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ANCHOR QEA

Memorandum

December 15, 2017

To: Artie Kapell and John Evered, Washington State Department of Ecology

From: Clay Patmont, John Laplante, and Jason Cornetta, Anchor QEA

cc: Linda Berry-Maraist and Stephanie Foster, Olympic Property Group

Re: Port Gamble Bay Cleanup Post-Stockpile Sampling

Introduction

Between September 2015 and January 2017, the in-water construction phase of the Port Gamble Bay and Mill Site cleanup project was successfully completed by Pope Resources, LP/Olympic Property Group, LLC (PR/OPG). The cleanup project was performed in accordance with the requirements of Consent Decree 13 2 02720-0 between the Washington State Department of Ecology and PR/OPG, and also consistent with the regulatory requirements of the Model Toxics Control Act and U.S. Army Corps of Engineers permit conditions (NWS-2013-1270).

Dredged and excavated sediments removed during the in-water construction phase of the cleanup project were temporarily stockpiled on upland areas of the Mill Site. Prior to disposal of these dredged and excavated sediments, upland sparging (rinsing with freshwater) and characterization of stockpiled Port Gamble Bay sediments and leachate was performed to verify the suitability of these materials for placement at the Limited Purpose Landfill (Landfill) at the Model Airplane Field (MAF) in Port Gamble. Leachate suitability characterization were previously provided in the *Port Gamble Stockpile Leachate Suitability Monitoring Memorandum* (Anchor QEA 2017a).

Temporary Stockpile Removal Activities

Sediment stockpiles with elevated chemical concentrations, along with all creosote-treated wood, were protectively separated and disposed at permitted off-site Subtitle D landfill facilities. In August and September 2017, stockpiled sparged sediments at the Mill Site that met Kitsap Public Health District suitability criteria were transported to the MAF Landfill, where they were placed, compacted, and capped in accordance with applicable permits as described in the *Port Gamble Model Airplane Field Limited Purpose Landfill Permitting Summary Memorandum* (Anchor QEA 2017b).

As material was transported from the Mill Site, visual inspections were conducted to confirm that all temporarily stockpiled material was successfully removed. An additional 6 to 12 inches of underlying soil was subsequently removed from below the temporary stockpiles to further ensure no residual stockpile material remained. Following removal of the temporary stockpiles at the Mill Site,

non-hardscape areas beneath the stockpiles were sampled to further verify that anti-degradation criteria were achieved.

Post-Stockpile Sampling and Analysis

From October 3 to 6, 2017, 13 five-point composite samples of surficial soils beneath the former Mill Site stockpile areas were collected (Figure 1). Samples were obtained and processed following the procedures described in the *Post-Stockpile Removal – Sampling and Quality Assurance Project Plan* (Anchor QEA 2017c). All 13 samples, along with additional field duplicates and other quality control samples, were analyzed for Port Gamble Bay chemicals of concern (CoCs) including cadmium, carcinogenic polycyclic aromatic hydrocarbons, and dioxins/furans. Laboratory analysis was performed at Analytical Resources, Inc., in Tukwila, Washington. Independent validation by Laboratory Data Consultants, Inc., in Carlsbad, California, confirmed that these data are suitable for site characterization. Table 1 presents validated analytical results for CoCs.

The post-stockpile removal characterization data summarized in Figure 1 are consistent with existing surface soil concentration data collected prior to the Port Gamble Bay Cleanup project. As these data help to refine characterization of the extent of soil contamination remaining at the Mill Site, post-stockpile removal sampling data are being incorporated into the ongoing, separate remedial investigation/feasibility study of the upland area of the Port Gamble Bay and Mill Site. No additional activities are required as part of the in-water cleanup stockpile removal.

References

Anchor QEA, 2017a. *Port Gamble Stockpile Leachate Suitability Monitoring Memorandum*. Prepared for Pope Resources, LP/OPG Properties, LLC, and Kitsap Public Health District. September 2017.

Anchor QEA, 2017b. *Port Gamble Model Airplane Field Limited Purpose Landfill Permitting Summary Memorandum.* Prepared for Pope Resources, LP/OPG Properties, LLC, and Kitsap Public Health District. November 2017.

