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APPENDIX B:

BARLOW POINT CONCEPTUAL PLANNING

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Barlow Point Conceptual Planning



February 25, 2016

This report documents the approach to the analysis, indicates the general sources, resulting data, provides overall estimates in counts and value, and evaluates the accuracy of the estimates.

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1 INTRODUCTION

This report was prepared for Port of Longview (the Port) staff and technical engineering resources working on the Barlow Point project. This document is intended to accompany conceptual plans and preliminary design documents prepared by KPFF and its subconsultants in 2015. This report and associated design criteria explain the approach to the work and the reasoning for concepts presented.



The Port of Longview and its team is currently studying the site and identifying the best-fit cargoes for it. The site is “green-field” and no tenants have yet signed on for use. This document includes key characteristics of the six cargoes projected by Martin Associates as candidates for Barlow Point.

Site Characteristics

The Barlow Point property includes 282.5 acres, and approximately 4,000 feet of riverfront suitable for wharf development. Of the gross acreage, the projected net “unconstrained” space available for and cargo handling is about 187 acres. (Reference Appendix A, Conceptual Plans of the main report)

Barlow Point is separated from the Columbia River by a levee. The top of the levee sits at an elevation that is approximately 20 to 25 feet above the rest of the site. The levee is maintained by the Consolidated Dike Improvement District (CDID) #1, which also retains an easement for levee access.

A drainage ditch and the Mt. Solo landfill border the northern edge of the Barlow Point property. The drainage ditch and landfill site follow an irregular and winding path across the site’s northern edge.

The eastern side of the site includes three (3) towers supporting overhead power transmission lines, owned and operated by Bonneville Power Administration (BPA). The power transmission lines cross the eastern edge of the Barlow Point property. The current BPA easement prohibits placing any structures beneath the power lines. According to easement documents, vehicles and trains may freely pass under the power lines to access the site. (Reference Appendix C, Land Use, Zoning, Comprehensive Plan and Easements Conceptual Plans of the main report)

The western edge of the site is bordered by farmland. A public road along the base of the levee terminates at the southwest corner of the Barlow Point property.

2 EXECUTIVE SUMMARY

In 2010, the Port of Longview (Port) purchased the Barlow Point property located on the west side of the City of Longview (City), Washington. The Port is performing a due diligence study to assess the feasibility to develop Barlow Point into a marine terminal. The conceptual master planning study for Barlow Point consisted of development and review of supporting analysis and site layout options. The consultant team worked with Port staff and stakeholders to identify the most likely cargoes that also fit various criteria defined by the Port. The team then developed site use alternatives for the expected cargoes at calculated target throughput levels.

A market analysis and conceptual site planning exercise was performed in late 2014 and early 2015 to identify possible types of use and site layouts. A decision was made to develop two main master-plan alternatives, each with space for three tenants. Two options resulted that focus on production and export of dry or liquid bulk commodities. Both options included industrial access for ships, trains, street trucks, and autos. Specific industry types were identified from the market analysis to be the basis to analyze demand and capacity requirements for Barlow Point. The Dry Bulk Option (Option1) includes Potash (export only), Urea (productions and export) and Wood Pellets (export only). The Liquid Bulk Option (Option 2) includes Crude Oil (export only), Methanol (production and export), and Biodiesel (production and export).

A variation on Option 2 where Methanol and Biodiesel were replaced by a single methanol/ammonia tenant was also considered. For the purposes of this study, that option is considered equivalent to Option 2.

Planning Process

The site planning began with a study of site opportunities and constraints, and progressed to the development of options for each industrial component. The wharf concepts were located first, suited to the cargo intended. Next, the team developed options for rail track loops that could handle arrival, working track and departure track for the expected unit train lengths. The rail track options defined cargo footprints, which were then provided access by roadways. Peripheral areas were designated for public access, buildings, and parking. The end result provided concepts that could progress into preliminary permitting and engineering, and could be used to market the site to potential tenants.

This document follows the sequence of our approach to the cargo selection and site planning work, as described here.

Sequential approach used to arrive at the cargoes and concepts shown

1. Port of Longview business development pipeline
2. Development of a cargo list and valuations
3. Port of Longview ranking (short-list of cargoes of interest)
4. Identification of cargo criteria / needs (access for ship, rail, truck + acres)
5. Grouping of cargoes (each has: 1 rail, 1 large and 1 small land use)
6. Base site footprints for process facilities on reference sites
7. Rough layouts with subsequent initial development in CAD
8. Economic evaluation by group

3 DEMAND STUDY: MARKET ANALYSIS AND CARGO SELECTION

A market analysis prepared by Martin Associates was used to establish a list of potential cargoes for Barlow Point. In addition, Port staff provided feedback on current business development opportunities and criteria to be used in ranking cargo attractiveness. Together, this information was evaluated to develop a list of cargoes to be used for conceptual planning of Barlow Point.

3.1 Market Analysis

The market analysis prepared by Martin Associates included a review of national and regional cargo trends, focusing on cargo types with good long-term potential for the Pacific Northwest region. The analysis resulted in this list of cargoes:

- Automobiles / Ro-Ro
- General cargo
- Omni-Bulk (logs, steel, etc)
- Scrap Metal
- Recycled Rubber
- Liquid Bulk (crude oil, Bio-fuel)
- Bulk Agriculture Products (corn, soybeans, wheat, etc)
- Dry Bulk (salt, fertilizers, coke, clay, talc, etc)
- Other Dry Bulk (bio-mass, wood chips, ores)

3.2 Port Business Development

The Port has received expressions of interest from several parties regarding development of cargo handling facilities at Barlow Point. This includes the following cargoes:

- Potash - investigating alternative to Port of Vancouver
- Urea (produced for export)
- Methanol (produced for export to Japan)
- Bio-diesel (produced for shipment within PNW)
- Crude Oil (for export)

3.3 Cargo Ranking Criteria

Barlow Point is planned to be complementary to existing Port facilities. The preference is to focus on new business opportunities rather than relocation of existing business from within the Port. Accordingly, the Port identified criteria to be used when considering development of new business at Barlow Point. Projects which best meet these criteria will have the highest chance of moving forward.

- Have maritime-related use
- Maximize return on Port investment
- Maximize employment opportunities
- Develop flexible use infrastructure
- Introduce development project(s) that are “highly bankable”

These criteria were applied to the list of potential cargo in order to generate a “short list” of the most likely cargoes for Barlow Point. Results of this review are as follows:

- General cargo, omni-bulk, scrap metal, and bulk agriculture products are currently handled elsewhere in the Port and were therefore removed from consideration for Barlow Point.
- Autos and ro-ro cargo are lower revenue cargoes which require a large quantity of paved land. They are not well suited to new, purpose-built facilities due to the high cost of construction. Additionally, excess auto handling capacity at nearby Port of Portland adds significant risk to autos and ro-ro at Barlow Point. For these reasons, these cargo types were removed from consideration.

After further discussion with the Port, the short list of cargoes and expected annual volumes were identified. These are shown below in Table 2.

Table 2. Short List of Cargoes and Expected Volumes

Cargo	Volume	MA Notes
CRUDE OIL	8.3 million MT	Based on planned activity at Columbia River ports.
POTASH	2 - 8 million MT	Based on actual data provided by BHP Billiton.
UREA	1.8 million MT	Based on actual manufacturing facility in Enid, OK.
METHANOL	1 million MT	Based on review of numerous plants under construction in the U.S.
BIODIESEL	340,000 MT	Based on operation of a similar facility in PNW.
WOOD PELLETS	150,000 MT	Based on actual data from existing wood pellet operations.

Further analysis was performed by Martin Associates to evaluate the economic impacts of the short-listed cargoes. The analysis looked at the effects of each cargo with respect to employment (direct, induced, and indirect), personal income (direct, re-spending, and indirect), business revenue, local purchases, and state and local taxes. The results of this analysis are presented in Table 3 on the following page.

Table 3. Analysis Results of Economic Impacts for Short-listed Cargoes

	Crude 8.3 Million Tons	Biodiesel 350,000 Tons	Urea 1.8 Million Tons	Wood Pellets 200,000 Tons	Potash 8 Million Tons	Methanol 1 Million Tons
JOBS						
DIRECT	393	101	270	55	348	223
INDUCED	497	126	424	63	496	339
INDIRECT	<u>462</u>	<u>119</u>	<u>317</u>	<u>65</u>	<u>410</u>	<u>262</u>
TOTAL	1,352	346	1,011	183	1,254	824
PERSONAL INCOME (1,000)						
DIRECT	\$20,455	\$5,158	\$18,024	\$2,540	\$20,772	\$14,340
RESPENDING/LOCAL CONSUMPTION	\$49,892	\$12,581	\$43,961	\$6,195	\$50,665	\$34,976
INDIRECT	<u>\$18,431</u>	<u>\$4,737</u>	<u>\$12,668</u>	<u>\$2,579</u>	<u>\$16,320</u>	<u>\$10,444</u>
TOTAL	\$88,778	\$22,476	\$74,653	\$11,314	\$87,757	\$59,759
BUSINESS REVENUE (1,000)	\$498,131	\$10,241	\$71,595	\$27,294	\$281,839	\$39,775
LOCAL PURCHASES (1,000)	\$27,376	\$7,035	\$18,816	\$3,831	\$24,241	\$15,512
STATE AND LOCAL TAXES (1,000)	\$8,415	\$2,130	\$7,076	\$1,073	\$8,318	\$5,664

The economics suggest that rail and manufacturing based cargoes present the greatest opportunity for Barlow Point. Therefore, rail infrastructure is important to the success of Barlow Point. It is also clear that Barlow Point is well suited to bulk handling facilities. The bulk cargoes under consideration for Barlow Point are compatible with the operations at other Port facilities.

3.4 Infrastructure Requirements

The characteristics of the short-listed cargoes were evaluated to determine infrastructure requirements including wharf, vehicle access, acreage, land-use, and rail needs. These characteristics form the basis of design for developing cargo layouts. They are summarized in Table 4.

Table 4. Basis of Design Characteristics

Cargo	Shared Berth	Rail Use	Unloading	Special Handling	Truck Volume	Shared Gate	Reqd Paving	Structures
CRUDE OIL	possible	dedicated	bottom dump	pipeline, heating, vapor recovery	minimal	yes	minimal	storage tanks, rail, office, pipelines
POTASH	no	dedicated	bottom dump	covered conveyor	minimal	yes	minimal	shed, conveyor, rail, office
UREA	no	none	n/a	covered conveyor	minimal	yes	minimal	mfg plant, waste water storage/treatment, storage shed, conveyor, admin/offices
METHANOL	possible	none	n/a	pipeline, vapor recovery	minimal	yes	minimal	mfg plant, pipeline, storage tanks, office
BIODIESEL	possible	low	bottom dump	pipeline, heating, vapor recovery	minimal	yes	yes	mfg plant, pipeline, storage tanks, rail, office
WOOD PELLETS	possible	minimal	bottom dump	covered conveyor	low	yes	minimal	shed, silos, office, conveyor

Rail infrastructure is identified as important to the success of Barlow Point. The rail needs of the target cargoes are summarized in Table 5. The train lengths listed are typical for the given cargoes as they are transported today. However, as train lengths continue to grow they should be considered, to the extent possible, in the infrastructure requirements. Current maximum train length allowed on Burlington Northern Santa Fe (BNSF) tracks is 8,500 feet. On Canadian National (CN) Railway tracks, train length is limited to 10,000 feet.

Table 5. Rail Needs of Target Cargoes

Cargo	Cars/Train	Train Length	Volume/Train	Trains/Day
CRUDE OIL	130	7,000 ft	60K - 90K bbl.	2 - 4
POTASH	174	8,000 ft	19,000 MT	2+
UREA	n/a	n/a	n/a	minimal
METHANOL	n/a	n/a	none	none
BIODIESEL	n/a	n/a	n/a	none
WOOD PELLETS	n/a	n/a	n/a	minimal

The targeted cargoes were further reviewed to determine how to group them together for developing conceptual site plans. Wharf type, land use requirements, and rail needs were listed for each of the cargoes to see whether any natural groupings could be identified. The cargo types fell into two general categories, Dry Bulk and Liquid Bulk.

The liquid bulk cargo group includes bio-diesel, crude oil, and methanol. All require single-use piers, tank storage, and pipeline transfer to/from vessels. One cargo is rail-intensive while bio-diesel and methanol are produced on site.

The dry bulk cargo group includes potash, urea, and wood pellets. All require enclosed storage (shed or silo) and conveyor transfer to/from vessels. Potash is rail-intensive, urea is produced on site, and wood pellets arrive via truck or rail.

Acreage requirements were estimated based on a review of similar facilities handling similar volumes. These values are summarized in Table 6. As groups, the Dry Bulk and Liquid Bulk cargoes have similar acreage demands confirming these two groups as the options to plan for the site.

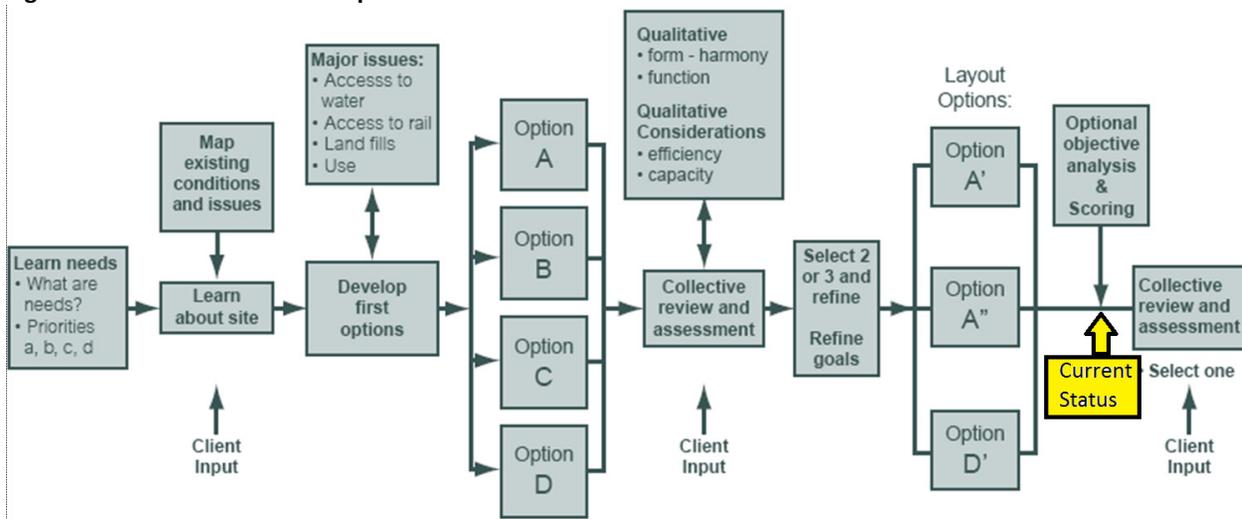
Table 6. Acreage Requirements for Planned Cargo Types

Cargo	Acreage Rqmt	Option 1	Option 2
CRUDE OIL	15 - 50	X	
POTASH	35 - 70		X
UREA	50 - 70		X
METHANOL	45 - 75	X	
BIODIESEL	10 - 20	X	
WOOD PELLETS	5 - 10		X
Acreage Req'd		70 - 145	90 - 150

4 CONCEPTUAL PLANNING APPROACH

The approach to conceptual planning relied upon development of cargo preferences, analysis of requirements for those cargoes, and then development of relevant options that fit the site. The team worked closely with the Port and stakeholders to develop practical alternatives with varying benefits. The major variables are the cargoes to be handled; how they fit together on the site; the proportional demand for each; the facility requirements suited to demand; variation for near- and long-term case. Figure 1 describes the general process of data gathering, coordination, development of alternatives, and the collaborative decision-making that occurred. The options were preliminarily scored by the planning team and two preferred option(s) were selected for refinement. The goal in the end was to arrive at a set of two refined conceptual plans for facilities and cargo handling at the site that best matched the needs of the Port. Further scoring refinement will take place in a later stage.

Figure 1. General Process Description



4.1 Sequence & Scope of Work

We conducted several studies during the work.

Task 1: Opportunities & Constraints Map

We collected pertinent information about the site, nearby lands, and access to produce a single drawing. The focus was on site development opportunities and limitations such as existing structures, facilities, adjacent properties, easements, grades, and any restrictions on wharf alignments.

Task 2: Interpret Market Study, Summarize Facility Operation Needs

We developed high-level graphics (charts, diagrams) that interpreted the cargo volumes by commodity in terms of site footprint, equipment types needed, and relevant transfer systems. We identified cargo types with affinity. For example, we grouped several dry bulk commodities in one concept, and several liquid bulk commodities in another. We separated rail intensive users because there was only room for one on each option. We document the operating goals, intended processes, and related facility needs in a Basis of Design in Chapter 5.

Task 3: Facility Requirements/Capacity Analysis

We used the assumed cargo projections to establish the throughput potential of the available wharf and backland areas and considered cargo storage and operating mode options. We utilized the results to develop the required sizes for storage yards, storage sheds, rail storage tracks, rail working/loading tracks, paved areas and the related storm water containment pond areas.

Task 4: Long-range Site Planning

We developed several long-term site layout concepts that show the long-term build-out potential of the facility for various operational options. The concepts were based on the market study, capacity analysis, and opportunities and constraints study. The concepts bring forward the conversation, and draw out any challenges or opportunities that the visions present, without focusing on details. Options varied with approaches to congestion-free traffic flow, proper visibility, maneuvering space and interaction with equipment, balance of operational benefits and capital costs, meeting of capacity goals, site flexibility, and sustainability. We selected two options for refinement.

Figure 2 below shows how we, in-sequence, considered access and site use starting with the most restrictive – the waterside access.

Figure 2. Sequence for Considering Access and Site Use



In the remainder of this section, we discuss a few interesting intermediate studies that led to the Draft layouts.

4.1.1 Opportunities and Constraints

The physical characteristics of Barlow Point and its surroundings were examined to identify factors that have the potential to affect the use of the site for cargo handling. Waterside access, landside access, adjacent parcels, and the site itself were all studied. Factors identified with the potential to have a positive effect on the site were classified as opportunities while factors identified with potential to limit use of the site were classified as constraints. Opportunities and constraints were identified on a site map for reference and visibility. (Reference Appendix I of the main report)

Along the southern boundary lies a levee separating Barlow Point from the Columbia River. The levee is subject to an easement controlled by the Cowlitz County, Consolidated Diking Improvement District (CDID) #1. Any changes to the levee must be approved by the US Army Corps of Engineers. In general, USACE has restrictions for development adjacent to the levee. (Reference Appendix I of the main report).

Opportunities

- 1) CDID #1 Property to the North, beyond the Mt. Solo landfill: This parcel was originally developed by CDID for use as a Regional Detention Pond. To date, the Detention Pond has some capacity to support storm water runoff from Barlow Point.
- 2) Drainage ditches: There are private maintained ditches in the northern portion of the site, nearest SR 432. The private maintained ditches are classified as fish bearing. They likely can be altered following review, allowing relocation as needed. (Reference Appendix D Riverfront Environmental and Other Considerations of the main report.
- 3) Adjacent Farmland: Approximately 320+ acres of farmland exist adjacent to the northwestern edge of the site. This property provides the potential for future expansion of Barlow Point. Vacant parcel to the east. An approximately 60-acre parcel is immediately adjacent and to the east of Barlow Point sits vacant. This parcel has the potential for the future expansion of Barlow Point.
- 4) FEMA flood classification: Barlow Point has a FEMA Zone classification representing minimal flood hazard.
- 5) Wharf construction area: Approximately 4,000 feet of riverfront is accessible and available for wharf construction, with 3,000 considered primary, direct access in the sketches that follow.
- 6) Mt. Solo landfill: The existing landfill has the potential to act as a visual and sound barrier to future cargo operations at Barlow Point.

Constraints

- 1) The adjacent Mt. Solo landfill is an adjacent property and considered a constraint to future development in that direction for now. The landfill contents have not been tested for contamination, but are not expected to be hazardous. Should a configuration concept rely on acquisition of a part of this land, this has the potential to result in significant cost and/or development delays.

2) Development plans for the former Reynolds Metal Company site has the potential to increase rail traffic along the rail corridor supporting Barlow Point.

3) Bonneville Power Administration (BPA) power transmission lines cross the eastern edge of Barlow Point. The current BPA easement prohibits placing any structures beneath the power lines. According to easement documents, vehicles and trains may freely pass under the power lines to access the site.

4) Barlow Point is separated from the Columbia River by a levee. The top of the levee sits at an elevation 20' +/- above the rest of the site. This restricts access cargo types.

