

Appendix D
**Coal Export Terminal Stages
of Construction and Operations**

**Millennium Bulk Terminals—Longview
Coal Export Terminal Stages of Construction and Operations**

TABLE 1

Stage of Construction/Operations: Stage 1a Construction

Description: Start of Stage 1 Construction

Timing: 0–1.5 years (18 months) from the start of construction

Approximate Years:¹ 2018–2020

Throughput Capacity: 0 MMTPY²

Stage 1a Construction	
Project Component	Activity
Number of Construction Workers	<ul style="list-style-type: none"> • 1,350 construction workers (combined number of workers for all construction activities associated with Stage 1 and Stage 2)
Construction Trips	<ul style="list-style-type: none"> • Total construction trips are dependent on how material is imported during preloading activities (numbers below are combined for preloading activities during Stage 1 and Stage 2): <ul style="list-style-type: none"> ○ If all material is imported by truck: approximately 88,000 loaded truck trips over an approximate 5-year period with the majority of the truck trips occurring during the first 1 to 2 years (Stage 1). ○ If all material is imported by rail: approximately 35,000 loaded railcars over an approximate 5-year period with the majority of the railcars received during the first 1 to 2 years (Stage 1). ○ If all material is imported by barge: approximately 1,130 barge trips over an approximate 5-year period with the majority of the barge trips occurring during the first 1 to 2 years (Stage 1)
Construction Staging	<ul style="list-style-type: none"> • Demolish existing structures • Prepare site area and make ground improvements/grading • Stockpile area, including preloading for stockpile pads (2 out of 4 stockpile pads would be preloaded during Stage 1 construction). • Coal export terminal start-up facilities <ul style="list-style-type: none"> ○ One shiploader and related conveyors on Dock 2 ○ Rail car unloading facilities (rapid unloader, bottom dumper) ○ Associated facilities and infrastructure (i.e., conveyors, etc.) • Construct rail loop <ul style="list-style-type: none"> ○ Complete berm for rail tracks ○ Install up to 8 rail storage tracks for train parking ○ Install 1 operating track • Conduct dredging in the Columbia River • Construct 2 docks (Docks 2 and 3) and trestle
Demolition of Existing Structures	<ul style="list-style-type: none"> • Demolish existing cable plant building (approximately 270,000 ft²) • Demolish existing potline buildings (approximately 600,000 ft²) and some smaller ancillary structures • Duration of approximately 6 months
Site Preparation	<ul style="list-style-type: none"> • Clearing of vegetation

¹ Assumes that construction begins 2018

² MMTPY = million metric tons per year

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Approximate Years:¹ 2018–2020

Throughput Capacity: 0 MMTPY²

Stage 1a Construction	
Project Component	Activity
	<ul style="list-style-type: none"> • Grading • Earthmoving • Earthworks • Construction of erosion control facilities (including settlement ponds) • Duration of approximately 3 months
Preloading	<ul style="list-style-type: none"> • Initiation of rolling preload: up to 7 years total for entire stockpile areas (continues through construction of both Stage 1 and Stage 2) • Preloading would commence on 2 of the 4 stockpiling areas • Existing soil conditions would be strengthened to improve load-bearing capacity • Preload material would be imported and wick drains would be installed for ground improvement for the stockyard area • Preload material would be placed in a pile approximately 35 feet high covering the area of the berm and adjacent stockpile pad(s) • Process would be repeated at each berm and stockpile location until soil consolidation is achieved across the complete stockyard • Groundwater expelled through the wick drains would be collected, treated, and discharged to the Columbia River • Excess preload material would be used on site, stockpiled, or removed from the area • Approximately 2.1 million cubic yards of preload material would be imported (Stage 1 and Stage 2) • Approximately 2.5 million cubic yards of material would be moved around the project area (Stage 1 and Stage 2)
Construction/Installation of Coal Export Terminal Equipment	<ul style="list-style-type: none"> • Coal would not be stockpiled during any stage of construction • Installation of plant and equipment for start-up operations would include: <ul style="list-style-type: none"> ○ One operating track ○ Up to 8 rail storage tracks for train parking/staging ○ One rapid discharge (bottom) tandem railcar unloader to unload coal for transfer by conveyor to the dock for shiploading; the rail car unloader would be capable of unloading 2 railcars at once. ○ Conveyors, buffer bin, and transfer towers, including approximately 4,300 lineal feet of conveyors, of which approximately 1,000 lineal feet would be open conveyors and approximately 3,300 lineal feet would be enclosed ○ Dock 2 and Dock 3 ○ One shiploader on Dock 2 ○ Support structures, electrical transformers, switchgear and equipment, process control systems, buildings, etc.
Rail Loop Construction	<ul style="list-style-type: none"> • Importing and placing of approximately 130,000 cubic yards of ballast rock for the rail foundations • Placement of railroad ties • Laying of steel rail lines

