Hood Canal Coordinating Council In Lieu Fee Program Use Plan

ILF Use Plan for Mitigation for Navy Explosives Handling Wharf #2, Naval Base Kitsap Bangor

U.S. Department of the Navy
Naval Facilities Engineering Command Northwest
Silverdale, Washington

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PART A: IMPACT PROJECT DESCRIPTION

1. Project Description

The project site is located along the eastern shoreline of Hood Canal as shown on Figure 1. The project will occur in the marine environment and the adjacent upland as shown on Figure 2. The Navy proposes to construct and operate the EHW-2 adjacent to, but separate from, the existing EHW. Figure 5 shows the location of all in-water and upland project facilities. The EHW-2 structure will consist of two components (1) wharf proper (operations area), including the warping wharf, and (2) two access trestles configured as shown on Figure 6. The operations area will include a support building and wharf cover. The warping wharf will be a long narrow wharf extension used to position submarines prior to moving into the operations area. Access trestles will allow vehicles to travel between the operations area and the shore. Cross sections of the facility are shown on Figure 7.

The wharf proper will lie approximately 600 feet off shore at water depths of 60 to 100 feet and will consist of a covered main wharf, warping wharf, and lightning protection towers. It will include a slip (docking area) for submarines, surrounded on three sides by the operational wharf area. The warping wharf will extend out from the main wharf and will be used to line up submarines to move into the slip. The main wharf will include an operations support building providing office and storage space and mechanical/electrical system component housing. Additional facility support at the wharf will include heavy-duty cranes suspended from the cover, power utility booms, six lightning protection towers, and mooring camels. The access trestles will connect the wharf to the shore. There will be an entrance trestle and an exit trestle, and these trestles will be combined where they cross shallow water habitat (water depths less than 30 feet) to reduce the amount of overwater coverage. The trestles are of concrete construction and are on average 7.8 feet above MHHW which result in direct shading and indirect shading adjacent to the trestle. It is estimated approximately 10ft on both sides of the trestle could have some functional loss. None of the vehicle trestle will be steel grated due to operational requirements. A grated steel pedestrian ramp (80 by 3.5 feet) and floating platform (35 by 18 feet, likely concrete) will provide access for Navy divers. The floating platform will be anchored to 4 steel pilings, which are included in the overall number of pilings below. The upper end of the ramp will be attached to the trestle; the lower end will rest on the floating platform. In deeper water, the trestle will separate into two trestles as shown on Figure 6. The proposed trestle length is 1,849 feet. Approximately 1,400 feet of the trestles are 40 feet wide (trestles separate) and 449 feet are 48 feet wide (trestles combined). Both the wharf and trestles will be pile supported. Up to 1,250 steel pipe piles ranging in diameter from 24 to 48 inches will be driven. All piles will be driven with a vibratory pile driver for their initial embedment depths and select piles will be impact driven for their final 10 to 15 feet for proofing. Construction and in-water work will include placement of a temporary trestle structure and installation of 36-inch diameter false-work piles in the nearshore environment to support the temporary structure during construction of the permanent trestle structure. The temporary structure will minimize impacts to marine vegetation and resources. Construction of the upland portion of the facilities will include a concrete trestle abutment at the shoreline requiring installation of 55 24-inch-diameter steel piles on the shoreline above MHHW with a portion of it below Highest Astrological Tide (HAT), a paved access road, utilities, a security fence, and a 5-acre upland construction laydown area for material and equipment storage, construction vehicle parking, and soil stockpiling. Approximately 20 existing facilities and/or structures in proximity to the EHW-2 would be modified or demolished to comply with DoD Explosives Safety Board (DDESB) and Naval

Ordnance Safety and Security Activity (NOSSA) requirements. Three new buildings totaling 22,191 square feet would be constructed to house the functions of four buildings that would be demolished (Figure 8). Two of the new buildings would house industrial functions, and one building would be administrative. The industrial buildings would likely be pre-engineered metal buildings. A new pure water facility would be constructed along the Bangor waterfront to replace Building 7604. Neither the three new buildings nor the pure water facility would affect wetlands or waters of the U.S.

2. Existing Conditions of Aquatic Resources and Wetlands

The Navy completed wetland delineations in 2008 (SAIC 2008) and 2011 (Navy 2011). The functional evaluation and credit/debit calculations are included herein as Appendix A. One wetland (wetland 32) will be affected by the proposed project. See Figures 3 and 4 for the location of the wetland. Wetland 32 is a 0.2 acre Category IV wetland that is located on a slope south of the manmade stormwater retention pond south of the existing EHW. Dominant vegetation includes trees and shrubs, and wetland hydrology appears to be supported by groundwater seeps. Dominant species are red alder overstory, scattered salmonberry, and a sedge understory. Appendix C contains both ground level and aerial pictures of the wetlands. An existing stormwater retention pond near the shoreline of the existing southern EHW trestle is a manmade feature that is considered a water of the U.S. due to its connection to Hood Canal. The proposed action would not affect this stormwater retention pond. Wetland 29 (0.01 acre) is located on a terrace at the toe of a slope south of the stormwater detention pond. The wetland includes a small shallow depression seasonally filled with water with saturated soil surrounding it. Hydrology in the wetland is supported by groundwater seepage at the toe of the slope. There is evidence of a small amount of intermittent outflow in a narrow channel on the west edge of the wetland that discharges down the bluff toward Hood Canal. The wetland is predominantly forested with a red alder overstory scattered salmonberry, and a sedge understory. Wetland 29 is not expected to be impacted by the project as shown in Figure 3.

The in-water portion of the proposed project is in open water near the east shore of Hood Canal with depths ranging from approximately +15.59 to -100 feet MLLW. Marine habitat conditions are generally good along this reach of Hood Canal due to the relatively undisturbed and unharvested nature of the shoreline as a result of the lack of public access to the tidelands and subtidal areas. A macrovegetation survey was completed in October, 2010. Eelgrass generally occupies depths between -2 and -14 feet MLLW in the vicinity of the project site. An eelgrass bed approximately 692 meters long (totaling 4.1 acres) is within the proposed project area.

Macroalgae occurs in a wide depth range from above MLLW to a depth of over 60 feet below MLLW in some areas. However, within the footprint of the proposed EHW2 beyond 30 feet below MLLW the macroalgae transitions to unvegetated areas. Appendix B includes still photos from a video survey conducted of the site. These photos show the conditions in locations with eelgrass and vegetated areas and the conditions of unvegetated areas in deeper waters under the warping wharf and wharf structure. Figure B-1 shows the locations of the photos in relationship to the proposed action. The macroalgae community has been identified to be common within the eelgrass beds as well. The community is concentrated at depths less than about 30 feet below MLLW and occurs only sparsely (less than 10 percent coverage or small patches at greater depths to about 40 feet below MLLW but based on the survey data beyond 30 feet below MLLW these areas do not constitute a community. Beyond these sparse or patchy areas the area is characterized as unvegetated . The dominant species of macroalgae in the project area is *Ulva* (green), often accompanied by larger bodied kelp

Saccharina (brown) and *Graciaria* (red). An approximately 69-foot-wide by 1,500-foot-long oyster bed is located at the existing EHW. An extensive mixed oyster and mussel bed occurs directly shoreward of the existing EHW. A few siphons believed to be geoducks have been documented to occur between -10 feet and -15 feet MLLW in the vicinity of the project area.

3. Avoidance and Minimization of Impacts to Aquatic Resources

The structures and components of the EHW-2 project have been designed to avoid and minimize aquatic impacts. This has been done by minimizing the project footprint, avoiding sensitive habitats to the extent possible, integrating design elements, and developing a robust construction management program. The Final Environmental Impact Statement (FEIS) for the project identified a number of potential impacts on resources, including construction-related impacts on aquatic resources and potential operational impacts. To the maximum extent practicable, impacts have been minimized or avoided to reduce impacts on aquatic resources. Without any controls or minimization and avoidance measures, impacts on aquatic resources and the need for compensatory would be greater. However, most potential impacts will be successfully minimized or avoided through a combination of design, operational controls, and other measures. Wetlands 32 is one area where neither minimization or avoidance will support operational requirements of the new wharf.

Appendix F of the FEIS, provides an extensive Mitigation Action Plan for addressing construction management and avoidance and minimization of potential adverse effects. The plan is extensive and includes but is not limited to;

- Stormwater control,
- Construction debris control,
- Prop wash control,
- Barge shading control,
- Work vessel grounding control,
- Mooring and anchoring,
- Monitoring and enforcement,
- Performance criteria.

Some EHW-2 project elements will cause a permanent loss of aquatic habitat area or function (and require compensatory mitigation through the use of ILF credits.

Table 1. Potential Impacts and Minimization and Avoidance Measures.

	Potential Impact	Avoided/Minimized[1]	Compensatory Mitigation
Temporary (Construction)	In-water Noise	X	
	Construction Lighting	X	
	Turbidity	X	
	Construction Stormwater	X	
	In-water Work Impacts on Marine Vegetation, including Eelgrass and Macroalgae	X	
	Barge Moorage	X	
	Barge Operations	X	
Long Term	Lighting (Operations)	X	X Degradation of function included as functional loss in calculation of required mitigation
	Vessel Traffic (Operations)	X No increase in tempo of operations or vessel call.	
	Stormwater (Operations)	X	
	Overwater Shading (Shallow) Includes Eelgrass Loss Includes Macroalgae Loss		X X X
	Benthic Fill (Piles)		X
	Habitat Complexity/Function Decrease		X
	Over Water Shading (Deep)[2]	X	Degradation of functions included in loss calculations

Notes:

1. Details of avoidance and minimization measures and mitigation requirements are included in Appendix F of the FEIS.
2. Vegetation surveys at the Bangor Waterfront were conducted for the project. Vegetation is sparse or absent in the area designated as overwater shading deep. Areas with marine vegetation including eelgrass and macroalgae were included in the zone listed as overwater (shallow).

The effects from construction disturbance do not result in a permanent loss of area or functions of habitat, but cause a short-term loss of function that is regained once the construction is complete. The FEIS conservatively placed a 150-foot-wide buffer around the EHW-2 where temporary effects could occur. These effects could occur from noise disturbance, increased turbidity, avoidance of the area by fish and marine mammals, and reduced function of aquatic vegetation areas and benthic communities. All of these effects would be short term and temporary. As discussed in the FEIS and JARPA, approximately 150 false-work piles will be used during construction. This estimate represents the total number of pile installations at discreet locations. The majority of these piles will be in place for short periods of time. A few piles, may be in place up to one year. These piles will be used as

temporary support during construction and removed during the construction process. This would create a temporary impact and functions in most areas would return to the preconstruction state. The most substantial construction impact would be construction and placement of a temporary trestle structure and installation of 36-inch diameter false-work piles in the nearshore environment to support the temporary structure during construction of the permanent trestle structure. The temporary structure will minimize impacts to marine vegetation and resources. The temporary trestle and associated piles would be in place for less than one year and would be removed as the permanent structure is constructed. It is anticipated that some of these false-work piles may impact marine vegetation in the nearshore. Unlike the majority of construction impacts the impacts of this temporary structure may degrade some of the functions for an extended period of time. Once the piles and temporary trestle are removed, functions would return to normal. However, the construction impacts associated with this temporary structure are included in the mitigation calculation. Although these piles will be removed, degradation and potential impact to vegetation in the footprint will occur. The Navy's proposed ILF debit calculation will provide mitigation beyond the required minimum and compensate for direct and indirect impacts. As stated in the FEIS, NAVFAC has developed a Mitigation Action Plan (Appendix F in the FEIS) with BMPs that include no grounding of barges, a debris spill management plan, construction monitoring, moving of barges to prevent shading of eelgrass and macroalgae, and a range of other requirements for contractors. The Mitigation Action Plan will be supplemented by other permit requirements and the result of ESA consultation with the National Marine Fisheries Service (NMFS). Thus, with the exception of the temporary structures and associated false-work piles other potential temporary effects have been minimized and avoided and are addressed by the Mitigation Action Plan and do not directly enter into the compensatory mitigation calculation. However, the risk factors and mitigation calculations used in the ILF debit requirements are considered very conservative and are expected to compensate for all impacts.

Potential impacts associated with operation of the facility were also evaluated. Minimization and avoidance measures were identified to reduce or eliminate the potential impacts. Stormwater collection and control facilities were designed for the structure to minimize contributions to stormwater pollution and ensure compliance with applicable water quality standards. Lighting was designed to direct the lighting to the deck and work areas and minimize light levels in the marine area. Lighting levels were designed to the minimum levels required to meet safe work conditions and shrouded and directed downward to minimize light levels in non-work areas. Light levels at the deck are 5 or 10 foot-candles, depending on the work area. Shrouding and directional controls reduce light levels to 0.5 foot-candles at 0 to 50 feet of the EHW-2 and 0.05 foot-candles at 50 to 100 feet. These low light levels would have minimal impacts on the functions and use of the area. With the implementation of minimization and avoidance measures, operation of the facility would not contribute to the loss of aquatic resources beyond what is included in the tables above. The location and type of Marine Impacts are shown in Figures 12 through 17. Figure 12 shows the overwater coverage and pilings associated with the structure in non-vegetated deep waters. Figure 13 shows the impacts to vegetated communities from the trestle. As shown in Figure 13 the eelgrass and macroalgae acreage and impact areas overlap. Figure 14 shows the area of partial shading impacts to the vegetated areas. Figure 15 shows the non-vegetated areas in shallow water affected by trestle. Figure 16 shows the partial shading area in the non-vegetated areas. Figure 17 shows the abutment fill area.

4. Unavoidable Wetland/Waters of the U.S. Impact Acreage

The Navy conducted an environmental review of the proposed action and prepared a Draft and Final Environmental Impact Statement (EIS). During the preparation of the DEIS and FEIS, the impacts associated with the proposed action were calculated and evaluated based off of preliminary drawings. Part of this analysis included determining the area of impacts to Waters of the U.S. Design drawings were overlayed with habitat maps, wetland delineation and other environmental data to assess the area and severity of impacts. As the project design and construction methods were refined calculations of impacted areas also evolved, early estimates based on preliminary design were more general and have since been refined to the acreages included in this mitigation action plan. During the EIS process alternatives were evaluated and every effort was made to avoid wetlands and waters of the U.S. The acreages included in Tables 2,3, and 5 represent area of impacts based on the analysis of the final project design drawings and final survey results. Areas were calculated using take-offs from detailed design drawings correlated to environmental survey data. Figures 9 through 14 representing the correlation between the location of the structure and the habitat types are included to demonstrate the location of impact areas and identify areas of overlapping impacts such as eelgrass and other marine vegetation.

Table 2. Permanent Loss of Function by Habitat Area (total loss of function due to loss of area or habitat).

Habitat Type	Full Shading of Aquatic Vegetation (acres)	Displaced by Structure and or Piles (acres)	Total Area (acres)
Freshwater Wetland		0.2 (fill)	0.2
Marine Aquatic			
Eelgrass	0.06* In common area with other marine vegetation area below	Accounted for in shading column	0.06 In common area with other marine vegetation area below
Other Marine Vegetation	0.13	Accounted for in shading column	0.13
Shallow Benthic		0.005	0.005
Deep Water		0.15	0.15
Fill in Non-wetland waters of U.S. (abutment)		0.03 Structure Above MHHW but portions below HAT	0.03 Structure Above MHHW but portions below HAT

*Some of this will be colonized by more shade-tolerant algae.

The long-term loss of ecological function is more difficult to quantify and may occur to different degrees based on the habitat type. The scientific literature provides some insight to how in-water and over-water structures contribute to a loss of function, for instance, how juvenile salmon avoid large overwater structures. A majority of the pier structure will be in deep water (greater than -30 MLLW),

subtidal habitat where site-specific surveys verify there is sparse vegetation and little algae and hence there is potential for only a small loss of function to aquatic vegetation or benthic invertebrate function. However, given that there is a wider range of functions provided in this area and many variables, a methodology to assign an appropriate multiplier of percentage of functional loss was developed for the partial loss of function in addition to direct loss of an area such as pile footprint or shading of vegetated communities. Translating an estimate of altered function into a quantity of compensatory mitigation is challenging; addressing this challenge was the purpose of using a HEA approach to provide objective scientific conclusions. Otherwise, the process is open to non-science based speculation. The partial loss of functions from EHW-2 is summarized in Table 3, drawn from information presented in the FEIS.

Table 3. Reduction of Function by Habitat Type (mitigation required for partial loss of functions).

Habitat Type	Full Shading (acres)	Partial Shading (acres)[1]
Freshwater Wetland	0	0
Shallow Benthic [2]	0.32	0.14
Eelgrass	Accounted for in Table 2	0.027 [3] Area in common with Other Marine Vegetation Below
Other Marine Vegetation	Accounted for in Table 2	0.05 [3]
Deep Water Coverage Functional Loss[4]	0.2975	

1&2. Partial function loss was accounted for in the HEA scoring and temporal loss components. These elements are described in ILF Use Plan Section 5. FEIS area of 0.41 acres of shallow benthic shading was revised to 0.32 acres based on final design review.
3. Acreage for Eelgrass and other marine vegetation partial shading overlap.
4. Area of coverage over deep water was scaled to account for partial loss.

As all functions are not lost within the partial loss areas, a functional assessment is required to identify the amount of aquatic resource functions lost within these areas, and to identify the appropriate amount of mitigation and the types of functions to be provided by the mitigation site. The mitigation for partial loss areas is less than that required for areas where all functions and values are lost.

5. Impacted Functions

The Navy conducted a functional analysis of the marine resources impacted by the proposed action. This analysis evaluated the functions performed by all habitat classifications in the project area. The habitat classifications and functions are based on information collected by the Science team and workgroup for the Nearshore Credit Debit tool. The classifications and functions used in the functional analysis of impacts are different than those habitat classes listed in the ILF instrument and ledger. However, the results of this analysis were used to determine the degree of impact and risk factors used in the ILF debit calculations. The functions evaluated in the analysis include:

- Processing of soluble pollutants
- Sediment source
- Sediment sink
- Production of organic matter
- Microclimate maintenance
- Forage fish habitat
- Salmonid habitat
- Shellfish habitat
- Other finfish habitat
- Invertebrate prey
- Shorebird/wading bird habitat
- Seabird habitat
- Riparian bird habitat
- Marine mammal habitat
- Native plant diversity
- Structural complexity

The factors were evaluated to determine the relative value and functions of each habitat class or subclass. Then the type of impact was evaluated to determine which functions would be lost and to what extent.

The following paragraphs list definitions from the Hood Canal Coordinating Council's ILF program.

The ILF program currently uses four habitat classes for classifying impacts:

- Subtidal – Areas below the intertidal zone that include habitats such as eelgrass, kelp, and consolidated and unconsolidated bottom. This habitat can be further characterized as vegetated or non-vegetated sub-classes, and includes presence or absence of native shellfish beds;
- Tidal Wetland – Vegetated wetlands with vascular marsh, shrub, and woody plants under tidal influence as defined as the upstream extent of tidal influence. Sub-classes could include tidal swamp, scrub-shrub, high marsh, and low marsh. No area of EHW-2 will occur in this habitat class;
- Intertidal Non-wetland – This includes all non-wetland areas within the intertidal zone including gravel, mud flats, oyster and other shellfish beds, eelgrass beds, and algae dominated sites. Sub-classes could include rocky/sandy ramp/platform, berm, beach face, low tide terrace, and tidal flats/channels; and
- Riparian – Vegetated and non-vegetated, non-wetland habitats within 200 ft of the OHWM. Sub-classes could include terrestrial edge, bluff face, rock face, supralittoral, and alluvial floodplain, noting vegetated and non-vegetated areas.

Degree of Impacts, for the purposes of the HCCC ILF Program, are evaluated in terms of their intensity, duration and cumulative effects.

Direct impacts are those adverse effects caused by project activities that occur contemporaneous with the action.

Indirect impacts are adverse effects caused by project activities that are reasonably certain to occur, but occur later in time or at some distance from the project site (e.g., a bulkhead project would eventually affect sediment recruitment, transport, or deposition at the site and "down drift" within the drift cell and adjacent drift cells). All development projects have indirect impacts.

Cumulative impacts are the summation of impacts on a habitat, species, or resource resulting from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions. All development projects contribute to cumulative impacts in some way, but there are no documented or accepted methods for quantifying cumulative impacts, especially using a rapid assessment approach. To attempt to account for cumulative impacts the Program Sponsor will identify zones within the marine/nearshore service area that are at increased risk of cumulative impacts (e.g., areas where there is a proliferation of overwater structures might be considered at increased risk of impacts from a new dock/piers; a bay with water quality problems might be at increased risk of impacts from a marina or aquaculture facility).

Permanent impacts are semi-irreversible (e.g., such as placement of a bulkhead or pier). Long-lasting impacts take longer than five growing seasons to restore (e.g., clearing a forested wetland). In contrast, **temporary** impacts are those typically associated with construction activities (e.g., road access through an emergent tidal wetland), and further described in DA nationwide permits as occurring in 6 months. Temporary impacts and their temporal effects can usually be restored within five growing seasons from implementation of mitigation activities.

Degree of Impact

Degree of impact has three functions:

1) **Duration:** If the direct, indirect, and cumulative impacts of a development project have permanent impacts, the Degree of Impact Factor should be selected from the top one-third of the range. Development projects with long-lasting impacts should have the Degree of Impact Factor selected from the middle one-third of the range. Temporary impacts should have Degree of Impact Factors selected from the bottom one-third of the range. Duration should account for 1/2 of the Degree of Impact Factor.

