Prepared by:
The Dredged Material Management Office
Seattle District, U.S. Army Corps of Engineers

MEMORANDUM FOR RECORD **October 4, 2019**

SUBJECT: DMMP TIER 1 ANTIDEGRADATION EVALUATION FOR THE CHINOOK WIND IN-LIEU FEE MITIGATION PROJECT, DUWAMISH RIVER (NWS-2018-879).

1. **Introduction**. This memorandum documents the Tier 1 evaluation by the Dredged Material Management Program (DMMP) agencies (U.S. Army Corps of Engineers, Washington Departments of Ecology and Natural Resources, and the Environmental Protection Agency) of the Chinook Wind In-Lieu Fee Mitigation Project. This evaluation – based on existing information – found that excavation at the site is likely to expose sediment/soil that will meet the State of Washington's antidegradation standard.

2. **Chinook Wind In-Lieu Fee Mitigation Project.** King County proposes constructing an in-lieu fee mitigation project on the right bank of the Duwamish River at river mile 6.7, just east of Tukwila International Boulevard and south of South 112th Street (Figure 1). The project will create estuarine habitat for juvenile salmonids and restore floodplain functions on a 5.8 acre site. A hotel was formerly located at the site, the foundation piles of which are shown in Figure 2. Approximately 90,000 cubic yards of fill material and alluvium will be excavated to create off-channel aquatic and intertidal mud flat habitat, as well as low and high marsh, and riparian habitat. Figures 3 and 4 show the grading plan and cross sections respectively for the site. All wood piles will be removed and hauled to an approved off-site upland disposal area. Concrete piles (unreinforced) will be cut off two feet below finished grade. Most of the excavated material, including all contaminated soil, will also be removed from the site. Some uncontaminated soil could potentially be reused on-site.

   The excavation work will be separated and isolated from the mainstem river channel by leaving a portion of the riverbank in place during site excavation or through the use of another isolation method such as a "porta-dam" or similar, to prevent soil from entering the river and to protect interior areas until the interior grading is complete. The interior will be dewatered of groundwater seepage and pumped into a temporary settling pond or tanks for treatment prior to discharge into the river. A silt curtain will be installed during the in-water work window prior to removing the final portion of the riverbank or other isolation structure. Finish elevations will be achieved prior to breaching the riverbank or removing the isolation structure.

3. **Characterization of Soils.** Soil sampling and testing were conducted in 2013, 2015 and 2017 (Maul Foster & Alongi, 2013; Hart Crowser, 2015; Aspect, 2017). Discrete and localized areas of confirmed or suspected contaminated soil were identified. These are depicted in Figure 5 as Areas 1, 2 and 3.

   Area 1. Area 1 includes the site of a former trash enclosure, where two 55-gallon drums were found, and an area of stormwater runoff ponding to the east of the trash enclosure. The contents of the drums remains undetermined, but following the Phase 1 Environmental Site Assessment

(ESA), the drums were reported to have been emptied into a grassy area near the trash enclosure. The stormwater runoff area was noted to have a floating sheen during the Phase 1 ESA (MFA, 2013).

Chemicals of concern (COCs) were found in surface soil samples collected from Area 1 (MFA, 2013). Dieldrin was found at a concentration of 11.6 ug/kg, which exceeded both the DMMP marine screening level (SL) of 1.9 ug/kg and the DMMP freshwater SL1 of 4.9 ug/kg. Benzo(a)pyrene was found at 185 ug/kg, exceeding both the Model Toxics Control Act (MTCA) Method A and B cleanup values of 100 and 140 ug/kg respectively. The DMMP marine SL of 1,600 ug/kg for benzo(a)pyrene was not exceeded and there is no DMMP freshwater SL1 for this COC. Similarly, carcinogenic polycyclic aromatic hydrocarbons (cPAH) were detected at a concentration of 267 ug/kg, exceeding the Method A and B cleanup values of 100 and 140 ug/kg respectively. There are no DMMP marine or freshwater SLs for cPAH.

The total depth of impacted soil in Area 1 is assumed to be two feet (Aspect/Anchor, 2019).

Area 2. The foundation piles on site are made of unreinforced concrete, with the exception of those in Area 2, which are creosote-treated wood piles. A single soil sample (AB-09) was collected from Area 2 (Aspect, 2017). This sample was analyzed for a subset of metals only, none of which exceeded any regulatory thresholds. A groundwater sample was collected from the borehole at this location and analyzed for TPH, petroleum distillates and PAHs. All results were non-detects, with reporting limits below MTCA Method A and B cleanup levels (with the exception of benzene for which the reporting limit slightly exceeded the Method B level). While petroleum hydrocarbons were not found in groundwater from AB-09, elevated levels of PAHs are suspected in Area 2 due to the presence of the creosote-treated wood piling (Aspect/Anchor, 2019).

Area 3. A groundwater sample collected from Station HC-CW-4 in Area 3 contained lube oil-range petroleum hydrocarbons of unknown origin at a concentration of 0.95 mg/L, which is slightly above the MTCA Method A cleanup level of 0.50 mg/L (Hart Crowser, 2015). The groundwater sample was collected from a temporary well drilled to a depth of 20 ft below ground surface (bgs). Soil samples were collected from the borehole at this location at 1 to 3 and 5 to 7 ft bgs. Petroleum hydrocarbons were not detected in the 1 to 3 ft bgs sample. In the soil sample collected from 5 to 7 ft bgs, lube oil-range hydrocarbons were present at a concentration of 71 mg/kg, which is well below the MTCA Method A cleanup level of 2,000 mg/kg for soil.

In 2017, Aspect Consulting investigated further in this area, drilling a borehole at Station HSA-02 to 21.5 ft bgs approximately 25 to 30 ft south-southwest of the Hart-Crowser borehole at Station HC-CW-4. Petroleum hydrocarbons were not detected in groundwater from the borehole; the reporting limit for motor oil-range TPH was 0.44 mg/L, which is below the MTCA Method A cleanup level of 0.50 mg/L. Aspect (2017) concluded that TPH is limited in extent to the immediate area of the Hart Crowser borehole HC-CW-4.

