization?

49b		
-----	--	--

50 Complete this table for the organization's five highest compensated employees (other than officers, directors, trustees and key employees) who each received more than \$100,000 of compensation from the organization. If there is none, enter "None."

(a) Name and title of each employee	(b) Average hours per week devoted to position	(c) Reportable compensation (Forms W-2/1099-MISC)	(d) Health benefits, contributions to employee benefit plans, and deferred compensation	(e) Estimated amount of other compensation

f Total number of other employees paid over \$100,000

51 Complete this table for the organization's five highest compensated independent contractors who each received more than \$100,000 of compensation from the organization. If there is none, enter "None."

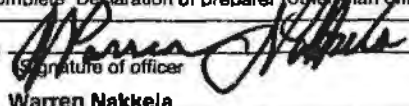
(a) Name and business address of each independent contractor	(b) Type of service	(c) Compensation

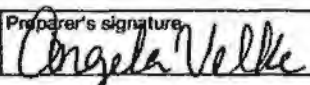
d Total number of other independent contractors each receiving over \$100,000

52 Did the organization complete Schedule A? **Note:** All section 501(c)(3) organizations must attach a completed Schedule A

☐ Yes ☐ No

Under penalties of perjury, I declare that I have examined this return, including accompanying schedules and statements, and to the best of my knowledge and belief, it is true, correct, and complete. Declaration of preparer (other than officer) is based on all information of which preparer has any knowledge.

Sign Here  **Date** 11/14/16
 Signature of officer
 Warren Nakkela
 Type or print name and title

Paid Preparer Use Only Print/Type preparer's name Angela Velke Preparer's signature  Date 11/14/16 Check ☒ if self-employed PTIN 533-74-4092
 Firm's name
 Firm's address 16 East Rd Cathlamet, WA 98612 Firm's EIN Phone no. (360) 751-8778

May the IRS discuss this return with the preparer shown above? See instructions ☒ Yes ☐ No

SCHEDULE O
(Form 990 or 990-EZ)

Department of the Treasury
Internal Revenue Service

Supplemental Information to Form 990 or 990-EZ

Complete to provide information for responses to specific questions on
Form 990 or 990-EZ or to provide any additional information.

▶ Attach to Form 990 or 990-EZ.

▶ Information about Schedule O (Form 990 or 990-EZ) and its instructions is at www.irs.gov/form990.

OMB No. 1545-0047

2015

Open to Public
Inspection

Name of the organization

Beaver Drainage Improvement Company, Inc.

Employer identification number

93-1146109

Part I (8) Other Revenue - Insurance Dividends

Part I (16) Other Expenses - Insurance, Association Dues, Office Supplies, and Bank Service Charges.

Part IV (c) Employee compensation for pump maintenance.

Part IV (e) Annual directors fee to board members.

Form **990-EZ****Short Form****Return of Organization Exempt From Income Tax**

OMB No 1545-1150

2016**Open to Public Inspection**Department of the Treasury
Internal Revenue Service

▶ Do not enter social security numbers on this form as it may be made public.

▶ Information about Form 990-EZ and its instructions is at www.irs.gov/form990.**A** For the 2016 calendar year, or tax year beginning **July 01**, 2016, and ending **June 30**, 20 **17****B** Check if applicable

- ☐ Address change
☐ Name change
☐ Initial return
☐ Final return/terminated
☐ Amended return
☐ Application pending

C Name of organization**Beaver Drainage Improvement Company, Inc.**

Number and street (or P.O. box, if mail is not delivered to street address)

Room/suite

P.O. Box 201

City or town, state or province, country, and ZIP or foreign postal code

Clatskanie, OR 97016**D** Employer identification number**93-1146109****E** Telephone number**360-751-8778****F** Group Exemption
Number ▶**G** Accounting Method: ☒ Cash ☐ Accrual Other (specify) ▶**I** Website: ▶**J** Tax-exempt status (check only one) - ☐ 501(c)(3) ☒ 501(c) (5) ◀ (insert no.) ☐ 4947(a)(1) or ☐ 527**K** Form of organization: ☒ Corporation ☐ Trust ☐ Association ☐ Other**L** Add lines 5b, 6c, and 7b to line 9 to determine gross receipts. If gross receipts are \$200,000 or more, or if total assets (Part II, column (B) below) are \$500,000 or more, file Form 990 instead of Form 990-EZ. ▶ \$**Part I Revenue, Expenses, and Changes in Net Assets or Fund Balances** (see the instructions for Part I)Check if the organization used Schedule O to respond to any question in this Part I. ☒

		1	2	3	4	5a	5b	5c	6a	6b	6c	6d	7a	7b	7c	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Revenue	1	Contributions, gifts, grants, and similar amounts received																0											
	2	Program service revenue including government fees and contracts																0											
	3	Membership dues and assessments																60,698											
	4	Investment income																2,069											
	5a	Gross amount from sale of assets other than inventory																0											
	5b	Less: cost or other basis and sales expenses																0											
	5c	Gain or (loss) from sale of assets other than inventory (Subtract line 5b from line 5a)																0											
	6	Gaming and fundraising events																											
	6a	Gross income from gaming (attach Schedule G if greater than \$15,000)																0											
	6b	Gross income from fundraising events (not including \$ of contributions from fundraising events reported on line 1) (attach Schedule G if the sum of such gross income and contributions exceeds \$15,000)																0											
6c	Less: direct expenses from gaming and fundraising events																0												
6d	Net income or (loss) from gaming and fundraising events (add lines 6a and 6b and subtract line 6c)																0												
Expenses	7a	Gross sales of inventory, less returns and allowances																0											
	7b	Less: cost of goods sold																0											
	7c	Gross profit or (loss) from sales of inventory (Subtract line 7b from line 7a)																0											
	8	Other revenue (describe in Schedule O)																268											
	9	Total revenue. Add lines 1, 2, 3, 4, 5c, 6d, 7c, and 8																63,035											
	10	Grants and similar amounts paid (list in Schedule O)																0											
	11	Benefits paid to or for members																0											
Net Assets	12	Salaries, other compensation, and employee benefits																3,300											
	13	Professional fees and other payments to independent contractors																9,922											
	14	Occupancy, rent, utilities, and maintenance																52,720											
	15	Printing, publications, postage, and shipping																68											
	16	Other expenses (describe in Schedule O)																4,435											
	17	Total expenses. Add lines 10 through 16																70,445											
	18	Excess or (deficit) for the year (Subtract line 17 from line 9)																-7,410											
19	Net assets or fund balances at beginning of year (from line 27, column (A)) (must agree with end-of-year figure reported on prior year's return)																187,758												
20	Other changes in net assets or fund balances (explain in Schedule O)																0												
21	Net assets or fund balances at end of year. Combine lines 18 through 20																180,348												

For Paperwork Reduction Act Notice, see the separate instructions.

Cat. No. 106421

Form **990-EZ** (2016)RECEIVED
NOV 17 2017
OGDEN, UT

Check if the organization used Schedule O to respond to any question in this Part II ☐

Check if the organization used Schedule O to respond to any question in this Part III ☐

Check if the organization used Schedule O to respond to any question in this Part IV ☒

Part V Other Information (Note the Schedule A and personal benefit contract statement requirements in the instructions for Part V) Check if the organization used Schedule O to respond to any question in this Part V. ☐

	Yes	No
33 Did the organization engage in any significant activity not previously reported to the IRS? If "Yes," provide a detailed description of each activity in Schedule O	33	☒
34 Were any significant changes made to the organizing or governing documents? If "Yes," attach a conformed copy of the amended documents if they reflect a change to the organization's name. Otherwise, explain the change on Schedule O (see instructions)	34	☒
35a Did the organization have unrelated business gross income of \$1,000 or more during the year from business activities (such as those reported on lines 2, 6a, and 7a, among others)?	35a	☒
b If "Yes," to line 35a, has the organization filed a Form 990-T for the year? If "No," provide an explanation in Schedule O	35b	
c Was the organization a section 501(c)(4), 501(c)(5), or 501(c)(6) organization subject to section 6033(e) notice, reporting, and proxy tax requirements during the year? If "Yes," complete Schedule C, Part III	35c	☒
36 Did the organization undergo a liquidation, dissolution, termination, or significant disposition of net assets during the year? If "Yes," complete applicable parts of Schedule N	36	☒
37a Enter amount of political expenditures, direct or indirect, as described in the instructions ▶ 37a 0		
b Did the organization file Form 1120-POL for this year?	37b	☒
38a Did the organization borrow from, or make any loans to, any officer, director, trustee, or key employee or were any such loans made in a prior year and still outstanding at the end of the tax year covered by this return?	38a	☒
b If "Yes," complete Schedule L, Part II and enter the total amount involved	38b	
39 Section 501(c)(7) organizations. Enter:		
a Initiation fees and capital contributions included on line 9	39a	
b Gross receipts, included on line 9, for public use of club facilities	39b	
40a Section 501(c)(3) organizations. Enter amount of tax imposed on the organization during the year under: section 4911 ▶ ; section 4912 ▶ ; section 4955 ▶		
b Section 501(c)(3), 501(c)(4), and 501(c)(29) organizations. Did the organization engage in any section 4958 excess benefit transaction during the year, or did it engage in an excess benefit transaction in a prior year that has not been reported on any of its prior Forms 990 or 990-EZ? If "Yes," complete Schedule L, Part I	40b	
c Section 501(c)(3), 501(c)(4), and 501(c)(29) organizations. Enter amount of tax imposed on organization managers or disqualified persons during the year under sections 4912, 4955, and 4958 ▶		
d Section 501(c)(3), 501(c)(4), and 501(c)(29) organizations. Enter amount of tax on line 40c reimbursed by the organization ▶		
e All organizations. At any time during the tax year, was the organization a party to a prohibited tax shelter transaction? If "Yes," complete Form 8886-T	40e	☒
41 List the states with which a copy of this return is filed ▶		
42a The organization's books are in care of ▶ Telephone no. ▶		
Located at ▶ ZIP + 4 ▶		
b At any time during the calendar year, did the organization have an interest in or a signature or other authority over a financial account in a foreign country (such as a bank account, securities account, or other financial account)? If "Yes," enter the name of the foreign country: ▶	42b	☒
See the instructions for exceptions and filing requirements for FinCEN Form 114, Report of Foreign Bank and Financial Accounts (FBAR).		
c At any time during the calendar year, did the organization maintain an office outside the United States? If "Yes," enter the name of the foreign country: ▶	42c	☒
43 Section 4947(a)(1) nonexempt charitable trusts filing Form 990-EZ in lieu of Form 1041—Check here and enter the amount of tax-exempt interest received or accrued during the tax year ▶ 43		☐
44a Did the organization maintain any donor advised funds during the year? If "Yes," Form 990 must be completed instead of Form 990-EZ	44a	☒
b Did the organization operate one or more hospital facilities during the year? If "Yes," Form 990 must be completed instead of Form 990-EZ	44b	☒
c Did the organization receive any payments for indoor tanning services during the year?	44c	☒
d If "Yes" to line 44c, has the organization filed a Form 720 to report these payments? If "No," provide an explanation in Schedule O	44d	
45a Did the organization have a controlled entity within the meaning of section 512(b)(13)?	45a	☒
b Did the organization receive any payment from or engage in any transaction with a controlled entity within the meaning of section 512(b)(13)? If "Yes," Form 990 and Schedule R may need to be completed instead of Form 990-EZ (see instructions)	45b	☒

46 Did the organization engage, directly or indirectly, in political campaign activities on behalf of or in opposition to candidates for public office? If "Yes," complete Schedule C, Part I

	Yes	No
46		☒

Part VI Section 501(c)(3) organizations only

All section 501(c)(3) organizations must answer questions 47-49b and 52, and complete the tables for lines 50 and 51.

Check if the organization used Schedule O to respond to any question in this Part VI ☐

47 Did the organization engage in lobbying activities or have a section 501(h) election in effect during the tax year? If "Yes," complete Schedule C, Part II

	Yes	No
47		

48 Is the organization a school as described in section 170(b)(1)(A)(ii)? If "Yes," complete Schedule E

48		
-----------	--	--

49a Did the organization make any transfers to an exempt non-charitable related organization?

49a		
------------	--	--

b If "Yes," was the related organization a section 527 organization?

49b		
------------	--	--

50 Complete this table for the organization's five highest compensated employees (other than officers, directors, trustees, and key employees) who each received more than \$100,000 of compensation from the organization. If there is none, enter "None."

(a) Name and title of each employee	(b) Average hours per week devoted to position	(c) Reportable compensation (Form W-2/1099-MISC)	(d) Health benefits, contributions to employee benefit plans, and deferred compensation	(e) Estimated amount of other compensation

f Total number of other employees paid over \$100,000 **▶** _____

51 Complete this table for the organization's five highest compensated independent contractors who each received more than \$100,000 of compensation from the organization. If there is none, enter "None."

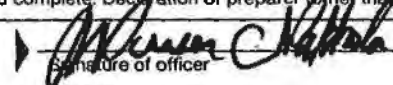
(a) Name and business address of each independent contractor	(b) Type of service	(c) Compensation

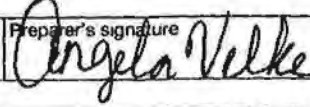
d Total number of other independent contractors each receiving over \$100,000 **▶** _____

52 Did the organization complete Schedule A? **Note:** All section 501(c)(3) organizations must attach a completed Schedule A

☐ Yes ☒ No

Under penalties of perjury, I declare that I have examined this return, including accompanying schedules and statements, and to the best of my knowledge and belief, it is true, correct, and complete. Declaration of preparer (other than officer) is based on all information of which preparer has any knowledge.

Sign Here  **Date** 11-14-17
 Warren Nakkela
 Type or print name and title

Paid Preparer Use Only Print/Type preparer's name: Angela Velke
 Preparer's signature: 
 Date: 11-14-17
 Check ☒ if self-employed
 PTIN: 533-74-4092
 Firm's name:
 Firm's address: 16 East Rd Cathlamet, WA 98612
 Firm's EIN:
 Phone no.: (360) 751-8778

May the IRS discuss this return with the preparer shown above? See instructions ☒ Yes ☐ No

SCHEDULE O
(Form 990 or 990-EZ)

Department of the Treasury
Internal Revenue Service

Supplemental Information to Form 990 or 990-EZ

Complete to provide information for responses to specific questions on
Form 990 or 990-EZ or to provide any additional information.

▶ Attach to Form 990 or 990-EZ.

▶ Go to www.irs.gov/Form990 for the latest information.

OMB No 1545-0047

2017

**Open to Public
Inspection**

Name of the organization

Beaver Drainage Improvement Company, Inc.

