CRETE Consulting Incorporated
108 S. Washington St., Suite 300
Seattle, WA 98104

DRAFT

February 5, 2021

John Evered
Toxics Cleanup Program
Washington State Department of Ecology
P.O Box 47600
Olympia, Washington 98504-7600

RE: Summary of IOSA/MTC Test Pitting and Data - Port of Friday Harbor Jensen's Marina

Dear John,

CRETE Consulting Inc. has prepared this letter on behalf of the Port of Friday to summarize field activities and an evaluation of analytical data for the portion of the Jensen's Marina site known as the Marine Trades Center (MTC), formerly referred to as IOSA. This work was performed consistent with the Agreed Order (AO No. DE 18071) and with the IOSA Development Sampling and Analysis Plan prepared for this work. Figure 1 includes the layout of the proposed MTC development.

Field Activities

On October 19, 2020, a small backhoe was used to excavate eight test pits in the within the proposed MTC development area and in near-shore areas (Figure 1). The test pits were dug as trenches of approximately 6 to 14 feet in length and varied in depth between 6.5 and 12 feet. Buried debris was encountered at three of the test pit locations (IOSA-TP5, IOSA-TP6, IOSA-TP7) as noted on the attached field logs. The debris was concentrated in the area referred to as the former dumping area in earlier project documents. Following examination of the walls and bottom of the test pit, and examination of the excavated soil and debris, samples were collected from the sidewalls and bottom of each test pit. Each excavated test pit was subsequently backfilled with the trench spoils to approximately match the initial grade. Soil samples were submitted to Friedman & Bruya, Inc. for metals analysis. One sample at IOSA-TP5 (from 5 feet below grade), where what appeared to be a small boat fuel tank was observed, was submitted for NWTPH-Dx, -Gx, and BTEX analyses. Initially the uppermost sample (1 foot below grade) was submitted for analysis, with other deeper samples placed on hold pending analysis. Additional samples from IOSA-TP-3, IOSA-TP5, and IOSA-TP6 were subsequently analyzed based on copper or zinc concentrations that exceeded screening levels.

Data Evaluation

Soil data for samples collected during the test pit work are provided in Table 1 along with soil data collected previously from the vicinity of the MTC. The soil data were compared to screening levels consistent with MTCA. Soil protective of groundwater screening and preliminary cleanup levels were developed based on the groundwater screening levels that are consistent with the "most stringent surface water preliminary cleanup levels" according to Ecology Interim Policy 730: Taking into Account Federal Human Health Surface Water Quality Criteria under MTCA (Ecology January 11, 2021). Where a chemical concentration exceeds a screening or preliminary cleanup level, the result is shaded to highlight the exceedance in Table 1.

Table 1 indicates that there are several soil screening level exceedances for copper and zinc and two soil screening level exceedances for mercury. These screening levels are based on MTCA default soil protective of groundwater (to surface water quality criteria) calculations or they were adjusted up to natural background because the soil protective of groundwater screening level was below natural background. MW-5 is located just downgradient of the MTC development footprint and samples collected in August 2018 and February 2020 indicate that groundwater at MW-5 meets surface water quality criteria for these compounds (Table 2). Based on this empirical groundwater data, the preliminary cleanup levels were adjusted upward relative to the screening levels to eliminate the soil protective of groundwater exposure pathway based on the empirical demonstration. Copper, mercury, and zinc soil concentrations are all below the preliminary cleanup levels.

Arsenic and TPH-Dx exceed preliminary cleanup levels at locations FDA-2 and FDA-3 located within the former dumping area.

