CENWS-OD-TS-DMMO

MEMORANDUM FOR: RECORD September 9, 2008

SUBJECT: DETERMINATION ON THE SUITABILITY OF PROPOSED MAINTENANCE DREDGED MATERIAL FROM WEYERHAEUSER, BAY CITY, ABERDEEN, WASHINGTON MAINTENANCE DREDGING PROJECT (NWS-2007-1065-SO) IN GRAYS HARBOR COUNTY EVALUATED UNDER SECTION 404 OF THE CLEAN WATER ACT FOR OPEN-WATER DISPOSAL AT A DMMP ESTUARINE DISPERSIVE DISPOSAL SITE.

1. The following summary reflects the consensus determination of 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) on the suitability of 20,000 cy of maintenance dredging material from the Bay City Weyerhaeuser dredging area for open-water unconfined disposal at either the Point Chehalis or South Jetty estuarine disposal sites at the mouth of Grays Harbor, Washington.

Table 1. Project Details

SAP received	August 3, 2007
Revised SAP received	March 24, 2008
SAP approved	April 11, 2008
Sampling dates	April 25, 2008
Final data report submitted	August 18, 2008
Recency Determination: Moderate Concern (5 years)	April 2013
DAIS reference number	WBCGH--1-A-F-257

2. Background. The 20,000 cubic yards of maintenance dredging proposed will restore the navigation depths to -38 ft MLLW (+ 2 feet of allowable overdepth) at the Weyerhaeuser Bay City Log Yard. The dredged material was previously characterized in 1992, 1993, and 1999, and found suitable for unconfined-open-water disposal. Previous testing also included evaluation of dioxins/furans, as well as the PSDDA/DMMP Chemical of Concern list.

3. Sampling. The revised Sampling and Plan was received on March 24, 2008, and approved by the DMMP agencies on April 11, 2008. Sampling was initiated and completed on April 25, 2008 at 4 stations (see Figure 1: vicinity map and Figure 2: plan view of sampling locations, Figure 3: Disposal site locations) with a Petite Ponar Grab sampler, and composited for a single dredged material management unit (DMMU) analysis (C1). The approved sampling and analysis plan was generally followed. The sampling and analysis characterization report was submitted to the DMMP agencies for review on August 18, 2008, and the DMMP agencies concluded that the quality assurance/quality control guidelines specified by the DMMP were generally complied with, and these data were deemed suitable for decision-making using best-professional-judgment.

4. Chemical Analysis and Comparison with DMMP Marine and SMS Marine Guidelines. The Agencies' approved sampling and analysis plan was followed and quality assurance/quality control guidelines specified by PSEP and DMMP were generally complied with. A summary of chemical analysis results for all COC except dioxins/furans is provided in Table 2, and demonstrates that for the single DMMU analyzed, there were no detected or undetected chemicals exceeding either DMMP-Marine or SMS-Marine guidelines. Table 3 and Figure 4 provides the results of dioxin/furan testing compared to previous testing history, and demonstrate dioxin/furan concentrations in the lower ranges of those observed during previous testing, with a total PCDD/F TEQ concentration of 4.232 pptr (U = ½). Based on these chemical testing results, no toxicity testing is

required. Furthermore, based on these testing results, there is no reason-to-believe that would trigger the requirement to resample and analyze the exposed surface after maintenance dredging has been completed.

5. **Suitability for Unconfined-Open Water Disposal.** Therefore, based on these testing results, all 20,000 cubic yards of maintenance dredged material is suitable for unconfined-open-water disposal at either dispersive estuarine disposal site at the mouth of Grays Harbor (e.g., Point Chehalis, or South Jetty) based on best-professional-judgment.

6. **Suitability for Beneficial Uses.** Therefore, based on these testing results, all 20,000 cubic yards of maintenance dredged material are suitable for an appropriate beneficial use project.

7. This memorandum affirms the suitability of the sediment proposed for dredging at the Weyerhaeuser Bay City maintenance dredging area for an unconfined-open-water disposal at an appropriate DMMP estuarine dispersive disposal site in Grays Harbor. However, this suitability determination does not constitute final agency approval of the project. A dredging plan for this project must be completed as part of the final project approval process. A final decision will be made after full consideration of agency input, and after an alternatives analysis is done under Section 404(b)(1) of the Clean Water Act.