Employer identification number

93-1146109

Part I (8) Other Revenue - Insurance Dividends

Part I (16) Other Expenses - Insurance, Association Dues, Office Supplies, and Bank Service Charges.

Part IV (c) Employee compensation for pump maintenance.

Part IV (e) Annual directors fee to board members.

C&E
964Form **990-EZ****Short Form****Return of Organization Exempt From Income Tax**

Under section 501(c), 527, or 4947(a)(1) of the Internal Revenue Code (except private foundations)

OMB No. 1545-1150

2017**Open to Public Inspection**Department of the Treasury
Internal Revenue Service

▶ Do not enter social security numbers on this form as it may be made public.

▶ Go to www.irs.gov/Form990EZ for instructions and the latest information.

A For the 2017 calendar year, or tax year beginning July 01, 2017, and ending June 30, 2018

B Check if applicable:
☐ Address change
☐ Name change
☐ Initial return
☐ Final return/terminated
☐ Amended return
☐ Application pending

C Name of organization
Beaver Drainage Improvement Company, Inc.
 Number and street (or P.O. box, if mail is not delivered to street address) Room/suite
P.O. Box 201
 City or town, state or province, country, and ZIP or foreign postal code
Clatskanie, OR 97016 **65**

D Employer identification number
93-1146109

E Telephone number
(360) 751-8778

F Group Exemption Number ▶

G Accounting Method: ☒ Cash ☐ Accrual Other (specify) ▶

H Check ☒ if the organization is not required to attach Schedule B (Form 990, 990-EZ, or 990-PF).

I Website: ▶

J Tax-exempt status (check only one) — ☐ 501(c)(3) ☒ 501(c) (5) ◀ (insert no.) ☐ 4947(a)(1) or ☐ 527

K Form of organization. ☒ Corporation ☐ Trust ☐ Association ☐ Other

L Add lines 5b, 6c, and 7b to line 9 to determine gross receipts. If gross receipts are \$200,000 or more, or if total assets (Part II, column (B) below) are \$500,000 or more, file Form 990 instead of Form 990-EZ. ▶ \$

Part I Revenue, Expenses, and Changes in Net Assets or Fund Balances (see the instructions for Part I)Check if the organization used Schedule O to respond to any question in this Part I ☒

	1	2	3	4	5a	5b	5c	6a	6b	6c	6d	7a	7b	7c	8	9	10	11	12	13	14	15	16	17	18	19	20	21					
Revenue	Contributions, gifts, grants, and similar amounts received	0	Program service revenue including government fees and contracts	0	Membership dues and assessments	77,387	Investment income	3,121	Gross amount from sale of assets other than inventory	0	Less: cost or other basis and sales expenses	0	Gain or (loss) from sale of assets other than inventory (Subtract line 5b from line 5a)	0	Gaming and fundraising events	Gross income from gaming (attach Schedule G if greater than \$15,000)	0	Gross income from fundraising events (not including \$ of contributions from fundraising events reported on line 1) (attach Schedule G if the sum of such gross income and contributions exceeds \$15,000)	0	Less: direct expenses from gaming and fundraising events	0	Net income or (loss) from gaming and fundraising events (add lines 6a and 6b and subtract line 6c)	0	Gross sales of inventory, less returns and allowances	0	Less: cost of goods sold	0	Gross profit or (loss) from sales of inventory (Subtract line 7b from line 7a)	0	Other revenue (describe in Schedule O)	309	Total revenue. Add lines 1, 2, 3, 4, 5c, 6d, 7c, and 8	80,817
Expenses	Grants and similar amounts paid (list in Schedule O)	0	Benefits paid to or for members	0	Salaries, other compensation, and employee benefits	3,300	Professional fees and other payments to independent contractors	15,599	Occupancy, rent, utilities, and maintenance	56,836	Printing, publications, postage, and shipping	128	Other expenses (describe in Schedule O)	4,873	Total expenses. Add lines 10 through 16	80,736	Excess or (deficit) for the year (Subtract line 17 from line 9)	81	Net assets or fund balances at beginning of year (from line 27, column (A) (must agree with end-of-year figure reported on prior year's return))	180,348	Other changes in net assets or fund balances (explain in Schedule O)	0	Net assets or fund balances at end of year. Combine lines 18 through 20	180,429									

For Paperwork Reduction Act Notice, see the separate instructions.

Cat. No. 10C421

Form **990-EZ** (2017)

Part II Balance Sheets (see the instructions for Part II)

Check if the organization used Schedule O to respond to any question in this Part II

		(A) Beginning of year	(B) End of year
22	Cash, savings, and investments	180,348	22 180,429
23	Land and buildings	0	23 0
24	Other assets (describe in Schedule O)	0	24 0
25	Total assets	180,348	25 108,429
26	Total liabilities (describe in Schedule O)	0	26 0
27	Net assets or fund balances (line 27 of column (B) must agree with line 21)	180,348	27 180,429

Part III Statement of Program Service Accomplishments (see the instructions for Part III)

Check if the organization used Schedule O to respond to any question in this Part III

What is the organization's primary exempt purpose? Provide drainage and diking service for over 5700 acres.

Describe the organization's program service accomplishments for each of its three largest program services, as measured by expenses. In a clear and concise manner, describe the services provided, the number of persons benefited, and other relevant information for each program title.

Expenses
(Required for section
501(c)(3) and 501(c)(4)
organizations, optional for
others.)

28	Provide drainage and diking service to landowners protecting over 5700 acres from flooding. Operating a pump station to drain surface and subsurface water. Maintain a cash reserve in the event natural disaster strikes, such as a major flood, levy repair, and/or pump rebuild or replacement. (Grants \$) If this amount includes foreign grants, check here ▶ ☐	28a	80,736
29	 (Grants \$) If this amount includes foreign grants, check here ▶ ☐	29a	
30	 (Grants \$) If this amount includes foreign grants, check here ▶ ☐	30a	
31	Other program services (describe in Schedule O) (Grants \$) If this amount includes foreign grants, check here ▶ ☐	31a	
32	Total program service expenses (add lines 28a through 31a) ▶	32	80,736

Part IV List of Officers, Directors, Trustees, and Key Employees (list each one even if not compensated—see the instructions for Part IV)

Check if the organization used Schedule O to respond to any question in this Part IV

[illegible]

Part V Other Information (Note the Schedule A and personal benefit contract statement requirements in the instructions for Part V.) Check if the organization used Schedule O to respond to any question in this Part V ☐

	Yes	No
33 Did the organization engage in any significant activity not previously reported to the IRS? If "Yes," provide a detailed description of each activity in Schedule O	33	✓
34 Were any significant changes made to the organizing or governing documents? If "Yes," attach a conformed copy of the amended documents if they reflect a change to the organization's name. Otherwise, explain the change on Schedule O (see instructions)	34	✓
35a Did the organization have unrelated business gross income of \$1,000 or more during the year from business activities (such as those reported on lines 2, 6a, and 7a, among others)?	35a	✓
b If "Yes" to line 35a, has the organization filed a Form 990-T for the year? If "No," provide an explanation in Schedule O	35b	
c Was the organization a section 501(c)(4), 501(c)(5), or 501(c)(6) organization subject to section 6033(e) notice, reporting, and proxy tax requirements during the year? If "Yes," complete Schedule C, Part III	35c	✓
36 Did the organization undergo a liquidation, dissolution, termination, or significant disposition of net assets during the year? If "Yes," complete applicable parts of Schedule N	36	✓
37a Enter amount of political expenditures, direct or indirect, as described in the instructions ▶ 37a 0		
b Did the organization file Form 1120-POL for this year?	37b	✓
38a Did the organization borrow from, or make any loans to, any officer, director, trustee, or key employee or were any such loans made in a prior year and still outstanding at the end of the tax year covered by this return?	38a	✓
b If "Yes," complete Schedule L, Part II and enter the total amount involved	38b	
39 Section 501(c)(7) organizations. Enter:		
a Initiation fees and capital contributions included on line 9	39a	
b Gross receipts, included on line 9, for public use of club facilities	39b	
40a Section 501(c)(3) organizations. Enter amount of tax imposed on the organization during the year under: section 4911 ▶ ; section 4912 ▶ ; section 4955 ▶		
b Section 501(c)(3), 501(c)(4), and 501(c)(29) organizations. Did the organization engage in any section 4958 excess benefit transaction during the year, or did it engage in an excess benefit transaction in a prior year that has not been reported on any of its prior Forms 990 or 990-EZ? If "Yes," complete Schedule L, Part I	40b	
c Section 501(c)(3), 501(c)(4), and 501(c)(29) organizations. Enter amount of tax imposed on organization managers or disqualified persons during the year under sections 4912, 4955, and 4958 ▶		
d Section 501(c)(3), 501(c)(4), and 501(c)(29) organizations. Enter amount of tax on line 40c reimbursed by the organization ▶		
e All organizations. At any time during the tax year, was the organization a party to a prohibited tax shelter transaction? If "Yes," complete Form 8886-T	40e	✓
41 List the states with which a copy of this return is filed ▶		
42a The organization's books are in care of ▶ <u>Angela Velke</u> Telephone no. ▶ <u>(360) 751-8778</u> Located at ▶ <u>16 East Rd Cathlamet, WA</u> ZIP + 4 ▶ <u>98612</u>		
b At any time during the calendar year, did the organization have an interest in or a signature or other authority over a financial account in a foreign country (such as a bank account, securities account, or other financial account)? If "Yes," enter the name of the foreign country: ▶ See the instructions for exceptions and filing requirements for FinCEN Form 114, Report of Foreign Bank and Financial Accounts (FBAR)	42b	✓
c At any time during the calendar year, did the organization maintain an office outside the United States? If "Yes," enter the name of the foreign country: ▶	42c	✓
43 Section 4947(a)(1) nonexempt charitable trusts filing Form 990-EZ in lieu of Form 1041—Check here and enter the amount of tax-exempt interest received or accrued during the tax year ▶ 43		
44a Did the organization maintain any donor advised funds during the year? If "Yes," Form 990 must be completed instead of Form 990-EZ	44a	✓
b Did the organization operate one or more hospital facilities during the year? If "Yes," Form 990 must be completed instead of Form 990-EZ	44b	✓
c Did the organization receive any payments for indoor tanning services during the year?	44c	✓
d If "Yes" to line 44c, has the organization filed a Form 720 to report these payments? If "No," provide an explanation in Schedule O	44d	
45a Did the organization have a controlled entity within the meaning of section 512(b)(13)?	45a	✓
b Did the organization receive any payment from or engage in any transaction with a controlled entity within the meaning of section 512(b)(13)? If "Yes," Form 990 and Schedule R may need to be completed instead of Form 990-EZ (see instructions)	45b	✓

- 48 Did the organization engage, directly or indirectly, in political campaign activities on behalf of or in opposition to candidates for public office? If "Yes," complete Schedule C, Part I

	Yes	No
48		☒

Part VI Section 501(c)(3) organizations only

All section 501(c)(3) organizations must answer questions 47-49b and 52, and complete the tables for lines 50 and 51.

Check if the organization used Schedule O to respond to any question in this Part VI ☐

- 47 Did the organization engage in lobbying activities or have a section 501(h) election in effect during the tax year? If "Yes," complete Schedule C, Part II
- 48 Is the organization a school as described in section 170(b)(1)(A)(ii)? If "Yes," complete Schedule E
- 49a Did the organization make any transfers to an exempt non-charitable related organization?
- b If "Yes," was the related organization a section 527 organization?
- 50 Complete this table for the organization's five highest compensated employees (other than officers, directors, trustees, and key employees) who each received more than \$100,000 of compensation from the organization. If there is none, enter "None."

	Yes	No
47		
48		
49a		
49b		

(a) Name and title of each employee	(b) Average hours per week devoted to position	(c) Reportable compensation (Forms W-2/1099-MISC)	(d) Health benefits, contributions to employee benefit plans, and deferred compensation	(e) Estimated amount of other compensation

f Total number of other employees paid over \$100,000

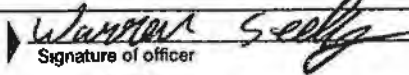
- 51 Complete this table for the organization's five highest compensated independent contractors who each received more than \$100,000 of compensation from the organization. If there is none, enter "None."

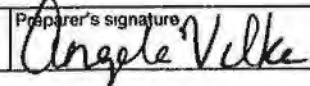
(a) Name and business address of each independent contractor	(b) Type of service	(c) Compensation

d Total number of other independent contractors each receiving over \$100,000

- 52 Did the organization complete Schedule A? **Note:** All section 501(c)(3) organizations must attach a completed Schedule A ☐ Yes ☐ No

Under penalties of perjury, I declare that I have examined this return, including accompanying schedules and statements, and to the best of my knowledge and belief, it is true, correct, and complete. Declaration of preparer (other than officer) is based on all information of which preparer has any knowledge.

Sign Here  11-14-18
 Signature of officer Date
 Warren Seely, Director
 Type or print name and title

Paid Preparer Use Only Preparer's name Date
 Angela Velke 11-14-18
 Preparer's signature 
 Check ☒ if self-employed PTIN 533-74-4092
 Firm's name Firm's EIN
 Firm's address 16 East Rd Cathlamet, WA 98612 Phone no (360) 751-8778

May the IRS discuss this return with the preparer shown above? See instructions ☒ Yes ☐ No

SCHEDULE O
(Form 990 or 990-EZ)

Department of the Treasury
Internal Revenue Service

Supplemental Information to Form 990 or 990-EZ

Complete to provide information for responses to specific questions on
Form 990 or 990-EZ or to provide any additional information.

▶ Attach to Form 990 or 990-EZ.

▶ Go to www.irs.gov/Form990 for the latest information.

OMB No 1545-0047

2017

Open to Public
Inspection

Name of the organization

Beaver Drainage Improvement Company, Inc.

Employer identification number

93-1146109

Part I (8) Other Revenue - Insurance Dividends

Part I (16) Other Expenses - Insurance, Association Dues, Office Supplies, and Bank Service Charges.

Part IV (c) Employee compensation for pump maintenance.

Part IV (e) Annual directors fee to board members.

Form **990-EZ****Short Form****Return of Organization Exempt From Income Tax**

Under section 501(c), 527, or 4947(a)(1) of the Internal Revenue Code (except private foundations)

OMB No. 1545-1150

2018**Open to Public Inspection**Department of the Treasury
Internal Revenue Service

▶ Do not enter social security numbers on this form as it may be made public.