5) Barlow Point Land Company holds the rights to approximately 2,800 feet of riverfront at the western-most end of the site restricting river access. This area is designated for a mitigation project in support of other development activities.

4.1.2 Wharf Area Alignment Options

The wharf alignment sketches shown below were presented in Meeting 2, Dec. 5, 2014, and have since been refined. They are presented here to show what high-level concepts were considered during the planning work.

The area usable for wharf construction includes at a minimum the Barlow Point river frontage between the power line easement to the East and the start of river frontage owned by others to the West. This results in over 3,000 feet of river frontage available for the construction piers and pier structures to support cargo operations. Draft assumptions for wharf placement utilized for the initial presentation of the sketches below are as follows (see Figure 1). These assumptions were later adjusted during structural planning.

- a) No vessel berthing or wharf construction within the power line footprint, and 250' adjacent
- b) Provide for a minimum 190 foot set back from river channel to allow for a vessel with a 125-foot beam another 65 feet to accommodate a bunker barge.
- c) Aim for a linear berth line, with longest possible alignment

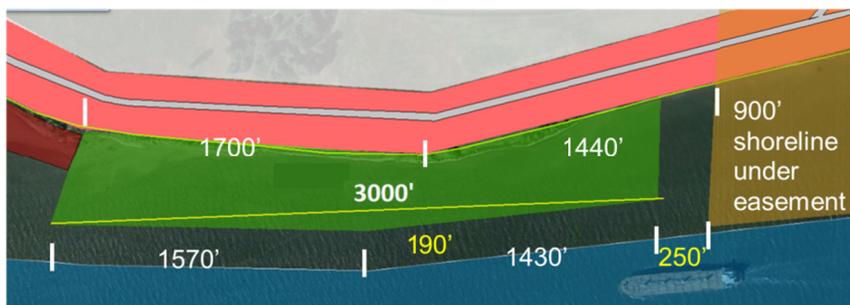


Figure 4. Selected Wharf Alignment with Vessel Berthing Closest to the Navigation Channel

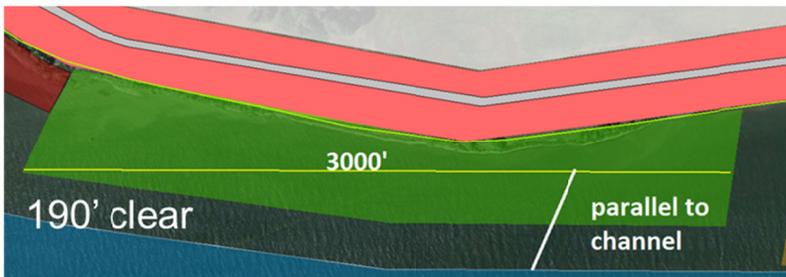


Figure 5. Rejected Option is Too Close to Bank

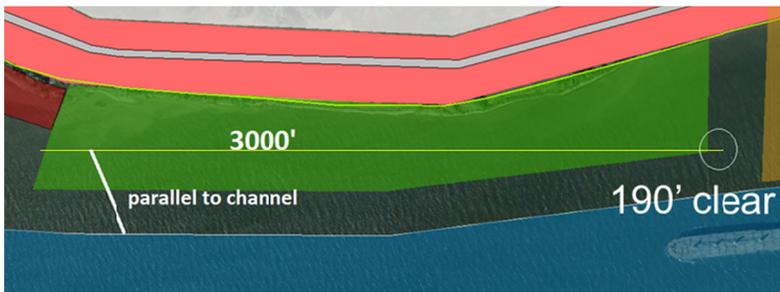


Figure 6. Rejected Option Due to Shorter Pier Head Line

4.1.3 Land Use Inventory

The site was reviewed to determine the maximum practical acreage that could be made available to potential site users. Several assumptions were made during this review. They will be explained in more detail throughout this section.

The Barlow Point site contains an irregular-shaped boundary along the northern edge adjacent to the Mt. Solo landfill. The northern edge of the property is the preferred location for a common roadway supporting traffic circulation throughout the site while maintaining the maximum contiguous space for cargo operations. A roadway which closely follows the property line is not practical. A more reasonable approach to maximizing use of these irregular-shaped areas would be to target them for fixed infrastructure such as electrical substations and common parking lots and public access. Creating a circulation roadway which excludes these areas is more practical. Such a roadway would relegate approximately 28 acres of land within these irregular-shaped areas to 'common' space which is not typically leasable to prospective tenants.

The BPA easement along the eastern boundary restricts use of approximately 15 acres for any cargo storage or handling activities.

The levee along the southern edge of the site occupies approximately 45 of the 282.5 gross site acres. It may be driven on but has limited development/change potential due to USACE usage restrictions.

The Barlow Point "backland" lies approximately 20' +/- below the top of the levee and measures approximately 187 acres in size. At this point, we have not identified a need for a substantial fill to the backlands, however some site options may need this. For concepts under consideration, we assume some fill will be needed to allow for paving, drainage, and operational elevation differences such as rail car loading.

Figure 7 recaps these primary areas of Barlow Point, as understood in Meeting 2, Dec. 5, 2014. The port of Longview has since acquired an additional 7.5 acres of adjacent property increase total acreage to 282.5. The additional acreage is not reflected in Figure 7.

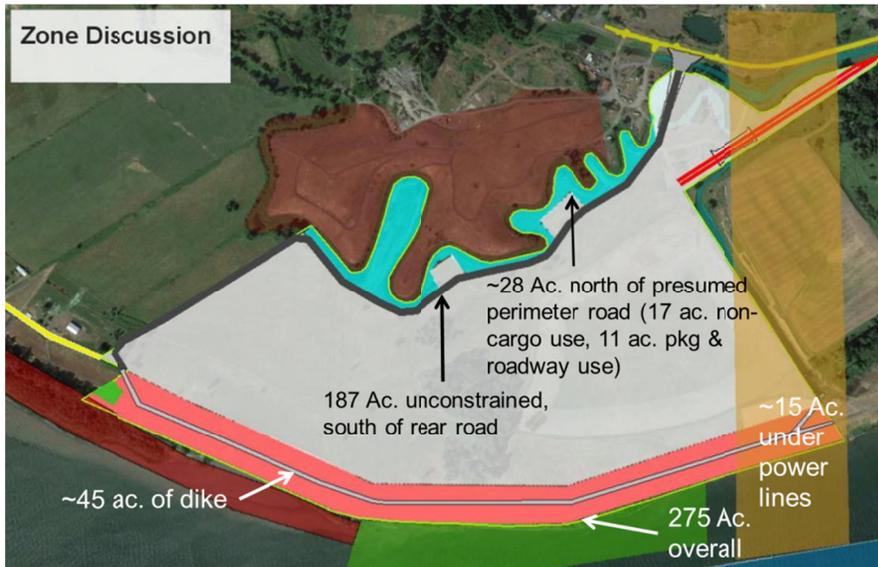


Figure 7. Primary Component Areas of Barlow Point

Summarizing these primary components of Barlow point, we find net leasable land totaling approximately 207 acres:

187 ac. unconstrained (white)
 + 5 ac. rear roadway (grey)
 + 15 ac. under power lines (orange)
 =====
 207 ac. leasable

4.1.4 Influences on Siting of Infrastructure

Site shape, dimensions, any physical characteristics all affect how the site is used including the resulting placement of infrastructure. These site characteristics were examined to identify potential influences and to develop an approach for developing layout options. A summary of the primary influences identified are presented graphically in Figure 10 and summarized below:

- a) The northeastern corner of the site will provide primary landside access. This area of the site narrows before opening up to the primary site acreage. Primary use of this area is likely to focus on ingress/egress and therefore placement of any large or permanent structures should be avoided.
- b) The eastern edge of the site contains overhead power lines encumbered by an easement. This easement prohibits placement of any structures within this power line footprint. While the easement does not restrict use of property adjacent to the power lines, consideration should be

given to dangerous or sensitive cargo and structures with proximity to the power lines. It may be possible to place storm water detention ponds or wastewater treatment ponds in this area.

c) The site's river frontage has three distinct straight sections linked by shallow curves. The natural axis lines for a cargo handling facility are for the wharf to be parallel to the riverfront and the cargo handling facility perpendicular to the wharf. This shape and alignment indicate an affinity for up to three separate cargo types or facilities.

d) The center of the site contains the primary wharf area. For cargo flexibility and efficient wharf access, placing permanent structures in this area should be avoided.

e) The primary area for wharf construction is approximately 3,000 feet long and located along the center of the site's river frontage.

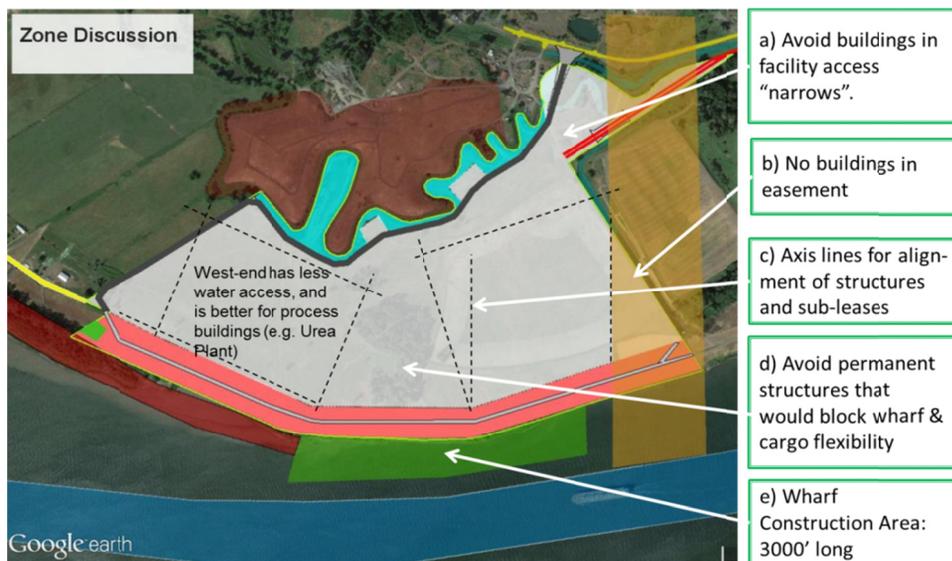


Figure 10. Primary Influences on Siting of Infrastructure as understood at Meeting 2, Dec. 5, 2014

4.1.5 Rail Alignment Options / Discussion

The rail sketches shown below were presented in Meeting 2, and have since been refined. They are presented here to show what high-level concepts were considered during the planning work.

The site must accommodate unit trains up to the maximum length of 8,500 feet allowed by US railroads. Accommodating trains of this length without breaking them apart is preferred. High-level track layouts were created to explore possible routing options and their related effect on site use.

Option 1 presented in Figure 11 provides for 16,000 feet of track length. The rail loop configuration creates two primary cargo-handling areas, one with 45 acres and the other with 75 acres. These loops require multiple roadway crossings.

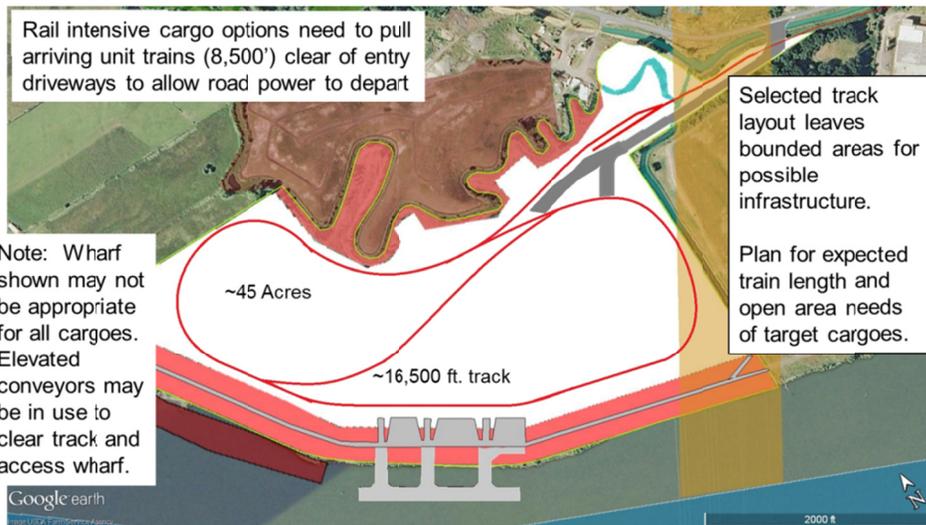


Figure 11. Rail Alignment Option 1 (presented at Meeting 2, Dec. 5, 2014)

Option 2 is presented in Figure 12. This option explores the creation of two separate rail loops, one with just over 10,000 feet of track length and the other just 8,500 feet of track length. These two loops create separated cargo handling areas of 56 acres and 60 acres. This option allows access to the site with no rail crossing. However, access to either of the primary cargo handling areas will require a separate rail crossing.

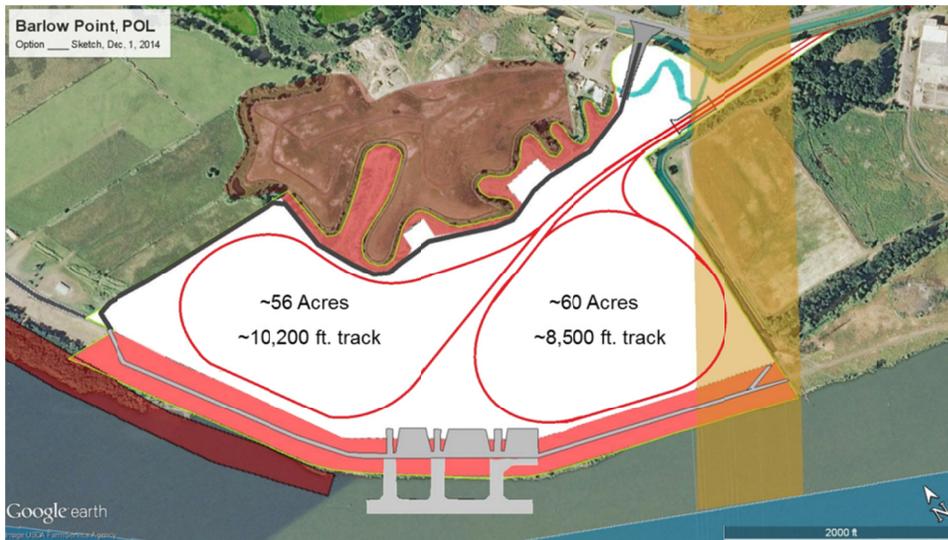


Figure 12. Rail Alignment Option 2 (presented at Meeting 2, Dec. 5, 2014)

Rail Option 3, presented in Figure 13, provides a single rail loop with approximately 15,000 feet of track length. This single loop provides two cargo handling areas, one approximately 80 acres in size and the other just 39 acres in size. Access to the larger site will require only one rail crossing while access to the smaller area will require two crossings.

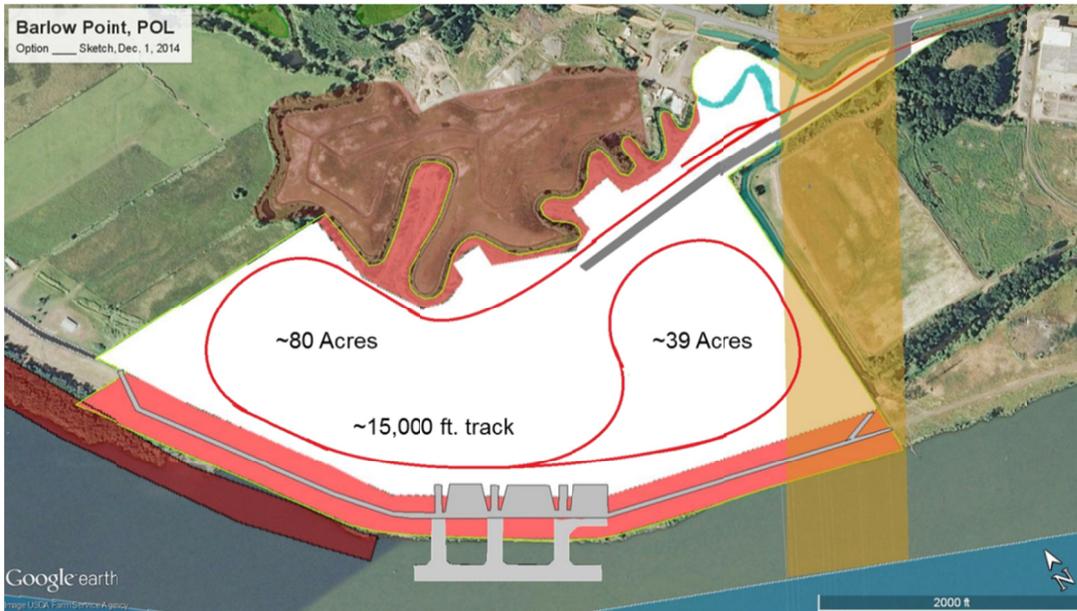


Figure 13. Rail Alignment Option 3 (presented at Meeting 2, Dec. 5, 2014)

The liquid bulk and dry bulk cargo groupings each had only one high-volume rail cargo and one manufacturing-based cargo. The team preferred a rail layout that separates arriving and departing trains from non-rail users. This is presented in Figure 14. This option separates vehicle and rail access; and separates rail and non-rail users.

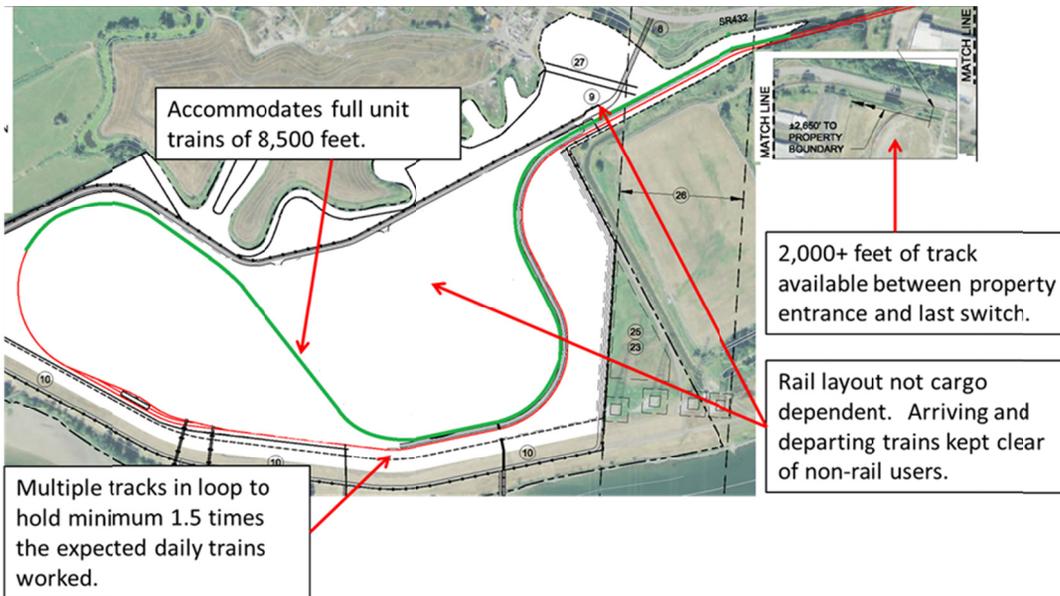


Figure 14. Rail Alignment Option 4 (presented at Meeting 3, Feb. 18, 2015)

4.1.6 Draft, Refined Conceptual Site Layouts

Site layouts were created for each of the optional cargo groupings. Figure 15 on the following page shows Option 1 - Dry Bulk. This option provides a separate pier structure for each cargo serviced by an overhead conveyor that bridges the rail loop and levee. The rail-intensive cargo, potash, is planned

inside the rail loop at the western end of the site with additional acreage available inside the rail loop for storage shed expansion. A roadway is provided between the entry and exit tracks for vehicle access to the storage shed. Buildings and all terminal facilities shown have not been planned for a specific tenant. They are approximately sized for expected representative facilities of each type. Actual site layouts will need to be determined in conjunction with the specific tenant, once identified. Our facility planning assumptions are detailed in the Basis of Design, in Chapter 5.

Wood chip storage and the urea manufacturing plant are located outside the rail loop. Truck deliveries, employees, and all other vehicle traffic are able to access these facilities without a rail crossing.