Note: The MTCA Method A cleanup level of 0.50 mg/L for groundwater is for heavy oil (which includes lube oil-range and motor-oil range petroleum hydrocarbons) and is based on drinking water standards.

Arsenic. In addition to these discrete and localized areas, arsenic was detected in all of the 2013 samples at concentrations (4.6 to 9.8 mg/kg; n = 6) exceeding the MTCA Method B value of 0.67 mg/kg, but not the Method A value of 20 mg/kg. Due to elevated background concentrations in Washington State, Ecology has set the cleanup level for arsenic in soil at 20 mg/kg. The detected concentrations were also all below the marine SL (57 mg/kg) and the freshwater SL1 (14 mg/kg).

Other COCs. Other COCs were detected, but did not exceed any regulatory guidelines. These included other metals (barium, chromium, lead), PCBs, and individual PAHs.

4. **Recommendations from Aspect Consulting.** Aspect (2017) included the following recommendations to address soil contamination found at the site:

- Field screening should be completed during excavation activities to identify impacted soils on other portions of the site.
- Any fill soil excavated from the known discrete and localized areas of the site [i.e. those areas already identified as having contaminated soil], and other isolated areas identified during construction, should be segregated from clean soil and should be considered "impacted."
- Specifically, excavated soils located within approximately 50 feet of the DU4-SS-Comp/AB-11 and 12 area [i.e. Area 1] should be temporarily stockpiled on a liner; sampled and analyzed for lead, chromium, gasoline- and diesel-range TPH and PAHs, at a minimum; and characterized for reuse and/or disposal per Ecology guidance and applicable waste regulations.
- The impacted soil can be transported and disposed of at a facility permitted to accept this waste, such as Republic Services or Waste Management in Seattle, Washington, CEMEX in Everett, Washington, or other similar facilities permitted to accept and/or treat impacted soil.
- Alternatively, the impacted soil can be reused in accordance with the Ecology criteria and guidelines for reuse of petroleum-contaminated soil (Ecology, 2016). The laboratory results indicate that the soil meets the Class II criteria for reuse as commercial fill above the water table and can also be used as daily cover in a landfill or in the manufacturing of asphalt.
- Concentrations of TPH and PAHs detected in groundwater are likely associated with COCs in fill soil and do not appear related to documented releases at the adjacent Triad Site. If groundwater dewatering is necessary to facilitate construction and excavation activities, water quality should be tested to ensure compliance with applicable discharge criteria.

King County has indicated that the recommendations provided in Aspect (2017) will be followed (O'Rollins, 2019b). In addition, soils excavated from 5 to 7 ft bgs within 5 feet of HC-CW-4 will be tested for lube-oil range TPHs to address potential contamination in Area 3.

In reviewing the Aspect (2017) recommendations, the DMMP agencies determined that the definition of "impacted" soil needs clarification. Based on a review of Ecology (2016) and following coordination with King County, "impacted" soil – for this project – is defined as any soil falling into Categories 2, 3 or 4 in Table 12.1 of Ecology (2016). Acceptable uses and best management practices for impacted soil falling into Categories 2, 3 or 4 are found in Table 12.2 of Ecology (2016).

For the purpose of identifying impacted soils during construction – beyond those already identified in Areas 1 and 3 – this means any visually identifiable contaminated soil or soil with a hydrocarbon odor.

5. **<u>Concerns for Sediment Surface to be Exposed by Excavation.</u>** No in-water placement of excavated material is proposed. Therefore, the primary concern of the DMMP agencies is the quality of the sediment surface that will be exposed to the aquatic environment following pile removal, excavation and grading. The exposed surface must meet the State's antidegradation standard.

   As indicated previously, the material to be excavated from the site includes native alluvium and overlying fill. The approximate depths of the fill material (Figure 6) were derived by DMMO from boring logs from Hart Crowser (2015) and Aspect (2017). The majority of the fill will be removed during excavation, leaving the native alluvium as the post-excavation surface throughout most of the project area. With the possible exception of soil in the immediate vicinity of creosote-treated pilings, the native alluvium is anticipated to be clean.

   Area 1. As indicated previously, the depth of impacted soil in Area 1 is assumed to be only two feet. With minor exceptions, the excavation depths in Area 1 are greater than six feet. Therefore, all known contaminated soil will be removed from this area during excavation.

   Area 2. The depth of the creosote-treated wood piles in Area 2 is unknown. It is likely that these piles were driven deeper than the maximum depth of proposed excavation. The creosote-treated piles will be removed in their entirety during construction following DNR's best management practices for pile removal and disposal (DNR, 2017). Impacted soil surrounding the piles will be removed and handled appropriately following characterization of the material (Aspect/Anchor, 2019). However, it is possible that some low-level PAH contamination will remain in the exposed surface following extraction and excavation. Following excavation to final grade, any visually identifiable contaminated soil or soil with a hydrocarbon odor will be removed to a depth of two feet below the finished grade. Areas excavated to remove contaminated soil will be backfilled with native soils from on-site that are similar in character to the surrounding soils to reach finished grade (O'Rollins, 2019a).

   Area 3. The deepest soil contamination at the site was found in Area 3 at Station HC-CW-4 in a sample taken from 5 to 7 ft bgs (7 to 9 ft NAVD88). The existing ground surface elevation at this station is approximately 14 ft NAVD88. The grading plan calls for removal of approximately 8 feet of material from this location (Aspect/Anchor, 2019) to a finished grade of approximately 6 ft NAVD88. This is only a foot deeper than the known soil contamination. Therefore, King County will test the finished grade in Area 3 for lube-oil range TPHs. If TPHs are found exceeding the MTCA cleanup thresholds, the area within 5 feet of the area that tested positive will be over-excavated by 2 feet and backfilled with clean native soils (O'Rollins, 2019c).