2) **Intensity:** Intensity is a measure of the strength of an impact, both direct and indirect. Within the area of impact, the relative intensity of a proposed development project will determine the Degree of Impact Factor. If the intensity is relatively higher than a typical development activity, the Degree of Impact Factor should be selected from the top one-third of the range. If the intensity is relatively similar to a typical development activity, the Degree of Impact Factor should be selected from the middle one-third of the range. If the intensity is relatively lower than a typical development activity, the Degree of Impact Factor should be selected from the bottom one-third of the range. The evalutaon of a relative nature of any single proposed development to a “typical” development activity is subjective, but will use recent development projects and best professional judgment to propose the Degree of Impact Factor. Intensity should account for 1/3 of the Degree of Impact Factor.

3) **Cumulative:** The Sponsor will, in conjunction with the regulatory agencies, assess each development project to determine if it is occurring in a cumulative impact ‘area of concern’, as identified above. For development projects within a cumulative impact ‘area of concern’ the Degree of Impact Factor should be selected from the top one-third of the range. Development projects near the ‘area of concern’ should have Degree of Impact Factors selected from the middle one-third of the range. Development projects well removed from the cumulative impact ‘area of concern’ should have Degree of Impact Factors selected from the bottom one-third of the range. Cumulative should account for 1/6 of the Degree of Impact Factor.

Risk

Risk is the ability to replace the affected habitat and resources to fully compensate for the range of functions, processes, and structures damaged by the development project. The Risk Factor is represented as a range of values that is multiplied by the area of impact. The range of values is based on three primary considerations:

1) The time frame typically needed to replace the habitat type. Habitat types that take a long time to replace (e.g., mature riparian forest) have a higher range of Risk Factor values than habitats that can be replaced more quickly (e.g., early successional riparian forest). Regardless of the Risk Factor, all mitigation projects must meet federal requirements where initial physical and biological improvements must be completed by the third full growing season after the first advance credit in that service area is secured by a permittee.

2) The level of knowledge, experience and success mitigation practitioners have had in replacing the habitat type. Some habitat types are better understood than others, consequently scientists have a better track record of being able to restore them. Habitat types that can be expected to be successfully replicated (e.g., riparian forests) have a lower range of Risk Factor values than more difficult to replace habitat types (e.g., eelgrass beds and tidally influenced forested wetlands).

3) The rarity of the impacted habitat and suitable mitigation projects to replace that habitat and its functions. Rare habitats by definition are highly risky to mitigate and are often difficult to mitigate given the lack of similar mitigation alternatives. Additionally, even mitigating an impact to a common habitat (e.g., subtidal eelgrass) can be difficult since potential mitigation projects in discrete locations with a high likelihood of success are limited.

Beyond this standard guidance, the ILF ledger was separated into areas with total loss (e.g. pile footprints) and areas with partial loss (e.g. shading in deep water and partial shading). The degree of loss and risk factors were based on the analysis of the impacts to all functions in these areas.

Subtidal Non-vegetated

The area calculation for this impact was based upon pile footprint from -30 feet MLLW to deepest part of the structure. The take-offs from the final CAD design drawings were used to calculate the area impacted by the placement of piles and is equal to 0.15 acre of impact associated with placement of piles and pile footprint in subtidal non-vegetated areas.

The subtidal non-vegetated area performs a lower degree of functions relative to other classifications of habitat including Subtidal and Intertidal Vegetated and Intertidal Non-wetland Non-vegetated. However, a wide variety of functions are present in the area. Many of the functions of deep-water benthic communities are similar to those described above for shallow-water communities. As with the benthic community in nearshore habitat, deeper water benthic habitats also include a number of large and small benthic invertebrates. Smaller benthic organisms in deeper habitats convert detritus and other organic matter to food for higher trophic level species (e.g., larger fish and crabs). Deeper water benthic habitats are important year-round habitat for larger invertebrate species, including Dungeness crabs, pandalid shrimp, and geoduck clams. Larger geoducks are more prevalent in deeper habitats (to 300-foot water depth). This habitat also functions to take up and recycle organic matter, assisting in the improvement of water clarity.

Deep-water benthic habitats (below 30 feet MLLW) generally do not provide the same function as shallow-water habitats for juvenile salmonids and forage fish. Smaller fish (including young chum and pink salmon) tend to avoid deeper water habitats where refuges from predation and suitable food resources are limited. In addition, these deeper habitats do not provide the necessary physical or biological conditions needed for successful forage fish spawning. As a result, these two species groups occur much less frequently in these habitats than along the shallow nearshore. Larger juvenile salmonids, such as coho salmon, occur at depths exceeding 30 feet MLLW, but they generally do not rely on the benthic community as a food resource, instead occurring as along-shore migrants. However, the benthic community within deeper water is still sufficiently productive to provide available food and habitat resources for a number of species, including greenling, flatfish, and sculpins. Although juvenile and sub-adult rockfish are undocumented along the Bangor shoreline, if they occur in these habitats they would be expected to prey on smaller crabs and other benthic organisms as a food source.

For the purposes of the mitigation and ILF debit calculations, all functions in the pile footprints were considered fully lost. The highest Degree of Impact (DOI) of two was used in the calculations meaning duration, intensity, and cumulative impacts were all assumed as the worst case. In addition, the highest risk factor of three was used in the calculation of required debits. In reality, based on a site specific functional analysis and existing conditions, this habitat does not represent the type of habitat, quality of habitat, or habitat connectivity that would warrant the maximum rating based on an assessment of the impact site and existing uses in the project area. However this conservative approach to debit calculations will help ensure the ILF mitigation addresses no net loss requirements and ensures mitigation for direct, indirect and cumulative impacts.

Subtidal Non-vegetated (Deep Shading, scaled total overwater coverage)

In addition to the losses associated with the placement of piles in the subtidal non-vegetated area which were discussed above, the impacts from overwater coverage in this area were also evaluated. The determination of impacts associated with deep water shading to functionality is subject to scientific debate, and the Navy's analysis shows negligible loss of functions associated with overwater coverage in deep water. Marine vegetation surveys demonstrate the absence of macroalgae and vegetation in the area of coverage and surveys and observations of fish and marine life at the existing Explosives Handling Wharf show little change in use and behavior. For the purposes of establishing mitigation and ILF debit calculations and providing an abundance of caution a scaling factor using both the percent of overwater coverage and an average intensity factor score were utilized to assign mitigation to this area. Based on a literature review, site specific surveys and a science team review the mitigation assigned to this area is considered to cover direct, indirect, and cumulative impacts and provide an abundance of caution to ensure no net loss.

The total area of overwater coverage in this area is 5.95 acres. Of this area, the majority is in water deeper than 70 feet. At this depth relatively few functions would be influenced by shading or overwater coverage. Benthic functions would be unchanged and the area would still be used by fish, marine mammals, sea birds and other marine species. Observations of similar overwater structures in the project area suggest behavior and use is similar in open water and covered areas. The area would still be used for resting and foraging by marine species. Minor behavioral changes to some fish species would be expected. There would also be some minor changes in predation rates. However, these would be relatively minor functional losses and would not adversely affect the overall functions

and use of the area. The total area of overwater coverage in deep water was scaled by a factor of 5% to account for partial functional losses to calculate ILF debits resulting in an acreage of 0.2975 acres of impact.

The total project area has been surveyed for marine vegetation and video surveys have confirmed the absence of vegetated communities in water deeper than 30 below MLLW. Photos of the subtidal conditions are included in Appendix B. Given the functional analysis conducted on the site, the absence of vegetated communities in this area, and the observed use of similar areas under existing structures in the area, scaling this overwater coverage area in deep water by 5% to account for partial loss of function would fully mitigate for impacts associated with this element of the project. As this area was scaled to assess partial losses, the highest DOI factors and the highest risk factors were used in ILF debit calculation. The Degree of Impact (DOI) of 2 was used to calculate the required debits from the losses in this area. In addition, the highest risk factor of 3 was used in the calculation of required debits.

Subtidal Vegetated (eelgrass, kelp)

The area calculation for this habitat class was based on the area of direct shading from the access trestle over vegetated communities combined with pile footprint in areas populated by vegetation. The area was determined by take-offs from GPS and CAD mappings of final design drawings and protocol surveys for marine vegetation.

Subtidal Vegetated (eelgrass, kelp) habitats can provide a number of functions for fish, including spawning, foraging, routes for nearshore migration, rearing, and refuge. However, relative to the project site and based on investigations that documented shoreline spawning habitats, notably for forage fish, the footprint and 150-foot construction buffer for the EHW-2 structure includes no documented shoreline spawning sites (Penttila 1997; Stout et al. 2001; WDFW 2008). Therefore, it does not appear that shallow-water benthic habitats in the immediate vicinity of the project function as spawning habitats for marine fish.

The Subtidal Vegetated (eelgrass, kelp) community in the project vicinity functions as foraging habitat for a variety of marine fish species. This habitat supports an abundant and diverse community of small invertebrate prey resources such as amphipods and copepods used as food by shallow habitat-occurring fish species, including juvenile salmonids, forage fish, perches, and demersal species such as juvenile English sole. In addition, these nearshore benthic habitats function as migratory corridors for fish such as salmonids and forage fish. Although seven nearshore docks, piers, or wharves currently occur along the Bangor waterfront, nearshore habitats continue to function as a migratory corridor. The function of shallow-water benthic habitats, specific to their capability to provide suitable rearing and refuge for smaller species and young age-classes of marine fish, is dependent on the health of associated marine vegetation, including eelgrass.

Eelgrass beds produce large amounts of carbon that fuel nearshore food webs and provide critical three-dimensional structure in otherwise two-dimensional environments, offering habitat to many marine species. Eelgrass beds build up in the spring and summer and decay in the fall and winter (Puget Sound Water Quality Action Team 2001). Some marine bird species (e.g., brant and Canada goose) feed on eelgrass, as do some benthic organisms such as isopods (Mumford 2007). Ducks and swans also may feed on eelgrass plants (Moore and Short 2006). Great blue herons feed extensively in eelgrass beds, but do not eat the plants, only associated fish and invertebrates.

Eelgrass blades can function to slow water currents and dampen waves, thereby trapping sediments, detritus, and larvae. The roots of eelgrass stabilize the sediment via the matting effects of their dense, interlocking rhizomes. Eelgrass presence can prevent nearshore erosion (Bos et al. 2007). In addition, the rhizomes strongly influence geochemical conditions in the sediments (Mumford 2007) by increasing decomposition in the sediments, accelerating nutrient regeneration, and regulating nutrient cycles (Moore and Short 2006). Eelgrass beds also produce and release oxygen (O_2) to the water column.

The blades of eelgrass, and to some degree the rhizomes, act as substrate for various organisms that otherwise would not be found on soft sediments; for example microalgae and macroalgae and invertebrates such as copepods, amphipods, and snails (Mumford 2007). Eelgrass beds attract permanent, seasonal, and transient residents (Phillips 1984). Shellfish, such as crabs and bivalves, use eelgrass beds for habitat and nursery areas. Dungeness and red rock crabs use eelgrass as a place for settlement of larvae, refuge from predators for juveniles, and general habitat for adults (Mumford 2007). Other species, such as shrimp, use eelgrass for feeding, refuge from predators, and nursery areas.

For a number of marine fish species, healthy eelgrass beds can function as migratory, recruitment, rearing, and refuge habitats. Small migrating fish, including juvenile salmonids and forage fish species, have been shown to prefer these habitats during their outmigration. Eelgrass beds are known to provide diverse benthic invertebrate food resources for smaller fish, and also protection from potential predators (Simenstad et al. 1979; Mumford 2007). Some marine fish species use eelgrass beds, including the grass blades, for spawning (Penttila 1997). Other species, including some species of rockfish (Palsson et al. 2009; Bargmann et al. 2010), are known to use eelgrass beds as larval and juvenile recruitment and rearing habitat. However, it is unknown whether rockfish use eelgrass beds in the project vicinity for these purposes. In addition, non-migratory species, including pipefish, tubesnouts, gunnels, pricklebacks, and a variety of sculpins and perches use these habitats for much of the year and their life history.

Macroalgae that occur in the project area include green (e.g., *Ulva*), red (e.g., *Gracilaria*), and brown varieties (e.g., *Fucus*), including kelp. Macroalgae provide two important ecosystem functions: as primary producers that provide food and nutrients to the seafloor and by providing structural habitat for other marine organisms. Sea lettuce (*Ulva*) is a green macroalga that has a high nutrient value (Kirby 2001) which, when it dies and decomposes, provides an important source of marine nitrogen, as detritus, that supports eelgrass growth. Understory kelp (e.g., *Saccharina* sp.) provides an important source of nutrients to the seafloor (from fragmentation and decomposition) and multi-species vertical habitat in deeper marine waters (Mumford 2007). Principal consumers of vegetation include herbivorous fish, gastropods, crustaceans, and echinoderms such as sea urchins. Principal consumers of detritus include deposit-feeding fish and invertebrates such as polychaetes, crustaceans, bivalves, and echinoderms.

As with eelgrass, other shallow-water vegetation can function as spawning, recruitment, rearing, foraging, and refuge habitat for marine fish. Along the Bangor shoreline where *Ulva* is plentiful, live-bearing shiner perch are abundant during the spring/summer (Bhuthimethee et al. 2009). Elsewhere in Puget Sound, Pacific herring deposit their adhesive eggs almost exclusively on benthic marine macro-vegetation (Penttila 2007); however, as indicated in the FEIS, this has not been documented along the Bangor shoreline. Similar to their use of eelgrass beds, some Puget Sound rockfish, and other marine fish species, use kelp and other aquatic vegetation as suitable recruitment,

rearing, and predator refuge habitat. However, as noted for eelgrass, it is unknown whether rockfish use other aquatic vegetation in the project vicinity for these purposes.

The presence of the EHW-2 would cause the loss of some intertidal and subtidal habitat area due to pile placement and reduction of some functions due to shading. The shallow vegetated areas would also experience some degradation of function and would lose productivity and changes in the density of vegetation would be expected to occur. Even though all functionality would not be lost in the direct shaded area and this area would continue to perform many functions, a conservative approach was used in selecting both Degree of Impact and Risk Factor. The highest Degree of Impact (DOI) of 2 and the highest risk factor of 5 were used in the calculation of required debits address direct, potential indirect, and cumulative impacts. In addition to using the highest and most conservative factors, the Navy is proposing to increase the area used in the debit calculations by 54% to 0.20 acres to ensure maximum protection of the resource.

Subtidal Vegetated (Partial Shading) eelgrass, kelp.

The area calculation for this was based upon partial shading as defined by a conservative estimate of some loss of function in a 10 foot corridor on both sides of the access trestle where vegetated areas occur. As with other area calculations the area was by take-offs from GPS and CAD mappings of final design drawings and protocol surveys for marine vegetation.

Some eelgrass habitat would be impacted principally because shading from the overwater structure of the trestle would reduce primary production. Approximately 0.027 acre of eelgrass and 0.05 acre of macroalgae overlapping areas occur within the 10 feet to either side of the trestle would be partially shaded. Marine vegetation, including eelgrass and macroalgae, presently grows within 10 feet of the existing EHW trestle, which has similar dimensions and height to the proposed EHW-2 trestle and would be expected to grow within this area of EHW-2. Shading analysis suggests that light would be able to penetrate partially under the structure given the height and it is likely that little or no losses of vegetation will occur along the trestle in the areas designated for partial shading loss and some eelgrass may be present under the structure in the area designated as full shading. Potential for partial shading effects are minimized by the height of the structure above the water (15.2 feet above MLLW). This height would allow light to diffuse and refract around the surface. Meaning light will reach areas under the structure for large parts of the day. Due to security reasons, performing a protocol survey under the current EHW trestle was not possible, although observations have indicated there is eelgrass present. Despite evidence of limited impact from partial shading, a conservative estimate for the area of partial shading was defined as marine vegetation within 10 feet of the proposed EHW structure. Partial loss of functions in this area would potentially occur due to reduction in eelgrass density and reduction in productivity. Many other functions would be relatively unchanged.

The Degree of Impact (DOI) of 1.660 was assigned using an intensity factor of medium based upon a conservative analysis of intensity being similar to a typical development project. However, given the range of development projects and the consideration that this project does not result in a total loss of functions this is considered a conservative estimate for this category of impacts. Duration and cumulative factors were assigned the maximum score. The highest risk factor of 5 was used in the calculation of required debits. This is considered a highly protective mitigation calculation as many functions in the area would largely remain unchanged.

Intertidal Non-wetland Vegetated (eelgrass, algae dominated sites, vegetated berm)

These areas where included in the sub-tidal range for debit calculations.

Intertidal Non-wetland Non-vegetated

This area is defined by area in from Highest Astrological tide to -30 feet MLLW with impacts associated with direct shading, pile footprint, and the complete abutment area including the abutment area above Highest Astrological Tide (HAT). The area used in this calculations was considered very conservative as the entire abutment area was included in the estimate although most of that area is actually above the HAT line.

Intertidal Non-wetland Non-vegetated habitats can provide a number of functions for fish, including spawning, foraging, routes for nearshore migration, rearing, and refuge. However, relative to the project site and based on investigations that documented shoreline spawning habitats, notably for forage fish, the footprint and 150-foot construction buffer for the EHW-2 structure includes no documented shoreline spawning sites (Penttila 1997; Stout et al. 2001; WDFW 2008). Therefore, it does not appear that shallow-water benthic habitats in the immediate vicinity of the project function as spawning habitats for marine fish.

The Intertidal Non-wetland Non-vegetated community in the project vicinity functions as foraging habitat for a variety of marine fish species. This habitat supports an abundant and diverse community of small invertebrate prey resources such as amphipods and copepods used as food by shallow habitat-occurring fish species, including juvenile salmonids, forage fish, perches, and demersal species such as juvenile English sole. In addition, these nearshore benthic habitats function as migratory corridors for fish such as salmonids and forage fish. Although seven nearshore docks, piers, or wharves currently occur along the Bangor waterfront, nearshore habitats continue to function as a migratory corridor. The function of shallow-water benthic habitats, specific to their capability to provide suitable rearing and refuge for smaller species and young age-classes of marine fish, is dependent on the health of associated marine vegetation, including eelgrass.

The Intertidal Non-wetland Non-vegetated area would continue to perform many of the functions presently performed by the site. However, the shading in this area may degrade primary productivity and affect juvenile salmonid behavior.

As shown in Table 5, a maximum Degree of Impact (DOI) of 2.0 was assigned and a risk factor of 1.327. The risk factor used in the calculations was based upon the relative habitat value of the area and an assessment that many functions would continue in the impacted area resulting in median habitat functions and quality post impact at the site. Information from the functional analysis of the site suggests this debit calculation would fully compensate for direct, potential indirect, and cumulative impacts in this category. As shown in Table 6, the Navy has increased the area used in the calculation of debits by 41% to 0.50 acres and increased the risk factor to 1.51 to provide an additional level of protection for the resource.

Intertidal Non-wetland Non-vegetated–Partial Shading

The area calculation for this was based upon partial shading as defined by a conservative estimate of some loss of function in a 10 foot corridor on both sides of the access trestle from Highest Astrological Tide line to -30 feet MLLW.

Shading from the overwater structure of the trestle would reduce primary production. This area does not include any vegetated communities. Those impacts are calculated separately. As a conservative assumption for mitigation and impact calculations, it is assumed that areas within the 10 feet to either side of the trestle would be partially shaded. For comparison, marine vegetation, including eelgrass and macroalgae, presently grows within 10 feet of the existing EHW trestle, which has similar dimensions and height to the proposed EHW-2 trestle and would be expected to grow within this area of EHW-2. Therefore there may be very little actual reduction in primary productivity. Shading analysis suggests that light would be able to penetrate partially under the structure given the height and it is likely that little or no losses of function will occur along the trestle in the areas designated for partial shading loss. Due to security reasons, performing a protocol survey under the current EHW trestle was not possible. Observations have indicated at a minimum and for comparative purposes, there is eelgrass present under portions of the existing EHW. Based on site specific surveys, observations of other structures and the design of the proposed EHW2, a conservative estimate for the area of partial shading was defined as within 10 feet of the proposed EHW2 structure. Partial loss of functions including reduction in primary productivity in this area would potentially occur due to reduction in light while many other functions would be relatively unchanged. Benthic communities, fisheries and use by marine mammals and shorebirds would be largely unaffected by the partial shading likewise this impact would have no impact on sediment source and sediment sink functions.

The Degree of Impact (DOI) of 1.660 was assigned using an intensity factor of medium based upon a conservative analysis of intensity being similar to a typical development project and an assessment that many functions would be largely unaffected by this impact. This is considered a conservative estimate for this category. As an additional measure of protection the Navy increased the DOI to 1.67 in the calculations of debits in Table 6. The risk factor of less than maximum or 1.327 was based upon the site specific conditions, functional assessment, and relative habitat value of the area and the an assessment that most functions would continue in the impacted area resulting in median habitat functions and quality post impact. As a further effort to provide conservative mitigation estimates and ensure no net loss and full protection, the Risk factor was increased to the maximum value of two to calculate the debits for the Navy's mitigation proposal in Table 6.