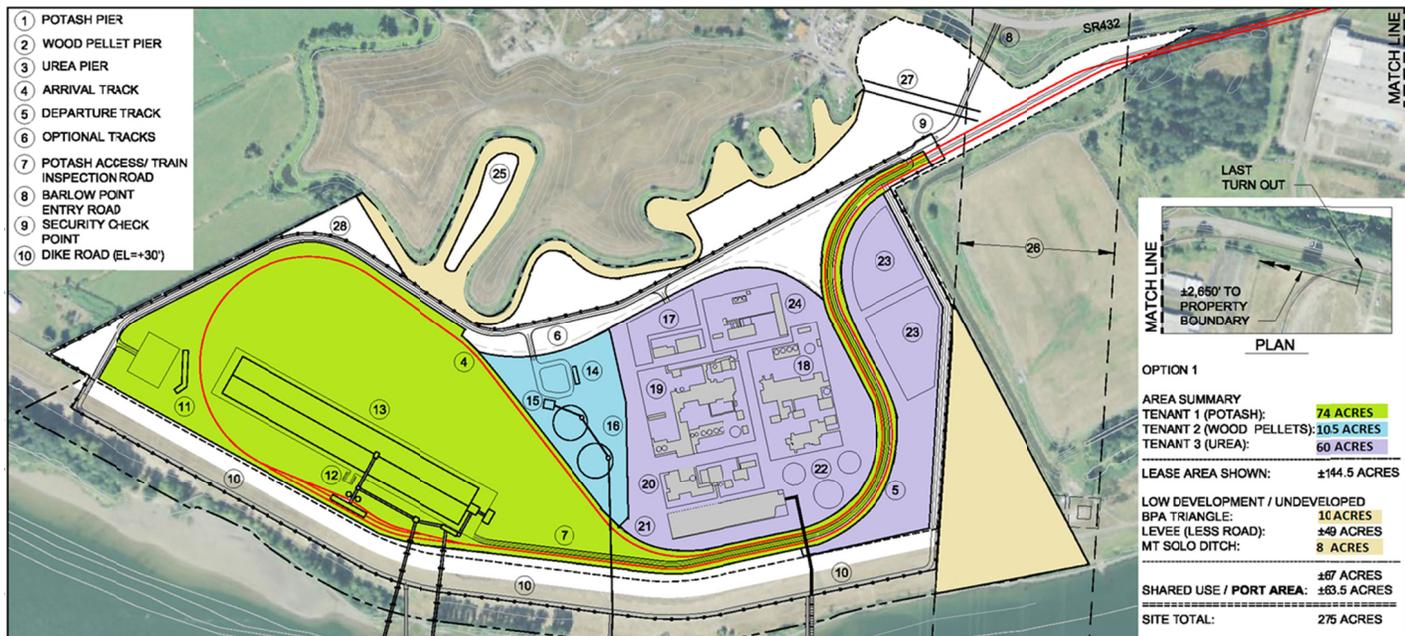


Figure 15. Option 1 - Dry Bulk (presented at Meeting 3, Feb. 18, 2015)

Figure 16 presents the site layout for Option 2 - Liquid Bulk. This option provides a separate pier structure for each cargo serviced by an overhead pipeline system that bridges the rail loop and levee. The rail-intensive cargo, crude oil, is planned at the western end of the site with unloading platforms and above-ground storage tanks located inside the rail loop. A roadway is provided between the entry and exit tracks for vehicle access to the working areas.

The bio-diesel and urea production facilities are located outside the rail loop. Truck deliveries, employees, and all other vehicle traffic are able to access these facilities without a rail crossing. Office space, parking, and product storage tanks are located along the site perimeter.

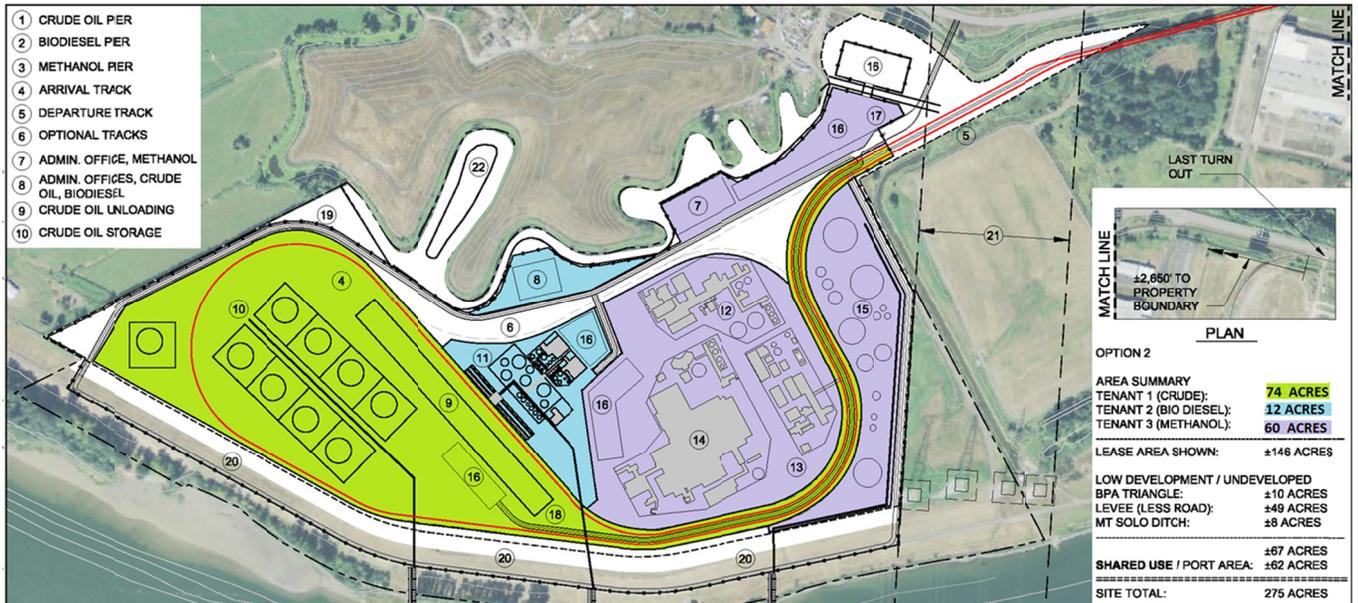


Figure 16. Option 2 - Liquid Bulk (presented at Meeting 3, Feb. 18, 2015)

Attention was given to site access by rail and road. The entry road was placed on the northern side of the rail. This placement maintains separate unimpeded access for non-rail users. Some possible use of the area north of the road was shown to work towards effective land use. As mentioned previously, a separate road is provided between the arriving and departing rail tracks for access to the interior of the rail loop. A common security checkpoint is provided for all site users.

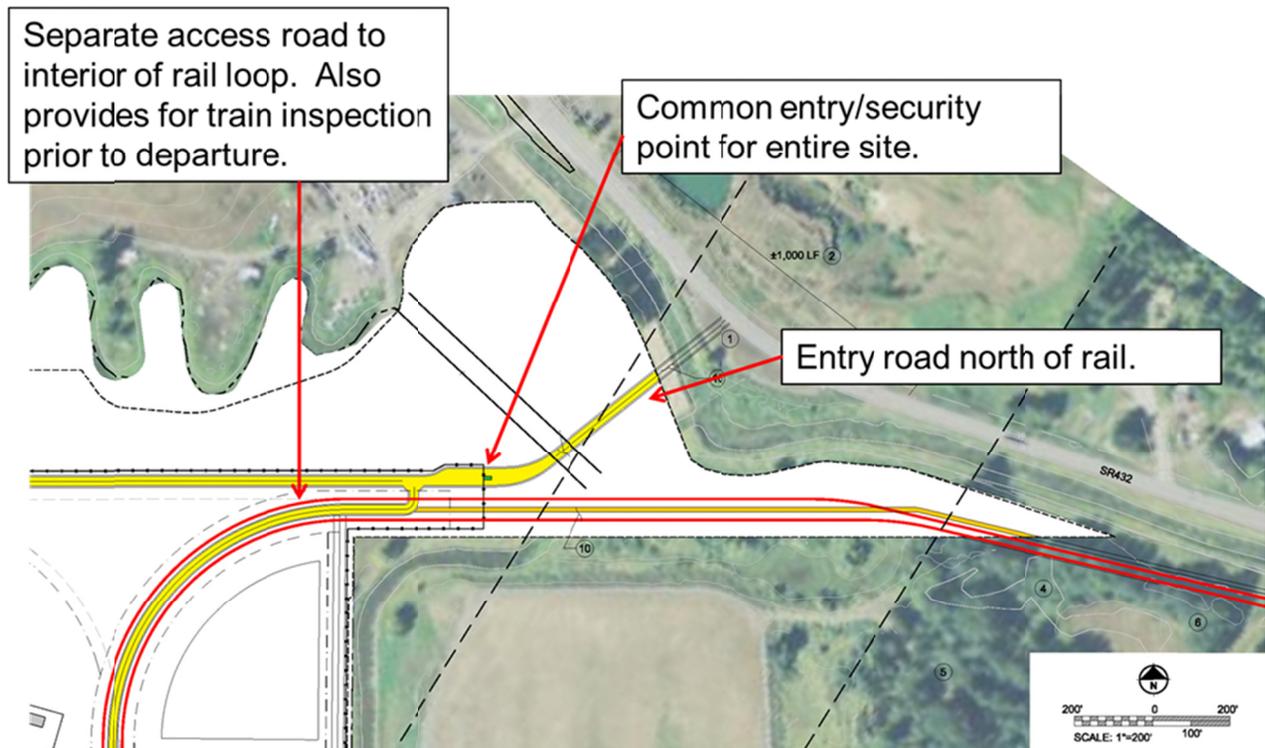


Figure 17. Entry Road on the Northern Side of the Rail (presented at Meeting 3, Feb. 18, 2015)

4.1.7 Site Layout Pros and Cons

The Port staff conducted an evaluation of the cargo decision factors with the team in Meeting 3, and arrived at the following order of priority, and weighting:

- Max Return on POL Investment (34% weighting)
- Long and Favorable Lease Terms (29% weighting)
- Bankable for Tenant (20% weighting)
- Max Employment (9% weighting)
- Results in Flexible Use Infrastructure (9% weighting)
- Low Investment by POL (0% weighting)

The site layout options were reviewed against the stated goals of the Port. The results of this review are presented in Table 7 below. Both options do well in meeting the Port’s goals.

	Pros	Cons
Option 1 - Dry Bulk	Long term leases High employment High investment by others Flexible rail infrastructure Medium revenue	Separate leases Limited reuse of tenant improvements Medium volume Lower land use efficiency
Option 2 - Liquid Bulk	Long term Leases High employment High investment by others Flexible rail infrastructure High revenue High volume	Separate leases Moderate risk Limited reuse of tenant improvements

Table 7. Site Layout Review Results

5 SUMMARY OF FINDINGS

A market analysis and conceptual site planning exercise was performed to identify possible cargo types and associated site layouts. The market analysis considered national and regional cargo trends. A list of potential cargoes was refined based on an economic impact analysis and Port of Longview feedback. The physical properties of the site were examined to identify characteristics affecting cargo handling. Two cargo options were identified for the site and conceptual layouts were prepared. The following sections summarize key findings with respect to cargo layout, site physical properties and site layouts.

5.1 Cargo

The market analysis and subsequent refinement of likely cargoes resulted in a short list of six cargoes for Barlow Point, including dry bulk and liquid bulk. The dry bulk cargo group (Option 1) includes potash,

urea, and wood pellets. The liquid bulk cargo group (Option 2) includes bio-diesel, crude oil, and methanol. Dry bulk cargoes all require enclosed storage (shed or silo), conveyor transfer to/from vessels and typically single-use piers. Liquid bulk cargoes require single-use piers, tank storage, and pipeline transfer to/from vessels.

The economic analysis of the shortlisted cargoes suggest process based cargoes that rely heavily on rail present the greatest opportunity for Barlow Point. Rail infrastructure is identified as important to the success of Barlow Point due to its location at the end of Reynolds lead track.

5.2 Physical Properties

Various site constraints limit use of the full acreage within the property lines. Net leasable land totals approximately 207 acres, which excludes the irregular shaped areas along the northern property line and the levee along the river front. The substantial difference in elevation between the primary site acreage and top of levee does not pose a significant issue. The favorable FEMA classification and the handling methods for the target bulk cargoes indicate substantial fill material is not required.

The property shape and alignment enable up to three separate cargo types or facilities. The northeastern corner of the site will provide the primary site landside access for both rail and vehicles. This narrow corner of the site is well suited to a common security checkpoint for all site users.

The primary area for wharf construction is approximately 3,000 feet long and located along the center of the site's river frontage. Additional riverfront is available for wharf construction if required. Placement of the wharf closest to the navigation channel is preferred.

5.3 Site Layouts

Two site layout concepts were created; one for each of two optional cargo groupings, dry bulk and liquid bulk. Both options include industrial access for ships, trains, street trucks, and autos. The site layouts require additional planning and refinement using facility requirements from prospective tenants to confirm assumptions made with regard to site infrastructure. The conceptual cargo uses shown in both site layout options support the Port's strategic goals for the property.

6 SECTION 2: BASIS OF DESIGN

In this section, we review the specifics of the basis of design for each cargo type.

DESCRIPTION OF CRITERIA

Function / Overview	<i>A general description of cargo type, typical storage and handling requirements, and traffic.</i>
Projected Employment Impacts, This Cargo Only	<i>Direct employment is on-site employment, total of all shifts. This is provided as a possible traffic volume indicator. Data provided by Martin Associates to Port of Longview: "Summary of market potential and ranking of opportunities for Barlow Point"; 1/20/2015.</i>
Acreage Demand	<i>The expected range of acreage needed to handle the tonnage noted, based on a comparison of comparable facilities.</i>
Cargo Volume	<i>As determined by Martin Associates and presented to the Port of Longview in a document titled, "Summary of market potential and ranking of opportunities for Barlow Point", 1/20/2015.</i>
On-site Cargo Storage Demand	<i>Storage capacity demand is calculated from cargo dwell times and frequency/size of vessel arrivals. For this study, we do not have this information for prospective cargoes. Therefore, we identified comparable facilities and measured the cargo storage capacity of each, such as shed or tank volume, and train track lengths.</i>
Adjacency & Access	<i>Information regarding location of facility components within the Barlow Point site.</i>
Wharf Design Criteria	<i>General description of operating needs which affect wharf design.</i>
Rail Design Criteria	<i>General description of operating factors, both cargo-related and site-related, which affect rail design.</i>
Other Design Criteria	<i>Other factors which may affect facility and/or site design.</i>

6.1 POTASH

Function / Overview

- Dry bulk cargo delivered for export via unit trains up to 8,500 ft. long
- Covered conveyor system for product movement between rail cars, storage shed, and vessel

Projected Employment Impacts, This Cargo Only

Direct: 348 jobs +/-, Induced: 496 jobs +/-, Indirect: 410 jobs +/-

Acreage Demand

Goal: 35 - 70 acres depending on user's needs

Cargo Volume

Assumption: 8 million MT (Metric Ton) per year
 Estimated unit trains per day: 2

On-site Cargo Storage Demand

Goal: Storage shed with 150,000 MT-capacity plus expansion opportunity

Adjacency & Access

- Preferred location for unload station is near conveyor system which feeds pier allowing direct loading to vessel
- Vehicle roadway with direct access to storage shed and conveyor equipment is desirable
- Vehicle traffic limited to employees and visitors

Wharf Design Criteria

- Pier must accommodate Handymax class vessels (650 ft.)
- Operators expected to prefer dedicated use pier and loading equipment
- Pier must accommodate emergency vehicle access

Rail Design Criteria

- Track configuration which considers non-rail dependent users of site
- Unit train servicing without breaking train apart is preferred
- Min. 9.5 degree curves are specified by BNSF for road power usage on a private terminal. A variance from RR is needed for 12 degree curves.
- Car capacity minimum: Sufficient total track on-site to accommodate a minimum of 1.5 times the daily railcar working volume
- Car capacity desired: Total track capacity for 2 to 2.5 times the daily rail working volume
- Prefer automated control of switch engines for unloading activity

Other Design Criteria

- Site served by multiple railroads is preferred (true for this site)
- Dust control in accordance with local standards



Figure 18. Representative Potash Facility at Port of Portland

6.2 UREA

Function / Overview

- Manufacturing of granular urea fertilizer for export
- Feed Stock (Liquefied Natural Gas) to be provided by pipeline connection to local LNG supplier
- Dedicated water supply for manufacturing
- On-site production of ammonia is expected
- Covered conveyor system for product movement between storage shed and vessel
- 24-hour daily operations

Projected Employment Impacts, This Cargo Only

Direct: 270 jobs +/-, Induced: 424 jobs +/-, Indirect: 317 jobs +/-

Acreage Demand

Goal: 50 - 70 acres depending on user's needs

Cargo Volume

Assumption: 1.8 million MT per year

On-site Cargo Storage Demand

Goal: Storage shed with 100,000 MT capacity

Adjacency & Access

- Preferred location of storage shed is in close proximity to pier in order to minimize conveyor length
- Expected vehicle traffic limited to employees and visitors

Wharf Design Criteria

- Pier must accommodate Handymax class vessels (650 ft.)
- Operators expected to prefer dedicated use pier and loading equipment
- Pier must accommodate emergency vehicle access

Rail Design Criteria

No rail use anticipated

Other Design Criteria

- Must provide on-site waste water storage & water treatment facility
- Elevated conveyor system required to bridge active rail lines and/or top of levee
- Dust control in accordance with local standards
- Safety zones for on-site ammonia storage tanks in accordance with local standards
- High power consumption is expected



Figure 19. Representative Urea Plant at Enid, OK

6.3 WOOD PELLETS

Function / Overview

- Dry bulk cargo delivered by truck and rail for export
- Approximately one vessel call per month is anticipated with additional vessel calls based on product demand
- Uses covered silos for product storage, alternatives to galvanized preferred
- Designated as an optional cargo opportunity for the site, with desired use to “fill in” around primary site tenants

Projected Employment Impacts, This Cargo Only

Direct: 55 jobs +/-, Induced: 63 jobs +/-, Indirect: 65 jobs +/-

Acreage Demand

Goal: 5 - 10 acres depending on user’s needs

Cargo Volume

Assumption: 150,000 MT per year

On-site Cargo Storage Demand

Goal: Covered storage with 20,000 MT capacity

Adjacency & Access

- Working and storage areas in close proximity to the staff parking area and office are preferred
- Primary working area adjacent to site interior roadways is preferred
- Prefer storage silos adjacent to primary rail loop on the site to minimize distance between delivery vehicle and storage

Wharf Design Criteria

- Pier must accommodate Handymax class vessels (650 ft.)
- Pier must accommodate emergency vehicle access

Rail Design Criteria

- Rail sidings available to accommodate up to 30 rail cars is preferred
- Rail spur with unloading station is desirable

Other Design Criteria

- Queue for arriving trucks located off primary interior roadway is desirable
- Bottom dump to below grade receptacle with conveyor to silo is desirable
- Requires elevated conveyor to pier with sufficient clearance to bridge active rail tracks and the levee
- Elevated conveyor system required to bridge active rail lines and/or top of levee

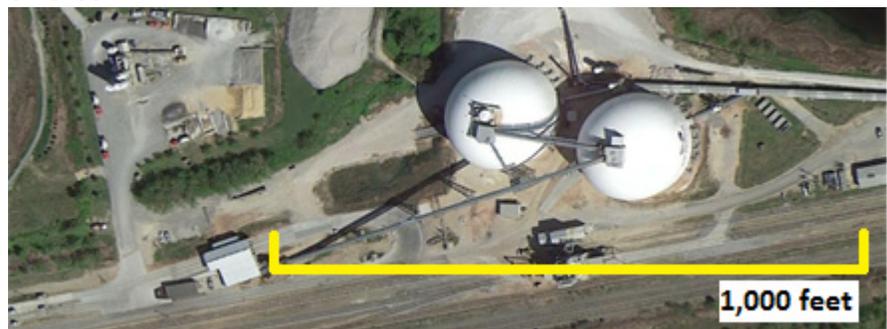


Figure 20. Representative Wood Pellet Facility, Chesapeake, VA

6.4 CRUDE OIL

Function / Overview

- Liquid bulk cargo delivered for export via unit trains up to 7,000 ft. long
- Above ground storage tanks with pipeline connections to unloading station and pier
- Vehicle traffic limited to employees and visitors

Projected Employment Impacts, This Cargo Only

Direct: 393 jobs +/-, Induced: 497 jobs +/-, Indirect: 462 jobs +/-

Acreage Demand

Goal: 15 - 50 acres depending on user’s needs

Cargo Volume

Assumption: 8 million MT per year
 Estimated unit trains per day: 2 - 4

On-site Cargo Storage Demand

Storage tanks which accommodate 150,000 MT preferred

Adjacency & Access

- Storage tanks located away from offices is desirable
- Access controlled by facility-specific security is preferred
- Vehicle roadway between inbound and outbound legs of rail loop for unimpeded access to storage tanks is desirable