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Approximate Years:¹ 2018–2020

Throughput Capacity: 0 MMTPY²

Stage 1a Construction	
Project Component	Activity
	<ul style="list-style-type: none"> • Installation of signaling • Installation of switching equipment • Installation of track lighting • Installation of 1 rapid discharge (bottom) tandem railcar unloader
Dredging, Trestle, and Dock Construction	<ul style="list-style-type: none"> • Dredging would occur as part of the construction of Docks 2 and 3 (simultaneous with site prep and preload; may require 2 fish windows to complete) • Dredging would remove approximately 500,000 cubic yards of material over a 48-acre area and to a depth of -43 feet Columbia River Datum • Dredging would be required from the river side face of the dock out to the Columbia River navigation channel; the riverbed would be sloped from the dock to the riverbank with a 3H:1V slope • Dock and trestle construction would include pile driving of approximately 630 36-inch-diameter steel pipe piles, 610 of which would be installed in aquatic areas below ordinary high water • Piling would be installed from approximately 140 to 165 feet below the mudline • Dredge spoils will be disposed of adjacent to the navigation channel between approximately river mile 60 and 66 • Approximately 225 linear feet (125 feet and 100 feet, respectively) of the existing west and east pile dikes would be removed

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TABLE 2

Stage of Construction/Operations: Stage 1b Construction and Start-Up Operations

Description: Continuation of Stage 1 construction through completion of Stage 1 construction and start-up operations

Timing: 0–3 years from the start of construction

Approximate Years¹: 2018–2021

Throughput Capacity: 5 to 10 MMTPY²

Stage 1b Construction		Start-Up Operations	
Project Component	Activity	Project Component	Activity
N/A	N/A	Number of Trains	Arrival of coal by rail: <ul style="list-style-type: none"> Up to 10 MMTPY throughput capacity Up to 60 unit trains arriving and departing monthly
N/A	N/A	Number of Vessels	Transfer of coal to ship: <ul style="list-style-type: none"> Up to 10 MMTPY throughout capacity Up to 15 ships loaded monthly (80% Panamax, 20% Handymax)
Number of Construction Workers	<ul style="list-style-type: none"> 1,350 construction workers (combined number of workers for all construction activities associated with Stage 1 and Stage 2) 	Number of Employees	<ul style="list-style-type: none"> 60 employees required
Construction Trips	<ul style="list-style-type: none"> Construction trips are dependent on how material is imported during preloading activities (numbers below are combined for preloading activities during Stage 1 and Stage 2): <ul style="list-style-type: none"> If all material is imported by truck: approximately 88,000 loaded truck trips over an approximate 5-year period with the majority of the truck trips occurring during the first 1 to 2 years (Stage 1) If all material is imported by rail: approximately 35,000 loaded railcars over an approximate 5-year period with the majority of the railcars received during the first 1 to 2 years (Stage 1) If all material is imported by barge: approximately 1,130 barge trips over an approximate 5-year period with the majority of the barge trips occurring during the first 1 to 2 years (Stage 1) 	N/A	—
Construction/Installation of Coal Export Terminal	Coal would not be stockpiled during any stage of construction. Would include the installation of additional facilities and	Rail Cars/Trains	<ul style="list-style-type: none"> Inbound and outbound trains would be staged on site on up to eight available storage tracks

¹ Assumes that construction begins 2018

² MMTPY = million metric tons per year

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TABLE 2

Stage of Construction/Operations: Stage 1b Construction and Start-Up Operations

Description: Continuation of Stage 1 construction through completion of Stage 1 construction and start-up operations