Concur:

9/11/2008
Date

David R. Kendall, Ph.D., Seattle District Corps of Engineers

9/11/2008
Date

Erika Hoffman, Environmental Protection Agency

9/11/2008
Date

Laura Inouye, Ph.D., Washington Department of Ecology

9/12/08
Date

Courtney Wasson, Washington Department of Natural Resources

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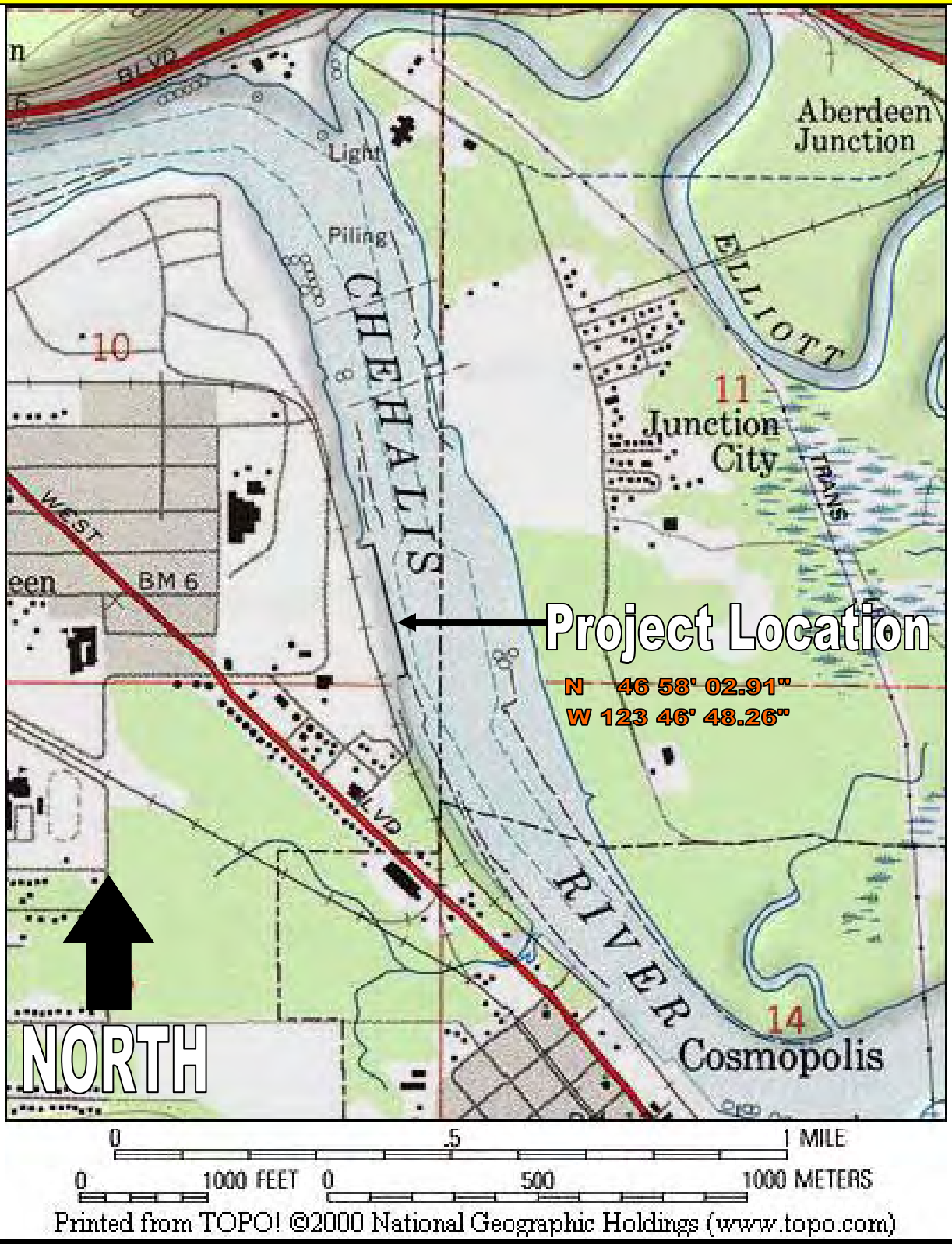
Courtney Wasson, DNR
DMMO file

Vicinity Figure 1 US Geologic Service 7.5 Minute Series (Aberdeen, WA)