Riparian (terrestrial edge, bluff/rock face, supralittoral, and alluvial floodplain)

This area is defined by the area within 200 ft of MHHW or within 100 feet of waters of the US. The area of riparian impacts were calculated based on the analysis of habitat lost within these areas using the clearing limits for the proposed construction. An area of 0.65 acre of riparian habitat would be impacted by the proposed action. Much of the riparian area is adjacent to previously disturbed areas, roads, and developed areas. Portions of the site include invasive species including blackberries.

The riparian area presently provides habitat for birds, mammals and other upland species. This habitat value would be lost. As the wetland adjacent to this riparian habitat is being removed the value of the habitat to support the wetland functions is minimized.

As shown in Table 5, the calculation of required mitigation and debits, the Degree of Impact (DOI) of 1.92 was assigned which is in the upper third of the range. A Risk Factor of 1.5 was used based on the relative value and risk of the habitat. In order to provide additional protection of the resource the DOI was increased to the maximum value of two and the Risk Factor was increased to 1.870 in the Navy's proposed debit calculations shown in Table 6.

Freshwater Wetlands (Wetland 32)

The functions performed by Wetlands 32 are evaluated using the Western Washington mitigation credits and debits methodology and the rating sheets are included in Appendix A. In general, wetlands provide several benefits including flood and stormwater control, baseflow support for streams and groundwater, erosion and shoreline protection, water quality improvement, and support for natural biological systems and wildlife habitat (Hruby 2004). Wetland 32 is a small Category IV (lowest category) palustrine forested seasonally flooded wetland that would be affected by the project. Its primary function is wildlife habitat based on analysis per the Washington wetland rating system (Hruby 2004). Wildlife habitat values include forested vegetation structure, seasonal availability of surface water, moderate interspersion of habitats, presence of large woody debris, presence of an undisturbed vegetated corridor, and proximity to nearshore habitats (Hood Canal). These values provide many wildlife species such as amphibians, small mammals, and song birds with foraging and breeding habitat, and opportunities to shelter. Wetland 32 has moderate potential to improve water quality downstream by storing surface and sub-surface flows and because it has persistent vegetation, but little opportunity because it does not drain developed areas that might release pollutants. The wetland has low potential or opportunity to reduce flooding and erosion due to its small size relative to the contributing watershed, and limited storage depth during wet periods.

The wetland presently performs some water quality functions but rates relatively low with a score of 4 in this category. The plants in the wetland and the wetland characteristics provide limited water quality functions. The Hydrologic functions of the wetland also have a relatively low score of 4 with some function at reducing velocity of surface flows during storms being lost. Given the type and condition of the wetland these functions are limited. The wetland does perform some habitat functions and receives a medium score of 6 in this category given the proximity to the marine environment.

6. Freshwater Wetland Rating and Mitigation Credit Requirements.

In addition to the marine aquatic resource impacts, a freshwater riparian wetland will be impacted by the proposed action. The area of impact is 0.2 acres. The required mitigation or debits associated with the propose action were calculated using the scoring form and Debit credit worksheet contained in Calculating Credits and Debits in Western Washington Final Report (WDOE, 2012). The resulting debit total for the freshwater impacts are included in Table 4. The forms and calculations are included in Appendix A.

Table 4. Expected Impacts to Freshwater Wetlands and Debit Calculation.

Wetland 32	Improving water quality	Hydrologic	Habitat
Debits-Forested Area	2.4 acre points	2.4 acre points	3.6 acre points

PART B: JUSTIFICATION FOR USING IN-LIEU FEE PROGRAM

1. Description of Mitigation Options Considered.

Compensatory Mitigation is required for permits authorized by the CWA Section 404 and other Department of the Army permits. The 1990 Section 404 Mitigation Memorandum of Agreement (MOA) signed by the USEPA and USACE established procedures for implementing existing Section 404 regulatory requirements. In particular, the MOA set forth the process by which USACE will comply with the Section 404(b)(1) Guidelines when considering impacts and mitigation within the context of Standard Permit (Individual Permit) applications. Only when USACE is satisfied that an applicant has taken all steps to first avoid the impact altogether and second to minimize impacts, will USACE consider mitigation. When determining the level of appropriate mitigation, USACE considers the type of aquatic resource impacted and its functions. The type of mitigation proposed to compensate for the project impact should be ecologically appropriate. In addition, the federal rule on compensatory mitigation titled *Compensatory Mitigation for Losses of Aquatic Resources; Final Rule* (Federal Rule) 33 CFR Section 332.3(b) specifies that when considering options for successfully providing the required compensatory mitigation, the district engineer shall consider the type and location options in the following order:

a. Wetland Mitigation Banks,
b. In-Lieu Fee Programs, and lastly
c. Permittee-Responsible Mitigation.

The Federal Rule emphasizes the use of a watershed approach to Compensatory Mitigation. The watershed approach involves consideration of several factors to assure proper implementation:

- Watershed needs and Compensatory Mitigation projects to address those needs,
- Landscape scale,
- Historic and potential aquatic resource conditions,
- Past and projected aquatic resource impacts, and
- Terrestrial connections between aquatic resources.

The changes to the regulations for Compensatory Mitigation are intended to increase the Compensatory Mitigation project success rate and improve the health of the aquatic resources in mitigated areas. The Compensatory Federal Rule was developed to provide better aquatic resource mitigation than the traditional focus on on-site/in-kind, which may not always be feasible or appropriate mitigation. Any proposed activity that impacts aquatic resources still needs to be addressed in the following order:

- Avoid. Proposed impacts must be avoided to the maximum extent possible.

- Minimize. Impacts that cannot be avoided should be minimized.
- Compensate for remaining impacts. Impacts that cannot be avoided must be compensated for through Compensatory Mitigation.

The Navy began the mitigation evaluation process with an investigation of potential mitigation actions on Navy-owned lands in Hood Canal. The Federal Rule provides for improved review of mitigation and anticipates enhanced mitigation success based on:

- The use of effective standards based on best available science that should increase the success rate of mitigation projects,
- Increased public participation that should lead to more input and ideas for proposed projects, and
- More uniform standards that should increase the viability of mitigation banks and ILF programs compared to the more traditional permittee-responsible mitigation.

There are limited opportunities for freshwater riparian enhancement or restoration potential on Navy owned land. Mission constraints and land use limit on-site mitigation. In addition, suitable candidate mitigation sites for Marine restoration or enhancement are limited and not sufficient to meet the needs of the proposed action. The Navy has authority to participate in ILF programs and Mitigation Banks through the Sikes Act and DOD Natural Resource Policy Guidance.

Based on a review of all available data on these mitigation options and in consideration of the benefits, risks and timelines associated with each option, the Navy determined that the support of the development of an ILF program with a qualified sponsor would ensure the most successful and beneficial mitigation within the proposed timeline for the EHW-2 project. The development and use of an ILF program was therefore selected as the Navy's preferred alternative for Compensatory Mitigation. At the time of project initiation, there were no established mitigation banks or ILF programs for Kitsap County or the Hood Canal. The Navy conducted market research and issued a Sources Sought to solicit mitigation bank sponsors and identify ILF program sponsors, including Hood Canal Coordinating Council. An additional benefit of an using Hood Canal Coordinating Council is that it already works with partners, community groups and citizens, and advocates for and implements regionally and locally appropriate actions to protect and enhance Hood Canal's environmental and economic health.

2. In-Lieu Fee Program Selection Rationale

The use of an ILF Program remains the preferred compensatory mitigation for the unavoidable impacts to aquatic resources from the proposed action as described in the Mitigation Action Plan, Appendix F in the FEIS. The proposed project is within the service area of the Hood Canal ILF program. The ILF program was approved by the IRT and the USACE Seattle District in July 2012. The ILF program has the ability to provide credits for all the anticipated impact types including marine and freshwater wetlands. With approval of the program the ILF program has credits available to fulfill the mitigation requirements of the proposed action.

ILF Program Goal and Objectives

The Goals and Objectives have been developed by the ILF program sponsor and are included in the Final Instrument. The primary goal of the HCCC ILF Program for Hood Canal is to ensure no net loss of aquatic resource functions in the Hood Canal watershed. This can be accomplished by

improving existing mitigation requirements and by rigorous site assessment and selection processes that fully support priorities for conserving and restoring Hood Canal. While mitigation seeks to generally offset the impacts of development projects resulting in no net loss, this ILF Program will add value to mitigation processes by implementing projects in a coordinated manner, consistent with existing regulations and legal limitations relating to mitigation. To accomplish this goal, the HCCC has incorporated the following additional goals into the ILF Program:

- Provide a viable option to ensure the availability of high-quality mitigation for unavoidable, site-specific impacts to freshwater wetlands, streams, lakes, buffers, and marine/nearshore aquatic resources in the Hood Canal watershed to ensure at a minimum no net loss of aquatic functions and values in Hood Canal.
- Meet the goals and aspirations of the Hood Canal Integrated Watershed Management Plan (IWMP).
- Develop, in cooperation with environmental regulatory and tribal partners, an ecologically based site selection process and associated tools to identify the most appropriate freshwater and marine/nearshore mitigation options(e.g. aquatic resource type, amount, location, and mitigation strategy) that result in greater ecological benefit to the Hood Canal watershed than could be achieved through permittee-responsible mitigation.
- Utilize scale efficiencies by combining the impacts from individual projects within a service area into mitigation at larger sites.
- Meet federal, state, tribal, and local regulatory requirements by creating an efficient mechanism for fulfilling compensatory mitigation requirements.
- Select the best mitigation receiving sites for the HCCC ILF Program through a rigorous analysis by a group of professional resource managers and local experts, drawing from local knowledge and best available science and analyses for a particular basin, watershed, or marine area.
- Develop a self-sustaining HCCC ILF Program that identifies, prioritizes, and completes mitigation projects that collectively produce ”no net loss” of aquatic functions and values at appropriate scales (e.g. drift cell, assessment and mitigation unit (AMU), sub-basin, watershed, and service areas) over time, and strives for “net resource gains”.
- Provide an effective and transparent accounting structure for collecting in-lieu fees, disbursing project funds, and compliance reporting, as required under 33 CFR § 332.8.
- Work in an efficient and transparent manner with the IRT, co-chaired by the Corps and Ecology, to review, analyze, and implement mitigation projects and enact amendments to the HCCC ILF Program Instrument.
- Ensure “difficult-to-replace” habitats are conserved and restored by working with the IRT and with regulatory agencies at local, state, federal, and tribal levels.

The HCCC has four mitigation strategies to accomplish its goal and objectives. These strategies are to: restore aquatic resource functions; enhance existing aquatic resources; establish new functions where they no longer exist; and, under certain circumstances, preserve intact or fully functioning aquatic resource functions. Compensatory mitigation can take one of these four forms, in order of preference:

1. Restoration: returning a damaged aquatic resource to its original condition through restoration of habitat forming processes;
2. Creation: converting an area that has no significant aquatic resources into an aquatic resource area with all of the physical and biological characteristics to replace the area lost or damaged;
3. Enhancement: making changes or improvements to an aquatic resource to replace the functions or values performed by the resources lost or damaged; and
4. Preservation: protecting aquatic resources in an area that is equivalent to the area damaged, and that might otherwise be impacted or lost.

The mitigation strategy selected for each permitted impact will be based upon an assessment of type and degree of disturbance at the landscape and/or drift cell scales. Restoration generally will be the first mitigation option considered because the likelihood of success is greater and the impacts to potential ecologically important uplands are reduced compared to enhancement or creation. Restoration also has potential to produce more substantial gains in aquatic resource functions compared to enhancement and preservation.

Hood Canal ILF Operating and Service Area

The operating area for the Hood Canal ILF Program would encompass those portions of Water Resource Inventory Areas 14, 15, 16, and 17 draining to Hood Canal, defined by a line extending from Foulweather Bluff to Tala Point and Port Ludlow, south through the Great Bend to its terminus near the town of Belfair, Washington.

The operating area is divided into two components for the purposes of this ILF Program:

1. Freshwater Environment, which generally includes areas landward of the marine riparian zone including freshwater and estuarine wetlands and streams up to and excluding any National Park or National Forest Lands; and
2. Marine / Nearshore Environment, which extends from the marine riparian area at the top of the coastal bluffs to the adjacent aquatic intertidal and subtidal zones.

This area is further divided into three freshwater service areas (WRIAs 15, 16/14b, and 17) and one marine/nearshore service area for purposes of the Program. The proposed project would affect wetlands in the WRIA 15 service area and saltwater habitats in the marine/nearshore service area. More information on this program can be found on the HCCC website: http://hccc.wa.gov/.

3. Wetland Functions Provided by the In-lieu Fee Program

A review of the Final Instrument demonstrates that all projected compensatory mitigation needs for all functions and values lost as a result of the proposed action can be fulfilled by the approved Hood Canal ILF program. The ILF program is capable of providing mitigation projects to replace all functions lost in the Marine environment. Roster sites and site selection will ensure projects are compatible with the functions lost in the Marine environment. The evaluation of the impact site provides sufficient information to analyze the requirements for the replacement of functions.

Likewise the freshwater wetlands functions lost will be replaced in accordance with the Western Washington credit/debit methodology and ensure replacement of all freshwater wetland functions.

4. Aquatic Resource Functions unlikely to be mitigated by projects implemented through the In-lieu Fee Program

None.

5. Proposed Use of ILF Credits

Mitigation Requirements and Debits associated with the proposed action were calculated using the methodology specified in the HCCC ILF Instrument Exhibit 4 (v 6.15.2012) and represented here as Table 5. This calculation is based on site-specific analysis of impacts and regulatory requirements. Table 5 represents the mitigation requirements associated with project impacts based on functional analysis, site specific conditions and known areas of impact. The Navy is proposing to use higher and more conservative mitigation values and increase impact area acreage used in the mitigation calculation in areas with increased potential for indirect impacts or in sensitive habitats including Subtidal Non-vegetated, Subtidal Vegetated, and Intertidal Non-wetland Non-vegetated to ensure losses are fully compensated. These areas are selected for increased mitigation coverage due to higher potential for impacts. For example in the Subtidal Vegetated (eelgrass, kelp) habitat area with 0.13 acres of impact and required mitigation, the Navy is proposing to calculate debits and mitigation fees using 0.2 acres.

While minimization and avoidance measures are expected to limit impacts and conservative estimates of all impacts and mitigation requirements have been used in all categories, additional mitigation is proposed to minimize risk to aquatic resources and ensure protection. This is in addition to using upper range DOI and Risk Factors which were developed to cover cumulative impacts and address risk resulting in conservative calculations in order to be fully protective of all aquatic resources and ensure no net-loss of functions and values. Additionally, in an abundance of caution all Debits are rounded up to next hundredth. Table 6 represents the Navy's mitigation offer for the proposed action intended to ensure highly conservative calculations and protection of the aquatic resources. ILF credits will be used to offset debits from the proposed action in both the WRIA 15 freshwater service area and the Hood Canal marine/nearshore service area.

Table 5. Project Mitigation Requirements ILF Debit Calculations

Category:	**Subtidal Non-vegetated**	**Subtidal Non-vegetated** ********* **Deep Shading, scaled total overwater coverage***	**Subtidal Vegetated** (eelgrass, kelp) *Accuracy (0.01 acre) determined by GPS and CAD mapping*	**Subtidal Vegetated) *Partial Shading*** (eelgrass, kelp *Accuracy (0.01 acre) determined by GPS and CAD mapping*	**Tidal Wetland** (tidal swamp, low marsh, high marsh, scrub-shrub, forested)	**Intertidal Non-wetland Vegetated** (eelgrass, algae dominated sites, vegetated berm)	**Intertidal Non-wetland Non-vegetated** (mudflats, oyster beds, tidal flats/channels, low tide terrace, beach face, berm, rocky or sandy	**Intertidal Non-wetland Non-vegetated *Partial Shaded*** (mudflats, oyster beds, tidal flats/channels, low tide terrace, beach face, berm, rocky or sandy ramp/platform)	**Riparian** (terrestrial edge, bluff/rock face, supralittoral, and alluvial floodplain)	**Total**
Description (Red = less than max. rating for factor)	Pile Footprint > -30ft MLLW	Calculated 5% of overwater coverage > -30ft MLLW	All vegetation. Eelgrass and macroalga overlap	All vegetation. Eelgrass and macroalga overlap. (Adjacent to Trestle)			Area from HAT to - 30 MLLW (Trestle Area) + Abutment Area	Area from HAT to -30MLLW (Adjacent to Trestle)		
Area of Impact in Acres	**0.15**	**0.2975**	**0.13**	**0.05**	**NA**	**Incl. w/subtidal**	**0.355**	**0.14**	**0.65**	
Degree of Impact Factor Range	1.2 to 2.0	1.2 to 2.0	1.2 to 2.0	1.2 to 2.0			1.2 to 2.0	1.2 to 2.0	1.2 to 2.0	
Duration (1/2 of DOI)	1	1	1	1			1	1	1	
Intensity (1/3 of DOI)	0.67	0.67	0.67	0.33			0.67	0.33	0.67	
Cumulative (1/6 of DOI)	0.33	0.33	0.33	0.33			0.33	0.33	0.25	
Total for DOI Factor (or 1.2, whichever is greater)	**2.00**	**2.00**	**2.00**	**1.66**			**2.00**	**1.66**	**1.92**	
Risk Factor Range	1.2 to 3.0	1.2 to 3.0	1.2 to 5.0	1.2 to 5.0			1.2 to 2.0	1.2 to 2.0	1.2 to3.0	
Type of Habitat Sub-class (1/2 of Risk)	1.5	1.5	2.5	2.5			0.5	0.5	1.2	
Quality of Habitat (1/6 of Risk)	0.5	0.5	0.83	0.83			0.167	0.167	0.1	
Habitat Connectivity (1/6 of Risk)	0.5	0.5	0.83	0.83			0.33	0.33	0.1	
Imperiled Species (1/6 of Risk)	0.5	0.5	0.84	0.84			0.33	0.33	0.1	
Total for Risk Factor (or 1.2, whichever is greater)	**3.000**	**3.000**	**5.000**	**5.000**			**1.327**	**1.327**	**1.500**	
Total Number of Habitat Class Debits (Area X DOI X Risk)	**0.9**	**1.785**	**1.3**	**0.415**			**0.94217**	**0.3083948**	**1.872**	
Cost per Habitat Class Credits [HCCC ILF Instrument, Exhibit 5, (v 6.15.2012)]	$835,034	$835,034	$835,034	$835,034			$835,034	$835,034	$82,544	
Total Mitigation Fee (Number X Cost)	**$751,530.60**	**$1,490,535.69**	**$1,085,544.20**	**$346,539.11**			**$786,743.98**	**$257,520.14**	**$154,522.37**	**$4,872,936.10**
Land Costs [HCCC ILF Instrument, Exhibit 5, (v 6.15.2012)]	$45,996	$45,996	$45,996	$45,996			$45,996	$45,996	$45,996	
Total Land Fee (Number X Cost)	**$41,396.40**	**$82,102.86**	**$59,794.80**	**$19,088.34**			**$43,336.05**	**$14,184.93**	**$86,104.51**	**$346,007.89**
Total Marine Debits										**$5,218,943.99**

Table 6: Navy's Proposed Mitigation ILF Calculations

Category:	**Subtidal Non-vegetated**	**Subtidal Non-vegetated** ********* **Deep Shading, scaled total overwater coverage***	**Subtidal Vegetated** (eelgrass, kelp)	**Subtidal Vegetated) *Partial Shading*** (eelgrass, kelp	**Tidal Wetland** (tidal swamp, low marsh, high marsh, scrub-shrub, forested)	**Intertidal Non-wetland Vegetated** (eelgrass, algae dominated sites, vegetated berm)	**Intertidal Non-wetland Non-vegetated** (mudflats, oyster beds, tidal flats/channels, low tide terrace, beach face, berm, rocky or sandy	**Intertidal Non-wetland Non-vegetated *Partial Shaded*** (mudflats, oyster beds, tidal flats/channels, low tide terrace, beach face, berm, rocky or sandy ramp/platform)	**Riparian** (terrestrial edge, bluff/rock face, supralittoral, and alluvial floodplain)	**Total**
Description (Red = less than max. rating for factor) ** Area increased to be conservative and/or due to rounding up	Pile Footprint > -30ft MLLW	Calculated 5% of overwater coverage > -30ft MLLW	All vegetation. Eelgrass and macroalga overlap	All vegetation. Eelgrass and macroalga overlap. (Adjacent to Trestle)			Area from HAT to - 30 MLLW (Trestle Area) + Abutment Area	Area from HAT to -30MLLW (Adjacent to Trestle)		
Area of Impact in Acres	**0.15**	**0.30****	**0.20****	**0.05**	**NA**	**Incl. w/ subtidal**	**0.50****	**0.14**	**0.65**	
Degree of Impact Factor Range	1.2 to 2.0	1.2 to 2.0	1.2 to 2.0	1.2 to 2.0			1.2 to 2.0	1.2 to 2.0	1.2 to 2.0	
Duration (1/2 of DOI)	1	1	1	1			1	1	1	
Intensity (1/3 of DOI)	0.67	0.67	0.67	0.34			0.67	0.34	0.67	
Cumulative (1/6 of DOI)	0.33	0.33	0.33	0.33			0.33	0.33	0.33	
Total for DOI Factor (or 1.2, whichever is greater)	**2.00**	**2.00**	**2.00**	**1.67**			**2.00**	**1.67**	**2.00**	
Risk Factor Range	1.2 to 3.0	1.2 to 3.0	1.2 to 5.0	1.2 to 5.0			1.2 to 2.0	1.2 to 2.0	1.2 to 3.0	
Type of Habitat Sub-class (1/2 of Risk)	1.5	1.5	2.5	2.5			0.6	1	1.2	
Quality of Habitat (1/6 of Risk)	0.5	0.5	0.83	0.83			0.25	0.34	0.25	
Habitat Connectivity (1/6 of Risk)	0.5	0.5	0.83	0.83			0.33	0.33	0.25	
Imperiled Species (1/6 of Risk)	0.5	0.5	0.84	0.84			0.33	0.33	0.17	
Total for Risk Factor (or 1.2, whichever is greater)	**3.00**	**3.00**	**5.00**	**5.00**			**1.510**	**2.00**	**1.87**	
Total Number of Habitat Class Debits (Area X DOI X Risk) (rounded up to two decimal places)	**0.90**	**1.80**	**2.00**	**0.42**			**1.51**	**0.47**	**2.44**	
Cost per Habitat Class Credits [HCCC ILF Instrument, Exhibit 5, (v 6.15.2012)]	$835,034	$835,034	$835,034	$835,034			$835,034	$835,034	$82,544	
Total Mitigation Fee (Number X Cost)	**$751,530.60**	**$1,503,061.20**	**$1,670,068.00**	**$350,714.28**			**$1,260,901.34**	**$392,465.98**	**$201,407.36**	**$6,130,148.76**
Land Costs [HCCC ILF Instrument, Exhibit 5, (v 6.15.2012)]	$45,996	$45,996	$45,996	$45,996			$45,996	$45,996	$45,996	
Total Land Fee (Number X Cost)	**$41,396.40**	**$82,792.80**	**$91,992.00**	**$19,318.32**	**$0.00**	**$0.00**	**$69,453.96**	**$21,618.12**	**$112,230.24**	**$438,801.84**
Total Marine Debits										**$6,568,950.60**