Timing: 0–3 years from the start of construction

Approximate Years¹: 2018–2021

Throughput Capacity: 5 to 10 MMTPY²

Stage 1b Construction		Start-Up Operations	
Project Component	Activity	Project Component	Activity
Equipment	equipment not installed during the start of Stage 1a construction: <ul style="list-style-type: none"> • Tandem rotary unloading facility (capable of unloading 2 rail cars) • Three berms (for stackers and reclaimers) • Water management facilities • Two stackers • Two reclaimers • Conveyors, buffer bin, and transfer towers, including approximately 16,100 lineal feet of conveyors, of which approximately 11,200 lineal feet would be open conveyors and approximately 4,900 lineal feet would be enclosed. • Support structures, electrical transformers, switchgear and equipment, process control systems, buildings, etc. Completion of Stage 1 construction would result in a nominal throughput capacity of up to 25 MMTPY		<ul style="list-style-type: none"> • Rail car unloading operations would use the operating track and the rapid discharge (bottom) unloaders • Up to 60 unit trains would arrive and depart monthly
		Rail Car Unloading	<ul style="list-style-type: none"> • No stockpiling of coal; coal would be delivered directly from the rail cars to the shiploader by way of a rapid discharge unloading facility and interconnecting conveyors
		Water Management Facilities	<ul style="list-style-type: none"> • Water collection, conveyance, treatment, reuse, or discharge
—	—	Shiploading	<ul style="list-style-type: none"> • Ship loading would be performed using a single electrical-powered traveling shiploader installed on Dock 2 • The shiploader would have an average capacity of 6,500 metric tons per hour
		Shipping	<ul style="list-style-type: none"> • Up to 15 ships per month (80% Panamax, 20% Handymax) would be loaded
		Ship Bunkering Crew Supplies	<ul style="list-style-type: none"> • These activities would not be allowed or provided for at the dock

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TABLE 2

Stage of Construction/Operations: Stage 1b Construction and Start-Up Operations

Description: Continuation of Stage 1 construction through completion of Stage 1 construction and start-up operations

Timing: 0–3 years from the start of construction

Approximate Years¹: 2018–2021

Throughput Capacity: 5 to 10 MMTPY²

Stage 1b Construction		Start-Up Operations	
<u>Project Component</u>	<u>Activity</u>	<u>Project Component</u>	<u>Activity</u>
		Equipment	<ul style="list-style-type: none"> • Equipment needed to maintain the terminal would include <ul style="list-style-type: none"> ○ wheel loaders ○ cranes ○ forklifts ○ trucks ○ welders ○ pumps and other similar equipment

Millennium Bulk Terminals—Longview Coal Export Terminal Stages of Construction and Operations

TABLE 3 Stage of Construction/Operations: Stage 2 Construction/Increased Operations Description: Stage 2 Construction and increased operations through completion of Stage 2 construction Timing: 4–6 years from the start of construction Approximate Years¹: 2022–2024 Throughput Capacity: Up to 25 MMTPY ²			
Stage 2 Construction		Increased Operations	
Project Component	Activity	Project Component	Activity
N/A	N/A	Number of Trains	Arrival of coal by rail: <ul style="list-style-type: none"> Up to 25 MMTPY throughput capacity An average of 150 unit trains arriving and departing monthly
N/A	N/A	Number of Vessels	Transfer of coal to ship: <ul style="list-style-type: none"> Up to 25 MMTPY throughput capacity Total average of 40 ships loaded monthly (80% Panamax, 20% Handymax)
Number of Construction Workers	<ul style="list-style-type: none"> 1,350 construction workers (combined number of workers for all construction activities associated with Stage 1 and Stage 2) 	Number of Employees	<ul style="list-style-type: none"> 115 employees required
Construction Trips	<ul style="list-style-type: none"> Construction trips are dependent on how material is imported during preloading activities (numbers below are combined for preloading activities during Stage 1 and Stage 2 Construction): <ul style="list-style-type: none"> If all material is imported by truck: approximately 88,000 loaded truck trips over an approximate 5-year period with the majority of the truck trips occurring during the first 1 to 2 years (Stage 1) If all material is imported by rail: approximately 35,000 loaded railcars over an approximate 5-year period with the majority of the railcars received during the first 1 to 2 years (Stage 1) If all material is imported by barge: approximately 1,130 barge trips over an approximate 5-year period with the majority of the barge trips occurring during the first 1 to 2 years (Stage 1) 	N/A	—
Construction Staging	<ul style="list-style-type: none"> Associated stockpile pads (preloading for remaining 2 of 4 berms/stockpile pads) Any of the remaining eight rail storage tracks for train parking that were not constructed as part of Stage 1 Two additional stackers Two additional reclaimers Conveyors 	Rail Cars/Trains	<ul style="list-style-type: none"> Inbound and outbound trains would be stored on site on up to eight available storage tracks Rail car unloading operations would use the operating track and rail cars would be unloaded using the tandem rotary unloader An average of 150 unit trains would arrive and depart monthly