6. **<u>Antidegradation and No-Test Determination.</u>** Based on existing data and the plans prepared by King County (including the implementation of recommendations from Aspect [2017] and the contingency plans for Area 2 described in this memorandum), the DMMP agencies' consensus determination is that the Chinook Wind project meets the State of Washington antidegradation standard; no additional sampling and testing are required.

7. **References**.

Aspect Consulting, 2017, *Environmental Conditions Report*, Chinook Wind Property, October 5, 2017.

Aspect/Anchor, 2019, *Chinook Wind Sampling and Analysis Plan,* Aspect Consulting, LLC and Anchor QEA, LLC, May 20, 2019 [draft].

DNR, 2017, *Derelict Creosote Piling Removal – Best Management Practices for Pile Removal & Disposal,* Washington Department of Natural Resources, updated January 25, 2017.

Ecology, 2016, *Guidance for Remediation of Petroleum Contaminated Sites*, Toxics Cleanup Program, Publication No. 10-09-057, Revised June 2016.

Hart Crowser, 2015, *Phase II Environmental Site Assessment Summary Report*, Chinook Wind Property, Tukwila, Washington. February 20, 2015.

MFA, 2013, *Focused Surface Soil and Sediment Investigation Activities*, Maul Foster & Alongi, December 9, 2013.

O'Rollins, 2019a, personal communication – email from Laird O'Rollins (King County) to David Fox (USACE), August 16, 2019.

O'Rollins, 2019b, personal communication – email from Laird O'Rollins (King County) to David Fox (USACE), August 20, 2019.

O'Rollins, 2019c, personal communication – email from Laird O'Rollins (King County) to David Fox (USACE), October 2, 2019.

8. <u>Agency Signatures</u>.

Concur: signed copy on file in DMMO - Seattle District office

_____	_____
Date	David Fox, P.E. - Seattle District Corps of Engineers
_____	_____
Date	Justine Barton - Environmental Protection Agency
_____	_____
Date	Laura Inouye, Ph.D. - Washington Department of Ecology
_____	_____
Date	Shannon Soto - Washington Department of Natural Resources

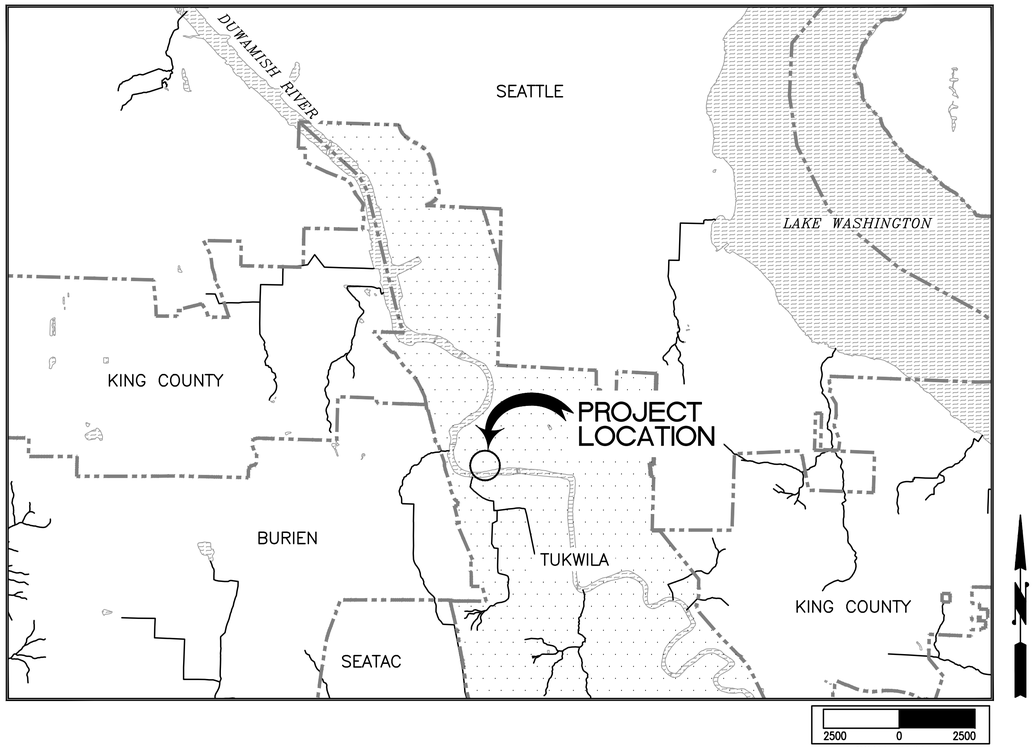
Copies furnished:

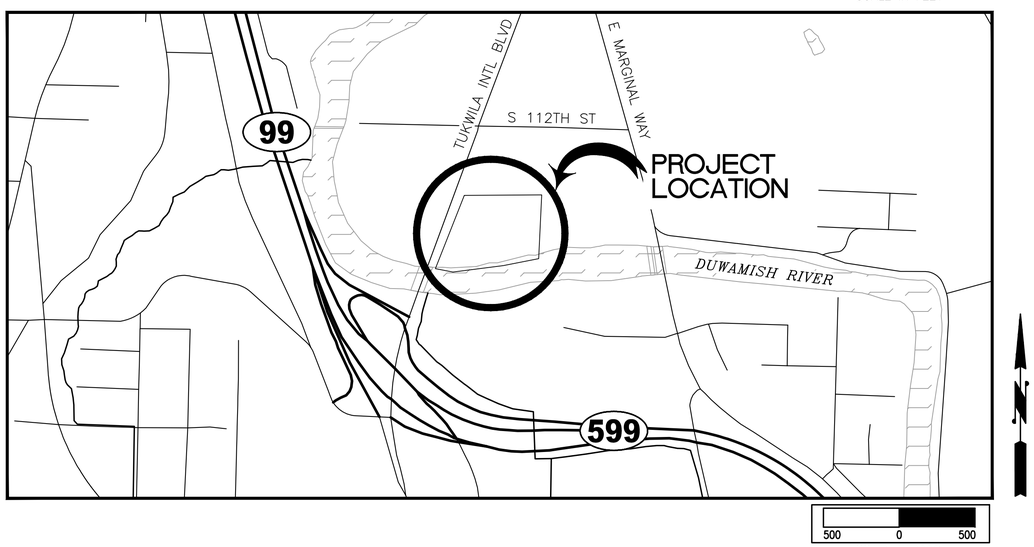
DMMP signatories
Rory Lee, CENWS-ODR
Laird O'Rollins, King County
Mason Bowles, King County
Nathan Soccorsy, Anchor QEA