Table 7. ILF Freshwater Debit Requirements

Impacted Area	Improving water quality	Hydrologic	Habitat
Wetland 32 Debits-Forested Area	2.4 acre points	2.4 acre points	3.6 acre points

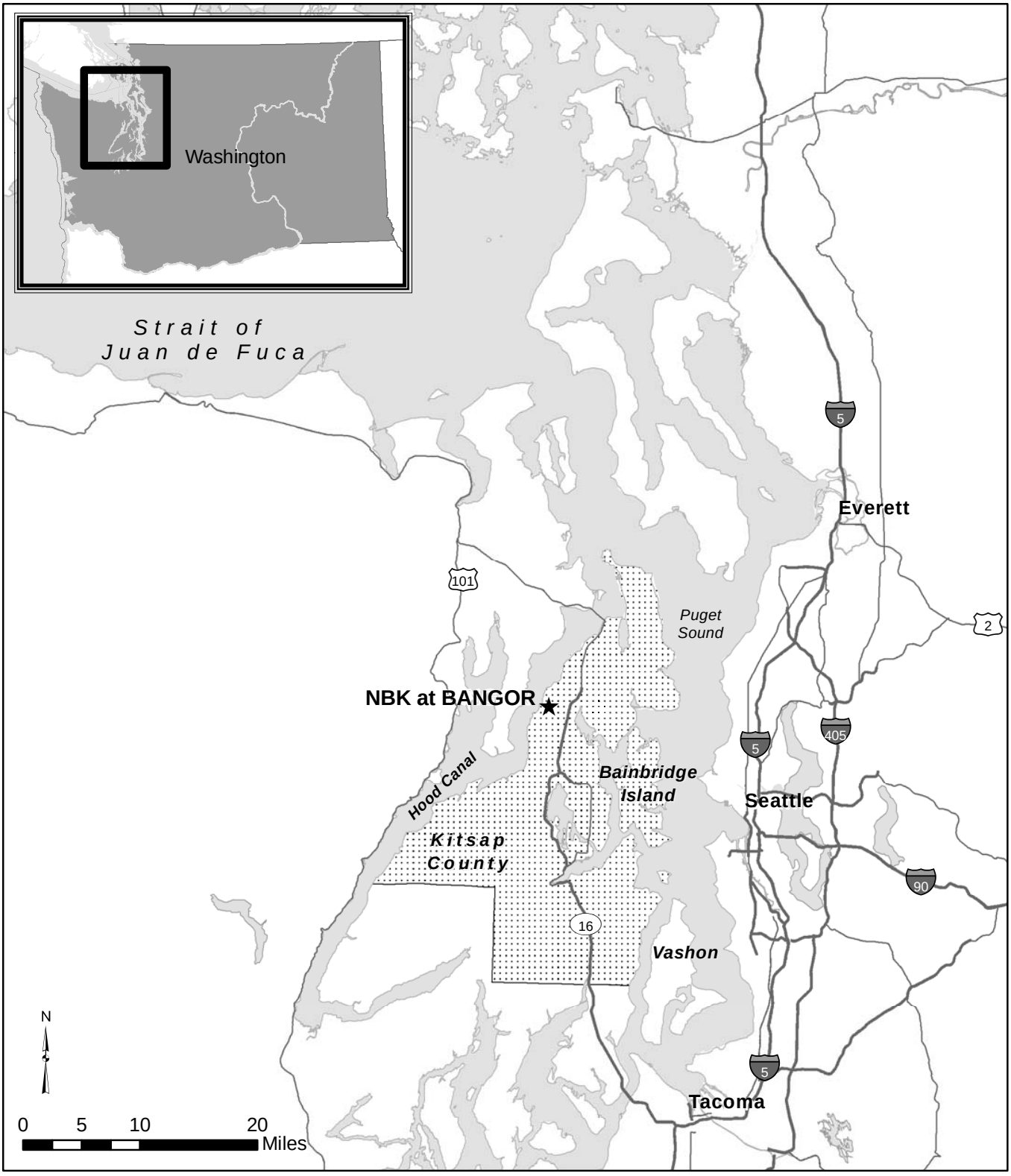
Table 8. ILF Freshwater Debit Calculations

Wetland Acre Points (WAP)	Cost Per Acre Point ($)	WAP Cost ($)	Total Freshwater Debits
8.4	38,000.00	319,200	
Wetland Acres	**Land Cost Per Acre ($)**	**Wetland Land Cost ($)**	
0.2	45,996.00	9,199.20	$328,399.20

6. Credit Purchase or Transfer Timing

Upon approval of the USACE permit, the Navy will purchase the required credits from the HCCC ILF program prior to in-water work.

Figures



PURPOSE:

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Olympia, WA 98504-7000

FIGURE 1
VICINITY MAP

U.S. NAVAL BASE KITSAP AT BANGOR
SILVERDALE, WASHINGTON

SECOND EXPLOSIVES HANDLING WHARF

TOWNSHIP: 26N
RANGE: 01E
47.75224 N LAT / -122.72383 W LONG

IN: HOOD CANAL
COUNTY OF: KITSAP
STATE OF: WA
APPLICATION BY: DEPT. OF THE NAVY
JANUARY 2012

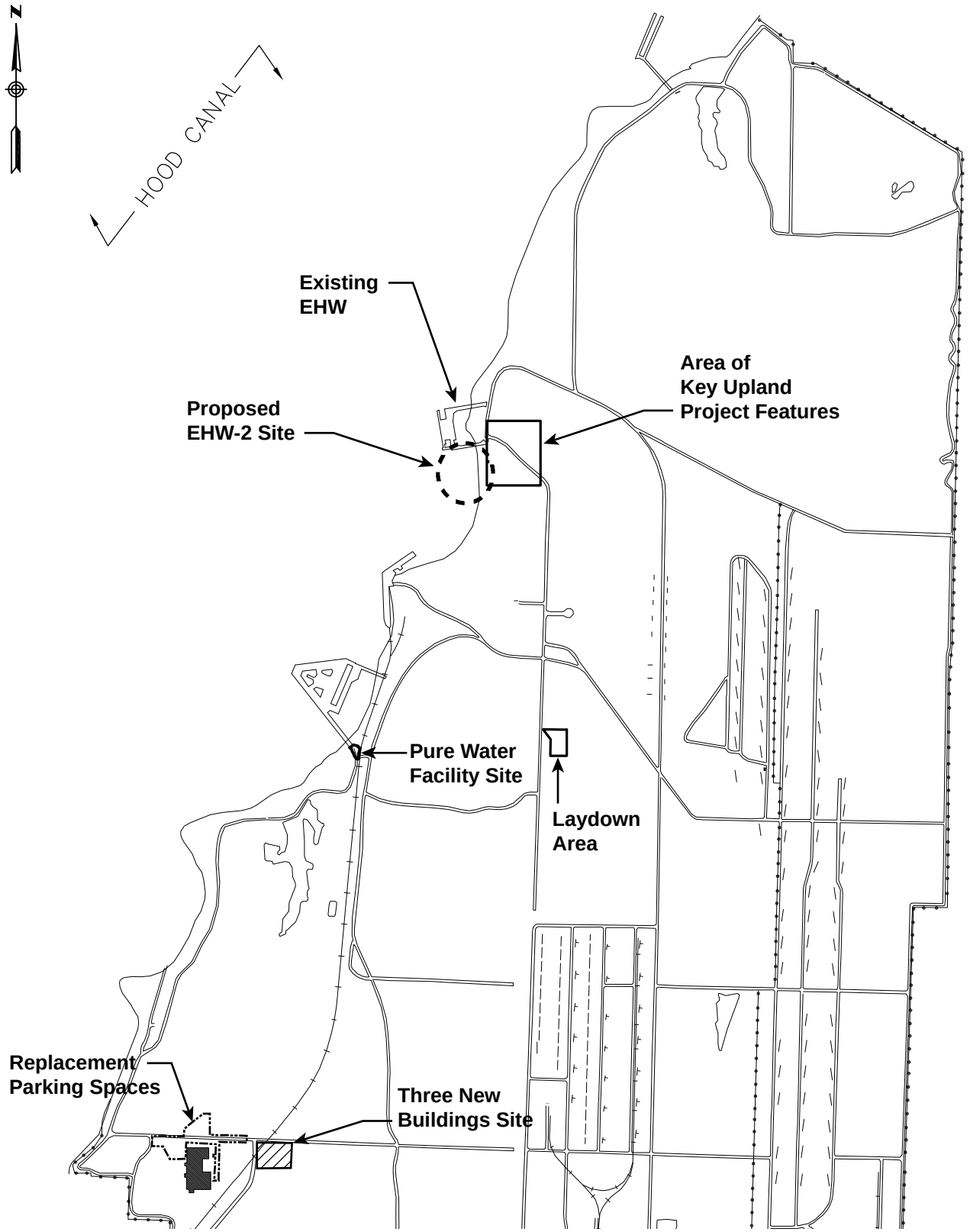

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FIGURE 2
PROPOSED PROJECT FACILITIES

U.S. NAVAL BASE KITSAP AT BANGOR
SILVERDALE, WASHINGTON

SECOND EXPLOSIVES HANDLING WHARF

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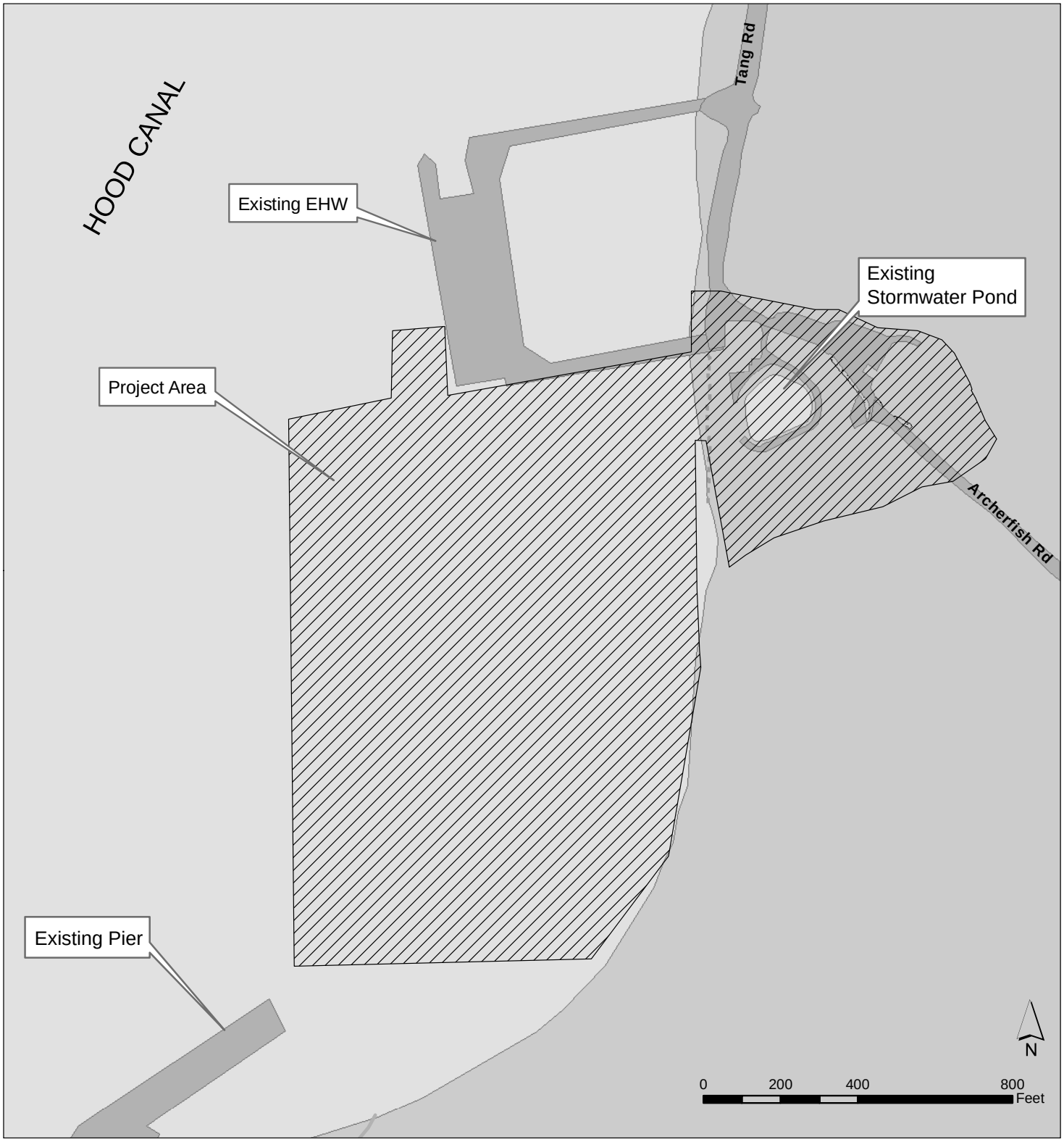

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FIGURE 3
PROJECT AREA AFFECTING WATERS OF THE U.S.

U.S. NAVAL BASE KITSAP AT BANGOR
SILVERDALE, WASHINGTON

SECOND EXPLOSIVES HANDLING WHARF

TOWNSHIP: 26N
RANGE: 01E
47.75224 N LAT / -122.72383 W LONG

IN: HOOD CANAL
COUNTY OF: KITSAP
STATE OF: WA
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JANUARY 2012

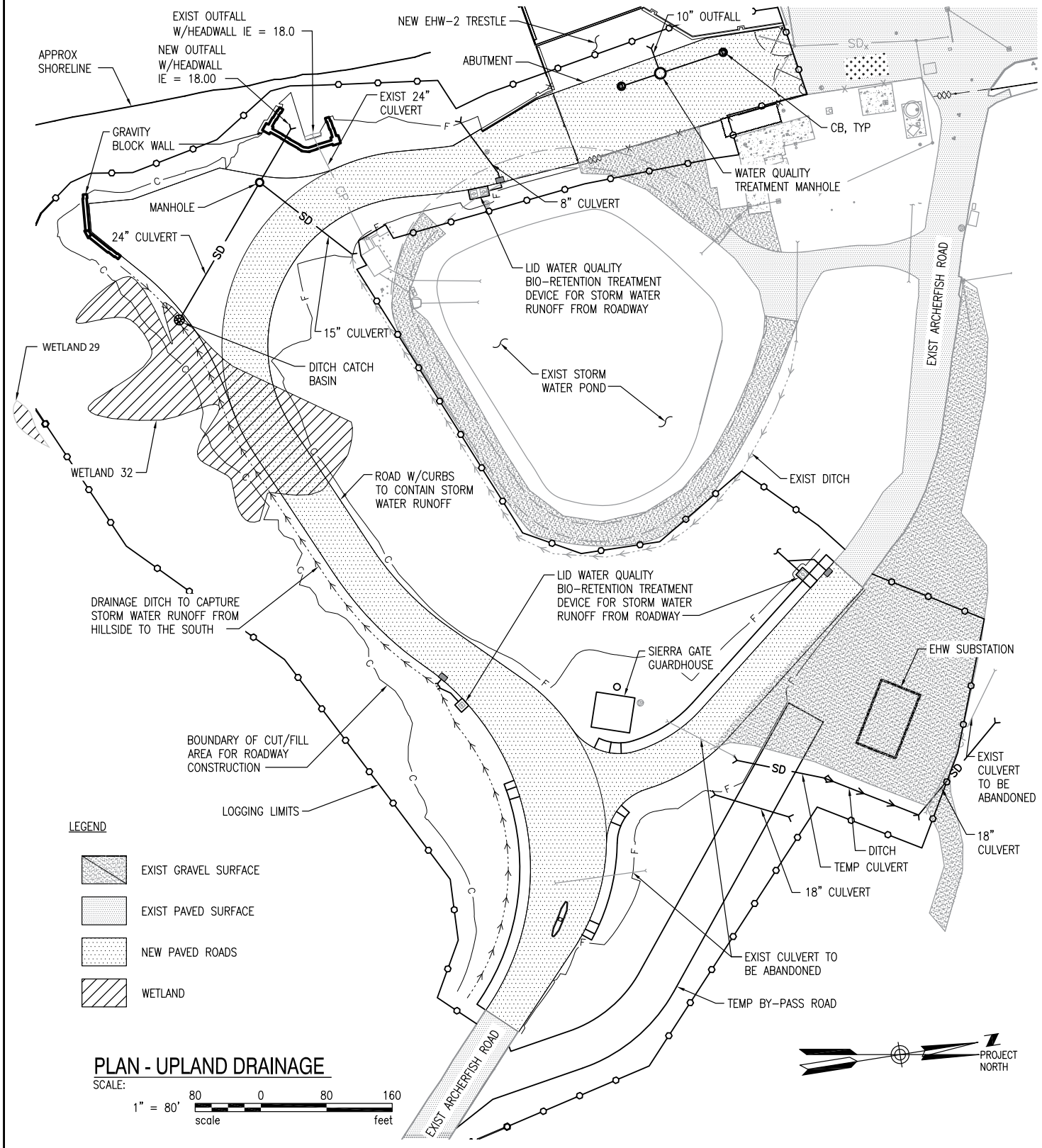

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FIGURE 4
UPLAND FEATURES OF THE PROJECT AFFECTING WETLANDS

U.S. NAVAL BASE KITSAP AT BANGOR
SILVERDALE, WASHINGTON

SECOND EXPLOSIVES HANDLING WHARF

TOWNSHIP: 26N
RANGE: 01E
47.75224 N LAT / -122.72383 W LONG

IN: HOOD CANAL
COUNTY OF: KITSAP
STATE OF: WA
APPLICATION BY: DEPT. OF THE NAVY
JANUARY 2012

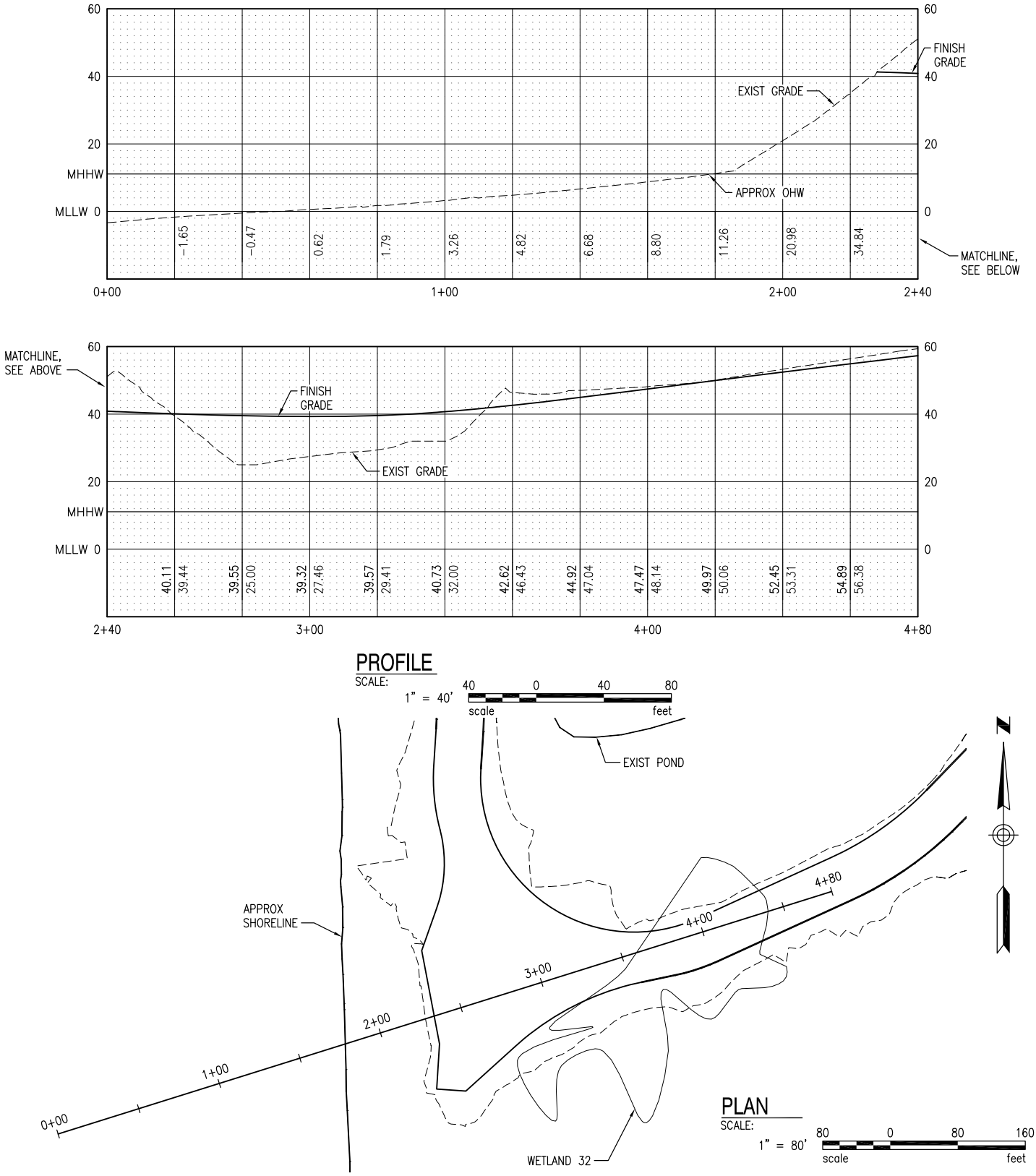

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FIGURE 5
PROFILE VIEW OF UPLAND FEATURES OF THE PROJECT AFFECTING WETLANDS