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Client: Weyerhaeuser Bay City
Project: Maintenance Dredging
Date: March 17, 2008
USGS 7.5-minute Series (Aberdeen, WA)
Project Location: Grays Harbor County, WA
Corp Ref. No.: NWS-2007-373-SO
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ENVIRONMENTAL SERVICES
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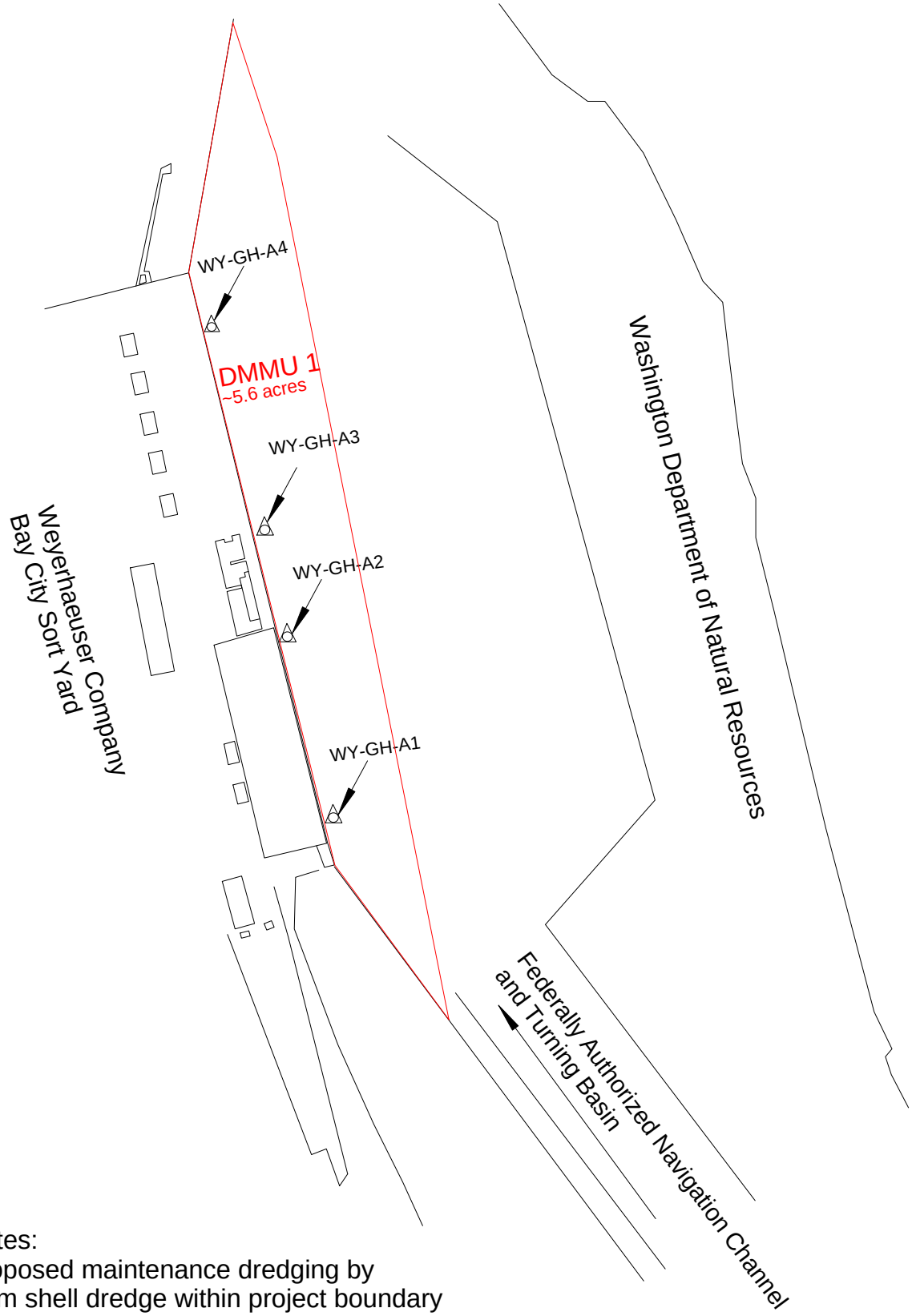
Figure 2.

Plan View DMMU with Sample Points



Notes:
Proposed maintenance dredging by clam shell dredge within project boundary to -38 FT with 2 FT overdepth. Estimated dredging volumes approx. 20,000 cubic yards per year for 10 years.