Figure 1

VICINITY MAP

NTS





SHEET INDEX

SHEET	DESCRIPTION
1	COVER, VICINITY MAP & INDEX
2	EXISTNG CONDITIONS
3	GRADING PLAN
4	CROSS SECTIONS
5	PLANTING PLAN

SITE LINETYPES AND SYMBOLS

- EXISTING DECIDUOUS TREE
- EXISTING CONIFEROUS TREE
- EASEMENT
- FENCE
- OHW — ORDINARY HIGH WATER
- PROPERTY LINE
- R/W — RIGHT OF WAY
- SURVEY — SURVEY BOUNDARY
- MAJOR CONTOUR
- MINOR CONTOUR

UTILITIES

- MW — MONITORING WELL
- G — GAS LINE
- P — POWER METER
- POWER RISER
- POWER POLE
- POWER TRANSFORMER
- GUY WIRE
- SEWER MANHOLE
- SEWER CLEAN OUT
- STORM DRAIN PIPE
- T — TELEPHONE
- W — WATER METER
- WATER VALVE
- HOSE BIB

SURVEY SYMBOLS

- HT — HUB & TACK
- IP — IRON PIPE
- RCKC — REBAR & CAP, KING COUNTY

CHINOOK WIND MITIGATION PROJECT

811
Know what's below.
Call before you dig.
(UNDERGROUND UTILITY LOCATIONS ARE APPROX.)

FIELD BOOK: 18039	5/2018	NUM.	REVISION	BY	DATE
SURVEYED: G. ELDER	5/2018		PRELIMINARY PROGRESS COPY 9/10/2018		
SURVEY BASE MAP: C. SIMEONA	5/2018				
CHECKED: J. EVANS	6/2018	NUM.	RECORD CHANGES APPROVED	BY	DATE

APPROVED:	WILL MANSFIELD, P.E.	9/2018
PROJECT MANAGER:	LAIRD O'ROLLINS	9/2018
DESIGNED:	RACHAEL VAICUNAS, P.E.	9/2018
	CRISTINA OLIVARES	9/2018
CAD DESIGN:	KEVIN WARD	9/2018

PROJECT No. 1126895
CONTRACT No. –

WILLIS R. MANSFIELD — STATE OF WASHINGTON — 46388 — REGISTERED PROFESSIONAL ENGINEER

King County
Department of Natural Resources and Parks
Water and Land Resources Division
Rural and Regional Services Section
Ecological Restoration and Engineering Services Unit
Christie True, Director

CHINOOK WIND MITIGATION PROJECT

COVER, VICINITY MAP & INDEX

SHEET **1** OF **5** SHEETS

2018-04

Figure 2

NE 1/4 SEC. 9, T. 23 N., R. 4 E., W.M.

CONTROL POINT TABLE				
POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION
305	186864.5377	1280027.0824	18.444	BD/K25D09
1000	186167.9475	1280623.2540	27.608	RCKC
1100	186140.9995	1280236.4905	21.925	RCKC
1200	185767.1674	1279349.1121	14.581	HT
100	186380.8031	1279460.5388	20.631	MSS
101	186106.6369	1279864.8289	20.621	RCKC
102	186317.9285	1279764.3631	18.366	RCKC
103	186136.9008	1279558.2502	17.022	RCKC

NOTES:

EQUIPMENT AND PROCEDURE

METHOD OF SURVEY
SURVEY PERFORMED BY FIELD TRAVERSE

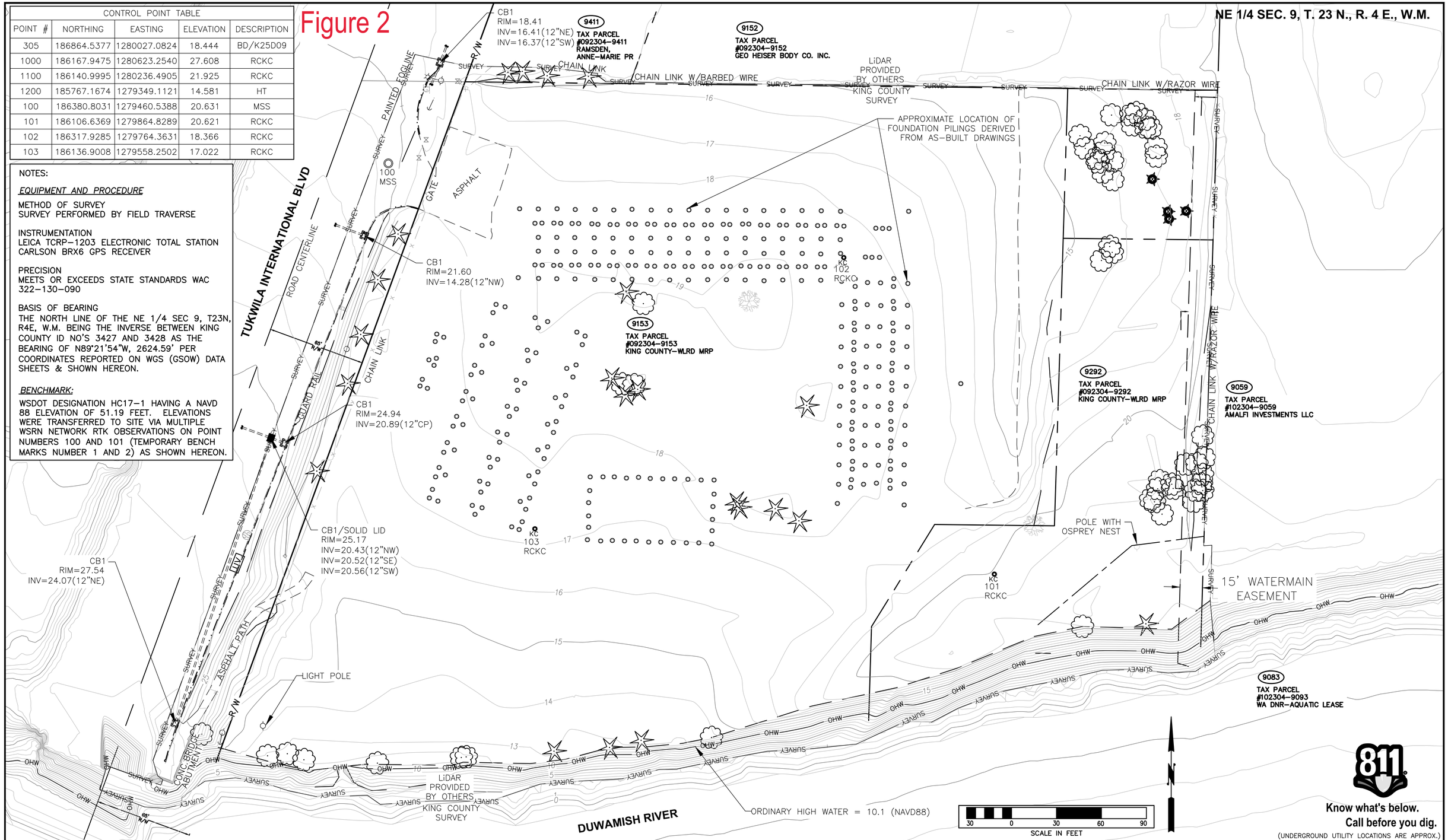
INSTRUMENTATION
LEICA TCRP–1203 ELECTRONIC TOTAL STATION
CARLSON BRX6 GPS RECEIVER

PRECISION
MEETS OR EXCEEDS STATE STANDARDS WAC 322–130–090

BASIS OF BEARING
THE NORTH LINE OF THE NE 1/4 SEC 9, T23N, R4E, W.M. BEING THE INVERSE BETWEEN KING COUNTY ID NO'S 3427 AND 3428 AS THE BEARING OF N89°21'54"W, 2624.59' PER COORDINATES REPORTED ON WGS (GSOW) DATA SHEETS & SHOWN HEREON.

BENCHMARK:

WSDOT DESIGNATION HC17–1 HAVING A NAVD 88 ELEVATION OF 51.19 FEET. ELEVATIONS WERE TRANSFERRED TO SITE VIA MULTIPLE WSRN NETWORK RTK OBSERVATIONS ON POINT NUMBERS 100 AND 101 (TEMPORARY BENCH MARKS NUMBER 1 AND 2) AS SHOWN HEREON.



FIELD BOOK: 18039	5/2018
SURVEYED: G. ELDER	5/2018
SURVEY BASE MAP: C. SIMEONA	5/2018
CHECKED: J. EVANS	6/2018

NUM.	REVISION	BY	DATE
	PRELIMINARY PROGRESS COPY 9/10/2018		

NUM.	RECORD CHANGES APPROVED	BY	DATE

APPROVED:	WILL MANSFIELD, P.E.	9/2018
PROJECT MANAGER:	LAIRD O'ROLLINS	9/2018
DESIGNED:	RACHAEL VAICUNAS, P.E.	9/2018
	CRISTINA OLIVARES	9/2018
CAD DESIGN:	KEVIN WARD	9/2018

PROJECT No. 1126895

CONTRACT No. –

WILLIS R. MANSFIELD
STATE OF WASHINGTON
46388
REGISTERED PROFESSIONAL ENGINEER

King County
Department of Natural Resources and Parks
Water and Land Resources Division
Rural and Regional Services Section
Ecological Restoration and Engineering Services Unit
Christie True, Director