U.S. NAVAL BASE KITSAP AT BANGOR
SILVERDALE, WASHINGTON

SECOND EXPLOSIVES HANDLING WHARF

TOWNSHIP: 26N
RANGE: 01E
47.75224 N LAT / -122.72383 W LONG

IN: HOOD CANAL
COUNTY OF: KITSAP
STATE OF: WA
APPLICATION BY: DEPT. OF THE NAVY
JANUARY 2012

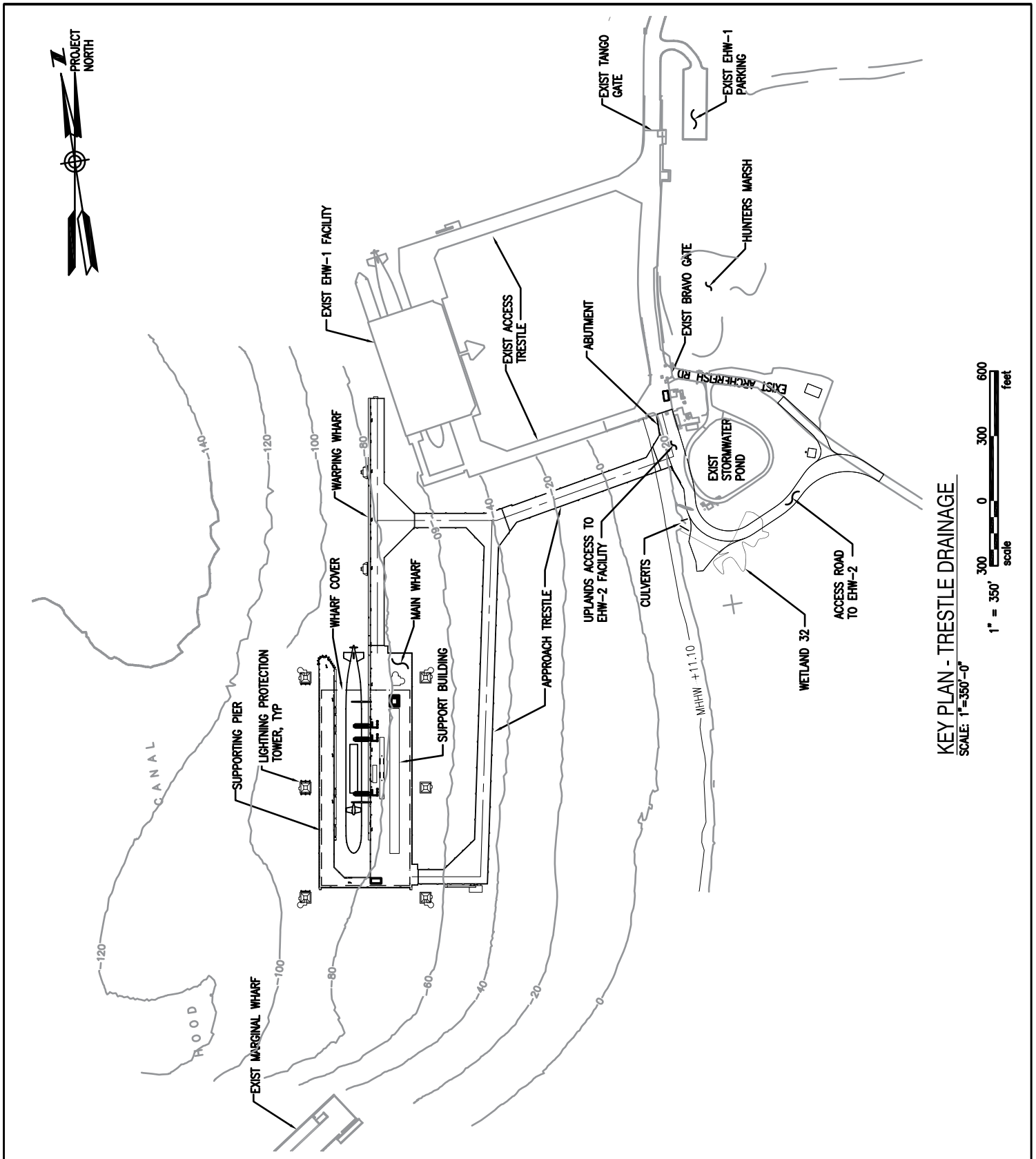

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FIGURE 6
PROPOSED PLAN VIEW
OF THE EHW-2

U.S. NAVAL BASE KITSAP AT BANGOR
SILVERDALE, WASHINGTON

SECOND EXPLOSIVES HANDLING WHARF

TOWNSHIP: 26N
RANGE: 01E
47.75224 N LAT / -122.72383 W LONG

IN: HOOD CANAL
COUNTY OF: KITSAP
STATE OF: WA
APPLICATION BY: DEPT. OF THE NAVY
JANUARY 2012

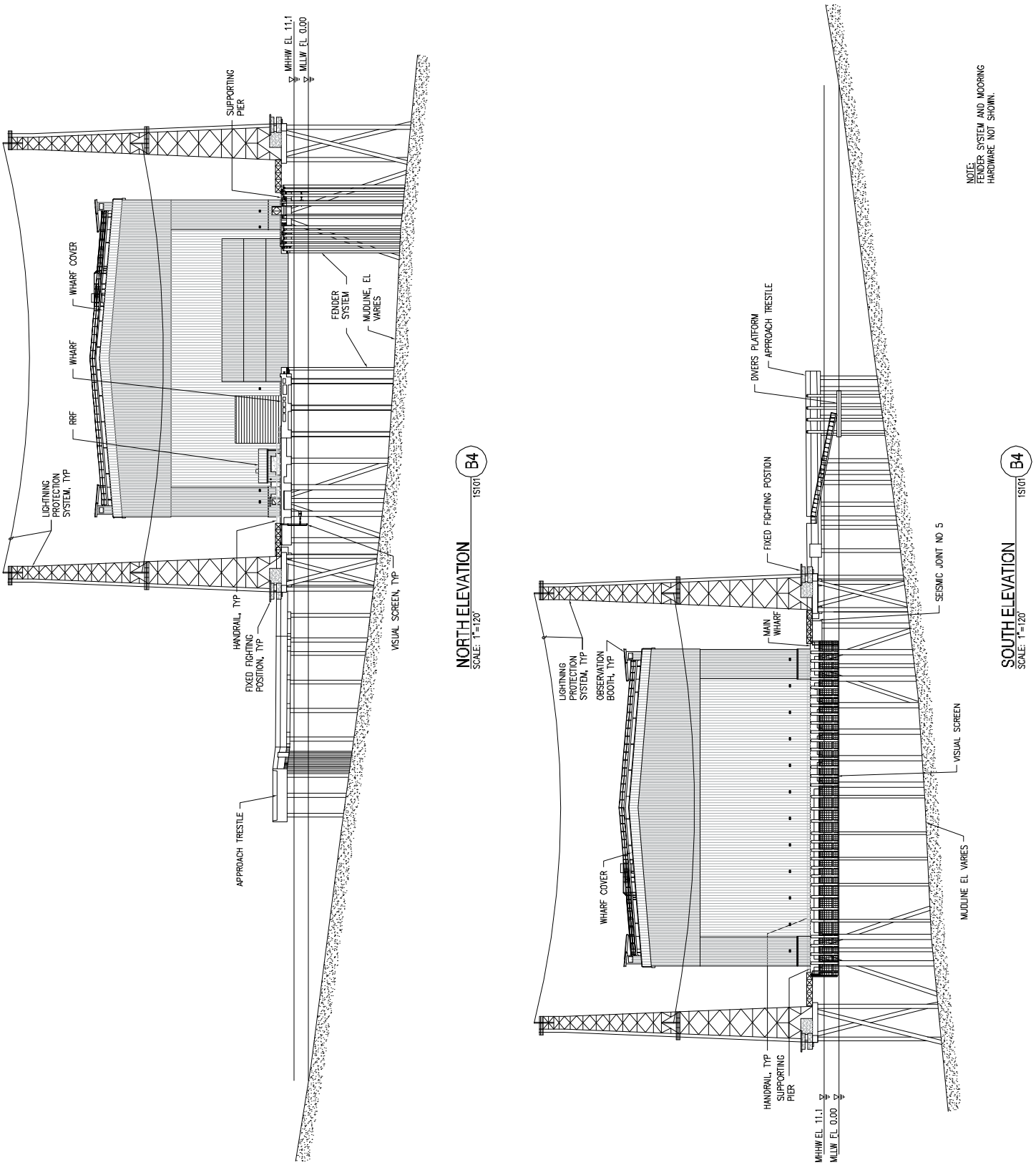

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FIGURE 7
PROPOSED PROFILE VIEW OF THE EHW-2

U.S. NAVAL BASE KITSAP AT BANGOR
SILVERDALE, WASHINGTON

SECOND EXPLOSIVES HANDLING WHARF

TOWNSHIP: 26N
RANGE: 01E
47.75224 N LAT / -122.72383 W LONG

IN: HOOD CANAL
COUNTY OF: KITSAP
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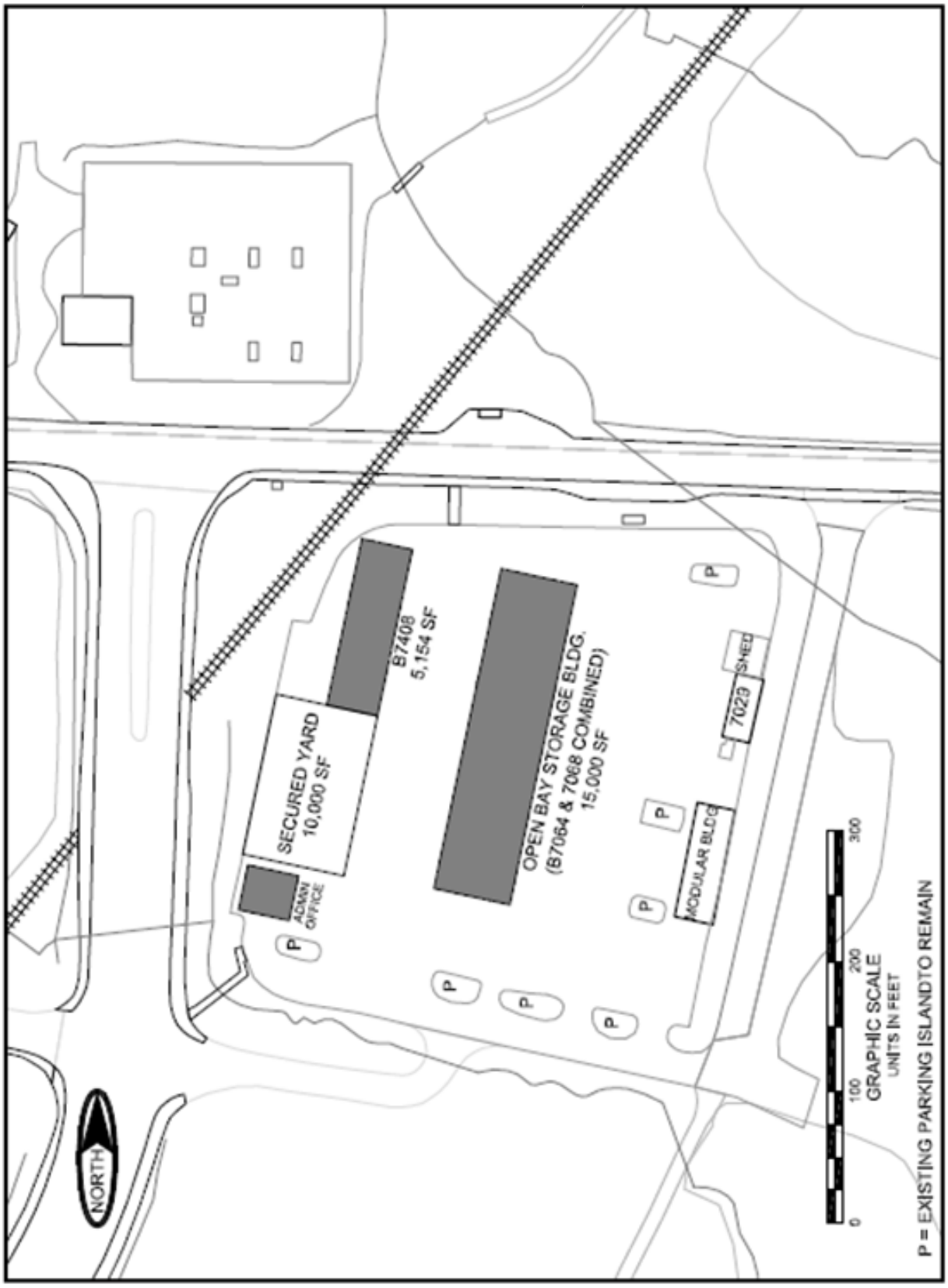

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FIGURE 8
THREE NEW BUILDINGS

U.S. NAVAL BASE KITSAP AT BANGOR
SILVERDALE, WASHINGTON

SECOND EXPLOSIVES HANDLING WHARF

TOWNSHIP: 26N
RANGE: 01E
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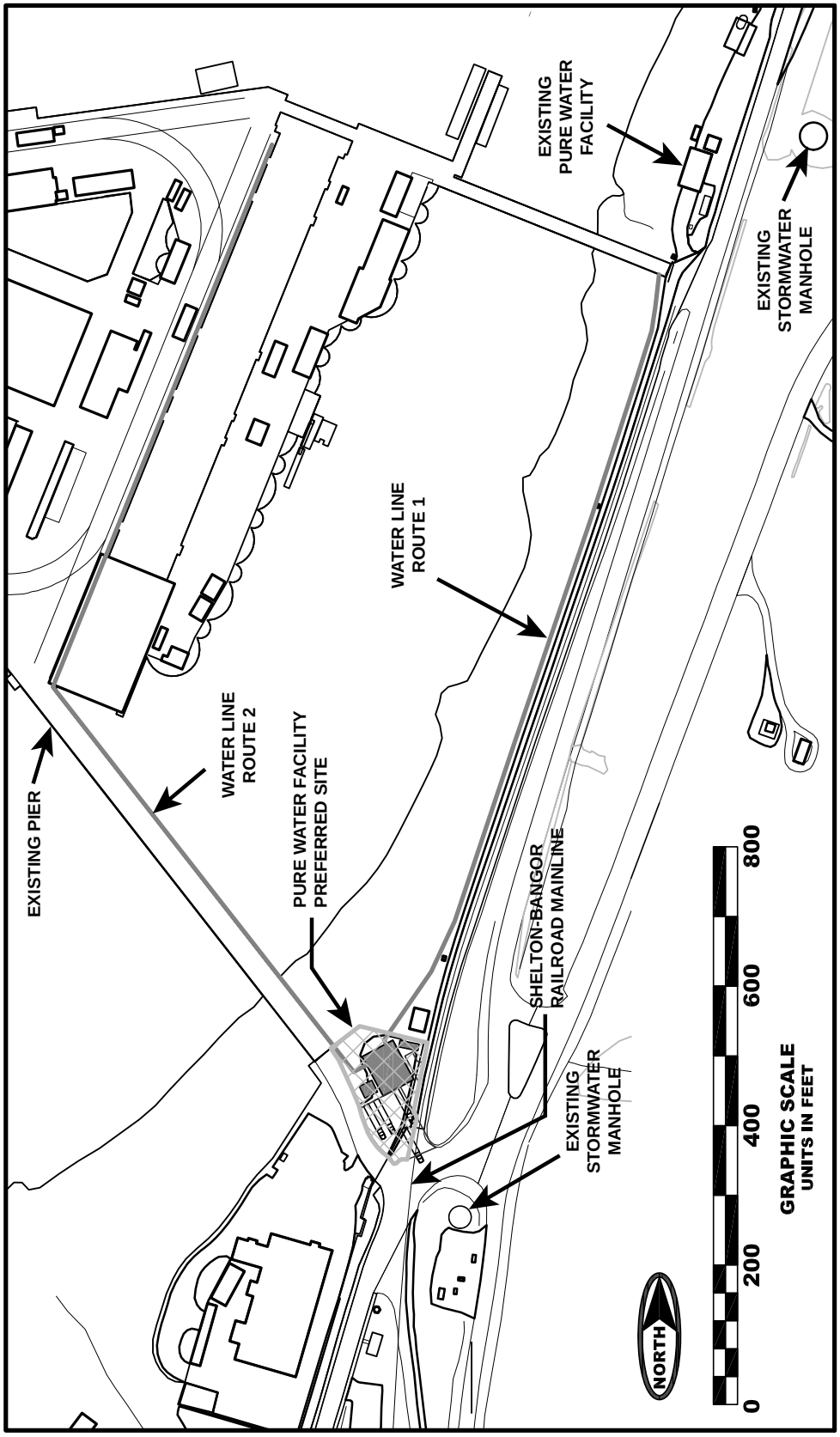

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FIGURE 9
PURE WATER FACILITY
AND WATER LINES

U.S. NAVAL BASE KITSAP AT BANGOR
SILVERDALE, WASHINGTON

SECOND EXPLOSIVES HANDLING WHARF

TOWNSHIP: 26N
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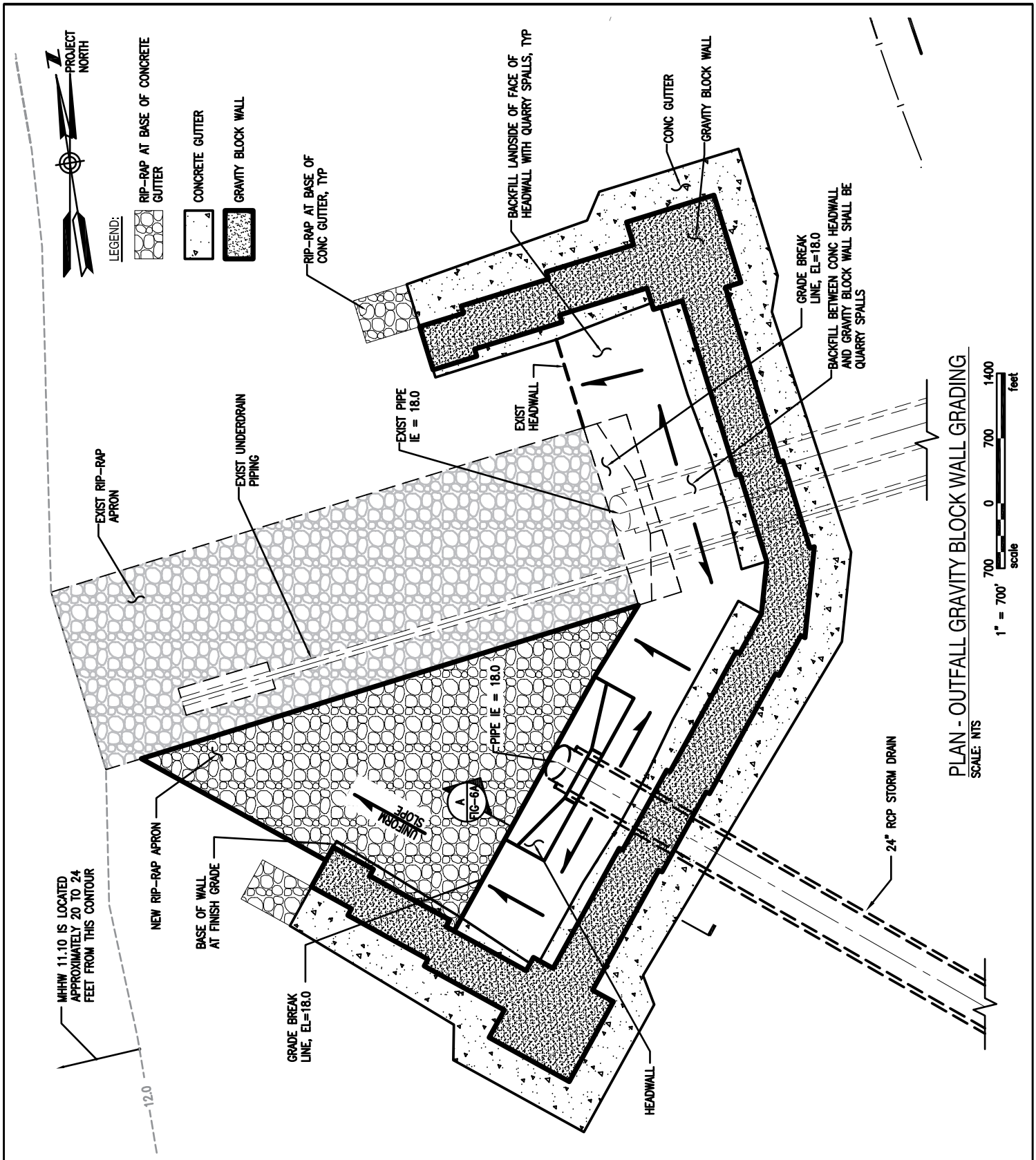