Wharf Design Criteria

- Pier must accommodate Aframax class vessels (850 ft.)
- Operators expected to prefer dedicated use pier and loading equipment
- Pier must accommodate emergency vehicle access

Rail Design Criteria

- Track configuration which considers non-rail dependent users of site
- Min 9.5 degree curves preferred/required by RR for road power usage
- Goal: Sufficient track on-site to accommodate a minimum of 1.5 times the daily rail car working volume
- Goal: Rail car unloading infrastructure spanning multiple side by side tracks is desirable

Other Design Criteria

- Steam heating system available for rail car unloading is desirable
- Rail car unloading from bottom is preferred
- Oil spill containment systems in accordance with local Codes
- Pipeline system for product transfer between rail car, storage, and vessel
- Requires pipeline system elevated to bridge active rail and top of levee

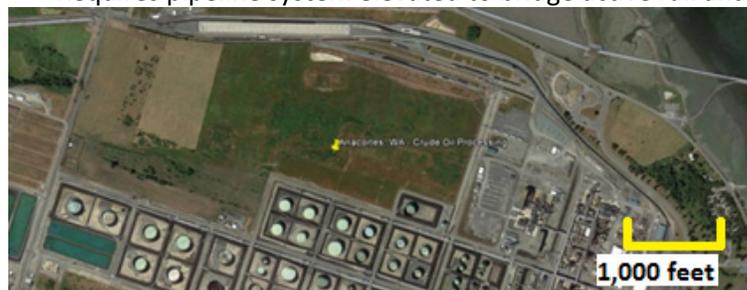


Figure 21. Representative Crude Oil Facility, Anacortes, WA

6.5 METHANOL

Function / Overview

- Liquid bulk manufacturing facility producing methanol for export
- Feed stock (Liquefied Natural Gas) provided via pipeline connection to local LNG supplier
- Above ground storage tanks for finished product
- Vehicle traffic limited to employees and visitors

Projected Employment Impacts, This Cargo Only

Direct: 223 jobs +/-, Induced: 339 jobs +/-, Indirect: 262 jobs +/-

Acreage Demand

Goal: 45 - 75 acres depending on user's needs

Cargo Volume

Assumption: 1 million MT per year

On-site Cargo Storage Demand

Storage tank capacity of 100,000 MT is desirable

Adjacency & Access

- Prefer direct access from site entrance road
- Access controlled by facility-specific security is preferred

Wharf Design Criteria

- Pier must accommodate special purpose vessels up to 610 ft. long
- Operators expected to prefer dedicated use pier and loading equipment
- Pier must accommodate emergency vehicle access

Rail Design Criteria

- No rail use is expected

Other Design Criteria

- Requires pipeline system elevated to bridge any active rail lines and/or top of levee
- Storage tank segregation in accordance with local Codes
- Unimpeded emergency access to manufacturing plant and pier is desirable
- High power consumption is expected



Figure 22. Representative Methanol Production Facility, Point Lisas, Trinidad

6.6 BIODIESEL

Function / Overview

- Liquid bulk manufacturing/refining facility producing biodiesel for regional use
- Shipment via vessel
- Supply material to be delivered to facility via rail and/or truck
- Above ground storage tanks for finished product
- Vehicle traffic to include trucks, employees, and visitors
- Designated as an optional cargo opportunity for the site, with desired use to “fill in” around primary site tenants

Projected Employment Impacts, This Cargo Only

Direct: 101 jobs +/-, Induced: 126 jobs +/-, Indirect: 119 jobs +/-

Acreage Demand

Goal: 10 - 15 acres

Cargo Volume

Anticipated: 340,000 MT per year

On-site Cargo Storage Demand

Storage tank capacity of 15,000 MT is desirable

Adjacency & Access

- Prefer working and storage areas adjacent to the staff parking area and offices
- Prefer primary work area located adjacent to site interior roadways
- Desirable to locate storage near primary rail loop
- Preferred access control by facility-specific security
- Direct access to pier from storage areas is desirable

Wharf Design Criteria

- Pier to accommodate Handymax class vessels (650 ft.).
- Operator expected to prefer dedicated use pier and loading equipment
- Pier must accommodate emergency vehicle access.

Rail Design Criteria

- Rail spur with unloading station is desirable
- Operator expected to prefer siding(s) capable of accommodating up to 25 rail cars

Other Design Criteria

- Requires elevated pipeline system to bridge active rail lines and/or top of levee
- Spill prevention in accordance with local Codes
- Storage tank segregation on site in accordance with local Codes



Figure 23. Representative Biodiesel Production Facility, Erie, PA

6.7 RAIL

Function / Overview	<ul style="list-style-type: none">• Provide access to site for multiple unit trains of bulk cargo arriving daily
Capacity	<ul style="list-style-type: none">• Provide working and storage tracks with sufficient track length to accommodate on site a minimum of 1.5 times the daily unit train volume
Critical Dimensions	<ul style="list-style-type: none">• Maximum unit train length of 8,500 feet based on current limits defined by BNSF and UP railroads• Min 9.5 degree curves preferred/required by RR for road power usage
Adjacency & Access	<ul style="list-style-type: none">• Site represents the last stop in the rail corridor through the Port of Longview• Rail corridor from the main line includes several at-grade crossings prior to reaching the Barlow Point site which must be considered when evaluating planned train movements• Impacts of train length, speed limit, and frequency must be considered
Special Design Elements	<ul style="list-style-type: none">• Site geometry supports a rail loop enabling unit trains to be accommodated on site and worked without being broken apart• An estimated 1,800 feet of track length is available between the Barlow Point property line and the main line connection point• An estimated 2,600 feet of track length is available between and the Barlow Point property line and the next closest rail switch, which can be used for staging inbound and outbound trains to minimize impact to site tenants and other port customers• The rail car unloading facility target location is approximately midway around the rail loop and provides sufficient track length on each side of the unloading station to hold a full unit train• A unit train will always extend beyond the Barlow Point property line on either the incoming or outgoing leg depending upon which way the train is brought onto the site• A rail loop around Mt. Solo has potential to provide alternative access to the site and would require additional investigation

**7 ATTACHMENTS: SLIDES FROM PRESENTATIONS AT MEETINGS 2
AND 3**



BARLOW POINT PLANNING – MEETING 2 PORT OF LONGVIEW, WA. DEC. 5, 2014

Delivery to:



Consultant Team:



Agenda

9:00 – 10:00 Site Understanding

- Opportunities & constraints (site & access)

10:00 – 11:00 Cargo-specific Planning

- Review site needs related to likely cargoes

11:00 – 12:00 Prepare for Next Meeting

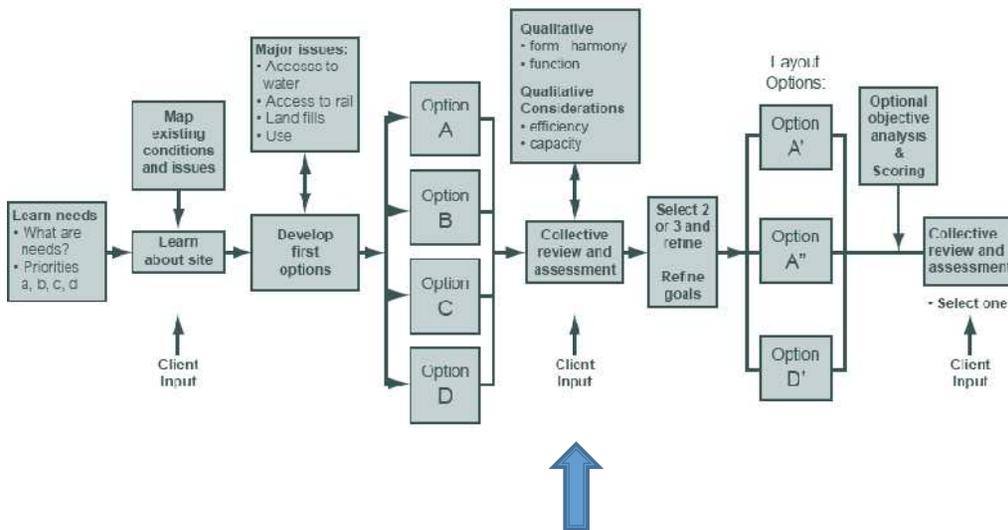
- Decision factor ranking exercise
- Steps forward

12:00 Lunch & Discussion

1:30 Site Visit



Planning Process Status



Now: Meeting 2

Data Collection & Reporting

- Summary: We are not waiting on data from the port
- Data Items Obtained and Reviewed:
 - Phase I Environmental Site Assessment for Mt Solo Property, 11/18/10
 - Longview Presentation by Norm K (Industrial Rail Corridor)
 - Port of Longview Comprehensive Scheme of Harbor Improvements, December 2011
 - PNW Marine Cargo Forecast Update and Rail Capacity Assessment, December 2011
 - Port of Longview Strategic Plan, 7/13/12
 - Port of Longview Master Plan Final Report, 6/14/11
 - SR 432, Rail Realignment & Highway Improvements Project, 11/13/13



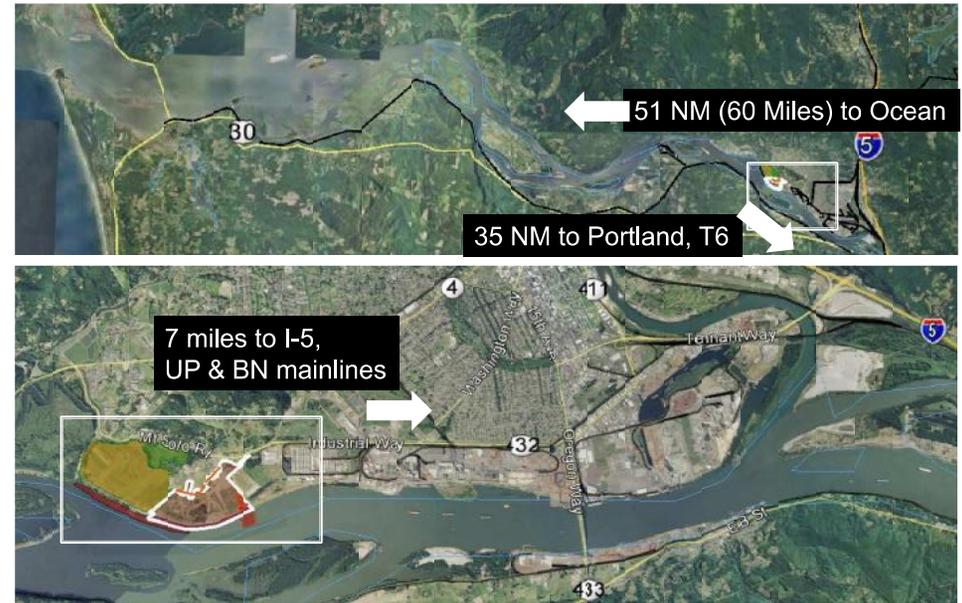


OPPORTUNITIES AND CONSTRAINTS STUDIES

- Review each site area in a set of studies
- Reach a full understanding of the potential value of the site for access and cargo handling.
- Red = Constraint, Green = Opportunity

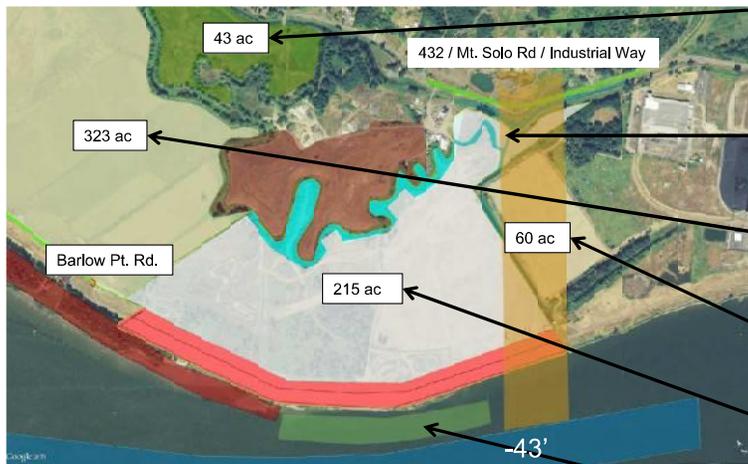
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C. Opportunities & Constraints Map (inputs)



6

Existing Conditions & Opportunities



CDID #1 property. Possible storm water retention area

Ditches moveable if needed for entrance gate

Potential future expansion area?

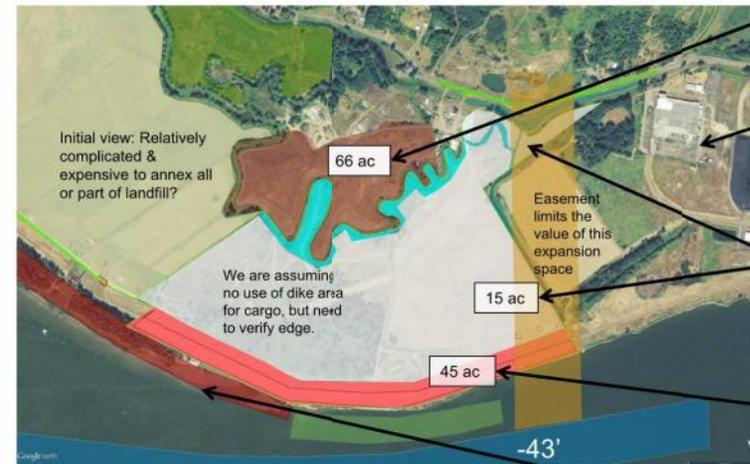
Potential future expansion under power lines?

FEMA Zone B

Wharf construction area ~3,000 ft long

7

Existing Conditions & Constraints



Mt. Solo landfill

Former Reynolds site occupied by Millennium Bulk

Cannot put buildings within power line easement?

Dike easement; CDID, USACE permits req'd for changes

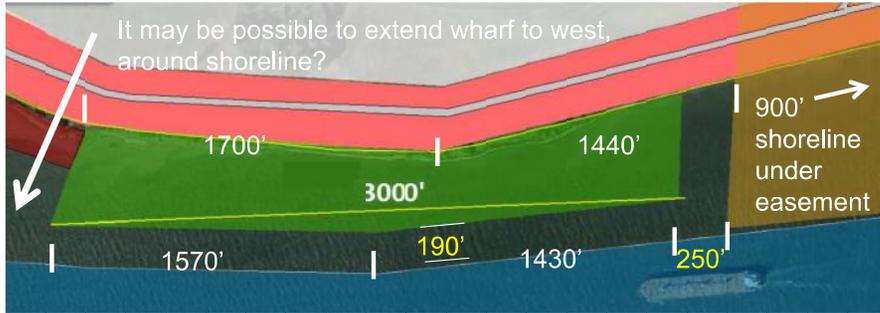
Ownership of waterfront by others

Initial view: Relatively complicated & expensive to annex all or part of landfill?

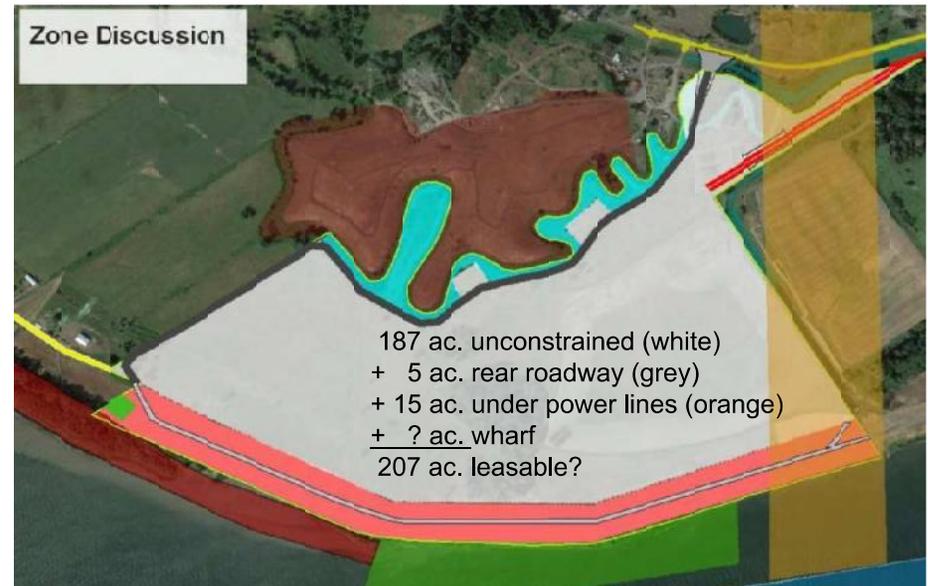
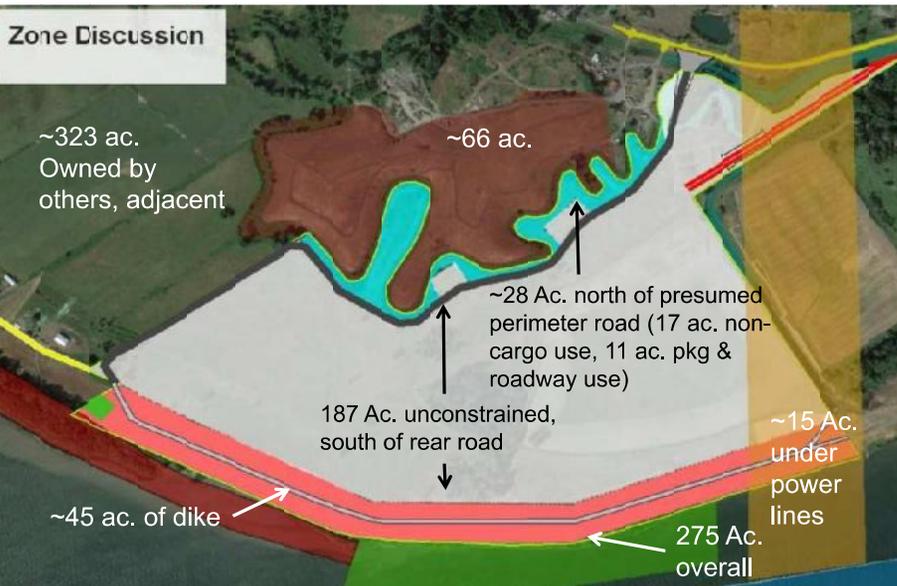
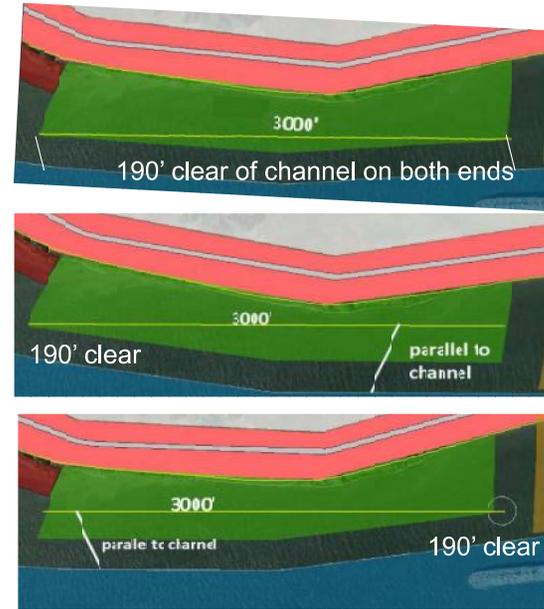
We are assuming no use of dike area for cargo, but need to verify edge.

Is future use/change of this riverfront property out of the question?

8



- Yellow numbers are set by team for now, & need further study
- We assume:
 - No vessel berthing or wharf construction under power lines (?)
 - 190' set back = 125' ship beam + 65' bunker barge beam (preliminary)
 - 250' set back mooring from power line easement due to risk of ship fire impact on power lines – not yet verified if this is relevant.

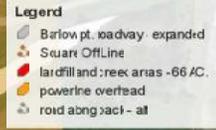


Option 2, Shift Back Edge: 228 Ac. "Leasable" Acres

Is it worth impacting landfill to obtain 21 acres of "useful" cargo area?

We assume cut area is removed or fills in the noted valley

208 ac. unconstrained
+ 5 ac. rear roadway
+15 ac. under power lines
228 ac. Leasable?



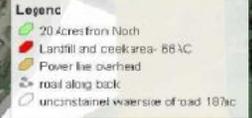
Option 3, Shift North Edge: 228 Ac. "Leasable" Acres

Is it easier/cheaper to expand north vs. impact landfill to obtain the +21 ac.?