CHINOOK WIND MITIGATION PROJECT

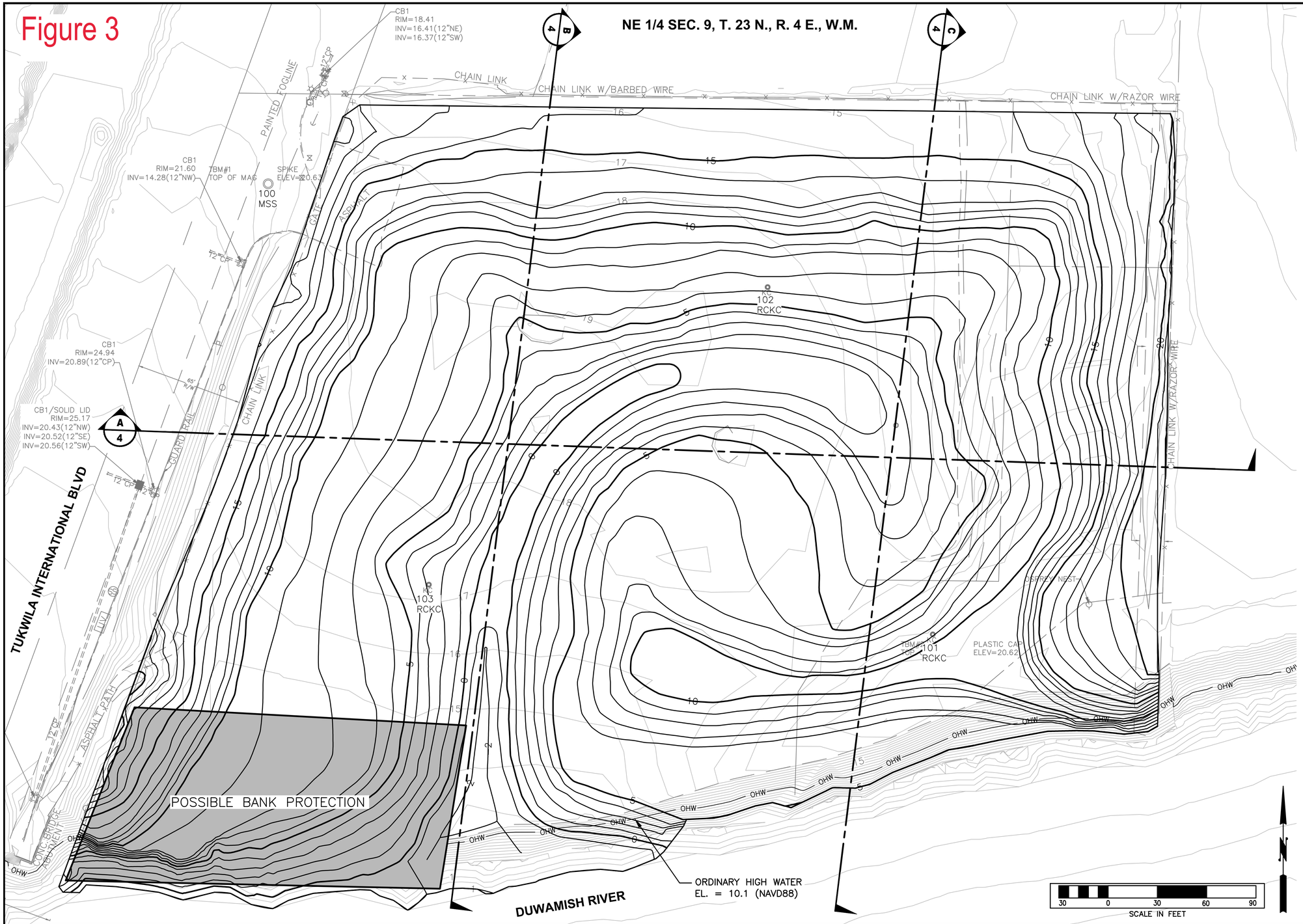
EXISTNG CONDITIONS

SHEET **2** OF **5** SHEETS

2018-04

Figure 3

NE 1/4 SEC. 9, T. 23 N., R. 4 E., W.M.



Know what's below.
Call before you dig.
(UNDERGROUND UTILITY LOCATIONS ARE APPROX.)

		NUM.	REVISION	BY	DATE
FIELD BOOK: 18039	5/2018		PRELIMINARY PROGRESS COPY 9/10/2018		
SURVEYED: G. ELDER	5/2018				
SURVEY BASE MAP: C. SIMEONA	5/2018				
CHECKED: J. EVANS	6/2018	NUM.	RECORD CHANGES APPROVED	BY	DATE

APPROVED:	WILL MANSFIELD, P.E.	9/2018
PROJECT MANAGER:	LAIRD O'ROLLINS	9/2018
DESIGNED:	RACHAEL VAICUNAS, P.E.	9/2018
	CRISTINA OLIVARES	9/2018
CAD DESIGN:	KEVIN WARD	9/2018

PROJECT No. 1126895

CONTRACT No. –

WILLIS R. MANSFIELD
STATE OF WASHINGTON
46388
REGISTERED
PROFESSIONAL ENGINEER

King County
Department of Natural Resources and Parks
Water and Land Resources Division
Rural and Regional Services Section
Ecological Restoration and Engineering Services Unit
Christie True, Director