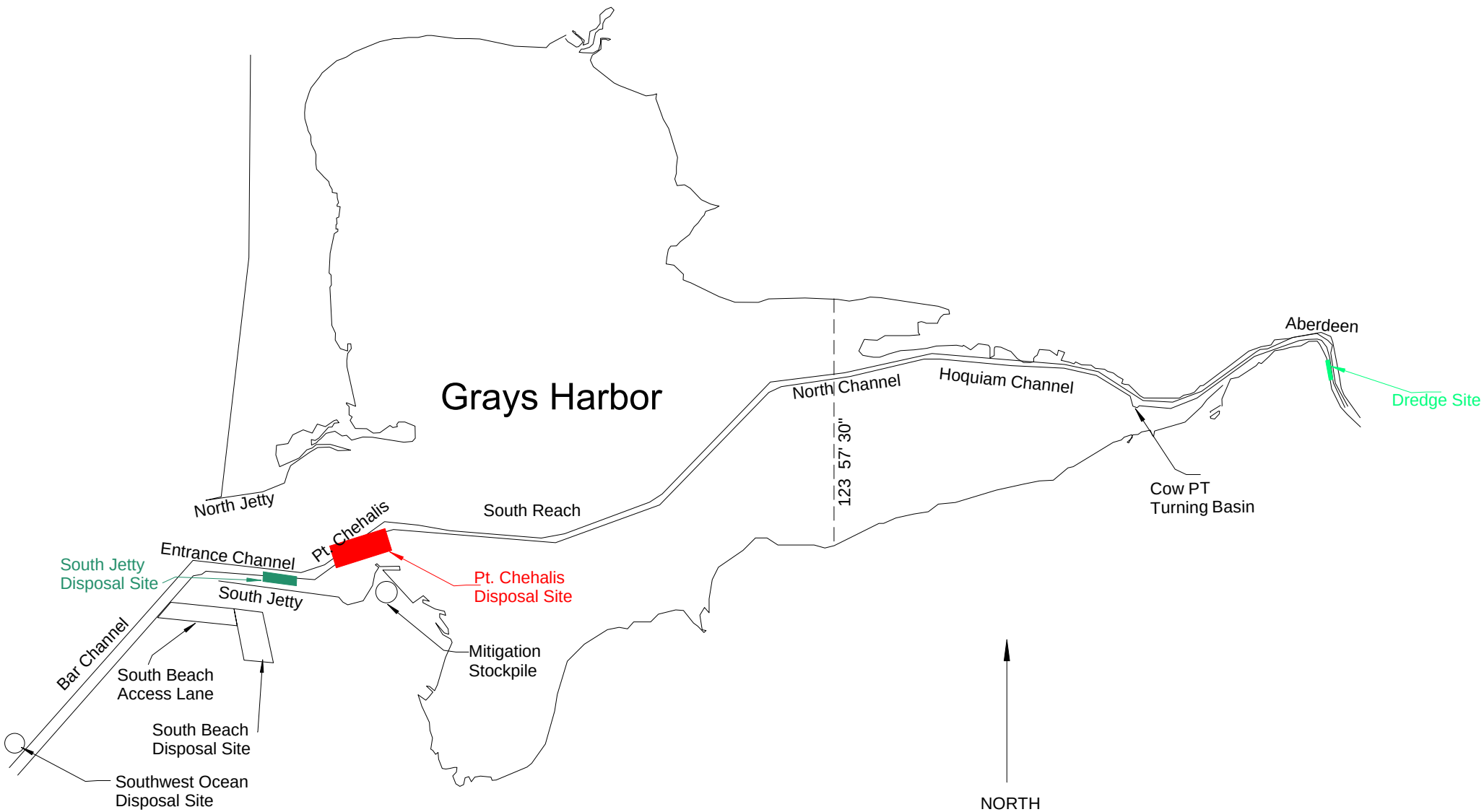
= Sample Point(s)

North

Northern Resource Consulting ENVIRONMENTAL SERVICES 1339 Commerce Ave., Suite 309B Longview, WA 98632 (360) 414-5239	Scale 1" = 270' Corps No. NWS-2007-373-SO	Client: Weyerhaeuser Company Date: 03_17_2008 Location: Chehalis River Greys Harbor, WA Sheet 4 of 8

Figure 3.