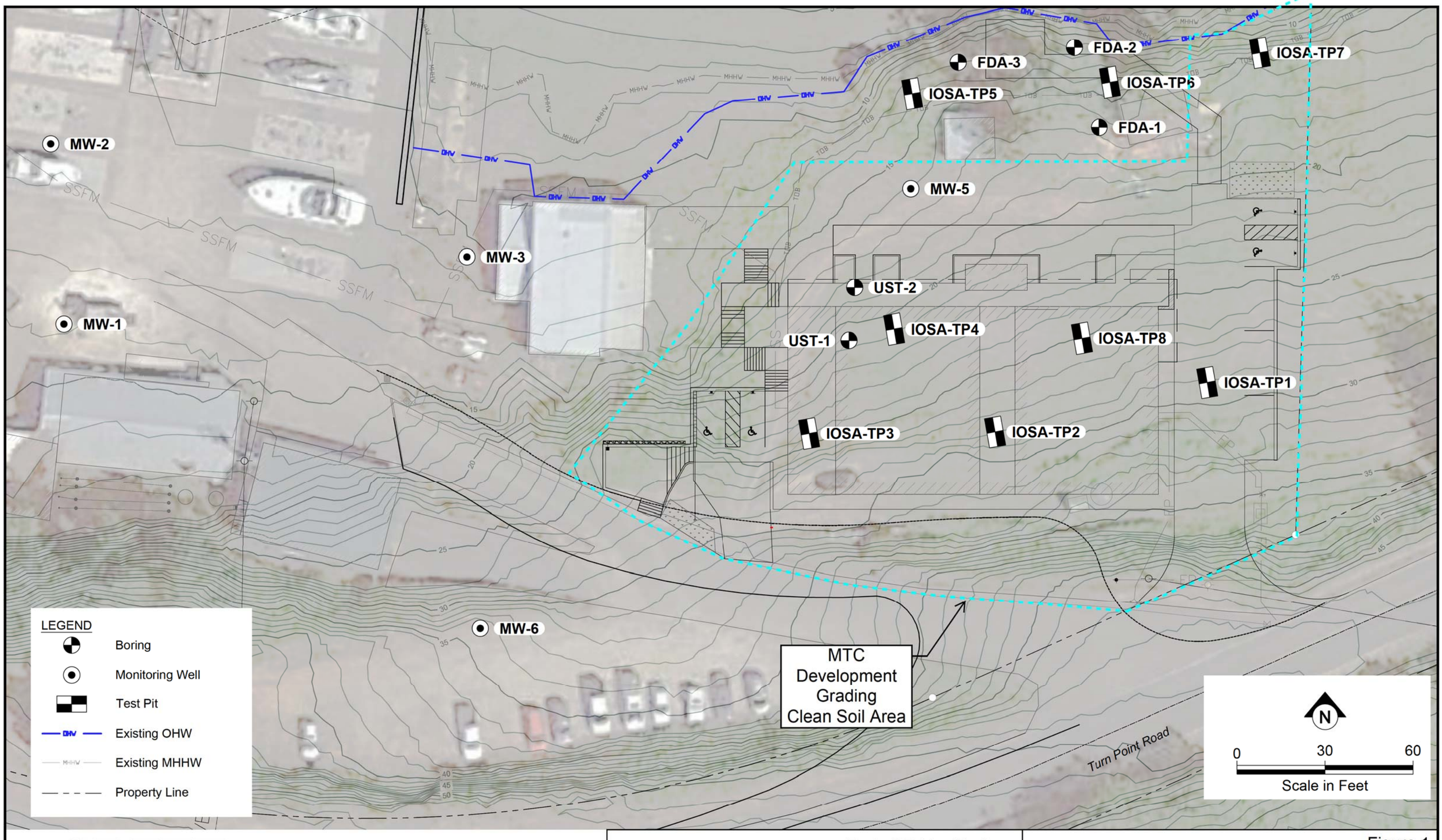
Summary

Based on these data, an area surrounding the MTC development has been outlined on Figure 1. This area excludes the locations where soil data exceed preliminary cleanup levels and areas where evidence of dumping is present. This area is intended to represent where soil meets MTCA cleanup standards and site development grading and construction can occur without the need for further soil sampling or Ecology consultation under the AO. Any ground disturbing work that occurs outside this area or the uncovering of any evidence of contamination during site development will trigger the need for Ecology consultation and sampling, as appropriate. The Port would like to receivet Ecology's concurrence regarding this approach.

Please feel free to contact me at your convenience via electronic mail or telephone at 253-797-6323.
Sincerely,

CRETE CONSULTING INCORPORATED, PC

Grant Hainsworth, P.E.
Principal, Senior Project Manager



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Port of Friday Harbor
Marine Technical Center
January 13, 2021

Figure 1
Sample Locations

Table 1 - Soil Analytical Results
IOSA/Marine Trade Center (MTC) Development Area - Port of Friday Harbor

Sample ID	Sample Depth (feet bgs)	NWTPH-Dx (mg/kg)			Metals (mg/kg)						
		DRO	ORO	Total	Arsenic	Cadmium	Copper	Lead	Mercury	Nickel	Zinc
Test Pit Samples Collected October 19, 2020											
IOSA-TP1-1-1020	1	NA	NA	NA	2.4	<1	**11.1**	**5.01**	<1	**15.4**	**27.5**
IOSA-TP2-1-1020	1	NA	NA	NA	2.51	<1	**9.72**	**5.78**	<1	**7.4**	**16.4**
IOSA-TP3-1-1020	1	NA	NA	NA	2.84 ca	<1	**60.9**	**56.4**	<1	**11.9**	**208**
IOSA-TP3-3-1020	3	NA	NA	NA	1.85	<1	**13.7**	**4.29**	<1	**10.9**	**23**
IOSA-TP4-1-1020	1	NA	NA	NA	2.33	<1	**18.5**	**12.2**	<1	**10.5**	**70.8**
IOSA-TP5-1-1020	1	NA	NA	NA	2.88 ca	<1	**56.9**	**248**	<1	**13.9**	**287**
IOSA-TP5-3-1020	3	NA	NA	NA	2.58 ca	<1	**30.1**	**46.4**	<1	**15.9**	**95.1**
IOSA-TP5-5-1020	5	<50	<250	ND	3.92	<1	**37**	**80.7**	<1	**13.6**	**115**
IOSA-TP6-1-1020	1	NA	NA	NA	2.4	<1	**33.9**	**241**	<1	**9.43**	**182**
IOSA-TP6-3-1020	3	NA	NA	NA	3.67 ca	<1	**15.1 J**	**3.21**	<1	**16.6**	**19.6 J**
IOSA-TP7-1-1020	1	NA	NA	NA	2.03	<1	**19.8**	**20.8**	<1	**9.81**	**34.7**
IOSA-TP8-1-1020	1	NA	NA	NA	2.21	<1	**12.9**	**8.14**	<1	**9.04**	**40.2**
Direct Push, Test Pit, and Hand Auger Samples Collected in 2018											
UST-1 5ft	5	<25	<50	ND	NA	NA	NA	NA	NA	NA	NA
UST-2 3ft	3	<25	<50	ND	NA	NA	NA	NA	NA	NA	NA
MW-5 2-6 in	0.5	<25	**96**	**96**	**4.9**	**0.7**	**140**	**120**	**0.1**		**190**
MW-5 10 ft	10	<25	<50	ND	**2.4**	<0.22	**14**	**2.1**	<0.02		**26**
FDA-1 2ft	2	<25	<50	ND	**3.5**	<0.5	**16**	**6.4**	**0.028**		**30**
FDA-2 0-6 in	0.5	<25	<50	ND	**8.7**	<0.5	**79**	**52**	<0.02		**270**
FDA-3 2.5 ft	2.5	<25	**420**	**420**	**3.5**	<0.5	**29**	**190**	**0.16**		**220**
Screening Level				**260**	**7.3**	**1.1**	**36.4**	**250**	**0.07**		**100.9**
Basis for Screening Level				Default TEE - Soil Biota	Natural Background	Method B Soil Prot of GW to SW	Natural Background	Method A	Natural Background		Method B Soil Prot of GW to SW
Preliminary Cleanup Level				**260**	**7.3**	**80**	**3200**	**250**	**2**	**1600**	**24000**
Basis for Screening Level (MW-5 Provides Empirical Demonstration That Soil is Protective of Grounwater to Surface Water Quality Criteria)				Default TEE - Soil Biota	Natural Background	Method B Direct Contact	Method B Direct Contact	Method A	Method B Direct Contact	Method B Direct Contact	Method B Direct Contact

NOTES:
Bold indicates a detected concentration
Shading indicates a concentration that exceeds the screening level
Shading indicates a concentration that exceeds the preliminary cleanup level
NA - Not analyzed
ND - Not detected
ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate

Table 2 - Groundwater Analytical Results
Jensen's Shipyard and Marina - Port of Friday Harbor

Well ID	Date Sampled	Arsenic	Cadmium	Copper	Lead	Mercury	Zinc
MW-1	8/28/2018	**12**	<1	**8**	<1	<0.2	**3.2**
	2/19/2020	**9.56**	<1	<2.5	<1	<0.2	<5
MW-2	8/28/2018	<1	<1	<2	<1	<0.2	<2.5
	2/19/2020	**7.63 J**	<1 J	<2.5 J	<1	<0.2	<5 J
MW-3	8/28/2018	**2.3**	<1	**3.2**	<1	<0.2	**9.8**
	2/19/2020	**7.81 J**	<1 J	**21.6**	**1.71**	<0.2	**47.8**
MW-4	8/28/2018	**1.1**	<1	**3.2**	<1	<0.2	**3**
	2/19/2020	**2.06**	< 1	**2.65**	<1	<0.2	<5
MW-5	8/28/2018	**1.2**	<1	<2	<1	<0.2	<2.5
	2/19/2020	<1	<1	**3.07**	<1	<0.2	<5
MW-6	8/28/2018	<1	<1	<2	<1	<0.2	<2.5
	2/19/2020	<1	<1	<2.5	<1	<0.2	**5.97**
Screening Level		**5**	**1.2**	**3.1**	**8.1**	**0.2**	**81**
Basis for Screening Level		Method A or Natural Background	Surface Water Quality Criteria	Surface Water Quality Criteria	Surface Water Quality Criteria	Practical Quantitation Limit	Surface Water Quality Criteria

Notes :

Values are for dissolved metals.