Anchor QEA, 2017c. *Post-Stockpile Removal – Sampling and Quality Assurance Project Plan.* Prepared for Pope Resources, LP/OPG Properties, LLC, and Washington State Department of Ecology. February 2017.

Table 1
Port Gamble Post-Stockpile Surface Soil Data

FINAL VALIDATED DATA

	Task	2017SedStockpile	2017SedStockpile	2017SedStockpile	2017SedStockpile	2017SedStockpile	2017SedStockpile	2017SedStockpile	2017SedStockpile
	Location ID	PG-SO-01	PG-SO-02	PG-SO-03	PG-SO-05	PG-SO-06	PG-SO-07	PG-SO-08	PG-SO-09
	Sample ID	PG-SO-01-20171006	PG-SO-02-20171006	PG-SO-03-20171006	PG-SO-05-20171005	PG-SO-06-20171005	PG-SO-07-20171005	PG-SO-08-20171005	PG-SO-09-20171003
	Sample Date	10/6/2017	10/6/2017	10/6/2017	10/5/2017	10/5/2017	10/5/2017	10/5/2017	10/3/2017
	Depth	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft
	Sample Type	N	N	N	N	N	N	N	N
	Matrix	SO	SO	SO	SO	SO	SO	SO	SO
	X	1211090	1211186	1211116	1211309	1211142	1211238	1211344	1211431
	Y	316730	316704	316826	316774	316923	316897	316868	316845
	MTCA Unrestricted*								
Conventional Parameters (pct)									
Total solids	--	**93.98**	**95.12**	**92.50**	**94.77**	**95.04**	**92.92**	**93.63**	**94.41**
Metals (mg/kg)									
Cadmium	2	**0.11**	**0.15**	**0.12**	**0.16**	**0.12**	**0.14**	**0.16**	**0.15**
Semivolatile Organics (µg/kg)									
1-Methylnaphthalene	--	**16.7 J**	**20.8**	**39.2**	**17.6 J**	**20.3**	**29.8**	**29.1**	**29.2**
2-Methylnaphthalene	--	**32.0**	**38.6**	**59.7**	**24.5**	**33.6**	**37.9**	**47.5**	**43.9**
Acenaphthene	--	**64.3**	**69.8**	**101**	**46.3**	**57.4**	**86.3**	**82.6**	**75.4**
Acenaphthylene	--	**18.1 J**	**22.3**	**21.4**	**22.5**	**15.6 J**	**21.4**	**30.0**	**32.5**
Anthracene	--	**60.0**	**80.9**	**73.8**	**67.6**	**95.7**	**80.6**	**71.7**	**86.5**
Benzo(a)anthracene	--	**84.9**	**78.9**	**102**	**117**	**72.8**	**84.9**	**90.6**	**140**
Benzo(a)pyrene	--	**79.9**	**69.7**	**71.4**	**90.9**	**54.2**	**63.9**	**69.4**	**109**
Benzo(b,j,k)fluoranthenes	--	**179**	**201**	**184**	**268**	**141**	**167**	**188**	**357**
Benzo(g,h,i)perylene	--	**54.0**	**64.6**	**52.9**	**71.0**	**38.2**	**47.1**	**52.5**	**109**
Chrysene	--	**131**	**151**	**174**	**244**	**122**	**155**	**151**	**284**
Dibenzo(a,h)anthracene	--	**16.4 J**	**19.8**	**17.9 J**	**30.6**	**13.6 J**	**14.4 J**	**15.3 J**	**32.5**