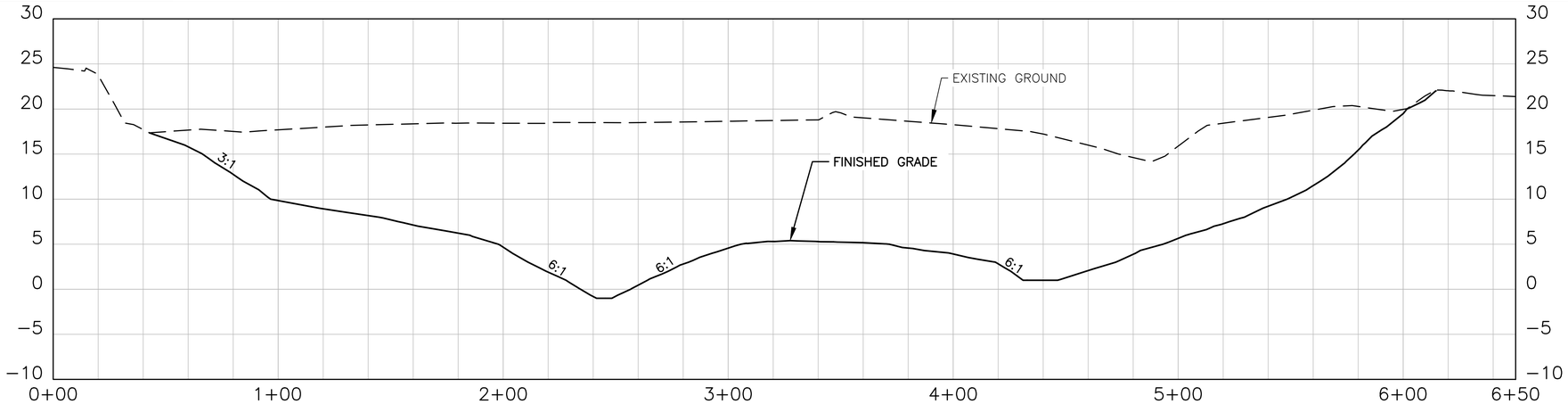
CHINOOK WIND MITIGATION PROJECT

GRADING PLAN

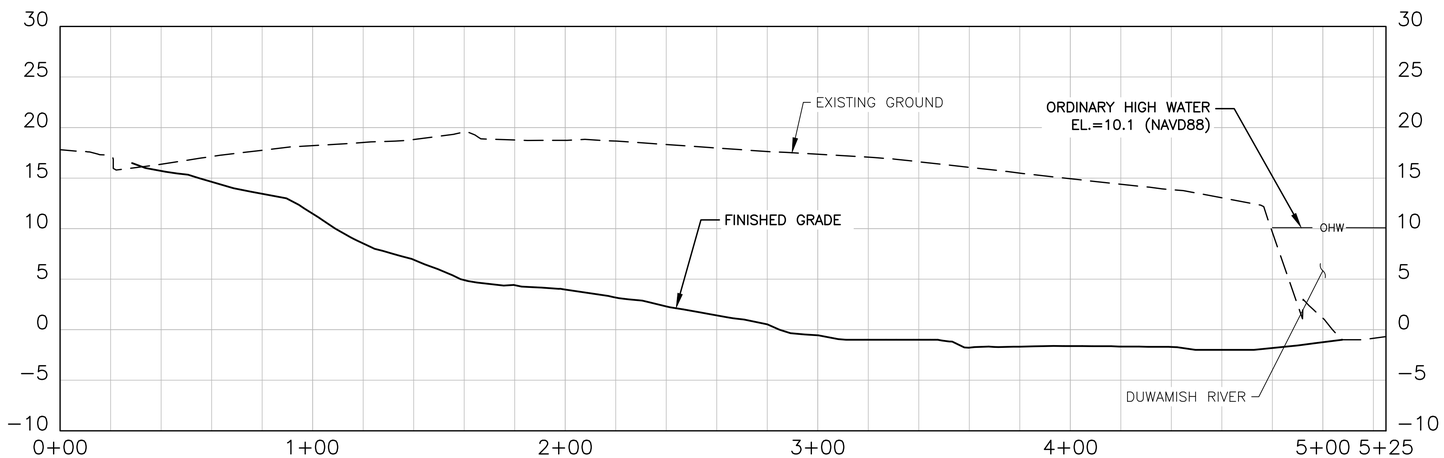
SHEET **3** OF **5** SHEETS

2018-04

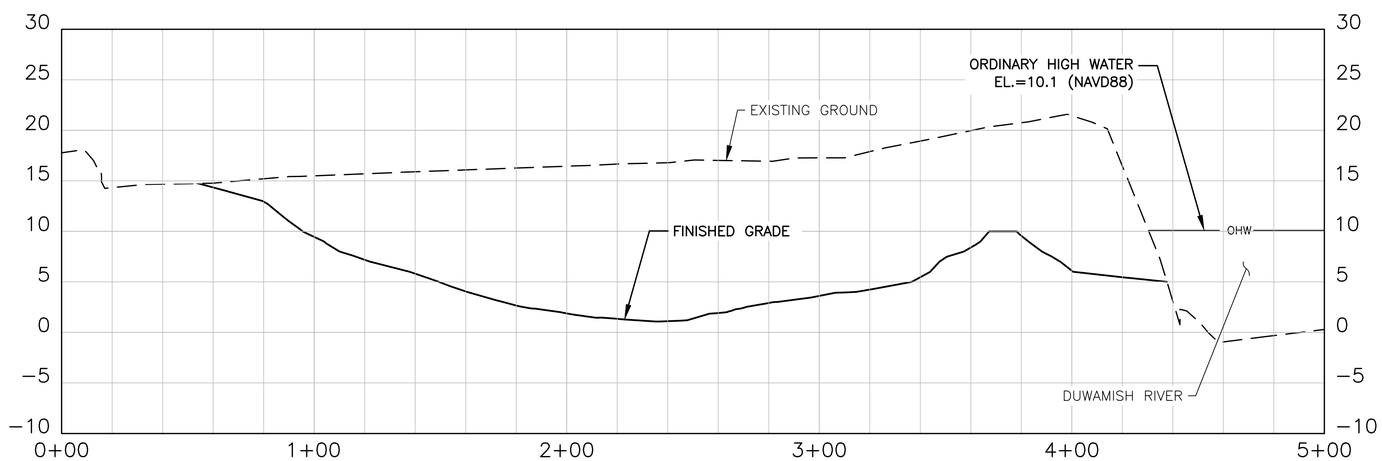
Figure 4



SECTION A 3
SCALE: 1"=1' HORIZ., 1"=4' VERT.



SECTION B 3
SCALE: 1"=1' HORIZ., 1"=4' VERT.



SECTION C 3
SCALE: 1"=1' HORIZ., 1"=4' VERT.

Know what's below.
Call before you dig.
(UNDERGROUND UTILITY LOCATIONS ARE APPROX.)

FIELD BOOK: 18039	5/2018
SURVEYED: G. ELDER	5/2018
SURVEY BASE MAP: C. SIMEONA	5/2018
CHECKED: J. EVANS	6/2018

NUM.	REVISION	BY	DATE

PRELIMINARY PROGRESS COPY 9/10/2018

NUM.	RECORD CHANGES APPROVED	BY	DATE

APPROVED:	WILL MANSFIELD, P.E.	9/2018
PROJECT MANAGER:	LAIRD O'ROLLINS	9/2018
DESIGNED:	RACHAEL VAICUNAS, P.E.	9/2018
	CRISTINA OLIVARES	9/2018
CAD DESIGN:	KEVIN WARD	9/2018

PROJECT No. 1126895
CONTRACT No. –

WILLIS R. MANSFIELD STATE OF WASHINGTON 46388 REGISTERED PROFESSIONAL ENGINEER

King County
Department of Natural Resources and Parks
Water and Land Resources Division
Rural and Regional Services Section
Ecological Restoration and Engineering Services Unit
Christie True, Director

CHINOOK WIND MITIGATION PROJECT

CROSS SECTIONS

SHEET **4** OF **5** SHEETS

2018-04

Figure 5

10-ft Proposed Contours

5-ft Proposed Contours

Existing 2-ft Contour (Survey)

Area of Concern

Site Parcel

King County Parcel

0 100 200

Feet

Note: Contour elevations shown in NAVD88 (vertical datum).