All units are in ug/L

Bold indicates that the analyte was detected

Shading indicates that the concentration exceeds the screening level

J - Reported concentration is an estimate

IOSA/MTC

Test Pit Logs

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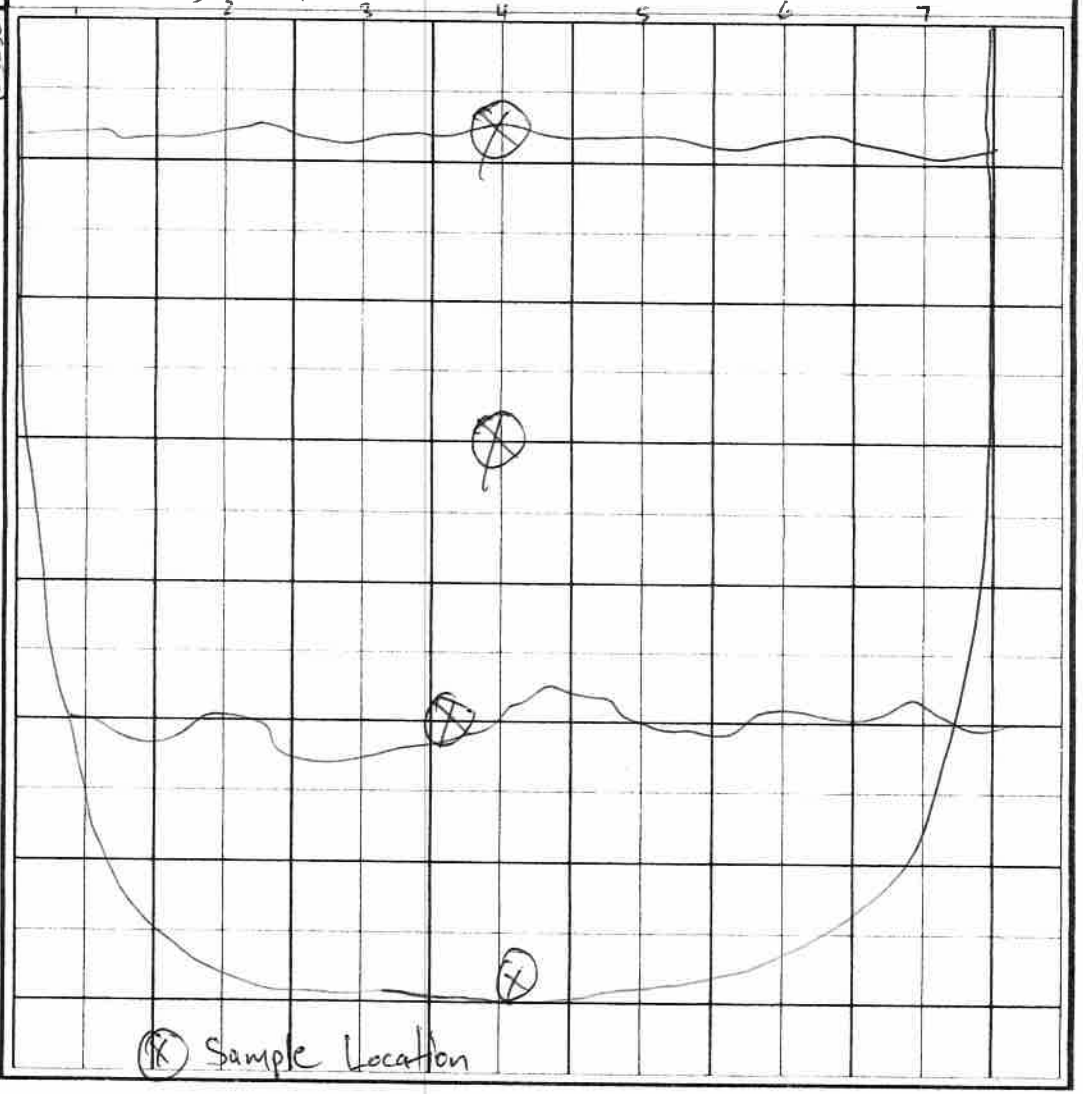
FIELD LOG OF TEST PIT 10SA-TP-1

Project: IOSA | Inspector: R. Jones | Contractor: POFH | Operator: Kyle Gropp
Job No.: POFH | Date: 10.19.2020 | Equipment: Kubota KX040-4
Location: Jensen's Shipyard | Weather: Overcast, 50s°F | Checked By: | Date:

Soil Description & Remarks	Ground Water	Samples	Depth in Feet
0-10" Organic-rich sandy topsoil, black, sl. moist = moist, grass roots.	NOT ENCOUNTERED	10SA-TP1 -1-10:20 @ 0850 1ppm	1
10"-5' GRAVELLY SAND, round-subround cobbles (up to 3-5" size), brown, reddish-brown, trace-minor roots		10SA-TP1 -3-10:20 @ 0855	2 3
5-7-7.5' CLAYEY, SANDY SILT ~~SILTY CLAY~~ LS RJ, non-plastic dark-gray, friable w/ pressure, gray sl. moist = moist, some ~~fg-med~~ SAND *Not a distinct/clean interface.* med sand,		10SA-TP1 -5-10:20 @ 0900 1ppm	4 5
No man-made debris or fill observed, No garbage or metal debris.		10SA-TP1 -7-10:20 @ 0905 0ppm	6 7 7.5

Sketch of WEST pit side | Surface Elevation (ft): | Datum:



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FIELD LOG OF TEST PIT IOSA-TP2

Project: IOSA	Inspector: R. Jones	Contractor: POFH		Operator: Kyle Carapp	
Job No.: POFH	Date: 10.19.2020	Equipment: Kubota KX040-4			
Location: Jensen's Shipyard	Weather: Overcast, 50s°F, no to little wind	Checked By:		Date:	