▶ Go to www.irs.gov/Form990EZ for instructions and the latest information.**A** For the 2018 calendar year, or tax year beginning July 01, 2018, and ending June 30, 2019**B** Check if applicable

- ☐ Address change
☐ Name change
☐ Initial return
☐ Final return/terminated
☐ Amended return
☐ Application pending

C Name of organization**Beaver Drainage Improvement Company, Inc.**

Number and street (or P.O. box, if mail is not delivered to street address)

Room/suite

P.O. Box 201

City or town, state or province, country, and ZIP or foreign postal code

Clatskanie, OR 97016**D** Employer identification number**93-1146109****E** Telephone number**(360) 751-8778****F** Group Exemption Number ▶**G** Accounting Method: ☒ Cash ☐ Accrual Other (specify) ▶**I** Website: ▶**J** Tax-exempt status (check only one) — ☐ 501(c)(3) ☒ 501(c) (5) ◀ (insert no) ☐ 4947(a)(1) or ☐ 527**K** Form of organization ☒ Corporation ☐ Trust ☐ Association ☐ Other**L** Add lines 5b, 6c, and 7b to line 9 to determine gross receipts. If gross receipts are \$200,000 or more, or if total assets (Part II, column (B)) are \$500,000 or more, file Form 990 instead of Form 990-EZ\$ **114,096****Part I Revenue, Expenses, and Changes in Net Assets or Fund Balances** (see the instructions for Part I)Check if the organization used Schedule O to respond to any question in this Part I ☒

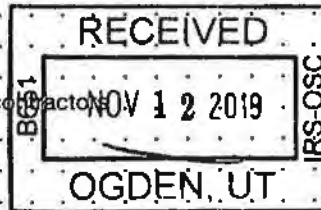
1	Contributions, gifts, grants, and similar amounts received	1	0
2	Program service revenue including government fees and contracts	2	0
3	Membership dues and assessments	3	111,592
4	Investment income	4	2,195
5a	Gross amount from sale of assets other than inventory	5a	0
b	Less cost or other basis and sales expenses	5b	0
c	Gain or (loss) from sale of assets other than inventory (Subtract line 5b from line 5a)	5c	0
6	Gaming and fundraising events:		
a	Gross income from gaming (attach Schedule G if greater than \$15,000)	6a	0
b	Gross income from fundraising events (not including \$ of contributions from fundraising events reported on line 1) (attach Schedule G if the sum of such gross income and contributions exceeds \$15,000)	6b	0
c	Less direct expenses from gaming and fundraising events	6c	0
d	Net income or (loss) from gaming and fundraising events (add lines 6a and 6b and subtract line 6c)	6d	0
7a	Gross sales of inventory, less returns and allowances	7a	0
b	Less cost of goods sold	7b	0
c	Gross profit or (loss) from sales of inventory (Subtract line 7b from line 7a)	7c	0
8	Other revenue (describe in Schedule O)	8	309
9	Total revenue. Add lines 1, 2, 3, 4, 5c, 6d, 7c, and 8	9	114,096
10	Grants and similar amounts paid (list in Schedule O)	10	0
11	Benefits paid to or for members	11	0
12	Salaries, other compensation, and employee benefits	12	2,200
13	Professional fees and other payments to independent contractors	13	12,645
14	Occupancy, rent, utilities, and maintenance	14	225,948
15	Printing, publications, postage, and shipping	15	149
16	Other expenses (describe in Schedule O)	16	5,233
17	Total expenses. Add lines 10 through 16	17	246,175
18	Excess or (deficit) for the year (Subtract line 17 from line 9)	18	-132,079
19	Net assets or fund balances at beginning of year (from line 27, column (A)) (must agree with end-of-year figure reported on prior year's return)	19	180,429
20	Other changes in net assets or fund balances (explain in Schedule O)	20	
21	Net assets or fund balances at end of year. Combine lines 18 through 20	21	48,350

For Paperwork Reduction Act Notice, see the separate instructions.

Cat No 106421

Form **990-EZ** (2018)

SCANNED DEC 18 2019



16

Part II Balance Sheets (see the instructions for Part II)

Check if the organization used Schedule O to respond to any question in this Part II

		(A) Beginning of year	(B) End of year
22	Cash, savings, and investments	180,429	22 48,350
23	Land and buildings	0	23 0
24	Other assets (describe in Schedule O)	0	24 0
25	Total assets	180,429	25 48,350
26	Total liabilities (describe in Schedule O)	0	26 0
27	Net assets or fund balances (line 27 of column (B) must agree with line 21)	180,429	27 48,350

Part III Statement of Program Service Accomplishments (see the instructions for Part III)

Check if the organization used Schedule O to respond to any question in this Part III

What is the organization's primary exempt purpose? **Provide drainage and diking service for over 5700 acres.**

Describe the organization's program service accomplishments for each of its three largest program services, as measured by expenses. In a clear and concise manner, describe the services provided, the number of persons benefited, and other relevant information for each program title.

Expenses
(Required for section
501(c)(3) and 501(c)(4)
organizations, optional for
others.)

28	Provide drainage and diking service to landowners protecting over 5700 acres from flooding. Operating a pump station to drain surface and subsurface water. Maintain a cash reserve in the event natural disaster strikes, such as a major flood, levy repair, and/or pump rebuild or replacement.		
	(Grants \$) If this amount includes foreign grants, check here ▶ ☐	28a	246,175
29			
	(Grants \$) If this amount includes foreign grants, check here ▶ ☐	29a	
30			
	(Grants \$) If this amount includes foreign grants, check here ▶ ☐	30a	
31	Other program services (describe in Schedule O)		
	(Grants \$) If this amount includes foreign grants, check here ▶ ☐	31a	
32	Total program service expenses (add lines 28a through 31a) ▶	32	246,175

Part IV List of Officers, Directors, Trustees, and Key Employees (list each one even if not compensated—see the instructions for Part IV)

Check if the organization used Schedule O to respond to any question in this Part IV

[illegible]

Part V Other Information (Note the Schedule A and personal benefit contract statement requirements in the instructions for Part V.) Check if the organization used Schedule O to respond to any question in this Part V ☐

	Yes	No
33 Did the organization engage in any significant activity not previously reported to the IRS? If "Yes," provide a detailed description of each activity in Schedule O		☒
34 Were any significant changes made to the organizing or governing documents? If "Yes," attach a conformed copy of the amended documents if they reflect a change to the organization's name. Otherwise, explain the change on Schedule O. See instructions		☒
35a Did the organization have unrelated business gross income of \$1,000 or more during the year from business activities (such as those reported on lines 2, 6a, and 7a, among others)?		☒
b If "Yes" to line 35a, has the organization filed a Form 990-T for the year? If "No," provide an explanation in Schedule O		
c Was the organization a section 501(c)(4), 501(c)(5), or 501(c)(6) organization subject to section 6033(e) notice, reporting, and proxy tax requirements during the year? If "Yes," complete Schedule C, Part III		☒
36 Did the organization undergo a liquidation, dissolution, termination, or significant disposition of net assets during the year? If "Yes," complete applicable parts of Schedule N		☒
37a Enter amount of political expenditures, direct or indirect, as described in the instructions	37a	0
b Did the organization file Form 1120-POL for this year?		☒
38a Did the organization borrow from, or make any loans to, any officer, director, trustee, or key employee or were any such loans made in a prior year and still outstanding at the end of the tax year covered by this return?		☒
b If "Yes," complete Schedule L, Part II and enter the total amount involved	38b	
39 Section 501(c)(7) organizations. Enter:		
a Initiation fees and capital contributions included on line 9	39a	
b Gross receipts, included on line 9, for public use of club facilities	39b	
40a Section 501(c)(3) organizations. Enter amount of tax imposed on the organization during the year under: section 4911; section 4912; section 4955		
b Section 501(c)(3), 501(c)(4), and 501(c)(29) organizations. Did the organization engage in any section 4958 excess benefit transaction during the year, or did it engage in an excess benefit transaction in a prior year that has not been reported on any of its prior Forms 990 or 990-EZ? If "Yes," complete Schedule L, Part I	40b	
c Section 501(c)(3), 501(c)(4), and 501(c)(29) organizations. Enter amount of tax imposed on organization managers or disqualified persons during the year under sections 4912, 4955, and 4958		
d Section 501(c)(3), 501(c)(4), and 501(c)(29) organizations. Enter amount of tax on line 40c reimbursed by the organization		
e All organizations. At any time during the tax year, was the organization a party to a prohibited tax shelter transaction? If "Yes," complete Form 8886-T	40e	☒
41 List the states with which a copy of this return is filed		
42a The organization's books are in care of Angela Velke Telephone no. (360) 751-8778 Located at 16 East Rd Cathlamet, WA ZIP + 4 98612		
b At any time during the calendar year, did the organization have an interest in or a signature or other authority over a financial account in a foreign country (such as a bank account, securities account, or other financial account)? If "Yes," enter the name of the foreign country	42b	☒
See the instructions for exceptions and filing requirements for FinCEN Form 114, Report of Foreign Bank and Financial Accounts (FBAR).		
c At any time during the calendar year, did the organization maintain an office outside the United States? If "Yes," enter the name of the foreign country	42c	☒
43 Section 4947(a)(1) nonexempt charitable trusts filing Form 990-EZ in lieu of Form 1041—Check here and enter the amount of tax-exempt interest received or accrued during the tax year	43	☐
44a Did the organization maintain any donor advised funds during the year? If "Yes," Form 990 must be completed instead of Form 990-EZ	44a	☒
b Did the organization operate one or more hospital facilities during the year? If "Yes," Form 990 must be completed instead of Form 990-EZ	44b	☒
c Did the organization receive any payments for indoor tanning services during the year?	44c	☒
d If "Yes" to line 44c, has the organization filed a Form 720 to report these payments? If "No," provide an explanation in Schedule O	44d	
45a Did the organization have a controlled entity within the meaning of section 512(b)(13)?	45a	☒
b Did the organization receive any payment from or engage in any transaction with a controlled entity within the meaning of section 512(b)(13)? If "Yes," Form 990 and Schedule R may need to be completed instead of Form 990-EZ. See instructions	45b	☒

46 Did the organization engage, directly or indirectly, in political campaign activities on behalf of or in opposition to candidates for public office? If "Yes," complete Schedule C, Part I

	Yes	No
46		☒

Part VI Section 501(c)(3) Organizations Only

All section 501(c)(3) organizations must answer questions 47-49b and 52, and complete the tables for lines 50 and 51.

Check if the organization used Schedule O to respond to any question in this Part VI ☐

47 Did the organization engage in lobbying activities or have a section 501(h) election in effect during the tax year? If "Yes," complete Schedule C, Part II

	Yes	No
47		

48 Is the organization a school as described in section 170(b)(1)(A)(ii)? If "Yes," complete Schedule E

48		
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49a Did the organization make any transfers to an exempt non-charitable related organization?

49a		
-----	--	--

b If "Yes," was the related organization a section 527 organization?

49b		
-----	--	--

50 Complete this table for the organization's five highest compensated employees (other than officers, directors, trustees, and key employees) who each received more than \$100,000 of compensation from the organization. If there is none, enter "None."

(a) Name and title of each employee	(b) Average hours per week devoted to position	(c) Reportable compensation (Forms W-2/1099-MISC)	(d) Health benefits, contributions to employee benefit plans, and deferred compensation	(e) Estimated amount of other compensation

f Total number of other employees paid over \$100,000

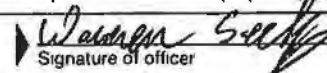
51 Complete this table for the organization's five highest compensated independent contractors who each received more than \$100,000 of compensation from the organization. If there is none, enter "None."

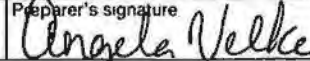
(a) Name and business address of each independent contractor	(b) Type of service	(c) Compensation

d Total number of other independent contractors each receiving over \$100,000

52 Did the organization complete Schedule A? **Note:** All section 501(c)(3) organizations must attach a completed Schedule A ☐ Yes ☐ No

Under penalties of perjury, I declare that I have examined this return, including accompanying schedules and statements, and to the best of my knowledge and belief, it is true, correct, and complete. Declaration of preparer (other than officer) is based on all information of which preparer has any knowledge.

Sign Here  11-5-19
Signature of officer Date
Warren Seely Chairperson
Type or print name and title

Paid Preparer Use Only
Print/Type preparer's name Angela Velke
Preparer's signature 
Date 11-05-19
Check ☒ if self-employed PTIN 533-74-4092
Firm's name
Firm's address 16 East Rd Cathlamet, WA 98612
Firm's EIN
Phone no. (360) 751-8778

May the IRS discuss this return with the preparer shown above? See instructions ☒ Yes ☐ No

SCHEDULE O
(Form 990 or 990-EZ)

Department of the Treasury
Internal Revenue Service

Supplemental Information to Form 990 or 990-EZ

Complete to provide information for responses to specific questions on
Form 990 or 990-EZ or to provide any additional information.

- ▶ Attach to Form 990 or 990-EZ.
- ▶ Go to www.irs.gov/Form990 for the latest information.

OMB No 1545-0047

2018

**Open to Public
Inspection**

Name of the organization

Beaver Drainage Improvement Company, Inc.

Employer identification number

93-1146109

Part I (8) Other Revenue - Insurance Dividends

Part I (16) Other Expenses - Insurance, Association Dues, Office Supplies, and Bank Service Charges.

Part IV (c) Employee compensation for pump maintenance.

Part IV (e) Annual directors fee to board members.

Form **990-EZ****Short Form****Return of Organization Exempt From Income Tax**

Under section 501(c), 527, or 4947(a)(1) of the Internal Revenue Code (except private foundations)

▶ Do not enter social security numbers on this form, as it may be made public.

▶ Go to www.irs.gov/Form990EZ for instructions and the latest information.**2019****Open to Public Inspection**Department of the Treasury
Internal Revenue Service

A For the 2019 calendar year, or tax year beginning July 01, 2019, and ending June 30, 20 20

B Check if applicable:
☐ Address change
☐ Name change
☐ Initial return
☐ Final return/terminated
☐ Amended return
☐ Application pending

C Name of organization
Beaver Drainage Improvement Company, Inc.
 Number and street (or P.O. box if mail is not delivered to street address) Room/suite
PO Box 201
 City or town, state or province, country, and ZIP or foreign postal code
Clatskanie, OR 97016 05

D Employer identification number
93-1146109

E Telephone number
(360) 751-8778

F Group Exemption Number ▶

G Accounting Method: ☒ Cash ☐ Accrual Other (specify) ▶

H Check ☒ if the organization is not required to attach Schedule B (Form 990, 990-EZ, or 990-PF).