¹ Assumes that construction begins 2018

² MMTPY = million metric tons per year

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TABLE 3
Stage of Construction/Operations: Stage 2 Construction/Increased Operations
Description: Stage 2 Construction and increased operations through completion of Stage 2 construction
Timing: 4–6 years from the start of construction
Approximate Years¹: 2022–2024
Throughput Capacity: Up to 25 MMTPY²

Stage 2 Construction		Increased Operations	
<u>Project Component</u>	<u>Activity</u>	<u>Project Component</u>	<u>Activity</u>
	<ul style="list-style-type: none"> • One additional shiploader on Dock 3 • Equipment necessary to add 19 MMTPY and bring the nominal total throughput up to 44 MMTPY 		
Preloading	<ul style="list-style-type: none"> • Remaining 2 of 4 berms/stockpile areas would be preloaded during Stage 2 construction • Existing soil conditions would be strengthened to improve load bearing capacity • Preload material would be imported and wick drains would be installed for ground improvement for the stockyard area • Preload material would be placed in a pile approximately 35 feet high covering the area of the berm and adjacent stockpile pad(s) • The preload process would be repeated at each berm and stockpile location until soil consolidation is achieved across the complete stockyard • Excess preload material would be used on site, stockpiled, or removed from the site • Approximately 2.1 million cubic yards of preload material would be imported (Stage 1 and 2) • Approximately 2.5 million cubic yards of material would be moved around the project area (Stage 1 and 2) 	Rail Car Unloading	<ul style="list-style-type: none"> • Rail cars would be unloaded by an electrical-powered tandem rotary unloader • The terminal would include a mechanical positioner to index the unit into the rotary unloader • Coal would be transferred to the stackers via conveyors

Millennium Bulk Terminals—Longview Coal Export Terminal Stages of Construction and Operations

TABLE 3 Stage of Construction/Operations: Stage 2 Construction/Increased Operations Description: Stage 2 Construction and increased operations through completion of Stage 2 construction Timing: 4–6 years from the start of construction Approximate Years¹: 2022–2024 Throughput Capacity: Up to 25 MMTPY ²			
Stage 2 Construction		Increased Operations	
Project Component	Activity	Project Component	Activity
Construction/ Installation of Coal Export Terminal Equipment	Coal would not be stockpiled during any stage of construction. Would include the installation of additional facilities and equipment not installed during Stage 1 construction: <ul style="list-style-type: none"> • The remaining rail storage tracks (total of eight rail storage tracks) • The remaining 2 berms for stackers and reclaimers (total of 5 berms after Stages 1 and 2 construction is complete) • Two stackers (total of up to 4 stackers after Stages 1 and 2 of construction are complete) • Two reclaimers (total of up to 4 reclaimers after Stages 1 and 2 construction is complete) • Conveyors, buffer bin, and transfer towers, including approximately 26,200 lineal feet of conveyors, of which approximately 17,900 lineal feet would be open conveyors and approximately 8,300 lineal feet would be enclosed • One shiploader on Dock 3 • Support structures, electrical transformers, switchgear and equipment, buildings, process control equipment, etc. 	Conveyor Systems	<ul style="list-style-type: none"> • Conveyors would transport coal from rail unloading to the stockyard and from the stockyard to the shiploader • Conveyors would be enclosed except where required to feed onto or reclaim from stockpiles or onto the shiploaders • Rail car unloading and shiplading would at times occur both independently and simultaneously • Conveyors would operate for approximately 45% of the available time • Conveyor drives are electrically powered
		Stockpiling	<ul style="list-style-type: none"> • Two electrical-powered traveling stackers would stockpile coal at an average rate of 7,500 metric tons per hour onto 2 longitudinal stockpiles with an estimated total storage capacity of 750,000 metric tons
		Reclaiming	<ul style="list-style-type: none"> • Two electrical-powered traveling bucket wheel reclaimers, each with an average rate of 6,500 metric tons per hour, would transfer coal from the stockpile to the shiplading system
		Shiplading	<ul style="list-style-type: none"> • Would use the shiploader installed for startup operations on Dock 2 only
		Shipping	<ul style="list-style-type: none"> • Total average of 40 ships per month (80% Panamax, 20% Handymax) would be loaded
		Mobile Equipment	<ul style="list-style-type: none"> • Equipment needed to maintain the terminal would include: <ul style="list-style-type: none"> ○ wheel loaders