Soil Description & Remarks

0-1' Topsoil, organic-rich, black, sl. moist-moist, Abundant GRASS roots

1-3/3.5' GRAVELLY SAND, up to 3-6" cobbles, fg-med. grains, reddish orange/brown, ~~minor~~ trace roots

3.5-8' CLAYEY, SANDY SILT, hard, non-plastic, sl. moist to moist, tannish gray, clumps

Ground Water	Samples	Depth in Feet	Sketch of WEST pit side	Surface Elevation (ft):	Datum:

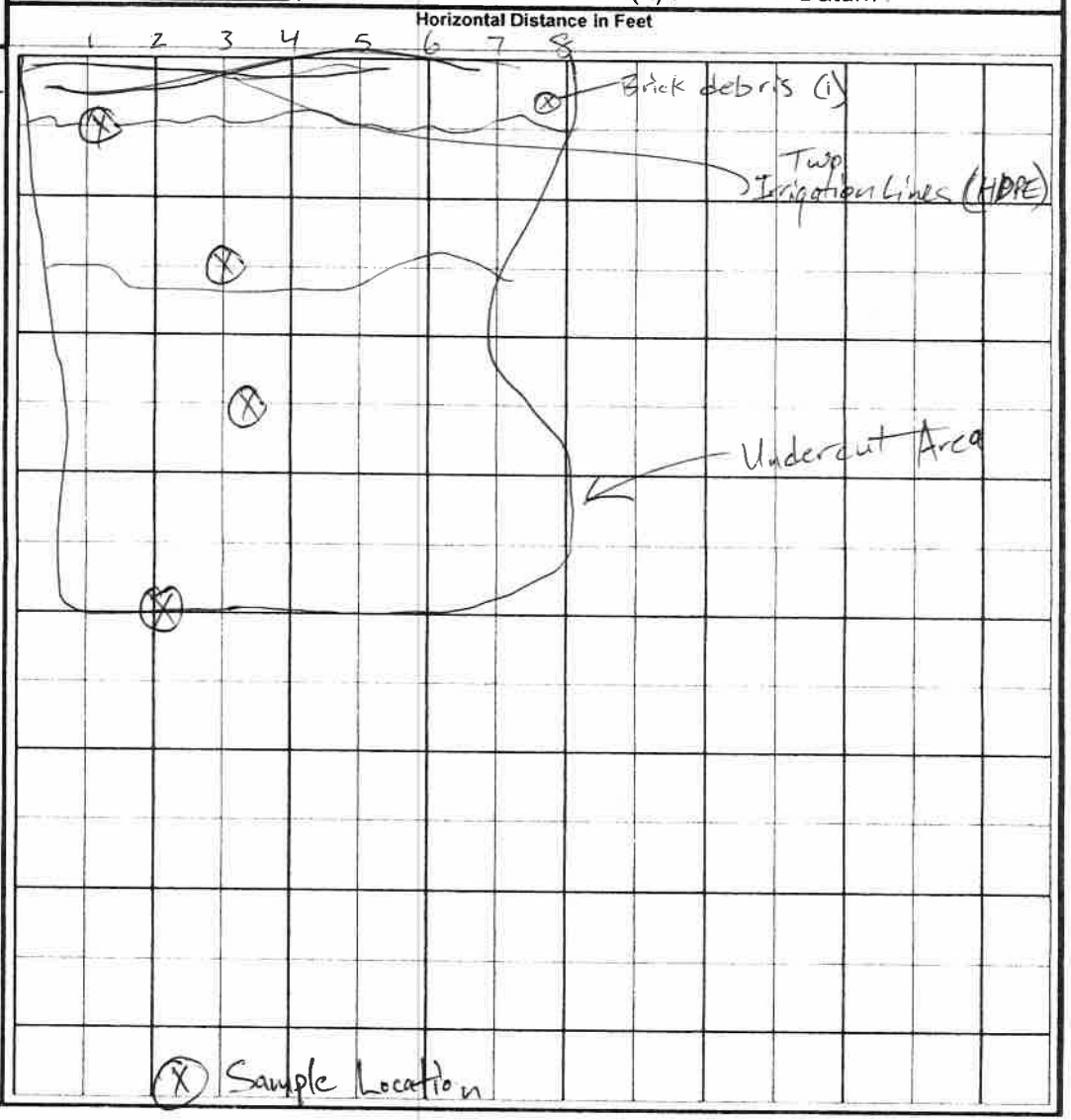
NOT ENCOUNTERED

IOSA-TP2 -1-1020 @0930 1ppm

IOSA-TP2 -3-1020 @0940 14ppm

IOSA-TP2 -5-1020 @0940 22ppm

IOSA-TP2 -8-1020 @0945 8ppm



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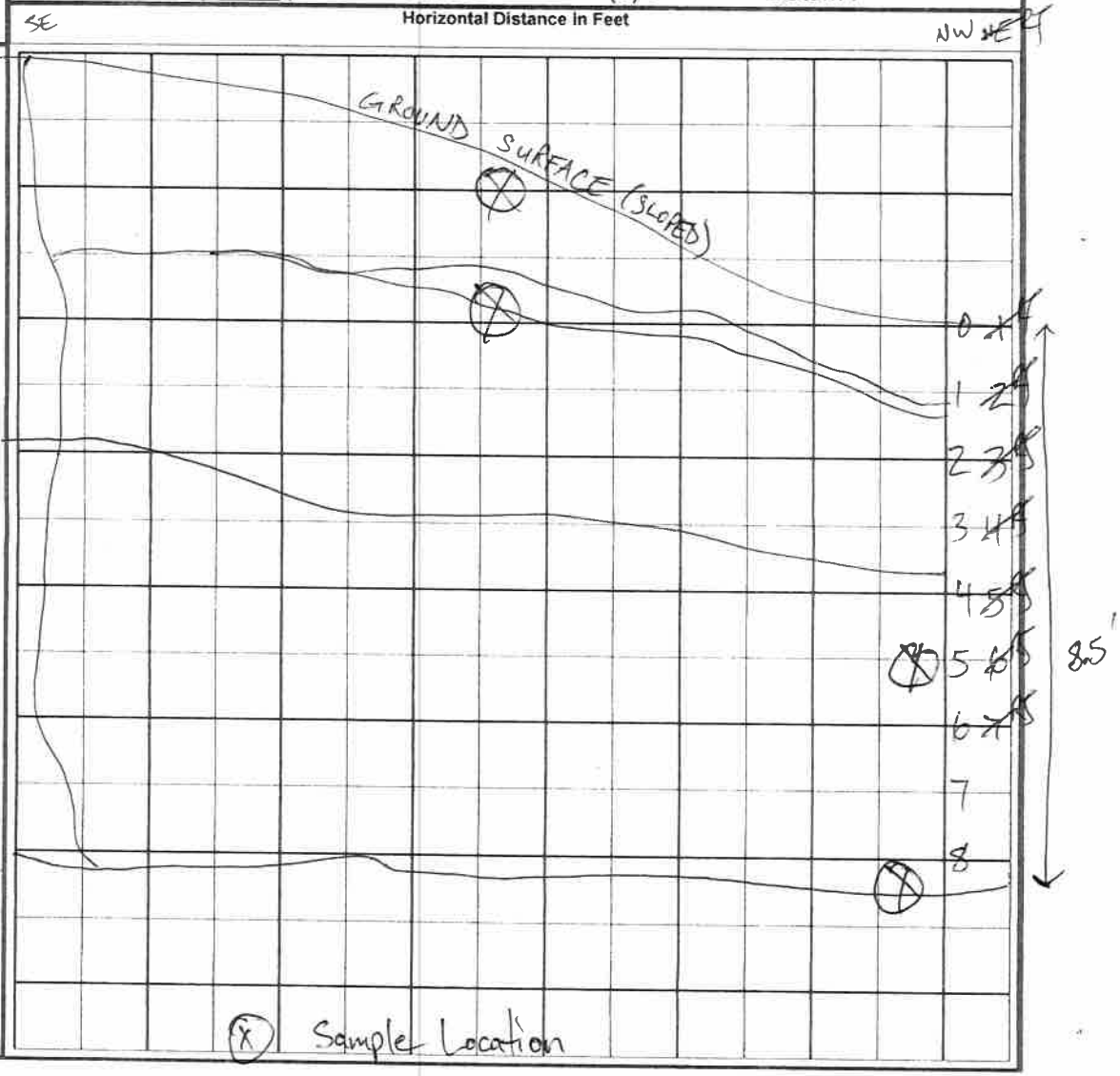
FIELD LOG OF TEST PIT IOSA-TP3

Project: IOSA | Inspector: K. Jones | Contractor: POFH | Operator: Kyle Gropp
Job No.: POFH | Date: 10.19.2020 | Equipment: Kubota KX040-4