Fluoranthene	--	**297**	**311**	**386**	**266**	**260**	**370**	**340**	**468**
Fluorene	--	**79.9**	**77.3**	**108**	**52.7**	**77.2**	**92.7**	**90.4**	**65.6**
Indeno(1,2,3-c,d)pyrene	--	**43.3**	**54.0**	**40.8**	**65.6**	**32.0**	**38.4**	**45.6**	**93.0**
Naphthalene	--	**101**	**170**	**270**	**111**	**145**	**184**	**211**	**198**
Phenanthrene	--	**238**	**242**	**297**	**178**	**199**	**255**	**261**	**276**
Pyrene	--	**269**	**260**	**337**	**238**	**227**	**315**	**293**	**406**
Total cPAH TEQ (7 minimum CAEPA 2005) (U = 0)	140	**114 J**	**107**	**108 J**	**141**	**81.4 J**	**95.9 J**	**105 J**	**174**
Dioxin Furans (ng/kg)									
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	--	**0.314 J**	**0.246 J**	**0.244 J**	**0.328 J**	**0.296 J**	**0.375 J**	**0.516 J**	**0.623 J**
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	--	**1.53**	**1.11**	**1.08**	**1.22**	**1.12**	**1.08 J**	**2.15**	**3.31**
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	--	**0.938 J**	0.859 U	**1.00**	**1.56 J**	**1.13**	**1.30 J**	**3.29**	**7.94**
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	--	**6.43**	**7.60**	**5.87**	**12.7**	**6.06**	**6.53**	**36.5**	**59.5**
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	--	**2.90**	**2.77 J**	**2.29**	**3.09**	**2.42**	**2.66**	**5.19**	**12.2**
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD	--	**161**	**237**	**138**	**304**	**124**	**249**	**636**	**1300**
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	--	**1660**	**2590**	**1430**	**3380**	**1440**	**3500**	**6040 J**	**17100 J**
Total Tetrachlorodibenzo-p-dioxin (TCDD)	--	**22.9**	**11.7**	**15.4**	**25.2**	**38.0**	**18.0**	**45.7 J**	**27.8**
Total Pentachlorodibenzo-p-dioxin (PeCDD)	--	**20.3**	**14.2**	**17.4**	**25**	**29.4**	**18.8**	**40.0**	**41.5**
Total Hexachlorodibenzo-p-dioxin (HxCDD)	--	**82.1**	**82.8**	**81.4**	**146**	**74.7**	**129**	**319**	**430**
Total Heptachlorodibenzo-p-dioxin (HpCDD)	--	**584**	**836**	**711**	**1600**	**585**	**1520**	**1580**	**3820**
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	--	**4.13**	**0.606 J**	**0.891 J**	**0.699 J**	**0.561 J**	**0.773 J**	**1.31**	**1.09**
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	--	**11.8**	**0.584 J**	**0.924 J**	**0.677 J**	**0.488 J**	**0.656 J**	**1.31**	**1.43 J**