Dredge Disposal Location Map



Corps No.
NWS-2007-373-SO

Northern Resource Consulting, Inc. ENVIRONMENTAL SERVICES 1339 Commerce Ave. Suite 309B Longview, WA 98632 360-414-5239	Company: Weyerhaeuser Co. Dwg by: MEC Date: 03_17_2008 Sheet 5 of 8	Note: Waterfront Contractor will dispose of all contaminated sediment in a landfill accepting contaminated materials.	Scale: 1" = 9785'

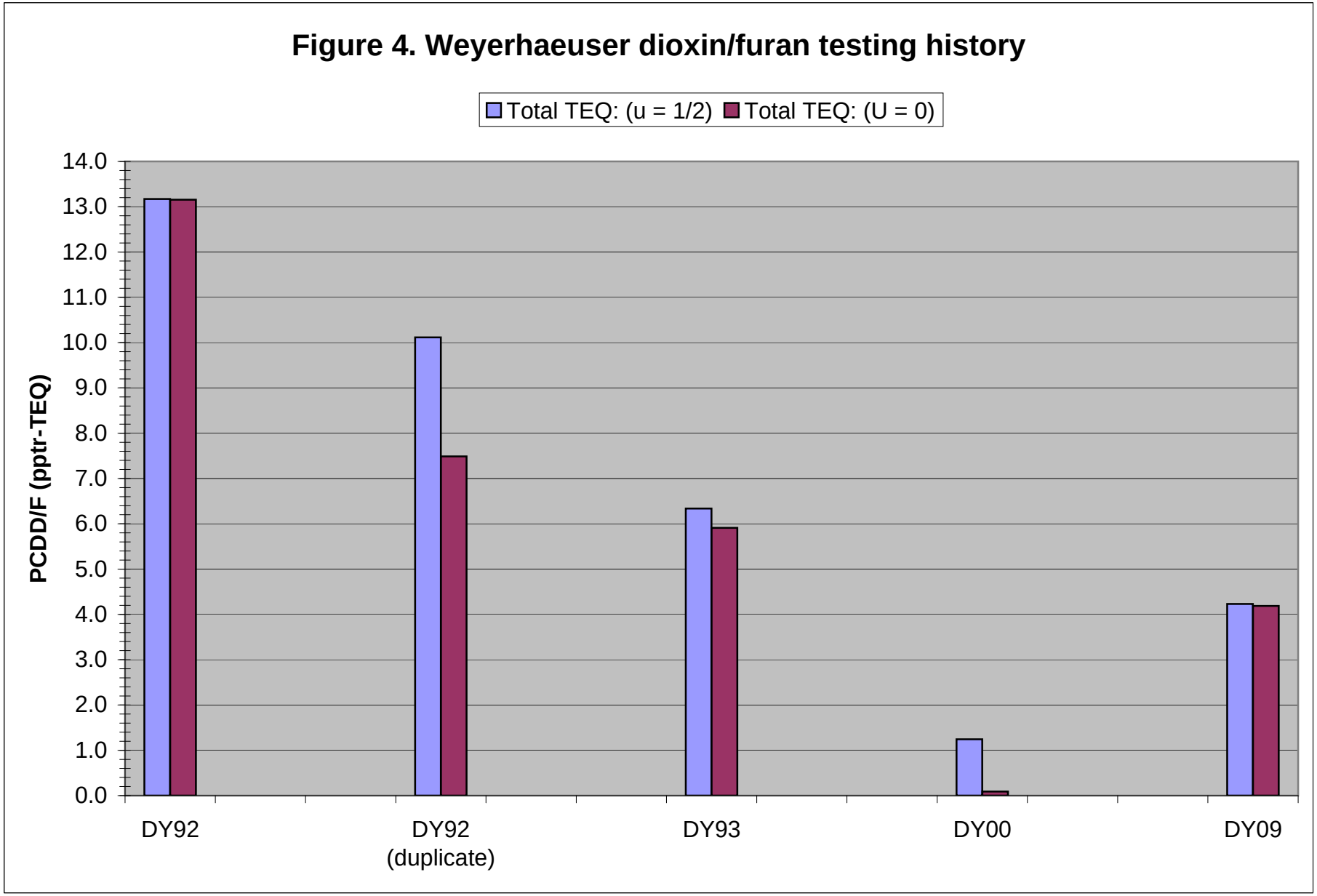


Figure 4. Weyerhaeuser dioxin/furan testing history
Total TEQ: (u = 1/2)
Total TEQ: (U = 0)
PCDD/F (pptr-TEQ)
14.0
13.0
12.0
11.0
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
DY92
DY92 (duplicate)
DY93
DY00
DY09

Table 2. Weyerhaeuser, Bay City, Aberdeen, WA DMMP Testing Summary DMMP/SMS Characterization Summary