+ 21 ac

187 ac. unconstrained
+ 5 ac. rear roadway
+ 15 ac. under power lines
+ 21 ac. potential northern expansion

228 ac Leasable?



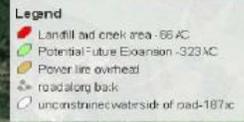
What about the far future? Should we consider possibility of growth to the north?

Alternate Vehicle Access

Alternate Rail Access

What are the sensitivities around long-range planning for this area?

187 ac. Unconstrained
+ 20 ac. Roadway & power lines
+ 323 ac. Potential expansion
530 ac. Leasable?



Let's discuss remaining questions..

What is local unit train length? Now vs. future?

Can we "send" storm water to this (underutilized) retention area?

How will we fence the property (Customs boundary)? At entry only or also on slough edge? Road edge?

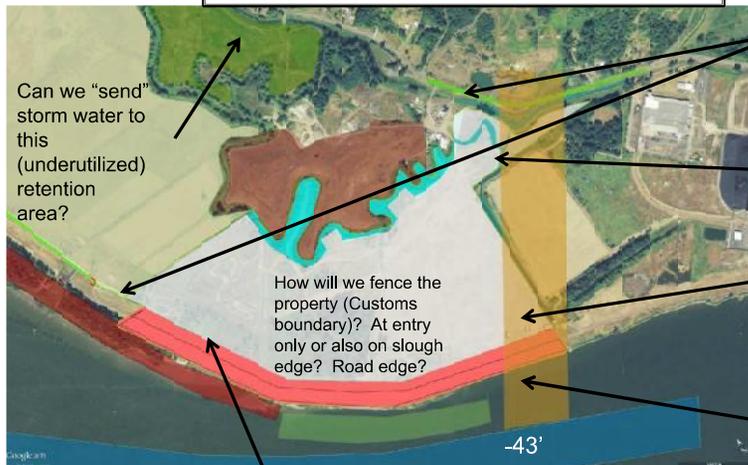
What is edge of dike on landside?

Is public access on Barlow Pt. Rd. adequate or also needed off of 432? Bike Access needs?

What changes to drainage ditches are allowed? removal or relocation?

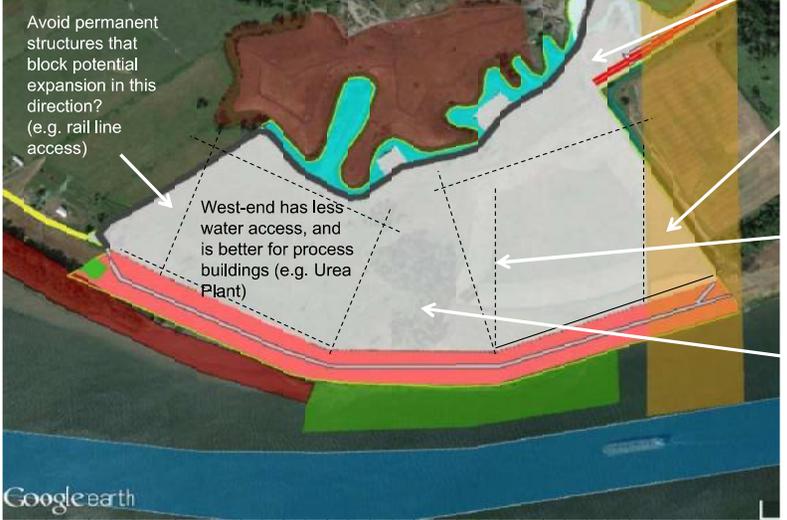
What are use limitations in easement?

Need to consult with contractors regarding practical limit of construction under / near power lines.



Identify influences on siting of infrastructure...

Zone Discussion



- Avoid buildings in facility access "narrows".
- No buildings in easement, & avoid flammable liquid tanks nearby?
- Axis lines for alignment of structures and sub-leases
- Avoid perm. structures that would block wharf & cargo flexibility
- Wharf Construction Area: 3000' long?



DECIDE WHAT CARGOES TO FOCUS ON & THEIR SITE REQUIREMENTS

1. Study the cargoes possible, and narrow-down the range in consideration.
2. Evaluate access, and use needs by cargo type
3. Summarize overall needs for initial planning options

Group cargoes by related wharf, land-use, rail needs

1. Decked wharf & open storage needed:

- Autos / Ro-Ro
- General Cargo (e.g. project cargo & wind energy)
- Omni-bulk (logs, steel)
- Scrap metal
- Recycled rubber

Some rail needed

2. Single-use pier needed:

- Liquid Bulk in tanks
 - Crude oil
 - Bio-fuel

Rail intensive, long/unit trains (except bio fuel)

3. Decked wharf or single-use pier OK, and would also use conveyors:

- Bulk Agriculture Products
 - Silos for Corn, Soybeans, Wheat
- Dry Bulk (shed/silo storage)
 - Salt, Urea/Fertilizer, potash, soda ash
 - Coke, clay, iron oxide fines, talc
 - Wood pellets
- Dry Bulk, open storage
 - Bio-mass
 - Wood chips / pellets
 - Ores
- Liquid bulk
 - LNG (bunkering only)

Rail intensive, long/unit trains (except LNG)

Probability of each category of land use? (High, Low)

1. Decked wharf & open storage needed:

- Autos / Ro-Ro
- General Cargo (e.g. project cargo & wind energy)
- Omni-bulk (logs, steel – RR rails)
- Scrap metal
- Recycled rubber

2. Single-use pier needed:

- Liquid bulk in tanks
 - Crude oil
 - Bio-fuel

3. Decked wharf or single-use pier OK, and would also use conveyors:

- Bulk Agriculture Products
 - Silos for Corn, Soybeans, Wheat
- Dry Bulk (shed/silo storage)
 - Salt, urea**/fertilizer, potash*, soda ash
 - Coke, clay, iron oxide fines, talc
 - Wood pellets
- Dry Bulk, open storage
 - Bio-mass
 - Wood chips
 - Ores (iron, manganese)
- Liquid bulk
 - LNG (bunkering only)

* BHP Billiton potential
 ** IFFCO possibility, including plant production

(Probability per Martin Associates)

So, we focus on these cargoes for now:

1. Decked wharf & open storage needed:

- Ro-Ro
- General Cargo (e.g. project cargo & wind energy)
- Omni-bulk (steel – RR rails)
- Recycled rubber

2. Single-use pier needed:

- Liquid bulk in tanks
 - Crude oil
 - Bio-fuel

3. Docked wharf or single-use pier OK, and could also use conveyors:

- Dry Bulk (shed/silo storage)
 - Salt, urea**/fertilizer, potash*, soda ash
 - Wood pellets
- Dry Bulk, open storage
 - Bio-mass
 - Wood chips
 - Ores (iron, manganese)
- Liquid bulk
 - LNG (bunkering only)

1. Potash/Potassium Chloride (BHP Billiton)



- Canpotex primary source in North America - Saskatchewan
- Primary Export Markets
 - US, China, India, Brazil, Asia
- Export Ports
 - Vancouver (BC), New Brunswick, Portland, OR (T5)

- Typical Vessel Size: Panamax
- Typical Draft: 39.5 ft
- Terminal Size: 40 net ac. in big site
- Delivery Method: Rail, unit trains
- Storage: Covered
- Load Method: Conveyor
- BHP Export goal: 8 M T/yr

BACKGROUND



Vancouver, BC

CHARACTERISTICS



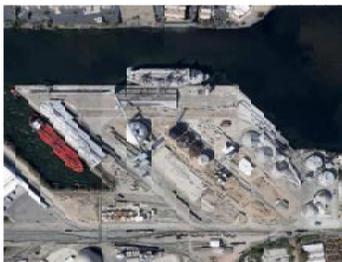
Portland, OR

2. DRY BULK – UREA Export (Fertilizer)

- USA is increasing urea production by ~9 million tons in the next 5 years to transition from importer to exporter
- Current Primary Import Sources
 - Trinidad, Canada, Ukraine, Russia
- Typical Vessel Size: Handymax

- Typical Ship Load: 40-55K MT
- Typical Draft: 33-36 ft.
- Terminal Size: 40 (load)-100+ AC (Plant+ load)
- Delivery Method: Rail (unit train)
- Storage: Covered
- Load Method: Conveyor

BACKGROUND



Stockton, CA (load port only)

CHARACTERISTICS



Port Sutton, FL (load port only)

UREA PRODUCTION (optional, on-site)

- Produced from Anhydrous Ammonia
- LNG used as primary source for Ammonia production & related pipelines or tank car delivery
- Nearest Ammonia Plant in Columbia City, OR

- 70 – 100+ Acres (plant only)
- Enid, Oklahoma example site:
 - 135 Acres
 - 998K Metric Tons per Year Ammonia
 - 800K Metric Tons per Year Urea
 - 143 Employees

BACKGROUND



IFFCO – QUEBEC (Plant in foreground, load port in background)

CHARACTERISTICS



KOCH INDUSTRIES – ENID, OK (Plant only)

3. LIQUID BULK (Canadian Crude)

- Top Crude-by-Rail Project Expansion at US Northwest Refineries
 - BP Refinery at Cherry Point → 70,000 bpd
 - Shell Puget Sound Refinery at Anacortes → 60,000 bpd
 - Tesoro at Anacortes → 50,000 bpd

- Typical Vessel Size: Panamax
- Typical Load: 50-60K MT
- Typical Draft: 39.5 ft
- Terminal Size: 20-100 AC net
- Delivery Method: Rail / Pipeline
- Storage: Storage tanks
- Load Method: Pipeline

BACKGROUND



HOUSTON, TX

CHARACTERISTICS



TACOMA, WA

4. Bio Mass – Wood Chips or Pellets

- Wood Chips/Pellets most common
 - Lumber processing byproducts
 - Scrap
- Export Markets
 - Asia (Korea, Japan), Europe
- Multiple load ports; PNW, SE

- Typical Vessel Size: Handy /max
- Typical Draft: 33 - 36 ft.
- Terminal Size: 10-55 ac
- Delivery Method: Rail / Truck
- Storage: Open, Silo
- Load Method: Conveyor

BACKGROUND



COOS BAY, OR

CHARACTERISTICS



MOREHEAD POINT, SC

Roll-up Cargoes into Layout Combinations

- Scenario 1: Mainly Dry Bulk, long trains, single-purpose wharves
 - Cargo: Urea (40 net ac.) + Potash (40 net ac.) + Other compatible (Crude, general cargo)
 - Lease: More likely separate leases, very long term
 - Investment: High investment by others, little flexibility. Relatively low risk. PPP possible
 - Flexibility of site in case tenant departs: Limited re-use of built infrastructure, probably
 - Example: Port of Houston Shipping Channel; North Harbor, Vancouver BC
- Scenario 2: Omni Terminal, short trains, general use wharf
 - Cargo: Probably 1-2 long term and 1-2 short term cargoes at a time
 - Lease: More likely a master lease concept, and operator signs lines for use
 - Investment: Port pays for wharf & access, maybe pavement. Operator pays for improvements, buildings, fixed equipment. PPP possible.
 - Flexibility of site in case tenant departs: Very good, probably.
 - Example: Grays Harbor terminal
- Scenario 3: Mix of 1 & 2: General use pier for multiple, plus one single purpose



LONG-RANGE SITE PLANNING, STEP 1

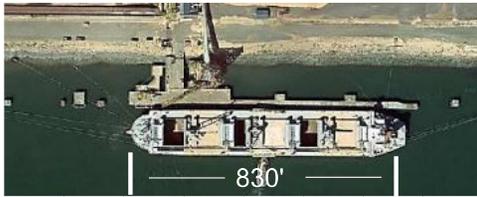
1. Given selected cargo types, and needs, layout optional concepts
2. Start with access difficulty in order: vessel access(wharf), rail access, truck access, cargo storage areas, buildings/conveyors, circulation, then public access



Potash – Portland, OR



Urea – Port Sutton, FL

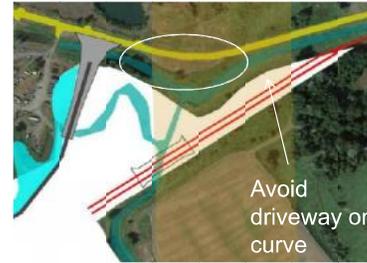


Wood Chips – Coos Bay, OR

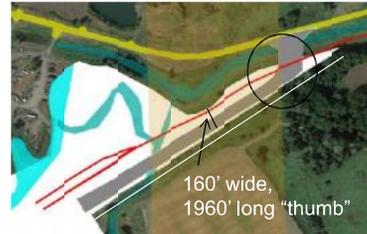


Liquid Bulk – Tacoma, WA

All images are shown to ~ the same scale.



Entry Area – Option 1



Entry Area – Option 2

Option 1: Cross rail later, driveway to north

Pros:

- Entrance location supports rear road concept
- If train arriving cars/trucks can still get into terminal

Cons:

- Truck entrance just after curve in road
- Crossings may occur within the terminal, disrupting train/truck movements

Option 2: Cross rail early, driveway to south

Pros:

- Truck entrance prior to curve
- For long train situation, sets earliest clear-point in yard
- Switching can be arranged storage to working with out crossing roadway

Cons:

- If train movement in the crossing, trucks are held up on public road



Entry Area – Option 3

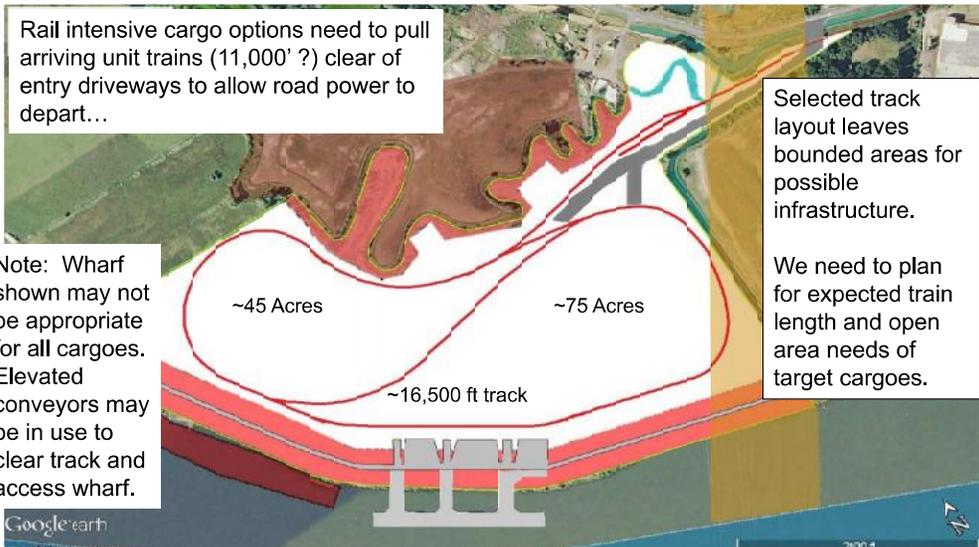
Option 3: Cross rail later, driveway to south

Pros:

- Truck entrance prior to curve
- If train arriving, some cars/trucks can still get into terminal

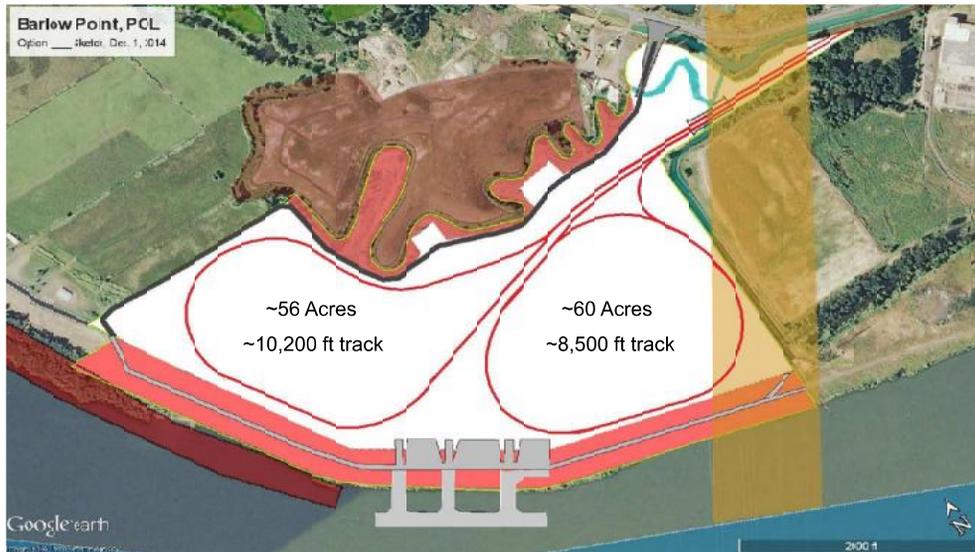
Cons:

- If train movement in the crossing, trucks are held up on public road



Note: Wharf shown may not be appropriate for all cargoes. Elevated conveyors may be in use to clear track and access wharf.

Rail Layout Option 2



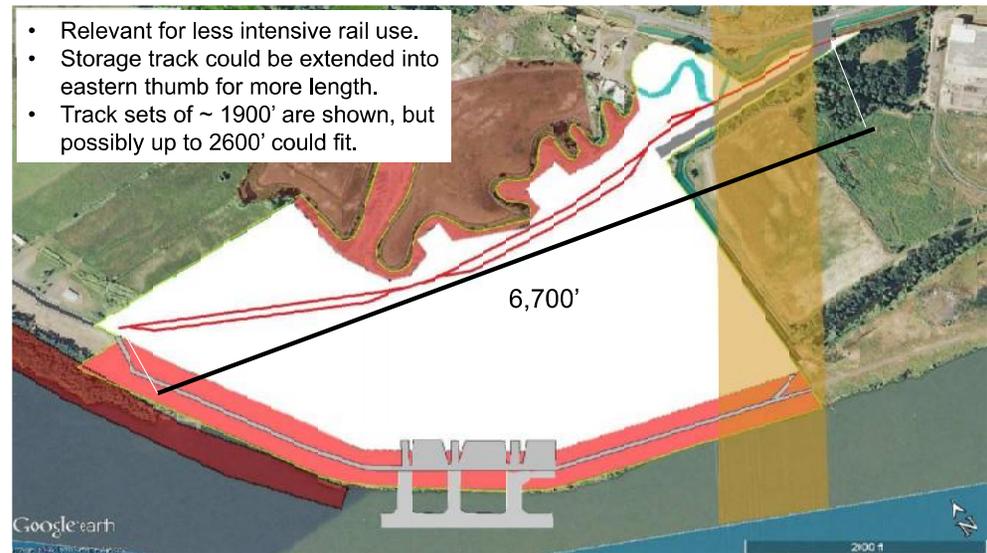
Rail Layout Option 3



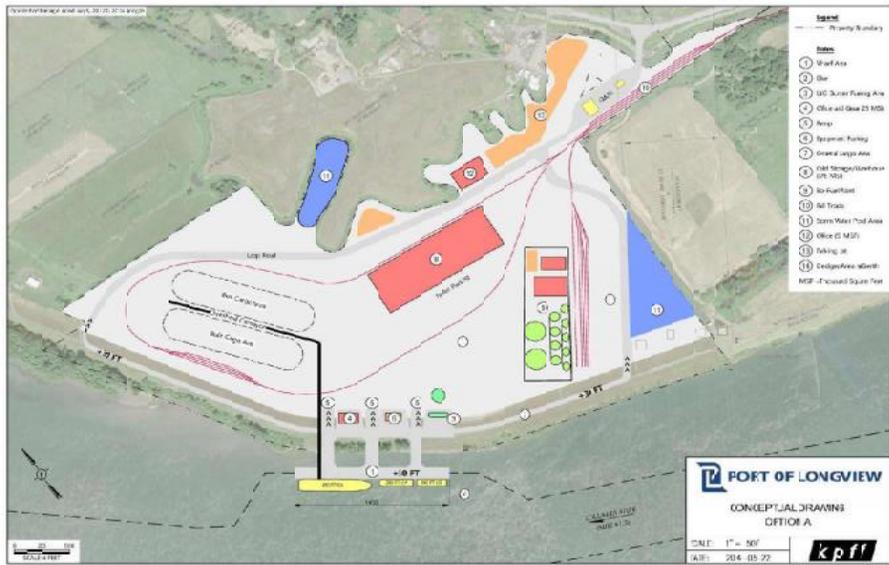
Rail Layout Option 4: Unit train can clear easily