Table 1
Port Gamble Post-Stockpile Surface Soil Data

FINAL VALIDATED DATA

	Task	2017SedStockpile	2017SedStockpile	2017SedStockpile	2017SedStockpile	2017SedStockpile	2017SedStockpile
	Location ID	PG-SO-10	PG-SO-11	PG-SO-12	PG-SO-13	PG-SO-14	PG-SO-14
	Sample ID	PG-SO-10-20171003	PG-SO-11-20171003	PG-SO-12-20171003	PG-SO-13-20171003	PG-SO-140-20171003	PG-SO-14-20171003
	Sample Date	10/3/2017	10/3/2017	10/3/2017	10/3/2017	10/3/2017	10/3/2017
	Depth	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft
	Sample Type	N	N	N	N	FD	N
	Matrix	SO	SO	SO	SO	SO	SO
	X	1211528	1211167	1211264	1211361	1211554	1211554
	Y	316819	317019	316994	316968	316916	316916
	MTCA Unrestricted*						
Conventional Parameters (pct)							
Total solids	--	**95.04**	**92.76**	**95.35**	**95.03**	**96.73**	**96.69**
Metals (mg/kg)							
Cadmium	2	**0.12**	**0.12**	**0.070 J**	**0.12**	**0.12**	**0.10**
Semivolatile Organics (µg/kg)							
1-Methylnaphthalene	--	**85.8**	**13.1 J**	**10.8 J**	**34.7**	**48.2**	**49.3**
2-Methylnaphthalene	--	**102**	**20.7**	**15.9 J**	**56.8**	**61.6**	**76.6**
Acenaphthene	--	**235**	**27.6**	**25.1**	**81.3**	**158**	**150**
Acenaphthylene	--	**46.0**	**9.90 J**	**7.7 J**	**23.6**	**28.1**	**30.5**
Anthracene	--	**179**	**24.6**	**22.9**	**84.6**	**117**	**127**
Benzo(a)anthracene	--	**189**	**34.5**	**26.9**	**93.5**	**126**	**143**
Benzo(a)pyrene	--	**134**	**25.8**	**21.5**	**72.5**	**80.1**	**95.5**
Benzo(b,j,k)fluoranthenes	--	**364**	**68.1**	**53.8**	**201**	**221**	**253**
Benzo(g,h,i)perylene	--	**110**	**26.0**	**17.1 J**	**63.6**	**58.0**	**66.5**
Chrysene	--	**306**	**52.1**	**40.8**	**163**	**179**	**221**
Dibenzo(a,h)anthracene	--	**38.4**	**7.00 J**	19.0 U	**22.4**	**20.3**	**20.9**
Fluoranthene	--	**854**	**134**	**114**	**415**	**521 J**	**580**
Fluorene	--	**234**	**32.9**	**30.9**	**82.3**	**162**	**146**
Indeno(1,2,3-c,d)pyrene	--	**87.5**	**19.6**	**14.2 J**	**49.4**	**46.3**	**52.5**
Naphthalene	--	**514**	**90.8**	**81.5**	**233**	**308**	**439**
Phenanthrene	--	**668**	**104**	**88.1**	**260**	**424 J**	**438**
Pyrene	--	**687**	**113**	**97.2**	**353**	**454**	**517**
Total cPAH TEQ (7 minimum CAEPA 2005) (U = 0)	140	**205**	**39.2 J**	**31.4 J**	**111**	**123**	**145**
Dioxin Furans (ng/kg)							
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	--	**9.76 J**	**0.533 J**	**0.277 J**	**1.35**	**0.421 J**	**0.553 J**
1,2,3,7,8-Pentachlorodibenzo-p-dioxin (PeCDD)	--	**45.2**	**1.89**	**0.465 J**	**2.25 J**	**1.67**	**1.88**
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	--	**127**	**1.57 J**	0.454 U	**10.7 J**	**3.64 J**	**5.51**
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin (HxCDD)	--	**1170**	**7.01**	**2.53**	**100**	**18.2**	**45.9**
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin (HxCDD)	--	**120**	**2.69**	1.10 U	**7.69**	**3.85**	**4.31**
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin (HpCDD	--	**21100**	**104**	**59.2**	**1680**	**391**	**808**
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin (OCDD)	--	**347000 J**	**1200**	**670**	**30800 J**	**5240 J**	**9140 J**
Total Tetrachlorodibenzo-p-dioxin (TCDD)	--	**104**	**67.6**	**9.35**	**19.6**	**36.6**	**32.8**
Total Pentachlorodibenzo-p-dioxin (PeCDD)	--	**230**	**51.6**	**7.69**	**18.9**	**32.7**	**30.9**
Total Hexachlorodibenzo-p-dioxin (HxCDD)	--	**3460**	**83.6**	**27.4**	**309**	**149**	**190**
Total Heptachlorodibenzo-p-dioxin (HpCDD)	--	**36100**	**362**	**254**	**3080**	**1340**	**1830**
2,3,7,8-Tetrachlorodibenzofuran (TCDF)	--	**2.42 J**	**1.90**	**0.307 J**	**0.721 J**	**0.913 J**	**0.855 J**
1,2,3,7,8-Pentachlorodibenzofuran (PeCDF)	--	**7.84 J**	**1.11 J**	0.301 UJ	**1.01**	**0.761 J**	**0.693 J**