								DMMU ID:	DMMU-C1	
	DMMP				SMS			mg/kg-dry wgt	mg/kg-OC	VQ
CHEMICAL NAME	Units	SL	BT	ML	Unita	SQS	CSL	DMMP	SMS	
Antimony		150		200				**0.070**		
Arsenic	mg/kg	57	507.1	700	mg/kg	57	93	**8.2**		
Cadmium	mg/kg	5.1	11.3	14	mg/kg	5.1	6.7	**0.22**		
Chromium	mg/kg	(2)	267	(2)	mg/kg	260	270	**45.2**		
Copper	mg/kg	390	1,027	1,300	mg/kg	390	390	**71.2**		
Lead	mg/kg	450	975	1,200	mg/kg	450	530	**8.99**		
Mercury	mg/kg	0.41	1.5	2.3	mg/kg	0.41	0.59	**0.08**		
Nickel	mg/kg	140	370	370	mg/kg	--	--	**27.3**		n
Selenium	mg/kg	(2)	**3**	(2)	mg/kg	--	--	**0.9**		b
Silver	mg/kg	6.1	6.1	8.4	mg/kg	6.1	6.1	**0.108**		
Zinc	mg/kg	410	2,783	3,800	mg/kg	410	960	**80.2**		
TBT ion (porewater)	ug/L	0.15	0.15		ug/L	0.05	0.35	NA		
Naphthalene	ug/kg	2,100		2,400	mg/kg-OC	99	170	**36.0**	**1.28**	
Acenaphthylene	ug/kg	560		2,000	mg/kg-OC	66	66	**7.4**	**0.26**	j
Acenaphthene	ug/kg	500		2,000	mg/kg-OC	16	57	**22.0**	**0.78**	
Fluorene	ug/kg	540		3,600	mg/kg-OC	23	79	**20.0**	**0.71**	
Phenanthrene	ug/kg	1,500		2,100	mg/kg-OC	100	480	**130.0**	**4.63**	
Anthracene	ug/kg	560		13,000	mg/kg-OC	220	1,200	**12.0**	**0.43**	j
2-Methylnapthalene	ug/kg	670		1,900	mg/kg-OC	38	64	**21.0**	**0.75**	
Total LPAH	ug/kg	5,200		29,000	mg/kg-OC	370	780	**248.4**	**8.84**	
Fluoranthene	ug/kg	1,700	4,600	30,000	mg/kg-OC	160	1,200	**430.0**	**15.3**	
Pyrene	ug/kg	2,600	11,980	16,000	mg/kg-OC	1,000	1,400	**280.0**	**9.96**	
Benzo(a)anthracene	ug/kg	1,300		5,100	mg/kg-OC	110	270	**59.0**	**2.10**	
Chrysene	ug/kg	1,400		21,000	mg/kg-OC	110	460	**87.0**	**3.10**	
Total Benzo(b+k)fluoranthenes	ug/kg	3,200		9,900	mg/kg/OC	230	450	**97.0**	**3.45**	
Benzo(a)pyrene	ug/kg	1,600		3,600	mg/kg-OC	99	210	**31.0**	**1.10**	
Indeno(1,2,3-cd)pyrene	ug/kg	600		4,400	mg/kg-OC	34	88	**17.0**	**0.60**	
Dibenzo(a,h)anthracene	ug/kg	230		1,900	mg/kg-OC	12	33	**4.8**	**0.17**	j
Benzo(g,h,I)perylene	ug/kg	670		3,200	mg/kg-OC	31	78	**12.0**	**0.43**	j
Total HPAH	ug/kg	12,000		69,000	mg/kg-OC	960	5,300	**1,018**	**36.2**	
1,3-Dichlorobenzene	ug/kg	170			mg/kg-OC	2.3	2.3	4.7	0.1	u
1,4-Dichlorobenzene	ug/kg	110		120	mg/kg-OC	3.1	9	4.5	0.1	u
1,2-Dichlorobenzene	ug/kg	35		110	mg/kg-OC	2.3	2.3	4.5	0.1	u
1,2,4-Trichlorobenzene	ug/kg	31		64	mg/kg-OC	0.81	1.8	4.1	0.07	u
Hexachlorobenzne (HCB)	ug/kg	22	168	230	mg/kg-OC	0.38	2.3	1.9	0.03	u
Dimethylphthalate	ug/kg	71		1,400	mg/kg-OC	53	53	1.6	0.03	u
Diethylphthalate	ug/kg	200		1,200	mg/kg-OC	61	110	**6.4**	**0.2**	j
Di-n-butylphthalate	ug/kg	1,400		5,100	mg/kg-OC	220	1,700	**13.0**	**0.5**	j
Butylbenzylphthalate	ug/kg	63		970	mg/kg-OC	4.9	64	**5.4**	**0.2**	j
Bis(2-ethylhexyl)phthalate	ug/kg	1,300		8,300	mg/kg-OC	47	78	**33.0**	**1.2**	j
Di-n-octylphthalate	ug/kg	6,200		6,200	mg/kg-OC	58	4,500	2.7	0.05	u
Phenol	ug/kg	420		1,200	ug/kg	420	1,200	**18.0**	**0.6**	j
2-Methylphenol	ug/kg	63		77	ug/kg	63	63	2.4		u
4-Methylphenol	ug/kg	670		3,600	ug/kg	670	670	**6.1**		j
2,4-Dimethylphenol	ug/kg	29		210	ug/kg	29	29	8.6		u
Pentachlorophenol	ug/kg	400		690	ug/kg	360	690	31.0		u
Benzyl alcohol	ug/kg	57		87	ug/kg	57	73	**22.0**		j
Benzoic acid	ug/kg	650		760	ug/kg	650	650	**190.0**		j
Dibenzofuran	ug/kg	540		1,700	mg/kg-OC	15	58	**14.0**	**0.50**	j
Hexachloroethane	ug/kg	600		1,600	mg/kg-OC			4.8		u
Hexachlorobutadiene	ug/kg	29		270	mg/kg-OC	3.9	6.2	3.9	0.07	u
N-Nitrosodiphenylamine	ug/kg	280		130	mg/kg-OC	11	11	2.5	0.04	u
Trichloroethene	ug/kg	160		1,600	ug/kg	--	--	NA		
Tetrachloroethene	ug/kg	57		210	ug/kg	--	--	NA		
Ethylbenzene	ug/kg	10		50	ug/kg	--	--	NA		
Total Zylene (sum of o-,m-,p-)	ug/kg	40		160	ug/kg	--	--	NA		
4,4'-DDE	ug/kg							0.65		u
4,4'-DDD	ug/kg							0.15		u
4,4'-DDT	ug/kg							0.31		u
Total DDT (sum of 4,4'-DDD, 4,4'-DDE and 4,4'-DDT)	ug/kg	6.9	50	69		--	--	0.65		u
Aldrin	ug/kg	10				--	--	0.19		u