Rail Layout Option 5: Less Than Unit Train



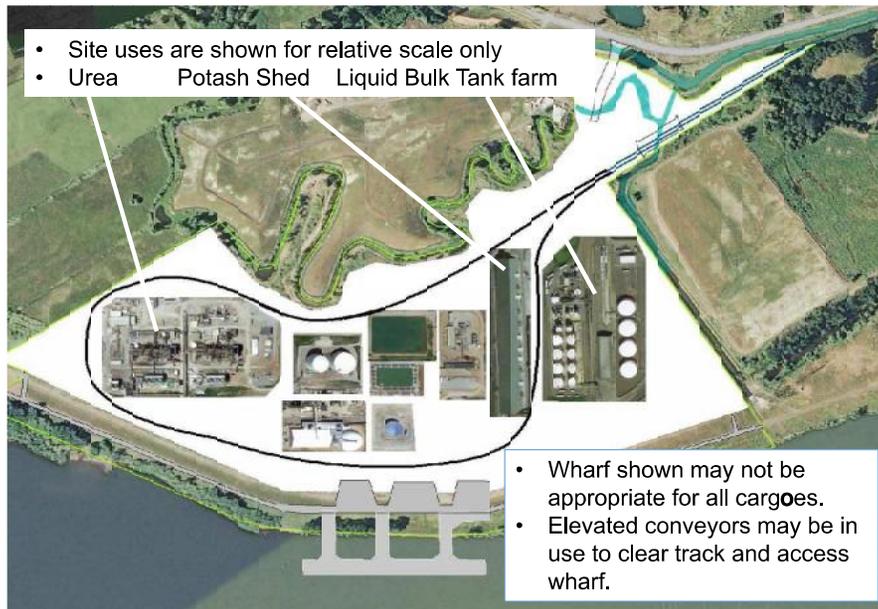
Overall Layout Option A, Presented Earlier



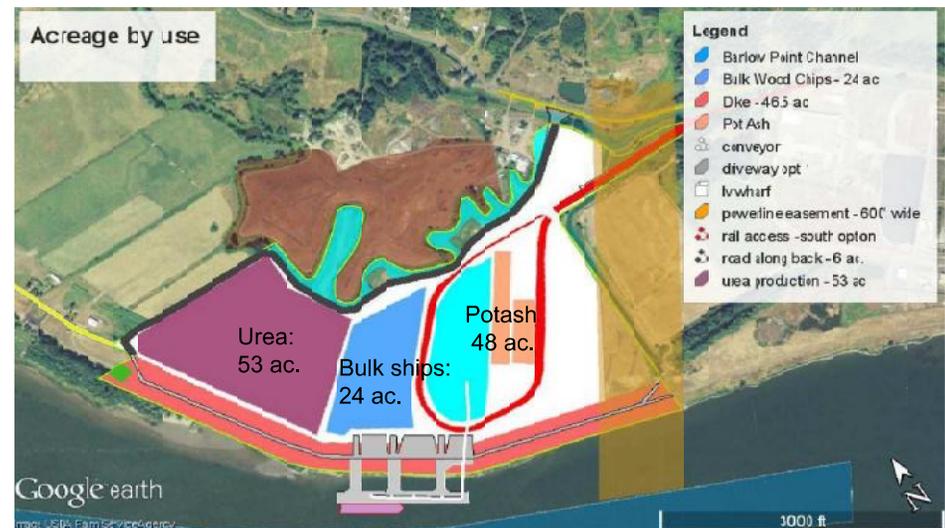
Overall Layout Option B, Presented Earlier



Option C: Urea, Potash, Liquid Bulk (to scale)



Option D: Example of Block Acreage Plan



PORT OF LONGVIEW DECISION FACTORS

Decision Factor Development by POL

- Intent: Create and prioritize factors that will be used to rank options
- Timeline: Narrow factors prior to or during December 5 work session
- Organization: Factors written in the positive
- What types: A range of benefits for Port & community
- How: Use matrix to do pair-wise comparison of each group of factors
Groups: Port financial, Port non-financial, Community
- How many: Aim for no more than 8 factors overall
- Avoid: Factors that are not variables (e.g. a must have for tenders)
- Example:

Criteria	Low Initial Cost	High Jack crane productivity	Fast crane truck service time	Low environmental impact	High safety	Scalability for future automation	Capable for Future Expansion	Lowest Cost Risk for Construction	Short Construction Duration						Sum of Scores for Each Letter	Order of Importance	Fraction of most important
A Low cost per lift	A2	A3 A4	F1	A4 A5	A5	A2 A4									30	1	100%
B Low Initial Cost	B2	B2 E2	F2 G2	B4	I2 B3										11	3	37%
C High Jack crane productivity		C2 E3	F1 C2	C2	I2 C2										8	5	27%
D Fast street truck service time		E2	F1 D1	E1	I2 D1										5	8	10%
E Low environmental impact			E2 E2	E3	E1 E4										19	2	63%
F High safety			F1	F1	F1 F1										8	5	27%
G Scalability for future automation					G1	H1 G1									4	7	13%
H Capable for Future Expansion						H1 J1									6	10	
I Lowest Cost Risk for Construction						I3									11	3	
J Short Construction Duration															1	9	

Decision Factors – Draft as selected by POL

Top 7 (Red are perhaps not variables; italics are commentary)

1. Low investment (CAPEX) required by POL
2. Maximize financial return on POL investment (e.g. per acre)
3. **Marine-dependent land use**
4. Highest and best land use (efficient, productive, high tonnage/acre)
5. High expected long-term success of planned cargo use
6. Maximize employment opportunities (cargo use requires good, new jobs)
7. **Meet or exceed (pre-defined) environmental standards**

Next preferred:

8. Highly bankable project (similar to 5)
9. Initial development results in flexible-use infrastructure (useful for other cargoes/future)
9. Long and favorable lease terms
10. Cargo use allows Longview to be a good neighbor
11. Improve connectivity (road, rail) outside of the terminal boundary (Listed as must-have)

Decision Factors – we suggest the 8 bold ones

Top 7 (Red are perhaps not variables; italics are commentary)

1. **Low investment (CAPEX) required by POL**
2. **Maximize financial return on POL investment (e.g. per acre)**
3. **Marine-dependent land use**
4. **Highest and best land use (efficient, productive, high tonnage/acre)**
5. **High expected long-term success of planned cargo use**
6. **Maximize employment opportunities (cargo use requires good, new jobs)**
7. **Meet or exceed (pre-defined) environmental standards**

Next preferred:

8. Highly bankable project (similar to 5)
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9. **Long and favorable lease terms**
10. **Cargo use allows Longview to be a good neighbor**
11. **Improve connectivity (road, rail) outside of the terminal boundary**

8 Factors, as revised by team, based on Longview responses

1. Low investment (CAPEX) required by POL
2. Maximize financial return on POL investment (e.g. per acre)
3. Highest and best land use (efficient, productive, high tonnage/acre)
4. High expected long-term success of planned cargo use
5. Maximize employment opportunities (cargo use requires good, new jobs)
6. Initial development results in flexible-use infrastructure (useful for other cargoes/future)
7. Long and favorable lease terms
8. Cargo use allows Longview to be a good neighbor



PREPARE DECISION WEIGHTING

- Decision factor ranking exercise

Action Items & Next Meetings:

Planning action items:

- Long-range Site Planning, step 2, 2 concepts (~ Jan 19?)
- Long-range Site Planning, step 3, 1 concept
- Capital Cost & Benefit Analysis
- Phasing Plan for Construction & Growth
- Basis of Design & Final Report

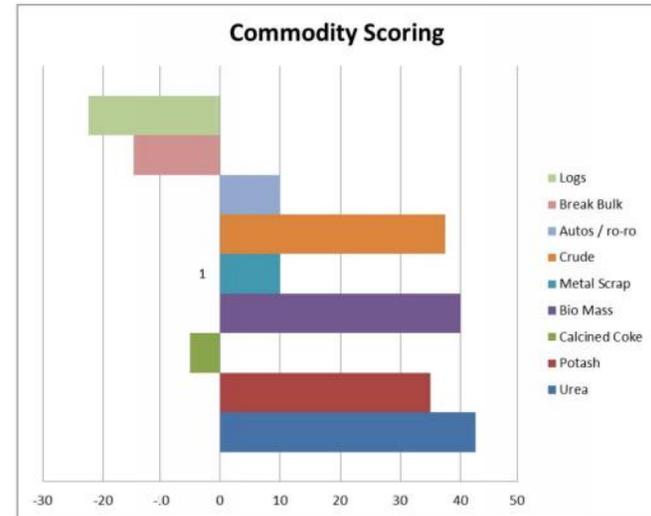
APPROACHES TO CARGO SELECTION

Cargo Selection Decision Analysis (Approach 1)

Add up the points

Points	Urea	Potash	Calcined Coke	Bio Mass	Metal Scrap	Crude	Autos / ro-ro	Break Bulk	Logs
42.5	35	-5	40	10	37.5	10	-15	-22.5	
Positive Factors									
Has shown interest in POL	20	1	1	0	0	0	1	0	0
Increasing Market	20	1	0.5	0	1	0.5	1	0	0
Above Average job creation	10	1	0	0.5	0.5	0	0	1	0
Low CAPEX Commodity	10	0	1	1	1	1	1	0	0
Limited wharf/pier requirements	5	1	1	1	1	0	0	0	0
High Revenue Commodity	5	0.5	0	0.5	0	0	0.5	0	1
Works well in multi-user facility	5	0	1	0.5	1	0	1	0	1
		0	0	0	0	0	0	0	0
Negative Factors									
Low Revenue Commodity	-5	0	1	0	1	0	0	0	0
Requires fixed assets	-5	1	1	1	0	0	1	0	0
Low Community Support	-10	0	0	0.5	0	0.5	1	1	0
Low/No Growth Commodity	-10	0	0.5	0	0	0.5	0	0	0.5
Best in a dedicated facility	-10	1	0	0	0	0.5	0.5	0	0
Existing Commodity at POL	-20	0	0	1	0	0	0	0	1
		0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0

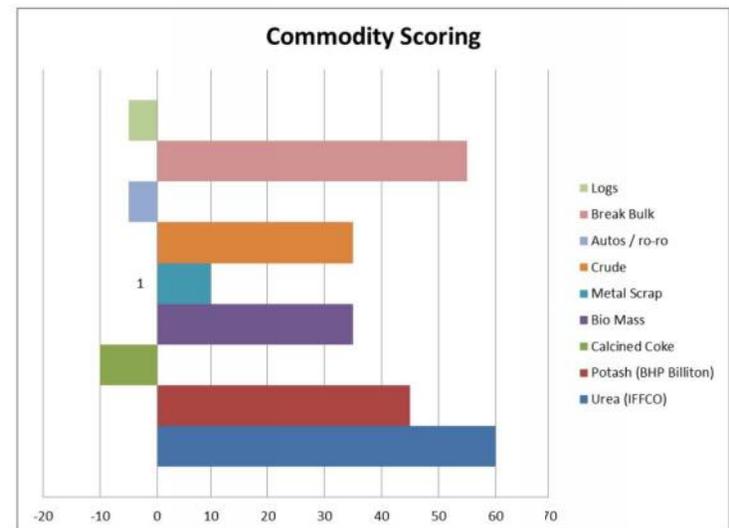
Cargo Selection Decision Analysis (Approach 1)



Cargo Selection Decision Analysis (Approach 2)

FACTORS	NEG	POS	Points	Urea (IFFCO)	Potash (BHP Billiton)	Calcined Coke	Bio Mass	Metal Scrap	Crude	Autos / ro-ro	Break Bulk	Logs
				60	45	-10	35	10	35	-5	55	-5
1. Has shown interest in POL	No	Yes	20	1	1	-1	-1	-1	1	-1	-1	-1
2. POL Investment	High	Low	20	1	1	0	1	1	-1	1	1	1
3. POL Revenue per Acre	Low	High	20	-1	1	1	0	0	1	-1	1	-1
4. Best Land Use; efficient, tons/acre	Low	High	10	0	-1	0	1	-1	0	-1	1	1
5. Expected long-term success of planned cargo	Low	High	10	1	0	1	0	1	1	0	1	0
6. Employment Opportunities	Low	High	10	1	-1	-1	-1	0	-1	1	1	0
7. Flexible use facility	Low	High	10	-1	1	-1	1	-1	-1	1	1	1
8. Potential Lease terms	Short	Long	10	1	0	1	0	1	1	-1	0	0
9. Projected Market Growth	Low	High	10	1	0	0	1	0	1	0	0	0
10. Existing POL Customer/Commodity	Yes	No	10	1	-1	-1	1	1	1	1	-1	-1
11. Cargo use allows POL to be a good neighbor	No	Yes	5	0	1	0	1	0	-1	1	1	1

Cargo Selection Decision Analysis (Approach 2)



SUPPORT SLIDES, IF NEEDED: OTHER COMMODITY INFO

AUTOS / RO-RO

- Primary Import/Export Ports
 - New York, Portland, Brunswick, Tampa
- Primary Export Markets
 - Canada, Mexico, Germany, China, Saudi Arabia

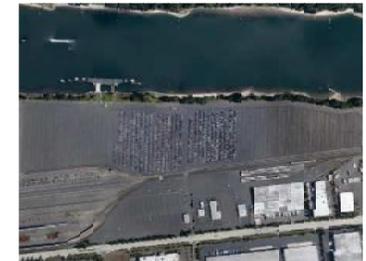
- Typical Vessel Size: Pure Car Carrier
- Typical Load: 6,000-6,500 cars
- Typical Draft: 32 ft
- Terminal Size: 150-250 AC gross
- Delivery Method: Rail & Truck
- Storage: Open
- Load Method: Self-driven

BACKGROUND



GRAYS HARBOR, WA

CHARACTERISTICS



PORTLAND, OR

AUTOS / RO-RO (cont)

Table E AUTOMOBILE TERMINAL CHARACTERISTICS AND PERFORMANCES

Case Study Model	Total Reported Area (Acres)	Reported Throughput (Vehicle / Year)	Vehicles / Acre / year	Vehicles per Acre*	Function
Colonels Island-AP, US	200	225,001	1,125	141	Import Base, common-user processing
Port of Antwerp, BE	606	1,260,000	2,079	260	Hib Center
Port of Tyne, UK	124	594,001	4,790	590	Exp., Imp., Transit port
Midway Port, LIK	260	300,001	1,154	146	Import Base
Colonels Island AutoPort, USA	346	332,001	960	123	Import Base
Southampton, UK	247	664,001	2,688	335	Exp., Imp. port
Port of Bremerhaven	494	2,100,000	4,251	531	Hib Center

Table F AUTOMOBILE TERMINAL REQUIRED AREA ESTIMATES

Case Study Model	Vehicles /Acre	300,000	500,000	750,000	1,000,000
		Vehicles/Year	Vehicles/Year	Vehicles/Year	Vehicles/Year
Estimate Required Terminal Area (Acr)					
30 Days Dwell Time					
US Industry Benchmark	60	156	266	391	521
Southampton Model	336	74	124	186	248
Bremerhaven Model	331	47	78	116	157
45 Days Dwell Time					
Industry Benchmark	60	234	391	586	781
Southampton Model	336	112	186	275	372
Bremerhaven Model	331	71	116	177	235

BULK CHEMICAL – CALCINED PETCOKE

- U.S. is the top calcined petcoke exporter in the world.
- Top US Coke Calcining Plants
 - Port Arthur, Baton Rouge, Baytown (TX); Cherry Point (WA); Whiting (IN)
- Primary Export Markets
 - China, Japan, Canada

- Typical Vessel Size: Handymax
- Typical Load: 40-55K MT
- Typical Draft: 33-36 ft
- Terminal Size: 55-100 AC gross
- Delivery Method: Rail
- Storage: Covered
- Load Method: Conveyor

BACKGROUND



HOUSTON, TX

CHARACTERISTICS



PORT ARTHUR, TX

BREAK BULK / NEO BULK

- Typical Vessel Size: Handymax
- Typical Load: 40-55K MT
- Typical Draft: 33-36 ft
- Terminal Size: 20 AC gross
- Delivery Method: Rail & Truck
- Storage: Open, paved
- Load Method: Crane

BACKGROUND



LONG BEACH, CA

CHARACTERISTICS



LOS ANGELES, CA

LOGS

- US Northwest and British Columbia are the primary source of logs in North America
- Primary Export Markets
 - China, Asia
- Export Ports
 - Longview, Coos Bay

- Typical Vessel Size: Handymax
- Typical Load: 40-55K MT
- Typical Draft: 33-36 ft
- Terminal Size: 25-35 AC gross
- Delivery Method: Rail & Truck
- Storage: Open, paved
- Load Method: Crane

BACKGROUND



COOS BAY, OR

CHARACTERISTICS



LANGDALE, BC

SUSTAINABLE PRODUCTS

- Scrap Metal
- Recycled Plastics
- Wastepaper
- Export Ports
 - LA/LB, Oakland, Portland, Tacoma, Seattle
- Bulk, containers

- Typical Vessel Size: Handymax
- Typical Load: 40-55K MT
- Typical Draft: 33-36 ft
- Terminal Size: 20-35 AC
- Delivery Method: Rail & Truck
- Storage: Open or covered
- Load Method: Crane

BACKGROUND



SCRAP METAL - OAKLAND, CA

CHARACTERISTICS



SCRAP METAL - TACOMA, WA

Summary of Cargo Characteristics

CARGO CHARACTERISTICS SUMMARY

Commodity	Delivery/Pick Up			Storage			Handling	Storage Facility Use	Manpower Level
	Rail	Truck	Pipeline	Open	Covered	Tank			
Auto	Heavy	Light	-	Heavy	Light	-	Self, Wheeled Platform	Dedicated	Heavy
Break Bulk	Heavy	Light	-	Heavy	Light	-	Crane, Forklift	Multi	Heavy
Logs	-	Heavy	-	Heavy	-	-	Crane, Forklift, On Deck Crane	Multi	Medium
Bulk Mineral	Heavy	Light	Light	Medium	Medium	-	Conveyor & Ship Loader, Crane	Dedicated	Light
Mfg Dry Bulk	Heavy	Light	-	-	Heavy	-	Conveyor & Ship Loader, Crane, On Deck Crane	Dedicated	Heavy
Bulk Chem	Heavy	Light	-	Heavy	Light	-	Conveyor & Ship Loader, Crane	Dedicated	Light
Bio Mass	Med	Med	-	Heavy	-	Light	Conveyor & Ship Loader	Multi	Medium
Liquid Bulk	Heavy	-	Heavy	-	-	Heavy	Pipeline	Dedicated	Light



BASIS OF DESIGN REFERENCE MATERIAL

Basis of Design: Bulk conveyor rates

- Typical options for bulk handling per station/equipment/conveyor:
 - Double-articulation cranes can load at a rate of 1,000 tons per hour
 - shore-based gantry cranes, reaching 2,000 tons per hour (e.g. 40 ton bucket, 1 minute cycle, = 2400 tons/hr.)
 - Conveyor belts - standard loading rates varying between 100 and 700 tons per hour
 - Conveyor at very advanced port: up to 16,000 tons per hour

Basis of Design: Train Sizes (Ref. Mainline M. 2011)

Assumptions on train sizes are based upon discussions with rail providers, terminal

- operators and consultant experience:
- Unit grain sizes are expected to remain at approximately 110 cars.
- Unit coal trains are expected to remain at 115 to 120 cars.
- Export potash trains operate with 170 cars, approximately 8,500 feet in length.
- Manifest trains will continue to operate at a maximum train size of approximately 7,000 feet.

Capacity of Vancouver, WA to Kalama/Longview, WA (Joint Rail Line)

- Congestion at Vancouver, and between Vancouver and Kalama/Longview.
- Numerous trains arrive and depart the main line to access marine terminals moving at slow speeds
- Need: third main track through the Kalama/Longview area, as well as construction of a bulk train staging and storage facility near Woodland.

Basis of Design: Ships





BARLOW POINT PLANNING – MEETING 3

PORT OF LONGVIEW, WA.