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FINAL VALIDATED DATA

	Task	2017SedStockpile	2017SedStockpile	2017SedStockpile	2017SedStockpile	2017SedStockpile	2017SedStockpile	2017SedStockpile	2017SedStockpile
	Location ID	PG-SO-01	PG-SO-02	PG-SO-03	PG-SO-05	PG-SO-06	PG-SO-07	PG-SO-08	PG-SO-09
	Sample ID	PG-SO-01-20171006	PG-SO-02-20171006	PG-SO-03-20171006	PG-SO-05-20171005	PG-SO-06-20171005	PG-SO-07-20171005	PG-SO-08-20171005	PG-SO-09-20171003
	Sample Date	10/6/2017	10/6/2017	10/6/2017	10/5/2017	10/5/2017	10/5/2017	10/5/2017	10/3/2017
	Depth	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft
	Sample Type	N	N	N	N	N	N	N	N
	Matrix	SO	SO	SO	SO	SO	SO	SO	SO
	X	1211090	1211186	1211116	1211309	1211142	1211238	1211344	1211431
	Y	316730	316704	316826	316774	316923	316897	316868	316845
	MTCA Unrestricted*								
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	--	**2.08 J**	**0.603 J**	**0.521 J**	**0.727 J**	**0.401 J**	**0.643 J**	**0.943 J**	**1.41**
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	--	**20.6**	**1.48**	**1.83**	**2.20**	**1.12**	**1.89**	**7.24**	**8.75**
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	--	**4.39**	**0.935 J**	**0.870 J**	**1.32**	**0.796 J**	**0.785 J**	**3.74**	**4.68**
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	--	**0.821 J**	0.557 U	0.344 U	**0.839 J**	0.510 U	0.557 U	**3.74**	**18.2**
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	--	**1.39**	**1.49**	**1.13**	**1.29 J**	**1.31**	**1.23**	**8.37**	**11.4**
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	--	**61.3**	**43.4**	**26.8**	**96.3**	**30.5**	**28.0**	**455**	**572**
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	--	**2.63**	**1.90**	**1.01 J**	**3.04**	**1.24**	**1.52**	**18.7**	**22.7**
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	--	**238**	**210**	**48.6**	**177**	**52.3**	**81.0**	**723**	**1050**
Total Tetrachlorodibenzofuran (TCDF)	--	**29.2**	**10.1**	**14.2**	**12.5**	**10.1**	**12.1**	**21.5**	**21.3**
Total Pentachlorodibenzofuran (PeCDF)	--	**39.2**	**14.2**	**13.3**	**15.6**	**11.7**	**11.7**	**26.5**	**42.8**
Total Hexachlorodibenzofuran (HxCDF)	--	**72.7**	**53.4**	**35.1**	**106**	**41.2**	**37.9**	**545**	**847**
Total Heptachlorodibenzofuran (HpCDF)	--	**235**	**191**	**79.2**	**308**	**96.4**	**99.2**	**1730**	**2170**
Total Dioxin/Furan TEQ 2005 (Mammal) (U = 0)	12	**9.80 J**	**6.71 J**	**5.00 J**	**9.26 J**	**4.90 J**	**7.04 J**	**23.1 J**	**41.2 J**

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Port Gamble Post-Stockpile Surface Soil Data

FINAL VALIDATED DATA

		Task	2017SedStockpile	2017SedStockpile	2017SedStockpile	2017SedStockpile	2017SedStockpile	2017SedStockpile
		Location ID	PG-SO-10	PG-SO-11	PG-SO-12	PG-SO-13	PG-SO-14	PG-SO-14
		Sample ID	PG-SO-10-20171003	PG-SO-11-20171003	PG-SO-12-20171003	PG-SO-13-20171003	PG-SO-140-20171003	PG-SO-14-20171003
		Sample Date	10/3/2017	10/3/2017	10/3/2017	10/3/2017	10/3/2017	10/3/2017
		Depth	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft	0 - 1 ft
		Sample Type	N	N	N	N	FD	N
		Matrix	SO	SO	SO	SO	SO	SO
		X	1211528	1211167	1211264	1211361	1211554	1211554
		Y	316819	317019	316994	316968	316916	316916
	MTCA Unrestricted*							
2,3,4,7,8-Pentachlorodibenzofuran (PeCDF)	--	**5.53 J**	**0.994 J**	**0.260 J**	**0.818 J**	**0.559 J**	**0.527 J**
1,2,3,4,7,8-Hexachlorodibenzofuran (HxCDF)	--	**198**	**1.28 J**	**0.486 J**	**15.7**	**3.10**	**7.38**
1,2,3,6,7,8-Hexachlorodibenzofuran (HxCDF)	--	**97.4**	**1.15**	0.399 U	**8.07**	**1.89**	**2.46**
1,2,3,7,8,9-Hexachlorodibenzofuran (HxCDF)	--	**74.3**	0.533 U	0.333 U	**7.17**	**1.63**	**2.74**
2,3,4,6,7,8-Hexachlorodibenzofuran (HxCDF)	--	**259**	**1.55**	0.298 U	**21.9**	**3.70**	**6.39**
1,2,3,4,6,7,8-Heptachlorodibenzofuran (HpCDF)	--	**16500**	**32.0**	**16.7**	**1380**	**189**	**422**
1,2,3,4,7,8,9-Heptachlorodibenzofuran (HpCDF)	--	**754**	**1.53**	0.697 U	**50.8**	**7.23**	**26.8**
1,2,3,4,6,7,8,9-Octachlorodibenzofuran (OCDF)	--	**26700**	**58.2**	**31.2**	**2160**	**329**	**1010**
Total Tetrachlorodibenzofuran (TCDF)	--	**54.8**	**30.6**	**5.31**	**13.8**	**17.3**	**16.4**
Total Pentachlorodibenzofuran (PeCDF)	--	**418**	**19.7**	**5.20**	**28.2**	**15.7**	**16.9**
Total Hexachlorodibenzofuran (HxCDF)	--	**18800**	**47.7**	**19.1**	**1750**	**244**	**577**
Total Heptachlorodibenzofuran (HpCDF)	--	**64400**	**107**	**54.1**	**5100**	**700**	**1960**
Total Dioxin/Furan TEQ 2005 (Mammal) (U = 0)	12	**757 J**	**6.22 J**	**2.12 J**	**62.1 J**	**13.5 J**	**25.8 J**