Table 2. Weyerhaeuser, Bay City, Aberdeen, WA DMMP Testing Summary DMMP/SMS Characterization Summary

								DMMU ID:	DMMU-C1	
	DMMP				SMS			mg/kg-dry wgt	mg/kg-OC	VQ
CHEMICAL NAME	Units	SL	BT	ML	Unita	SQS	CSL	DMMP	SMS	
Chlordane	ug/kg	10	37			--	--	10.0		u
Dieldrin	ug/kg	10				--	--	0.4		u
Heptachlor	ug/kg	10				--	--	0.74		u
Alpha-BHC	ug/kg		10			--	--	0.29		u
Gamma-BHC (Lindane)	ug/kg	10				--	--	1.30		u
Aroclor 1016	ug/kg							3.7		u
Aroclor 1221	ug/kg							2.1		u
Aroclor 1232	ug/kg							2.6		u
Aroclor 1242	ug/kg							2.1		u
Aroclor 1248	ug/kg							2.2		u
Aroclor 1254	ug/kg							2.1		u
Aroclor 1260	ug/kg							2.1		u
Total PCBs	ug/kg	130	38***	3,100.0	mg/kg-OC	12	65	3.7		u
Total Solids	%							**32.3**		
Total Volatile Solids	%							**10.6**		
Total Organic Carbon	%							**2.81**		
Total Ammonia	mg/kg							**48.5**		
Total Sulfides	mg/kg							**15.0**		
Gravel	%							**0.03**		
Sand	%							**8.5**		
Silt	%							**58.5**		
Clay	%							**23.2**		
Fines (percent silt + clay)	%							**81.2**		
Bioassay Determination: (P/F)								**NA**		
BTs exceeded:								**no**		
Bioaccumulation conducted:								**no**		
ML Rule exceeded:								**no**		
PSDDA Determination:								**PASS**		
DMMU Volume:	cy							**20,000**		
Rank								**LM**		
Mean Grab sampling depth	ft							**0.3**		
Maximum sampling depth (mudline) (no Z-sample)	ft							**0.3**		
DMMU ID: (4 grabs composited)								**DMMU-C1**		