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FIGURE 10
PLAN VIEW OF CULVERT OUTFALL

U.S. NAVAL BASE KITSAP AT BANGOR
SILVERDALE, WASHINGTON

SECOND EXPLOSIVES HANDLING WHARF

TOWNSHIP: 26N
RANGE: 01E
47.75224 N LAT / -122.72383 W LONG

IN: HOOD CANAL
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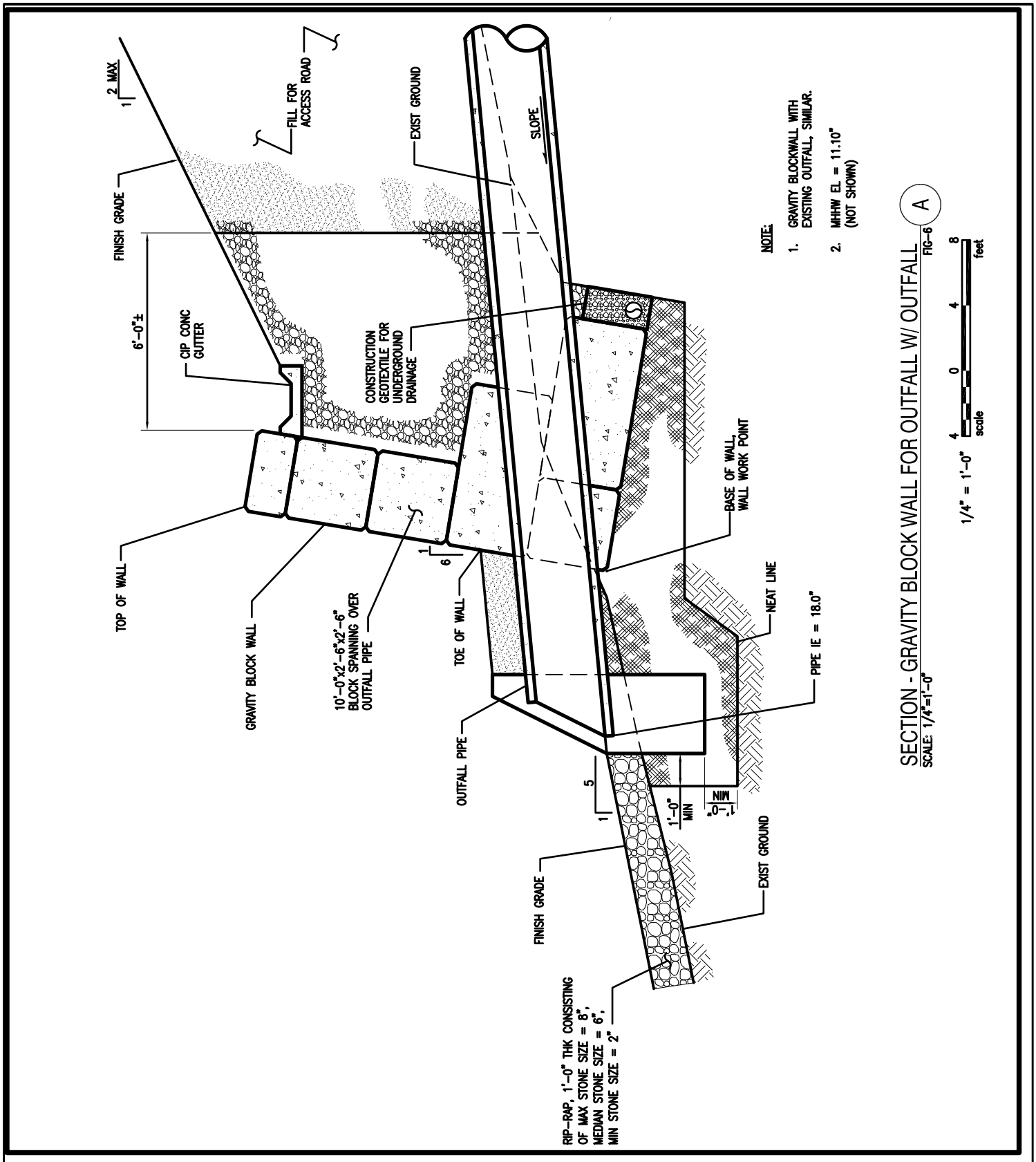

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FIGURE 11
PROFILE VIEW OF
CULVERT OUTFALL

U.S. NAVAL BASE KITSAP AT BANGOR
SILVERDALE, WASHINGTON

SECOND EXPLOSIVES HANDLING WHARF

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IN: HOOD CANAL
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JANUARY 2012

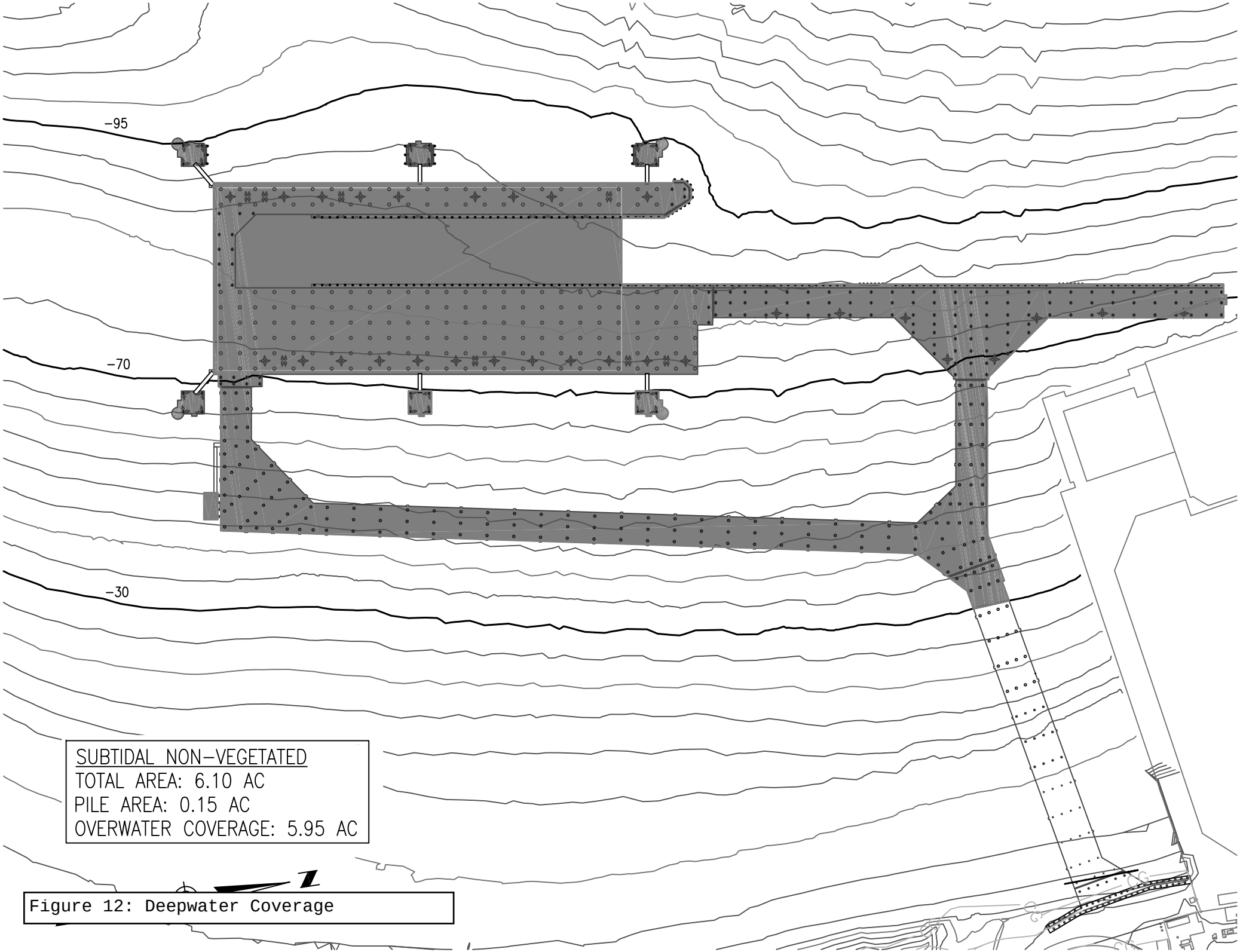


Figure 12: Deepwater Coverage

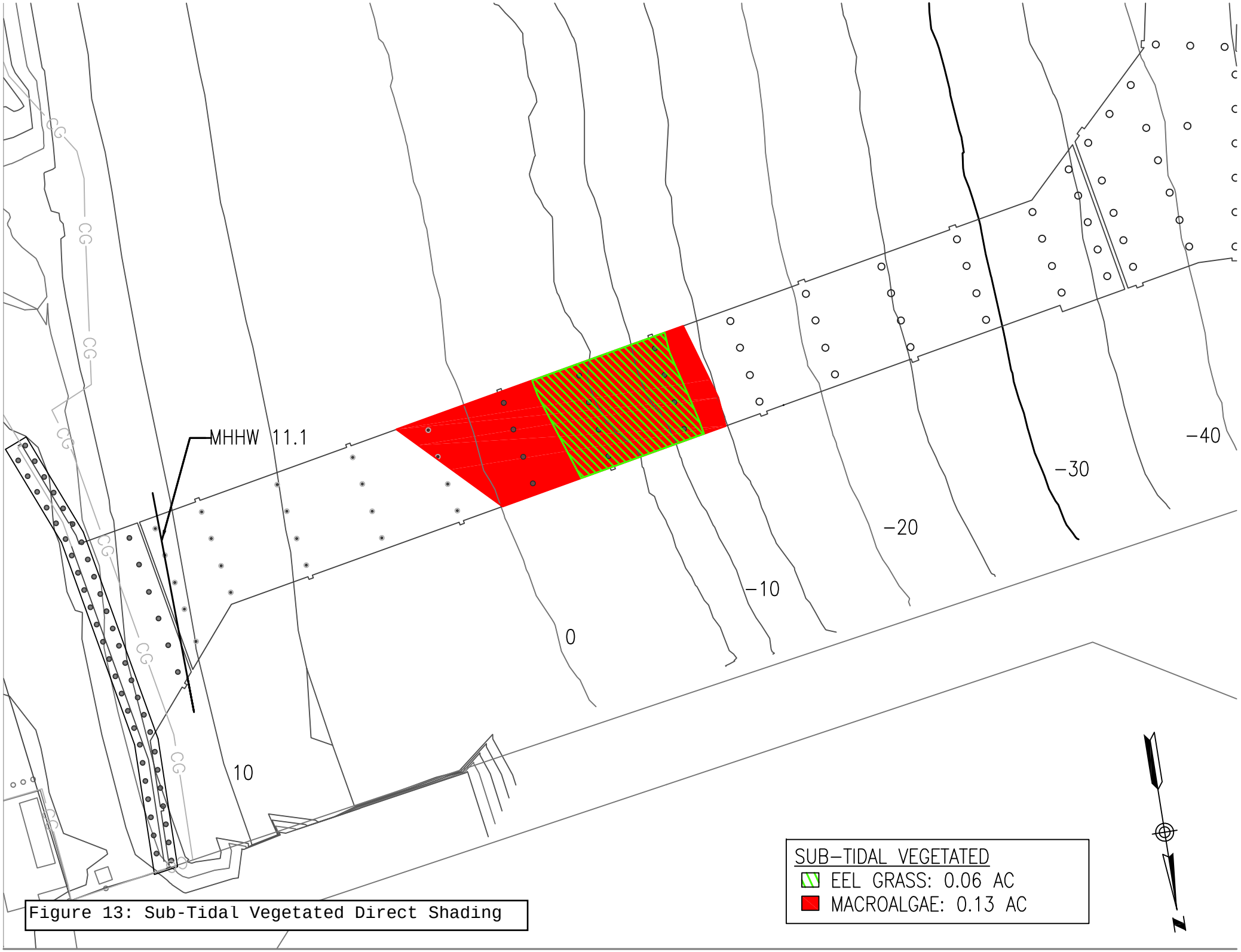


Figure 13: Sub-Tidal Vegetated Direct Shading

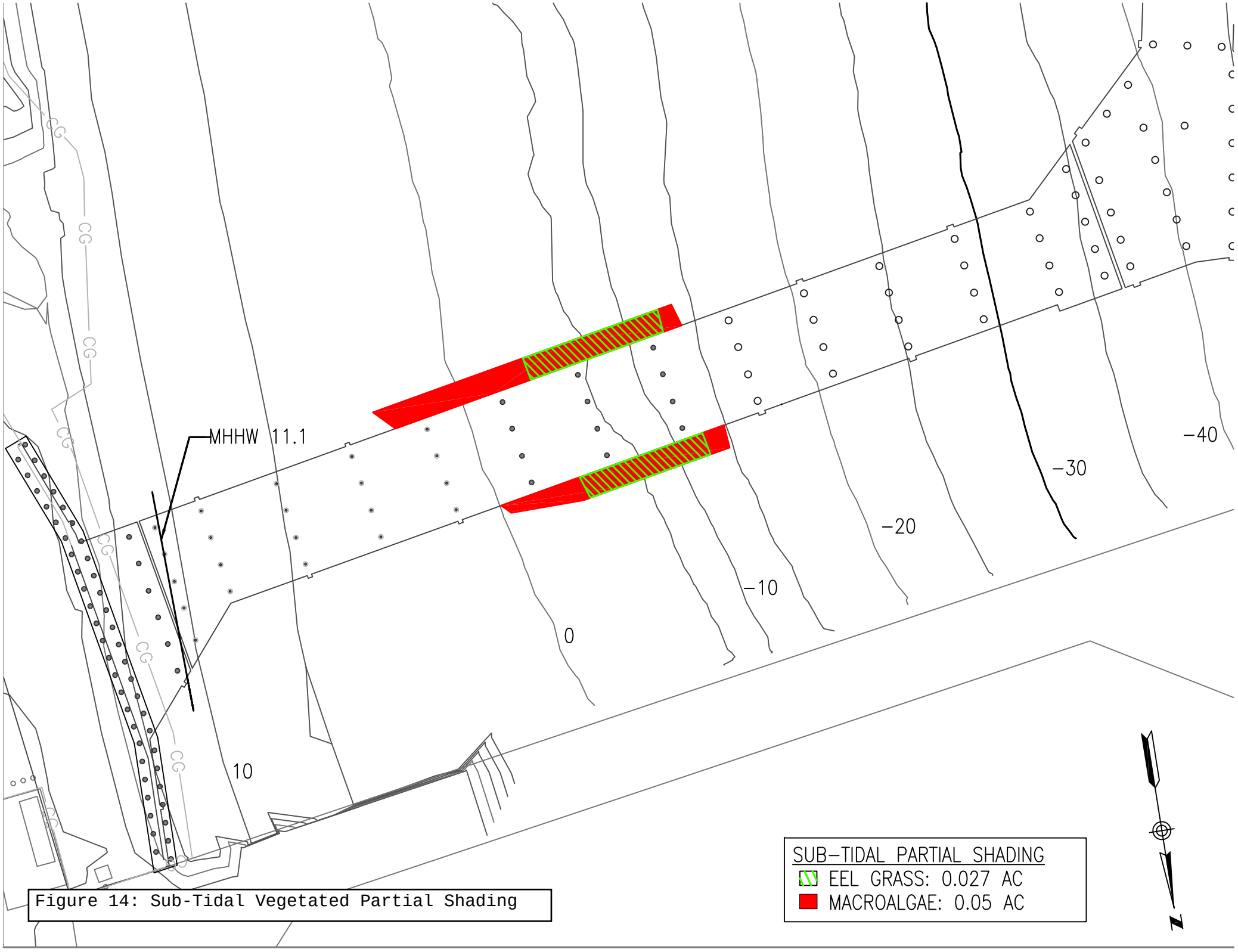


Figure 14: Sub-Tidal Vegetated Partial Shading

Figure 15: Intertidal Direct Shading

Figure 16: Intertidal Partial Shading

Figure 17: Abutment Fill Area

Appendix A

Freshwater Credit/Debit Forms

Wetland name or number Wetland 32

SCORING FORM

Scoring functions to calculate mitigation credits and debits in Western Washington

Name of wetland (if known): Wetland 32 Date of site visit: ____

Scored by_____
SEC: __ TWNSHP: ___ RNGE: ___ Estimated size:0.2 Aerial photo included? Y

These scores are for:
X
_____Wetland being altered
_____Mitigation site before mitigation takes place
_____Mitigation site after goals and objectives are met

SUMMARY OF SCORING

FUNCTION	Improving Water Quality	Hydrologic	Habitat
Rating of Site Potential	L	M	M
Rating of Landscape Potential	L	L	M
Rating of Value	M	L	M
Score Based on Ratings (see table below)	4	4	6

	Wetland HGM Class Used for Rating	
	Depressional	
	Riverine	
	Lake-fringe	
	Slope	X
	Flats	
	Freshwater Tidal	
	Check if unit has multiple HGM classes present	

Scores
(*Order of ratings is not important*)
9 = H,H,H
8 = H,H,M
7 = H,H,L
7 = H,M,M
6 = H,M,L
6 = M,M,M
5 = H,L,L
5 = M,M,L
4 = M,L,L
3 = L,L,L

NOTE: Form is not complete without the figures requested.
Put only the highest score for a question in each box of the form, even if more than one indicator applies to the unit. Do NOT add the scores within a question.

"DEBIT" WORKSHEET

Wetland unit to be altered: Wetland 32 Date 8/9/2012

Use the following tables to calculate the Debits for the impact site. Use a separate worksheet for each wetland unit being altered. In addition, you will need to calculate the debits separately for forested areas and for emergent/shrub areas. Use the map of Cowardin plant types from question H 1.1 on the Scoring Form to determine the boundaries between forested areas and non-forested areas.

FUNCTION *From Scoring Form*	**Improving Water Quality**	**Hydrologic**	**Habitat**
Rating of Site Potential	L	M	M
Rating of Landscape Potential	L	L	M
Rating of Value	M	L	M
Score for Wetland	4	4	6

CALCULATIONS **emergent or shrub areas**	**Improving Water Quality**	**Hydrologic**	**Habitat**
Score for wetland unit (see above)			
Impact - Acres of **non-forested** areas *(same for all functions)*			
Basic mitigation requirement (BMR) = *Score for function x acres impacted*			
Temporal loss factor (TLF) (See table below)			
Mitigation required DEBITS = BMR x TLF			
CALCULATIONS **forested areas**	**Improving Water Quality**	**Hydrologic**	**Habitat**
Score for wetland unit (see above)	4	4	6
Impact - Acres of **forest** *(Create a separate column for each type of forest)* Deciduous (D), Evergreen (E), Cat. 1 deciduous (>50%cover) (CD) Cat. 1 evergreen (>50% cover)(CE)	D E CD CE 0.2	D E CD CE 0.2	D E CD CE 0.2
Basic mitigation requirement (BMR) = *Score x acres impacted*	0.8	0.8	1.2
Temporal loss factor (TLF) (See table below)	3		
Mitigation required DEBITS = BMR x TLF	2.4	2.4	3.6
TOTAL for forested areas (D+E+CD+CE)	2.4	2.4	3.6

Temporal Loss Factors:

Timing of Mitigation	Temporal Loss Factor
Advance – At least two years has passed since plantings were completed or one year since "as-built" plans were submitted to regulatory agencies	1.25
Concurrent – Physical alterations at mitigation site are completed within a year of the impacts, but planting may be delayed by up to 2 years if needed to optimize conditions for success.	
For impacts to an emergent or shrub community	1.5
For impacts to a deciduous forested wetland community	2.0
For impacts to an evergreen forested wetland community	2.5
For impacts to a deciduous Category I forested wetland community	3
For impacts to an evergreen Category I forested wetland community	3.5
Delayed - Construction is not completed within one year of impact, but is completed (including plantings if required) within 5 growing seasons of impact.	
For impacts to an emergent or shrub community	3
For impacts to a deciduous forested wetland community	4
For impacts to an evergreen forested wetland community	5
For impacts to a deciduous Category I forested wetland community	6
For impacts to an evergreen Category I forested wetland community	7

NOTE: The ratings, scoring and calculations are valid for only five years because wetlands and their functions will change with time. If delays in the construction of the site are more than 5 years, the mitigation plan will probably have to be re-negotiated and the calculation re-done. This time limit was chosen to be consistent with the validity of wetland delineations as established by the U.S. Army Corps of Engineers.