Location: Jensen's Shipyard | Weather: Mostly Sunny, 50s°F, Milnerbreeze | Checked By: | Date:

DEPTHS AS MEASURED ON SE WEST WALL CORNER — Soil Description & Remarks	Ground Water	Samples	Depth in Feet
0-3' GRAVELLY TOPSOIL, some round gravel, moist, gray-brown (dk), abundant grass roots,	*NOT ENCOUNTERED*	IOSA-TP3-1-1020 @1035 2ppm	0
3-5.5' GRAVELLEY SAND, med-coarse, abundant cobbles (up to 5" dia) round, loose, reddish orange brown		IOSA-TP3-3-1020 @1040 3ppm	2
5.5-12' SANDY SILT, minor CLAYEY LINES, Sl. moist to moist, vfg-med, firm, gray, clumps		IOSA-TP3-5-1020 @1045 4ppm	4
		IOSA-TP3-8.5-1020 @1050 5ppm	5
			6
			7
			8
			9
			10
			11
			12

Sketch of WEST pit side | Surface Elevation (ft): | Datum:



No human/man-made debris or unusual fill or odors.

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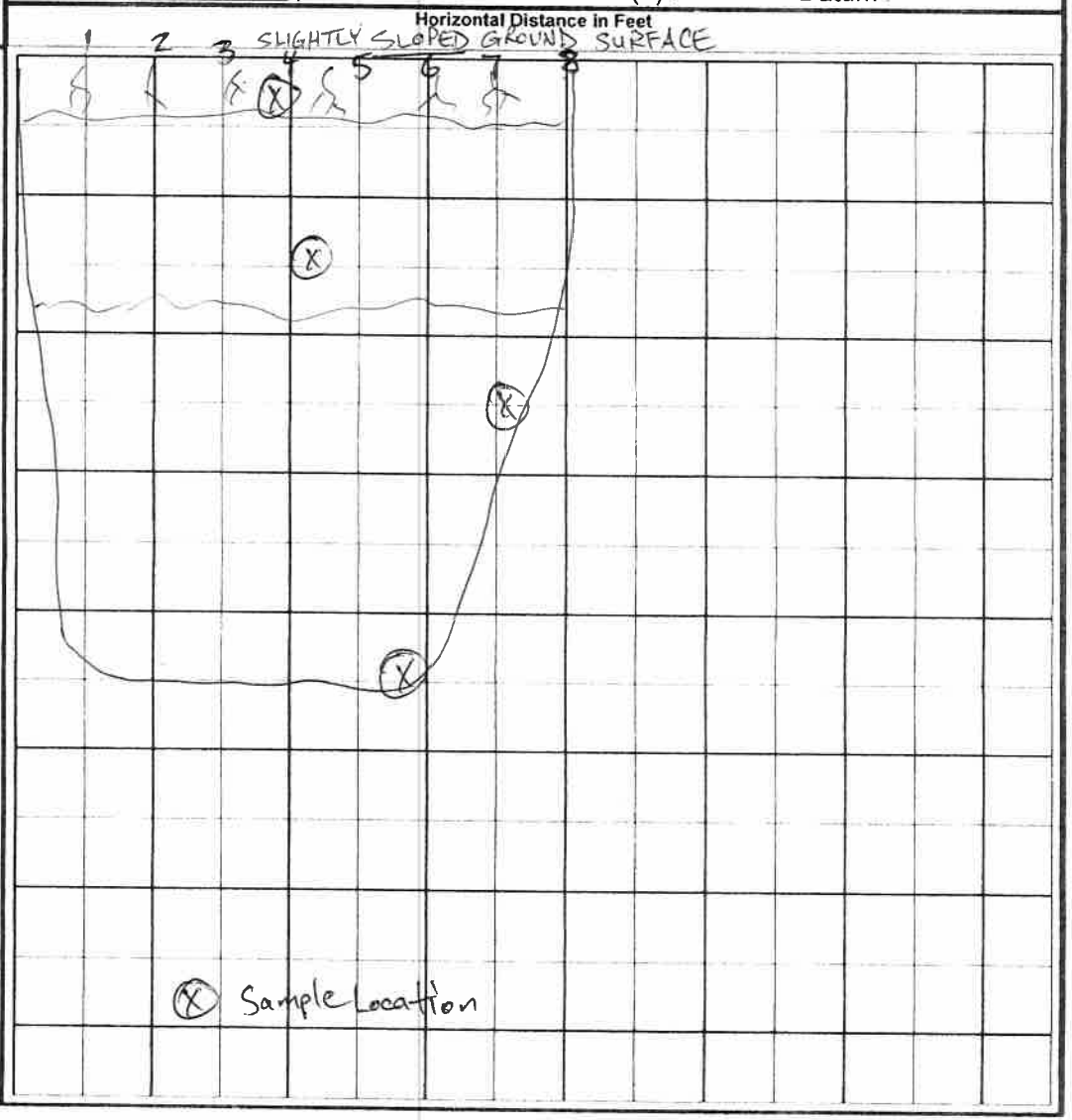
FIELD LOG OF TEST PIT 10SA-TP4