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TABLE 3
Stage of Construction/Operations: Stage 2 Construction/Increased Operations
Description: Stage 2 Construction and increased operations through completion of Stage 2 construction
Timing: 4–6 years from the start of construction
Approximate Years¹: 2022–2024
Throughput Capacity: Up to 25 MMTPY²

Stage 2 Construction		Increased Operations	
<u>Project Component</u>	<u>Activity</u>	<u>Project Component</u>	<u>Activity</u>
			<ul style="list-style-type: none"> ○ dozers ○ cranes ○ forklifts ○ trucks ○ welders ○ pumps and other similar equipment

Millennium Bulk Terminals—Longview Coal Export Terminal Stages of Construction and Operations

TABLE 4			
Stage of Construction/Operations: Full Build-Out Operations			
Description: Construction complete and full build-out operations			
Timing: 6+ years from the start of construction			
Approximate Years ¹ : 2024+			
Throughput Capacity: Up to 44 MMTPY ²			
		Full Build-Out Operations	
		Project Component	Activity
—	—	Number of Trains	Arrival of coal by rail: <ul style="list-style-type: none"> • Up to 44 MMTPY throughput capacity • Average of 240 unit trains arriving and departing monthly
—	—	Number of Vessels	Transfer of coal to ship: <ul style="list-style-type: none"> • Up to 44 MMTPY throughput capacity • Total average of 70 ships loaded monthly (80% Panamax, 20% Handymax)
—	—	Number of Employees	<ul style="list-style-type: none"> • 135 employees
—	—	Rail Loop	<ul style="list-style-type: none"> • Arrival and departure tracks, with 1 operating turnaround track • Eight storage tracks would allow trains to travel directly onto the site from the Reynolds Lead • Two rail cars at unloading station inside an enclosed facility; both would be rotated at the same time for discharge of material • Hopper to feed coal onto conveyor 2 at a nominal rate of 7,500 metric tons per hour
—	—	Stockyard	<ul style="list-style-type: none"> • Four parallel stockpile pads (hold approximately 1,500,000 metric tons of coal) and 5 berms, located inside the rail loop • Stockyard would cover an area of approximately 75 acres • Served by up to 4 rail-mounted stackers and up to 4 bucket wheel reclaimers, each with associated conveyors • Pads would vary in length from 2,200 feet to 2,500 feet and hold from 360,000 metric tons to 400,000 metric tons each • Coal would be stacked up to a height of approximately 85 feet above the pads