Grading Design

Sampling and Analysis Plan
King County WLRD Chinook Wind Property
11244 Tukwila International Blvd
Tukwila, Washington

Aspect CONSULTING | ANCHOR QEA

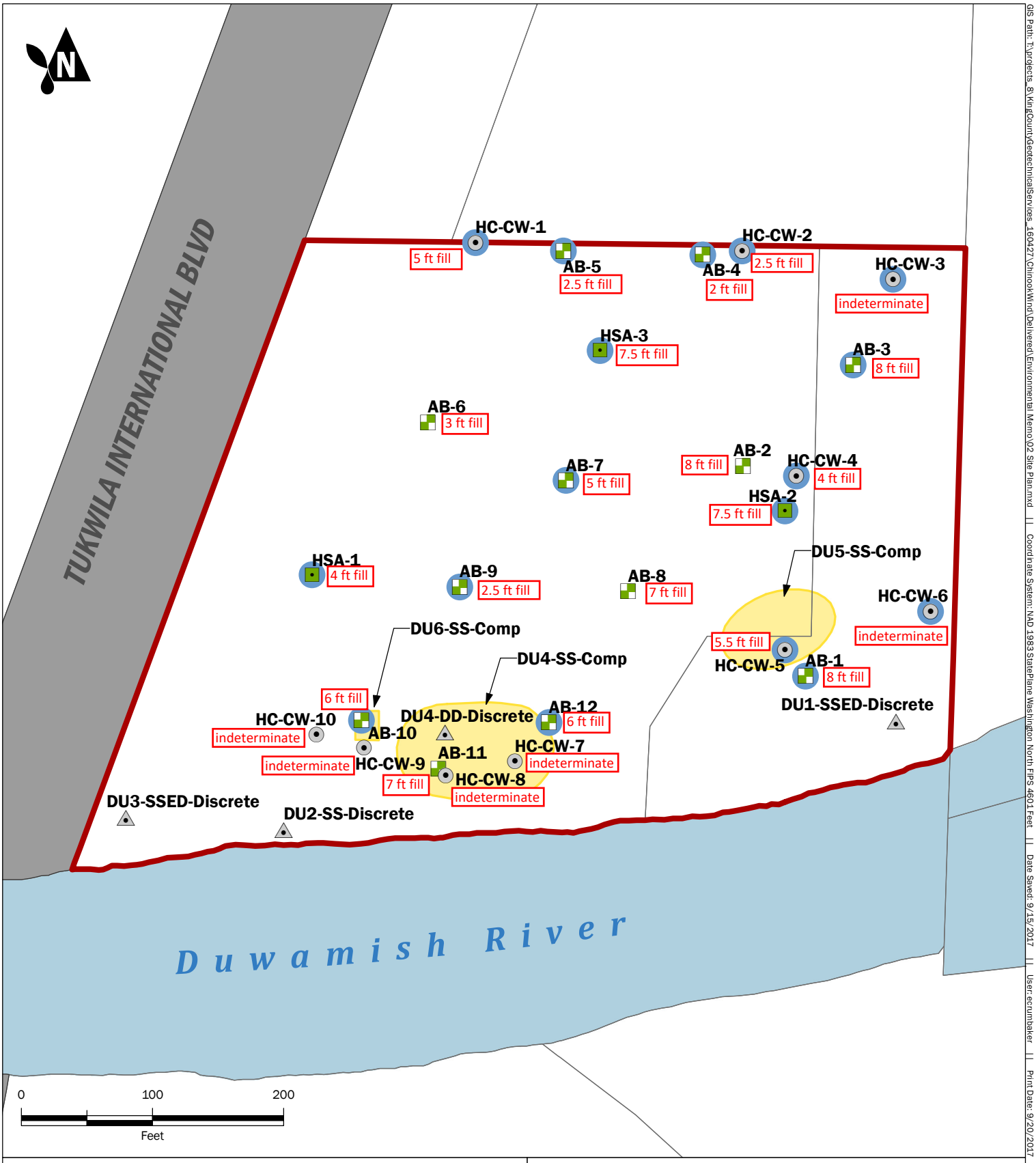
FIRM: ASPECT

DRAWN BY: JCH / EAC

GIS Path: T:\projects_8\KingCountyGeotechnicalServices_160427\ChinookWind\Delivered\SamplingAndAnalysisPlan\02_Grading Design.mxd || Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet || Date Saved: 5/16/2019 || User: ecrumbaker || Print Date: 5/16/2019

Basemap Layer Credits || Pictometry, King County

Figure 6



Direct-Push Boring (Aspect Consulting, 2017)

Hollow-Stem Auger Boring (Aspect Consulting, 2017)

Geoprobe (Hart Crowser, 2015)

Soil Sample (Maul, Foster, Alonghi, 2013)

Composite Sample (Maul, Foster, Alongi, 2013)

Indicates Location of Groundwater Grab Sample

Site Parcel

King County Parcel

Site Plan

King County WLRD Chinook Wind Property
11244 Tukwila International Blvd
Tukwila, Washington

Aspect CONSULTING

SEP-2017	BY: CEB / EAC
PROJECT NO. 160427-004-02	REVISED BY: ---

GIS Path: T:\projects_8\KingCounty\GeotechnicalServices_160427\ChinookWind\Delivered\Environmental Memo\02 Site Plan.mxd || Coordinate System: NAD 1983 StatePlane Washington North FIPS 4601 Feet || Date Saved: 9/15/2017 || User: ecrumbaker || Print Date: 9/20/2017