Project: IOSA | Inspector: R. Jones | Contractor: POFH | Operator: Kyle Gropp
Job No.: POFH | Date: 10.19.2020 | Equipment: Kubota KX040-4
Location: Jensen's Shipyard | Weather: Overcast, 50°F | Checked By: | Date:

Soil Description & Remarks	Ground Water	Samples	Depth in Feet
0-12" Topsoil, roots, brown to dk brown, organic-rich, variable thickness 12"-3to4' GRAVELLY SAND, fg-med reddish brown, rounded cobbles, sl. moist-moist 3/4'-9' SANDY SILT, minor CLAY fines, moist, tan brown w/ gray, fg-med, firm bit friable *No observed man-made buried debris, no ~~usual~~ unusual soils or odors.*	*Not encountered.*	10SA-TP4 @1110 -1-1020 10SA-TP4 @1120 -3-1020 10SA-TP4 @1125 -5-1020 10SA-TP4 @1125 -9-1020	0 ppm 1 0 ppm 2 0 ppm 3 0 ppm 4 0 ppm 5 6 7 0 ppm 8 9

Sketch of EAST pit side | Surface Elevation (ft): | Datum:



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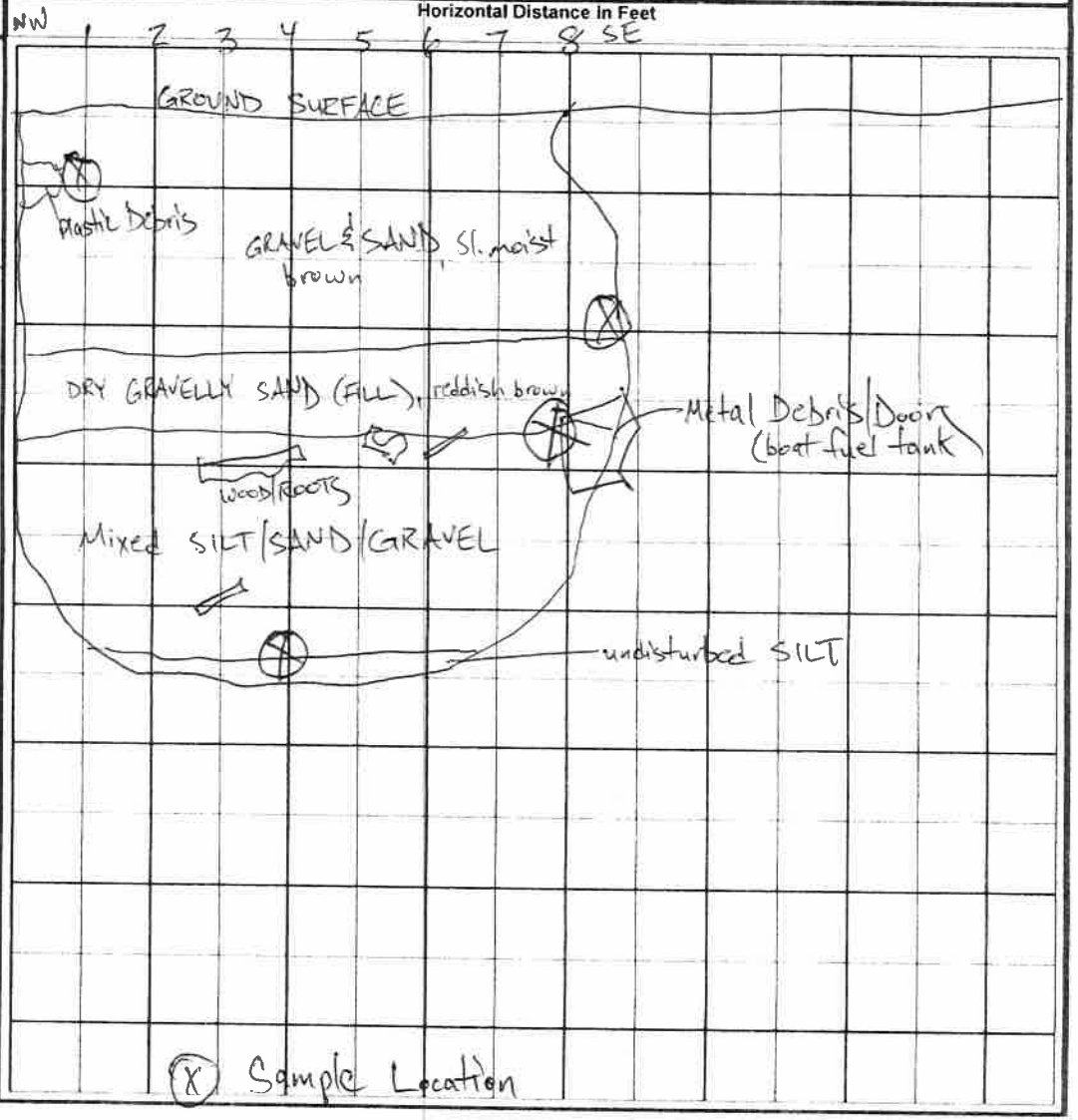
FIELD LOG OF TEST PIT IOSA-TP5

Project: IOSA | Inspector: R. Jones | Contractor: POFH | Operator: Kyle/Erik
Job No.: POFH | Date: 10.19.2020 | Equipment: Kubota ~~KX040-4~~ KX040-4
Location: Jensen's Harbor/Shipyard | Weather: Overcast, 50s°F, Mineral Some Breeze | Checked By: _____ | Date: _____