¹ Assumes that construction begins 2018

² MMTPY = million metric tons per year

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TABLE 4 Stage of Construction/Operations: Full Build-Out Operations Description: Construction complete and full build-out operations Timing: 6+ years from the start of construction Approximate Years¹: 2024+ Throughput Capacity: Up to 44 MMTPY ²			
		Full Build-Out Operations	
		<u>Project Component</u>	<u>Activity</u>
—	—	Conveyors, Transfer Towers, and Buffer Bins	<ul style="list-style-type: none"> • Stockyard would be graded to allow water to drain and be collected for treatment and reuse • Conveyors would transport coal from railcar unloading to the stockpile and stockpile to the shiploader • Conveyors would be enclosed except where required to feed to or receive from stacking, reclaiming, or shiploading equipment • Stockyard and ship loading conveyors would be open • Buffer bins would provide storage capacity during the shiploading process • Once unloaded, coal would be stockpiled or loaded directly onto ships • Stockpiled coal would be reclaimed for shiploading
—	—	Dock 2	<ul style="list-style-type: none"> • 1,400 feet long and varying in width from approximately 100 feet up to 130 feet • Dredging required to provide berthing access
—	—	Dock 3	<ul style="list-style-type: none"> • 900 feet long, with a width of approximately 100 feet • Dredging would be required to provide berthing access
—	—	Trestle	<ul style="list-style-type: none"> • Access to Docks 2 and 3 would be provided by a single trestle approximately 800 feet long and varying in width from approximately 35 feet on the northern end and up to 60 feet on the southern end

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TABLE 4
Stage of Construction/Operations: Full Build-Out Operations
Description: Construction complete and full build-out operations
Timing: 6+ years from the start of construction
Approximate Years¹: 2024+
Throughput Capacity: Up to 44 MMTPY²

		Full Build-Out Operations	
		<u>Project Component</u>	<u>Activity</u>
—	—	Shiploaders	<ul style="list-style-type: none"> Each dock would be served by its own shiploader to load ships at the 2 docks
—	—	Rail Cars/Trains	<ul style="list-style-type: none"> Total of 8 storage tracks and 1 operating track The 1 operating track installed as part of start-up operations would service full build-out operations 90 additional unit trains per month, increasing the overall number of trains to an average of 240 unit trains arriving and departing monthly
—	—	Rail Car Unloading	<ul style="list-style-type: none"> The Stage 1 tandem rotary unloader would service full build-out operations No additional unloading equipment would be required The rapid discharge (bottom) tandem railcar unloader installed for Stage 1 Start-Up Operations would remain operable and be used during maintenance of the tandem rotary unloader

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Description: Construction complete and full build-out operations
Timing: 6+ years from the start of construction
Approximate Years¹: 2024+
Throughput Capacity: Up to 44 MMTPY²

		Full Build-Out Operations	
		<u>Project Component</u>	<u>Activity</u>
—	—	Conveyor Systems	<ul style="list-style-type: none"> • Conveyors would transport coal from railcar unloading area to the stockyard, and from the stockyard to the shiploader • Conveyors would be enclosed except where required to feed onto or reclaim from stockpiles or onto the shiploaders • When unloading rail cars, the conveyors from rail car unloading to the stockyard would operate • When loading ships, the conveyors from the stockyard to the shiploaders would operate • Rail car unloading and ship loading would at times occur both independently and simultaneously • Conveyors would operate approximately 80% of the time
—	—	Stockpiling	<ul style="list-style-type: none"> • Total of up to 4 stackers • Each stacker would stockpile coal at an average rate of 7,500 metric tons per hour onto 2 additional longitudinal stockpiles with a total storage capacity of up to 1.5 million metric tons
—	—	Reclaiming	<ul style="list-style-type: none"> • Total of up to 4 reclaimers • Each would reclaim coal from the stockpile to the shiploading system, with an average capacity of 6,500 metric tons per hour
—	—	Shiploading (Docks 2 and 3)	<ul style="list-style-type: none"> • Total of 2 traveling shiploaders, 1 on each dock • Each shiploader would have an average rated capacity of 6,500 metric tons per hour

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Description: Construction complete and full build-out operations
Timing: 6+ years from the start of construction
Approximate Years¹: 2024+
Throughput Capacity: Up to 44 MMTPY²

		Full Build-Out Operations	
		<u>Project Component</u>	<u>Activity</u>
—	—	Shipping	<ul style="list-style-type: none"> • Up to 30 additional ships, for a total average of 70 ships per month (80% Panamax, 20% Handymax) would be loaded
—	—	Ship Bunkering and Crew Supplies	<ul style="list-style-type: none"> • These activities would not be allowed or provided for at the dock
—	—	Mobile Equipment	<ul style="list-style-type: none"> • Equipment needed to maintain the terminal would include: <ul style="list-style-type: none"> ○ wheel loaders ○ dozers ○ cranes ○ forklifts ○ trucks ○ welders ○ pumps and other similar equipment