TOTALS

	Improving Water Quality	Hydrologic	Habitat
DEBITS - Emergent or shrub areas	Acre-points	Acre-points	Acre-points
DEBITS - Forested areas	2.4 Acre-points	2.4 Acre-points	3.6 Acre-points
TOTAL	2.4 Acre-points	2.4 Acre-points	3.6 Acre-points

=8.4

Wetland name or number # 32

Slope Wetlands **WATER QUALITY FUNCTIONS** - Indicators that the site functions to improve water quality Questions S 1.1 – S 1.3 are from Wetland Rating System (Hruby 2004b).	
S 1. Does the wetland unit have the potential to improve water quality?	
S 1.1 Characteristics of average slope of unit: *(a 1% slope has a 1 ft vertical drop in elevation for every 100 ft horizontal distance)* Slope is1% or less — points = 3 Slope is 1% - 2% — points = 2 Slope is 2% - 5% — points = 1 Slope is greater than 5% — points = 0	1
S 1.2 The soil 2 inches below the surface (or duff layer) is clay or organic *(use NRCS definitions)* YES = 3 points NO = 0 points	0
S 1.3 Characteristics of the plants in the wetland that trap sediments and pollutants: Choose the points appropriate for the description that best fits the plants in the wetland. *Dense plants means you have trouble seeing the soil surface (>75% cover), and uncut means not grazed or mowed and plants are higher than 6 inches. Provide photo or map showing polygons of different plants types* Dense, uncut, herbaceous plants > 90% of the wetland area — points = 6 Dense, uncut, herbaceous plants > ½ of area — points = 3 Dense, woody, plants > ½ of area — points = 2 Dense, uncut, herbaceous plants > ¼ of area — points = 1 Does not meet any of the criteria above for plants — points = 0	Figure_ 0
Total for S 1 — Add the points in the boxes above	
Rating of Site Potential: If score is **12 = H** **6 - 11 = M** **0 - 5 = L** *Record the rating on the first page*	L

S 2. 0 Does the landscape have the potential to support the water quality function at the site?	
S 2.1 IS >10% of the buffer area within 150 ft upslope of wetland unit in agricultural, pasture, residential, commercial, or urban? Yes = 1 No = 0	0
Rating of Landscape Potential: If score is **1 = M** **0 = L** *Record the rating on the first page*	L

Wetland name or number 32

S 3.0 Is the water quality improvement provided by the site valuable to society?	
S 3.1 Does the unit discharge directly to a stream, river, or lake that is on the 303(d) list? Yes = 1 No = 0	0
S 3.2 Is the unit in a sub-basin where water quality is an issue? (at least one aquatic resource in the basin is on the 303(d) list) Yes = 1 No = 0	1
S 3.3 Has the site been identified in a watershed or local plan as important for maintaining water quality? Yes = 2 No = 0	0
Total for D 3 Add the points in the boxes above	1
Rating of Value: If score is **2 - 4 = H** **1 = M** **0 = L**	M

Record the rating on the first page

Slope Wetlands

HYDROLOGIC FUNCTIONS - Indicators that the site functions to reduce flooding and stream erosion

Questions S 4.1 – S 4.2 are from Wetland Rating System (Hruby 2004b).

S 4.0 Does the wetland unit have the potential to reduce flooding and stream erosion?	
S 4.1 Characteristics of plants that reduce the velocity of surface flows during storms. Choose the points appropriate for the description that best fit conditions in the wetland. *(Stems of plants should be thick enough (usually > 1/8 in), or dense enough, to remain erect during surface flows)* Dense, uncut, **rigid** plants covers > 90% of the area of the wetland. YES = 1 All other conditions = 0	1
Rating of Site Potential: If score is **1 = M** **0 = L**	M

Record the rating on the first page

NOTES and FIELD OBSERVATIONS:

Wetland name or number 32

S 5.0 Does the landscape have the potential to support the hydrologic functions at the site?	
S 5.1 Is more than 25% of the buffer area within 150 ft upslope of wetland unit in agricultural, pasture, residential, commercial, or urban ? Yes = 1 No = 0	0

Rating of Landscape Potential: If score is 1 = M
0 = L L

Record the rating on the first page

S 6.0 Are the hydrologic functions provided by the site valuable to society?	
S 6.1 Distance to the nearest areas downstream that have flooding problems? Immediate sub-basin down-gradient of site has surface flooding problems that results in $$ loss or loss of natural resources points = 2 Surface flooding problems are in a sub-basin further down-gradient points = 1 No flooding problems anywhere downstream points = 0	0
S 6.2 Has the site been identified as important for flood storage or flood conveyance in a regional flood control plan? Yes = 2 No = 0	0
Total for R 6 Add the points in the boxes above	0

Rating of Value: **If score is 2 - 4 = H**
1 = M
0 = L L

Record the rating on the first page

NOTES and FIELD OBSERVATIONS:

Wetland name or number 32

These questions apply to wetlands of all HGM classes.

HABITAT FUNCTIONS – Indicators that site functions to provide important habitat.
Questions H 1.1 – H 1.5 are from Wetland Rating System (Hruby 2004b).

H 1. Does the wetland unit have the potential to provide habitat for many species?

H 1.1 Structure of plant community – *indicators are Cowardin classes and layers in forest*
Check the Cowardin plant classes in unit – *Polygons for each class must total ¼ acre, or more than 10% of the unit if it is smaller than 2.5 acres.*

Figure__

Provide map of Cowardin plant classes

___Aquatic bed
✓ Emergent plants ← this is different from our wetland Rating form - which was done in winter & herbaceous layer was almost non-existent
✓ Scrub/shrub (areas where shrubs have > 30% cover)
✓ Forested (areas where trees have > 30% cover)

If the unit has a forested class check if:

___The forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the forested polygon

Add the number of structures checked. If you have:

4 structures or more	points = 4
3 structures	points = 2
2 structures	points = 1
1 structure	points = 0

2

H 1.2. Hydroperiods

Figure__

Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or ¼ acre to count (*see text for descriptions of hydroperiods*).

Provide map of polygons with different hydroperiods

___Permanently flooded or inundated	4 or more types present	points = 3
✓ Seasonally flooded or inundated	3 types present	points = 2
✓ Occasionally flooded or inundated	2 types present	points = 1
✓ Saturated only	1 type present	points = 0

___Permanently flowing stream or river in, or adjacent to, the wetland
___Seasonally flowing stream in, or adjacent to, the wetland
___**Lake-fringe wetland = 2 points**
___**Freshwater tidal wetland = 2 points**

2

H 1.3. Richness of Plant Species

Count the number of plant species in the wetland unit that cover at least 10 ft².
Different patches of the same species can be combined to meet the size threshold and you do not have to name the species.
Do not include Eurasian Milfoil, reed canarygrass, purple loosestrife, Canadian Thistle

If you counted:	> 19 species	points = 2
List species below if you want to:	5 - 19 species	points = 1
	< 5 species	points = 0

0

Wetland name or number 32

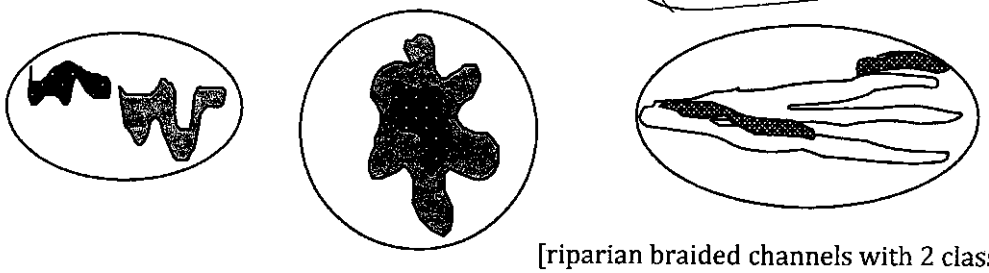
H 1.4. Interspersion of habitats

Decide from the diagrams below whether interspersion between Cowardin plants classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, medium, low, or none.

Provide map of Cowardin plant classes (same as H1.1)

Figure_

None = 0 points Low = 1 point Moderate = 2 points



[riparian braided channels with 2 classes]

High = 3 points

NOTE: If you have four or more classes or three plants classes and open water the rating is always "high."

2

H 1.5. Special Habitat Features:

Check the habitat features that are present in the wetland. The number of checks is the number of points you put into the next column.

✓ Large, downed, woody debris within the unit (>4 inches diameter and 6 ft long).

___ Standing snags (diameter at the bottom > 4 inches) within the unit

___ Undercut banks are present for at least 6.6 ft (2m) **and/or** overhanging plants extends at least 3.3 ft (1m) over a stream (or ditch) in, or contiguous with the unit, for at least 33 ft (10m)

___ Stable steep banks of fine material that might be used by beaver or muskrat for denning (>30degree slope) OR signs of recent beaver activity are present *(cut shrubs or trees that have not yet weathered where wood is exposed)*

___ At least ¼ acre of thin-stemmed persistent plants or woody branches are present in areas that are permanently or seasonally inundated.*(structures for egg-laying by amphibians)*

✓ Invasive plants cover less than 25% of the wetland area in every stratum of plants (*see H 1.1 for list of strata*)

2

H 1. TOTAL Score - potential for providing habitat

Add the scores from H 1.1, H 1.2, H 1.3, H 1.4, and H 1.5

8

Rating of Site Potential: If score is

15 - 18 = H

7 – 14 = M

0 – 6 = L

M

Record the rating on the first page

Wetland name or number 32

H 2.0 Does the landscape have the potential to support habitat at the site?		
H 2.1 Accessible habitat (include *only habitat that directly abuts wetland unit*).		Figure_
Calculate: % undisturbed habitat + [(% moderate and low intensity land uses)/2] = _____		
Provide map of land use within 1 km of unit edge		
If total accessible habitat is:		
>1/3 (33.3%) of 1 km circle *(~100 hectares or 250 acres)*	points = 3	
20 - 33% of 1 km circle	points = 2	2
10 - 19% of 1 km circle	points = 1	
<10% of 1 km circle	points = 0	
H 2.2 Undisturbed habitat in 1 km circle around unit. If:		
Undisturbed habitat > 50% of circle	points = 3	
Undisturbed habitat 10 - 50% and in 1-3 patches	points = 2	
Undisturbed habitat 10 - 50% and > 3 patches 40%	points = 1	1
Undisturbed habitat < 10% of circle	points = 0	
H 2.3 Land use intensity in 1 km circle. If:		
> 50% of circle is high intensity land use	points = (- 2)	0
Does not meet criterion above	points = 0	
Total for H 2 Add the points in the boxes above		3

Rating of Landscape Potential: If score is 4- 6 = H
1-3 = M
< 1 = L

M

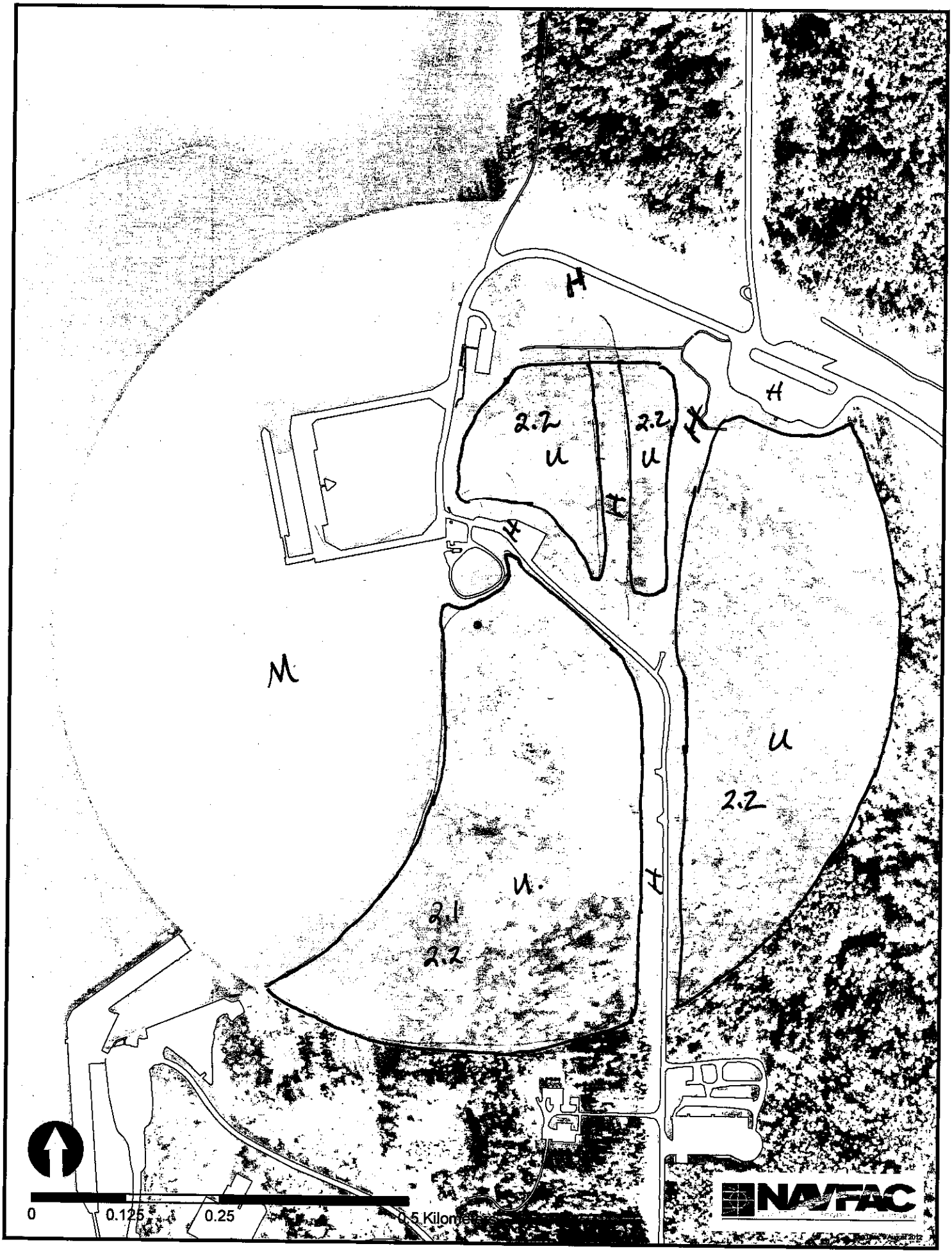
Record the rating on the first page

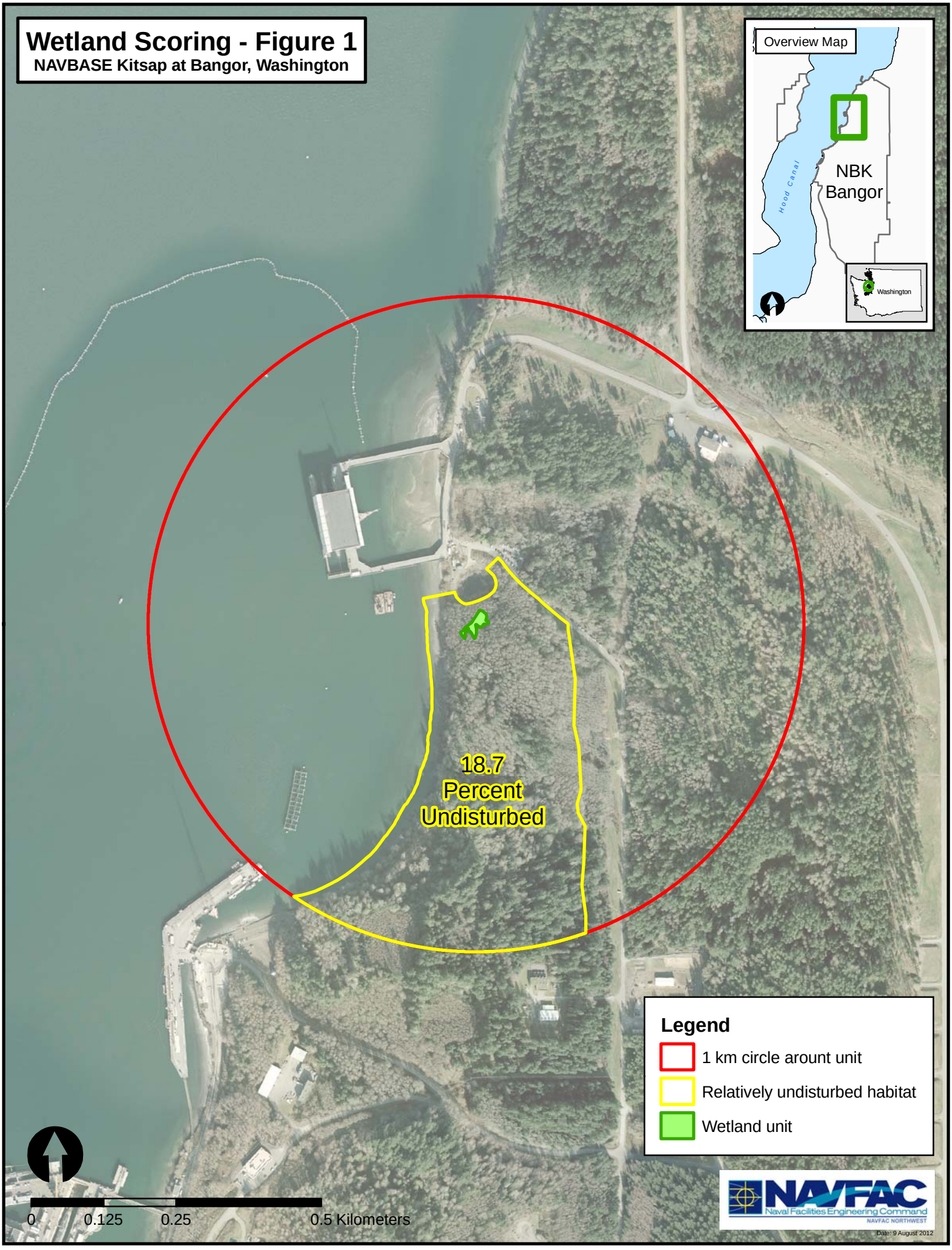
H 3.0 Is the Habitat provided by the site valuable to society?		
H3.1Does the site provides habitat for species valued in laws, regulations or policies? *(choose only the highest score)*		
Site meets ANY of the following criteria:	points = 2	
— It provides habitat for Threatened or Endangered species (any plant or animal on the state or federal lists)		
— It is a "priority area" for an individual WDFW species		
— It is a Natural Heritage Site as determined by the Department of Natural Resources		
— It scores 4 on question H2.3 of the wetland rating system		
— It has been categorized as an important habitat site in a local or regional comprehensive plan, in a Shoreline Master Plan, or in a watershed plan		
Site scores 1-3 on question H2.3 of the wetland rating system	points = 1	1
Site does not meet any of the criteria above	points = 0	

Rating of Value: If score is **2 = H**
1 = M
0 = L

M

Record the rating on the first page


H
H
2.2
2.2
U
U
M
U
2.2
U.
2.1
2.2
0
0.125
0.25
0.5 Kilometers
NAVFAC


Wetland Scoring - Figure 1
NAVBASE Kitsap at Bangor, Washington
Overview Map
Hood Canal
NBK
Bangor
Washington
18.7
Percent
Undisturbed
Legend
1 km circle arount unit
Relatively undisturbed habitat
Wetland unit
0
0.125
0.25
0.5 Kilometers
NAVFAC
Naval Facilities Engineering Command
NAVFAC NORTHWEST
Date: 9 August 2012

Appendix B

Underwater photos and location diagram

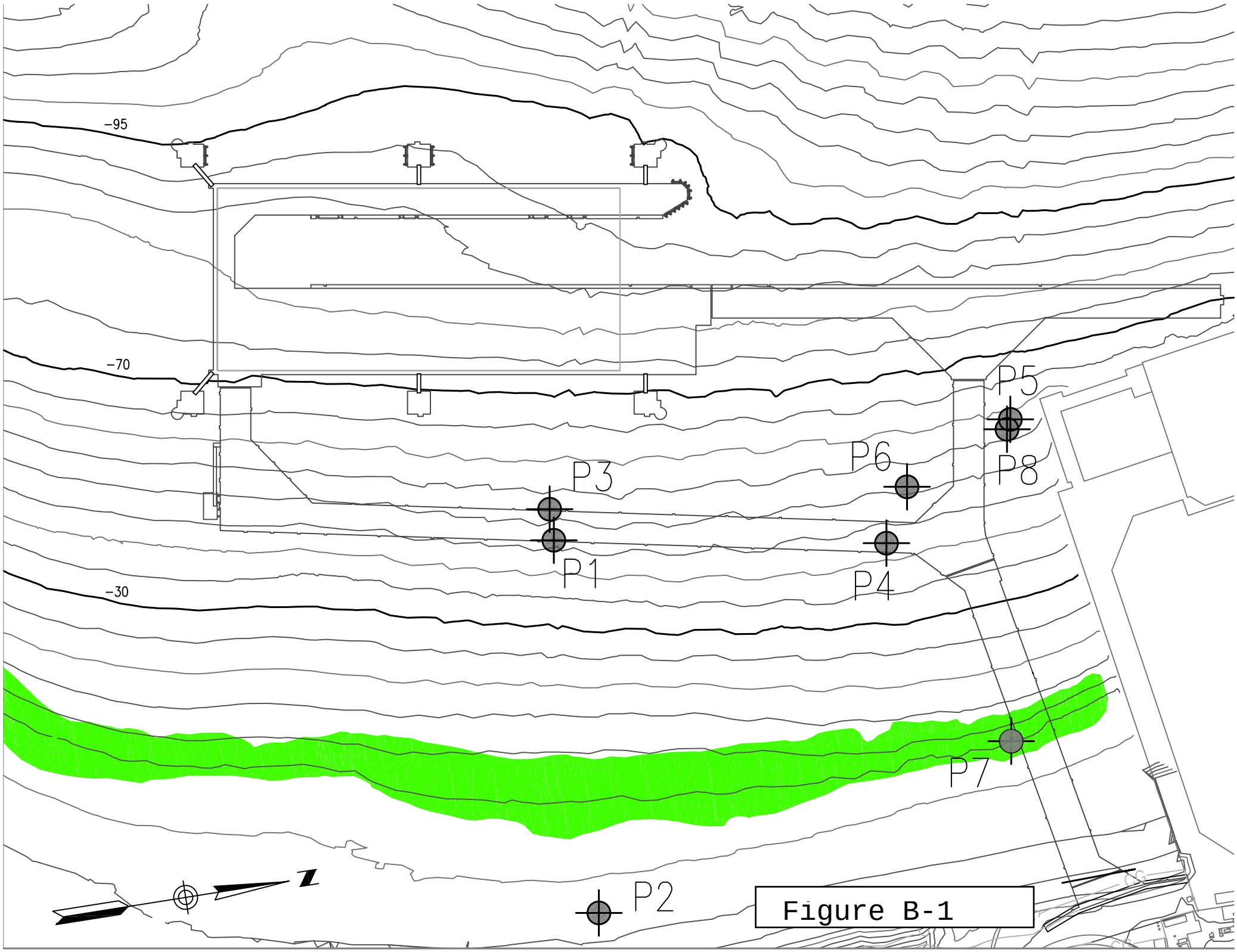


Figure B-1

P1 A3LN3 Clam Siphon


N 47 45.081
W122 43.309
Hdg: 103.1
Speed: 000.6
16:58:02
08-05-07
P2 A3LN3 Sand and Ulva

P3 A3LN3 Seawhip

P4 A3LN4 Clam Siphon

P5 A3LN4 Mooring Chain


N 47 45.159
W122 43.431
Hdg: 280.4
Speed: 001.1
17:02:42
08-05-07
P6 A3LN4 Sunstar and Seawhip


N 47 45.174
W122 43.348
Hdg: 255.8
Speed: 001.4
17:17:12
08-05-07
P7 A3LN5 Dense Eelgrass


N 47 45.182
W122 43.445
Hdg: 255.8
Speed: 000.9
17:20:41
08-05-07
P8 A3LN5 Sandy Silt

Appendix C

Wetlands 32, riparian diagrams, and vicinity photos

To see all the details that are visible on the screen, use the "Print" link next to the map.