FEB 19, 2015

Delivery to:



Consultant Team:



Review Site Concepts

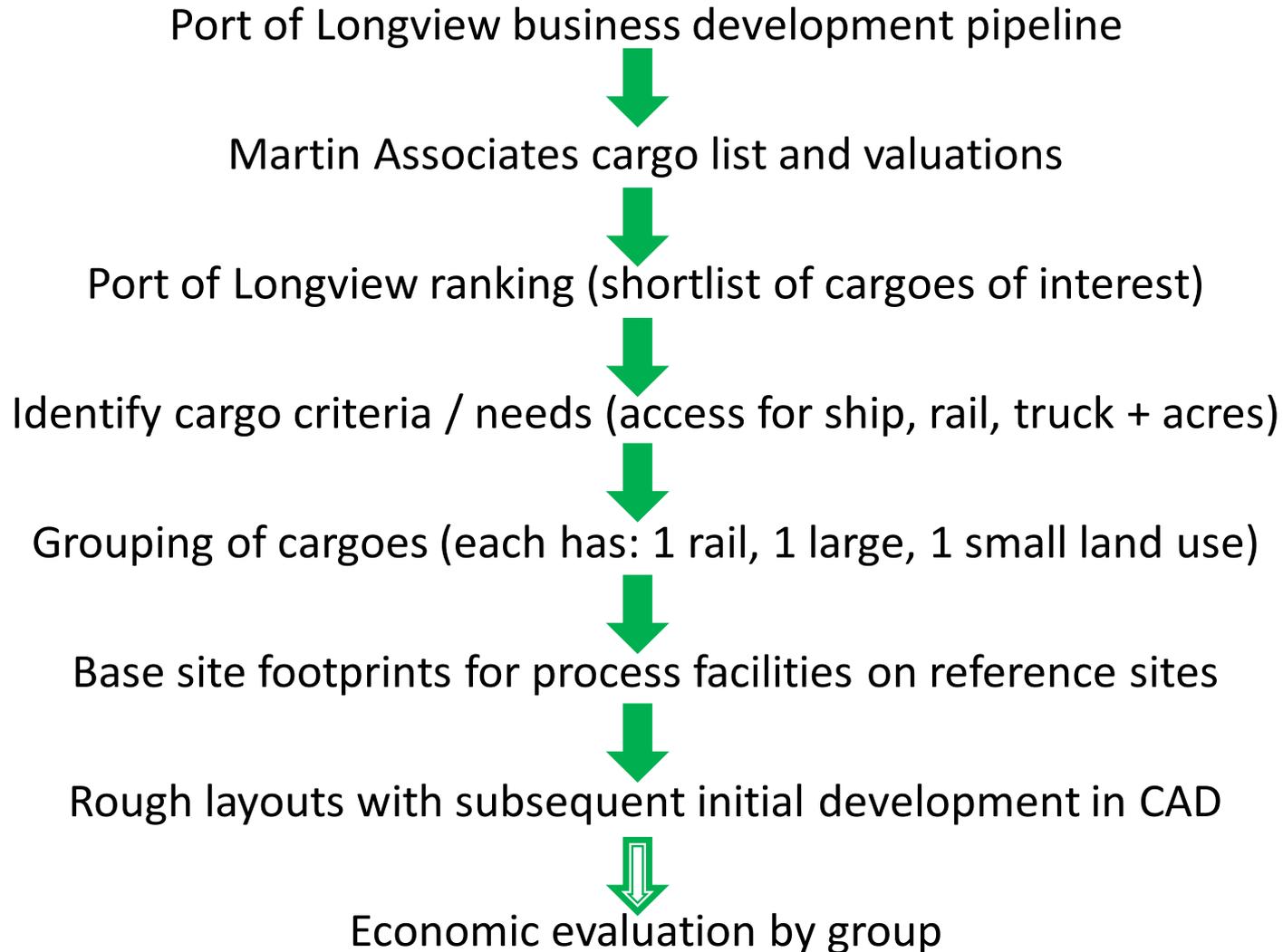
Decision Matrix Evaluation

Next Steps



- Work completed since Dec. 5 meeting
 - Market analysis to identify target cargoes
 - Clarified site constraints (BPA easement, location of dike toe)
 - Cargo analysis, infrastructure requirements
 - Identified estimated cargo tonnages
 - Investigated expected ship sizes
 - Identified wharf design factors
 - Assessed rail length needs
 - Evaluated cargo space requirements
 - Prepared optional site configurations
- Feedback needed during meeting to move ahead
 - Confirm with broader group the cargo priorities provided during January 26th call
 - Decide if two options move ahead or only one
 - Decide how much detail to show on revised options

Our process to arrive at the options presented today



Market opportunities for Barlow Point (input from Martin Associates). Ranked in order of tonnage.

Cargo	Volume	MA Notes
CRUDE OIL	8.3 million MT	Based on planned activity at Columbia River ports.
POTASH	2 - 8 million MT	Based on actual data provided by BHP Billiton.
UREA	1.8 million MT	Based on actual manufacturing facility in Enid, OK.
METHANOL	1 million MT	Based on review of numerous plants under construction in the U.S.
BIODIESEL	340,000 MT	Based on operation of a similar facility in PNW.
WOOD PELLETS	150,000 MT	Based on actual data from existing wood pellet operations.

Economic impact of identified cargoes per Martin Associates.

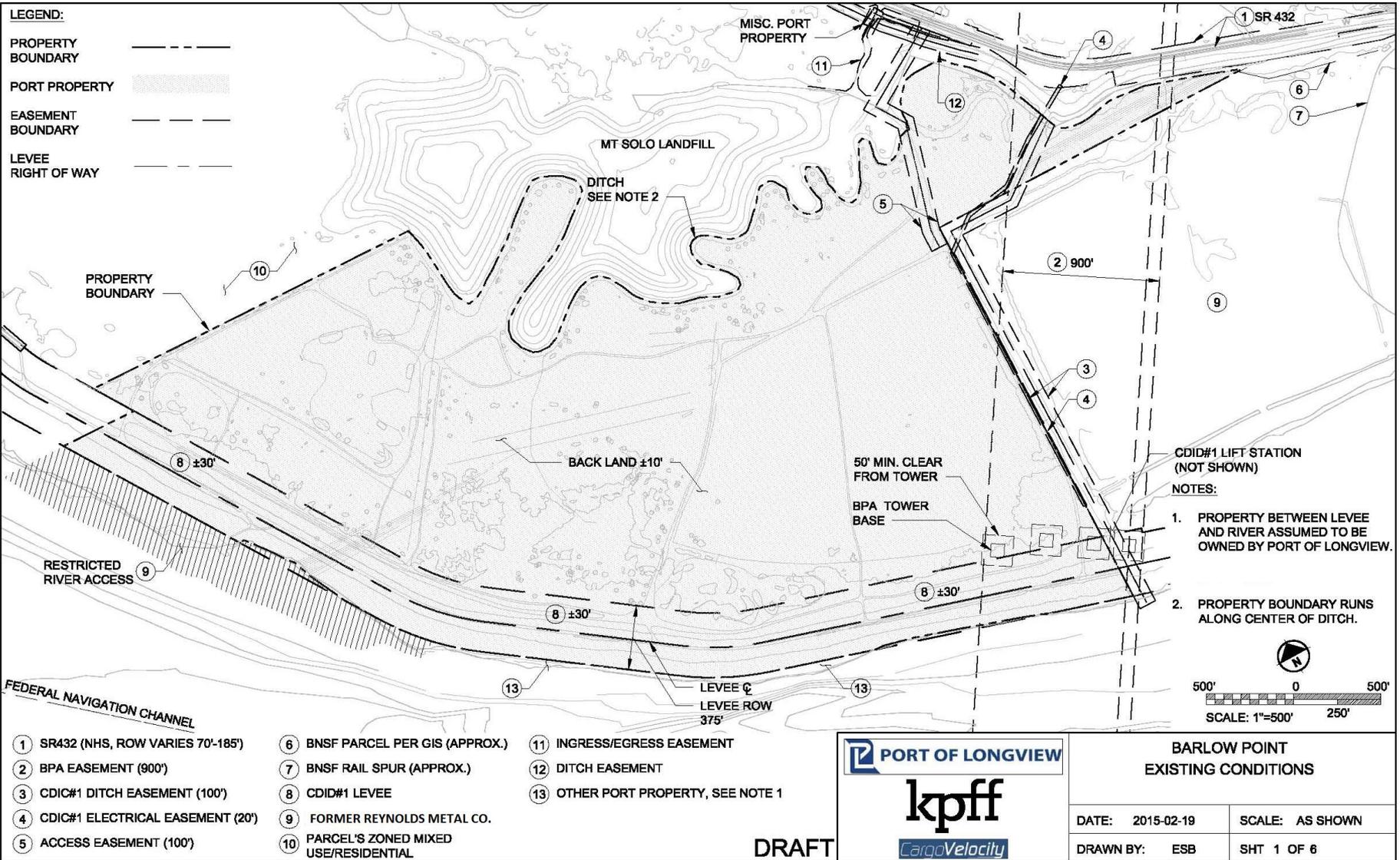
	Crude 8.3 Million Tons	Biodiesel 350,000 Tons	Urea 1.8 Million Tons	Wood Pellets 200,000 Tons	Potash 8 Million Tons	Methanol 1 Million Tons
JOBS						
DIRECT	393	101	270	55	348	223
INDUCED	497	126	424	63	496	339
INDIRECT	<u>462</u>	<u>119</u>	<u>317</u>	<u>65</u>	<u>410</u>	<u>262</u>
TOTAL	1,352	346	1,011	183	1,254	824
PERSONAL INCOME (1,000)						
DIRECT	\$20,455	\$5,158	\$18,024	\$2,540	\$20,772	\$14,340
RESPENDING/LOCAL CONSUMPTION EXPENDITURES	\$49,892	\$12,581	\$43,961	\$6,195	\$50,665	\$34,976
INDIRECT	<u>\$18,431</u>	<u>\$4,737</u>	<u>\$12,668</u>	<u>\$2,579</u>	<u>\$16,320</u>	<u>\$10,444</u>
TOTAL	\$88,778	\$22,476	\$74,653	\$11,314	\$87,757	\$59,759
BUSINESS REVENUE (1,000)	\$498,131	\$10,241	\$71,595	\$27,294	\$281,839	\$39,775
LOCAL PURCHASES (1,000)	\$27,376	\$7,035	\$18,816	\$3,831	\$24,241	\$15,512
STATE AND LOCAL TAXES (1,000)	\$8,415	\$2,130	\$7,076	\$1,073	\$8,318	\$5,664

Notes:

- Direct terminal impacts based on actual operations at U.S. ports
- Induced and indirect impacts and maritime services impacts based on Port Longview Economic Impact Model developed by Martin Associates

- Economics suggest Barlow Point best suited to bulk handling facilities.
- Bulk cargoes are compatible with current operations at other Port of Longview facilities (no competition).
- Rail and manufacturing based cargoes present the greatest opportunity.
- Rail infrastructure is important to the success of Barlow Point.
- **Additional conclusions?**

Opportunities map



Infrastructure requirements for target cargoes

- The basis of design used by the KPFF team for developing the cargo layouts presented today.

Cargo	Shared Berth	Rail Use	Unloading	Special Handling	Truck Volume	Shared Gate	Reqd Paving	Structures
CRUDE OIL	possible	dedicated	bottom dump	pipeline, heating, vapor recovery	minimal	yes	minimal	storage tanks, rail, office, pipelines
POTASH	no	dedicated	bottom dump	covered conveyor	minimal	yes	minimal	shed, conveyor, rail, office
UREA	no	none	n/a	covered conveyor	minimal	yes	minimal	mfg plant, waste water storage/treatment, storage shed, conveyor, admin/offices
METHANOL	possible	none	n/a	pipeline, vapor recovery	minimal	yes	minimal	mfg plant, pipeline, storage tanks, office
BIODIESEL	possible	low	bottom dump	pipeline, heating, vapor recovery	minimal	yes	yes	mfg plant, pipeline, storage tanks, rail, office
WOOD PELLETS	possible	minimal	bottom dump	covered conveyor	low	yes	minimal	shed, silos, office, conveyor

Basis of design review for vessels

- Does Port of Longview agree with this assessment?
- Thoughts on how Columbia River Environment should control design criteria?

Cargo	Standard Sizes Suitable For Columbia River					Observations From Reference Sites			
	Vessel Class	Capacity	Typical Vessel LOA	Typical Vessel Beam	Typical Vessel Draft	Pier Structure Length	Distance between Moorings	Length of Vessel Alongside	Location
CRUDE OIL	Aframax	80-120K DWT	830 ft.	145 ft.	38 ft.				
	Panamax	60-80K DWT	750 ft.	106 ft.	41 ft.				
						285 ft.	830 ft.	475 ft.	Grays Harbor, WA
						345 ft.	975 ft.	945 ft.	Cherry Point, WA
METHANOL						475 ft.	770 ft.	590 ft.	Point Lisas, Trinidad
		50,000 DWT	609 ft.	105 ft.	41 ft.				
		~45,000 DWT	590 ft.	105 ft.	40.5 ft.				
UREA	Handymax	35 - 50K DWT	650 ft.	105 ft.	39 ft.				
POTASH	Handymax	35 - 50K DWT	650 ft.	105 ft.	39 ft.				
						825 ft.	835 ft.	650 ft.	Portland, OR
						820 ft.	820 ft.	760 ft.	Vancouver, BC

Confirm expected train lengths with Port and verify track requirements.

Cargo	Cars/Train	Train Length	Volume/Train	Trains/Day
CRUDE OIL	130	7,700 ft	60K - 90K bbl.	2 - 4
POTASH	174	8,362 ft	2,800 MT	2+
UREA	n/a	n/a	n/a	minimal
METHANOL	n/a	n/a	none	none
BIODIESEL	n/a	n/a	n/a	none
WOOD PELLETS	n/a	n/a	n/a	minimal

- Maximum train length on CN tracks is currently 10,000 ft.
- Maximum train length on BNSF tracks is currently 8,500 ft.
- Plan track length at Barlow point for a minimum of 18,000 ft. to avoid breaking units trains.

Group cargoes by related wharf, land-use, rail needs

We used the requirements to identify compatible cargoes for two options.

1. Decked wharf & open storage needed:

- None

2. Single-use wharf, tank storage with pipeline:

- Liquid Bulk
 - Crude oil (*rail intensive*)
 - Bio-fuel (*manufacturing*)
 - Methanol (*manufacturing*)

3. Multi-use wharf, enclosed storage, using conveyors:

- Dry Bulk with silo storage
 - Wood Pellets

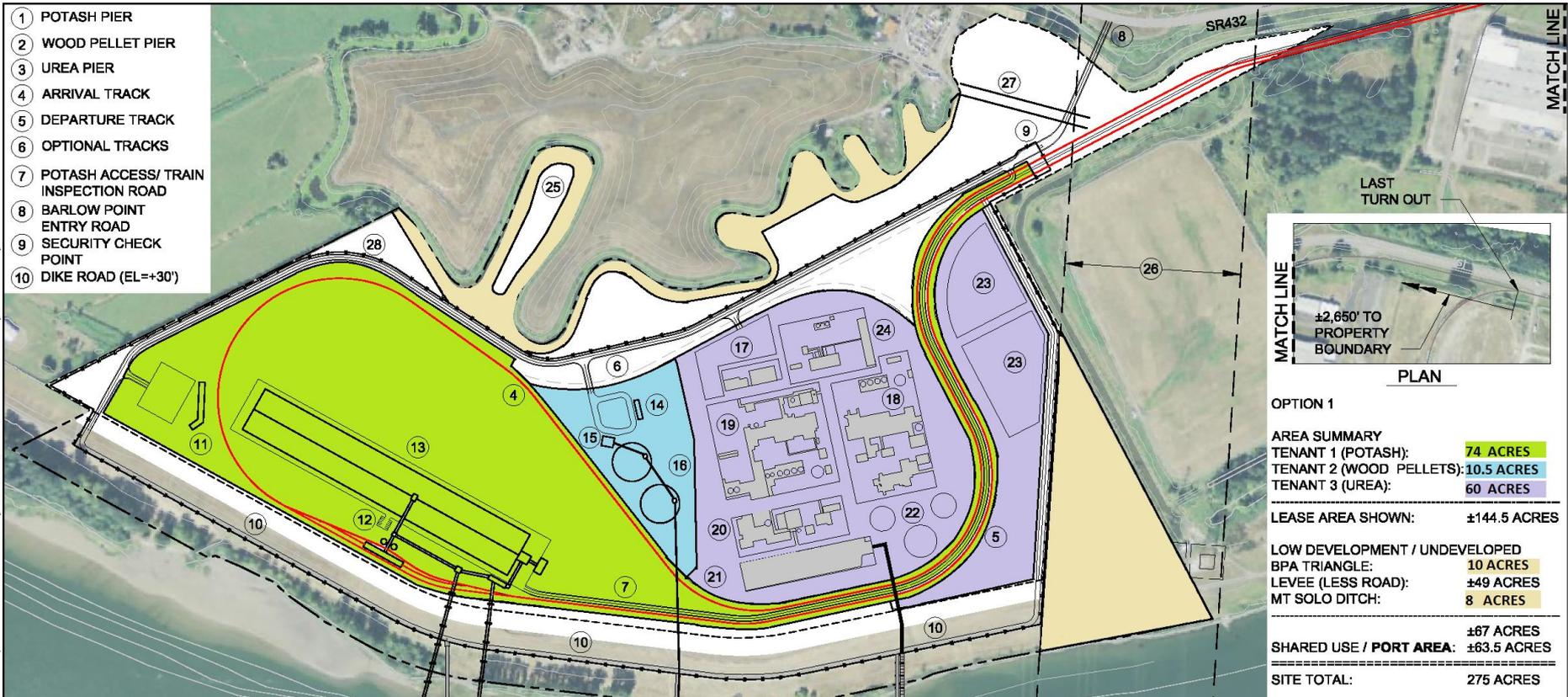
4. Single-use wharf, enclosed storage, using conveyors:

- Dry Bulk with shed storage
 - Urea (*manufacturing*)
 - Potash (*rail intensive*)

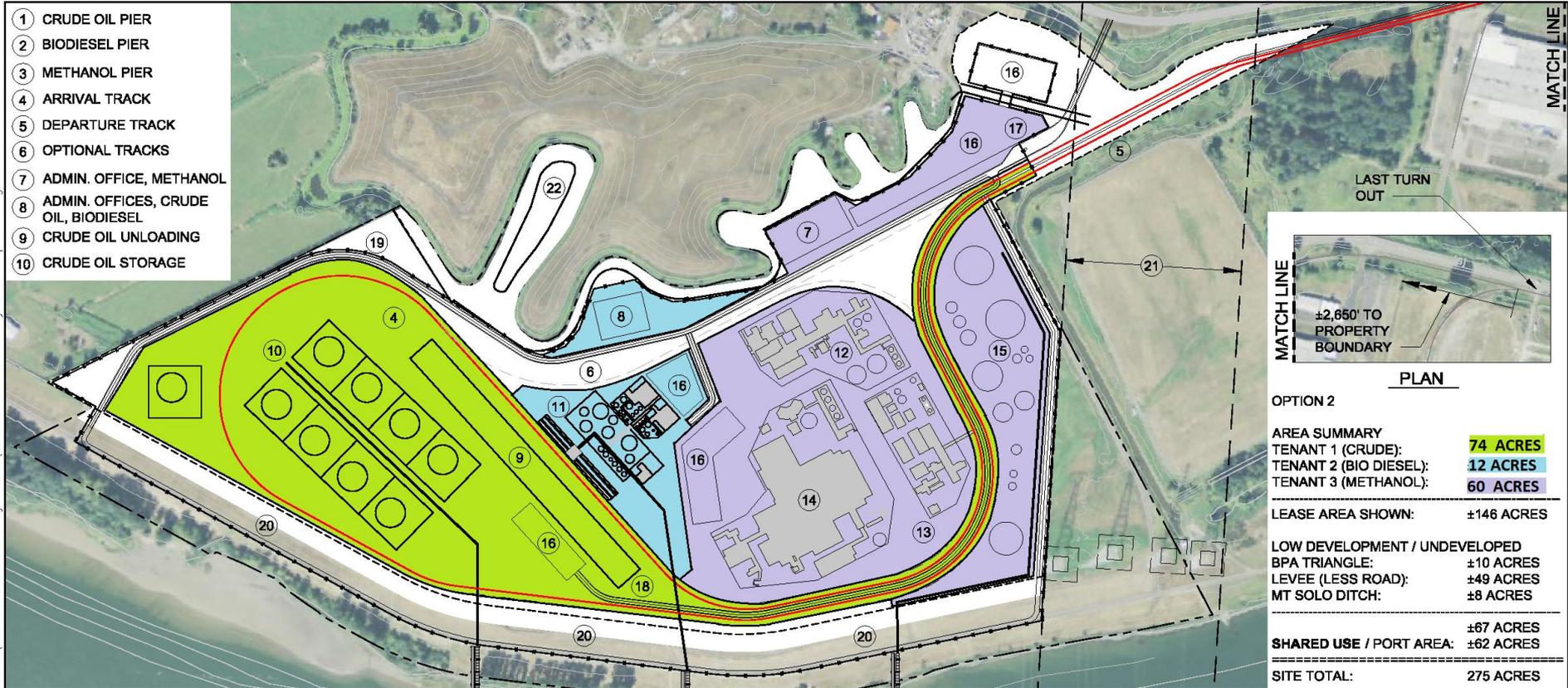
5. Summary Grouping

Cargo	Acreage Rqmt	Option 1	Option 2
CRUDE OIL	15 - 50	X	
POTASH	35 - 70		X
UREA	50 - 70		X
METHANOL	45 - 75	X	
BIODIESEL	10 - 20	X	
WOOD PELLETS	5 - 10		X
Acreage Req'd		70 - 145	90 - 150

Layout Option 1



Layout Option 2



Site layout options: land use comparison

Component	OPTION 1	OPTION 2
Tennant leasable	144.5 acres	146 acres
No/low development	67 acres	67 acres
Port/shared use	63.5 acres	62 acres
Total	275 acres	275 acres
% efficient	52.5%	53 %

Site layout options: pros and cons

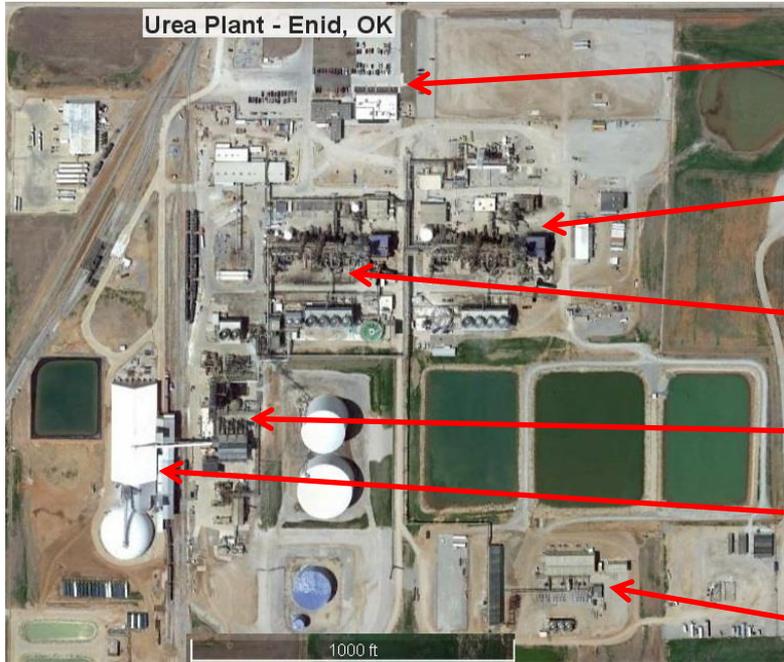
- Layout Option 1: Potash, Urea, Wood Pellets
 - Dry Bulk, long trains, on-site manufacturing, dedicated piers
- Layout Option 2: Crude Oil, Methanol, Biodiesel
 - Liquid Bulk, long trains, on-site manufacturing, dedicated piers

	Pros	Cons
Layout Option 1	Long term leases High employment High investment by others Flexible rail infrastructure Medium revenue	Separate leases Limited reuse of tenant improvements Medium volume Lower land use efficiency
Layout Option 2	Long term Leases High employment High investment by others Flexible rail infrastructure High revenue High volume	Separate leases Moderate risk Limited reuse of tenant improvements

Should other cargo combinations be considered?

- POL Preference from Meeting #2: General use pier for multiple cargoes, plus one single use pier.
 - Identified cargoes do not require general use pier
 - Characteristics of key cargoes are rail or manufacturing
- Scenario 3: Other combination of cargoes (e.g. all manufacturing, all rail, etc.)
 - Suggested combination is one rail based cargo, one manufacturing based cargo and one (or more) small volume cargoes.

Planned urea plant vs. reference site



Admin Offices

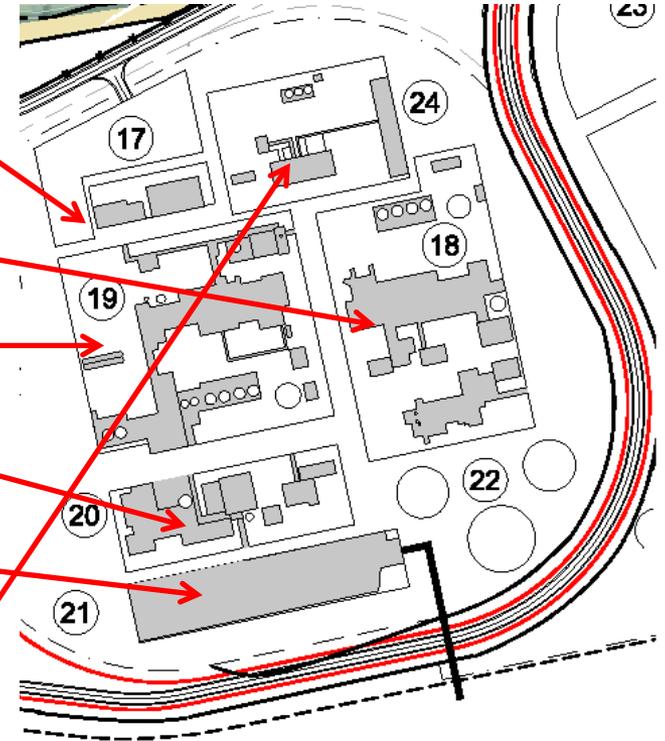
Ammonia Production

Urea Production

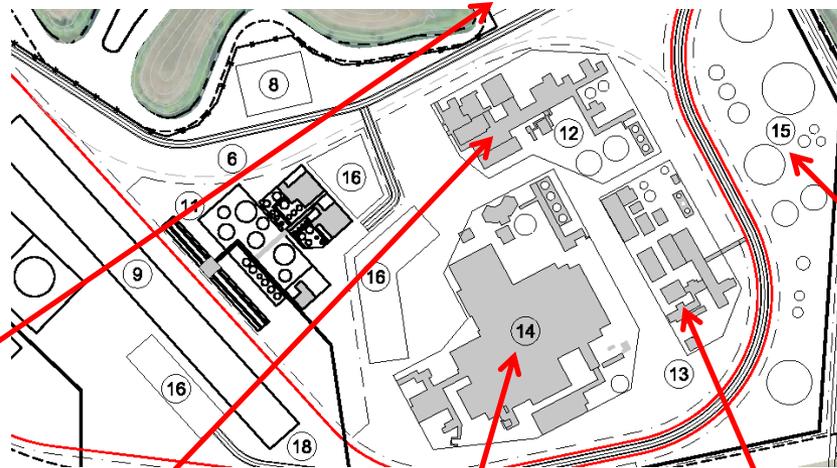
Granulating

Storage

Water Treatment



Planned methanol plant vs. reference site



- 1. Admin Offices
- 2. Feed Purification
- 3. Synthesis
- 4. Methanol Purification
- 5. Storage



Methanol Plant - Pt. Lisas, Tinidad

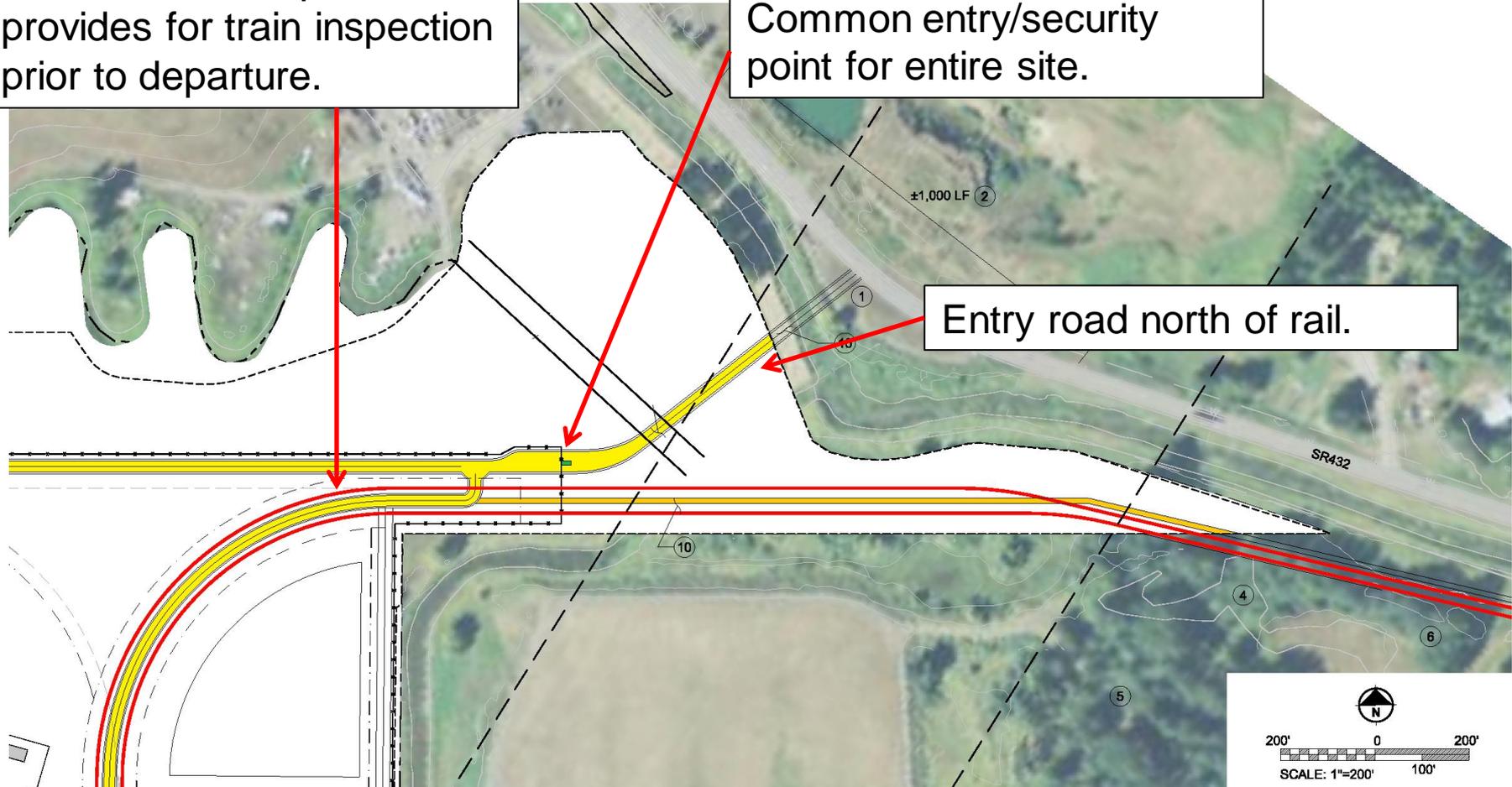
1000 ft

Site entry coordinates with rail to provide flexibility for all tenants

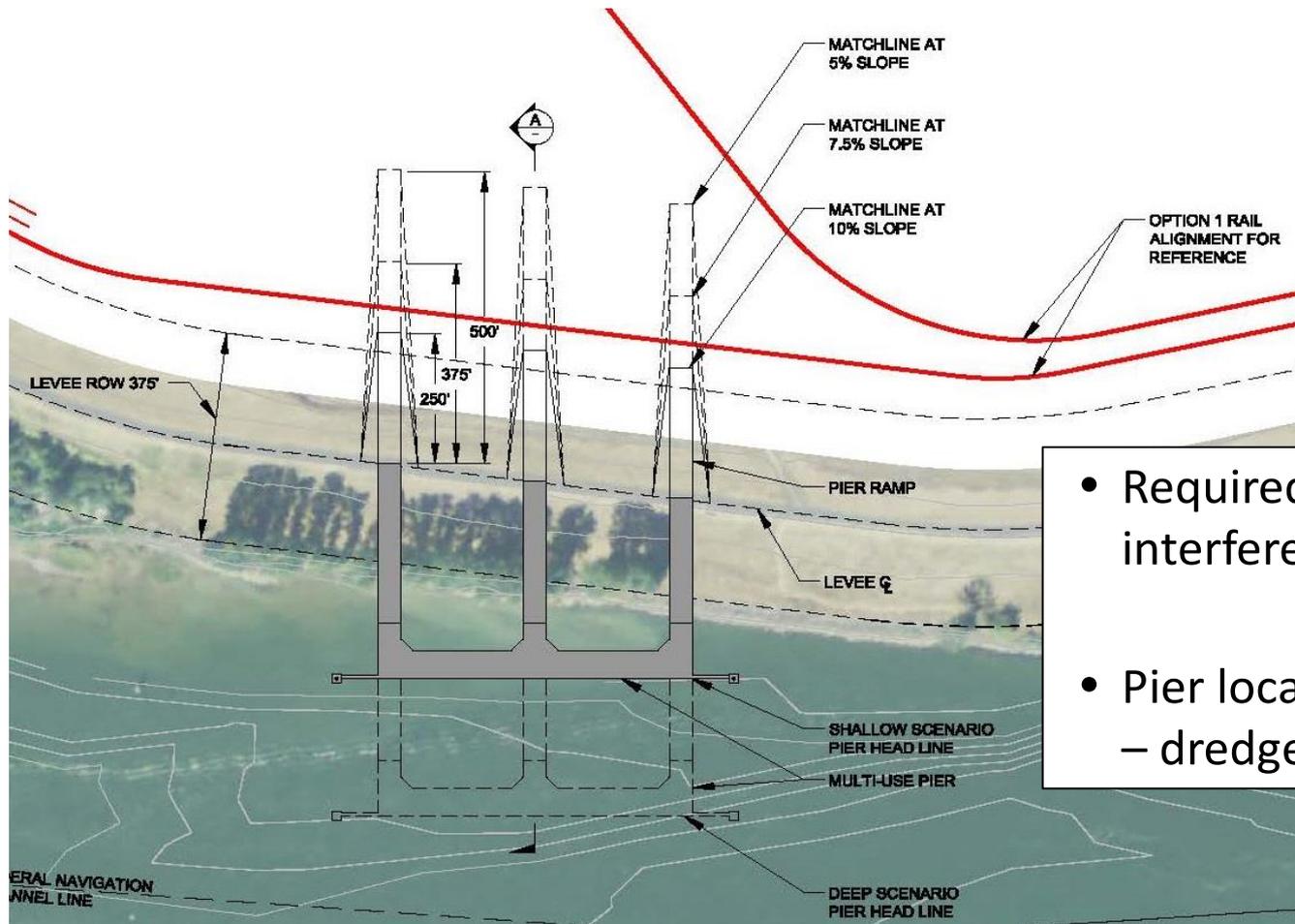
Separate access road to interior of rail loop. Also provides for train inspection prior to departure.

Common entry/security point for entire site.

Entry road north of rail.

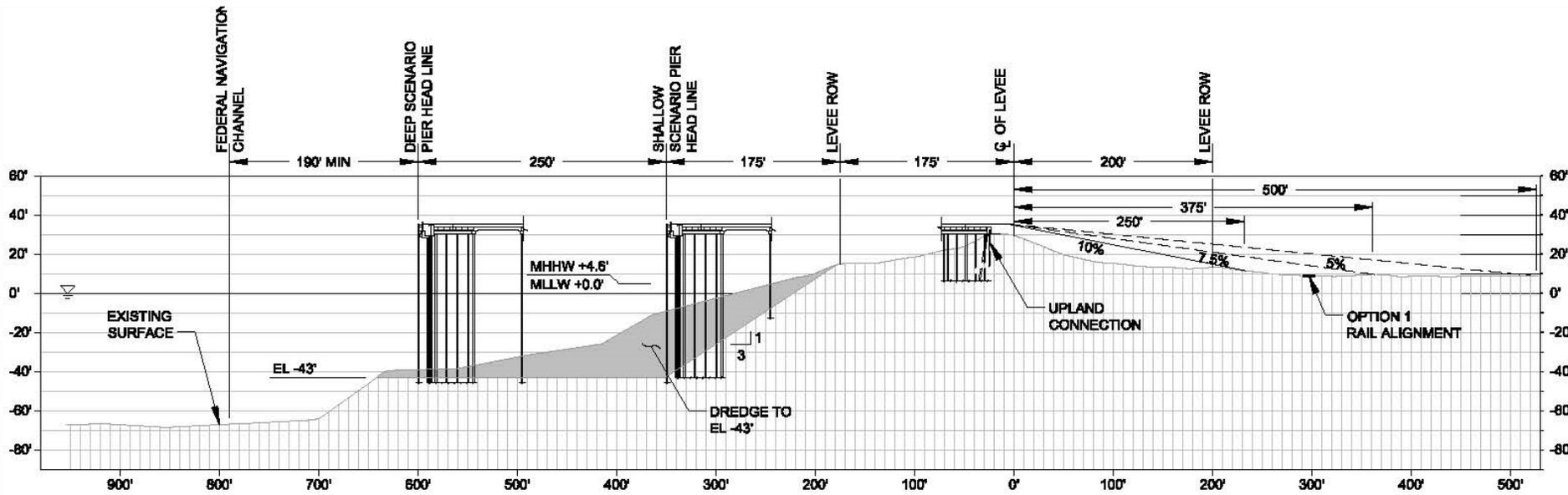


Bulk handling vs. multi-purpose pier



- Required ramp length interferes with rail routing
- Pier location cost consideration – dredge vs structure

Multi-use pier location vs dredge. No low cost option.



SECTION A

Decision matrix scoring review

- Exercise: Decision matrix evaluation of current options

- Finalize decision matrix
- Refine a single option (or two?)
- Estimate capital costs
- Criteria, limits and comments on cargo development phasing
- Basis of Design Report
- Complete Due Diligence Environmental and Engineering Studies
- Meetings:
 - Pilots
 - BNSF & UPRR
 - Diking District (Corps of Engineers)
 - BPA
- What Content does POL need for these meetings? (drawings, video?)
 - Tenants (Fall)
 - Public (Fall)
 - Possible Customers
 - BNSF & UPRR
 - City of Longview

END

Reference data from Martin Associates

OPPORTUNITIES FOR BARLOW POINT

Key Market Opportunities for Barlow Point

- **BHP Billiton**
- **Methanol plant**
- **Fertilizer exports (urea)**
- **Wood pellets/biomass**
- **Auto/RoRo facility**
- **Liquid bulk (LPG) export facility**
- **Dry bulk facility—**
 - Ores exports
 - Barite imports

Shortlist of Projects

- **BHP Billiton- 8 million Tons of Potash exports**
 - Based on actual data provided by BHP Billiton
 - **Methanol Plant – 1 million tons**
 - Based on a review of numerous methanol plants now under construction in U.S.
 - Assume 150 jobs in plant plus maritime services impact
 - Rail supplied natural gas
 - **Urea – 1.8 million tons**
 - Based on actual manufacturing facility in Enid, OK
 - **Crude – 8.3 million tons**
 - Based on PNW planned activity at Columbia River ports
 - **Biodiesel - 337,000 tons**
 - Based on actual operations of similar facility in PNW
 - **Wood Pellets – 150,000-200,000 tons**
 - Based on actual operations of existing pellet operation
-

Economic Impact Analysis

- **Develop direct terminal impacts based on actual operations at U.S. ports as detailed previously**
 - **Induced and indirect impacts and maritime services impacts based on Port Longview Economic Impact Model developed by Martin Associates**
-

Economic Impact of Selected Projects

	Crude 8.3 Million Tons	Biodiesel 350,000 Tons	Urea 1.8 Million Tons	Wood Pellets 200,000 Tons	Potash 8 Million Tons	Methanol 1 Million Tons
JOBS						
DIRECT	393	101	270	55	348	223
INDUCED	497	126	424	63	496	339
INDIRECT	<u>462</u>	<u>119</u>	<u>317</u>	<u>65</u>	<u>410</u>	<u>262</u>
TOTAL	1,352	346	1,011	183	1,254	824
PERSONAL INCOME (1,000)						
DIRECT	\$20,455	\$5,158	\$18,024	\$2,540	\$20,772	\$14,340
RESPENDING/LOCAL CONSUMPTION EXPENDITURES	\$49,892	\$12,581	\$43,961	\$6,195	\$50,665	\$34,976
INDIRECT	<u>\$18,431</u>	<u>\$4,737</u>	<u>\$12,668</u>	<u>\$2,579</u>	<u>\$16,320</u>	<u>\$10,444</u>
TOTAL	\$88,778	\$22,476	\$74,653	\$11,314	\$87,757	\$59,759
BUSINESS REVENUE (1,000)	\$498,131	\$10,241	\$71,595	\$27,294	\$281,839	\$39,775
LOCAL PURCHASES (1,000)	\$27,376	\$7,035	\$18,816	\$3,831	\$24,241	\$15,512
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