Notes:
RED: Detected concentration is greater than MTCA Unrestricted criteria*
Bold: Detected result

µg/kg: micrograms per kilogram
FD: field duplicate sample
J: Estimated value
mg/kg: milligram per kilogram
MTCA: Model Toxics Control Act
N: normal environmental sample
ng/kg: nanograms per kilogram
pct: percent
SO: soil matrix
U: Compound analyzed, but not detected above detection limit
UJ: Compound analyzed, but not detected above estimated detection limit

*The cadmium criterion is MTCA Method A unrestricted; dioxin/furan TEQ and cPAH TEQ criteria are MTCA Method B unrestricted.
Horizontal coordinate datum is NAD 1983 State Plane Washington North FIPS 4601 (US Survey Feet).
Totals are calculated as the sum of all detected results (U=0). If all results are not detected, the highest reporting limit value is reported as the sum.
Total cPAH TEQ (7 minimum CAEPA 2005) calculation includes benzo(a)pyrene, benzo(a)anthracene, benzo(b)fluoranthene,
benzo(k)fluoranthene, chrysene, dibenzo(a,h)anthracene and indeno(1,2,3-c,d)pyrene. Per MTCA cleanup Regulation, Table 708-2
"Toxicity Equivalency Factors for Minimum Required Carcinogenic Polyaromatic Hydrocarbons (cPAHs) under WAC 173-340-708(e).
Dioxin/furan TEQ values were calculated with 2005 World Health Organization toxicity equivalency factor values for mammals.
USEPA Stage 4 data validation on the dioxin/furan data and USEPA Stage 2B data validation on the rest of the data were completed by Laboratory Data Consultants.
FINAL VALIDATED DATA

LEGEND:

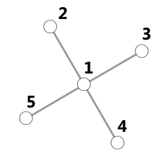
- Actual Sample Locations
- Hardscape Encountered
- Not Sampled due to Hardscape
- 62 Detected concentration is greater than MTCA Method B Unrestricted criteria
- Additional Hardscape Area Exposed After Stockpile Removal
- Hardscape
- Stockpile Boundaries
- Option: 1983 Deed Line with Ordinary High Water

Total Dioxin/Furan TEQ 2005

(U = 1/2) (ng/kg)

- < 5
- 5 - 12
- 12 - 45
- > 45

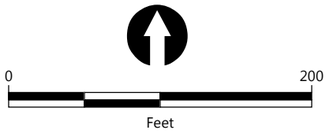
Sample Location Orientation:



NOTE(S):

Sample locations were surveyed and marked prior to mechanical evacuation using an excavator. All samples were collected within 10 feet of target.

SOURCE: Stockpile locations from surveys by Orion Engineering and Google Earth.
Aerial image from Google Earth (July, 2016).
HORIZONTAL DATUM: Washington State Plane North, NAD83, U.S. Feet.



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ANCHOR QEA

Figure 1
Post-Stockpile Surface Soil Sample Results
Data Report
Port Gamble Bay Cleanup Project