I Website: ▶

J Tax-exempt status (check only one) — ☐ 501(c)(3) ☒ 501(c) (5) ◀ (insert no.) ☐ 4947(a)(1) or ☐ 527

K Form of organization: ☒ Corporation ☐ Trust ☐ Association ☐ Other

L Add lines 5b, 6c, and 7b to line 9 to determine gross receipts. If gross receipts are \$200,000 or more, or if total assets (Part II, column (B)) are \$500,000 or more, file Form 990 instead of Form 990-EZ. ▶ \$

Part I Revenue, Expenses, and Changes in Net Assets or Fund Balances (see the instructions for Part I)Check if the organization used Schedule O to respond to any question in this Part I ☒

Revenue		Expenses		Net Assets	
1	Contributions, gifts, grants, and similar amounts received	1	0	18	Excess or (deficit) for the year (subtract line 17 from line 9)
2	Program service revenue including government fees and contracts	2	0	19	Net assets or fund balances at beginning of year (from line 27, column (A)) (must agree with end-of-year figure reported on prior year's return)
3	Membership dues and assessments	3	137,907	20	Other changes in net assets or fund balances (explain in Schedule O)
4	Investment income	4	1,544	21	Net assets or fund balances at end of year. Combine lines 18 through 20
5a	Gross amount from sale of assets other than inventory	5a	0		
b	Less: cost or other basis and sales expenses	5b	0		
c	Gain or (loss) from sale of assets other than inventory (subtract line 5b from line 5a)	5c	0		
6	Gaming and fundraising events:				
a	Gross income from gaming (attach Schedule G if greater than \$15,000)	6a	0		
b	Gross income from fundraising events (not including \$ of contributions from fundraising events reported on line 1) (attach Schedule G if the sum of such gross income and contributions exceeds \$15,000)	6b	0		
c	Less: direct expenses from gaming and fundraising events	6c	0		
d	Net income or (loss) from gaming and fundraising events (add lines 6a and 6b and subtract line 6c)	6d	0		
7a	Gross sales of inventory, less returns and allowances	7a	0		
b	Less: cost of goods sold	7b	0		
c	Gross profit or (loss) from sales of inventory (subtract line 7b from line 7a)	7c	0		
8	Other revenue (describe in Schedule O)	8	290		
9	Total revenue. Add lines 1, 2, 3, 4, 5c, 6d, 7c, and 8	9	139,741		
10	Grants and similar amounts paid (list in Schedule O)	10	0		
11	Benefits paid to or for members	11	0		
12	Salaries, other compensation, and employee benefits	12	3,300		
13	Professional fees and other payments to independent contractors	13	5,990		
14	Occupancy, rent, utilities, and maintenance	14	70,633		
15	Printing, publications, postage, and shipping	15	180		
16	Other expenses (describe in Schedule O)	16	5,662		
17	Total expenses. Add lines 10 through 16	17	85,765		
18	Excess or (deficit) for the year (subtract line 17 from line 9)	18	53,976		
19	Net assets or fund balances at beginning of year (from line 27, column (A)) (must agree with end-of-year figure reported on prior year's return)	19	48,350		
20	Other changes in net assets or fund balances (explain in Schedule O)	20			
21	Net assets or fund balances at end of year. Combine lines 18 through 20	21	102,326		

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Check if the organization used Schedule O to respond to any question in this Part II

Check if the organization used Schedule O to respond to any question in this Part II

		(A) Beginning of year	(B) End of year
22	Cash, savings, and investments	48,350	22 102,326
23	Land and buildings	0	23 0
24	Other assets (describe in Schedule O)	0	24 0
25	Total assets	48,350	25 102,326
26	Total liabilities (describe in Schedule O)	0	26 0
27	Net assets or fund balances (line 27 of column (B) must agree with line 21)	48,350	27 102,326

Check if the organization used Schedule O to respond to any question in this Part III ☐

Check if the organization used Schedule O to respond to any question in this Part III ☐

Expenses
(Required for section
501(c)(3) and 501(c)(4)
organizations, optional for
others)

Describe the organization's program service accomplishments for each of its three largest program services, as measured by expenses. In a clear and concise manner, describe the services provided, the number of persons benefited, and other relevant information for each program title.

28	Provide drainage and diking service to landowners protecting over 5700 acres from flooding. Operating a pump station to drain surface and subsurface water. Maintain a cash reserve in the event natural disaster strikes, such as a major flood, levy repair, and/or pump rebuild or replacement.	(Grants \$) If this amount includes foreign grants, check here ▶ ☐	28a	85,765
29				
30		(Grants \$) If this amount includes foreign grants, check here ▶ ☐	29a	
31	Other program services (describe in Schedule O)	(Grants \$) If this amount includes foreign grants, check here ▶ ☐	30a	
32	Total program service expenses (add lines 28a through 31a)		31a	
			32	85,765

Check if the organization used Schedule O to respond to any question in this Part IV

Check if the organization used Schedule O to respond to any question in this Part IV

[illegible]

Part V Other Information (Note the Schedule A and personal benefit contract statement requirements in the instructions for Part V.) Check if the organization used Schedule O to respond to any question in this Part V ☐

	Yes	No
33 Did the organization engage in any significant activity not previously reported to the IRS? If "Yes," provide a detailed description of each activity in Schedule O	33	☒
34 Were any significant changes made to the organizing or governing documents? If "Yes," attach a conformed copy of the amended documents if they reflect a change to the organization's name. Otherwise, explain the change on Schedule O. See instructions	34	☒
35a Did the organization have unrelated business gross income of \$1,000 or more during the year from business activities (such as those reported on lines 2, 6a, and 7a, among others)?	35a	☒
b If "Yes" to line 35a, has the organization filed a Form 990-T for the year? If "No," provide an explanation in Schedule O	35b	
c Was the organization a section 501(c)(4), 501(c)(5), or 501(c)(6) organization subject to section 6033(e) notice, reporting, and proxy tax requirements during the year? If "Yes," complete Schedule C, Part III	35c	☒
36 Did the organization undergo a liquidation, dissolution, termination, or significant disposition of net assets during the year? If "Yes," complete applicable parts of Schedule N	36	☒
37a Enter amount of political expenditures, direct or indirect, as described in the instructions ► 37a	37b	☒
b Did the organization file Form 1120-POL for this year?	37b	☒
38a Did the organization borrow from, or make any loans to, any officer, director, trustee, or key employee; or were any such loans made in a prior year and still outstanding at the end of the tax year covered by this return?	38a	☒
b If "Yes," complete Schedule L, Part II, and enter the total amount involved	38b	
39 Section 501(c)(7) organizations. Enter	39a	
a Initiation fees and capital contributions included on line 9	39a	
b Gross receipts, included on line 9, for public use of club facilities	39b	
40a Section 501(c)(3) organizations. Enter amount of tax imposed on the organization during the year under section 4911 ► ; section 4912 ► , section 4955 ►		
b Section 501(c)(3), 501(c)(4), and 501(c)(29) organizations. Did the organization engage in any section 4958 excess benefit transaction during the year, or did it engage in an excess benefit transaction in a prior year that has not been reported on any of its prior Forms 990 or 990-EZ? If "Yes," complete Schedule L, Part I	40b	
c Section 501(c)(3), 501(c)(4), and 501(c)(29) organizations. Enter amount of tax imposed on organization managers or disqualified persons during the year under sections 4912, 4955, and 4958 ►		
d Section 501(c)(3), 501(c)(4), and 501(c)(29) organizations. Enter amount of tax on line 40c reimbursed by the organization ►		
e All organizations. At any time during the tax year, was the organization a party to a prohibited tax shelter transaction? If "Yes," complete Form 8886-T	40e	☒
41 List the states with which a copy of this return is filed ►		
42a The organization's books are in care of ► <u>Angela Velke</u> Telephone no. ► <u>(360) 751-8778</u>		
Located at ► <u>16 East Rd Cathlamet, WA</u> ZIP + 4 ► <u>98612</u>		
b At any time during the calendar year, did the organization have an interest in or a signature or other authority over a financial account in a foreign country (such as a bank account, securities account, or other financial account)?	42b	☒
If "Yes," enter the name of the foreign country ►		
See the instructions for exceptions and filing requirements for FinCEN Form 114, Report of Foreign Bank and Financial Accounts (FBAR).		
c At any time during the calendar year, did the organization maintain an office outside the United States?	42c	☒
If "Yes," enter the name of the foreign country ►		
43 Section 4947(a)(1) nonexempt charitable trusts filing Form 990-EZ in lieu of Form 1041—Check here and enter the amount of tax-exempt interest received or accrued during the tax year	43	☐
44a Did the organization maintain any donor advised funds during the year? If "Yes," Form 990 must be completed instead of Form 990-EZ	44a	☒
b Did the organization operate one or more hospital facilities during the year? If "Yes," Form 990 must be completed instead of Form 990-EZ	44b	☒
c Did the organization receive any payments for indoor tanning services during the year?	44c	☒
d If "Yes" to line 44c, has the organization filed a Form 720 to report these payments? If "No," provide an explanation in Schedule O	44d	
45a Did the organization have a controlled entity within the meaning of section 512(b)(13)?	45a	☒
b Did the organization receive any payment from or engage in any transaction with a controlled entity within the meaning of section 512(b)(13)? If "Yes," Form 990 and Schedule R may need to be completed instead of Form 990-EZ. See instructions	45b	☒

46 Did the organization engage, directly or indirectly, in political campaign activities on behalf of or in opposition to candidates for public office? If "Yes," complete Schedule C, Part I

	Yes	No
46		

Part VI Section 501(c)(3) Organizations Only

All section 501(c)(3) organizations must answer questions 47–49b and 52, and complete the tables for lines 50 and 51.

Check if the organization used Schedule O to respond to any question in this Part VI ☐

47 Did the organization engage in lobbying activities or have a section 501(h) election in effect during the tax year? If "Yes," complete Schedule C, Part II

	Yes	No
47		

48 Is the organization a school as described in section 170(b)(1)(A)(ii)? If "Yes," complete Schedule E

48		
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49a Did the organization make any transfers to an exempt non-charitable related organization?

49a		
------------	--	--

b If "Yes," was the related organization a section 527 organization?

49b		
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50 Complete this table for the organization's five highest compensated employees (other than officers, directors, trustees, and key employees) who each received more than \$100,000 of compensation from the organization. If there is none, enter "None."

(a) Name and title of each employee	(b) Average hours per week devoted to position	(c) Reportable compensation (Forms W-2/1099-MISC)	(d) Health benefits, contributions to employee benefit plans, and deferred compensation	(e) Estimated amount of other compensation

f Total number of other employees paid over \$100,000 ▶

51 Complete this table for the organization's five highest compensated independent contractors who each received more than \$100,000 of compensation from the organization. If there is none, enter "None."

(a) Name and business address of each independent contractor	(b) Type of service	(c) Compensation

d Total number of other independent contractors each receiving over \$100,000 ▶

52 Did the organization complete Schedule A? **Note:** All section 501(c)(3) organizations must attach a completed Schedule A ☐ Yes ☐ No

Under penalties of perjury, I declare that I have examined this return, including accompanying schedules and statements, and to the best of my knowledge and belief, it is true, correct, and complete. Declaration of preparer (other than officer) is based on all information of which preparer has any knowledge.

Sign Here ▶ Warren Seely Signature of officer 11/10/2020 Date
 ▶ Warren Seely Chairperson
 Type or print name and title

Paid Preparer Use Only ▶ Preparer's name Angela Velke Preparer's signature Angela Velke Date 11/10/2020 Check ☒ if self-employed PTIN 533-74-4092
 Firm's name ▶ Firm's EIN ▶
 Firm's address ▶ 16 East Rd Cathlamet, WA 98612 Phone no (360) 751-8778

May the IRS discuss this return with the preparer shown above? See instructions ☒ Yes ☐ No

SCHEDULE O
(Form 990 or 990-EZ)

Department of the Treasury
Internal Revenue Service

Supplemental Information to Form 990 or 990-EZ

Complete to provide information for responses to specific questions on
Form 990 or 990-EZ or to provide any additional information.

▶ Attach to Form 990 or 990-EZ.

▶ Go to www.irs.gov/Form990 for the latest information.

OMB No 1545-0047

2019

**Open to Public
Inspection**

Name of the organization

Beaver Drainage Improvement Company, Inc.

Employer identification number

93-1146109

Part I (8) Other Revenue - Insurance Dividends

Part I (16) Other Expenses - Insurance, Association Dues, Office Supplies, and Bank Service Charges.

Part IV (c) Employee compensation for pump maintenance.

Part IV (e) Annual directors fee to board members.

Form **990-EZ****Short Form****Return of Organization Exempt From Income Tax**

Under section 501(c), 527, or 4947(a)(1) of the Internal Revenue Code (except private foundations)

OMB No. 1545-0047

2019**Open to Public Inspection**Department of the Treasury
Internal Revenue Service

▶ Do not enter social security numbers on this form, as it may be made public.

▶ Go to www.irs.gov/Form990EZ for instructions and the latest information. **2006**

A For the 2019 calendar year, or tax year beginning **July 01**, 2019, and ending **June 30**, 20 **20**

B Check if applicable:
☐ Address change
☐ Name change
☐ Initial return
☐ Final return/terminated
☐ Amended return
☐ Application pending

C Name of organization
Beaver Drainage Improvement Company, Inc.
 Number and street (or P.O. box if mail is not delivered to street address) Room/suite
PO Box 201
 City or town, state or province, country, and ZIP or foreign postal code
Clatskanie, OR 97016

D Employer identification number
93-1146109

E Telephone number
(360) 751-8778

F Group Exemption Number ▶

G Accounting Method: ☒ Cash ☐ Accrual Other (specify) ▶

H Check ☒ if the organization is not required to attach Schedule B (Form 990, 990-EZ, or 990-PF).