Google

To see all the details that are visible on the screen, use the "Print" link next to the map.

Google

To see all the details that are visible on the screen, use the "Print" link next to the map.

Google

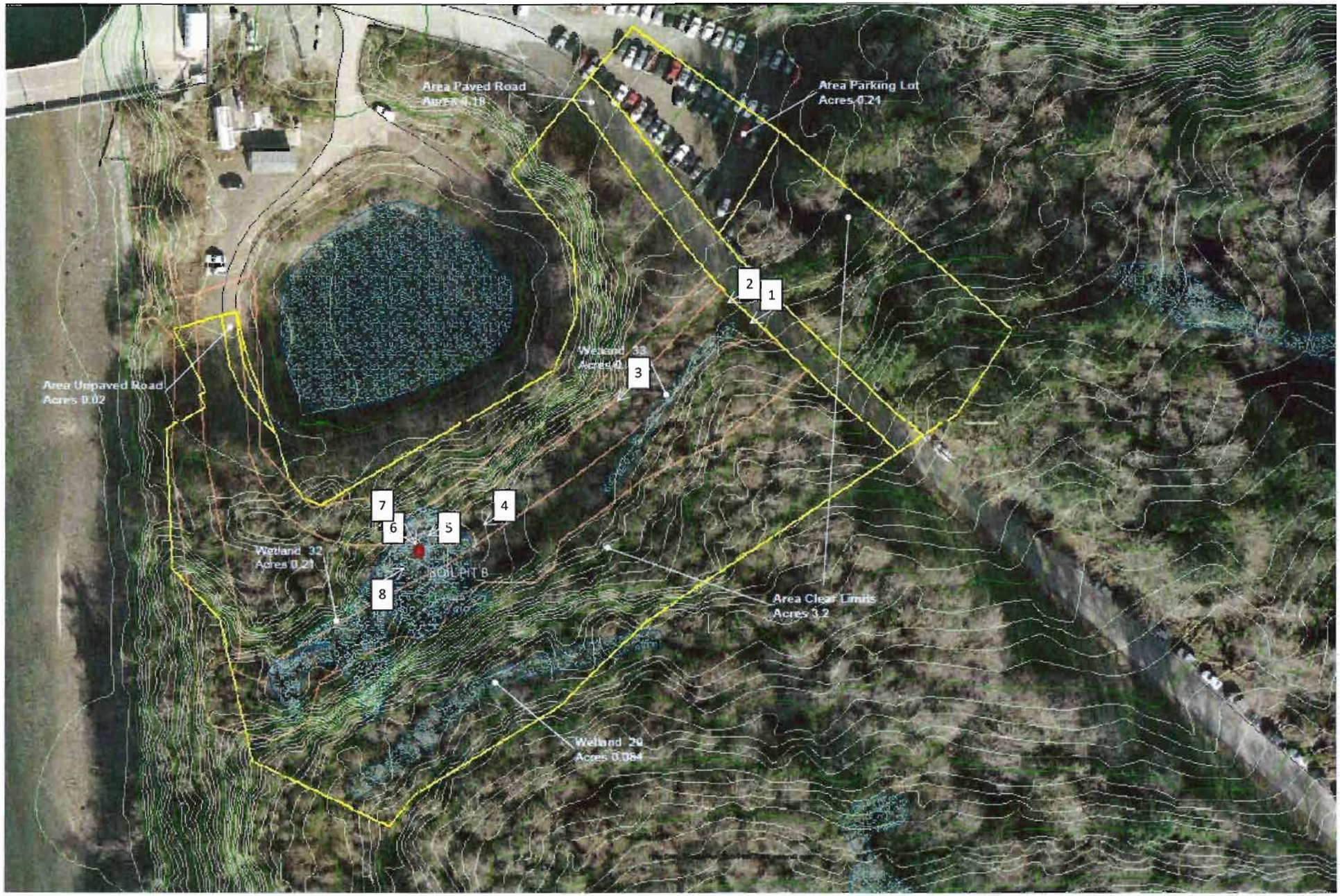

Area Paved Road
Acres 4.18
Area Parking Lot
Acres 0.21
2
1
Wetland 33
Acres 0
3
Area Unpaved Road
Acres 0.02
7
6
5
4
Wetland 32
Acres 0.21
SOIL PIT B
8
Area Clear Limits
Acres 3.2
Wetland 29
Acres 0.084

Figure C-1

Figure C-2

Figure C-3

Figure C-4

Figure C-5

Figure C-6

Figure C-7

Figure C-8

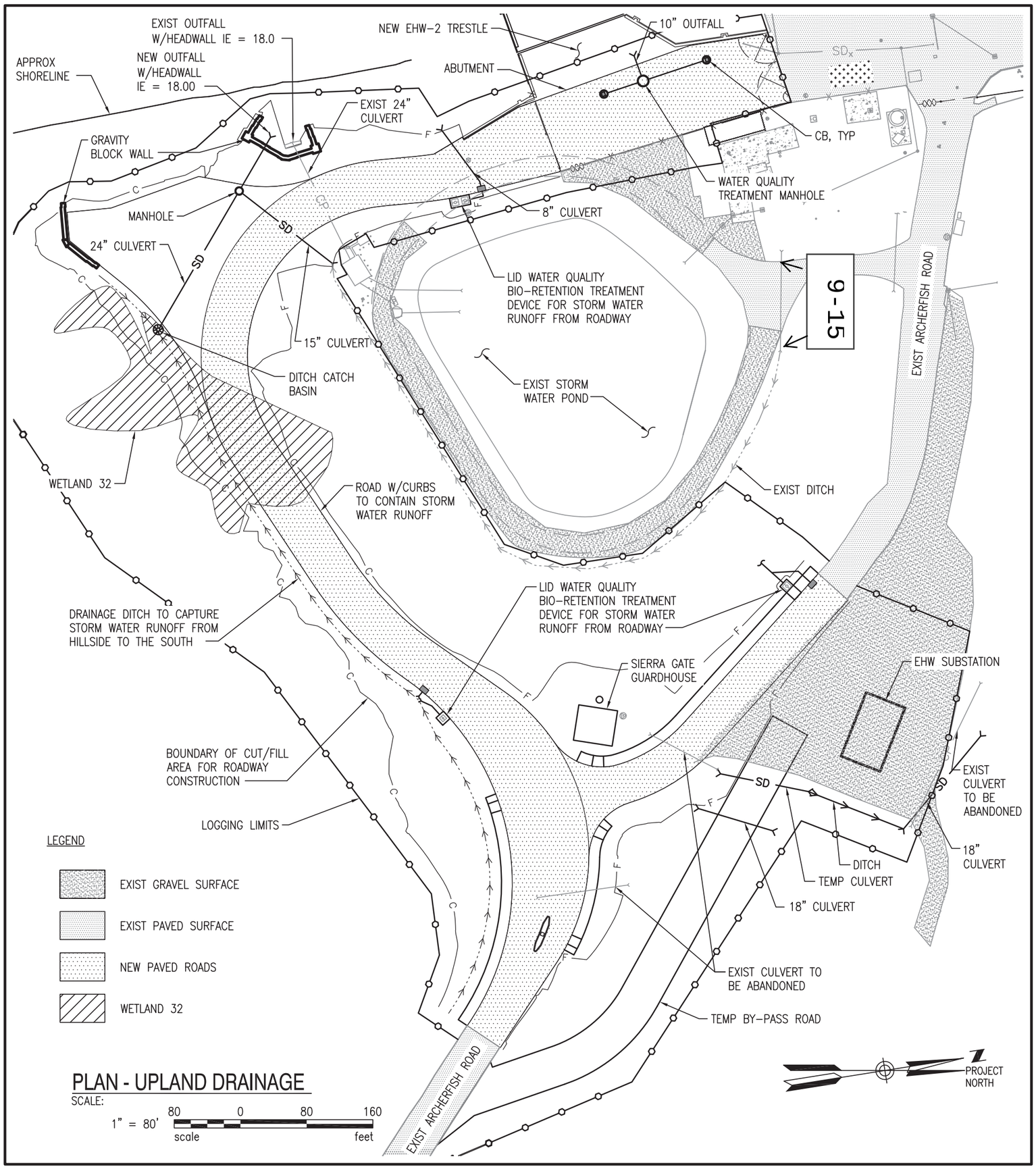

EXIST OUTFALL W/HEADWALL IE = 18.0
NEW OUTFALL W/HEADWALL IE = 18.00
APPROX SHORELINE
NEW EHW-2 TRESTLE
ABUTMENT
10" OUTFALL
EXIST 24" CULVERT
GRAVITY BLOCK WALL
CB, TYP
WATER QUALITY TREATMENT MANHOLE
MANHOLE
8" CULVERT
24" CULVERT
LID WATER QUALITY BIO-RETENTION TREATMENT DEVICE FOR STORM WATER RUNOFF FROM ROADWAY
9-15
EXIST ARCHERFISH ROAD
15" CULVERT
DITCH CATCH BASIN
EXIST STORM WATER POND
WETLAND 32
ROAD W/CURBS TO CONTAIN STORM WATER RUNOFF
EXIST DITCH
DRAINAGE DITCH TO CAPTURE STORM WATER RUNOFF FROM HILLSIDE TO THE SOUTH
LID WATER QUALITY BIO-RETENTION TREATMENT DEVICE FOR STORM WATER RUNOFF FROM ROADWAY
SIERRA GATE GUARDHOUSE
EHW SUBSTATION
BOUNDARY OF CUT/FILL AREA FOR ROADWAY CONSTRUCTION
EXIST CULVERT TO BE ABANDONED
LOGGING LIMITS
18" CULVERT
DITCH
TEMP CULVERT
18" CULVERT
EXIST CULVERT TO BE ABANDONED
TEMP BY-PASS ROAD
EXIST ARCHERFISH ROAD
PROJECT NORTH
LEGEND
EXIST GRAVEL SURFACE
EXIST PAVED SURFACE
NEW PAVED ROADS
WETLAND 32
PLAN - UPLAND DRAINAGE
SCALE:
1" = 80'
80 0 80 160
scale feet

Figure C-9

Figure C-10

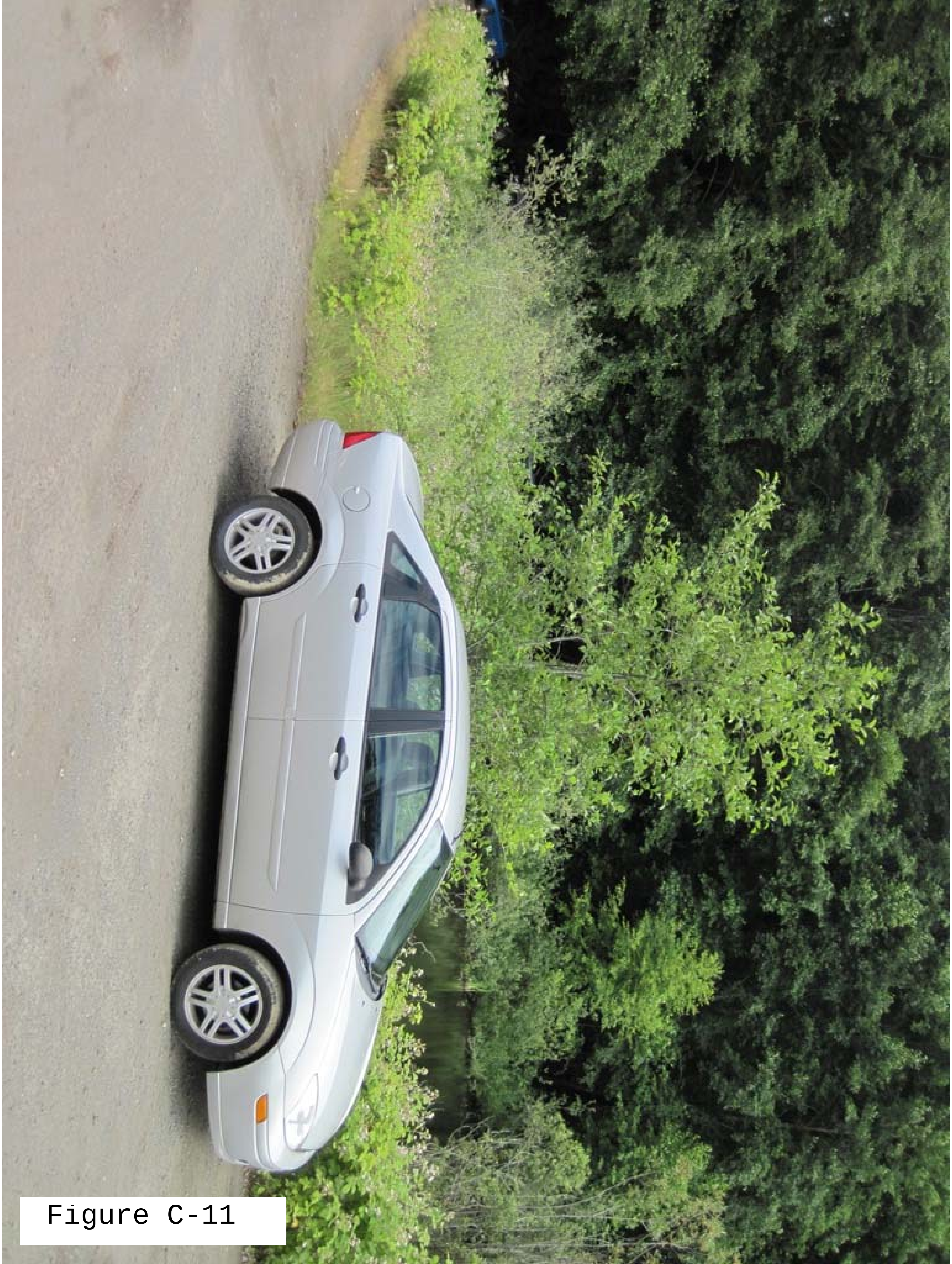


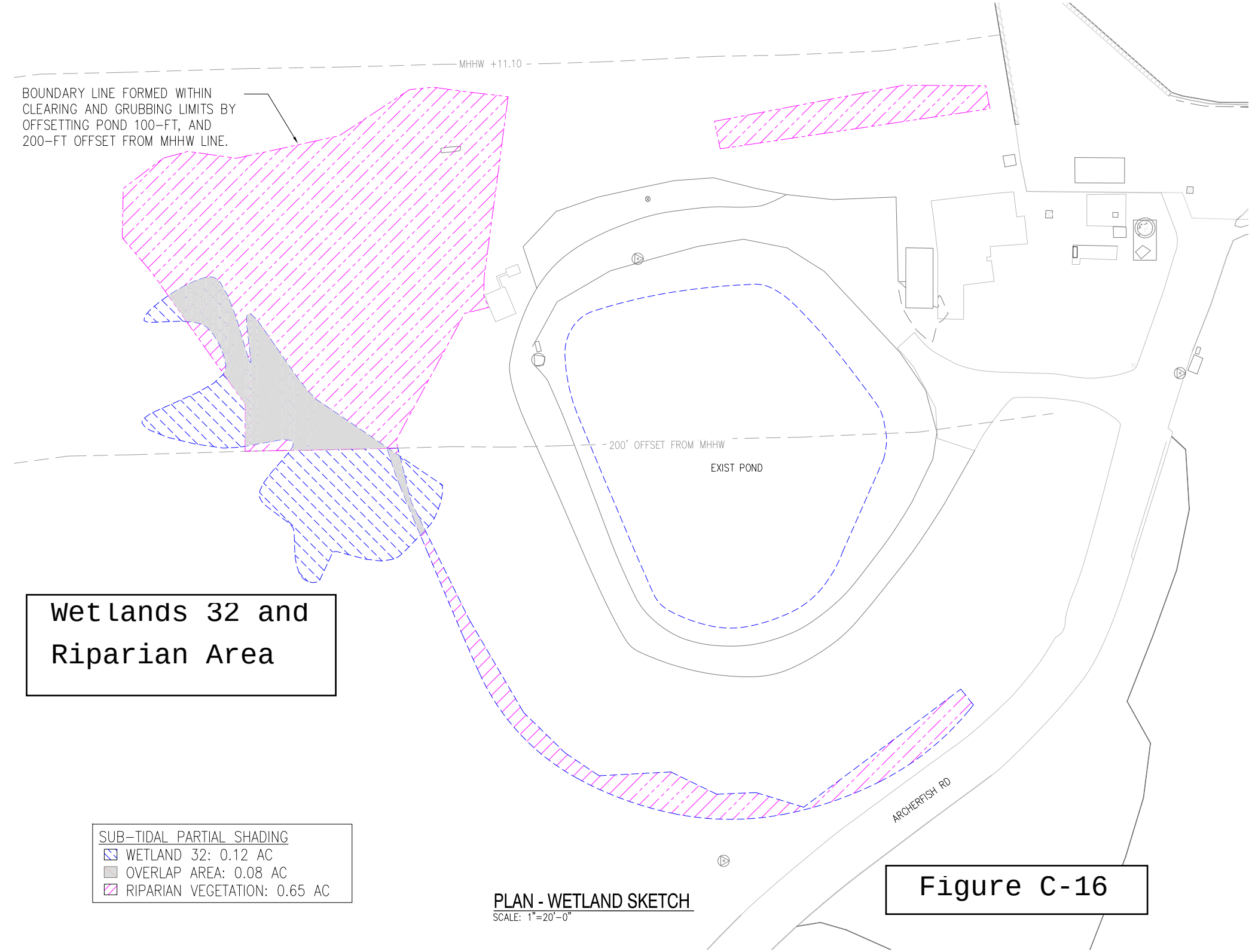
Figure C-11

Figure C-12

Figure C-13

Figure C-14

Figure C-15


MHHW +11.10
BOUNDARY LINE FORMED WITHIN CLEARING AND GRUBBING LIMITS BY OFFSETTING POND 100-FT, AND 200-FT OFFSET FROM MHHW LINE.
200' OFFSET FROM MHHW
EXIST POND
ARCHERFISH RD
Wetlands 32 and Riparian Area
SUB-TIDAL PARTIAL SHADING
WETLAND 32: 0.12 AC
OVERLAP AREA: 0.08 AC
RIPARIAN VEGETATION: 0.65 AC
PLAN - WETLAND SKETCH
SCALE: 1"=20'-0"
Figure C-16