Soil Description & Remarks	Ground Water	Samples	Depth in Feet
0-6" Some organic-rich soils, sand topsoil, Abundant ~~roots~~ roots, moist brown to dk brown			0
~6" to ~3.5' Mixed GRAVEL and SAND, Disturbed SOILS/FILL, med. brown, sl. moist cobbles *Some plastic sheeting	*Not Encountered*	IOSA-TP5 -1-1020 @1235 @1 ppm	1
		IOSA-TP5 -3-1020 @1240 1ppm	3
3.5 to 4.5/5' GRAVELLY SAND, dry, cobbles reddish/orangish-brown, med.-cg. w/ some metal debris		IOSA-TP5 ~~5-1020 @1245 0 ppm~~ -5-1020 @1245 0 ppm	4 5
@ 4.5-5' most METAL debris car door? rebar, misc. sheet metal, all rusted Also some melted glassy slag material			6
5-7.5' Mixed GRAVELLY SAND, cobbles with SILT debris (clumps), sl. moist ~~to moist~~ dk red-brown, *Some wood/root/metal debris		IOSA-TP5 -8-1020 @1250 1ppm	7 8
@7.5-8 SANDY SILT moist undisturbed hard, brown, vfg-med no clay fines			

Sketch of _____ pit side | Surface Elevation (ft): | Datum:



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FIELD LOG OF TEST PIT IOSA-TP6

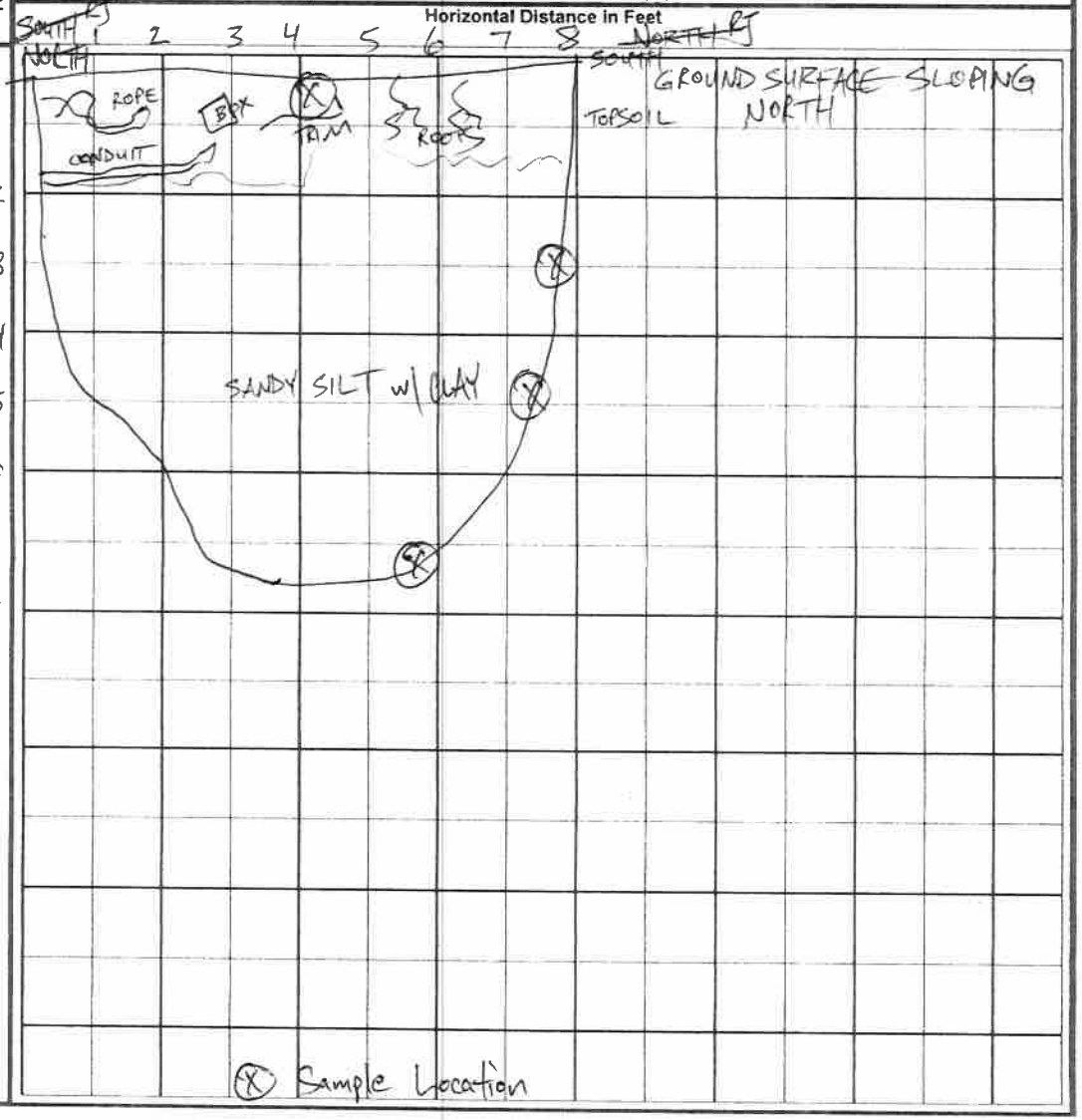
Project: IOSA | Inspector: R. Jones | Contractor: POFH | Operator: Winter

Job No.: POFH | Date: 10.19.2020 | Equipment: Kubota KX040-4

Location: Jensen's Shipyard | Weather: Overcast, 50s°F, breezy, cool | Checked By: | Date:

Soil Description & Remarks	Ground Water	Samples	Depth in Feet
0 to 1.5/2' SANDY TOPSOIL, organic-rich, dk brown, med-c.g, sl. moist = moist, rooty, minor gravel *Most manmade debris buried in upper 2-2.5 ft BGS.* *Observed: electrical box & conduit (abandoned), aluminum trim, rope, mesh sack, *On ground surface: wood, pallet debris, propane/gas canister, plywood, rubber or plastic tubing, boat ball* 2-3' Transition zone. Mixed SAND/TOPSOIL, some COBBLES, med. tan-brown, Abundant TREE ROOTS ~3 to 7.5' SANDY SILT, some CLAY content, moist, tan to gray, fg-med, no gravel, no roots, no debris, seemingly undisturbed, non-plastic, blocky cleavage	*Not encountered.	IOSA-TP6-1-10.20 @ 1420 IOSA-TP6-3-10.20 @ 1435 1ppm IOSA-TP6-5-10.20 @ 1440 1ppm IOSA-TP6-7.5-10.20 @ 1445 1ppm	1 2 3 4 5 6 7 8

Sketch of East pit side | Surface Elevation (ft): SLOPING | Datum:



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FIELD LOG OF TEST PIT IOSA-TP7