Legend:

SL = Screening Level exceedance
BT = Bioaccumulation Trigger exceedance
P = Pass (Suitable for UCOWD)
F(B) = Failure (UCOWD Unsuitable wo biological testing)
SQS = Sediment Quality Standards exceedance (SMS)
CSL = Cleanup Screening Level exceedance (SMS)

VQ = Validation Qualifier
UCOWD = Unconfined open-water disposal
u = undetected at the reported concentration
j = Estimated Concentration (< reporting limit)
n = The matrix spike recovery is not within control limits

Table 3. Weyerhaueser dioxin/furan testing history summary

Analyte	WHO (05) TEF	DY92 C1 ng/kg-dw	DY92 C1 LQ	DY92 C1 TEQ	DY92 (duplicate) C1 (dup) ng/kg-dw	DY92 (duplicate) C1 (dup) LQ	DY92 (duplicate) C1 (dup) TEQ	DY93 C1 ng/kg-dw	DY93 C1 LQ	DY93 C1 TEQ	DY00 C1 ng/kg-dw	DY00 C1 LQ	DY00 C1 TEQ	DY09 C1 ng/kg-dw	DY09 C1 LQ	DY09 C1 TEQ
2,3,7,8-TCDD	1	3.7		3.7	3.5		3.5	0.25	u	0.125	0.64	u	0.32	1.04	jk	1.04
1,2,3,7,8-PeCDD	1	4.1		4.1	4	u	2	0.41	u	0.205	0.99	u	0.495	1.29	jk	1.29
1,2,3,4,7,8-HxCDD	0.1	1.8		0.18	1.8	u	0.09	0.39	u	0.0195	0.47	u	0.0235	0.488	jk	0.0488
1,2,3,6,7,8-HxCDD	0.1	6.1		0.61	5.8	u	0.29	9.16	j	0.916	0.98	u	0.049	3.02	j	0.302
1,2,3,7,8,9-HxCDD	0.1	16		1.6	15.4		1.54	5.89		0.589	0.52	u	0.026	3.65	j	0.365
1,2,3,4,6,7,8-HpCDD	0.01	125		1.25	118		1.18	309		3.09	8.5	j	0.085	65.3		0.653
OCDD	0.0003	935		0.2805	917		0.2751	1533		0.4599	17	j	0.0051	607	b	0.1821
2,3,4,7,8-PeCDF	0.3	0.77		0.231	0.85	u	0.1275	0.25	u	0.0375	0.61	u	0.0915	0.127	u	0.01905
2.3.7.8-TCDF	0.1	4.9		0.49	5.2		0.52	2.62		0.262	0.44		0.044	0.299	u	0.01495
1,2,3,4,7,8-HxCDF	0.1	2.2		0.22	2		0.2	1.23	j	0.123	0.34	u	0.017	1.11	j	0.111
1,2,3,6,7,8-HxCDF	0.1	0.73		0.073	0.78		0.078	0.15	u	0.0075	0.29	u	0.0145	0.462	j	0.0462
2,3,4,6,7,8-HxCDF	0.1	1.9		0.19	1.8	u	0.09	0.22	u	0.011	0.65	u	0.0325	0.588	j	0.0588
1,2,3,7,8,9-HxCDF	0.1	0.3	u	0.015	0.3	u	0.015	0.27	u	0.0135	0.47	u	0.0235	0.177	u	0.00885
1,2,3,7,8-PeCDF	0.03	0.6		0.018	0.58	u	0.0087	0.28	u	0.0042	0.63	u	0.00945	0.127	u	0.001905
1,2,3,4,6,7,8-HpCDF	0.01	18.7		0.187	18.3		0.183	46		0.46	1	u	0.005	8.33	j	0.0833
1,2,3,4,7,8,9-HpCDF	0.01	1.1		0.011	1	u	0.005	0.29	u	0.00145	0.47	u	0.00235	0.235	u	0.001175
OCDF	0.0003	45.2		0.01356	42.3		0.01269	38.4		0.01152	3.6		0.00108	19.4	j	0.00582
Total TEQ: (u = 1/2)				13.169			10.115			6.336			1.244			4.232
Total TEQ: (U = 0)				13.154			7.489			5.911			0.091			4.186
Total TOC, %:				3.1, 3.1, 3.6						3.1			2.7			2.86, 2.75, 2.81
TOC Average, %:				**3.27**												**2.81**