I Website: ▶

J Tax-exempt status (check only one) — ☐ 501(c)(3) ☒ 501(c)(5) ◀ (insert no.) ☐ 4947(a)(1) or ☐ 527

K Form of organization: ☒ Corporation ☐ Trust ☐ Association ☐ Other

L Add lines 5b, 6c, and 7b to line 9 to determine gross receipts. If gross receipts are \$200,000 or more, or if total assets (Part II, column (B)) are \$500,000 or more, file Form 990 instead of Form 990-EZ. ▶ \$

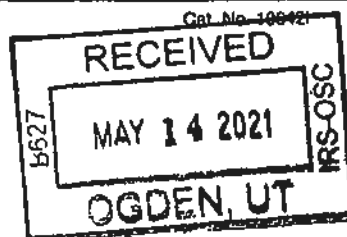
Part I Revenue, Expenses, and Changes in Net Assets or Fund Balances (see the instructions for Part I)

Check if the organization used Schedule O to respond to any question in this Part I ☒

Line	Description	Amount
1	Contributions, gifts, grants, and similar amounts received	0
2	Program service revenue including government fees and contracts	0
3	Membership dues and assessments	137,907
4	Investment income	1,544
5a	Gross amount from sale of assets other than inventory	0
5b	Less: cost or other basis and sales expenses	0
5c	Gain or (loss) from sale of assets other than inventory (subtract line 5b from line 5a)	0
6	Gaming and fundraising events:	
6a	Gross income from gaming (attach Schedule G if greater than \$15,000)	0
6b	Gross income from fundraising events (not including \$ of contributions from fundraising events reported on line 1) (attach Schedule G if the sum of such gross income and contributions exceeds \$15,000)	0
6c	Less: direct expenses from gaming and fundraising events	0
6d	Net income or (loss) from gaming and fundraising events (add lines 6a and 6b and subtract line 6c)	0
7a	Gross sales of inventory, less returns and allowances	0
7b	Less: cost of goods sold	0
7c	Gross profit or (loss) from sales of inventory (subtract line 7b from line 7a)	0
8	Other revenue (describe in Schedule O)	290
9	Total revenue. Add lines 1, 2, 3, 4, 5c, 6d, 7c, and 8	139,741
10	Grants and similar amounts paid (list in Schedule O)	0
11	Benefits paid to or for members	0
12	Salaries, other compensation, and employee benefits	3,300
13	Professional fees and other payments to independent contractors	5,990
14	Occupancy, rent, utilities, and maintenance	70,633
15	Printing, publications, postage, and shipping	180
16	Other expenses (describe in Schedule O)	5,662
17	Total expenses. Add lines 10 through 16	85,765
18	Excess or (deficit) for the year (subtract line 17 from line 9)	53,976
19	Net assets or fund balances at beginning of year (from line 27, column (A)) (must agree with end-of-year figure reported on prior year's return)	48,350
20	Other changes in net assets or fund balances (explain in Schedule O)	
21	Net assets or fund balances at end of year. Combine lines 18 through 20	102,326

For Paperwork Reduction Act Notice, see the separate instructions.

Cat No. 100421

Form **990-EZ** (2019)

016-394088
 06-32-276 JUL 1 2021
 SCANNED JUN 16 2022

Part V Other Information (Note the Schedule A and personal benefit contract statement requirements in the instructions for Part V.) Check if the organization used Schedule O to respond to any question in this Part V ☐

	Yes	No
33 Did the organization engage in any significant activity not previously reported to the IRS? If "Yes," provide a detailed description of each activity in Schedule O	☐	☒
34 Were any significant changes made to the organizing or governing documents? If "Yes," attach a conformed copy of the amended documents if they reflect a change to the organization's name. Otherwise, explain the change on Schedule O. See instructions	☐	☒
35a Did the organization have unrelated business gross income of \$1,000 or more during the year from business activities (such as those reported on lines 2, 6a, and 7a, among others)?	☐	☒
b If "Yes" to line 35a, has the organization filed a Form 990-T for the year? If "No," provide an explanation in Schedule O	☐	☐
c Was the organization a section 501(c)(4), 501(c)(5), or 501(c)(6) organization subject to section 6033(e) notice, reporting, and proxy tax requirements during the year? If "Yes," complete Schedule C, Part III	☐	☒
36 Did the organization undergo a liquidation, dissolution, termination, or significant disposition of net assets during the year? If "Yes," complete applicable parts of Schedule N	☐	☒
37a Enter amount of political expenditures, direct or indirect, as described in the instructions ▶ 37a	☐	☐
b Did the organization file Form 1120-POL for this year?	☐	☒
38a Did the organization borrow from, or make any loans to, any officer, director, trustee, or key employee; or were any such loans made in a prior year and still outstanding at the end of the tax year covered by this return?	☐	☒
b If "Yes," complete Schedule L, Part II, and enter the total amount involved	☐	☐
39 Section 501(c)(7) organizations. Enter:	☐	☐
a Initiation fees and capital contributions included on line 9	☐	☐
b Gross receipts, included on line 9, for public use of club facilities	☐	☐
40a Section 501(c)(3) organizations. Enter amount of tax imposed on the organization during the year under: section 4911 ▶ ; section 4912 ▶ ; section 4955 ▶	☐	☐
b Section 501(c)(3), 501(c)(4), and 501(c)(29) organizations. Did the organization engage in any section 4958 excess benefit transaction during the year, or did it engage in an excess benefit transaction in a prior year that has not been reported on any of its prior Forms 990 or 990-EZ? If "Yes," complete Schedule L, Part I	☐	☐
c Section 501(c)(3), 501(c)(4), and 501(c)(29) organizations. Enter amount of tax imposed on organization managers or disqualified persons during the year under sections 4912, 4955, and 4958 ▶	☐	☐
d Section 501(c)(3), 501(c)(4), and 501(c)(29) organizations. Enter amount of tax on line 40c reimbursed by the organization ▶	☐	☐
e All organizations. At any time during the tax year, was the organization a party to a prohibited tax shelter transaction? If "Yes," complete Form 8886-T	☐	☒
41 List the states with which a copy of this return is filed ▶	☐	☐
42a The organization's books are in care of ▶ <u>Angela Velke</u> Telephone no. ▶ <u>(360) 751-8778</u> Located at ▶ <u>16 East Rd Cathlamet, WA</u> ZIP + 4 ▶ <u>98612</u>	☐	☐
b At any time during the calendar year, did the organization have an interest in or a signature or other authority over a financial account in a foreign country (such as a bank account, securities account, or other financial account)? If "Yes," enter the name of the foreign country ▶ See the instructions for exceptions and filing requirements for FinCEN Form 114, Report of Foreign Bank and Financial Accounts (FBAR).	☐	☒
c At any time during the calendar year, did the organization maintain an office outside the United States? If "Yes," enter the name of the foreign country ▶	☐	☒
43 Section 4947(a)(1) nonexempt charitable trusts filing Form 990-EZ in lieu of Form 1041—Check here and enter the amount of tax-exempt interest received or accrued during the tax year ▶ 43 ☐	☐	☐
44a Did the organization maintain any donor advised funds during the year? If "Yes," Form 990 must be completed instead of Form 990-EZ	☐	☒
b Did the organization operate one or more hospital facilities during the year? If "Yes," Form 990 must be completed instead of Form 990-EZ	☐	☒
c Did the organization receive any payments for indoor tanning services during the year?	☐	☒
d If "Yes" to line 44c, has the organization filed a Form 720 to report these payments? If "No," provide an explanation in Schedule O	☐	☐
45a Did the organization have a controlled entity within the meaning of section 512(b)(13)?	☐	☒
b Did the organization receive any payment from or engage in any transaction with a controlled entity within the meaning of section 512(b)(13)? If "Yes," Form 990 and Schedule R may need to be completed instead of Form 990-EZ. See instructions	☐	☒

46 Did the organization engage, directly or indirectly, in political campaign activities on behalf of or in opposition to candidates for public office? If "Yes," complete Schedule C, Part I

	Yes	No
46		

Part VI Section 501(c)(3) Organizations Only

All section 501(c)(3) organizations must answer questions 47-49b and 52, and complete the tables for lines 50 and 51.

Check if the organization used Schedule O to respond to any question in this Part VI ☐

47 Did the organization engage in lobbying activities or have a section 501(h) election in effect during the tax year? If "Yes," complete Schedule C, Part II

	Yes	No
47		

48 Is the organization a school as described in section 170(b)(1)(A)(ii)? If "Yes," complete Schedule E

48		
----	--	--

49a Did the organization make any transfers to an exempt non-charitable related organization?

49a		
-----	--	--

b If "Yes," was the related organization a section 527 organization?

49b		
-----	--	--

50 Complete this table for the organization's five highest compensated employees (other than officers, directors, trustees, and key employees) who each received more than \$100,000 of compensation from the organization. If there is none, enter "None."

(a) Name and title of each employee	(b) Average hours per week devoted to position	(c) Reportable compensation (Forms W-2/1099-MISC)	(d) Health benefits, contributions to employee benefit plans, and deferred compensation	(e) Estimated amount of other compensation

f Total number of other employees paid over \$100,000 ▶

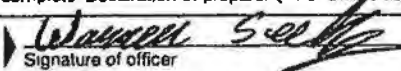
51 Complete this table for the organization's five highest compensated independent contractors who each received more than \$100,000 of compensation from the organization. If there is none, enter "None."

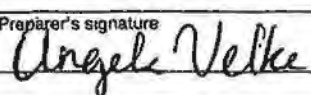
(a) Name and business address of each independent contractor	(b) Type of service	(c) Compensation

d Total number of other independent contractors each receiving over \$100,000 ▶

52 Did the organization complete Schedule A? Note: All section 501(c)(3) organizations must attach a completed Schedule A ☐ Yes ☐ No

Under penalties of perjury, I declare that I have examined this return, including accompanying schedules and statements, and to the best of my knowledge and belief, it is true, correct, and complete. Declaration of preparer (other than officer) is based on all information of which preparer has any knowledge.

Sign Here  Signature of officer 11/10/2020
Date
Warren Seely Chairperson
Type or print name and title

Paid Preparer Use Only Preparer's name ▶ Angela Velke Preparer's signature  Date 11/10/2020 Check ☒ if self-employed PTIN 533-74-4092
Firm's name ▶ Firm's EIN ▶
Firm's address ▶ 16 East Rd Cathlamet, WA 98612 Phone no (360) 751-8778

May the IRS discuss this return with the preparer shown above? See instructions ☒ Yes ☐ No

SCHEDULE O
(Form 990 or 990-EZ)

Department of the Treasury
Internal Revenue Service

Supplemental Information to Form 990 or 990-EZ

Complete to provide information for responses to specific questions on
Form 990 or 990-EZ or to provide any additional information.

▶ Attach to Form 990 or 990-EZ.

▶ Go to www.irs.gov/Form990 for the latest information.

OMB No 1545-0047

2019

Open to Public
Inspection

Name of the organization

Beaver Drainage Improvement Company, Inc.

Employer identification number

93-1146109

Part I (8) Other Revenue - Insurance Dividends

Part I (16) Other Expenses - Insurance, Association Dues, Office Supplies, and Bank Service Charges.

Part IV (c) Employee compensation for pump maintenance.

Part IV (e) Annual directors fee to board members.

Form **990-EZ****Short Form****Return of Organization Exempt From Income Tax**

Under section 501(c), 527, or 4947(a)(1) of the Internal Revenue Code (except private foundations)

2020**Open to Public Inspection**Department of the Treasury
Internal Revenue Service

▶ Do not enter social security numbers on this form, as it may be made public.

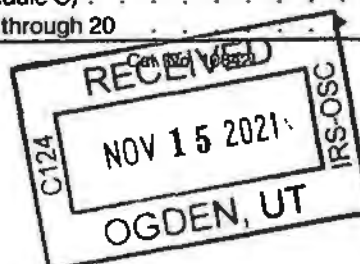
▶ Go to www.irs.gov/Form990EZ for instructions and the latest information.**A** For the 2020 calendar year, or tax year beginning July 01, 2020, and ending June 30, 20 21

B Check if applicable: ☐ Address change ☐ Name change ☐ Initial return ☐ Final return/terminated ☐ Amended return ☐ Application pending	C Name of organization <u>Beaver Drainage Improvement Company, Inc.</u>		D Employer identification number <u>93-1146109</u>
	Number and street (or P.O. box if mail is not delivered to street address) Room/suite <u>PO Box 201</u>		E Telephone number <u>(360) 751-8778</u>
	City or town, state or province, country, and ZIP or foreign postal code <u>Clatskanie, OR 97016</u>		F Group Exemption Number ▶

G Accounting Method: ☒ Cash ☐ Accrual Other (specify) ▶**I** Website: ▶**J** Tax-exempt status (check only one) — ☐ 501(c)(3) ☒ 501(c)(5) (insert no) ☐ 4947(a)(1) or ☐ 527**K** Form of organization: ☒ Corporation ☐ Trust ☐ Association ☐ Other**L** Add lines 5b, 6c, and 7b to line 9 to determine gross receipts. If gross receipts are \$200,000 or more, or if total assets (Part II, column (B)) are \$500,000 or more, file Form 990 instead of Form 990-EZ. ▶ \$**Part I Revenue, Expenses, and Changes in Net Assets or Fund Balances** (see the instructions for Part I)Check if the organization used Schedule O to respond to any question in this Part I ☒

Revenue	1 Contributions, gifts, grants, and similar amounts received	1	<u>0</u>
	2 Program service revenue including government fees and contracts	2	<u>0</u>
	3 Membership dues and assessments	3	<u>140,817</u>
	4 Investment income	4	<u>1,097</u>
	5a Gross amount from sale of assets other than inventory	5a	<u>0</u>
	b Less: cost or other basis and sales expenses	5b	<u>0</u>
	c Gain or (loss) from sale of assets other than inventory (subtract line 5b from line 5a)	5c	<u>0</u>
	6 Gaming and fundraising events:		
	a Gross income from gaming (attach Schedule G if greater than \$15,000)	6a	<u>0</u>
	b Gross income from fundraising events (not including \$ of contributions from fundraising events reported on line 1) (attach Schedule G if the sum of such gross income and contributions exceeds \$15,000)	6b	<u>0</u>
c Less: direct expenses from gaming and fundraising events	6c	<u>0</u>	
d Net income or (loss) from gaming and fundraising events (add lines 6a and 6b and subtract line 6c)	6d	<u>0</u>	
7a Gross sales of inventory, less returns and allowances	7a	<u>0</u>	
b Less: cost of goods sold	7b	<u>0</u>	
c Gross profit or (loss) from sales of inventory (subtract line 7b from line 7a)	7c	<u>0</u>	
8 Other revenue (describe in Schedule O)	8	<u>810</u>	
9 Total revenue. Add lines 1, 2, 3, 4, 5c, 6d, 7c, and 8	9	<u>142,724</u>	
Expenses	10 Grants and similar amounts paid (list in Schedule O)	10	<u>0</u>
	11 Benefits paid to or for members	11	<u>0</u>
	12 Salaries, other compensation, and employee benefits	12	<u>3,300</u>
	13 Professional fees and other payments to independent contractors	13	<u>24,233</u>
	14 Occupancy, rent, utilities, and maintenance	14	<u>31,988</u>
	15 Printing, publications, postage, and shipping	15	<u>288</u>
	16 Other expenses (describe in Schedule O)	16	<u>7,141</u>
17 Total expenses. Add lines 10 through 16	17	<u>66,950</u>	
Net Assets	18 Excess or (deficit) for the year (subtract line 17 from line 9)	18	<u>75,774</u>
	19 Net assets or fund balances at beginning of year (from line 27, column (A)) (must agree with end-of-year figure reported on prior year's return)	19	<u>102,326</u>
	20 Other changes in net assets or fund balances (explain in Schedule O)	20	
	21 Net assets or fund balances at end of year. Combine lines 18 through 20	21	<u>178,100</u>

For Paperwork Reduction Act Notice, see the separate instructions.

Form **990-EZ** (2020)

Part V Other Information (Note the Schedule A and personal benefit contract statement requirements in the instructions for Part V.) Check if the organization used Schedule O to respond to any question in this Part V ☐

	Yes	No
33 Did the organization engage in any significant activity not previously reported to the IRS? If "Yes," provide a detailed description of each activity in Schedule O	33	☒
34 Were any significant changes made to the organizing or governing documents? If "Yes," attach a conformed copy of the amended documents if they reflect a change to the organization's name. Otherwise, explain the change on Schedule O. See instructions	34	☒
35a Did the organization have unrelated business gross income of \$1,000 or more during the year from business activities (such as those reported on lines 2, 6a, and 7a, among others)?	35a	☒
b If "Yes" to line 35a, has the organization filed a Form 990-T for the year? If "No," provide an explanation in Schedule O	35b	
c Was the organization a section 501(c)(4), 501(c)(5), or 501(c)(6) organization subject to section 6033(e) notice, reporting, and proxy tax requirements during the year? If "Yes," complete Schedule C, Part III	35c	☒
36 Did the organization undergo a liquidation, dissolution, termination, or significant disposition of net assets during the year? If "Yes," complete applicable parts of Schedule N	36	☒
37a Enter amount of political expenditures, direct or indirect, as described in the instructions ▶ 37a 0	37a	
b Did the organization file Form 1120-POL for this year?	37b	☒
38a Did the organization borrow from, or make any loans to, any officer, director, trustee, or key employee; or were any such loans made in a prior year and still outstanding at the end of the tax year covered by this return?	38a	☒
b If "Yes," complete Schedule L, Part II, and enter the total amount involved 38b	38b	
39 Section 501(c)(7) organizations. Enter:		
a Initiation fees and capital contributions included on line 9 39a	39a	
b Gross receipts, included on line 9, for public use of club facilities 39b	39b	
40a Section 501(c)(3) organizations. Enter amount of tax imposed on the organization during the year under: section 4911 ▶ ; section 4912 ▶ ; section 4955 ▶		
b Section 501(c)(3), 501(c)(4), and 501(c)(29) organizations. Did the organization engage in any section 4958 excess benefit transaction during the year, or did it engage in an excess benefit transaction in a prior year that has not been reported on any of its prior Forms 990 or 990-EZ? If "Yes," complete Schedule L, Part I	40b	
c Section 501(c)(3), 501(c)(4), and 501(c)(29) organizations. Enter amount of tax imposed on organization managers or disqualified persons during the year under sections 4912, 4955, and 4958 ▶		
d Section 501(c)(3), 501(c)(4), and 501(c)(29) organizations. Enter amount of tax on line 40c reimbursed by the organization ▶		
e All organizations. At any time during the tax year, was the organization a party to a prohibited tax shelter transaction? If "Yes," complete Form 8886-T	40e	
41 List the states with which a copy of this return is filed ▶		
42a The organization's books are in care of ▶ Angela Velke Telephone no. ▶ (360) 751-8778 Located at ▶ 16 East Rd Cathlamet, WA ZIP + 4 ▶ 98612		
b At any time during the calendar year, did the organization have an interest in or a signature or other authority over a financial account in a foreign country (such as a bank account, securities account, or other financial account)? If "Yes," enter the name of the foreign country ▶ See the instructions for exceptions and filing requirements for FinCEN Form 114, Report of Foreign Bank and Financial Accounts (FBAR).	42b	☒
c At any time during the calendar year, did the organization maintain an office outside the United States? If "Yes," enter the name of the foreign country ▶	42c	☒
43 Section 4947(a)(1) nonexempt charitable trusts filing Form 990-EZ in lieu of Form 1041—Check here and enter the amount of tax-exempt interest received or accrued during the tax year ▶ 43		☐
44a Did the organization maintain any donor advised funds during the year? If "Yes," Form 990 must be completed instead of Form 990-EZ	44a	☒
b Did the organization operate one or more hospital facilities during the year? If "Yes," Form 990 must be completed instead of Form 990-EZ	44b	☒
c Did the organization receive any payments for indoor tanning services during the year?	44c	☒
d If "Yes" to line 44c, has the organization filed a Form 720 to report these payments? If "No," provide an explanation in Schedule O	44d	
45a Did the organization have a controlled entity within the meaning of section 512(b)(13)?	45a	☒
b Did the organization receive any payment from or engage in any transaction with a controlled entity within the meaning of section 512(b)(13)? If "Yes," Form 990 and Schedule R may need to be completed instead of Form 990-EZ. See instructions	45b	☒

- 46** Did the organization engage, directly or indirectly, in political campaign activities on behalf of or in opposition to candidates for public office? If "Yes," complete Schedule C, Part I

	Yes	No
46		☒

Part VI Section 501(c)(3) Organizations Only

All section 501(c)(3) organizations must answer questions 47-49b and 52, and complete the tables for lines 50 and 51.

Check if the organization used Schedule O to respond to any question in this Part VI ☐

- 47** Did the organization engage in lobbying activities or have a section 501(h) election in effect during the tax year? If "Yes," complete Schedule C, Part II

	Yes	No
47		

- 48** Is the organization a school as described in section 170(b)(1)(A)(ii)? If "Yes," complete Schedule E

48		
-----------	--	--

- 49a** Did the organization make any transfers to an exempt non-charitable related organization?

49a		
------------	--	--

- b** If "Yes," was the related organization a section 527 organization?

49b		
------------	--	--

- 50** Complete this table for the organization's five highest compensated employees (other than officers, directors, trustees, and key employees) who each received more than \$100,000 of compensation from the organization. If there is none, enter "None."

(a) Name and title of each employee	(b) Average hours per week devoted to position	(c) Reportable compensation (Forms W-2/1099-MISC)	(d) Health benefits, contributions to employee benefit plans, and deferred compensation	(e) Estimated amount of other compensation

- f** Total number of other employees paid over \$100,000 ▶

- 51** Complete this table for the organization's five highest compensated independent contractors who each received more than \$100,000 of compensation from the organization. If there is none, enter "None."

(a) Name and business address of each independent contractor	(b) Type of service	(c) Compensation

- d** Total number of other independent contractors each receiving over \$100,000 ▶

- 52** Did the organization complete Schedule A? **Note:** All section 501(c)(3) organizations must attach a completed Schedule A

▶ ☐ Yes ☐ No

Under penalties of perjury, I declare that I have examined this return, including accompanying schedules and statements, and to the best of my knowledge and belief, it is true, correct, and complete. Declaration of preparer (other than officer) is based on all information of which preparer has any knowledge.

Sign Here ▶ Warren Seely Signature of officer Date 11-9-21
 ▶ Warren Seely, Chairperson Type or print name and title

Paid Preparer Use Only Print/Type preparer's name Angela Velke Preparer's signature Angela Velke Date 11-9-21 Check ☒ if self-employed PTIN P02448349
 Firm's name ▶ Firm's EIN ▶
 Firm's address ▶ 16 East Rd Cathlamet, WA 98612 Phone no (360) 751-8778

May the IRS discuss this return with the preparer shown above? See instructions

▶ ☒ Yes ☐ No

SCHEDULE O
(Form 990 or 990-EZ)

Department of the Treasury
Internal Revenue Service

Supplemental Information to Form 990 or 990-EZ

Complete to provide information for responses to specific questions on
Form 990 or 990-EZ or to provide any additional information.

▶ Attach to Form 990 or 990-EZ.

▶ Go to www.irs.gov/Form990 for the latest information.

OMB No 1545-0047

2020

Open to Public
Inspection

Name of the organization

Beaver Drainage Improvement Company, Inc.

Employer identification number

93-1146109

Part I (8) Other Revenue - Insurance Dividends and Office Supplies Refund

Part I (16) Other Expenses - Insurance, Association Dues, Office Supplies, and Bank Service Charges.

Part IV (c) Employee compensation for pump maintenance.

Part IV (e) Annual directors fee to board members.

APPENDIX J

EPA [Chemicals] List of Lists

Note: Appendix J is an excerpt from the full document that includes the Table of Contents and Introduction.

***The full document was found at:
<https://www.epa.gov/epcra/consolidated-list-lists>***



Columbia County, Oregon

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United States
Environmental Protection
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LIST OF LISTS

Consolidated List of Chemicals
Subject to the Emergency Planning and
Community Right-To-Know Act (EPCRA),
Comprehensive Environmental Response,
Compensation and Liability Act
(CERCLA), and Section 112(r) of the
Clean Air Act (CAA)

- EPCRA Section 302 Extremely Hazardous Substances
 - CERCLA Hazardous Substances
 - EPCRA Section 313 Toxic Chemicals
 - CAA 112(r) Regulated Chemicals for Accidental Release Prevention
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INTRODUCTION

LIST OF LISTS

**Consolidated List of Chemicals Subject
the Emergency Planning and Community Right-to-Know Act (EPCRA),
Comprehensive Environmental Response, Compensation and Liability Act (CERCLA),
and Section 112(r) of the Clean Air Act (CAA)**

This consolidated chemical list includes chemicals subject to reporting requirements under the Emergency Planning and Community Right-to-Know Act (EPCRA), also known as Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA), the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), and section 112(r) of the Clean Air Act (CAA). This consolidated list does not include all hazardous chemicals subject to the reporting requirements in EPCRA sections 311 and 312, for which safety data sheets (SDS), formerly material safety data sheets (MSDS), must be developed under the Hazard Communication Standard (29 CFR 1910.1200). These hazardous chemicals are identified by broad criteria, rather than by enumeration. There are over 500,000 products that satisfy the criteria. See 40 CFR Part 370 for more information.

This consolidated list has been prepared to help facilities handling chemicals determine whether they need to submit reports under sections 302 and 313 of EPCRA and determine if releases of chemicals are reportable under section 102 and 103 of CERCLA and section 304 of EPCRA. It will also help facilities determine whether they will be subject to accident prevention regulations under CAA section 112(r). The consolidated list is in alphabetical order; Appendix A lists the chemicals in CAS number order. This document also includes a list of radionuclides reportable under CERCLA (refer to Appendix B); waste stream codes for listed and unlisted hazardous wastes under the Resource Conservation and Recovery Act (RCRA) (refer to Appendix C); definitions of chemical categories listed under EPCRA section 313 (refer to Appendix D); list of PFAS listed under EPCRA section 313 in alphabetical order and CASN number order (refer to Appendices E and F); definitions or clarifications of CERCLA chemical categories (refer to Appendix G); and the list of salts and isomers of perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS) designated as hazardous substances under CERCLA section 102 (refer to Appendices H and I).

***Note:** This document should be used only as a reference tool, not as a definitive source of compliance information. Reporting requirements for EPCRA are published in the Code of Federal Regulations (CFR), 40 CFR parts 355, 370, and 372. The list of EHS chemicals can be found at 40 CFR 355 Appendix A (alphabetical order) and Appendix B (CAS number order). The list of TRI chemicals can be found at 40 CFR 372.65. Reporting requirements for releases of CERCLA chemicals are in 40 CFR part 302, with list of CERCLA hazardous substances in 40 CFR 302.4. Regulatory requirements for accident prevention CAA section 112(r) are published in 40 CFR part 68 with the list of Risk Management Program chemicals in 40 CFR 68.130. The electronic CFR can be accessed at <https://www.ecfr.gov/cgi-bin/ECFR?page=browse>*

The chemicals on the consolidated list are ordered both by the Chemical Abstracts Service (CAS) registry number and alphabetically. Categories of chemicals which generally do not have CAS registry numbers, but which are cited under CERCLA, have "Not Applicable (N.A.)" listed in place of the CAS number. If the category of chemical is on EPCRA section 313 list, then the section 313 category code is also included in the CAS number column.

This document lists chemicals referenced under five federal statutory provisions, discussed below. More than one chemical name may be listed for one CAS number because the same chemical may appear on different lists under different names. For example, for CAS number 8001-35-2, the names toxaphene (from the section 313 list), camphechlor (from the section 302 list), and camphene, octachloro- (from the CERCLA list) all appear on this consolidated list. The chemical names on the consolidated lists generally are those names used in the regulatory programs developed under EPCRA, CERCLA, and CAA section 112(r), but each chemical may have other synonyms that do not appear on these lists.

(1) EPCRA Section 302 Extremely Hazardous Substances (EHSs)

The presence of Extremely Hazardous Substances (EHSs) in quantities at or above the Threshold Planning Quantity (TPQ) requires certain emergency planning activities to be conducted. The EHSs and their TPQs are listed in 40 CFR part 355, Appendices A and B. For section 302 EHSs, Local and Tribal Emergency Planning Committees (LEPCs or TEPCs) must develop emergency response plans and facility owner or operator must notify the State or Tribal Emergency Response Commission (SERC or TERC) and their LEPC or TEPC if any of the EHS is present at the facility or above its TPQ. Additionally, if the TPQ is equaled or exceeded, facilities with a listed EHS are subject to the reporting requirements of EPCRA section 311 (provide safety data sheet or a list of covered chemicals to the SERC or TERC, LEPC or TEPC, and local fire department) and section 312 (submit inventory form -Tier I or Tier II). The minimum threshold for section 311-312 reporting for EHSs is 500 pounds or the TPQ, whichever is less.

TPQ. The consolidated list presents the TPQ (in pounds) for section 302 chemicals in the column following the CAS number. For chemicals that are solids, there are two TPQs given (e.g., 500/10,000). In these cases, the lower quantity applies for solids in powder form with particle size less than 100 microns, or if the substance is in solution or in molten form. Otherwise, the 10,000-pound TPQ applies. If a solid EHS is in molten form, the facility must multiply the amount of EHS on-site by 0.3 before comparing to the lower listed TPQ. If a solid EHS is in solution form, the facility must multiply amount EHS on-site by 0.2 before comparing to the lower listed TPQ. The reducing factors of 0.3 for molten solids and 0.2 for solids in solution are not to be used for the 12 solid reactive chemicals are noted by footnote "a" in Appendix A and B in 40 CFR part 355. These twelve chemicals are not listed with two TPQs and higher threshold quantity of 10,000 pounds; they only have one TPQ.

EHS RQ. Releases of reportable quantities (RQ) of EHSs are subject to State or Tribal and local reporting under section 304 of EPCRA. EPA has adjusted RQs for EHSs without CERCLA RQs to levels equal to their TPQs. The EHS RQ column lists these adjusted RQs for EHSs not listed under CERCLA and the CERCLA RQs for those EHSs that are CERCLA hazardous substances (see the next section for a discussion of CERCLA RQs).

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Note: Ammonia is listed as an EPCRA EHS with an RQ of 100 pounds in 40 CFR part 355 Appendices A and B and covers both anhydrous and aqueous forms, unlike under CERCLA where aqueous ammonia is listed separately as ammonium hydroxide, with a higher RQ.

(2) **CERCLA Hazardous Substances**

Releases of CERCLA hazardous substances, in quantities equal to or greater than their reportable quantity (RQ), are subject to reporting to the National Response Center (NRC) under CERCLA. Notification requirements for these releases are found in 40 CFR 302. Such releases are also subject to State or Tribal and local reporting under section 304 of EPCRA. CERCLA hazardous substances, and their reportable quantities, are listed in 40 CFR part 302, Table 302.4. Radionuclides listed under CERCLA are provided in a separate list in Appendix B of this document, with RQs in Curies. Chemical categories under CERCLA (including metal compound categories), which have “N.A.” listed for the CAS Number in the consolidated table, are also listed in Appendix G of this document with further explanation of each chemical category, where information was available.

RQ. The CERCLA RQ column in the consolidated list shows the RQs (in pounds) for chemicals that are CERCLA hazardous substances.

Ammonia and ammonium hydroxide. Under 40 CFR 302.4, CERCLA Hazardous substances ammonia and ammonium hydroxide are listed separately, with RQs of 100 and 1,000 pounds, respectively. Ammonium hydroxide is an aqueous solution of ammonia.

Metals. For metals listed under CERCLA (antimony, arsenic, beryllium, cadmium, chromium, copper, lead, nickel, selenium, silver, thallium, and zinc), no reporting of releases of the solid form is required if the mean diameter of the pieces of the solid metal released is greater than 100 micrometers (0.004 inches) (Ref: Footnote after Table 302.4 in 40 CFR 302.4). The RQs shown on the consolidated list apply to smaller particles.

Note that the consolidated list does not include all CERCLA regulatory synonyms. See 40 CFR part 302, Table 302.4 for a complete list.

Sulfur monochloride. (formula S_2Cl_2) is listed with an incorrect CAS numbers of 12771-08-3, which is found on the CERCLA Hazardous Substances list. The correct CAS number should be 10025-67-9, however, the List of Lists will still include the CAS number of 12771-08-3 because it has not been changed on the CERCLA list. According to the Chemical Abstract Services which assigns CAS numbers, the correct CAS number for sulfur monochloride is 10025-67-9, which is now included on the List of Lists with an explanatory footnote.

CAS number 12771-08-3 is assigned to the substance sulfur chloride (formula SCl_2) which was listed as a synonym for sulfur monochloride when EPA finalized the Clean Water Act Designation of Hazardous Substances rule (43 FR 10474, March 13, 1978). The CAS number 10025-67-9 is used for sulfur monochloride on EPA’s TSCA Inventory and EPA’s Substance Registry Services lists. See <https://cdxapps.epa.gov/oms-substance-registry-services/search>

(3) CAA Section 112(r) List of Substances for Accidental Release Prevention

Under the accident prevention provisions of section 112(r) of the CAA (also known as Risk Management Program or RMP), EPA developed a list of 77 toxic substances and 63 flammable substances. Threshold quantities (TQs) were established for these substances. The list and TQs identify processes subject to accident prevention regulations. The list of substances and TQs, and the requirements for risk management programs for accidental release prevention are found in 40 CFR part 68. This consolidated list includes both the common name for each listed chemical under section 112(r) and the chemical name, if different from the common name, as separate listings.

The CAA section 112(r) list includes several substances in solution that are covered only in concentrations above a specified level. These substances include ammonia (concentration 20% or greater) (CAS number 7664-41-7); hydrochloric acid (37% or greater) (CAS number 7647-01-0); hydrogen fluoride/hydrofluoric acid (50% or greater) (CAS number 7664-39-3); and nitric acid (80% or greater) (CAS number 7697-37-2). Hydrogen chloride (anhydrous) and ammonia (anhydrous) are listed, in addition to the solutions of these substances, with different TQs. Only the anhydrous form of sulfur dioxide (CAS number 7446-09-5) is covered. These substances are presented on the consolidated list with the concentration limit or specified form (e.g., anhydrous), as they are listed under CAA section 112(r). Flammable fuels used as a fuel or held for sale as a fuel at a retail facility are not subject to the rule.

TQ. The CAA section 112(r) TQ column in the consolidated list shows the TQs (in pounds) for chemicals listed for accidental release prevention. The TQ applies to the quantity of substance in a process, not at the facility as a whole.

(4) EPCRA Section 313 Toxic Chemicals (a.k.a Toxics Release Inventory (TRI) Chemicals)

Emissions, transfers, and waste management data for chemicals listed under section 313 must be reported annually as part of the community right-to-know provisions of EPCRA (40 CFR part 372). These reports are also known as Toxics Release Inventory (TRI) reports.

Section 313. The notation “313” in the column for section 313 indicates that the chemical is subject to reporting under section 313 and section 6607 of the Pollution Prevention Act under the name listed. In cases where a chemical is listed under section 313 with a second name in parentheses or brackets, the second name is included on this consolidated list with an “X” in the section 313 column. An “X” in this column also may indicate that the same chemical with the same CAS number appears on another list with a different chemical name. The “X” listed with the chemical name “Ammonia (anhydrous)” and “Ammonia (concentration of 20% or greater)” does not mean that the section 313 reporting for these substances are limited to those forms, but it does include them.

Ammonium Salts. The EPCRA section 313 listing for ammonia includes the following qualifier “includes anhydrous ammonia and aqueous ammonia from water dissociable ammonium salts and other sources; 10 percent of total aqueous ammonia is reportable under this listing.” The qualifier for ammonia means that anhydrous forms of ammonia are 100% reportable and aqueous forms are limited to 10% of total aqueous ammonia. Therefore, when determining threshold and releases and other waste management quantities all anhydrous ammonia is included but only 10% of total aqueous ammonia is included. Any evaporation of ammonia from aqueous ammonia solutions is considered anhydrous ammonia and should be included in threshold determinations and release and other waste management calculations.

In this document ammonium salts are not specifically identified as being reportable EPCRA section 313 chemicals. However, water dissociable ammonia salts, such as ammonium chloride, are reportable if they are placed in water. When ammonium salts are placed in water, reportable aqueous ammonia is manufactured. As indicated in the ammonia qualifier, all aqueous ammonia solutions from water dissociable ammonium salts are covered by the ammonia listing. For example, ammonium chloride is a water-dissociable ammonium salt and reportable aqueous ammonia will be manufactured when it is placed in water.

Unlike other ammonium salts, ammonium hydroxide is specifically identified as being a reportable EPCRA section 313 chemical. This is because the chemical ammonium hydroxide (NH_4OH) is a misnomer. It is a common name used to describe a solution of ammonia in water (i.e., aqueous ammonia), typically a concentrated solution of 28 to 30 percent ammonia. EPA has consistently responded to questions regarding the reportability of these purported ammonium hydroxide solutions under the EPCRA section 313 ammonia listing by stating that these are 28 to 30 percent solutions of ammonia in water and that the solutions are reportable under the EPCRA section 313 ammonia listing. For a more detailed discussion, see page 34175 of the Federal Register final rule of June 30, 1995 (60 FR 34172) on TRI reporting for Ammonia; Ammonium Sulfate (solution); Ammonium Nitrate (solution); Water Dissociable Ammonium Salts, (See <https://www.federalregister.gov/documents/1995/06/30/95-16184/ammonia-ammonium-sulfate-solution-ammonium-nitrate-solution-water-dissociable-ammonium-salts-toxic>. (See also EPA’s TRI *Guidance for Reporting Aqueous Ammonia*, EPA 745-B-19-002, revised in February 2019 at https://guideme.epa.gov/ords/guideme_ext/f?p=guideme:gd-title:::::title:ammonia)

Stayed TRI Chemicals. There are two EPCRA section 313 chemicals that are listed in the CFR but for which the Agency has issued an administrative stay that excludes them from reporting until the stays are lifted. These chemicals, identified by “313s” in the Sec. 313 table column, are methyl mercaptan (CAS number 74-93-1), and 2, 2-dibromo-3-nitrilopropionamide (CAS number 10222-01-2). Check the TRI website <https://www.epa.gov/toxics-release-inventory-tri-program/tri-listed-chemicals> for updated regulatory information.

New TRI Chemicals. National Defense Authorization Act Additions. Section 7321 of the National Defense Authorization Act for Fiscal Year 2020 (P.L. 116-92) (NDAA) added certain Per- and Polyfluoroalkyl Substances (PFAS) to the TRI list. Among these added chemicals are chemicals that met two criteria: (1) they were subject to a significant new use rule at either 40 CFR 721.9582 or 721.10536 on or before December 20, 2019; and (2) they were identified as active in commerce on the Toxic Substances Control Act (TSCA) Inventory that was published in February 2019. Chemicals meeting only one of the two criteria were not added to the TRI list.

The names and CAS numbers for some of the chemicals listed under 40 CFR 721.9582 and/or 40 CFR 721.10536 are subject to a claim of protection from disclosure. Under section 7321 of the NDAA, EPA must review any such chemicals before the chemicals are added to the TRI list (NDAA Section 7321(e)). Therefore, the chemicals that are subject to a claim of protection from disclosure will not be added to the EPCRA Section 313 toxic chemical list until EPA completes the process provided by section 7321(e) of the NDAA.

Via the considerations described above, 170 chemicals were identified. Additionally, the NDAA specifically identified fourteen PFAS for addition to the TRI list. Twelve of these fourteen chemicals were among the chemicals described above; with the addition of the other two, there are a total of 172 PFAS subject to the NDAA. See Appendices E and F of this document.

Under the automatic listing provisions of the 2020 NDAA, four additional PFAS were added for reporting year 2021. The four new PFAS are: Silver(I) perfluorooctanoate (CAS number 335-93-3), Perfluorooctyl iodide (CAS number 507-63-1), Potassium perfluorooctanoate (CAS number 2395-00-8), and 2-Propenoic acid, 2-methyl-, 3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,11,11,12,12,12-heneicosafuorododecyl ester, polymer with 3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,10-heptadecafluorodecyl 2-methyl-2-propenoate, methyl 2-methyl-2-propenoate, 3,3,4,4,5,5,6,6,7,7,8,8,9,9,10,10,11,11,12,12,13,13,14,14,14-pentacosafuorotetradecyl 2-methyl-2-propenoate and 3,3,4,4,5,5,6,6,7,7,8,8,8-tridecafluorooctyl 2-methyl-2-propenoate (CAS number 65104-45-2).

Under the automatic listing provisions of the 2020 NDAA, four additional PFAS were added for reporting year 2022. The four new PFAS are: Perfluorobutane sulfonic acid (CAS number 375-73-5); Potassium perfluorobutane sulfonate (CAS number 29420-49-3); Perfluorobutanesulfonate (CAS number 45187-15-3), and 2-Propenoic acid, 2-methyl-, hexadecyl ester, polymers with 2-hydroxyethyl methacrylate, .gamma.-.omega.-perfluoro-C10-6-alkyl acrylate and stearyl methacrylate (CAS number 203743-03-7).

Under the automatic listing provisions of the 2020 NDAA, nine additional PFAS were added for reporting year 2023. The nine new PFAS are: Acetamide, N-[3-(dimethylamino)propyl]-, 2-[(γ - ω -perfluoro-C4-20-alkyl)thio] derivs. (CAS number 2738952-61-7), Acetic acid, 2-[(γ - ω -perfluoro-C4-20-alkyl)thio] derivs., 2-hydroxypropyl esters (CAS number 2744262-09-5), Acetamide, N-(2-aminoethyl)-, 2-[(γ - ω -perfluoro-C4-20-alkyl)thio] derivs., polymers with N1,N1-dimethyl-1,3-propanediamine, epichlorohydrin and ethylenediamine, oxidized (CAS number 2742694-36-4), Alcohols, C8-16, γ - ω -perfluoro, reaction products with 1,6-diisocyanatohexane, glycidol and stearyl alc. (CAS number 2728655-42-1), Ammonium perfluorobutanoate (CAS number 10495-86-0), Perfluorobutanoate (CAS number 45048-62-2), Perfluorobutanoic acid (CAS number 375-22-4), Potassium heptafluorobutanoate (CAS number 2966-54-3), and Sodium perfluorobutanoate (CAS number CAS number 2218-54-4).

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Under the automatic listing provisions of the 2020 NDAA, seven additional PFAS were added for reporting year 2024. The seven new PFAS are: Ammonium perfluorohexanoate (CAS number 21615-47-4), Betaines, dimethyl(.gamma.-.omega.-perfluoro-.gamma.-hydro-C8-18-alkyl) (CAS number 2816091-53-7), Lithium bis[(trifluoromethyl)sulfonyl] azanide (CAS number 90076-65-6), Perfluorohexanoic acid (PFHxA) (CAS number 307-24-4), Perfluoropropanoic acid (PFPrA) (CAS number 422-64-0), Sodium perfluorohexanoate (CAS number 2923-26-4), and 1,1,1-Trifluoro-N-[(trifluoromethyl)sulfonyl] methanesulfonamide (TFSI) (CAS number 82113-65-3).

Petition Additions. In response to a petition filed by the Toxics Use Reduction Institute, EPA added 12 chemicals to the EPCRA section 313 list (<https://www.govinfo.gov/content/pkg/FR-2022-11-30/pdf/2022-25946.pdf>). These 12 chemicals are reportable beginning with the 2023 reporting year (reports due July 1, 2024). In addition, EPA has classified one of the chemicals as a persistent, bioaccumulative, and toxic (PBT) chemical and designated it as a chemical of special concern with a 100-pound reporting threshold: 1,3,4,6,7,8-Hexahydro-4,6,6,7,8,8-hexamethylcyclopenta[g]-2-benzopyran, or HHCB. The 12 chemicals are: Dibutyltin dichloride (CAS number 683-18-1); 1,3-Dichloro-2-propanol (CAS number 96-23-1); Formamide (CAS number 75-12-7); 1,3,4,6,7,8-Hexahydro-4,6,6,7,8,8-hexamethylcyclopenta[g]-2-benzopyran (CAS number 1222-05-5); N-Hydroxyethylethylenediamine (CAS number 111-41-1); Nitrilotriacetic acid trisodium salt (CAS number 5064-31-3); p-(1,1,3,3-Tetramethylbutyl)phenol (CAS number 140-66-9); 1,2,3-Trichlorobenzene (CAS number 87-61-6); Triglycidyl isocyanurate (CAS number 2451-62-9); Tris(2-chloroethyl) phosphate (CAS number 115-96-8); Tris(1,3-dichloro-2-propyl) phosphate (CAS number 13674-87-8); and Tris(dimethylphenol) phosphate (CAS number 25155-23-1).

(5) Chemical Categories

The CERCLA and EPCRA section 313 lists include a number of chemical categories as well as specific chemicals. Categories appear on this consolidated list at the beginning of the CAS number order listing. The specific chemicals or substances that are included in the CERCLA category Radionuclides can be found in Appendix B. Appendix D contains explanations and definitions for the EPCRA section 313 (TRI) chemical categories. For the CERCLA listed categories reported with CAS number of N.A., Appendix G contains information available on the CERCLA chemical categories from their original statutory and regulatory sources.

Specific chemicals listed as members of the diisocyanates, dioxin and dioxin-like compounds, hexabromocyclododecane, nonylphenol, nonylphenol ethoxylates, and PAC categories under EPCRA section 313 are included in the list of specific chemicals by CAS number, not in the category listing.

EPA has attempted to identify those chemicals on the consolidated list that are clearly reportable under one or more of the EPCRA section 313 (TRI) chemical categories. For example, mercuric acetate (CAS number 1600-27-7), listed under section 302, is not specifically listed under section 313, but is reportable under the section 313 “Mercury Compounds” category (no CAS number). Listed chemicals that have been identified as being reportable under one or more EPCRA section 313 categories are identified by “313c” in the Sec. 313 table column.

The chemicals on the consolidated list have not been systematically evaluated to determine whether they fall into any of the CERCLA listed categories. Some chemicals not specifically listed under CERCLA may be subject to CERCLA reporting as part of a category. For example, strychnine sulfate (CAS number 60-41-3), listed under EPCRA section 302, is not individually listed on the CERCLA list, but is subject to CERCLA reporting under the listing for strychnine and salts (CAS number 57-24-9), with an RQ of 10 pounds. Similarly, nicotine sulfate (CAS number 65-30-5) is subject to CERCLA reporting under the listing for nicotine and salts (CAS number 54-11-5, RQ 100 pounds), and warfarin sodium (CAS number 129-06-6) is subject to CERCLA reporting under the listing for warfarin and salts, concentration >0.3% (CAS number 81-81-2, RQ 100 pounds).

Note that some CERCLA listings, although they include CAS numbers, are for general categories and are not restricted to the specific CAS number (e.g., warfarin and salts). The CERCLA list also includes a number of generic categories that have not been assigned RQs; chemicals falling into these categories are considered CERCLA hazardous substances, but they are not required to be reported under CERCLA unless otherwise listed under CERCLA with an RQ.

On May 8, 2024, EPA published the Final Rule, Designation of Perfluorooctanoic Acid (PFOA) and Perfluorooctanesulfonic Acid (PFOS), and their salts and structural isomers as hazardous substances under CERCLA section 102. The main section of this document is updated to include entries for PFOA and PFOS indicating the RQ of 1 pound (1b). In addition, Appendices H and I include the list of salts and isomers of PFOA and PFOS in CAS number and Alphabetical Order. The list currently includes 98 chemicals.

EPA's CompTox Chemicals Dashboard (<https://comptox.epa.gov/dashboard/chemical-lists/PFOAPFOSCERCLAV1>) is a resource that can be used to identify salts and structural isomers of PFOA and PFOS. EPA periodically updates the CompTox Chemicals Dashboard to include new information on PFAS, including PFOA and PFOS. This list also includes ions as they have their own CASRN. *Note: The list could change as the chemicals included on the CompTox Chemicals Dashboard are expanded or otherwise are modified. Such changes will be noted and curated in a transparent manner.*

(6) RCRA Hazardous Wastes

The consolidated list includes specific chemicals from the RCRA P and U lists only (40 CFR 261.33). This listing is provided as an indicator that companies may already have data on a specific chemical that may be useful for EPCRA reporting. It is not intended to be a comprehensive list of RCRA P and U chemicals. RCRA hazardous wastes consisting of waste streams on the F and K lists, and wastes exhibiting the characteristics of ignitability, corrosivity, reactivity, and toxicity, are provided in Appendix C in this document. This list also includes K181 hazardous waste with a statutory one-pound RQ (indicated by an asterisk "*" following the RQ). The descriptions of the F and K waste streams have been abbreviated; see 40 CFR part 302, Table 302.4, or 40 CFR part 261 for complete descriptions.

RCRA Code. The letter-and-digit code in the RCRA Code column is the chemical's RCRA hazardous waste code.

SUMMARY OF CODES

Codes in Section 313 column

- + Member of EPCRA Section 313 PAC category.
- # Member of EPCRA Section 313 Diisocyanate category.
- c Although not listed by name and CAS number, this chemical is reportable under one or more of the EPCRA section 313 chemical categories.
- s Indicates that this chemical is currently under an administrative stay of the EPCRA section 313 reporting requirements, therefore, no Toxics Release Inventory reports are required until the stay is removed.
- ! Member of the EPCRA section 313 Dioxin and dioxin-like compounds category.
- X Indicates that this is a second name for an EPCRA section 313 chemical already included on this consolidated list. May also indicate that the same chemical with the same CAS number appears on another list with a different chemical name.
- \$ Member of the EPCRA section 313 Nonylphenol category.
- ^ Member of the EPCRA section 313 Hexabromocyclododecane category.
- % Member of the EPCRA section 313 Nonylphenol ethoxylates category.

Codes in CERCLA RQ column

- * The Agency may adjust the statutory RQ for this RCRA hazardous substance (K181 waste) in a future rulemaking; until then the statutory one-pound RQ applies. K codes wastes are listed in Appendix C.
- PMN This EHS chemical was identified from a Premanufacture Review Notice (PMN) submitted to EPA. The submitter has claimed certain information on the submission to be confidential, including specific chemical identity.
- & Indicates that no RQ is assigned to this generic or broad class, although the class is a CERCLA hazardous substance. See 50 Federal Register 13456 (April 4, 1985).
- @ Releases in amounts less than 1,000 pounds per 24 hours of nitrogen oxide or nitrogen dioxide to the air that are the result of combustion and combustion related activities are exempt from the notification requirements of EPCRA section 304 and CERCLA.
- § The adjusted RQs for radionuclides may be found in Appendix B in this document.

Codes in Name column

- 1 Sulfur monochloride (formula S_2Cl_2) is listed with an incorrect CAS number of 12771-08-3, which is found on the CERCLA Hazardous Substances list. The correct CAS number should be 10025-67-9 according to the Chemical Abstract Services. However, the List of Lists has sulfur monochloride with both CAS numbers because CAS number 12771-08-3 has not been changed on the CERCLA list.
- †† No reporting of releases of this CERCLA hazardous substance is required under CERCLA if the diameter of the pieces of the solid metal released is larger than 100 micrometers (0.004 inches).
- ††† The RQ for asbestos is limited to friable forms only.
- a Benzene was already a CERCLA hazardous substance prior to the CAA Amendments of 1990 and received an adjusted 10-pound RQ based on potential carcinogenicity in an August 14, 1989, final rule (54 FR 33418). The CAA Amendments specify that “benzene (including benzene from gasoline)” is a hazardous air pollutant and, thus, a CERCLA hazardous substance.
- b The CAA Amendments of 1990 list DDE (CAS number 3547-04-4) as a CAA hazardous air pollutant (HAP). The CAS number, 3547-04-4, is for the chemical, p, p'-dichlorodiphenylethane. DDE or p, p'-dichlorodiphenyldichloroethylene, CAS number 72-55-9, is already listed in Table 302.4 with a final RQ of 1 pound. The substance identified by the CAS number 3547-04-4 has been evaluated and listed as DDE to be consistent with the CAA section 112 listing, as amended.
- c Includes mineral fiber emissions from facilities manufacturing or processing glass, rock, or slag fibers (or other mineral derived fibers) of average diameter 1 micrometer or less.
- d For CERCLA hazardous substances, includes mono- and di-ethers of ethylene glycol, diethylene glycol, and triethylene glycol $R-(OCH_2CH_2)_n-OR'$ where:
- $n = 1, 2, \text{ or } 3$;
 $R = \text{alkyl C7 or less; or}$
 $R = \text{phenyl or alkyl substituted phenyl;}$
 $R' = H \text{ or alkyl C7 or less; or}$
 $OR' \text{ consisting of carboxylic acid ester, sulfate, phosphate, nitrate, or sulfonate.}$
- Note:** the phrase “mono- and di-ethers of ethylene glycol, diethylene glycol, and triethylene glycol” is not included the TRI definition, but the defined formula is the same for the CERCLA and TRI listing and by formula definition would cover “mono- and di-ethers of ethylene glycol, diethylene glycol, and triethylene glycol.”
- e Includes organic compounds with more than one benzene ring, and which have a boiling point greater than or equal to 100 °C.

Code in RCRA Waste Stream Codes

- f See 40 CFR 302.6(b)(1) for application of the mixture rule to this hazardous waste. See Appendix C for listing of “K” code RCRA waste streams.

APPENDIX K

CSA Planning, Ltd. Resumes



Columbia County, Oregon

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John "Jay" H. Harland, III

President



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Jay Harland is President and a Principal Planner with CSA Planning. He joined CSA Planning in 2004 as an Associate Planner. In 2006, Jay became a firm Principal and owner. Jay became president of the company in 2017.

Mr. Harland has an in-depth knowledge of Oregon land use and has been the lead planner on numerous CSA projects over his tenure. Mr. Harland has expertise in tackling major spatial analysis and geographic analysis projects. He is expert in complex spatial statistics and geographic analytics.

Mr. Harland works on all kinds of urban and rural land use planning projects. Examples rural project types include: Goal Exceptions, Farm and Forest Impacts Analyses, landfills, mining operations, commercial activities in conjunction with farm and forest uses, major infrastructure siting projects including water mains, natural gas transmission lines, transportation facilities and power lines.

In addition to his professional work, Mr. Harland has a personal background in rural land issues. He grew up in Montana and worked in the summers on his family's forest property and has done work on neighbor's and friend's ranches. Other rural resource jobs include commercial gillnet salmon fishing in Bristol Bay, Alaska.

Professional Employment

President

CSA Planning, Ltd, Medford, Oregon

Land-Use and Transportation Planner

Jackson County, Medford, Oregon

Special Research Planner

Missoula Office of Planning and Grants, Missoula, Montana

Education

Bachelor of Arts in Philosophy

Master of Arts in Geography

University of Montana, Missoula, Montana

Project Responsibilities

- Project Management
- Principal Investigator for Analysis Projects
- GIS Land-Use Analysis and Spatial Statistics
- Project Research and Development
- Project Feasibility Review
- Site Plan Development and Review

PROJECT EXPERIENCE

CSA Planning, Ltd.

Major Rural Projects:

- Goal 3 Exception for a ~900 acre Hazardous Waste Landfill Expansion, Gilliam County
- Goals 3, 4, 11, and 14 Exception documents for transportation improvements in Washington, County
- Whetstone Unincorporated Industrial Park Master Plan update.
- Goal 6 amendment to Jackson County's Very Sensitive Big Game Winter Range Habitat Goal 5 protection overlay that added ~1,121.3 acres of protection area and removing ~672.2 acres from protection.
- Farm Impacts Analysis for Willamette Water Supply Pipeline.
- Farm and Forest Impacts analysis for Tillamook People's Utility District for the Tillamook to Netarts Reinforcement powerline.
- Goal 5 Aggregate Resource amendment and expansion of Dry Creek Landfill on approximately ~670 acres.
- Numerous Farm and Forest Resource Homesites
- Goal 5 Sand & Gravel Aggregate Resource amendment of ~260 acres for Rock-n-Ready Mix
- Tree Fruit Orchard productivity and investment strategy analysis for ~1,800 of orchard investments.
- Rural Community Solar permitting.
- Plus many others not listed



Nathan Emerson

Associate Planner



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Nathan Emerson is a professional planner with extensive experience in land-use planning, energy analysis, and project management. He has worked for CSA Planning, Ltd. since 2018, providing consultation, analysis, and project management for land use and development projects. He has worked on a diverse set of projects, such as goal exceptions, farm and forest dwellings, farm impact analyses, and urban growth boundary amendments.

Before joining CSA Planning, Ltd., Nathan Emerson was a land-use planner for the City of Ashland, Oregon. He was responsible for reviewing project proposals, managing planning actions, staffing the front counter and the tree commission, and managing the community service rating and tree city status.

He also has experience as an energy analyst and project coordinator for PECO (later CLEAResult) in Portland, Oregon from 2009 to 2017. He developed energy models, reviewed and analyzed energy savings, worked with national grocery chains, managed complex custom savings projects, and performed complex data analysis.

In addition to his professional work, Mr. Emerson has a personal background in rural land issues. He grew up in Southern Oregon and worked at the family butcher shop. He enjoys hunting, hiking, and long distance cycling in his spare time.

Professional Employment

Associate Planner
CSA Planning, Ltd, Medford, Oregon

Land Use Planner
City of Ashland, Oregon

Energy Analyst, Project Coordinator
PECO (later CLEAResult), Portland, Oregon

Education

Bachelor of Arts in Political Science
Linfield College, McMinnville, Oregon

Master of Urban and Regional Planning
Portland State University, Portland, Oregon

Project Responsibilities

- Project Management
- GIS Land-Use Analysis and Spatial Statistics
- Project Research and Development
- Project Feasibility Review
- Site Plan Development and Review

PROJECT EXPERIENCE

CSA Planning, Ltd.

Major Projects:

- Goal 3 Exception for a ~900 acre Hazardous Waste Landfill Expansion, Gilliam County
- Goals 3, 4, 11, and 14 Exception documents for transportation improvements, Washington County
- Farm Impacts Analysis for Willamette Water Supply Pipeline.
- Tree Fruit Orchard productivity and investment strategy analysis for ~1,800 of orchard investments.
- Rural Community Solar permitting.
- City of Talent, Oregon Urban Growth Boundary Amendment
- Jacksonville, Oregon Division 38 UGB Amendment Prioritization Analysis
- Hours of Operation Amendment for Dry Creek Landfill
- Farm Use Assessments for Nonfarm projects
- Large Tract and Forest Template Homesite Applications
- Complicated Lawful Lot Determinations
- Comprehensive Map, Zone Change, Subdivision, and PUD for Cherry Street Meats
- Additional projects available upon request