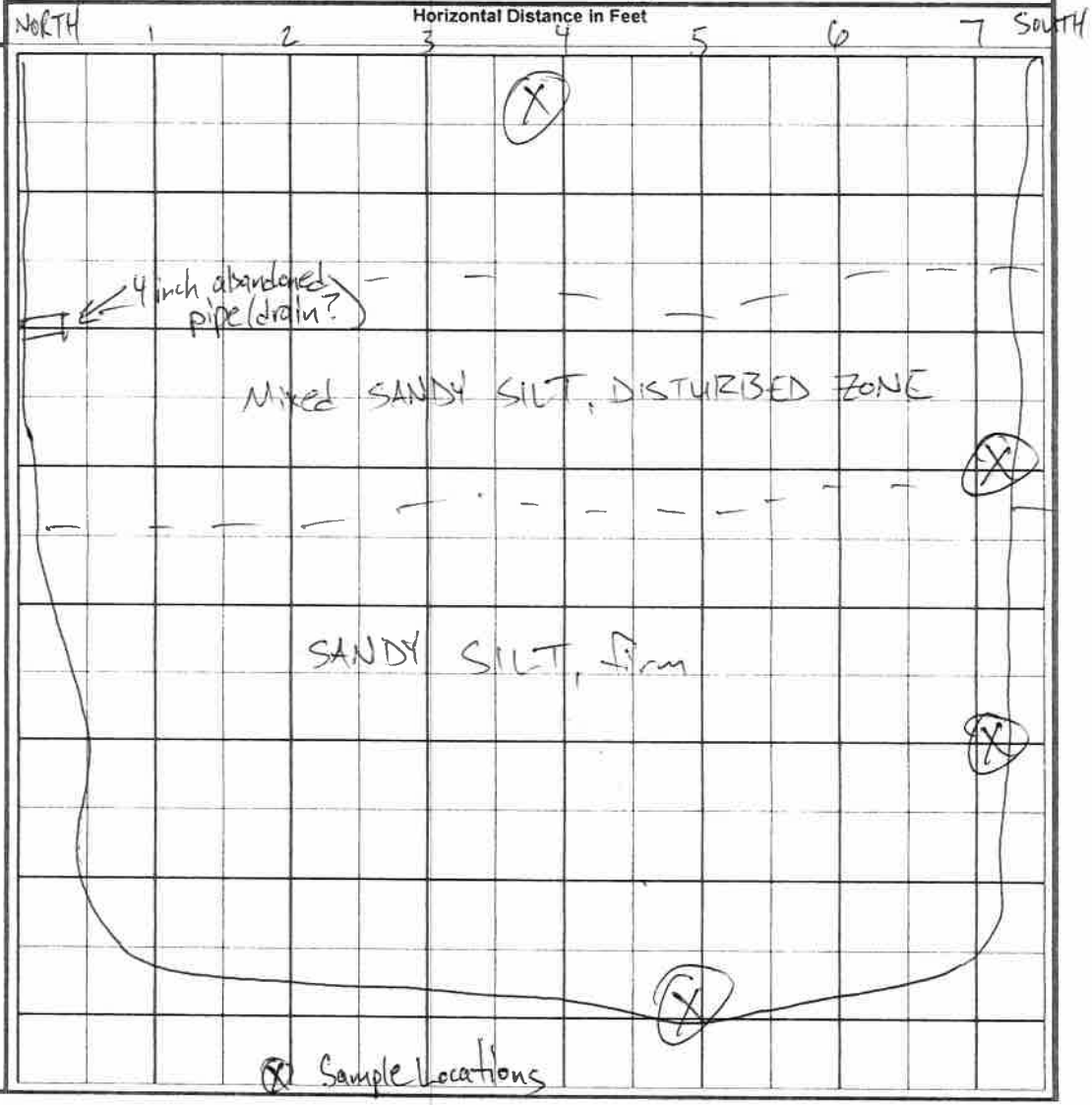
Project: IOSA | Inspector: R. Jones | Contractor: POFH | Operator: Winter

Job No.: Port of Friday Harbor | Date: 10.19.2020 | Equipment: Kubota KX040-4

Location: Jensen's Shipyard | Weather: Overcast, low 50s°F, some wind (10 mph) | Checked By: | Date:

Soil Description & Remarks	Ground Water	Samples	Depth in Feet
GRASS @ SURFACE, dense 0-2' Mixed SANDY TOPSOIL, some gravel (rounded up to 2-3"), med-c.g, moist, dk brown, organics Beyond 2' ~~abundant roots~~ Trace organics, minor roots ~2-4' Mixed sand & SILT, not a clean SANDY SILT interface, trace cementation ~3-7' SANDY, SILT, tan to gray, moist, med, ~~hard clumps~~, MF med-hard, clumps, trace pockets of cementation * No manmade debris outside of the buried 4inch pipe at ~7-ft BGS.* Appear to be outside of the former dumping area.	* Not encountered.*	IOSA-TP7-1-102020@1535 IOSA-TP7-3-102020@1540 IOSA-TP7-5-102020@1545 IOSA-TP7-7-102020@1550	1 ppm 2 ppm 3 ppm 4 ppm 5 ppm 6 ppm 7

Sketch of WEST pit side | Surface Elevation (ft): | Datum:



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FIELD LOG OF TEST PIT IOSA-TP8

Project: IOSA | Inspector: R. Jones | Contractor: POFH | Operator: Winter/Kyle
Job No.: POFH | Date: 10.19.2020 | Equipment: Kubota KX040-4
Location: Jensen's Shipyard | Weather: Overcast, ~50°F, cool/cold, 0-10mph | Checked By: | Date:

Soil Description & Remarks

Heavy/dense Grass @ surface.

0-1' organic-rich TOPSOIL, sandy (med), dk brown to black, moist, abundant grass roots.

1-3' GRAVELLY, SAND, rounded Gravel (up to 2-3" dia) med-cg, sl. moist to moist, reddish tan to light brown, 75-90% SAND

3-7' SANDY SILT, tan to gray, occ. trace round gravel, sl. moist to moist firm to hard trace cementation in pockets trace CLAY fines

@6' Erratic boulder (igneous texture)

No observed, buried man-made debris.
No indications of gross/bulk contamination.

Ground Water	Samples	Depth in Feet
Not Encountered	IOSA-TP8-1-10202@1635	1
	IOSA-TP8-2-10202@1640	2
		3
	IOSA-TP8-3-10202@1645	4
		5
	IOSA-TP8-4-10202@1650	6
		7

Sketch of EAST pit side | Surface Elevation (ft): | Datum: