23.10.5 v.2
2/22/03

Compliance Monitoring Water Quality Summary

Thea Foss & Wheeler-Osgood Waterways Remediation 2002 Construction Project

Work Order DC 2001 / Specification No. G-250-2

Prepared for the City of Tacoma
Public Works Department

PREPARED BY:
LLOYD & ASSOCIATES, INC.

FEBRUARY 22, 2003

USEPA SF
1272050

Water Quality Monitoring
Daily / Weekly Report Checklist

Date	Daily Report	Weekly Report	Site(s) Monitored	Cover Letter	Data Table	Lab Data (TSS)	Field Notes	Comments
12/12/02	x		Martinac	x	x	x	x	
12/13/02	x		St. Paul Waterway	x	x	x	x	
12/14/02	x		St. Paul Waterway	x	x	x	x	
12/15/02	x		St. Paul Waterway	x	x	x	x	
12/16/02	x		St. Paul Waterway	x	x	x	x	
12/17/02	x		St. Paul Waterway	x	x	x	x	
12/18/02	x		St. Paul Waterway	x	x	x	x	
12/22/02		x	Martinac for 12/12/02 and St. Paul Waterway for 12/13/02 through 12/18/02	x				
12/27/02	x		Totem Marine	x	x	x	x	
12/28/02	x		Totem Marine	x	x	x	x	
12/29/02	x		Totem Marine	x	x	x	x	
12/30/02		x	Totem Marine for 12/27/02 through 12/29/02	x				
01/02/03	x		Totem Marine	x	x	x	x	
01/03/03	x		Totem Marine	x	x	x	x	
01/05/03	x		Totem Marine	x	x	x	x	
01/06/03		x	Totem Marine for 1/02/03 through 1/05/02	x				
01/06/03	x		Totem Marine	x	x	NA	x	
01/07/03	x		Totem Marine	x	x	x	x	
01/09/03	x		Totem Marine	x	x	x	x	
01/10/03	x		Totem Marine	x	x	x	x	
01/11/03	x		Wheeler-Osgood	x	x	x	x	
01/12/03	x		Wheeler-Osgood	x	x	x	x	
01/13/03		x	Totem Marine for 1/06/03 through 1/10/02 and Wheeler-Osgood for 1/11/03 and 1/12/03	x				
01/14/03	x		Wheeler-Osgood and Totem Marine	x	x	x	x	
01/15/03	x		Wheeler-Osgood and Totem Marine	x	x	x	x	
01/16/03	x		Wheeler-Osgood and Totem Marine	x	x	x	x	
01/17/03	x		Wheeler-Osgood and Totem Marine	x	x	x	x	

Water Quality Monitoring
Daily / Weekly Report Checklist

Date	Daily Report	Weekly Report	Site(s) Monitored	Cover Letter	Data Table	Lab Data (TSS)	Field Notes	Comments
01/18/03	x		Wheeler-Osgood and Totem Marine	x	x	x	x	
01/19/03	x		Wheeler-Osgood and Totem Marine	x	x	x	x	
01/20/03		x	Wheeler-Osgood for 1/14/03 through 1/19/03 and Totem Marine for 1/14/03 through 1/19/03	x				
01/20/03	x		Totem Marine	x	x	x	x	
01/21/03	x		Wheeler-Osgood and Totem Marine	x	x	x	x	
01/22/03	x		Wheeler-Osgood and Totem Marine	x	x	x	x	
01/23/03	x		Wheeler-Osgood and Totem Marine	x	x	x	x	
01/24/03	x		Wheeler-Osgood and Totem Marine	x	x	x	x	
01/25/03	x		Totem Marine and Thea's Park	x	x	x	x	
01/26/03	x		Thea's Park	x	x	x	x	
01/27/03		x	Totem Marine for 1/20/03 through 1/25/03, Wheeler-Osgood for 1/21/03 through 1/24/03, and Thea's Park for 1/25/03 and 1/26/03.	x				
01/27/03	x		Totem Marine and Thea's Park	x	x	x	x	
01/28/03	x		Thea's Park	x	x	x	x	
01/29/03	x		Thea's Park	x	x	x	x	
01/30/03	x		Totem Marine and Thea's Park	x	x	x	x	
01/31/03	x		Thea's Park	x	x	x	x	
02/01/03	x		Thea's Park	x	x	x	x	
02/02/02	x		Thea's Park	x	x	x	x	
02/03/03		x	Totem Marine for 1/20/03 through 1/25/03 and 1/27/03; Wheeler-Osgood for 1/21/03 through 1/24/03; and Thea's Park for 1/25/03 through 1/28/03	x				
02/03/03	x		Thea's Park	x	x	x	x	
02/04/03	x		Thea's Park	x	x	x	x	
02/05/03	x		Thea's Park	x	x	x	x	
02/06/03	x		Thea's Park	x	x	x	x	
02/07/03	x		Thea's Park	x	x	x	x	

Water Quality Monitoring
Daily / Weekly Report Checklist

Date	Daily Report	Weekly Report	Site(s) Monitored	Cover Letter	Data Table	Lab Data (TSS)	Field Notes	Comments
02/04/03		x	Thea's Park for 1/29/03 through 2/4/03	x				
02/08/03	x		Thea's Park	x	x	x	x	
02/09/03	x		Thea's Park	x	x	NA	x	
02/10/03	x		Thea's Park	x	x	NA	x	
02/11/03	x		Thea's Park	x	x	NA	x	
02/12/03	x		Thea's Park	x	x	NA	x	
02/13/03	x		Thea's Park	x	x	NA	x	
02/14/03	x		Thea's Park	x	x	NA	x	

HURLEN CONSTRUCTION COMPANY
Contractor Reg. Number 223-01 HU-RL-EC*307BS
P.O. Box 80945
700 South Riverside Drive
Seattle, Washington 98108
(206) 763-1230
FAX (206) 762-1854
Phone 763-1230

LETTER OF TRANSMITTAL

DATE 2/26/03
JOB NO. 02-079
ATTENTION
RE: THEA FOSS

FEB 26 2003
RECEIVED

TO KPFF FOR
CITY OF TACOMA

GENTLEMEN:

WE ARE SENDING YOU ☒ Attached ☐ Under separate cover via _____ the following items:

☐ Shop drawings ☐ Prints ☐ Plans ☐ Samples ☐ Specifications
☐ Copy of letter ☐ Change order ☐ _____

COPIES	DATE	NO.	DESCRIPTION
1			CAPPING REPORT FOR TOTEM
2	2/22/03		COMPLIANCE WATER QUALITY MONITORING SUMMARY

THESE ARE TRANSMITTED as checked below:

☐ For approval ☐ Approved as submitted ☐ Resubmit _____ copies for approval
☒ For your use ☐ Approved as noted ☐ Submit _____ copies for distribution
☐ As requested ☐ Returned for corrections ☐ Return _____ corrected prints
☐ For review and comment ☐ _____
☐ FOR BIDS DUE _____ 19 _____ ☐ PRINTS RETURNED AFTER LOAN TO US

REMARKS _____

COPY TO _____

SIGNED:

Lloyd & Associates, Inc.
38210 SE 92nd Street, Snoqualmie, Washington 98065 425-888-1905(v/f) rml@centurytel.net

February 24, 2003

TRANSMITTAL

To: O'Loughlin/Wingard

From: Michael Lloyd

Subject: Compliance Water Quality Monitoring Summary

Please find enclosed two copies of the Compliance Water Quality Monitoring Summary. This complaince summary is organized chronologically. If you have any questions or require additional information, please call me at 425-888-1905.

Lloyd & Associates, Inc.
38210 SE 92nd Street, Snoqualmie, Washington 98065 425-888-1905(v/f) rml@centurytel.net

March 28, 2003

TRANSMITTAL

To: John O'loughlin
Iain Wingard

From: Michael Lloyd

Additional information, reports, etc. requested to complete Summary report

RE: Project Closeout on Water Quality Monitoring

Enclosed please find the following documents and requested information:

Ambient TSS Laboratory Reports (Compliance TSS reports submitted 3/27/03)
Weekly Water Quality Reports for the following:
- 12/22/02
- 12/29/02
- 1/6/03
- 1/13/03
- 1/20/03
- 1/27/03
- 2/3/03 (essentially a data transmittal of updated daily reports)
- 2/10/03 (incorrectly dated, prepared 2/8 and submitted 2/9/03)
- 2/17/03 (weekly report, submitted as compilation report 2/24/03)

Missing Logbook Pages for 12/27/02 (pages 5 & 6)
Daily Report for 1/6/03
TSS Data Sheet for 1/7/03 Daily Report
Missing Logbook Pages for 1/19/03

Lloyd & Associates, Inc.
38210 SE 92nd Street, Snoqualmie, Washington 98065 425-888-1905

December 22, 2002

TRANSMITTAL

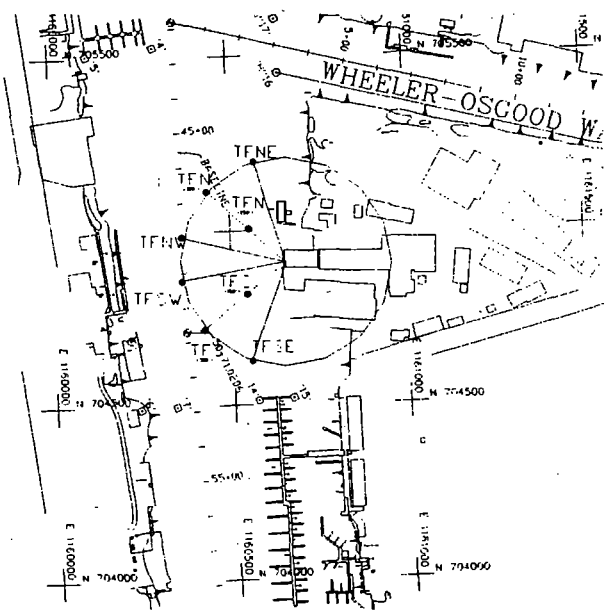
To: Iain Wingard
John O'Loughlin

Subject: Martinac Complaince Monitoring 12/12/02
Data Transmittal

Attached please find results from complaince monitoring for pile removal on the St. Paul Waterway on the evening of 12/12/02 during toe berm installation at night. This revised submittal includes TSS results. Data was collected with the YSI Sonde. The weather was cool and rainy. The sampling rose also includes proposed sample points in the event that the activity would have carried over to an Ebb tide. No fish kills or distress was observed at any time. No oil sheen was observed.

WATER QUALITY WAS ACCEPTABLE DURING THIS COMPLIANCE MONITORING EVENT.

Sampling points and locations are shown in the



Dissolved Oxygen
Up Current = 5.7 mg/L
Down Current average = 5.7 mg/L

Turbidity
Up Current = 2.7 NTU
Down Current average = 2.7 NTU

Temperature
Up Current = 10.4 ^{0}C
Down Current average = 10.4 ^{0}C

REPRINTED 2/4/03

Michael Lloyd/Date
Environmental Section

- Martinac 12 12 02.doc

Construction Compliance Monitoring

12/12 **Location:** **Martinac**

Station	Depth (ft)	Salinity (ppt)	DO (mg/L)	DO (No Sal)*	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Tidal/Comment
Station TFSE/TOP (down)	2	28.5	5.8		4.9	10.4		5,233,037	542,957	2355	300' Compliance
Middle	13	31.0	5.6	6.8	1.2	10.4	3			2350	
Deep	20	31.0	5.6		1.30	10.4				2345	
Average		30.2	5.7		2.5	10.4					DTB =2'
Station TFS/TOP(down)	2	28.1	5.8		4.7	10.3		5,233,094	542,952	2335	150' sample
Middle	11	30.9	5.5	6.8	2.2	10.4	3			2330	
Deep	20	31.0	5.9		1.8	10.4				2325	
Average		30.0	5.7		2.9	10.4					DTB =23'
Station TFSW/TOP (down)	2	27.0	6		5.4	10.3		5,233,106	542,895	2320	300' Compliance
Mid	12	30.9	5.5	6.8	1.8	10.4	2			2315	
Deep	20	30.9	5.5		1.5	10.4				2310	
Average		29.6	5.7		2.9	10.4					DTB =24'
Station TFN/TOP (up)	2	27.3	5.8		6.0	10.3		5,233,184	542,916	0010	Flood Tide
Mid	14	30.9	5.5	6.7	1.0	10.4	4			0005	UpCurrent Sample
Deep	25	31.0	5.7		1.0	10.4				2400	
Upcurrent Average		29.7	5.7		2.7	10.4					DTB =25'
Down-Current Avg.		29.9	5.7		2.7	10.4					
Station 2+00 TOP	2	30.5	6.1		1.5	10.4		5,233,443	542,451	0025	
Middle	22	31.0	5.9	7.9	0.7	10.4	3			0020	
Deep	40	31.0	6.1		2.8	10.4				0015	DTB =43'
Average		30.8	6.0		1.7	10.4					

Pre-Survey Calibration	Steve High 12/12	Calibration Notes:	Weather Co, ndtions: Cool, drizzle, dark
Post-Survey Calibration Check	Steve High 12/12	Calibrated in air/salinity correction	

FD = Field Duplicate

All compliance data collected with YSI Sonde. *No salinity correction for YSI 550 duplicate analyses

Final Submittal	Final Review	
Michael Lloyd 12/22/02	Dan Berta 12/22/02	L&AI

STL Seattle

Client Name	Lloyd & Assoc. Inc.
Project Name	Thea Foss
Date Received	12-13-02

General Chemistry Parameters

Client Sample ID 021212/TSE/M/13/C
Lab ID 110644-01

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	12-17-02	mg/L	3	2

Client Sample ID 021212/TS/M/11/C
Lab ID 110644-02

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	12-17-02	mg/L	3	2

Client Sample ID 021212/TN/M/14/C
Lab ID 110644-03

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	12-17-02	mg/L	4	2

Client Sample ID 021212/TSW/M/12/C
Lab ID 110644-04

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	12-17-02	mg/L	2	2

Client Sample ID 021212/2/M/22/C
Lab ID 110644-05

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	12-17-02	mg/L	3	2

STL Seattle

QUALITY CONTROL REPORT

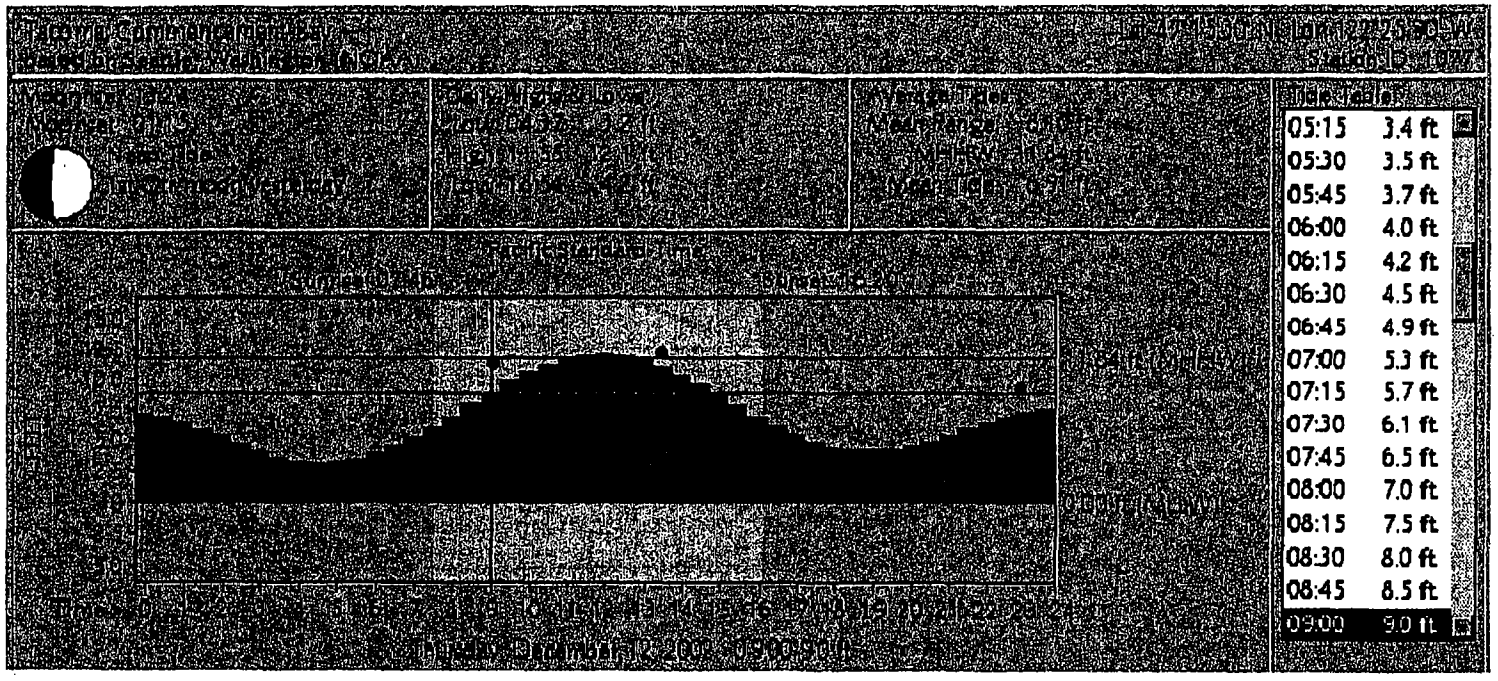
Client Sample ID: Batch QC
Lab ID: 110551-1
QC Batch Number: 1114-132

Method Blank

Parameter	Result (mg/L)	PQL
Total Suspended Solids	ND	2

Duplicate

Parameter	Sample Result (mg/L)	Duplicate Result (mg/L)	RPD (%)	Flag
Total Suspended Solids	14	15	6.9	


Tide Table
05:15 3.4 ft
05:30 3.5 ft
05:45 3.7 ft
06:00 4.0 ft
06:15 4.2 ft
06:30 4.5 ft
06:45 4.9 ft
07:00 5.3 ft
07:15 5.7 ft
07:30 6.1 ft
07:45 6.5 ft
08:00 7.0 ft
08:15 7.5 ft
08:30 8.0 ft
08:45 8.5 ft
09:00 9.0 ft

PROJECT Thea - Data

02/2/12

N / E	t	DTB	Sta	Sample Depth	Event	Sal	T	DO	TSS	Turb
5234827/542985	0900	31	F	D 26	A	31.0	10.4	6.0		1.2
Flood Tide	0905			M 16		31.0	10.4	6.0 D	✓	1.0
	0910			S 2		31.0	10.6	6.2		1.7
5234944/542926	0940	44	N	D 40	A	31.0	10.4	6.4		0.8
	0945			M 22		31.0	10.4	6.2 D	✓	0.8
Dry	0950			S 2		30.8	10.6	6.2		1.1
5234963/542987	1005	34	E	D 30	A	31.0	10.4	6.4		1.0
	1010			M 17		31.0	10.5	6.1	✓	0.8
Rain	1015			S 2		30.9	10.6	6.1		0.8
5234050/542840	1020	48	W	D 45	A	31.0	10.4	6.1		1.2
Rain	1025			M 24		31.1	10.4	6.1	✓	1.5
	1030			S 2		30.9	10.6	6.1		1.1
SP 7400 Ambient	1035	38	Amb	D 35	A	31.0	10.4	6.2		1.1
Rain	1040			M 19		31.0	10.4	6.1	✓	1.5
	1045			S 2		30.9	10.6	6.1		1.0
Thea 2400 Amb	1050	49	Amb	D 45	A	31.1	10.4	6.4		0.6
	1055			M 24		31.0	10.4	6.1	✓	0.5
	1100			S 2		29.9	10.4	6.1		2.7
	~~1105~~									
Thea 30400 Amb	1110	42	Amb	D 37		31.1	10.4	6.2		3.0
	1115			M 21		31.1	10.4	6.1 (5.0) 6.2	✓	0.9
	1120			S 2		30.2	10.4	5.9		1.3
Thea 60400 Amb	1135	34	Amb	D 30		31.1	10.4	5.9		1.8
	1140			M 17		31.0	10.4	5.3	✓D	1.6
	1145			S 2		30.9	10.4	5.7		0.9
Thea 30400 Ba	1310			D 45	B	31.1	10.4	6.0		0.5
	1315			M 25		31.0	10.4	6.0		0.6
	1320			L 2		31.0	10.4	6.0		0.8

Continued on Page

Read and Understood By

Signed: [illegible] Date: 12/12 Signed: [illegible] Date: 02/2/12

PROJECT

Notebook No.

Continued From Page

[illegible]

Cal [illegible] = 19.2 mtr
(was calib. at 20.0 mtr [illegible]
on 02/11/[illegible])
Do by in 0.2 mg
at 0100 hrs
at office.

Continued on Page

Read and Understood By

Signed | Date | Signed | Date

Continued From Page _____

PROJECT _____

02-12-12

Note Dupe 003 W 550 cal to 0 subtract 1 ↓

N	E	t	DTB	Sta	sample depth	Event	Sal	T	DO	TSS	Turb	
~~889~~												
3030	887	1100	24	TSW	D 20	C	30.9	10.4	5.5	—	1.5	
flood		1115			M 12		30.9	10.4	5.5 (D)	✓	1.8	6.8
		1120			S 2		27.0	10.3	6.0	—	5.4	
~~3028.5~~	~~922~~	1125	23	TS	D 20		31.0	10.4	5.9	—	1.8	
3028	933	1130			M 11	C	30.9	10.4	5.5 (D)	✓	2.2	6.8
flood		1135			S 2		28.1	10.3	5.8	—	4.7	
2995	899	1145	25	TSE	D 20	C	31.0	10.4	5.6	—	1.3	
flood		1150			M 13		31.0	10.4	5.6 (D)	✓	1.2	6.8
		1155			S 2		28.5	10.4	5.8	—	4.9	
3116	893	0000	27		D 25	C	31.0	10.4	5.7	—	2.2	
		0005			M 14		30.9	10.4	5.5 (D)	✓	1.0	6.7
		0010			S 2		27.3	10.3	5.8	—	6.0	
5234443	542851	0015	43		D 40		31.0	10.4	6.1	—	2.8	
		0020			M 22	C.	31.0	10.4	6.1 (D)	✓	[illegible]	7.9
		0025			S 2		30.5	10.4	5.95 6.1 (D)	—	0.7 1.5	
											2.8	
											0.7	

Continued on Page _____

Read and Understood By

M Floyd 12/12 — Signed — Date

[illegible] — Signed — Date 02/12/12

Lloyd & Associates, Inc.
38210 SE 92nd Street, Snoqualmie, Washington 98065 425-888-1905

December 22, 2002

TRANSMITTAL

To: Iain Wingard
John O'Loughlin

Subject: Daily Compliance Monitoring/St. Paul Waterway 12/13/02
Final Data Transmittal

Attached please find results from complaince monitoring for pile removal on the St. Paul Waterway on the afternoon of 12/13/02. Data was collected with the YSI Sonde. The weather was cold and wet. Wind from the SW. TSS data has been included into this compliance report

WATER QUALITY WAS ACCEPTABLE DURING THE MORNING AND AFTERNOON COMPLIANCE MONITORING EVENTS.

Sampling points and locations are shown in the sampling figure below.

MORNING SAMPLING EVENT

Dissolved Oxygen
Up Current = 5.9 mg/L
Down Current average = 6.0 mg/L

Turbidity
Upgradient = 0.5 NTU
Down Current average = 0.6 NTU

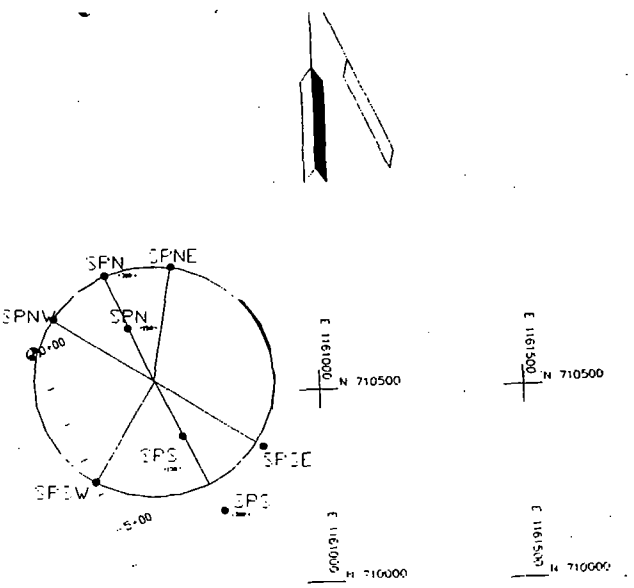
Temperature
Upgradient = 10.5 ^{0}C
Down Current average = 10.5 ^{0}C

AFTERNOON SAMPLING EVENT

Dissolved Oxygen
Up Current = 5.8 mg/L
Down Current average = 5.5 mg/L

Turbidity
Up Current = 1.4 NTU
Down Current average = 0.6 NTU

Temperature
Up Current = 10.5 ^{0}C
Down Current average = 10.6 ^{0}C



REPRINTED 2/4/03

Michael Lloyd/Date
Environmental Section

- St Paul 12 13 02.doc

Construction Compliance Monitoring **Date: 12/13** **Location: St. Paul AM**

Station	Depth (ft)	Salinity (ppt)	DO (mg/L)	DO (FD)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Tidal/Comment
Station SPSE/TOP (down)	2	30.5	6.0		1.2	10.5		5,234,852	542,998	1305	300' Compliance
Middle	18	30.9	6.0		0.2	10.4	5			1300	Sample mislabeled
Deep	32	31.0	6.1		0.50	10.4				1255	
Average		30.8	6.0		0.6	10.4					DTB =36'
Station SPS/TOP(down)	2	30.4	6.0		1.5	10.4		5,234,851	542,979	1250	150' sample
Middle	17	30.9	5.9		0.4	10.4	3			1245	Flood Tide
Deep	30	30.9	6.0		0.5	10.4				1240	
Average		30.7	6.0		0.8	10.4					DTB =34'
Station SPSW/TOP (down)	2	30.2	6.1	6.2	1.2	10.4		5,234,827	542,985	1240	300' Compliance
Mid	14	30.8	6.0		0.2	10.6	3			1235	
Deep	25	30.9	5.9		0.4	10.4				1230	
Average		30.6	6.0		0.6	10.5					DTB =28
Station SPN/TOP (up)	2	30.8	5.9		0.7	10.7		5,234,991	542,899	1320	Flood Tide
Mid	27	31.0	5.9		0.2	10.4	3			1315	Up Current Sample
Deep	50	31.0	6.0		0.5	10.4				1310	
Upcurrent Average		30.9	5.9		0.5	10.5					DTB =54'
Down-Current Average:		30.7	6.0		0.6	10.5					
Station 7+00 TOP	2	30.7	5.9		1.5	10.4		5,234,443	542,451	1335	
Middle	20	31.0	6.0		0.4	10.4	4			1330	
Deep	36	31.0	6.1		0.5	10.4				1325	DTB =41'
Average		30.9	6.0		0.8	10.4					

Pre-Survey Calibration Check	Steve High 12/13	Calibration Notes:	Weather Condtions: Cool, drizzle, cloudy
Post-Survey Calibration Check	Steve High 12/13	Calibrate in air/salinity correction	

FD = Field Duplicate

All data colledected with Sonde.

Final Submittal	Final Review	
Michael Lloyd 12/22/02	Dan Berta 12/22/02	L&AI

Construction Compliance Monitoring

Date: 12/13 **Location:** St. Paul PM

Station	Depth (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Tidal/Comment
Station SPNE/TOP (down)	2	30.5	5.6	1.5	10.6		5,234,972	542,985	1640	300' Compliance
Middle	14	30.9	5.5	0.5	10.6	3			1635	Ebb Tide
Deep	22	30.9	5.4	0.6	10.5				1630	
Average		30.8	5.5	0.9	10.6					DTB =27'
Station SPN/TOP(down)	2	30.7	5.6	0.5	10.7		5,234,951	542,970	1615	150' sample
Middle	19	30.8	5.5	0.5	10.6	5			1610	
Deep	32	31.1	5.7	2.1	10.4				1605	
Average		30.9	5.6	1.0	10.6					DTB =37
Station SPNW/TOP (down)	2	30.8	5.5	0.5	10.7		5,235,622	542,913	1700	300' Compliance
Mid	20	30.9	5.5	0.2	10.6	3			1655	
Deep	36	31.1	5.7	0.4	10.4				1650	
Average		30.9	5.6	0.4	10.6					DTB =41
Station SPS/TOP (up)	2	30.6	5.6	2.9	10.5		5,234,823	543,023	1550	Ebb Tide
Mid	16	30.8	5.6	0.2	10.6	4			1545	Up Current Sample
Deep	27	31.0	6.1	1.1	10.4				1540	
Upcurrent Average		30.8	5.8	1.4	10.5					DTB =32
Down-Current Avg.		30.9	5.5	0.6	10.6					
Station 7+00 TOP	2	30.5	5.6	4.7	10.6		5,234,915	542,972	1530	
Middle	19	30.8	5.6	0.5	10.6				1525	
Deep	32	30.9	5.7	0.5	10.4				1520	DTB =37'
Average		30.7	5.6	1.9	10.5					

Pre-Survey Calibration Check	Steve High 12/13	Calibration Notes: Calibrate in air/salinity correction	Weather Condtions: Cool, cloudy, rain all afternoon
Post-Survey Calibration Check	Steve High 12/13		

All data colledected with Sonde.

Final Submittal	Final Review	
Michael Lloyd 12/22/02	Dan Berta 12/22/02	L&AI

12/13/02

STL Seattle

Client Name	Lloyd & Assoc. Inc.
Project Name	Thea Foss
Date Received	12-16-02

General Chemistry Parameters

Client Sample ID 021213/SPSW/M/A
Lab ID 110686-01

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	12-18-02	mg/L	3	2

Client Sample ID 021213/SPS/M/A
Lab ID 110686-02

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	12-18-02	mg/L	3	2

Client Sample ID 021213/SPSE/M/A
Lab ID 110686-03

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	12-18-02	mg/L	5	2

Client Sample ID 021213/SPN/M/A
Lab ID 110686-04

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	12-18-02	mg/L	3	2

Client Sample ID 021213/SP7/M/A
Lab ID 110686-05

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	12-18-02	mg/L	5	2

STL Seattle

Client Sample ID	021213/T2/M/A
Lab ID	110686-06

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	12-18-02	mg/L	4	2

Client Sample ID	021213/~~SP2~~/M/B SD7
Lab ID	110686-07

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	12-18-02	mg/L	4	2

Client Sample ID	021213/SPS/M/B
Lab ID	110686-08

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	12-18-02	mg/L	3	2

Client Sample ID	021213/SPN/M/B
Lab ID	110686-09

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	12-18-02	mg/L	3	2

Client Sample ID	021213/SPSW/M/B
Lab ID	110686-10

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	12-18-02	mg/L	3	2

Client Sample ID	021213/SPNW/M/B
Lab ID	110686-11

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	12-18-02	mg/L	5	2

STL Seattle

QUALITY CONTROL REPORT

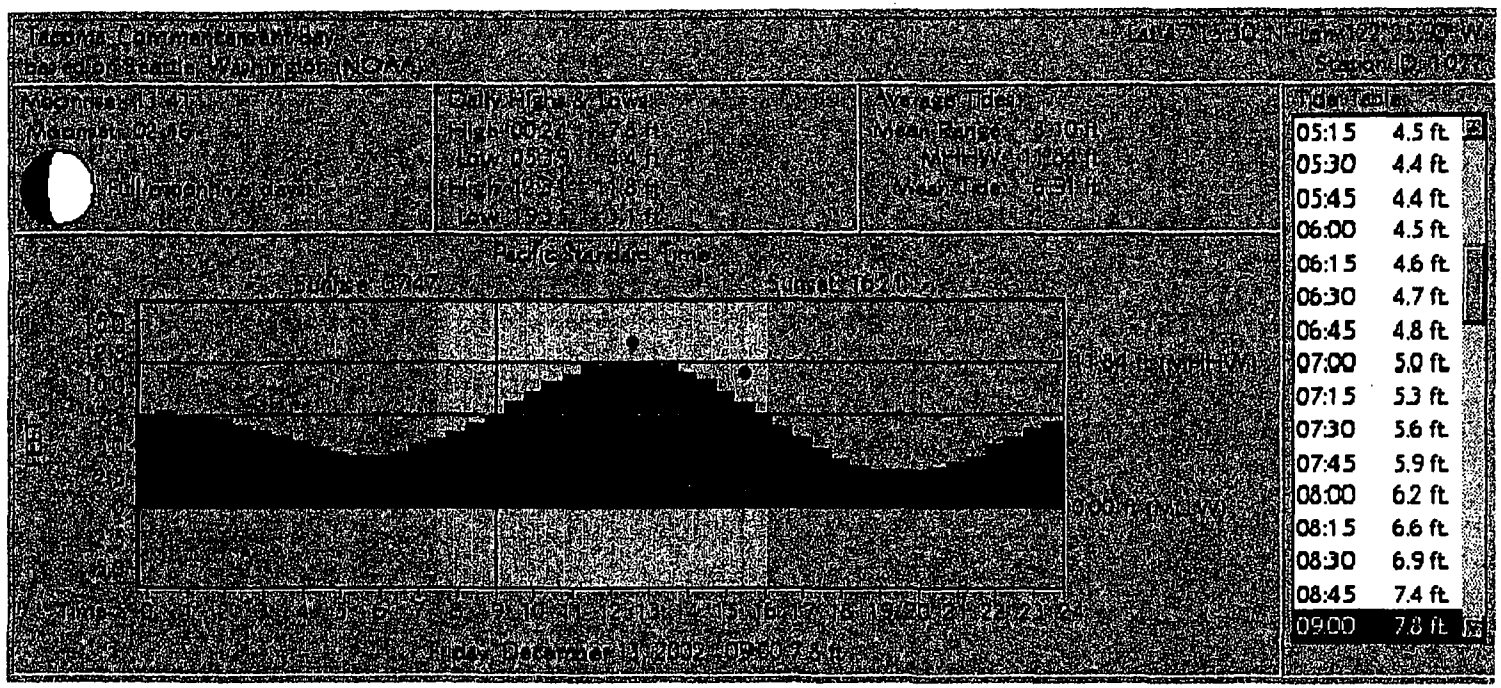
Client Sample ID: 021213/SP7/M/A
Lab ID: 110686-05
QC Batch Number: 1114-134

Method Blank

Parameter	Result (mg/L)	PQL
Total Suspended Solids	ND	2

Duplicate

Parameter	Sample Result (mg/L)	Duplicate Result (mg/L)	RPD (%)	Flag
Total Suspended Solids	2.45	3.29	29	X4a


Tacoma Commencement Bay
based on Seattle, Washington (NOAA)
Daily Highs & Lows
Average Tides
Pacific Standard Time
Tide Table
05:15 4.5 ft.
05:30 4.4 ft.
05:45 4.4 ft.
06:00 4.5 ft.
06:15 4.6 ft.
06:30 4.7 ft.
06:45 4.8 ft.
07:00 5.0 ft.
07:15 5.3 ft.
07:30 5.6 ft.
07:45 5.9 ft.
08:00 6.2 ft.
08:15 6.6 ft.
08:30 6.9 ft.
08:45 7.4 ft.
09:00 7.8 ft.

ECT Thea

Notebook No. _____

Continued From Page _____

021213

Event (A) Flood

N	E	t	DTD	Sta	Sample Depth	Event	Sal	T	DO	TSS	Turb	Field DO Corr
5234827	542985	1230	28	SPSW	D 25		30.9	10.4	5.9	—	0.4	
	SPSW	1235			M 14	A	30.8	10.6	6.0	✓	0.2	
(5234833)	(542978)	1240			S 2		30.2	10.4	6.1	D3 —	1.2	6.2
	Flood	(1230										
		1235										
		1240)										
5234851	542979	1240	34	SPS	D 30	A	30.9	10.4	6.0	—	0.5	
	Flood	1245			M 17		30.9	10.4	5.9	✓	0.4	
		1250			S 2		30.4	10.4	6.0	—	1.5	
5234852	542998	1255	36	SPSE	D 32	A	31.0	10.4	6.1	—	0.5	
		1300			M 18		30.9	10.4	6.0	✓	0.2	
		1305			S 2		30.5	10.5	6.0	—	1.2	
5234991	542899	1310	54	SPN	D 50	A	31.0	10.4	6.0	—	0.5	
	Slack	1315			M 27		31.0	10.4	5.9	✓	0.2	
		1320			S 2		30.8	10.7	5.9	—	0.7	
5234912	542965	1325	41	SP7	D 36	A	31.0	10.4	6.1	—	0.5	
	Slack	1330			M 20		31.0	10.4	6.0	✓	0.2	
	Ambient	1335			S 2		30.7	10.5	5.9	—	0.7	
					A							
5234[illegible]	542442	1445	47		D 42		30.9	10.4	5.6	—	0.1	
	Ebb Ambient	1450	T7		M 24		30.9	10.5	5.6	—	0.0	
	Rain	1455	Ambient		S 2		30.5	10.5	5.2	—	0.5	
					B							
5234915	542972	1520	37		D 32		30.9	10.4	5.7		0.5	
	Rain Ebb Ambient SP2	1525	Ambient		M 19		30.8	10.6	5.6		0.5	
		1530	SP7		S 2		30.5	10.6	5.6		4.7	
5234823	543023	1540	32		D 27		31.0	10.4	6.1		1.1	
	Ebb Rain	1545	Ebb S		M 16		30.8	10.6	5.6		0.2	
		1550	SPS		S 2		30.6	10.5	5.0		2.9	
5234957	542970	1605	37		D 32		31.1	10.4	5.7		2.1	
	Ebb	1610	SPN		M 19		30.8	10.6	5.5		0.5	
		1615	Rain		S 2		30.7	10.7	5.9		0.5	

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Read and Understood By

[signature] 12/13 [signature] [signature] 021213

Signed Date Signed Date

PROJECT

Continued From Page

Manson Boat People:

Bill Teasdale (Hooker V)

(206) 793-2635

Josh (Bub)

(206) 465- ~~6329~~ (6329)

Meet at

Bill
Teasdale
206-2635
793-

Continued on Page

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OJECT

Notebook No.

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73 75

N	E	DTB	DTB	Depth			
5264903	542994	1620	24	D	20		
		1624		M	12		
		1630		S	2		

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N	E	t	DTB	St.	Sample D	EV	Sal	T	DO	TSS	Turb
5234	592	1630	27	SP NE	D	22	30.9	10.5	5.4	—	0.6
972	985	1635			M	14	30.9	10.6	5.5	✓	0.5
Ebb		1640			S	2	30.5	10.6	5.6	—	1.5
Rain											
5235	542	1650	41	SP SW	D	36	31.1	10.4	5.7	—	0.4
622	913	1655			M	20	30.9	10.6	5.5	✓	0.2
Ebb		1700			S	2	30.8	10.7	5.5	—	0.5
Dry											

021214

Event (A)

Work on piling removal @ St. Panel - use coords from ACAD.

E 542961	N 5234811	t	DTB	St	Sample depth		Sal	T	DO	TSS	Turb
SPSE		1130	14	SPSE	D	10	30.7	10.5	6.8		0.4
(can't set into		1135			M	7	30.6	10.6	6.0	✓	0.5
pilings w/out		1140			S	2	30.2	10.6	5.9		0.6
light rain											
heavy wind											
542025	5234804										
SPSE		1220		SPSE	D	30	30.9	10.4	5.7		0.3
(ditto logs in		1225	35		M	17	30.9	10.4	5.6	✓	0.1
way more East)		1230			S	2	29.5	10.5	5.8		2.0
542873	5234919	1245	50	SPN	D	55	31.0	10.4	5.8		0.1
SPN		1250			M	30	31.0	10.4	5.5	✓	0.1
flood tide		1255			S	2	30.4	10.6	5.6		0.7
wind ↑ rain ↑											
542866	5234755	1300	19	SPSW	D	10	30.5	10.5	5.6		0.3
		1305	15		M	8	30.3	10.4	5.5		0.6
		1310			S	2	30.6	10.0	5.[illegible]		0.8

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Read and Understood By

[signature] 12/14 [signature] 02/12/14

Signed Date Signed Date

Lloyd & Associates, Inc.
38210 SE 92nd Street, Snoqualmie, Washington 98065 425-888-1905

December 22, 2002

TRANSMITTAL

To: Iain Wingard
John O'Loughlin

Subject: Compliance Monitoring/St. Paul Waterway 12/14/02 AM/PM
Final Data Transmittal

Attached please find results from complaince monitoring for pile removal on the St. Paul Waterway on 12/14/02. Data was collected with the YSI Sonde. The weather was cold and wet. The sampling rose also includes sample points from the afternoon sampling event.

WATER QUALITY WAS ACCEPTABLE DURING THESE COMPLIANCE MONITORING EVENTS.

Sampling points and locations are shown in the sampling figure below.

Morning Sampling Event

Dissolved Oxygen
Up Current = 5.6 mg/L
Down Current average = 5.6 mg/L

Turbidity
Up Current = 0.3 NTU
Down Current average = 0.7 NTU

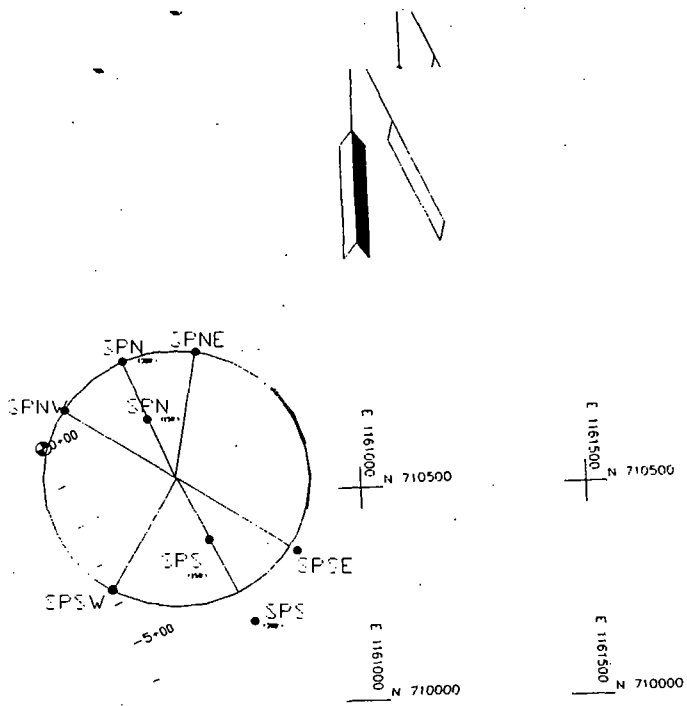
Temperature
Up Current = 10.5 ^{0}C
Down Current average = 10.4 ^{0}C

Afternoon Sampling Event

Dissolved Oxygen
Up Current = 5.2 mg/L
Down Current average = 5.6 mg/L

Turbidity
Up Current = 0.3 NTU
Down Current average = 1.0 NTU

Temperature
Up Current = 10.6 ^{0}C
Down Current average = 10.5 ^{0}C



Reprinted 2/4/03

Michael Lloyd/Date
Environmental Section

- St Paul 12 14 02.doc

Construction Compliance Monitoring

Date: 12/14 **Location:** St. Paul AM

Station	Depth (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp.°C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Tidal/Comment
Station SPSE/TOP (down)	2	29.5	5.8	2.0	10.5		5,234,804	542,025	1230	300' Compliance
Middle	17	30.9	5.6	0.1	10.4	4			1225	Flood Tide
Deep	30	30.9	5.7	0.3	10.4				1220	Log rafts in way
Average		30.4	5.7	0.8	10.4					DTB =35'
Station SPS/TOP(down)	2	30.2	5.9	0.6	10.6		5,234,811	542,961	1140	150' sample
Middle	7	30.6	6.0	0.5	10.6	3			1135	Piling in the way
Deep	10	30.7	6.0	0.4	10.5				1130	for planned position.
Average		30.5	6.0	0.5	10.6					DTB =14
Station SPSW/TOP (down)	2	30.6	5.6	0.8	10.4		5,234,751	542,866	1310	300' Compliance
Mid	8	30.3	5.5	0.6	10.4	3			1305	
Deep	10	30.5	5.6	0.3	10.5				1300	
Average		30.5	5.6	0.6	10.4					DTB =15
Station SPN/TOP (up)	2	30.9	5.6	0.7	10.6		5,234,919	542,873	1255	Flood Tide
Mid	30	31.0	5.5	0.1	10.4	3			1250	Up Current Sample
Deep	55	31.0	5.8	0.1	10.4				1245	
Upcurrent Average		31.0	5.6	0.3	10.5					DTB =60
Down-Current Avg.		30.5	5.6	0.7	10.4					
Station 2+00 TOP	2	30.6	5.2	0.1	10.4		52,344,427	542,452	1440	
Middle	24	31.0	5.2	0.1	10.4	3			1435	
Deep	45	31.0	5.4	0.3	10.4				1430	DTB =48'
Average		30.9	5.3	0.2	10.4					

Pre-Survey Calibration	Steve High 12/14	Calibration Notes:	Weather Condtions: Cool, cloudy, heavy rain, heavy wind
Post-Survey Calibration Check	Steve High 12/14	Calibrated in air/salinity correction	

Windy, not able to reach SPS position which was within boom area in the piling. Sample relocated as shown in drawing.

Sampling conducted by Steve High and Michael Lloyd. Calibration acceptable.

All data colledected with YSI Sonde.

Data Entered By/Date:	Reviewed By/Date:	
Michael Lloyd MML 12/22	Dan Berta	L&AI

Construction Compliance Monitoring

Date: 12/14 **Location:** St. Paul PM

Station	Depth (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E; m)		Time	Tidal/Comment
Station SPNE/TOP (down)	2	30.6	5.4	0.4	10.6		5,234,949	542,928	1610	300' Compliance
Middle	22	31.0	5.5	0.4	10.4	3			1605	Ebb Tide
Deep	40	31.1	5.7	1.1	10.4				1600	
Average		30.9	5.5	0.6	10.5					DTB =44
Station SPN/TOP(down)	2	30.6	5.3	0.5	10.6		5,234,942	542,870	1530	150' sample
Middle	30	31.0	5.2	0.2	10.4	5			1525	Ebb Tide
Deep	50*	31.0	5.2	0.8	10.4				1520	Depth exceeded cable length
Average		30.9	5.2	0.5	10.5					DTB =61'
Station SPNW/TOP (down)	2	30.1	5.9	0.4	10.6		5,234,889	542,835	1550	300' Compliance
Mid	31	31.1	5.5	0.1	10.4	3			1545	
Deep	50	31.0	5.4	0.1	10.4				1540	Depth exceeded cable length
Average		30.7	5.6	0.2	10.5					DTB =62'
Station SPS/TOP (up)	2	30.4	5.1	0.8	10.6		52,349,811	542,961	1515	Ebb Tide
Mid	9	30.9	5.2	0.4	10.6	5			1510	Up Current Sample
Deep	15	30.9	5.3	0.4	10.6				1505	
Upcurrent Average		30.7	5.2	0.5	10.6					DTB = 18
Down-Current Average		30.8	5.6	0.4	10.5					
Station 2+00 TOP	2	30.4	5.3	0.2	10.4		5,234,446	542,429	1640	
Middle	22	31.0	5.4	0.2	10.4	3			1635	
Deep	40	31.1	5.4	0.1	10.4				1630	DTB =45'
Average		30.8	5.4	0.2	10.4					

Pre-Survey Calibration	Steve High 12/14	Calibration Notes:	Weather Condtions: Cool, overcast rain
Post-Survey Calibration Check	Steve High 12/14	Calibrated in saturated air/salinity correction	

No problems observed in monitoring.

Minor debris in the water in the form of fine dust blowing from Simpson

All data collected with Sonde, Steve High *Sampling depth exceeded length of Sonde cable. New cable ordered

Final	Final Review	
Michael Lloyd	Dan Berta	L&AI

STL Seattle

Client Name	Lloyd & Assoc. Inc.
Project Name	Thea Foss
Date Received	12-16-02

General Chemistry Parameters

Client Sample ID	021214/SPS/M/A
Lab ID	110692-01

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	12-18-02	mg/L	3	2

Client Sample ID	021214/SPSE/M/A
Lab ID	110692-02

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	12-18-02	mg/L	4	2

Client Sample ID	021214/SP~~H~~N/M/A TNL
Lab ID	110692-03

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	12-18-02	mg/L	3	2

Client Sample ID	021214/SPSW/M/A
Lab ID	110692-04

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	12-18-02	mg/L	3	2

Client Sample ID	021214/TF2/M/A
Lab ID	110692-05

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	12-18-02	mg/L	3	2

Client Sample ID	021214/SP7/M/A
Lab ID	110692-06

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	12-18-02	mg/L	3	2

STL Seattle

Client Sample ID	021214/SPS/M/B
Lab ID	110692-07

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	12-18-02	mg/L	5	2

Client Sample ID	021214/SPNW/M/B
Lab ID	110692-08

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	12-18-02	mg/L	3	2

Client Sample ID	021214/SPNE/M/B
Lab ID	110692-09

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	12-18-02	mg/L	3	2

Client Sample ID	021214/SP7/M/B
Lab ID	110692-10

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	12-18-02	mg/L	3	2

Client Sample ID	021214/SPN/M/B
Lab ID	110692-11

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	12-18-02	mg/L	5	2

Client Sample ID	021214/SP7/M/DUP
Lab ID	110692-12

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	12-18-02	mg/L	3	2

Client Sample ID	021214/TF2/M/B
Lab ID	110692-13

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	12-18-02	mg/L	3	2

STL Seattle

QUALITY CONTROL REPORT

Client Sample ID: Batch QC
Lab ID: 110719-04
QC Batch Number: 1114-135

Method Blank

Parameter	Result (mg/L)	PQL
Total Suspended Solids	ND	2

Duplicate

Parameter	Sample Result (mg/L)	Duplicate Result (mg/L)	RPD (%)	Flag
Total Suspended Solids	3.8	3.8	0.0	

STL Seattle

QUALITY CONTROL REPORT

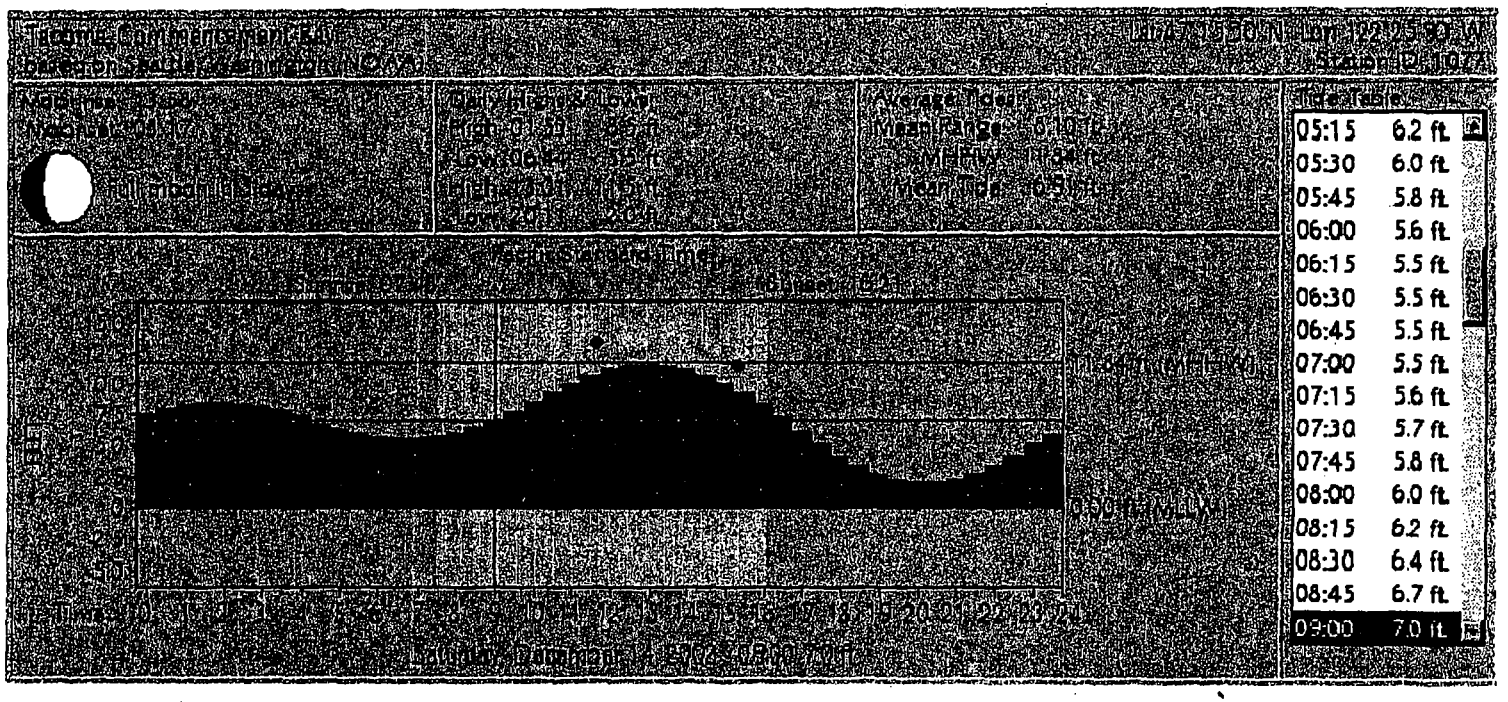
Client Sample ID: Batch QC
Lab ID: 110686-05
QC Batch Number: 1114-134

Method Blank

Parameter	Result (mg/L)	PQL
Total Suspended Solids	ND	2

Duplicate

Parameter	Sample Result (mg/L)	Duplicate Result (mg/L)	RPD (%)	Flag
Total Suspended Solids	2.45	3.29	29	X4a


Tacoma Commencement Bay
Tide Table
05:15 6.2 ft
05:30 6.0 ft
05:45 5.8 ft
06:00 5.6 ft
06:15 5.5 ft
06:30 5.5 ft
06:45 5.5 ft
07:00 5.5 ft
07:15 5.6 ft
07:30 5.7 ft
07:45 5.8 ft
08:00 6.0 ft
08:15 6.2 ft
08:30 6.4 ft
08:45 6.7 ft
09:00 7.0 ft

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PROJECT _____

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N	E	t	DTB	St.	Sample D	E✓	Sal.	T	DO	TSS	Turb
5234	592	1630	27	SP NE	D	22	30.9	10.5	5.4	—	0.6
972	985	1635			M	14	30.9	10.6	5.5	✓	0.5
Ebb		1640			S	2	30.5	10.6	5.6	—	1.5
Rain											
5235	542	1650	41	SP NW	D	36	31.1	10.4	5.7	—	0.4
622	913	1655			M	20	30.9	10.6	5.5	✓	0.2
Ebb		1700			S	2	30.8	10.7	5.5	—	0.5
Dry											

021214

Event (A)

Work on piling removal @ St. Panel - use coords from ACAD.

E	N	t	DTB	St	Sample	depth	Sal	T	DO	TSS	Turb
5[illegible]961	5234811										
SPSE		1130	14	SPSE	D	10	30.7	10.5	6.8		0.4
(can't get into		1135			M	7	30.6	10.6	6.0	✓	0.5
pilings w/out		1140			S	2	30.2	10.6	5.9		0.6
light rain											
heavy wind											
542025	5234804										
SPSE		1220		SPSE	D	30	30.9	10.4	5.7	✓	0.3
(ditto logs in		1225	35		M	17	30.9	10.4	5.6		0.1
way more East)		1230			S	2	29.5	10.5	5.8		2.0
542873	5234919	1245	50	SPN	D	55	31.0	10.4	5.8		0.1
SPN		1250			M	30	31.0	10.4	5.5	✓	0.1
Flood tide		1255			S	2	30.4	10.6	5.6		0.7
wind ↑ rain ↑											
542866	5234755	1300	19	SPSW	D	10	30.5	10.5	5.6		0.3
		1305	15		M	8	30.3	10.4	5.5		0.6
		1310			S	2	30.6	10.4	5.4		0.8

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02/12/14 — Date

PROJECT _____ Continued From Page _____

Calibration DO. [illegible] at 1500 hrs. [illegible] 0.2 mg/L. Yes 630 = Sonde ± 0.2

Copied by S. High

5234889	542835	1540	(62)	SPNW	(B)	D	50	31.0	10.4	5.4	0.1
		1545				M	31	31.0	10.4	5.5 ✓	0.1
		1550				S	2	30.1	10.6	5.9	0.4
5234949	5429285	1600	(44)	SPNE	(B)	D	44	31.1	10.4	5.7	1.1
		1605				M	22	31.0	10.4	5.5 ✓	0.4
		1610				S	2	30.6	10.6	5.4	0.4
5234913	542973	1615	(35)	SP7	(B)	D	30	31.0	10.4	5.9	0.4
		1620				M	18	31.0	10.5	5.5 ✓D	0.2 Dupe TSS
		1625				S	2	30.6	10.5	5.5	0.4
5234446	542429	1630	(45)	T2	(B)	D	40	31.1	10.4	5.4	0.2
		1635				M	22	31.0	10.4	5.4 ✓	0.1
		1640				S	2	30.4	10.4	5.3	0.2

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'ECT Thm

N	E	t	DTB	Sta	(A)	Sample depth	Sal	T	DO	TSS	Turb
5234427		1430	(48)	TF-02+00		D 45	31.0	10.4	5.4		0.3
Ebb	542452	1435				M 24	31.0	10.4	5.2	✓	0.1
Rain amb. out Then [illegible]		1440				S 2	30.6	10.4	5.2		0.1
Ebb		1450	(42)	SP7	(A)	Sample depth	Sal	T	DO	TSS	Turb
N	E	1455				D 37	31.0	10.4	5.4	—	0.5
234921		1500				M 21	31.0	10.4	5.2	✓	1.4
	542952					S 2	30.7	10.6	5.2	—	0.4
Rain lt. wind											
	542961	1505				D 15	30.9	10.6	5.3		0.4
234811	Ebb	1510	(18)	SPS	B	M 9	30.9	10.6	5.2	✓	0.4
		1515				S 2	30.4	10.6	5.1		0.8
5234942	542870	1520	(61)	SPN	B	D 60	31.0	10.4	5.2		0.8
	Ebb	1525				M 30	31.0	10.4	5.2	✓	0.2
→ Rain		1530				S 2	30.6	10.6	5.3		0.5

Note weigh anchor & move barge while sampling about 30 ft down flow.

5234889	542835	1540	(62)	SPNW	B	D 50	31.0	10.4	5.4		0.1
		1545				M 33	31.1	10.4	5.5	✓	0.1
		1550				S 2	30.1	10.6	5.9		0.4
234949	542928	1600	(44)	SPNE	B	D 40	31.1	10.4	5.7		1.1
Ebb Rain		1605				M 22	31.0	10.4	5.5	✓	0.4
		1610				S 2	30.6	10.6	5.4		0.4
234913	542973	1615	(35	SP7	B	D 30	31.0	10.4	5.4		0.4
Ebb Rain		1620				M 18	31.0	10.5	5.5	✓ D	0.2 Dupe
		1625				S 2	30.6	10.5	5.5		0.4 TSS
[illegible]	[illegible]	1630	(45)	TD	B	D [illegible]	31.1	[illegible]	5.4		0.2
		1635				[illegible]	31.0	[illegible]	5.4		0.1
[illegible]		1640				[illegible]	[illegible]	[illegible]	[illegible]		[illegible]

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PROJECT Thea

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021214 15 St. Paul - CALIBRATED DO/DEPTH/TURBIDITY ✓ ok

Event A 760.73 mm Hg @ 0800

Clear calm no rain at 10:30

N	E	E	DTB	Sta	Sample	D	Sal	T	DO	TSS	Turb
5234465	542492	1105	47	TF2	D	42	30.98	10.3	5.6		0.5
Flood		1110		A	M	24	30.9	10.3	5.6	✓	0.1
		1115			S	2	30.5	10.5	5.6		0.4
5234911	542979	1140	35	SP7	D	30	30.9	10.3	5.8		0.5
Flood		1145		A	M	18	30.9	10.3	5.6	✓	0.1
		1150			S	2	30.3	10.5	5.6		1.4
5234842	542957	1155	18	SPS	D	13	30.9	10.5	5.7		0.7
Flood		1200		A	M	9	30.8	10.5	5.5	✓	0.6
		1205			S	2	30.5	10.5	5.5		1.1

[Notes: SPS set @ 150' S of work zone, on E side of pilings due to wind & piling work
AND SPSE set equal to ~~SP~~ SP 10+00]

5234859		1210	35	SPSE	D	30	31.0	10.3	5.6	–	0.1
542998		1215		A	M	18	31.0	10.3	5.5	Dup ✓	0.4
DRY		1220			S	2	30.4	10.5	5.4	–	1.7
		1230			D	38	31.0	10.3	5.8	–	0.2
5234904		1235	43	SP11	M	22	30.9	10.4	5.4	✓	0.2 Dup = 5.3
542890		1240		A	S	2	30.7	10.5	5.4	–	0.9

NOTE: NE CORNER OF WASTE BARGE

5234776		1245	43	SPSW	D	38	31.0	10.3	5.5	–	0.4
542866		1250		A	M	22	31.0	10.3	5.3	✓	0.1
		1255			S	2	30.5	10.3	5.4	–	0.8

EVENT B

5234785		1430	21	SPSE	D	16	30.9	10.4	5.0	–	0.4
542991		1435		B	M	11	30.9	10.4	5.0	✓	0.5
WINDY W/RAIN		1440			S	2	30.8	10.5	4.9	–	0.6

NOTE: SPSE SET @ 300' S OF WORK ZONE, ON EAST SIDE OF PILINGS DUE TO PILING WORK & ACESS.

5234785
542991

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Signed Date Signed Date

Lloyd & Associates, Inc.
38210 SE 92nd Street, Snoqualmie, Washington 98065 425-888-1905

December 15, 2002

TRANSMITTAL

To: Iain Wingard
John O'Loughlin

Subject: Compliance Monitoring/St. Paul Waterway 12/15/02
Final Data Transmittal

Attached please find results from complaince monitoring for pile removal on the St. Paul Waterway on the morning and afternoon of 12/15/02. Data was collected with the YSI Sonde. The weather was cool and windy.

WATER QUALITY WAS ACCEPTABLE DURING THESE COMPLIANCE MONITORING EVENTS

Sampling points and locations are shown in the sampling figure below.

Morning Sampling Event

Dissolved Oxygen
- Up Current = 5.5 mg/L
- Down Current average = 5.5 mg/L

Turbidity
- Up Current = 0.4 NTU
- Down Current average = 0.6 NTU

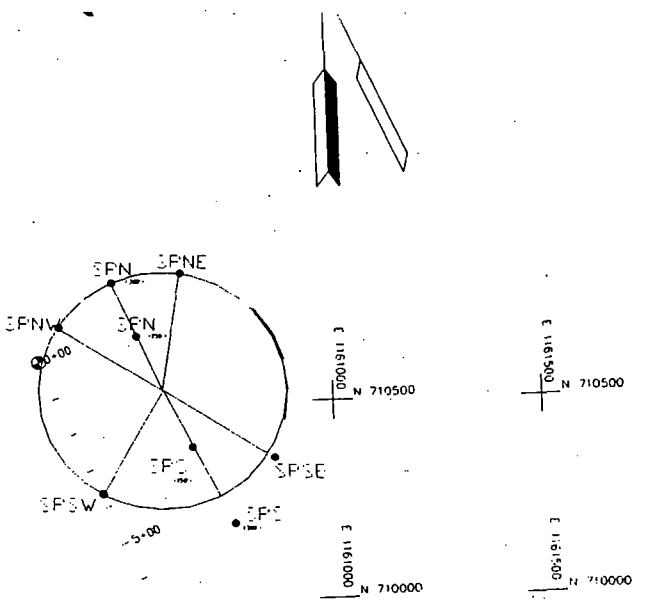
Temperature
- Up Current = 10.4 ^{0}C
- Down Current average = 10.3 ^{0}C

Afternoon Sampliing Event

Dissolved Oxygen
- Up Current = 5.0 mg/L
- Down Current average = 5.1 mg/L

Turbidity
- Up Current = 0.5 NTU
- Down Currentt average = 0.8 NTU

Temperature
- Up Current = 10.4 ^{0}C
- Down Current average = 10.4 ^{0}C



REPRINTED 2/4/03

Michael Lloyd/Date
Environmental Section

- St Paul 12 15 02.doc

Construction Compliance Monitoring

Date: 12/15 **Location:** St. Paul AM

Station	Depth (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Tidal/Comment
Station SPSE/TOP (down)	2	30.4	5.4	1.7	10.5		5,234,859	542,998	1220	300' Compliance
Middle	18	31.0	5.5	0.4	10.3	8			1215	Flood Tide
Deep	30	31.0	5.6	0.1	10.3				1210	Log rafts in way
Average		30.8	5.5	0.7	10.4					DTB =35'
Station SPS/TOP(down)	2	30.5	5.5	1.1	10.5		5,234,842	542,951	1205	150' sample
Middle	9	30.8	5.5	0.6	10.5	6			1200	Piling in the way
Deep	13	30.9	5.7	0.7	10.5				1155	for planned position.
Average		30.7	5.6	0.8	10.5					DTB =18
Station SPSW/TOP (down)	2	30.5	5.4	0.8	10.3		5,234,776	542,866	1255	300' Compliance
Mid	22	31.0	5.3	0.1	10.3	3			1250	
Deep	38	31.0	5.5	0.4	10.3				1245	
Average		30.8	5.4	0.4	10.3					DTB =43
Station SPN/TOP (up)	2	30.7	5.4	0.9	10.5		5,234,904	542,890	1240	Flood Tide
Mid	22	30.9	5.4	0.2	10.4	3			1235	Up Current Sample
Deep	38	31.0	5.8	0.2	10.3				1230	
Upcurrent Average		30.9	5.5	0.4	10.4					DTB =43
Down-Current Avg.		30.8	5.5	0.6	10.3					
Station 7+00 TOP	2	30.3	5.6	1.4	10.5		5,234,911	542,979	1150	
Middle	18	30.9	5.6	0.1	10.3	3			1145	
Deep	30	30.9	5.8	0.5	10.3				1140	DTB =35'
Average										

Pre-Survey Calibration	Steve High 12/15	Calibration Notes:	Weather Condtions: Cool, cloudy, dry
Post-Survey Calibration Check	Steve High 12/15	Calibrated in air/salinity correction	

Windy, not able to reach SPS position which was within boom area in the piling. Sample relocated as shown in drawing.

Sampling conducted by Steve High and Dan Berta. Calibration acceptable.

All data colledected with YSI Sonde.

Final	Final Review	
Michael Lloyd	Dan Berta	L&AI

Reprinted 2/4

Construction Compliance Monitoring

Date: 12/15 **Location:** St. Paul PM

Station	Depth (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Tidal/Comment
Station SPNE/TOP (down)	2	30.7	5.0	2.8	10.4		5,234,925	542,922	1455	300' Compliance
Middle	17	31.0	4.9	0.2	10.4	3			1450	Ebb Tide
Deep	29	31.1	5.0	0.1	10.3				1445	
Average		30.9	5.0	1.0	10.4					DTB =34
Station SPN/TOP(down)	2	30.8	5.2	0.7	10.5		5,234,919	542,872	1510	150' sample
Middle	22	31.0	5.2	0.1	10.3	3			1505	NE of barge corner
Deep	39	31.0	5.4	0.1	10.3				1500	
Average		30.9	5.3	0.3	10.4					DTB = 44
Station SPNW/TOP (down)	2	30.8	5.2	1.3	10.4		5,234,884	542,833	1525	300' Compliance
Mid	27	31.0	5.2	0.1	10.3	3			1520	
Deep	46	31.0	5.3	0.1	10.3				1515	NW of barge corner
Average		30.9	5.2	0.5	10.3					DTB = 52'
Station SPS/TOP (up)	2	30.8	4.9	0.6	10.5		52,344,785	542,891	1440	Ebb Tide
Mid	11	30.9	5.0	0.5	10.4	3			1435	Up Current Sample
Deep	16	30.9	5.0	0.4	10.4				1430	
Upcurrent Average		30.9	5.0	0.5	10.4					DTB =21'
Down-Current Average		30.9	5.1	0.8	10.4					
No ambient data collected										
Average										

Pre-Survey Calibration	Dan Berta 12/15	Calibration Notes: Calibrate in air/salinity correction	Weather Condtions: Cool, overcast, rain at end of survey
Post-Survey Calibration Check	Dan Berta 12/15		

No problems observed in monitoring. Ambient monitoring stations previously sampled.

Minor debris in the water in the form of fine dust blowing from Simpson

All data collected with Sonde by Dan Berta

Data Entered By/Date	Reviewed By/Date:	
Michael Lloyd	Dan Berta	L&AI

STL Seattle

Client Name	Lloyd & Assoc. Inc.
Project Name	Thea Foss
Date Received	12-16-02

General Chemistry Parameters

Client Sample ID 021215/TF2/M/A
Lab ID 110694-01

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	12-18-02	mg/L	2	2

Client Sample ID 021215/SP7/M/A
Lab ID 110694-02

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	12-18-02	mg/L	3	2

Client Sample ID 021215/SPS/M/A
Lab ID 110694-03

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	12-18-02	mg/L	6	2

Client Sample ID 021215/SPSE/M/DUP
Lab ID 110694-04

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	12-18-02	mg/L	4	2

Client Sample ID 021215/SPSE/M/A
Lab ID 110694-05

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	12-18-02	mg/L	8	2

Client Sample ID 021215/SP~~H~~N/M/A TML
Lab ID 110694-06

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	12-18-02	mg/L	3	2

STL Seattle

Client Sample ID	021215/SPSW/M/A
Lab ID	110694-07

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	12-18-02	mg/L	3	2

Client Sample ID	021215/SPSE/M/B
Lab ID	110694-08

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	12-18-02	mg/L	3	2

N TM

Client Sample ID	021215/SP~~H~~E/M/B
Lab ID	110694-09

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	12-18-02	mg/L	3	2

N TM

Client Sample ID	021215/SP~~H~~/M/B
Lab ID	110694-10

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	12-18-02	mg/L	3	2

Client Sample ID	021215/SPNW/M/B
Lab ID	110694-11

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	12-18-02	mg/L	3	2

STL Seattle

QUALITY CONTROL REPORT

Client Sample ID: Batch QC
Lab ID: 110545-02
QC Batch Number: 1114-136

Method Blank

Parameter	Result (mg/L)	PQL
Total Suspended Solids	ND	2

Duplicate

Parameter	Sample Result (mg/L)	Duplicate Result (mg/L)	RPD (%)	Flag
Total Suspended Solids	41	32	16	

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Notebook No. _____ 79

PROJECT Thea

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021214 15 St. Paul — CALIBRATED DO/DEPTH/TURBIDITY ✓ ok

Event A 760.73 mm Hg @ 0800

Clear calm no rain at 10:30

N	E	E	DTB	Sta	Sample	D	Sal	T	DO	TSS	Turb
5234465	542492	1105	47	TF2	D	42	30.98	10.3	5.6		0.5
Flood		1110		A	M	24	30.9	10.3	5.6	✓	0.1
		1115			S	2	30.5	10.5	5.6		0.4
5234911	542979	1140	35	SP7	D	30	30.9	10.3	5.8		0.5
Flood		1145		A	M	18	30.9	10.3	5.6	✓	0.1
		1150			S	2	30.3	10.5	5.6		1.4
5234842	542957	1155	18	SPS	D	13	30.9	10.5	5.7		0.7
Flood		1200		A	M	9	30.8	10.5	5.5	✓	0.6
		1205			S	2	30.5	10.5	5.5		1.1

[Notes: SPS set @ 150' S of work zone, on E side of pilings due to wind & piling work
AND SPSE set equal to ~~SP~~ SP 10+00]

5234859		1210	35	SPSE	D	30	31.0	10.3	5.6	—	0.1
542998		1215		A	M	18	31.0	10.3	5.5	✓ Dup	0.4
DRY		1220			S	2	30.4	10.5	5.4	—	1.7
		1230			D	38	31.0	10.3	5.8	—	0.2
5234904		1235	43	SP11	M	22	30.9	10.4	5.4	✓	0.2 Dup = 5.3
542896		1240		A	S	2	30.7	10.5	5.4	—	0.9

NOTE: NE CORNER OF WASTE BARGE

5234796		1245	43	SPSW	D	38	31.0	10.3	5.5	—	0.4
542866		1250		A	M	22	31.0	10.3	5.3	✓	0.1
		1255			S	2	30.5	10.3	5.4	—	0.8

EVENT B

5234788		1430	21	SPSE	D	16	30.9	10.4	5.0	—	0.4
542991		1435		B	M	11	30.9	10.4	5.0	✓	0.5
WINDY W/RAIN		1440			S	2	30.8	10.5	4.9	—	0.6

NOTE: SPSE SET @ 300' S OF WORK ZONE, ON EAST SIDE OF PILINGS DUE TO PILING WORK & ACESS.

5234788
542991

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JECT St Paul Waterway

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EVENT B

N	E	t	DTB	STA	SAMPLE D	SAL	T	DO	TSS	TURB
5234925		1445	(34)	SPNE	D 29	31.1	10.3	5.0	—	0.1
	542922	1450		(B)	M 17	31.0	10.4	4.9	✓	0.2
		1455			S 2	30.7	10.4	5.0	—	2.8
5234919		1500	(44)	SPN	D 39	31.0	10.3	5.4	—	0.1
	542872	1505		(B)	M 22	31.0	10.3	5.2	✓	0.1
		1510			S 2	30.8	10.5	5.2	—	0.7

NOTE: LOCATION AT N.E. CORNER OF MANSON BARGE.

5234884		1515	52 DB (54)	SPNW	D 46	31.0	10.3	5.3	—	0.1
	542833	1520		(B)	M 27	31.0	10.3	5.2	✓	0.1
		1525			S 2	30.8	10.4	5.2	—	1.3

NOTE: LOCATION AT NW CORNER OF MANSON BARGE

021216 0715, Rain, dark, baro. pres. = 28.93" (= 734.82 mm Hg)
CM DO & Turb (0,20)

N	E	t	DTB	Sta	Sample D	Sal	T	Do	TSS	Turb
					D 40	30.8	10.4	5.6	—	1.0
5234439	542445	0730	45	T2	M 22	30.8	10.4	5.7	✓	0.7
		0735		(A)	S 2	26.7	10.7	7.0	—	3.4
E h-Slack		0740					9.7			
Rain										
5234910	542996	0800	32	SP7	D 27	30.8	10.4	4.8	—	2.9
		0805		(A)	M 16	30.6	10.5	4.8	✓	1.6
Rain		0810			S 2	27.7	10.0	5.6	—	3.2
5234785	542991	0815	(11)	SPS	D 9	30.1	10.5	5.4	—	1.4
		0820		(=SPSE)	M 4	28.1	10.0	5.4	✓	2.4
(UP) Rain		0825		log raft (A)	S 2	25.5	9.6	5.8	—	3.8
5234925	542922	0830	(33)	SPNE	D 28	30.8	10.4	5.0	—	1.9
Dry Slack		0835		(A)	M 17	30.7	10.6	4.7	✓	4.3
		0840			S 2	27.3	10.0	5.1		3.0

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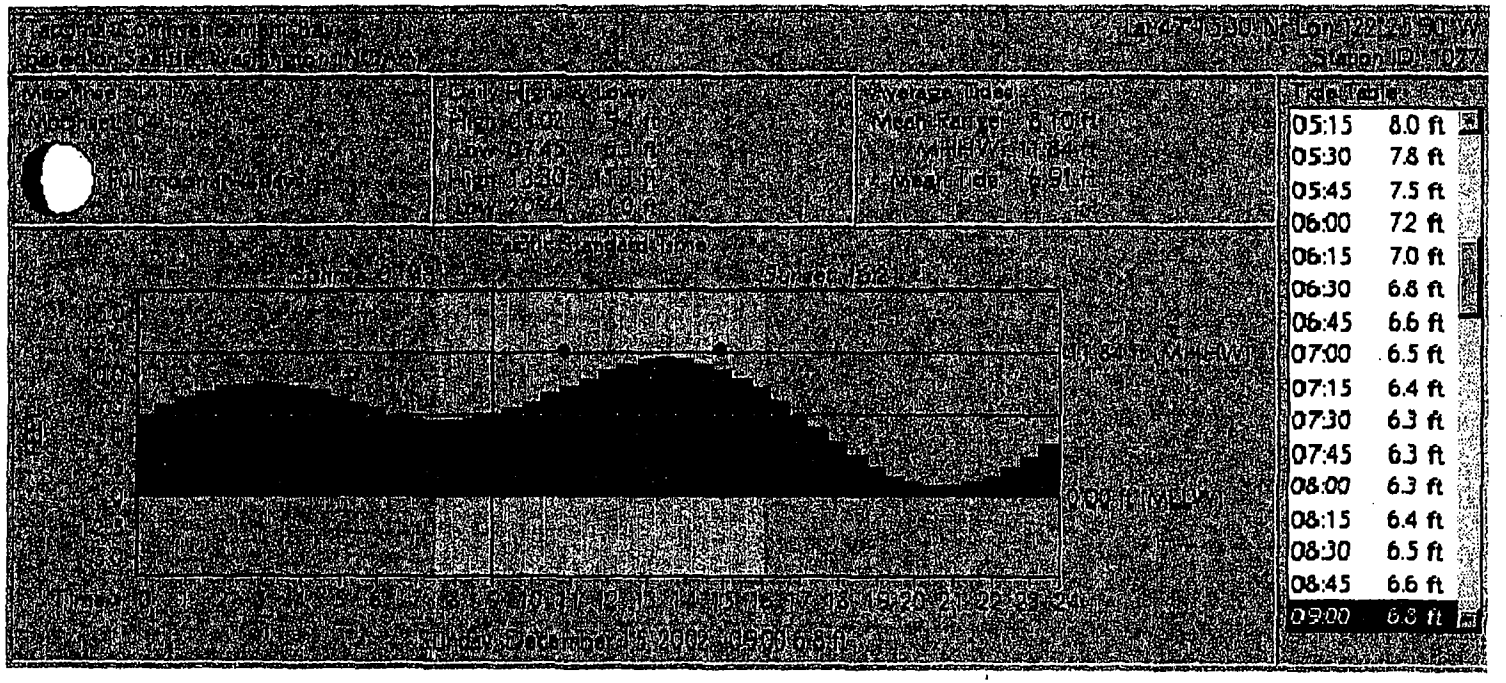
Read and Understood By

49.3 mc

[signature] 12/14 [signature] 02/12/16

Signed Date Signed Date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05:30 7.8 ft
05:45 7.5 ft
06:00 7.2 ft
06:15 7.0 ft
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06:45 6.6 ft
07:00 6.5 ft
07:15 6.4 ft
07:30 6.3 ft
07:45 6.3 ft
08:00 6.3 ft
08:15 6.4 ft
08:30 6.5 ft
08:45 6.6 ft
09:00 6.8 ft

Lloyd & Associates, Inc.
38210 SE 92nd Street, Snoqualmie, Washington 98065 425-888-1905

December 22, 2002

TRANSMITTAL

To: Iain Wingard
John O'Loughlin

Subject: Compliance Monitoring/St. Paul Waterway 12/16/02
Final Data Transmittal

Attached please find results from complaince monitoring for pile removal on the St. Paul Waterway on 12/16/02. Data was collected with the YSI Sonde. The weather was cool and windy. The sampling rose also includes sample points from the afternoon sampling event. The morning routine sampling event indicated a potential dissolved oxygen problem. The instrument was recalibrated and sampling was repeated. All data points were retested. Iain Wingard was present for the retesting/resampling event.

WATER QUALITY WAS ACCEPTABLE AFTER RECALIBRATION AND RETESTING

Sampling points and locations are shown in the sampling figure below.

Dissolved Oxygen

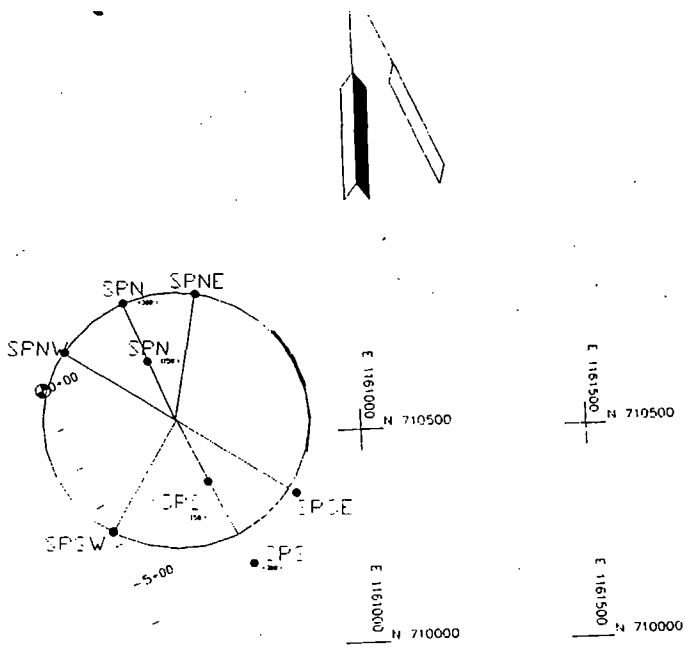
Up-Current = 5.5 mg/L;
5.3 mg/L as retested
Down-Current Avg. = 4.92 mg/L;
5.3 mg/Las retested

Turbidity

Up-Current = 2.5 NTU;
1.9 NTU as retested
Down-Current Avg. = 2.1 mg/L;
1.3 mg/Las retested

Temperature

Up-Current = 10.0 ^{0}C;
10.3 ^{0}C, as retested
Down-Current Avg. = 10.3 ^{0}C
10.4 ^{0}C, as retested



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Michael Lloyd/Date
Environmental Section

- St Paul 12 16.doc

Construction Compliance Monitoring

Date: 12/16 **Location:** St. Paul Waterway

Station	Depth (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Tidal/Comment
Station SPNE/TOP (down)	2	27.3	5.1	3.0	10.0		5,234,925	542,922	840	300' Compliance
Middle	17	30.7	4.7	4.3	10.6	3			835	Dry
Deep	28	30.8	5.0	1.9	10.4				830	
Average		29.6	4.93	3.1	10.3					DTB =33'
Station SPN/TOP(up)	2	28.2	5.2	2.9	10.0		5,234,952	542,890	855	150' sample
Middle	30	30.9	4.8	1.0	10.4	3			850	N. End of barge
Deep	52	30.9	5.1	2.0	10.3				845	dry
Average		30.0	5.0	2.0	10.2					DTB =59'
Station SPNW/TOP (down)	2	28.8	5.0	2.2	10.2		5,234,884	542,833	910	300' Compliance
Mid	27	30.9	4.8	0.7	10.4	4			905	Dry
Deep	52	30.9	4.9	0.7	10.4				900	
Average		30.2	4.90	1.2	10.3					DTB =58'
Station SPS(E)/TOP (up)	2	25.5	5.8	3.8	9.6		5,234,785	542,990	825	Ebb Tide/rain
Mid	4	28.1	5.4	2.4	10.0	4			820	Up Current Sample
Deep	9	30.1	5.4	1.4	10.5				815	Moved to SE avoid logs
Upcurrent Average		27.9	5.5	2.5	10.0					DTB =11
Down-Current Average		29.9	4.92	2.1	10.3					
Station 2+00 TOP	2	26.7	7.0	3.4	9.7		5,234,439	542,445	740	Dry
Middle	22	30.8	5.7	0.7	10.4	3			735	
Deep	40	30.8	5.6	1	10.4				730	DTB =45'
Average		29.4	6.1	1.7	10.2					

Pre-Survey Calibration	Steve High 12/16	Calibration Notes: Calibrated in air/salinity correctio	Weather Condtions: Cool, dry wind from south in afternoon
Post-Survey Calibration Check	Steve High 12/16		

All data colledected with Sonde.

Revised/Corrected	Final Review	
Michael Lloyd	Dan Berta	**L&AI**

Reprinted 2/4/03

Construction Compliance Monitoring **Date: 12/16** **Location: St. Paul Retest**

Station	Depth (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp oC	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Tidal/Comment
Station SPNE/TOP (down)	2	28.7	5.3	2.6	10.2		5,234,925	542,922	1440	300' Compliance
Middle	22	30.6	5.1	1.2	10.5				1435	Start of Ebb Tide
Deep	39	30.9	5.4	1.2	10.4				1430	Strong current
Average		30.1	5.27	1.7	10.4					DTB =44
Station SPN/TOP(up)	2	29.2	5.5	3.6	10.2		5,234,877	542,890	1449	150' sample
Middle	29	30.8	5.0	1.1	10.5				1447	
Deep	47	30.9	5.1	1.1	10.4				1445	
Average		30.3	5.2	1.9	10.4					DTB = 59
Station SPNW/TOP (down)	2	29.2	5.5	1.7	10.3		5,234,884	542,833	1425	300' Compliance
Mid	30	30.7	5.2	1.0	10.5				1420	
Deep	52	30.7	5.2	1.2	10.4				1415	
Average	8	30.2	5.3	1.3	10.4					DTB =60
Station SPS(E)/TOP (up)	2	29.1	5.6	1.9	10.2		5,234,785	542,990	1451	Ebb Tide
Mid	8	30.4	5.1	1.9	10.5				1453	Up Current Sample
Deep	11	30.4	5.1	1.8	10.5				1455	Moved SE to avoid logs
Upcurrent Average		30.0	5.3	1.9	10.4					DTB = 16
Down-Current Avg.		30.1	5.3	1.5	10.4					
Station 2+00 TOP	2	27.4	5.3	2.6	10.1		5,234,443	542,451	1509	Stong Ebb Tide Current
Middle	24	30.8	5.0	1.2	10.5				1507	
Deep	43	31.0	5.1	0.6	10.3				1505	DTB =48
Average		29.7	5.1	1.5	10.3					

Pre-Survey Calibration	Steve High 12/16	Calibration Notes:	Weather Condtions: Cool, drizzle, cloudy
Post-Survey Calibration Check	Dan Berta 12/16	Calibrate in air/salinity correction	

All data colledected with Sonde.

Revised/Corrected	Final Review	
Michael Lloyd	Dan Berta	**L&AI**

Reviewed 2/4/03 [illegible]

STL Seattle

Sample Identification:

Lab. No.	Client ID	Date/Time Sampled	Matrix
110755-1	021216/T2/M/A	12-16-02 07:35	Liquid
110755-2	021216/SP 7/M/A	12-16-02 08:05	Liquid
110755-3	021216/SPS/M/A	12-16-02 08:20	Liquid
110755-4	021216/SPNE/M/A	12-16-02 08:35	Liquid
110755-5	021216/SPN /M/A	12-16-02 08:50	Liquid
110755-6	021216/SPNW/M/A	12-16-02 09:05	Liquid

This report is issued solely for the use of the person or company to whom it is addressed. Any use, copying or disclosure other than by the intended recipient is unauthorized. If you have received this report in error, please notify the sender immediately at 253-922-2310 and destroy this report immediately.

STL Seattle

Client Name	Lloyd & Assoc. Inc.
Project Name	THEA FOSS
Date Received	12-17-02

General Chemistry Parameters

Client Sample ID 021216/T2/M/A
Lab ID 110755-01

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	12-18-02	mg/L	3	2

Client Sample ID 021216/SP 7/M/A
Lab ID 110755-02

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	12-18-02	mg/L	4	2

Client Sample ID 021216/SPS/M/A
Lab ID 110755-03

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	12-18-02	mg/L	4	2

Client Sample ID 021216/SPNE/M/A
Lab ID 110755-04

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	12-18-02	mg/L	3	2

Client Sample ID 021216/SPN /M/A
Lab ID 110755-05

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	12-18-02	mg/L	3	2

Client Sample ID 021216/SPNW/M/A
Lab ID 110755-06

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	12-18-02	mg/L	4	2

STL Seattle

QUALITY CONTROL REPORT

Client Sample ID: Batch QC
Lab ID: 110709-01
QC Batch Number: 1114-137

Method Blank

Parameter	Result (mg/L)	PQL
Total Suspended Solids	ND	2

Duplicate

Parameter	Sample Result (mg/L)	Duplicate Result (mg/L)	RPD (%)	Flag
Total Suspended Solids	64.3	62	3.64	

EVERN RENT STL

STL Seattle
5755 8th Street East
Tacoma, WA 98424

Tel: 253 922 2310
Fax: 253 922 5047
www.stl-inc.com

TA QUALIFIERS AND ABBREVIATIONS

This analyte was detected in the associated method blank. The analyte concentration was determined not to be significantly higher than the associated method blank (less than ten times the concentration reported in the blank).

This analyte was detected in the associated method blank. The analyte concentration in the sample was determined to be significantly higher than the method blank (greater than ten times the concentration reported in the blank).

Second column confirmation was performed. The relative percent difference value (RPD) between the results on the two columns was evaluated and determined to be ≤ 40%.

Second column confirmation was performed. The RPD between the results on the two columns was evaluated and determined to be > 40%. The higher result was reported unless anomalies were noted.

GC/MS confirmation was performed. The result derived from the original analysis was reported.

The reported result for this analyte was calculated based on a secondary dilution factor.

The concentration of this analyte exceeded the instrument calibration range and should be considered an estimated quantity.

The analyte was analyzed for and positively identified, but the associated numerical value is an estimated quantity.

:L: Maximum Contaminant Level

)L: Method Detection Limit

See analytical narrative.

) Not Detected

2 Practical Quantitation Limit

: Contaminant does not appear to be "typical" product. Elution pattern suggests it may be _____ .

:: Contaminant does not appear to be "typical" product.

:: Identification and quantitation of the analyte or surrogate was complicated by matrix interference.

4: RPD for duplicates was outside advisory QC limits. The sample was re-analyzed with similar results. The sample matrix may be nonhomogeneous.

4a: RPD for duplicates outside advisory QC limits due to analyte concentration near the method practical quantitation limit/detection limit.

5: Matrix spike recovery was not determined due to the required dilution.

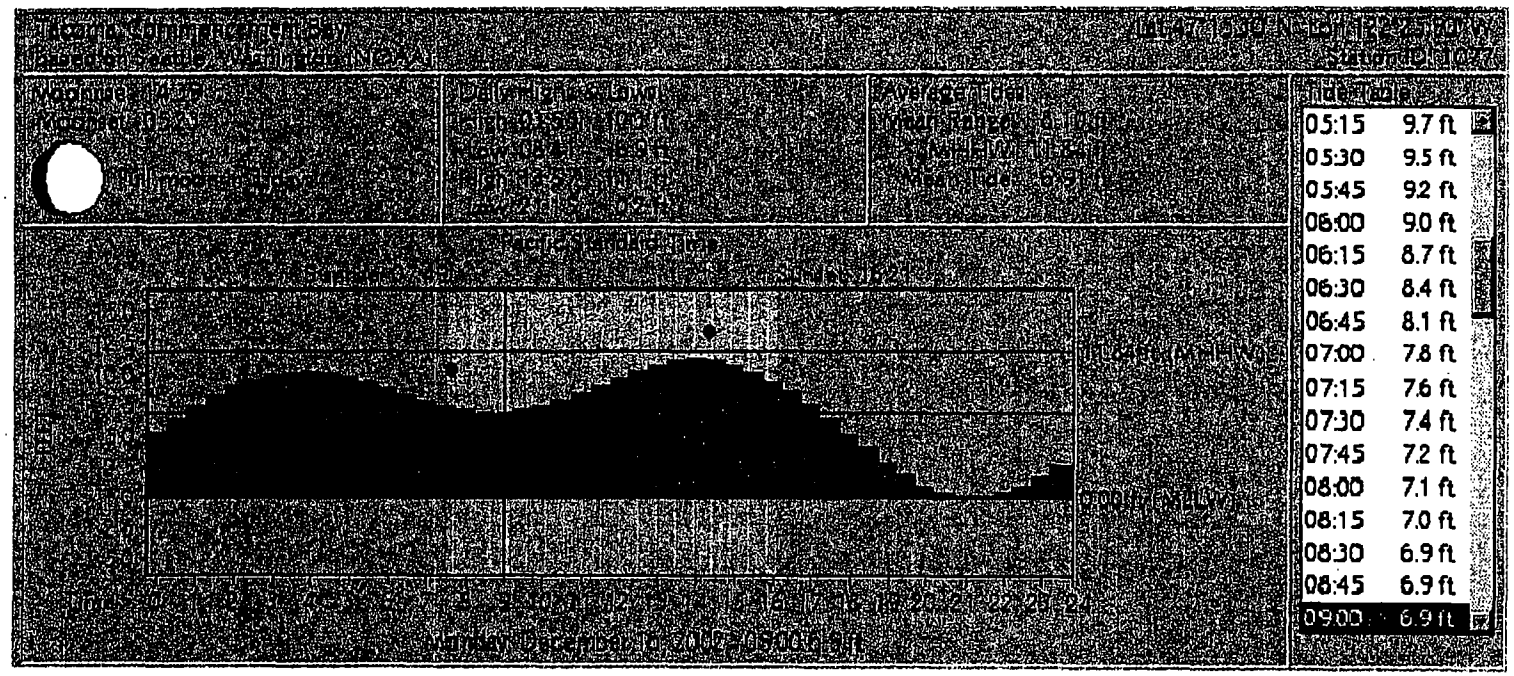
6: Recovery and/or RPD values for matrix spike(/matrix spike duplicate) outside advisory QC limits. Sample was re-analyzed with similar results.

7: Recovery and/or RPD values for matrix spike(/matrix spike duplicate) outside advisory QC limits. Matrix interference may be indicated based on acceptable blank spike recovery and/or RPD.

7a: Recovery and/or RPD values for this spiked analyte outside advisory QC limits due to high concentration of the analyte in the original sample.

8: Surrogate recovery was not determined due to the required dilution.

9: Surrogate recovery outside advisory QC limits due to matrix interference.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05:30 9.5 ft
05:45 9.2 ft
06:00 9.0 ft
06:15 8.7 ft
06:30 8.4 ft
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07:00 7.8 ft
07:15 7.6 ft
07:30 7.4 ft
07:45 7.2 ft
08:00 7.1 ft
08:15 7.0 ft
08:30 6.9 ft
08:45 6.9 ft
09:00 6.9 ft

Notebook No. _____ 81
Continued From Page _____

OJECT St Paul Waterway

EVENT B

N	E	t	DTB	STA	SAMPLE D	SAL	T	DO	TSS	TURB
5234925		1445	(34)	SPNE	D 29	31.1	10.3	5.0	—	0.1
	542922	1450		(B)	M 17	31.0	10.4	4.9	✓	0.2
		1455			S 2	30.7	10.4	5.0	—	2.8
5234919		1500	(44)	SPN	D 39	31.0	10.3	5.4	—	0.1
	542872	1505		(B)	M 22	31.0	10.3	5.2	✓	0.1
		1510			S 2	30.8	10.5	5.2	—	0.7

NOTE: LOCATION AT N.E. CORNER OF MAHEGI BARGE.

5234884		1515	52 DB (54)	SPHW	D 48	31.0	10.3	5.3	—	0.1
	542833	1520		(B)	M 27	31.0	10.3	5.2	✓	0.1
		1525			S 2	30.8	10.4	5.2	—	1.3

NOTE: LOCATION AT HW CORNER OF MANSON BARGE

021216 0715, Rain, dark, baro. pres. = 28.93" (= 734.82 mm Hg)
Cal DO & Turb (0,20)

N	E	t	DTB	Sta	Sample D	Sal	T	Do	TSS	Turb
			45		D 40	30.8	10.4	5.6	—	1.0
5234739	542445	0730		T2	M 22	30.8	10.4	5.7	✓	0.7
E L-Slack		0735		(A)	S 2	26.7	10.0 9.7	7.0	—	3.4
Rain		0740								
5234910	542996	0800	32	SP7	D 27	30.8	10.4	4.8	—	2.9
		0805		(A)	M 16	30.6	10.5	4.8	✓	1.6
Rain		0810			S 2	27.7	10.0	5.6	—	3.2
5234785	542991	0815	(11)	SPS	D 9	30.1	10.5	5.4	—	1.4
		0820		(=SPSE)	M 4	28.1	10.0	5.4	✓	2.4
(UP) Rain		0825		log raft (A)	S 2	25.5	9.6	5.8	—	3.8
5234925	542922	0830	(33)	SPNE	D 28	30.8	10.4	5.0	—	1.9
Dry Slack		0835		(A)	M 17	30.7	10.6	4.7	✓	4.3
		0840			S 2	27.3	10.0	5.1		3.0

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Read and Understood By 493 mc

[signature] 12/14 [signature] 02/12/16

Signed Date Signed Date

PROJECT

Continued From Page

Seattle: NWS
206-526-6087
1) Info
2) 29.23 28.94 at 353 am

Time = 1350
Sonde Recalibrate by
Salinity = 30.1 Dan
BP = 29.23 × 25.4 = 744.22 Berta
Calibrate = 10.8 mg/L
Salinity = 30.1
High Tide at 1:57 pm
Marine 66

Continued on Page

Read and Understood By

Signed Date Signed Date

[redacted]

PROJECT Thea Foss

Notebook No. _____ 83

Continued From Page _____

OL 12 16

N	E	t	DTB	Sta	Sample dpt	Sal	T	DO	TSS	Turb
5234952	542890	0845	(59)	SPN						
set up off N		0850		(~150') (A)	D	52	30.9	10.3	5.1	—	2.0
end of rig		0855			M	30	30.9	10.4	4.8	✓	1.0
Dry/windy					S	2	28.2	10.0	5.2	—	2.9
5234884	542833	0900	(58)	SPNW	D	~52	30.9	10.4	4.9	—	0.7
Ebb/slack		0905			M	~~37~~ 27	30.9	10.4	4.8	✓	0.7
~~Dry~~ windy		0910			S	2	28.8	10.2	5.0	—	2.2
Rain											
		1415		SPNW	D	52	47	30.7	10.4	~~5.2~~	1.2
EBB (not		1420	(60)		M	30		30.7	10.5	5.2	1.0
in max EBB		1425			S	2		29.2	10.3	5.5	1.7
window)											
5234884		1430		SPNE	D	39		30.9	10.4	5.4	1.1
542833		1435		DTB 44'	M	22		30.6	10.5	5.1	1.2
		14 pm									
5234925		1440			S	2		28.7	10.2	5.3	2.6
542922											
5234877		1445		DTB = 59	D	47		30.9	10.4	~~5.7~~ 5.1 pm	1.1
542890		1447			M	29		30.8	10.5	5.0	1.1 ~~1.2~~ pm
Start of Ebb tide		1449		SPN 150'	S	2		29.2	10.2	~~5.4~~ 5.5	3.6
				SPS	D	~~13~~ 13		30.4	10.5	5.1	1.8
				DTW = 16	M	8		30.4	10.5	5.1	1.9
					S	2		29.1	10.2	~~5.3~~ 5.6	1.9
		1505		DTB = 48	D	43		31.0	10.3	5.1	0.6
1507					M	24 pm		~~30.3~~ 30.8	10.5	5.0	1.2
1509				STA 2+00	S	2		~~28.7~~ 27.4	10.1	5.3	2.6

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[signature] 12/16 [signature] 12/16

Signed Date Signed Date

Lloyd & Associates, Inc.
38210 SE 92nd Street, Snoqualmie, Washington 98065 425-888-1905

December 22, 2002

TRANSMITTAL

To: Iain Wingard
John O'Loughlin

Subject: Compliance Monitoring/St. Paul Waterway 12/17/02
Final Data Transmittal

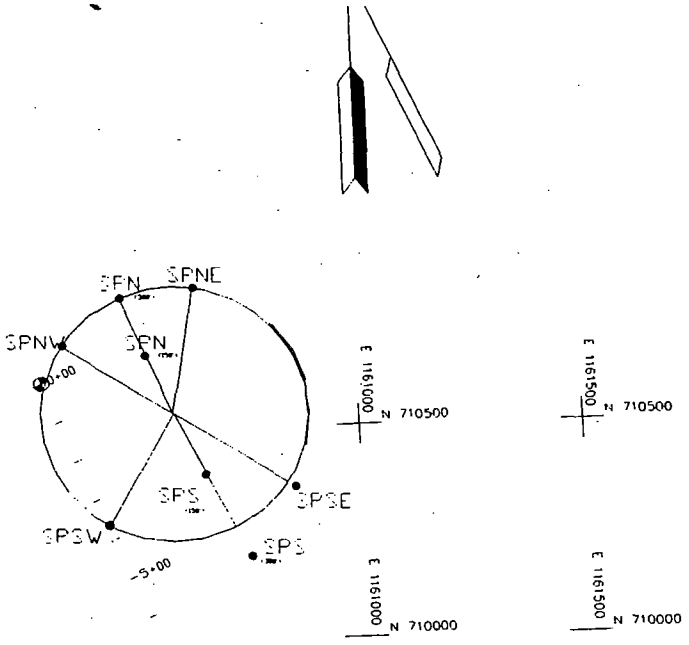
Attached please find results from routine compliance monitoring for pile removal on the St. Paul Waterway on 12/17/02. Data was collected with the YSI Sonde. The weather was cool and windy. A final report will be generated as soon as TSS data is available from the laboratory.

WATER QUALITY WAS ACCEPTABLE FOR THIS ROUTINE MONITORING EVENT
Sampling points and locations are shown in the sampling figure below.

Dissolved Oxygen
Up-Current = 6.0 mg/L;
Down-Current Avg. = 6.1 mg/L;

Turbidity
Up-Current = 1.8 NTU;
Down-Current Avg. = 1.8 mg/L;

Temperature
Up-Current = 10.3 ^{0}C;
Down-Current Avg. = 10.3 ^{0}C



Reprinted 2/4/03

Michael Lloyd/Date
Environmental Section

- St Paul 12 17.doc

Construction Compliance Monitoring

Date: 12/17 Location: St. Paul Waterway

Station	Depth (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Tidal/Comment
Station SPNE/TOP (down)	2	30.2	5.9	2.0	10.2		5,234,966	542,934	905	300' Compliance
Middle	20	30.8	5.8	1.9	10.4	4			902	Cold, wet rainly and windy
Deep	36	30.9	6.0	1.1	10.3				900	Actual = 290 ft.
Average		30.6	5.90	1.7	10.3					DTB =41'
Station SPN/TOP(down)	2	30.6	6.6	2.2	10.5		5,234,932	542,899	940	150' DO Compliance
Middle	22	30.8	6.5	1.7	10.4	4			935	
Deep	40	31.0	6.5	1.1	10.3				920	Cold, wet rainly and windy
Average		30.8	6.5	1.7	10.4					DTB =45'
Station SPNW/TOP (down)	2	30.4	6.3	3.5	10.4		5,234,921	542,830	830	300' Compliance
Mid	31	30.9	6.2	0.6	10.3	5			825	Cold, wet rainly and windy
Deep	57	30.7	6.3	1.7	10.3				820	Actual = 290 ft.
Average		30.7	6.27	1.9	10.3					DTB = 62'
Station SPS(E)/TOP (up)	3	30.2	6.1	2.1	10.2		5,234,815	542,978	920	300' Compliance, 292 actual
Mid	10	30.7	6.0	1.5	10.4	5			915	Up-current location moved
Deep	15	30.8	6.0	1.7	10.4				910	to SPSE to avoid logs.
Upcurrent Average		30.6	6.0	1.8	10.3	5				DTB =21
Down-Current Avg.		30.7	6.1	1.8	10.3					
Station 2+00 TOP	2	30.2	6.5	1.5	10.4		5,234,434	542,444	808	Wet, windy
Middle	23	30.8	6.5	1.7	10.3	6			805	
Deep	41	30.9	6.4	1.9	10.3				800	DTB =46'
Average		30.6	6.5	1.7	10.3					

Pre-Survey Calibration	Dan Berta	Calibration Notes:	Weather Condtions: Cool, wet and windy
Post-Survey Calibration Check	Dan Berta	*Calibrated in air/salinity correction*	

Suvery conducted by D. Berta and M. Lloyd. Manson confirmed compliance distances with laser gun.

Manson crews were pulling pile before and during monitoring. Sample location SPS moved to SPSE avoid log rafts.

All data collected with Sonde except bomb sample at depth at SPNW before measurment.

Revised	Final Review	
Michael Lloyd	Dan Berta	**L&AI**

Reprinted 2/4/03 TMM

STL Seattle

Client Name	Lloyd & Assoc. Inc.
Project Name	THEA FOSS
Date Received	12-17-02

General Chemistry Parameters

Client Sample ID	021217/TP2/M/A
Lab ID	110756-01

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	12-18-02	mg/L	6	2

Client Sample ID	021217/SPNW/M/A
Lab ID	110756-02

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	12-18-02	mg/L	5	2

Client Sample ID	021217/SPNE/M/A
Lab ID	110756-03

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	12-18-02	mg/L	4	2

Client Sample ID	021217/SPNE/M/DUP
Lab ID	110756-04

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	12-18-02	mg/L	6	2

Client Sample ID	021217/SPS/M/A
Lab ID	110756-05

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	12-18-02	mg/L	5	2

N PM

Client Sample ID	021217/SP~~A~~/M/A
Lab ID	110756-06

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	12-18-02	mg/L	4	2

STL Seattle

QUALITY CONTROL REPORT

Client Sample ID: Batch QC
Lab ID: 110545-02
QC Batch Number: 1114-136

Method Blank

Parameter	Result (mg/L)	PQL
Total Suspended Solids	ND	2

Duplicate

Parameter	Sample Result (mg/L)	Duplicate Result (mg/L)	RPD (%)	Flag
Total Suspended Solids	41	35	16	

PROJECT _____ Continued From Page _____

12/17/02

Notes & Observations:

0600 - YSI 610-DM Term. Ser. # 22767R / Probe Model # 6820-C-M Ser. # 01F0061 Connected & turned on for warm up. Period

0645 - D.O. Calibration / Air - Barometric Pressure (206 526-6087) National Weather Service (Narrows) 29.55" x25.4mm/inch = 750.57mm Hg

(D.O. Air 10.1 mg/L)

- Calibration of Turbidity 2 Point method as per MFG. 0 NTU (DE I water) & 20 NTU standard - Reading after Cal./20.2 NTU

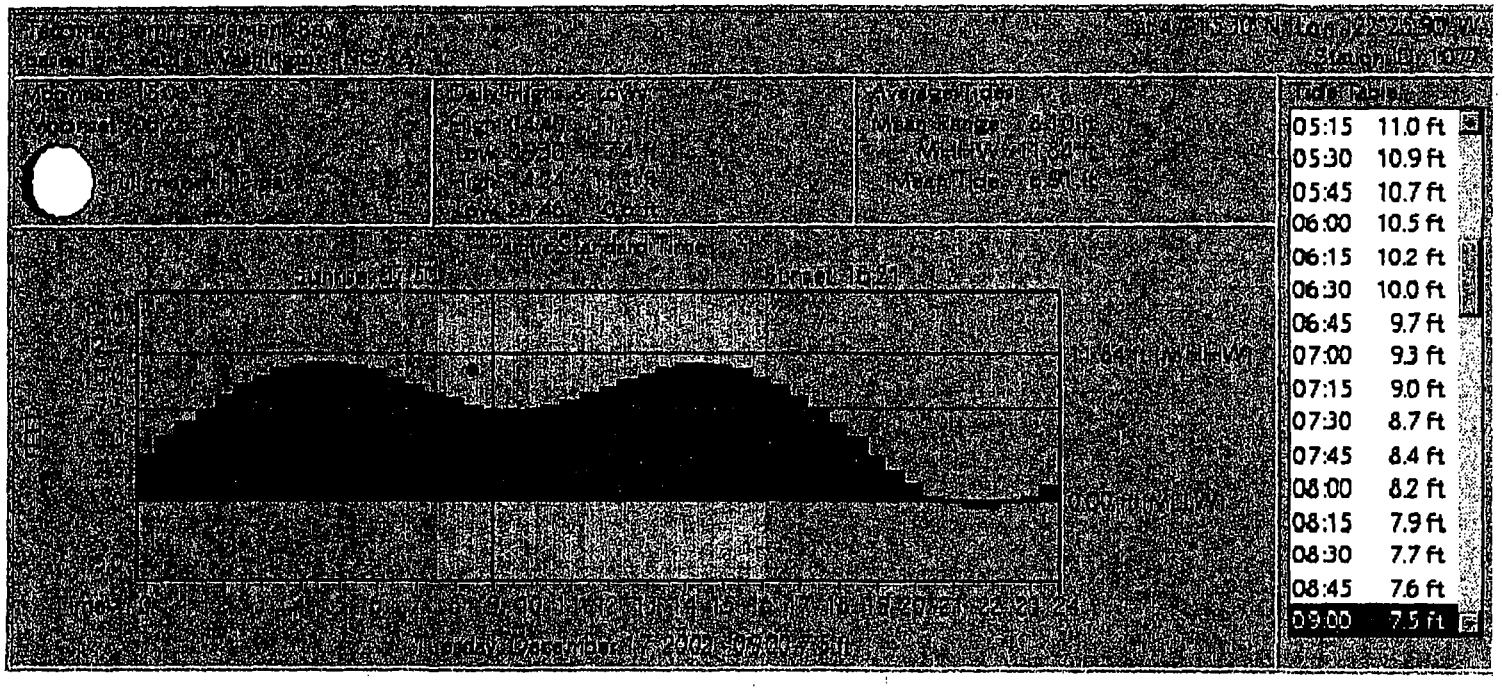
Note 810: Floating Debris in water. Lots of herring in water.

GPS Position @ J. Seafood provided by N. Brunes @ Parametrix
5233056.31
542789.02

Continued on Page

Read and Understood By

Signed _____ Date _____ Signed _____ Date _____


05:15 11.0 ft
05:30 10.9 ft
05:45 10.7 ft
06:00 10.5 ft
06:15 10.2 ft
06:30 10.0 ft
06:45 9.7 ft
07:00 9.3 ft
07:15 9.0 ft
07:30 8.7 ft
07:45 8.4 ft
08:00 8.2 ft
08:15 7.9 ft
08:30 7.7 ft
08:45 7.6 ft
09:00 7.5 ft

OJECT _____ Continued From Page _____

12/17/02 RML

					Sal	Temp	Do	Turb	
Station 2+00	D	730	41		30.8	10.3	4.8	1.4	See Below
5422444			23		30.8	10.3	4.8	1.2	
5234434			2		30.4	10.4	4.8	1.4	

Calibrated on Model

DTB = 46'

				S	T	DO	Turb
D	730	41		30.8	10.3	4.9	1.6
M	735	23		30.8	10.3	4.9	1.9
S	738	2		30.3	10.4	4.9	1.4

Recal

Calibration Check @ 750. 11.5/w DI water.

2+00 Nearest 46	D	800	41	30.9	10.3	6.4	1.9	Sample Collection TF	
	M	805	23	30.8	10.3	6.5	1.7	TSS 02/12/17/2/M/A	
	S	808	2	30.2	10.4	6.5	1.5	811	

SPNW Moved location to get 300'

			47						300'
	D	820	62	30.9	10.3	6.3	1.7	TSS =	
E 542833	M	825	31	30.9	10.3	6.3	0.6	02/12/17/SPNW/	
N 5234921	S	830	2	30.4	10.4	6.3	3.5	M/A	

(63) Manson used radar gun to set distance 290' total 260' to barge, 30 feet to work area.

DATA FROM WHEATON at 57'

8:40 57 ~~87~~ 30.7 9.9 6.6 1.3 Manson Radar = D = 290 for SPNW

SPNE

(41)	D	900	36	30.9	10.3	6.0	1.1	RML	
	M	902	20	30.8	10.4	5.8	1.9	TSS 02/12/17	
E 934	S	905	2	30.3	10.2	5.9	2.0	SPNE/M/A	
N 966								DUPLICATE Collected	

SPS - Location/Distance =

E 978	D	910	(21)	15	30.8	10.4	6.0	1.7	
N 8152	M	915		10	30.7	10.4	6.0	1.5	Distance = 292'
(1.8)	S	920		30	30.2	10.2	6.1	2.1	from work

Continued On Page

Read and Understood By

RMLloyd 12/17 Paul H Butler 02/12/17

Signed Date Signed Date

Continued From Page

12/17/02

		D	Sal	T	DO	TB			
SPN	E897	40	31.0	10.3	6.5	1.1	Mn	150	9
	N932	22	30.8	10.4	6.5	1.7	30' from		9
(45)		2	30.6	10.5	6.6	2.2	barge		9

S.W. Corner TSS Sample collected at M

E 899 96
N 931 09 Barge 542910 5234879 + 40' S to pile

Calib. = 11.1 w/DI. Calibration check in DI compares w/ presurvey check + initial calibration

Called Iain Wingard to communicate results.

All sampling completed by D. Berta. M Lloyd recording. Weather is very wet + rainy. Water is rough. Manson provided distance confirmation with laser/radar gun, so we could know our position from GPS positions adjusted to work zone. Angles from work zone are approximate + will be computed later. GPS working well, but unit not as accurate as Magellan or Garvin 176.

MASON ACTIVLY PULLING TIMBER PILES AT THE TIME OF MONITORING.

021218

Calibration

DO 759.46 mm Hg 11.2 mg/L in air

Turb 0 & DO 0 = DI 20 = Formazin soln. pigment & checked on VN meter = after 19.9 – 20.1 ntu

Depth gauge on "Bub" is varying a lot at each location, we divided to error on shallow side to protect Sample.

Continued on Page

Read and Understood By

Signed 021218 Date Signed 02/12/18 Date

Lloyd & Associates, Inc.
38210 SE 92nd Street, Snoqualmie, Washington 98065 425-888-1905

December 18, 2002

TRANSMITTAL

To: Iain Wingard
John O'Loughlin

Subject: Compliance Monitoring/St. Paul Waterway 12/18/02
Preliminary Data Transmittal

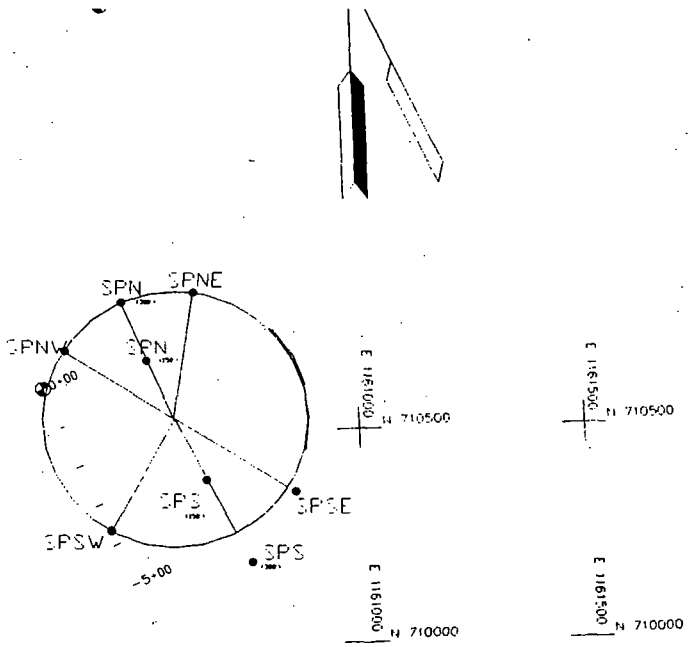
Attached please find results from complaince monitoring for pile removal on the St. Paul Waterway on 12/18/02. Data was collected with the YSI Sonde. The weather was cool and windy. A final report will be generated as soon as TSS data is available from the laboratory. ok

WATER QUALITY WAS ACCEPTABLE DURING THIS ROUTINE MONITORING EVENT
Sampling points and locations are shown in the sampling figure below.

Dissolved Oxygen
Up-Current = 6.4 mg/L;
Down-Current Avg. = 6.2 mg/L;

Turbidity
Up-Current = 3.4 NTU;
Down-Current Avg. = 1.6 mg/L;

Temperature
Up-Current = 10.3 ^{0}C;
Down-Current Avg. = 10.3 ^{0}C



Reprinted 2/4/03

Michael Lloyd/Date
Environmental Section

Construction Compliance Monitoring **Date: 12/18** **St. Paul Waterway AM**

Station	Depth (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Tidal/Comment
Station SPNE/TOP (down)	2	30.6	6.2	2.1	10.3		5,234,884	542,833	1040	300' Compliance
Middle	17	30.8	6.2	1.5	10.4	3			1035	Ebb/Slack tide
Deep	33	30.9	6.4	1.9	10.3				1030	
Average		30.8	6.27	1.8	10.3					DTB =37'
Station SPN/TOP(up)	2	30.6	6.3	2	10.3		5,234,904	542,917	1025	150' sample
Middle	11	30.7	6.2	1.7	10.5	2			1020	20' north of rig
Deep	20	30.9	6.2	0.6	10.3				1015	Ebb Tide
Average		30.7	6.2	1.4	10.4					DTB = 22
Station SPNW/TOP (down)	2	30.6	6.0	1.7	10.4		5,234,889	542,833	1055	Ebb/Slack Tide
Mid	27	31.0	6.0	0.4	10.3	4			1050	
Deep	50	31.0	6.1	1.7	10.3				1045	
Average		30.9	6.0	1.3	10.3					DTB =54
Station SPS(E)/TOP (up)	2	30.4	6.5	2.7	10.3		5,234,785	542,991	1000	Ebb Tide
Mid	14	30.7	6.3	3.6	10.3	4			955	Up Current Sample
Deep	22	30.8	6.3	4.0	10.2				950	Moved east to avoid log raft
Upcurrent Average		**30.6**	**6.4**	**3.4**	**10.3**					**DTB = 28**
Down-Current Avg.		**30.8**	**6.2**	**1.6**	**10.3**					
Station 2+00 TOP	2	29.9	5.8	2.8	10.2		5,234,465	542,492	1115	Ebb/Slack Tide Current
Middle	22	30.8	5.8	1.4	10.3	3			1110	Dry
Deep	40	30.9	5.8	1.4	10.3				1100	DTB =44
Average		30.5	5.8	1.9	10.3					

Pre-Survey Calibration	Steve High 12/18	Calibration Notes: Turb. 0 & 20 NTU std.	Weather Condtions: Partly cloudy, cool with light breeze
Post-Survey Calibration Check	Steve High 12/18	DO calibrate in air/salinity correction	

All data colledected with YSI Sonde. Instrument calibrated by Steve High on the sample boat after a 1 hour warm up period. Instrument calibration looked good. Calibration check at end was good. Points located with Garmin 176 GPS. We were inside of 300 feet for downgradient measures. Upgradient station SPS was located to SPSE (north and east of programmed position) to work around piling and a log raft. Manson was operating when we were present.

Prepared By/Date:	Final Review	
Dan Berta	Michael Lloyd	**L&AI**

2/4/03 Reprinted

STL Seattle

Client Name	Lloyd & Assoc. Inc.
Project Name	THEA FOSS
Date Received	12-18-02

General Chemistry Parameters

Client Sample ID 021218/SP7/M/A
Lab ID 110794-01

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	12-19-02	mg/L	3	2

Client Sample ID 021218/SP7/M/DUP
Lab ID 110794-02

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	12-19-02	mg/L	4	2

Client Sample ID 021218/SPS/M/A
Lab ID 110794-03

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	12-19-02	mg/L	4	2

Client Sample ID 021218/SPN/M/A
Lab ID 110794-04

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	12-19-02	mg/L	2	2

Client Sample ID 021218/SPNW/M/A
Lab ID 110794-05

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	12-19-02	mg/L	4	2

Client Sample ID 021218/TF2/M/A
Lab ID 110794-06

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	12-19-02	mg/L	3	2

STL Seattle

Client Sample ID		021218/SPNE/M/A			
Lab ID		110794-07			
Parameter	**Method**	**Date Analyzed**	**Units**	**Result**	**PQL**
Total Suspended Solids	EPA 160.2	12-19-02	mg/L	3	2

STL Seattle

QUALITY CONTROL REPORT

Client Sample ID: Batch QC
Lab ID: 110647-1
QC Batch Number: 1114-138

Method Blank

Parameter	Result (mg/L)	PQL
Total Suspended Solids	ND	2

Duplicate

Parameter	Sample Result (mg/L)	Duplicate Result (mg/L)	RPD (%)	Flag
Total Suspended Solids	1,060	1,080	1.87	

Continued From Page

12/17/02 — D Sal T DO TB

SPN E897 40 31.0 10.3 6.5 1.1 Mn 150 9

N 932 22 30.8 10.4 6.5 1.7 30' from 9

(45) 2 30.6 10.5 6.6 2.2 barge 9

S.W. Corner TSS Sample collected at M

E 89996 542910

N 931 09 Barge 5234879 + 40' S to pile

Calib. = 11.1 w/ DI. Calibration check in DI compares w/ presurvey check + initial calibration

— Called Iain Wingard to communicate results.

All sampling completed by D. Berta. M Lloyd recording. Weather is very wet + rainy. Water is rough. Manson provided distance confirmation with laser/radar gun, so we could know our position from GPS positions adjusted to work zone. Angles from work zone are approximate + will be computed later. GPS working well, but unit not as accurate as Magellan or Garvin 176.

MASON ACTIVLY PULLING TIMBER PILES AT THE TIME OF MONITORING.

021218

Calibration

DO 759.46 mm Hg 11.2 mg/L air

Turb 0.2 DO 0 = DI 20 = Formazin soln pigment & checked on VN meter — after 19.9 — 20.1 ntu

Depth gauge on "Bub" is varying a lot at each location, we decided to error on shallow side to protect [illegible]

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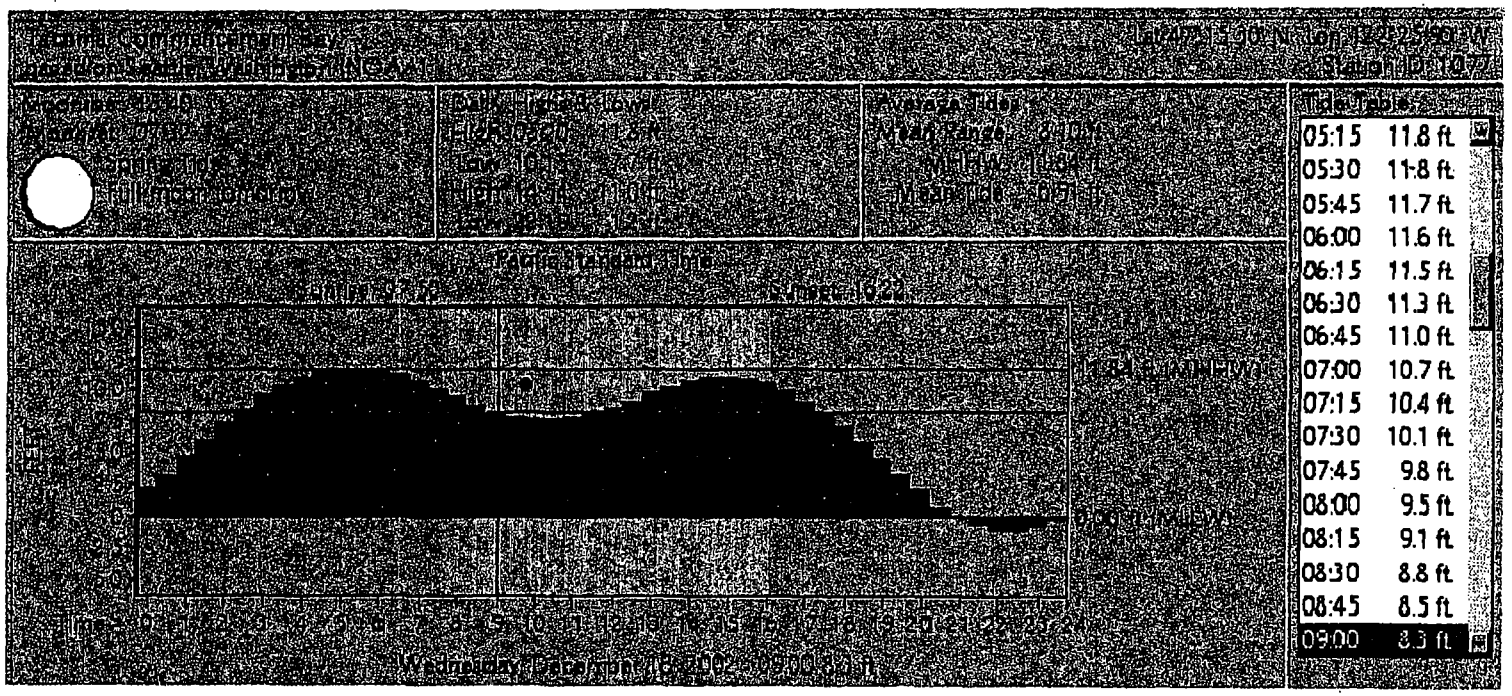
Read and Understood By

Signed 021218 Date Signed 02/12/18 Date


Tide Table
05:15 11.8 ft
05:30 11.8 ft
05:45 11.7 ft
06:00 11.6 ft
06:15 11.5 ft
06:30 11.3 ft
06:45 11.0 ft
07:00 10.7 ft
07:15 10.4 ft
07:30 10.1 ft
07:45 9.8 ft
08:00 9.5 ft
08:15 9.1 ft
08:30 8.8 ft
08:45 8.5 ft
09:00 8.3 ft

PROJECT Tren Fosi

Notebook No. _____

Continued From Page _____

02 12 18

N	E	t	DTB	Sta	Sample depth	Sal	T	DO	TSS	Turb
5234465	542~~[illegible]~~	~~0830~~ 1100	(44)	2+10	D ~~37~~ 40 st	30.9	10.3	5.8	—	1.4
	542	~~0835~~ 1110			M 22	30.8	10.3	5.8	✓	1.4
Ebb Dry Sun Slack		~~0840~~ 1115			S 2	29.9	10.2	5.8	—	2.8
5234440						30.9	10.3	6.4	—	1.3
	542956	0930	(38)	SP7	D 35	30.7	10.5	6.4	✓	1.5
		0935		(Amb)	M 19					
Ebb Dry Sun		0940			S 2	30.4	10.2	6.3	—	1.9
5234785						30.8	10.3	6.3	—	4.0
	542991	0950	(28)	SP8	D 22	30.7	10.3	6.3	✓	3.6
Ebb Dry Sun		0955			M 14					
		1000			S 2	30.4	10.2	6.5	—	2.7

Log rept along East side of pilings (in St. Paul Wav)

5234904 (904)	542917	1015	(22)	SPN	D ~~20~~	30.9	10.3	6.2	—	0.6
		1020			M ~~[illegible]~~ 11	30.7	10.5	6.2	✓	1.7
		1025			S 2	30.6	10.3	6.3	—	2.0

Nail of oil boom at rig (ca. 20' ft N of rig)

5234884	542833	1030	(37)	SPNE	D 33	30.9	10.3	6.4	—	1.9
		1035			M 17	30.8	10.4	6.2	✓	1.5
Ebb Rm	1040	1040			S 2	30.6	10.3	6.2	—	2.1
5234884	542883	1045	(47)	SPNW	D ~~[illegible]~~ 50 st	31.0	10.3	6.1	—	1.7
Ebb/Slack		1050			M ~~[illegible]~~ 27 st	31.0	10.3	6.0	✓	0.4
		1055	(54) st		S 2	30.6	10.4	6.0	—	1.7

Continued on Page

Read and Understood By

Signed [signature] Date 02 12 18 Signed [signature] Date 02/12/18

Lloyd & Associates, Inc.
38210 SE 92nd Street, Snoqualmie, Washington 98065 425-888-1905(v/f) rml@centurytel.net

December 22, 2002

TRANSMITTAL

To: John O'Laughlin
Iain Wingard
From: Michael Lloyd

Subject: Weekly Water Quality Monitoring Report for week ending 12/22/02

This weekly water quality monitoring report summarizes water quality results for the week ending 12/22/02. During the past week, the following water quality monitoring events were conducted:

- St. Paul Waterway Compliance Monitoring
  Intensive Monitoring. Beginning on 12/13/02, the water quality monitoring team conducted intensive water quality monitoring for the removal of piling at the Middle Peninsula between the St. Paul Waterway and the Middle Waterway.
  Routine Monitoring. Beginning on 12/16/02, the water quality monitoring team conducted routine monitoring for the removal of piling at the Middle Peninsula.
  Cessation of Monitoring. On 12/19/02 water quality monitoring was discontinued per a directive from EPA to Iain Wingard. This directive was given orally just as the crew was getting ready to get on the water. A copy of the water quality certification/modification was received on 12/20/02

  Copies of revised daily reports for the St. Paul piling removal project are attached to this report. These revisions include TSS data that was not available at the time of preliminary submittal. These daily reports have been reviewed and data entries checked and corrected where applicable. Water quality compliance at the St. Paul piling removal area continues to meet specified water quality criteria. Dissolved oxygen levels for down current monitoring have ranged from a low of 5.1 mg/L to 6.2 mg/L. Turbidity values have also been low, ranging from 0.6 to 1.8 NTUs for down current monitoring. Temperatures have been very consistent for both up and down current locations.

  Dissolved oxygen levels at the 150' warning locations (within the mixing zone) have met water quality criteria for compliance boundary monitoring conducted at 300'. Although not required, we have also looked at turbidity and temperature at the 150' early warning locations. Both turbidity and temperature measurements were well within compliance criteria.

- Martinac Shipbuilding Monitoring
  A single water quality monitoring event was conducted during placement of the toe berm at Martinac. Water quality criteria were acceptable. No impact was observed with the placement of quarry spalls to construct the toe berm. Down current conditions during this event were very similar to up current conditions for all measured parameters.

RM Lloyd Approved 3/26/03

Lloyd & Associates, Inc.
38210 SE 92nd Street, Snoqualmie, Washington 98065 425-888-1905

December 27, 2002

TRANSMITTAL

To: Iain Wingard
John O'Loughlin

Subject: Daily Water Quality Report 12/27/02
Compliance Monitoring/Totem Marine

Attached please find results from complaince monitoring for toe berm installation at Totem Marine on 12/27/02. Construction was ongoing during monitoring. Data was collected with the YSI Sonde. The weather was cold and very windy. A final report will be generated as soon as TSS data is available from the laboratory.

WATER QUALITY WAS ACCEPTABLE.

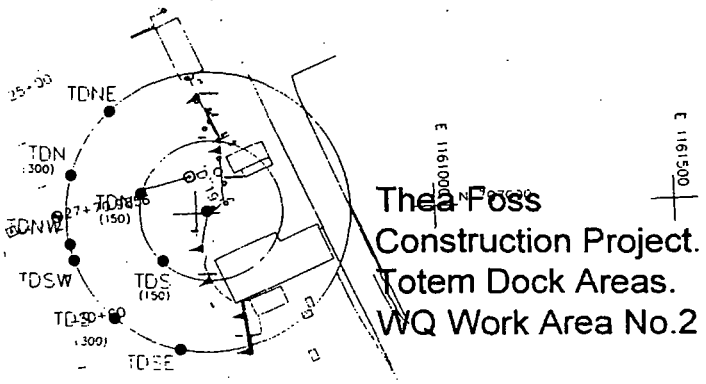
Water quality was acceptable at all down-current locations. Elevated turbidity was noticeable at the 150' location. Field duplicate measurements (see table) all less than 2% RPD. Sample 021227/M/TDS was split with City of Tacoma for Winkler Titration. A second set of Winkler titrations was conducted by monitoring team. Results summarized below:

- DO measured with the YSI Sonde = 6.3 mg/L
- DO measured by COT on Winkler Titration = 7.1 mg/L
- DO measure by L&AI on Winkler Titration = 6.3 and 6.6 mg/L

Dissolved Oxygen Average
Up-Current = 6.5 mg/L;
Down-Current Avg. = 5.8 mg/L;

Turbidity
Up-Current = 2.7 NTU;
Down-Current Avg. = 3.9 mg/L;

Temperature
Up-Current = 9.7 ^{0}C;
Down-Current Avg. = 9.6 ^{0}C



1/7/02 TSS Data included

Michael Lloyd/Date
Environmental Section

- Totem 12 27 02

Construction Compliance Monitoring

Date: 12/27 **Totem Marine - Ebb Tide**

Station	Depth/DTB (ft)	Salinity (ppt)	Salinity FD (ppt)	DO (mg/L)	DO/FD (mg/L)	Turbidity (NTU)	Turbidity FD (NTU)	Temp °C	Temp/FD °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	/Comment
TDNE/TOP (down)	2	28.1		6.0		8.5		9.5			5,234,826	542,859	1610	300' Compliance
021227/M/TDNE/A	14	30.1		5.5		1.4		9.8		5			1605	Ebb Tide
Deep	25/28	30.2		5.3		7.2		9.5					1600	
TDNW/TOP (down)	2	27.0		6.1		5.2		9.4			5,234,740	542,836	1625	300' Compliance
Mid	17	30.1	30.2	5.8	5.8	0.4	0.4	9.8	9.8	4			1620	
Deep	30/34	30.2		6.0		0.7		9.8					1615	
TDN150/TOP (down)	2	28.4		5.9		3.1		9.7			5,234,747	542,878	1555	150' Warning sample
021227/M/TDN150/A - MID	17	30.1		5.6		2.2		9.8		5/5			1550	North side of tug
Deep	30/33	30.1		5.7		12.8		9.8					1545	
TDS/TOP (up)	2	27.8		6.7		6.0		9.6			5,234,698	542,860	1520	Up Current sample.
021227/M/TDS/A - MID	18	30.1		**6.3**		0.4		9.8		4			1515	
Deep	32/36	30.1		6.4		1.7		9.8					1510	
Up current Average		**29.3**		**6.5**		**2.7**		**9.7**						
Down-Current Avg.		**29.3**		**5.8**		**3.9**		**9.6**						
Station 2+00 TOP	2	29.9		5.8		2.8		10.2			5,234,542	542,492	1640	Reference Station
021227/M/T2/A - MID	20	30.8		5.8		1.4		10.3		4			1635	
Deep	35/40	30.9		5.8		1.4		10.3					1630	
Average		30.5		5.8		1.9		10.3						

Pre-Survey Calibration	D. Berta 12/27	11.8 mg/L In DI water	DO calibrate in Saturated air/salinity correction	Weather Condtions Cloudy, cold, high winds
Post-Survey Calibration Check	S. High 12/27	11.4 mg/L In DI water	DO calibrate in Saturated air/salinity correction	

DO Calibration as per manufacturer's specifications. Presurvey calibration in DI was 11.8 as noted above.

Turbidity Calibration as per manufacturer's specifications. Calibration at 0 and 10 NTU's. Winkler samples collected with Wheaton Bottle

Winkler Titration conducted on sample 021227/M/TDS/A by Field team DO = 6.3, 6.8 mg/L

Winkler Titration conducted on sample 021227/MTDS/A - City of Tacoma. DO = 7.1 mg/L (Results phoned in by J. O'Loughlin)

Prepared By/Date:	*Revised 1/7/03 to include TSS data*	
M. Lloyd 12/27	M. Lloyd 1/7/03	**L&AI**

1/2/+/02

STL Seattle

Client Name	Lloyd & Assoc. Inc.
Project Name	Thea Foss
Date Received	12-27-02

General Chemistry Parameters

Client Sample ID 021227/M/TDS/A
Lab ID 110975-01

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	12-30-02	mg/L	4	2

N RM

Client Sample ID 021227/M/TH150/A
Lab ID 110975-02

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	12-30-02	mg/L	5	2

N RM

Client Sample ID 021227/M/TH150/DUP
Lab ID 110975-03

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	12-30-02	mg/L	5	2

N RM

Client Sample ID 021227/M/TDHE/A
Lab ID 110975-04

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	12-30-02	mg/L	5	2

N

Client Sample ID 021227/M/TDHW/A
Lab ID 110975-05

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	12-30-02	mg/L	4	2

Client Sample ID 021227/M/T2/A
Lab ID 110975-06

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	12-30-02	mg/L	4	2

STL Seattle

QUALITY CONTROL REPORT

Client Sample ID: Batch QC
Lab ID: 110978-6
QC Batch Number: 1114-146

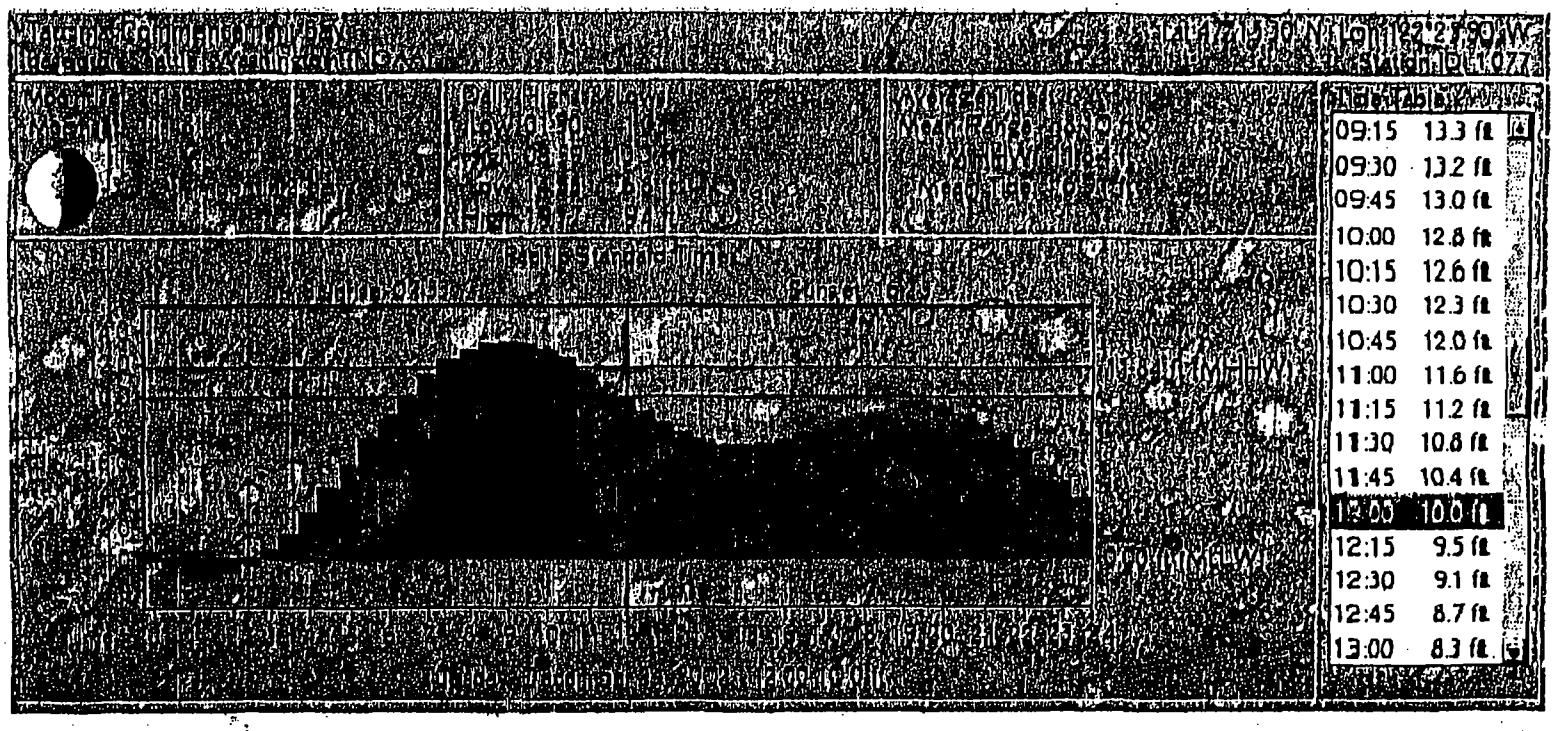
Method Blank

Parameter	Result (mg/L)	PQL
Total Suspended Solids	ND	2

Duplicate

Parameter	Sample Result (mg/L)	Duplicate Result (mg/L)	RPD (%)	Flag
Total Suspended Solids	4.8	5.17	7.4	

OK, [illegible]


09:15 13.3 ft
09:30 13.2 ft
09:45 13.0 ft
10:00 12.8 ft
10:15 12.6 ft
10:30 12.3 ft
10:45 12.0 ft
11:00 11.6 ft
11:15 11.2 ft
11:30 10.8 ft
11:45 10.4 ft
12:00 10.0 ft
12:15 9.5 ft
12:30 9.1 ft
12:45 8.7 ft
13:00 8.3 ft

021222

Thea Foss

Water Quality Monitoring Location

Work Zone No. 3 (south-most) 1

	Northing	Easting
Center of Work Zone No. 2	5233 ~~668~~ 759	542 ~~9[illegible]~~ 921
TD NE	5233 ~~745~~ 826	542 ~~893~~ 857
TD N (300)	5233 ~~708~~ 784	542 ~~863~~ 836
TD N (150)	5233 ~~688~~ 772	542 ~~905~~ 881
TD NW	5233 ~~661~~ 740	542 ~~854~~ 836
TD SW	5233 ~~630~~ 728	542 ~~860~~ 837
TD S (300)	5233 ~~597~~ 690	542 ~~888~~ 864
TD S (150)	5233 ~~632~~ 727	542 ~~916~~ 894
TD SE	5233 ~~578~~ 670	542 ~~932~~ 905

SDM

Calibration 610 DM / Recorded by RM

Depth = 1 ft ✓

Conduct @ 50 mS ✓ (Full above probe hole dead 2"

Lot # 021023 YSI 50 mS Exp 5/2004 (~~130~~ 130 ml of solution)

Dissolved oxygen ✓ 30 ml H_2O + in air as H_2O saturation

Rinse w/ DI

BP = 755.4 mmHg ✓ Stabilize for 40 sec

Successful cal. = 11.01 mg/L

Turbidity Std. Calibration.

0.0 NTU = deionized water ok RM

10.0 NTU = Hach Stable Calc. 10 NTU. ok RM

washed lens w/ brush

rinsed w/ DT + recalibrated.

cleaned optics + ran wiper motor (key 3)

Test Trial / Foss Waterway Marina

2.0' = depth

T = 9.4

Sal = 28.0

DO = 5.8

Turb = 0.4

Calibration Successful for all parameters. RM

Continued on Page

Read and Understood By

RM [signature] 12/27

Signed Date Signed Date

PROJECT Fwl

Notebook No.

Continued From Page

12/27/02 1410 PM

206

Calibrate YSI 650MDS (second head unit)

423-0388

Marty

DO = 11.8 mg/L calibration in saturated air

calibration acceptable

Turbidity cal @ 0 and 10 NTU. Check 10.0 = 10.2

calibration acceptable

~~T = 9.4~~

~~D = 2~~

~~Sal = 28.1~~

~~=~~

YSI Sonde

Sal = 28.3 (entered)

Calibrated - Test Run at Marina = ~~6.5~~ 7.5 mg/L

YSI 550

Calibrated = 7.6 mg/L

Weather Conditions

Strong wind from South

Occasional but short showers

Continued on Page

Read and Understood By

RM Lloyd 12/27 | | | 030205

Signed | Date | Signed | Date

PROJECT Hen

Notebook No.

Continued From Page

02 12 27

Area No. 3

	N	E
center of work area	5233736	542921
TDNE	5233802	542858
TDN(300)	5233761	542832
TDN(150)	5233747	542878
TDNW	5233715	542834
TDSE	5233705	542835
TDS(300)	5233668	542860
TDS(150)	5233701	542889
TDSW	5233687	542905

Continued on Page

Read and Understood By

Signed Date Signed Date

PROJECT

Notebook No.

Continued From Page

TD = tofen dock

Continued on Page

Read and Understood By

Signed	Date	Signed	Date

PROJECT [illegible]

Continued From Page

021227

	Z	DTB	Sal	PH	Dep	T°C	Sal	DO	TBD	Turb
6										COT
868	1510	36	TDS Ebb (302)	P	32	9.8	30.1	6.4		1.7
	1515			M	18	9.8	30.1	6.3	7.1	0.4
	1520			S	2	9.6	27.8	6.7		6.0

DO bottles (salt sample at 2d - 18 ft.)

Sample # 021227/M/TDS/A collected w/ Wheaton + transfered to DO Bottle. Winkler sample collected for Citry + L+A I. Added 2 ml of each reagent, [illegible] agent for L+A sample

7/7	878	150' Sample	TDN Ebb (COT)	D	30	9.8	30.1	5.7	12.2	
		1545		M	17	9.8	30.1	5.6	2.2	
		1550	33	S	2	9.7	28.4	5.9	3.1	
		1555								

Nothing at N side of Twy

Sample 021227/M/TN150/A Elevated turbidity at 150' for TSS

										TSS
	554	1600	TDNE Ebb	D	25	9.8	30.2	5.6	7.2	
		1605		M	14	9.8	30.1	5.5	1.4	✓
	28'	1610		S	2	9.5	28.1	6.0	8.5	

TSS Sample ID 021227/M/TDNW/A

										TSS
740	536	1615	TDNW Ebb	D	30	9.6	29.2	6.7	3.0	✓
San		1620	DTB = 34'	M	17	9.6	29.1	6.3	2.8	
		1625		S	2	9.7	29.2	5.5	2.4	

TSS Sample 021227/M/TDNW/A

D	30	9.8	30.2	6.0	0.7		
M	17	9.8	30.1	5.8	0.4		
S	2	9.4	27.0	6.1	5.2		
Duplicate-M	17	9.8	30.2	5.8	0.4		

Repeat

Continued on Page

Read and Understood By

RM Floyd — Signed — 12/27 — Date — Signed — Date

PROJECT

Notebook No.

Continued From Page

Continued on Page

Read and Understood By

Signed	Date	Signed	Date

12/27/02 ; T2+00

		T	Sal	DO	Turb.	TSS
1630 PM	35	9.8	30.2	5.8	0.2	
1635		9.8	30.2	6.2	0.2	021227/MN/T2/A
1640 PM		9.6	28.7	6.5	1.4	

Calibration check = 11.4 @ 1645 PM

Dissolved Oxygen 8215/Azide modification of Winkler Method

Titration #1 100 ml x 0.02 x 315 = 6.3

Titration #2 50 ml x 0.02 x 169 x2 = 6.76

Continued on Page

Read and Understood By

FML 12/27

Signed Date Signed Date

Lloyd & Associates, Inc.
38210 SE 92nd Street, Snoqualmie, Washington 98065 425-888-1905

December 28, 2002

TRANSMITTAL

To: Iain Wingard
John O'Loughlin

Subject: Daily Water Quality Report 12/28/02 AM
Compliance Monitoring/Totem Marine - ~~Preliminary~~ FINAL

Attached please find results from complaince monitoring for toe berm installation at Totem Marine on 12/28/02. Toe berm construction was ongoing with quarry spalls during monitoring. Data was collected with the YSI Sonde. The weather was cold and strong wind from the north during this flood tide event. Actual high tides were approximately 1' higher than tide charts predicted. A final report will be generated as soon as TSS data is available from the laboratory.

WATER QUALITY WAS ACCEPTABLE.

Water quality was acceptable at all down-current locations although shallow fresh water with lower salinity at TDSW did contain elevated turbidity at 11.9 NTU. Field duplicate measurements (see table) indicate the reproducibility of measurments and good precision. Two samples (essentially field duplicates) were collected for Winkler Titration Methodology for dissolved oxygen measurement by the City of Tacoma and our project team. Results summarized below:

021228/M/TDS150/A (midpoint depth)

- DO measured with the YSI Sonde = 7.8 mg/L
- DO measured by COT on Winkler Titration = 6.7 mg/L
- DO measure by L&AI on Winkler Titration = 7.0 mg/L

021228/M/TDSW/A (midpoint depth)

- DO measured with the YSI Sonde = 7.3 mg/L
- DO measured by COT on Winkler Titration = 7.0 mg/L
- DO measure by L&AI on Winkler Titration = 6.7 mg/L

Dissolved Oxygen Average

Up-Current = 7.8 mg/L;
Down-Current Avg. = 7.6 mg/L;

Turbidity

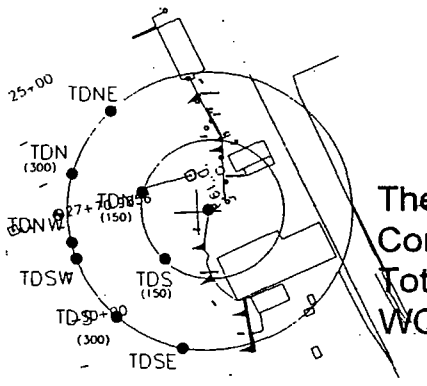
Up-Current = 0.9 NTU;
Down-Current Avg. = 3.1 mg/L;

Temperature

Up-Current = 9.6 ^{0}C;
Down-Current Avg. = 9.6 ^{0}C

Revised to include TSS
BML 1/8/03

Michael Lloyd/Date
Environmental Section



Thea Foss
Construction Project.
Totem Dock Areas.
WQ Work Area No.2

- Totem 12 28 02

Lloyd & Associates, Inc.
38210 SE 92nd Street, Snoqualmie, Washington 98065 425-888-1905 425-785-1357 (cell)

December 28, 2002

TRANSMITTAL

To: Iain Wingard
John O'Loughlin

Subject: Daily Water Quality Report 12/28/02 PM
Compliance Monitoring/Totem Marine - Preliminary

Attached please find results from compliance monitoring for sand filter cap and toe berm installation at Totem Marine on 12/28/02. Sand cap placement was ongoing during monitoring. Data was collected with the YSI Sonde. The weather was cold and strong wind from the north during this early ebb tide event. Actual high tides were approximately 1' higher than tide charts predicted. A final report will be generated as soon as TSS data is available from the laboratory.

WATER QUALITY WAS NOT ACCEPTABLE. FOR FILTER CAP PLACEMENT

Water quality was not acceptable for averaged down-current locations. In particular a turbidity of 42 NTU's was observed at a depth of 17' (midpoint station) at the 300' down-current location of TDNE. Repeat analysis of this data point from a field duplicate taken within 10 minutes showed a turbidity of 38 NTU. An earlier reading at the TDN 150' station (early warning station) showed a turbidity of 48.2 NTU at the midpoint depth of 18'. After confirming the earlier measurement and checking the readings against a standard, I contacted ACC-Hurlen personnel on board the derrick and indicated that they would have to cease operations until the turbidity returned to acceptable levels. ACC-Hurlen indicated that they were at a good stopping point and elected to cease placing filter material for the day. The time was about 4 PM. By 4:30 PM the elevated turbidity had returned to 5.6 NTU.

Based on comments made by ACC-Hurlen, they believed that the filter material was causing the observed turbidity. Because ACC-Hurlen had stopped in-water work for the day at Totem Marine, we discontinued monitoring. The recovery time for return to acceptable turbidity is believed less than 60 minutes and may in fact be closer to 45 minutes as there was a strong current by 4:30 PM on the ebb tide.

After talking with Iain Wingard, I called both Piper Peterson Lee and John Malek to notify them of the action taken (stopping filter material placement). I left messages on phone machines and was not able to talk directly with EPA.

The data set collected also shows that shallow fresh water with substantially lower salinity and higher dissolved oxygen was observed at all stations including Ambient Station 2+00. Strong north winds and high tides potentially pushed lighter/floating fresh water into the Thea Foss during the preceding high tide. This conjecture is supported by salinity data, dissolved oxygen data (characteristic of fresh water), temperature data, strong wind from the north, and visual observation of greenish "glacial bloom" typical of the Puyallup River. Rain falling throughout the day (at times heavy) would also contribute stormwater (lower salinity) to the Thea Foss. Sorting out the relative contributions is beyond the scope of our data set

Water quality criteria and methodology for handling water quality compliance issues were relatively clear as presented in the bid specification initially adopted by EPA. For example, the bid specification prescribed that all water quality measurements for the down-gradient stations be averaged to determine compliance. After reviewing the water quality certification recently issued by EPA, the certification is silent as to the possibility of averaging. Although in the given circumstance the distinction may be meaningless, there may be an occasion where different data/compliance assessment procedures would yield different results. For the purposes of this compliance assessment and the stop work order issued, I reached my conclusions under the working assumption that the water quality certification did not contemplate down-current data averaging. Clarification on the issue of data averaging is desirable.

Our project team will meet in the morning to discuss options for reducing filter cap derived turbidity before any related placement is conducted. Potential options include:

- Slowing the rate of filter cap placement
- Placement of filter cap material closer to the slope
- Alternating filter cap and quarry spall placement to minimize the short tem impact.
- Securing a source of filter cap material that contains fewer fines (washed or screened to reduce fines that are likely causing the observed turbidity.

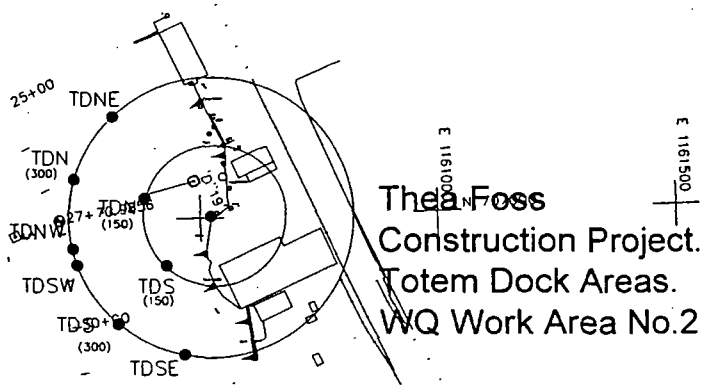
Field duplicate measurements (see monitoring data attached) indicate the reproducibility of measurements and reasonably good precision, except at the lowest turbidity levels where small changes increase the RPD as would be expected.

Field monitoring results are summarized below:

Dissolved Oxygen Average
Up-Current = 7.8 mg/L;
Down-Current Avg. = 7.7 mg/L;

Turbidity
Up-Current = 7.3 NTU;
Down-Current Avg. = 14.2 mg/L
(with a high of 42 NTU at station TDNE)

Temperature
Up-Current = 9.4 °C;
Down-Current Avg. = 9.4 °C



Michael Lloyd/Date
Environmental Section

Construction Compliance Monitoring

Date: 12/28 **Totem Marine - Flood Tide AM**

Station	Depth/D TB (ft)	Salinity (ppt)	Salinity FD (ppt)	DO (mg/L)	DO/FD (mg/L)	Turbidity (NTU)	Turbidity FD (NTU)	Temp °C	Temp/FD °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
TDSE/TOP (down)	2	29.1		7.4		1.2		9.5			5,233,670	542,905	905	Maximum Flood at 0756
021228/TDSE/M/A	19	30.0		6.9		0.8		9.8		3			900	rain/wind
Deep	35/39	30.1		6.8		2.1		9.9					855	
TDSW/TOP (down)	2	22.5		10.0		11.9		9.0			5,233,728	542,837	925	Near influence of storm drain
021228/TDSW/M/A	20	30.0		**7.3**	Winkler	0.7		9.8		5			920	from City of Tacoma, fresher
Deep	35/40	30.1		7.3		1.8		9.8					915	water in upper layer.
TDS(150/TOP down)	2	27.7	26.9	7.8	7.9	2.1	2.3	9.1	9.8		5,233,727	542,894	850	No water quality impacts
021228/TDS/M/A - MID	19	29.9	29.9	6.9	7.2	0.2	0.7	9.8	9.8	4			845	at 150' early warning
Deep	36/39	30.0	30.0	6.8	7.1	2.2	3.2	9.8	9.3				840	near debris containment
TDN/TOP (up)	2	27.6		8.4		1.4		9.2			5,233,784	542,836	820	
021228/TDN/M/A - MID	19	29.9		**7.8**	Winker	0.5		9.8		3			815	Field Duplicate for Winkler
Deep	35/38	29.9		7.3		0.8		9.9					810	
Up current Average		**29.1**		**7.8**		**0.9**		**9.6**						
Down-Current Avg.		**28.6**		**7.6**		**3.1**		**9.6**						
Station 2+00 TOP	**Station 2+00 Monitoring conducted before afternon monitoring**													Appears to be a very high tide
021228/T2/M/A - MID	See PM event.									X				coming in as pushed by winds
Deep														from North
Average														

Pre-Survey Calibration	S. High 12/28	11.4 mg/L In DI water	DO calibrate in Saturated air/salinity correction	Weather Condtions Cloudy, cold, windy from N, rain showers
Post-Survey Calibration Check	M. Lloyd 12/28	11.97 mg/L In DI water	DO calibrate in Saturated air/salinity correction	

DO Calibration as per manufacturer's specifications. Presurvey calibration in DI was 11.8 as noted above.

Turbidity Calibration as per manufacturer's specifications. Calibration at 0 and 10 NTU's. Winkler samples collected as FD with Wheaton Bottle

Winkler Titration conducted on sample 021228/M/TDN/A by Field team DO = 7.0 mg/L

Winkler Titration conducted on sample 021228/M/TDN/A - City of Tacoma. DO = 6.7 mg/L (Results phoned in by J. O'Loughlin)

Winkler Titration conducted on sample 021228/M/TDSW/A by Field team DO = 6.7 mg/L

Winkler Titration conducted on sample 021228/M/TDSW/A - City of Tacoma. DO = 7.0 mg/L (Results phoned in by J. O'Loughlin)

Prepared By/Date:

M. Lloyd 12/28

Revised with TSS data

1/7/03

L&AI

Construction Compliance Monitoring **Date: 12/28** **Totem Marine - Early Ebb Tide PM**

Station	Depth/D TB (ft)	Salinity (ppt)	Salinity FD (ppt)	DO (mg/L)	DO/FD (mg/L)	Turbidity (NTU)	Turbidity FD (NTU)	Temp °C	Temp/FD °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
TDNE/TOP (down)	2	**21.7**	**21.8**	**9.1**	**10.5**	**16.7**	**14.7**	**8.4**	**8.3**		5,234,826	542,859	1535	
021228/TDNE/M/B	17	29.5	29.6	6.9	7.4	**42.0**	**38.2**	9.8	9.8	14			1530	Turbidity plume at mid-depth
Deep	31	30.1	30.0	6.8	7.6	5.7	9.6	9.9	9.9				1525	
TDNW/TOP (down)	2	**21.7**		**9.5**		**18.6**		**8.4**			5,234,740	542,836	1500	Salinity/DO at shallow depth
021228/TDNW/M/B	19	29.7		6.9		0.7		9.8		5			1455	indicative of fresh water from
Deep	35	30.1		6.9		1.4		9.9					1450	river blown in by 20-25 mph wind
TDN150/TOP (down)	2	**22.0**		**9.9**		**14.6**		**8.4**			5,234,824	542,881	1515	DO acceptable at early warning
021228/TDN150/M/A - MID	18	29.6		6.8		48.2		9.8		27			1510	Adjacent to tug
Deep	32	30.0		6.9		14.6		9.9					1505	
TDS/TOP (up)	2	**21.5**		**9.5**		**19.1**		**8.4**			5,234,690	542,864	1445	Salinity/DO at shallow depth
021228/TDS/M/B - MID	19	29.7		6.9		1.0		9.8		4/5			1440	indicative of fresh water from
Deep	35	30.1		7.0		1.7		9.9					1435	river blown in by 20-25 mph wind
Up current Average		**27.1**		**7.8**		**7.3**		**9.4**						
Down-Current Avg.		**27.1**		**7.7**		**14.2**		**9.4**						
Station 2+00 TOP	2	**21.3**		**10.6**		**14.5**		**8.4**			5,234,542	542,492	1435	Salinity/DO at shallow depth
021228/T2/M/B - MID	22	29.6		7.4		1.5		9.7		6			1430	indicative of fresh water from
Deep	41	30.0		7.2		1.4		9.8					1425	river blown in by 20-25 mph wind
Average		27.0		8.4		5.8		9.3						

Pre-Survey Calibration	S. High 12/28	11.98 mg/L In DI water	DO calibrate in Saturated air/salinity correction	Weather Condtions Cloudy, cold, high winds, rain (showers & squalls)
Post-Survey Calibration Check	S. High 12/27	11.8 mg/L In DI water	DO calibrate in Saturated air/salinity correction	

DO Calibration as per manufacturer's specifications.

Turbidity Calibration as per manufacturer's specifications. Calibration at 0 and 10 NTU's.

Field Duplicate data for sample location taken as a matter of course to check results and provide precision information

See turbidity discussion in text portion of submittal. Turbidity returned to 5.6 NTU at 4:30 PM (1640)

Prepared By/Date:	Revised with TSS data	
M. Lloyd 12/28	1/7/03	L&AI

STL Seattle

Client Name	Lloyd & Assoc. Inc.
Project Name	Thea Foss
Date Received	12-30-02

General Chemistry Parameters

Client Sample ID 021228/TDSW/M/A
Lab ID 110978-01

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	12-31-02	mg/L	5	2

Client Sample ID 021228/TDS/M/A
Lab ID 110978-02

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	12-31-02	mg/L	4	2

Client Sample ID 021228/TDSE/M/A
Lab ID 110978-03

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	12-31-02	mg/L	3	2

Client Sample ID 021228/TDN/M/A
Lab ID 110978-04

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	12-31-02	mg/L	3	2

Client Sample ID 021228/TDNE/M/B
Lab ID 110978-05

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	12-31-02	mg/L	14	2

Client Sample ID 021228/TDNW/M/B
Lab ID 110978-06

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	12-31-02	mg/L	5	2

STL Seattle

Client Sample ID	021228/TDS/M/B
Lab ID	110978-07

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	12-31-02	mg/L	4	2

Client Sample ID	021228/TDS/M/B/DUP
Lab ID	110978-08

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	12-31-02	mg/L	5	2

Client Sample ID	021228/TDN150/M/B
Lab ID	110978-09

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	12-31-02	mg/L	27	2

Client Sample ID	021228/T2/M/B
Lab ID	110978-10

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	12-31-02	mg/L	6	2

Client Sample ID	021229/TDN150/M/A
Lab ID	110978-11

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	12-31-02	mg/L	3	2

Client Sample ID	021229/TDNE/M/A
Lab ID	110978-12

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	12-31-02	mg/L	3	2

Client Sample ID	021229/TDS/M/A
Lab ID	110978-13

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	12-31-02	mg/L	3	2

STL Seattle

Client Sample ID	021229/TDNW/M/A
Lab ID	110978-14

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	12-31-02	mg/L	3	2

Client Sample ID	021229/T2/M/A
Lab ID	110978-15

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	12-31-02	mg/L	4	2

STL Seattle

QUALITY CONTROL REPORT

Client Sample ID: 021228/TDNW/M/B
Lab ID: 110978-06
QC Batch Number: 1114-146

Method Blank

Parameter	Result (mg/L)	PQL
Total Suspended Solids	ND	2

Duplicate

Parameter	Sample Result (mg/L)	Duplicate Result (mg/L)	RPD (%)	Flag
Total Suspended Solids	4.8	5.17	7.4	

021228

0630 barometric pres = 757.68
calibrate YSI 650 data sonde
- enter barometric pressure = 757.68
- calibrate DO in % in air over dri
- cal. turb @ 0.0 NTU (DI) & 10 ntu. (Hach & Sigma/DVB copolymer (YSI 6073, 1° turb standard detector cert in D1 lab code: KØ724Ø2), exp by 7/24/2004.)
- no calibration problems
- calibrate chart in D1 = DO @ 8.7 mg/L in water

021228 — Totem Marine Dock = TD 3 RWL
Calibrate by S.H prior to service. Check = 11.4 mg/L in saturated air

N	E									
731	836	TDN								
					TC	Salinity	DO	Turb		
DTB=38		810	D	35	9.9	29.9	7.3	0.8		FLOOD
		815	M	19	9.8	29.9	7.8	0.5	V	
		820	S	2	9.2	27.6	8.4	B 1.4		TIDE
								6.7		B"
727	894	39 DTB		021228 TDS (152)		Totem 150			B	FOR LAB
		840	D	36	9.8	30.0	6.8	2.2		
		845	M	19	9.8	29.9	6.9	0.2		TDS 150
		850	S	2	9.1	27.7	7.5	2.1		
			D	36	9.5	30.0	7.1	3.2		
			M	19	9.8	29.9	7.2	0.7		
			S	2	9.3	26.9	7.9	2.3		
N	E	DTB								
670	915	39	D	35	9.9	30.1	6.8	2.1		TDE
		855	M	19	9.8	30.0	6.9	0.8		
		855	S	2	9.5	29.1	7.4	1.2		021228 TDE
729	837	9:00								M/A
		Next Page								

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Read and Understood By

Signed	Date	Signed	Date
[illegible]	12/28/02 PM	[illegible]	021228

PROJECT

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Read and Understood By

Signed	Date	Signed	Date

021228/TDSW/M/A

			T	Sal	DO	Turb	TSS	
723/837	35	915	9.8	30.1	7.0	3.6		Traffic
(40)	20	920	9.8	30.0	7.0	0.4	✓	Traffic
	~~2~~	~~925~~	~~8.6~~	~~30.~~	~~9.4~~	~~13.2~~		Boat Turbidity
PM	~~30~~ 35	915	9.8	30.1	7.3	1.8		
	20	920	9.8	30.0	7.3	0.7		— COT
	2	925	9.0	22.5	10.0	11.9		→ 7.0 COT

(C)

Weather = rain wind from North
Will pickup 2+00 before next sampling round

Samples submitted to City of Tacoma collected as field duplicates from a drop with Wheaton Bottle. Sample collected at TDSW at shallow depth was very low salinity from stormwater discharge on westside of Thea Foss. Turbulence + turbidity not observed in upgradient or other sample to

Calibration Check = 11.97 @ RMLL 12/25/02

Instrument Recalibrated by M. Lloyd + S High

Turbidity run after 0,10 STD = 9.6
Dissolved Oxygen Calibrate in = 11.98

Station 2+00 021228/T2/M/B

(45) 1425	D	41	9.8	30.0	7.2	1.4	
1430	M	22	9.7	29.6	7.4	1.5	✓ 021228/T2/M/B
1435	S	2	8.4	21.3	10.6	14.5	

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Read and Understood By

R M Lloyd — Signed
12/28/02 — Date
Signed
Date

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Continued From Page

1.0
19.1
1.7
21.8
3 | 2
7.6

3
1.4
0.7
18.6
25.7
42.0
16.7
85.1

4
0.7
3 | 2
1.8
2.7

15.2
6 | 85.1
6
25
24
11

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Signed Date Signed Date

Storm TDS (300) N 690 E 864 Up Current Ebb tide Monitoring

38

			T°C	Sal	DO	Turb	
~~1445~~	~~1435~~	35	9.9	30.1	7.0	1.7	
~~1440~~	1440	19	9.8	29.7	6.9	1.0	
~~1445~~	1445	2	8.4	21.5	9.5	19.1	High up gradient

1440 021228/TDS/M/B TSS collection + TSS Dupe @ d = 19

TDNW (300) N 740 E 836 Down Current Ebb

38

1450	35	9.9	30.1	6.9	1.4
1455	19	9.8	29.7	6.9	0.7
1500	2	8.4	21.7	9.5	18.6

1455 TDNW 021228/TDNW/M/A

TDN (150') (@ tug, north side) → pm
storm N 772 E 881
actual N 824 E 881

36

1505	32	9.9	30.0	6.89	5.0
1510	18	9.8	29.6	6.8	48.2 ← high at 150'
1515	2	8.4	22.0	9.9	14.6

1510 021228/TDNW/M/A – TSS collection

34 ~~1523~~ TDNE N 826 E 859

1525	31	9.9	30.1	6.8	5.7
1530	17	9.8	29.5	6.9	42.0 High Turbidity
1535	2	8.4	21.7	9.1	16.7

P

Field Duplicate

31	9.9	30.0	7.6	9.6
17	9.8	29.6	7.4	38.2
2	8.3	21.8	10.5	14.7

206-571-1890

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Read and Understood By

Signed	Date	Signed	Date

021228	DTB	TD NE	T	Sal	DO	Turb
1630 hrs.	33	D 30	9.9	30.1	8.7	2.0
		M 17	9.8	29.5	9.2	5.6
		S 2	8.4	21.6		12.0
1640 hrs.						2.1
						7.6
						10.6

post Sampling Calibration DO over saturated air = 11.8 mg/L

Turbidity = 11.5 in yr standard (10 ntu)

Winkler Titration w/ MACH

B #1 351 on digimeter x100 ml x.02 = 7.0

CB #2 334 on " x100 x.02 = 6.7 mg

12/29/02 ISI Sonde Calibration BP = 761.24

DO calibrate acceptable @ 10.1 mg/L
Turbidity calibration acceptable @ 0 NTU, 10 NTU, 100 NTU } 3 point

check w/100 = 103.3 NTU

Check in DI water T = 16.4
Sal = 0.0
DO = 10.0
Turb = 0.0

1116 ↓ [signature] 12/29

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Read and Understood By

[signature] 12/28 4/12/29

Signed Date Signed Date

Lloyd & Associates, Inc.
38210 SE 92nd Street, Snoqualmie, Washington 98065 425-888-1905

December 29, 2002

TRANSMITTAL

To: Iain Wingard
John O'Loughlin

Subject: Daily Water Quality Report 12/29/02
Compliance Monitoring/Totem Marine - ~~Preliminary~~ RM

Attached please find results from compliance monitoring for filter cap placement at Totem Marine on the afternoon of 12/29/02. Filter cap placement was ongoing just as we were taking our first water quality measurements, so there really was not time for turbidity, if present, to disperse. Our first measurements were taken at a slack tide at high tide. We set up for an ebb tide sampling scheme because an ebb tide would follow in the early afternoon.

Prior to filter cap placement, we met with ACC-Hurlen to discuss options for reducing the lateral spread of turbidity as observe the previous day. We agreed that placement would be slower and that the box would be first lowered into the water to allow water to come up through the box to minimize entrainment of air and increased disturbance of the filter cap material. I observed the process from close range. The filter cap material does contain substantial fines, which contribute to turbidity when, first place in the water. Nevertheless, observed turbidity disperses relatively quickly. In part the containment of elevated turbidity was also aided by the slack tide since there were not strong currents sweeping the work zone so particulate matter had an opportunity to settle.

Stratification (freshwater lying on top of salt water) as observed the previous evening was not observed. Water clarity was excellent throughout the Thea Foss from Station 2+00 to Totem Marine.

WATER QUALITY WAS ACCEPTABLE.

Water quality was acceptable at all up and down-current locations. Dissolved oxygen at the early warning boundary was 5.3 mg/L. A single sample was collected with the Wheaton sampler and analyzed by the City of Tacoma Laboratory. The results, like previous results, are very comparable. Monitoring results summarized below:

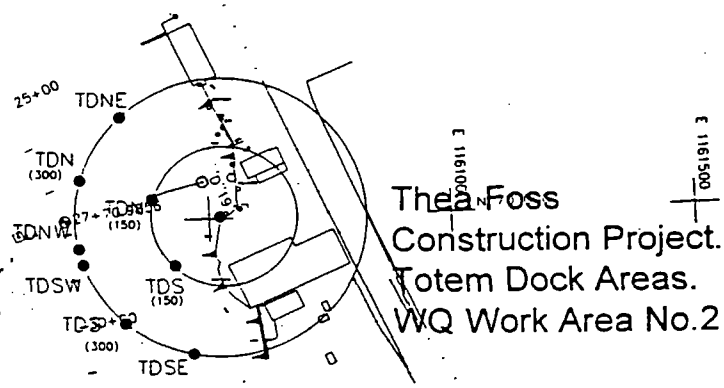
021229/M/TDNE/A (midpoint depth)

- DO measured with the YSI Sonde = 6.5 mg/L
- DO measured by COT on Winkler Titration = 6.8 mg/L

Dissolved Oxygen Average (2nd round of sampling at Ebb Tide)
Up-Current = 6.6 mg/L;
Down-Current Avg. = 6.0 mg/L;

Turbidity
Up-Current = 4.9 NTU;
Down-Current Avg. = 1.7 mg/L;

Temperature
Up-Current = 9.7 °C;
Down-Current Avg. = 9.7 °C



Michael Lloyd/Date
Environmental Section

Revised to include TSS 1/7/03

- Totem 12 29 02.doc

Construction Compliance Monitoring **Date: 12/28** **Totem Marine - Slack to Ebb Tide**

Station	Depth/ DTB (ft)	Salinity (ppt)	Salinity FD (ppt)	DO (mg/L)	DO/FD (mg/L)	Turbidity (NTU)	Turbidity FD (NTU)	Temp °C	Temp/FD °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
TDNE/TOP (down)	2	28.7	27.9	6.6	7.2	5.0	4.3	9.6	9.5		5,234,826	542,859	1240	Slack Tide (High tide)
021229/TDNE/M/A	21	30.0	30.0	**6.5**	6.3	0.3	0.7	9.8	9.8	3			1235	Field duplicate collected after
Deep	38/42	30.1	30.1	6.4	6.3	0.6	0.6	9.8	9.8				1230	initial data collection
TDNW/TOP (down)	2	28.5		6.2		3.1		9.6			5,234,740	542,836	1305	Beginning of Ebb tide
021229/TDNW/M/A	20	30.0		6.0		0.1		9.8		3			1300	
Deep	37/41	30.1		6.0		0.3		9.8					1255	
TDN150/TOP (down)	2	28.2		6.7		3.1		9.4			5,234,795	542,881	1220	DO acceptable at early warning
021229/TDN150/M/A - MID	20	30.0		6.7		0.5		9.8		3			1215	Adjacent to tug
Deep	35/40	30.0		6.6	6.6	0.5		9.8					1210	FD measured with YSI 550
TDS/TOP (up)	2	28.4		6.2		1.6		9.6			5,234,690	542,864	1445	Beginning of Ebb tide
021229/TDS/M/A - MID	19	30.0		6.0		1.7		9.8		3			1440	
Deep	37/41	30.1		6.0		0.4		9.8					1435	
Up current Average		**29.5**		**6.1**		**1.2**		**9.7**						
Down-Current Avg.		**29.6**		**6.3**		**1.6**		**9.7**						
Station 2+00 TOP	2	29.2		8.2		0.7		9.7			5,234,542	542,492	1205	Slack Tide
021229/T2/M/B - MID	25	30.0		7.8		0.0		9.8		4			1200	Water extremely clear. Lots of
Deep	45/49	30.0		7.9		0.0		9.8					1155	Herring in water below boat.
Average		29.7		8.0		0.2		9.8						Visibility at least 25 feet
Pre-Survey Calibration		M. Lloyd 12/29		10.0	mg/L In tap water		DO calibrate in Saturated air/salinity correction						Weather Condtions Clear, cold, light wind from north. T = 8.4 °C	
(See next Page		S. High 12/29		9.6	mg/L In tap water									

DO Calibration as per manufacturer's specifications. Barometric pressure 15 points higher than yesterday at 761.2 mmHg

Turbidity Calibration as per manufacturer's specifications. Calibration at 0, 10 and 100 NTU's. 100 NTU check at 103.3 NTU's

Crews had just stopped placing filter cap material just as we were taking our first sample. Earlier in the morning they were doing an underwater survey

Sample 021229M/TDNE/A analyzed in field by monitoring team DO = 6.5 mg/L

Sample 021229M/TDNE/A analyzed by City of Tacoma Lab by Winkler DO = 6.8 mg/L

Prepared By/Date: M. Lloyd 12/29 [illegible]

Revised to include TSS [illegible] 1/7

L&AI

Construction Compliance Monitoring - Continued

Date: 12/29 **Totem Marine - Slack to Ebb Tide**

Station	Depth/DTB (ft)	Salinity (ppt)	Salinity FD (ppt)	DO (mg/L)	DO/FD (mg/L)	Turbidity (NTU)	Turbidity FD (NTU)	Temp °C	Temp/FD °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
TDNE/TOP (down)	2	28.1		6.2		7.3		9.5			5,234,826	542,859	1346	Ebb Tide
Mid	20	30.0		5.7		0.3		9.8		NS			1344	
Deep	35/39	30.1		5.6		0.5		9.8					1342	
TDNW/TOP (down)	2	27.3		6.4		0.9		9.5			5,234,836	542,864	1357	
Mid	21	30.0		5.9		0.9		9.8		NS			1356	Extremely clear water
Deep	36/41	30.1		6.1		0.0		9.8					1354	
TDN150/TOP (down)	2	28.9		5.4		6.1		9.6			5,234,795	542,881	1340	
Mid	20	30.0		5.5		2.6		9.8		NS			1335	
Deep	37/41	30.1		5.3		4.2		9.8					1330	
TDS/TOP (up)	2	25.8		7.2		1.6		9.4			5,234,690	542,864	1404	
Mid	19	30.0		6.3		3.8		9.8		NS			1402	
Deep	35/39	30.1		6.2		9.3		9.8					1400	
Up current Average		**28.6**		**6.6**		**4.9**		**9.7**						
Down-Current Avg.		**29.3**		**6.0**		**1.7**		**9.7**						

Comments:

Work presented here is a continuation of water quality monitoring presented in the previous page. Last night our project team met with ACC Hurlen to discuss options to reduce turbidity observed on 12/28. Although there were a number of options, we agreed to go with a slower placement combined with easing the box into the water and allowing the water to rise through the sand. More rapid placement entrains air and stirs the water rapidly. We also agreed to place the material at a distance closer to the bottom although this aspect of the operations change was not always observed, but was corrected before completing water quality monitoring in the second go around.

Although operational changes had a positive impact, the fact that there was a slack tide also tended to keep any turbidity more localized and not drifting toward the compliance boundary. M. Lloyd observed the placement at a close distance of 20+ feet. The major portion of turbidity occurred at the first touch with water. This turbidity bloom tended to sink and/or rapidly disperse as visibility in the water was actually quite good in the work zone.

Instrument calibration chek at the end of the day agreed well with initial calibration numbers.

Prepared By/Date:

M. Lloyd 12/29

No revisions

L&AI

STL Seattle

Client Name	Lloyd & Assoc. Inc.
Project Name	Thea Foss
Date Received	12-30-02

General Chemistry Parameters

Client Sample ID	021228/TDSW/M/A
Lab ID	110978-01

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	12-31-02	mg/L	5	2

Client Sample ID	021228/TDS/M/A
Lab ID	110978-02

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	12-31-02	mg/L	4	2

Client Sample ID	021228/TDSE/M/A
Lab ID	110978-03

Parameter	Method	Date Analyzed	Units	Result	PQL
al Suspended Solids	EPA 160.2	12-31-02	mg/L	3	2

Client Sample ID	021228/TDN/M/A
Lab ID	110978-04

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	12-31-02	mg/L	3	2

Client Sample ID	021228/TDNE/M/B
Lab ID	110978-05

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	12-31-02	mg/L	14	2

Client Sample ID	021228/TDNW/M/B
Lab ID	110978-06

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	12-31-02	mg/L	5	2

STL Seattle

Client Sample ID	021228/TDS/M/B
Lab ID	110978-07

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	12-31-02	mg/L	4	2

Client Sample ID	021228/TDS/M/B/DUP
Lab ID	110978-08

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	12-31-02	mg/L	5	2

Client Sample ID	021228/TDN150/M/B
Lab ID	110978-09

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	12-31-02	mg/L	27	2

Client Sample ID	021228/T2/M/B
Lab ID	110978-10

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	12-31-02	mg/L	6	2

Client Sample ID	021229/TDN150/M/A
Lab ID	110978-11

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	12-31-02	mg/L	3	2

Client Sample ID	021229/TDNE/M/A
Lab ID	110978-12

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	12-31-02	mg/L	3	2

Client Sample ID	021229/TDS/M/A
Lab ID	110978-13

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	12-31-02	mg/L	3	2

STL Seattle

Client Sample ID			021229/TDNW/M/A		
Lab ID			110978-14		
Parameter	**Method**	**Date Analyzed**	**Units**	**Result**	**PQL**
Total Suspended Solids	EPA 160.2	12-31-02	mg/L	3	2

Client Sample ID			021229/T2/M/A		
Lab ID			110978-15		
Parameter	**Method**	**Date Analyzed**	**Units**	**Result**	**PQL**
Total Suspended Solids	EPA 160.2	12-31-02	mg/L	4	2

PMS 1/7/03

STL Seattle

QUALITY CONTROL REPORT

Client Sample ID: 021228/TDNW/M/B
Lab ID: 110978-06
QC Batch Number: 1114-146

Method Blank

Parameter	Result (mg/L)	PQL
Total Suspended Solids	ND	2

Duplicate

Parameter	Sample Result (mg/L)	Duplicate Result (mg/L)	RPD (%)	Flag
Total Suspended Solids	4.8	5.17	7.4	

OK
PM 1/7

PROJECT

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021228	DTB	TD NE		T	N 826	E 859	
1630 hrs.	33	D	30	9.9	Sal 30.1	DO 9.7	Turb 2.0
		M	17	9.8	29.5	9.2	5.6
		S	2	8.4	21.6		12.0

1640 hrs

2.1
7.6
10.6

post Sampling Calibration DO over saturated air = 11.0 mg/L

Turbidity = 11.5 in yr standard (10 ntu)

Winker Titration w/ HACH

B #1 351 on digimeter x100 ml x.02 = 7.0

CB #2 334 on " x100 x.02 = 6.7 mg

12/29/02 YSI Sonde Calibration BP = 761.24

DO calibrate acceptable @ 10.1 mg/L
Turbidity calibration acceptable @ 0 NTU, 10 NTU, 100 NTU } 3 point

Check w/100 = 103.3 NTU

Check in DI water T = 10.4
Sal = 0.0
DO = 10.0
Turb = 0.0

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Signed Date Signed Date

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Signed	Date	Signed	Date

12/29/02 Totem Marine/Sand
High tide Slack

Station 2+00

				Temp	Sal	DO	Turb	TSS #
DTG=49'	D	1155	45	9.8	30.0	7.9	0.0	
	M	1200	25	9.8	30.0	7.8	0.0	021229/T2/M/A
Flooded	S	1205	2	9.7	29.2	8.2	0.7	

Clear, sunny, wind to north. M. Lloyd recording

stopped due to just out of water

TDN15C N=772 E=551 (Barge in way of a
795 551 (rotated)

drained. Lowered DTG-40

	D	1210	35	9.8	30.0	6.6	0.5	
	M	1215	20	9.8	30.0	6.7	0.5	021229/TDN15C/
2F	S	1220	2	9.4	28.2	6.7	3.1	M/A
	S	→		YSI 550 = 6.6				

TDNE300 826 - 859

COT-6:8

DTB = 42'	D	~~38~~ 1230	38	9.8	30.1	6.4	0.6	
	M	1235	21	9.8	30.0	6.5	0.3	021229/TDNE/M/A
	S	1240	2	9.4	28.7	6.6	5.0	Collected DO for COT 1 L4AI for Winkler

Field Duplicate/Separate drop.

D	1242	38	9.8	30.1	6.3	0.6	
M	1244	21	9.8	30.0	6.43	0.7	
S	1246	2	9.5	~~30.0~~ 27.9	7.2	4.3	

TDNW

DTB=41	D	1255	37	9.8	30.1	6.0	0.3	
	M	1300	20	9.8	30.0	6.0	0.1	021229/TDNW/M/A
	S	1305	2	9.6	28.5	6.2	3.1	

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RMcFlynn 12/29

Signed Date Signed Date

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Read and Understood By

Signed _____ Date _____ Signed _____ Date _____

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TDS (300) 690 864 12/29/02

TB = 41'

1305	D	37	9.8	30.1	6.0	0.4	TSS
1310		20	9.8	30.0	6.0	1.7	021229
1305		2	9.6	28.4	6.2	1.6	TDS/MA

Sound/Event B 795 881

TB = 39	1330	D	35	9.8	30.1	5.3	4.2
	1335	M	20	9.8	~~5.3~~ 30.0	5.5 pm	~~5.5~~ 2.6
TDN 150	1340	S	2	9.6	pm 28.9	5.4	6.1

TDNE 826 / 859 SLACK => EBB

D = 39	1342	D	35	9.8	30.1	5.6	0.5
	1344	M	20	9.8	30.0	5.7	0.3
	1346	S	2	9.5	28.1	6.2	7.3

~~TDNW~~ ~~710 / 836~~ pm 800/840

Currents 35 pm

Point-1 40		1348	D	9.8	30.1	6.0	0.2
40	20	1350	M	9.8	30.0	5.9	0.1
	2	1352	S	9.6	28.9	6.1	1.3

Post Survey Calibrat

T = 8.6

Sal = 0.01

D.O = 9.46

Turb = 0.

TDN W 740 / 836

TB 41	D	36	1354	9.8	30.1	6.1	0.0
	M	21	1356	9.8	30.0	5.9	0.9
	S	2	1357	9.5	~~27.3~~ 27.3 pm	6.4	0.9

TDS. 690 / 864

34	D	35	1400	9.5	30.1	6.2	9.3
	M	19	1402	9.8	30.0	6.3	7.8
	S	2	1404	9.4	23.8	7.2	1.6

Upgradient current

Continued on Page

Read and Understood By

Signed Date Signed Date

Lloyd & Associates, Inc.
38210 SE 92nd Street, Snoqualmie, Washington 98065 425-888-1905(v/f) rml@centurytel.net

December 30, 2002

TRANSMITTAL

To: John O'Laughlin
Iain Wingard

From: Michael Lloyd

Subject: Weekly Water Quality Monitoring Report for week ending 12/29/02

This weekly water quality monitoring report summarizes water quality results for the week ending 12/29/02. During the past week, the following water quality monitoring events were conducted at Totem Marine. Copies of daily Water Quality Reports have been submitted to the City of Tacoma for sampling events on 12/27, 12/28, and 12/29. These reports are incomplete and are waiting for TSS data from Severn Trent Laboratories. As soon as this data is available, revised daily reports will be submitted. Please note that the data is considered preliminary and subject to final review and correction.

During monitoring at Totem Marine, water quality criteria for turbidity was exceeded during the afternoon monitoring event. At this time ACC-Hurlen was placing filter material, and turbidity plume was detected at the compliance boundary as described in the daily report.

As presented in daily monitoring events, we have been comparing dissolved oxygen concentrations as measured by the YSI Sound instrumentation and Winkler Titrations conducted both by the City of Tacoma and ourselves. In general the comparison is reasonably good. The YSI tends to read slightly lower as the sample is a an in-situ measurement while the Winkler Titration consists of collecting a sample, bringing it to the surface, and transferring the sample to a BOD bottle for the Winkler Titration. Some entertainment of air in the BOD bottle is unavoidable, but still the differences are relatively small. As soon as the rest of the data is collected, this data will be reviewed and a short report presenting the results.

Duplicate analyses of field monitored parameters continue to look good. This data is presented in the daily monitoring forms. In essence this represents a field duplicate taken with the YSI Sonde and consists of collecting a second data set for depth profiles.

I have attached a briet summary of Water Quality Criteria incorporating ambient data as previously requested. Because of the complexity of the inputs to the Thea Foss, sorting our background impacts may be more difficult than has been observed to date.

Attached also please find copies of field logs for the recent compliance monitoring events as requested.

Water Quality Criteria Summary

Locations	DO (mg/L)	Turbidity (NTU's)	Temperature (°C)	
Thea Foss/Class C	>4.0	<11.95*	<19	
(S. of 11th Street Bridge)	>3.5?	N/A	N/A	early warning (150')
Thea Foss/St Paul Class B	>5.0	<11.95*	<19	
(N. of 11th Street Bridge)	>3.5	N/A	N/A	early warning (150')

* = Data derived from Ambient Water Quality Report
* = 10 NTU + ambient water quality criteria (90th percentile)
* = alternatively, if background is < 50 NTU, then 10 NTU above background, or if background is > 50 NTU, then <20 % increase above background

Lloyd & Associates, Inc.
38210 SE 92nd Street, Snoqualmie, Washington 98065 425-888-1905

January 2, 2003

TRANSMITTAL

To: Iain Wingard
John O'Loughlin

Subject: Daily Water Quality Report 1/2/03
Compliance Monitoring/Totem Marine - ~~Preliminary~~ BML

Attached please find results from compliance monitoring for quarry spall placement at the toe berm and on the slope at Totem Marine. Three rounds of sampling were conducted. The last round of the day was exclusively quarry spall placement on the slope.

Water quality was acceptable for these sampling events, although low dissolved oxygen was observed at Station TDSW on the flood tide. A calibration check was performed that indicated that the Sonde was measuring oxygen with an acceptable calibration. Station TDSW was retested and the results are provided in the summary table. Low dissolved oxygen results were also observed in the up-current station TDN. As our team was finishing up, ACC-Hurlen broke for lunch. After lunch the survey team waited for construction activity to develop then conducted another round of sampling to assess low dissolved results observed before lunch. Up-current results during this slack going to ebb tide showed lower dissolved oxygen (still above 5.0). Because tidal direction was at slack with slight ebb when we arrived, we chose to do two up-current stations and two down-current stations with the knowledge that a stronger ebb tide was coming. The evening session went well with good water quality. The weather was a downpour in the rain with a brisk wind from the south. Dissolved oxygen levels were generally higher than the morning/afternoon events.

Field duplicate data for events A and C provided relatively good precision for all measurements although some variability with turbidity was observed.

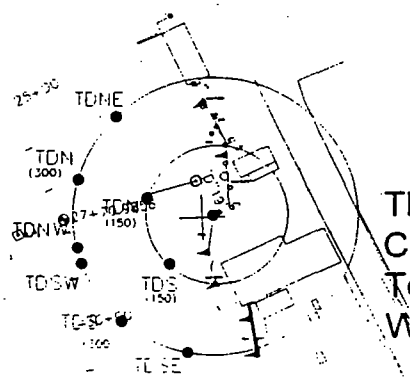
A field duplicate sample was collected for analysis by the Winkler Method. This analysis was conducted by the City of Tacoma.

030102/TDS300/M/A (midpoint depth)

- DO measured with the YSI Sonde = 6.5 mg/L
- DO measured by COT on Winkler Titration = 7.2 mg/L

Revised to include TSS. BML

Michael Lloyd/Date
Environmental Section



Thea Foss
Construction Project.
Totem Dock Areas.
WQ Work Area No.2

Construction Compliance Monitoring

Date: Jan 2 **Totem Marine - Slack/Flood Tide**

Station	Depth/DTB (ft)	Salinity (ppt)	Salinity FD (ppt)	DO (mg/L)	DO/FD (mg/L)	Turbidity (NTU)	Turbidity FD (NTU)	Temp °C	Temp/FD °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
TDSE/TOP (down)	2	27.6	26.6	5.2	5.7	3.4	2.9	9.7	9.7		5,233,670	542,905	1202	Slack tide going to flood
030102/TDSE/M/A1 + A2	19	30.0	30.0	5.0	5.1	2.1	2.3	9.7	9.7	2/3			1200	Duplicate TSS collected
Deep	35/38	30.0	30.0	5.0	5.3	3.2	2.3	9.7	9.7				1155	
		Initial Salinity	Retest Salinity	Initial DO	Retest DO	Initial Turbidity	Retest Tubidity	Initial Temp.	Retest Temp					
TDSW/TOP (down)	2	24.5	24.0	5.1	5.8	2.4	5.2	9.7	9.7		5,233,728	542,837	1208	Observed low DO
030102/TDSW/M/A - MID	20	30.0	30.0	4.5	5.3	1.3	2.0	9.7	9.7	3			1206	Calibration checked at 10.8 mg/L
Deep	35/40	30.0	30.0	4.7	5.1	2.5	2.9	9.7	9.7				1205	Repeated data highlighted
CP TDSW150/TOP *	2	28.5		5.3		1.7		9.7			5,233,728	542,860	1209	Moved to point directly east
Mid	20	30.0		5.0		1.6		9.7						toward work zone to check
Deep	35/40	30.0		4.9		3.0		9.7						
TDS300 (down)	2	24.6		7.3		2.0		9.5			5,233,690	542,864	1120	
030102/TDS300/M/A-MID	20	29.9		6.5	7.2**	1.3		9.7		3			1115	Winkler sample for DO by COT
Deep	35/39	30.0		6.5		2.3		9.7					1110	
TDS150/TOP (down)	2	23.9		5.9		3.1		9.6			5,233,722	542,874	1150	Near derrick
MID	20	30.0		5.2		2.0		9.7					1145	
Deep	35/39	30.0		5.2		1.1		9.7					1140	
TDN/TOP (up)	2	28.5		5.1		3.5		9.7			5,233,826	542,836	1220	Flood tide
030102/TDN/M/A - MID	20	30.0		4.7		1.2		9.7		2			1218	Low DO in upcurrent direction
Deep	35/41	30.1		4.9		5.7		9.7					1215	
Station 2+00 TOP	2	29.6		6.6		0.7		9.8			5,233,826	542,492	1300	
030102/T2/M/A - MID	22	29.9		6.3		0.4		9.7		2U			1255	
Deep	40/45	30.0		6.7		0.4		9.7					1250	

Pre-Survey Calibration	S. High 1/2	10.7 mg/L In DI water	DO calibrate in Saturated air/salinity correction	Weather Conditions: Wind from south, warm, slight rain
Post-Survey Calibration Check	S. High 1/2	11.3 mg/L In DI water	DO calibrate in Saturated air/salinity correction	

DO Calibration as per manufacturer's specifications. Presurvey calibration in DI was 10.7 as noted above.

Instrument was checked for calibration after TDSW sample. The DO result was 11.2 mg/L

Turbidity Calibration as per manufacturer's specifications. Calibration at 0, 10 and 100 NTU's. Winkler samples collected as FD with Wheaton Bottle

*CP TDSW150/TOP - Sample collected 23m directly east of TDSW point near the debris curtain.

**Winkler Titration conducted on sample 030102/TDS300/A by COT DO = 7.2 mg/L (Results phoned in by I. Wingard)

Winkler results indicate that YSI Sonde is likely providing a conservative measure of DO since field measured value was 6.5 mg/L.

ACC-Hurlen stopped work just after noon for lunch. Up-Current DO was also recorded as low as noted for TDN.

Prepared By/Date:

M. Lloyd 1/2

Preliminary

M. Lloyd 1/7

L&AI

Construction Compliance Monitoring **Date: Jan 2** **Totem Marine - Slack/Ebb Tide B**

Station	Depth/DTB (ft)	Salinity (ppt)	Salinity FD (ppt)	DO (mg/L)	DO/FD (mg/L)	Turbidity (NTU)	Turbidity FD (NTU)	Temp °C	Temp/FD °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
TDSE/TOP (up)	2	29.0		5.2		2.4		9.8			5,233,670	542,905	1553	Ebb tide
030102/TDSE/M/B	20	29.7		5.2		2.6		9.7		NS			1548	
Deep	35/40	30.0		5.2		10.0		9.7					1545	
TDS/TOP (up)	2	29.2		5.4		1.4		9.7			5,233,690	542,864	1535	Ebb tide
030102/TDS300M/B - MID	22	30.0		5.4		5.4		9.7		3			1435	
Deep	38/43	30.0		5.7		3.0		9.7					1530	
TDNE (down)	2	28.7		5.6		1.5		9.8			5,233,826	542,859	1522	Slight ebb current
030102/TDNE/M/B-MID	22	29.9		5.4		1.4		9.7		3			1520	
Deep	37/42	30.0		5.6		2.9		9.7					1518	
TDN150/TOP (down)	2	28.6		5.5		4.0		9.8			5,233,772	542,881	1529	
030102/TDS150/M/A - MID	20	30.0		5.2		3.0		9.7		2			1527	
Deep	38/41	30.0		5.4		1.6		9.7					1525	
TDN/TOP (up)	2	28.5		6.3		2.3		9.7			5,233,784	542,836	1515	Slack/Slight ebb current
030102/TDN/M/B - MID	21	29.9		5.7		0.5		9.7		2U			1513	
Deep	37/42	29.9		6.4		0.7		9.7					1511	

Pre-Survey Calibration	S. High 1/2	10.8 mg/L In DI water	DO calibrate in Saturated air/salinity correction	Weather Condtions: Wind from south, cool, slight rain
Post-Survey Calibration Check	M. Lloyd 1/2	10.9 mg/L In DI water	DO calibrate in Saturated air/salinity correction	

Calibration acceptable for DO.

Post survey turbidity check was acceptable at 0.4 for DI water.

No problems observed during monitoring event. TDN300 substituted for TSNW to catch observed down current flow form work area.

Prepared By/Date:	~~Preliminary~~	
M. Lloyd 1/2	TML 1/7	L&AI

Construction Compliance Monitoring

Date: Jan 2 **Totem Marine - Ebb Tide**

Station	Depth/DTB (ft)	Salinity (ppt)	Salinity FD (ppt)	DO (mg/L)	DO/FD (mg/L)	Turbidity (NTU)	Turbidity FD (NTU)	Temp °C	Temp/FD °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	/Comment
TDN(300)/TOP (down)	2	26.4		6.5		2.9		9.8			5,233,784	542,836	2117	Ebb Tide
030102/TDN300/M/C	15	30.0		6.1		1.1		9.7		2			2116	Low tide @1040
Deep	25/29	30.0		6.6		1.9		9.7					2115	
TDNW/TOP (down)	2	24.1		7.5		1.3		9.8			5,233,740	542,836	2112	Rain/Downpour
030102/TDNW/M/C	14	30.0		6.5		1.4		9.7		3			2110	
Deep	25/29	30.0		7.1		2.7		9.7					2108	
TDNE/TOP (down)	2	25.4	26.3	6.5	6.5	3.4	6.7	9.8	9.8		5,233,826	542,859	2134	Rain/Downpour
030102/TDNE/M/C	14	30.0	30.0	5.5	5.5	1.8	3.8	9.7	9.7	3			2132	Near low tide
Deep	23/28	30.0	30.0	6.1	6.4	2.5	4.6	9.7	9.7				2130	
TDN150/TOP (down)	2	27.8		6.0		3.2		9.7			5,233,772	542,881	2126	Near low tide
030102/TDN150/M/C	14	30.0		5.7		2.9		9.7		3			2124	
Deep	22/27	30.0		6.0		4.2		9.7					2123	
TDS/TOP (up)	2	25.4		7.8		10.2		9.8			5,233,690	542,864	2105	Ebb tide/rain
030102/TDS/M/C	15	29.9		7.4		1.0		9.7		3			2103	
Deep	25/29	30.0		7.5		1.6		9.7					2105	
Station 2+00 TOP	Data collected earlier in day.													

Pre-Survey Calibration	S. High 1/2	10.8 mg/L In DI water	DO calibrate in Saturated air/salinity correction	Weather Condtions: cold, high winds, downpour
Post-Survey Calibration Check	S. High 1/2	11.2 mg/L In DI water	DO calibrate in Saturated air/salinity correction	

DO Calibration as per manufacturer's specifications. Presurvey calibration in DI was 10.8 as noted above.

Calibration check on 10 ntu = 10.4 Post survey check = 9.7 ntu (may have received rain water in downpour)

Quarry spall placement on slope and in-water

Prepared By/Date:

Michael Lloyd

~~Preliminary~~ MoL 1/7

L&AI

112103

STL Seattle

Client Name	Lloyd & Assoc. Inc.
Project Name	Thea Foss
Date Received	01-03-03

General Chemistry Parameters

Client Sample ID 030102/TDN/M/A
Lab ID 111034-01

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-03-03	mg/L	2	2

Client Sample ID 030102/TDSW/M/A
Lab ID 111034-02

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-03-03	mg/L	3	2

Client Sample ID 030102/TDSE/M/A1
Lab ID 111034-03

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-03-03	mg/L	2	2

Client Sample ID 030102/TDSE/M/A2
Lab ID 111034-04

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-03-03	mg/L	3	2

Client Sample ID 030102/TDS300/M/A
Lab ID 111034-05

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-03-03	mg/L	2	2

Client Sample ID 030102/T2/M/A
Lab ID 111034-06

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-03-03	mg/L	ND	2

STL Seattle

Client Sample ID	030102/TDNE/M/A
Lab ID	111034-07

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-03-03	mg/L	3	2

Client Sample ID	030102/TDN150/M/A
Lab ID	111034-08

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-03-03	mg/L	2	2

Client Sample ID	030102/TDS300/M/B
Lab ID	111034-09

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-03-03	mg/L	3	2

Client Sample ID	030102/TDN300/M/B
Lab ID	111034-10

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-03-03	mg/L	ND	2

STL Seattle

QUALITY CONTROL REPORT

Client Sample ID: Batch QC
Lab ID: 111036-4
QC Batch Number: 1114-150

Method Blank

Parameter	Result (mg/L)	PQL
Total Suspended Solids	ND	2

Duplicate

Parameter	Sample Result (mg/L)	Duplicate Result (mg/L)	RPD (%)	Flag
Total Suspended Solids	7	7.2	2.82	

RML 1/7

1/2/03 C

STL Seattle

Client Name	Lloyd & Assoc. Inc.
Project Name	THEA FOSS
Date Received	01-06-03

General Chemistry Parameters

Client Sample ID 030102/TDN300/M/C
Lab ID 111055-01

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-06-03	mg/L	2	2

Client Sample ID 030102/TDNW/M/C
Lab ID 111055-02

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-06-03	mg/L	3	2

Client Sample ID 030102/TDNE/M/C
Lab ID 111055-03

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-06-03	mg/L	3	2

Client Sample ID 030102/TDN150/M/C
Lab ID 111055-04

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-06-03	mg/L	3	2

Client Sample ID 030102/TDS/M/C
Lab ID 111055-05

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-06-03	mg/L	3	2

STL Seattle

QUALITY CONTROL REPORT

Client Sample ID: Batch QC
Lab ID: 111046-1
QC Batch Number: 1159-003

Method Blank

Parameter	Result (mg/L)	PQL
Total Suspended Solids	ND	2

Duplicate

Parameter	Sample Result (mg/L)	Duplicate Result (mg/L)	RPD (%)	Flag
Total Suspended Solids	2.44	2	19.8	

1/7

BP = 760.48

Instrument Calibration. New NTU stds
made for 10 ntu.
Turbidity calibrated at Calibrate @ 0, 10, 100
0, 10, + 100 - acceptable. 100 ± 2.5%
Check at 10 NTU = 9.7 # 6073 Turb. Std

Dissolved Oxygen/accept. 10 ml 100 ST ⇒ 100 ml w DI
Check = 10.7
RMR

Arrived on site at 11.15 - Harlem is temp. Stopped
Wind from south, warm slight rain slack
Tail end of Flood Et
going to flood

STA - TDS 300 690 542 / 864 N/E

				T.	Sal	DO	Turb.	
DTB	1120	D	35	9.7	30.0	6.5	2.3	
39	1115	M	20	9.7	29.9	6.5	1.3	030102/TDS 300/M/A
	1110	S	2	9.5	24.6	7.3	2.0	COT Sample = 7.2

RMR

Sample collected for City of Tacoma

STA - TDS 150 N 722 / E 874 - against derrick, can't get closer

DTB	1140	D	35	9.7	30.0	5.2	1.1	
	1145	M	20	9.7	30.0	5.2	2.0	No TSS
39	1150	S	2	9.6	24.6	5.9	3.1	

RMR 23.9 pm

STA - TDS 40E 670 / 905 Observed turbidity low

DTB	1155	D	35	9.7	30.0	5.0	3.2
38	1200	M	19	9.7	30.0	5.0	2.1
	1202	S	2	9.7	27.6	5.2	3.4

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[signature] 1/2/02 [signature] 030102
Signed Date Signed Date

CP = curiosity point at ~~TDS(150)~~ PM
a point 23 M E of
TDSW

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Read and Understood By

Signed	Date	Signed	Date
			030102

DTB – Duplicate of TDSE

39	D	35	9.7	30.0	5.3	2.3	
1205	M	19	9.7	30.0	5.1	2.3	030103/TDSE/M/A1 + M/A2
	S	2	9.7	26.6	5.7	2.9	

TDSW 728/837

40	1205 ~~35~~	35	9.7	30.0	4.7	2.5	
DTB	1206	20	9.7	30.0	4.5	1.3	
	1208	2	9.7	24.5	5.1	2.4	

Moving straight at rig to measure DO + rotten @ 6523 M E

1209	40' CP	D	35	9.7	30.0	~~4.7~~ 4.9	3.1
		M	20	9.7	30.0	5.0	1.6
		S	2	9.7	28.5	5.3	1.7

030102/TDSW/M/A

~~705/60~~

SW point located directly ~~E.o.~~ West of CoT storm drain

Repeat

1210	TDSW	35	9.7	30.0	5.1	2.9	
1212		20	9.7	30.0	5.3	2.0	DO calibration Check = 11.2 mg/L
1214		2	9.7	24.0	5.8	5.2	

TDN (Up Current) in flood

~~1215~~	1215	35	9.7	30.1	4.9	5.7	
41 = DTB	1218	20	9.7	30.	4.7	1.2	030102/TDN/M/A
TDN	1220	2	9.7	28.5	5.1	3.5	

Recalibration on DO

10.5 @ 1208

DO = ~~10.8~~ mg/L ⇒ 11.3 0.4 on NTU ⇒

Recalibrate
DO = 11.3
Turb = 0.4 on NTU.

T2	DTB = 45'	1250	40	9.7	30.0	6.7	0.4
		1255	22	9.7	29.9	6.3	0.4
542/[illegible]		1300	2	9.8	29.6	6.6	0.7

030102/T2/M/A

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Signed	Date	Signed	Date
[signature]	1/2/02	[signature]	030102

PROJECT

Notebook No.

Continued From Page

5233715 54905

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Read and Understood By

Signed	Date	Signed	Date

January 2, 2002

Calibration for DO = 10.77 mg/L at 1500 hours

~~Flood~~ Tide / Slack going To Ebb

TDN300 5233784 542836 high = ebb

DTB (42)	1513			To				
	1516	D	37	9.7	29.9	6.4	0.7	
	1513	M	21	9.7	29.9	5.7	0.5	030102/TDN300/
	1511	S	2	9.7	28.5	6.3	2.3	M/B

Times backwards Rm

TDNE 5233826 542859

(42)	1518	D	37	9.7	30.0	5.6	2.9
	1520	M	22	9.7	29.9	5.4	1.4 030102/TDNE/M
	1522	S	2	9.8	28.7	5.6	1.5 B

TDN150 5233772 542881

(41)	1525	D	38	9.7	30.0	5.4	1.6
	1527	M	20	9.7	30.0	5.2	3.0 030102/TDN50/M/B
	1529	S	2	9.8	28.6	5.5	4.0

TDS 5233690 542864

(43)	D	1530	38	9.7	30.0	5.7	3.0
	M	1535	22	9.7	30.0	5.4	5.4 030102/TDS300/M
	S	1538	2	9.7	29.2	5.4	1.4 B

TDSE 5233670 / 542905

(40)	1545	D	35	9.7	30.0	5.2	10.0
	1548	M	20	9.7	29.7	~~4.9~~ 5.2	2.6 NOTES
	1553	S	2	9.8	29.0	5.2	2.4

Continued on Page

Read and Understood By

Final Cal. check = 10.8 mg/L
Turb check = 0.4 NTU
030102 [illegible]

[signature] 1/2/03 [signature]

Signed Date Signed Date

Lloyd & Associates, Inc.
38210 SE 92nd Street, Snoqualmie, Washington 98065 425-888-1905

January 3, 2003

TRANSMITTAL

To: Iain Wingard
John O'Loughlin

Subject: Daily Water Quality Report 1/3/03
Compliance Monitoring/Totem Marine - ~~Preliminary~~ BM

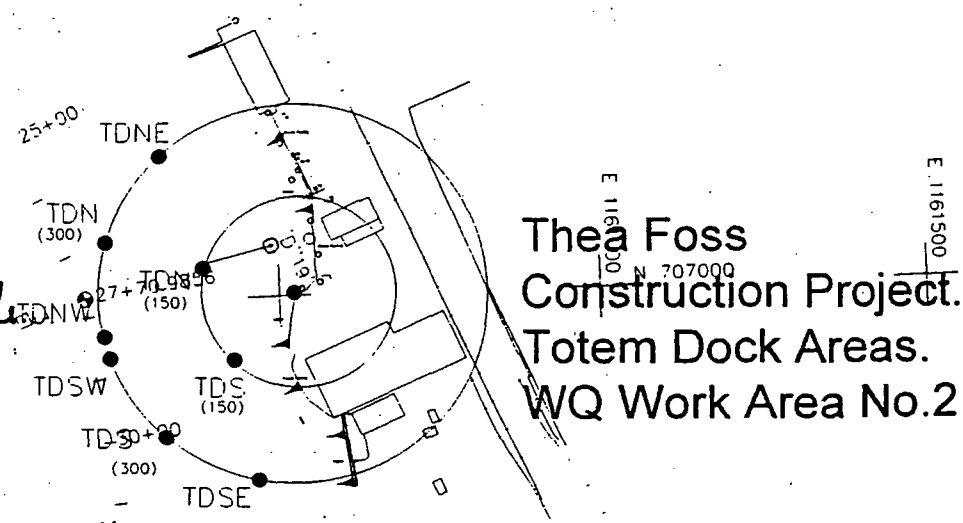
Attached please find results from monitoring during placement of the grout mat at Totem Marine. We also provided post construction monitoring while the tugs and barges were being moved. Visual observations on a clear sunny day with clam waters indicated that minor turbidity was generated along the shoreline, but this turbidity was not persistent and rapidly dissapated within the work zone.

Field duplicate data for provided relatively good precision for all measurements although some variability with turbidity was observed.

A field duplicate sample was collected for analysis by the Winkler Method. This analysis was conducted by the City of Tacoma.

030103/T2/M/A (midpoint depth)

- DO measured with the YSI Sonde = 5.4 mg/L
- DO measured by COT on Winkler Titration = 7.0 mg/L (reported by J. O'Laughlin)



Thea Foss
Construction Project.
Totem Dock Areas.
WQ Work Area No.2

Revised to include TSS data

Michael Lloyd 1/6/03

Michael Lloyd/Date
Environmental Section

Construction Compliance Monitoring

Date: Jan 3 **Totem Marine - Flood Tide**

Station	Depth/DTB (ft)	Salinity (ppt)	Salinity FD (ppt)	DO (mg/L)	DO/FD (mg/L)	Turbidity (NTU)	Turbidity FD (NTU)	Temp °C	Temp/FD °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	/Comment
TDN(300)/Top (up)	2	29.2		5.9		3.9		9.8			5,233,746	542,827	1222	Start of Flood Tide
	19	29.8		6.0		1.5		9.7					1220	Low tide @1130
Deep	34/37	29.9		6.0		2.6		9.7					1215	
TD Center	2	29.5		5.8		3.1		9.8			5,233,721	542,895	1315	Monitoring in work zone
Mid	16	29.9		5.8		1.5		9.7					1314	
Deep	30	29.9		5.8		1.9		9.7					1310	
TDS/Top (up)	2	29.5		5.8		2.1		9.8			5,233,652	542,856	2105	Flood Tide
Mid	19	29.9		5.7		1.3		9.7					2103	
Deep	35/38	29.9		5.8		2.0		9.7					2105	
Station 2+00 Top	2	29.3		5.5		2.2		9.9			5,233,465	542,492	1524	
030103/T2/M/A	23	29.9		5.4	7.0	1.2		9.7		2U			1522	
Deep	40/44	30.0		5.5		1.2		9.7					1520	

Pre-Survey Calibration	S. High 1/3	10.04 mg/L In DI water	DO calibrate in Saturated air/salinity correction	Weather Condtions: moderate, cloudy, no wind
Post-Survey Calibration Check	S. High 1/3	10.2 mg/L In DI water	DO calibrate in Saturated air/salinity correction	

Replaced membrane on Sonde before survey. Cleaned instrument. Turbidity calibration good.
Observed placement of grout mat at Totem. Water visibility very good. No visibile or persistent turbidity. Some floating debris in water. Minor amounts of oil in waterway away from the construction activity. No sheen or debris from work at Totem. FD data for DO = 7.0 for Winkler

Prepared By/Date:	Revised to include TSS data	
Michael Lloyd	BAB 1/8	L&AI

Post Constuction Monitoring **Date: Jan 3** **Totem Marine - /Ebb Tide**

Station	Depth/DTB (ft)	Salinity (ppt)	Salinity FD (ppt)	DO (mg/L)	DO/FD (mg/L)	Turbidity (NTU)	Turbidity FD (NTU)	Temp °C	Temp/FD °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
TDNE(down)	2	29.3		5.1		2.0		9.8			5,233,787	542,853	1638	Ebb tide
030103/TDNE/M/A	20	29.9		5.0		1.3		9.7		3			1637	
Deep	36/41	30.0		5.0		2.2		9.7					1635	
TDN300(down)	2	28.6	29.1	5.1	5.6	9.4	9	9.8	9.8		5,233,726	542,847	1626	Ebb tide
030103/TDN300/M/A	20	29.9	29.9	5.0	5.3	1.3	1.7	9.7	9.7	2			1624	
Deep	35/40	30.0	30.0	5.2	5.5	3.1	3.1	9.7	9.7				1622	
TDNW (down)	2	27.8		5.3		3.1		9.8			5,233,700	542,826	1606?	
030103/TDNE/M/A	20	29.9		5.0		1.8		9.7		2			1604?	
Deep	36/41	30.0		5.2		1.7		9.7					1602	
TDN150	2	28.6		5.1		2.2		9.8			5,233,734	542,874	1618	
030103/TDN150/M/A	20	29.9		5.0		1.6		9.7		2			1617	
Deep	35/40	30.0		5.2		2.0		9.7					1619	
TDS (300)	2	29.3		5.1		2.2		9.8			5,233,652	542,856	1551?	
030103/TDS300/M/A	20	29.9		5.0		1.8		9.7		2			1549?	
Deep	37/41	30.0		5.1		2.2		9.7					1547	

See Previous Page			DO calibrate in Saturated air/salinity correction	Weather Condtions: Wind from south, warm
See Previous Page			DO calibrate in Saturated air/salinity correction	

Calibration data acceptable for DO, see previous page

Post survey turbidity check was acceptable at 0.4 for DI water.

No work going on during monitoring. Barges and tugs being repositioned for removal of piling next work day.

Prepared By/Date:	Revised to include TSS data	
M. Lloyd	BML 1/8	L&AI

1/3/07

STL Seattle

Client Name	Lloyd & Assoc. Inc.
Project Name	THEA FOSS
Date Received	01-06-03

General Chemistry Parameters

Client Sample ID 030103/TDN(300)/M/A
Lab ID 111056-01

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-06-03	mg/L	2	2

Client Sample ID 030103/TF2+00/M/A
Lab ID 111056-02

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-06-03	mg/L	ND	2

Client Sample ID 030103/TDNE/M/A
Lab ID 111056-03

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-06-03	mg/L	3	2

Client Sample ID 030103/TDN(150)/M/A
Lab ID 111056-04

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-06-03	mg/L	2	2

Client Sample ID 030103/TDNW/M/A
Lab ID 111056-05

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-06-03	mg/L	2	2

JAN-07-2003 TUE 02:50 PM STL_SEATTLE FAX NO. 2539225047 P. 04

STL Seattle

Client Sample ID	030103/TDS(300)/M/A
Lab ID	111056-06

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-06-03	mg/L	2	2

JAN-07-2003 TUE 02:50 PM STL SEATTLE FAX NO. 2539225047 P. 05

Pelican Marine

030102

Calibrate DO @ 0.0 & 10.0

2005 " turbidity [illegible]

Calibration for DO = 10.8 mg/L
Turbidity okay at 10.8 NTU

Pen Trouble. RAIN Hurlen-Work started at 2015

TDS (300) 690/864 Up Current on Ebb

DTB = 33 29	2101	D	25	9.7	30.0	7.5	1.6	TSS
	2103	M	14 15	9.7	29.9	7.4	1.0	030102/TDS/M/C
	2105	S	2	9.8	25.4	7.8	10.2	

TDNW (300) 740/836 RAIN

DTB = 29'	2108	D	25	9.7	30.0	7.1	2.7	
	2110	M	14	9.7	30.0	6.5	1.4	030102/TDNW/
	2112	S	2	9.8	24.1	7.5	1.3	M/C

TDN (300) 784/836 RAIN (WIND)

DTB 29	2115	25	D	9.7	30.0	6.6	1.9	
	2116	15	M	15 9.7	30.0	6.1	1.1	030102/TDN300/M
	2117	2	S	9.8	26.4	6.5	2.9	/C

TDN (150) 772/881 = predicted = 27 actual

DTB = 27	2123	22		9.7	30.0	6.0	4.2	
	2124	14		9.7	30.0	5.7	2.9	030102/TDN150
	2126	2		9.7	27.8	6.0	3.2	

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[signature] 1/2/02 [signature] 030102

Signed Date Signed Date

PROJECT

Notebook No.

Continued From Page

Continued on Page

Read and Understood By

Signed	Date	Signed	Date

TDNE ~~759~~ 759/ 826/859 RAIN!
PM

	D=28	D	2130	23	9.7	30.0	6.1	2.5
030102/		M	2132	14	9.7	30.0	5.5	1.8
TDNE		S	2134	2	9.8	25.4	6.5	3.4
FIELD DUPLICATE		D	23	9.7	30.0	6.4	4.6	
		M	14	9.7	30.0	5.5	3.8	
		S	2	9.8	~~25.~~ 26.3	6.5	6.7	

Calibration Check DO=11.2 Ebb/=> Slack
10 ppm NTU 9.7

Continued on Page

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[signature] 1/2/02 _____ _____ 030102

Signed Date Signed Date

Totem Marine
Work Zone # 2
(Centered offshore MHT off NW corner of
Totem marine bldg at.

	N	E
	5233723	542915
TDNE	787	853
TDN (300)	746	827
TDN (150)	734	874
TD NW	700	826
TD SW	689	829
TDS (300)	652	856
TDS (150)	689	888
TDSE	631	898
Then 2+00	465	492

Continued on Page

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Signed | Date 030103 | Signed | Date

030103 Totem Marine

1[illegible]0 Calibrate
DO - replace membrane & KCl
Cal in moist air 10.04 mg/L
Cal Turbidity 0.0 & 10.0 @ 14.7 °C
barometric pressure 762.9 mm Hg

1210 Slack Flood tide

	N, E		Event	TDTB	depth		T	Sal	DO	Turb	TSS
1215	TDN (300)										
	746	827	A	37	D	34	9.7	29.9	6.0	2.6	—
1220					M	19	9.7	29.8	6.0	1.5	— no TSS
1222					S	2	9.8	29.2	5.9	3.9	—

Solid line on fish finder @ 18'
Work = Not working in water; placing vis green on shore

1253	TDS (300)		Flood								
57	652	856	A	38	D	35	9.7	29.9	5.8	2.0	—
59					M	19	9.7	29.9	5.7	1.3	—
1301					S	2	9.8	29.5	5.8	2.1	—

Work = 1215 hrs.

Flood	TD Center (in work zone ca. 20' from grout mat placement)										
1310	721	895	A	33	D	30	9.7	29.9	5.8	1.9	—
1314					M	16	9.7	29.9	5.8	1.5	—
1315					S	2	9.8	29.5	5.8	3.1	—

work = 1215
no visible turbidity; "normal" floating debris & oil from water way. (None generated from construction activities)

1517	Then ambient 2+00										
1520	465	492	A	44	D	40	9.7	30.0	5.5	1.2	—
1522					M	23	9.7	29.9	5.4	1.2	✓
1524					S	2	9.9	29.3	5.5	2.2	—

Collect DO sample for lab @ 1522

Continued on Page

Read and Understood By

Signed	Date	Signed	Date
	030103	M Lloyd	3/4/02

Cal - DO 5.01 1530

Cal Turb 0.0 , 10.0

Calibration 1650

DO 10.2 mg/L

Turb 0.2

Continued on Page

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Signed Date Signed Date

030103	Tolm Ebb		Event DTB		Sample depth		T	Sal	DO	Turb	TS
1545	TDS(300) N	E									
1547	652	856	A	41	D	37	9.7	30.0	5.1	2.2	—
					M	20	9.7	29.9	5.0	1.8	✓
					S	2	9.8	29.3	5.1	2.2	—
	work moving barges										
	TDNW										
1602	700	826	A	41	D	36	9.7	30.0	5.2	1.7	—
					M	20	9.7	29.9	5.0	1.8	✓
					S	2	9.8	27.8	5.3	3.1	—
	work — none										
	TDN(150)										
1614	734	874	A	40	D	35	9.7	30.0	5.2	2.0	—
1617					M	20	9.7	29.9	5.0	1.6	✓
1618					S	2	9.8	28.6	5.1	2.2	—
	TDN (300)										
	726	847	A	41	D	35	9.7	30.0	5.5	3.1	—
1622					M	20	9.7	29.9	5.1	1.3	—
1624					S	2	9.8	29.1	5.6	9.4	—
1626		Done			D	35	9.7	30.0	5.5	3.1	—
					M	20	9.7	30.0	5.7	1.7	—
					S	2	9.8	29.1	5.6	9.0	—
	TDNE		A	41	D	36	9.7	30.0	5.0	2.2	—
1635	787	853			M	20	9.7	29.9	5.0	1.3	✓
1637					S	2	9.8	29.3	5.1	2.0	—
1638											

Continued on Page

Read and Understood By

Signed	Date	Signed	Date
[signature]	030103	[signature] 3/4	

Lloyd & Associates, Inc.
38210 SE 92nd Street, Snoqualmie, Washington 98065 425-888-1905

January 5, 2003

TRANSMITTAL

To: Iain Wingard
John O'Loughlin

Revised To include TSS data

Subject: Compliance Monitoring/Totem Marine 1/5/03
~~Preliminary~~ Data Transmittal

Attached please find results from compliance monitoring for light riprap placement in the toe berm at Totem Marine. As will be discussed in this note, turbidity was a problem with placement throughout the day. I believe that placement of riprap spalls should be halted until we are able to jointly meet and to discuss how to best proceed. Operational measures available to us may not be sufficient to counter the placement of rock that contains substantial amounts of fines. After inspecting the barge materials at the end of the day, I came away with the opinion that we may need to secure materials that do not contain the fines (and potentially silt). The alternative is to substantially slow down operations by placing rock at a substantially slower rate. The most immediate concern is of course water quality. A consequence of proceeding substantially slower is that the cost and time to complete the job will likely increase.

During the morning sampling event, turbidity values were observed to be increasing at the down-current sampling station, TDN. Initial results were 11.8 NTU (acceptable). However, the monitoring team was reluctant to stop monitoring since it was obvious from direct observation of the process, that turbidity was being generated by quarry spall placement at an approximate rate of 1 bucket every 4 or 5 minutes. We elected to continue monitoring. Upon resampling at 1125, the turbidity had increased to 26.9 NTU at station TDN. I called ACC-Hurlen and notified them that I was stopping work. I also called John O'Loughlin and EPA (Piper Peterson Lee). Within 35 minutes, the turbidity reading at the TDN station had dropped to 14.5 NTU. ACC Hurlen continued working on site (lead-line soundings of the toe berm), but in-water placement of quarry spalls was halted. At noon Hurlen went to lunch and there was no more in-water work.

After lunch I met with ACC-Hurlen (Marty) and observed all operations for the afternoon (from the derrick cab and on shore) while the sampling team picked up the monitoring. By the time in-water work had restarted, the tide had changed to a flood tide and new monitoring points were established. Initially work was going fine. Marty was proceeding very slowly following the procedure described below:

- The box was filled with quarry spalls and lowered to position just above the water.
- The box was then lowered very slowly into the water.

- Water was allowed to flow slowly up through the box to avoid turbulent conditions (rapidly escaping entrapped air) that would disturb fines and increase turbidity).
- As soon as air had stopped escaping from the box, Marty lowered the box slowly through the water column to rest it on the edge of the last pile of quarry spalls that was placed in the water.
- The box was opened and slowly raised through the water column.

As I observed this process from the derrick, I was able to see turbidity "cloud" as soon as the box was lowered slowly into the water. This cloud was visible, distinct and dissipated fairly rapidly from the surface. As the box was lowered slowly through the water column, some additional bubbles rose to the surface, but any potential added turbidity was masked by lowering the box into the water just mentioned. Placement of the box on the edge of the toe berm could be observed fairly easily. Although it may be possible to lower the box to near bottom, the procedure employed by Marty appeared to be reasonable although some additional discussion is appropriate on measures to minimize turbidity impacts.

As Marty raised the box slowly, he pointed out that if you pull the box up too quickly, a vortex will be created that will also cause additional turbidity. My impressions are that Marty raised the box slowly. At this time rock was being placed at a rate of 5 to 7 minutes per box. As directed, Marty had slowed down the operation.

Nevertheless, when we occupied Station TDSE the sampling team elected to do a field duplicate. This consists of sampling all depths, recording Salinity, DO, T, and Turbidity. As soon as the TSS sample was collected, the station is resampled to generate field duplicate data. In the intervening minutes the turbidity had jumped to 33.4 NTU. However, our instrument readings for turbidity were apparently bouncing all over the place. The sampling crew contacted me and indicated that they were having a problem and needed to check their instrument and recalibrate before proceeding.

At that time I elected not to stop work until the monitoring crew could work out the cleaning and recalibration with fresh standards. Station TDSE was reoccupied and a reading of 13 NTU was obtained. In the interim ACC-Hurlen had stopped placing rock and a crew in the skiff was conducting lead-line soundings.

As I mentioned earlier, placement of riprap turned out to be more problematic on this day than anticipated. When work stopped, I talked with Marty, and he took me out on the barge to visually inspect the rock. The rock remaining on the barge appeared to contain clumping fines suggesting silts and potentially some clay.

I am recommending several courses of action for placement of light riprap:

- The rate of placement must be substantially slower (10 to 12 minutes/box)
- Rock from Glacier may require washing or other means to reduce fines
- Filter cap materials must not be mixed with rock
- Riprap should be inspected (and potentially rejected) prior to loading on the barge.

- A turbidity curtain should be installed around the active work area. Because of currents, the curtain must be weighted and of a pore size to allow passage of water.

Please note than even if some filter cap material was mixed with light riprap, as suggested by John O'Loughlin, this also indicate that placement of filter cap materials may be much more problematic than previously anticipated.

In spite of problems encountered on this day, it is clear that our monitoring efforts are up to the task of detecting turbidity arising from construction activity. Notably, dissolved oxygen levels were acceptable and increased as would be expected for a flood tide.

Because much of the remaining work on this project will focus on capping, I am requesting that representatives from EPA, City of Tacoma, ACC-Hurlen, and Manson meet to discuss the problems associated with quarry spalls, light riprap, and filter cap materials.

Michael Lloyd
Lloyd & Associates, Inc.

Construction Compliance Monitoring

Date: Jan 5 **Totem Marine - Ebb Tide/A**

Station	Depth/DTB (ft)	Salinity (ppt)	Salinity FD (ppt)	DO (mg/L)	DO/FD (mg/L)	Turbidity (NTU)	Turbidity FD (NTU)	Temp °C	Temp/FD °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
TDS (up-current)	3	28.2		6.4		0.5		9.6			5,233,652	542,846	915	
030105/TDS/M/A	21	29.6		5.9		0.1		9.7		3			910	
Deep	38/42	29.8		5.7		1.5		9.7					905	
TDNE (down)	3	28.0		6.3		1.3		9.5			5,233,787	542,853	935	
030105/TDNE/M/A	21	29.7		6.1		0.1		9.7		3			930	
Deep	37/42	29.8		5.6		6.9		9.7					925	
TDN150 (down)	3	29.1	29.2	5.9	5.8	0.4	3.5	9.7	9.7		5,233,750	542,874	950	Sample taken at edge of
030105/TDN150/M/A	21	29.7	29.3	5.7	6.1	0.5	0.3	9.7	9.7	3/5			945	debris boom
Deep	36/41	29.8	29.8	6.0	5.7	**15.5**	**19.5**	9.7	9.7				940	High turbidity at 150'
TDN300 (down)	3	28.6		6.0		1.0		9.6			5,233,746	542,827	1017	
030105/TDN300/M/A	21	29.7		5.7		1.5		9.7		3			1013	
Deep	37/42	29.8		5.9		11.8		9.7					1010	Elevated turbidity at 11.8
TDNW (down)	3	28.6		5.7		0.8		9.7			5,233,700	542,826	1032	
030105/TDNW/M/A	21	29.7		5.3		0.7		9.7		3			1028	
Deep	37/42	29.9		5.1		4.3		9.7					1025	
Station 2+00	3	28.7		6.2		0.1		9.6			5,233,465	542,492	1046	
030105/T2/M/A	27	29.2		6.4		0.1		9.6		2			1043	
Deep	48/53	29.9		6.4		0.1		9.6					1040	
Pre-Survey Calibration		S. High 1/5		Calibration acceptable			DO calibrate in saturated air/salinity correction						Weather Condtions Partly cloudy, warm, wind from NW	
Post-Survey Calibration Check		S. High 1/5		Calibration acceptable			DO calibrate in Saturated air/salinity correction							

Sampling team conducted a number of turbidity checks after completing the sampling event to determine if elevated turbidity at TDN300 was going to develop into a problem with turbidity. This data is presented on page 43 of notebook (pages provided). At 1125 to 1129 the following data was obtained:

TDN300 (down)	3	29.5		5.6		0.1		9.6			5,233,746	542,827	1129	Still an ebb tide
Mid	20	29.8		5.5		0.1		9.7					1127	
Deep	34/39	29.9		5.2		**26.9**		9.7					1125	Turbidity exceeded compliance

Notified ACC-Hurlen about turbidity. Rather than wait for us to tell them to stop, they had stopped placing quarry spalls and did soundings on toe berm, then broke for lunch. Notified John O'Loughlin and EPA about turbidity problem. Sampling team continued monitoring at TDN (300') with the following results before stopping for lunch as there was no in-water work on-going.

TDN300 (down)	3	29.1		5.3		1.3					5,233,746	542,827	1204	Turbidity in TDN (deep) dropped
Mid	20	29.7		5.0		1.3							1202	to 14.5 NTU in about 35 minutes
Deep	34/39	29.8		5.2		**14.5**							1200	

Prepared By/Date:

M. Lloyd 1/5

Revised to include TSS data

L&AI

Construction Compliance Monitoring

Date: Jan 5 **Totem Marine - Flood Tide/B**

Station	Depth/DTB (ft)	Salinity (ppt)	Salinity FD (ppt)	DO (mg/L)	DO/FD (mg/L)	Turbidity (NTU)	Turbidity FD (NTU)	Temp °C	Temp/FD °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
TDN 300 (up-current)	3	28.4		7.0		1.1		9.8			5,233,746	542,827	1331	Slack tide/turning to flood
030105/TDN/M/B	20	29.8		6.8		1.3		9.7		2U			1330	ACC-Hurlen placing rock
Deep	34/39	29.8		6.6		2.4		9.7					1325	
TDS 150 (down)	3	29.2		7.3		1.5		9.8			5,233,678	542,888	1340	Sample taken at south edge of
030105/TDS/M/B	19	29.8		6.9		1.9		9.7		3			1338	derrick.
Deep	33/38	29.9		9.8		7.9		9.7					1335	
TDSE (down)	3	27.8	28.8	7.0	6.9	2	1.8	9.8	9.8		5,233,631	542,898	1354	Flood tide
030105/TDSE/M/B + dup	18	29.8	29.8	6.7	6.8	5	4.0	9.7	9.7	2/2			1352	
Deep	32/37	29.9	29.9	6.6	6.7	8.3	**33.4**	9.7	9.7				1342	
Unstable response on turbidity probe noted with field duplicate. Probe cleaned and recalibrated with fresh standard for repeat analysis of TDSE														
TDSE (down)	3	27.4		7.6		4.8		9.8			5,233,631	542,898	1458	
Mid	19	29.8		7.0	*	2.8		9.7					1455	DO collected for COT
Deep	33/38	29.8		7.0		**13.0**		9.7					1452	Upcurrent Turb = 2.4
TDS (down)	3	27.4		7.5		3.1		9.7			5,233,652	542,856	1509	In-water work stopped
030105/TDS/M/B	20	29.8		7.2		1.6		9.7		2U			1507	
Deep	34/39	29.9		7.4		3.2		9.6					1506	
TDSW (down)	3	28.2		7.2		2.2		9.8			5,233,689	542,829	1520	No in-water work
030105/TDSW/M/B	20	29.8		7.5		1.5		9.7		2U			1519	
Deep	34/39	29.9		7.5		1.9		9.7					1517	

Pre-Survey Calibration	S. High 1/5	Calibration acceptable	DO calibrate in saturated air/salinity correction
Post-Survey Calibration Check	S. High 1/5	Calibration acceptable	DO calibrate in Saturated air/salinity correction

Weather Condtions Partly cloudy, warm, wind from NW

High turbidity measured with turbidity probe during a field duplicate taken within minutes of the initial readings is an estimate since the results were bouncing all over. Because of this instrument was cleaned and recalibrated. Repeat analysis of sampling point yielded a turbidity of 13 mg/L as noted above. If background readings are considered (TDN), then the actual turbidity increase was potentially less than 13 mg/L.

Prepared By/Date:

M. Lloyd 1/5

Revised to include TSS data

TMh 1/8/03

L&AI

4/5/03

STL Seattle

Client Name	Lloyd & Assoc. Inc.
Project Name	Thea Foss
Date Received	01-06-03

General Chemistry Parameters

Client Sample ID 030105/TDS(300)/M/A
Lab ID 111054-01

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-06-03	mg/L	3	2

Client Sample ID 030105/TDNE/M/A
Lab ID 111054-02

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-06-03	mg/L	3	2

Client Sample ID 030105/TDN(150)/M/A
Lab ID 111054-03

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-06-03	mg/L	3	2

Client Sample ID 030105/TDN(150)/M/DUP
Lab ID 111054-04

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-06-03	mg/L	5	2

Client Sample ID 030105/TDN(300)/M/A
Lab ID 111054-05

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-06-03	mg/L	3	2

Client Sample ID 030105/TDNW/M/A
Lab ID 111054-06

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-06-03	mg/L	3	2

STL Seattle

Client Sample ID 030105/T2+00/M/A
Lab ID 111054-07

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-06-03	mg/L	2	2

Client Sample ID 030105/TDN(300)/M/B
Lab ID 111054-08

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-06-03	mg/L	ND	2

Client Sample ID 030105/TDS(150)/M/B
Lab ID 111054-09

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-06-03	mg/L	3	2

Client Sample ID 030105/TDSE/M/B
Lab ID 111054-10

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-06-03	mg/L	2	2

Client Sample ID 030105/TDSE/M/DUP
Lab ID 111054-11

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-06-03	mg/L	2	2

Client Sample ID 030105/TDS(300)/M/B
Lab ID 111054-12

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-06-03	mg/L	ND	2

Client Sample ID 030105/TDSW/M/B
Lab ID 111054-13

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-06-03	mg/L	ND	2

STL Seattle

QUALITY CONTROL REPORT

Client Sample ID: Batch QC
Lab ID: 111040-5
QC Batch Number: 1159-002

Method Blank

Parameter	Result (mg/L)	PQL
Total Suspended Solids	ND	2

Duplicate

Parameter	Sample Result (mg/L)	Duplicate Result (mg/L)	RPD (%)	Flag
Total Suspended Solids	120	120	0.0	

TMP 1/8/03

PROJECT THEA FOSS

Notebook No. _____
Continued From Page _____

030105 CALIBRATION NOTES; JANUARY 5, 2003

0840 30.46 = BAROMETRIC PRESSURE
773.7 = MM OF MERCURY

D.O. CALIBRATED @ MOIST AIR @ 7.2 °C
% D.O. 100%

PARTLY CLOUDY TO SUNNY, SLIGHT BREEZE
(FROM NW)

TDH (150)
X-1 @ 35'
X-2 @ 35'

1020 ADVISED OPERATOR (MARTY) THAT WE WERE APPROACHING THE LIMIT FOR TURBIDITY AT THE TDH (300) LOCATION. OPERATOR INDICATED THEY WILL SLOW DOWN THEN BREAK FOR LUNCH

Continued on Page

Read and Understood By

Signed	Date	Signed	Date
[signature]	030105	[signature]	3/5

Daniel A. Berta 030105

030105 Tolem place rip-rap - EBB TIDE

TIME	Nom Ring	Event	DTB	Sample depth	T	SAL	DO	Turb	TSS
	TDS (300)								
0905	76 652 856								
~~0910~~		A	*~~40~~	D ~~44~~	39	9.7	29.8	5.7	15	—
0910			42	M ~~25~~	21	9.7	29.6	5.9	0.1	✓
0915				S 3		9.6	23.2	6.4	0.5	—

NOTE: APPEARS TO BE VERY SOFT SED. LAYER @ 42'
WORK placement rip-rap.

030105

0925	TONE			46	D	~~41~~	37	9.7	29.8	5.6	6.9	—
0930	787	853	A	42	M	~~23~~	21	9.7	29.7	6.1	0.1	✓
0935					S	3		9.5	28.0	6.3	1.3	—

PLACING ROCK* @ TIME OF READINGS.
RIP RAP

030105

0940	TON (150)	A		41	D	36		9.7	29.8	6.0	15.5	—
0945	734	874			M	21		9.7	29.7	5.7	0.5	✓ BUP
0950	*750	874			S	3		9.7	29.1	5.9	0.4	— BEL

PLACING RIP RAP @ TIME OF READINGS; * SAMPLE TAKEN @ EDGE OF BOOM (TURBIDITY BOOM)

DUPLICATE

									DB		DB	
0955	TON (150)	A		41	D	36		9.7	29.8	↓5.7	19.5	↓—
1000	*750	874			M	21		9.7	29.7	6.1 5.8	3.5	0.3 ✓
1005					S	3		9.7	29.2	5.8	3.5	

1010	TON (300)	A		42	D	37		9.7	29.8	5.9	11.8	—
1013	744	827			M	21		9.7	29.7	5.7	1.5	✓
1017					S	3		9.6	28.6	6.0	1.0	—

PLACING RIP RAP @ TIME OF MEASUREMENTS

Continued on Page _____

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030105 — [illegible] 3/5
Signed Date Signed Date

[illegible] 030105

PROJECT THEA FOSS OMIT

Notebook No. _____

Continued From Page _____

TIME	LOCATION	EVENT	DTB		TEMP	SAL	D.O.	TURB	TSS
1025	TDHW	A	(42)	O 37	9.7	29.9	5.1	4.3	—
1028	700	526		M 21	9.7	29.7	5.3	0.7	✓
1032				S 3	9.7	28.6	5.7	0.8	—

* PLACING RIP RAP UNTIL 1030

SEE NEXT PAGE (43) FOR DATA KB

PLACING RIP RAP FROM 1045 AM, ADDITIONAL CHECKS PERFORMED FOR EVENT A - NO TSS SAMPLES OBTAINED. →

1110: STOPPED PLACING RIP RAP - TAKING SOUNDINGS WITH WEIGHTED LINE - RESUMED PLACING @ 1117

PLACING ROCK @ ≈ 1 BUCKET / 4 MINUTES

1127: INFORMED OPERATOR ~~OF 26~~ DB (MARTY) THAT TURBIDITY READING EXCEEDED LIMIT (SEE TDH (300) @ 34') CONTRACTOR DISCONTINUED PLACING ROCK

1130:
RECALIBRATED TURBIDITY WITH 0 & 10 STANDARDS THEN RESAMPLED TDH (300) SEE PAGE 45
CONTRACTOR MOVED BARGE SLIGHTLY TO SOUTH & STOPPED FOR LUNCH.

Continued on Page

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[signature] 030105 _____ [signature] 3/5

Signed Date Signed Date

030105

TIME	LOCATION	EVENT	DTB	SAMPLE DEPTH	TEMP	SAL	D.O.	TURB	TSS
1025	TPNW	A	42	D 37	9.7	29.9	5.1	4.3	—
1028	700 826			M 21	9.7	29.7	5.3	0.7	✓
1032				S 3	9.7	29.6	5.7	0.8	—
	NOTE: PLACING RIP RAP UNTIL 1030								
1040	TF 2+00	A	53	D 48	9.6	29.9	6.4	0.1	—
1043	465 492			M 27	9.6	29.9	6.4	0.1	✓
1046				S 3	9.6	28.7	6.2	0.1	—
	STARTED PLACING ROCK AGAIN @ 1045								
	TURBIDITY CHECKS:								
1052	TDN (300)	A	46	D 35	9.7	29.8	5.8	5.0	—
1054	746 827			M 20	9.7	29.7	5.7	0.7	—
1055				S 3	9.7	29.2	6.1	0.3	—
1057	TDNE (150)	A	29	D 24	9.7	29.8	6.0	21.0	—
1058	~~750 874~~			M 15	9.7	29.7	5.8	2.4	—
1059	~~*SEE NOTE PG #41~~ PB			S 3	9.6	29.1	5.9	1.8	—
1100	TDN (150)	A	39	D 34	9.7	29.9	6.3	1.5	—
1101	*750 874			M 20	9.7	29.7	5.8	1.9	—
1102	*SEE NOTE PG #41			S 3	9.7	29.6	5.9	0.7	—
1104	TDENE	A	30	D 25	9.7	29.8	6.0	14.6	—
1105	(NON STANDARD)			M 15	9.7	29.7	5.8	3.0	—
1106	770 903			S 3	9.7	29.2	5.7	1.9	—
1121	TDN (150)	A	39	D 34	9.7	29.8	5.6	29.8	—
1123	*750 874			M 20	9.7	29.7	5.2	6.8	—
1124	SEE NOTE PG #41			S 3	9.7	29.5	5.3	2.2	—
1125	TDN (300)	A	39	D 34	9.7	29.9	5.2	26.9	—
1127	746 827			M 20	9.7	29.8	5.5	9.1	—
1129				S 3	9.7	29.5	5.6	0.7	

Continued on Page _____

Read and Understood By

Signed [illegible] 030105 Date

Signed [illegible] 3/5 Date

PROJECT THEA FOSS 030105

Notebook No. _____
Continued From Page _____

1315: RESUMED ROCK PLACEMENT:
1320:
RECALIBRATED SONDE FOR SAMPLE EVENT B.

* 1335
SAMPLE TDS (150) TAKEN AGAINST THE SOUTH EDGE OF THE RAINIER

Calibration was done multiple times on DO probe. Will sand & recondition tomorrow. [illegible]

1445 AFTER TDSE DUP MEASUREMENTS: PERFORMED 2 POINT CALIBRATION WITH 0 & 100 STANDARD SOLUTION - STANDARD SOLUTION OF 10 NTU MIXED AND MEASURED VALUE = 9.7. D.O. CALIBRATION IN MOIST AIR w/100% READING

1508 STOPPED PLACING RIP RAP FOR THE [illegible]

Continued on Page

Read and Understood By Daniel A. Berta 030105

[signature] 030105 [signature] 3/5

Signed Date Signed Date

TURBIDITY CHECKS

Time	Location	Event	DTB	Sample		Temp	Sal	D.O	Turb	TSS
1200	TDH (300)	A	39	D	34	9.7	29.8	5.2	14.5	—
1202	746 827			M	20	9.7	29.7	5.0	1.3	—
1204				S	3	9.8	29.1	5.3	1.3	—
				"~ SLACK TIDE" SLACK FLOOD						
1325	TDH (300)	B	39	D	34	9.7	29.8	~~7.1~~ 6.6	2.4	—
1330	746 827			M	20	9.7	29.8	6.8	1.3	✓
1331				S	3	9.8	28.4	7.0	1.1	—
	NOTE: Parking Rock							recal		
1335	TDS (150)	B	38	D	33	9.7	29.9	6.8	7.9	—
1338	689 898			M	19	9.7	29.8	6.9	1.9	✓
1340	*678 898			S	3	9.8	29.2	7.3	1.5	—
								recal		
	~~TDSE (300)~~							6.6		
1342	631 898	B	37	D	32	9.7	29.9	~~8.3~~ 8.5		—
52				M	18	9.7	29.8	6.7	5.1	✓
54				S	3	9.8	27.8	7.0	2.0	—
								recal		
1356	TDSE									
1357	DUPLICATE	B	38	D	33	9.7	29.9	6.7	33.4?	—
1358	631 898			M	19	9.7	29.9	6.8	4.0	✓
				S	3	9.8	28.2	6.9	1.8	—
1452	TDSE	B	38	D	33	9.7	29.8	7.0	13.0	—
1455	631 898			M	19	9.7	29.8	7.0	2.8	** ✓ DB
1458				S	3	9.8	~~29.3~~	7.6	1.8	—
							DB 27.4			

** NOTE: DO SAMPLE COLLECTED FOR CITY OF TACOMA LAB @ M 19'

1506	TPS (300)	B	39	D	34	9.6	29.9	7.4	5.2	—
1507	652 956			M	20	9.7	29.8	7.2	1.6	✓
1509				S	3	9.7	27.4	7.5	3.1	—

Continued on Page

Read and Understood By

Signed: Daniel A. Bruce 030105 Date: 030105

Signed: PM Floyd 3/5 Date:

PROJECT THEA FOSS 030105

Notebook No.

Continued From Page

1530

TAP CALIBRATION CHECK: 11.0 & 0.4

WATER

Continued on Page

Read and Understood By Daniel A. Barta 030105

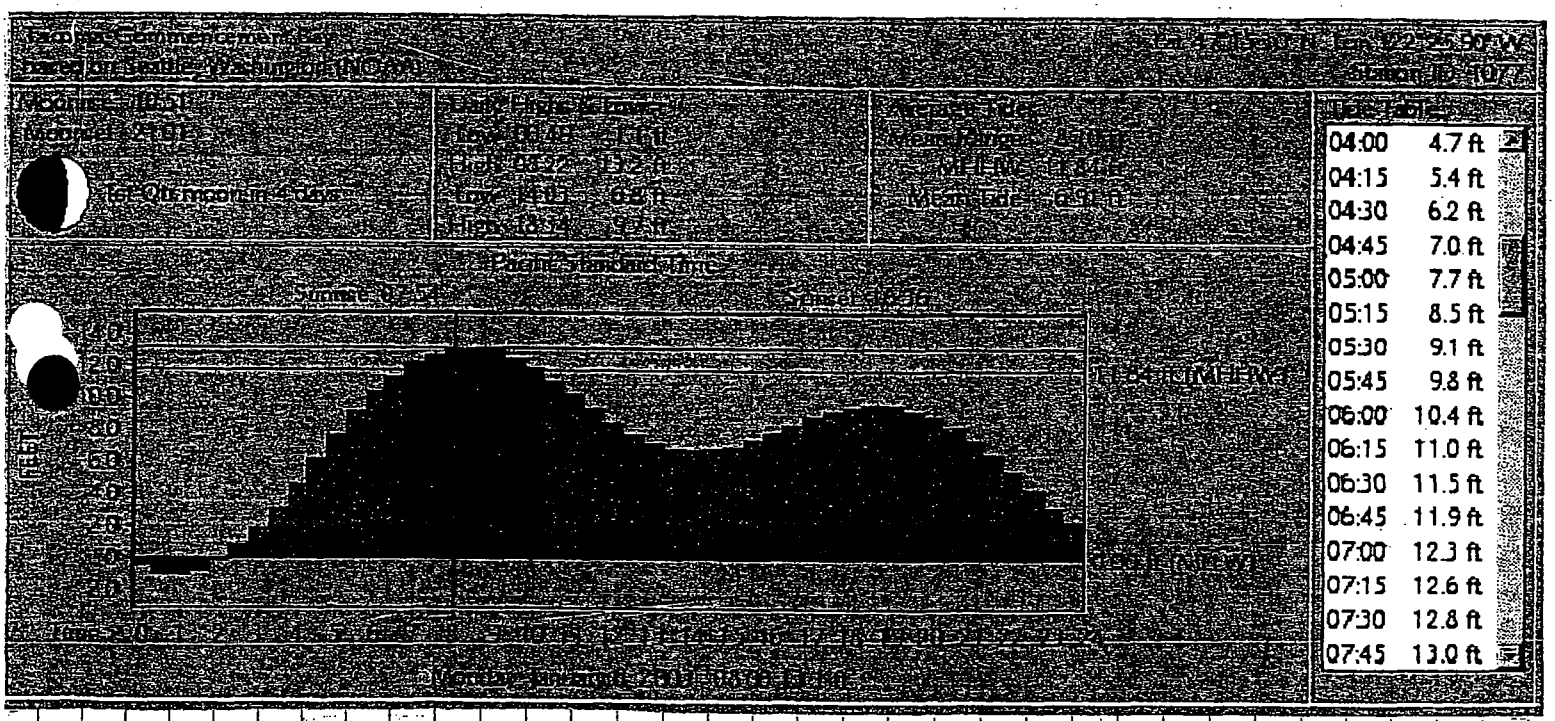
Signed	Date	Signed	Date
[signature]	030105	[signature]	3/5

PROJECT THEA FOSS 030105

TIME	LOCATION	EVENT	DTB	SAMPLE DEPTH	TEMP	SAL	DO	TURB	TSS
1517	TOSW	B	39	D 34	9.7	29.9	7.2	1.9	—
1519	689 929			M 20	9.7	29.8	7.5	1.5	✓
1520				S 3	9.8	25.2	7.5	2.2	—

NOTE: NO RIP RAP PLACED

THEA FOSS - 030106 TIDE INFO



Continued on Page _____

Read and Understood By Daniel A. Bache 030105

Signed	Date	Signed	Date
	030105	[illegible]	

Lloyd & Associates, Inc.
38210 SE 92nd Street, Snoqualmie, Washington 98065 425-888-1905

January 6, 2003

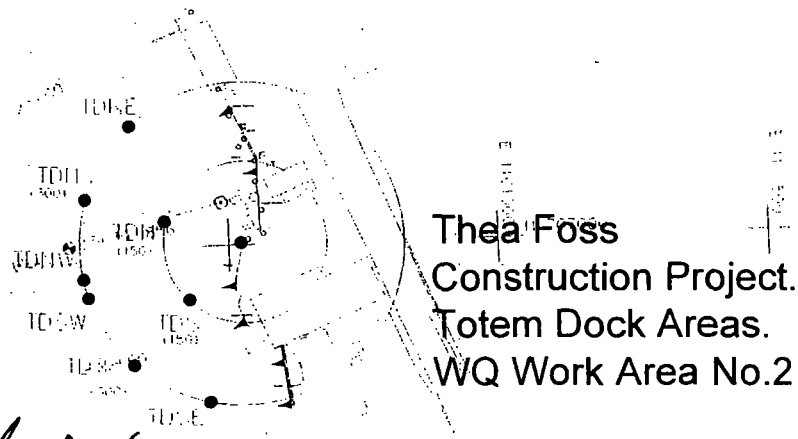
TRANSMITTAL

To: Iain Wingard
John O'Loughlin

Subject: Compliance Monitoring/Totem Marine 1/6/03
Final Data Transmittal

Attached please find results from compliance monitoring during the pour on grout mats at Totem Marine. Visual observations from the sampling boat indicated no persistent impact on turbidity Contact with the divers indicated that although there was a small leak in one of the bags, there was no impact on water quality.

Before leaving the area, the sampling crew conducted a quick round of sampling for the ebb tide. Dissolved oxygen levels were good. Elevated turbidity was observed up-current at Station TDS which was 300' south. This turbidity is unrelated to site activities.



MK Reprinted 3/26/03
Michael Lloyd
Lloyd & Associates, Inc.

Note book pages provided in 1/7/03 packet.
ML

- Totem Marine 1 6 03.doc

Construction Compliance Monitoring: Totem Marine **Date: JAN 6** **Slack going to Ebb Tide**

Station	Depth/D TB (ft)	Salinity (ppt)	Salinity FD (ppt)	DO (mg/L)	DO/FD (mg/L)	Turbidity (NTU)	Turbidity FD (NTU)	Temp °C	Temp/FD °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
TDNW (down-current)	3	28.8		6.5		1.9		9.7			5,233,700	542,828	1206	Slack tide going to ebb
Mid	19	29.7		6.2		1.7		9.7					1201	
Deep	34/39	29.9		6.5		3.2		9.7					1159	
TDN (down-current)	3	28.7		6.3		2		9.6			5,233,746	542,827	1211	Crews filling the grout mat
Mid	19	29.7		6.2		1.4		9.7					1210	with grout during monitoring
Deep	34/39	29.9		6.4		2.5		9.7					1209	in water.
TDNE (down-current)	3	27.8		6.3		1.9		9.7			5,233,787	542,853	1215	
	19	29.7		6.2		1.1		9.7					1214	
	33/38	29.9		6.4		2.6		9.7					1213	
TDS (up-current)	3.0	3.0		6.1		2.1		9.7			5,233,652	542,856	1202	
Mid	21.0	21.0		6.1		2.2		9.7					1201	
Deep	36/41	41.0		6.0		**17.0**		9.7					1159	Turbidity observed up-current

Pre-Survey Calibration	S. High 1/6	10.12 mg/L In DI water

Clear sunny day, water visibility good. Survey conducted by S.High and D. Berta. TSS samples not collected. ✓

Visual observations from diver indicated that there was no turbidity plume created even though there was a hole in one of the bags.

Readings near the grout mat indicated no apparent turbidity.

Simplified standard sampling conducted to verify no apparent impact on the waterway form construction activity.

Prepared By/Date:

Michael Lloyd Michael Lloyd Representative 3/26/03

L&AI

Calibration — 0715
Do probe sanded & reconditioned for 20 minutes on 4 second burn-in cycle.
Barometric pressure = 770.38 mm Hg
DO @ 10.12 over tap water
Turb cal @ 0.0 & 10.0 use standard dilution for 100 mtr
Turb ~~over~~ tap water = 0.7 ratio

0830 - ABUNDANT DEBRIS, STYROFOAM PIECES (≈ 1/4"), PUBITC, SMALL PIECES WOOD CHIPS, GRASS LIKE MATERIAL OR SHEEN, ETC. *

0925 TELECONFRMC ACCORDING TO 1 DILIGARD VISUAL MONITORING ONLY UNLESS A TURBIDITY PLUME IS DETECTED FOR TODAYS GROUT PLACEMENT.

0930 - DIVERS - ON "LOCK" INDICATE THEY CHECKED THE FINAL HAY OUT OF TUBES - THEY DID NOT GET INTO SEDIMENTS & REPORTEDLY VISIBILITY WAS 6' - NO VISIBLE TURBIDITY PLUME AS A RESULT OF DIVERS ACTIVITY - GROUT WAS REPORTEDLY PUSHED BACK TO 1030.
SEE NEXT PAGE

*1155 ACCORDING TO DIVERS AT 2ND GROUT TRUCK A SMALL HOLE IN THE GROUT MAT WAS NOTED - NO TURBIDITY WAS OBSERVED AT SURFACE

1215 DIVER NOTES PILLOW #2 NO HOLES / NO LEAKS

* NOTE: MATERIAL ON SURFACE BEFORE WORK STARTED FROM DOCK STREET WEST, DOCK TO ISTEM MARINE AS SAMPLE BOAT MOTORED TO SITE

Continued on Page

Read and Understood By

Signed	Date	Signed	Date
[signature]	080106	[signature]	080106

PROJECT Thea Foss

Notebook No. _____ 49

Continued From Page _____

030106 SLACK - EBB - READINGS NEAR GROUT WORK @ TOTEM MARINE.

TIME	LOCATION	EVENT	DTB	SAMPLE DEPTH	TEMP	SAL	DO	TURB	TSS
	~~TDS (300)~~ ~~652 856~~								
1140	@ SOUTH END GROUT SITE	A	35	D 30	9.7	29.8	6.1	6.4	—
1142	699 903			M 18	9.7	29.7	5.7	2.6	—
1145				S 3	9.6	28.4	6.3	2.4	—
~~X~~ SEE PREV PAGE	726 901 @ GROUT SITE (IE ~30' W OF BANK)	A	29	D 24	9.7	29.7	6.1	52	—
				M 14	9.7	29.6	5.8	46.6	—
				S 3	9.6	27.6	6.4	2.6	—
1159	TDS (300)	A	41	D 36	9.7	29.8	6.0	17.0	—
1201	652 856			M 21	9.7	29.7	6.1	2.2	—
1202				S 3	9.7	28.7	6.1	2.1	—
1204	TDNW	A	39	D 34	9.7	29.9	6.3	3.2	—
1205	700 826			M 19	9.7	29.7	6.2	1.7	—
1206				S 3	9.6	28.8	6.5	1.9	—
1209	TDW (300)	A	37	D 34	9.7	29.9	6.4	2.5	—
1210	746 827			M 19	9.7	29.7	6.2	1.4	—
1211				S 3	9.6	28.7	6.3	2.0	—
1213	TDNE	A	38	D 33	9.7	29.9	6.4	2.6	—
1214	787 853			M 19	9.7	29.7	6.2	1.1	—
1215				S 3	9.7	27.8	6.3	1.9	—

Continued on Page

Read and Understood By

Signed _____ Date 030106 Signed [signature] 030106 Date _____

PROJECT 030106

Notebook No. _____
Continued From Page _____

NOTE: WHEELER OSGOOD RECON

COORD FOR W. OSGOOD

	N	E
4+00	305	004
5+00	299	034
6+00	292	064
7+00	286	094
8+00	279	123
9+00	272	153
10+00	266	183
11+00	259	213
12+00	253	242
13+00	246	272
14+00	240	302
15+00	233	332

1130 RIG BERTHED IN MID CHANEL @ ~10+00 FOR MAINTAIN. (MANSON DERICK)

ABUNDANT SMALL FLOATING WOOD DEBRIS ON WATER SURFACE

Continued on Page

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[signature] 030106 [signature] 030106

Signed Date Signed Date

WHEELER OSGOOD RECON

PROJECT 030106 EBB FLOW

Notebook No. _____ 51

Continued From Page _____

TIME	LOCATION	EVENT	DTB	SAMPLE DEPTH	TEMP	SAL	DO	TURB	TSS
1058	4+NORTH	A	10.4	D 7.5	9.7	29.0	6.5	2.7	—
1100	5233329			M 5	9.6	28.5	6.5	3.2	
1102	543012			S 2.5	9.5	28.0	6.4	4.0	—
1110	4+SOUTH	A	12.1	D 9.0	9.6	29.1	6.8	2.7	—
1111	5233285			M 6.0	9.6	28.8	6.8	2.2	—
1112	542996			S 3.0	9.5	28.3	6.7	2.7	—
1115	4+00	A	14.6	D 10	9.7	29.1	6.4	2.8	—
1116	5233306			M 7	9.6	29.0	6.4	2.6	—
1117	543004			S 3.0	9.6	28.0	6.5	4.0	—
1123	6+00	A	DB 14.0	D 10	9.7	29.2	6.2	3.5	—
1124	292			M 7	9.7	29.1	6.2	2.6	—
1125	064			S 3.0	9.6	28.4	6.3	4.0	—
1127	8+00	A	13.4	D 10	9.7	29.1	6.1	3.0	—
1128	279			M 7	9.6	28.7	6.3	3.9	—
1130	123			S 3.0	9.5	28.2	6.4	5.0	—

— (~10+00) — BARGE IN WAY TO REACH 10+00

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Continued on Page

Read and Understood By

[signature] 030106 Daniel A. Burke 030106

Signed Date Signed Date

PROJECT THEA FOSS 030106 Notebook No. _____

Continued From Page _____

FROM WHEELER OSGOOD - TOTEM MARINE
@ ≈ -1.0

[illegible]	- NTU	DO (mg/L)	(~~TURBIDITY~~ SAL)	
1135	4.0	7.2	25.3	(IN W.O.)
1136	4.8	6.9	24.1	(@ MOUTH OF W.O.)
1137	3.9	6.9	24.8	IN THEA FOSS @ WOODWORTH
1138	3.6	6.9	24.7	" " NEAR 10TH ST BRIDGE TOS
1139	3.6	6.9	25.2	@ 10TH ST BRIDGE
1140	3.3	6.8	25.7	NORTH OF 10TH ST BRIDGE
1141	3.4	7.0	25.5	SOUTH END TOTEM MARINE
1142	3.5	6.9	27.5	CENTER TOT. MARINE

NOTE READINGS OBTAINED MOTORING FROM WHEELER OSGOOD TO TOTEM MARINE IN WATER @ ~ 2.0' DEPTH

Continued on Page

Read and Understood By

[signature] 030107 [signature] 030106

Signed Date Signed Date

Lloyd & Associates, Inc.
38210 SE 92nd Street, Snoqualmie, Washington 98065 425-888-1905(v/f) rml@centurytel.net

January 6, 2003

TRANSMITTAL

To: John O'loughlin
Iain Wingard

From: Michael Lloyd

RE: Weekly Water Quality Monitoring Report 1/6/03

Daily water quality monitoring reports have been previously submitted to the City of Tacoma. These reports will be finalized as soon as final laboratory reports for TSS from STL have been provided.

Water Quality Monitoring was at Totem Marine was conducted on January 2nd, 3rd, and 5th. As noted in daily reports, turbidity problems with capping activities will continue to be an issue for the project. Field duplicate samples have been analyzed by field instrumentation and the City of Tacoma. In general the field measurment has been lower (more conservative) than the Winkler Titration results.

Also attached are copies of notebook pages from 12/27 to 1/5 as requested.

Michael Lloyd
Lloyd & Associates, Inc.

cc. CQC
File

Lloyd & Associates, Inc.
38210 SE 92nd Street, Snoqualmie, Washington 98065 425-888-1905

January 7, 2003

TRANSMITTAL

To: Iain Wingard
John O'Loughlin

Subject: Compliance Monitoring/Totem Marine 1/7/03
Preliminary Data Transmittal

Reprinted 3/24/03 for TSS PM

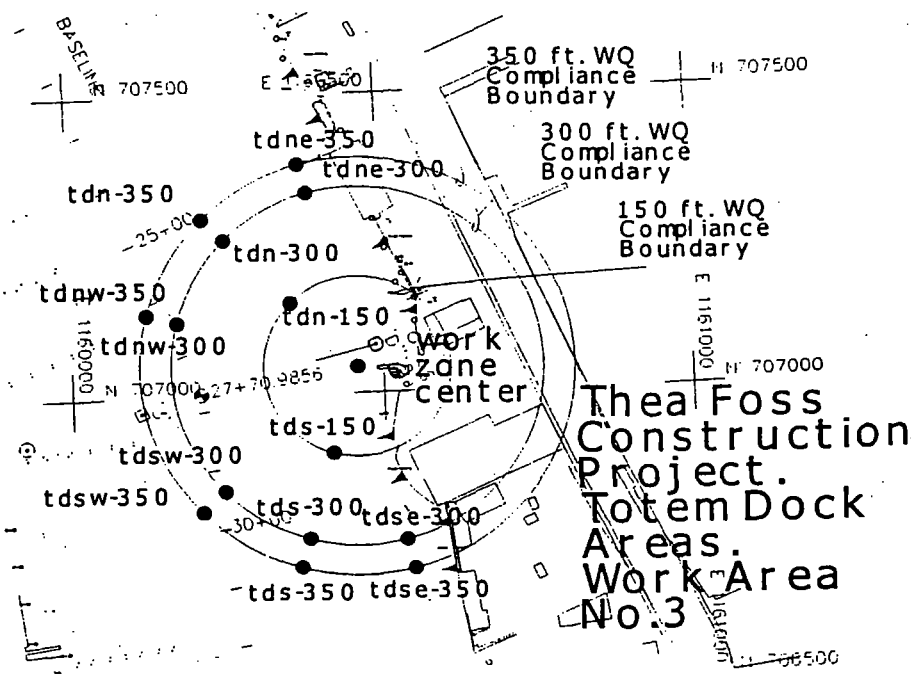
Attached please find results from compliance monitoring for riprap placement in the toe berm at Totem Marine. Monitoring results include additional points established for turbidity compliance at 350' as shown in the sampling rose below. Field notebook pages for 1/6 and 1/7 are attached.

ACC-Hurlen had obtained a new load of rock that was visually much cleaner that materials observe on January 5th. In truth very little rock was placed because of a lack of entry agreements to the north and south.

Field duplicate data was gathered for sampling station TDN150. Salinity, dissolved oxygen, turbidity, and temperature readings were consistently close for all parameters. Winkler Titration results for sample 030107/TDN300/M/A yielded dissolved oxygen results for the field duplicate and a laboratory duplicate of 6.3 and 6.4 mg/L (L&AI data). Data measured in the field yeilded a result of 6.1 mg/L.

1/8/03

Michael Lloyd
Lloyd & Associates, Inc.



Construction Compliance Monitoring

Date: JAN 7 **Totem Marine - Slack/Ebb**

Station/Sample	Depth/DTB (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
TDS350 (up-current)	3	28.2	6.5	1.5	9.7		5,233,659	542,905	1005	Slack/ Ebb Tide
Mid	21	29.5	6.3	1.2	9.7				1004	No TSS at 350'
Deep	37/42	29.7	6.4	2.6	9.7				1003	
TDS300 (up-current)	3	28.1	6.4	1.5	9.7		5,233,683	542,880	1005	Slack/ Ebb Tide
030107/TDS300/M/A	22	29.5	6.1	1.4	9.7	2			1004	Placement of riprap on-going
Deep	38/43	29.7	6.0	11.2	9.7				1003	
TDN150 (down-current)	3	28.7	6.4	1.4	9.5		5,233,810	542,871	1030	
030107/TDN150/M/A	21	29.7	6.2	1.8	9.7				1029	DO>5.0 mg/L
Deep	37/42	29.8	6.5	2.7	9.7				1028	
TDN150 (down-current)	*3*	*28.8*	*6.3*	*1.4*	*9.5*		*5,233,810*	*542,871*	*1033*	*Field Duplicate of TDN150*
Mid	*21*	*29.6*	*6.2*	*1.8*	*9.7*				*1032*	*Field Duplicate of TDN150*
Deep	*37/42*	*29.8*	*6.8*	*2.8*	*9.7*				*1031*	*Field Duplicate of TDN150*
TDN300 (down-current)	3	28.9	6.4	1.9	9.4		5,233,835	542,838	1040	
030107/TDN300/M/A+Dup.	22	29.6	6.1*	2.3	9.7	3/2			1039	Winkler Titration/COT & L&AI
Deep	38/43	29.8	6.2	3.1	9.7				1037	
TDN350 (down-current)	3	28.3	6.6	1.5	9.5		5,233,846	542,827	1102	
Mid	21	29.7	6.2	1.3	9.7				1101	No TSS at 350'
Deep	37/42	29.8	6.1	2.8	9.7				1059	
TDNE300 (down-current)	3	29.0	6.2	5.2	9.6		5,233,860	542,884	1117	Ebb tide
030107/TDNE300/M/A	7	29.2	6.2	5.2	9.6	3			1116	
Deep	11/14	29.4	6.3	3.0	9.7				1114	
TDNE350 (down-current)	3	29.0	6.2	3.0	9.5		5,233,871	542,875	1128	
Mid	9	29.4	6.1	1.8	9.7				1126	No TSS at 350'
Deep	12/17	29.5	6.2	1.8	9.7				1125	
TDNW300 (down-current)	3	28.3	6.0	1.6	9.4		5,233,793	542,815	1135	
030107/TDNW300/M/A	21	29.8	5.8	2.0	9.7	2			1134	
Deep	36/41	29.9	6.1	2.1	9.6				1133	
TDNW350 (down-current)	3	28.3	6.1	2.2	9.6		5,233,797	542,800	1142	
Mid	21	29.7	6.1	2.2	9.7				1141	No TSS at 350'
Deep	36	29.9	6.7	2.6	9.7				1140	
Station 2+00	3	29.5	6.9	1.9	9.6		5,233,670	542,905	947	
030107/TF2/M/A	24	29.7	6.8	1.6	9.6	5			946	
	42/47	29.8	6.9	0.9	9.6				944	

Pre-Survey Calibration S. High 1/7 10.7 mg/L

DO Calibration as per manufacturer's specifications. Presurvey calibration in DI was 10.7 as noted in field notebook.

Survey work conducted by D. Berta and S. high Clear, warm & sunny weather

Notebook pages for 1/6/03 and 1/7/03 attached to submittal.

Turbidity Calibration as per manufacturer's specifications. Calibration at 0, 10NTU's.

*Winkler samples collected as FD with Wheaton type Bomb L&AI Winkler results = 6.3, 6.4 mg/L

Prepared By/Date: M. Lloyd 1/7 Reprinted 3/26/03

Preliminary

L&AI

STL Seattle

Client Name	Lloyd & Assoc. Inc.
Project Name	THEA FOSS
Date Received	01-07-03

General Chemistry Parameters

Client Sample ID 030107/TF2+00/M/A
Lab ID 111099-01

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-08-03	mg/L	5	2

Client Sample ID 030107/TDS(300)/M/A
Lab ID 111099-02

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-08-03	mg/L	2	2

Client Sample ID 030107/TDN(300)/M/A
Lab ID 111099-03

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-08-03	mg/L	3	2

Client Sample ID 030107/TDN(300)/M/DUP
Lab ID 111099-04

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-08-03	mg/L	2	2

Client Sample ID 030107/TDNE(300)/M/A
Lab ID 111099-05

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-08-03	mg/L	3	2

STL Seattle

Client Sample ID	030107/TDNW(300)/M/A
Lab ID	111099-06

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-08-03	mg/L	2	2

STL Seattle

QUALITY CONTROL REPORT

Client Sample ID: Batch QC
Lab ID: 111096-1
QC Batch Number: 1159-006

Method Blank

Parameter	Result (mg/L)	PQL
Total Suspended Solids	ND	2

Duplicate

Parameter	Sample Result (mg/L)	Duplicate Result (mg/L)	RPD (%)	Flag
Total Suspended Solids	2	1.67	18	

Calibration — 0715
Do probe sanded & reconditioned for 20 minutes on 4 second burn-in cycle.
Barometric pressure = 770.38 mm Hg
DO @ 10.12 over tap water
Turb cal @ 0.0 & 10.0 use standard dilution for 100 mtu
Turb over tap water = 0.7 mtu

0830 - ABUNDANT DEBRIS, STYROFOAM PIECES (≈1/4"), PUBITIC, SMALL PIECES WOOD CHIPS, GRASS LIKE MATERIAL OCC. SHEEN, ETC. *

0925 TELECONFERENCE ACCORDING TO 1 WILLGARD VISUAL MONITORING ONLY UNLESS A TURBIDITY PLUME IS DETECTED FOR TODAYS GROUT PLACEMENT.

0830 - DIVERS - ON "LOCK" INDICATE THEY CHECKED THE FINAL LAY OUT OF TUBES - THEY DID NOT GET INTO SEDIMENTS & REPORTEDLY VISIBILITY WAS 6' - NO VISIBLE TURBIDITY PLUME AS A RESULT OF DIVERS ACTIVITY. - GROUT WAS REPORTEDLY PUSHED BACK TO 1030.

SEE NEXT PAGE

*1155 ACCORDING TO DIVERS AT 2ND GROUT TRUCK A SMALL HOLE IN THE GROUT MAT WAS NOTED - NO TURBIDITY WAS OBSERVED AT SURFACE

1215 DIVER NOTES PILLOW #2 NO HOLES / NO LEAKS

* NOTE: MATERIAL ON SURFACE BEFORE WORK STARTED FROM DOCK STREET REST, DOCK TO ITEM MARINE AS SAMPLE BOAT MOTORED TO SITE

Continued on Page

Read and Understood By

Signed	Date	Signed	Date
[signature]	080104	[signature]	080106

ROJECT Thea Foss Notebook No. _____ 49
Continued From Page _____

030106 SLACK - EBB - READINGS NEAR GROUT WORK
@ TOTEM MARINE.

TIME	LOCATION	EVENT	DTB	SAMPLE DEPTH	TEMP	SAL	DO	TURB	TSS
	~~TDS (300)~~ DB ~~652 856~~							DB	
1140	@ SOUTH END GROUT SITE	A	35	D 30	9.7	29.8	6.1	6.4	—
1142	699 903			M 18	9.7	29.7	5.7	2.6	—
1145				S 3	9.6	28.4	6.3	2.4	—
~~X~~ SEE PREV PAGE	726 901 @ GROUT SITE (IE ~30' W OF BANK)	A	29	D 24	9.7	29.7	6.1	52	—
				M 14	9.7	29.6	5.8	46.6	—
				S 3	9.6	27.6	6.4	2.6	—
1159	TDS (300)	A	41	D 36	9.7	29.8	6.0	17.0	—
1201	652 856			M 21	9.7	29.7	6.1	2.2	—
1202				S 3	9.7	28.7	6.1	2.1	—
1204	TDNW	A	39	D 34	9.7	29.9	6.3	3.2	—
1205	700 826			M 19	9.7	29.7	6.2	1.7	—
1206				S 3	9.6	28.8	6.5	1.9	—
1209	TDN (300)	A	37	D 34	9.7	29.9	6.4	2.5	—
1210	746 827			M 19	9.7	29.7	6.2	1.4	—
1211				S 3	9.6	28.7	6.3	2.0	—
1213	TDNE	A	38	D 33	9.7	29.9	6.4	2.6	—
1214	787 853			M 19	9.7	29.7	6.2	1.1	—
1215				S 3	9.7	27.8	6.3	1.9	—

Continued on Page

Read and Understood By

[signature] 030106 [signature] 030106

Signed Date Signed Date

PROJECT 030106

Notebook No. _____
Continued From Page _____

NOTE: WHEELER OSGOOD RECON

COORD FOR W. OSGOOD

	N	E
4+00	305	004
5+00	299	034
6+00	292	064
7+00	286	094
8+00	279	123
9+00	272	153
10+00	266	183
11+00	259	213
12+00	253	242
13+00	246	272
14+00	240	302
15+00	233	332

1130 RIG BERTHED IN MID CHANEL @ ~10+00 FOR MAINTAIN. (MANSON DERICK)

ABUNDANT SMALL FLOATING WOOD DEBRIS ON WATER SURFACE

Continued on Page

Read and Understood By

[signature] 030106 [signature] 030106

Signed Date Signed Date

PROJECT 030106 EBB FLOW Notebook No. 51

Continued From Page

TIME	LOCATION	EVENT	DTB	SAMPLE DEPTH	TEMP	SAL	DO	TURB	TSS
1058	4+NORTH	A	10.4	D 7.5	9.7	29.0	6.5	2.7	—
1100	5233329			M 5	9.6	28.5	6.5	3.2	—
1102	543012			S 2.5	9.5	28.0	6.4	4.0	—
1110	4+SOUTH	A	12.1	D 9.0	9.6	29.1	6.8	2.7	—
1111	5233285			M 6.0	9.6	28.8	6.8	2.2	—
1112	542996			S 3.0	9.5	28.3	6.7	2.7	—
1115	4+00	A	14.6	D 10	9.7	29.1	6.4	2.8	—
1116	5233306			M 7	9.6	29.0	6.4	2.6	—
1117	543004			S 3.0	9.6	28.0	6.5	4.0	—
1123	6+00	A	14.0	D 10	9.7	29.2	6.2	3.5	—
1124	292			M 7	9.7	29.1	6.2	2.6	—
1125	064			S 3.0	9.6	28.4	6.3	4.0	—
1127	8+00	A	13.4	D 10	9.7	29.1	6.1	3.0	—
1128	279			M 7	9.6	28.7	6.3	3.9	—
1130	123			S 3.0	9.5	28.2	6.4	5.0	—

— (~10+00) — BARGE IN WAY TO REACH 10+00

259

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Continued on Page

Read and Understood By

[signature] 030106 Daniel A. Burke 030106

Signed Date Signed Date

PROJECT THEA FOSS 030106

Notebook No. _____

Continued From Page _____

FROM WHEELER OSGOOD - TOTEM MARINE

@ ≈ -1.0

[illegible]	NTU	DO (mg/L)	(~~TURBIDITY~~ SAL)	
1135	4.0	7.2	25.3	(IN W.O.)
1136	4.8	6.9	24.1	(@ MOUTH OF W.O.)
1137	3.9	6.9	24.8	IN THEA FOSS @ WOODWORTH
1138	3.6	6.9	24.7	" " NEAR 10TH ST BRIDGE TOS
1139	3.6	6.9	25.2	@ 10TH ST BRIDGE
1140	3.3	6.8	25.7	NORTH OF 10TH ST BRIDGE
1141	3.4	7.0	25.5	SOUTH END TOTEM MARINE
1142	3.5	6.9	27.5	CENTER TOT. MARINE

NOTE READINGS OBTAINED MOTORING FROM WHEELER OSGOOD TO TOTEM MARINE IN WATER @ ~ 1.0' DEPTH

Continued on Page

Read and Understood By

Signed	Date	Signed	Date
[signature]	030107	Daniel A. Butz 030106	

PROJECT Lea Ross

Notebook No. _____ 53

Continued From Page _____

030107 Robin Dock SLACK/EBB TIDE

TIME 0944	LOCATION	SEAT	DTB	SAMPLE DEPTH	TEMP	SAL	DO	TURB	TSS
0944	TF2+00	A	(47)	D 42	9.6	29.8	6.9	0.9	—
0946	465 492			M 24	9.0	29.7	6.3	1.6	030107/TF2+00/M/A
0947	(ACCURACY GPS 5')			S 3	9.6	29.5	6.9	1.9	—
						EBB TIDE			
1003	TDS 350	A	(42)	D 37	9.7	29.7	6.4	2.6	—
1004	659 905			M 21	9.7	29.5	6.3	1.2	~~030107/TDS(350)/M/A~~
1005	(ACCURACY 5.6)			S 3	9.4	28.2	6.5	1.5	— DG*
									(NOTE: NO TSS @ THIS LOCATION)
1016	TDS 300	A	(43)	D 38	9.7	29.7	6.0	1.2	—
1017	(683 880)			M 22	9.7	29.5	6.1	1.4	030107/TDS(300)/M/A
1019	(ACCURACY 5.5')			S 3	9.3	28.1	6.4	1.5	—
1028	TDN (150)	A	(42)	D 37	9.7	29.3	6.5	2.7	—
1029	804 871			M 21	9.7	29.7	6.2	1.8	—
1030	818 871*			S 3	9.5	28.7	6.2	1.4	—
	(ACCURACY 7.2')								

* AGAINST NORTH EDGE OF BARGE

DUPLICATE ↓

1031	TDN (150) DUP		(42)	D 37	9.7	29.8	6.8	2.8	—
1032	818 871*			M 21	9.7	29.6	6.2	1.8	—
1033				S 3	9.5	28.8	6.3	1.4	—
1037	TDN (300)		(43)	D 38	9.7	29.8	6.2	3.1	—
1039	835 838		★	M 22	9.7	29.6	6.1	2.3	030107/TDN(300)/M/F
1040	(ACCURACY 7.2')			S 3	9.4	28.9	6.4	1.9	030107/TDN(300)/M/DU
				NOTE: 2-DO BOTTLES TAKEN @ MID DEPTH - CITY & L&A					
1059	TDN (350)		(42)	D 37	9.7	29.8	6.1	2.8	—
1101	846 827			M 21	9.7	29.7	6.2	1.3	—
1102	(ACCURACY 6.2)			S 3	9.5	29.3	6.6	1.5	—

★ NOTE: DUP TSS TAKEN @ 1039 TDN (300) & SPLIT DO SAMPLE 1 FOR CITY & 1 FOR L&A.

Continued on Page

Read and Understood By

Signed _____ Date _____ Signed _____ Date 030107

Daniel A. Burke 030107

THEA FOSS - TOTEM MARINE

PROJECT 030107 NOTES: Notebook No. _____

Continued From Page _____

CALIBRATION NOTES: 0550:
D.O. CALIBRATION IN MOIST AIR OVER TAP WATER - READS 10.7

TURBIDITY CALIBRATION WITH 2 POINTS
0.0 - DEIONIZED WATER
10.0 - CALIBRATION STANDARD
CALIBRATION SUCESSFULL
READING IN TAP WATER: 102% - DO

TOTEM DOCK WORK ZONE #3

WORK ZONE CENTER	N	E	N	E
			5233772	542904
TDNE-350	871	875		
TDNE-300	860	884		
TDN-350	846	827		
TDN-300	835	838		
TDN-150	804	871		
TDNW-350	797	800		
TDNW-300	793	815		
TDSW-350	708	837		
TDSW-300	697	828		
TDS-350	659	905		
TDS-300	6 883	880		
TDS-150	08 727	892		
TDSE-350	669	931		
TDSE-300	683	927		

0815 ON WATER - NO ROCK PLACEMENT @ TOTEM MARINE SITE. CONTINUE INSTALLATION OF GROUT WEATHER CLEAR COOL NO BREEZE - "WATER LIKE GLASS" MINOR SMALL PARTICULATE ON SURFACE

Continued on Page

Read and Understood By

Signed _____ Date _____ Signed _____ Date 030107

Daniel A. Burke 030107

030107

TIME	LOCATION	EVNT	DTB	SAMPLE DEPTH	TEMP	SAL	DO	TURB	TSS
1114	TOWE (300)	A	8.15 (14)	D 12	9.7	29.4	6.3	3	—
1116	500 554			M 7	9.6	29.2	6.2	5.2	030107/TOWE(300)/M/A
1117	(ACCURACY 6.0)			S 3	9.6	29.0	6.2	5.2	—
	TOWE (350)								
1125	571 575	A	(17)	D 12	9.7	29.5	6.2	1.8	—
1126	(ACCURACY 5.5)			M 9	9.7	29.4	6.1	1.8	—
1128				S 3	9.5	29.0	6.2	3.0	—
1133	TOWW (300)	A	(41)	D 36	9.6	29.9	6.1	2.1	—
1134	793 815			M 21	9.7	29.8	5.8	2.0	030107/TOWW/300/M/A
1135	(ACCURACY 5.1)			S 3	9.4	28.3	6.0	1.6	—
1140	TOWW (350)	A	(41)	D 36	9.7	29.9	6.7	2.6	—
1141	797 800			M 21	9.7	29.7	6.1	2.2	—
1142	(ACCURACY 4.1)			S 3	9.6	29.3	6.1	2.2	—

030107 WHEELER ASGOOD WATERWAY - EBB TIDE

TIME	LOCATION	EVENT	DTB	SAMPLE DEPTH	TEMP	SAL	DO	TURB	TSS
1315	4-North	B	(7.3)	D 6	9.6	29.9	6.4	2.4	—
1316	329 012			M 4.5	9.6	29.8	6.1	2.1	—
1317	(ACCURACY 6')			S 2.5	9.5	27.7	6.1	2.9	—
1320	4-Cen	B	(11.7)	D 8	9.7	29.1	DO 6.3 ~~7.0~~	2.0	—
1321	366 004			M 5.5	9.6	29.9	6.2	1.6	—
1322	(ACCURACY 6')			S 2.5	9.5	29.4	6.3	3.4	—
1324	4-South	B	(12.8)	D 9	9.7	29.2	6.1	1.9	—
1325	235 996			M 6.5	9.6	29.0	6.1	1.6	—
1326	(ACCURACY 6.4')			S 2.5	9.6	28.7	6.2	3.1	—

Continued on Page

Read and Understood By

Signed _____ Date _____ Signed _____ Date 030107

Paul A. Birk 030107

030107 NOTES

PROJECT Tilea Foss - Totem Marine

Notebook No. _____

Continued From Page _____

1012 - Hullen Begins Loading Rip Rap. - & Placing @ Slower Rate ie 1 Bucket / ~10 min.

1200 - Grout Finished / Rock Placement ~~Finish~~ Terminated.

Note: Silt Boom Placed Across the Mouth of Wheeler - 08600 since our last readings on 030106

RE - Calibration Notes:

1310:

Do calibrated in air above tap water ~~= 102.9 DB~~

Calibrated with distilled water = 0.0 NTU and 10.0 turbidity standard

Readings in moist air above tap water 99% Do after calibration.

1335 Results of Winkler Titration: TDH (300)/M/A

322 x 100 x .02 = 6.4 mg/L

315 x 100 x .02 = 6.3 mg/L ⇒ Duplicate / [illegible]

1405 Depth checks @ P. Barious Request

St Paul Waterway - Middle Waterway

*Northern most exist. Pile

Time	N	E	Depth	Time	N	E	Depth
1406	*5234870	0542928	7.1 →	1412	865	925	3.6
				1413	862	924	5.0
1407	880	927	9.4	1413	859	920	6.7
				1414	852	916	7.5
1407	889	921	12.3	1414	849	912	7.7
				1415	845	908	7.5
1408	896	919	15.1				

Continued on Page

835 920 7.4

Read and Understood By

1632 hrs Post sampling calib. check 9.0°C 88% & 0.2 & 0.4 NTU in tap water.

030107

Signed Date Signed Date

David A. Byte 030107

Lloyd & Associates, Inc.
38210 SE 92nd Street, Snoqualmie, Washington 98065 425-888-1905

January 9, 2003

TRANSMITTAL

To: Iain Wingard
John O'Loughlin

TSS Update 1/18/03
PML

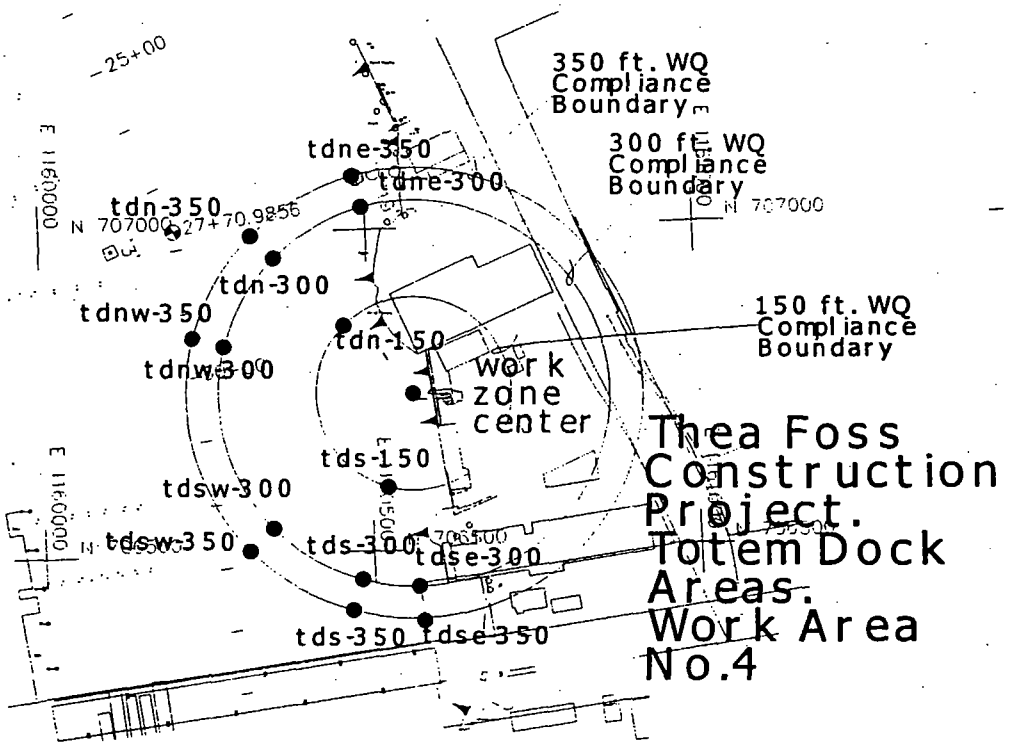
Subject: Compliance Monitoring/Totem Marine 1/9/03
~~Preliminary~~ Data Transmittal

Attached please find results from compliance monitoring for riprap placement in the toe berm at Totem Marine. Monitoring results include additional points established for turbidity compliance at 350' as shown in the sampling rose below. Tidal flow for the first sampling event was a flood tide with maximum high tide estimated for after 1010. Tidal flow for the second sampling event was on an ebb tide.

ACC-Hurlen had obtained a new load of rock that was visually much cleaner that materials observe on January 5th. Materials later in the afternoon likely contained some filter cap material. Placement was along the south and west side of the toe berm. Operator was intentionally working an even pace to keep turbidity down although afternoon work was not observed to be as controlled (per Iain Wingard).

Field duplicate data collected for sampling station TDNW300 was acceptable for all parameters (dissolved oxygen, turbidity, salinity, temperature). TSS duplicate samples submitted to STL.

Data measured in the field with the YSI Sonde yielded a result of 6.2 mg/L for sample 030109/TF2/M/A submitted to the City of Tacoma for Winkler Titration. Results not reported by City of Tacoma.



Michael Lloyd
Lloyd & Associates, Inc.

- Totem Marine 1 9 03.doc

Compliance Monitoring: Totem Marine **Date: January 9, 2003**

Station/Sample	Depth/DTB (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
TDN350 (up-current)	3	27.3	6.2	1.6	9.4		5,233,756	542,863	744	Flood Tide
Mid	20	29.7	6.5	0.6	9.6				743	rock placement on-going
Deep	35/40	29.7	6.5	2.0	9.6				742	in toe berm on S. end
TDN300 (up-current)	3	27.4	6.1	1.3	9.4		5,233,745	542,874	749	
030109/TDN300/M/A	20	29.7	6.4	0.6	9.6	2			748	
Deep	34/39	29.8	6.4	1.0	9.6				747	
TDS150 (down-current)	3	27.7	6.1	1.5	9.4		5,233,633	542,909	801	Station moved to just west of
030109/TDS150/M/A	20	29.7	6.2	1.5	9.6	2			800	Crowley Tug
Deep	35/40	29.8	6.5	1.8	9.6				759	
TDS300 (down-current)	3	27.5	6.2	1.4	9.5		5,233,593	542,916	805	
030109/TDS300/M/A	20	29.7	6.3	0.9	9.6	2U/2U			804	Duplicate
Deep	34/39	29.8	6.2	1.2	9.6				803	
TDS350 (down-current)	3	27.3	6.1	1.8	9.4		5,233,579	542,913	817	
Mid	20	29.7	6.2	1.1	9.6				816	
Deep	35/40	29.8	6.3	1.4	9.6				815	
TDSE300 (down-current)	3	27.1	6.2	1.8	9.1		5,233,590	542,943	827	
030109/TDSE300/M/A	16	29.7	6.1	1.2	9.6	2			826	
Deep	27/32	29.8	6.2	1.3	9.6				825	
TDSE350 (down-current)	3	27.4	5.8	1.6	9.4		5,233,566	542,946	822	Station moved to just N of
Mid	15	29.6	6.0	1.1	9.7				821	Fire Boat
Deep	25/30	29.7	6.1	1.7	9.7				820	
TDSW300 (down-current)	3	27.9	6.1	1.3	6.3		5,233,618	542,875	839	
030109/TDSW300/M/A	22	29.7	6.4	1.0	6.2	2			838	
Deep	36/41	29.8	6.3	2.0	6.1				838	
TDSW350 (down-current)	3	28.7	6.2	1.1	9.5		5,233,604	542,864	836	
Mid	21	29.7	6.4	0.4	9.6				835	
Deep	37/42	29.8	6.3	1.3	9.6				834	
Station 2+00	3	28.1	6.3	0.9	9.3		5,233,465	542,492	902	
030109/TF2/M/A	23	29.4	6.2*	0.7	9.5	44			901	
Deep	41/46	29.8	6.1	0.4	9.7				900	

Pre-Survey Calibration S. High 1/9 99.5% in moist air

DO Calibration as per manufacturer's specifications.

Survey work conducted by D. Berta and S. high

Turbidity Calibration as per manufacturer's specifications. Calibration at 0, 10 ntu's

Hurlen placing rock at south end of Totem Marine.

*DO sample collected for City of Tacoma analysis by Winkler.

Water is calm, no floating debris

Clear,cool & sunny weather

Air T = 3 °C

Prepared By/Date: M. Lloyd 1/9

TSS Data Update DMR. 1/18/03

L&AI

Compliance Monitoring: Totem Marine **Date: January 9, 2003**

Station/Sample	Depth/DTB (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
TDS350 (up-current)	3	25.0	6.9	1.9	9.3		5,233,579	542,913	1414	Ebb Tide
Mid	18	29.5	6.1	1.8	9.7				1413	rock placement on-going
Deep	30/35	29.7	6.1	1.9	9.6				1412	in toe berm on S. end
TDS300 (up-current)	3	27.9	6.3	2.4	9.3		5,233,593	542,916	1421	
030109/TDS300/M/B	18	29.5	6.1	1.8	9.7	3			1419	TSS Sample
Deep	30/35	29.6	6.1	1.9	9.6				1417	
TDN150 (down-current)	3	28.7	5.9	4.5	9.5		5,233,713	542,907	1520	
030109/TDN150/M/B	16	29.6	5.9	4.2	9.6	5			1518	TSS sample
Deep	27/32	29.7	6.3	3.3	9.6				1515	
TDN300 (down-current)	3	28.5	6.1	3.7	9.5		5,233,745	542,874	1508	
030109/TDN300/M/B	17	29.5	5.9	4.5	9.6	4			1506	
Deep	29/34	29.7	6.6	6.6	9.6				1504	
TDN350 (down-current)	3	28.8	6.0	10.0	9.4		5,233,707	542,836	1501	Some near surface turbidity
Mid	17	29.6	6.0	4.7	9.6				1458	
Deep	29/34	29.7	6.6	5.4	9.6				1455	
TDNE300 (down-current)	3	28.9	5.7	5.7	9.5		5,233,763	542,892	1544	Moved to position close to
030109/TDNE300/M/B	12	29.5	5.5	3.5	9.6	4			1540	debris berm
Deep	19/24	29.6	5.5	10.4	9.6				1536	Slightly elevated turbidity
TDNE350 (down-current)	3	28.7	5.7	4.7	9.4		5,233,785	542,911	1534	
Mid	12	29.6	5.7	4.2	9.6				1532	
Deep	18/23	29.6	6.2	4.8	9.6				1531	
TDNW300 (down-current)	3	28.7	6.4	1.3	9.5		5,233,703	542,851	1440	
030109/TDNW300/M/B	18	29.6	6.3	1.9	9.6	2			1438	
Deep	30/35	29.7	6.5	2.2	9.6				1437	
TDNW300 (down-current)	*3*	*28.8*	*6.5*	*1.4*	*9.5*		*5,233,703*	*542,851*	*1451*	*Field duplicate*
030109/TDNW300/M/B-dup	*18*	*29.6*	*6.3*	*1.6*	*9.6*	*5*			*1445*	*Field duplicate*
Deep	*30/35*	*29.7*	*6.5*	*2.2*	*9.6*				*1441*	*Field duplicate*
TDNW350 (down-current)	3	28.5	6.6	1.2	9.4		5,233,707	542,836	1435	
Mid	18	29.6	6.5	2.3	9.6				1433	
Deep	30/35	29.7	6.7	2.0	9.6				1431	

Pre-Survey Calibration D. Berta 1/9 99.7% in moist air

DO Calibration as per manufacturer's specifications. Water is calm, no floating debris

Survey work conducted by D. Berta Clear,cool & sunny weather

Turbidity Calibration as per manufacturer's specifications. Calibration at 0, 10 ntu's

Hurlen placing rock at south end of Totem Marine. At 1600 they stopped and started pulling piling

Observed release of grout into water during sampling. Release form pump hose when placing into mat.

Prepared By/Date: M. Lloyd 1/9

TSS Update TMR 1/18/03

L&AI

STL Seattle

Client Name	Lloyd & Assoc. Inc.
Project Name	Thea Foss
Date Received	01-10-03

General Chemistry Parameters

Client Sample ID 030109/TDS150/M/A
Lab ID 111178-01

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-13-03	mg/L	2	2

Client Sample ID 030109/TDS300/M/A
Lab ID 111178-02

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-13-03	mg/L	ND	2

Client Sample ID 030109/TDS300/M/A-DUP
Lab ID 111178-03

rameter	Method	Date Analyzed	Units	Result	PQL
al Suspended Solids	EPA 160.2	01-13-03	mg/L	ND	2

Client Sample ID 030109/TDSW300/M/A
Lab ID 111178-04

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-13-03	mg/L	2	2

Client Sample ID 030109/TDN300/M/A
Lab ID 111178-05

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-13-03	mg/L	2	2

Client Sample ID 030109/TDSE300/M/A
Lab ID 111178-06

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-13-03	mg/L	2	2

STL Seattle

	Client Sample ID		030109/T2+00/M/A		
	Lab ID		111178-07		
Parameter	**Method**	**Date Analyzed**	**Units**	**Result**	**PQL**
Total Suspended Solids	EPA 160.2	01-13-03	mg/L	4	2

STL Seattle

QUALITY CONTROL REPORT

Client Sample ID: 030109/TDS150/M/A
Lab ID: 111178-01
QC Batch Number: 1159-008

Method Blank

Parameter	Result (mg/L)	PQL
Total Suspended Solids	ND	2

Duplicate

Parameter	Sample Result (mg/L)	Duplicate Result (mg/L)	RPD (%)	Flag
Total Suspended Solids	218	242	10	

119103

STL Seattle

Client Name	Lloyd & Assoc. Inc.
Project Name	Thea Foss
Date Received	01-10-03

General Chemistry Parameters

Client Sample ID 030109/TDNW300/M/B
Lab ID 111179-01

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-13-03	mg/L	2	2

Client Sample ID 030109/TDS300/M/B
Lab ID 111179-02

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-13-03	mg/L	3	2

Client Sample ID 030109/TDNW300/M/B-DUP
Lab ID 111179-03

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-13-03	mg/L	5	2

Client Sample ID 030109/TDNE300/M/B
Lab ID 111179-04

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-13-03	mg/L	4	2

Client Sample ID 030109/TDN150/M/B
Lab ID 111179-05

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-13-03	mg/L	5	2

Client Sample ID 030109/TDN300/M/B
Lab ID 111179-06

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-13-03	mg/L	4	2

STL Seattle

QUALITY CONTROL REPORT

Client Sample ID: Batch QC
Lab ID: 111170-1
QC Batch Number: 1159-008

Method Blank

Parameter	Result (mg/L)	PQL
Total Suspended Solids	ND	2

Duplicate

Parameter	Sample Result (mg/L)	Duplicate Result (mg/L)	RPD (%)	Flag
Total Suspended Solids	218	242	10	

RMF 1/18/03

PROJECT THEA FOSS - TOTEM MARINE Notebook No. _____
Continued From Page _____

030109 FLOOD TIDE

3.5°C = CAL. TEMP

0730 - CALIBRATION NOTES:
DO CALIBRATION IN MOIST AIR AIR ABOVE TAP WATER - CALIB SUCESSFULL -
DO CHECK 99.5%

- 2 POINT TURBIDITY CALIBRATION WITH DISTILLED WATER = 0.0 & 10 NTU STANDARD SOLUTION
- CALIBRATION CHECK ON 10 NTU = 10.0

HERLAN - STARTS PLACING RIP RAP ON SOUTH END @ 0730 -

0745 - WATER SURFACE SMOOTH, NO FLOAT, DEBRIS, WEATHER CLEAR, COOL

0825 PLACING ROCK @ ~ RATE OF 1 BUCKET / 7 MINUTES

[illegible]5 CALIBRATION CHECK TEMP 3.0 C 88% READING IN MOIST AIR OVER TAP WATER

1320 HURLEN BEGINS PLACING RIP RAP.

1335 - CALIBRATION NOTES
DO CALIBRATION IN MOIST AIR OVER TAP WATER
BAROMETRIC PRESSURE: 769.1 mm Hg
DO CHECK = 99.7% / 10.0 = TURBID CHECK WITH 10 NTU STANDARD

SEE PAGE 64 CONTINUATION OF NOTES

Continued on Page

Read and Understood By

[signature] 030109 _____ [signature] 030109
Signed Date Signed Date

030109

TIME	LOCATION	EVENT	DTB	SAMPLE DEPTH	TEMP	SAL	DO	TURB	TSS
0742	TDN (300)	A	31.9	D 35	9.6	29.7	6.5	2.0	—
0743	78 563			M 20	9.6	29.7	6.5	0.6	—
0744	(Acc. 4.7')			S 3	9.4	27.3	6.2	1.6	—
0747	TDN(300)	A	37	D 34	9.6	29.8	6.4	1.0	—
0748	745 574			M 20	9.6	29.7	6.4	0.6	030109/TDN(300)/M/A
0749	(Acc. 4.5')			S 3	9.4	27.4	6.1	1.3	—
0759	TDS(300)	A	42	D 35	9.6	29.8	6.5	1.8	—
0760	637 925			M 20	9.6	29.7	6.2	1.5	—
0761	*623 929			S 3	9.4	27.7	6.1	1.5	—
	(Acc. 5.1')								
	* NOTES AGAINST CREWEY TIME IN WORK TIME								
0803	TDS(300)	A	39	D 34	9.6	29.8	6.2	1.2	—
0804	593 916			M 20	9.6	29.7	6.3	0.9	030109/TDS(300)/M/A
0805	(Acc 5.3')			S 3	9.5	27.5	6.2	1.4	—
0807	TDS (300)	A	39	D 34	9.6	29.8	6.4	1.2	—
0808	(Acc 4.6')			M 20	9.6	29.7	6.4	0.9	030109/TDS(300)/M/DUP
0809	593 916			S 3	9.4	27.1	6.2	1.7	—
0815	TDS (350)	A	42	D 35	9.6	29.8	6.3	1.4	—
0816	579 913			M 20	9.6	29.7	6.2	1.1	—
0817	Acc 6.1'			S 3	9.3	27.3	6.1	1.8	—
0825	TDE(300)	A	32	D 27	9.6	29.7	6.2	1.3	—
0826				M 16	9.6	29.7	6.1	1.2	030109/TDE(300)/M/A
0827	596 943			S 3	9.2	27.4	6.2	1.8	—
	(Acc 5.3')				9.1	27.1			
					DUP				
0820	TDE(300)	A	32	D 25	9.7	29.7	6.1	1.2	—
0821	*575 946			M 15	9.7	29.6	6.0	1.1	—
0822	*566 946			S 3	9.4	27.4	5.8	1.6	Continued on Page
	(Acc 10.7')								

* NOTE. LOCATION OFF DESIGN/ PER CITY FIRE DEPT TOWER AND FIRE BOAT CONTAINEMENT

Read and Understood By

Tiffa A. Porter 030109 — Signed — Date

Signed — Date 030109

PROJECT THEA FOSS - TOTEM MARINE

Notebook No.

Continued From Page

030109

455 ACTIVITIES @ GROUT LOCATION ~~COMPLETE~~
DISCONTINUED THEN RESUMED AFTER 20 MIN. FOR
EQUIP. WORK

1555 GROUT OPERATIONS COMPLETE - DIVERS
LEAVE SITE
HURLEY WORKING ON ORGANIZING DECK ETC

1600 HURLEY PUT PILE PULLER ON CRANE

Continued on Page

Read and Understood By

[signature] 030109 — Signed — Date

[signature] — Signed — 1/9/03 — Date

PROJECT THEA TOSS – TOTEM MARINE 030109

TIME	LOCATION	EVENT	DTB	SAMPLE DEPTH	TEMP	SAL	DO	TURB	TSS
0834	TDSW (350)	A	42	D 37	9.6	29.8	6.3	1.3	—
0835	607 864			M 21	9.6	29.7	6.4	0.4	—
0836	(Acc 6.5)			S 3	9.5	28.7	6.2	1.1	—
0833	TDSW (300)	A	41	D 36	9.7	29.8	6.3	2.6	—
0838	618 875			M 22	9.6	29.7	6.4	1.0	030109/TDSW(300)/m/A
0839	(Acc 6.9)			S 3	9.4	27.9	6.1	1.3	—
0900	T=2400	A	46	D 41	9.7	29.8	6.1	0.4	—
0901	465 412			M 23	9.5	29.4	6.2	0.7	030109/T2400/m/A
0902	(Acc 4.4)			S 3	9.3	28.1	6.3	0.9	—
NOTE: SPLIT SAMPLE OBTAINED FOR DO, FOR CTM & LSA LABS. *LSA sample spilled by Rick/A.C.									
				EBB TIDE					
1412									
~~1405~~	TDS(350)	B	35	D 30	9.6	29.7	6.6	1.9	—
~~1407~~ 1413	579 913			M 18	9.7	29.5	6.1	1.8	—
1414	(Acc 16.2)			S 3	9.3	25.0	6.9	1.9	—
1417	TDS(300)	B	35	D 30	9.6	29.6	6.6	1.9	—
1419	595 916			M 18	9.7	29.5	6.1	1.8	030109/TDS(300)/m/B
1421	(Acc 7.2)			S 3	9.3	27.9	6.3	2.4	—
1431	TDNW(350)	B	35	D 30	9.6	29.7	6.7	2.0	—
1433	707 836			M 18	9.6	29.6	6.5	2.3	—
1435	(Acc 6.1)			S 3	9.4	28.5	6.6	1.2	—
1437	TDNW(300)	B	35	D 30	9.6	29.7	6.5	2.2	—
1438	703 851			M 18	9.6	29.6	6.3	1.9	030109/TDNW(300)/m/B
1440	(Acc 6.0)			S 3	9.5	28.7	6.4	1.3	—
			DUPLICATE						
1441	TDNW(300)	B	35	D 30	9.6	29.7	6.5	~~2.2~~ 2.2	—
1445	703 851			M 18	9.6	29.6	6.3	1.6	030109/TDNW(300)/m/B DUP
1451	(Acc 5.9)			S 3	9.5	28.8	6.5	1.4	—

Continued on Page

Read and Understood By

Paul A Baker 030109 — Signed — Date

RMK 11/4/03 — Signed — 030109 Date

PROJECT THEA FOSS - TOTEM MARINE

Notebook No.

Continued From Page

03/01/09

1605

CALIBRATION CHECK @ END OF SAMPLING

DO = 88.7 % in MOIST AIR over DI WATER

TURBIDITY 0.2 NTU in D.I WATER @ 9.5°C

Continued on Page

Read and Understood By

Signed	Date	Signed	Date
[illegible] 03/01/09		D M Lloyd	1/9/03

030109

PROJECT THEA FOSS - TOTEM MARINE

Notebook No. _____ 67

Continued From Page _____

TIME	LOCATION	EVENT	DTB	SAMPLE DEPTH	TEMP	SAL	DO	TURB	TSS
1455	TDN (350)	B	(34)	D 24	9.6	29.7	6.6	5.4	—
1458	756 863			M 17	9.6	29.6	6.0	4.7	—
1501	(ACC 6.0)			S 3	9.4	28.8	6.0	10.0	—
1504	TDN (300)	B	(34)	D 29	9.6	29.7	6.6	6.6	—
1506	745 874			M 17	9.6	29.5	5.9	4.5	030109/TDN(300)/M/B
1508	(ACC 7.0)			S 3	9.5	28.5	6.1	3.7	—
1515	TDN (150)	B	(32)	D 27	9.6	29.7	6.3	3.3	—
1518	713 907			M 16	9.6	29.6	5.9	4.2	030109/TDN(150)/M/B
1520	713 886*			S 3	9.5	28.7	5.9	4.5	—
	(ACC 8.6)								

* AT EDGE OF DEBRIS BOOM BETWEEN GROUT PLACEMENT AND RIP RAP PLACEMENT AREAS.

1531	TDN DB (350)	B	(23)	D 18	9.6	29.6	6.2	4.8	—
1532	785 911			M 12	9.6	29.6	5.7	4.2	—
1534	(ACC 5.5')			S 3	9.4	28.7	5.7	4.7	—
									—
1536	TDN DB (300)	B	24 ~~(28)~~ DB	D ~~23~~ 19	9.6	29.6	5.5	10.4	—
1540	763 892**			M ~~14~~ 12	9.6	29.5	5.5	3.5	030109/TDNE(300)/M/B
1544	(ACC 6.9)			S 3	9.5	28.9	5.7	5.7	—

769 915 (*) DESIGN LOCATION - ACTUAL LOCATION ** WAS AT THE EDGE OF THE DEBRIS BOOM. - OBSERVED A RELEASE OF GROUT INTO WATER DURING PLACEMENT. ~ 1-2 WHEEL BARROW MEASURES. - RELEASE FROM PUMP. HOSE WHEN PLACING INTO MAT.

Continued on Page

Read and Understood By

[signature] 030109 — Signed — Date

[signature] 1/9/02 — Signed — Date

Lloyd & Associates, Inc.
38210 SE 92nd Street, Snoqualmie, Washington 98065 425-888-1905 rml@centurytel.net

January 10, 2003

TRANSMITTAL

TSS Revision 1/18

To: Iain Wingard
John O'Loughlin

Subject: Compliance Monitoring/Totem Marine 1/10/03
~~Preliminary~~ Data Transmittal

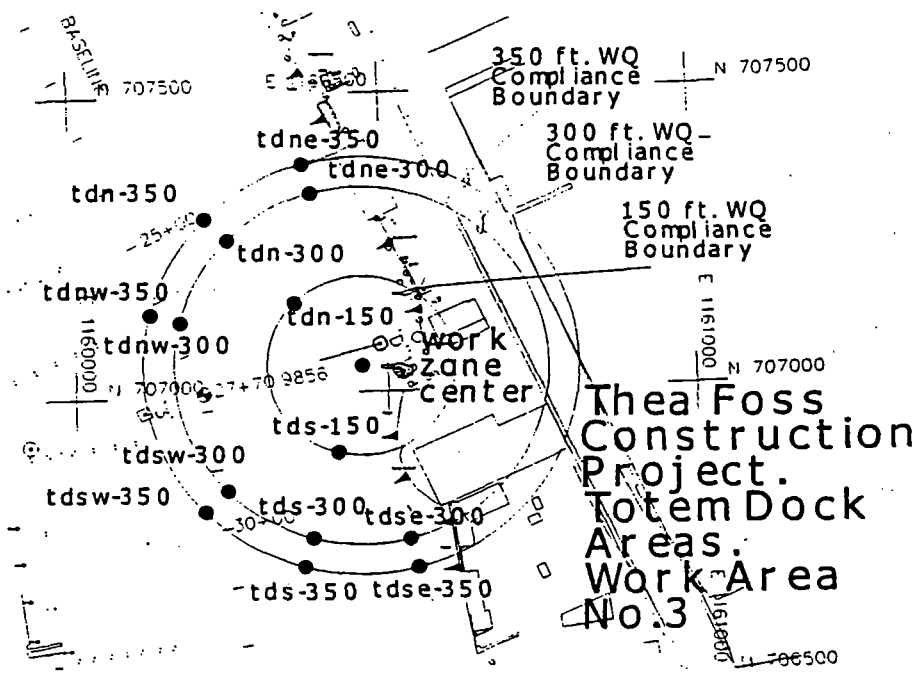
Attached please find results from compliance monitoring for riprap placement in the toe berm at Totem Marine. Monitoring results include additional points established for turbidity compliance at 350' as shown in the sampling rose below. Tidal flow for the sampling event was an ebb tide. Water quality monitoring results were acceptable at all stations and depths.

Placement was along the north side of the toe berm. Apparently, a right-of-entry agreement was obtained. Operator was reportedly working an even pace to keep turbidity down.

Field duplicate data collected for sampling station TDS300 was acceptable for all parameters (dissolved oxygen, turbidity, salinity, temperature). TSS duplicate samples submitted to STL. Shortly after the dup[licate data was collected, readings on DO at TDS350 were low (although above 5.0 mg/L). A check on calibration indicated a problem. D. Berta performed probe cleaning, new membrane, and recalibrated in the field before completing the survey.

Data measured in the field with the YSI Sonde yielded a result of 5.8 mg/L for sample 030110/TDS300/M/A. Winkler titration results for this sample yielded 6.4 and 6.5 mg/L.

Michael Lloyd
Lloyd & Associates, Inc.



- Totem Marine 1 10 03.doc

Construction Compliance Monitoring Date: JAN 10 Totem Marine - Ebb Tide

Station/Sample	Depth/DTB (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
TDS300 (up-current)	3	28.5	5.7	1.6	9.5		5,233,683	542,880	1316	
030110/TDS300/M/A	20	29.6	**5.8***	0.9	9.5	2U			1315	DO by Winkler (results below)
Deep	34/39	29.7	5.9	1.1	9.5				1313	
TDS300 (up-current)	*3*	*28.6*	*5.8*	*1.6*	*9.5*		*5,233,683*	*542,880*	*1322*	*Field Duplicate*
030110/TDS300/M/A-Dup	*19*	*29.6*	*5.9*	*1.0*	*9.5*	*2*			*1320*	*Field Duplicate*
Deep	*19*	*29.7*	*5.9*	*1.6*	*9.6*				*1318*	*Field Duplicate*
TDS350 (up-current)	3	28.6	5.2	1.1	9.4		5,233,683	542,880	1348	DO readings appeared low,
Mid	19	29.7	5.2	1.5	9.5				1347	Instrument checked and
Deep	32/37	29.8	5.5	1.8	9.5				1345	recalibrated, 100.4%
TDN150 (down-current)	3	28.2	6.6	1	9.5		5,233,804	542,871	1642	Point moved north to edge of
030110/TDN150/M/A	17	29.6	6.6	3.2	9.6	4			1641	debris boom
Deep	28/33	29.7	6.8	3.0	9.5				1640	
TDN300 (down-current)	3	28.5	6.5	1.4	9.6		5,233,835	542,838	1633	
030110/TDN300/M/A	17	29.7	6.7	2.0	9.6	3			1632	
Deep	28	29.7	6.8	2.4	9.5				1631	
TDN350 (down-current)	3	28.5	6.4	1.4	9.6		5,233,846	542,827	1629	
Mid	17	29.7	6.5	2.0	9.6				1628	
Deep	28/33	29.7	6.8	2.4	9.5				1627	
TDNE300 (down-current)	2	27.9	6.7	1.1	9.5		5,233,860	542,884	1653	ACCHurlen stopped placing
030110/TDNE300/M/A	5	29.2	6.5	1.0	9.6	2U			1652	rock at 1700
Deep	8/10	29.3	6.7	0.9	9.5				1651	
TDNE350 (down-current)	3	28.1	6.7	0.9	9.5		5,233,871	542,875	1647	
Mid	6	29.2	6.6	0.9	9.6				1646	
Deep	10/13	29.4	6.9	1.3	9.5				1645	
TDNW300 (down-current)	3	27.9	6.4	0.8	9.5		5,233,793	542,815	1625	
030110/TDNW300/M/A	17	29.6	6.6	1.2	9.6	2			1623	
Deep	29/34	29.7	6.6	1.6	9.5				1620	
TDNW350 (down-current)	3	28.8	6.4	1.2	9.5		5,233,797	542,800	1618	
Mid	17	29.6	6.5	1.4	9.6				1617	
Deep	29/34	29.7	6.5	1.0	9.5				1617	
Station 2+00	3	29.4	6.5	1.2	9.5		5,233,665	542,492	941	–
030110/TF2/M/A	23	29.7	6.6	0.9	9.5	3			940	
	40/45	29.7	6.5	0.9	9.5				935	

Pre-Survey Calibration D. Berta 100.6 % DO in Saturated air

DO Calibration as per manufacturer's specifications.

Survey work conducted by D. Berta. Clear, warm & sunny weather

Instrument recalibrated, new membrane installed, and KCL. = 100.4% DO in air. water clear

Turbidity Calibration as per manufacturer's specifications. Calibration at 0, 10NTU's.

*Winkler samples collected as FD with Wheaton type Bomb L&AI Winkler results = 6.4, 6.5 mg/L (Sonde = 5.8)

Prepared By/Date:
M. Lloyd 1/10

TSS Data Update
M. Lloyd 1/18 1/18

L&AI

STL Seattle

Client Name	Lloyd & Assoc. Inc.
Project Name	Thea Foss
Date Received	01-13-03

General Chemistry Parameters

Client Sample ID	030110/TF2+00/M/A
Lab ID	111215-01

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-13-03	mg/L	3	2

Client Sample ID	030110/TDS(300)/M/A
Lab ID	111215-02

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-13-03	mg/L	ND	2

Client Sample ID	030110/TDS(300)/M/DUP
Lab ID	111215-03

'arameter	Method	Date Analyzed	Units	Result	PQL
otal Suspended Solids	EPA 160.2	01-13-03	mg/L	2	2

Client Sample ID	030110/TDNW(300)/M/A
Lab ID	111215-04

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-13-03	mg/L	2	2

Client Sample ID	030110/TDN(300)/M/A
Lab ID	111215-05

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-13-03	mg/L	3	2

Client Sample ID	030110/TDN(150)/M/A
Lab ID	111215-06

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-13-03	mg/L	4	2

STL Seattle

Client Sample ID	030110/TDNE(300)/M/A
Lab ID	111215-07

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-13-03	mg/L	ND	2

STL Seattle

QUALITY CONTROL REPORT

Client Sample ID: 030110/TDN(150)/M/A
Lab ID: 111215-06
QC Batch Number: 1159-011

Method Blank

Parameter	Result (mg/L)	PQL
Total Suspended Solids	ND	2

Duplicate

Parameter	Sample Result (mg/L)	Duplicate Result (mg/L)	RPD (%)	Flag
Total Suspended Solids	3.6	3.43	4.8	

RWL 1/18/03

030110 FLOOD - START

TIME	LOCATION	EVENT	DMB	SAMPLE DEPTH	TEMP	SAL	DO	TURB	TSS	
[illegible]	TF 2400	A	75	D 40	9.5	29.7	6.5	0.9	—	
0940	465 492			M 23	9.5	29.7	6.6	0.8		030110/TF2400/M/A
0941	(5.1' Acc)			S 3	9.6	29.4	6.5	1.2	—	
	TDS (300/150)	A		EBB TIDE (MAX)						
1313	727 892		39	D 25 34	9.5	29.7	5.9	1.1	—	
1315	(6.8' Acc)			M 17 20	9.5	29.6	5.8	0.9		030110/TDS(300)/M/A
1316				S 3	9.5	28.5	5.7	1.6	—	
	683 909			NOTE: SPLIT SAMPLE DO: WINKLER METHOD CITY / L&A						
	683 880			DUPLICATE						
1318	TDS (300)	A	38	D 33	9.6	29.7	5.9	1.6	—	
1320	683 880			M 19	9.5	29.6	5.9	1.0		030110/TDS(300)/M/DUP
1322	(6.8' Acc)			S 3	9.5	28.6	5.8	1.6	—	
1345	TDS (350)	A	37	D 32	9.5	29.8	5.5	1.8	—	
1347	659 905			M 19	9.5	29.7	5.2	1.5	—	
1348	(Acc. 7.6)			S 3	9.4	28.6	5.2	1.1	—	
	DO SEE NOTES PAGE 70 →									
[illegible]	TDNW (350)	A	37	D 29	9.5	29.7	6.5	1.0	—	
1617	797 800		34	M 17	9.6	29.6	6.5	1.4	—	
1618	(Acc 7.0)			S 3	9.5	28.8	6.4	1.2	—	
1620	TDNW (300)		34	D 29	9.5	29.7	6.6	1.6	—	
1623	797 815			M 17	9.6	29.6	6.6	1.2		030110/TDNW(300)/M/A
1625	(Acc 6.1)			S 3	9.5	27.9	6.4	0.8	—	
1627	TDN (350)		33	D 28	9.5	29.7	6.8	2.1	—	
1628	846 827			M 17	9.6	29.7	6.5	1.4	—	
1629	(Acc 6.1)			S 3	9.4	28.5	6.4	0.8	—	
1631	TDN (300)		33	D 28	9.5	29.7	6.8	2.4	—	
1632	835 838			M 17	9.6	29.7	6.7	2.0		030110/TDN(300)/M/A
1633	(Acc 5.8)			S 3	9.6	28.5	6.5	1.4		

Continued on Page

Read and Understood By

[illegible] 1/10/03 — Signed — Date

[illegible] 1/10/03 — Signed — Date

PROJECT THEA FOSS TOTEM MARINE

Notebook No. _____
Continued From Page _____

030110

1245 BARDGE RELOCATED TO WORK ZONE #3.

RECALIBRATED SOLIDE:
BAROMETRIC PRESSURE = 768.0 mm Hg
D.O. CALIBRATED IN MOIST AIR OVER TAP WATER @ 11.3 °C - CALIBRATION SUCESSFULL READING 100.6 % DO IN AIR.
CALIBRATED TURBIDITY 2 POINT METHOD
0.0 - DISTILLED WATER 10.0 NTU STANDARD SOLUTION
CALIB. CHECK WITH 10.0 NTU SOLUTION = 9.9 NTU

1250 HURLEN BEGINS PLACING RIP RAP

1350 AFTER LOWER D.O. READINGS PERFORMED CALIB.
CHECK 69.4% IN AIR OVER TAP WATER.
RECALIB. D.O. ~~STARTED~~
100.4 % ← STARTED TPNW 350 OBTAINED
D.O. ≈ 7.6 @ DEEP STATION - RECALIB.
GAUGE FROM START

1432 SHUT DOWN - EXAMINED DO. PROBE
(MEMBRANE - WRINKLE IN MEMBRANE -
BAROMETRIC PRESSURE 766.6)
REPLACED MEMBRANE / RECONDITIONED D.O. PROBE

1600 BAROMETRIC PRESSURE 766.6
DO. CALIB IN AIR OVER TAP = 100.4
2 POINT TURBIDITY CALIB. W 0.0 NTU =
DI WATER & 10.0 NTU STD. SOLUTION
CHECK = 10.0 NTU.

≈ 1700 HURLEN SHUTTING DOWN ROCK PLACEMENT
ACCORDING TO DISCUSSION ON RADIO

- CALIBRATION CHECK 99.2% IN MOIST AIR OVER TAP WATER

Continued on Page

Read and Understood By

Daniel A. Beck 1/10/03 RM Floyd 1/10/03

Signed Date Signed Date

PROJECT TITEA FOSS - TOTEM MARINE 030110 Notebook No. _____ Continued From Page _____

TIME	LOCATION	EVENT	DTB	SAMPLE DEPTH	TEMP	SAL	DO	TURB	TSS
1640	TDN(150)	A	33	D 28	9.5	29.7	6.8	3.0	—
[illegible]	818 871*			M 17	9.6	29.6	6.6	3.2	030110/TDN(150)M/A
16[illegible]	804 871			S 3	9.5	29.2	6.6	1.0	
	(ACC 5.7')								
1645	TDNE (350)		13	D 10	9.5	29.4	6.9	1.3	—
1646	871 875			M 6	9.6	29.2	6.6	0.9	—
1647	(ACC 5.3)			S 3	9.5	28.1	6.7	0.9	—
1651	TDNE (300)		10	D 8	9.5	29.3	6.7	0.9	—
1652	860 884			M 5	9.6	29.2	6.5	1.0	030110/TDNE(300)M/A
1653	(4.8' ACC)			S 2	9.3	27.9	6.7	1.1	—

D.O. BY WINKLER TITRATION ON L&A SAMPLE
= 6.4 and 6.45 mg/L
From Hach instructions

Lab Dup
(1) 100 ml sample × 0.02 × 3.19 = 6.4
(2) 100 ml × 0.02 × 3.25 = 6.5

M L Lloyd

Continued on Page

Read and Understood By

[illegible] A. Burke 1/10/03 _____ [signature] 1/10/03

Signed Date Signed Date

Lloyd & Associates, Inc.
38210 SE 92nd Street, Snoqualmie, Washington 98065 425-888-1905 rml@centurytel.net

January 11, 2003

TRANSMITTAL

Tss Update 1/18/03

To: Iain Wingard
John O'Loughlin

Subject: Compliance Monitoring/Wheeler Osgood 1/11/03
Preliminary Data Transmittal

Attached please find results from compliance monitoring for riprap placement in the toe berm in the Wheeler-Osgood Waterway. Established monitoring points are shown in the sampling rose below. Tidal flow for the sampling event was an ebb tide. Water quality monitoring results were acceptable at all compliance stations and depths. DO was greater than 5.0 mg/L for station WO300 (early warning point for dissolved oxygen).

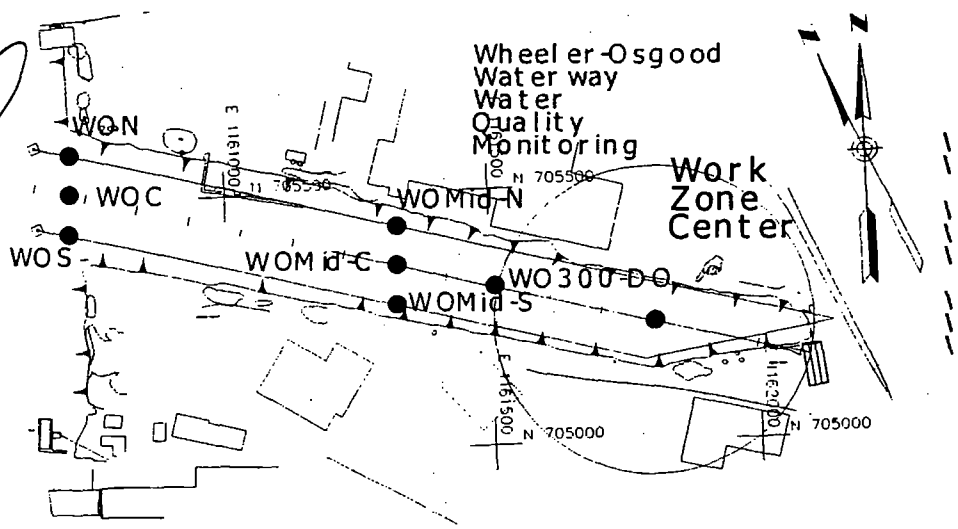
Rock placement was along the south side of the waterway. Manson was working from east to west. Manson used a clamshell to place the rock, and that seemed to work quite well. There was observable turbidity at the immediate work zone. Nevertheless, the turbidity bloom around the actual location rapidly dissipated and did not appear to be persistent. Manson worked quickly through the late morning into the early afternoon when the ebb tide dictated that it was time to leave. As soon as the barge was moved to the mouth of the waterway, crews from Manson begaon sweeping debris from the water surface.

Field duplicate data collected for sampling station WO300 was acceptable for all parameters (dissolved oxygen, turbidity, salinity, temperature) although some variability in turbidity was observed over the sampling interval of about 6 minutes.

Turbidty, temperature and dissolved oxygen levels were good at the compliance line at the mouth of the Wheeler-Osgood Waterway.

Data measured in the field with the YSI Sonde yielded a result of 6.3 mg/L for sample 030111/WO300/M/B. Winkler titration results for this sample location yielded 6.5 mg/L. The laboratory duplicate was also recorded at 6.5 mg/L for Dissolved Oxygen.

Michael Lloyd
Lloyd & Associates, Inc.



Wheeler 1 11 03.doc

Construction Compliance Monitoring **Date: JAN 11** **Wheeler-Osgood**

Station/Sample	Depth/DTB (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
WO300 (down-current)	3	28.6	6.3	5.6	9.3		5,233,253	542,241	1149	DO compliance point
030111/WO300/M/A	6	29.0	6.3*	1.3	9.5	4			1148	Near high tide
	*YSI Sonde = 6.3 mg/L Winkler = 6.5 mg/L and 6.5 mg/L (dup)								1545	Winkler Titration/L&AI
Deep	10/13	29.4	6.3	1.7	9.6				1147	
WOS (down-current)	3	28.8	6.1	1.9	9.4		5,233,284	542,994	1345	Ebb Tide
0301011/WOS/M/B	7	29.4	6.1	1.7	9.6	4			1344	Compliance points at mouth
Deep	10/14	29.5	6.2	1.9	9.6				1343	of Wheeler-Osgood Waterway
WOC (up-current)	3	28.3	6.6	2.8	9.0		5,233,308	542,994	1349	Mid-channel
0301011/WOC/M/B	10	29.6	7.0	2.6	9.3	5			1348	
Deep	15/20	29.7	6.6	1.4	9.5				1347	
WON (down-current)	3	27.3	6.6	1.8	9.1		5,233,331	542,994	1353	Manson moving rig out of
030111/WON/M/B	7	29.5	6.9	1.5	9.6	4			1352	waterway to avoid grounding
Deep	10/15	29.5	7.3	1.7	9.5				1351	
WO300 (down-current)	3	28.7	6.2	14.7	9.2		5,233,253	542,241	1358	DO compliance point
Deep	7/9	29.4	6.9	6.5	9.4				1357	
030111/WO300/M/B	5					12			1359	
WO300 (down-current)	*3*	*28.6*	*5.9*	*9.2*	*9.2*		*5,233,253*	*542,241*	*1404*	*Field Duplicate*
Deep	*6/8*	*29.4*	*5.9*	*3.0*	*9.5*				*1402*	*Field Duplicate*
030111/WO300/M/B-DUP	*4*					*11*			*1405*	*Field Duplicate*
WOMIDS (down-current)	3	28.8	6.1	6.2	9.3		5,233,243	542,184	1408	Midway between head and
Deep	6/8	29.2	6.3	5.7	9.5				1406	mouth of channel
WOMIDC (down-current)	3	28.7	5.9	5.7	9.3		523,266	542,184	1412	Mid-channel
Deep	7/10	29.5	5.9	4.1	9.6				1410	
WOMIDN (down-current)	3	28.6	5.8	2.9	9.4		523,167	542,184	1414	Point relocated to S. edge of
Deep	7/10	29.5	5.8	2.9	9.5				1414	float on N. bank of waterway
Station TF 2+00	3	29.4	6.9	0.9	9.5		5,233,465	542,492	1229	
030111/TF2/M/A	22	29.7	6.9	0.3	9.5	5			1228	
	39/44	29.7	6.9	0.3	9.5				1225	

Pre-Survey Calibration	S. High 1/11	100.6 % in saturated air
Post-Survey Calibration	S. High 1/11	89.4 % in saturated air

Clear, cool & cloudy
Started to drizzle at end of survey

DO & Turbidity calibration as per manufacturer's specifications.
Survey work conducted by D. Berta and S. high
Slight sheen observed north of 11th street bridge toward "The Dock Street". Diesel like odor.
Manson worked quickly on toe berm. Some turbidity observed at placement. Rock was clean.

Prepared By/Date:
M. Lloyd 1/12 TML

TSS Data Update
RMf 1/18/03

L&AI

STL Seattle

Client Name	Lloyd & Assoc. Inc.
Project Name	Thea Foss
Date Received	01-13-03

General Chemistry Parameters

Client Sample ID 030111/TF2+00/M/A
Lab ID 111214-01

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-13-03	mg/L	5	2

Client Sample ID 030111/WOS/M/B
Lab ID 111214-02

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-13-03	mg/L	4	2

Client Sample ID 030111/WOC/M/B
Lab ID 111214-03

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-13-03	mg/L	5	2

Client Sample ID 030111/WON/M/B
Lab ID 111214-04

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-13-03	mg/L	4	2

Client Sample ID 030111/WO300/M/B
Lab ID 111214-05

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-13-03	mg/L	12	2

Client Sample ID 030111/WO300/M/DUP
Lab ID 111214-06

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-13-03	mg/L	11	2

STL Seattle

Client Sample ID			030111/WO300/M/A		
Lab ID			111214-07		
Parameter	**Method**	**Date Analyzed**	**Units**	**Result**	**PQL**
Total Suspended Solids	EPA 160.2	01-13-03	mg/L	4	2

STL Seattle

QUALITY CONTROL REPORT

Client Sample ID: 030111/WO300/M/DUP
Lab ID: 111214-06
QC Batch Number: 1159-010

Method Blank

Parameter	Result (mg/L)	PQL
Total Suspended Solids	ND	2

Duplicate

Parameter	Sample Result (mg/L)	Duplicate Result (mg/L)	RPD (%)	Flag
Total Suspended Solids	103	90.7	12	

11/18/03

PROJECT THEA FOSS - WHEELER - OSGOOD

Notebook No. _____
Continued From Page _____

030N1
1045 - CALIBRATION NOTES:
1125 DO 100.5% ✓ TURB. CALIB @ 0.0 W/DI WATER
& 10.0 STANDARD SOLUTION - CALIB CHECK 10.0 DB

1000* ON WATER - MANSON CREW PLACING QUARRY SPALL
FOR TOE BERM - SLIGHT TO MODERATE AMOUNT OF
FLOAT. WOOD (SMALL PIECES)

1140 CONVERSATION WITH KURT KPFF - REQUESTED DO SAMPLES
@ 300' FROM WORK ZONE FOR ANALYSIS BY CITY LAB
(@ SLACK TIDE)

*NOTE: SHEEN FROM ≈ 10th STREET BRIDGE TO ~DOCK STREET
"THE DOCK" - W/ DIESEL LIKE ODOR.

WHEELER OSGOOD CO CRD.
(WORK ZONE CENTER 5233 233(N) 543 332(E)

WO 300	N 253	E 241
WO MID-NORTH	N 290	E 184
WO MID-CENTER	266	184
WO MID-SOUTH	243	184
WO NORTH	331	994
WO CENTER	308	994
WO SOUTH	234	994

Continued on Page

Read and Understood By

[signature] 01/11/03 _____ [signature] 1/11/03
Signed Date Signed Date

030111

Time	Location	Event	DTB	Sample Depth	Temp	Sal	DO	Turb	TSS
[illegible]	WO 300	A	(13)	D 10	9.6	29.4	6.3	1.7	—
1148	(Acc 4.8')	*		M 6	9.5	29.0	6.3	1.3	030111/WO300/M/A
1149				S 3	9.3	28.6	6.3	5.6	—

* SAMPLE SPLIT FOR DO BY WINKLER METHOD 1 FOR L&A, 1 FOR CITY OF TACOMA LAB – HAND DELIVERED

1217

1225	TF2+00	B	(44)	D 39	9.5	29.7	6.9	0.3	—
1228	465 492			M 22	9.5	29.7	6.9	0.3	030111/TF2+00/M/A
1229	(Acc 7.4)			S 3	9.5	29.4	6.9	0.9	—
1343	WO SOUTH	B	(14)	D 10	9.6	29.5	6.2	1.2	—
1344	284 994			M 7	9.6	29.4	6.1	1.7	030111/WOS/M/B
1345	(Acc 7.1)			S 3	9.4	28.8	6.1	1.9	—
1347	WO CENTER	B	(20)	D 15	9.5	29.7	6.6	1.4	—
1348	(Acc 4.1)			M 10	9.3	29.6	7.0	2.6	030111/WOC/M B
1349	308 994			S 3	9.0	28.3	6.6	2.8	—
[illegible]	WO NORTH	B	(15)	D 10	9.5	29.5	7.3	1.7	—
1352	331 994			M 7	9.6	29.5	6.9	1.5	030111/WON/M/B
1353	(Acc 5.2)			S 3	9.1	27.3	6.6	1.8	—

* MALISON MOVES BARGE & RIG OUT DEPTH – 10' (IE DTB)

1357	WO 300		(10)	D 7	9.4	29.4	6.9	6.5	—
1358	253 241			S 3	9.2	28.7	6.2	14.7	—
1359	(Acc 5.5)			– TSS @ 5.0			–		030111/WO300/M/B

DUPLICATE

1402	WO300		(8)	D 6	9.5	29.4	5.9	3.0	—
1404	253 241			S 3	9.2	28.6	5.9	9.2	—
1405	(Acc 5.0)			M TSS @ 4.0'					030111/WO300/M/DUP
				DB →	9.5	29.2	6.3		
1406	WO MID S		(8)	D 6	~~9.3~~	~~29.3~~	~~8.6~~	5.7	—
1408	(Acc 6.1)			S 3	9.3	28.8	6.1	6.2	—

Continued on Page

Read and Understood By

[illegible] A. Burke 01/11/03 — Signed — Date

[illegible] 1/11/03 — Signed — Date

PROJECT THEA FOSS - WHEELER OSGOOD Notebook No. _____
Continued From Page _____

030111
1430
CALIBRATION CHECK @ END OF SAMPLING.
DO. CHECK IN MOIST AIR OVER TAP WATER
89.4%

Continued on Page

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[signature] 1/11/03 — Signed — Date

PROJECT THEA FOSS/WHEELER OSGOOD 030111 Notebook No. _____ Continued From Page _____

TIME	LOCATION	EVENT	DTB	TEMP	SAL	DO	TURB	TSS
410	WO MID C	B	(10) D 7	9.6	29.5	5.9	4.1	—
412	266 184		M 3	9.3	28.7	5.9	5.7	—
	(Acc 6.7)							
1414	WO MID N	B	(10) D 7	9.5	29.5	5.8	2.9	—
1414	(Acc 6.7)		M 3	9.4	28.6	5.8	2.9	—
	167 184*							
	290 184 — DESIGN LOCATION							

* RELOCATED AGAINST SOUTH EDGE OF FLOATING DOCK ON NORTH BANK OF WATERWAY

Winkler Titration. M. Lloyd 1545

① 100 ml + s x 0.02 x $\frac{324}{100}$ = 6.5 mg/L

② Repeat analysis with second 100 ml aliquot

100 ml x .02 x 325/100 = 6.5 mg/L

Continued on Page

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[signature] 01/11/03 — Signed — Date

[signature] 1/11/03 — Signed — Date

Lloyd & Associates, Inc.
38210 SE 92nd Street, Snoqualmie, Washington 98065 425-888-1905 rml@centurytel.net

January 12, 2003

TRANSMITTAL

TSS update 1/18/03

To: Iain Wingard
John O'Loughlin

1/12/03

Subject: Compliance Monitoring/Wheeler Osgood ~~1/1/03~~
~~Preliminary~~ Data Transmittal

Attached please find results from compliance monitoring for riprap placement in the Wheeler-Osgood Waterway. Established monitoring points are shown in the sampling rose below. Two sampling events were conducted:

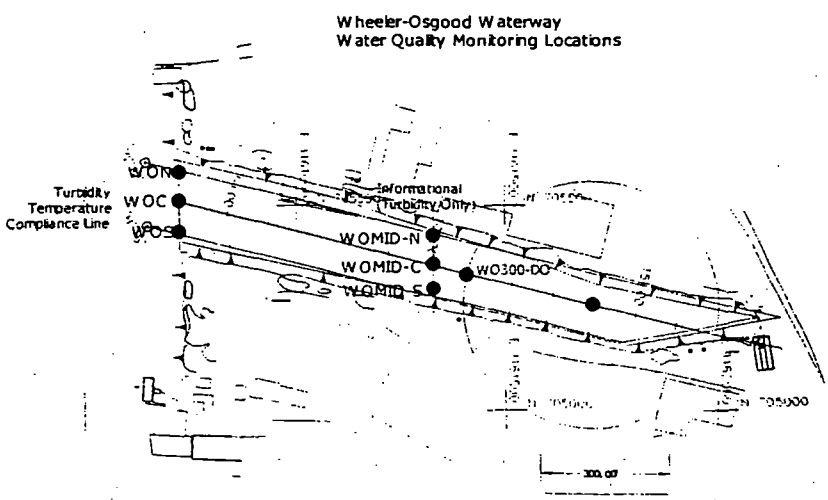
- The first was a slack tide event while rock placement was on-going along the north side of the waterway at a small inlet.
- The seond monitoring event was during the maximum ebb tide.

There was observable turbidity (visual) at the immediate work zone . Nevertheless, the turbidity bloom around the actual location appeared to disperse and did not appear to be persistent (visually).

Slack Tide Monitoring Discussion. Observable and detectable turbidity was present at WO300. This is the early warning compliance station for dissolved oxygen. As shown in the attached report forms, turbidity was detected in shallow depths although dissolved oxygen levels were acceptable (greater than 3.5 mg/L). This same trend was observed at the mid-waterway stations (WOMID series) where turbidity was detected at 22 NTU at the centerline. Compliance criteria for all parameters were met at the mouth of the Wheeler-Osgood Waterway (WO series).

Ebb Tide Monitoring Discussion. Monitoring during the ebb tide yielded results similar to those obtained during the slack tide. Turbidity was detected in shallow depths although dissolved oxygen levels were acceptable (greater than 3.5 mg/L) for the early warning station. Elevated turbidity was also observed at mid-waterway (WOMID series) stations. Manson moved Derrick 3 and the barge during maximum ebb. They had just completed placing rock prior to the move. Compliance criteria for all parameters were met at the mouth of the Wheeler-Osgood Waterway (WO series).

Quality Control/Assurance. Instrument calibrations were acceptable for all parameters. Field duplicate data collected for sampling station WO300 was acceptable for all parameters for both sampling events(dissolved oxygen, turbidity, salinity, temperature). Data measured in the field with the YSI Sonde yielded a result of 6.9 mg/L for sample 030112/TF2/M/B. Winkler titration results for this sample location yielded duplicates at 6.8 and 6.9 mg/L for Dissolved Oxygen (L&AI data). A DO sample was also submitted to the City of Tacoma.



Michael Lloyd
Lloyd & Associates, Inc.

Wheeler 1 12 03.doc

Construction Compliance Monitoring Date: JAN 12 Wheeler-Osgood/Slack

Station/Sample	Depth/DTB (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
WO300 (down-current)	3	27.6	6.6	30.7	9.4		5,233,253	542,216	1215	**Slack tide**
030112/WO300/M/A	6	29.3	6.5	2.1	9.5	21			1214	High tide at about 1200
Deep	8/13	29.4	6.7	2.6	9.5				1212	
WO300 (down-current)	*3*	*28.6*	*6.5*	*28.6*	*9.4*				*1219*	*Field Duplicate*
030112/WO300/M/A-Dup	*6*	*1.0*	*6.5*	*1.0*	*9.5*	*18*			*1217*	*Field Duplicate*
Deep	*8/13*	*0.9*	*6.6*	*0.9*	*9.5*				*1216*	*Field Duplicate*
WOS (down-current)	3	28.3	6.9	2.0	9.5		5,233,284	542,994	1205	
0301012/WOS/M/A	11	29.6	7.0	1.7	9.5	4			1204	Compliance points at mouth
Deep	17/22	29.7	7.0	1.2	9.5				1203	of Wheeler-Osgood Waterway
WOC (up-current)	3	25.7	6.8	4.3	9.4		5,233,308	542,994	1158	Mid-channel
0301012/WOC/M/A	8	29.5	6.6	0.9	9.6	4			1157	
Deep	11/16	29.6	6.8	1.1	9.4				1155	
WON (down-current)	3	26.4	6.7	4.5	9.3		5,233,331	542,994	1153	
030112/WON/M/A	9	29.4	6.6	1.4	9.5	5			1151	
Deep	12/17	29.6	6.8	4.5	9.5				1147	
WOMIDS (down-current)	3	28.9	6.6	2.9	9.5		5,233,243	542,184	1231	Midway between head and
Deep	6/9	29.4	6.7	2.9	9.6				1230	mouth of channel
WOMIDC (down-current)	3	28.7	6.5	22.0	9.4		523,266	542,184	1229	Mid-channel
Mid	5	29.2	6.5	7.3	9.4				1229	
Deep	7/12	29.4	6.5	1.5	9.5				1228	
WOMIDN (down-current)	3	28.1	6.6	7.4	9.2		523,285	542,177	1226	Point relocated to S. edge of
Mid	5	29.1	6.6	1.2	9.5				1224	float on N. bank of waterway
Deep	712	29.6	7.6	1.4	9.5				1223	

Pre-Survey Calibration	S. High 1/12	101.7 % in saturated air
Post-Survey Calibration	S. High 1/12	101 % in saturated air

Clear, warm & cloudy
light drizzle

DO & Turbidity calibration as per manufacturer's specifications.
Survey work conducted by D. Berta and S. high
Strong sheen observed north of 11th street bridge toward "The Dock Street". Diesel like odor.
Manson worked quickly on rock placement. Some turbidity observed at placement. Rock was clean.

Prepared By/Date:
M. Lloyd 1/12

TSS Update
1/18/03

L&AI

Construction Compliance Monitoring Date: JAN 12 Wheeler-Osgood

Station/Sample	Depth/DTB (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
WO300 (down-current)	3	27.4	6.3	48.4	9.4		5,233,253	542,216	1502	**Maximum Ebb Tide**
030112/WO300/M/B	5	N/A	N/A	N/A	N/A	103				Derrick & Barge moving out
Deep	5/8.5	27.1	6.3	38.2	9.4				1501	of Wheeler-Osgood
WO300 (down-current)	3	27.8	6.2	32.2	9.4		5,233,253	542,216	1504	
030112/WO300/M/B	5	N/A	N/A	N/A	N/A	78				
Deep	5/8.5	29.0	6.5	15.0	9.4				1505	
WOS (down-current)	3	27.8	6.5	1.6	9.2		5,233,284	542,994	1452	
0301012/WOS/M/B	7	28.6	6.3	2.7	9.4	2			1451	Compliance points at mouth
Deep	9/12	28.8	6.4	2.6	9.5				1450	of Wheeler-Osgood Waterway
WOC (up-current)	3	26.7	6.5	1.6	9.3		5,233,308	542,994	1456	Mid-channel
0301012/WOC/M/B	9	29.4	6.6	1.9	9.6	3			1455	
Deep	15/18	29.6	6.8	1.6	9.5				1454	
WON (down-current)	3	26.6	6.3	3.8	9.2		5,233,331	542,994	1448	
030112/WON/M/B	5	N/A	N/A	N/A	N/A	3				TSS Sample Only
Deep	6/9	28.7	6.2	5.9	9.4				1445	
WOMIDS (down-current)	3	26.0	6.4	17.6	9.4		5,233,243	542,184	1515	Midway between head and
Deep	5/6	28.1	6.6	24.4	9.4				1514	mouth of channel
WOMIDC (down-current)	3	27.1	6.1	15.3	9.4		523,266	542,184	1512	Mid-channel
Deep	6/9	28.5	6.1	16.5	9.5				1511	
WOMIDN (down-current)	3	27.3	6.2	24.3	9.4		523,285	542,177	1509	Point relocated to S. edge of
Deep	6/9	28.5	6.4	23.7	9.5				1509	floating docks
Station TF 2+00	3	28.0	7.7	0.7	9.3		523,465	542,492	1426	
030112/TF2/M/B	23	29.5	6.9*	0.6	9.6	3			1425	
Deep	39/45	29.5	6.9	0.4	9.6				1424	

Pre-Survey Calibration	S. High 1/12	101 % in saturated air	Clear, warm & partly cloudy
Post-Survey Calibration	S. High 1/12	96.9 % in saturated air	

DO & Turbidity calibration as per manufacturer's specifications.

Survey work conducted by D. Berta and S. high

Strong sheen observed north of 11th street bridge toward Thea's Park.

Turbidity observed at placement. Rock was clean, but last of rock likely had more fines.

*Winkler titration conducted on 030112/TF2/M/B YSI Sonde = 6.9 mg/L

L&AI = 6.8 mg/L, 6.9 mg/L

Prepared By/Date:	Preliminary	
M. Lloyd 1/12	RMLloyd 1/18	**L&AI**

1/12/03

STL Seattle

Client Name	Lloyd & Assoc. Inc.
Project Name	Thea Foss
Date Received	01-13-03

General Chemistry Parameters

Client Sample ID 030112/WON/M/A
Lab ID 111212-01

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-13-03	mg/L	5	5

Client Sample ID 030112/WOC/M/A
Lab ID 111212-02

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-13-03	mg/L	4	4

Client Sample ID 030112/WOS/M/A
Lab ID 111212-03

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-13-03	mg/L	4	4

Client Sample ID 030112/WO300/M/A
Lab ID 111212-04

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-13-03	mg/L	21	21

Client Sample ID 030112/WO300/M/DUP
Lab ID 111212-05

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-13-03	mg/L	18	18

Client Sample ID 030112/TF2+00/M/B
Lab ID 111212-06

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-13-03	mg/L	3	2

STL Seattle

Client Sample ID	030112/WON/M/B
Lab ID	111212-07

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-13-03	mg/L	3	2

Client Sample ID	030112/WOS/M/B
Lab ID	111212-08

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-13-03	mg/L	2	2

Client Sample ID	030112/WOC/M/B
Lab ID	111212-09

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-13-03	mg/L	3	2

Client Sample ID	030112/WO300/M/B
Lab ID	111212-10

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-13-03	mg/L	103	3

Client Sample ID	030112/WO300/M/DUP
Lab ID	111212-11

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-13-03	mg/L	78	3

STL Seattle

QUALITY CONTROL REPORT

Client Sample ID: 030112/WO300/M/B
Lab ID: 111212-10
QC Batch Number: 1159-010

Method Blank

Parameter	Result (mg/L)	PQL
Total Suspended Solids	ND	2

Duplicate

Parameter	Sample Result (mg/L)	Duplicate Result (mg/L)	RPD (%)	Flag
Total Suspended Solids	103	90.7	13	

TM Lloyd
1/18/03

PROJECT THEA FOSS / WHEELER OSGOOD

Notebook No. _____
Continued From Page _____

030112 1000
- NO ACTIVITY @ TOTEM MARINE
-

CALIBRATION NOTES:

1050 DO CALIBRATED IN MOIST AIR OVER TAP WATER
READING AFTER CALIBRATION. (767.5 mm Hg.)
= 101.7

TURBIDITY CALIBRATED WITH 2 POINT METHOD.
0.0 NTU (DISTILLED WATER) 10.0 NTU CALIBRATION STANDARD

READING AFTER CALIBRATION IN 10.0 NTU SOLUTION = 9.9

SAMPLE COORD. WORK ZONE CENTER N 5233233
E 543332

WO 300	N 253	E 241
WO MID-NORTH	290	184
WO MID-CENTER	266	184
MID-SOUTH	243	184
WO NORTH	331	994
WO CENTER	308	994
WO SOUTH	284	994

1117
- MANSON PLACING QUARRY SPALLS ON NORTH SIDE OF WHEELER OSGOOD WITH CLAM SHELL BUCKET - 2 SKIFFS OPERATING IN WORK ZONE - REMOVING DEBRIS ETC.. W/ NET & BY HAND. BOOM PLACED ACROSS ENTIRE WATER WAY WEST OF WORK ZONE.

1200 MANSON BREAKS FOR LUNCH

1234 MANSON RESUMES WORK

Continued on Page

Read and Understood By

Daniel H. Burke 01/12/03 — Signed
[signature] 030112 — Date
[signature] 1/12/03 — Signed
Date

PROJECT THE A FOSS / WHEELER-OSGOOD Notebook No. _____ 3
Continued From Page _____

030112 ~~FLOOD~~ EBB / SLACK (12 ~ HIGH TIDE)

TIME	LOCATION	EVENT	DTB	SAMPLE DEPTH	TEMP	SAL	DO	TURB	TSS
1212	WO 300	A	(13)	D 8	9.5	29.4	~~6.7~~ DB	2.6	—
1214	(253 241' (YESTERDAYS LOCATION)			M 6	9.5	29.3	6.5	2.1	030112/WO300/M/A
1215	253 216			S 3	9.4	27.6	6.6	30.7	—
	↳ 300' LOCATION TODAY								
	(ACCURACY 4.7)			SLACK TIDE					
1147	WO N	A	(17)	D 12	9.5	29.6	6.8	4.5	—
1151	(~~308~~ 331 994)			M 9	9.5	29.4	6.6	1.4	030112/WON/M/A
1153	(ACC 4.7)			S 3	~~9.5~~	~~27~~	6.7	4.5	—
				DB	9.3	26.4			
1155	WOC	A	(~HIGH)	SLACK TIDE	9.4	29.6	6.8	1.1	
1157	308 994		(16)	D 11					—
1158	(4.7 ACCURACY)			M 8	9.6	29.5	6.6	0.9	030112/WOC/M/A
				S 3	9.4	25.7	6.8	4.3	—
				(SLACK)					
23	WOS	A	(22)	D 17	9.5	29.7	7.0	1.2	—
4	284 994			M 11	9.5	29.6	7.0	1.7	030112/WOS/M/A
1205	(ACC 4.9')			S 3	9.5	28.3	6.9	2.0	
				DUPLICATE OF WS 300 - EBB / SLACK					
1216	WO 300 A		(13)	D 8	9.5	29.5	6.6	0.9	—
1217	253 216			M 6	9.5	29.3	6.5	1.0	030112/WO300/M/DUP
1219	(ACC 4.7')			S 3	9.4	28.3	6.5	28.6	
				EBB					
1223	WO MID NORTH	A	(12)	D 7	(9.6) 9.5	DB (29.6) 29.6	7.6	1.4	—
1224	290 184			M 5	(9.5) 9.5	29.6 (29.1)	6.6	1.2	—
1226	285 177 ★			S 3	9.2	28.1	6.6	7.1	—
	(ACCURACY = 5.2)			EBB					
1228	WO MID CENTER	A	(12)	D 7	9.5	29.4	6.6	1.5	—
1229	266 184			M 5	9.4	29.2	6.5	7.3	—
1229	(ACCURACY 9.6)			S 3	9.4	28.7	6.5	22.0	—

★ SAMPLED AGAINST FLOATING DOCK

Continued on Page

Read and Understood By

[signature] 01/12/03 — Signed — Date

[signature] 1/12/03 — Signed — Date

PROJECT THEA FOSS / WHEELER - OSGOOD

Notebook No. _____

Continued From Page _____

030112

1400 - CHANGE MEMBRANE ON D.O. METER & RECALIBRATED D.O. IN MOIST AIR & OVER TAP WATER 101 % FOR CALIBRATION CHECK

1500 BARGE MOVES OUT OF HEAD OF WATERWAY TO MOUTH FOR END OF SHIFT.

WO 5, WO 4 & WOC SAMPLED BEFORE MOVE.

WO 300 SAMPLED AFTER MOVE

Continued on Page

Read and Understood By

Signed _____ Date _____ Signed _____ Date 03/14

PROJECT TITEA FOSS/WHEELER - OSGOOD 030112 Notebook No. _____ Continued From Page _____

TIME	LOCATION	EVENT	DTB	SAMPLE DEPTH	TEMP	SAL	DO	EBB TURB	TSS
1230	WO MID SOUTH	A	(9)	D 6	9.6	29.4	6.7	2.9	—
	(ACCURACY 9.1)			M NA	—	—	—	—	—
	243 184			S 3	9.5	28.9	6.6	2.9	—
				EBB (MAX)					
1345	TF 2+00	B	(45)	D 39	9.5	29.6	6.9	0.4	—
1350	465 492			M 23	9.6	29.6	7.2	0.3	030112/TF2+00/M/B ★
1351	(ACCURACY 8.1)			S 3	~~9.6~~	~~29.5~~	~~6.6~~	~~0.4~~	—
1424									
	RECALIBRATED & REMEASURED								
1424				D 39	9.6	29.5	6.6	0.4	
1425	465 492	B		M 23	9.6	29.5	6.9	0.6	
1426				S 3	9.3	28.0	7.7	0.7	

★ SPLIT SAMPLE FOR D.O. BY WINKLER METHOD OBTAINED 1-300 ml BOTTLE (PRESERVED) FOR CITY OF TACOMA, & 1 300 ml BOTTLE (PRESERVED) FOR L&A

TIME	LOCATION	EVENT	DTB	SAMPLE DEPTH	TEMP	SAL	DO	EBB TURB	TSS
				EBB (MAX)					
1501	WO 3+00	B (8.5)	(9.0)	D 5	9.4	27.4	6.3	38.2	—
NA	253 216			M —	NA	—	—	—	5.0' (1503) 030112/WO300/M/B
	(ACCURACY = 5.2)			S 3	9.4	27.1	6.3	48.4	—
				EBB (MAX)					
1445	WO N	B	(9)	D 6	9.4	28.7	6.2	5.9	—
—	331 994			M NA	—	—	—	—	TSS @ 5'
1448	(ACCURACY = 5.8)			S 3	9.2	26.6	6.3	3.8	030112/WON/M/B
				EBB (MAX)					
1450	WOS	B	(12)	D 9	9.5	28.8	6.4	2.6	—
1451	284 ~~308~~ 994			M 7	9.4	28.6	6.3	2.7	030112/WOS/M/B
1452	(ACCURACY 5.9)			S 3	9.2	27.8	6.5	1.6	—
				EBB (MAX)					
1454	WOC	B	(18)	D 15	9.5	29.6	6.8	1.6	—
1455	308.994			M 9	9.6	29.4	6.6	1.9	030112/WOC/M/B.
1456	(ACCURACY 7.7')			S 3	9.3	26.7	6.5	1.6	—
				DUPLICATE EBB (MAX)					
1504	WO 3+00	B	9.0	D 6	9.5	29.0	6.5	15.1	—
1505	253 216			S	9.4	27.8	6.2	32.2	—
	(ACCURACY 5.4')								

Continued on Page

Read and Understood By @ 5.0 = 030112/W300/M/DUP.

[signature] 01/02/03 — Signed

[signature] 030114 — Date

[signature] 1/12/03 — Signed — Date

PROJECT THEA FOSS / WHEELER-OSGOOD

Notebook No. _____
Continued From Page _____

030112

NOTE EVENT B SAMPLES IN WHEELER OSGOOD (IE NOT @ MOUTH) WERE LESS THAN 10' DEPTH & ONLY "DEEP AND SHALLOW" READINGS TAKEN AS PER WHEELER OSGOOD FIELD DIRECTIVE #19

1530
D.O. CALIBRATION CHECK IN MOIST AIR OVER TAP WATER = 96.9 %

Winkler Titration of 030112/TF2/M/B
YSI Sonde = 6.9 mg/L per Hach procedure

(1) 100 ml × 0.02 × 3.42/100 = 6.8 mg/L

(2) 100 ml × 0.02 × 3.45/100 = 6.9 mg/L

TMF @ 1640

Continued on Page

Read and Understood By

Daniel A. Berta 01/12/03 — Signed — Date

[signature] 1/12/03 — Signed — Date

03-114

TIME	LOCATION	EVENT	DTB	SAMPLE DEPTH	TEMP	SAL	DO	TURB	TSS
1509	WO MID NORTH	B	9.0	D 6	9.5	28.5	6.1	23.7	—
1509	(285 177*)			S 3	9.4	27.3	6.2	29.3	—
	*SAMPLED AGAINST FLOATING DOCK (ACCURACY = 6.4')								
1511	WO MID CENTER		9.0	D 6	9.5	28.5	6.1	16.5	—
1512	(266 184)			S 3	9.4	27.1	6.1	15.3	—
	(ACCURACY 6.2)								
			6 ~~8~~		EBB				
1514	WO MID SOUTH			D 6 (5)	9.4	28.1	6.6	24.4	—
1515	243 184			S 3	9.4	26.0	6.4	17.6	—
	(ACCURACY 6.0)								

INFORMATIONAL READINGS ON WEST SIDE OF DEBRIS BOOM, IN THEA FOSS WATERWAY - AT MOUTH OF WHEELER OSGOOD WATERWAY; ALL READINGS @ EBB (MAX) TIDE

1520	(542)		25	D 23	9.6	29.7	6.3	1.3	—
1521	277 965			M 14	9.6	29.6	6.3	1.8	—
1522	(ACCURACY 8.1)			S 3	9.4	28.0	6.3	1.4	—
	(SOUTH)								
1524	289 963 (542)		25	D 23	9.6	29.7	6.4	1.9	—
1524	(ACCUR. 6.2)			M 14	9.6	29.6	6.3	1.4	—
1525	(MIDDLE)			S 3	9.3	26.6	6.4	1.6	—
			22	D 17	9.6	29.6	6.2	1.6	—
1527	336 971			M 11	9.6	29.3	6.1	2.6	—
1527	(7.2' ACCURACY)			S 3	9.4	28.3	6.1	3.0	—
1528	(NORTH)								

Note: The Readings above Taken after barge had moved.

MK

Continued on Page

Read and Understood By

Paul A. Barta 01/12/03 — Signed — Date

PMK 1/12/03 — Signed — Date

030114

Lloyd & Associates, Inc.
38210 SE 92nd Street, Snoqualmie, Washington 98065 425-888-1905(v/f) rml@centurytel.net

January 13, 2003

TRANSMITTAL

To: John O'loughlin
Iain Wingard

From: Michael Lloyd

RE: Weekly Water Quality Monitoring Report 1/13/03

Water quality monitoring was conducted at both Totem Marine and in the Wheeler-Osgood Waterway. Daily reports have been previously submitted for the following:

Totem Marine
- January 6 - grout mat work
- January 7 - riprap placement (grout mat work on-going)
- January 9 - riprap placement (grout mat work on-going)
- January 10 - riprap placement (grout mat work on-going)

Wheeler-Osgood
- January 11 - toe berm placement
- January 12 - toe berm placement & north shore rock placement

In general work went well at both Totem Marine and in the Wheeler-Osgood Waterway. Water quality criteria were not exceeded for construction activity in either project location. The monitoring program for the Wheeler-Osgood appears to work well. Manson got their work done, and water quality criteria were good.

I am also attaching revised compliance reports which have been updated with TSS data. I expect that each week there will be a number of report revisions for TSS data (12/27 - 1/7/03). Although TSS data is informational, there does appear to be some correlation between high turbidity and higher TSS levels (see 12 28 02 daily report).

Reprinted 3/27/03

Michael Lloyd
Lloyd & Associates, Inc.

cc. CQC
File

Lloyd & Associates, Inc.
38210 SE 92nd Street, Snoqualmie, Washington 98065 425-888-1905 rml@centurytel.net

January 14, 2003

TRANSMITTAL

To: Iain Wingard
John O'Loughlin

TSS update
1/18/03

Subject: Compliance Monitoring/Wheeler Osgood 1/14/03
Compliance Monitoring / Totem Marine 1/14/03
~~Preliminary~~ Data Transmittal

Attached please find results from compliance monitoring for the following work activities:

- Capping work the Wheeler-Osgood Waterway; and
- Placement of riprap and filter material at Totem Marine.

Wheeler-Osgood Capping Work.

Manson Construction worked with Parametrix early in the morning to verify toe berm construction. As soon as elevations were confirmed, filter material was placed beginning at about15+00. Initially, Manson tried to use a clamshell, but instead used a re-handler bucket because the clamshell leaked material when closed. The re-handler worked well. Placement occurred from the high end of the slope. The filter material tends to slump to an approximate 2:1 slope. As filter material was placed from the top it would flow down slope. There was considerable turbidity created at the waterline when filter material reached water, but the turbidity tended to remain relatively localized within the work zone. A debris boom surrounded the work area, but there was very little debris generated by capping.

Water Quality monitoring was conducted early in the day on a slack tide. These results are provided in attached pages. Dissolved Oxygen levels were acceptable at the early warning stations. Turbidity was elevated at the midpoint stations (WOMID series), particularly immediately south and mid-channel. However, the turbidity levels at compliance points at the mouth of the Wheeler-Osgood were low. Water quality was again monitored later in the day during the ebb tide. Some turbidity was observed at the early warning station (WO300), but all compliance stations were acceptable for turbidity, temperature and dissolved oxygen. Later in the afternoon (still ebb tide), the monitoring crew returned to verify that compliance criteria were met at the Wheeler-Osgood Waterway.

Overall, the monitoring team was very pleased with the work at Wheeler-Osgood with the revised monitoring plan for this waterway. Dissolved oxygen levels are good, and turbidity concentrations at compliance locations are acceptable. This data tends to support the visual observations that the immediate turbidity observed with placement disperses or settles within the mixing zone..

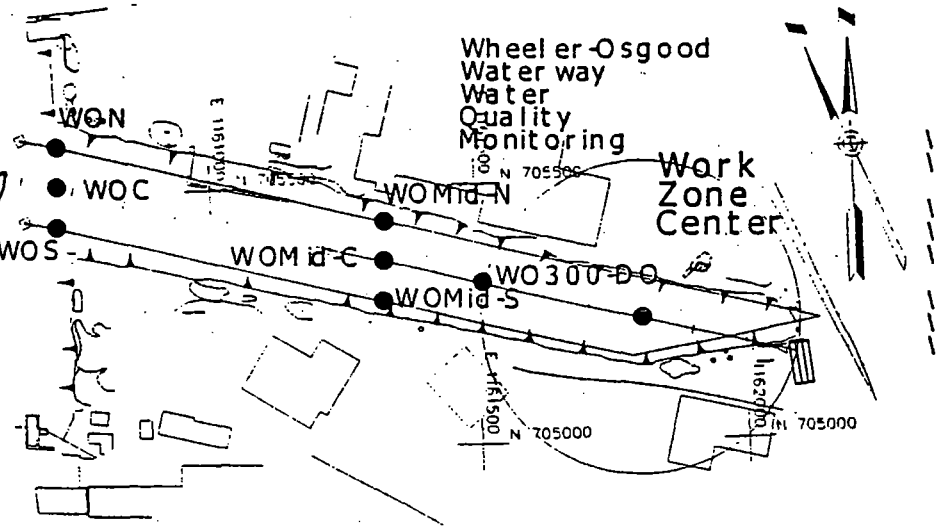
Totem Marine Capping/Rocking.

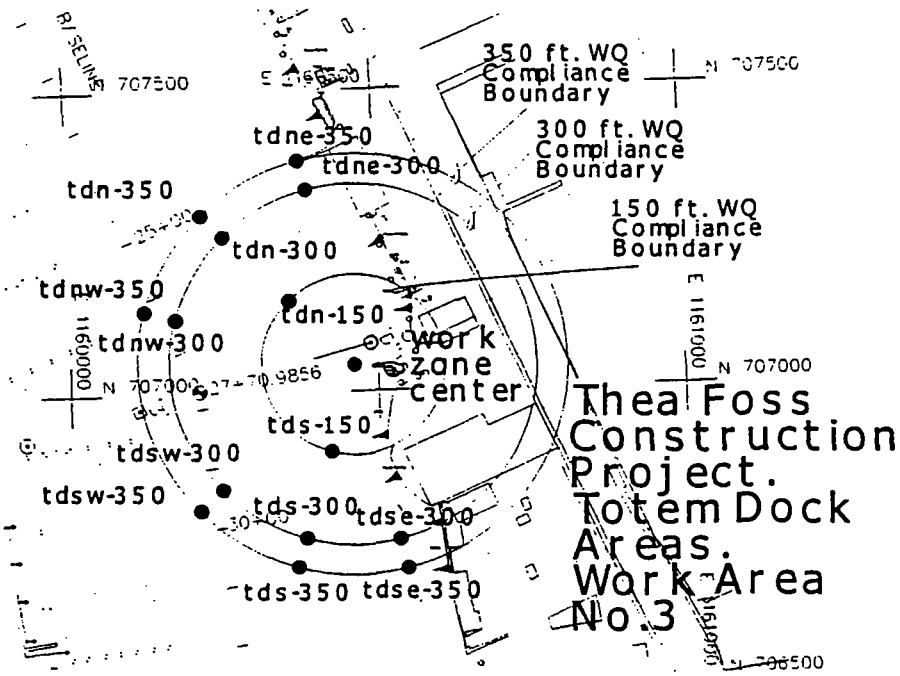
With the exception of one sampling event for rock placement, turbidity has not been a major problem. Nevertheless, the antifipation is that filter cap placement will be a more significant problem. EPA modified the mixing zone to provide for turbidity compliance at 350 feet from the work zone. Since the establishment of this revised mixing zone, turbidity levels have been acceptable. Water quality monitoring was conducted at Totem during rock and filter cap placement in the afternoon session. The morning sampling event turned out to be an informational session as ACC-Hurlen moved materials from shore to the barge while divers investigated the toe berm. Turbidity and Dissolved oxygen levels were accceptable during the afternoon session when both rock and filter cap materials were placed.

Quality Control/Assurance. Instrument calibrations were acceptable for all parameters. Field duplicate data collected for sampling stations WO300 in the Wheeler-Osgood, and TDN300 at Totem Marine. This data was acceptable for all parameters for both sampling events (dissolved oxygen, turbidity, salinity, temperature). Data measured in the field with the YSI Sonde yielded a result of 6.6 mg/L for sample 030114/WO300/M/B. Winkler

titration results for this sample location yielded replicates at 6.6 and 6.7 mg/L for Dissolved Oxygen (L&AI data). A DO sample was also submitted to the City of Tacoma.

Michael Lloyd
Lloyd & Associates, Inc.





Construction Compliance Monitoring **Date: JAN 14** **Wheeler-Osgood Slack Tide**

Station/Sample	Depth/DTB (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E. m)		Time	Comment
WO300 (down-current)	3	28.1	6.9	5.8	9.3		5,233,253	542,241	939	**Slack Tide**
030114/WO300/M/A	6/9	28.8	6.9	3.2	9.4	13			938	
WO300 (down-current)	*3*	*28.5*	*7.0*	*3.0*	*9.4*		*5,233,253*	*542,241*	*1041*	*Station Reanlaysis*
030114/WO300/M/A-dup	*6/9*	*29.5*	*6.9*	*2.2*	*9.4*	*7*			*1040*	*Station Reanlaysis*
WOS (down-current)	3	29.1	7.0	1.1	9.4		5,233,284	542,994	1050	
0301014/WOS/M/A	6	29.3	7.1	1.1	9.4	3			1050	Compliance points at mouth
Deep	9/12	29.5	7.4	0.9	9.5				1049	of Wheeler-Osgood Waterway
WOC (up-current)	3	28.8	7.1	1.1	9.4		5,233,308	542,994	1052	Mid-channel
0301014/WOC/M/A	6	29.6	7.2	0.9	9.5	4			1052	
Deep	9/13	29.8	7.2	0.8	9.4				1051	
WON (down-current)	3	9.4	7.0	2.8	9.4		5,233,331	542,994	1055	
030114/WON/M/A	5	9.4	7.0	2.0	9.4	3			1054	
Deep	7/11	9.4	7.0	1.2	9.4				1053	
WOMIDS (down-current)	2	9.4	26.9	7.0	3.2		5,233,243	542,184	1045	Midway between head and
Deep	4/5	9.4	28.9	6.9	2.6				1045	mouth of channel
WOMIDC (down-current)	3	9.5	29.1	2.2	9.5		5,233,266	542,184	1044	Mid-channel
Deep	6/10	9.4	29.6	2.0	9.4				1044	
WOMIDN (down-current)	3	9.4	7.0	2.8	9.4		5,233,276	542,184	1043	Point relocated to S. edge of
Mid	5	9.4	7.0	2.0	9.4				1043	floating docks
Deep	7/11	9.4	7.0	1.2	9.4				1042	
Station TF 2+00	3	27.9	7.2	0.8	9.2		5,233,465	542,492	809	
030114/TF2/M/A	20	30.0	7.4	0.3	9.4	2			808	
Deep	36/41	30.1	7.4	0.2	9.4				806	

Pre-Survey Calibration	S. High 1/14	100.2 % in saturated air	Clear, warm & partly cloudy
Post-Survey Calibration	S. High 1/14	100.2 % in saturated air	

DO & Turbidity calibration as per manufacturer's specifications.
Survey work conducted by D. Berta and S. high
Most of morning survey Manson was picking up debris and sounding the toe berm. Started placing filter cap at 1010. Turbidity observed at placement. Most of material being placed up the bank and allowed to slide down into water to a natural 2:1 slope. Mat+A7

Prepared By/Date:	TSS DATA UPDATE	
M. Lloyd 1/14	TAM 1/18/03	**L&AI**

Construction Compliance Monitoring Date: JAN 14 Totem Marine - Flood Tide

Station/Sample	Depth/D TB (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
TDN300(up-current)	3	29.6	7.5	0.5	9.4		5,233,836	542,840	1142	**Small Flood Tide**
030114/TDN300/M/A	19	30.2	7.5	0.4	9.4	2U			1141	No in-water work on-going
Deep	34/39	30.2	7.2	1.1	9.4				1141	moving filter to barge
TDN300(up-current)	3	29.6	7.5	0.5	9.4		5,233,836	542,840	1150	**Small Flood Tide**
030114/TDN300/M/A-Dup	19	30.2	**7.6***	0.4	9.4	2U			1149	
Deep	34/39	30.2	7.2	1.1	9.4				1147	No in-water work on-going
TDN350 (up-current)	3	29.1	7.5	0.4	9.4		5,233,847	542,829	1152	moving filter to barge
Mid	19	30.2	7.6	0.4	9.4				1151	
Deep	34/39	30.2	7.5	0.6	9.4				1150	
TDS150 (down-current)	3	28.8	7.4	0.8	9.4		5,233,711	542,886	1116	Against work area boom
Mid	18	30.1	7.5	0.7	9.4	x			1116	
Deep	31/36	30.2	7.4	0.6	9.4				1115	DO > 5.0 mg/L
TDS300 (down-current)	3	28.7	7.4	1.1	9.4		5,233,683	542,882	1121	
030114/TDS300/M/A	19	30.1	7.4	1.1	9.4	3			1120	
Deep	34/39	30.2	7.4	0.4	9.4				1119	
TDS350 (down-current)	3	29.1	7.2	0.9	9.4		5,233,669	542,878	1127	
Mid	19	30.1	7.6	0.5	9.4				1126	
Deep	34/39	30.2	7.7	0.4	9.4				1125	
TDSE300 (down-current)	3	28.8	7.2	0.8	9.4		5,233,680	542,910	1113	
030114/TDSE300/M/A	18	30.1	7.3	0.9	9.4	4			1113	
Deep	30/36	30.1	7.1	1.1	9.4				1112	
TDSE350 (down-current)	3	29.1	7.3	0.9	9.4		5,233,665	542,912	1111	
Mid	18	30.1	7.5	1.0	9.4				1110	
Deep	31/37	30.1	7.6	1.3	9.4				1110	
TDSW300 (down-current)	3	28.8	7.4	1.0	9.4		5,233,793	542,815	1135	
030114/TDSW300/M/A	19	30.2	7.5	0.4	9.4	3			1135	
Deep	34/39	30.2	7.3	0.8	9.4				1134	
TDSW350 (down-current)	3	28.7	7.3	0.9	9.4		5,233,797	542,800	1131	
Mid	19	30.1	7.5	0.4	9.4				1130	
Deep	34/39	30.2	7.5	0.6	9.4				1130	

Pre-Survey Calibration D. Berta 100.2 % DO in Saturated air

DO Calibration as per manufacturer's specifications.

Survey work conducted by D. Berta. partly cloudy, warm

No in-water work only going. ACC only moved material to barge, but not into water. water clear

Turbidity Calibration as per manufacturer's specifications. Calibration at 0, 10NTU's.

*Winkler samples collected as FD with Wheaton type Bomb L&AI Winkler results = 6.8, 6.9 mg/L (Sonde = 7.6)

Prepared By/Date:

M. Lloyd 1/14

TSS Update
MM 1/18

L&AI

Construction Compliance Monitoring Date: JAN 14 Totem Marine - EBB

Station/Sample	Depth/DTB (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
TDN350 (down-current)	3	28.7	7.0	1.2	9.5		52,338,447	542,829	1533	Ebb tide
Mid	18	30.1	7.2	0.6	9.4				1532	ACC-Hurlen placing rock
Deep	32/37	30.2	7.4	0.4	9.4				1530	followed by filter material
TDN300 (down-current)	3	29.1	7.0	1.2	9.5		5,233,836	542,840	1536	Turbidity minimal during
030114/TDN300/M/C	18	30.2	7.2	0.6	9.4	2U			1535	construction activity
Deep	32/37	30.2	7.0	0.6	9.4				1535	
TDN150 (down-current)	3	28.6	7.0	1.4	9.4		5,233,804	542,874	1540	DO > 5.0 mg/L
Mid	18	30.1	7.0	2.8	9.4				1540	
Deep	32/37	30.2	7.0	2.9	9.4				1539	
TDS300 (Up-current)	3	28.8	7.0	1.5	9.5		5,233,683	542,882	1519	
0301014/TDS300/M/C	18	30.1	7.1	0.8	9.4	2U			1519	Turbidity minimal during
Deep	32/37	30.2	7.0	1.4	9.4				1518	construction activity
TDS350 (up-current)	3	28.6	7.2	1.2	9.5		5,233,669	542,878	1517	
Mid	18	30.1	7.3	0.6	9.4				1516	
Deep	32	30.2	7.3	0.6	9.4				1515	
TDNE300 (down-current)	3	28.9	6.8	1.1	9.5		5,233,860	542,880	1546	Water clarity is excellent
030114/TDNE300/M/C	10	29.8	6.9	1.0	9.5	2U			1545	
Deep	17/21	31.1	7.0	0.9	9.4				1544	
TDNE350 (down-current)	3	29.3	6.8	1.1	9.5		5,233,874	542,877	1551	
Mid	10	29.7	6.8	1.2	9.5				1550	
Deep	14/19	29.9	6.9	2.2	9.5				1549	
TDNW300 (down-current)	3	29.6	7.1	1.1	9.5		5,233,793	542,817	1525	Water clarity is excellent
030114/TDNW300/M/A	19	30.2	7.3	0.6	9.4	2U			1524	
Deep	33/38	30.2	7.3	0.8	9.4				1523	
TDNW350 (down-current)	3	29.0	7.0	1.2	9.5		5,233,803	542,798	1529	
Mid	19	30.2	7.3	0.6	9.4				1528	
Deep	33/38	30.2	7.3	0.6	9.4				1525	

Pre-Survey Calibration S. High 1/14 100.2%

DO Calibration as per manufacturer's specifications.

Survey work conducted by D. Berta and S. high Clear, warm & partly sunny weather

No observed turbidity plume form WQ boat outside of work zone. Turbidity check 10 ntu for 10 ntu standard

Turbidity Calibration as per manufacturer's specifications. Calibration at 0, 10NTU's.

Prepared By/Date:
M. Lloyd 1/14

~~Preliminary~~ TSS Update
DML 1/18/03

L&AI

Construction Compliance Monitoring

Date: JAN 14 **Wheeler-Osgood/Ebb**

Station/Sample	Depth/DTB (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
WO300 (down-current)	3	29.1	6.6	4.0	9.5		5,233,253	542,216	1332	**Ebb Tide**
030114/WO300/M/B	5	29.3	**6.6***	4.1	9.5	5			1331	
Deep	8/10	29.7	6.7	3.1	9.5				1330	
WO300 (down-current)	*3*	*29.9*	*6.6*	*15.3*	*9.5*		5,233,253	542,216	*1336*	*Field Duplicate*
030114/WO300/M/B-Dup	*5*	*29.4*	*6.6*	*4.0*	*9.5*	*5*			*1336*	*Field Duplicate*
Deep	8/10	*29.8*	*6.5*	*2.6*	9.5				*1335*	*Field Duplicate*
WOS (down-current)	3	29.3	6.9	1.9	9.5		5,233,284	542,994	1205	
0301014/WOS/M/B	10	30.1	7.0	0.9	9.4	2			1204	Compliance points at mouth
Deep	15/20	30.1	7.0	1.5	9.4				1203	of Wheeler-Osgood Waterway
WOC (up-current)	3	28.7	6.7	1.6	9.8		5,233,308	542,994	1158	Mid-channel
0301014/WOC/M/B	7	29.8	6.8	1.3	9.5	2			1157	
Deep	10/15	30.1	6.7	0.9	9.4				1155	
WON (down-current)	3	28.3	6.7	2.6	9.5		5,233,331	542,994	1359	
030114/WON/M/B	5	29.5	6.8	2.0	9.5	3			1358	
Deep	8/10	30.0	6.9	1.1	9.4				1357	
WOMIDS (down-current)	3	29.1	6.7	3.9	9.5		5,233,243	542,184	1351	Midway between head and
Deep	5/7	29.5	6.7	2.4	9.5				1350	
WOMIDC (down-current)	3	28.9	6.7	3.2	9.5		5,233,266	542,184	1349	Mid-channel
Mid	6	29.7	6.6	1.4	9.5				1349	
Deep	8/12	29.8	6.7	3.2	9.5				1348	
WOMIDN (down-current)	3	28.8	6.6	3.2	9.5		5,233,290	542,184	1346	Point relocated to S. edge of
Deep	5/7	29.3	6.6	2.3	9.5				1345	float on N. bank of waterway

Pre-Survey Calibration	S. High 1/14	101.7 % in saturated air	Partly cloudy, no wind, dry
Post-Survey Calibration	S. High 1/14	101. % in saturated air	

DO & Turbidity calibration as per manufacturer's specifications.

Survey work conducted by D. Berta and S. high

*Winkler titration on 030114/WO300/M/B = 6.6 and 6.7 mg/L

Manson worked quickly on filter material placement. High turbidity observed at placement.

Prepared By/Date:

M. Lloyd 1/14

~~Preliminary~~ TSS UPDATE RMZ. 1/18/03

L&AI

Construction Compliance Monitoring **Date: JAN 14** **Wheeler-Osgood/Ebb**

Station/Sample	Depth/DTB (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
WO300 (down-current)	3	28.7	6.6	14.0	9.5		5,233,253	542,216	1442	**Maximum Ebb Tide**
030114/WO300/M/C	5	29.5	6.6	2.3	9.5	6			1442	1 hour 10 min. later
Deep	8/10	30.0	6.5	1.5	9.5				1441	
WOS (down-current)	3	28.0	6.8	2.3	9.5		5,233,284	542,994	1500	Recheck of
0301014/WOS/M/C	10	30.0	6.8	1.3	9.5	2U			1459	Compliance points at mouth
Deep	15/20	30.1	6.6	1.2	9.5				1459	of Wheeler-Osgood Waterway
WOC (up-current)	3	28.5	6.7	2.5	9.5		5,233,308	542,994	1457	Mid-channel
0301014/WOC/M/B	7	29.3	6.7	1.6	9.5	2			1457	
Deep	10/15	29.9	6.8	1.5	9.5				1456	
WON (down-current)	3	28.4	6.8	2.7	9.5		5,233,331	542,994	1454	
030114/WON/M/C	6	29.3	6.9	2.1	9.6	3			1453	
Deep	9/12	29.8	7.3	3.5	9.5				1452	
WOMIDS (down-current)	3	28.4	6.6	10.5	9.5		5,233,243	542,184	1449	Midway between head and
Deep	5/7	29.4	6.6	3.5	9.5				1448	
WOMIDC (down-current)	3	28.9	6.7	11.2	9.5		5,233,266	542,184	1447	Mid-channel
Mid	5	29.6	6.8	2.3	9.5				1447	
Deep	9/11	30.0	6.8	2.5	9.5				1446	
WOMIDN (down-current)	3	28.5	6.7	2.9	9.5		5,233,287	542,199	1445	Point relocated to S. edge of
Deep	5/6	29.6	6.8	5.3	9.5				1444	float on N. bank of waterway

Pre-Survey Calibration S. High 1/14 101.7 % in saturated air

Warm & Partly cloudy

DO & Turbidity calibration as per manufacturer's specifications.

Survey work conducted by D. Berta and S. high

Manson finished with filter mateial placement. Some turbidity observed at placement.

Prepared By/Date:

M. Lloyd 1/14

~~Preliminary~~

TSS Update

RMP. 1/18/03

L&AI

STL Seattle

Client Name	Lloyd & Assoc. Inc.
Project Name	THEA FOSS
Date Received	01-14-03

General Chemistry Parameters

Client Sample ID	030114/TF2+00/M/A
Lab ID	111254-01

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-14-03	mg/L	2	2

Client Sample ID	030114/WO300/M/A
Lab ID	111254-02

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-14-03	mg/L	13	2

Client Sample ID	030114/WO300/M/A - Dup
Lab ID	111254-03

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-14-03	mg/L	7	2

Client Sample ID	030114/WON/M/A
Lab ID	111254-04

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-14-03	mg/L	3	2

Client Sample ID	030114/WOC/M/A
Lab ID	111254-05

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-14-03	mg/L	4	2

Client Sample ID	030114/WOS/M/A
Lab ID	111254-06

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-14-03	mg/L	3	2

STL Seattle

Client Sample ID	030114/TDSE(300)/M/A
Lab ID	111254-07

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-14-03	mg/L	4	2

Client Sample ID	030114/TDS(300)/M/A
Lab ID	111254-08

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-14-03	mg/L	3	2

Client Sample ID	030114/TDSW(300)/M/A
Lab ID	111254-09

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-14-03	mg/L	3	2

Client Sample ID	030114/TDN(300)/M/A
Lab ID	111254-10

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-14-03	mg/L	ND	2

Client Sample ID	030114/TDN(300)/M/DUP
Lab ID	111254-11

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-14-03	mg/L	ND	2

Client Sample ID	030114/WO300/M/B
Lab ID	111254-12

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-14-03	mg/L	5	2

Client Sample ID	030114/WO300/M/DUP
Lab ID	111254-13

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-14-03	mg/L	5	2

STL Seattle

WON/TAN

Client Sample ID	030114/WOH/M/B
Lab ID	111254-14

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-14-03	mg/L	3	2

Client Sample ID	030114/WOC/M/B
Lab ID	111254-15

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-14-03	mg/L	2	2

Client Sample ID	030114/WOS/M/B
Lab ID	111254-16

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-14-03	mg/L	2	2

Client Sample ID	030114/WOS/M/C
Lab ID	111254-17

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-14-03	mg/L	2	2

Client Sample ID	030114/WON/M/C
Lab ID	111254-18

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-14-03	mg/L	3	2

Client Sample ID	030114/WOC/M/C
Lab ID	111254-19

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-14-03	mg/L	ND	2

Client Sample ID	030114/WO300/M/C
Lab ID	111254-20

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-14-03	mg/L	6	2

STL Seattle

Client Sample ID	030114/TDS(300)/M/C
Lab ID	111254-21

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-14-03	mg/L	ND	2

Client Sample ID	030114/TDNW(300)/M/C
Lab ID	111254-22

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-14-03	mg/L	ND	2

Client Sample ID	030114/TDN(300)/M/C
Lab ID	111254-23

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-14-03	mg/L	ND	2

Client Sample ID	030114/TDNE(300)/M/C
Lab ID	111254-24

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-14-03	mg/L	ND	2

STL Seattle

QUALITY CONTROL REPORT

Client Sample ID: Batch QC
Lab ID: 111229-12
QC Batch Number: 1159-012

Method Blank

Parameter	Result (mg/L)	PQL
Total Suspended Solids	ND	2

Duplicate

Parameter	Sample Result (mg/L)	Duplicate Result (mg/L)	RPD (%)	Flag
Total Suspended Solids	1.8	2.4	29	X4a

STL Seattle

QUALITY CONTROL REPORT

Client Sample ID: Batch QC
Lab ID: 111218-1
QC Batch Number: 1159-013

Method Blank

Parameter	Result (mg/L)	PQL
Total Suspended Solids	ND	2

Duplicate

Parameter	Sample Result (mg/L)	Duplicate Result (mg/L)	RPD (%)	Flag
Total Suspended Solids	72	74.3	3.1	

030112 1000
- NO ACTIVITY @ TOTEM MARINE
-

CALIBRATION NOTES:

1050 DO CALIBRATED IN MOIST AIR OVER TAP WATER
READING AFTER CALIBRATION: (767.5 mm Hg)
= 101.7

TURBIDITY CALIBRATED WITH 2 POINT METHOD.
0.0 NTU (DISTILLED WATER), 10.0 NTU CALIBRATION STANDARD

READING AFTER CALIBRATION IN 10.0 NTU SOLUTION = 9.9

SAMPLE CODES WORK ZONE CENTER N 523233
E 543332

WO 300 N	253	E 241
WO MID-NORTH	290	184
WO MID-CENTER	266	184
MID-SOUTH	243	184
WO NORTH	331	994
WO CENTER	308	994
WO SOUTH	284	994

1147
- MANSON PLACING QUARRY SPALLS ON NORTH SIDE OF WHEELER OSGOOD WITH CLAM SHELL BUCKET - 2 SHIFTS OPERATING IN WORK ZONE - REMOVING DEBRIS ETC W/ NET & BY HAND BOOM PULLED ACROSS ENTIRE WATER WAY WEST OF WORK ZONE

1200 MANSON BREAKS FOR LUNCH

1234 MANSON RESUMES WORK

Continued on Page

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Signed 01/12/03 Date Signed 1/12/03 Date

PROJECT THE H FOSS / WIKE ISL - OSWOOD Notebook No. _____ Continued From Page _____

030112 EBB ~~Flood~~ / SLACK (12 ~ HIGH TIDE)

SAMPLE

TIME	LOCATION	EVENT	DTS	DEPTH	TEMP	SAL	DO	TURB	TSS
1212	WO 300	A	(13)	D 8	9.5	29.4	~~6.7~~ DB	2.6	—
1214	(253 241* (YESTERDAYS LOCATION)			M 6	9.5	29.3	6.5	2.1	030112/WO300/M/A
1215	253 216			S 3	9.4	27.6	6.6	30.7	—
	↳ 300' LOCATION TODAY (ACCURACY 4.7')								
				SLACK TIDE					
1147	WO#	A	(17)	D 12	9.5	29.6	6.8	4.5	—
1151	(331 ~~305~~ 994)			M 9	9.5	29.4	6.6	1.4	030112/WO#/M/A
1155	(ACC 4.7)			S 3	~~9.5~~	~~27~~	6.7	4.5	—
				DB	9.3	26.4			
1155	WOC	A	(~HIGH)	SLACK TIDE	9.4	29.6	6.8	1.1	
1157	308 994		(16)	D 11					—
1158	(4.7 ACCURACY)			M 8	9.6	29.5	6.6	0.9	030112/WOC/M/A
				S 3	9.4	25.7	6.8	4.3	—
				(SLACK)					
1203	WOS	A	(22)	D 17	9.5	29.7	7.0	1.2	—
1204	284 994'			M 11	9.5	29.6	7.0	1.7	030112/WOS/M/A
1205	(ACC 4.4')			S 3	9.5	28.3	6.9	2.0	
				DUPLICATE OF WS 300 - EBB / SLACK					
1216	WO 300 A		(13)	D 8	9.5	29.5	6.6	0.9	—
1217	253 216			M 6	9.5	29.3	6.5	1.0	030112/WO300/M/D
1219	(ACC 4.7')			S 3	9.4	28.3	6.5	28.6	
				EBB					
1223	WO MID NORTH	A	(12)	D 7	(9.4) 9.5	29.5 DB (29.6)	7.6	1.4	—
1224	290 184			M 5	(9.5) 9.5	29.4	6.6	1.2	—
1226	285 177 ★			S 3	9.2	25.1	6.6	7.1	—
	(ACCURACY = 5.2)			EBB					
1228	WO MID CENTER	A	(12)	D 7	9.5	29.4	6.6	1.5	—
1229	266 154			M 5	9.4	29.2	6.5	7.3	—
1229	(ACCURACY 96)			S 3	9.4	28.7	6.5	22.0	—

★ SAMPLED AGAINST FLOATING DOCK

Continued on Page

Read and Understood By

Daniel A. Berta 01/12/03 — Signed — Date

[illegible] 1/12/03 — Signed — Date

PROJECT THEA FOSS / WHEELER - OSGOOD

Notebook No. _____

Continued From Page _____

030112

1400 - CHANGE MEMBRANE ON D.O. METER & RECALIBRATED DO IN MOIST AIR OVER TAP WATER 101 % FOR CALIBRATION CHECK.

1500 BARGE MOVES OUT OF HEAD OF WATERWAY TO MOUTH FOR END OF SHIFT.

WO S, WO N & WOC SAMPLED BEFORE MOVE.

WO 300 SAMPLED AFTER MOVE

Continued on Page

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Signed	Date	Signed	Date
			03/14

PROJECT TITEA FOSS/WHEELER - OSGOOD 030112 Notebook No. _____ 5

Continued From Page _____

TIME	LOCATION	EVENT	DTB	SAMPLE DEPTH	TEMP	SAL	DO	EBB TURB	TSS
1230	WO MID SOUTH	A	(9)	D 6	9.6	27.4	6.7	2.9	—
1231	(ACCURACY 9.1)			M NA	—	—	—	—	—
1231	243 184			S 3	9.5	28.9	6.6	2.9	—
				EBB (MAX)					
1345	TF 2+00	B	(45)	D 39	9.5	29.6	6.9	0.4	—
1350	465 492			M 23	9.6	29.6	7.2	0.3	030112/TF2+00/M/B ☆
~~1351~~	(ACCURACY 8.6)			S 3	~~9.6~~	~~29.5~~	~~6.6~~	~~0.4~~	—
1424					NO READING				
	RECALIBRATED & REMEASURED								
1424				D 39	9.6	29.5	6.6	0.4	
1425	465 492	B		M 23	9.6	29.5	6.9	0.6	
1426				S 3	9.3	28.0	7.7	0.7	

☆ SPLIT SAMPLE FOR D.O. BY WINKLER METHOD OBTAINED 1-300 ml BOTTLE (PRESERVED) FOR CITY OF TACOMA, & 1 300 ml BOTTLE (PRESERVED) FOR L&A

				EBB (MAX)					
1501	WO 3+00	B (8.5)	(8.0)	D 5	9.4	27.4	6.3	38.2	—
NA	253 216			M —	NA	—	—	—	5.0' (1503) 030112/WO300/M/B
1502	(ACCURACY = 8.2)			S 3	9.4	27.1	6.3	48.4	—
				EBB (MAX)					
1445	WON	B	(9)	D 6	9.4	28.7	6.2	5.9	—
—	331 994			M NA	—	—	—	—	TSS @ 5'
1448	(ACCURACY = 5.8)			S 3	9.2	26.6	6.3	3.8	030112/WON/M/B
				EBB (MAX)					
1450	WOS	B	(12)	D 9	9.5	28.8	6.4	2.6	—
1451	284 ~~308~~ 994			M 7	9.4	28.6	6.3	2.7	030112/WOS/M/B
1452	(ACCURACY 5.9)			S 3	9.2	27.8	6.5	1.6	—
				EBB (MAX)					
1454	WOC	B	(18)	D 15	9.5	29.6	6.8	1.6	—
1455	308 994			M 9	9.6	29.4	6.6	1.9	030112/WOC/M/B
1456	(ACCURACY 7.7')			S 3	9.3	26.7	6.5	1.6	—
				DUPLICATE EBB (MAX)					
1504	WO 3+00	B	9.0	D 6	9.5	29.0	6.5	15.1	—
1505	253 216			S	9.4	27.8	6.2	32.2	—
	(ACCURACY 5.4')								

Continued on Page

Read and Understood By @ 5.0 = 030112/W300/M/DUP

Daniel A. Berta 01/02/03 — Signed

30114 — Date

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PROJECT THEA FOSS / WHEELER-OSGOOD

Notebook No. _____
Continued From Page _____

030112

NOTE EVENT B SAMPLES IN WHEELER OSGOOD (IE NOT @ MOUTH) WERE LESS THAN 10' DEPTH & ONLY "DEEP AND SHALLOW" READINGS TAKEN AS PER WHEELER OSGOOD FIELD DIRECTIVE #19

1530
D.O. CALIBRATION CHECK IN MOIST AIR OVER TAP WATER = 96.9 %

Winkler Titration of 030112/TF2/M/B
YSI Sonde = 6.9 mg/L per Hach procedure

(1) 100 ml × 0.02 × 3.42/100 = 6.8 mg/L

(2) 100 ml × 0.02 × 3.45/100 = 6.9 mg/L

PMF @ 1640

Continued on Page

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03-114

030112

PROJECT THEA FOSS / WHEELER - OSGOOD

Notebook No. _____ 7

Continued From Page _____

TIME	LOCATION	EVENT	DTB	SAMPLE DEPTH	TEMP	SAL	DO	TURB	TSS
1509	WO MID NORTH	B	9.0	D 6	9.5	28.5	6.1	23.7	—
1509	(285 177*)			S 3	9.4	27.3	6.2	24.3	—
	*SAMPLED AGAINST FLOATING DOCK (ACCURACY = 6.4')								
1511	WO MID CENTER		9.0	D 6	9.5	28.5	6.1	16.5	—
1512	(266 184)			S 3	9.4	27.1	6.1	15.3	—
	(ACCURACY 6.2)								
					EBB				
1514	WO MID SOUTH		6 DB ~~8~~	D 6 (5')	9.4	28.1	6.6	24.4	—
1515	243 184			S 3	9.4	26.0	6.4	17.6	—
	(ACCURACY 6.0)								

INFORMATIONAL READINGS ON WEST SIDE OF DEBRIS BOOM, IN THEA FOSS WATERWAY - AT MOUTH OF WHEELER OSGOOD WATERWAY; ALL READINGS @ EBB (MAX TIDE

1520	(542)	28	D	23	9.6	29.7	6.3	1.3	—
1521	277 965		M	14	9.6	29.6	6.3	1.8	—
1522	(ACCURACY 8.1)		S	3	9.4	28.0	6.3	1.4	—
	(SOUTH)								
1524	299 (542) 963	28	D	23	9.6	29.7	6.4	1.9	—
1524	(ACCUR. 6.2)		M	14	9.6	29.6	6.3	1.4	—
1525	(MIDDLE)		S	3	9.3	26.6	6.4	1.6	—
		22	D	17	9.6	29.6	6.2	1.6	—
1527	336 971		M	11	9.6	29.3	6.1	2.6	—
1527	(7.2' ACCURACY)		S	3	9.4	28.3	6.1	3.0	—
1528	(NORTH)								

Note: All Readings above Taken after barge had moved.

MK

Continued on Page

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Daniel A. Berta 01/12/03 — Signed — Date

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230114

PROJECT THEA FOSS / WHEELER-OSGOOD

Notebook No. _____

Continued From Page _____

030114 CO-ORD

UZ 95

	N	E
Center	5233 681	542 941
TDN 150	713	907
TDN 300	745	874
TDN 350	755	863
TDNE 300	770	915
TDNE 350	784	911
(TDNE 150)	723	923
TDNW 300	703	851
TDNW 350	707	836
~~TDS 150~~	~~637~~	~~920~~
TDS 300	593	917
TDS 350	579	913
TDSE 300	590	945
TDSE 350	575	946
(TDSE 150)	636	942
TDSW 300	617	875
TDSW 350	606	865

CALIBRATION NOTES:

0740 CALIBRATED SONDE WITH 50,000 µS = 50 mS ~200 ml USED CALIBRATION STANDARD LOT 0220423 EXPIRES 05/2004 - MFG BY YSI INC. CONDUCTIVITY CALIBATION SUCESSFUL

0750 CALIBRATED FOR D.O. IN MOIST AIR OVER TAP WATER CALIB SUCCESSFUL - READS 102%

0755 CALIBRATED FOR TURBIDITY W 2 POINT CALIBRATION 0.0 NTU = D.I. WATER 100 NTU = STANDARD READS 9.7 NTU ON CALIB. CHECK

Continued on Page

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[signature] 031014

Signed 01/14/03 Date Signed Date

PROJECT THEA FOSS / WHEELER - OSGOOD

Notebook No. _____
Continued From Page _____

030114

SAMPLE

TIME	LOCATION	EVENT	DB	DEPTH	TEMP	SAL	DO	TURB	TSS
0806	TF 2+00	A	(41)	D 36	9.4	30.1	7.4	0.2	—
0808	465 492			M 20	9.4	30.0	7.4	0.3	030114/TF2+00/M/A
0809	(ACC=4.7')			S 3	9.2	27.9	7.2	0.8	—
	INFORMATIONAL @ THEA FOSS 30+00 & 60+00								
0822	TF 30+00	A	(37)	D 32	9.4	30.1	7.2	0.7	—
0823	629 851			M 19	9.4	30.0	7.3	0.5	—
0824	(5.2'=ACC)			S 3	9.3	28.4	7.1	0.8	—
0834	TF 60+00	A	(32)	D 27	9.5	30.0	7.1	1.5	—
0835	782 938			M 16	9.5	30.0	6.8	1.6	—
0835	(6.4'=ACC)			S 3	9.4	28.6	6.7	1.2	—
	INFORMATIONAL ~~INFORMATIONAL~~ DB WHEELER - OSGOOD								
0937	WO 300		(9.0)	D 6	9.4	28.8	6.9	3.2	—
0938	253 ~~247~~ ~~243~~ 241			S 3	9.3	28.1	6.9	5.8	—
0939	(6.1' ACC)			—	@5'	—			030114/WO300/M/A
	~~DUPLICATE~~ DB								
1040	WO 300		(9.0)	D6	9.4	29.5	6.9	2.2	—
1041	253 241			S3	9.4	28.5	7.0	3.0	—
1042	(6.4' ACC)			DEPTH 5.0' FOR TSS					030114/WO300/M/A
1042	WO MID NORTH		(11)	D7	9.4	29.5	7.0	1.2	—
1043	290 184			M5	9.4	29.1	7.0	2.0	—
1043	276 184 *			S3	9.4	28.1	7.0	2.8	—
	(ACC=10.2)								
	* ACTUAL LOCATION - AGAINST FLOATING DOCK								
1044	WO MID CENTER		(10)	D 6	9.4	29.6	6.9	2.0	—
—	266 184		9.5	M NA	—	—	—	—	—
1044	(ACC=12.3)			S 3	9.5	29.1	6.9	2.2	—
1045	WO MID SOUTH		(5)	D 4	9.4	28.9	6.9	2.6	—
1045	243 184			S 2	9.4	26.9	7.0	3.2	—
	(ACC=8.3')								

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[signature] 030114 [signature] 1/14/03

Signed Date Signed Date

Daniel A. Butler 030114

PROJECT TIKEA FOSS / WHEELER - OSGOOD

Notebook No. _____
Continued From Page _____

030114

WZ 6

	N	E
WZ center	5233 772	542 906
TDN 150	804	874
TDN 300	836	840
TDN 350	847	829
TDNE 300	860	880
TDNE 350	874	877
TDNW 300	793	817
TDNW 350	803	798
TDS 150	727	894
TDS 300	683	882
TDS 350	878	669
TDSE 300	680	910
TDSE 350	665	912
TDSW 300	708	841
TDSW 350	694	830

0830 MANSON BARGE & RIG MOBILIZES TO EAST END OF (≈ 11.0' DEPTH TO BOTTOM @ TIME OF ENTRY) WHEELER-OSGOOD. FLOOD TIDE @ TIME OF ENTRY.

OBSERVATIONS:

- TIKEA FOSS NO FLOAT DEBRIS OBSERVED
- WHEELER-OSGOOD MINOR FLOAT DEBRIS @ MOUTH OF WATERWAY

0925 MANSON IN WATER ON SOUTH BANK WITH CLAMSHELL BUCKET, PULLING WOOD/METAL DEBRIS FROM BANK MOVING DEBRIS BOOMS INTO PLACE.

1000 DB BEGAN PLACING FILTER CAP.

Continued on Page

D.O CHECK IN MOST AIR OVER THE WATER = 100.1 %

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030114 — Date

030114 SAMPLE

TIME	LOCATION	EVENT	DIA	DEPTH	TEMP	SAL	DO	TURB	TSS
1049	WON	A	(22)	D 9	9.5	29.5	7.4	0.9	—
1050	331 994			M 6	9.4	29.3	7.1	1.1	030114/WON/M/A
1050	(ACC. = 8.2)			S 3	9.4	29.1	7.0	1.1	—
1051	WOC	A	(13)	D 9	9.4	29.5	7.2	0.5	—
1052	338 994			M 6	9.5	29.6	7.2	0.9	030114/WOC/M/A
1052	(ACC = 11.2')			S 3	9.4	28.5	7.1	1.1	
	WOS								
1053	384 994	A	(13)	D 9	9.5	29.9	7.2	1.2	—
1054	(ACC 6.8)			M 6	9.5	29.4	7.0	1.0	030114/WOS/M/A
1055				S 3	9.5	28.0	7.1	1.3	
1110	TDSE (300)	A		WORK ZONE 6 @ TOTEM DOCK					
1110	665 912		(37)	D 31	9.4	30.1	7.6	1.3	—
1111	(ACC = 7.1')			M 18	9.4	30.1	7.5	1.0	—
				S 3	9.4	29.1	7.3	0.9	—
	TDSE (300)	A							
1112	680 910		(36)	D 30	9.4	30.1	7.1	1.1	—
113	(ACC 6.5)			M 18	9.4	30.1	7.3	0.9	030114/TDSE(300)/M/
113				S 3	9.4	28.5	7.2	0.5	—
1115	TDS (150)	A	(36)	D 31	9.4	30.2	7.4	0.6	—
1116	727 894			M 18	9.4	30.1	7.5	0.7	—
1116	711 894*			S 3	9.4	28.5	7.4	0.5	—
	(ACC 6.4')		* AGAINST WEST AREA DEBRIS BOOM						
1119	TDS (300)	A	(39)	D 34	9.4	30.2	7.4	0.4	—
1120	683 832			M 19	9.4	30.1	7.4	1.1	030114/TDS(300)/M/A
1121	(ACC. 6.6)			S 3	9.4	28.7	7.4	1.1	—
1125	TDS (350)	A	(39)	D 34	9.4	30.2	7.7	0.4	—
1126	669 878			M 19	9.4	30.1	7.6	0.5	—
1127	(5.8' ACC)			S 3	9.4	29.1	7.2	0.7	—

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PROJECT THEA FOSS/WHEELER - OSGOOD Notebook No. _____
Continued From Page _____

030114

1100 HURLEY MOVING MATERIAL FROM BARGE TO SHORE & AROUND BARGE - ON BARGE WITH FRONT END LOADER

1200 D.O. CHECK IN ~~TAP~~ MOIST AIR OVER TAP WATER = 100.7 %

(*HURLEYS ACTIVITY WAS REPORTEDLY MOVING HABITAT MIX FROM TOTEM DOCK SITE TO MARTINAC SITE (IE LOADING TRUCKS ETC...)

1300
RECALIBRATED: DO IN MOIST AIR OVER TAP WATER
CALIBRATION CHECK 100.2 %

TURBIDITY CALIBRATED BY 2 POINT METHOD 0.0 NTU = DI WATER 10.0 NTU W/ STANDARD SOLUTION.
TURB CHECK AFTER CALIB = 10.0 NTU

- 1300 DIVERS AT TOTEM MARINE DOCK SITE - NO ROCK/FILTER CAP ETC. BEING PLACED IN WATER

- WHEELER OSGOOD - MANSON CONTINUES TO PLACE FILTER CAP MATERIAL NO FLOAT DEBRIS NOTED

1510
- D.O. RESULTS FROM WINKLER TITRATION ARE RUN RESULTS 6.6 & 6.7 FOR 2 RUNS.
WO 300/M/B

Analyses conducted by M. Lloyd
① 100 ml x 0.02 x 331/100 = 6.6 mg/L
② WO x 0.02 x 334/100 = 6.7 mg/L
Sonde = 6.6 mg/L

Continued on Page

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PROJECT TITEA FOS / WHEELER-OSGOOD

Notebook No. _____ 13

Continued From Page _____

030114 SAMPLE (ALL SAMPLES IN FLOOD FLOW)

TIME	LOCATION	EVENT	DTB	DEPTH	TEMP	SAL	DO	TURB	TSS
1130	TDSW(350)	A	(39)	D 34	9.4	30.2	7.5	0.6	—
1130	696 830			M 19	9.4	30.1	7.5	0.4	—
1131	(ACCURACY = 5.0')			S 3	9.4	28.7	7.3	0.9	—
1134	TDSW(300)	A	(39)	D 34	9.4	30.2	7.3	0.8	—
1135	708 841			M 19	9.4	30.2	7.5	0.4	030114/TDSW(300)/M/A
1135	(ACC. = 5.0')			S 3	9.4	28.8	7.4	1.0	—
1141	TDH(300)	A	(39)	D 34	9.4	30.2	7.4	1.1	—
1141	836 840			M 19	9.4	30.2	7.5	0.4	030114/TDH(300)/M/A
1142	(ACC. 5.6)			S 3	9.4	29.6	7.5	0.5	—
			DUPLICATE						
1147	TDH(300)	A	(39)	D 34	9.4	30.2	7.6	0.7	—
1149	836 840			M 19	9.4	30.2	7.6	0.3	030114/TDH(300)/M/DUP
1150	(ACC = 7.1)			S 3	9.4	28.1	7.5	0.7	—
DB	TDH(350)	A	(39)	D 34	9.4	30.2	7.5	0.6	—
1150	847 829			M 19	9.4	30.2	7.6	0.4	—
1151	(ACC. 6.9)			S 3	9.4	29.1	7.5	0.4	—
1152									

☆ - SPLIT SAMPLE FOR DO BY WINKLER METHOD.
1 SAMPLE FOR CITY OF TACOMA LAB
1 1 SAMPLE FOR LAI LAB: LAI RESULTS: 6.8 & 6.9
SAMPLES PRESERVED ACCORDING TO MFC'S PROCEDURE.
CITY SAMPLE PRESERVED ACCORDING TO CITY OF TACOMA RECOMENDATIONS (SAMPLE HAND DELIVERED TO CITY REP)

1330	WO 300	B	WHEELER - OSGOOD DB EBB FLOW						—
↳	253 241	(11.0)	D 8	9.5	29.7	~~7.6~~ 6.7	3.1		—
1331	(ACC. = 17.7)		M 5	9.5	29.3	6.6	4.1	030114/WO300/M/B	
1332			S 3	9.5	29.1	6.6	4.0		—
			DUPLICATE						
1335	WO 300	B	(10)	9.5	29.8	~~6.5~~	2.6		—
1336	253 241			9.5	29.4	6.6	4.0	030114/WO300/M DUP	
1336	(ACC. = 17.8)			9.5	29.4	6.6	15.3		

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PROJECT THEA FOSS/WHEELER - CSGCOD

Notebook No. _____

Continued From Page _____

030114

* SPLIT SAMPLE OBTAINED FOR D.O. 1 FOR L&A I & 1 FOR CITY OF TACOMA WO 300 B

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PROJECT THEA FOSS / WHEELER - OSGOOD

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030114

SAMPLE

TIME	LOCATION	EVENT	DTB	DEPTH	TEMP	SAL	DO	TURB	TSS
1345	WO MID NORTH	B	(4) (6)	D 5	9.5	29.3	6.6	2.3	—
1346	290 184		(7)	S 3	9.5	28.8	6.6	3.2	—
	(ACC 17.9)								
1348	WO MID CENTER	B	(12)	D 8	9.5	29.8	6.7	4.5	—
1349	266 184			M 6	9.5	29.7	6.6	1.4	—
1349	(ACC = 17.8')			S 3	9.5	28.9	6.7	3.2	—
1350	WO MID SOUTH	B	(7)	D 5	9.5	29.5	6.7	2.4	—
NA	243 184			M NA	—	—	—	—	—
1351	(ACC, 17.4')			S 3	9.5	29.1	6.7	3.9	—
1357	WON	B	(11)	D 8	9.4	30.0	6.9	1.1	—
1358	331 994			M 5	9.5	29.5	6.8	2.0	030114/WON/M/B
1359	(ACC=17.9)			S 3	9.5	28.3	6.7	2.6	—
1401	WOS DB	B	(15)	D 10	9.4	30.1	6.7	0.9	—
1402	308 994			M 7	9.5	29.8	6.8	1.3	030114/WOS/M/B
1403	(ACC = 20.5'			S 3	9.5	28.7	6.7	1.6	—
1405	WOS	B	(20)	D 15	9.4	30.1	6.9	1.5	—
1406	284 994			M 10	9.4	30.1	7.0	0.9	030114/WOS/M/B
1407	(ACC = 18.8')			S 3	9.5	29.3	~~6~~ 7.0	1.9	—
	~ MAX EBB FLOW (@ START)								
1441	WO 300	C	(10)	D 8	9.5	30.0	6.6	1.5	—
1442	253 241			M 5	9.5	29.5	6.6	2.3	030114/WO300/M/C
1442	(ACC = 20.4')			S 3	9.5	28.7	6.6	14.0	
1444	WO MID NORTH	C	(6)	5	9.5	29.6	6.8	2.9	—
1445	287 199*			3	9.5	28.5	6.7	5.3	—
	290 184								—
	(22.4' ACC)								

* LOCATION AGAINST FLOATING DOCK

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PROJECT THEA FOSS / WHEELER OSGOOD

Notebook No. _____
Continued From Page _____

03/01/14

- 1450 ADVISED THAT HURLEY WILL START PLACING QUARRY SPALLS & FILTER CAP.

- 1505 PLACING ROCK (QUARRY SPALLS)

- NO TURBIDITY PLUMES VISIBLE FROM WATER QUALITY BOAT IE OBSERVED OUTSIDE OF DEBRIS BOOM & BARGE

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R M Floyd 1/14/03 — Signed — Date

PROJECT THEA FOSS / WHEELER-OSGOOD

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030114 SAMPLE

TIME	LOCATION	EVENT	DTB	DEPTH	TEMP	SAL	DO	TURB	TSS
TIME	WO MID CENTER	C	(11)	D 9	9.5	30.0	6.8	2.5	—
1447	1446 266 184			M 5	9.5	29.6	6.8	2.3	—
1447	(ACC = 18.4')			S 3	9.5	28.9	6.7	11.2	—
	WO MID SOUTH								
1448	243 184	C	(7)	D 5	9.5	29.4	6.6	3.5	—
1449	(ACC = 20.4')			S 3	9.5	28.4	6.6	10.5	—
1452	WON	C	(12)	D 9	9.5	29.8	7.3	3.5	—
1453	331 994			M 6	9.6	29.3	6.9	2.1	030114/WON/M/C
1454	(ACC = 17.6)			S 3	9.5	28.4 DB	6.8	2.7	—
									—
1456	WOC	C	(15)	D 10	9.5	29.9	6.8	1.5	—
1457	308 994			M 7	9.5	29.3	6.7	1.6	030114/WOC/M/C
1457	(ACC = 18.8)			S 3	9.5	28.5	6.7	2.5	—
1459	WOS	C	(20)	D 15	9.5	30.1	6.6	1.2	—
1459	284 994			M 10	9.5	30.0	6.8	1.3	030114/WOS/M/C
1500	(ACC = 18.3)			S 3	9.5	28.0	6.8	2.3	—

TOTEM MARINE DOCK

1515	TDS (350)	C	(38) DB	D 32	9.4	30.2	7.3	0.6	—
1516	669 878		33	M 18	9.4	30.1	7.3	0.6	—
1517	(ACC = ~~20.2'~~ 8.8' DB)		DB	S 3	9.5	28.6	7.2	1.2	—
1518	TDS (300)	C	(37)	D 32	9.4	30.2	7.0	1.4	—
1519	683 382			M 18	9.4	30.1	7.1	0.8	030114/TDS(300)/M/C
1519	(ACC 5.3)			S 3	9.5	28.8	7.0	1.5	—
1523	TDHW (300)	C	(38)	D 33	9.4	30.2	7.3	0.8	—
1524	793 817			M 19	9.4	30.2	7.3	0.6	030114/TDHW(300)/M/C
1525	(ACC 5.2')			S 3	9.5	29.0	7.1	1.1	—
1527	TDHW (350)	C	(38)	D 33	9.4	30.2	7.3	1.6	—
1528	803 798			M 19	9.4	30.2	7.3	0.6	—
1529	(ACC = 7.0')			S 3	9.5	29.0	7.0	1.2	

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RMC Floyd 1/14/03 — Signed — Date

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PROJECT THEA FOSS / WHEELER - OSGOOD

Notebook No. _____

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030114

INFORMATIONAL READINGS

1543 - NOTE: @ TDNE (150) DEPTH TO BOTTOM 34'
@ 33' TURBIDITY = 6.4

1555 DTB 34.6'
716 892 - AGAINST NORTH EDGE OF "RANIER" BARGE
(ACC 6.2')

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PROJECT THEA FOSS / WHEELER-OSGOOD

Notebook No. _____

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030114

TIME	LOCATION	EVENT	DTB	SAMPLE DEPTH	TEMP	SAL	DO	TURB	TSS
1530	TDN (350)	C	37	D 32	9.4	30.2	7.4	0.4	—
1532	847 827			M 18	9.4	30.1	7.2	0.6	—
1533	(Acc = 6.5')			S 3	9.5	28.7	7.0	1.2	—
1535	TDN (300)	C	37	D 32	9.4	30.2	7.0	0.6	—
1535	836 840			M 18	9.4	30.2	7.2	0.6	030114/TDN(300)/M/C
1536	(Acc = 5.9')			S 3	9.5	29.1	7.0	1.2	—
							DB↑		
1539	TDN (150)	C	37	D 32	9.4	30.2	7.0	2.9	—
1540	804 874			M 18	9.4	30.1	7.0	2.8	—
1540	(Acc = 5.9')			S 3	9.4	28.6	7.0	1.4	—
1544	TDNE (300)	C	21	D 17	9.4	30.1	7.0	0.9	—
1545	860 880			M 10	9.5	29.8	6.9	1.0	030114/TDNE(300)/M/C
1546	(Acc. 7.5')			S 3	9.5	28.9	6.8	1.1	—
1549	TDNE (350)	C	24	D 14	9.5	29.9	6.9	2.2	—
1550	874 877		19	M 10	9.5	29.7	6.8	1.2	—
1551	(Acc. 6.1')		DB↑	S 3	9.5	29.3	6.8	1.1	—

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Lloyd & Associates, Inc.
38210 SE 92nd Street, Snoqualmie, Washington 98065 425-888-1905 rml@centurytel.net

January ~~14~~ 15, 2003

TRANSMITTAL

Tss Data update 1/24/03 RMZ.

To: Iain Wingard
John O'Loughlin

Subject: Compliance Monitoring/Wheeler Osgood 1/15/03
Compliance Monitoring / Totem Marine 1/15/03
Preliminary Data Transmittal

Attached please find results from compliance monitoring for the following work activities:

- Capping work the Wheeler-Osgood Waterway; and
- Placement of riprap and filter material at Totem Marine.

Wheeler-Osgood Capping Work.

Water quality monitoring was conducted during three sampling events. The first was a flood tide condition, and the results are provided in attached pages. Dissolved oxygen levles at the early warning station (WO300) were acceptable and only moderate turbidity was observed at midpoint stations. Compliance points were acceptable for all parameters.

Water quality monitoring was also conducted at two ebb tide events near the start and at maximum ebb. Water quality at WO300 was acceptable although turbidity was elevated at the shallow depth. Water quality at the compliance line was acceptable for all parameters. Water quality was also monitored later in the ebb tide to assess whether turbidity would be an issue later in the tidal event. The highest observed turbidity was 4.7 at the mixing zone boundary in shallow sampling.

Overall, the monitoring team was very pleased with the work at Wheeler-Osgood with the revised monitoring plan for this waterway. Dissolved oxygen levels are good, and turbidity concentrations at compliance locations are acceptable.

Recommendation: Based upon results obtained since January 1 (multiple sampling events), water quality monitoring should be reduced to sampling only during ebb tides (once per day) in the Wheeler-Osgood waterway.

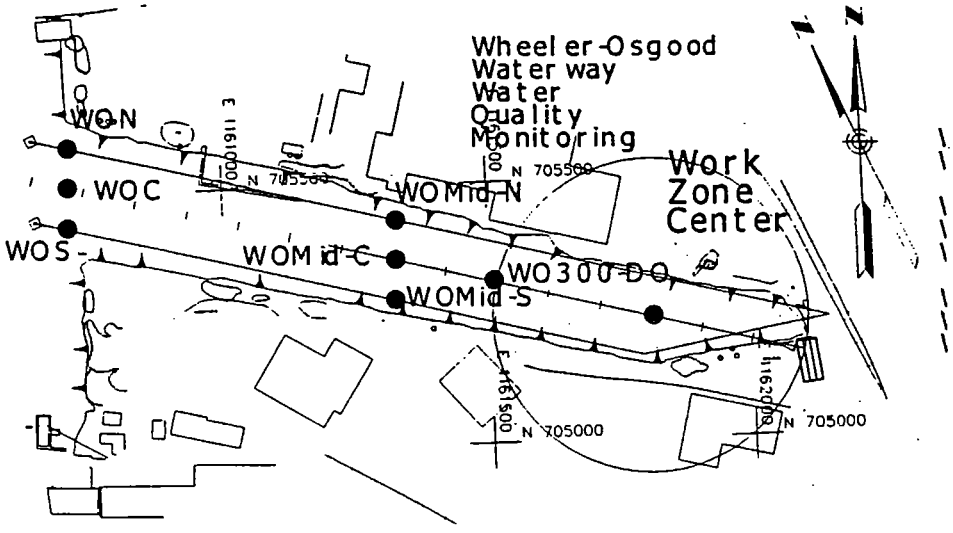
Totem Marine Capping/Rocking.

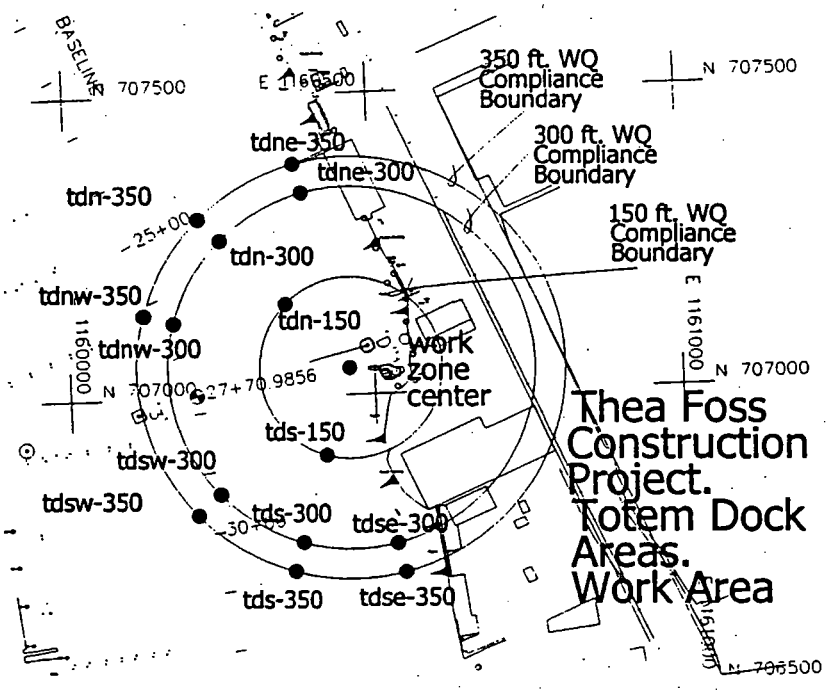
Water quality monitoring was conducted during two sampling events. The early event occurred while ACC-Hurlen was placing filter cap material. Dissolved oxygen and turbidity levels were acceptable for all sampling stations. Monitoring during the second sampling event occurred during a maximum ebb tide and yielded acceptable water quality at all sampling stations. At the time ACC-Hurlen was placing filter cap material. Initial data with rock and filter material appears that methods employed by ACC-Hurlen are working reasonably well under present conditions.

Recommendation: If water quality results (for all paramenters, including turbidity) are acceptable at the 300' compliance boundary, then sampling at the 350' stations should be discontinued for that sampling event.

Quality Control/Assurance. Instrument calibrations were acceptable for all parameters. Field duplicate data was collected for sampling station TF2+00 in the Theas Foss Waterway. This data was acceptable for all parameters (dissolved oxygen, turbidity, salinity, temperature). Data measured in the field with the YSI Sonde yielded a result of 7.5 mg/L for sample 030115/TF2/M/A. Winkler titration results for this sample location yielded replicates at 6.9 and 7.1 mg/L for Dissolved Oxygen (L&AI data). A DO sample was also submitted to the City of Tacoma.

Michael Lloyd
Lloyd & Associates, Inc.





Construction Compliance Monitoring Date: JAN 15 Wheeler-Osgood Flood Tide

Station/Sample	Depth/DTB (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
WO300 (down-current)	3	28.1	7.0	8.7			5,233,253	542,241	1140	**Flood Tide**
030114/WO300/M/B	5					6			1141	
Deep	6/9	29.3	7.0	2.0					1139	
WOS (down-current)	3	28.2	7.2	1.9	9.4		5,233,284	542,994	1201	
0301015/WOS/M/B	8	29.7	7.2	1.6	9.5	2U			1200	Compliance points at mouth
Deep	12/17	29.9	7.2	1.6	9.4				1159	of Wheeler-Osgood Waterway
WOC (up-current)	3	28.2	7.1	1.6	9.4		5,233,308	542,994	1158	Mid-channel
0301015/WOC/M/B	7	29.5	7.1	1.6	9.5	2			1157	
Deep	11/15	30.0	7.2	1.1	9.5				1156	
WON (down-current)	3	28.5	6.9	1.7	9.5		5,233,331	542,994	1153	
030115/WON/M/B	5					2U			1154	
Deep	6/10	29.4	6.9	1.7	9.4				1152	
WOMIDS (down-current)	2	27.7	7.1	5.7	9.4		5,233,243	542,184	1149	Midway between head and
Deep	5/7	29.0	7.0	3.2	9.4				1149	mouth of channel
WOMIDC (down-current)	3	28.5	7.0	2.6	9.4		5,233,266	542,184	1148	Mid-channel
	6	29.4	7.0	2.0	9.5				1147	
Deep	9/11	29.7	7.0	1.7	9.5				1146	
WOMIDN (down-current)	2	27.5	7.1	4.6	9.3		5,233,290	542,184	1144	
Deep	4/5	28.3	7.1	3.2	9.4				1143	
Pre-Survey Calibration		S. High 1/15	102 % in saturated air							Mild, partly cloudy, dry

DO & Turbidity calibration as per manufacturer's specifications.
Survey work conducted by D. Berta and S. high
Manson was placing rock on slope.
Turbidity observed at placement. Most of material being placed up the bank and allowed to slide down into water to a natural 2:1 slope.

Prepared By/Date:	TSS Data Update	
M. Lloyd 1/15	DM Lloyd	L&AI

Construction Compliance Monitoring **Date: JAN 15** **Wheeler-Osgood/Ebb**

Station/Sample	Depth/DTB (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
WO300 (down-current)	3	28.5	6.7	32.3	9.4		5,233,253	542,241	1509	**Start of Ebb Tide**
030115/WO300/M/C	6	29.6	6.6	3.5	9.5				1509	
Deep	8/10	29.7	6.7	2.9	9.5				1508	
WOS (down-current)	3	28.9	7.1	1.8	9.5		5,233,284	542,994	1536	
0301014/WOS/M/B	9	29.8	7.2	0.9	9.5				1536	Compliance points at mouth
Deep	14/19	30.0	7.1	1.7	9.5				1535	of Wheeler-Osgood Waterway
WOC (up-current)	3	29.0	7.1	2.2	9.5		5,233,308	542,994	1534	Mid-channel
0301014/WOC/M/B	10	29.9	7.1	0.8	9.5				1533	
Deep	16/21	30.0	7.1	1.2	9.5				1532	Manson barge returns w/ rock
WON (down-current)	3	29.0	6.9	2.9	9.5		5,233,331	542,994	1523	
Deep	7/8	29.7	6.9	1.3	9.5				1522	
WOMIDS (down-current)	2	28.5	6.8	6.8	9.5		5,233,243	542,184	1520	Midway between head and
Deep	6/8	29.8	6.8	4.2	9.5				1519	
WOMIDC (down-current)	3	28.9	6.8	4.2	9.5		5,233,266	542,184	1517	Mid-channel
Mid	6	29.6	6.8	1.7	9.5				1516	
Deep	9/11	29.9	6.9	1.2	9.5				1515	
WOMIDN (down-current)	2	27.7	6.7	11.3	9.3		5,233,291	542,189	1513	Point relocated to S. edge of
Deep	5/6	29.5	6.6	4.0	9.5				1512	float on N. bank of waterway

Pre-Survey Calibration S. High 1/15 See previous page

Partly cloudy, no wind, dry

DO & Turbidity calibration as per manufacturer's specifications.
Survey work conducted by D. Berta and S. high

Manson worked quickly on filter material placement. High turbidity observed at placement.

Prepared By/Date:
M. Lloyd 1/15

~~Preliminary~~
TSS update 1/24/03
PM

L&AI

Construction Compliance Monitoring **Date: JAN 15** **Wheeler-Osgood/Ebb**

Station/Sample	Depth/D TB (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
WO300 (down-current)	3	28.5	7.0	9.0	9.4		5,233,253	542,216	1556	**Near Maximum Ebb Tide**
030115/WO300/M/D	5					6			1552	
Deep	8/9	29.8	6.9	2.8	9.5				1555	
WOS (down-current)	3	28.6	7.2	4.2	9.3		5,233,284	542,994	1641	Recheck of
0301015/WOS/M/D	10	30.0	7.2	0.8	9.5	3			1641	Compliance points at mouth
Deep	15/20	30.0	7.2	1.2	9.5				1640	of Wheeler-Osgood Waterway
WOC (up-current)	3	28.6	7.1	4.7	9.4		5,233,308	542,994	1612	Mid-channel
0301015/WOC/M/D	8	29.7	7.1	1.8	9.5	3			1611	
Deep	10/15	29.9	7.1	1.3	9.5				1611	At 1620 Manson moves
WON (down-current)	3	28.7	7.2	3.8	9.5		5,233,331	542,994	1609	barge/derrick out of waterway
030115/WON/M/D	4					6			1608	
Deep	6/8	29.8	7.2	1.4	9.5				1607	
WOMIDS (down-current)	2	28.6	7.0	10.2	9.4		5,233,243	542,184	1605	Midway between head and
Deep	4/5	29.3	7.0	7.8	9.4				1604	
WOMIDC (down-current)	3	29.2	7.0	5.5	9.5		5,233,266	542,184	1603	Mid-channel
Deep	7/9	29.8	7.0	2.8	9.5				1602	
WOMIDN (down-current)	2/3	26.8	7.1	5.4	9.2		5,233,291	542,198	1559	Point relocated to S. edge of
										float on N. bank of waterway

Post-Survey Calibration S. High 1/15 103 % in saturated air

Mild & Partly cloudy

DO & Turbidity calibration as per manufacturer's specifications.

Survey work conducted by D. Berta and S. high

Maximum Ebb Tide measurements taken after work in water was complete an d intended to follow potential plume from earlier ebb tide measuement.

Manson placing filter cap material.

Prepared By/Date:

M. Lloyd 1/15

TSS Data Update

M Lloyd 1/24

L&AI

Construction Compliance Monitoring Date: JAN 15 Totem Marine - EBB

Station/Sample	Depth/D TB (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
TDN350 (down-current)	3	28.9	7.3	0.6	9.4		52,338,447	542,829	918	**Ebb tide going to slack**
Mid	18	30.0	7.4	0.1	9.4				918	ACC-Hurlen placing filter
Deep	32/37	30.1	7.3	1.7	9.4				917	cap material
TDN300 (down-current)	3	28.5	7.3	0.3	9.4		5,233,836	542,840	924	Water appears more opaque
030115/TDN300/M/A	18	30.0	7.4	0.1	9.4	2U			924	in down-current, but no
Deep	32/37	30.1	7.3	0.4	9.4				923	distinct plume.
TDN150 (down-current)	3	28.6	7.4	0.1	9.4		5,233,804	542,874	929	DO > 5.0 mg/L
Mid	18	30.0	7.4	0.1	9.4				929	
Deep	32/37	30.4	7.4	5.0	9.4				928	
TDS300 (Up-current)	3	28.4	7.3	0.6	9.4		5,233,683	542,882	858	
0301015/TDS300/M/A	19	30.0	7.6	0.1	9.4	2			858	Turbidity minimal during
Deep	33/38	30.0	7.5	0.9	9.4				857	construction activity
TDS350 (up-current)	3	27.8	7.8	0.5	9.4		5,233,669	542,878	809	See calibration notes
Mid	19	29.9	7.8	0.1	9.4				810	in field log
Deep	33/38	30.0	7.8	0.4	9.4				811	
TDSW300 (up-current)	3	28.5	7.4	0.5	9.3		5,233,708	542,841	906	Information monitoring
Mid	18	30.0	7.5	0.7	9.4	No Sample			905	at ebb/slack
Deep	34/37	30.1	7.5	1.1	9.4				904	
TDNE300 (down-current)	3	28.1	7.1	9.1	9.4		5,233,860	542,880	942	This station continues to be
030115/TDNE300/M/A	10	29.7	7.1	**10.5**	9.5	5			941	the most sensitive for ebb
Deep	16/21	29.9	7.1	2.6	9.4				940	flow turbidity
TDNE350 (down-current)	3	27.8	7.1	4.0	9.3		5,233,874	542,877	947	
Mid	9	29.6	7.0	**10.4**	9.5				946	Turbidity observed, but less
Deep	13/18	29.7	7.0	5.8	9.5				945	than compliance limit
TDNW300 (down-current)	3	28.8	7.4	0.8	9.4		5,233,793	542,817	912	
030115/TDNW300/M/A	19	30.0	7.5	0.1	9.4	2U			911	Hurlen is placing filter cap
Deep	33/38	30.1	7.5	1.6	9.4				910	material at rate of about 1 box
TDNW350 (down-current)	3	28.8	7.4	0.2	9.4		5,233,803	542,798	916	every 5-6 minutes.
Mid	19	30.0	7.5	1.1	9.4				915	
Deep	33/38	30.1	7.4	1.7	9.4				914	
Station TF2+00	3	29.6	7.5	1.4	9.4		5,233,465	542,492	1102	
030115/TF2/M/A	21	30.1	7.6	1.2	9.4	2U			1101	
Deep	37/42	30.2	7.7	2.5	9.4				1100	
Station TF2+00	*3*	*29.5*	*7.6*	*1.4*	*9.4*				*1107*	*Field Duplicate*
030115/TF2/M/A-Dup	*21*	*30.0*	*7.5*	*1.2*	*9.4*	2U			*1106*	*Field Duplicate*
Deep	*37/42*	*30.2*	*7.6*	*2.5*	*9.4*				*1105*	*Field Duplicate*

Pre-Survey Calibration S. High 1/15 101.5%

DO Calibration as per manufacturer's specifications.

Survey work conducted by D. Berta and S. High Mild, partly sunny weather

Turbidity Calibration as per manufacturer's specifications. Calibration at 0, 10NTU's.

Turbidity check 10.4 ntu for 10 ntu standard

*Winkler for sample returned 6.9 and 7.1 mg/L Dissolved Oxygen

Prepared By/Date:	TSS Update 1/24	
M. Lloyd 1/15	M. Lloyd	L&AI

Construction Compliance Monitoring Date: JAN 15 Totem Marine - EBB

Station/Sample	Depth/DTB (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
TDN350 (down-current)	3	29.6	7.2	3.3	9.4		52,338,447	542,829	1722	**Maximum Ebb**
Mid	17	30.0	7.3	1.4	9.4				1721	
Deep	29/34	30.2	7.3	2.2	9.4				1720	
TDN300 (down-current)	3	29.5	7.3	2.0	9.5		5,233,836	542,840	1703	
030115/TDN300/M/D	17	30.0	7.3	0.7	9.4	2			1702	
Deep	30/35	30.2	7.3	1.3	9.4				1702	
TDN150 (down-current)	3	29.6	7.3	4.9	9.4		5,233,804	542,874	1700	DO > 5.0 mg/L
Mid	18	30.1	7.2	9.7	9.4				1659	
Deep	31/36	30.1	7.3	10.8	9.4				1658	
TDS300 (Up-current)	3	29.4	7.1	1.8	9.5		5,233,683	542,882	1647	
0301015/TDS300/M/D	17	30.0	7.3	2.1	9.4	3			1646	
Deep	29/34	30.2	7.2	2.9	9.4				1645	
TDS350 (up-current)	3	29.5	7.1	2.0	9.5		5,233,669	542,878	1641	Hurlen is placing filter cap
Mid	18	30.1	7.3	2.7	9.4				1641	material. Turbidity at
Deep	31/36	30.2	7.2	1.0	9.4				1640	work zone.
TDNE300 (down-current)	3	29.4	7.3	6.1	9.4		5,233,860	542,880	1709	
030115/TDNE300/M/A	13	30.0	7.3	1.0	9.4	6			1708	
Deep	20/25	30.0	7.2	2.0	9.4				1707	
TDNE350 (down-current)	3	29.3	7.2	6.5	9.4		5,233,874	542,877	1717	
Mid	12	29.9	7.2	5.4	9.5				1716	
Deep	19/24	30.0	7.2	2.7	9.4				1715	
TDNW300 (down-current)	3	29.5	7.3	1.5	9.4		5,233,793	542,817	1652	Low turbidity at 300'
030115/TDNW300/M/D	18	30.1	7.3	1.2	9.4	2			1651	
Deep	31/36	30.2	7.2	2.4	9.4				1649	
TDNW350 (down-current)	3	29.0	7.3	2.0	9.5		5,233,803	542,798	1725	Low turbidity at 350'
Mid	17	30.1	7.3	1.4	9.4				1724	
Deep	29/34	30.2	7.3	1.9	9.4				1723	

Post survey calibration check S. High 1/15 103%

DO Calibration as per manufacturer's specifications.

Survey work conducted by D. Berta and S. High cool, partly cloudy weather

Turbidity Calibration as per manufacturer's specifications. Calibration at 0, 10NTU's.

Turbidity check 10.4 ntu for 10 ntu standard

Prepared By/Date:

M. Lloyd 1/15

TSS Update 1/24

M. Lloyd 1/24/03

L&AI

1/15/03

STL Seattle

Client Name	Lloyd & Assoc. Inc.
Project Name	Thea Foss
Date Received	01-15-03

General Chemistry Parameters

Client Sample ID 030115/TDS(300)/M/A
Lab ID 111290-01

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-16-03	mg/L	2	2

Client Sample ID 030115/TDNW(300)/M/A
Lab ID 111290-02

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-16-03	mg/L	ND	2

Client Sample ID 030115/TDN(300)/M/A
Lab ID 111290-03

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-16-03	mg/L	ND	2

Client Sample ID 030115/TDNE(300)/M/A
Lab ID 111290-04

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-16-03	mg/L	5	2

Client Sample ID 030115/TF2+00/M/A
Lab ID 111290-05

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-16-03	mg/L	ND	2

Client Sample ID 030115/TF2+00/m/DUP
Lab ID 111290-06

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-16-03	mg/L	ND	2

STL Seattle

Client Sample ID	030115/WO300/M/B
Lab ID	111290-07

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-16-03	mg/L	6	2

Client Sample ID	030115/WON/M/B
Lab ID	111290-08

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-16-03	mg/L	ND	2

Client Sample ID	030115/WOC/M/B
Lab ID	111290-09

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-16-03	mg/L	2	2

Client Sample ID	030115/WOS/M/B
Lab ID	111290-10

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-16-03	mg/L	ND	3

STL Seattle

QUALITY CONTROL REPORT

Client Sample ID: 030115/TDNW(300)/M/A
Lab ID: 111277-02
QC Batch Number: 1159-014

Method Blank

Parameter	Result (mg/L)	PQL
Total Suspended Solids	ND	2

Duplicate

Parameter	Sample Result (mg/L)	Duplicate Result (mg/L)	RPD (%)	Flag
Total Suspended Solids	42	41	2.4	

STL Seattle

Client Name	Lloyd & Assoc. Inc.
Project Name	Thea Foss
Date Received	01-16-03

General Chemistry Parameters

Client Sample ID 030115/WO300/M/D
Lab ID 111312-01

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-17-03	mg/L	6	2

Client Sample ID 030115/WON/M/D
Lab ID 111312-02

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-17-03	mg/L	6	2

Client Sample ID 030115/WOC/M/D
Lab ID 111312-03

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-17-03	mg/L	3	2

Client Sample ID 030115/WOS/M/D
Lab ID 111312-04

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-17-03	mg/L	3	2

Client Sample ID 030115/TDS(300)/M/D
Lab ID 111312-05

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-17-03	mg/L	3	2

Client Sample ID 030115/TDNW(300)/M/D
Lab ID 111312-06

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-17-03	mg/L	2	2

STL Seattle

Client Sample ID		030115/TDN(300)/M/D			
Lab ID		111312-07			
Parameter	**Method**	**Date Analyzed**	**Units**	**Result**	**PQL**
Total Suspended Solids	EPA 160.2	01-17-03	mg/L	3	2

Client Sample ID		030115/TDNE(300)/M/D			
Lab ID		111312-08			
Parameter	**Method**	**Date Analyzed**	**Units**	**Result**	**PQL**
Total Suspended Solids	EPA 160.2	01-17-03	mg/L	6	2

STL Seattle

QUALITY CONTROL REPORT

Client Sample ID: Batch QC
Lab ID: 111241-2
QC Batch Number: 1159-016

Method Blank

Parameter	Result (mg/L)	PQL
Total Suspended Solids	ND	2

Duplicate

Parameter	Sample Result (mg/L)	Duplicate Result (mg/L)	RPD (%)	Flag
Total Suspended Solids	56	56	0.0	

PM 1/24/03

PROJECT TIKEA FOSS / WHEELER-OSGOOD

Notebook No. _____
Continued From Page _____

030115
0720
CALIBRATION NOTES: CALIBRATED IN MOIST AIR OVER TAP WATER CALIBRATION CHECK
DO = 101.5 % BAROMETRIC PRESSURE = 777.1 mm Hg
TURBIDITY - 2 POINT CALIBRATION
0.0 NTU = D.I. WATER 10.0 NTU = STANDARD SOLUTION
CALIBRATION CHECK WITH 10.0 NTU SOLUTION.
10.~~4~~ 10 NTU

0730
~~0730~~ HURLEY PLACING HABITAT MIX OR FILTER CAP?
FRATE 1 BUCKET / 6 MINUTES
0730 WEATHER COOL, MORNING LIGHT FOG, NO FLOAT, DEBRIS OBSERVED @ TOTEM MARINE DOCK.
WATER "FLAT-LIKE GLASS"

AFTER TDS 350 MEASUREMENTS.
→ THE YSI 550 D.O. METER WAS CALIBRATED & BACK TO BACK IN SITU MEASUREMENTS TAKEN WITH SONDE = 8.0 mg/L WITH SONDE
6.6 mg/L WITH 550

- VISUAL EXAMINATION OF MEMBRANE ON SONDE WRINKLE NEAR O RING. MEMBRANE REPLACED & RECALIBRATED

- DO = 102% OVER TAP WATER

- BACK/BACK 7.5 mg/L - SONDE @ 25' @ TDS (350)
6.7 mg/L - 550

0850
RETURNED TO TDS (350) FOR RETESTS

Continued on Page

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PROJECT TIEA FOSS / WHEELER - OSGOOD

Notebook No. _____ 23

(MAX) Continued From Page _____

030115 SAMPLE EBB TIDE @ TOTEM MARINE

TIME	LOCATION	EVENT	DTB	DEPTH	TEMP	SAL	DO	TURB	TSS
0809	TDS(350)			D 33	9.4	30.0	7.7	0.4	—
0810	669 878	A	38	M 19	9.4	29.9	7.8	0.1	—
0811	(ACC 5.9')			S 3	9.4	27.8	7.8	0.5	—
					EBB				
0857	TDS(300)	A	38	D 33	9.4	30.0	7.5	0.9	—
0858	683 882			M 19	9.4	30.0	7.6	0.1	030115/TDS(300)/M/A
0858	(ACC 6.1)			S 3	9.4	28.4	~~7.4~~ 7.3 DB	0.6	—
0854	TDS(350)	A	38	D 33	9.4	30.0	7.6	0.1	—
0855	669 878			M 19	9.4	29.9	7.6	0.1	—
0856	(ACC = 5.9')			S 3	9.4	28.6	7.5	0.5	—
			← INFORMATIONAL →						
0904	~~TDNW~~ TDSW(300)	A	37	D 34	9.4	30.1	7.5	1.1	—
0905	708 841			M 18	9.4	30.0	7.5	0.7	~~030115/TDNW(300)/M/~~
0906	(ACC = 4.2')			S 3	9.3	28.5	7.4	0.5	—
0910	TDNW(300)	A	38	D 33	9.4	30.1	7.5	1.6	—
0911	793 817			M 19	9.4	30.0	7.5	0.1	030115/TDNW(300)/M/A
0912	(ACC = 5.0')			S 3	9.4	28.8	7.4	0.8	—
0914	TDNW(350)	A	38	D 33	9.4	30.1	7.4	1.7	—
0915				M 19	9.4	30.0	7.5	1.1	—
0916	803 798			S 3	9.4	28.8	7.4	0.2	—
	(ACC 5.6)								
				EBB - (SLACK)					
0917	TDN(350)	A	37	D 32	9.4	30.1	7.3	1.7	—
0918	847 829			M 18	9.4	30.0	7.4	0.1 ~~030115/~~	—
0918	(ACC = 4.9')			S 3	9.4	28.9	7.3	0.6	—
				EBB - (SLACK)					
0923	TDN(300)	A	37	D 32	9.4	30.1	7.3	0.4	—
0924	836 840			M 18	9.4	30.0	7.4	0.1	030115/TDN(300)/M/A
0924	(ACC 4.9')			S 3	9.4	28.5	7.3	0.3	—
				- SLACK -					
0928	TDN(150)	A	37	D 32	9.4	30.4	7.4	5.0	—
0929	804 874			M 18	9.4	30.0	7.4	0.1	—
0929	(ACC = 5.1)			S 3	9.4	28.6	7.4	0.1	

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PROJECT THEA FOSS / WHEELER-OSGOOD

Notebook No. _____
Continued From Page _____

030115

NOTE: AFTER 0933 READING RECALIBRATED ~~PR~~ FOR TURBIDITY WITH 0.0 NTU = D.I WATER
10.0 NTU STANDARD SOLUTION
READS 9.9 NTU IN CALIB. CHECK WITH STANDARD SOLUTION.
REMEASURED & ~~[illegible]~~ APPEARS TO BE BELOW ACCEPT. LIMIT.
NOTE: WHEN SONDE RAISED FOR RECALIBRATION PROBE (TURBIDITY) HAD WHITE TISSUE LIKE MATERIAL ON END. PROBE WAS CLEANED WITH BRUSH BEFORE RECALIBRATION.
(~0930-0950)
- NOTE: WATER APPEARS GENERALLY MORE TURBID AT NORTH EAST LOCATION, NO DISTINCT "PLUME" VISIBLE.

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030115

TIME	LOCATION	EVENT	DIB	SAMPLE DEPTH	TEMP	SAL	DO	TURB	TSS
0932	TOWE(300)	A							
0933	860 850		(2)	D 16	9.4	29.9	7.1	2.1 08 25.8	—
0933	(ACC = 6.9)			M 10	9.5	29.7	7.1	18.4	030115/TOWE(300)/m/A
				S 3	9.4	29.1	7.1	14.3	—
0940	TOWE(300)	A	RECALIBRATED TURBIDITY						
0941	860 850			D 16				2.6	—
0942	(ACC = 6.9)			M 10	← OLD TURB → READINGS			10.5	—
				S 3				9.1	—
0945	TOWE(350)								
0946	574 577		(13)	D 13	9.5	29.7	7.0	5.8	—
0947	(ACCURACY = 6.9)			M 9	9.5	29.6	7.0	10.4	—
				S 3	9.3	27.8	7.1	4.0	—
				FLOOD TIDE					
1100	TF 2+00		(42)	D 37	9.4	30.2	7.7	2.5	—
1101	465 492			M 21	9.4	30.1	7.6	1.2	030115/TF2+00/m/B
1102	(ACC = 4.9)			S 3	9.4	29.6	7.5	1.4	—
				DUPLICATE					
1105	TF 2+00		(42)	D 37	9.4	30.2	7.6	1.1	—
1106	465 492			M 21	9.4	30.0	7.5	0.6	030115/TF2+00/m/DUP ★
1107	(ACC = 4.7)			S 3	9.4	29.5	7.6	1.0	—

★ SPLIT DO. SAMPLE OBTAINED FOR WINKLER METHOD
1) CITY OF TACOMA 2) L&A I LAB
6.9 & 7.1

~~WO 300~~

Continued on Page

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Signed _____ Date _____ Signed _____ Date 3/5/03

PROJECT THEA FOSS / WHEELER-OSGOOD

Notebook No. _____

Continued From Page _____

1135 - MINOR FLOAT, DEBRIS PIECES WOOD ETC. FROM WORK ZONE TO MOUTH, MODERATE @ DEBRIS BOOM. DOES NOT APPEAR ASSOCIATED WITH MANSON ACTIVITIES. WORKING ON DECK AT THE TIME OF EVENT B MEASUREMENTS.

Continued on Page

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Daniel H. Berk 01/15/03 _____ Michael Lloyd 3/15/03

Signed Date Signed Date

030115 FLOOD TIDE

Time	Location	Event	DTB	Sample Depth	Temp	Sal	DO	Turb	TSS
1139	WO 300	B	D (9.4)	D 6	9.5	29.3	7.0	20	—
1141	253 216		M	M —	SAMPLE DEPTH 5'				030115/WO300/M/B
1140	(Acc 4.8')		S 3	S 3	9.3	28.1	7.0	8.7	—
1143	WO MID NORTH	B	(5.0)	D 4	9.4	28.3	7.1	3.2	—
1144	290 184			S 2	9.3	27.5	7.1	4.6	—
1	(Acc = 6.1')		*AGAINST FLOATING DOCK						
	293 188*								
1146	WO MID CENTER	B	(11)	D 9	9.5	29.7	7.0	1.7	—
1147	266 184			M 6	9.5	28.4	7.0	2.0	—
1148	(Acc = 5.0)			S 3	9.4	28.5	7.0	2.6	—
1149	WO MID SOUTH	B	(7)	D 5	9.4	29.0	7.0	3.2	—
1149	243 184			M 2	9.4	27.7	7.1	5.7	—
	(Acc = 5.0')								
[illegible]	WO N	B	(10)	D 6	9.4	29.4	6.9	1.7	—
[illegible]	331 994			M 5	SAMPLE DEPTH 5.0'				030115/WON/M/B
1153	(Acc = 7.3')			S 3	9.5	28.5	6.9	1.7	—
1156	WO C	B	(15)	D 11	9.5	30.0	7.2	1.1	—
1157	308 994			M 7	9.5	29.5	7.1	1.6	030115/WOC/M/B
1158	(Acc = 6.5')			S 3	9.4	28.2	7.1	1.6	—
1159	WO S	B	(17)	D 12	9.4	29.9	7.2	1.6	—
1200	284 994			8	9.5	29.7	7.2	1.6	030115/WOS/M/B
1201	(Acc = 8.2')			3	9.4	28.2	7.2	1.9	—

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PROJECT THEA FOSS / WHEELER-OSGOOD

Notebook No. _____
Continued From Page _____

030115

NOTE: PLACING ROCKS* FROM SHORE ONTO BARGE & PLACING HABITAT MIX/SLOPE CAP FILTER MATERIAL ?
(SEE DRAWING C-7)
(* EXISTING SLAG ?)

1450 – MANSON MOVES MATERIALS BARGE FROM HEAD OF WHEELER-OSGOOD TO THEA FOSS WATERWAY.

1510 WHEELER-OSGOOD
– WATER APPEARS GENERALLY MORE TURBID THAN AM / NO "PLUME" VISIBLE

1525 MANSON BARGE RETURNS WITH LOAD OF SAND & GRAVEL

Continued on Page

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Signed Date Signed Date

PROJECT TIKEA FOSS / WHEELER - OSGOOD

030115

	LOCATION	EVENT	DTB	SAMPLE DEPTH	TEMP	SAL	DO	TURB	TSS	
1315 - Begin moving rock at Tolen WZ #6.										
								Flood Tide		
1352	TDN	150	C 39	34	9.4	30.2	7.3	1.2	—	
1358				20	9.4	30.1	7.3	0.6	—	Info.
1359				3	9.4	28.8	7.2	4.3	—	
1401	TDS	150	35	30	9.4	30.1	7.2	2.3	—	
1402			~~18~~	18	9.4	30.1	7.3	1.1	—	Info.
				3	9.5	29.2	7.2	2.4	—	
WORK ZONE (1) — W.O. INFORMATIONAL START OF EBB FLOW										
1508	WO300	C	(10)	D 3	9.5	29.7	6.7	2.9	—	
1509	253 241			M 6	9.5	29.6	6.6	3.5	—	
1509	(ACC 5.5')			S 3	9.4	28.5	6.7	32.3	—	
	WO MID NORTH C									
1512	189 291		(6)	D 5	9.5	29.5	6.6	4.0	—	
1513	(ACC = 5.3')			S 2	9.3	27.7	6.7	11.3	—	
1515	WO MID CENTER		(11)	D 9	9.5	29.9	6.9	1.2	—	
1516	266 184	C		M 6	9.5	29.6	6.8	1.7	—	
1517	(ACC = 5.3)			S 3	9.5	28.9	6.8	4.2		
1519	WO MID SOUTH	C	(5)	D 6	9.5	29.8	6.8	4.2	—	
—	243 184			M —	NA	—	—	—	—	
1520	(ACC = 5.9)			S 32	9.5	28.5	6.8	6.5	—	
1522	WON	C	(10)	D 7	9.5	29.7	6.9	1.3	—	
—	331 994		8	M —	NA	—	—	—	—	
1523	(ACC = 11.9)			S 3	9.5	29.0	6.9	2.9	—	

Continued on Page

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[signature] 3/16/03 — Signed — Date

PROJECT THEA FOSS / WHEELER - OSGOOD

Notebook No. _____

Continued From Page _____

030115

1535 BEGAN PLACING MATERIAL FROM BARGE W/ WHEELER-OSGOOD

Continued on Page

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PROJECT THEA FOSS / WHEELER-OSGOOD 030115

Notebook No. _____ 31

Continued From Page _____

TIME	LOCATION	EVENT	DIB	SAMPLE DEPTH	TEMP	SAL	DO		
1532	WOC	C	(21)	D 16	9.5	30.0	7.1	1.2	—
33	308 994			M 10	9.5	29.9	7.1	0.8	—
4	(ACC = 5.1')			S 3	9.5	29.0	7.1	2.2	—
1535	WOS	C	(19)	D 14	9.5	30.0	7.1	1.7	—
1536	284 994			M 9	9.5	29.8	7.2	0.9	—
1536	(ACC = 5.9')			S 3	9.5	28.9	7.1	1.8	—

WORK ZONE #2 - EBB FLOW

	WO 300								
1555	253 216	D	9.4	D 8	9.5	29.8	6.9	2.8	—
1552	(ACC = 5.9')			M - 5.0' SAMPLE					030115/WO300/M/D
1556				S 3	9.4	28.5	7.0	9.0	—
1559	WO MID NORTH	D	(3)	∅					
	(ACC = 13.4')			S 2	9.2	26.8	7.1	5.4	—
	291 198 *			DESIGN LOCATION = 290 184					
	AGAINST FLOATING DOCK								
02	WO MID CENTER	D	(9)	D 7	9.5	29.8	7.0	2.8	—
3	266 184			S 3	9.5	29.2	7.0	5.5	—
	(ACC = 5.4')								
1604	WO MID SOUTH	D	(5)	D 4	9.4	29.2	7.0	7.8	—
1605	243 184			S 2	9.4	28.6	7.0	10.2	—
	(ACC = 5.4)								
1607	WON	D	(5)	D 6	9.5	29.8	7.2	1.4	—
1608	331 994			S 3	9.5	28.7	7.2	3.8	—
1609	(ACC = 4.6')			M - SAMPLE @ 4' -					030115/WON/M/D
1611	WOC	D	(15)	D 10	9.5	29.9	7.1	1.3	—
1611	308 994			M 8	9.5	29.7	7.1	1.8	030115/WOC/M/D
1612	(ACC = 5.0')			S 3	9.4	28.6	7.1	4.7	—

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PROJECT THEA FOSS / WHEELER - OSGOOD

Notebook No. _____
Continued From Page _____

030N5

1620 MANSON STOPS PLACING FILTER CAP & MOVES BARGE & CRAIN OUT OF WATERWAY

1630 HURLEN PLACING FILTER CAP MATERIAL
NO FLOTO DEBRIS OBSERVED

1700 HURLEN STOPS PLACING MATERIAL &

Continued on Page

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PROJECT THEA FOSS / WHEELER - OSGOOD

Notebook No. _____ 33

Continued From Page _____

TIME	LOCATION	EVENT	DTB	SAMPLE DEPTH	TEMP	SAL	DO	TURB	TSS
1615	WOS	D	(20)	D 15	9.5	30.0	7.2	1.2	—
1615	284 994			M 10	9.5	30.0	7.2	0.8	030115/WOS/M/D
[illegible]6	(Acc = 4.4')			S 3	9.3	28.6	7.2	4.2	—

TOTEM MARINE DOCK (MAX) EBB TIDE

1640	TDS (350)	D	(36)	D 31	9.4	30.2	7.2	1.0	—
1641	D2 689 878			M 18	9.4	30.1	7.3	2.7	—
1641	(Acc = 5.5)			S 3	9.5	29.5	7.1	2.0	—
1645	TDS (300)	D	(34)	D 29	9.4	30.2	7.2	2.9	—
1646	683 916 882			M 17	9.4	30.0	7.3	2.1	030115/TDS(300)/M/D
1647	(Acc = 4.4)			S 3	9.5	29.4	7.1	1.8	—
1649	TDNW (300)	D	(36)	D 31	9.4	30.2	7.2	2.4	—
1651	793 817			M 18	9.4	30.1	7.3	1.2	030115/TDNW(300)/M/D
1652	(Acc = 6.4')			S 3	9.4	29.5	7.3	1.5	—
1658	TDN 150	D							
1659	(804 874)		(35)	D 30	9.4	30.1	7.3	10.8	—
1700	(Acc = 10.0)			M 17	9.4	30.1	7.2	9.7	—
				S 3	9.4	29.6	7.3	4.9	—
1702	TDN (300)	D	(35)	D 30	9.4	30.2	7.3	1.3	—
1702	836 840			M 17	9.4	30.0	7.3	0.7	030115/TDN 300/M/D
1703	(Acc = 6.3')			S 3	9.5	29.5	7.3	2.0	—
1707	TDNE (300)	D	(25)	D 20	9.4	30.0	7.2	2.0	—
1708	860 880			M 13	9.4	30.0	7.3	6.0	030115/TDNE(300)/M/D
1709	(Acc = 6.8)			S 3	9.4	29.4	7.3	6.1	—
1715	TDNE (350)	D	(24)	D 19	9.4	30.0	7.2	2.7	—
1716	874 877			M 12	9.5	29.9	7.2	5.4	—
1717	(Acc 6.9)			S 3	9.4	29.3	7.2	6.5	—
1720	TDN (350)	D	(34)	D 29	9.4	30.2	7.3	2.2	—
1721	847 829			M 17	9.4	30.0	7.3	1.4	—
1722	(Acc = 7.0)			S 3	9.4	29.6	7.2	3.3	—

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PROJECT THEA FOSS/ WHEELER - OSGOOD

Notebook No. _____

Continued From Page _____

030115

1730

CALIBRATION CHECK IN MOIST AIR OVER TAP WATER = 103.0 %

Continued on Page

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Daniel A. Burke 01/15/03 _____ TM Floyd 3/16

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030113

ROJECT THEA FOSS / WHEELER-OSGOOD

Notebook No. _____

Continued From Page _____

TIME	LOCATION	EVENT	DTB	SAMPLE DEPTH	TEMP	SAL	TURB		TSS
	TDNW (350								
1723	803 798	D	34	D 29	9.4	30.2	7.3	1.9	—
1724	(ACC 6.1)			M 17	9.4	30.1	7.3	1.4	—
1725				S 3	9.5	29.0	7.3	2.0	—

Continued on Page

Read and Understood By

Paul A. Buta 01/15/03 _____ [signature] 3/16

Signed Date Signed Date

Lloyd & Associates, Inc.
38210 SE 92nd Street, Snoqualmie, Washington 98065 425-888-1905 rml@centurytel.net

January 16, 2003

TSS Data Update 1/24/03

TRANSMITTAL

To: Iain Wingard
John O'Loughlin

Subject: Compliance Monitoring/Wheeler Osgood 1/16/03
Compliance Monitoring / Totem Marine 1/16/03
Preliminary Data Transmittal

Attached please find results from compliance monitoring for the following work activities:

- Capping work the Wheeler-Osgood Waterway; and
- Placement of riprap and filter material at Totem Marine.

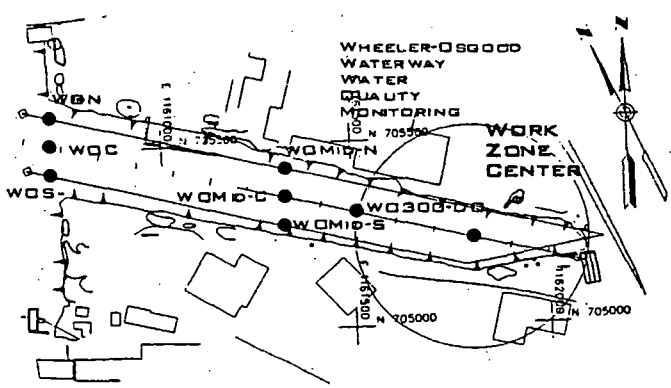
Wheeler-Osgood Capping Work.

Water quality monitoring was conducted during the morning while filter material was being placed in the Wheeler Osgood during a short ebb tide event. Water quality at WO300 was acceptable although turbidity was in the 10 to 12 NTU range. Water quality at the compliance boundary was acceptable for all parameters.

Totem Marine Capping/Rocking.

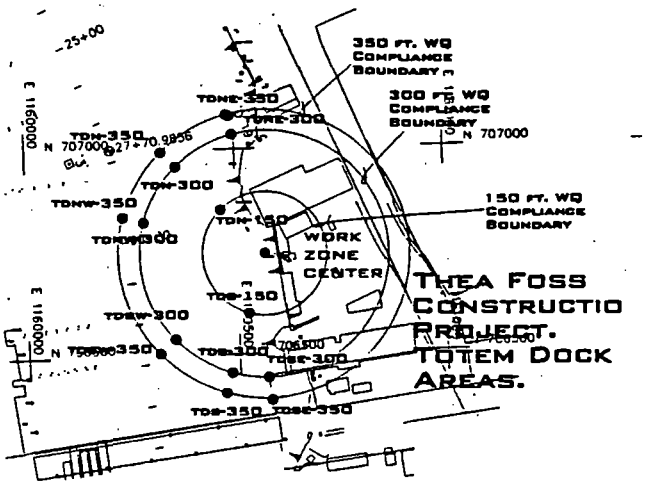
Water quality monitoring was conducted during the morning while filter cap material was being placed. Because tides were relatively high during much of the day, there was an extended slack period when there was very little flow during placement Dissolved oxygen levels were acceptable and turbidity was not a problem throughout the day. As our sampling team was preparing to do another round of monitoring, work was stopped and an afternoon round of sampling was not conducted.

Quality Control/Assurance. Instrument calibrations were acceptable for all parameters. Field duplicate data was collected for sampling station TDN300 at Totem Marine. This data was acceptable for all parameters (dissolved oxygen, turbidity, salinity, temperature). Data measured in the field with the YSI Sonde yielded a result of 7.2 mg/L for sample 030116/DNE300/M/A. Winkler titration results for this sample location yielded replicates at 6.9 and 7.0 mg/L for Dissolved Oxygen (L&AI data). A DO sample was also submitted to the City of Tacoma.



Michael Lloyd
Lloyd & Associates, Inc.

Wheeler 1 16 03.doc


350 FT. WQ COMPLIANCE BOUNDARY
300 FT. WQ COMPLIANCE BOUNDARY
150 FT. WQ COMPLIANCE BOUNDARY
WORK ZONE CENTER
THEA FOSS CONSTRUCTIO PROJECT. TOTEM DOCK AREAS.
TDNE-350
TDNE-300
TDN-350
TDN-300
TDNW-350
TDN-150
TDS-150
TDSW-300
TDS-300
TDSE-300
TDS-350
TDSE-350
N 707000
E 1160000

Construction Compliance Monitoring **Date: JAN 16** **Wheeler-Osgood Ebb Tide**

Station/Sample	Depth/DTB (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
WO300 (down-current)	3	28.7	6.3	3.8	9.5		5,233,253	542,216	836	**Ebb Tide**
030116/WO300/M/A	5					7			835	
Deep	7/10	29.5	6.6	3.9	9.4				835	
WO300 (down-current)	3	28.3	6.7	8.6	9.3		5,233,253	542,216	1521	*Manson finished placing
030116/WO300/M/B	5					6			1520	rock on top of filter cap above
Deep	8/10	29.4	6.8	1.5	9.4				1519	water at 11:15 AM
WOS (down-current)	3	28.9	6.1	3.2	9.4		5,233,284	542,994	858	Manson placing rock
0301016/WOS/M/A	13	29.8	6.1	2	9.5	7			857	on south side of WO
Deep	20/25	29.9	6.1	2.2	9.5				856	
WOC (up-current)	3	29.0	6.1	6.5	9.4		5,233,308	542,994	854	Moderate turbidity observed
0301016/WOC/M/A	6	29.4	6.1	5.4	9.4	11			853	but below 10 ntu
Deep	9/12	29.5	6.1	6.5	9.4				852	
WON (down-current)	3	27.3	6.1	3.6	9.3		5,233,331	542,994	849	
030116/WON/M/A	7/9	29.1	6.0	3.4	9.2	3			848	
WOMIDS (down-current)	3	28.4	5.9	12.2	9.3		5,233,243	542,184	847	
Deep	5/7	29.2	5.8	9.3	9.4				846	
WOMIDC (down-current)	3	21.3	5.9	3.0	9.4		5,233,266	542,184	845	Mid-channel
Deep	8/9	29.5	5.9	3.8	9.4				844	
WOMIDN (down-current)	2	27.9	6.1	3.2	9.2		5,233,284	542,187	841	Against floating dock
Deep	4/5	29.9	6.1	3.5	9.3				840	moved slightly S.
Station TF2+00	3	29.1	7.6	0.7	9.3		5,233,465	542,492	936	
030116/TF2/M/A	22	30.0	7.5	0.8	9.4	2			935	
Deep	38/43	30.1	7.7	1.0	9.4				935	

Pre-Survey Calibration	S. High 1/16	101 % in saturated air	Cold, partly cloudy, dry
Post Survey Check	S. High 1/16	103 % in saturated air	

DO & Turbidity calibration as per manufacturer's specifications.

Survey work conducted by D. Berta and S. high

Manson was placing rock on slope on top of filter material.

Turbidity observed at placement at water line. Most of material being placed up the bank above water line

*Manson finished in-water work before lunch.

Crew circled the derrick and work zone after Manson had pulled out and sampled WO300 as a check at 1520

Prepared By/Date:	TSS Data Update	
M. Lloyd 1/16	1/24/03	L&AI

Construction Compliance Monitoring **Date: JAN 16** **Totem Marine - Flood**

Station/Sample	Depth/DTB (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
TDS300 (Up-current)	3	23.7	7.5	1.6	9.4		5,233,593	542,917	1058	**Flood Tide**
0301016/TDS300/M/A	18	30.0	7.4	3.0	9.4	4			1058	
Deep	31/36	30.1	7.4	3.4	9.4				1057	
TDS350 (up-current)	3	23.8	7.5	1.3	9.4		5,233,579	542,913	1104	Hurlen placing filter cap
Mid	18	30.0	7.5*	2.0	9.4				1104	at S. end
Deep	31/36	30.1	7.5	4.0	9.4				1103	
TDN300 (down-current)	3	23.6	7.4	3.2	9.2		5,233,745	542,874	1014	
030116/TDN300/M/A	18	30.0	7.6	1.6	9.4	4			1013	
Deep	31/36	30.1	7.5	1.5	9.4				1013	
TDN300 *(down-current)*	*3*	*23.8*	*7.5*	*3.6*	*9.4*				*1019*	*Field Duplicate*
030116/TDN300/M/A-Dup	*18*	*30.0*	*7.5*	*7.4*	*9.4*	*3*			*1017*	*Field Duplicate*
Deep	*31/36*	*30.1*	*7.4*	*3.2*	*9.4*				*1015*	*Field Duplicate*
TDN350 (down-current)	3	23.5	7.4	2.1	9.4		52,338,755	542,863	1049	**Flood Tide**
Mid	18	30.0	7.5	0.9	9.4				1049	ACC-Hurlen placing filter
Deep	32/37	30.1	7.4	0.7	9.4				1048	cap material
TDNE150 (down-current)	3	23.2	7.3	1.2	9.4		5,233,732	542,894	1004	DO > 5.0 mg/L
Mid	15	30.0	7.4	2.9	9.4				1003	Location moved for
Deep	25/30	30.1	7.6	2.3	9.4				1002	work activity
TDNE300 (down-current)	3	23.5	7.3	2.6	9.3		5,233,770	542,915	1040	
030115/TDNE300/M/A	8	23.6	7.2	5.6	9.4	28			1038	
Deep	11/16	23.8	7.2	10.0	9.4				1036	
TDNE350 (down-current)	3	23.6	7.3	1.2	9.3		5,233,784	542,911	1045	
Mid	17	23.9	7.3	1.4	9.4				1045	
Deep	30/35	30.1	7.3	2.2	9.4				1044	
TDNW300 (down-current)	3	23.1	7.5	2.5	9.4		5,233,707	542,851	1054	Flood/slack tide
030116/TDNW300/M/A	18	30.0	7.5	2.2	9.4	5			1054	
Deep	32/37	30.1	7.5	1.1	9.4				1053	
TDNW350 (down-current)	3	23.8	7.4	1.1	9.3		5,233,707	542,836	1052	
Mid	18	30.0	7.5	2.2	9.4				1051	
Deep	32/37	30.1	7.4	1.1	9.4				1051	

Pre-Survey Calibration S. High 1/16 103%

DO Calibration as per manufacturer's specifications.

Survey work conducted by D. Berta and S. High Mild, partly sunny weather

Turbidity Calibration as per manufacturer's specifications. Calibration at 0, 10NTU's.

*Winkler for sample returned 6.9 and 7.0 mg/L Dissolved Oxygen

Prepared By, Date:

M. Lloyd 1/17

TDS Data Update

M Lloyd 1/24/03

L&AI

STL Seattle

Client Name	Lloyd & Assoc. Inc.
Project Name	Thea Foss
Date Received	01-16-03

General Chemistry Parameters

Client Sample ID 030116/WO300/M/A
Lab ID 111314-01

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-17-03	mg/L	7	2

Client Sample ID 030116/WON/M/A
Lab ID 111314-02

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-17-03	mg/L	3	2

Client Sample ID 030116/WOC/M/A
Lab ID 111314-03

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-17-03	mg/L	11	2

Client Sample ID 030116/WOS/M/A
Lab ID 111314-04

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-17-03	mg/L	7	2

Client Sample ID 030116/TF2+00/M/A
Lab ID 111314-05

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-17-03	mg/L	2	2

Client Sample ID 030116/TDN(300)/M/A
Lab ID 111314-06

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-17-03	mg/L	4	2

STL Seattle

Client Sample ID	030116/TDN(300)/M/DUP
Lab ID	111314-07

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-17-03	mg/L	3	2

Client Sample ID	030116/TDNE/(300)/M/A
Lab ID	111314-08

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-17-03	mg/L	28	2

Client Sample ID	030116/TDNW(300)/M/A
Lab ID	111314-09

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-17-03	mg/L	5	2

Client Sample ID	030116/TDS(300)/M/A
Lab ID	111314-10

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-17-03	mg/L	4	2

STL Seattle

QUALITY CONTROL REPORT

Client Sample ID: Batch QC
Lab ID: 111241-2
QC Batch Number: 1159-016

Method Blank

Parameter	Result (mg/L)	PQL
Total Suspended Solids	ND	2

Duplicate

Parameter	Sample Result (mg/L)	Duplicate Result (mg/L)	RPD (%)	Flag
Total Suspended Solids	56	56	0.0	

PROJECT THEA FOSS/WHEELER-OSGOOD

Notebook No. _____
Continued From Page _____

030116 CALIBRATION NOTES

D.O.
CALIBRATED IN MOIST AIR OVER TAP WATER
D.O. CHECK = 101.0 % BAROMETRIC PRESSURE
= 780.0 mm Hg

- TURBIDITY CALIBRATION
2 POINT METHOD 0.0 NTU - DI WATER
10.0 NTU CALIB. SOLUTION.
- TURBIDITY CHECK ON STANDARD = 10.0

0815
- HURLEN MOVING RIG.
0845 MOVING BARGED MATERIAL TO SITE

0815 MANSON PLACING FILTER CAP MATERIAL
ON SOUTH SIDE OF WHEELER OSGOOD

- NOTE: 0910 HURLEN SETTING UP WATER QUALITY
CREW MOVES TO 2+00

0914 TOTEM MARINE DOCK NO FLOAT. DEBRIS
OBSERVED
WHEELER-OSGOOD MINOR FLOAT. DEBRIS @
MOUTH OF WATERWAY ON EAST SIDE OF DEBRIS
BOOM.
0900 RECALIBRATED D.O. & TURBIDITY BEFORE
SAMPLING TF 2+00.

- DO CHECK ON DB MOIST AIR OVER TAP WATER = 103.0 %
- TURBIDITY CALIB 2 POINT METHOD 0.0 - D.I WATER
10.0 NTU = TURBIDITY STANDARD SOLUTION.
TURBIDITY CHECK AFTER CALIB = 10.0 NTU
ON STANDARD SOLUTION

Continued on Page

Read and Understood By

Daniel A. Beck 01/16/03 _____ 030116 _____
Signed Date Signed Date

PROJECT TREA FOSS/WHEELER-OSGOOD

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030116 SAMPLE EBB FLOW (WORK ZONE 2)

TIME	LOCATION	EVENT	DTB	DEPTH	TEMP	SAL	DO	TURB	TSS
0835	WO 300	A	10	D 7	9.4	29.5	6.6	3.9	—
0835	253 216		(9.8)	S 3	9.5	28.7	6.3	3.8	—
0836	(ACC = 4.7')			SAMPLE @ 5.0'					030116/WO300/M/A
0840	WO, MID NORTH	A	DB 7	D 4	9.3	28.9	6.1	3.5	—
0841	187 284*		5	S 2	9.2	27.9	6.1	3.2	—
	(ACC 4.5) DESIGN LOCATION = 290 184								
	* AGAINST FLOATING DOCK ON NORTH SIDE OF WATERWAY								
0844	WO MID CENTER	A	9	D 8	9.4	29.5	5.9	3.8	—
0845	(ACC = 5.7)			S 3	9.4	28.6	5.9	3.0	—
	266 184								
0846	WO MID SOUTH	A	7	D 5	9.4	29.2	5.8	9.3	—
0847	243 184			S 3	9.3	28.4	5.9	12.2	—
	(ACC = 4.0')								
0848	WON	A	9	D 7	9.2	29.1	6.0	3.4	—
0850	331 994			M NA	SAMPLE @ 5'				030116/WON/M/A
0849	(ACC = 4.5)			S 3	9.3	27.6	6.1	3.6	—
0852	WOC	A	12	D 9	9.4	29.5	6.1	6.5	—
0853	308 994			M 6	9.4	29.4	6.1	5.4	030116/WOC/M/A
0854	(ACC = 5.8')			S 3	9.4	29.0	6.1	6.5	—
0856	WOS	A	25	D 20	9.5	29.9	6.1	2.2	—
0857	284 994			M 13	9.5	29.8	6.1	2.0	030116/WOS/M/A
0858	(ACC = 7.5)			S 3	9.4	28.9	6.1	3.2	—
				- EBB FLOW -					
0935	TF 2+00		43	D 38	9.4	30.1	7.7	1.0	—
0935	465 492			M 22	9.4	30.0	7.5	0.8	030116/TF2+00/M/A
0936	(ACC = 6.2)			S 3	9.3	29.1	7.6	0.7	—

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[signature] 07/01/16 — Signed — Date

PROJECT THEA FOSS / WHEELER - OSGOOD

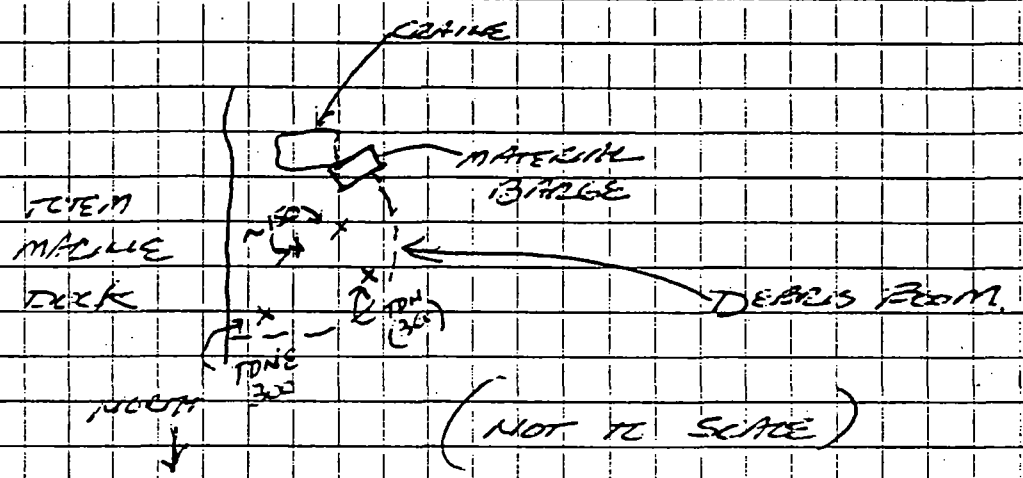
Notebook No. _____

Continued From Page _____

030116

0930 HURLEN BEGINS PLACING FILTER CAP MATERIAL
NOTE SAMPLE LOCATIONS INSIDE DEBRIS BOOM
AS INDICATED IN ≈ LOCATIONS BELOW.

1000 VISIBLE TURBIDITY NEAR POINT OF PLACEMENT



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Daniel A. Barth 01/16/03 — Signed — Date

030116 — Signed — Date

PROJECT THEA FOSS/WHEELER-OSGOOD

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030116

SAMPLE EBB/SLACK WORK ZONE

TIME	LOCATION	EVENT	DTB	DEPTH	TEMP	SAL	DO	TURB	TSS
1002	TDNE(~~300~~ 150)		(35)	DB D ~~30~~ 25	9.4	30.1	7.6	2.3	—
1003	713 907		(30)	M ~~17~~ 15	9.4	30.0	7.4	2.9	—
1004	732 894 *			S ~~3~~ 3	9.4	29.2	7.3	1.2	—

*ACTUAL LOCATION ADJUSTED FOR WORK ACTIVITY

INFORMATIONAL NEAR TDNE 150

1006			(26)	D 21	9.4	30.0	7.3	5.1	—
1007	733 897			M 13	9.7	30.0	7.3	11.9	—
1008	(Acc = 8.9)			S 3	9.4	29.5	7.3	2.1	—

INFORMATIONAL NEAR TDNW 150

1009	TDNW(150)		(35)	D 30	9.4	30.1	7.3	2.7	—
1010	708 883			M 17	9.4	30.0	7.4	11.0	—
1011	(Acc. 6.0')			S 3	9.4	29.6	7.4	4.0	—

1013	TDN(300)		(36)	D 31	9.4	30.1	7.5	1.5	—
1014	745 874			M 8	9.4	30.1	7.6	1.6	030116/TDN(300)/M/A
1014	(Acc = 8.4')			S 3	9.2	28.6	7.4	3.2	—
1015	TDN(300)		(36)	D 31	9.4	30.1	7.4	3.2	—
1017	745 874			M 18	9.4	30.1	7.5	~~3~~ 7.4 DB	030116/TDN(300)/M/DUP *
1019	(Acc = 7.8)			S 3	9.4	28.8	7.5	3.6	—

* SPLIT SAMPLE FOR DO BY WINKLER METHOD
1) - CITY OF TACOMA 2) L&AI LAB.
6.9 mg/L & 7.- mg/L

	TDNE(300)								
1036	770 915		(16)	D 11	9.4	29.8	7.2	10.0	—
1038	(Acc = 8.9')			M 8	9.4	29.6	7.2	5.6	030116/TDNE(300)/M/A
1040				S 3	9.3	28.5	7.3	2.6	—

Continued on Page

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[signature] 01/16/03 _____ [signature] 030116 _____

Signed Date Signed Date

PROJECT THEA FOSS / WHEELER - OSGOOD

Notebook No. _____
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030116

1115 MANSON MOVING MATERIAL BARGE OUT OF WHEELER OSGOOD (NOT PLACING MATERIAL)

1300 TOTEM MARINE DOCK - HURLEN CONTINUES INSTALLATION OF FILTER CAP MATERIAL - NO FLOT DEBRIS OR TURBIDITY PLUMES NOTED - (FLOOD TIDE)

Continued on Page

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Signed	Date	Signed	Date
Daniel A. Beck 01/16/03		030116	

030116

PROJECT THEA FOSS / WHEELER - OSGOOD

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				SAMPLE				SLACK TIDE		
ME	LOCATION	EVENT	DTB	DEPTH	TEMP	SAL	DO	TURB	TSS	
44	784 911	A	35	D 30	9.4	30.1	7.3	2.2	—	
1045	TDNE(350)			M 17	9.4	29.9	7.3	1.4	—	
1045	(ACC=6.4)			S 3	9.3	28.6	7.3	1.2	—	
								FLOOD (SLACK) TIDE		
1048	TDN(350)	A	37	D 32	9.4	30.1	7.4	0.7	—	
1049	755 863	A		M 18	9.4	30.0	7.5	0.9	—	
1049	(ACC =6.5')			S 3	9.4	28.5	7.4	2.1	—	
1051	TDNW(350) 350 DB		37	D 32	9.4	30.1	7.4	1.4	—	
1051	707 836			M 18	9.4	30.0	7.5	1.2	~~030116/TDNW(300)/m/A~~	
1052	(ACC=5.8')			S 3	9.3	27.8	7.4	1.1	—	
								FLOOD (SLACK) TIDE		
1053	707 851		37	D 32	9.4	30.1	7.5	1.1	—	
1054	TDNW(300)			M 18	9.4	30.0	7.5	2.2	030116/TDNW(300)/m/A	
1054	(ACC=5.7')			S 3	9.4	28.1	7.5	2.5	—	
								FLOOD TIDE		
57	TDS(300)		36	D 31	9.4	30.1	7.3	3.4	—	
58	(ACC=6.4')			M 18	9.4	30.0	7.4	3.0	030116/TDS(300)/m/A	
1058	593 917			S 3	9.4	28.7	7.5	1.6	—	
								FLOOD TIDE		
1103	TDS(350)		36	D 31	9.4	30.1	7.5	4.0	—	
1104	579 913			M 18	9.4	30.0	7.5	2.0	—	
1104	(ACC =11.7')			S 3	9.4	28.8	7.5	1.3	—	

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Daniel A. Baker 01/16/03 _____ 03-16 _____

Signed Date Signed Date

PROJECT THEA FOSS/WHEELER - OSGOOD. Notebook No. _____

Continued From Page _____

030116

@ 1438 HURLEN CONTINUES TO PLACE FILTER CAP MATERIAL
SLACK TIDE, - NO FLOAT DEBRIS OR TURBIDITY
PLUME NOTED @ TOTEM MARINE DOCK
MANSON FINISH UP PLACING ROCK ON MATERIAL
BARGE (MATERIAL PLACED ON SOUTH BANK OF
WHEELER OSGOOD) - NO FLOAT DEBRIS OR TURBIDITY
PLUME OBSERVED.

1510 CIRCLED WORK AREA AFTER MANSON BARGE
EXITS. MINOR FLOATING DEBRIS GENERAL
MODERATE TURBIDITY (IE NO DISTINCT PLUME)

1445 - HURLEN OUT OF FILTER CAP MATERIAL &
BEGINS SURVEY OF TOE BERM.

1555 HURLEN INDICATES NO FURTHER IN WATER
PLACEMENT TODAY

DO CHECK @ END OF DAY IN ~~TAP~~ MOIST AIR OVER
TAP 87.5 %

Continued on Page

Daniel A. Beck 03/01/16
030116

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Signed Date Signed Date

ROJECT TIPEA FOSS / WHEELER - OSGOOD

Notebook No. _____

Continued From Page _____

030116

				SAMPLE					
[illegible]E	LOCATION	EVENT	DTB	DEPTH	TEMP	SAL	DO	TURB	TSS
1512	245 322	B	6.2	8.4'	9.5	29.5	5.9	6.0	—
1513	(Acc 6.6)		7.0'	5.0'	9.5	29.3	5.9	7.3	—
1514	NW OF WORK ZONE		9.6	2.0'	9.4	28.4	6.0	15.8	—

← EBB TIDE INFORMATIONAL READINGS →

1519	WO 300	B	10	D3	9.4	29.4	6.8	1.5	—
1521	253 216			M	TSS @ 5'				030116 ~~0316~~ / WO 300 / M / B.
1520	(Acc = 5.81)			S3	9.3	28.6	6.7	8.6	—
1530	WORK ENDED @ WHEELER-OSGOOD								

Continued on Page

Read and Understood By

[signature] 030116 — Signed — Date

Daniel A. Beck 03/01/16 — Signed — Date

American Civil Constructors

Hurlen Construction

PO Box 80945
700 S. Riverside Dr.
Seattle, WA 98108
(206) 763-1230
FAX (206) 762-1854

FAX TRANSMITTAL

Date:	1/18/03	**Number of Pages Including this Sheet:**	11
Deliver To:	WINGARD / O'LOUGHLIN		
Company:	CITY OF TACOMA		
Fax Number:	253-272-2412		

From:	L4AI
Company:	**ACC / Hurlen Construction**
Fax Number:	**206-762-1854**
Subject	DAILY REPORT 1/16/03

Lloyd & Associates, Inc.
38210 SE 92nd Street, Snoqualmie, Washington 98065 425-888-1905 rml@centurytel.net

January 17, 2003

TSS Data Update 1/24/03 RML

TRANSMITTAL

To: Iain Wingard
John O'Loughlin

Subject: Compliance Monitoring/Wheeler Osgood 1/17/03
Compliance Monitoring / Totem Marine 1/17/03
Preliminary Data Transmittal

Attached please find results from compliance monitoring for the following work activities:

- Capping work the Wheeler-Osgood Waterway; and
- Placement of riprap and filter material at Totem Marine.

Wheeler-Osgood Capping Work.

Water quality monitoring was conducted during the morning while filter material was being placed in the Wheeler Osgood during an ebb tide event. Water quality at WO300 was acceptable although turbidity was elevated. Water quality at the compliance boundary stations (WOS, WOC, and WON) was acceptable for all parameters. Manson stopped in-water work shortly after water quality data was collected.

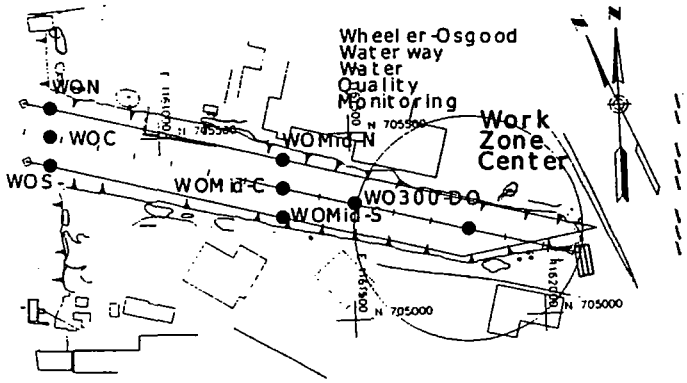
Totem Marine Capping/Rocking.

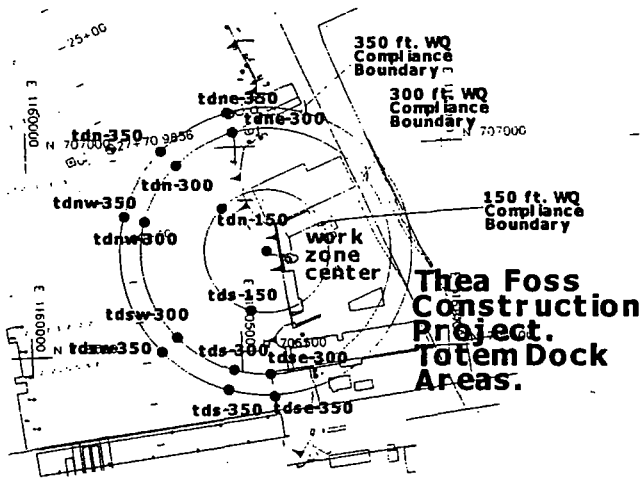
Water quality monitoring was conducted during the morning while filter cap material was being placed. Very high turbidity (93 NTU's) was observed in the morning event at Station TDN350 in shallow water. ACC-Hurlen had been placing filter cap material at shallow depths or on the back at Totem. Turbidity was not observed at TDNE350 or TDS350. Data collection at other stations was suspended, the Sonde was recalibrated, and notifications were made to the City of Tacoma and EPA. Approximately 1 hour later, turbidity levels had returned to below 10 NTU. Following notice, all sampling stations were monitored (see data). Because there was also a tide change, the sampling team checked both flood and ebb sampling stations. This data was provided to the City. By mid afternoon approval to go back to work was provided. This second monitoring event was thankfully uneventful. The major operational change incorporated was to vary the depth of placement along the very steep back on the south side of Totem.

As has been observed at Wheeler-Osgood and at Totem, the highest turbidity appears to occur at the point of placement. When filter cap material is placed at shallow depths, we see elevated turbidity in shallow samples. When materials are placed at greater depth, the turbidity is detectable at greater depth. There is of course the obvious visual evidence that when filter cap materials are place in the water considerable turbidity is observed. In the Wheeler-Osgood the closed conditions tend to minimize tidal flow except at ebb tides. The circumstance is considerably different at Totem Marine (and likely Thea's Park). Both flood and ebb tides can generate considerable flow through the work zone to sweep turbidity generated by filter cap placement. At the Wheeler-Osgood site, flows are minimal except at ebb tide. The primary difference appears to be that residence time at the Wheeler-Osgood allows settleable materials form the filter cap to drop out of the water column.

Tidal flow through the work zone is of course highly variable and depends on the rate that the water column is rising and falling as may be adjusted by local conditions and weather. Periodically, we see considerable fresh water (lower salinity in the upper layers) as a result of storm events. Additionally, we also see considerable fresh water being moved into the Thea Foss Waterway after a low tide event from the Puyallup River. Our data demonstrates the input of fresh water when it is not raining and also indicates the complexity of the problem. Operational changes (similar to a BMP) have benefit in dealing with materials that will continue to generate substantial turbidity. On the positive side, dissolved oxygen levels remain very good and protective of fishes and marine life within the Thea Foss Waterway.

Michael Lloyd
Lloyd & Associates, Inc.





Thea Foss Construction Project. Totem Dock Areas.

Construction Compliance Monitoring **Date: JAN 17** **Wheeler-Osgood Ebb Tide**

Station/Sample	Depth/DTB (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
WO300 (down-current)	3	22.2	9.1	>100	7.8		5,233,253	542,216	1036	**Ebb Tide**
030117/WO300/M/A	4					13			1037	
Deep	6/8	26.8	8.0	10.5	8.9				1036	
WOS (down-current)	3	23.3	9.1	2.2	8.2		5,233,284	542,994	1026	Manson placing rock
0301017/WOS/M/A	12	29.7	7.2	2.7	9.4	3			1025	on south side of WO*
Deep	19/24	29.9	7.4	2.6	9.5				1025	
WOC (up-current)	3	20.4	9.3	2.5	7.6		5,233,308	542,994	1012	
0301017/WOC/M/A	6	28.6	7.6	2.5	0.0	4			1011	
Deep	9/12	29.2	7.3	4.0	9.4				1010	
WON (down-current)	3	24.5	8.6	3.1	8.5		5,233,331	542,994	1020	
030117/WON/M/A	7/10	28.2	7.7	2.6	9.2	2			1016	Sampled at 5' depth

Pre-Survey Calibration	S. High 1/16	101 % in saturated air	Cold, partly cloudy, dry
Post Survey Check	S. High 1/16	103 % in saturated air	

DO & Turbidity calibration as per manufacturer's specifications.
Survey work conducted by D. Berta and S. high
Manson was placing rock on slope on top of filter material.
Turbidity observed at placement at water line. Most of material being placed up the bank above water line
*Manson finished in-water work before lunch.
Informational sampling not conducted to deal with turbidity issues at Totem Marine. In-water work completed at 11:15.
Recommend that if time allows, additional sampling be conducted at end of day to confirm earlier compliance data.

Prepared By/Date:	TSS Data Update	
M. Lloyd 1/17	D M Lloyd 1/17/03	**L&AI**

Construction Compliance Monitoring Date: JAN 17 Totem Marine - EBB

Station/Sample	Depth/D TB (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
TDS350 (up-current)	3	24.4	8.7	2.8	8.5		5,233,579	542,913	958	Maximum Ebb
Mid	18	30.0	7.7	0.9	9.4				957	
Deep	31/36	30.1	7.6	1.2	9.4				956	
TDN350 (down-current)	3	25.1	8.9	**93.0**	8.2		5,233,755	542,863	843	Very high turbidity in shallow
	18	29.9	7.5	1.0	9.4				843	water
Deep	32/37	31.1	7.5	0.2	9.4				842	
TDNE350 (down-current)	3	22.3	9.2	1.8	7.8		5,233,784	542,911	825	
	11	29.7	7.3	0.8	9.4				824	Near Outfall 208 across from
Deep	17/22	29.9	7.2	1.6	9.5				824	Globe Bldg.

Post survey calibration check S. High 1/15 102%

DO Calibration as per manufacturer's specifications.

Survey work conducted by D. Berta and S. High cool, partly cloudy weather

Turbidity Calibration as per manufacturer's specifications. Calibration at 0, 10NTU's.

Turbidity check 10.4 ntu for 10 ntu standard

Water quality monitoring stopped after checking the up-current station. Instrument recalibrated and station TDN350 was reoccupied. High turbidity readings did not return to levels below 10 NTU until approximately 1 hour had passed (see supplemental trubidity readings, p46 of field notebook). After ebb monitoring results were taken in Wheeler-Osgood, sampling crew returned and completed sampling at Totem Marine as noted on the next page (approximatley 1100 hours).

Prepared By/Date:	Preliminary	
M. Lloyd 1/17	TMLg 1/17/03	L&AI

Construction Compliance Monitoring Date: JAN 17 Totem Marine - Slack/Flood

Station/Sample	Depth/DTB (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
TDS300	3	25.6	8.0	2.4	8.7		5,233,593	542,917	1114	**Slacl/Flood Tide**
0301017/TDS300/M/B	19	29.7	7.4	2.5	9.4	7			1113	
Deep	32/37	29.9	7.3	1.8	9.4				1112	No work activity at Totem
TDS350	3	25.8	7.9	3.0	9.0		5,233,579	542,913	1108	
Mid	18	29.5	7.4	1.4	9.4				1107	
Deep	31/36	29.8	7.5	1.9	9.4				1106	
TDSE300	3	23.6	7.9	2.3	9.1		5,233,590	542,945	1216	Salinity in shallow water
0301017/TDSE300/M/B	15	29.3	7.5	4.0	9.4	4			1216	suggests fresh water input
Deep	25/30	29.7	7.5	3.0	9.4				1215	from Puyallup River
TDSE350	3	25.8	7.9	2.0	8.8		5,233,571	542,919	1212	
0301017/TDSE300/M/B	18	29.3	7.4	1.7	9.4				1211	Sample station moved to near
Deep	31/36	29.9	7.5	1.1	9.4				1210	fireboat dock
TDSW300	3	22.0	9.3	3.1	8.0		5,233,617	542,875	1229	
0301017/TDSW300/M/B	19	29.6	7.6	2.2	9.4	4/4			1228	
Deep	33/38	29.8	8.0	2.5	9.4				1228	
TDSW350	3	21.3	9.2	2.6	7.8		5,233,606	542,865	1225	
Mid	19	29.6	7.6	2.3	9.4	4			1224	
Deep	33/38	29.9	7.7	1.3	9.4				1223	
TDN300	3	25.1	8.0	**6.8**	8.7		5,233,745	542,874	1125	Still some residual turbidity
030117/TDN300/M/B	18	29.6	7.3	2.6	9.4	5			1124	in shallow water
Deep	32/36	29.8	7.5	1.5	9.4				1123	
TDN350 (down-current)	3	26.9	7.6	**6.2**	9.4		52,338,755	542,863	1129	
Mid	18	29.6	7.5	4.7	9.4				1128	
Deep	31/36	29.8	7.7	2.4	9.4				1127	
TDNE300	3	21.6	8.7	**9.7**	8.1		5,233,770	542,915	11149	
030115/TDNE300/M/B	14	29.2	7.3	1.6	9.4	4			1148	
Deep	25/29	29.6	7.6	2.4	9.4				1147	
TDNE350	3	25.2	8.1	**10.8**	8.5		5,233,784	542,911	1133	Still some residual turbidity
Mid	16	29.6	7.4	1.5	9.4				1133	in shallow water
Deep	27/32	29.7	7.4	2.3	9.4				1132	
TDNW300	3	21.1	9.4	2.3	7.9		5,233,703	542,851	1251	Flood/slack tide
030117/TDNW300/M/B	19	29.5	7.5	2.5	9.7	4			1250	
Deep	33/38	29.8	7.6	1.4	9.7				1251	
TDNW300	3	22.2	9.5	2.2	8.1				1255	Field Duplicate
030117/TDNW300/M/B-Dup	19	29.5	7.4	1.7	9.4				1254	Field Duplicate
Deep	33/36	29.9	7.5	0.7	9.4				1253	Field Duplicate
TDNW350	3	21.6	9.2	2.2	7.9		5,233,707	542,836	1246	
Mid	19	29.5	7.5	1.1	9.4				1245	
Deep	33/38	29.8	7.5	0.8	9.4				1244	

Pre-Survey Calibration S. High 1/16 102%

DO Calibration as per manufacturer's specifications.

Survey work conducted by D. Berta and S. High Mild, partly sunny weather

Turbidity Calibration as per manufacturer's specifications. Calibration at 0, 10NTU's.

Prepared By/Date:

M. Lloyd 1/17

TSS Data Update

M Lloyd 1/23/03

L&AI

Construction Compliance Monitoring **Date: JAN 17** **Totem Marine - Flood**

Station/Sample	Depth/DTB (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
TDS300	3	22.0	10.7	1.4	8.1		5,233,593	542,917	1528	**Slacl/Flood Tide**
0301017/TDS300/M/C	20	29.6	8.6	1.2	9.4	3			1527	Down current at slack/flooe
Deep	34/39	29.8	8.6	0.8	9.4				1526	No work activity at Totem
TDS350	3	21.7	8.7	1.5	8.1		5,233,579	542,913	1536	
Mid	19	29.4	8.7	1.1	9.4				1536	
Deep	33/38	29.8	10.7	1.1	9.4				1535	
TDS150	3	22.1	10.5	1.7	8.1		5,233,637	542,908	1521	Moved to point next to Hurlen
Mid	20	29.6	8.4	5.7	9.4				1521	Barge
Deep	34/39	29.8	8.4	1.7	9.4				1520	
TDSE300	2	22.2	10.5	1.7	8.1		5,233,590	542,945	1506	Salinity in shallow water
0301017/TDSE300/M/C	17	29.3	8.0	1.3	9.4	4			1505	suggests fresh water input
Deep	30/35	29.8	8.0	0.8	9.4				1504	from Puyallup River
TDSE350	3	22.7	10.3	1.8	8.1		5,233,576	542,925	1500	
Mid	19	29.5	7.7	1.1	9.4				1500	
Deep	33/38	29.8	7.7	0.8	9.4				1459	
TDSE150	3	22.1	28.2	2.0	8.1		5,233,641	542,932	1517	
Mid	13	28.5	8.2	1.8	9.3				1516	
Deep	21/26	29.6	7.7	1.5	9.4				1515	
TDSW300	3	21.6	11.1	1.3	8.2		5,233,617	542,875	1548	
0301017/TDSW300/M/C	20	29.5	8.8	1.4	9.4	3			1547	
Deep	34/39	29.8	8.8	1.7	9.4				1546	
TDSW350	3	22.1	11.1	1.4	7.8		5,233,606	542,865	1542	
Mid	20	29.5	8.7	1.8	9.4				1541	
Deep	35/40	29.8	8.7	2.6	9.4				1540	
TDN300	3	19.5	12.0	2.2	7.8		5,233,745	542,874	1617	Slack to Ebb Flow
030117/TDN300/M/C	14	29.0	8.8	1.6	9.3	4			1616	
Deep	23/28	29.3	8.7	1.9	9.4				1615	
TDN350 (down-current)	3	21.9	11.1	2.7	8.1		52,338,755	542,863	1610	
Mid	20	29.2	8.6	1.9	9.4				1609	
Deep	34/39	29.7	8.7	10.7	9.4				1608	
TDNE300	3	7.7	19.2	11.9	1.9		5,233,770	542,915	1623	Slack to Ebb Flow
030117/TDNE300/M/C	13	9.3	29.0	8.6	1.5	5			1622	
Deep	21/26	9.4	29.3	8.6	2.2				1620	
TDNE350	3	19.2	11.9	1.9	7.7		5,233,784	542,911	1628	Elevated shallow turbidity
Mid	13	29.0	8.6	1.5	9.3				1627	
Deep	21/26	29.3	8.6	2.2	9.4				1626	
TDNW300	3	21.7	10.8	1.4	8.2		5,233,703	542,851	1555	Slack to Ebb Flow
030117/TDNW300/M/C	20	29.4	8.8	1.5	9.4	3			1555	
Deep	34/39	29.8	8.8	1.2	9.4				1554	
TDNW350	3	21.8	11.9	1.4	8.1		5,233,707	542,836	1602	
Mid	26	29.3	8.8	1.5	9.4				1601	
Deep	34/39	29.7	8.9	0.4	9.4				1600	
Station TF2+00	3	22.3	10.1	1.3	8.6		5,233,465	542,492	1640	
030117/TF2/M/C	22	28.8	8.7	0.3	9.2	2U			1639	
Deep	37/42	29.5	8.5	0.6	9.4				1638	

Pre-Survey Calibration S. High 1/17 102% Final= 96%

DO Calibration as per manufacturer's specifications.

Survey work conducted by D. Berta and S. High

Cold, partly sunny weather

Turbidity Calibration as per manufacturer's specifications. Calibration at 0, 10NTU's.

ACC-Hurlen restarts with filter material at 2:30 PM

Prepared By/Date: M. Lloyd 1/17

TSS Data Update 1/23/03

L&AI

1/17/03

STL Seattle

Client Name	Lloyd & Assoc. Inc.
Project Name	Thea Foss
Date Received	01-20-03

General Chemistry Parameters

Client Sample ID 030116/WO300/M/B
Lab ID 111369-01

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-21-03	mg/L	6	2

Client Sample ID 030117/WON/M/A
Lab ID 111369-02

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-21-03	mg/L	2	2

Client Sample ID 030117/WOC/M/A
Lab ID 111369-03

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-21-03	mg/L	4	2

Client Sample ID 030117/WOS/M/A
Lab ID 111369-04

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-21-03	mg/L	3	2

Client Sample ID 030117/WO300/M/A
Lab ID 111369-05

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-21-03	mg/L	13	2

Client Sample ID 030117/TDS(300)/M/B
Lab ID 111369-06

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-21-03	mg/L	7	2

STL Seattle

Client Sample ID	030117/TDN(300)/M/B
Lab ID	111369-07

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-21-03	mg/L	5	2

Client Sample ID	030117/TDNE(300)/M/B
Lab ID	111369-08

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-21-03	mg/L	4	2

Client Sample ID	030117/TDSE(30)/M/B
Lab ID	111369-09

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-21-03	mg/L	4	2

Client Sample ID	030117/TDSW(300)/M/B
Lab ID	111369-10

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-21-03	mg/L	4	2

Client Sample ID	030117/TDSW(300)/M/DUP
Lab ID	111369-11

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-21-03	mg/L	4	2

Client Sample ID	030117/TDNW(300)/M/B
Lab ID	111369-12

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-21-03	mg/L	4	2

Client Sample ID	030117/TDSE(300)/M/C
Lab ID	111369-13

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-21-03	mg/L	4	2

STL Seattle

Client Sample ID	030117/TDS(300)/M/C
Lab ID	111369-14

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-21-03	mg/L	3	2

Client Sample ID	030117/TDSW(300)/M/C
Lab ID	111369-15

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-21-03	mg/L	3	2

Client Sample ID	030117/TDNW(300)/M/C
Lab ID	111369-16

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-21-03	mg/L	3	2

Client Sample ID	030117/TDN(300)/M/C
Lab ID	111369-17

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-21-03	mg/L	4	2

Client Sample ID	030117/TDNE(300)/M/C
Lab ID	111369-18

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-21-03	mg/L	5	2

Client Sample ID	030117/TF2+00/M/C
Lab ID	111369-19

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-21-03	mg/L	ND	2

STL Seattle

QUALITY CONTROL REPORT

Client Sample ID: Batch QC
Lab ID: 111316-1
QC Batch Number: 1159-021

Method Blank

Parameter	Result (mg/L)	PQL
Total Suspended Solids	ND	2

Duplicate

Parameter	Sample Result (mg/L)	Duplicate Result (mg/L)	RPD (%)	Flag
Total Suspended Solids	4	3.5	13	

PROJECT TIEA FOSS / WHEELER-OSGOOD Notebook No. _____
Continued From Page _____

030117

0800 PLACED 1ST LOAD OF FILTER CAP MATERIAL @ TOTEM MARINE DOCK

CALIBRATION NOTES:

0815 BAROMETRIC PRESSURE = 777 mm/Hg
D.O. - CALIBRATED IN MOIST AIR OVER TAP WATER
CALIBRATION CHECK = 102.0 %.
TURB - CALIBRATED BY 2 POINT METHOD.
0.0 = DISTILLED WATER
10.0 = STANDARD SOLUTION (YSI 6073 TURB. STANDARD LOT CODE # K07240R) - SAME MATERIAL AS PREVIOUS DATES STANDARD
EXPIRATION DATE JULY 24, 2004.

- TURBIDITY CHECK WITH 10 NTU STANDARD AFTER CALIBRATION = 10.0 NTU

840 NO VISIBLE TURBIDITY PLUME OR FLOAT DEBRIS. OBSERVED - HURLEN PLACED INITIAL BUCKETS (~ 0.5 HOURS) IN WATER. THEN PLACING MAJORITY OF MATERIAL ON THE SLOPE ABOVE THE WATER. MATERIAL FLOWING INTO WATER AT BOTTOM OF SLOPE
0850 RECALIBRATED AFTER READING @ 0843
FOR TURBIDITY USEING FRESH STANDARD SOLUTIONS: 10.0 NTU & 0.0 NTU (D.I. WATER)
~~ST~~ CALIBRATION CHECK = 10.4 NTU

0910 USEING CAT TRACK HOE ON SHORE TO PUSH FILTER CAP MATERIAL DOWN SLOPE (& INTO WATER)
0928 STARTED LOGGING AFTER REALIBRATION (@ TDN (350))

0950 - HURLEN DISCONTINUES WORK, WATER QUALITY CREW MOVES TO WHEELER OSGOOD

Continued on Page

Read and Understood By

[signature] 1/17/03 Signed _____ Date

[signature] 1/17/03 Signed Date

030117

TIME	LOCATION	EVENT	DB	DEPTH	TEMP	SAL	DO	TURB	TSS	
				SAMPLER		EAB	FULL	(MAX)		
0824	TOW (350)	A	(39)	D 17	9.5	29.9	7.2	1.6	—	
0824	754 911			M 11	9.4	28.7	7.3	0.8	—	*
0825	(Acc 7.4')			S 3	9.5 DB	22.3	9.2	1.8	—	

* NOTE: READINGS DIRECTLY WEST OF OUT FALL - ACROSS FROM GRAND BLD IE OUTFALL (205) - 15" LINE (210)
SEE DRAWING SHEET C-6

0842	TOW (350)	A	(37)	D 32	9.4	30.1	7.7	0.2	—	
0843	755 863			M 18	9.4	29.9	7.5	1.0	—	
0843	(Acc=5.1')			S 3	8.2	25.1	8.9	93	—	
0954	TOW (350) DB	A	(26)	D 31	9.4	30.1	7.6	1.2	—	
0957	(345 874 511 913)			M 18	9.4	30.0	7.7	0.9	—	
0958	(Acc = 12.3)			S 3	9.5	29.4	8.7	2.8	—	

TOW (350) 593 917 (Acc = — WORK DOWNSTREAM @ TREEM

WHEELER OSGOOD EAB (→ SURFACE)

1016	WOW 331 994	(10)	D 7	9.2	25.2	9.7	2.6		—	
1020	(Acc=5.7		S 3	8.5	24.5	8.6	3.1		—	
1021			M @ 5' FOR TSS						030117/WOW/M/A	
1000	WOC	(12)	D 9	9.4	29.2	7.3	4.0		—	
1011	305 984		M 6	9.0	28.6	7.6	2.5		030117/WOC/M/A	
1012	(Acc=6.2)		S 3	7.6	20.4	9.3	2.5		—	
1025	WOS	(24)	D 19	9.5	29.9	7.4	2.6		—	
1025	284 994		M 12	9.4	29.7	7.2	2.7		030117/WOS/M/A	
1026	(Acc=6.2)		S 3	8.2	23.3	9.1	2.2		—	

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Signed: [illegible] 1/17/03 — Date

PROJECT THEA FOSS / WHEELER-OSGOOD

Notebook No. _____
Continued From Page _____

030117

TDN (350)

SUPPLEMENTAL TURBIDITY READINGS

TIME	TURBIDITY	HIGHEST VALUE
0932	6.7	
0933	55.8	
0934	7.8	
0935	10.0	
0936	46.8	56.0
0937	60.0	52.1
0938	13.3	46.0
0939	2.2	2.2
0940	2.6	2.6
0941	2.2	2.2
0942	2.4	2.4
0943	2.4	2.4
0944	2.2	2.3
0945	2.2	2.4
0946	14.4	14.7
0947	9.4	9.5
0948	9.5	9.5

1030 MANSON PLACING FILTER CAP MATERIAL ON SOUTH SIDE OF WATERWAY LITTLE TO NO FLOT. DEBRIS (MINOR AMOUNTS ON INSIDE OF BOOM @ MOUTH OF WATERWAY.

1036 TURBIDITY "CLOUDS NOTED" ~ 1.5' BELOW SURFACE BILL WITH MANSON WAS ADVISED OF OBSERVATION AND 1036 READING

1042 RECALIBRATION FOR 1) CONDUCTIVITY, & D.O. CALIBRATED WITH CONDUCTIVITY SOLUTION REFERENCED ON PAGE # 8 OF THIS LOG. D.O. CALIBRATED IN MOIST AIR OVER TAP WATER. D.O. CHECK = 102.5 %

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SAMPLE SNACK → DB (WORK ZONE 2)

TIME	LOCATION	EVENT	DTB	DEPTH	TEMP	SAL	DO	TURB	TSS
1036	WC 300	A	(8)	D 6	8.9	26.8	8.0	10.5	—
1037	253 216			M	4' = TSS SAMPLE DEPTH				030117/WC300/M/A
1036	(ACC = 10.1)			S 3	7.8	22.2	9.1	120.0	—

TOTEM MARINE (SLACK) FLOOD TIDE WORK ZONE

1106	TDS (350)								
1107	579 913		(36)	D 31	9.4	29.8	7.5	1.9	—
1108	(ACC = 6.3')			M 18	9.4	29.5	7.4	1.4	—
				S 3	9.0	25.8	7.9	3.0	—
1112	TDS (300)		(37)	D 32	9.4	29.8	7.3	1.8	—
1113	593 917			M 19	9.4	29.7	7.4	2.5	030117/TDS(300)/M/A
1114	(ACC = 4.6)			S 3	8.7	25.6	8.0	2.4	—
1123	TDN (300)		(36)	D 32	9.4	29.8	7.5	1.5	—
1124	745 874			M 18	9.4	29.6	7.3	2.6	030117/TDN(300)/M/A
1125	(ACC = 9.2)			S 3	8.7	25.1	8.0	6.8	—
1127	TDN (350)		(36)	D 31	9.5	29.8	7.7	2.4	—
1128	755 863			M 18	9.4	29.6	7.5	4.7	—
1129	(ACC = 4.1')			S 3	9.4	26.9	7.6	6.2	—
1132	TDNE (350)		(32)	D 27	9.4	29.7	7.7	2.3	—
1133	784 911			M 16	9.4	29.6	7.4	1.5	—
1133	(ACC = 4.5)			S 3	~~9.3~~	~~26.5~~	8.1	10.8	—
					DB 8.5	25.2			
1147	TDNE (300)		(24)	D 25	9.4	29.6	7.6	2.4	—
1148	770 ~~860~~ ~~880~~ 915			M 14	9.4	29.2	7.3	1.6	030117/TDNE(300)/M/B
1149	(ACC = 5.2)			S 3	8.1	21.6	8.7	9.7	—
	~~TDNW (300)~~			~~D~~					
	~~707 836~~			~~M~~					
	~~(ACC =)~~			~~S~~					

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[signature] 1/17/03 — Signed — Date

PROJECT THEA FOSS/WHEELER - OSGOOD

Notebook No. _____
Continued From Page _____

030117

1155 - FOSS TUG MOVES BARGE - HURLEN MATERIALS
NO WORK OF HURLEN BARGE.
1200 LUNCH BREAK
1400 - NO MATERIALS BEING PLACED AT
TOTEM OR WHEELER - OSGOOD (IN WATER)
(MANSON - MOVING EQUIPMENT/MATERIALS ETC..
ON BARGE

1435 HURLEN STARTS PLACEMENT OF FILTER CAP
AT TOTEM MARINE SERVICES DOCK

Continued on Page

Read and Understood By

Daniel A Burke 01/17/03 — Signed — Date

P M Floyd 1/17 — Signed — Date

030117

SAMPLE

TIME	LOCATION	EVENT	DTB	DEPTH	TEMP	SAL	DO	TURB	TSS
1210	TDSE(350)	B	(30)	D 31	9.4	29.9	7.5	1.1	—
1211	575 913			M 18	9.4	29.3	7.4	1.7	—
1212	(Acc) 946			S 3	8.8	25.8	7.9	2.0	—
	571 919* (Acc. = 37')			* SAMPLED AGAINST CITY FIRE BOAT DOCK					

FLOOD

1215	TDSE(300)		(30)	D 25	9.4	29.7	7.5	3.0	—
1216	510 945			M 15	9.4	29.3	7.5	4.0	030117/TDSE(300)/M/B
1216	(Acc = 7.0')			S 3	9.1	23.6	7.9	2.3	—
1223	TDSW(350)		(38)	D 33	9.4	29.9	7.7	1.3	—
1224	606 865			M 19	9.4	29.6	7.6	2.3	—
1225	(Acc = 9.1)			S 3	7.8	21.3	9.2	2.6	—
1228	TDSW(300)		(38)	D 33	9.4	29.8	8.0	2.5	—
1228	617 875			M 19	9.4	29.6	7.6	2.2	030117/TDSW(300)/M/B*
1229	(Acc = 7.8)			S 3	8.0	22.0	9.3	3.1	—
				TSS - DUP. →					030117/TDSW(300)M/DUP

— * SPLIT DO SAMPLE FOR CITY OF TAC & L&A I LABS —

FLOOD TIDE

1244	TDNW(350)		(38)	D 33	9.4	29.8	7.5	0.8	—
1245	707 836			M 19	9.4	29.5	7.5	1.1	—
1246	(Acc = 6.1)			S 3	7.9	21.6	9.2	2.2	—
1249	TDNW(300)		(38)	D 33	9.4	29.8	7.6	1.4	—
1250	703 851			M 19	9.4	29.5	7.5	2.5	030117/TDNW(300)/M/B
1251	(Acc = 5.4)			S 3	7.9	21.1	9.4	2.3	—

DUPLICATE READINGS

1253	TDNW(300)		(36)	D 33	9.4	29.9	7.5	0.7	—
1254	703 851			M 19	9.4	29.5	7.4	1.7	—
1255	(Acc = 5.5)			S 3	8.1	22.2	9.5	2.2	—

Continued on Page

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[signature] 01/17/03 — Signed — Date

[signature] 1/17 — Signed — Date

PROJECT THEA FOSS/WHEELER - OSGOOD

Notebook No. _____
Continued From Page _____

030117
1144
CALIBRATION NOTES
D.O. CALIBRATED IN MOIST AIR OVER TAP WATER
CALIBRATION CHECK = 102.0 %
TURB. CALIBRATED BY 2 POINT METHOD.
1) 0.0 = DI WATER
2) 10.0 = STANDARD SOLUTION
TURBIDITY CHECK = 10.2 NTU IN 10.0 NTU STD.
SOLUTION AFTER CALIBRATION.

SAMPLED NEAR TDSE 150 BARGE OVER TDS 150.
SAMPLED ON WEST SIDE OF EXISTING PIER

030117 - 1720
Hach/Winkler Titration

(1.) 100 ml aliquot x 0.02 x 356/100 = 7.1 mg/L

(2) 100 ml x 0.02 x 362/100 = 7.2 mg/L

TML

Continued on Page

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Signed _____ Date _____ Signed TMLgd 1/17 Date

030117 TOTEM MARINE DOCK

TIME	LOCATION EVENT	DIB	SAMPLE DEPTH	TEMP	SAL	DO	TURB	TSS
						FLOOD TIDE		
1459	TDSE(350) C	(33)	D 33	9.4	29.5	7.7	0.8	—
1500	575 946 (DESIGN)		M 19	9.4	29.5	7.7	1.1	—
1500	576 925*		S 3	8.1	22.7	10.3	1.8	—
	* - AGAINST FIRE BOAT DOCK							
	(ACC = 8.1)							
1504	TDSE(300) C	(35)	D 30	9.4	29.8	8.0	0.8	—
1505	590 945		M 17	9.4	29.3	8.0	1.3	030117/TDSE(300)/M/C
1506	(ACC = 6.4)		S 3	8.1	22.2	10.5	1.7	—
1515	~TDSE(150) C	(26)	D 21	9.4	29.6	8.0	1.5	—
1516	641 932		M 13	9.3	28.5	8.2	1.8	—
1517	(ACC = 8.5)		S 3	8.1	22.1	10.5	2.0	—
	(SEE NOTE PAGE 50)							
			SLACK TIDE					
1520	TDS (150)	(31)	D 34	9.4	29.8	8.4	1.7	—
1521	637 928		M 20	9.4	29.6	8.4	5.7	—
1521	637 905 *		S 3	8.1	22.1	10.5	1.7	—
	* AGAINST END OF HUREN BARGE							
	(ACC = 7.0)		SLACK TIDE					
1526	TDS(300)	(34)	D 34	9.4	29.8	8.6	0.8	—
1527	593 917		M 20	9.4	29.6	8.0	1.2	030117/TDS(300)/M/C
1528	(ACC = 6.0)		S 3	8.1	22.0	10.7	1.4	—
1535	TDS(350)	(38)	D 33	9.4	29.8	8.7	1.1	—
1536	579 913		M 19	9.4	29.4	8.7	1.1	—
1536	(ACC = 6.3)		S 3	8.1	21.7	10.7	1.5	—
1540	TDSW(350)	(40)	D 35	9.4	29.8	8.7	2.6	—
1541	606 965		M 20	9.4	29.5	8.7	1.8	—
1542	(ACC = 8.4)		S 3	8.1	22.1	11.1	1.4	—
			DB					
1546	TDSW(300)	(31)	D 31	9.4	29.8	8.8	1.7	—
1547	617 875		M 20	9.4	29.5	8.8	1.4	030117/TDS(300)/M/C
1548	(ACC = 5.3)		S 3	8.2	21.6	10.8	1.3	

Continued on Page

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Daniel A. Bake 01/17/03 — Signed — Date

D. Mefford 1/17 — Signed — Date

PROJECT THEA FOSS / WHEELER - OSGOOD

Notebook No. _____
Continued From Page _____

030117
1655
CALIBRATION CHECK IN MOIST AIR OVER TAP WATER ~~[illegible]~~ 96%.

-1650 WHEELER-OSGOOD WORK COMPLETE & BARGE MOVES OUT

Continued on Page

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Daniel A. Barker 9/17/03
Signed Date

[signature] 1/17
Signed Date

PROJECT THEA FOSS/WHEELER-OSWOOD. Notebook No. _____ Continued From Page _____

030117 EBB FLOW TIDE

SAMPLE

TIME	LOCATION	EVENT	DTB	DEPTH	TEMP	SAL	DO	TURB	TSS
1554	TDNW (300)	C	39	D 34	9.4	29.8	8.9	1.2	—
1555	703 857			M 20	9.4	29.4	8.8	1.5	030117/TDNW(300)/M/C
1555	(ACC=5.6')			S 3	8.2	21.7	10.8	1.4	—
						EBB FLOW TIDE			
1600	TDNW (350)	C	39	D 34	9.4	29.7	8.9	0.4	—
1601	707 836			M 20	9.4	29.3	8.8	1.5	—
1602	(ACC=5.7')			S 3	8.1	21.8	11.9	1.4	—
						EBB FLOW			
1608	TDN (350)	DB	39	D 34	9.4	29.7	8.7	10.7	—
1609	755 (~~847~~ ~~829~~)	23		M 20	9.4	29.2	8.6	1.9	—
1610	(ACC=5.0')			S 3	8.1	21.9	11.1	2.7	—
						EBB FLOW			
1615	TDN (300)		~~33~~	D ~~28~~ 23	9.4	29.3	8.7	1.9	—
1616	745 874		28	M ~~17~~ 14	9.3	29.0	8.8	1.6	030117/TDN(300)/M/C
1617	(ACC=5.1')			S 3	7.8	19.5	12.0	2.2	—
						EBB FLOW			
1620	TDNE (300)		22	D 17	9.3	29.0	8.8	1.6	—
1622	770 915			M 11	9.3	28.9	8.8	1.6	030117/TDNE(300)/M/C
1623	(ACC=4.6')			S 3	7.8	19.8	11.8	2.7	—
1626	TDNE (350)		26	D 21	9.4	29.3	8.6	2.2	—
1627	784 911			M 13	9.3	29.0	8.6	1.5	—
1628	(ACC=4.6')			S 3	7.7	19.2	11.9	1.9	—
1638	TF 2+00		42	D ~~40~~ 37	9.4	29.5	8.5	0.6	—
1639	465 492			M 22	9.2	28.8	8.7	0.3	030117/TF2+00/M/C
1640	(ACC=4.3)			S 3	8.6	22.3	10.1	1.3	—

Continued on Page

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American Civil Constructors

Hurlen Construction

PO Box 80945
700 S. Riverside Dr.
Seattle, WA 98108
(206) 763-1230
FAX (206) 762-1854

FAX TRANSMITTAL

Date:	1/18/03	**Number of Pages Including this Sheet:**	18
Deliver To:	O'LOUGHLIN/WINGARD		
Company:	CITY OF TACOMA		
Fax Number:	253-272-2412		

From:	M. Lloyd
Company:	**ACC / Hurlen Construction**
Fax Number:	**206-762-1854**
Subject	WQ 1/17/03

Lloyd & Associates, Inc.
38210 SE 92nd Street, Snoqualmie, Washington 98065 425-888-1905 rml@centurytel.net

January 18, 2003

TRANSMITTAL

To: Iain Wingard
John O'Loughlin

Subject: Compliance Monitoring/Wheeler Osgood 1/18/03
Compliance Monitoring / Totem Marine 1/18/03
Preliminary Data Transmittal

Attached please find results from compliance monitoring for the following work activities:

- Capping work the Wheeler-Osgood Waterway; and
- Placement of riprap and filter material at Totem Marine.

Wheeler-Osgood Capping Work.

Water quality monitoring was conducted during the morning while filter material was being placed in the Wheeler Osgood during an ebb tide event. Dissolved oxygen at WO300 was acceptable although turbidity was elevated. Water quality at the compliance boundary stations (WOS, WOC, and WON) was acceptable for all parameters. Water quality was also monitored during the afternoon. Water quality was acceptable for all parameters at all compliance stations and informational stations.

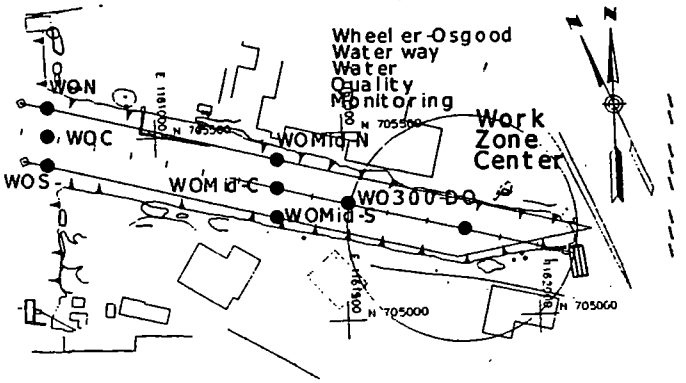
Totem Marine Capping/Rocking.

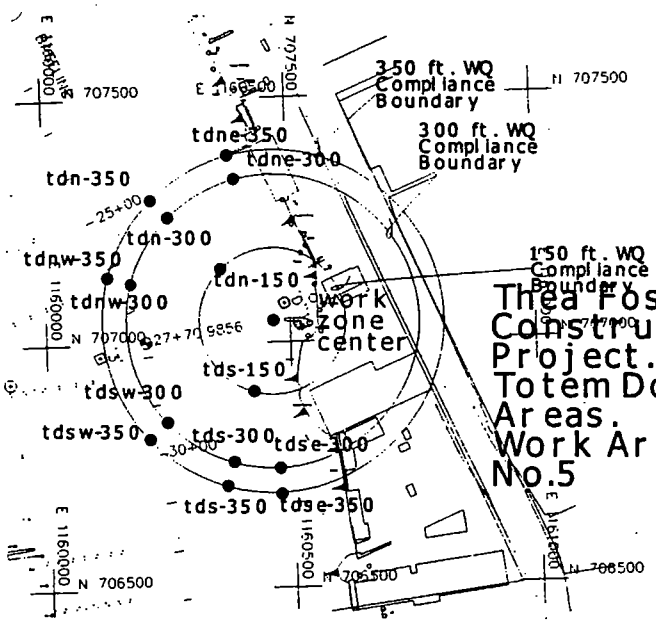
Water quality monitoring was conducted during the morning ebb while filter cap material was being placed. Moderately elevated turbidity (>12 NTU's) was observed in the morning event at Station TDNE300 and TDNE350 stations. I advised John O'Loughlin of the circumstance and indicated that the water quality survey team would monitor TDNE300/TDN350 while ACC-Hurlen prepared to move barges. I also left a message for John Malek of EPA. After moving equipment and switching out barges, ACC-Hurlen started placing filter cap material again and we monitored the 350' statons to determine if a problem would develop. Tidal changes meant that we would be principally monitoring for the flood tide late in the morning.

Water quality remained good for the remainder of the day and subsequent monitoring during the afternoon. We did notice that in the upgradient locations that turbidity had returned at the 350 stations and was lower at the 300 stations. Down current stations were acceptable for all criteria. The water monitoring crew patrolled around TDNE350 and noted that there are two outfalls in the immediate area, and they may be releasing turbidity into the waterway near TDNE stations. Whether this would also impact TDN stations seems unlikely, but we obviously do not have a complete understanding of tidal flow patterns or flux. As indicated in supplemental readings, a clear picture is not presented for why the up-current turbidity is higher around TDNE 350 and TDNE 300 except that we have noted previously that the TDNE stations do pick up turbidity more often than other stations. Some additional investigation of this area is highly recommended because turbidity had declined from the morning work and the change in tide supports the conclusion that the elevated turbidity did not arise from construction activity during this monitoring event.

Michael Lloyd
Lloyd & Associates, Inc.

Wheeler 1 18 03.doc





Thea Foss
Construction
Project.
Totem Dock
Areas.
Work Area
No.5

Construction Compliance Monitoring **Date: JAN 18** **Wheeler-Osgood Ebb Tide**

Station/Sample	Depth/DTB (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
WO300 (down-current)	3	22.2	9.1	>100	7.8		5,233,253	542,216	1118	Ebb to slack Tide
030117/WO300/M/B	4					5			1119	Manson placing rock
Deep	6/8	26.8	8.0	10.5	8.9				1117	since early morning
WOMID-N (down-current)	1	24.7	7.9	5.5	8.5		5,233,289	542,187	1123	
Deep	3/4	26.9	7.6	4.3	8.9				1122	Moved station to point
WOMID-C (down-current)	3	27.6	7.4	3.8	9.1		5,233,266	542,184	1124	Against floating dock
Deep	6/9	28.8	7.5	2.5	9.2				1124	
WOMID-S (down-current)	1	24.4	7.7	5.7	9.1		5,233,243	542,184	1127	Work zone immediately East.
Deep	3/4	26.5	7.6	4.7	9.2				1127	
WOS (down-current)	3	28.1	6.9	2.8	9.2		5,233,284	542,994	1026	Manson placing rock
030118/WOS/M/B	7	29	6.8	3.2	9.3	6			1025	on south side of WO*
Deep	10/15	29.3	6.9	3.3	9.4				1025	
WOC (up-current)	3	27.5	7.2	3.3	9.2		5,233,308	542,994	1012	
030118/WOC/M/B	6	28.8	7.0	2.4	9.2	3			1011	
Deep	8/12	29.1	6.9	2.5	9.3				1010	
WON (down-current)	3	28.3	7.1	1.8	9.3		5,233,331	542,994	1020	
030118/WON/M/B	5					3			1015	
Deep	7/10	28.9	7.1	1.8	9.3				1016	

Pre-Survey Calibration	S. High 1/18	101 % in saturated air	Mild, partly cloudy, dry
Post Survey Check	S. High 1/18	93.6 % in saturated air	

DO & Turbidity calibration as per manufacturer's specifications.
Survey work conducted by S. High
Manson was placing filter material on top of slope
Turbidity observed at placement at water line. Most of material being placed up the bank above water line
Recommend that if time allows, additional sampling be conducted at end of day to confirm earlier compliance data.

Prepared By/Date:	TSS DATA UPDATE	
M. Lloyd 1/18	1/23	L&AI

Construction Compliance Monitoring **Date: JAN 18** **Wheeler-Osgood Ebb Tide**

Station/Sample	Depth/DTB (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
WO300 (down-current)	3	27.6	6.5	6.1	9.1		5,233,253	542,216	1515	**Slack to Ebb Tide**
030118/WO300/M/C	5	28.4	6.4	5.2	9.3	8			1507	Manson placing rock
Deep	9/11	29.3	6.4	2.9	9.4				1503	since early morning
WOMID-N (down-current)	3	27.9	6.6	4.5	9.2		5,233,286	542,187	1519	Against floating dock
Deep	6/7	28.7	6.6	2.9	9.3					
WOMID-C (down-current)	3	27.5	6.7	3.8	9.1		5,233,266	542,187	1524	
Mid	6	28.7	6.6	3.9	9.2					
Deep	10/12.6	29.1	6.6	2.9	9.3					
WOMID-S (down-current)	3	27.8	6.9	3.6	9.4		5,233,243	542,184	1528	Work zone immediately East.
Deep	7/8	28.8	6.7	2.7	9.2					
WOS (down-current)	3	28.2	7	2.4	9.3		5,233,284	542,994	1536	@1500 Manson moves
030118/WOS/M/C	10	29.3	6.9	1.9	9.4	2			1535	barge out of waterway
Deep	15/19	29.4	6.9	1.4	9.4				1533	
WOC (up-current)	3	28.4	6.9	3.3	9.3		5,233,308	542,994	1542	
030118/WOC/M/C	7	29.2	6.7	2.3	9.4	3			1540	
Deep	12/15	29.3	6.7	1.8	9.4				1538	
WON (down-current)	3	28.6	6.9	2.6	9.4		5,233,331	542,994	1553	Ebb tide
030118/WON/M/C	7	29.1	6.8	1.8	9.4	2			1550	
Deep	11/14	29.3	6.7	2	9.4				1548	

Pre-Survey Calibration	S. High 1/18	101 % in saturated air	Mild, partly cloudy, dry
Post Survey Check	S. High 1/18	93.6 % in saturated air	

DO & Turbidity calibration as per manufacturer's specifications.
Survey work conducted by S. High
Manson was placing filter material on top of slope
Turbidity observed at placement at water line. Most of material being placed up the bank above water line
Recommend that if time allows, additional sampling be conducted at end of day to confirm earlier compliance data.

Prepared By/Date:	TSS DATA UPDATE	
M. Lloyd 1/18	TM Foley 01/23	**L&AI**

Construction Compliance Monitoring **Date: JAN 18** **Totem Marine - Ebb Tide**

Station/Sample	Depth/DTB (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
TDS300	3	26.5	6.6	3.1	9.0		5,233,593	542,917	912	**Ebb Tide - Up Current**
0301018/TDS300/M/A	19	29.6	6.6	1.2	9.3	3			912	Hurlen placing filter material
Deep	33/38	29.8	6.6	1.0	9.4				911	on south end
TDS350	3	26.5	6.7	3.2	9.0		5,233,579	542,913	915	**Ebb Tide - Up Current**
Mid	19	29.7	6.7	1.2	9.3				914	
Deep	33/38	29.8	6.7	1.8	9.3				914	
TDN300	3	27.8	6.6	5.8	9.0		5,233,745	542,874	831	Ebb Tide Down-Current
030118/TDN300/M/A	20	29.7	6.6	0.8	9.3	7			830	
Deep	34/39	29.8	6.5	1.1	9.3				829	
TDN350	3	27.7	6.6	2.6	9.0		52,338,749	542,887	821	Ebb Tide Down-Current
Mid	20	29.6	6.6	0.8	9.3				821	
Deep	34/39	29.8	6.5	0.9	9.4				820	
TDN150	3	28.0	6.6	5.1	9.0		52,338,755	542,863	821	Ebb Tide Down-Current
Mid	17	29.6	6.6	7.4	9.3				821	Position moved against debris
Deep	30/35	29.8	6.6	1.5	9.3				820	boom
TDNE300	3	9.0	6.4	**13.8**	9.0		5,233,770	542,915	839	Slight elevation in turbidity
030118/TDNE300/M/A	12	9.3	6.6	9.5	9.3	10			838	Called M. Lloyd to discuss
Deep	19/24	9.0	6.6	3.5	9.3				837	
TDNE350	3	9.1	6.5	**12.2**	9.1		5,233,784	542,911	842	Slight elevation in turbidity*
Mid	15	9.4	6.7	10.6	9.4				842	
Deep	25/30	9.3	6.6	2.4	9.3				841	
TDNE350	3	9.0	6.2	**13.7**	9.0		5,233,784	542,911	901	Reanalysis after recalibrating
Mid	11	9.3	6.2	**14.3**	9.3				901	turbidity. Called City/EPA
Deep	17/22	9.3	6.3	6.6	9.3				902	Hurlen moving barges around
TDNW300	3	27.6	6.8	3.2	9.0		5,233,784	542,911	849	
030118/TDNW300/M/A	20	29.6	6.8	3.6	9.3	5			848	
Deep	34/39	29.8	6.8	0.7	9.3				848	
TDNW350	3	28.0	6.7	1.9	9.1		5,233,707	542,836	846	
Mid	20	29.7	6.8	0.5	9.3				845	
Deep	34/39	29.8	6.8	0.9	9.3				845	

Pre-Survey Calibration S. High 1/18 101%

DO Calibration as per manufacturer's specifications.

Survey work conducted by D. Berta and S. High

Mild, partly sunny weather

Turbidity Calibration as per manufacturer's specifications. Calibration at 0, 10NTU's.

Slight elevation in turbidity observed. Confirmed after recalibrating. Called City and EPA. Informed them that Hurlen had finished and was moving barges around. Did not shut down work (see follow on analyses after restarting)

Prepared By/Date:

M. Lloyd 1/18

TSS DATA UPDATE TMR 1/23

L&AI

Recovery Monitoring at Totem **Date: JAN 18** **Totem Marine - Ebb Tide**

Station/Sample	Depth/DTB (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
TDNE350	3	28.2	6.7	8.0	9.2		5,233,784	542,911	1042	Some residual turbidity
Mid	13	29.6	7.0	7.2	9.4				1041	
Deep	20/25	29.7	6.7	3.0	9.3				1041	
TDN350	3	27.8	7.1	3.0	9.0		52,338,749	542,887	1045	Ebb Tide Down-Current
Mid	18	29.7	7.2	2.2	9.4				1045	
Deep	31/36	29.8	7.2	1.2	9.3				1044	
TDNW350	3	28.4	7.2	2.1	9.2		5,233,707	542,836	1050	
Mid	18	29.7	7.3	1.1	9.3				1049	
Deep	32/37	29.8	7.1	1.2	9.4				1049	
TDS350	3	28.3	7.3	2.0	9.3		5,233,579	542,913	1054	**Ebb Tide - Up Current**
Mid	18	29.8	7.4	0.9	9.3				1054	
Deep	31/36	29.8	7.4	1.0	9.3				1053	

The above data was gathered while ACC-Hurlen resumed work in placing filter cap material. Elevated turbidity at TDNE had dropped and work was allowed to proceed on without interuption.

Prepared By/Date:

M. Lloyd 1/18

TSS DATA UPDATE

TMB 1/23

L&AI

Supplemental Readings JAN 18 Totem Marine

Station/Sample	Depth/DTB (ft)	Turbidity (NTU)	GPS Coordinates (N/E, m)		Time	Comment
South Station	3	5.7	5,233,806	542,897	1234	Southerm Most Station
	5	11.9				
	10	13.3				
	15	1.6				
	22	1.4				
	27/30	1.3				
Sampling Point South	3	1.8	5,233,800	542,902	1238	Approximatley 50' south of TDNE 350
	5	1.8				
	10	3.1				
	15	11.2				
	22	12.0				
	27/30	11.0				
TDNE 350	3	**12.3**	5,233,784	542,911	1229	Elevated turbidity from Up
Mid	10	**16.5**			1228	Current near outfall 210
Deep	16/21	**4.0**			1228	
	3	1.1	5,233,783	542,902	1243	Sampling point near TDNE 350
	5	1.3				
	10	5.8				
	15	8.6				
	22	14.3				
	27/28	9.0				
	3	8.4	5,233,773	542,906	1246	Sampling point north of TDNE 350
	5	12.1				
	10	7.9				
	15	2.2				
	20/22	1.8				
North of TDNE 350	3	8.4	5,233,764	542,907	1248	
Up Current toward	5	8.6				
Work zone	10	8.7				
	15/17	8.0				
	3	6.3	5,233,746	542,895	1253	Northrn most point away from work zone
	5	7.9				
	10	18.4				
	15	9.7				
	20/21	3.0				
Prepared By/Date: M. Lloyd 1/18						L&AI

Construction Compliance Monitoring Date: JAN 18 Totem Marine Flood

Station/Sample	Depth/D TB (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
TDS300 Down Current	3	28.3	7.5	2.4	9.3		5,233,593	542,917	1149	**Flood Tide**
030118/TDS300/M/C	18	29.7	7.6	1.0	9.4	X			1149	Down current at slack/flooe
Deep	31/36	29.8	7.6	1.8	9.4				1148	Hurlen placing filter material
TDS350 Down Current	3	28.4	7.5	1.9	9.3		5,233,579	542,913	1146	
Mid	18	29.6	7.6	0.9	9.4				1146	
Deep	32/37	29.8	7.6	1.0	9.4				1145	
TDS150 Down Current	3	28.2	7.5	4.3	9.2		5,233,637	542,928	1156	Elevated turbidity at depth
Mid	16	29.8	7.5	**28.0**	9.4				1155	at early warning point
Deep	26/31	29.8	7.6	**64.2**	9.3				1154	at mid and deep levels
TDS150 Down Current	3	28.4	7.2	3.7	9.2		5,233,637	542,928	1322	Minor turbidity down current
Mid	18	29.7	7.3	1.8	9.3				1323	near work zone
Deep	31/36	29.8	7.3	1.6	9.4				1322	
TDSE300 Down Curent	3	28.7	7.5	3.7	9.2		5,233,590	542,945	1142	
030118/TDSE300/M/C	14	29.4	7.6	4.1	9.3	6			1142	Minor turbidity down current
Deep	22/27	29.7	7.6	2.9	9.3				1141	
TDSE350 Down Current	3	28.4	7.3	2.4	9.2		5,233,576	542,925	1138	
Mid	12	29.6	7.4	2.1	9.3				1137	
Deep	19/24	29.7	7.4	5.0	9.3				1137	Minor turbidity down current
TDSW300 Down Current	3	28.5	7.2	2.1	9.2		5,233,617	542,875	1204	
030118/TDSW300/M/C	18	29.8	**7.5***	1.1	9.4	2			1204	
Deep	31/36	29.9	7.5	0.6	9.3				1203	
TDSW350 Down Current	3	28.3	7.2	2.1	9.2		5,233,606	542,865	1209	
Mid	19	29.8	7.4	0.6	9.4				1209	
Deep	33/38	29.8	7.4	1.2	9.4				1208	
TDN300 UP Current	3	28.5	7.1	6.8	9.3		5,233,745	542,874	1215	Flood Tide
030118/TDN300/M/C	19	29.8	7.5	0.7	9.4	6			1214	
Deep	33/38	29.8	7.5	1.9	9.3				1214	
TDN350 Up Current	3	28.8	7.5	**29.8**	9.2		52,338,755	542,863	1223	High Turbidity from Up
Mid	18	29.8	7.5	0.8	9.4				1222	Current. Not observed in
Deep	32	29.8	7.3	2.0	9.3				1221	1044 measument (previous)
TDNE350	3	28.3	7.1	**12.3**	9.3		5,233,784	542,911	1229	Elevated turbidity from Up
Mid	10	29.4	7.0	**16.5**	9.3				1228	Current near outfall 210
Deep	16/21	29.7	7.0	**4.0**	9.4				1228	
Station TF2+00	3	29.2	7.3	1.0	9.3		5,233,465	542,492	1343	
030118/TF2/M/C	21	29.7	7.3	0.4	9.3	2U			1343	
37/42	37/42	29.8	7.3	0.7	9.3				1342	

Pre-Survey Calibration S. High 1/18 102% Final= 93.6%

DO Calibration as per manufacturer's specifications.

Survey work conducted by D. Berta and S. High Cold, partly sunny weather

Turbidity Calibration as per manufacturer's specifications. Calibration at 0, 10NTU's.

*Winkler results from L&AI = 7.1 and 7.2 mg/L compared to 7.5 with the YSI Sonde

Prepared By/Date:
M. Lloyd 1/18

TSS DATA UPDATE

L&AI

STL Seattle

Client Name	Lloyd & Assoc. Inc.
Project Name	Thea Foss
Date Received	01-20-03

General Chemistry Parameters

Client Sample ID 030118/TDN(300)/M/A
Lab ID 111371-01

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-21-03	mg/L	7	2

Client Sample ID 030118/TDNE(300)/M/A
Lab ID 111371-02

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-21-03	mg/L	10	2

Client Sample ID 030118/TDNW(300)/M/A
Lab ID 111371-03

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-21-03	mg/L	5	2

Client Sample ID 030118/TDS(300)/M/A
Lab ID 111371-04

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-21-03	mg/L	3	2

Client Sample ID 030118/WOS/M/B
Lab ID 111371-05

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-21-03	mg/L	6	2

Client Sample ID 030118/WOC/M/B
Lab ID 111371-06

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-21-03	mg/L	3	2

STL Seattle

Client Sample ID: 030118/WON/M/B
Lab ID: 111371-07

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-21-03	mg/L	3	2

Client Sample ID: 030118/WO300/M/B
Lab ID: 111371-08

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-21-03	mg/L	5	2

Client Sample ID: 030118/TDSE(300)/M/C
Lab ID: 111371-09

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-21-03	mg/L	6	2

Client Sample ID: 030118/TDS(300)/M/C
Lab ID: 111371-10

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-21-03	mg/L	3	2

Client Sample ID: 030118/TDSW(300)/M/C
Lab ID: 111371-11

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-21-03	mg/L	2	2

Client Sample ID: 030118/TDN(300)/M/C
Lab ID: 111371-12

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-21-03	mg/L	6	2

Client Sample ID: 030118/TF2+00/M/C
Lab ID: 111371-13

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-21-03	mg/L	ND	2

STL Seattle

Client Sample ID	030118/WO300/M/C
Lab ID	111371-14

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-21-03	mg/L	8	2

Client Sample ID	030118/WOS/M/C
Lab ID	111371-15

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-21-03	mg/L	2	2

Client Sample ID	030118/WOC/M/C
Lab ID	111371-16

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-21-03	mg/L	3	2

Client Sample ID	030118/WNO/M/C
Lab ID	111371-17

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-21-03	mg/L	2	2

STL Seattle

QUALITY CONTROL REPORT

Client Sample ID: Batch QC
Lab ID: 111300-1
QC Batch Number: 1159-022

Method Blank

Parameter	Result (mg/L)	PQL
Total Suspended Solids	ND	2

Duplicate

Parameter	Sample Result (mg/L)	Duplicate Result (mg/L)	RPD (%)	Flag
Total Suspended Solids	8	8	0.0	

PROJECT THEA FOSS 1/18/03 Notebook No. _____
Continued From Page _____

030.18
Tentative Schedule

Totem Marine Ebb Tide AM

WHEELER-OSGOOD Ebb Tile Ebb tide AM
Compliance Points Only (WO300, WOS, WOC, WON)
Unless there is time for informational stations
Totem Marine - Flood Tide EARLY PM

WHEELER-OSGOOD Ebb Tide PM
Compliance Points Only (WO300, WOS, WOC, WON)
Unless there is time for informational stations

- NATIONAL WEATHER SERVICE (206) 526 6087
- SEATTLE OFFICE WEATHER INFO.
WWW.FEAWFO.NOAA.GOV
NOAA WEATHER RADIO.

CALIBRATION NOTES:
- DO CALIBRATED IN MOIST AIR OVER TAP WATER
D.O. CHECK = 101.0 % BAROMETRIC PRESSURE = 771.2 mm/Hg
- TURBIDITY CALIBRATION BY 2 POINT METHOD.
1) 0.0 = DI WATER 2) 10.0 NTU STANDARD SOLUTION.
TURB CHECK = 10.0

0700 - HURLEN PLACING ROCK @ TOTEM MARINE SITE

206 423 0355 MARTY (HURLEN)
0555 ADVISED HURLEN (RANIER) READINGS @ TONE (350)
OPERATOR INDICATED THEY HAD 2 MORE BUCKETS
AND WILL BREAK TO SWITCH BARGES
AROUND

Continued on Page

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PROJECT Tiger Fog / Wheeler - Osgood

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030118 EBB (MAX) TIDE

SAMPLE

TIME	LOCATION	EVENT	DTB	DEPTH	TEMP	SAL	DO	TURB	TSS
0820	TDN(350)	A	39	D 34	9.4	29.8	6.5	0.9	—
0821	755 863			M 20	9.3	29.6	6.6	0.8	—
0821	(Acc = 5.2)			S 3	9.0	27.7	6.6	2.6	—
0829	TDN(300)		39	D 34	9.3	29.8	6.5	1.4	—
0830	745 874			M 20	9.3	29.7	6.6	0.8	030118/TDN(300)/M/A
0831	(Acc = 4.4)			S 3	9.0	27.8	6.6	5.8	—
0834	TDN(150)		35	D 30	9.3	29.8	6.6	1.5	—
0834	749 857*			M 17	9.3	29.6	6.6	7.4	—
0835	713 907			S 3	9.0	28.0	6.6	5.1	—
	(Acc. 5.9)								
0837	TDNE(300)		24	D 19	9.3	29.7	6.6	3.5	—
0838	770 915			M 12	9.3	29.4	6.6	9.5	030118/TDNE(300)/M/A
0839	(Acc = 5.9)			S 3	9.0	28.2	6.4	13.8	—
0841	TDNE(350)		30	D 25	9.3	29.8	6.6	2.4	—
0842	784 911			M 15	9.4	29.5	6.7	10.6	—
0842	(Acc = 7.5)			S 3	9.1	28.4	6.5	12.2	—
					(AVERAGE - 8.4)			25.2	
0845	TDNW(350)		39	D 34	9.3	29.8	6.8	0.9	—
0845	707 836			M 20	9.3	29.7	6.8	0.5	—
0846	(Acc = 7.5)			S 3	9.1	28.0	6.7	1.9	—
0848	TDNW(300)		39	D 34	9.3	29.8	6.8	0.7	—
0848	703 857			M 20	9.3	29.6	6.8	3.6	030118/TDNW(300)/M/A
0849	(Acc = 8.6)			S 3	9.0	27.6	6.8	3.2	—
0900	TDNE 350		22	D 17	9.3	29.6	6.3	6.6	—
0901	(784 911			M 11	9.3	29.4	6.2	14.3	—
0901	(Acc. 7.4')			S 3	9.0	28.2	6.2	13.7	—

RE RUN OF TDNE 350

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PROJECT THEA FOSS/WHEELER - OSGOOD

Notebook No.

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030118

BARGE BACK TO SITE @ TOTEM MARINE WITH FILTER CAP MATERIAL

1040 HURLEN BEGINS & LOADING MATERIAL - OUTSIDE OF DEBRIS BOOM NO FLOAT. DEBRIS OR VISIBLE TURBIDITY PLUME OBSERVED. MINOR AMOUNTS OF FLOATING WOOD OBSERVER ON INSIDE WORK ZONE AGAINST DEBRIS BOOM

1100 MANSON PLACING ROCK OVER FILTER CAP ON SOUTH BANK OF WHEELER OSGOOD

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TO 30118

TIME	LOCATION	EVENT	DTB							
0911	TDS(300)	A	(58)	D	33	9.4	29.8	6.6	1.0	—
0912	593 917			M	19	9.3	29.6	6.6	1.2	030118/TDS(300)/M
0912	(Acc = 7.3			S	3	9.0	26.5 TB	6.6	3.1	—
0914	TDS(350)	A	(35)	D	33	9.3	29.8	6.7	1.8	—
0914	579 913			M	19	9.3	29.7	6.7	1.2	—
0915	(Acc 13.6)			S	3	9.0	26.5	6.7	3.2	—

— RECHECK OF TDNE(350) EBB TIDE —

TDN (350) AND TDNW 350 & TDS 350

1041	TDNE(350)	B	(25)	D	20	9.3	29.7	6.9	3.0	—
1041	784 911			M	13	9.4	29.6	7.0	7.2	—
1042	(Acc = 5.5')			S	3	9.2	28.2	6.7	8.0	—
1044	TDN (350)	B	(36)	D	31	9.3	29.8	7.2	1.2	—
1045	755 863			M	18	9.4	29.7	7.2	2.2	—
1045	(Acc 4.9')			S	3	9.0	27.8	7.1	3.0	—
1049	TDNW(350)	B	(37)	D	32	9.4	29.8	7.1	1.2	—
1050	707 836			M	18	9.3	29.7	7.3	1.1	—
1050	(Acc 6.3)			S	3	9.2	28.4	7.2	2.1	—
1053	TDS(350)	B	(36)	D	31	9.3	29.8	7.4	1.0	—
1054	579 913			M	18	9.3	29.8	7.4	0.9	—
1054	(Acc = 16.3')			S	3	9.3	28.3	7.3	2.0	—

WHEELER - OSGOOD EBB (→ SLACK)

1102	WOS	B	(15)	D	10	9.4	29.3	6.9	3.3	—
1102	284 994			M	7	9.3	29.0	6.8	3.2	030118/WOS/M/B
1103	(Acc = 6.0)			S	3	9.2	28.1	6.9	2.8	—
1107	WOC	B	(12)	D	8	9.3	29.1	6.9	2.5	—
1108	308 714			M	6	9.2	28.8	7.0	2.4	030118/WOC/M/B
1108	(Acc = 5.9')			S	3	9.2	~~28~~ 27.5	7.2	3.3	—

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PROJECT THEA FOSS/WHEELER - OSGOOD

Notebook No.

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030118

1135 - HURLEY CONTINUE'S PLACEMENT OF FINER CAP MATERIAL

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PROJECT THEA FOSS/WHEELER - OSGOOD

Notebook No. _____ 5

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030118 SAMPLE EBB - (SLACK)

TIME	LOCATION	EVENT	DTB	DEPTH	TEMP	SAL	DO	TURB	TSS
1110	WON	B	(10)	D 7	9.3	28.9	7.1	1.8	—
1110	331 994		(9.7)	M - TSS @ 5.0'					030118/WON/M/B
1111	(ACC=5.2')			S 3	9.3	28.3	7.1	1.8	—
1117	WO 300	B	(8)	D 6	9.3	29.0	7.2	4.5	—
1119	DB ~~266~~ ~~184~~ 253 241			M 4					030118/WO 300/M/B
1118	(ACC=5.5')			S 3	9.1	27.5	7.2	3.5	—
	254 213* * AGAINST DEBRIS BOOM								
1122	WO MID NORTH	B	(4)	D 3	8.9	26.9	7.6	4.3	—
1123	289 187*			S 1	8.5	24.7	7.7	5.5	—
	290 184 (DESIGN) * AGAINST FLOATING DOCK								
1124	WO MID CENTER	B	(9)	D 6	9.2	28.8	7.5	2.5	—
1124	266 184			S 3	9.1	27.6	7.4	3.8	—
	(ACC=6.2')								
1127	WO MID SOUTH	B	(7)	D 3	8.8	26.5	7.6	4.7	—
1127	243 184			S 1	8.6	24.4	7.7	5.7	—
	(ACC=5.1')								
	TOTEM MARINE (SLACK) - FLOOD								
1137	TDSE(350)	C	(24)	D 19	9.3	29.7	7.4	5.0	—
1137	575 946			M 12	9.3	29.6	7.4	2.1	—
1138	(ACC=8.5)			S 3	9.2	28.4	7.3	2.4	—
1141	TDSE(300)	C	(27)	D 22	9.3	29.7	7.6	2.9	—
1142	590 945			M 14	9.3	29.4	7.6	4.1	030118/TDSE(300)/M/C
1142	(ACC=8.6')			S 3	9.2	28.7	7.5	3.7	—
								(DB 1.0)	
1145	TDS(350)		(37)	D 32	9.4	29.8	7.6	1.0	—
1146	579 913			M 18	9.4	29.6	7.6	0.9	—
1146	(ACC=6.2')			S 3	9.3	28.4	7.5	1.9	—

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RM Floyd 1/18 — Signed — Date

PROJECT THEA FOSS / WHEELER - OSGOOD

Notebook No.
Continued From Page

030118

1200 - HURLEN BREAKS FOR LUNCH - LOADER CONTINUES
~~[illegible]~~ MANAGING MATERIALS ON BARGE UNTIL 1215
1300 PUSHING FILTER CAP MATERIAL IN WORK ZONE #5

HACK Winkler Titration 1535 1/18/03

replicate ① 100 ml × 0.02 × 356/100 = 7.1 mg/L

" ② 100 ml × 0.02 × 361/100 = 7.2 mg/L

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030118 FLOOD

SAMPLE

TIME	LOCATION	EVENT	DIR	DEPTH	TEMP	SAL	DO	TURB	TSS
1148	TDS (300)	C	(36)	D 31	9.4	29.9	7.6	1.5	—
1149	593 917			M 18	9.4	29.7	7.6	1.0	030118/TDS(300)/m/c
1149	(Acc = 7.4')			S 3	9.3	28.3	7.5	2.4	—
1154	TDS (15)	C	(31)	D 26	9.3	28.8	7.6	64.2	—
1155	637 928			M 16	9.4	29.8	7.5	28.6	—
1156	(Acc = 16.1)			S 3	9.2	28.2	7.5	4.3	—
1203	TDSW (300)	C	(36)	D 31	9.3	29.9	7.5	0.6	—
1204	617 575			M 18	9.4	29.8	7.5	1.1	030118/TDSW(300)/m/c
1204	(Acc 24.7)			S 3	9.2	28.5	7.2	2.1	—
	* DO SAMPLE CONTAMINATED FROM LINE. MISSED @ LAB LAB								
1208	TDSW (350)	C	(38)	D 33	9.4	29.8	7.4	1.2	—
1209	666 865			M 19	9.4	29.3	7.4	0.6	—
1209	(Acc = 5.1)			S 3	9.2	28.3	7.2	2.1	—
1214	TDW (300)	C	(35)	D 33	9.3	29.8	7.5	1.9	—
1214	745 874			M 19	9.4	29.8	7.5	0.7	030118/TDW(300)/m/c
1215	(Acc = 9.2)			S 3	9.3	28.5	7.1	6.8	—
1221	TDW (350)	C	(37)	D 32	9.3	29.8	7.3	20	—
1222	755 843			M 18	9.4	29.8	7.5	0.8	—
1223	(Acc = 6.6')			S 3	9.2	28.8	7.5	~~17.8~~ 29.8	—
1228	TDNE (350)		(21)	D 16	9.3	29.7	7.0	4.0	—
1228	754 911			M 10	9.3	29.4	7.0	10.5	—
1229	(Acc = 8.7)			S 3	9.3	28.3	7.1	12.3	—

TOTEM MARINE INFORMATIONAL READINGS. SOUTH SIDE ZONE 5
23.17' (AGAINST INTERNAL BARGE LESS THAN 150')

1317	658 932	↳	(14)	D 17	9.4	29.7	7.2	27.8	—
1319	(Acc = 9.4)	C		M 8	9.3	28.5	7.2	16.3	
1319				S 3	9.3	28.5	7.1	7.0	

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Diane H. Bick 01/18/03 _____ [illegible] 1/18 _____
Signed Date Signed Date

PROJECT Thea Foss / Wheeler - Osgood

Notebook No. _____

Continued From Page _____

Supplemental Turbidity Readings Continued from Bottom of this Page

1253	746	895	20	3.0	6.3'	21'
			15	9.7		
			10	12.4		
			5	7.9		
			3	6.3		

1500 Manzer Derrick moved out to mouth of W-O water way.

Supplemental Turbidity Readings Near Totem Marine.

Time	Location		Depth	Turb ~~DTB~~	(Accuracy of GPS)	DTB
1234	806	897	27	1.3 ~~30~~	7.7'	30
			22	1.4		
			15	1.6		
			10	12.3		
			5	11.9		
			3	5.7		
1239	800	902	27	1.8	8.0'	30
			22	1.8		
			15	3.1		
			10	11.2		
			5	12.0		
			3	11.0		
1243	783	902	27	1.1	6.7'	28
			22	1.3		
			15	5.8		
			10	8.6		
			5	14.3		
			3	9.0		
1246	773	906	22	1.8	6.5'	22
			15	2.2		
			10	7.9		
			5	12.1		
			3	8.4		
1248	764	907	15	8.0	6.4'	17
			10	8.7		
			5	9.6		
			3	8.4		

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030118 ADDITIONAL INFORMATION/RESPONSES; SAME

TIME	LOCATION	EVENT	DIB	DEPTH	TEMP	SAL	DO	TURB	TSS
1322	TDS 152	a	34	D 31	9.4	29.5	7.3	1.6	—
1323	640 915	c		M 18	9.3	29.7	7.3	1.8	—
1324	(Acc = 10.1)			S 3	9.2	28.4	7.2	3.7	
1342	TF2+00	c	42	D 37	9.3	29.5	7.3	0.7	—
1343	465 492			M 21	9.3	29.7	7.3	0.4	030118/TF2+00/M/
1343	(Acc = 6.8)			S 3	9.3	29.2	7.3	1.0	—

Wheeler - Osgood Tidal Mix

1503	WO3 ~~0~~	c	11.2	D 9	9.4	29.3	6.7	2.9	—
1507	253 241			M 5	9.3	28.4	6.4	5.2	030118/WO3~~0~~/M/C
1515	Acc = 8.1			S 3	9.1	27.6	6.5	6.1	—
1519	WO MID WATER C		7.1	D 6	9.3	28.7	6.6	2.9	—
	286 157			M —	—	—	—	—	—
	Acc = 8.1			S 3	9.2	27.9	6.6	8.5	
	290 184 Bump - dragged dock, north end of mooring								
1524	WO MID WATER C		12.4	D 10	9.4	29.1	6.6	2.8	—
	266 157			M 4	9.3	28.7	6.6	~~4~~ 2.4	—
	Acc = 5.9			S 3	9.2	27.5	6.7	3.9	—
1528	WO MID SURF C		5.0	D = 7.0	9.3	28.8	6.7	2.7	—
	243 157			M = —	—	—	—		—
	Acc = 7.7			S = 3.0	9.1	27.8	6.9	3.4	—
1533	WO S C		19.0	D = 15	9.4	29.4	6.7	1.4	—
1535	284 96			M = 10	9.4	29.3	6.7	1.9	030118/WO5/M/C
1536	Acc = 6.0			S = 3.0	9.3	28.2	7.0	2.4	—

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Read and Understood By

Signed	Date	Signed	Date
[illegible]	030118	[illegible]	1/18

4
ROJECT

Notebook No.
Continued From Page

1615 Calibration - Post-Sampling
DO = 93.4 %

Continued on Page

Read and Understood By

Signed | Date | Signed | Date

PROJECT Thin Rose

Notebook No. _____

Continued From Page _____

030118 Wheeler - Osgood (con't)

1538	3-1 002	C	14.6	D	12	9.4	29.3	6.7	1.8	—
1540	wcc = 7.5"			M	7	9.4	29.2	6.7	2.3	030118/WOC/M/C
1542	WOC			S	3	9.3	28.4	6.9	3.3	—
	303 994 design									
1548	WON		13.8	D	11	9.4	29.3	6.7	2.0	—
1550	331 994	C		M	7	9.4	24.1	6.8	1.8	030118/WON/
1553	wcc = 6.3"			S	3	9.4	28.6	6.9	2.6	—

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Read and Understood By

[signature] 1/18 _____ [signature] 030118 _____

Signed Date Signed Date

PROJECT THEA FOSS/WHEELER - OSGOOD

Notebook No. _____

Continued From Page _____

230198

1135 - HURLEY CONTINUES PLACEMENT OF FINER CAP MATERIAL

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Signed	Date	Signed	Date

PROJECT THEA FOSS/WHEELER - OSGOOD

Notebook No. _____ 5

Continued From Page _____

030118 SAMPLE EBB - (SLACK)

TIME	LOCATION	EVENT	PTB	DEPTH	TEMP	SAL	DO	TURB	TSS
1110	WOW	B	(10)	D 7	9.3	28.9	7.1	1.8	—
1110	331 994		(9.7)	M - TSS @ 5.0'					030118/WOW/M/B
1111	(Acc=5.2')			S 3	9.3	28.3	7.1	1.8	—
1117	WC 300	B	(8)	D 6	9.3	29.0	7.2	4.5	—
1119	DB ~~266~~ ~~184~~ 253 241			M 4					030118/WO 300/M/B
1118	(Acc=5.5')			S 3	9.1	27.5	7.2	3.5	—
	254 213* * AGAINST DEBRIS BOOM								
1122	WO MID NORTH	B	(4)	D 3	8.9	26.9	7.6	4.3	—
1123	289 187*			S 1	8.5	24.7	7.7	5.5	—
	290 184 (DESIGN) * AGAINST FLOATING DOCK								
1124	WO MID CENTER	B	(9)	D 6	9.2	28.8	7.5	2.5	—
1124	266 184			S 3	9.1	27.6	7.4	3.8	—
	(Acc=6.2')								
1127	WO MID SOUTH	B	(7)	D 3	8.8	26.5	7.6	4.7	—
1127	243 184			S 1	8.6	24.4	7.7	5.7	—
	(Acc=5.1')								
	TOTEM MARINE (SLACK) - FLOOD								
1137	TDSE(350)	C	(24)	D 19	9.3	29.7	7.4	5.0	—
1137	575 946			M 12	9.3	29.6	7.4	2.1	—
1138	(Acc=8.5')			S 3	9.2	28.4	7.3	2.4	—
1141	TDSE(300)	C	(27)	D 22	9.3	29.7	7.6	2.9	—
1142	590 945			M 14	9.3	29.4	7.6	4.1'	030118/TDSE(300)/M/C
1142	(Acc=8.6')			S 3	9.2	28.7	7.5	3.7	—
								(DB 1.0)	
1145	TDS(350)		(37)	D 32	9.4	29.8	7.6	1.0	—
1146	579 913			M 18	9.4	29.6	7.6	0.9	—
1146	(Acc=6.2')			S 3	9.3	28.4	7.5	1.9	—

Continued on Page

Read and Understood By

Daniel A. Becker 01/18/03 — Signed — Date

R M Floyd 1/18 — Signed — Date

PROJECT THEA FOSS / WHEELER - OSGOOD

Notebook No.

Continued From Page

030118

1200 - HURLEIN BREAKS FOR LUNCH - LOADER CONTINUES ~~[illegible]~~ MANAGING MATERIALS ON BARGE UNTIL 1215

1300 PLACING FILTER CAP MATERIAL IN WORK ZONE #5

HACH Winkler Titration 1535 1/18/03

replicate ① 100 ml × 0.02 × 356/100 = 7.1 mg/L

" ② 100 ml × 0.02 × 361/100 = 7.2 mg/L

[signature]

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Signed Date Signed [signature] 1/18 Date

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PROJECT Thea Foss / Wheeler - Osgood
Notebook No.
Continued From Page

1500 Manzer Derrick moved out to mouth of W-O water way.

Continued on Page

Read and Understood By

Signed Date Signed Date

American Civil Constructors

Hurlen Construction

PO Box 80945
700 S. Riverside Dr.
Seattle, WA 98108
(206) 763-1230
FAX (206) 762-1854

FAX TRANSMITTAL

Date:	1/19/03	**Number of Pages Including this Sheet:**	A LOT
Deliver To:	O'LOUGHLIN/WINOARD		
Company:	CITY OF TACOMA		
Fax Number:	253-272-2412		

From:	M. LLOYD
Company:	ACC / Hurlen Construction / L+AI
Fax Number:	206-762-1854
Subject	DAILY REPORT

Lloyd & Associates, Inc.
38210 SE 92nd Street, Snoqualmie, Washington 98065 425-888-1905 rml@centurytel.net

January 19, 2003

TRANSMITTAL

TSS Updated 1/23/03

To: Iain Wingard
John O'Loughlin

Subject: Compliance Monitoring/Wheeler Osgood 1/19/03
Compliance Monitoring / Totem Marine 1/19/03
~~Preliminary Data Transmittal (no TSS)~~

Attached please find results from compliance monitoring for the following work activities:

- Capping work the Wheeler-Osgood Waterway; and
- Placement of filter material at Totem Marine.

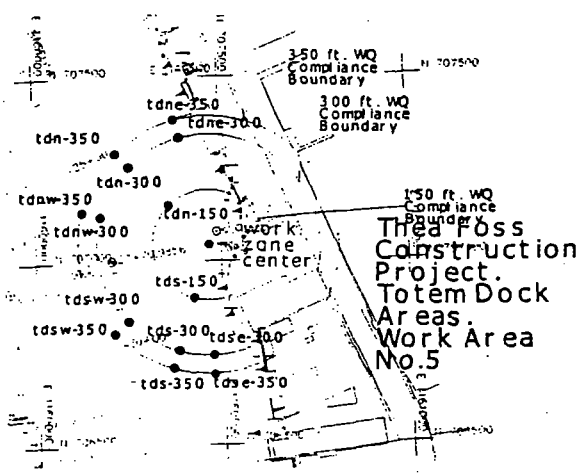
Wheeler-Osgood Capping Work.

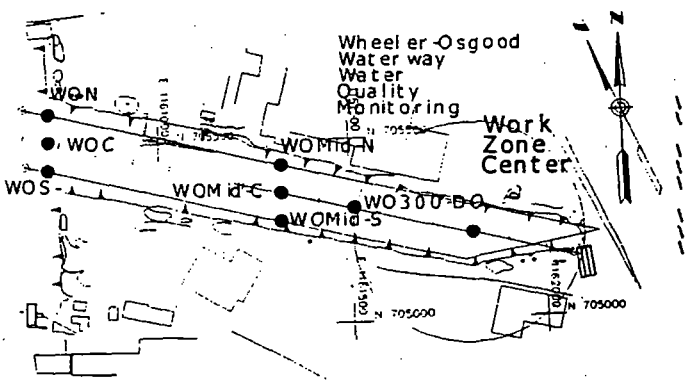
Water quality monitoring was conducted during the morning and afternoon while filter material was being placed in the Wheeler Osgood during an ebb tide event and slack/high tide event. Dissolved oxygen levels at WO300 were acceptable although some turbidity was detected from operations at informationsal stations (WOMID series). Water quality at compliance boundary stations (WOS, WOC, and WON) was acceptable for all parameters.

Totem Marine Capping/Rocking.

Water quality monitoring was conducted during the morning ebb while filter cap material was being placed. Moderately elevated turbidity (12.4 NTU's) was observed in the morning event at Station TDN150, but otherwise work went well without much excitement and/or fanfare. Turbidity was not observed at TDNE stations even though this station has been particularly sensitive to turbidity in previous sampling events when elevated turbidity has been a problem. Additional sampling will be conducted in the coming week to further investigate this sampling area.

Michael Lloyd
Lloyd & Associates, Inc.





Construction Compliance Monitoring **Date: JAN 19** **Wheeler-Osgood Ebb Tide**

Station/Sample	Depth/DTB (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
WO300 (down-current)	3	28.4	7.6	4.8	9.1		5,233,253	542,241	932	**Ebb Tide**
030119/WO300/M/A	4	29.2	7.6	4.1	9.3	4			931	Manson placing rock
Deep	6/8	29.4	7.6	4.8	9.3				930	since early morning
WOMID-N (down-current)	3	28.9	7.8	4.2	9.3		5,233,290	542,184	936	Moved station to point
Deep	6/7.6	29.2	7.7	3.7	9.3				935	Against floating dock
WOMID-C (down-current)	3	28.8	9.3	8.0	3.7		5,233,266	542,184	940	
Mid	6	29.3	9.3	8.0	4.9				939	
Deep	9/11	29.5	9.4	7.9	3.9				938	
WOMID-S (down-current)	1	28.6	9.2	8.0	4.2		5,233,243	542,184	943	
Deep	3/5.5	28.9	9.2	7.9	3.7				941	
WOS (down-current)	3	28.9	8.5	2.2	9.2		5,233,284	542,994	1026	Manson placing rock
030119/WOS/M/A	6	29.3	8.7	2	9.3	2U			1025	on south side of WO*
Deep	10/16	29.4	8.6	2.3	9.3				1025	
WOC (up-current)	3	28.7	8.5	3.0	9.3		5,233,308	542,994	953	
030119/WOC/M/A	8	29.4	8.4	1.3	9.3	2			952	
Deep	14/15.6	29.5	8.4	1.5	9.4				951	
WON (down-current)	3	28.9	8.3	3.1	9.2		5,233,331	542,994	943	
030119/WON/M/A	6	29.3	8.3	1.5	9.3	2U			942	
Deep	10/13	29.5	8.3	1.6	9.3				944	

Pre-Survey Calibration S. High 1/19 99.5 % in saturated air Mild, partly cloudy, dry

DO & Turbidity calibration as per manufacturer's specifications. Turbidity check = 10.2 for 10.0 ntu standard

Survey work conducted by S. High and D. Berta

Manson was placing filter material on top of slope

Turbidity observed at placement at water line. Most of material being placed up the bank above water line

Work in the Wheeler-Osgood Waterway continues to be acceptable. Manson continues to be very responsive to the water quality team and recommendations provided.

Prepared By/Date: M. Lloyd 1/19

TSS DATA UPDATED M. Lloyd 1/25/03

L&AI

Construction Compliance Monitoring **Date: JAN 19** **Totem Marine - Ebb Tide**

Station/Sample	Depth/DTB (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
TDS300	3	29.0	8.8	1.3	9.3		5,233,593	542,917	1032	Ebb Tide - Up Current
030119/TDS300/M/A	19	29.6	9.0	1.1	9.3	2U			1030	Hurlen placing filter material
Deep	32/37	29.8	8.9	1.1	9.4				1028	on south end
TDS350	3	29.0	8.8	1.4	9.0		5,233,579	542,913	1025	
Mid	19	29.6	9.0	1.0	9.3				1020	Hurlen placing filter material
Deep	32/37	29.7	8.9	1.1	9.3				1019	
TDN300 (down-current)	3	29.1	8.9	1.3	9.3		5,233,745	542,874	1054	Ebb Tide Down-Current
030119/TDN300/M/A	19	29.7	8.9	1.8	9.3	2U			1053	
Deep	32/37	29.8	8.9	1.3	9.3				1052	
TDN350	3	29.4	8.9	0.9	9.3		52,338,755	542,863	1050	
Mid	19	29.6	8.9	1.1	9.3				1049	
Deep	32/37	29.7	8.9	1.1	9.3				1048	
TDN150	3	29.0	8.8	12.4	9.2		52,338,713	542,907	1057	Some turbidity at early
Mid	14	29.6	8.7	1.0	9.3				1056	warning point.
Deep	23/28	29.7	8.7	1.6	9.3				1055	
TDNE300 (down-current)	3	29.4	8.7	1.2	9.3		5,233,770	542,915	1100	
030119/TDNE300/M/A	10	29.6	8.7	0.9	9.3	3			1059	No turbidity observed at
Deep	17/21	29.6	8.7	0.9	9.3				1058	these close to shore
TDNE350	3	29.2	8.7	1.1	9.3		5,233,784	542,911	1106	stations.
Mid	12	29.5	8.7	0.9	9.3				1105	
Deep	20/24	29.7	8.6	1.0	9.3				1104	
TDNW300 (down-current)	3	29.3	9.0	0.8	9.3		5,233,703	542,851	1043	
030119/TDNW300/M/A	19	29.6	9.0	0.6	9.3	2U			1042	
Deep	32/37	29.8	9.0	2.0	9.3				1039	
TDNW350	3	29.1	8.9	1.0	9.3		5,233,707	542,836	1047	
Mid	19	29.6	8.9	1.0	9.3				1046	
Deep	32/37	29.8	8.9	1.5	9.3				1045	
Station TF2+00	3	29.6	9.1	0.5	9.3		5,234,465	542,492	1117	
030119/TF2/M/A	20	29.9	9.1	0.9	9.3	2			1116	
37/42	35/41	29.9	9.1	0.6	9.3				1115	
Station TF2+00	3	29.6	9.1	0.6	9.3		5,234,465	542,492	1117	Hurlen finished in-water
030119/TF2/M/A-dup	20	29.9	9.0	0.7	9.3	2			1116	work after lunch.
37/42	35/41	29.9	9.1	0.7	9.3				1115	

Pre-Survey Calibration S. High 1/19 99.5%

DO Calibration as per manufacturer's specifications.

Survey work conducted by D. Berta and S. High Mild, partly sunny weather

Turbidity Calibration as per manufacturer's specifications. Calibration at 0, 10NTU's.

Turbidty check for 10 ntu standard = 10.0 ntu

Relatively calm day at Totem. Hurlen got to a late start in placing sand. They stopped in the early afternoon to move barges and to get survey completed for filtermaterial. They expect to place riprap tomorrow.

Prepared By/Date: M. Lloyd 1/19

Preliminary: M. Lloyd 1/23/03

L&AI

Construction Compliance Monitoring **Date: JAN 19** **Wheeler-Osgood/Flood Tide**

Station/Sample	Depth/DTB (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
WO300 (down-current)	3	28.9	8.5	5.5	9.3		5,233,253	542,216	1315	**Slack to Flood Tide**
030119/WO300/M/B	4					9			1314	Manson placing rock
Deep	6/9	29.4	8.5	4.9	9.3				1312	since mid morning
WOMID-N (down-current)	1	28.4	8.6	7.8	9.2		5,233,290	542,184	1321	
Deep	3/4	28.6	8.6	6.6	9.2				1320	
WOMID-C (down-current)	3	28.6	8.8	6.8	9.2		5,233,266	542,184	1324	
Deep	6/9.5	29.4	8.7	3.3	9.3				1323	
WOMID-S (down-current)	1	28.3	8.8	7.4	9.1		5,233,243	542,184	1328	
Deep	3/4	28.7	8.7	5.6	9.2				1327	
WOS (down-current)	3	29.0	9.1	1.9	9.3		5,233,284	542,994	1348	
030119/WOS/M/B	5	29.1	9.0	1.4	9.3	2U			1347	
Deep	8/11	29.5	9.0	1.3	9.3				1346	
WOC (up-current)	3	28.9	9.2	1.7	9.3		5,233,308	542,994	1324	
030119/WOC/M/B	7	29.6	9.1	0.7	9.3	2			1341	
Deep	10/13	29.6	9.0	1.4	9.4				1340	
WON (down-current)	3	29	9.1	1.9	9.3		5,233,331	542,994	1336	
030119/WON/M/B	5	29.1	9.0	1.4	9.3	2U			1334	
Deep	8/11	29.5	9.0	1.3	9.3				1332	

Pre-Survey Calibration check D. Berta 1/19 — Mild, cloudy, dry

DO & Turbidity calibration as per manufacturer's specifications.
Survey work conducted by D. Berta
Manson was placing filter material on top of slope
Most of material being placed up the bank above water line
Work continues to go well. No problems observed in Wheeler-Osgood.

Prepared By/Date:
M. Lloyd 1/19

TSS DATA UPDATED
M. Lloyd 1/25/03

L&AI

Construction Compliance Monitoring Date: JAN 19 Totem Marine - Ebb Tide

Station/Sample	Depth/DTB (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
TDS300	3	29.0	8.8	1.3	9.3		5,233,593	542,917	1032	**Ebb Tide - Up Current**
030119/TDS300/M/A	19	29.6	9.0	1.1	9.3	2U			1030	Hurlen placing filter material
Deep	32/37	29.8	8.9	1.1	9.4				1028	on south end
TDS350	3	29.0	8.8	1.4	9.0		5,233,579	542,913	1025	
Mid	19	29.6	9.0	1.0	9.3				1020	Hurlen placing filter material
Deep	32/37	29.7	8.9	1.1	9.3				1019	
TDN300 (down-current)	3	29.1	8.9	1.3	9.3		5,233,745	542,874	1054	Ebb Tide Down-Current
030119/TDN300/M/A	19	29.7	8.9	1.8	9.3	2U			1053	
Deep	32/37	29.8	8.9	1.3	9.3				1052	
TDN350	3	29.4	8.9	0.9	9.3		52,338,755	542,863	1050	
Mid	19	29.6	8.9	1.1	9.3				1049	
Deep	32/37	29.7	8.9	1.1	9.3				1048	
TDN150	3	29.0	8.8	**12.4**	9.2		52,338,713	542,907	1057	Some turbidity at early
Mid	14	29.6	8.7	1.0	9.3				1056	warning point.
Deep	23/28	29.7	8.7	1.6	9.3				1055	
TDNE300 (down-current)	3	29.4	8.7	1.2	9.3		5,233,770	542,915	1100	
030119/TDNE300/M/A	10	29.6	8.7	0.9	9.3	3			1059	No turbidity observed at
Deep	17/21	29.6	8.7	0.9	9.3				1058	these close to shore
TDNE350	3	29.2	8.7	1.1	9.3		5,233,784	542,911	1106	stations.
Mid	12	29.5	8.7	0.9	9.3				1105	
Deep	20/24	29.7	8.6	1.0	9.3				1104	
TDNW300 (down-current)	3	29.3	9.0	0.8	9.3		5,233,703	542,851	1043	
030119/TDNW300/M/A	19	29.6	9.0	0.6	9.3	2U			1042	
Deep	32/37	29.8	9.0	2.0	9.3				1039	
TDNW350	3	29.1	8.9	1.0	9.3		5,233,707	542,836	1047	
Mid	19	29.6	8.9	1.0	9.3				1046	
Deep	32/37	29.8	8.9	1.5	9.3				1045	
Station TF2+00	3	29.6	9.1	0.5	9.3		5,234,465	542,492	1117	
030119/TF2/M/A	20	29.9	9.1	0.9	9.3	2			1116	
37/42	35/41	29.9	9.1	0.6	9.3				1115	
Station TF2+00	3	29.6	9.1	0.6	9.3		5,234,465	542,492	1117	Hurlen finished in-water
030119/TF2/M/A-dup	20	29.9	9.0	0.7	9.3	2			1116	work after lunch.
37/42	35/41	29.9	9.1	0.7	9.3				1115	

Pre-Survey Calibration S. High 1/19 99.5%

DO Calibration as per manufacturer's specifications.

Survey work conducted by D. Berta and S. High Mild, partly sunny weather

Turbidity Calibration as per manufacturer's specifications. Calibration at 0, 10NTU's.

Turbidty check for 10 ntu standard = 10.0 ntu

Relatively calm day at Totem. Hurlen got to a late start in placing sand. They stopped in the early afternoon to move barges and to get survey completed for filtermaterial. They expect to place riprap tomorrow.

Prepared By/Date:

M. Lloyd 1/19

TSS DATA UPDATED: M. Lloyd 1/23/03

L&AI

STL Seattle

Client Name	Lloyd & Assoc. Inc.
Project Name	Thea Foss
Date Received	01-20-03

General Chemistry Parameters

Client Sample ID 030119/WO300/M/A
Lab ID 111375-01

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-20-03	mg/L	4	2

Client Sample ID 030119/WNO/M/A
Lab ID 111375-02

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-20-03	mg/L	ND	2

Client Sample ID 030119/WOC/M/A
Lab ID 111375-03

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-20-03	mg/L	2	2

Client Sample ID 030119/WOS/M/A
Lab ID 111375-04

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-20-03	mg/L	ND	2

Client Sample ID 030119/TDS(300)/M/A
Lab ID 111375-05

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-20-03	mg/L	ND	2

STL Seattle is a part of Severn Trent Laboratories, Inc.

STL Seattle

Client Sample ID	030119/TDNW(300)/M/A
Lab ID	111375-06

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-20-03	mg/L	ND	2

Client Sample ID	030119/TDH(300)/M/A
Lab ID	111375-07

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-20-03	mg/L	2	2

Client Sample ID	030119/TDNE(300)/M/A
Lab ID	111375-08

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-20-03	mg/L	3	2

Client Sample ID	030119/TF2+00/M/A
Lab ID	111375-09

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-20-03	mg/L	2	2

Client Sample ID	030119/TF2+00/M/DUP
Lab ID	111375-10

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-20-03	mg/L	2	2

Client Sample ID	030119/WO300/M/B
Lab ID	111375-11

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-20-03	mg/L	9	2

Client Sample ID	030119/WNO/M/B
Lab ID	111375-12

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-20-03	mg/L	ND	2

STL Seattle

Client Sample ID	030119/WOC/M/B
Lab ID	111375-13

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-20-03	mg/L	2	2

Client Sample ID	030119/WOS/M/B
Lab ID	111375-14

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-20-03	mg/L	ND	2

PROJECT THEA FOSS

Notebook No. _____
Continued From Page _____

SCHEDULE 1/19/03

7:30 Totem Marine Ebb - Check TDNE150
GCC-Hurlen will start late @ 900
10:00 Wheeler - OSgood Ebb
Manson will start and end early
1300/1400 Totem Marine Flood Tide

Do not let otters bite your Sonde Have a good day

MICHAEL LLOYD

CALIBRATION NOTES:

D.O. CALIBRATED IN MOIST AIR OVER TAP WATER
D.O. CALIBRATION CHECK = 99.5 ℓ=773 y [illegible]

TURBIDITY CALIBRATED BY MANUFACTURERS 2 POINT METHOD: 1/ 0.0 NTU = D.I WATER 2/ 10.0 NTU = 10.2, 0.0 STANDARD SOLUTION.
TURBIDITY CALIBRATION CHECK = 10.0

MANSON WORKING IN WHEELER - OSGOOD

Continued on Page

Read and Understood By

[signature] 030119 Daniel A. Burke 01/19/03

Signed Date Signed Date

PROJECT Thea Foss / Wheeler - Osgood

Notebook No. _____

Continued From Page _____

030119 Wheeler - Osgood

Sample

Time	Location	Event	D.B.	Depth	Temp	Sal	Do	Turb	TSS
0930	WO300	A	10.0	D 8	9.3	29.4	7.5	4.8	—
0931	253 241			M 5	9.3	29.2	7.6	4.1	030119/WO300/M/A
0932	acc = 5.9'			S 3	9.1	28.4	7.6	4.8	

Placing spall on N. side of WO water way in WZ #1

0934	WOMID N	A	7.6	D 6	9.3	29.2	7.7	3.7	—
0935	290 184			M —	—	—	—	—	—
0936	acc - 7.0'			S 3	9.3	28.9	7.8	4.2	—
0938	WOMID Center		10.9	D 9	9.4	29.5	7.9	3.9	—
0939	266 184	A		M 6	9.3	~~29.3~~	8.0	4.9	—
0940	acc = 7.2'			S 3	9.3	28.8	8.0	3.7	—
0941	WOMID South		5.5	D 3	9.2	28.9	7.9	3.7	—
0942	243 184	A		M —	—	—	—	—	—
0943	acc = 6.9			S 1	9.2	28.6	8.0	4.2	—
0941	WO N		13.0	D 10	9.3	29.5	8.3	1.6	—
0942	331 994	A		M 6	9.3	29.3	8.3	1.5	030119/WON/M/A
0943	acc 6.4			S 3	9.2	28.9	8.3 (8.3)	3.1	
0951	WO Center		15.6	D 14	9.4	29.5	8.4	~~14.8~~ 1.5 Aft Bottom w/Sonde	—
0952	308 994	A		M 8	9.3	29.4	8.4	1.3	030119/WOC/M/A
0953	acc 7.0			S 3	9.3	28.7	8.5	3.0	—

Continued on Page

Read and Understood By

Daniel A. Berk 01/19/03 — Signed — Date

030119 — Signed — Date

PROJECT

Notebook No.

Continued From Page

1020 Begin placing [illegible] MR at WZ #5

Continued on Page

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030119 Daniel A. Baker 01/19/03

Signed Date Signed Date

PROJECT THEA FOSS/WHEELER OSGOOD

Notebook No. _____

Continued From Page _____

030119

t	Location	Event	DTB	Depth	Temp	Sal	DO	turb	TSS
0956	WOS		~~16.7~~	D 10	9.3	29.4	8.6	2.3	
0957	284 994		13.0	M 6	9.3	29.3	8.7	2.0	030119/WOS/M/A
0958	acc 7.4			S 3	9.2	28.9	8.5	2.2	

Totem Dock / Ebb Tide - RM

1019	TDS 350	A	37.3	D 32	9.3	29.7	8.9	1.1	—
	579 913			M 19	9.3	29.6	9.0	1.0	— ~~030119/TDS300/M/~~
1025	acc 7.5			S 3	9.3	29.0	8.8	1.7	—
1028	TDS 300	A	37.2	D 32	9.4	29.8	8.9	1.1	—
1030	593 917			M 19	9.3	29.6	9.0	1.1	030119/TDS300/M/A
1032	acc			S 3	9.3	29.0	8.8	1.3	—
1039	TDNW300	A	37.3	D 32	9.4	29.8	9.0	2.0	—
1042	703 851			M 19	9.3	29.6	9.0	0.6	030119/TDNW300/M/A
1043	acc 4.2'			S 3	9.3	29.3	9.0	0.8	—
1045	TDNW350	A	37.3	D 32	9.3	29.8	8.9	1.5	—
1046	707 836			M 19	9.3	29.6	8.9	1.0	—
1047	acc = 8.2			S 3	9.3	29.1	8.9	1.0	—
1048	TDN 350	A	37.0	D 32	9.3	29.7	8.9	1.1	—
1049	765 863			M 19	9.3	29.6	8.9	1.1	—
1050	acc = 5.2'			S 3	9.3	29.4	8.9	0.9	—

Continued on Page

Read and Understood By

Daniel A. Beck 01/19/03 — Signed — Date

030119 — Signed — Date

PROJECT

Notebook No.
Continued From Page

1250 HURLEY STOPS PLACING MATERIAL ACCORDING TO OPERATORS ONLY WORK REMAINING IS TO LOAD MATERIAL FOR MANSON IE NO IN WATER WORK

1300 MANSON PLACING FILTER CAP MATERIAL ON SOUTH SIDE OF WHEELER OSGOOD

Continued on Page

Read and Understood By

030119

Signed Daniel H. Bek Date 01/19/03 Signed Date

PROJECT The Pool

Notebook No. _____ 71

Continued From Page _____

030119 Tolson Dock

t	Location	Event	DTB	Depth	Temp	Sal	DO	Turb	TSS
1047	TDN300	A	36.8	D 32	9.3	29.8	8.8	1.3	—
1053	745 874			M 19	9.3	29.7	8.9	1.8	030119/TDN300/M/A
1054	acc = 5.2'			S 5	9.3	29.1	8.9	1.3	—
1055	TDN150		25	D 23	9.3	29.7	8.7	1.6	—
1056	713907	A		M 14	9.3	29.6	8.7	1.0	—
1057	acc = 5.3			S 3	9.2	29.0	8.8	12.7	—
1058	TDNE300		21.2	D 17	9.3	29.6	8.7	0.9	—
1059	770 915	A		M 10	9.3	29.4	8.7	0.9	030119/TDNE300/M/A
1100	acc = 4.8			S 3	9.3	29.4	8.7	1.2	—
1104	TDNE350		24.3	D 20	9.3	29.7	8.6	1.0	—
1105	784 911	A		M 12	9.3	29.5	8.7	0.9	—
1106	acc = 5.0			S 3	9.3	29.2	8.7	1.1	—
1115	TF2400	A	40.6	D 35	9.3	29.9	9.1	0.6	—
1116	465 492			M 20	9.3	29.9	9.2	0.9	030119/TF2400/M/A
1117	acc = 5.5			S 3	9.3	29.6	9.1	0.5	—
1119				M 20	9.3	29.9	9.1	0.7	030119/TF2400/M/D
1120				D 35	9.3	29.9	9.0	0.7	—
1121				S 3	9.3	29.6	9.1	0.6	—

SINK => FLOAT Cover Cone 2

WHEELER CLOSED

t	Location	Event	DTB	Depth	Temp	Sal	DO	Turb	TSS
1312	WO300	B (8.7)		D 6	9.3	29.4	8.5	7.9	—
1314	283 216			M 4	TSS SAMPLE ONLY @ 4.0' 030119/WO300/M				
1315	(Acc 6.5)			S 3	9.3	28.9	8.5	5.5	—
1320	WO MID NORTH B		7.0	D 5.0	9.2	28.6	8.6	6.6	—
1321	290 154			~~M~~ NA	—	—	—	—	—
	(Acc = 6.1')			S 1.0	9.2	29.4	8.6	7.9	

Continued on Page

Read and Understood By

030119

Signed Paul A. Beck Date 01/19/03 Signed Date

PROJECT THEA FOSS / WHEELER - OSGOOD.

Notebook No.

Continued From Page

030119

1400

ACCORDING TO MANSON REP THEY WERE DONE WITH MATERIAL OF WORK THEY WILL CLEAN UP & EXIT WATERWAY BY 1430

Continued on Page

Read and Understood By

Daniel A Burke 01/19/03 — Signed — Date

[signature] 1/19/07 — Signed — Date

PROJECT THEA FOSS / WHEELER OSGOOD

Notebook No. _____

Continued From Page _____

030119

TIME	LOCATION	EVENT	DTB	SAMPLE DEPTH	TEMP	SAL	DO	TURB	TSS
1323	WO MID CENTER	B	D 9.5	D 6	9.3	29.4	8.7	3.3	—
1324	266 184		S	S 3	9.2	28.6	8.8	6.8	—
	(Acc=6.2)								
1327	WO MID SOUTH	B	D 4	D 3	9.2	28.7	8.7	5.6	—
1328	243 184		S	S 1	9.1	28.3	8.8	7.4	—
	(Acc = 6.0')								
1332	WON	B 11	D 8		9.3	29.5	9.0	1.3	—
1334	331 994		M 5		9.3	29.1	9.0	1.4	030119/WON/M/B
1336	(Acc 6.1)		S 3		9.3	29.0	9.1	1.9	—
1340	WOC	B 15	D 10		9.4	29.6	9.0	1.4	—
1341	308 994		M 7		9.3	29.6	9.1	0.7	030119/WOC/M/B
1342	(Acc=7.5)		S 3		9.3	28.9	9.2	1.7	—
1346	WOS	B 18	D 13		9.4	29.6	9.0	1.5	—
47	254 994		M 9		9.3	29.6	9.0	1.3	030119/WOS/M/B
48	(Acc 5.5')		S 3		9.3	29.2	9.2	1.6	—

Continued on Page

Read and Understood By

Daniel A Bark 01/19/03 — Signed

[signature] 030120 — Date

[signature] 1/19/03 — Signed — Date

L&A

Lloyd & Associates, Inc.
38210 SE 92nd Street, Snoqualmie, Washington 98065 425-888-1905 rml@centurytel.net

January 20, 2003

TRANSMITTAL

TSS Updated 1/30/03 RML

To: Iain Wingard
John O'Loughlin

Subject: Compliance Monitoring / Totem Marine 1/20/03
Preliminary Data Transmittal (no TSS)

Attached please find results from compliance monitoring for the following work activities:

- Placement of rock at Totem Marine.

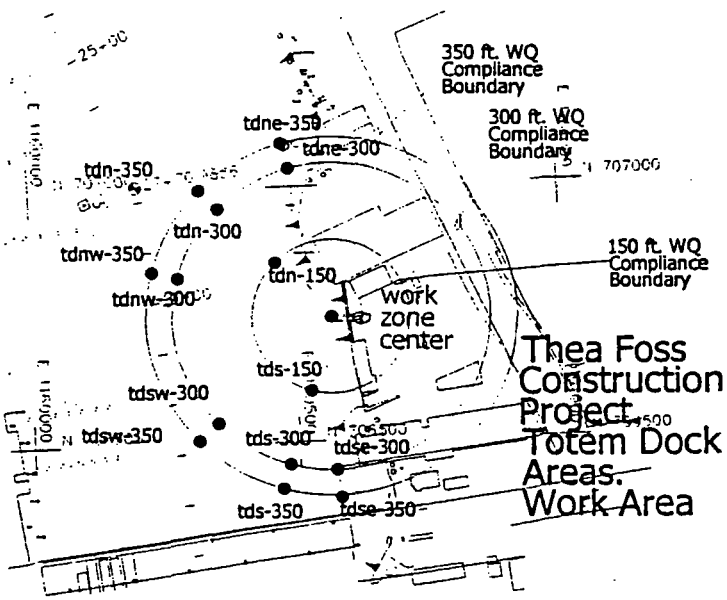
There was no in-water work at Wheeler-Osgood today.

Totem Marine Capping/Rocking.

Water quality monitoring was conducted during the morning ebb while rock was being placed. Moderately elevated turbidity (12.2 NTU's) at depth was observed at Station TDNE350 (see data summary), but this pattern of turbidity at depth was quite differenct that than observed at TDNE300 or TDN150, closer to the construction zone. The morning survey was repeated while Hurlen continued to place rock on the slope on the south side. Dissolved oxygen levels were acceptable and no problems were reported.

Field Duplicate data continues to be very good as noted in data reports provided to date. TSS data will be provided as an update to this report when submitted by STL.

Michael Lloyd
Lloyd & Associates, Inc.



Construction Compliance Monitoring

Date: JAN 20 **Totem Marine - Ebb Tide**

Station/Sample	Depth/DTB (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
TDS300 (Up-Current)	3	28.3	8.8	1.7	9.2		5,233,593	542,917	933	**Ebb Tide - Up Current**
030120/TDS300/M/B	20	29.5	8.4	1.1	9.3	X			932	Hurlen placing rock material
Deep	35/39	29.7	8.3	1.8	9.4				931	on south end at 7:45 AM
TDS350	3	28.0	8.7	1.8	9.2		5,233,579	542,913	930	
Mid	20	29.5	8.4	1.2	9.3				929	
Deep	35/40	29.7	8.5	1.7	9.4				928	
TDN300 (down-current)	3	28.4	8.9	1.1	9.2		5,233,745	542,874	953	Ebb Tide Down-Current
030120/TDN300/M/A	20	29.6	8.6	1.3	9.3	3			952	
Deep	35/39	29.7	8.7	2.2	9.4				951	
TDN350	3	28.6	8.9	0.9	9.1		52,338,755	542,863	950	
Mid	20	29.6	8.6	1.0	9.3				949	
Deep	35/39	29.7	8.7	2.1	9.4				948	
TDN150	3	28.9	8.8	1.1	9.2		52,338,729	542,886	959	Location moved to point
Mid	18	29.6	8.4	1.3	9.3				958	near debris boom
Deep	31/36	29.7	8.4	2.3	9.4				957	
TDNE300 (down-current)	3	28.6	8.7	5.3	9.1		5,233,770	542,915	1002	
030120/TDNE300/M/B	9	29.2	8.6	9.9	9.3	9			1001	
Deep	15/17	29.5	8.8	6.2	9.3				1000	
TDNE350	3	28.8	8.6	7.1	9.2		5,233,784	542,911	1006	Turbidity at this station is oddly
Mid	12	29.4	8.5	5.6	9.3				1005	higher at depth than TDNE300
Deep	20/24	29.6	8.7	2.4	9.3				1004	
TDNW300 (down-current)	3	27.9	9.0	1.1	9.0		5,233,703	542,851	938	
030120/TDNW300/M/B	20	29.5	8.7	1.2	9.3	3			936	
Deep	35/40	29.7	8.8	2.1	9.4				935	
TDNW350	3	28.5	9.0	1.1	9.0		5,233,707	542,836	942	
Mid	20	29.5	8.8	1.0	9.3				941	
Deep	35/39	29.7	8.8	1.6	9.4				940	
Station 2+00	3	29.0	9.1	0.6	9.2		5,233,465	542,492	1018	
030120/TF2/M/B	21	29.8	9.2	0.3	9.3	2U			1017	
Deep	37/42	29.8	9.1	0.3	9.3				1016	
Station 2+00	3	29.2	9.1	0.6	9.3				1023	Field duplicate
030120/TF2/M/B-Dup	21	29.8	9.1	0.2	9.3	2U			1022	Field duplicate
Deep	37/42	29.8	9.2	0.6	9.3				1021	Field duplicate

Pre-Survey Calibration D. Berta 1/20 101.6% Final = 98.4 %

DO Calibration as per manufacturer's specifications.

Survey work conducted by D. Berta and S. High

Mild, cloudy weather, dry

Turbidity Calibration as per manufacturer's specifications. Calibration at 0, 10NTU's.

Relatively calm day at Totem. Hurlen placed riprap at about 7:45 AM and finished before lunch

Hurlen will not do in-water work until a barge shows up tomorrow.

Prepared By/Date:

M. Lloyd 1/20

TSS Updated 1/30/03

L&AI

Construction Compliance Monitoring Date: JAN 20 Totem Marine - Ebb Tide

Station/Sample	Depth/DTB (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
TDS300 (Up-Current)	3	27.9	8.3	0.9	9.0		5,233,593	542,917	911	**Ebb Tide - Up Current**
030120/TDS300/M/A	20	29.4	8.0	1.3	9.3	2			909	Hurlen placing rock material
Deep	35/39	29.7	8.1	1.5	9.4				908	on south end at 7:45 AM
TDS300 (Up-Current)	3	27.1	8.5	1.3	9.0		5,233,593	542,917	915	**Field Duplicate**
030120/TDS300/M/A-Dup	20	29.5	7.9	1.6	9.3	3			914	
Deep	35/39	29.7	8.0	2.0	9.4				912	
TDS350 (Up-Current)	3	28.7	8.6	0.8	9.2		5,233,579	542,913	927	
Mid	20	29.5	8.3	1.1	9.3				926	
Deep	35/39	29.7	8.4	1.8	9.4				925	
TDN300 (down-current)	3	28.5	8.0	0.8	9.2		5,233,745	542,874	856	Ebb Tide Down-Current
030120/TDN300/M/A	20	29.5	7.7	1.4	9.3	3			854	
Deep	35/40	29.7	7.7	2.1	9.3				853	
TDN350	3	28.5	8.0	0.8	9.2		52,338,755	542,863	852	
Mid	20	29.5	7.7	1.0	9.3				850	
Deep	35/40	29.6	7.7	1.5	9.4				849	
TDN150	3	27.1	7.5	9.1	9.2		52,338,750	542,898	831	Location moved to point
Mid	15	29.4	7.3	1.2	9.3				831	near debris boom
Deep	25/30	29.5	7.3	1.4	9.2				831	
TDNE300 (down-current)	3	28.0	7.8	9.8	9.1		5,233,770	542,915	841	
030120/TDNE300/M/A	7	28.9	7.6	1.5	9.3	2			839	
Deep	12/14	29.2	7.5	1.3	9.3				838	
TDNE350	3	28.5	7.7	10.0	9.2		5,233,784	542,911	846	Turbidity at this station is oddly
Mid	11	29.1	7.6	12.2	9.3				845	higher at depth than TDNE300
Deep	20/22	29.5	7.5	10.4	9.3				844	
TDNW300 (down-current)	3	28.3	8.1	1.0	9.2		5,233,703	542,851	900	
030120/TDNW300/M/A	20	29.5	7.8	1.0	9.3	2U			859	
Deep	35/41	29.7	8.1	1.5	9.4				857	
TDNW350	3	28.1	8.2	1.0	9.2		5,233,707	542,836	905	
Mid	20	29.5	7.9	0.8	9.3				904	
Deep	35/40	29.7	8.0	1.5	9.4				903	

Pre-Survey Calibration D. Berta 1/20 101.6%

DO Calibration as per manufacturer's specifications.

Survey work conducted by D. Berta and S. High Mild, cloudy weather, dry

Turbidity Calibration as per manufacturer's specifications. Calibration at 0, 10NTU's.

Relatively calm day at Totem. Hurlen placed riprap at about 7:45 AM

Prepared By/Date:

M. Lloyd 1/20

TSS Updated 1/30/03

L&AI

1/20/03

STL Seattle

Client Name	Lloyd & Assoc. Inc.
Project Name	Thea Foss
Date Received	01-22-03

General Chemistry Parameters

Client Sample ID 030120/TDN(300)/M/A
Lab ID 111436-01

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-23-03	mg/L	3	2

Client Sample ID 030120/TDNW(300)/M/A
Lab ID 111436-02

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-23-03	mg/L	ND	2

Client Sample ID 030120/TDNE(300)/M/A
Lab ID 111436-03

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-23-03	mg/L	2	2

Client Sample ID 030120/TDS(300)/M/A
Lab ID 111436-04

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-23-03	mg/L	ND	2

Client Sample ID 030120/TDS(300)/M/DUP
Lab ID 111436-05

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-23-03	mg/L	3	2

Client Sample ID 030120/TDS(300)/M/B
Lab ID 111436-06

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-23-03	mg/L	2	2

STL Seattle

Client Sample ID	030120/TDNW(300)/M/B
Lab ID	111436-07

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-23-03	mg/L	3	2

Client Sample ID	030120/TDN(300)/M/B
Lab ID	111436-08

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-23-03	mg/L	3	2

Client Sample ID	030120/TDNE(300)/M/B
Lab ID	111436-09

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-23-03	mg/L	9	2

Client Sample ID	030120/TF2+00/M/B
Lab ID	111436-10

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-23-03	mg/L	ND	2

Client Sample ID	030120/TF2+00/M/DUP
Lab ID	111436-11

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-23-03	mg/L	ND	2

STL Seattle

QUALITY CONTROL REPORT

Client Sample ID: Batch QC
Lab ID: 111443-10
QC Batch Number: 1159-024

Method Blank

Parameter	Result (mg/L)	PQL
Total Suspended Solids	ND	2

Duplicate

Parameter	Sample Result (mg/L)	Duplicate Result (mg/L)	RPD (%)	Flag
Total Suspended Solids	3.8	4.4	15	

PROJECT

Notebook No.
Continued From Page

0745 Start placing material at Toten (spalls)
0819 Calibrate
DO = 101.6
Turbidity 0, 10.0

Continued on Page

Read and Understood By

030120 | 1/20/03
Signed | Date | Signed | Date

PROJECT Thea Ross

Notebook No. _____ 75

Continued From Page _____

030120

Time	Location	Event	DTB	Sample Depth	Temp	Sal	DO	Turb	TSS
0831	TDN150	A	29.8	D 25	9.3	29.5	7.3	1.4	—
	750 898			M 15	9.3	29.4	7.3	1.2	030120/TDN150/M/A
	acc 17'			S 3	9.2	27.1	7.5	9.1	—
	Design 713 907								
	→ wt. Proved								
0835	TDNE300		17.2	D 12	9.3	29.2	7.5	9.8	— 300 ZOL
0839	770 915	A		M 7	9.3	28.9	7.6	1.5	030120/TDNE150/M/A
0841	acc 16'			S 3	9.1	28.0	7.8	1.3	—
0844	TDNE350		22.0	D 20	9.3	29.5	7.5	10.4	—
0845	784 911	A		M 11	9.3	29.1	7.6	12.2	—
0846	acc 5.2			S 3	9.2	28.5	7.7	10.0	—
0849	TDN350		40.0	D 35	9.4	29.6	7.7	1.5	—
0850	755 863	A		M 20	9.3	29.5	7.7	1.0	—
42	acc 4.9'			M 3	9.2	28.5	8.0	0.8	—
0853	TDN 300		39.8	D 35	9.3	29.7	7.9	2.1	—
0854	745 874	A		M 20	9.3	29.5	7.7	1.4	030120/TDN300/M/A
0856	acc 4.9'			S 3	9.2	28.5	8.0	0.8	—
0857	TDNW300		40.8	D 25	9.4	29.7	8.0	1.5	—
0859	703 851	A		M 20	9.3	29.5	7.8	1.0	030120/TDNW300/M/A
0900	acc 4.9'			S 3	9.2	28.3	8.1	1.0	—
0903	TDNW350	A	40.0	D 35	9.4	29.7	8.0	1.5	—
0904	707 836			M 20	9.3	29.5	7.9	0.8	—
0905	acc 4.9			S 3	9.2	28.1	8.2	1.0	—

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[signature] Signed 1/20/03 ~~1/20/03~~ Date

PROJECT

Notebook No.

Continued From Page

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Read and Understood By

Signed	Date	Signed	Date

PROJECT The Ross

Notebook No. _____ 77

Continued From Page _____

030120 Totem Marine Dock

Time	Location	Event	DTB	Sample Depth	Temp	~~DO~~ Sal	~~Turbidity~~ DO	Turb	TBS
0908	~~TDS~~ 300	A	39.4	D 35	9.4	29.7	8.1	1.5	—
0909	TDS			M 20	9.3	29.4	8.0	1.3	030120/TDS300/M A
0911	593 917			S 3	9.0	27.9	8.3	0.9	—
Drum	acc = 9.0'								
0912		A	39.4	D 35	9.4	29.7	8.0	2.0	—
0914	~~TDS~~			M 20	9.3	29.5	7.4	1.6	030120/TDN300/M/Dup
0915	~~TDS 350~~			S 3	9.0	27.1	8.5	1.3	—
0925	TDS350	A	39.3	D 35	9.4	29.7	8.4	1.8	—
0926	579 913			M 20	9.3	29.5	8.3	1.1	—
0927	acc 12.4			S 3	9.2	28.7	8.6	0.8	—
0928	TDS350	B	39.6	D 35	9.4	29.7	8.5	1.7	—
0929	579 913			M 20	9.3	29.5	8.4	1.2	—
0930	acc 8.1'			S 3	9.2	28.0	8.7	1.8	—
0931	TDS300		38.5	D 35	9.4	29.7	8.3	1.8	—
0932	593 917			M 20	9.3	29.5	8.4	1.1	030120/TDS300/M/B
0933	acc 7.6'			S 3	9.2	28.3	8.8	1.7	—
0935	TDNW300		40.0	D 35	9.4	29.7	8.8	2.1	—
0936	703 857			M 20	9.3	29.5	8.7	1.2	030120/TDNW300/M/B
0938	acc 6.0'			S 3	9.0	27.9	9.0	1.1	—
0940	TDNW350		39.3	D 35	9.4	29.7	8.8	1.6	—
0941	707 836			M 20	9.3	29.5	8.8	1.0	—
0942				S 3	9.1	28.5	9.0	1.1	—

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[signature] Signed 1/20/03 Date

PROJECT

Notebook No.

Continued From Page

1028 Post Sampling Calibration DO = 98.4 % DO
(Turb = 0.3 in DI)

Continued on Page

Read and Understood By

Daniel A. Kirkwood/[illegible] — Signed — Date

[illegible] Michael Floyd — Signed — 1/20/03 — Date

PROJECT Ther Fo33 Notebook No. _____ 79

Continued From Page _____

030120 Tokin Marine Dock

Time	Location	Event	DTB	Sample Depth	t	Sal	DO	Tub	TS
0948	TDN350	B	39.3	D 35	9.4	29.7	8.7	2.1	—
0949	755 863			M 20	9.3	29.6	8.4	1.0	—
0950	acc 5.8			S 3	9.1	28.6	8.9	0.9	—
0951	TDN300	B	39.0	D 35	9.4	29.7	8.7	2.2	—
0952	745 874			M 20	9.3	29.4	8.6	1.3	030120/TDN300/W
0953	acc 5.8			S 3	9.2	28.4	8.9	1.1	—
0957	TDN150	B	36.2	D 31	9.4	29.7	8.4	2.3	—
0958	729 886			M 18	9.3	29.6	8.7	1.3	—
0959	acc 6.2'			S 3	9.2	28.9	8.8	1.1	—
	design: 713 907								
	→ at Boom								
1000	TDNE300	B	17.0	D 15	9.3	29.5	8.8	6.2	—
1001	770 915			M 9	9.3	29.2	8.6	9.9	030120/TDNE300/W
1002	acc 6.4'			S 3	9.1	28.6	8.7	5.3	—
1004	TDNE350	B	24.0	D 20	9.3	29.6	8.7	2.4	—
1005	784 911			M 12	9.3	29.4	8.5	5.6	—
1006	acc 8.8'			S 3	9.2	28.8	8.6	7.1	—
1016	TF2400	B	42.4	D 37	9.3	29.8	9.1	0.3	—
1017	Grab.cat			M 21	9.3	29.8	9.2	0.3	030120/TF2400/
1018	465 492			S 3	9.2	29.0	9.1	0.6	— M/B
	acc = 6.1								
Dupe 1021	TF2400	B	42.3	D 37	9.3	29.8	9.1	0.6	—
1022	Grab.cat	Dupe		M 21	9.3	29.8	9.1	0.2	030120/TF2400/
1023	465 492			S 3	9.3	29.2	9.1	0.6	— M/Dupe
	acc 5.5'								

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[signature] 1/30/03 _____ [signature] 1/30/03

Signed Date Signed Date

Lloyd & Associates, Inc.
38210 SE 92nd Street, Snoqualmie, Washington 98065 425-888-1905(v/f) rml@centurytel.net

January 20, 2003

TRANSMITTAL

To: John O'loughlin
Iain Wingard
From: Michael Lloyd

RE: Weekly Water Quality Monitoring Report 1/20/03

Water quality monitoring was conducted at both Totem Marine and in the Wheeler-Osgood Waterway. Daily reports have been previously submitted for the following:

Totem Marine
- January 14 – riprap placement and filter cap material placement
- January 15 – riprap placement and filter cap material placement
- January 16 – riprap placement and filter cap material placement
- January 17 – riprap placement and filter cap material placement
- January 18 – riprap placement and filter cap material placement
- January 19 – riprap placement and filter cap material placement

Wheeler-Osgood
- January 14 – riprap placement and filter cap material placement
- January 15 – riprap placement and filter cap material placement
- January 16 – riprap placement and filter cap material placement
- January 17 – riprap placement and filter cap material placement
- January 18 – riprap placement and filter cap material placement
- January 19 – riprap placement and filter cap material placement

In general work went well at both Totem Marine and in the Wheeler-Osgood Waterway. Water quality criteria were not exceeded for construction activity in the Wheeler-Osgood. The monitoring program for the Wheeler-Osgood appears to work well. Manson got their work done, and water quality criteria were good.

Work at Totem Marine has indicated turbidity problems were observed on Friday the 17th and Saturday the 18th during filter cap material placement. Turbidity readings on the 17th were particularly elevated at TDN350 (which is directly down-current) and work was stopped until the turbidity returned to acceptable conditions. Meanwhile the tide had changed and additional sampling was undertaken to assure that the turbidity was not a problem before work restarted. Work was resumed later in the day without incident.

On the 18th we saw some slight elevation of turbidity at Totem Marine. In this case work was not stopped as ACC-Hurlen was moving equipment during the time that we monitored recovery. The sampling team conducted some information gathering near TDNE(300 & 350) stations. While the information was not conclusive, we came away with the impression that there may be an additional source of turbidity from storm drains nearby. Additional data gathering will be conducted in the next few days of monitoring to see if we can confirm whether or not there is an additional source contributing turbidity to the TDNE area.

Updated compliance reports with TSS data have been submitted to the City of Tacoma. Work planned for the next week will include the completion of capping work in the Wheeler-Osgood, and continued monitoring at Totem Marine.

Michael Lloyd
Lloyd & Associates, Inc.

Lloyd & Associates, Inc.
38210 SE 92nd Street, Snoqualmie, Washington 98065 425-888-1905 rml@centurytel.net

January 21, 2003

TSS Updated 1/30/03 RML

TRANSMITTAL

To: Iain Wingard
John O'Loughlin

Subject: Compliance Monitoring / Totem Marine 1/21/03
Compliance Monitoring / Wheeler-Osgood 1/21/03
Preliminary Data Transmittal (no TSS)

Attached please find results from compliance monitoring for the following work activities:

- Rock placement at Wheeler-Osgood
- Placement of rock at Totem Marine.

Wheeler-Osgood - Capping/Rocking.

Manson was placing riprap during this morning's ebb tide. Work appears to be going well. There was no floating debris and no visual turbidity outside of the work zone although rain limited visual observations. Dissolved oxygen levels at WO300 were acceptable and compliance points at the mouth of the waterway were acceptable for turbidity.

Totem Marine - Capping/Rocking.

Water quality monitoring was conducted during the morning ebb while filter cap material was being placed near the grout mat. Turbidity at TDNE 350 (ebb tide) was in excess of 24 NTU's at a mid depth after ACC-Hurlen had been placing filter. Data taken an hour earlier at the same depth was acceptable. As has been previously mentioned in water quality monitoring reports, the stations closest to the shore tend to show higher turbidity at Totem Marine. Elevated turbidity was brought to the attention of the City of Tacoma and this information was communicated to EPA. We were instructed to continue monitoring while ACC-Hurlen continued to place rock, although at a slower rate (approximately 1 skip box every 12 to 15 minutes).

Sampling in the afternoon sessions, confirmed the presence of construction activity-derived turbidity in down-current stations even though the tidal flow had changed from an ebb to a flood tide, and the work zone moved to the north near the grout mat. When the rate of placement was increased at approximately 1400 at my direction, turbidity was observed to visually increase in the work zone and at TDSE350 (down-current) approximately 45 minutes later.

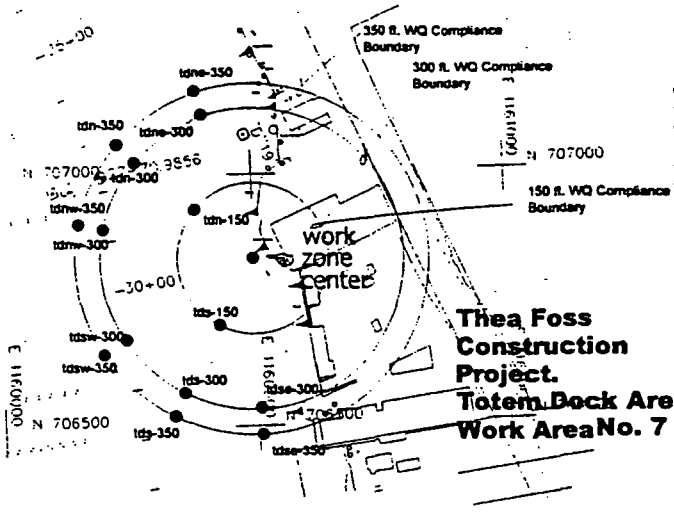
Turbidity at TDSE350 (near shore) indicated elevated levels (16.4 NTU's) at a mid-depth (approximately the depth of placement). Stations located further out in the waterway (TDN/TDS and TDNW/TDSW) have typically yielded low turbidity throughout water quality monitoring events at Totem Marine. In part this occurs because tidal flow appears to be in a north/south direction on strong ebb/flood, and turbidity does not appear to disperse toward mid-channel.

Operational changes have some impact. Hurlen was placing materials relatively slowly with considerable deliberation. Data presented to date suggests that very slow placement will keep turbidity levels to within acceptable limits, but that increasing the placement rate will continue to be problematic. The bottom line is that elevated turbidity (>12 NTU's) was observed in near-shore sampling stations (TDNE and TDSE series) that are directly down-current at Totem Marine.

Field Duplicate data continues to be very good as noted in data reports provided to date. TSS data will be provided as an update to this report when submitted by STL.

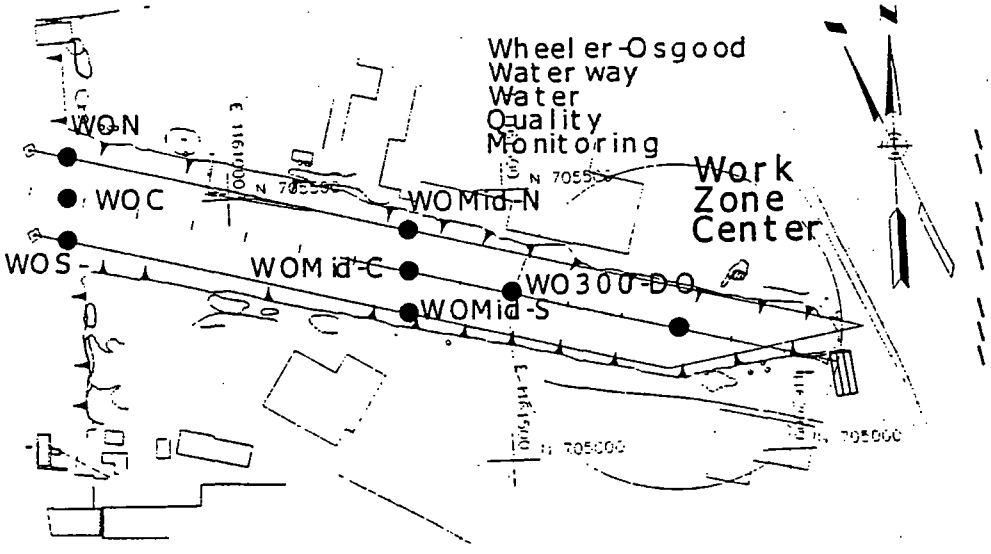
Michael Lloyd
Lloyd & Associates, Inc.

Totem 1 21 03.doc



WZ Center	N-5233 708	E-542 917
TDN150	737	882
TDN300	765	848
TDN350	776	836
TDNE300	794	888
TDNE350	811	882
TDNW300	727	828
TDNW350	728	812
TDS150	668	897
TDS300	626	875
TDS350	613	870
TDSE300	617	924
TDSE350	601	924
TDSW300	658	841
TDSW350	648	828

Thea Foss Construction Project. Totem Dock Areas. Work Area No. 7



Construction Compliance Monitoring **Date: JAN 21** **Wheeler-Osgood/Ebb Tide**

Station/Sample	Depth/DTB (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
WO300 (down-current)	3	27.4	9.1	10.8	9.1		5,233,253	542,216	923	**Ebb Tide**
030121/WO300/M/A	6	27.9	9.2	1.8	9.2	9			922	Manson placing rock
Deep	8/12	28.2	9.2	2.1	9.2				922	(riprap)
WOMID-N (down-current)	3	27.4	9.4	4.0	9.2		5,233,290	542,184	925	
Deep	6/8	27.8	9.4	2.0	9.1				924	
WOMID-C (down-current)	3	25.6	10.1	5.6	9.2		5,233,266	542,184	928	
Mid	6	28	9.9	1.8	9.2				928	
Deep	9/13	28.3	9.9	3.2	9.2				927	
WOMID-S (down-current)	2	26.7	9.9	13.1	9.1		5,233,243	542,184	931	
Deep	5/8	27.7	9.7	7.7	9.2				930	
WOS (down-current)	3	27.5	9.2	2.5	9.8		5,233,284	542,994	1057	Sonde hit bottom
030121/WOS/M/A	11	28.4	9.3	0.9	9.4	6			1056	Readings were taken after
Deep	17/22	28.7	9.3	1.6	9.4				1044	cleaning the turbidity porbe
WOC (up-current)	3	27.5	10.6	2.0	9.2		5,233,308	542,994	941	and recalibrating
0301121/WOC/M/A	10	28.4	10.4	0.6	9.2	2			941	
Deep	15/20	28.6	10.6	1.3	9.2				940	
WON (down-current)	3	27.7	10.6	2	9.2		5,233,331	542,994	937	
030121/WON/M/A	6	28.1	10.5	0.6	9.2	3			936	
Deep	9/12	28.2	10.8	1.3	9.2				936	
Pre-Survey Calibration check	S. High 1/21	101.7 % in saturated air								Mild, cloudy, drizzle

DO & Turbidity calibration as per manufacturer's specifications.
Survey work conducted by D. Berta
Manson was placing riprap on slope of cap

Work continues to go well. No problems observed in Wheeler-Osgood.

Prepared By/Date:	TSS Update 1/30	L&AI
M. Lloyd 1/21		

Construction Compliance Monitoring **Date: JAN 21** **Totem Marine - Ebb Tide**

Station/Sample	Depth/DTB (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
TDN300 (down-current)	3	27.9	10.3	1.3	9.2		5,233,745	542,874	1013	Hurlen placing filter cap
030121/TDN300/M/A	18	28.9	9.8	2.2	9.3	5			1013	on south bank
Deep	32/37	29.1	9.8	1.7	9.3				1012	
TDN350	3	27.8	10.1	0.2	9.2		52,338,755	542,863	1028	
Mid	19	29	9.9	1.2	9.3				1028	
Deep	33/38	29.2	10.1	1.8	9.3				1028	
TDN150	3	28.0	9.9	3.1	9.2		52,338,745	542,893	1010	Location moved to point
Mid	15	28.9	9.7	6.9	9.3				1010	against debris boom
Deep	24/29	29.0	10.0	9.6	9.3				1009	
TDNE300 (down-current)	3	27.8	10.1	7.2	9.2		5,233,770	542,915	1016	
030121/TDNE300/M/A	11	28.8	10.0	**18.6**	9.3	2			1015	Elevated turbidity
Deep	17/22	29.0	10.1	4.2	9.3				1015	
TDNE350	3	27.9	10.1	**17.3**	9.2		5,233,784	542,911	1018	Elevated turbidity
Mid	10	28.7	9.8	**15.9**	9.3				1018	Notified I. Wingard/RML
Deep	14/19	28.9	9.9	3.7	9.3				1017	Told Hurlen to take it slower
TDNE300 (down-current)	3	25.5	9.6	4.2	9.2		5,233,770	542,915	1057	Repeat readings at TDNE stations
Mid	9	28.7	9.2	**32.1**	9.3				1056	
Deep	12/17	28.8	9.1	**26.0**	9.3				1055	
TDNE350	3	26.9	9.5	6.7	9.1		5,233,784	542,911	1104	Near Maximum Ebb Tide
Mid	12	28.8	9.2	**24.8**	9.3				1104	
Deep	18/23	29.0	9.1	2.9	9.3				1103	
TDNE300 (down-current)	3	27.6	9.6	5.0	9.2		5,233,770	542,915	1116	Repeat readings at TDNE stations
Mid	9	28.6	9.4	**19.4**	9.3				1115	
Deep	12/17	28.8	9.5	**24.3**	9.3				1114	
TDNE350	3	26.8	9.8	4.5	9.1		5,233,784	542,911	1128	Near Maximum Ebb Tide
Mid	9	28.6	9.5	**17.1**	9.3				1127	
Deep	12/17	28.7	9.6	**25.0**	9.3				1126	

Pre-Survey Calibration s. High 1/21 101.7%

DO Calibration as per manufacturer's specifications.

Survey work conducted by D. Berta and S. High

Mild, cloudy weather, drizzle

Turbidity Calibration as per manufacturer's specifications. Calibration at 0, 10NTU's.

Prepared By/Date:

M. Lloyd 1/21

TSS Update 1/30/03

L&AI

Construction Compliance Monitoring **Date: JAN 21** **Totem Marine - Slack to Flood**

Station/Sample	Depth/DTB (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
TDS150 (Down-Current)	3	25.2	7.8	6.0	9.2		5,233,668	542,897	1403	**Flood Tide**
Mid	17	29.0	7.7	6.4	9.3				1402	Hurlen moves work zone
Deep	30/35	29.2	7.9	**20.8**	9.3				1402	from earlier work on south
TDS300 (Down-Current)	3	25.7	9.0	5.0	9.2		5,233,626	542,875	1442	
030121/TDS300/M/D	18	29.1	8.9	1.5	9.3	5			1442	
Deep	31/36	29.2	9.0	0.9	9.3				1441	
TDS350 (Down-Current)	3	25.6	9.2	3.4	9.2		5,233,613	542,870	1524	Low salinity in shallow
Mid	18	29.1	9.2	1.4	9.3				1524	
Deep	31/37	29.2	9.5	2.0	9.3				1523	
TDSE300 (Down-Current)	3	25.6	7.9	5.3	9.2		5,233,617	542,924	1414	Flood Tide
030121/TDSE300/M/D	16	29.1	7.7	7.4	9.3	12			1414	HUrlen moves work zone
Deep	27/32	29.2	7.9	7.4	9.3				1413	
TDSE300 (Down-Current)	3	26.4	8.5	7.6	9.2				1418	Field Duplicate
030121/TDSE300/M/A-Dup	16	29	8.3	11.4	9.3	5			1417	Field Duplicate
Deep	27/32	29.2	8.3	**19.3**	9.3				1417	Field Duplicate
TDSE350 (Down-Current)	3	26.2	9.0	4.3	9.2		5,233,601	542,924	1448	
Mid	16	29	8.9	**16.4**	9.4				1448	
Deep	27/32	29.2	9.0	10.5	9.3				1447	
TDSW300 (down-current)	3	25.3	9.3	4.7	9.2		5,233,658	542,841	1518	
030121/TDSW/M/D	18	29.1	9.3	1.0	9.3	2			1518	
Deep	31/37	29.2	9.3	0.7	9.3				1517	
TDSW350	3	25.7	9.3	4.5	9.2		5,233,648	542,828	1514	
Mid	18	29.0	9.2	1.1	9.3				1514	
Deep	31/37	29.2	9.0	4.6	9.3				1513	
TDNE300 (Up-current)	3	27.1	8.9	2.0	9.2		5,233,794	542,888	1458	Curiosity sampling event
Mid	16	28.9	9.0	8.6	9.3				1458	
Deep	28/34	29.2	9.0	2.1	9.3				1457	
TDN300 (Up-current)	3	28.6	8.8	4.1	9.2		52,338,765	542,848	1502	
030121/TDN300/M/D	18	29	9.1	**16.0**	9.3	5			1501	Elevated turbidity from up-current
Deep	30/36	29.2	9.0	1.2	9.3				1500	Readings moving around/SDH
TDN350	3	27.1	9.0	3.7	9.2		52,338,776	542,836	1507	
Mid	18	29	9.0	**3.5**	9.3				1506	
Deep	30/37	29.2	9.3	1.0	9.3				1506	

Pre-Survey Calibration D. Berta 1/20 106.5%

DO Calibration as per manufacturer's specifications.

Survey work conducted by D. Berta and S. High

Mild, cloudy weather, rain/drizzle

Turbidity Calibration as per manufacturer's specifications. Calibration at 0, 10NTU's.

Hurlen working at a rate of 1 bucket every 12-15 minutes before survey

Hurlen working at a rate of 1 bucket every 8-10 minutes ar 1400

Prepared By/Date:

M. Lloyd 1/21

TSS Update 1/30/03

M Lloyd

L&AI

Construction Compliance Monitoring

Date: JAN 21 **Totem Marine - Flood**

Station/Sample	Depth/DTB (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
TDS150 (Down-Current)	3	24.3	9.2	7.3	9.2		5,233,668	542,897	1555	**Flood Tide**
Mid	29	29.0	8.9	17.3	9.3				1555	Hurlen filling low spots
Deep	32/37	29.2	9.4	1.2	9.3				1554	after survey
TDS300 (Down-Current)	3	24.4	9.2	6.6	9.2		5,233,626	542,875	1559	Fresh water inputs ot TF
Mid	19	29.1	9.1	6.3	9.3				1559	
Deep	32/37	29.2	9.2	2.2	9.3				1558	
TDS350 (Down-Current)	3	25.4	9.2	5.1	9.2		5,233,613	542,870	1602	Low salinity in shallow
Mid	19	29.0	9.4	1.1	9.3				1601	
Deep	32/37	29.2	9.5	0.5	9.3				1600	
TDSE300 (Down-Current)	3	24.8	9.2	7.2	9.2		5,233,617	542,924	1551	Flood Tide
Mid	18	29.1	9.0	18.8	9.3				1550	Hurlen woring moderate pace
Deep	30/35	29.2	9.1	9.7	9.3				1550	
TDSE350 (Down-Current)	3	25.2	9.1	5.4	9.2		5,233,601	542,924	1546	
Mid	17	29	9.2	13.7	9.3				1546	Hurlen placing materials at mid
Deep	29	29.2	9.3	3.3	9.3				1545	depth/RML visual
TDSW300 (down-current)	3	25.8	9.2	3.1	9.3		5,233,658	542,841	1609	
Mid	19	29.1	9.3	0.9	9.3				1609	
Deep	32/38	29.2	9.3	1.3	9.3				1608	
TDSW350	3	25.5	9.2	4.2	9.2		5,233,648	542,828	1607	
Mid	19	29.1	9.3	0.8	9.3				1607	
Deep	32/38	29.2	9.2	0.9	9.3				1606	
TDN300 (Up-current)	3	25.7	9.2	3.3	9.3		52,338,765	542,848	1612	
Mid	19	29.1	9.2	1.1	9.3				1612	
Deep	32/38	29.2	9.3	0.8	9.3				1611	
TDN350	3	27.4	9.1	1.8	9.2		52,338,776	542,836	1615	
Mid	19	29.1	9.2	1.0	9.3				1615	
Deep	32/38	29.2	9.1	1.0	9.3				1614	
Station TF 2+00	3	27.4	9.2	1.9	9.1		52,338,465	542,492	1615	
030121/TF2/M/E	21	29.1	9.3	0.5	9.3	2U			1615	
Deep	37/42	29.2	9.3	0.4	9.3				1614	

Pre-Survey Calibration D. Berta 1/20 100.7% final Check 106.5%

DO Calibration as per manufacturer's specifications.

Survey work conducted by D. Berta and S. High

Cool, cloudy weather, rain

Turbidity Calibration as per manufacturer's specifications. Calibration at 0, 10NTU's.

Hurlen working at a rate of 1 bucket every 8-10 minutes ar 1400

Prepared By/Date:

M. Lloyd 1/21

TSS Update 1/30/03

L&AI

1/21/03

STL Seattle

Client Name	Lloyd & Assoc. Inc.
Project Name	Thea Foss
Date Received	01-22-03

General Chemistry Parameters

Client Sample ID 030121/TDNE(300)/M/A
Lab ID 111435-01

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-23-03	mg/L	2	2

Client Sample ID 030121/TDN(300)/M/A
Lab ID 111435-02

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-23-03	mg/L	5	2

Client Sample ID 030121/TDNW(300)/M/A
Lab ID 111435-03

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-23-03	mg/L	4	2

Client Sample ID 030121/TDS(300)/M/A
Lab ID 111435-04

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-23-03	mg/L	4	2

Client Sample ID 030121/WO300/M/A
Lab ID 111435-05

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-23-03	mg/L	9	2

Client Sample ID 030121/WON/M/A
Lab ID 111435-06

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-23-03	mg/L	3	2

STL Seattle

Client Sample ID	030121/WOC/M/A
Lab ID	111435-07

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-23-03	mg/L	2	2

Client Sample ID	030121/WOS/M/A
Lab ID	111435-08

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-23-03	mg/L	6	2

Client Sample ID	030121/TDSE(300)/M/D
Lab ID	111435-09

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-23-03	mg/L	12	2

Client Sample ID	030121/TDSE(300)/M/DUP
Lab ID	111435-10

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-23-03	mg/L	5	2

Client Sample ID	030121/TDS(300)/M/D
Lab ID	111435-11

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-23-03	mg/L	5	2

Client Sample ID	030121/TDN(300)/M/D
Lab ID	111435-12

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-23-03	mg/L	5	2

Client Sample ID	030121/TDSW(300)/M/D
Lab ID	111435-13

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-23-03	mg/L	2	2

STL Seattle

	Client Sample ID		030121/TF2+00/M/E		
	Lab ID		111435-14		
Parameter	**Method**	**Date Analyzed**	**Units**	**Result**	**PQL**
Total Suspended Solids	EPA 160.2	01-23-03	mg/L	ND	2

STL Seattle

QUALITY CONTROL REPORT

Client Sample ID: Batch QC
Lab ID: 111300-1
QC Batch Number: 1159-025

Method Blank

Parameter	Result (mg/L)	PQL
Total Suspended Solids	ND	2

Duplicate

Parameter	Sample Result (mg/L)	Duplicate Result (mg/L)	RPD (%)	Flag
Total Suspended Solids	16.6	14	17	

SECT THEA FOSS / WHEELER OSGOOD

Notebook No. _____
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030121 FLOOD TIDE

TIME	LOCATION	EVENT	DTB	SAMPLE DEPTH	TEMP	SAL	DO	TURB	TSS
413	TDSE(300)	D	32	D 27	9.3	29.2	7.9	7.4	—
414	617 924			M 16	9.3	29.1	7.7	7.4	030121/TDSE(300)/M/D
414	(Acc = 7.5')			S 3	9.2	25.6	7.9	5.3	—
417	TDSE(300)	D	34	D 27	9.3	29.2	8.3	19.3	—
417	617 924			M 16	9.3	29.0	8.3	11.4	030121/TDSE(300)/M/D
418	(Acc = 7.5')			S 3	9.2	26.4	8.5	7.6	—
	SUPPLEMENTAL READINGS AT TDSE (300)								
435	TDSE (300)	D	34	D 27	9.3	29.2	8.9	15.0	—
436	617 924			M 16	9.3	28.9	8.6	20.4	—
437	(Acc 5.6')			S 3	9.2	26.2	8.8	4.4	—
	* DO SAMPLE OBTAINED FOR CITY OF TACOMA								
441	TDS DB (300)	D	36	D 31	9.3	29.2	9.0	0.9	—
442	626 875			M 18	9.3	29.1	8.9	1.5	030121/TDS(300)/M/D
442	(Acc = 9.1')			S 3	9.2	~~26.0~~ DB 25.7	9.0	5.0	—
1447	TDSE(350)	D	32	D 27	9.3	29.2	9.0	10.5	—
1448	601 924			M 16	9.4	29.0	8.9	16.4	—
1448	(Acc = 7.5)			S 3	9.2	26.2	9.0	4.3	—
523	TDS(350) DB	D	37	D 31	9.3	29.2	9.5	2.0	—
524	626 875			M 18	9.3	29.1	9.2	1.4	—
524	(Acc = 6.8')			S 3	9.2	25.6	9.2	3.4	—
	INFORMATIONAL READING								
457	TDNE(300) DB	D	34	D 28	9.3	29.2	9.0	2.1	—
458	794 888			M 16	9.3	28.9	9.0	8.6	—
458	(Acc = 5.8)			S 3	9.2	27.1	8.9	2.0	—
	TDNE (300) DB								
500	TDN (300)	D	36	D 30	9.3	29.2	9.0	1.2	16.0 DB —
501	765 848			M 18	9.3	29.0	9.1	~~7.5~~	030121/TDN(300)/M/D
502	(Acc = 5.5)			S 3	9.2	27.6	8.8	4.1	—

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Daniel A. Burke 1/21/03 — Signed — Date

T M Floyd 1/21/03 — Signed — Date

PROJECT THEA FOSS WHEELER-CSGOOD Notebook No. _____

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230121

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PROJECT Thea Foss / Wheeler - Osgood

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030121 FLOOD

SAMPLE

TIME	LOCATION	EVENT	DTB	DEPTH	TEMP	SAL	DO	TURB	TSS
1506	TDW(350)	D	37	D 30	9.3	29.2	9.3	1.0	—
1506	776 836			M 18	9.3	29.0	9.0	3.5	—
1507	(Acc = 5.9')			S 3	9.2	27.1	9.0	3.7	—
1513	TDSW(350)	D	37	D 31	9.3	29.2	9.0	4.6	—
1514	648 828			M 18	9.3	29.0	9.2	1.1	—
1514	(Acc = 6.0)			S 3	9.2	25.7	9.3	4.5	—
1517	TDSW(300)	D	37	D 31	9.3	29.2	9.3	0.7	—
1518	658 ~~658~~ 841			M 18	9.3	29.1	9.3	1.0	030121/TDSW(300)/M/D
1518	DB (Acc = 6.2')			S 3	9.2	25.3	9.3	4.7	—
1545	TDSE(350)	E	34	D 29	9.3	29.2	9.3	3.3	—
1546	601 924			M 17	9.3	29.0	9.2	13.7	—
1546	(Acc = 5.8')			S 3	9.2	25.2	9.1	5.4	—
1550	TDSE(300)	E	35	D 30	9.3	29.2	9.1	9.7	—
1550	617 924			M 18	9.3	29.1	9.0	18.8	—
1551	(Acc = 5.5')			S 3	9.2	24.8	9.2	7.2	—
1554	TDS(150)		37	D 32	9.3	29.2	9.4	1.2	—
1555	668 897			M 19	9.3	29.0	8.9	17.3	—
1555	(Acc = 6.8)			S 3	9.2	24.3	9.2	7.3	—
1558	TDS(300)		37	D 32	9.3	29.2	9.2	2.2	—
1559	626 875			M 19	9.3	29.1	9.1	6.3	—
1559	(Acc = 4.8')			S 3	9.2	24.4	9.2	6.6	—
1600	TDS(350)		37	D 32	9.3	29.2	9.5	0.5	—
1601	613 870			M 19	9.3	29.0	9.4	1.1	—
1602	(Acc = 19.5')			S 3	9.2	25.4	9.2	5.1	—

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Daniel H. Buck 01/21/03 — Signed — Date

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S2
PROJECT THEA FOSS / WHEELER - OSGOOD

Notebook No. _____
Continued From Page _____

030121

1625 HURLEN FINISHES ROCK PLACEMENT

1645
P.O. CHECK ON CALIBRATION
IN ~~TAP~~ MOIST AIR OVER TAP WATER
106.5 %

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030121

TIME	LOCATION	EVENT	DTB	SAMPLE DEPTH	SAMPLE TEMP	SAMPLE SAL	FLOOD DO	FLOOD TURB	TSS
1606	TDSW (350)	E	38	D 32	9.3	29.2	9.2	0.9	—
1607	648 823			M 19	9.3	29.1	9.3	0.3	—
1607	(Acc = 4.8)			S 3	9.2	25.5	9.2	4.2	—
							FLOOD		
1609	TDSW (300)	E	38	D 32	9.3	29.2	9.3	1.3	—
1609	655 841			M 19	9.3	29.1	9.3	0.9	—
1609	(Acc = 6.1)			S 3	9.3	25.8	9.2	3.1	—
							FLOOD		
1611	TDW (300)	E	38	D 32	9.3	29.2	9.3	0.8	—
1612	765 848			M 19	9.3	29.1	9.2	1.1	—
1612	(Acc = 4.7)			S 3	9.3	25.7	9.2	3.3	—
							FLOOD		
1614	TDW (350)	E	38	D 32	9.3	29.2	9.1	1.0	—
1615	776 836			M 19	9.3	29.1	9.2	1.0	—
1615	(Acc = 6.5)			S 3	9.2	27.4	9.1	1.8	—
	INFORMATIONAL:						(FLOOD)		
1617	TDWE (350)	E	36	D 31	9.3	29.2	9.0	2.1	—
1618	811 882			M 18	9.3	27.1	9.1	0.8	—
1618	(Acc = 4.4)			S 3	9.3	27.3	9.1	3.4	—
1620	TDWE (300)	E	36	D 31	9.3	29.2	8.9	1.0	—
1621	794 855			M 18	9.3	29.1	9.1	0.9	—
1621	(Acc = 5.3)			S 3	9.3	24.4	9.2	6.0	—
1638	TF 200	E	42	D 37	9.3	29.2	9.3	0.4	—
1639	465 492			M 21	9.3	29.1	9.3	0.5	030121 / TF 200 / M / E
1640	(Acc = 6.8)			S 3	9.1	27.4	9.2	1.9	—

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PROJECT THEA FOSS

Notebook No. _____
Continued From Page _____

1/21/03 Anticipated Work Schedule

1. Totem Marine - filter material placement
Near center of ~~fit~~ slope mat
8-530

2 Wheeler-Osgood - Ebb Tide
10-10:30 start

3. Totem in Afternoon / Flood tide
2 pm

4 Wheeler-Osgood - maybe this afternoon.
Tide not cooperative

CALIBRATION NOTES

1) CONDUCTIVITY CALIBRATED TO 50 mS WITH SAME STANDARD SOLUTION AS PREVIOUS
TO CALIBRATED IN MOIST AIR OVER TAP WATER
D.O. CALIB. CHECK 101.7
3) TURBIDITY 2-POINT CALIBRATION WITH 0.0 NTU = DI WATER & 10.0 NTU STANDARD SOLUTION.
TURB. CHECK IN 10.0 STANDARD AFTER CALIBRATION = 10.0 NTU

0730 - ~~ACCORDING~~ DB AFTER 1-2 BUCKETS. FROM 0700 TO 0730 BEGAN PLACING. FILTER CAP @ REGULAR RATE.
STEADY RAIN LIGHT - MODERATE.

0930 - NO FLOATABLE DEBRIS OR TURBIDITY PLUMES OBSERVED

Continued on Page

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Daniel A. Burke 01/21/03 _____ T. Michael Floyd 1/21/03
Signed Date Signed Date

ROJECT THEA FOSS / WHEELER - OSGOOD

Notebook No. _____

Continued From Page _____

30121

EBB TIDE

SAMPLE WORK ZONE #5

TIME	LOCATION	EVENT	DIB	DEPTH	TEMP	SAL	DO	TURB		TSS
0819	TDN(150)	A	(30)	D 25	9.3	28.8	7.9	0.7	DB	—
0820	747 900*			M 15	9.3	28.7	8.1	0.5	7.9	—
0820	713 907 (DESCH)			S 3	9.1	26.6	8.1	1.0		—
	(ACC = 5.1)			* AGAINST DEBRIS FROM						
0823	TDNE (300)		(21)	D 16	9.3	28.7	8.2	0.5		—
0824	770 915	A		M 10	9.2	28.5	8.2	0.4	030121/TDNE(300)/M/A	
0824	(ACC = 4.5)			S 3	9.1	27.7	8.3	0.8		—
0831	TDN(300)	A	(41)	D 36	9.4	29.0	8.3	6.1		—
0832	745 874			M 20	9.3	28.8	8.4	0.9	030121/TDN(300)/M/A	
0833	(ACC = 11.9)			S 3	9.1	27.4	8.7	1.0		—
0840	TDNE (350)	A	(29)	D 24	9.3	28.8	8.6	1.1		—
0841	784 911			M 15	9.3	28.8	8.5	0.6		—
0841	(ACC = 4.9')			S 3	9.1	27.8	8.6	1.3		—
				(START OF MAX EBB)						
0843	TDN (350)		(41)	D 36	9.4	29.1	8.3	1.0		—
0843	755 863			M 20	9.3	28.8	8.4	0.5		—
0844	(ACC = 7.7')			S 3	9.2	28.0	8.7	0.5		—
0847	TDNW (350)		(41)	D 36	9.4	29.0	8.3	1.1		—
0847	707 836			M 20	9.3	28.8	8.3	0.7		—
0848	(ACC = 6.1)			S 3	9.1	27.8	8.7	0.6		—
										—
	TDNW (300)		(41)							
0852	703 ~~836~~ 851			D 36	9.4	29.0	8.6	1.6		—
0853	(ACC = 7.9)			M 20	9.3	28.8	8.6	0.9	030121/TDNW(300)/M/A	
0854				S 3	9.1	27.6	8.9	0.7		—
0900	TDS (300)		(40)	D 35	9.4	29.0	8.6	1.4		—
0901	593 917			M 20	9.4	28.8	8.5	0.9	030121/TDS(300)/M/A	
0901	(ACC = 10.3)			S 3	9.1	26.9	8.9	0.7		

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PROJECT THEA FOSS / WHEELER-OSGOOD

Notebook No. _____
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030121

MANSON PLACING QUARRY SPALLS (RIPRAP) ON SOUTH BANK OF WHEELER OSGOOD.
TRACE FLOATABLE DEBRIS GENERAL SLIGHT TURBIDITY NEAR WORK ZONE (IE NO OBSERVABLE TURB. PLUME NOTED
AFTER WOS SURFA
1048 RECALIBRATED FOR TURBIDITY USEING 2 POINT METHOD 1) 0.0 NTU = D.I WATER 2) 10 NTU = STANDARD SOLUTION CALIBRATION CHECK = 10.0 NTU

2ND READING WAS WITHIN PROJECT SPECIFICATIONS

NOTE: ON WO (~0930) ENCOUNTERED "GOOEY" MID SOUTH
MATERIAL NEAR BOTTOM & RAN CLEAN OPTICS MORE SEVERAL TIMES BEFORE CONTINUING TO SAMPLE

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ROJECT THEA FOSS/WHEELER - OSGOOD Notebook No. _____ 83
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30121 (MAX EBB)

TIME	LOCATION	EVENT	DTB	SAMPLE DEPTH	TEMP	SAL	DO	TURB	TSS
0907	TDS (350)	A	(41)	D 36	9.3	29.0	8.8	1.1	—
0908	577 9.3			M 20	9.3	28.7	8.7	0.6	—
0908	(Acc = 10.9)			S 3	9.1	26.8	9.1	1.0	—

WHEELE OSGOOD (MAX EBB) WORK ZONE 2

0922	WO 300	A	(12)	D 8	9.2	28.2	9.2	2.1	—
0922	255 216			M 6	9.2	27.9	9.2	1.8	WO 030121/WO 300/M/A
0923	(Acc = 6.9)			S 3	9.1	27.4	9.1	10.8	—
0924	WO MID NORTH	A	(8)	D 6	9.1	27.8	9.4	2.6	—
0925	290 184			S 3	9.2	27.4	9.4	4.0	—
	(Acc = 6.9')								
0927	WO MID CENTER	A	(13)	D 9	9.2	28.3	9.9	3.2	—
[illegible]	266 184			M 6	9.2	28.0	9.9	1.8	—
[illegible]	(Acc = 6.9')			S 3	9.2	25.6	10.1	5.6	—
0930	WO MID SOUTH		(8)	DB 5 D ~~6~~	9.2	27.7	DB 9.7 ~~10.2~~	7.7	—
0931	243 184			S 3	9.1	26.7	9.4	13.1	—
	(Acc = 5.2)								
0936	WON		(12)	D 9	9.2	28.2	10.5	1.0	—
0936	331 994			M 6	9.2	28.1	10.5	0.7	030121/WON/M/A
0937	(Acc = 7.9)			S 3	9.2	27.7	10.6	1.0	—
0940	WOC		(20)	D 15	9.2	28.6	10.6	1.3	—
0940	308 994			M 10	9.2	28.4	10.4	0.6	030121/WOC/M/A
0941	(Acc = 6.7)			S 3	9.2	27.5	10.6	2.0	—
	~~Note: Crew moved to~~								
1043	WOS		(22)	D 17	9.3	~~28.7~~	10.1	1.6	—
1043	284 994			M 11	9.2	28.4	10.1	0.6	030121/WOS/M/A
1044	(Acc = 6.2)			S 3	9.2	26.7	10.4	13.2	

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[signature] 1/21/03 Signed Date

03/01/21
RAL 2ND SET OF READINGS FOR INFORMATION PURPOSE EVENT B (WITHOUT TSS SAMPLES)

1007 - NOTE: AT TIME OF MEASUREMENT FOR TDH 150 (1009 - 1010) HURLEN PUMPING FILTER CAP MATERIAL ~ 75' SOUTH OF SAMPLE STATION.

1020 - AFTER RECORDING TONE (35) ADVISED RML OF RESULTS RML TO ADVISE CONTRACTOR

1035 RECALIBRATED FOR TURBIDITY: USING 2 POINT METHOD 1) 0.0 NTU = DI WATER 2) 10.0 NTU = STANDARD SOLUTION.
TURBIDITY CHECK = 10.0 NTU

(1030 - HURLEN SLOWS DOWN OPERATIONS.) - 1035 HURLEN STOPS PUMPING MATERIAL IN WATER
1122 - RESUMES PUMPING MATERIAL AT A REDUCED RATE. DISCUSSION OVER RADIO W/ OPERATOR INDICATES ~ 1 LOAD / 15 MINUTES

Continued on Page

Read and Understood By

Signed 01/21/23 Date

Signed 1/21/03 Date

121 *RECHECK AFTER RECALIBRATION

SAMPLE FOR TURBIDITY.

TIME	LOCATION	EVENT	DTB	DEPTH	TEMP	SAL	DO	TURB	TSS
1055	WOS	A1	D17	D 17	9.3	29.7	9.4	1.6	—
1056	284 994		(D)	M 11	9.3	28.4	9.4	0.9	—
1057	(ACC=5.8)			S 3	9.2	27.5	9.8	2.5	—

INFORMATIONAL (MAX EBB)

B

1009	TDW 150		(29)	D 24	9.3	29.0	10.0	9.6	—
1010	713 907			M 15	9.3	28.4	9.7	6.9	—
1010	745 873*			S 3	9.2	28.0	9.9	3.1	—
	(ACC=6.1')	* AGAINST DEBRIS BOOM.							

1012	TDW (300) B		(37)	D 32	9.3	29.1	9.9	1.7	—
1013	745 874			M 18	9.3	28.9	9.8	2.2	—
1013	(ACC=9.0')			S 3	9.2	27.9	10.3	1.3	—

				D3 17					
1015	TDWE (300) B		(22)	D ~~17~~	9.3	29.0	10.4	4.2	—
[illegible]	770 915			M 11	9.3	28.8	10.0	18.6	—
[illegible]	(ACC=9.1)			S 3	9.2	27.8	10.1	7.2	—

1017	TDWE (350) B		(19)	D 14	9.3	28.9	9.9	3.7	—
1018	784 911			M 10	9.3	28.7	9.8	15.9	—
1018	(ACC=10.3)			S 3	9.2	27.9	10.1	17.3	—

1027	TDW (350) B		(35)	D 33	9.3	29.2	10.0	1.8	—
1028	755 863			M 19	9.3	29.0	9.9	1.2	—
1028	(ACCURACY 5.3')			S 3	9.2	27.8	10.1	0.2	—

		A		D13					
1055	TDWE (300) B		(24)	D ~~17~~ 12	9.3	28.8	9.1	26.0	—
1056	770 915			M ~~12~~ 9	9.3	28.7	9.2	32.1	—
1057	(ACC=5.6)			S 3	9.1	25.5	9.6	7.2	—

1103	TDWE (350) B		(23)	D 18	9.3	29.0	9.1	2.9	—
1104	784 911			M 12	9.3	28.8	9.2	24.8	—
1104	(ACC=5.8')			S 3	9.1	26.9	9.5	6.7	—

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Read and Understood By

[illegible] 1/21/03 — Signed — Date

[illegible] 1/21/03 — Signed — Date

PROJECT THE [illegible] Notebook No. _____
Continued From Page [illegible]

3/21

1145 – AFTER R. 1125 WATER SAMPLE CREW ADVISED THAT [illegible] WITH WORKING AT WORK STATION # 7

1200 HURLEN BREAKS FOR LUNCH

1340 HURLEN PLACING FILTER CAP MATERIAL AT SLOW RATE IE ≈ 1/15 MINUTES

1350 CALIBRATED FOR DB IN MOIST AIR OVER TAP WATER CALIB CHECK 100.7%.

TURBIDITY – 2 POINT CALIBRATION; 1) 0.0 NTU DI WATER 2) 10.0 NTU = STANDARD SOLUTION
9.9 CALIBRATION CHECK IN 10.0 NTU STANDARD ~~10.0~~ NTU.
DB

1410 OPERATOR (RADIO CONVERSATION) INDICATES THEY WILL INCREASE RATE ON HURLEN RIG.

1420 RATE OF PLACEMENT ≈ 1/10 MINUTES

1445 STOPPED PLACING MATERIAL

1550 RESUMED PLACEMENT AFTER SURVEY CREW SOUNDS AREA

Continued on Page

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OJECT THEA FOSS/WHEELER - OSGOOD

Notebook No. _____
Continued From Page _____

30/21 MAX EBB TIDE

[illegible]	LOCATION	EVENT	DTB	SAMPLE DEPTH	TEMP	SAL	DO	TURB	TSS	
[illegible]	TDNE (300)	B	20	D 18	9.3	29.8	9.5	24.3	—	
1115	770 915		17	M 14	9.3	28.0	9.4	19.4	—	
1116	(Acc = 5.2')			S 3	9.2	27.6	9.6	5.0	—	
126	TDNE 350	B	17	D 12	9.3	28.7	9.6	25.0	—	
127	784 911			M 9	9.3	28.6	9.5	17.1	—	
128	(Acc = 4.9')			S 3	9.1	26.8	9.8	4.5	—	
					(END-MAX) EBB TIDE					WZ #7
1138 55	DB TDNE (300)	C	32	D 26	9.3	29.1	9.4	2.2	—	
1139 56	770 918			M 16	9.2	28.9	9.3	17.1	—	
1140 56	(Acc = 9.1')			S 3	9.0	26.8	9.5	4.7	—	
	737 882				EBB TIDE					
203	DB TDNE (350)	C	35	D 30	9.3	29.2	9.6	6.0	—	
204	8 [illegible] 882			M 17	9.3	28.9	9.1	16.4	—	
204	(Acc = 9.0'			S 3	9.1	27.3	9.5	3.6	—	
					EBB TIDE					
208	TDN (350)	C	35	D 30	9.3	29.2	9.9	0.9	—	
	776 836			M 17	9.3	29.0	9.6	3.6	—	
[illegible]	(Acc = 7.0')			S 3	9.2	25.5	9.8	2.8	—	
					EBB TIDE					
213	TDNW (350)	C	36	D 31	9.3	29.2	9.7	1.4	—	
213	728 812			M 18	9.3	29.1	9.9	1.4	—	
214	(Acc = 5.3')			S 3	9.2	26.2	9.8	1.6	—	
					EBB TIDE					
218	TDN (350)	C	36	D 31	9.3	29.2	9.8	2.1	—	
219	613 870			M 18	9.3	29.0	9.7	2.0	—	
219	(Acc = 10.8')			S 3	9.1	26.2	9.7	3.4	—	WORK ZONE #7
	~~TDS 150~~	D			SLACK ⇒ FLOOD					
202	TDS (150)		35	D 30	9.3	29.2	7.9	20.8	—	
202	668 897			M 17	9.3	29.0	7.7	6.4	—	
203	(Acc = 6.1')			S 3	9.2	25.2	7.8	6.0	—	

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[illegible] 1/20/03 _____ [illegible] 1/21/03

Signed Date Signed Date

PROJECT THEA FOSS/WHEELER - OSGOOD

Notebook No. _____
Continued From Page _____

030121

1418 - ADVISED OFFICE OF TEST RESULTS, REPORTED RELAYED TO OPERATOR.

1450 RELAYED TDSE (350 RESULTS TO OFFICE)

NOTE:
1330 } MANSON/ MOVING EQUIPMENT BARGE ETC..
1540 } NO IN WATER MATERIAL PLACEMENT OBSERVED

Continued on Page

Read and Understood By

Daniel A. Berk 01/21/03 — Signed — Date

R M Lloyd 1/21/03 — Signed — Date

Lloyd & Associates, Inc.
38210 SE 92nd Street, Snoqualmie, Washington 98065 425-888-1905 rml@centurytel.net

January 22, 2003

TSS Update
1/30/03
RML

TRANSMITTAL

To: Iain Wingard
John O'Loughlin

Subject: Compliance Monitoring / Totem Marine 1/22/03
Compliance Monitoring / Wheeler-Osgood 1/22/03
Preliminary Data Transmittal (no TSS)

Attached please find results from compliance monitoring for the following work activities:

- Rock placement at Wheeler-Osgood
- Placement of rock at Totem Marine.

Wheeler-Osgood - Capping/Rocking.

Manson was placing filter material and riprap during this morning's ebb tide. Work appears to be going well. There was no floating debris and no visual turbidity outside of the work zone although rain limited visual observations. Dissolved oxygen levels at WO300 were acceptable and compliance points at the mouth of the waterway were acceptable for turbidity.

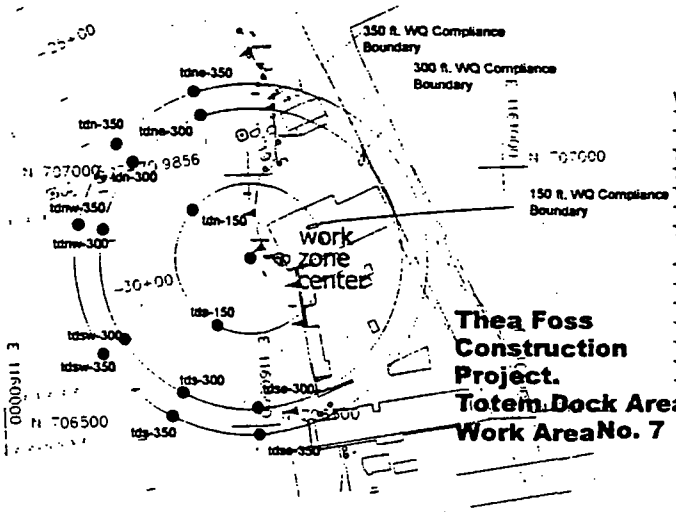
Totem Marine - Capping/Rocking.

Water quality monitoring was conducted during the morning ebb while rock was being placed near the grout mat along the toe berm. Hurlen was placing rock slowly and working carefully around the overhead crane and up the bank above the toe berm. Water quality monitoring during the morning sampling event was acceptable and turbidities were generally low, even at TDN150.

Monitoring was resumed after lunch at Totem Marine during a slack tide when tidal flow is minimal. Before work had started in the waterway, turbidity was elevated at both TDS300 and TDS 350 at shallow depths where lower salinities were observed, suggesting fresh water inputs to the waterway from stormdrains. Down-current station TDN150 showed very high turbidity when work resumed, but elevated turbidity was not observed and TDN350. On the other hand TDN300 had elevated turbidity and very low salinity. This data suggests that stormwater may be a factor to observed turbidity. Moderate turbidity was observed along the shoreline at TDNE 300 and TDNE 350 during the early afternoon sampling with TDNE350 at a slightly higher turbidity than TDNE300.

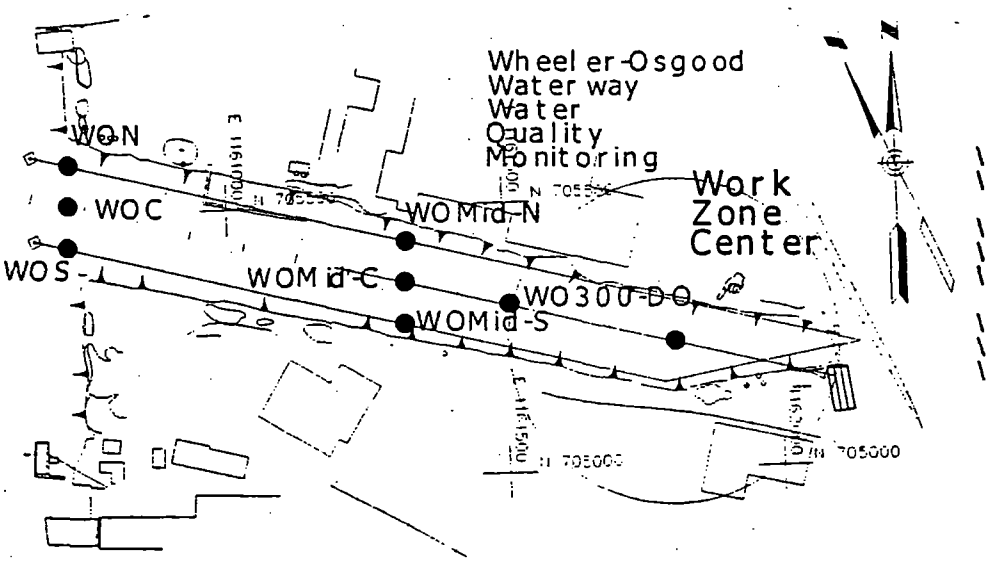
Late afternoon sampling at Totem occurred during a slack to flood tide. The water quality sampling team conducted sampling at all points because there was no apparent tidal direction until later in the survey. As expected, turbidity was highest near the work zone at both TDN150 and TDS150. Turbidities ranged in the 12 to 20 NTU range at TDS300 and slightly higher at TDS350 at depth. TDSE (near shore and down current on a flood tide) yielded high turbidites up until the time that Hurlen stopped work for checking depths. Hurlen planned to start up later in the afternoon to place rock, but we were notified that they were going to be switching barges, moving the derrick, and would pick up the work in the morning on the south end.

Michael Lloyd
Lloyd & Associates, Inc.



Thea Foss Construction Project. Totem Dock Areas. Work Area No. 7

WZ Center	N-5233 708	E-542 917
TDN150	737	882
TDN300	765	848
TDN350	776	836
TDNE300	794	888
TDNE350	811	882
TDNW300	727	829
TDNW350	728	812
TDS150	668	897
TDS300	626	875
TDS350	613	870
TDSE300	617	924
TDSE350	601	924
TDSW300	658	841
TDSW350	648	828



Construction Compliance Monitoring **Date: JAN 22** **Wheeler-Osgood/Ebb Tide**

Station/Sample	Depth/DTB (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
WO300 (down-current)	3	19.9	8.2	8.8	8.8		5,233,253	542,241	836	Ebb Tide
030122/WO300/M/A	7	26.7	7.6	3.6	9.1	5			835	Manson placing Habitat mix
Deep	10/14	27.4	7.6	2.5	9.1				833	
WOMID-N (down-current)	3	24.9	8.1	4.4	8.8		5,233,294	542,189	844	Point moved to avoid
Deep	6/8	26.5	8.3	3.8	9.0				843	floats
WOMID-C (down-current)	3	23.1	8.1	5.8	8.9		5,233,266	542,184	850	
Mid	7	27.2	7.9	2.1	9.1				849	
Deep	12/15	27.9	8.0	3.2	9.2				848	
WOMID-S (down-current)	2	19.7	8.4	7.8	8.9		5,233,243	542,184	852	
Deep	6/9	27	8.1	4.5	9.1				851	
WOS (down-current)	3	27.5	9.2	2.5	9.8		5,233,284	542,994	906	
030122/WOS/M/A	11	28.4	9.3	0.9	9.4	3			905	
Deep	17/22	28.7	9.3	1.6	9.4				904	
WOC (up-current)	3	27.5	10.6	2.0	9.2		5,233,308	542,994	902	
0301122/WOC/M/A	10	28.4	10.4	0.6	9.2	2			901	
Deep	15/20	28.6	10.6	1.3	9.2				900	
WON (down-current)	3	22.9	8.4	1.6	8.9		5,233,331	542,994	859	
030122/WON/M/A	7	26.8	8.0	1.3	9	3			857	
Deep	10/14	27.5	8.0	2	9.2				856	

Pre-Survey Calibration check S. High 1/21 100.2 % in saturated air Cool, cloudy, rain

DO & Turbidity calibration as per manufacturer's specifications.
Survey work conducted by D. Berta
Manson was placing habitat mix

Work continues to go well. No problems observed in Wheeler-Osgood.

Prepared By/Date:
M. Lloyd 1/22

TSS Update 1/30
M Lloyd

L&AI

Construction Compliance Monitoring **Date: JAN 22** **Totem Marine - Ebb Tide**

Station/Sample	Depth/DTB (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
TDS300 (Up-Current)	3	26.1	8.4	2.6	8.8		5,233,626	542,875	936	**Sart of Ebb Tide**
030122/TDS300/M/A	20	28.6	7.9	1.3	9.2	3			935	Hurlen placing rock material
Deep	35/41	29.1	8.0	1.7	9.3				933	
TDS350	3	24.9	8.5	2.2	9.1		5,233,613	542,870	945	
Mid	20	28.7	8.0	1.0	9.3				944	
Deep	35/41	29.1	8.0	1.6	9.3				943	
TDNW300 (down-current)	3	26.1	8.6	1.4	9.1		5,233,727	542,828	951	
030122/TDN300/M/A	20	28.8	8.2	0.5	9.3	2U			948	
Deep	35/42	29.1	8.4	1.7	9.3				947	
TDNW300 (down-current)	3	25.7	8.7	1.8	9.1		52,338,727	542,828	955	Field Duplicate
030122/TDN300/M/A-Dup	20	28.8	8.2	1.0	9.3	2			953	Field Duplicate
Deep	35/41	29.1	8.3	2.4	9.3				952	Field Duplicate
TDNW350	3	24.9	8.8	2.4	9.1		52,338,728	542,812	958	
Mid	20	28.8	8.4	1.6	9.3				957	
Deep	35/40	29.1	8.7	2.0	9.3				956	
TDN300 (down-current)	3	27.2	8.6	1.1	9.1		5,233,765	542,848	1009	
030122/TDN300/M/A	20	28.8	8.3	1.0	9.3	2U			1008	
Deep	35/41	29.1	8.3	1.8	9.3				1006	
TDN350	3	25.1	8.9	2.6	9.0		5,233,707	542,836	1013	
Mid	20	28.8	8.4	1.1	9.3				1012	
Deep	35/41	29.1	8.5	1.6	9.3				1011	
TDN150	3	25.9	8.6	5.4	9.1		52,338,737	542,882	1004	point move to near debris boom
Mid	18	28.7	8.2	1.6	9.3				1003	
Deep	31/36	29.1	8.3	5.0	9.3				1002	
TDNE300 (down-current)	3	24.9	8.7	6.4	9.0		5,233,794	542,888	1017	
030122/TDNE300/M/A	20	28.9	8.2	1.2	9.3	3			1016	
Deep	35/40	29.1	8.3	2.5	9.3				1015	
TDNE350	3	24.4	8.6	4.8	9.0		5,233,784	542,911	1021	
Mid	20	28.9	8.3	1.7	9.3				1020	
Deep	35/38	29.1	8.5	2.6	9.3				1019	
Station 2+00	3	28.4	7.8	0.9	9.2		5,234,465	542,492	1149	
030122/TF2/M/B	21	29.2	7.8	0.6	9.3	2			1148	
Deep	36/42	29.2	7.8	0.3	9.3				1148	

Pre-Survey Calibration D. Berta 1/20 100.4%

DO Calibration as per manufacturer's specifications.

Survey work conducted by D. Berta and S. High cool, cloudy weather, wed

Turbidity Calibration as per manufacturer's specifications. Calibration at 0, 10NTU's.

Relatively calm morning at Totem. Hurlen placing riprap

Prepared By/Date: M. Lloyd 1/22

TSS Update 1/30/03 M. Lloyd

L&AI

Construction Compliance Monitoring Date: JAN 22 Totem Marine - Ebb Tide

Station/Sample	Depth/DTB (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
TDS300 (Up-Current)	3	25.9	8.9	**19.4**	9.0		5,233,626	542,875	1228	*High turbidity at shallow, but*
Mid	18	29.0	8.5	6.2	9.3				1228	*Low salinity, stormwater?*
Deep	32/36	29.1	8.5	9.5	9.3				1227	Near maximum ebb
TDS350	3	26.6	8.8	**12.4**	9.1		5,233,613	542,870	1226	
Mid	18	29.0	8.6	5.4	9.3				1226	
Deep	32/37	29.1	8.9	9.5	9.3				1225	
TDS300 (Up-Current)	*3*	*26.0*	*9.2*	*27.0*	*9.0*		*5,233,626*	*542,875*	*1309*	*High turbidity at shallo, but*
Mid	*18*	*29.1*	*8.9*	*6.2*	*9.3*				*1309*	*Low salinity, stormwater?*
Deep	*32/36*	*29.2*	*8.8*	*9.5*	*9.3*				*1308*	*Repeat of earlier sampling*
TDS150	*3*	*27.3*	*9.1*	*7.3*	*9.2*		*5,233,660*	*542,938*	*1314*	
Mid	*6*	*29.0*	*9.0*	*8.5*	*9.2*				*1314*	
Deep	*9/12*	*29.1*	*9.1*	*8.1*	*9.2*				*1313*	
TDN300 (down-current)	3	**22.7**	9.1	**20.7**	9.2		5,233,765	542,848	1240	Low salinity, stormwater?
Mid	18	29.1	8.7	5.7	9.3	x			1239	
Deep	32/36	29.2	8.9	8.1	9.3				1239	
TDN350	3	27.7	9.1	4.2	9.2		5,233,776	542,836	1238	turbidity acceptable at 350
Mid	18	29.0	8.7	6.2	9.3				1238	
Deep	32/36	29.2	8.9	7.9	9.3				1237	
TDN150	3	27.7	8.6	**36.0**	9.2		52,338,737	542,882	1232	point moved to near debris boom
Mid	17	29.0	8.4	**155.0**	9.3				1231	Very high turbidity at early warning
Deep	29/34	29.2	8.5	9.8	9.3				1231	
TDNE300 (down-current)	3	27.4	8.7	8.0	9.2		5,233,794	542,888	1243	
Mid	17	29.0	8.6	8.0	9.3				1243	
Deep	29/34	29.2	8.9	**12.0**	9.3				1242	
TDNE350	3	27.4	8.7	12.5	9.2		5,233,811	542,882	1246	
Mid	18	29.1	8.6	10.7	9.3				1246	
Deep	32/35	29.2	8.7	**16.0**	9.3				1245	Tubidity at TDNE350>TDNE300
TDNW300 (down-current)	3	27.5	8.9	5.0	9.1		52,338,727	542,828	1254	Hurlen placing rock over filter
Mid	18	29.1	8.7	5.0	9.3				1554	
Deep	32/36	29.2	8.8	6.0	9.3				1254	
TDNW350 (down-current)	3	27.6	8.8	5.2	9.1		52,338,728	542,812	1252	
Mid	18	29.1	8.7	6.6	9.3				1251	
Deep	32/36	29.2	8.9	11.4	9.3				1250	

Pre-Survey Calibration D. Berta 1/20 100.4%

DO Calibration as per manufacturer's specifications.

Survey work conducted by D. Berta and S. High cool, cloudy weather, wet

Turbidity Calibration as per manufacturer's specifications. Calibration at 0, 10NTU's.

Prepared By/Date:

M. Lloyd 1/22

TSS Update 1/30/03

M. Lloyd

L&AI

Construction Compliance Monitoring **Date: JAN 22** **Totem Marine - Slack to Flood**

Station/Sample	Depth/DTB (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
TDNE300	3	27.7	9.4	29.2	9.2		5,233,811	542,882	1351	elevated turbidity at 300
Mid	17	29.2	9.2	6.9	9.3				1351	
Deep	30/35	29.2	9.2	8.1	9.3				1350	
TDNE350	3	27.6	9.3	16.0	9.2		5,233,794	542,888	1353	elevated turbidity at 350
Mid	17	29.1	9.3	9.2	9.3				1352	
Deep	30/34	29.2	9.4	11.3	9.3				1352	
TDN150	3	28.3	9.2	38.0	9.2		5,233,750	542,893	1355	point moved to near debris boom
Mid	17	28.9	9.1	87.0	9.3				1354	outside of swing of crane
Deep	29/34	29.0	9.1	45.0	9.3				1354	
TDN300	3	28.1	9.4	5.0	9.2		5,233,785	542,848	1358	elevated turbidity at 300
Mid	17	29.1	9.2	5.2	9.3				1358	
Deep	30/35	29.2	9.4	7.6	9.3				1357	
TDN350	3	27.6	9.4	8.4	9.1		5,233,776	542,836	1402	turbidity acceptable at 350
Mid	17	29.2	9.2	6.6	9.3				1402	
Deep	30/35	29.2	9.3	6.0	9.3				1401	
TDNW300 (down-current)	3	28.3	9.2	10.0	9.3		5,233,727	542,828	1408	
Mid	17	29.1	9.2	7.1	9.3				1407	
Deep	30/35	29.2	9.4	7.4	9.3				1407	
TDNW350 (slack)	3	28.1	9.3	6.1	9.3		52,338,728	542,812	1405	
Mid	18	29.1	9.3	5.0	9.3				1404	
Deep	30/35	29.2	9.3	15.8	9.3				1404	Elevated tubidity at depth
TDSW300	3	27.6	9.3	8.9	9.2		5,233,658	542,841	1408	
Mid	17	29.1	9.2	5.8	9.3				1407	
Deep	30/35	29.2	9.2	7.3	9.3				1407	
TDSW350	3	26.9	9.4	13.7	9.2		52,338,648	542,828	1416	Elevated turbidity at 350
Mid	17	29.1	9.2	4.5	9.3				1415	
Deep	30/35	29.2	9.4	11.6	9.3				1415	
TDS150	3	27.8	9.3	12.2	9.2		5,233,668	542,897	1419	Slack
Mid	17	29.1	9.2	69.5	9.3				1418	
Deep	30/34	29.2	9.4	30.7	9.3				1418	
TDS300 (Slack)	3	27.6	9.2	12.3	9.2		5,233,626	542,875	1423	
Mid	17	29.1	9.2	8.8	9.3				1422	
Deep	30/35	29.2	9.2	15.1	9.3				1422	
TDS350	3	27.9	9.2	18.4	9.2		5,233,613	542,870	1425	TD3 350 turbidity greater
Mid	17	29.1	9.1	5.2	9.3				1425	than TDS 300
Deep	30/35	29.2	9.3	32.2	9.3				1424	
TDSE300 (Down-Current)	3	27.2	9.2	11.4	9.1		5,233,626	542,875	1433	Start of Flood Tide
Mid	15	29.1	9.1	35.3	9.3				1433	
Deep	25/30	29.2	9.3	28.2	9.3				1432	
TDSE350	3	27.9	9.1	10.5	9.2		5,233,601	542,924	1430	
Mid	16	29.1	9.1	39.5	9.3				1429	
Deep	27/32	29.2	9.1	19.4	9.3				1429	Hurlen stops placing rock @ 1500

Pre-Survey Calibration S. High 1/22 100.2% 97% at finish

DO Calibration as per manufacturer's specifications.

Survey work conducted by D. Berta and S. High cool, cloudy weather, wet

Turbidity Calibration as per manufacturer's specifications. Calibration at 0, 10NTU's.

Hurlen stopped work to move barges and derrick and to relocated to south end. Surveying the area for elevation. @1500

Prepared By/Date: M. Lloyd 1/22

TSS Data Update 1/30/03 M Lloyd

L&AI

1/22/03

STL Seattle

Client Name	Lloyd & Assoc. Inc.
Project Name	Thea Foss
Date Received	01-23-03

General Chemistry Parameters

Client Sample ID 030122/WO300/M/A
Lab ID 111468-01

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-27-03	mg/L	5	2

Client Sample ID 030122/WON/M/A
Lab ID 111468-02

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-27-03	mg/L	3	2

Client Sample ID 030122/WOC/M/A
Lab ID 111468-03

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-27-03	mg/L	2	2

Client Sample ID 030122/WOS/M/A
Lab ID 111468-04

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-27-03	mg/L	3	2

Client Sample ID 030122/TDS(300)/M/A
Lab ID 111468-05

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-27-03	mg/L	3	2

Client Sample ID 030122/TDNW(300)/M/A
Lab ID 111468-06

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-27-03	mg/L	ND	2

STL Seattle

Client Sample ID	030122/TDNW(300)/M/DUP
Lab ID	111468-07

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-27-03	mg/L	2	2

Client Sample ID	030122/TDN(300)/M/A
Lab ID	111468-08

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-27-03	mg/L	ND	2

Client Sample ID	030122/TDNE(300)/M/A
Lab ID	111468-09

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-27-03	mg/L	3	2

Client Sample ID	030122/TF+200/M/B
Lab ID	111468-10

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-27-03	mg/L	2	2

STL Seattle

QUALITY CONTROL REPORT

Client Sample ID: Batch QC
Lab ID: 111456-2
QC Batch Number: 1159-027

Method Blank

Parameter	Result (mg/L)	PQL
Total Suspended Solids	ND	2

Duplicate

Parameter	Sample Result (mg/L)	Duplicate Result (mg/L)	RPD (%)	Flag
Total Suspended Solids	49.2	47.6	3.31	

DMF.
1/30

PROJECT THEA FOSS / WHEELER-OSGOOD Notebook No. _____
Continued From Page _____

030122

CO ORD

TOTEM MARINE AREA #7

CENTER WORK ZONE N=5233708 E=542917

TDN	(150)	737	882
	(300)	765	848
	(350)	776	836
TDNE	(300)	794	888
	(350)	811	882
TDNW	(300)	727	828
	(350)	728	812
TDS	(150)	668	897
	(300)	626	875
	(350)	613	870
TDSE	(300)	617	924
	(350)	601	924
TDSW	(300)	658	841
	(350)	648	828

CENTER N=5233772 AREA # 6
E=542906

TDN	(150)	804	874
	(300)	836	842
T	(350)	847	829
TDNE	(300)	860	880
	(350)	874	877
TDNW	(300)	793	817
	(350)	803	798
TDS	(150)	727	894
	(300)	683	882
	(350)	878	669
TDSE	(300)	680	910
	(350)	665	912
TDSW	(300)	908	814
	(350)	696	830

Continued on Page

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Daniel H Burke 01/22/03 _____ R M Floyd 7/22/03

Signed Date Signed Date

PROJECT THEA FOS/WHEELER - OSGOOD

Notebook No. _____ 11

Continued From Page _____

030122

SAMPLE

ME	LOCATION	EVENT	PTB	DEPTH	TEMP	SAL	DO	TURB	TSS

Continued on Page

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[illegible] 01/22/03		[illegible]	1/22

PROJECT THEA FOSS / WHEELER-OSGOOD Notebook No. _____
Continued From Page ____

WHEELER-OSGOOD
WORK ZONE #1 & #2
CENTER OF WORK ZONE: N=5233233 E=543332

WO 300 253 241 - WORK ZONE #1
253 216 - WORK ZONE #2

WO MID NORTH 290 184
WO MID CENTER 266 184
WO MID SOUTH 243 184

WON 331 994
WOC 308 994
WOS 284 994

0745 Totem Dock - Crane began moving - no material placed yet

0813 Calibrate Instruments
DO @ 76.1 mm Hg & salinity
Calibrate over Tap water at ambient temp = 1.00
[note: Sonde was uncalibrated first]

Rain Rain & some more Rain

Continued on Page

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Daniel A. Berta 01/22/03 Signed Date

[signature] Signed 3/22/03 Date

PROJECT Thea Foss

Notebook No. _____ 13

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030122

Wheeler - OS good

Work Zone # 1 Max Ebb Tide

Time	Location	Event	DTB	Sample Depth	t	Sal	DO	Turb	TSS
0833	WO300	A	14.2	D 10	9.1	27.4	7.5	2.5	—
0835	253 241			M 7	9.1	26.7	7.6	3.6	030122/WO300/M/L
0836	acc 7.3'			S 2	8.8	19.9	8.2	8.8	—
0843	WOMID North	A	5.4	D 6	9.0	26.5	8.3	3.8	—
~~05~~	297 184			M —					—
0844	acc 5.2' (deep: 290 184)			S 3	8.8	24.9	8.1	4.4	—
0848	WOMID Center	A	14.6	D 12	9.2	27.9	8.0	3.2	—
0849	296 184			M 7	9.1	27.2	7.9	2.1	—
0850	acc = 4.3'			S 3	8.9	23.1	8.1	5.8	—
0851	WOMID South	A	~~7.3~~ 8.5	D 6	9.1	27.0	8.1	4.5	—
~~[illegible]~~	~~[illegible]~~ 243 184			M —	-				
0852	acc 7.5'			S 2	8.9	19.7	8.4	7.8	—
0856	WON	A	14.4	D 10	9.2	27.5	8.0	2.0	—
0857	331 994			M 7	9.0	26.8	8.0	1.3	030122/WON/M/L
0859	acc = 4.9			S 3	8.9	22.9	8.4	1.6	—
0900	WOC	A	18.2	15	9.2	28.2	8.0	3.4	—
0901	308 994			M 9	9.2	27.4	7.9	1.8	030122/WOC/M/L
0902	acc 5.5'			S 3	9.0	23.8	8.3	4.0	—

Continued on Page

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[signature] 1/22/03 — Signed TMW — Date

Tetra Dock
0905 Changing Barges

Continued on Page

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PROJECT Thunfoss

Notebook No. _____ 15

Continued From Page _____

030122

Whale - Osgood Lock Zone #1

Time	Location	Event	DTB	Sample Depth	ft	Sal	DO	Turb	TSS
0904	WOS	A	14.6	D 10	9.1	28.0	8.5	1.7	—
0905	284 999			M 7	9.1	27.6	8.2	1.5	030122/WOS/M/A
0906	acc 5.8			S 3	8.9	22.8	8.5	3.0	—

Totem Dock Max Ebb Tide

~~TDN300~~
~~765 848~~
~~acc 7.8'~~

0933	TDS300		41.2	D 35	9.3	29.1	8.0	1.7	—
0935	626 875			M 20	9.2	28.6	7.9	1.3	030122/TDS300/M/A
0936	acc = 7.0'			S 3	8.8	26.1	8.4	2.6	—
0943	TDS350		40.9	D 35	9.3	29.1	8.0	1.6	—
0944	613 870			M 20	9.3	28.7	8.0	1.0	—
0945	acc = 8.5			S 3	9.1	24.9	8.5	2.2	—
0947	TDNW300		41.6	D 35	9.3	29.1	8.4	1.7	—
0948	727 828			M 20	9.3	28.8	8.2	0.5	030122/TDNW300/M/A
0951	acc = 7.8			S 3	9.1	26.1	8.6	1.4	—
0952	TDNW300		41.4	D 35	9.3	29.1	8.3	2.4	—
0953	727 828			M 20	9.3	28.8	8.2	1.0	030122/TDNW300
0955	acc = 7.3			S 3	9.1	25.7	8.7	1.8	—
0956	TDNW350		40.0	D 35	9.3	29.1	8.7	2.0	—
0957	728 812			M 20	9.3	28.8	8.4	1.6	—
0958	acc = 7.1			S 3	9.1	24.9	8.8	2.4	—

Continued on Page

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David A. Berk 01/22/03 — Signed — Date

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PROJECT

Notebook No.

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030122

~~Lake Lou Esquit~~ Tolin Marina

Time	Location	Event	TTB	Single Dipper	T	Sal	DO	Turb	TSS
1002	TDN 150	A	36.3	D 31	9.3	29.1	8.3	5.0	—
1003	737 882			M 18	9.3	25.7	8.2	1.6	—
1004	acc 5.9'			S 3	9.1	25.9	8.6	5.4	—
	actual 745 882								
1006	TDN 300	A	40.5	D 35	9.3	29.1	8.3	1.5	—
1008	715 848			M 20	9.3	28.8	8.3	1.0	030122/TDN300/M/A
1009	acc = 6.8			S 3	9.1	27.2	8.6	1.1	—
1011	TDN 350	A	40.7	D 35	9.3	29.1	8.5	1.6	—
1012	777 836			M 20	9.3	28.8	8.4	1.1	—
1013	acc = 6.1			S 3	9.0	25.1	8.9	2.6	—
1015	TDNE 300	A	39.5	D 35	9.3	29.1	8.3	2.5	—
1016	794 888			M 20	9.3	28.9	8.2	1.2	030122/TDNE300/M/A
1017	acc = 6.2			S 3	9.0	24.9	8.7	6.4	—
1019	TDNE 350		38.0	D 35	9.3	29.1	8.5	2.6	—
1020	811 892	A		M 20	9.3	28.9	8.3	1.7	—
1021	acc = 6.1			S 3	9.0	24.4	8.6	4.8	—
1148	TF 200	B	42	D 36	9.3	29.2	7.8	0.3	—
1148	465 492			M 21	9.3	29.2	7.8	0.6	030122/TF200/M/B
1149	(acc = 7.5)			S 3	9.2	28.4	7.8	0.9	—

Continued on Page

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Paul A. Rice 01/22/03 — Signed — Date

D Michael Lyd 1/23 — Signed — Date

PROJECT THE A FOSS / WHEELER-OSGOOD Notebook No. _____
Continued From Page _____

030122

1200 PM CALIBRATION

BAROMETRIC PRESSURE 763.4 mm Hg

DO CALIBRATION IN MOIST AIR OVER TAP WATER
= 100.2 (CALIB. CHECK)

TURBIDITY CALIBRATION BY 2 POINT METHOD.
1) 0.0 NTU = DI WATER, 2) 10.0 NTU STANDARD
SOLUTION - TURBIDITY CHECK AFTER CALIBRATION
= 10.0 NTU

NOTE: @ 1200 WE OBSERVED THE MAHSON RIG AT THE MOUTH OF THE WHEELER-OSGOOD (IE DURING END OF MAX EBB TIDE) NO IN WATER PLACEMENT OF MATERIALS OBSERVED

Continued on Page

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B Michael Floyd 1/22/03 — Signed — Date

PROJECT Thea Foss/Wheeler-Osgood

Notebook No. _____ 19

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030122 WORK AREA # 7

ME	LOCATION	EVENT	DTB	SAMPLE DEPTH	TEMP	SAL	DO	TURB	TSS
	TDN 150	B		D					—
	737 882			M	(SEE BELOW)				—
	(Acc =)			S	3				—
						MAX EBB FLOW			
1225	TDS (~~350~~ 350 DB)	B	(37)	D	32	9.3	29.1	8.9	9.5	—
1226	613 870			M	18	9.3	29.0	8.6	5.4	—
1226	(Acc = 5.4)			S	3	9.1	26.6	8.8	12.4	—
1227	DB TDS (~~350~~ 300)	B	(36)	D	32	9.3	29.1	8.5	9.5	—
1228	626 ~~626~~ 875			M	18	9.3	29.0	8.5	6.2	—
1228	(Acc = 5.5)			S	3	9.0	25.9	8.9	19.4	—
						9.3 DB S	29.2	8.5		
1231	TDN (150)	B	(34)	D	29	9.3	~~25.9~~	~~8.9~~	9.8	—
1231	737 882			M	17	9.3	29.0	8.4	155.0	—
1232	(Acc = 5.5)			S	3	9.2	27.7	8.6	36.0	—
						EBB TIDE			
237	TDN (350)	B	(36)	D	32	9.3	29.2	8.7	7.9	—
38	776 836			M	18	9.3	29.0	8.7	6.2	—
1238	(Acc = 5.8)			S	3	9.2	27.7	8.8	4.2	—
1239	TDN (300)		(36)	D	32	9.3	29.2	8.9	8.1	—
1239	765 848			M	18	9.3	29.1	8.7	5.7	—
1240	(Acc = 5.7)			S	3	9.2	22.7	9.1	20.7	—
1242	TDNE (~~35~~ 300 DB)		(34)	D	29	9.3	29.2	8.9	12.2	—
1243	794 888			M	17	9.3	29.0	8.6	8.0	—
1243	(Acc = 6.2)			S	3	9.2	27.4	8.7	8.0	—
1245	TDNE (~~35~~ 300 DB)		(35)	D	32	9.3	29.2	8.7	16.4	—
1246	811 882			M	18	9.3	29.1	8.6	10.7	—
1246	(Acc = 6.4)			S	3	9.2	27.4	8.7	12.5	—

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PROJECT

Notebook No.
Continued From Page

1250 - HURLEN LOADING 1ST BUCKET OF QUARRY SPALLS
PLACED @ 1255

PLACING MATERIAL @ ≈ 1 BUCKET / 5 MINUTES

1353 HURLEN BEGINS PLACING FILTER CAP -
GRAVEL FROM SHORELINE AT TOP OF SLOPE.
GRAVEL DID NOT ENTER WATER DURING OUR
OBSERVATIONS

Continued on Page

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PROJECT THEA FOSS/WHEELER - USGOOD

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030122

WORK ZONE #7

SAMPLE

EBB TIDE

ME	LOCATION	EVENT	DTB	DEPTH	TEMP	SAL	DO	TURB	TSS
1250	TDNW(350)	B	(36)	D 32	9.3	29.2	8.9	11.4	—
1251	728 812			M 18	9.3	29.1	8.7	6.6	—
1252	(ACC = 5.8')			S 3	9.1	27.6	8.8	5.2	—
1254	TDNW(300)	B	(36)	D 32	9.3	29.2	8.8	6.0	—
1254	727 828			M 18	9.3	29.1	8.7	5.0	—
1254	(ACC = 6.8)			S 3	9.1	27.5	8.9	5.0	—
					26.0 DB				
1308	TDS (300)		(36)	D 32	9.3	29.2	8.8	8.9	—
1309	626 875			M 18	9.3	29.1	3.9	8.8	—
1309	(ACC = 6.4)			S 3	9.0	26.0	9.2	27.0	—

INFORMATIONAL READINGS

1313	TDS ≈ 150		(12)	D 9	9.2	28.5	9.1	8.1	—
1314	660 938			M 6	9.2	28.2	9.0	8.5	—
1314	(ACC = 7.7')			S 3	9.2	27.3	9.1	7.3	—

SLACK TIDE (WORK ZONE #7)

1350	TDNE(300)	C	(35)	D 30	9.3	29.2	9.2	8.1	—
1351	(811 882)			M 17	9.3	29.2	9.2	6.9	—
1351	(ACC = 6.0')			S 3	9.2	27.7	9.4	29.2	—
								DB	
1352	TDNE(300)	C	(34)	D 30	9.3	29.2	9.4	11.9 3	—
1352	794 888			M 17	9.3	29.1	9.3	9.2	—
1353	(ACC = 6.1')			S 3	9.2	27.6	9.3	16.0	—
					DB 25.9				
1354	≈TDN (150)	C	(21)	D 16	9.3	29.0	9.1	45.0	—
1354	727 882			M 10	9.3	28.9	9.1	87.2	—
1355	(ACC, 5.5')			S 3	9.2	28.3	9.2	38.1	—

*750 893 AGAINST BOOM/TO BE OUTSIDE OF TRAVEL OF CRAW'S BUCKET.

1357	TDN(300)	C	(35)	D 30	9.3	29.2	9.4	7.6	—
1358	765 848			M 17	9.3	29.1	9.2	5.2	—
1358	(ACC = 5.8)			S 3	9.2	28.1	9.4	5.0	

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PROJECT THEA FOSS / WHEELER-OSGOOD

Notebook No. _____
Continued From Page _____

030122

~1415 HURLEY STOPS PLACING FILTER CAP FROM SHORE

NOTE: Material on shore for concrete at top of grout mat

DML 2310
1/22/03

Continued on Page

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Signed	Date	Signed	Date
Daniel A. Beck 01/22/03		R M [illegible]	1/22/03

PROJECT Thea Foss/Wheeler-Osgood

Notebook No. _____ 23

Continued From Page _____

030122 TOTEM MARINE DOCK WORK ZONE #7

SAMPLE SLACK TIDE

TIME	LOCATION	ELEV	DTB	DEPTH	TEMP	SAL	DO	TURB	TSS
1401	TDN (350)	C	35	D 30	9.3	29.2	9.3	6.0	—
1402	776 836			M 17	9.3	29.2	9.2	6.6	—
1402	(Acc = 6.9)'			S 3	9.1	27.6	9.4	8.4	—
1404	TDNW (350)	C	35	D 30	9.3	29.2	9.8	15.8	—
1404	723 ~~803~~ ~~798~~ 812			M 17	9.3	29.1	9.3	5.0	—
1405	(Acc = 5.7')			S 3	9.3	29.1	9.3	6.1	—
1407	TDNW (300)	C	35	D 30	9.3	29.2	9.4	7.4	—
1407	727 828			M 17	9.3	29.1	9.2	7.1	—
1408	(Acc = 6.5')			S 3	9.3	28.3	9.2	10.0	—
1410	TDSW (350)	C	35	D 30	9.3	29.2	9.4	11.6	—
1411	648 828			M 17	9.3	29.1	9.2	4.5	—
1411	(Acc = 6.3')			S 3	9.2	26.9	9.4	13.7	—
1415	TDSW (300)	C	35	D 30	9.3	29.2	9.2	7.3	—
1415	658 841			M 17	9.3	29.1	9.2	5.7	—
1416	(Acc = 6.7)			S 3	9.2	27.6	9.3	8.9	—
1418	TDS (150)	C	34	D 30	9.3	29.2	9.4	30.7	—
1418	668 897			M 17	9.3	29.1	9.2	69.5	—
1419	(Acc = 8.4)			S 3	9.2	27.8	9.3	12.2	—
1422	TDS (300)	C	35	D 30	9.3	29.2	9.8	15.1	—
1422	626 875			M 17	9.3	29.1	9.2	8.8	—
1423	(Acc = 10.7)			S 3	9.2	27.6	9.2	12.3	—
1424	TDS (350)	C	35	D 30	9.3	29.2	9.3	32.2	—
1425	613 870			M 17	9.3	29.1	9.1	5.2	—
1425	(Acc = 5.9')			S 3	9.2	27.9	9.2	18.4	—

NOZ

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[signature] 01/22/03 _____ [signature] 1/23/03 _____

Signed Date Signed Date

PROJECT THEA FOSS / WHEELER - OSGOOD

Notebook No. _____
Continued From Page _____

030122

5 DO CALIB CHECK = 97.0%

HURLEN MOVING BARGES NO SIGNIFICANT PLACEMENT OF CAP MATERIALS IN WATER WILL REPORTEDLY BE PERFORMED ~~THE REM~~ UNTIL 030123

NOTE: Called Jain to advise @ ±1500. Crew took a break while Hurlen moved barges, checked depths, relocated dessick.

Continued on Page

Read and Understood By

Daniel A. Burke 01/22/03 — Signed — Date

[signature] 1/23/03 — Signed — Date

PROJECT THEA FOSS / WHEELER - OSGOOD

Notebook No. _____

Continued From Page _____

TOTEM MARINE DOCK SLACK TIDE

30122 WORK ZONE #7

SAMPLE

TIME	LOCATION	EVENT	DTB	DEPTH	TEMP	SAL	DO	TURB	TSS
1429	TDSE(302)	C	(32)	D 27	9.3	29.2	9.1	19.4	—
1429	601 924			M 16	9.3	29.1	9.1	39.5	—
1430	(ACC=7.5)			S 3	9.2	27.9	9.1	10.5	—
1432	TDSE(300)	C	(30)	D 25	9.3	29.2	9.3	28.2	—
1433	617 924			M 15	9.3	29.1	9.1	35.3	—
1433	(ACC=7.4)			S 3	9.1	27.2	9.2	11.4	—

Continued on Page

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[signature] 01/22/03 _____ [signature] 1/23/07 _____

Signed Date Signed Date

Lloyd & Associates, Inc.
38210 SE 92nd Street, Snoqualmie, Washington 98065 425-888-1905 rml@centurytel.net

January 23, 2003

TSS update
1/30/03
RML

TRANSMITTAL

To: Iain Wingard
John O'Loughlin

Subject: Compliance Monitoring / Totem Marine 1/23/03
Compliance Monitoring / Wheeler-Osgood 1/23/03
Preliminary Data Transmittal (no TSS)

Attached please find results from compliance monitoring for the following work activities:

- Rock placement at Wheeler-Osgood
- Placement of rock at Totem Marine.

Wheeler-Osgood - Capping/Rocking.

Manson was placing filter material and riprap during this morning's ebb tide. Work appeared to be going well although the rock appeared to be "muddy" when placed on the north shore. There was no floating debris, but the water appeared very turbid. Dissolved oxygen levels at WO300 were acceptable, but turbidity was unusually high (greater than previously observed). Compliance points at the mouth of the waterway were elevated and ranged from 8 to 27 NTU's.

The source of turbidity is believed to be the placement of muddy rock. In all past monitoring events Manson has placed rock or filter cap materials on a flood tide. The effect has been to contain turbidity within the waterway for a sufficient length of time for the turbidity to settle out before an ebb tide. This morning Manson had to place rock on an ebb tide, then exit the waterway shortly after our water quality measurements were taken.

Totem Marine - Capping/Rocking.

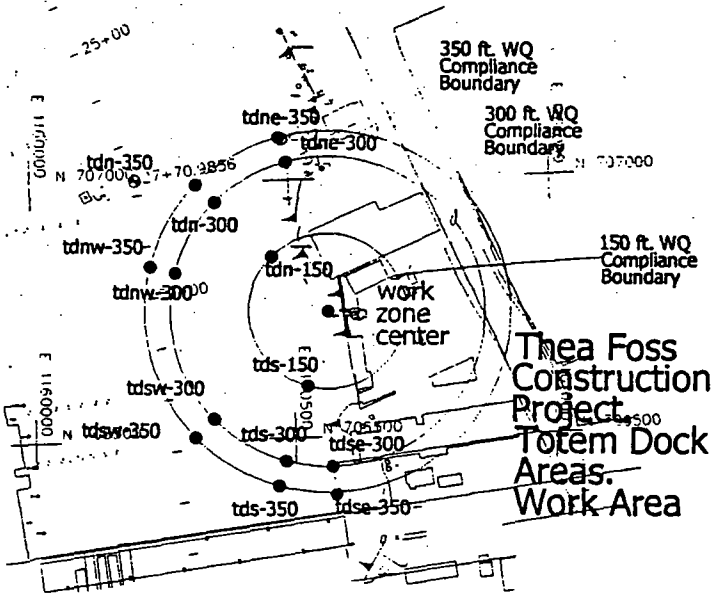
Water quality monitoring was conducted during the morning ebb while rock was being placed on the south side of Totem Marine to fill in spots that had been identified as requiring additional material. The riprap was very muddy and contained substantial quntities of fines. High turbidity was identified at TDN350, but turbidities closer to the work zone and up-current were sustantially lower suggesting that there is potentially another source of the turbidity. The highest turbidity associated with the work activity occurred and TDN300 where a turbidity of 19.7 NTU's was recorded at a depth of 3 feet. Turbidity at 23 NTU's was also observed up-current at TDS300 at depth. As indicated in the data forms, considerable turbidity was observed in the immediate area of the work zone.

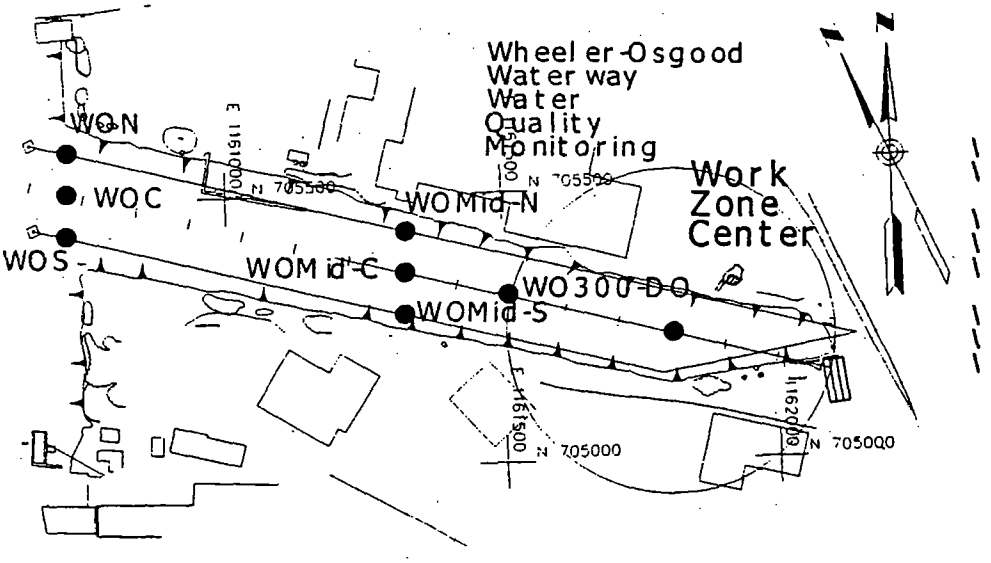
Late afternoon sampling at Totem occurred during a slack to flood tide. The water quality sampling team did not detect elevated turbidity at any sampling station while Hurlen placed filter matrial on the north side of the boat lift.

QA/QC information. Early this morning the water quality sampling crew cleaned the DO electrodes, replaced the KCl, and installed a new membrane. No instuementation problems were noted throughout the day, and all calibrations and calibrations checks were acceptable. Field triplicates were collected for sample stations TDNE300 and TDNE 350 over a period of approximately 1 hour. Results are provided in the field log and confirm that result are very reproducible even though some variation in the turbidity was observed.

Michael Lloyd
Lloyd & Associates, Inc.

Totem 1 23 03.doc


350 ft. WQ Compliance Boundary
300 ft. WQ Compliance Boundary
150 ft. WQ Compliance Boundary
tdne-350
tdne-300
tdn-350
tdn-300
tdnw-350
tdnw-300
tdn-150
work zone center
tds-150
tdsw-300
tdsw-350
tds-300
tdse-300
tds-350
tdse-350
Thea Foss Construction Project Totem Dock Areas. Work Area


Wheeler-Osgood Waterway Water Quality Monitoring
WON
WOC
WOS
WOMid-N
WOMid-C
WOMid-S
WO300-DO
Work Zone Center

Construction Compliance Monitoring Date: JAN 23 Wheeler-Osgood/Ebb Tide

Station/Sample	Depth/DTB (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
WO300 (down-current)	3	28.0	6.5	**172**	9.3		5,233,253	542,216	1130	**Ebb Tide**
030123/WO300/M/A	6	28.8	6.4	**48**	9.3	17			1129	Manson placing rock
Deep	1012	29	6.6	**23**	9.3				1129	reportedly "dirty"
WOMID-N (down-current)	3	28.3	6.4	**81**	9.3		5,233,290	542,184	1135	Point moved to avoid
Deep	5/6	28.3	6.4	**64**	9.3				1135	floats
WOMID-C (down-current)	3	27.4	6.5	**157**	9.3		5,233,266	542,184	1138	Manson placing rock
Deep	7/9	28.9	6.4	**71**	9.3				1137	on N. side of waterway
WOMID-S (down-current)	3	27.3	6.5	**110**	9.3		5,233,241	542,170	1141	STA. against debris boom
Deep	5/7	28.1	6.5	**118**	9.3				1140	
WON (down-current)	3	9.3	6.6	**13.4**	9.3		5,233,331	542,994	1147	Elevated turbidity at
030123/WON/M/A	5		6.6*			5/3			1148	all compliance points
Deep	7/10	9.3	6.6	6.6	9.3				1146	
WOC (up-current)	3	28.0	6.5	**24.0**	9.3		5,233,308	542,994	1210	Manson stops all in-water
0301123/WOC/M/A	7	28.3	6.6	**27.0**	9.3	5			1210	work in WO because they
Deep	10/15	28.6	6.7	**20.0**	9.3				1210	were running out of depth and
WOS (down-current)	3	27.7	6.5	**22.0**	9.3		5,233,284	542,994	1208	moved derrick.
030123/WOS/M/A	6	28.2	6.5	**21.0**	9.3	4			1208	
Deep	10/12	28.4	6.5	11.2	9.3				1207	
Pre-Survey Calibration check	S. High 1/22	101.8 % in saturated air								Cool, cloudy, some sun

DO & Turbidity calibration as per manufacturer's specifications.
Survey work conducted by D. Berta & S. High
Manson was placing rock on north shore during an ebb tide. Typically Manson has had more favorable tides to allow more settling (residence) time for turbidity to settle out.
*Winkler Titration on sample yielded 6.2 and 6.3 mg/L. YSI = 6.6

Prepared By/Date:	TSS Update 1/30/03	
M. Lloyd 1/23	Tom Lloyd	**L&AI**

Construction Compliance Monitoring **Date: JAN 23** **Totem Marine - Ebb Tide**

Station/Sample	Depth/DTB (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
TDS150 (Up-Current)	3	28.0	6.9	6.9	9.2		5,233,637	542,928	854	Ebb Tide
Mid	20	29.1	7.3	6.0	9.3				854	
Deep	35/41	29.1	7.2	6.8	9.3				853	
TDS300 (Up-Current)	3	27.8	7.0	9.0	9.2		5,233,596	542,917	904	
030123/TDS300/M/A	20	29.1	7.2	8.6	9.3	2			904	Hurlen placing rock material
Deep	35/41	29.1	7.0	**23.0**	9.3				903	Up-Gradient turbidity
TDS350	3	28.1	7.1	7.9	9.3		5,233,579	542,913	909	
Mid	21	29.1	7.3	2.0	9.3				908	
Deep	37/42	29.1	7.2	9.8	9.3				908	
TDN150 (Down-Current)	3	28.8	6.6	**134***	9.3		52,338,713	542,907	940	Inside debris boom at point
Mid	15	29.1	7.0	**211***	9.3				932	
Deep	24/29	29.1	7.2	**140***	9.3				923	
TDN300	3	28.5	6.8	**19.7**	9.3		5,233,745	542,874	946	Elevated turbidity at shallow
030123/TDN300/M/A	2	29.1	7.2	0.1	9.3	3			945	
Deep	35/40	29.2	7.2	3.8	9.3				945	
TDN350	3	28.6	6.9	3.2	9.3		5,233,755	542,863	955	
Mid	22	29.2	7.1	0.1	9.3				954	Hurlen takes a break
Deep	39/44	29.1	7.1	6.6	9.3				954	
TDNE300 (down-current)**	3	28.5	6.7	10.8	9.3		5,233,770	542,915	1039	Multiple Measurements
030123/TDNE300/M/A	8	28.7	6.7	5.4	9.3	3			1039	
Deep	11/16	28.7	6.7	5.2	9.3				1039	
TDNE350**	3	28.5	6.8	3.5	9.3		5,233,784	542,911	1036	
Mid	20	28.8	6.7	9.3	9.3				1035	Hurlen placing rock material
Deep	35/38	29.1	6.9	**102.0**	9.3				1035	Very high turbidity at depth

**Multiple measurments were taken at TDNE300 and 350 which confirm that turbidity is substantially higher at TDNE350 than TDNE300. Suspect that storm drains to the east have/are contributing to turbidity at this location

TDNW300 (down-current)	3	28.3	7.1	4.8	9.3		52,338,703	542,851	1110	
030123/TDN300/M/A	21	29.1	7.1	0.1	9.3	2 U			1110	
Deep	37/42	29.2	7.1	1.4	9.3				1109	
TDNW350	3	28.4	7.0	4.0	9.3		52,338,707	542,836	1107	
Mid	21	29.1	7.1	0.1	9.3				1107	
Deep	37/42	29.2	7.1	1.3	9.3				1106	
Station TF 2+00	3	28.9	9.2	1.9	9.1		52,338,465	542,492	1418	
030123/TF2/M/B	19	19	9.3	0.5	9.3				1417	
Deep	33/38	29.2	9.3	0.4	9.3				1415	

Pre-Survey Calibration D. High 1/23 100.4%

DO Calibration as per manufacturer's specifications. downpour in early AM

Survey work conducted by D. Berta and S. High cool, cloudy weather, wed

Turbidity Calibration as per manufacturer's specifications. Calibration at 0, 10NTU's.

Perfomed routine maintenance on YSI Sonde early in the morning before survey.

*Highest value reported over a 7-8 minute monitoring period

Prepared By/Date: M. Lloyd 1/23

TSS Update 1/30/03

L&AI

Construction Compliance Monitoring

Date: JAN 23 **Totem Marine - Slack to Flood**

Station/Sample	Depth/DTB (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
TDN300 (Up-Current)	3	28.7	7.0	1.6	9.3		5,233,765	542,848	1538	Up current turbidity low
Mid	16	29.1	7.1	1.8	9.3				1537	
Deep	27/33	29.2	7.1	1.6	9.3				1536	Hurlen placing gravel NW of
TDN350	3	28.7	7.0	1.4	9.3		5,233,776	542,836	1542	boat sling (filter material)
Mid	16	29.1	7.1	1.9	9.3				1541	
Deep	27/33	29.2	7.1	0.9	9.3				1540	
TDS150 (down-current)	3	27.9	6.9	3.8	9.3		5,233,668	542,897	1548	Flood
Mid	16	29.1	6.8	1.5	9.3				1547	
Deep	27/33	29.2	6.9	1.1	9.3				1546	
TDS300	3	27.9	6.9	3.8	9.4		5,233,626	542,875	1552	Hurlen worked at a relatively
Mid	16	29.1	6.8	1.5	9.3				1551	slow, even pace.
Deep	27/32	29.2	6.9	1.1	9.3				1550	
TDS350	3	28.6	6.8	1.4	9.3		5,233,613	542,870	1555	
Mid	16	29.1	6.8	1.4	9.3				1554	
Deep	27/33	29.1	6.9	1.2	9.3				1553	
TDSE300 (Down-Current)	3	27.9	6.9	2.7	9.3		5,233,617	542,924	1558	
Mid	16	29.1	6.9	2.8	9.3				1557	
Deep	27/32	29.2	7.0	1.3	9.3				1556	
TDSE350	3	28.6	6.9	2.3	9.3		5,233,601	542,924	1601	
Mid	16	29.0	6.9	1.7	9.3				1600	
Deep	27/31	29.1	7.0	1.6	9.3				1559	
TDSW300	3	28.9	6.9	1.2	9.3		5,233,658	542,841	1607	
Mid	17	29.2	7.0	2.6	9.3				1606	
Deep	28/34	29.2	7.1	1.2	9.3				1605	
TDSW350	3	28.6	6.9	1.4	9.3		52,338,648	542,828	1604	
Mid	17	29.1	6.9	1.2	9.3				1603	
Deep	28/34	29.2	7.0	0.9	9.3				1602	

Pre-Survey Calibration S. High 1/23 101.9% 97% at finish

DO Calibration as per manufacturer's specifications.

Survey work conducted by D. Berta and S. High warm, partly sunny

Turbidity Calibration as per manufacturer's specifications. Calibration at 0, 10NTU's.

Prepared By/Date:

M. Lloyd 1/23

TSS Update 1/30/03

M M Lloyd

L&AI

1/23/03

STL Seattle

Client Name	Lloyd & Assoc. Inc.
Project Name	Thea Foss
Date Received	01-23-03

General Chemistry Parameters

Client Sample ID 030123/TDS(300)/M/A
Lab ID 111469-01

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-24-03	mg/L	2	2

Client Sample ID 030123/TDN(300)/M/A
Lab ID 111469-02

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-24-03	mg/L	3	2

Client Sample ID 030123/TDNE(300)/M/A
Lab ID 111469-03

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-24-03	mg/L	3	2

Client Sample ID 030123/TDNW(300)/M/A
Lab ID 111469-04

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-24-03	mg/L	ND	2

Client Sample ID 030123/WO300/M/A
Lab ID 111469-05

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-24-03	mg/L	17	2

Client Sample ID 030123/WON/M/A
Lab ID 111469-06

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-24-03	mg/L	5	2

STL Seattle

Client Sample ID	030123/WON/M/DUP
Lab ID	111469-07

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-24-03	mg/L	3	2

Client Sample ID	030123/WOC/M/A
Lab ID	111469-08

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-24-03	mg/L	5	2

Client Sample ID	030123/WOS/M/A
Lab ID	111469-09

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-24-03	mg/L	4	2

STL Seattle

QUALITY CONTROL REPORT

Client Sample ID: Batch QC
Lab ID: 111474-12
QC Batch Number: 1159-026

Method Blank

Parameter	Result (mg/L)	PQL
Total Suspended Solids	ND	2

Duplicate

Parameter	Sample Result (mg/L)	Duplicate Result (mg/L)	RPD (%)	Flag
Total Suspended Solids	6	6.2	3.28	

RMR 1/30/03

STL Seattle

QUALITY CONTROL REPORT

Client Sample ID: Batch QC
Lab ID: 111456-2
QC Batch Number: 1159-027

Method Blank

Parameter	Result (mg/L)	PQL
Total Suspended Solids	ND	2

Duplicate

Parameter	Sample Result (mg/L)	Duplicate Result (mg/L)	RPD (%)	Flag
Total Suspended Solids	49.2	47.6	3.31	

TAL
1/30

530123

0800 CALIBRATION NOTES:

0750
(HURLEN CONT. PLACING QUARRY SPALLS NEAR S.W. CORNER)

0805 - CLEANED ELECTRODES ON D.O. PROBE & CHANGED MEMBRANE - ACCORDING TO MANUFACTURERS RECOMENDATIONS

BAROMETRIC PRESSURE = 773.8 mm/Hg
D.O. CALIBRATED IN MOIST AIR OVER TAP WATER. CALIBRATION CHECK = 101.8.

TURBIDITY CALIBRATION WITH 2 POINT METHOD
1) 0.0 = DI WATER 2) 10.0 NTU = STANDARD SOLUTION.
TURBIDITY CHECK = 10.0 NTU.

- 0850 HURLEN USEING TRACK HOE ON SHORE TO MOVE GRAVEL INTO PLACE

*NOTE: TURBIDITY REPORTED AS RANGE DUE TO RAPID FLUCTUATIONS. TIME RANGE & TURBIDITY RANGE REPORTED. SAL/DO & TEMP APPEARED STABLE DURING TIME PERIOD.

0910 TDN (150) - OBTAINED INSIDE THE DEBRIS BOOM VISIBLE TURBIDITY NOTED IN WORK ZONE NEAR 150' STATION.

1:00 HURLEN TAKES BREAK

Continued on Page

Read and Understood By

Signed Date Signed Date

30123

TIME	LOCATION	EVENT	DTB	SAMPLE DEPTH	TEMP	SAL	DO	TURB	TSS
	TOTEM MARINE DOCK - WORK ZONE #5								
				DB ~~FLOOD~~ ⇒ SLACK TIDE (~~⇒ EBB~~)					
	~~TDN(30)~~	~~A~~		~~D~~					
				~~M~~					
	(			~~S 3~~					
					SLACK ⇒ EBB				
0853	TDS(150)	A	(41)	D 35	9.3	29.1	7.2	6.8	—
0854	637 928			M 20	9.3	29.1	7.3	6.0	—
0854	(ACC=6.3')			S 3	9.2	28.0	6.9	6.9	—
					EBB (SLACK)				
0903	TDS(300)	A	(41)	D 35	9.3	29.1	7.0	23.0	—
0904	593 917			M 20	9.3	29.1	7.2	8.6	030123/TDS(300)/M/A
0904	(ACC=5.5')			S 3	9.2	27.8	7.0	9.0	—
					EBB				
0908	TDS(350)		(42)	D 37	9.3	29.1	7.2	9.8	—
0908	579 913			M 21	9.3	29.1	7.3	2.0	—
0909	(ACC=7.5')			S 3	9.3	28.1	7.1	7.9	—
RANGE*					EBB			*RANGE:	
0919-0922	TDN(150)		(29)	D 24	9.3	29.1	7.2	~~67~~ 8.8 - 134	—
0928-0936	713 907			M 15	9.3	29.1	7.0	174 - 211	—
0936-0944	(ACC=5.7')			S 3	9.3	28.8	6.6	11 - 140	—
					EBB				
0945	TDN(300)		(~~43~~ 40)	D 35	9.3	29.2	7.2	3.8	—
0945	745 874		DB	M 20 (20)	9.3	29.1	7.2	0.1	030123/TDN(300)/M/A
0946	(ACC=8.0')			S 3	9.3	28.5	6.8	19.7	—
					EBB (START OF MAX EBB)				
0954	TDN(350)		(44)	D 39	9.3	29.1	7.1	6.6	—
0954	755 863			M 22	9.3	29.2	7.1	0.1	—
0955	(ACC=5.6')			S 3	9.3	28.6	6.9	3.2	—

Continued on Page

Read and Understood By

Daniel A. Berta 07/23/03 _____ [signature] 030123

Signed Date Signed Date

PROJECT THEA FOSS / WHEELER - OSGOOD

Notebook No. _____
Continued From Page _____

030123

1005 CLEANED TURBIDITY PROBE WITH MANUFACTURERS BRUSH. RECALIBRATED TURBIDITY WITH 2 POINT METHOD. REFERENCED ON PAGE #26
CALIBRATION CHECK: 10.0 NTU.

1035 HURLEN RESUMES ROCK PLACEMENT - QUARRY SPALLS ("LIGHT RIP RAP?")

1100 CONTRACTOR CHECKS LOCATIONS? - 20 MINUTES WITHOUT PLACEMENT OF ROCK

Continued on Page

Read and Understood By

Daniel A. Berta 01/23/03 _____ [signature] 030123

Signed Date Signed Date

PROJECT THEA FOSS / WHEELER - OSGOOD

Notebook No. _____ 29

Continued From Page _____

030123 TOTEM MARINE DOCK MAX EBB TIDE

SAMPLE WORK ZONE #5

TIME	LOCATION	EVENT	DTB	DEPTH	TEMP	SAL	DO	TURB	TSS
10 ~~08~~35	TONE(350)	A(1)	37	D 23	9.3	29.1	6.9	102.0	—
10 0935	784 911		31	M 13	9.3	28.8	6.7	9.3	—
10 0936	(Acc=4.9)	DB	25	S 3	9.3	28.5	6.8	3.5	—
DB									
						MAX EBB			
~~10~~ 1038	TONE(300)	A(1)	16	D 11	9.3	28.7	6.7	5.2	—
1039	770 915			M 8	9.3	28.7	6.7	5.4	030123/TONE(300)/M/A
1039	(Acc=4.9)			S 3	9.3	28.5	6.7	10.8	—
						MAX EBB			
1046	TONE(350)	A(2)	30	D 25	9.3	29.1	6.8	80.0	—
1047	784 911			M 15	9.3	28.9	6.8	50.0	—
1047	(Acc=4.5)			S 3	9.3	28.5	6.7	32.0	—
						MAX EBB			
1049	TONE(300)	A(2)	15	11 DB 16	9.3	28.7	6.8	4.5	—
1049	770 915			8 ~~8~~	9.3	28.6	6.8	9.3	—
1050	(Acc=4.8')			3	9.3	28.5	6.7	12.5	—
						MAX EBB			
1053	TONE(350)	A(3)	26	D 25	9.3	29.1	6.9	82.0	—
1054	784 911			M 15	9.3	29.0	6.8	50	—
1054	(Acc=4.8)			S 3	9.3	28.4	6.7	17	—
						MAX EBB			
1056	TONE(300)	A(3)	15	D 11	9.3	28.8	6.8	6.4	—
1057	770 915			M 8	9.3	28.7	6.8	8.1	—
1058	(Acc=5.7)			S 3	9.3	28.4	6.8	15	—
						MAX EBB			
1106	TONW(350)		42	D 37	9.3	29.2	7.1	1.3	—
1107	707 836			M 21	9.3	29.1	7.1	0.1	—
1107	(Acc=4.8')			S 3	9.3	28.4	7.0	4.0	—
						MAX EBB			
1109	TONW(300)		42	D 37	9.3	29.2	7.1	1.4	—
1110	703 851			M 21	9.3	29.1	7.1	0.1	030123/TONW(300)/M/A
1110	(Acc=4.7')			S 3	9.3	28.3	7.1	4.8	—

Continued on Page

Read and Understood By

Daniel H. Berta 01/23/03 — Signed — Date

[signature] 030123 — Signed — Date

PROJECT THEA FOSS/WHEELER OSGOOD

Notebook No.
Continued From Page

1130 OBSERVED MANSON PLACING (HABITAT MIX?)
ON NORTH SIDE OF WATERWAY - OVER SPALLS.
1200 HURLEN BREAKS FOR LUNCH.
1225 MANSON MOVES RIG TO MOUTH OF WHEELER
OSGOOD

* D.O. RESULTS BY WINKLER METHOD @ L&A LAB
1) 6.2 mg/L 2) 6.3 mg/L

SONDE READING @ SAME LOCATION & ~~DEPTH~~
AND NEAR DEPTH = 6.6-6.5

(TITRATION MATERIAL LOT # A 23.5)

Hach titration Data 030123/WON/M/A @ 1240

Rep #1 = 100 ml x 0.02 x 312/100 = 6.2 mg/L

REP #2 = 100 ml x 0.02 x 314/100 = 6.3 mg/L

Data entered by RML at 1620 1/23/03

RML

Continued on Page

Read and Understood By

Paul A. Burk 01/23/03 — Signed — Date

030123 — Signed — Date

PROJECT THEA FOSS/WHEELER - OSGOOD

Notebook No. _____ 31

Continued From Page _____

WHEELER OSGOOD

030123

WORK ZONE #2

TIME	LOCATION	EVENT	DTB	SAMPLE DEPTH	TEMP	SAL	MAX EBB DO	TURB	TIDE TSS
1129	WO 300	A	(12)	D 10	9.3	29.0	6.6	23.0	—
1129	253 216			M 6	9.3	28.8	6.4	48	030123/WO300/M/A
1130	(Acc=8.9)			S 3	9.3	28.0	6.5	172	—
1135	WO MID NORTH		(6)	D 5	9.3	28.3	6.4	64	—
1135	290 184	A		S 3	9.3	28.3	6.4	81	—
	287 195*	AGAINST DEBRIS BOOM & FLOATING DOCK							
	(Acc=6.8)								
1137	WO MID CENTER		(9.0)	D 7	9.3	28.9	6.4	71	—
1138	266 184	A		S 3	9.3	27.4	6.5	157	—
	(Acc=7.6)								
1140	WO MID SOUTH		(7.0)	D 5	9.3	28.1	6.5	118	—
1141	243 184			S 3	9.3	27.3	6.5	110	—
	*241 170	- * AGAINST DEBRIS BOOM							
	(Acc=8.5)								
1146	WON		(10)	D 7	9.3	28.8	6.6	6.6	—
1148	331 994			M 5	TSS @ 5	"			030123/WON/M/A
1147	(Acc=7.1)			S 3	9.3	28.1	6.6	13.4	—
1149	WON		(10)	D 7	9.3	28.8	6.5	8.0	—
1151	331 994			M 5	TSS @ 5				030123/WON/M/DUP ★
1150	(Acc=6.7)			S 3	9.3	28.2	6.6	10.9	—
	★ DO SAMPLES OBTAINED FOR CITY OF TACOMA & 1 FOR L&A LAB								
1209	WOC		(15)	D 10	9.3	28.6	6.7	20	—
1210	308 994			M 7	9.3	28.3	6.6	27	030123/WOC/M/A
1210	(Acc=5.1)			S 3	9.3	28.0	6.5	24	—
1207	WOS		(12)	D 10	9.3	28.4	6.4	11.2	—
1208	284 994			M 6	9.3	28.2	6.5	21	030123/WOS/M/A
1208	(Acc=5.2)			S 3	9.3	27.7	6.5	22	—

Continued on Page

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Daniel A. Buta 01/23/03 _____ _____ 030123

Signed Date Signed Date

1410 Calibration
DO 101.9% b.p. = 773.0 mmHg
Turb. 0.0, 10.0

1535 Harlan starts loading gravel & placing it at NW of boat slinger at Tolan Dock

Continued on Page

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[signature] 1/23 030123

Signed Date Signed Date

PROJECT Thea Foss

Notebook No. _____ 33

Continued From Page _____

030123

Ambient Station Thea Foss [illegible] @ 2+00

time	location	Event	DTB	Sample depth	T	Sal	DO	Turb	TSS
1415	TF2+00	B	38	D 33	9.3	29.2	7.3	0.6	—
1417	465 492			M 19	9.3	29.2	7.3	0.5	030123/TF2+00/[illegible]/B
1418	acc 5.0			S 3	9.3	28.9	7.2	1.2	—
1536	TDN300		33	D 27	9.3	29.2	7.1	1.6	—
1537	765 848	B		M 16	9.3	29.1	7.1	1.8 (1.8)	—
1538	acc 7.7			S 3	9.3	28.7	7.0	1.6	—
1540	TDN350		33	D 27	9.3	29.2	7.1	0.9	—
1541	776 836	B		M 16	9.3	29.1	7.1	1.9	—
1542	acc 7.9			S 3	9.3	28.7	7.0	1.4	—
1546	TDS150		32	D 27	9.3	29.2	7.0	1.3	—
1547	668 897	B		M 16	9.3	29.1	6.9	1.4	—
1548	acc 5.2			S 3	9.3	28.5	6.9	1.7	—
1550	TDS300	B	32	D 27	9.3	29.2	6.9	1.1	—
1551	626 875			M 16	9.3	29.1	6.8	1.5	—
1552	acc 4.4			S 3	9.4	27.9	6.9	3.8	—
1553	TDS350	B	33	D 27	9.3	29.1	6.9	1.2	—
1554	613 870			M 16	9.3	29.1	6.8	1.4	—
1555	acc = 5.3			S 3	9.3	28.6	6.8	1.4	—
1556	TDSE300	B	32	D 27	9.3	29.2	7.0	1.3	—
1557	617 924			M 16	9.3	29.1	6.9	2.8	—
1558	acc 5.2			S 3	9.3	27.9	6.9	2.7	—
1559	TDSE350	B	31	D 27	9.3	29.1	7.0	1.6	—
1600	601 924			M 16	9.3	29.0	6.9	1.7	—
1601	acc 7.3			S 3	9.3	28.6	6.9	2.3	—

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[signature] 1/23 — Signed — Date

[signature] 030123 — Signed — Date

PROJECT

Notebook No.

Continued From Page

1615 Post Sampling Calibration:
DO = 97%

Continued on Page

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Signed Date Signed Date

030123

time	Location	Event	DTB	Sample depth	t	Sal	DO	Turb	TSS
1602	TDSW 350	B	34	D	28	9.3	29.2	7.0	0.9	—
1603	648828			M	17	9.3	29.1	6.9	1.2	—
1604	time = 7:1			S	3	9.3	28.6	6.9	1.4	—
1605	TDSW 300	B	34	D	28	9.3	29.2	7.1	1.2	—
1606	655841			M	17	9.3	29.2	7.0	2.6	—
1607	time 7:2			S	3	9.3	28.9	6.9	1.2	—

Continued on Page

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Signed	Date	Signed	Date
[illegible] 1/23		030123	

Lloyd & Associates, Inc.
38210 SE 92nd Street, Snoqualmie, Washington 98065 425-888-1905 rml@centurytel.net

January 24, 2003

TSS Update
1/30/03
RML

TRANSMITTAL

To: Iain Wingard
John O'Loughlin

Subject: Compliance Monitoring / Totem Marine 1/24/03
Compliance Monitoring / Wheeler-Osgood 1/24/03
Preliminary Data Transmittal (no TSS)

Although editorial comments are not usually provided, it was nice to have a day where turbidities were not a problem. Attached please find results from compliance monitoring for the following work activities:

- Filter cap placement at Totem
- Habitat Mix placement at Wheeler-Osgood

Wheeler-Osgood - Capping/Rocking.

Manson was placing habitat mix during a slack and ebb tide sampling events. Dissolved oxygen levels at WO300 were acceptable, and turbidity was much less than yesterday when they placed muddy rock. Compliance points at the mouth of the waterway were acceoptable during both sampling events.

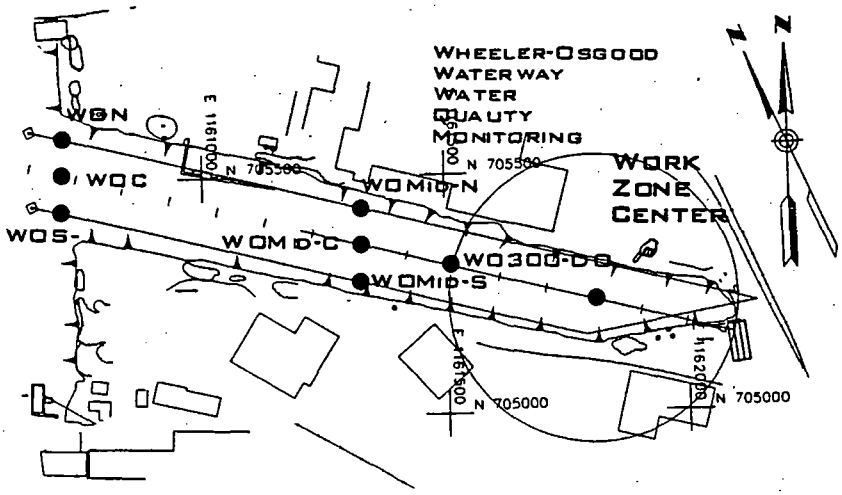
With the exception of a single monitoring event, work in the Wheeler-Osgood has proceeded quite well since January 11th. Neither Mr. Wheeler or Mr. Osgood came by to say hello for our last water quality monitoring event at the Wheeler-Osgood Waterway.

Totem Marine - Capping/Rocking.

Water quality monitoring was conducted during the morning and afternoon ebb while filter material was being placed on the north side of Totem Marine. The highest turbidity associated with the work activity occurred and TDN350 where a turbidity of 13.2 NTU's was recorded at a depth of 35 feet. Hurlen was working a slow pace during sampling events to avoid hitting the boat lift and to frequently check elevations with a leadline. They stopped in-water work at 1410 to reposition barges and the derrick.

Michael Lloyd
Lloyd & Associates, Inc.

WQM 1 24 03.doc


WHEELER-OSGOOD
WATERWAY
WATER
QUALITY
MONITORING
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ZONE
CENTER
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E 1161000
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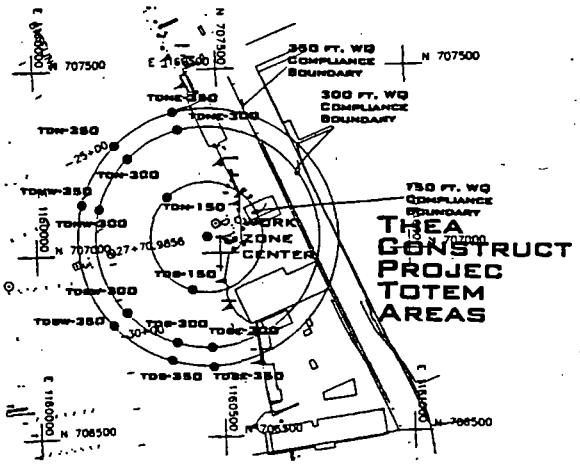
350 FT. WQ
COMPLIANCE
BOUNDARY
300 FT. WQ
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750 FT. WQ
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PROJEC
TOTEM
AREAS
N 707500
N 707000
N 706500
TDN-350
TDN-300
TDN-150
TDS-150
TDS-300
TDS-350
TDSE-350

Construction Compliance Monitoring **Date: JAN 24** **Wheeler-Osgood/Slack**

Station/Sample	Depth/DTB (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
WO300 (down-current)	3	28.2	7.1	5.1	9.4		5,233,253	542,241	822	**Slack/High tide**
030124/WO300/M/A	7	28.7	1.7	1.7	9.3	7			820	
Deep	10/14	28.9	6.9	1.8	9.3				819	
WOMID-N (down-current)	3	28.5	7.0	4.5	9.3		5,233,273	542,184	828	Point moved to avoid
Mid	7	28.9	7.1	3.2	9.3				827	floats
Deep	10/15	29.0	7.1	3.0	9.3				826	
WOMID-C (down-current)	3	28.4	7.1	4.2	9.3		5,233,266	542,184	831	Manson placing habitat mix
Mid	7	28.9	7.2	2.8	9.3				830	
Deep	10/13	29.0	7.2	3.1	9.3				829	
WOMID-S (down-current)	2	27.7	7.3	6.3	9.4		5,233,243	542,184	835	
Deep	4/5	27.8	7.9	6.5	9.4				832	
WON (down-current)	3	28.0	7.5	6.8	9.3		5,233,331	542,994	839	
030124/WON/M/A	7	28.8	7.4	1.2	9.3	3			838	
Deep	10/15	29.0	7.4	2.0	9.3				837	
WOC (up-current)	3	28.3	7.5	7.4	9.3		5,233,308	542,994	843	
0301124/WOC/M/A	10	29.0	7.5	1.1	9.3	2			842	
Deep	15/19	29.1	7.4	1.6	9.3				841	
WOC (up-current)	3	28.6	7.5	2.6	9.3		5,233,308	542,994	848	Field Duplicate
0301124/WOC/M/A-Dup	10	29.0	7.5*	1.0	9.3	3			847	Field Duplicate
Deep	15/19	29.1	7.4	1.6	9.3				846	Field Duplicate
WOS (down-current)	3	28.6	7.6	1.4	9.3		5,233,284	542,994	900	
030124/WOS/M/A	15	29.1	7.7	1.2	9.3	2			859	
Deep	15/17	29.1	7.5	1.3	9.3				857	

Pre-Survey Calibration check S. High 1/24 101.5 % in saturated air — Mild, cloudy, drizzle

DO & Turbidity calibration as per manufacturer's specifications.

Survey work conducted by D. Berta & S. High

Manson was placing rock on north shore during an ebb tide. Typically Manson has had more favorable tides to allow more settling (residence) time for turbidity to settle out.

*Winkler Titration on sample yielded 6.4 and 6.5 mg/L. YSI = 7.5

Prepared By/Date: M. Lloyd 1/24

TSS Update 1/30/03

L&AI

Construction Compliance Monitoring Date: JAN 24 Wheeler-Osgood/MAX EBB

Station/Sample	Depth/DTB (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
WON (down-current)	3	28.0	7.4	4.0	9.4		5,233,331	542,994	1146	Manson placing habitat
Mid	7	28.7	7.4	1.1	9.4				1146	mix on south bank or
Deep	10/13	28.8	7.4	1.2	9.4				1145	Wheeler-Osgood
WOC (up-current)	3	28.2	7.2	3.7	9.4		5,233,308	542,994	1150	
Mid	9	28.9	7.2	4.0	9.3				1149	
Deep	12/17	29.0	7.2	2.7	9.3				1148	
WOS (down-current)	3	27.2	7.3	5.6	9.4		5,233,284	542,994	1152	
Mid	9	28.9	7.3	1.3	9.3				1151	
Deep	12/17	29.0	7.2	1.4	9.3				1151	

Pre-Survey Calibration check S. High 1/24 101.3 % in saturated air Mild, cloudy, drizzle

DO & Turbidity calibration as per manufacturer's specifications.

Survey work conducted by D. Berta & S. High

Manson was preparing to move derrick out of Wheeler-Osgood. Data collected before tug came in

Prepared By/Date:

M. Lloyd 1/24

TSS Update 1/30/03

M Lloyd

L&AI

Construction Compliance Monitoring

Date: JAN 24 **Totem Marine - Ebb Tide**

Station/Sample	Depth/DTB (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
TDS300 (Up-Current)	3	28.5	7.4	1.4	9.3		5,233,613	542,870	1055	
Mid	20	29.2	7.5	1.5	9.3	3			1053	Hurlen placing rock material
Deep	35/41	29.2	7.4	1.3	9.3				1052	
TDS350	3	28.6	7.4	1.4	9.3		5,233,579	542,913	1050	
Mid	20	29.2	7.5	1.5	9.3				1049	
Deep	35/41	29.2	7.4	1.3	9.3				1048	
TDN150 (Down-Current)	3	28.8	7.6	2.5	9.3		52,338,737	542,882	1107	Moved to point near debris
Mid	20	29.1	7.6	4.0	9.3				1106	boom
Deep	35/40	29.1	7.6	41.0	9.3				1105	
TDN300	3	27.4	7.6	2.4	9.4		5,233,765	542,848	1110	
030124/TDN300/M/A	20	29.1	7.6	3.5	9.3	3			1109	Hurlen placing filter material
Deep	35/41	29.2	7.6	6.8	9.3				1108	around boat lift at a careful
TDN350	3	28.7	7.6	1.8	9.3		5,233,776	542,836	1114	slow pace
Mid	20	29.1	7.6	2.7	9.3				1113	
Deep	35/41	29.2	7.6	10.1	9.3				1112	
TDNW300 (down-current)	3	28.7	7.5	1.6	9.3		52,338,727	542,828	1058	
030124/TDNW300/M/A	20	29.1	7.5	1.2	9.3	3			1057	
Deep	35/41	29.2	7.4	1.2	9.3				1056	
TDNW350	3	28.7	7.5	1.6	9.3		52,338,728	542,812	1101	
Mid	20	29.1	7.5	1.2	9.3				1100	
Deep	35/41	29.2	7.4	1.2	9.3				1059	
TDNE300 (down-current)	3	28.7	7.7	5.1	9.3		5,233,794	542,888	1120	
030124/TDNE300/M/A	20	29.1	7.8	3.4	9.3	4			1119	
Deep	35/39	29.2	7.7	9.3	9.3				1118	
TDNE350	3	28.5	7.6	9.6	9.3		5,233,784	542,911	1124	
Mid	20	29.2	7.7	8.9	9.3				1123	
Deep	35/39	29.2	7.6	**13.2**	9.3				1122	Slight turbidity elevation
Station TF 2+00	3	29	7.9	0.9	9.4		52,338,465	542,492	940	
030124/TF2/M/A	23	29.2	8.0	0.5	9.3	3			938	
Deep	41/46	29.2	7.9	0.7	9.3				936	

Pre-Survey Calibration D. High 1/24 101.3% cool, cloudy weather, rain

DO Calibration as per manufacturer's specifications.

Survey work conducted by D. Berta and S. High

Turbidity Calibration as per manufacturer's specifications. Calibration at 0, 10NTU's.

Visible turbidity near at point of entry with eddying turbidity moving north along shore typical of an ebb tide.

Prepared By/Date:

M. Lloyd 1/24

TSS Update 1/30/03

M Lloyd

L&AI

Construction Compliance Monitoring

Date: JAN 24 **Totem Marine - Max Ebb Tide**

Station/Sample	Depth/DTB (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
TDS300 (Up-Current)	3	27.8	7.2	2.2	9.4		5,233,626	542,875	1444	Hurlen doing soundings
Mid	18	29.1	7.2	1.1	9.3				1443	then placed rock after 1330
Deep	30/35	29.2	7.3	1.5	9.3				1443	
TDS350	3	28.1	7.3	4.0	9.4		5,233,613	542,870	1351	
Mid	16	29.0	7.3	2.1	9.3				1351	
Deep	26/31	29.2	7.4	6.6	9.3				1350	
TDN150 (Down-Current)	3	28.2	7.3	4.0	9.5		52,338,737	542,882	1424	Moved to point against scow
Mid	14	29.0	7.3	1.2	9.3				1424	
Deep	22/27	29.1	7.3	1.4	9.3				1423	
TDN300	3	28.1	7.3	4.8	9.4		5,233,765	542,848	1421	
Mid	16	29.0	7.3	1.7	9.3				1421	Hurlen placing filter material
Deep	27/32	29.2	7.3	3.5	9.3				1420	around boat lift at a careful
TDN350	3	27.9	7.3	4.0	9.4		5,233,776	542,836	1415	slow pace
Mid	18	29.1	7.4	1.2	9.3				1415	
Deep	30/34	29.2	7.5	1.4	9.3				1414	
TDNW300 (down-current)	3	28.3	7.3	1.9	9.4		52,338,727	542,828	1412	
Mod	18	28.9	7.3	3.0	9.3				1411	
Deep	30/34	29.2	7.4	1.3	9.3				1411	
TDNW350	3	28.3	7.3	1.5	9.4		52,338,728	542,812	1409	Hurlen stops placing filter
Mid	18	29.1	7.3	1.7	9.3				1408	material to reposition rig
Deep	30/34	29.2	7.3	1.3	9.3				1408	
TDNE300 (down-current)	3	27.7	7.4	4.2	9.4		5,233,794	542,888	1429	
Mid	16	28.9	7.3	2.7	9.3				1429	
Deep	27/32	29.2	7.4	10.3	9.3				1428	
TDNE350	3	28.1	7.3	4.0	9.4		5,233,784	542,911	1440	
Mid	16	29.0	7.3	2.1	9.3				1439	
Deep	26/31	29.2	7.4	6.6	9.3				1439	~~Slight turbicity elevation~~

Pre-Survey Calibration D. High 1/24 101.3% Final = 98.2 cool, cloudy weather, some clearing

DO Calibration as per manufacturer's specifications.

Survey work conducted by D. Berta and S. High

Turbidity Calibration as per manufacturer's specifications. Calibration at 0, 10NTU's.

Prepared By/Date:

M. Lloyd 1/24

TSS Update 1/30/03

L&AI

1/24/03

STL Seattle

Client Name	Lloyd & Assoc. Inc.
Project Name	THEA FOSS
Date Received	01-24-03

General Chemistry Parameters

Client Sample ID 030124/WO300/M/A
Lab ID 111518-01

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-27-03	mg/L	7	2

Client Sample ID 030124/WON/M/A
Lab ID 111518-02

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-27-03	mg/L	3	2

Client Sample ID 030124/WOC/M/A
Lab ID 111518-03

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-27-03	mg/L	2	2

Client Sample ID 030124/WOC/M/DUP
Lab ID 111518-04

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-27-03	mg/L	3	2

Client Sample ID 030124/WOS/M/A
Lab ID 111518-05

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-27-03	mg/L	2	2

STL Seattle

Client Sample ID	030124/TF2+00/M/A
Lab ID	111518-06

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-27-03	mg/L	2	2

Client Sample ID	030124/TDS300/M/A
Lab ID	111518-07

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-27-03	mg/L	3	2

Client Sample ID	030124/TDNW300/M/A
Lab ID	111518-08

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-27-03	mg/L	3	2

Client Sample ID	030124/TDN300/M/A
Lab ID	111518-09

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-27-03	mg/L	3	2

Client Sample ID	030124/TDNE300/M/A
Lab ID	111518-10

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-27-03	mg/L	4	2

Client Sample ID	030123/TF2+00/M/B
Lab ID	111518-11

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-27-03	mg/L	3	2

STL Seattle

QUALITY CONTROL REPORT

Client Sample ID: Batch QC
Lab ID: 111463-4
QC Batch Number: 1159-031

Method Blank

Parameter	Result (mg/L)	PQL
Total Suspended Solids	ND	2

Duplicate

Parameter	Sample Result (mg/L)	Duplicate Result (mg/L)	RPD (%)	Flag
Total Suspended Solids	ND	ND	NC	

PMLeyd
1/30/03

0800 Calibration DO = 101.4 Bp = 770
Cs

Duplicate

0850 DO Samples
DO winkler from 1 & 2 = 6.4 & 6.5

Continued on Page

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Signed	Date	Signed	Date
[signature]	1/23	030124	

030124

Wheeler Osgood N.W. Work Zone #1

Flood Tide

Time	Location	Event	DTB	Sample Depth		t	Sal	DO	Turb	TBS
819	WO30		14	O	10	9.3	28.9	6.9	1.8	—
820	253 141	A		M	7	9.3	28.7	7.1	1.7	030124/WO320/M/A
822	acc 8.8			S	3	9.4	28.2	7.1	5.1	—
826	WOMD N		15	D	10	9.3	29.0	7.1	3.0	—
827	273 184	A		M	7	9.3	28.9	7.1	3.2	—
828	acc 8.2			S	3	9.3	28.5	7.0	4.5	—
829	WOMD C		13	D	10	9.3	29.0	7.2	3.1	—
830	266 184	A		M	7	9.3	28.9	7.2	2.8	—
831	acc 8.2			S	3	9.3	28.4	7.1	4.2	—
832	WOMD S		5	D	4	9.4	27.8	7.9	6.5	—
833	243 184	A		M	—					—
835	acc 8.2 (@ 243, 170)			S	2	9.4	27.7	7.3	6.7	—
[illegible]	WON		15	D	10	9.3	29.0	7.4	2.0	—
838	331 994	A		M	7	9.3	28.8	7.4	1.2	030124/WON/M/A
839	acc 9.0			S	3	9.3	28.0	7.5	6.8	—
0841	WOC		19	D	15	9.3	29.1	7.4	1.6	—
0842	308 994	A		M	10	9.3	29.0	7.5	1.1	030124/WOCM/A
0843	acc 10.5			S	3	9.3	28.3	7.5	7.4	—
replicate										
0846	WOC		19	D	15	9.3	29.1	7.4	1.6	—
0847	308 994	A		M	10	9.3	29.0	7.5	1.0	030124/WOCM/Dupl
0848	acc 9.2			S	3	9.3	28.6	7.5	2.6	—
0850										
collect 2 DO screen (second dip) CWT & Test										
0857	WOS		17	D	15	9.3	29.1	7.5	1.3	—
0858	284 994	A		M	10	9.3	29.1	7.7	1.2	030124/WOS/M/A
0900	acc 11.4			S	3	9.3	28.6	7.6	1.7	

Continued on Page

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Michael R Floyd 1/23/03 — Signed — Date

030124 — Signed — Date

1045 Recalibrate DO (note that DO values gradually increased from 0800 hrs to 1000 hrs) = 101.3%

1105 * TONISO for this WZ would be under path of crane

Continued on Page

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[signature] 1/23/03 [signature] 030124

Signed Date Signed Date

24 ~~Tothen Dock~~ Ambient Station @ TF2+00

Slack Tide

Location	Event	DTB	Sample Depth	t	Sal	DO	Turb	TSS
TF2+00	A	44	D 41	9.3	29.2	7.9	0.7	—
			M 23	9.3	29.2	8.0	0.5	030124/TF2+00/M/A
			S 3	9.4	29.0	7.9	0.9	

Ebb Tide Tothen Dock - Work Zone #7

TDS350	A	41	D 35	9.3	29.2	7.6	1.3	—
615 870			M 20	9.3	29.2	7.6	2.8	~~030124/TDS~~ —
acc 5.1			S 3	9.3	28.6	7.4	1.7	—
TDS300		41	D 35	9.3	29.2	7.4	1.3	—
626 875	A		M 20	9.3	29.2	7.5	1.5	030124/TDS300/M/A
acc 5.1			S 3	9.3	28.5	7.4	1.4	—
TDNW300	A	42	D 35	9.3	29.2	7.5	5.3	—
777 828			M 20	9.3	29.1	7.5	2.0	030124/TDNW300/M/A
acc 4.7			S 3	9.3	28.7	7.5	2.0	—
TDNW350		41	D 35	9.3	29.2	7.4	1.2	—
728 812	A		M 20	9.3	29.1	7.5	1.2	—
acc 6.4			S 3	9.3	28.7	7.5	1.6	—
TDN150		40	D 35	9.3	29.1	7.6	41	—
737 882*			M 20	9.3	29.1	7.6	4.0	—
acc 12.0	781 882		S 3	9.3	28.8	7.6	2.5	—
TDN300		41	D 35	9.3	29.2	7.6	6.8	—
765 848			M 20	9.3	29.1	7.6	3.5	030124/TDN300/M/A
acc = 5.3	772 848		S 3	9.4	27.4	7.6	2.4	—
TDN350		41	D 35	9.3	29.2	7.6	13.1	—
776 836			M 20	9.3	29.1	7.6	2.7	—
acc 7.1			S 3	9.3	28.7	7.6	1.8	

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PROJECT THEA FOSS/WHEELER OSGOOD

Notebook No. _____

Continued From Page _____

1140 - MANSON PLACING ("HABITAT MIX?) ON SOUTH BANK OF WHEELER OSGOOD

(- WEATHER: OCCASIONAL LIGHT RAIN, OVERCAST - CALM TO LIGHT WIND)

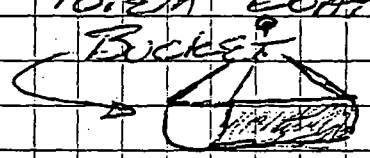
1200 - HURLEN BREAKS FOR LUNCH

1240 - MANSON MOVING OUT OF THE WHEELER-OSGOOD

1300 - STEADY MODERATE - HEAVY RAIN

★ HURLEN PERFORMING SOUNDINGS - IE. 1200-1330 NO MATERIAL PLACEMENT INFORMATIONAL READINGS BEFORE WORK RESUMED.

1340 HURLEN PLACING MATERIAL - QUARRY SPALLS - LIGHT RIP RAP? AROUND EXISTING PIERS FOR TOTEM BOAT HOIST USEING AN OPEN ENDED BUCKET TO DIRECT MATERIAL TO PILES



PLACING MATERIAL AT ≈ RATE 1 BUCKET/5 MINUTES

Continued on Page

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Daniel A. Berta 01/24/03 — Signed — Date

[signature] 1/23 — Signed — Date

030124

Totem Dock

	Location	Event	DTB	Sample depth	T	Sal	DO	Turbidity	TSS
1118	TONE300	A	39	D 35	9.3	29.2	7.7	9.3	—
1119	794 888			M 20	9.5	29.1	7.8	3.4	030124 TONE300 w/A
1120	acc 5.5			S 3	9.3	28.7	7.7	5.1	—
1122	TONE350		39	D 35	9.3	29.2	7.6	13.2	—
1123	811 882			M 20	9.3	29.2	7.7	8.9	—
1124	acc 8.3			S 3	9.3	28.5	7.7	9.4	—
		WHEELER OSGOOD						WORK ZONE #1	
		INFORMATIONAL READINGS						MAX EBB	
1145	WOW	B	(13)	D 10	9.4	28.8	7.7	1.2	—
1146	331 994			M 7	9.4	28.7	7.4	1.1	—
1146	(Acc = 11.6)			S 3	9.4	28.0	7.4	4.0	—
1148	WOC	B	(17)	D 12	9.3	29.0	7.2	2.7	—
19	308 994			M 9	9.3	28.9	7.2	4.0	—
[illegible]	(Acc = 7.6)			S 3	9.4	28.2	7.2	3.7	—
1151	WOS	B	(17)	D 12	9.3	29.0	7.2	1.4	—
1151	284 994			M 9	9.3	28.9	7.3	1.3	—
1152	(Acc = 7.4)			S 3	9.4	27.2	7.3	5.6	—
		TOTEM MARINE DOCK - WORK ZONE 7 / MAX EBB							
1345	TONE350	B	(32)	D 27	9.3	29.2	7.1	2.2	—
1345	601 924			M 16	9.3	29.0	7.1	1.4	
1346	(Acc = 5.5)			S 3	9.4	27.6	7.2	2.0	WORK ZONE #7
~~1346~~		★ INFORMATIONAL READINGS						MAX EBB	
1324	TONE(350)	B	(32)	D 27	9.3	29.2	7.2	5.8	—
1325	811 882			M 16	9.3	29.0	7.1	10.6	—
1326	(Acc 7.4)			S 3	9.4	29.2	7.1	3.5	—
1330	TONE(300)	B	(32)	D 27	9.3	29.2	7.2	8.3	—
1331	794 888			M 16	9.3	29.0	7.2	2.5	—
1331	(Acc = 6.0)			S 3	9.4	28.2	7.1	3.6	Continued on Page

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[illegible] 9/24/03 — Signed — Date

[illegible] 1/23 — Signed — Date

O 30124

PROJECT THEA TOSS/WHEELER-OSGOOD

Notebook No.

Continued From Page

1410 HURLEY REARR EQUIP ON RIG / REPOSITIONING MATERIALS BARGE (RAIL STOPS)

1500

CALIBRATION CHECK IN MOST ME OVER TAP WATER = 98.290

Continued on Page

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Signed [illegible] 1/24/03 Date

Signed [illegible] 1/23/03 Date

030124

TIME	LOCATION	EVENT	DTB	SAMPLE DEPTH	TEMP	SAL	DO	TURB	TSS
							MAX EBB		
1350	TDS 350	B	35	D 30	9.3	29.2	7.3	1.5	—
1351	G13 870			M 18	9.3	29.1	7.1	1.1	—
1351	(Acc=7.0)			S 3	9.4	27.8	7.2	2.2	—
							MAX EBB		
1359	TDSW 350	B	35	D 30	9.3	29.2	7.3	1.2	—
1400	648 828			M 18	9.3	29.1	7.2	1.2	—
1400	Acc (7.4)			S 3	9.4	27.9	7.3	2.9	—
							EBB		
1408	TDNW 350	B	34	D 30	9.3	29.2	7.3	1.3	—
1408	728 812			M 18	9.3	29.1	7.3	1.7	—
1408	(Acc = 6.6)			S 3	9.4	28.3	7.3	1.5	—
							EBB		
1411	TDNW 300	B	34	D 30	9.3	29.2	7.4	1.3	—
1411	727 828			M 18	9.3	28.9	7.3	3.0	—
1412	(Acc=8.9)			S 3	9.4	28.3	7.3	1.9	—
							EBB		
1414	TDN (350)		34	D 30	9.3	29.2	7.5	1.4	—
1415	776 836			M 18	9.3	29.1	7.4	1.2	—
1415	(Acc=6.4)			S 3	9.4	27.9	7.3	4.0	—
							EBB		
1420	TDN (300)		32	D 27	9.3	29.2	7.4	3.5	—
1421	765 848			M 16	9.3	29.0	7.3	1.7	—
1421	(Acc = 7.5)			S 3	9.4	28.1	7.3	4.8	—
	* 772 878	AGAINST HARLEM BARGE					EBB		
1423	TDN 150		27	D 22	9.3	29.1	7.5	5.8	—
1424	737 882			M 14	9.3	29.0	7.3	1.3	—
1424	(Acc = 8.2)			S 3	9.5	28.2	7.3	3.3	—
	* 760 882	AGAINST HARLEM BARGE							
							EBB		
1428	TDNE 300		32	D 27	9.3	29.2	7.4	10.3	—
1429	794 888			M 16	9.3	28.9	7.3	2.7	—
1429	(Acc = 6.7)			S 3	9.4	27.7	7.4	4.2	—

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Signed: [illegible] 1/28/03 Date

PROJECT THEA FOSS / WHEELER - OSGOOD

Notebook No. _____

Continued From Page _____

030124

1435 RAIN RESUMES

1500 HURLEN - NO PLACEMENT OF MATERIALS SINCE 1410

- WATER QUALITY CREW CONSTRUCTING CO ORD. FOR THEAS PARK WORK REPORTEDLY TO START 1/25/03.

Continued on Page

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Daniel A. Burke 01/24/03 _____ [signature] 1/23

Signed Date Signed Date

030124

TIME	LOCATION	EVENT	DIB	SAMPLE DEPTH	TEMP	SAL	DO	ET TURB	TSS
								EBB	
1439	TDNE (350)	B	31	TD 26	9.3	29.2	7.4	6.6	—
1439	SN 582			M 16	9.3	29.0	7.3	2.1	—
1440	(ALL=6.0)			S 3	9.4	29.1	7.3	4.0	—
								EBB	
1443	TDS (300)	B	33	D 28	9.3	29.2	7.4	1.4	—
1443	626 875			M 17	9.3	29.1	7.3	1.1	—
1444	(ALL=7.5)			S 3	9.5	27.7	7.3	1.8	—

Continued on Page

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[illegible] 01/24/03 _____ [illegible] 1/23/03
Signed Date Signed Date

American Civil Constructors

Hurlen Construction

PO Box 80945
700 S. Riverside Dr.
Seattle, WA 98108
(206) 763-1230
FAX (206) 762-1854

FAX TRANSMITTAL

Date:	1/25	Number of Pages Including this Sheet:	
Deliver To:	O'LOUGHLIN / WINGARD		
Company:	CITY of TACOMA		
Fax Number:	253-272-2412		

From:	M. Lloyd
Company:	ACC / Hurlen Construction / L+AI
Fax Number:	206-762-1854
Subject	WQ 1/24/03

Lloyd & Associates, Inc.
38210 SE 92nd Street, Snoqualmie, Washington 98065 425-888-1905 rml@centurytel.net

January 25, 2003

TSS Update 1/30/03

TRANSMITTAL

To: Iain Wingard
John O'Loughlin

Subject: Compliance Monitoring / Totem Marine 1/25/03
Compliance Monitoring / Thea's Park 1/25/03
Preliminary Data Transmittal (no TSS)

Attached please find results from compliance monitoring for the following work activities:

- Toe Berm Placement at Thea's Park
- Riprap Placement at Totem Marine

Thea's Park – Filter Material Placement.

Monitoring today at Thea's Park followed the placement of filter material at Thea's Park at the south end adjacent to the end berm installed yesterday. The filter material was placed on top of native sediments. As described in geotechnical sediment sampling (RD-SO3) the primary components of the bottom sediments are principally: silt (60%), clay (20%), and fine sand (20%). Manson began placing rock on a flood tide in the early morning. Manson was using a rehandler type bucket rather than a clamshell. Filter material was placed from the corner of the toe berm to locations up the slope in shallow water.

Our first monitoring station was TPSW300 where we ran into turbidity at about 25 NTU at depth. Sampling at TPSW350 yielded a result of 30 NTU. Monitoring throughout the morning indicated that turbidity was only observed at depth from the work zone to about 450' at information station TPSW450 where it dropped to 15 NTU. Laterally the turbidity plume was observed at depth to about 90 -100' east before dropping to background levels of 1-3 NTU. TPS350 is about 150' east of TPSW. Elevated turbidity was not observed at TPS350 or any other stations.

TPSW stations are in a direct tidal flow line from the work zone where filter material was being placed. Typiclly with filter material, our sampling team has measured turbidity at all elevations, depending on placement. If placement is shallow, then we have typically seen turbidity at shallow depths (based on our experince with Totem). This trend was not observed at Thea's Park. Throughout the day, turbidity at shallow or mid-depths was negligible except at the immediate work zone station (TPS/N150 series). Because a substantial portion of the material was placed at shallow dept, we would have expected to see turbidity at shallow elevations. Instead, all turbidity was observed near the bottom at near-shore stations during the morning flood tide.

Pat Barton (Manson) had reported to me that the berm placed in the last 3 days was sinking (displacing actually) into the soft sediments at Thea's Park. As noted above, these sediments are principally silt and to a lesser degree, clay and fine sand. It is my opinion that as the filter material is being placed, it is disturbing the fine sediments along the south end of Thea's Park where filter material placement is on-going. I inspected the filter material on the barge. This particular batch of filter material does not appear to contain the very high levels of fines observed previously. This observation correlates with visual observations that placement in the water does not cause the high turbidity normally seen in shallow water (ie, Totem). Instead turbidity rapidly dissipates and is not detected in shallow or mid-depth water quality monitoring data. When the filter material is placed at Thea's Park by prescribed methodology (lowering through the water column to bottom/near bottom) the actual release is more likely similar to wet cement. The resultant turbidity of fine fluff is persistent and does not rapidly settle out as has typicaly been observed. Indeed, turbidity is still observed several hours after placement (see TPSW data taken between 1330 and 1400 hours) during a shallow flood, slack and ebb time frame.

Totem Marine – Riprap Placement.

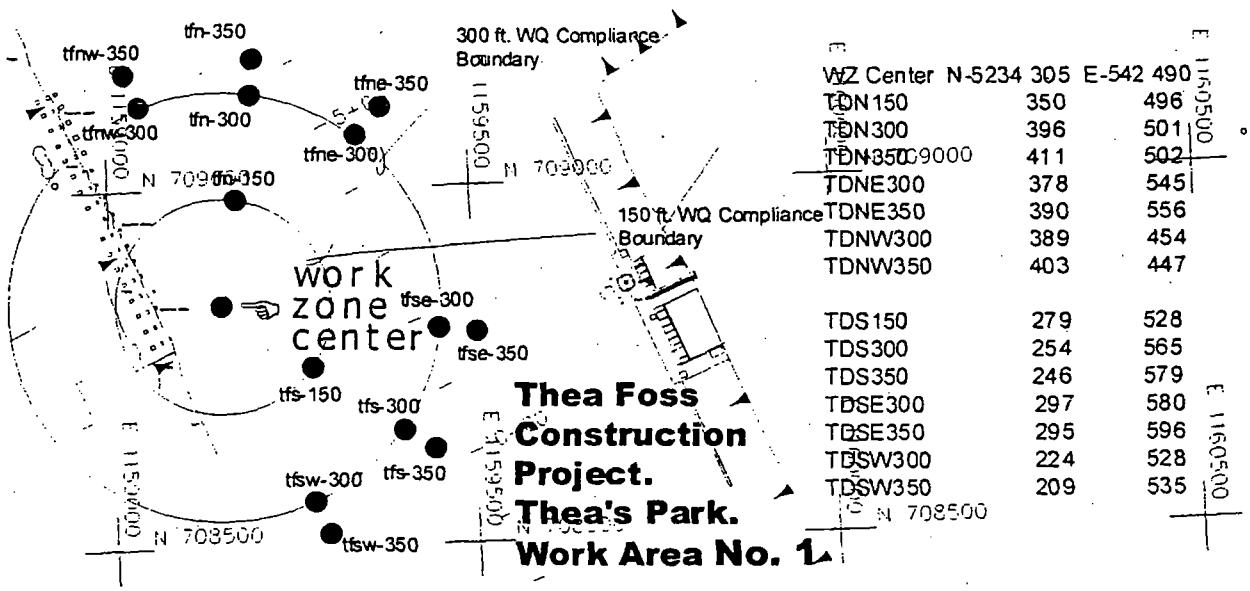
Work at Totem Marine was monitored during two sampling events. Water quality criteria were acceptable during both events even though elevated turbidity was observed at TDSE300 (flood tide) and TDNE300 (ebb tide). Turbidity at 350' stations were acceptable for both monitoring events.

QA/QC.

Field duplicate data looked very good for sample 030125/SP7/M/A. Some variability was observed in turbidity, but indicative of conditions expected. A Winkler titration was conducted on same sample. The YSI yielded a result of 7.0 mg/L and the Winkler gave results of 6.4 and 6.5 mg/L.

PWL (reprint) 1/30

Michael Lloyd
Lloyd & Associates, Inc.



WZ Center	N-5234 305	E-542 490
TDN150	350	496
TDN300	396	501
TDN350	411	502
TDNE300	378	545
TDNE350	390	556
TDNW300	389	454
TDNW350	403	447
TDS150	279	528
TDS300	254	565
TDS350	246	579
TDSE300	297	580
TDSE350	295	596
TDSW300	224	528
TDSW350	209	535

Construction Compliance Monitoring

Date: JAN 25 **Thea's Park - Max Ebb Tide**

Station/Sample	Depth/DTB (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
TPS300 (Up-Current)	3	28.6	7.4	1.1	9.3		5,234,254	542,565	1238	Up-Current sample very
030125/TPS300/M/A	22	29.2	7.3	0.9	9.3	2U			1237	clear
Deep	36/40	29.2	7.3	1.1	9.3				1236	
TPS350	3	28.6	7.4	0.8	9.3		5,234,246	542,579	1232	
Mid	22	29.2	7.5	0.9	9.3				1232	
Deep	36/41	29.2	7.3	0.8	9.3				1231	
TPN150 (Down-Current)	3	27.1	7.2	1.2	9.3		5,234,350	542,496	1148	Manson Starts work on
Mid	22	29.1	7.1	1.2	9.3				1148	toe berm at 1045
Deep	39/44	29.2	7.1	2.6	9.3				1147	
TPN300	3	28.7	7.2	1.6	9.3		5,234,396	542,501	1155	Manson working at moderate
030125/TPN300/M/A	20	29.2	7.2	1.1	9.3	5			1154	pace with rock
Deep	38/43	29.2	7.1	5.0	9.3				1154	
TFN350	3	29.6	7.2	0.7	9.3		5,234,411	542,502	1202	
Mid	22	29.1	7.2	1.8	9.3				1201	
Deep	38/43	29.2	7.2	7.8	9.3				1200	
TPNW300 (down-current)	3	28.4	7.1	6.9	9.4		5,234,389	542,454	1137	Highest turbidity observed
030125/TPNW300/M/A	22	29.1	7.1	0.5	9.3	4			1137	during s+K19urvey
Deep	39/44	29.2	7.1	4.0	9.3				1136	
TPNW350	3	28.9	7.1	1.6	9.3		5,234,403	542,447	1143	
Mid	23	29.1	7.1	1.1	9.3				1143	
Deep	40/46	29.2	7.1	5.0	9.3				1142	
TPNE300 (down-current)	3	28.3	7.2	0.9	9.4		5,234,378	542,545	1212	No floating debria or visible
030125/TPNE300/M/A	22	29.2	7.3	0.8	9.3	2U			1212	turbiity outside of work zone
Deep	38/44	29.2	7.3	2.3	9.3				1211	
TFNE350	3	28.1	7.2	0.7	9.4		5,234,390	542,556	1208	
Mid	22	29.2	8.3	0.4	9.3				1208	
Deep	38/44	29.2	7.3	0.4	9.3				1207	
Station/ SP7+00	3	28.5	7.4	0.9	9.3		5,234,940	542,955	1247	
030125/SP7/M/A	20	29.0	7.5	0.5	9.5	2U			1246	
Deep	34/39	29.2	7.4	0.3	9.5				1246	
Station/ SP7+00	3	28.6	7.0	7.3	9.3	2U	5,234,940	542,955	1251	Field Duplicate
030125/SP7/M/A	20	29.0	7.0*	1.3	9.4				1250	Field Duplicate
Deep	34/39	29.2	7.3	0.8	9.5				1250	Field Duplicate

Pre-Survey Calibration D. High 1/25 100.6%

mild, drizzle, cloudy weather, partial sun in afternoon

DO Calibration as per manufacturer's specifications.

Survey work conducted by D. Berta and S. High

Turbidity Calibration as per manufacturer's specifications. Calibration at 0, 10NTU's. 10 NTU Standard check = 9.9 NTU

Survey work went well. No problems observed. Work appears to be going well.

*Sample collected for Winkler titrations. Results = 6.4, 6.5 mg/L

Prepared By/Date:

M. Lloyd 1/25

TSS Data Update 1/30/03

M M Lloyd 1/30

L&AI

Construction Compliance Monitoring

Date: JAN 25 **Thea's Park - Max Ebb Tide/B**

Station/Sample	Depth/DTB (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
TPS300 (Up-Current)	3	28.3	6.8	0.9	9.4		5,234,254	542,565	1549	Up-Current sample very
Mid	17	29.1	7.1	0.5	9.3				1549	clear
Deep	29/34	29.2	7.3	0.5	9.3				1548	
TPS350	3	28.5	6.8	1.4	9.3		5,234,246	542,579	1551	
Mid	17	29.0	6.8	0.8	9.3				1551	
Deep	29/34	29.2	6.7	1.7	9.3				1550	
TPN150 (Down-Current)	3	28.7	7.0	1.1	9.4		5,234,350	542,496	1559	Manson resumed work
Mid	18	29.0.	7.0	0.7	9.3				1559	after lunch
Deep	30/35	29.2	6.9	0.7	9.3				1558	
TPN300	3	28.8	7.2	1.1	9.4		5,234,396	542,501	1615	
Mid	18	29.1	7.1	2.0	9.3				1615	
Deep	30/34	29.2	7.1	9.6	9.3				1614	
TFN350	3	28.7	7.2	1.0	9.4		5,234,411	542,502	1612	
Mid	22	29.1	7.1	0.7	9.3				1612	
Deep	30/34	29.2	7.1	1.4	9.3				1611	
TPNW300 (down-current)	3	28.6	7.2	2.3	9.4		5,234,389	542,454	1619	Highest turbidity observed
Mid	19	29.0	7.1	10.2	9.3				1619	during survey
Deep	32/36	29.1	7.2	**40.0**	9.3				1618	
TPNW350	3	28.9	7.2	1.7	9.4		5,234,403	542,447	1622	
Mid	19	29.1	7.2	4.5	9.3				1622	
Deep	32/36	29.2	7.2	8.4	9.3				1621	
TPNE300 (down-current)	3	28.7	7.1	2.0	9.4		5,234,378	542,545	1603	
030125/TPNE300/M/A	18	29.1	7.1	0.8	9.3				1603	
Deep	30/35	29.2	7.1	1.3	9.3				1602	
TFNE350	3	28.4	7.2	1.1	9.4		5,234,390	542,556	1606	
Mid	18	29.1	7.1	0.7	9.3				1606	
Deep	30/35	29.2	7.1	1.3	9.3				1505	

Pre-Survey Calibration D. High 1/25 100.6% mild, drizzle, cloudy weather, some clearing

DO Calibration as per manufacturer's specifications.

Survey work conducted by D. Berta and S. High

Turbidity Calibration as per manufacturer's specifications. Calibration at 0, 10NTU's. 10 NTU Standard check = 9.9 NTU

Survey work went well. No problems observed. Work appears to be going well.

*Sample collected for Winkler titrations. Results = 6.4, 6.5 mg/L

Prepared By/Date:

M. Lloyd 1/25

TSS Data Update 1/30/03

DMLloyd 1/30/03

L&AI

Construction Compliance Monitoring

Date: JAN 25 **Totem Marine - Flood to Slack**

Station/Sample	Depth/DTB (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
TDN300 (Up-Current)	3	27.2	6.5	1.2	9.4		5,233,765	542,848	853	**Flood to slack**
030125/TDN300/M/A	20	28.9	6.5	1.0	9.3	2			853	Hurlen placing rock material
Deep	35/41	29.1	6.5	1.6	9.3				852	at 815
TDN350	3	27.3	6.5	1.6	9.4		5,233,579	542,913	843	
Mid	20	28.8	6.5	0.9	9.3				842	
Deep	36/41	29.1	6.6	3.8	9.3				841	
TDS150 (Down-Current)	3	27.3	6.6	1.7	9.4		5,233,668	542,897	900	No floating debris or
Mid	20	28.8	6.6	0.6	9.3				900	turbidity observed
Deep	36/42	29.1	6.7	0.8	9.3				859	
TDS300 (Down-Current)	3	27.7	6.6	3.0	9.4		5,233,626	542,875	903	
030125/TDS300/M/A	20	29.0	6.7	0.9	9.3	3			903	
Deep	36/41	29.1	6.7	1.0	9.3				902	
TDS350	3	27.7	6.7	5.0	9.4		5,233,613	542,870	908	
Mid	20	29.0	6.7	3.1	9.3				908	
Deep	36/42	29.1	6.6	1.3	9.3				907	
TDSW300 (down-current)	3	27.8	6.7	1.5	9.4		52,338,658	542,841	920	
030125/TDSW300/M/A	20	29.0	6.7	1.0	9.3	3			920	
Deep	36/41	29.1	6.7	1.3	9.3				919	
TDSW350	3	27.4	6.7	0.8	9.4		52,338,648	542,828	911	
Mid	20	29.0	6.9	0.8	9.3				911	
Deep	36/42	29.1	6.8	1.0	9.3				910	
TDSE300 (down-current)	3	27.6	6.6	17.0	9.3		5,233,617	542,924	930	Elevated turbidity at 300'
030125/TDSE300/M/A	14	28.7	6.5	19.0	9.3	28			930	
Deep	21/27	29.0	6.4	4.4	9.3				929	
TDNE350	3	27.5	6.7	8.9	9.4		5,233,784	542,911	927	
Mid	20	29.1	6.8	2.3	9.3				927	
Deep	36/40	29.1	6.7	3.4	9.3				926	Slight turbicity elevation @350'

Pre-Survey Calibration D. High 1/25 100.6% Final = 87% cool, cloudy weather, rain

DO Calibration as per manufacturer's specifications.

Survey work conducted by D. Berta and S. High

Turbidity Calibration as per manufacturer's specifications. Calibration at 0, 10NTU's.

Visible turbidity near at point of entry with eddying turbidity moving north along shore typical of an ebb tide.

Prepared By/Date:

M. Lloyd 1/25

TSS Data Update 1/30/03

TM Lloyd 1/30

L&AI

Construction Compliance Monitoring

Date: JAN 25 **Totem Marine - EBB**

Station/Sample	Depth/DTB (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
TDS300 (Up-Current)	3	27.9	6.4	1.5	9.4		5,233,613	542,848	1408	**Ebb Tide**
Mid	17	29.0	6.5	0.8	9.3				1409	Hurlen placing rock near or over
Deep	29/34	29.1	6.4	0.7	9.3				1409	grout mat
TDS350	3	28.5	6.6	1.5	9.4		5,233,626	542,875	1401	
Mid	17	29.1	6.7	0.8	9.3				1401	
Deep	29/34	29.2	6.7	0.7	9.3				1400	
TDN150 (Down-Current)	3	28.5	7.2	10.7	9.3		5,233,804	542,874	1536	Hurlen working at a moderate
Mid	16	29.1	7.3	11.8	9.3				1536	work rate at north side
Deep	27/32	29.1	7.3	5.2	9.3				1535	of site
TDN300 (Down-Current)	3	28.7	7.3	2.0	9.4		5,233,836	542,840	1523	
Mid	18	29.1	7.4	1.2	9.3				1523	
Deep	28/33	29.2	7.4	2.3	9.3				1522	
TDN350	3	28.5	6.4	1.5	9.3		5,233,847	542,829	1526	
Mid	18	29.1	7.5	1.1	9.3				1525	
Deep	28/33	29.2	7.4	1.1	9.3				1525	
TDNW300 (down-current)	3	27.6	7.3	4.5	9.3		52,333,793	542,817	1516	
Mid	18	29.1	7.4	1.3	9.3				1516	
Deep	28/33	29.2	7.4	2.0	9.3				1515	
TDNW350	3	28.5	7.4	1.2	9.3		5,233,803	542,798	1514	
Mid	16	29.0	7.4	0.8	9.3				1514	
Deep	26/31	29.1	7.3	1.4	9.3				1513	
TDNE300 (down-current)	3	28.1	7.2	**20.0**	9.4		5,233,874	542,874	1530	Elevated turbidity
Mid	7	28.7	7.2	**28.0**	9.3				1529	
Deep	10/13	28.8	7.3	**14.4**	9.3				1529	
TDNE350	3	27.9	7.2	10.5	9.4		5,233,874	542,877	1530	Moderate turbidity observed,
Mid	7	28.8	7.2	8.2	9.3				1529	okay at 350'
Deep	12/13	29.1	7.2	7.4	9.3				1529	

Pre-Survey Calibration D. High 1/25 100.6% cool, cloudy weather, rain

DO Calibration as per manufacturer's specifications.

Survey work conducted by D. Berta and S. High

Turbidity Calibration as per manufacturer's specifications. Calibration at 0, 10NTU's.

Visible turbidity near at point of entry with eddying turbidity moving north along shore typical of an ebb tide.

Prepared By/Date:

M. Lloyd 1/25

TSS Data Update 1/30/03

M Lloyd 1/30

L&AI

STL Seattle

Client Name	Lloyd & Assoc. Inc.
Project Name	THEA FOSS
Date Received	01-27-03

General Chemistry Parameters

Client Sample ID 030125/TDS(300)M/A
Lab ID 111522-01

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-28-03	mg/L	3	2

Client Sample ID 030125/TDN(300)M/A
Lab ID 111522-02

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-28-03	mg/L	2	2

Client Sample ID 030125/TDSW(300)M/A
Lab ID 111522-03

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-28-03	mg/L	3	2

Client Sample ID 030125/TDSE(300)M/A
Lab ID 111522-04

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-28-03	mg/L	28	2

Client Sample ID 030125/TPNW(300)M/A
Lab ID 111522-05

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-28-03	mg/L	4	2

Client Sample ID 030125/TPN(300)M/A
Lab ID 111522-06

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-28-03	mg/L	5	2

STL Seattle

Client Sample ID	030125/TPNE(300)M/A
Lab ID	111522-07

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-28-03	mg/L	ND	2

Client Sample ID	030125/TPS(300)M/A
Lab ID	111522-08

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-28-03	mg/L	ND	2

Client Sample ID	030125/SP7+00)M/A
Lab ID	111522-09

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-28-03	mg/L	ND	2

Client Sample ID	030125/SP7+00)M/DUP
Lab ID	111522-10

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-28-03	mg/L	ND	2

STL Seattle

QUALITY CONTROL REPORT

Client Sample ID:	Batch QC
Lab ID:	111539-2
QC Batch Number:	1159-033

Method Blank

Parameter	Result (mg/L)	PQL
Total Suspended Solids	ND	2

Duplicate

Parameter	Sample Result (mg/L)	Duplicate Result (mg/L)	RPD (%)	Flag
Total Suspended Solids	42.8	46.4	8.07	

TMLloyd
1/30/03

PROJECT THEA FOSS/WHEELER - OSGOOD

Notebook No. _____
Continued From Page _____

930125

0815 TOTEM MARINE DOCK - HURLEN BEGINS PLACING MATERIAL (FLOOD => SLACK) - GRAVEL/SAND FILTER CAP? MANSON SETTING BOOMS ETC @ THEA'S PARK SITE

CLOUDY ≈ 45°F

HABITAT MIT?

CALIBRATION NOTES:

BAROMETRIC PRESSURE = 771.6 mm/Hg

0835 DO CALIBRATION IN MOIST AIR OVER TAP WATER
CALIBRATION CHECK => 100.6 %

TURBIDITY CALIBRATION USING 2 POINT METHOD
0.0 = DI WATER 10.0 = CALIBRATION STANDARD
CALIBRATION CHECK IN 10.0 NTU STANDARD
= 9.9 NTU

0855 - TOTEM DOCK - NO FLOAT. DEBRIS OR TURB. PLUMES OBSERVED. PLACING MATERIAL

Continued on Page

Read and Understood By

Daniel A. Barta 01/25/03 — Signed — Date

Michael Lloyd 1/25 — Signed — Date

030125

WORK ZONE #7
FLOOD (DO)
TOTEM MARINE SITE

TIME	LOCATION	EVENT	DTB	SAMPLE DEPTH DB	TEMP	SAL	DO	TURB	TSS
0841	TDN 350	A	(41)	D 35/36	9.3	29.1	6.6	3.8	—
0842	776 836			M 20	9.3	28.9	6.5	0.9	—
0843	(Acc=5.0')			S 3	9.4	27.2	6.5	1.6	—
						FLOOD			
0852	TDN 300	A	(42)	D 36	9.3	29.1	6.7	1.6	—
0853	765 848			M 20	9.3	28.8	6.6	1.0	030125/TDS(300)/M/A
0853	(Acc=6.1)			S 3	9.4	27.3	6.6	1.2	—
						FLOOD			
0859	TDNS 150	A	(42)	D 36	9.3	29.1	6.7	0.8	—
0900	668 897			M 20	9.3	29.0	6.7	0.6	—
0900	(Acc=6.7')			S 3	9.4	27.3	6.6	1.7	—
						FLOOD			
0902	TDS 300	A	(41) DO (40)	D 36	9.3	29.1	6.7	1.0	—
0903	626 875			M 20	9.3	29.0	6.7	0.9	030125/TDS(300)/M/A
0903	(Acc=7.0)			S 3	9.4	27.7	6.6	3.0	—
						FLOOD			
0907	TDS 350	A	(42)	D 36	9.3	29.1	6.6	1.3	—
0908	613 870			M 20	9.3	29.0	6.7	3.1	—
0908	(Acc=5.0)			S 3	9.4	27.7	6.7	5.0	—
						FLOOD			
0910	TDSW 350	A	(42)	D 36	9.3	29.1	6.8	1.0	—
0911	648 828			M 20	9.3	29.0	6.9	0.3	—
0911	(Acc=6.1)			S 3	9.4	27.6	6.7	0.8	—
						FLOOD			
0919	TDSW 300	A	(41)	D 36	9.3	29.1	6.7	1.3	—
0920	658 841			M 20	9.3	29.0	6.7	1.0	030125/TDSW(300)/M/A
0920	(Acc=6.4)			S 3	9.4	27.8	6.6	1.5	—
						FLOOD			
0926	TDSE 350		(40)	D 36	9.3	29.1	6.7	3.4	—
0927	601 924			M 20	9.3	29.1	6.8	2.3	—
0927	(Acc=6.3			S 3	9.4	27.5	6.7	8.9	—

Continued on Page

Read and Understood By

[signature] 01/25/03 Signed _____ Date

[signature] 1/25 Signed Date

PROJECT THEA FOSS / WHEELER - OSGOOD

Notebook No. _____

Continued From Page _____

030125

THEAS PARK COORD. WORK ZONE #1

CENTER OF WORK ZONE

N-5234305

E-542490

STA		N	E	
TPN	150	350	496	
	300	396	501	~4+40
	350	411	502	
TPNE	300	378	545	
	350	390	556	
TPNW	300	389	454	- ~ ~~3+50~~ ~ 3+75 (~50' E OF BULKHEAD)
	350	403	447	3+00 (~50' E OF BULKHEAD)
TPS	150	279	528	
	300	254	565	
	350	246	579	
TPSE	300	297	580	
	350	295	596	
TPSW	300	224	528	
	350	209	535	

1045 - MANSON BEGINS PLACING ROCK AT SOUTH END OF THEAS PARK

1152 LIGHT RAIN STARTS

1200 THEAS PARK - NO FLOAT, DEBRIS, OR TURB PLUMES OBSERVED

1210 MANSON PLACING, @ ~ 1 BUCKET / 8 MIN. RATE INCREASES IN AFTERNOON

Continued on Page

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[signature] 1/25 — Signed — Date

030125

TIME	LOCATION/ EVENT	DTB	SAMPLE DEPTH	TEMP	SAL	DO	TURB	TSS
								(FLOOD)
0929	TDSE 300 A	28	D 24	9.3	28.6	6.4	4.4	—
0930	6.1 ~~8.26 575~~ 424	27	M 14	9.3	28.7	6.5	14.0	030125/TDSE(300)/m/A
0930	(Acc 6.2)		S 3	9.3	27.6	6.6	17.0	—
			TIEAS TPRT				EBB	
1147	TPN 150 A	44	D 39	9.3	29.2	7.1	2.6	—
1148	350 496		M 22	9.3	29.1	7.1	1.2	—
1148	(Acc = 1.3)		S 3	9.3	27.1	7.2	1.2	—
							EBB	
1136	TPNW 300 A	44	D 39	9.3	29.2	7.1	4.0	—
1137	389 454		M 22	9.3	29.1	7.1	0.5	030125/TPNW(300)/m/A
1137	(Acc = 8.7)		S 3	9.4	28.4	7.1	6.9	—
							EBB	
1142	TPNW 350 A	46	D 40	9.3	29.2	7.1	5.0	—
1143	403 447		M 23	9.3	29.1	7.1	1.1	—
1143	(Acc = 7.8)		S 3	9.3	28.1	7.1	1.6	—
1154	TPN 300 A	43	D 38	9.3	29.2	7.1	4.6	—
1154	396 501		M 22	9.3	29.2	7.2	0.9	030125/TPN(300)/m/A
1155	(Acc = 7.2)		S 3	9.3	29.7	7.2	1.6	—
1200	TPN 350 A	43	D 38	9.3	29.2	7.2	7.8	—
1201	411 502		M 22	9.3	29.1	7.2	1.8	—
1201	(Acc = 6.9)		S 3	9.4	29.6	7.2	0.7	—
1211	TPNE 300	44	D 38	9.3	29.2	7.3	2.3	—
1212	378 595		M 22	9.3	29.2	7.3	0.8	030125/TPNE(300)/m/A
1212	(Acc = 5.4)		S 3	9.4	28.3	7.2	0.9 DO	—
1207	TPNE 350	44	D 38	9.3	29.2	7.3	1.0	—
1208	370 556		M 22	9.3	29.2	7.3	0.4	—
1208	(Acc = 5.8)		S 3	9.4	28.1	7.2	0.7	—

Continued on Page _____

Read and Understood By

Signed _____ Date 1/25/03 Signed _____ Date 1/25/03

030125

1400 HURLEY CONTINUING (HABITAT/FILTER CAP?) MATERIAL PLACEMENT OVER GROUT MAT AT TOTEM MARINE SITE

1500 - HURLEY STOPS PLACING MATERIAL

1510

NOTE: AFTER TOW RAY 150-350 LOCATED IT WAS APPARENT WORK ZONE 6 WAS ACTIVE BEING WORKED. SEE READINGS AT MID PAGE #53 FOR START OF B EVENT WORK ZONE

1658 Picked up DO for Winkler for titration

030125/SP7/A/A Dup. Sonde = 7.0 mg/L

Replicate #1 100 ml x $\frac{328}{100}$ x 0.02 = 6.6 mg/L

#2 100 ml x $\frac{336}{100}$ x 0.02 = 6.7 mg/L

[illegible]
1/25/03

Continued on Pag

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[illegible] 01/25/03 Signed Date

[illegible] 1/25/0 Signed Date

0125

LOCATION	EVENT	DTB	SAMPLE DEPTH	TEMP	SAL	DO	TURB	TSS
						EBB T		
TPS 350	A	41	D 36	9.3	29.2	7.3	0.8	—
246 579			M 22	9.3	29.2	7.3	0.9	—
(Acc 6.2')			S 3	9.3	28.6	7.4	0.8	—
						EBB ~~FLD~~		
TPS (300)	A	40 DB	D 35	9.3	29.2	7.4	1.1	—
254 565			M 20	9.3	29.2	7.5	0.9	030125/TPS(300)/M/A
(Acc=6.6)			S 3	9.4	28.5	7.4	1.1	—
						EBB		
SP 7+00		39	D 34	9.3	29.2	7.7	0.3	—
940 955			M 20	9.5	29.0	7.2	0.5	030125/SP 7+00/M/A
(Acc=6.0)			S 3	9.5	28.5	7.1	0.9	—
						EBB		
SP 7+00		36	D 34	9.3	29.2	7.3	7.3	—
940 955			M 20	9.4	29.0	7.0	1.3	030125/SP 7+00/M/DUP*
(Acc=6.1)			S 3	9.5	28.6	7.0	0.8	—

DO SAMPLE FOR WINKLER METHOD OBTAINED.
L&A & CITY SAMPLE OBTAINED.

TOTEM MARINE WORK ZONE # 7

						EBB (MAX)		
TDS 350	B	34	D 29	9.3	29.1	6.4	0.7	—
613 870			M 17	9.3	29.0	6.5	0.8	—
(Acc=16')			S 3	9.4	27.9	6.4	1.5	—
TDS 300	B	34	D 29	9.3	29.2	6.7	0.5	—
626 875			M 17	9.3	29.1	6.7	0.7	—
(Acc=14')			S 3	9.3	28.5	6.6	1.8	—
TDN (150)	B	32	D 27	9.3	29.1	7.1	9.0	—
737 882			M 16	9.3	29.1	7.2	11.8	—
(Acc=6.3)			S 3	9.4	28.4	7.2	8.3	—

* 813 882 AC MINST BARGE.

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[signature] 01/25/03 — Signed — Date

[signature] — Signed — Date

PROJECT THEA FOSS / WHEELER - CSGOOD

Notebook No. _____
Continued From Page _____

030125

- 1540 MANSON CONTINUES PLACEMENT OF QUARRY SPALLS FOR BERM WATER QUALITY TEAM STARTS EVENT # B MEASUREMENTS

Continued on Page

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Signed	Date	Signed	Date
		[signature]	1/25

30125

TIME	LOCATION	EVENT	DTB	SAMPLE DEPTH	TEMP	SAL	DO	TURB	TSS
	TDN 300 B								
	765 848								
	(Acc								
1457	TDNE 300 B		(32)	D 27	9.3	29.1	7.2	7.0	—
1457	794 888			M 16	9.3	29.1	7.3	10.4	—
1452	(Acc = 5.9)			S 3	9.4	27.4	7.2	17.0	—
	* 809 888	AGAINST BARGE							
1455	TDNE 350 B		(26)	D 21	9.3	29.1	7.4	9.6	—
1456	811 882			M 13	9.3	29.0	7.3	8.1	—
1456	(Acc = 5.9)			S 3	9.4	28.4	7.2	21.2	—
	TDN 350			D					—
	776 836			M					—
	(Acc =)			S 3					—
				WORK ZONE #6				EBB	
[illegible]B	TDNW 350		(31)	D 26	9.3	29.1	7.3	1.4	—
1514				M 16	9.3	29.0	7.4	0.8	—
1514	(Acc = 5.9)			S 3	9.3	28.5	7.4	1.2	—
								EBB	
1515	TDNW 300		(33)	D 28	9.3	29.2	7.4	2.0	—
1516	793 817			M 18	9.3	29.1	7.4	1.3	—
1516	(Acc = 5.7)			S 3	9.4	27.6	7.3	4.5	—
								EBB	
1522	TDN (300)		(33)	D 28	9.3	29.2	7.4	2.3	—
1523	836 840			M 18	9.3	29.1	7.5	1.2	—
1523	(Acc = 5.5)			S 3	9.3	28.7	6.4	2.0	—
								EBB	
1525	TDN (350)		(33)	D 28	9.3	29.2	7.4	1.1	—
1525	847 829			M 18	9.3	29.1	7.4	1.1	—
1526	(Acc = 5.4)			S 3	9.3	28.5	7.4	1.5	—

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PROJECT THEA FOSS/WHEELER-OSGOOD

Notebook No. _____

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		[illegible]	1/25

6/30/25

- SAMPLE

TIME	LOCATION	EBB	DIR	DEPTH	TEMP	SAL	DO	TURB	TSS
								EBB	
1529	TDHE 350	B	13	D 12	9.3	29.1	7.2	7.4	—
1529	874 877		DO	M 7	9.3	28.8	7.2	8.2	—
1530	(Acc = 5.6)			S 3	9.4	27.9	7.2	10.5	—
								EBB	
1532	TDHE 300 B		13	D 10	9.4	28.8	7.3	14.4	—
1532	800 880			M 7	9.4	28.7	7.2	28.0	—
1533	(Acc = 5.7)			S 3	9.4	28.1	7.2	20.0	—
								EBB	
1535	TDH 150 B		32	D 27	9.3	29.1	7.2	5.2	—
1536	804 874			M 16	9.3	29.1	7.3	11.8	—
1536	(Acc = 5.6)			S 3	9.3	28.5	7.2	10.7	—
	* 813 874			AGAINST BARGE / AERIAL LOCATION					
				D TIDAL PHASE - WELL TIME ± 1					EBB
1548	TDS 350		34	MID 29	9.3	29.2	7.3	0.5	—
1549	254 565			S M 17	9.3	29.1	7.1	0.5	—
1549	(Acc = 5.2)			S 3	9.4	28.3	6.8	0.9	—
	~~246 579~~ DB							EBB	
1550	TDS 350		34	D 29	9.3	29.2	6.7	1.7	—
1551	246 579			M 17	9.3	29.0	6.8	0.8	—
1551	(Acc = 5.0)			S 3	9.3	28.5	6.8	1.4	—
								EBB	
1558	TDH 150		35	D 30	9.3	29.2	6.9	0.7	—
1559	350 496			M 18	9.3	29.0	7.0	0.7	—
1559	(Acc = 5.5)			S 3	9.4	28.7	7.0	1.1	—
								EBB	
1602	TDHE 300		35	D 30	9.3	29.2	7.1	1.3	—
1603	379 545			M 18	9.3	29.1	7.1	0.8	—
1603	(Acc = 4.9)			S 3	9.4	28.7	7.1	2.0	—
								EBB	
1605	TDHE 350		35	D 30	9.3	29.2	7.1	1.3	—
1606	390 556			M 18	9.3	29.1	7.1	0.7	—
1606	(Acc = 5.4)			S 3	9.4	28.4	7.2	1.1	—

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Read and Understood By

Paul A. Bite 01/25/23 _____ [signature] 1/25
Signed Date Signed Date

PROJECT THEA FOSS/WHEELER-OSGOOD

Notebook No.

Continued From Page

030125 - 1630

D.O. CALIBRATION CHECK: IN MOIST AIR OVER TAP WATER = 87.0 %

Continued on Page

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Daniel H. Burton 01/25/03 — Signed — Date

[signature] 1/25 — Signed — Date

030125

TIME	LOCATION	EVENT	DTB	SAMPLE DEPTH	TEMP	SAL	DO	EBB TORB	TSS
1611	TDN 350	B	34	D 30	9.3	29.2	7.1	1.4	—
1612	411 502			M 18	9.3	29.1	7.1	0.7	—
1612	(ACC = 5.6)			S 3	9.4	28.7	7.2	1.0	—
								EBB	
1614	TDN 300	B	34	D 30	9.3	29.2	7.1	9.6	—
1615	396 501			M 18	9.3	29.1	7.1	2.0	—
1615	(ACC = 6.5)			S 3	9.4	28.8	7.2	1.1	—
								EBB	
1618	TDNW 300	B	37	D 32	9.3	29.1	7.2	40.0	—
1619	389 454			M 19	9.3	29.0	7.1	10.2	—
1619	(ACC = 5.8)			S 3	9.4	28.6	7.2	2.3	—
								EBB	
1621	TDNW 352	B	36	D 32	9.3	29.2	7.2	8.4	—
1622	403 447			M 19	9.3	29.1	7.2	4.5	—
1622	(ACC = 6.2)			S 3	9.4	28.9	7.2	1.7	—

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[signature] — Signed — 1/25/03 — Date

Lloyd & Associates, Inc.
38210 SE 92nd Street, Snoqualmie, Washington 98065 425-888-1905 rml@centurytel.net

January 25, 2003

TSS Data Update 1/30/03 RM

TRANSMITTAL

To: Iain Wingard
John O'Loughlin

Subject: Compliance Monitoring / Thea's Park (1/26/03)
Preliminary Data Transmittal (no TSS)

Although editorial comments are not usually provided, it was nice to have a day where turbidities were not a problem. Attached please find results from compliance monitoring for the following work activities:

- ~~Filter cap/rock placement at Totem~~ RM
- Toe Berm Placement at Thea's Park

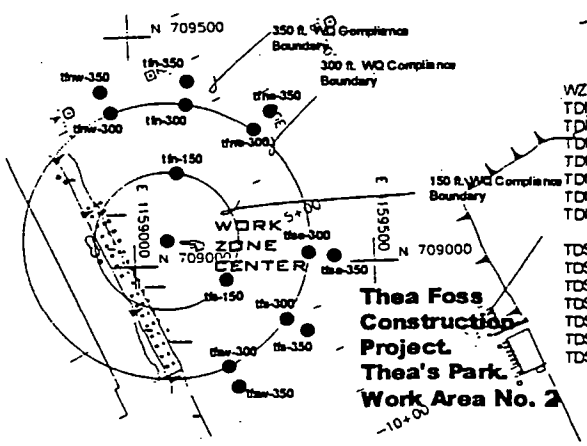
Thea's Park – Toe Berm Construction.

Today was the second day of work at Thea's Park. The first rock was placed at or before 8 AM. Parametrix was present to verify placement as work moved along. Two sampling events were conducted. The first occurred during a short flood tide, and the second during the mzximum ebb tide. Sampling went very well and all water quality criteria were met at the compliance boundaries. Elevated turbidity was observed at TPN350 at depth at a concentration of 14 NTU. Recalibrations and reanalysis yielded a result of 6.6 NTU. Backgound turbidity for up-current turbidities averaged 3.4 NTU.

QA/QC.

Field duplicate data looked very good for sample 030126/TPS350P7/M/B. As is typical, some variability was observed in turbidity, but indicative of conditions expected. A Winkler titration was conducted on Sample 030126/TPNW350. The YSI Sonde reading was 7.2 mg/L. The Winkler titration gave results of 7.2 and 7.2 mg/L.

Michael Lloyd
Lloyd & Associates, Inc.



WQ Center	N-5234 371	E-542 461
TDN150	416	468
TDN300	462	473
TDN350	477	473
TDNE300	444	517
TDNE350	456	526
TDNW300	455	425
TDNW350	470	418
TDS150	346	499
TDS300	319	537
TDS350	312	550
TDSE300	363	551
TDSE350	360	567
TDSW300	288	500
TDSW350	275	506

WQM 1 26 03.doc

Construction Compliance Monitoring **Date: JAN 26** **Thea's Park - Flood Tide**

Station/Sample	Depth/DTB (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
TPN300 Up-Current	3	28.8	7.7	0.6	9.4		5,234,396	542,501	1137	Manson working at moderate
030126/TPN300/M/A	23	29.1	7.7	0.1	9.3	2U			1135	pace with rock
Deep	39/43	29.1	7.7	0.1	9.3				1130	
TFN350	3	28.8	7.6	0.1	9.4		523,439	542,556	1126	
Mid	22	29.1	7.7	0.1	9.3				1125	
Deep	38/44	29.1	7.7	0.1	9.3				1124	
TPS150 (Down-Current)	3	23.9	7.1	3.6	9.9		5,234,279	542,528	1031	Probable fresh water input
Mid	23	29.0	7.0	0.1	9.3	X			1030	
Deep	40/46	29.1	7.1	0.1	9.3				1029	
TPS300	3	27.7	7.1	1.4	9.5		5,234,254	542,565	1040	
030126/TPS300/M/A	23	29.0	7.2	0.1	9.3	2			1037	
Deep	42/47	29.1	7.1	2.4	9.3				1036	
TPS350	3	25.3	7.3	3.6	9.5		5,234,246	542,579	1052	
Mid	23	29.0	7.4	0.1	9.3				1049	
Deep	40/45	29.2	7.3	0.8	9.3				1048	
TPSW300 (down-current)	3	28.4	7.3	1.3	9.4		5,234,224	542,528	1058	Manson placing rock since 800
030126/TPSW300/M/A	23	29.0	7.4	0.2	9.3	2			1056	
Deep	42/47	29.2	7.4	5.5	9.3				1055	
TPSW350	3	28.7	7.5	0.6	9.5		5,234,209	542,535	1105	
Mid	23	29.1	7.5	0.1	9.3				1103	
Deep	41/46	29.1	7.5	5.4	9.3				1102	
TPSE300 (down-current)	3	28.3	7.6	1.0	9.5		5,234,297	542,580	1118	No floating debria or visible
030126/TPSE300/M/A	23	29.0	7.7	0.1	9.3	2			1115	turbiity outside of work zone
Deep	40/45	29.2	7.7	3.6	9.3				1111	
TFSE350	3	28.5	7.6	0.3	9.3		5,234,295	542,596	1122	
Mid	22	29.1	7.7	0.1	9.3				1120	
Deep	39/44	29.1	7.7	0.1	9.3				1119	
Station/ SP7+00	3	27.8	8.5	0.6	9.9		5,234,940	542,955	1308	Background from ST. Paul
030126/SP7/M/A	21	28.9	8.2	0.1	9.5	3			1305	
Deep	37/42	29.2	8.2	0.4	9.3				1300	

Pre-Survey Calibration D. High 1/26 100.6%

mild, drizzle, cloudy weather, partial sun in afternoon

DO Calibration as per manufacturer's specifications.

Survey work conducted by S. High

Turbidity Calibration as per manufacturer's specifications. Calibration at 0, 10NTU's.

Survey work went well. No problems observed. Work appears to be going well.

Prepared By/Date:

M. Lloyd 1/26 M. Lloyd 1/30/03

TSS Data Update

L&AI

Construction Compliance Monitoring **Date: JAN 26** **Thea's Park - Max Ebb Tide/B**

Station/Sample	Depth/DTB (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
TPS300 (Up-Current)	3	28.8	7.6	1.3	9.5		5,234,319	542,537	1436	Maximum Ebb Tide
030126/TPS300/M/B	16	29.2	7.6	5.8	9.3	5-Feb			1435	
Deep	33/38	29.2	7.6	4.1	9.3				1434	Background turbidity at depth
TPS350	3	28.2	7.6	1.3	9.5		5,234,312	542,550	1443	is approximately 3.4 NTU
Mid	19	29.1	7.6	0.6	9.3				1442	
Deep	34/38	29.2	7.6	2.5	9.3				1440	
TPS350	*3*	*28.7*	*7.7*	*1.0*	*9.4*		*5,234,312*	*542,550*	*1446*	*Field Duplicate*
Mid	*19*	*29.2*	*7.7*	*0.1*	*9.3*				*1445*	*Field Duplicate*
Deep	*34/38*	*29.2*	*7.6*	*3.7*	*9.3*				*1444*	*Field Duplicate*
TPN150 (Down-Current)	3	28.7	6.6	1.8	9.4		5,234,416	542,466	1331	Manson resumed work right
Mid	21	29.2	6.8	16.0	9.3				1330	after lunch
Deep	37/42	29.2	6.7	78.0	9.3				1329	High turbidity at work zone
TPN300	3	29.1	7.2	0.1	9.4		5,234,462	542,473	1337	
Mid	22	29.2	7.1	0.1	9.3				1336	
Deep	38/43	29.2	7.1	0.1	9.3				1335	
TPN350	3	9.4	7.3	0.1	9.4		5,234,477	542,473	1344	
Mid	22	9.3	7.3	7.3	9.3				1343	
Deep	38/43	9.3	7.3	14.0	9.3				1342	slight elevation in turbidity
TPN350 (Re-anlaysis)	3	29.1	7.2	0.1	9.4		5,234,477	542,473	1402	Reanalysis after recalibrating
Mid	22	29.2	7.2	0.2	9.3				1400	Called Manson to be aware of
Deep	37/43	29.2	7.1	6.6	9.3				1358	problem before recalibrating
TPNW300 (down-current)	3	29.1	7.3	5.8	9.3		5,234,455	542,425	1409	Highest turbidity observed
Mid	23	29.2	7.2	5.3	9.3				1408	during survey
Deep	40/45	29.2	7.2	32.0	9.3				1407	
TPNW350	3	29.1	7.3	2.5	9.3		5,234,403	542,447	1412	
Mid	23	29.2	7.2*	3.0	9.3				1411	
Deep	42/47	29.2	7.2	9.0	9.3				1410	
TPNE300 (down-current)	3	28.4	7.6	1.7	9.3		5,234,444	542,517	1427	
Mid	20	29.2	7.6	5.3	9.3				1426	
Deep	36/41	29.2	7.5	1.9	9.3				1425	
TPNE350	3	28.8	7.6	1.3	9.5		5,234,390	542,556	1436	
Mid	16	29.2	7.6	5.8	9.3				1436	
Deep	28/38	29.2	7.6	1.1	9.3				1434	

Pre-Survey Calibration D. High 1/26 100.6% mild, drizzle, cloudy weather, some clearing

DO Calibration as per manufacturer's specifications.

Survey work conducted by S. High

Turbidity Calibration as per manufacturer's specifications. Calibration at 0, 10NTU's

Some turbidity observed at TPM at depth. M. Lloyd discussed results and potential solutions with Barton.

*Sample collected for Winkler titrations. Results = 7.2, 7.2 mg/L

Prepared By/Date: M. Lloyd 1/25

TSS Data Update

L&AI

1126103

STL Seattle

Client Name	Lloyd & Assoc. Inc.
Project Name	THEA FOSS
Date Received	01-27-03

General Chemistry Parameters

Client Sample ID 030126/TPS(300)/M/A
Lab ID 111524-01

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-28-03	mg/L	2	2

Client Sample ID 030126/TPSW(300)/M/A
Lab ID 111524-02

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-28-03	mg/L	2	2

Client Sample ID 030126/TPSE(300)/M/A
Lab ID 111524-03

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-28-03	mg/L	2	2

Client Sample ID 030126/TPN(300)/M/A
Lab ID 111524-04

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-28-03	mg/L	ND	2

Client Sample ID 030126/SP7+00/M/B
Lab ID 111524-05

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-28-03	mg/L	3	2

Client Sample ID 030126/TPS(300)/M/B
Lab ID 111524-06

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-28-03	mg/L	2	2

STL Seattle

Client Sample ID			030126/TPS(300)/M/DUP		
Lab ID			111524-07		
Parameter	**Method**	**Date Analyzed**	**Units**	**Result**	**PQL**
Total Suspended Solids	EPA 160.2	01-28-03	mg/L	5	2

STL Seattle

QUALITY CONTROL REPORT

Client Sample ID: Batch QC
Lab ID: 111405-1
QC Batch Number: 1159-032

Method Blank

Parameter	Result (mg/L)	PQL
Total Suspended Solids	ND	2

Duplicate

Parameter	Sample Result (mg/L)	Duplicate Result (mg/L)	RPD (%)	Flag
Total Suspended Solids	5.75	5.75	0.0	

DMR 1/30/03

PROJECT Thurs Ferry

Notebook No.
Continued From Page

1000 Bp: 767.8 mmHg
Calibrate DO 100.6 over Tyr Hot-A 14.6 °C
Calibrate Turb: 0, & 10.0

Manson placing spall rock until 1120
when they moved north & continue placing spalls

Continued on Page

Read and Understood By

Michael Lloyd 1/26/03 [signature]

Signed Date Signed Date

124 Thea's Park

Flood Tide

Time	Location	Event	DTB	Sample depth	t	Sal	DO	Turb.	TSS
1029	TPS 150	A	46	D 40	9.3	29.1	7.1	0.1	—
1030	279 528			M 23	9.3	29.0	7.0	0.1	—
1031	acc 6.1			S 3	9.9	23.9	7.1	3.6	—
1036	TPS 300	A	47	D 42	9.3	29.1	7.1	24.-	—
1037	254 565			M 23	9.3	29.0	7.2	0.1	030126/TPS300/
1040	4.7			S 3	9.5	27.7	7.1	1.4	— M/A
1048	TPS 350		45	D 40	9.3	29.2	7.4	0.8	—
1049	246 579	A		M 23	9.3	29.0	7.4	0.1	—
1052	acc 6.5			S 3	9.5	25.3	7.3	3.6	—
[illegible]	TPSW 300		47	D 42	9.3	29.2	7.4	5.5	—
[illegible]	224 528	A		M 23	9.3	29.0	7.4	0.2	030126/TPSW300/
1058	acc 6.2			S 3	9.4	28.4	7.3	1.3	— M/A
1102	TPSW 350		46	D 41	9.3	29.1	7.5	5.4	—
1103	209 535	A		M 23	9.3	29.1	7.5	0.1	—
1105	acc 6.3			S 3	9.5	28.7	7.5	0.6	—
1111	TPSE 300	A	45	D 40	9.3	29.2	7.7	3.6	—
1115	297 580			M 23	9.3	29.0	7.7	0.1	030126/TPSE300/
1118	acc 5.1			S 3	9.5	28.3	7.6	1.0	— M/A
1119	TPSE 350	A	44	D 39	9.3	29.1	7.7	0.1	—
1122	295 596			M 22	9.3	29.1	7.7	0.1	—
1122	acc 4.9			S 3	9.3	28.5	7.6	0.3	—

Continued on Page

Read and Understood By

030126 — Signed — Date

RM Pigal 1/26/03 — Signed — Date

PROJECT Ren Ross

Notebook No. _____
Continued From Page _____

1256 St. Paul water away for background (ambient) sample
[illegible] Rain

1351 Informed Bill Teasdale they were above the WQ criteria for turbidity at 3.50 from the work zone. He indicated he would attend to it. Tried to call Michael, did not get through

Recalibrate for turbidity 0, 10.0

Continued on Page

Read and Understood By

[signature] 1/28/03 — Signed — Date

[signature] 030124 — Signed — Date

SUBJECT Then Fors

3.4126 Rei's Park

Time	Location	Grab	DTB	Sample depth	t	Sal	DO	Turb	TSS
124	TPN 350	A	44	D 38	9.3	29.1	7.7	0.1	—
125	390 556			M 22	9.3	29.1	7.7	0.1	—
126	acc 6.4			S 3	9.4	28.8	7.6	0.1	—
130	TPN 300		45	D 39	9.3	29.1	7.7	0.1	—
135	396 567	A		M 23	9.3	29.1	7.7	0.1	030126/TEN300/
137	acc 8.2			S 3	9.4	28.8	7.7	0.6	— n/A
				EBB Tide					
300	597 + 00	B	42	D 37	9.3	29.2	8.2	0.4	—
305	940 955			M 21	9.5	28.9	8.2	0.1	030126/SP2400/
708	acc = 6.2			S 3	9.9	27.8	8.5	0.6	— n/B
	Then Park EBB Tide Work Zone #2								
3[illegible]	TPN 350		42	D 37	9.3	28.2	6.7	78	—
330	416 461	B		M 21	9.3	29.2	6.8	16	—
331	acc 7.8			S 3	9.4	20.7	6.6	1.8	—
335	TPN 300		43	D 38	9.3	29.2	7.1	0.1	—
336	462 473	B		M 22	9.3	29.2	7.1	0.1	—
337	acc 8.9			S 3	9.4	29.1	7.2	0.1	—
343	TPN 350		43	D 38	9.3	29.2	7.2	14	—
343	477 473	B		M 22	9.3	29.2	7.3	7.8	—
344	acc 9.2			S 3	9.4	29.0	7.3	0.1	—
358	TPN 350		42	D 37	9.3	29.2	7.1	6.6	—
400	477 473			M 21	9.3	29.2	7.2	0.2	—
402	acc 5.9			S 3	9.4	29.1	7.2	0.1	

Continued on Page

Read and Understood By

D Michael Olsen 1/28/03 — 030126

Signed Date Signed Date

1515

DO Analysis 030126/TPNW/550/M/B Pull 1575

(1.) $\frac{360}{100} \times 0.02 \times 100 = 7.2$ mg/L

(2) $3.62/100 \times 0.02 \times 100 = 7.2$ mg/L

PMLyd

Continued on Page

Read and Understood By

PMLyd 1/26/03

Signed Date Signed Date

080124

~~Est~~ The Park Cbb — WE #2

	Location	Event	DTB	Sample Depth	t	Sal	DO	Turb	TSS	
407	TPNW300		45	D 39 40	9.3	29.2	7.2	3.2	—	
408	455 425	B		M 23	9.3	29.2	7.2	5.3	—	
409	acc 5.1			S 3	9.3	29.1	7.3	5.8	—	
410	TPNW350		47	D 42	9.3	29.2	7.2	9.5	—	
411	470 415	B		M 23	9.3	29.2	7.2	3.0	—	DO sample 030124/TPNW 350/M/B
412	acc 5.9			S 3	9.3	29.1	7.3	2.5	—	
				~~DO~~ for ~~Case~~						
421	TPNE350									
422	456 526	B	41	D 36	9.3	29.2	7.5	4.5	—	
423	acc 7.2			M 20	9.3	29.2	7.6	1.4	—	
				S 3	9.4	28.9	7.5	1.0	—	
1425	TPNE300	B	41	D 36	9.3	29.2	7.5	6.9	—	
	444 517			M 20	9.3	29.2	7.6	5.3	—	
	acc 5.4			S 3	9.3	28.4	7.6	1.7	—	
1431	TPS300		38	D 33	9.3	29.2	7.6	1.1	—	
1435	369 537	B		M 16	9.3	29.2	7.6	5.8	030124/TPS300/M/B	
1436	acc 5.2			S 2	9.5	28.8	7.6	1.3	—	2 Purge @ 1437
1440	TPS350	B	38	D 34	9.3	29.2	7.6	2.5	—	
1442	342 550			M 19	9.3	29.1	7.6	0.6	~~030124/TPS~~	
1443	acc 5.5			S 3	9.5	28.2	7.6	1.3	—	
1444	TPS350	B	38	D 34	9.3	29.2	7.6	3.7	—	
1445	312 550			M 19	9.3	29.2	7.7	0.1	~~030124/TPS~~	
1446	acc 5.3			S 3	9.7	28.7	7.7	1.0	—	

Continued on Page _____

Read and Understood By

Signed _____ Date _____ Signed _____ Date _____

American Civil Constructors

Hurlen Construction

PO Box 80945
700 S. Riverside Dr.
Seattle, WA 98108
(206) 763-1230
FAX (206) 762-1854

FAX TRANSMITTAL

Date:	1/27	Number of Pages Including this Sheet:	10
Deliver To:	O'LOUGHLIN / WINGARD		
Company:	CITY of TACOMA		
Fax Number:	253-272-2412		

From:	M. LLOYD
Company:	ACC / Hurlen Construction
Fax Number:	206-762-1854
Subject	WQ REPORT 1/26/03

Lloyd & Associates, Inc.
38210 SE 92nd Street, Snoqualmie, Washington 98065 425-888-1905 rml@centurytel.net

January 27, 2003

TSS Update
1/30/03
TML

TRANSMITTAL

To: John O'Loughlin
Iain Wingard

Subject: Compliance Monitoring / Thea's Park (1/27/03)
Compliance Monitoring / Totem Marine
Preliminary Data Transmittal (no TSS)

Attached please find results from compliance monitoring for the following work activities:

- Rock placement at Totem
- Toe Berm Placement at Thea's Park

Thea's Park – Toe Berm Construction.

Today was the third day of intensive monitoring at Thea's Park. The first rock was placed at or before 8 AM. Parametrix was present to verify placement as work moved along. Two sampling events were conducted. The first occurred during a short flood tide, and the second during the maximum ebb tide. Sampling went very well, and all water quality criteria were met at the compliance boundaries. Elevated turbidity was observed at TPSW300 at depth at a concentration of 24 NTU. This was brought to the attention of Manson, and they slowed their placement on the bottom. At the compliance boundary, the turbidity was measured to be 8.5 NTU. Work on the south end in the afternoon monitoring went well as Manson placed rock to form an end berm to the cap.

Recommend: additional testing for filter cap placement. Discontinue or reduce to one sampling event daily for toe berm placement.

Totem Marine.

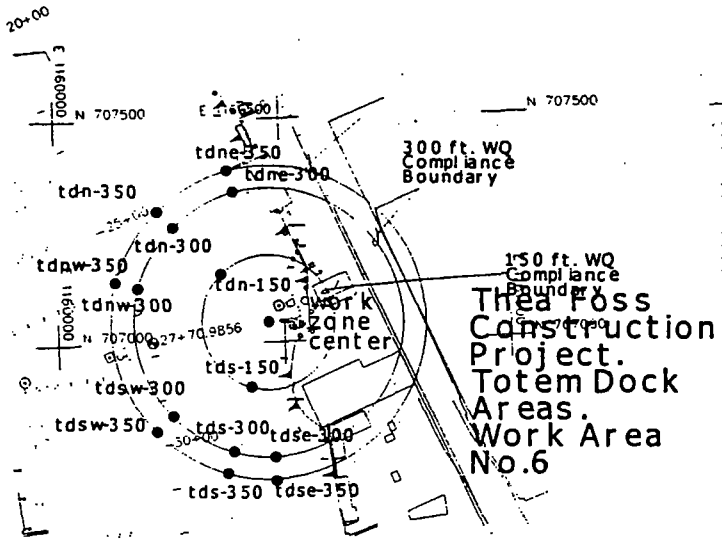
ACC-Hurlen placed rock at the north end of Totem Marine all day. Work apparently went well, and there were no compliance problems. Placement went slowly as crews filled in low spots, surveyed elevations, etc.

Recommend: Reduce sampling to 1 time per day.

QA/QC.

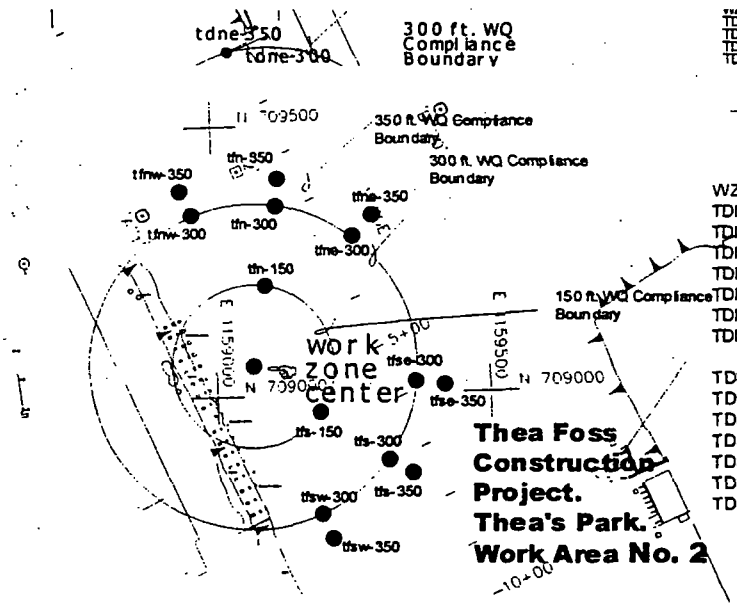
Field duplicate data looked very good for sample 030127/TDSW300/M/A. As is typical, some variability was observed in turbidity, but indicative of conditions expected. A Winkler titration was conducted on Sample 030127/TDSW300/M/A. The YSI Sonde reading was 7.1 mg/L. The Winkler titration gave a result of 6.4 mg/L. Field duplicate data continues to be very good as shown in Totem Marine data for the first sampling event.

Michael Lloyd
Lloyd & Associates, Inc.



WZ Center	N-5233 772	E-542 906
TDN150	804	874
TDN300	836	840
TDN350	847	829
TDNE300	860	880
TDNE350	874	877
TDNW300	793	917
TDNW350	803	798
TDS150	727	894
TDS300	683	882
TDS350	678	669
TDSE300	680	910
TDSE350	665	912
TDSW300	708	841
TDSW350	696	830

Thea Foss Construction Project. Totem Dock Areas. Work Area No.6



WZ Center	N-5234 371	E-542 461
TDN150	416	466
TDN300	462	473
TDN350	477	473
TDNE300	444	517
TDNE350	456	526
TDNW350	455	425
TDNW350	470	418
TDS150	346	499
TDS300	319	537
TDS350	312	550
TDSE300	363	551
TDSE350	360	567
TDSW300	288	500
TDSW350	275	506

Thea Foss Construction Project. Thea's Park. Work Area No. 2

Construction Compliance Monitoring Date: JAN 27 Thea's Park - Flood Tide

Station/Sample	Depth/DTB (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
TPN300 Up-Current	3	28.8	7.0	2.2	9.4		5,234,462	542,473	1058	Manson working at moderate
030127/TPN300/M/A	23	29.1	7.0	1.7	9.3	4			1057	pace with rock
Deep	41/46	29.2	7.0	1.7	9.3				1056	
TFN350	3	28.7	7.0	1.9	9.4		523,477	542,473	1102	
Mid	23	29.1	7.0	1.1	9.3				1100	
Deep	41/46	29.2	7.0	0.8	9.3				1059	
TPS150 (Down-Current)	3	27.9	7.1	1.8	9.5		5,234,346	542,499	1011	
Mid	22	29.0	7.0	2.5	9.3				1010	
Deep	40/43	29.2	7.1	10.0	9.3				1009	
TPS300	3	28.7	7.0	1.7	9.4		5,234,319	542,537	1014	
030127/TPS300/M/A	22	29.0	7.0	1.8	9.3	3			1013	
Deep	40/43	29.2	7.1	1.5	9.3				1012	
TPSW300 (down-current)	3	27.7	7.0	2.2	9.4		5,234,288	542,500	1017	M Lloyd notified Manson of
030127/TPSW300/M/A	22	29.0	7.0	7.0	9.3	4			1016	Elevated turbidity at 300'
Deep	40/43	29.2	7.0	24.7	9.3				1015	
TPSW350	3	28.5	7.0	1.5	9.4		5,234,275	542,506	1043	
Mid	23	29.1	6.9	1.0	9.3				1042	
Deep	42/47	29.2	7.0	8.5	9.3				1041	
TPSW350	3	28.2	7.0	1.4	9.4		5,234,275	542,506	1120	Check on TP350 readings
Mid	23	29.1	7.1	1.2	9.3				1119	from earlier
Deep	40/46	29.2	7.2	2.0	9.3				1118	(slack to ebb)
TPSE300 (down-current)	3	28.4	7.0	1.3	9.4		5,234,363	542,551	1050	No floating debris or visible
030127/TPSE300/M/A	22	29.1	7.0	1.5	9.3	4			1049	turbiity outside of work zone
Deep	40/44	29.2	7.0	1.1	9.3				1048	
TPSE350	3	28.8	7.0	1.9	9.4		5,234,295	542,596	1047	
Mid	22	29.1	7.0	1.1	9.3				1046	
Deep	41/46	29.2	7.0	0.8	9.3				1045	
Station SP 7+00	3	28.7	7.0	2.0	9.4		5,234,940	542,955	1109	
030127/TF2/M/A	21	29.1	7.1	1.4	9.3	4			1108	
Deep	38/43	29.2	7.2	1.2	9.3				1107	

Pre-Survey Calibration D. High 1/26 100.6%

mild, drizzle, rain showers in am, cloudy weather, partial sun in afternoon

DO Calibration as per manufacturer's specifications.

Survey work conducted by S. High

Turbidity Calibration as per manufacturer's specifications. Calibration at 0, 10NTU's.

Survey work went well. Work appears to be going well.

Prepared By/Date: M. Lloyd 1/27

TSS Data Update: TM Lloyd 1/30

L&AI

Construction Compliance Monitoring **Date: JAN 26** **Thea's Park - Max Ebb Tide/B**

Station/Sample	Depth/DTB (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
TPS300 (Up-Current)	3	28.2	7.6	1.5	9.5		5,234,254	542,565	1422	Maximum Ebb Tide
Mid	20	29.1	7.6	1.2	9.3				1421	Manson placing rock at south
Deep	35/40	29.2	7.6	1.9	9.3				1420	end of cap
TPS350	3	28.4	7.6	1.3	9.5		5,234,246	542,579	1416	
Mid	20	29.1	7.7	0.8	9.3				1415	
Deep	35/40	29.2	7.6	1.7	9.3				1414	
TPN150 (Down-Current)	3	28.7	7.7	1.2	9.4		5,234,350	542,496	1445	
Mid	21	29.1	7.6	2.0	9.3				1444	
Deep	35/40	29.2	7.6	3.0	9.3				1444	
TPN300	3	28.9	7.6	0.8	9.4		5,234,396	542,501	1448	
Mid	20	29.2	7.6	1.0	9.3				1447	
Deep	35	29.2	7.6	2.9	9.3				1447	
TPN350	3	28.9	7.6	0.9	9.4		5,234,477	542,473	1450	
Mid	20	29.2	7.5	2.1	9.3				1450	
Deep	35/40	29.2	7.6	2.0	9.3				1449	
TPNW300 (down-current)	3	28.7	7.6	1.5	9.4		5,234,389	542,454	1457	
Mid	20	29.2	7.5	4.4	9.3				1457	
Deep	35/39	29.2	7.5	7.4	9.3				1456	
TPNW350	3	28.9	7.6	1.8	9.3		5,234,403	542,447	1454	
Mid	20	29.2	7.6	5.0	9.3				1454	
Deep	35/41	29.2	7.6	5.9	9.3				1453	
TPNE300 (down-current)	3	28.3	7.6	1.3	9.3		5,234,378	542,545	1442	
Mid	20	29.1	7.6	1.3	9.3				1441	
Deep	35/41	29.2	7.6	1.7	9.3				1440	
TPNE350	3	28.6	7.6	1.3	9.4		5,234,390	542,556	1438	
Mid	20	29.1	7.6	0.9	9.3				1438	
Deep	35/41	29.2	7.6	0.5	9.3				1437	

Pre-Survey Calibration D. High 1/27 101.8% Final = 102.8 mild, drizzle, cloudy weather, some clearing

DO Calibration as per manufacturer's specifications.

Survey work conducted by S. High

Turbidity Calibration as per manufacturer's specifications. Calibration at 0, 10NTU's

Prepared By/Date:

M. Lloyd 1/27

TSS Data Update

M Lloyd 1/30

L&AI

Construction Compliance Monitoring **Date: JAN 27** **Totem Marine - Flood Tide**

Station/Sample	Depth/DTB (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
TDN300 (Up-Current)	3	27.5	7.0	2.1	9.5		5,233,836	542,840	1110	
030127/TDN300/M/A	20	28.9	6.9	1.7	9.3	2			1109	Hurlen placing filter material
Deep	35/41	29.0	7.0	2.0	9.3				1108	around boat lift at a careful
TDN350	3	28.3	7.0	1.6	9.4		5,233,847	542,829	1114	slow pace
Mid	20	28.9	7.0	1.2	9.3				1113	
Deep	35/41	29.2	7.0	4.4	9.3				1112	
TDS150 (Down-Current)	3	27.3	6.3	2.5	9.5		5,238,727	542,894	830	
Mid	17	28.9	6.0	3.1	9.3				829	
Deep	30/34	29.1	6.0	3.7	9.3				828	
TDS150	3	28.0	7.2	2.2	9.4		5,238,727	542,894	914	Field Duplicate/Recal on DO
Mid	15	28.9	7.0	1.8	9.3				913	Field Duplicate
Deep	25/30	29.0	7.3	2.1	9.3				912	Field Duplicate
TDS300	3	28.0	7.2	1.7	9.5		5,233,683	542,882	919	Hurlen stopped to measure
030127/TDS300/M/A	20	28.9	7.0	1.2	9.4	3			918	thickness of placement
Deep	35/40	29.0	7.3	2.0	9.3				917	
TDS350	3	23.8	7.3	5.5	9.5		5,233,669	542,878	932	Fresh water input
Mid	20	29.0	7.1	1.4	9.3				931	
Deep	35/40	29.1	7.1	1.6	9.3				930	
TDSE300 (down-current)	3	23.8	7.2	2.7	9.5		5,233,680	542,910	924	Fresh water input
030127/TDSE300/M/A	20	29.0	7.0	1.9	9.3	3			923	
Deep	35/39	29.1	7.0	1.8	9.3				922	
TDSE350	3	26.3	7.1	3.3	9.5		5,233,784	542,911	929	
Mid	20	28.9	7.0	2.3	9.3				928	
Deep	35/39	29.1	7.1	2.4	9.3				927	Slight turbicity elevation
TDSW300 (down-current)	3	24.4	7.3	3.4	9.5		5,238,708	542,841	938	Fresh water input
030127/TDSW300/M/A	20	29.0	7.1*	1.4	9.3	3			937	
Deep	35/39	29.1	7.2	1.6	9.3				936	
TDSW300 (down-current)	*3*	*23.0*	*7.3*	*9.1*	*9.5*		5,238,708	*542,841*	*941*	*Field Duplicate*
030127/TDSW300/M/A-Dup	*20*	*28.9*	*7.1*	*1.2*	*9.3*	3			*940*	*Field Duplicate*
Deep	*35/40*	*29.1*	*7.0*	*1.2*	*9.3*				*939*	*Field Duplicate*
TDSW350	3	27.0	7.2	1.9	9.5		5,238,696	542,830	935	
Mid	20	28.9	7.2	1.1	9.3				934	
Deep	35/40	29.1	7.3	0.9	9.3				933	
Station TF 2+00	3	29.0	7.9	0.9	9.4		5,234,465	542,492	940	
030127/TF2/M/A	23	29.2	8.0	0.5	9.3	X			938	
Deep	41/46	29.2	7.9	0.7	9.3				936	

Pre-Survey Calibration D. Berta 1/27 101.2 cool, cloudy weather, rain 14.1 °C

DO Calibration as per manufacturer's specifications.

Survey work conducted by D. Berta and S. High

Turbidity Calibration as per manufacturer's specifications. Calibration at 0, 10NTU's.

Visible turbidity near at point of entry with eddying turbidity moving north along shore typical of an ebb tide.

*Winkler Titration results for 030127/TDSW/M/A = 6.4 mg/L

Prepared By/Date: M. Lloyd 1/27

TSS Data Update M M Lloyd 1/30

L&AI

Construction Compliance Monitoring

Date: JAN 27 **Totem Marine - Ebb Tide**

Station/Sample	Depth/DTB (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
TDS300 (Up-Current)	3	27.9	7.5	1.9	9.5		5,233,683	542,870	1355	
Mid	20	29.1	7.6	1.9	9.3				1354	Hurlen placing rock material
Deep	35/40	29.2	7.7	1.0	9.3				1353	
TDS350	3	25.0	7.7	3.8	9.5		5,233,669	542,878	1400	
Mid	20	29.1	7.4	1.5	9.3				1358	
Deep	35/39	29.2	7.5	1.3	9.3				1357	
TDN150 (Down-Current)	3	28.4	7.5	1.7	9.4		5,238,804	542,874	1322	
Mid	20	29.1	7.5	2.8	9.3				1321	
Deep	36/41	29.2	7.7	2.6	9.3				1320	
TDN300	3	28.3	7.5	1.8	9.4		5,233,836	542,840	1326	
Mid	20	29.1	7.5	3.7	9.3				1325	Hurlen placing rock material
Deep	36/41	29.2	7.7	2.4	9.3				1324	
TDN350	3	28.4	7.5	1.8	9.4		5,233,847	542,829	1330	
Mid	20	29.1	7.7	0.8	9.3				1329	
Deep	36/41	29.2	7.7	0.9	9.3				1328	
TDNW300 (down-current)	3	27.5	7.6	2.4	9.5		5,238,793	542,817	1348	
Mid	20	29.1	7.5	0.8	9.3				1347	
Deep	35/41	29.2	7.6	1.5	9.3				1346	
TDNW350	3	28.5	7.5	2.1	9.4		5,238,803	542,798	1345	
Mid	20	29.1	7.5	0.9	9.3				1344	
Deep	35/41	29.2	7.6	1.0	9.3				1343	
TDNE300 (down-current)	3	28.6	7.5	2.3	9.3		5,233,860	542,880	1342	
Mid	10	28.8	7.4	2.0	9.3				1341	
Deep	16/19	29.0	7.5	2.1	9.3				1340	
TDNE350	3	28.3	7.5	2.2	9.3		5,233,874	542,877	1334	
Mid	11	28.9	7.4	1.2	9.3				1333	
Deep	17/22	29.0	7.5	2.3	9.3				1332	

Pre-Survey Calibration D. Berta 1/27 101.8% cool, cloudy weather, rain

DO Calibration as per manufacturer's specifications.

Survey work conducted by D. Berta and S. High

Turbidity Calibration as per manufacturer's specifications. Calibration at 0, 10NTU's.

Visible turbidity near at point of entry with eddying turbidity moving north along shore typical of an ebb tide.

Prepared By/Date: M. Lloyd 1/27

TSS Data Update TM Floyd 1/30

L&AI

1127103

STL Seattle

Client Name	Lloyd & Assoc. Inc.
Project Name	THEA FOSS
Date Received	01-27-03

General Chemistry Parameters

Client Sample ID 030127/TDS(300)/M/A
Lab ID 111523-01

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-28-03	mg/L	3	2

Client Sample ID 030127/TDSE(300)/M/A
Lab ID 111523-02

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-28-03	mg/L	3	2

Client Sample ID 030127/TDSW(300)/M/A
Lab ID 111523-03

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-28-03	mg/L	3	2

Client Sample ID 030127/TDSW(300)/M/DUP
Lab ID 111523-04

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-28-03	mg/L	3	2

Client Sample ID 030127/TDN(300)/M/A
Lab ID 111523-05

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-28-03	mg/L	2	2

Client Sample ID 030127/TPS(300)/M/A
Lab ID 111523-06

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-28-03	mg/L	3	2

STL Seattle

Client Sample ID	030127/TPSW(300)/M/A
Lab ID	111523-07

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-28-03	mg/L	4	2

Client Sample ID	030127/TPSE(300)/M/A
Lab ID	111523-08

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-28-03	mg/L	4	2

Client Sample ID	030127/TPN(300)/M/A
Lab ID	111523-09

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-28-03	mg/L	4	2

Client Sample ID	030127/SP7+00/M/A
Lab ID	111523-10

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-28-03	mg/L	4	2

STL Seattle

QUALITY CONTROL REPORT

Client Sample ID: Batch QC
Lab ID: 111405-1
QC Batch Number: 1159-032

Method Blank

Parameter	Result (mg/L)	PQL
Total Suspended Solids	ND	2

Duplicate

Parameter	Sample Result (mg/L)	Duplicate Result (mg/L)	RPD (%)	Flag
Total Suspended Solids	5.75	5.75	0.0	

PWL
1/30/03

PROJECT

Notebook No.

Continued From Page

0730 Begin moving sand at Tobin, stopped ~ 0740 to measure grades.

0819 Calibration

Bp = 769.2 @ 14.1°C

DO = 98.8%

Turbidity 0, 0.0 (9.9 ntu post-cal Turb)

0837 Recal DO (101.2%), replaced membrane, burn-in = 20 min
Sanded electrodes.

0750–0910 Hurlin stopped to measure grade

Henry Rain

Clarification

Continued on Page

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PROJECT Thea Foss

Notebook No. _____ 65

Continued From Page _____

030127

Totem Dock Flood Tide Work Zone 6

Time	Location	Event	DTB	Sample depth	Temp	Sal	DO	Turb	TSS
0828	TDS150	A	39	D 30	9.3	29.1	6.0	3.7	—
0829	727 874			M 17	9.3	28.9	6.0	3.1	—
0830	acc 5.3			S 3	9.5	27.3	6.3	2.5	—
(Dup. Readings after recal.)									
0912	TDS150								
0913	722 894	A	30	D 25	9.3	29.0	7.0	2.1	—
0914	acc 7.0			M 15	9.4	28.8	7.0	1.8	—
				S 3	9.5	27.8	7.1	2.2	—
0917	TDS300		40	D 35	9.3	29.0	7.3	2.0	—
0918	683 852	A		M 20	9.3	28.9	7.0	1.2	030127/TDS300/m/A
0919	acc 7.1			S 3	9.4	28.0	7.2	1.7	—
0922	TDSE300		39	D 35	9.3	29.2	7.0	1.8	—
0923	680 910	A		M 20	9.3	29.0	7.0	1.9	030127/TDSE300/m/A
0924	acc 7.1			S 3	9.6	25.3	7.2	2.7	—
0927	TDSE350		39	D 35	9.3	29.1	7.1	2.4	—
0928	665 912	A		M 20	9.3	28.9	7.0	2.3	—
0929	acc 7.3			S 3	9.5	26.3	7.1	3.3	—
0930	TDS350	A	40	D 35	9.3	29.1	7.1	1.6	—
0931	669 878			M 20	9.3	29.0	7.1	1.4	—
0932	acc 6.2			S 3	9.5	23.8	7.3	5.5	—
0933	TDSW350	A	40	D 35	9.3	29.1	7.3	0.9	—
0934	696 830			M 20	9.3	28.9	7.2	1.1	—
0935	acc 6.9			S 3	9.5	27.0	7.2	1.9	—
0936	TDSW300		39	D 35	9.4	29.1	7.2	1.6	—
0937	708 841			M 20	9.3	29.0	7.1	1.4	030127/TDSW300/m/A
0938	acc 6.7			S 3	9.5	24.4	7.3	3.4	

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[signature] 1/27/03 [signature] 030127

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PROJECT

Notebook No.
Continued From Page

0945 Collect DO samples for LOT & RTR

1000 ~~[illegible]~~ Monson placing rock @ center of TP (WZ #2)
Henry Rock B.P. =

Continued on Page

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030127

Tolan Dock

Calculate ↓

time	location	Event	DTB	sample depth	t	Sal	DO	turb	TSS
0939	TDSW300								
0940	708 841	A	40	D 35	9.3	29.1	7.0	1.2	—
0941	acc 6.8			M 20	9.3	28.9	7.1	1.2	030127/TDSW300/M/
				S 3	9.5	23.0	7.3	9.1	— Dupe

→ Collected DO samples @ 20 ft ← (★ see results PAGE 68)

0948	TDN300	A	41	D 35	9.3	29.0	7.0	2.0	—
0949	836 840			M 20	9.3	28.9	6.9	1.7	030127/TDN300/M/A
0950	acc 6.1			S 3	9.5	27.5	7.0	2.1	—
0956	TDN 350		41	D 35	9.3	29.2	7.0	4.4	—
0957	847 829	A		M 20	9.3	28.9	7.0	1.2	—
0958	acc 6.4			S 3	9.4	28.3	7.0	1.6	—

Thea's Park Flood Tide
Work Zone 2

10[illegible]	TPS150		43	D 40	9.3	29.2	7.1	10.0	—
1010	346 499	A		M 22	9.3	29.0	7.0	2.5	—
1011	acc 5.7			S 3	9.5	27.9	7.1	1.5	—
									—
012	TPS300		43	D 40	9.3	29.2	7.1	1.5	— 030127/TPS300/M/A
013	319 537	A		M 22	9.3	29.0	7.0	1.8	—
014	acc 7.5			S 3	9.4	28.7	7.0	1.7	—
015	TPSW300	A	41	D 40	9.3	29.2	7.0	24.7	—
016	288 500			M 22	9.3	29.0	7.0	7.0	030127/TPSW300/M/A
017	acc 5.2			S 3	9.4	27.7	7.0	2.2	—
018	TPSW350	A	46	D 40	9.3	29.2	7.0	20.2	—
019	275 506			M 22	9.3	29.0	7.0	6.8	—
020	acc 5.0			S 3	9.4	28.2	7.0	2.3	—

Continued on Page

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[signature] 1/27 [signature] 030127

Signed Date Signed Date

29 Recalibrate turb (0,0,0)
Called Michael about turbidity @ SW 350. He will take my Mansion.

Extra @ SW 350

EXTRA @ SW 350

★ RESULTS OF 3 RUNS OF DO BY WINKLER METHOD FOR TDSW (300)/M/DUP. AVERAGED 6.4 mg/L (SEE PAGE #67)

Ambient @ St. Paul

EXTRA @ SW 350

Continued on Page

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B Michael Floyd	1/27/03		

PROJECT Thea Foss

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030127

Thea's Park (cont) (WZ #2)

Time	Location	Event	DTB	Sample depth	t	Sal	DO	Turb	TSS
1033	TPSW353	A	45	D 40	9.3	29.2	7.7	14.5	—
1034	275 500			M 22	9.3	29.0	7.1	5.1	—
1035	acc 4.7			S 3	9.4	28.5	7.1	2.1	—
1038	TPS 350		43	D 40	9.3	29.2	7.0	5.0	—
1039	319 537	A		M 22	9.3	29.1	7.1	2.3	—
1040	acc 5.2			S 3	9.4	28.4	7.0	1.5	—
1041	TPSW350		47	D 42	9.3	29.2	7.0	8.5	—
1042	275 506	A		M 23	9.3	29.1	6.9	1.0	—
1043	acc 4.7			S 3	9.4	28.5	7.0	1.5	—
1045	TPSE350		44	D 40	9.3	29.2	7.1	1.3	—
1046	360 567	A		M 22	9.3	29.1	7.0	1.7	—
1047	acc 4.9			S 3	9.4	28.6	7.0	1.4	—
48	TPSE300		44	D 40	9.3	29.2	7.0	1.1	—
9	363 551	A		M 22	9.3	29.1	7.0	1.5	030127/TPSE300/M/A
1050	acc 5.9			S 3	9.4	28.4	7.0	1.3	—
1056	TPN300		46	D 41	9.3	29.2	7.0	1.7	—
1057	462 473	A		M 23	9.3	29.1	7.0	1.7	030127/TPN300/M/A
1058	acc 5.3			S 3	9.4	28.8	7.0	2.2	—
1059	TPN350		46	D 41	9.3	29.2	7.0	0.8	—
1100	477 473	A		M 23	9.3	29.1	7.0	1.1	—
1102	acc 5.0			S 3	9.4	28.7	7.0	1.9	—
1107	SP7400	A	43	D 38	9.3	29.2	7.2	1.4	—
108	940955			M 21	9.4	29.1	7.1	1.2	030127/SP7400/M/A
109	acc 4.9			S 3	9.5	28.7	7.0	1.4	—
118	TPSW350	A	46	D 40	9.3	29.2	7.2	2.0	—
119	275 506			M 23	9.3	29.1	7.1	1.2	—
120	acc 5.6			S 3	9.4	28.2	7.0	1.4	—

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[signature] 1/27/03 [signature] 030127

Signed Date Signed Date

PROJECT

Notebook No.

Continued From Page

1300 Calibrate
DO 101.8%
Turb 0, 0.0 (10.1 inter)

Harbor placing rock

Continued on Page

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ROJECT Tden Ross

Notebook No. _____ 71

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030127

Tofam Dock Ebb Tide

	Location	Event	DTB	Sample depth		t	sal	DO	Turb	TSS
320	TDN150		41		D	36	9.3	29.2	7.7	2.0	–
1321	804 874	B			M	20	9.3	29.1	7.5	2.8	–
322	acc 8.5 (actual 822/858)				S	3	9.4	28.4	7.5	1.7	
324	TDN300		41		D	36	9.3	29.2	7.6	2.4	–
1325	836 840	B			M	20	9.3	29.1	7.5	3.7	–
1326	acc = 7.7				S	3	9.4	28.3	7.5	1.8	–
1327	TDN350		41		D	36	9.3	29.2	7.7	0.9	–
1328	847 829	B			M	20	9.3	29.1	7.7	0.8	–
1330	acc 5.5				S	3	9.4	28.4	7.5	1.8	–
1332	TDNE350		22		D	17	9.4	29.0	7.5	2.3	–
1333	874 877	B			M	11	9.4	28.9	7.4	1.2	–
1334	acc 5.7				S	3	9.4	28.3	7.5	2.2	–
1340	TDNE300	B	29		D	16	9.4	29.0	7.5	2.1	–
1341	860 880				M	10	9.4	28.8	7.4	2.0	–
1342	acc 7.1				S	3	9.4	28.6	7.5	2.3	–
1343	TDNW350		40		D	35	9.3	29.2	7.6	1.0	–
1344	803 798	B			M	20	9.3	29.1	7.5	0.9	–
1345	acc 5.7				S	3	9.4	28.5	7.5	2.1	–
1346	TDNW300		41		D	35	9.3	29.2	7.6	1.5	–
1347	793 817	B			M	20	9.3	29.1	7.5	0.8	–
1348	acc 5.7				S	3	9.5	27.5	7.6	2.4	–
1353	TDS300		40		D	35	9.3	29.2	7.7	1.0	–
1354	653 882	B			M	20	9.3	29.1	7.4	1.9	–
1355	acc 5.9				S	3	9.5	27.9	7.5	1.9	–

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[signature] 1/27/03 — Signed — Date

030127 — Signed — Date

PROJECT Thea Foss

Notebook No.
Continued From Page

030127

- 1430 - ~~Hor~~ Manson Continues Placing Rock for Toe Berm at Thea's Park.
No Floatable Debris or Turb. Plumes Observed.
Water Appeared Generally Clear.
- Occasional Sunbreaks in Pim

Continued on Page

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Daniel A. Berta 01/27/03 — Signed — Date

[signature] 1/27/03 — Signed — Date

02/27

Tube Dock (cont) Ebb tide

time	location	Event	DTD	sample depth		t	Sal	DO	Turb	TSS
1357	TDG 350		39	D	35	9.3	29.2	7.5	1.3	—
1358	669 878	B		M	20	9.3	29.1	7.4	1.5	—
1400	acc 5.9			S	3	9.5	25.0	7.7	3.8	—

Three Pack Ebb Tide WZ #1

1414	TPS 350		40	D	35	9.3	29.2	7.6	1.7	—
1415	~~312 550~~	B		M	20	9.3	29.1	7.7	0.8	—
1416	246 574 acc			S	3	9.5	28.4	7.4	1.3	—
1420	TPS 300		40	D	35	9.3	29.2	7.6	1.9	—
1421	254 565			M	20	9.3	29.1	7.6	1.2	—
1422	acc 5.4			S	3	9.5	28.2	7.6	1.5	—
1437	TPNE 350		41	D	35	9.3	29.2	7.6	0.5	—
1438	340 556			M	20	9.3	29.1	7.6	0.9	—
[illegible]8	acc 5.5'			S	3	9.4	28.6	7.6	1.3	—
1440	TPNE 300	B	41	D	35	9.3	29.2	7.6	1.7	—
1441	378 545			M	20	9.3	29.1	7.6	1.3	—
1442	Acc = 7.5			S	3	9.5	28.3	7.6	1.3	—
1444	TPN 150	B		D	35	9.3	29.2	7.7	3.0	—
1444	352 496		40	M	20	9.3	29.1	7.6	2.0	—
1445	Acc = 5.9			S	3	9.4	28.7	7.7	1.2	—
1447	TPN 300		40	D	35	9.3	29.2	7.7	2.9	—
1447	316 501	B		M	20	9.3	29.2	7.6	1.0	—
1448	Acc = 5.9			S	3	9.4	28.9	7.6	0.8	—
1449	TPN 350		40	D	35	9.3	29.2	7.6	2.0	—
1450	411 502	B		M	20	9.3	29.2	7.5	2.1	—
1450	Acc = 5.8			S	3	9.4	28.9	7.6	0.9	—

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[illegible] 01/27/03 Signed _____ Date

[illegible] 1/27/03 Signed Date

PROJECT TITEA FOSS

Notebook No. _____
Continued From Page _____

030127

1530 CALIBRATION CHECK:
- DO IN MOIST AIR OVER TAP WATER
= 102.8 %

Continued on Page

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Daniel A. Bate 01/27/03 _____ Michael [illegible] 1/27/03
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PROJECT THEA FOSS

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Continued From Page _____

030127

TIME	LOCATION	EVENT	DTB	SAMPLE DEPTH	TEMP	SAL	PO	TURB	TSS
1453	TPNW 350	B	41	D 35	9.3	29.2	7.7	5.9	—
1454	403 447			M 20	9.3	29.2	7.6	5.0	—
1454	Acc = 6.1			S 3	9.4 (9.4) DB	28.9	7.6	1.8	—
1456	TPNW300	B	39	D 35	9.3	29.2	7.5	7.4	—
1457	389 454			M 20	9.3	29.2	7.5	4.4	—
1457	Acc = 5.9			S 3	9.4	28.7	7.6	1.5	—

Continued on Page

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[signature] 01/27/03 _____ [signature] 1/27/03

Signed Date Signed Date

American Civil Constructors

Hurlen Construction

PO Box 80945
700 S. Riverside Dr.
Seattle, WA 98108
(206) 763-1230
FAX (206) 762-1854

FAX TRANSMITTAL

Date:		Number of Pages Including this Sheet:	
Deliver To:	O'LOUGHLIN / WINGARD		
Company:	CITY of TACOMA		
Fax Number:	253-272-2413		

From:	M. Lloyd
Company:	ACC / Hurlen Construction
Fax Number:	206-762-1854
Subject	Daily WQ Report

Lloyd & Associates, Inc.
38210 SE 92nd Street, Snoqualmie, Washington 98065 425-888-1905(v/f) rml@centurytel.net

January 27, 2003

TRANSMITTAL

To: John O'loughlin
Iain Wingard
From: Michael Lloyd

RE: Weekly Water Quality Monitoring Report 1/27/03

Water quality monitoring was conducted at both Totem Marine and in the Wheeler-Osgood Waterway. Daily reports have been previously submitted for the following:

Totem Marine
- January 20 - riprap placement
- January 21 - riprap placement and/or filter cap material placement
- January 22 - riprap placement
- January 23 - riprap placement
- January 24 - filter cap material placement
- January 25 - filter cap material placement

Wheeler-Osgood
- January 21 - riprap placement
- January 22 - filter cap material placement
- January 23 - riprap placement and filter cap material placement
- January 24 - habitat mix placement

Thea's Park
- January 25 - toe berm construction
- January 26 - toe berm construction

In general work went well at both the Wheeler-Osgood and Thea's Park construction area. Except for a single sampling event (January 23) all the work at the Wheeler-Osgood was completed without environmental monitoring excitement. Work on the 23rd was the only day that work was conducted during an ebb tide. Water quality at Totem continues to be more problematic. This is particularly true of ebb tide events which draw turbidity along the shoreline from the work area toward the NE monitoring stations. The picture of turbidiy movement is compounded by eddies that develop at ebb tides and potential discharges from storm drains in the area. Oddly enough, "dirty rock" appears to cause more problems than filter cap material placement.

Updated compliance reports with TSS data have been submitted to the City of Tacoma. Work planned for the next week will include rock work at Totem and filter cap/rock at Thea's Park. The toe berm should be complete at Thea's Park by 1/28/03 if continued compliance with water quality criteria does not require slower placement.

MML Reprinted 3/26/03

Michael Lloyd
Lloyd & Associates, Inc.

Cc: CQC, ACC-Hurlen, Manson, File

Lloyd & Associates, Inc.
38210 SE 92nd Street, Snoqualmie, Washington 98065 425-888-1905 rml@centurytel.net

January 28, 2003

TRANSMITTAL

TSS Updated
1/31/03
PML

To: Iain Wingard
John O'Loughlin

Subject: Compliance Monitoring / Thea's Park 1/28/03
Preliminary Data Transmittal (no TSS)

Attached please find results from compliance monitoring for the following work activity:

- Filter Cap Placement at Thea's Park

Thea's Park – Filter Material Placement.

Monitoring today at Thea's Park followed the placement of filter material at the south end adjacent to the end berm that was installed yesterday. The filter material was placed on top of native sediments. As described in geotechthe bid specification (RD-SO3), the primary components of the bottom sediments are principally silt (60%), clay (20%), and fine sand (20%). Manson began placing rock on a flood tide in the early morning. Manson was using a rehandler type bucket rather than a clamshell. Filter material was placed from the corner of the toe berm to locations up the slope in shallow water.

Our first monitoring station was TPSW300 where we ran into turbidity at about 25 NTU at depth. Sampling at TPSW350 yielded a result of 30 NTU. Monitoring throughout the morning indicated turbidity was observed at depth from the work zone to about 450' at information station TPSW450 (15 NTU). Laterally, the turbidity plume was observed at depth to about 90 -100' east before dropping to background levels of 1-3 NTU. TPS350 is about 150' east of TPSW. Elevated turbidity was not observed at TPS350 or other stations.

TPSW stations are in a direct tidal flow line from the work zone where filter material was being placed. Typically with filter material, our sampling team has measured turbidity at all elevations, depending on placement. If placement is shallow, we have typically seen turbidity at shallow depths (based on our experience with Totem). This trend was not observed at Thea's Park. Throughout the day, turbidity at shallow or mid-depths was negligible except at the immediate work zone station (TPS/N150 series). Because a substantial portion of the material was placed at shallow depth, we would have expected to see turbidity at shallow elevations. Instead, all turbidity was observed near the bottom at near-shore stations during the morning flood tide.

Pat Barton (Manson) had reported to me that the berm placed in the last 3 days was sinking (displacing actually) into the soft sediments at Thea's Park. As noted above, these sediments are principally silt and to a lesser degree, clay and fine sand. It is my opinion that as the filter material is being placed, it is disturbing the fine sediments along the south end. I inspected the filter material on the barge. This particular batch of filter material does not appear to contain the very high levels of fines that have been previously observed. This observation correlates with visual observation that placement in the water does not cause the high turbidity normally seen in shallow to mid-depth water (i.e., Totem).

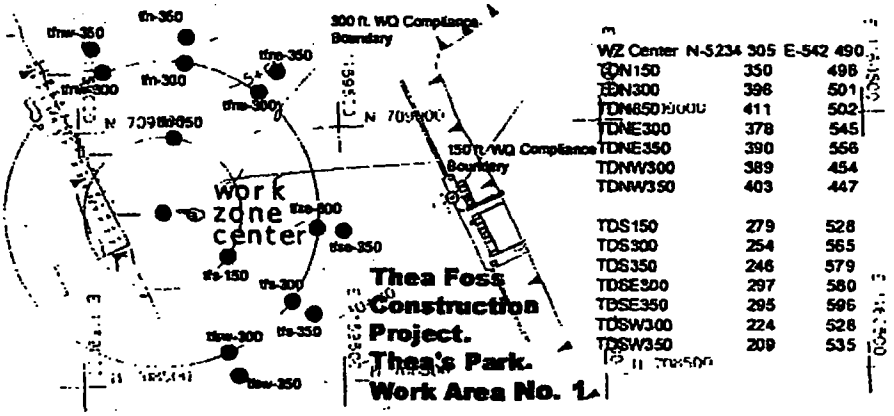
QA/QC.

Field duplicate data looked very good. Some variability was observed in turbidity. A Winkler titration was conducted on sample 030128/TP/M/A4. The YSI yielded a result of 7.4 mg/L and the Winkler titration gave results of 7.2 and 7.3 mg/L.

If you have any questions or wish to discuss these results, please call me at 425-785-1357 (cell).

Michael Lloyd
Lloyd & Associates, Inc.

WQM 1 28 03.doc



WZ Center	N-5234 305	E-542 490
TDN150	350	498
TDN300	396	501
TDN850	411	502
TDNE300	378	545
TDNE350	390	556
TDNW300	389	454
TDNW350	403	447
TDS150	279	528
TDS300	254	565
TDS350	246	579
TDSE300	297	580
TDSE350	295	596
TDSW300	224	528
TDSW350	209	535

Construction Compliance Monitoring **Date: JAN 28** **Thea's Park - Slack/Flood Tide**

Station/Sample	Depth/DTB (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E m)		Time	Comment
TPSW300 (down-current)	3	28.2	7.5	2.2	9.4		5,234,224	542,528	917	M Lloyd notified Manson of
030128/TPSW300/M/A	22	28.9	7.5	3.2	9.4	4			917	
Deep	40/45	29.2	7.6	**24.8**	9.3				916	Elevated turbidity at 300'
TPSW350	3	27.8	7.5	2.8	9.4		5,234,209	542,535	921	Notified M. Lloyd
Mid	22	28.9	7.5	3.4	9.4				921	Recal'd and reanalyzed
Deep	40/45	29.2	7.6	**30.0**	9.4				920	
TPSW350	3	28.2	7.4	2.4	9.4		5,234,209	542,535	934	Recal'd and reanalyzed
Mid	22	28.9	7.5	3.8	9.4				933	
Deep	40/45	29.1	7.5	**25.6**	9.4				932	
TPSW450	3	28.2	7.5	2.8	9.4		5,234,275	542,506	952	Check on extent of plume to
Mid	22	28.9	7.6	2.2	9.3				951	the south at about 450'
Deep	38/43	29.1	7.6	**15.0**	9.4				951	
TPSW350+40' West	3	28.3	7.4	3.9	9.4		5,234,209	542,521	1014	Moved to station 40' west
Mid	17	28.9	7.4	7.2	9.4				1013	
Deep	28/33	29.1	7.4	2.0	9.4				1009	
TPSW350+30+' East	3	28.3	7.4	2.6	9.4		5,234,209	542,521	1014	Moved to station 40 east
Mid	22	28.9	7.5	2.6	9.4				1013	
Deep	39/44	29.2	7.5	**20.0**	9.4				1009	
TPSW350+60 East	3	27.5	7.6	2.6	9.3		5,234,209	542,521	1118	Moved to station 40 east
Mid	23	29.0	7.5	2.6	9.4				1118	
Deep	41/45	29.2	7.6	**24.0**	9.3				1117	
Turbidity drops off to about 1-2 NTU at about 100' east of TNSW350, see notebook, p76										
TPSW350	3	28.2	7.4	2.4	9.4		5,234,275	542,506	1055	Repeat of TPSW350
Mid	22	28.9	7.5	3.8	9.4				1055	1 hour 20 minutes later
Deep	40/45	29.1	7.5	**25.6**	9.4				1054	on slack to flood tide
TPSW150	3	27.9	7.6	3.0	9.3		5,234,257	542,526	1112	Against Boom near work
Mid	23	29.0	7.6	6.5	9.4				1112	area
Deep	41/46	29.2	7.6	**48.0**	9.3				1111	Manson takes 15 minute break
TPSW350 R+3	3	28.2	7.4	2.2	9.4		5,234,209	542,535	1236	Revisit of monitoring stations
Mid	23	28.9	7.4	1.5	9.4				1236	after almost 3 hours
Deep	41/47	29.2	7.4	14.4	9.4				1235	at slack/flood
TPSW350 R+3	3	28.3	7.5	2.1	9.4		5,234,209	542,535	1242	Manson stops to take
Mid	23	29.0	7.4	1.6	9.4				1242	soundings of work
Deep	41/47	29.2	7.4	14.2	9.4				1241	
Station SP 7+00	3	27.3	7.8	3.3	9.4		5,234,940	542,955	846	No floating debris or visible
030128/SP7/M/A	21	29.0	7.7	1.0	9.4	5			846	turbiity outside of work zone
Deep	37/42	29.1	7.7	1.4	9.4				845	
Station SP 7+00	*3*	*27.3*	*7.8*	*3.3*	*9.4*		*5,234,940*	*542,955*	*846*	*Field Duplicate*
030128/SP7/M/A-Duplicate	*21*	*29.0*	*7.7*	*1.0*	*9.4*	*14*			*846*	*Field Duplicate*
Deep	*37/42*	*29.1*	*7.7*	*1.4*	*9.4*				*845*	*Field Duplicate*

Calibration = 101.8% in saturated air. 10 ntu Standard measured at 9.8 ntu

Sampling Event Continued on the Next Page

Prepared By/Date:

M. Lloyd 1/28

TSS DATA UPDATE 1/31/03

L&AI

Continued from Previous Page **Date: JAN 28** **Thea's Park - Flood Tide**

Station/Sample	Depth/DTB (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
TPS300 (Down-Current)	3	28.4	7.4	2.5	9.4		5,234,246	542,579	1020	Moderate Flood Tide
030128/TPS300/M/A	21	29.0	7.3	2.0	9.4	3			1019	
Deep	37/42	29.2	7.6	1.3	9.4				1018	Virtually no turbidity at TPS
TPS350	3	28.4	7.4	2.5	9.4		5,234,254	542,565	1020	stations
Mid	21	29.0	7.3	2.0	9.4				1019	
Deep	37/42	29.2	7.6	1.3	9.4				1048	
TPSE300 (down-current)	3	28.2	7.5	3.8	9.4		5,234,297	542,580	1035	
030128/TPSE300/M/A	22	29.0	7.6	1.5	9.4	5			1035	
Deep	39/44	29.2	7.6	0.7	9.4				1034	
TPN300	3	27.0	7.7	3.5	9.4		5,234,396	542,501	1046	
030128/TPN300/M/A	22	29.0	7.6	1.6	9.4	3			1045	
Deep	39/44	29.1	7.6	0.8	9.4				1044	

Pre-Survey Calibration mild, cloudy weather, rain in early morning

DO Calibration as per manufacturer's specifications.

Survey work conducted by D. Berta

Turbidity Calibration as per manufacturer's specifications. Calibration at 0, 10NTU's.

Prepared By/Date:	TSS DATA UPDATE 1/31/03	L&AI
M. Lloyd 1/29		

Construction Compliance Monitoring

Date: JAN 28 **Thea's Park - Max Ebb Tide/B**

Station/Sample	Depth/D TB (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
TPSW300 (slack)	3	28.2	7.4	3.0	9.4		5,234,224	542,528	1327	Slack Tide
Mid	23	29.0	**7.4***	8.7	9.4				1326	
Deep	41/46	29.2	7.4	**12.9**	9.4				1325	Moderate turbidity at 300'
TPSW350	3	27.9	7.4	2.8	9.4		5,234,209	542,535	1359	
Mid	23	29.0	7.3	7.9	9.4				1359	
Deep	41/47	29.2	7.3	9.9	9.5				1358	
TPS300 (Up-Current)	3	28.5	7.4	2.4	9.5		5,234,254	542,565	1412	Maximum Ebb Tide
Mid	21	29.0	7.3	5.7	9.4				1411	Manson placing filter material
Deep	37/43	29.2	7.3	6.9	9.4				1410	at south end
TPS350	3	28.1	7.4	2.6	9.5		5,234,246	542,579	1407	May be some residual turbidity
Mid	21	29.0	7.4	3.4	9.5				1406	from morning
Deep	37/42	29.2	7.4	4.0	9.5				1405	
TPNE300 (down-current)	3	28.3	7.4	2.1	9.4		5,234,378	542,545	1424	Light eddy described by
Mid	23	29.1	7.4	8.2	9.4				1424	Jeremy Scott, boat operator
Deep	40/44	29.2	7.4	5.9	9.4				1423	
TPNE350	3	28.4	7.4	2.1	9.4		5,234,390	542,556	1419	
Mid	23	29.1	7.4	4.0	9.4				1418	
Deep	40/45	29.2	7.4	3.7	9.4				1417	
TPN150 (Down-Current)	3	28.3	7.3	2.4	9.5		5,234,350	542,496	1457	Point move to N. end of barge
Mid	21	29.1	7.3	15.5	9.4				1456	
Deep	37/42	29.2	7.3	**15.0**	9.4				1455	
TPN300	3	28.4	7.4	2.5	9.4		5,234,396	542,501	1451	
Mid	21	29.1	7.3	5.6	9.4				1451	
Deep	37/42	29.2	7.3	**17.5**	9.4				1450	
TPN350	3	**22.5**	7.7	8.0	9.5		5,234,411	542,502	1432	Fresh water input
Mid	23	29.1	7.4	1.6	9.4				1431	
Deep	40/44	29.2	7.5	10.3	9.4				1430	
TPNW300 (down-current)	3	28.3	7.3	2.4	9.5		5,234,389	542,454	1507	Near shore location
Mid	21	29.1	7.3	3.0	9.4				1506	Maximum Ebb Tide
Deep	37/43	29.2	7.4	**16.6**	9.4				1505	
TPNW350	3	28	7.3	2.8	9.6		5,234,403	542,447	1512	
Mid	21	29.1	7.3	3.0	9.4				1511	
Deep	38/43	29.2	7.3	**12.5**	9.4				1510	Moderate turbidity at 350'

Pre-Survey Calibration D. Berta 1/27 101.8% Final = 98.8% mild, sunny, partly cloudy

DO Calibration as per manufacturer's specifications.

Survey work conducted by S. High

Turbidity Calibration as per manufacturer's specifications. Calibration at 0, 10NTU's

*Winkler Titration of sample yielded 7.2 and 7.3 mg/L

Prepared By/Date:	TSS DATA UPDATE 1/31/03	L&AI
M. Lloyd 1/28		

STL Seattle

Client Name	Lloyd & Assoc. Inc.
Project Name	Thea Foss
Date Received	01-28-03

General Chemistry Parameters

Client Sample ID 030128/SP7+00/M/A
Lab ID 111554-01

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-29-03	mg/L	5	2

Client Sample ID 030128/TDSW(300)/M/A
Lab ID 111554-02

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-29-03	mg/L	4	2

Client Sample ID 030128/SP7+00/M/DUP
Lab ID 111554-03

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-29-03	mg/L	14	2

Client Sample ID 030128/TPS(300)/M/A
Lab ID 111554-04

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-29-03	mg/L	3	2

Client Sample ID 030128/TPSE(300)/M/A
Lab ID 111554-05

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-29-03	mg/L	4	2

STL Seattle

Client Sample ID	030128/TPN(300)/M/A
Lab ID	111554-06

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-29-03	mg/L	3	2

STL Seattle

QUALITY CONTROL REPORT

Client Sample ID: Batch QC
Lab ID: 111451-1
QC Batch Number: 1159-035

Method Blank

Parameter	Result (mg/L)	PQL
Total Suspended Solids	ND	2

Duplicate

Parameter	Sample Result (mg/L)	Duplicate Result (mg/L)	RPD (%)	Flag
Total Suspended Solids	5.5	4.5	20	

PROJECT Thea Foss

Notebook No. _____

Continued From Page _____

030128

0730 - MANSON STARTS PLACING FILTER CAP & SOUNDING (PLACING MATERIAL @ A SLOW RATE)

WEATHER: PTLY CLOUDY - OVERCAST COOL IN AM.

CALIBRATION NOTES: BAROMETRIC PRESSURE = 773.6 mm Hg

- DO CALIBRATED IN MOIST AIR ABOVE TAP WATER
  DO CHECK = 101.8%

- TURBIDITY CALIBRATED USEING MANUFAC. 2 POINT METHOD. 0.0 = DISTILLED WATER
  10.0 = CALIBRATION STANDARD.
  TURB. CALIBRATION CHECK IN STANDARD SOLUTION AFTER CALIBRATION = 9.8

0930 INFORMED OFFICE & MANSON RIG (BLW) OF TURBIDITY RESULTS FOR TPSW 300 & 350 A.

★ RECALIBRATION FOR TURBIDITY = 9.8 = CAL. WECK 2 POINT METHOD AS ABOVE.

0932 (NOTE ON TRIP DOWN WITH SOUNDE AFTER RECALIB NOTED TURB. APPEARS TO START TO INCREASE ~ 32'

0948 'SAME AS ABOVE @ 35'

1000 MANSON TAKES BREAK

Continued on Page

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030128 WORK ZONE #1

TIME	LOCATION	EVENT	DTB	SAMPLE DEPTH	TEMP	SAL	DO	TURB	TSS
									SLACK-FLOOD
0845	SP 7+00	A	(42)	D 37	9.3	29.1	7.7	1.4	—
0846	940 955			M 21	9.4	29.0	7.7	1.0	030128/SP 7+00/M/A
0846	Acc = 5.5'			S 3	9.4	27.3	7.8	3.3	—
									SLACK-FLOOD
0849	SP 7+00	A	(42)	D 37	9.3	29.1	7.7	0.8	—
0850	940 955			M 21	9.4	29.0	7.7	1.0	030128/SP 7+00/M/DUP
0851	Acc = 5.5'			S 3	9.4	27.9	7.7	2.8	—
									FLOOD
	~~TPSW (300)~~	~~A~~		~~D~~	SEE PAGE # 79				
	~~296 524~~			~~M~~	FOR RESULTS				
	~~Acc =~~			~~S~~					
0910	TPSW (300)	A	(45)	D 40	9.3	29.2	7.6	24.8	—
0917	~~224 525~~ 224 525			M 22	9.4	28.9	7.5	3.2	030128/TPSW(300)/M/A
0917	Acc = 6.1			S 3	9.4	28.2	7.5	2.2	—
[illegible]	TPSW (350)	A	(45)	D 40	9.4	29.2	7.6	30.0	—
0921	209 535			M 22	9.4	28.9	7.5	3.4	—
0921	Acc = 6.1			S 3	9.4	27.8	7.5	2.8	—
0932	TPSW (350)	A1	(45)	D 40	9.4	29.1	7.5	25.6	—
0933	209 535			M 22	9.4	28.9	7.5	3.8	—
0934	Acc = 6.1			S 3	9.4	28.2	7.4	2.4	—
0948	TPSW 300	A1	(45)	D 40	9.3	29.2	7.6	350	—
0949	224 525			M 22	9.4	28.9	7.6	2.8	—
—	Acc = 6.1			S 3		NA			—
	— INFORMATIONAL READINGS —								
0951	≈ TPSW 400	A1	(43)	D 38	9.4	29.1	7.5	150	—
0951	195 533			M 22	9.3	29.0	7.6	2.2	
0952	Acc = 6.4			S 3	9.4	27.8	7.5	2.8	

Actual = ≈ 450' RMH 1/28/03

Continued on Page

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RMH 1/28/03 — Signed — Date

PROJECT

Notebook No.

Continued From Page

1007 NOTE HIT BOTTOM @ 33', SAMPLE LOCATION AGAINST WAREHOUSE PILE

1020 MANSON RESUMES FILTER CAP PLACEMENT

1100 MANSON STOPS FILTER CAP PLACEMENT RESUMES ~1115

1115 HURLEY RIG MOVING AT TOTEM DOCK (NO ACTIVITY PRIOR TO THIS.) LOADING 1ST BUCKET ≈ 1135

Continued on Page

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030128

SAMPLE

TYPE	LOCATION	EVENT	DTB	DEPTH	TEMP	SAL	DO	TURB	TSS
				INFORMATIONAL READINGS					FLOOD
1007	~ TPSW 350	A_1	33 (43)	D ~~28~~ 28	9.4	29.1	7.4	2.0	—
1008	~~30' WEST OF~~			M ~~22~~ 17	9.4	28.9	7.4	7.2	—
1009	209 521			S 3	9.4	28.3	7.4	3.9	—
	Acc = 5.8	Actual = ±40' PM							
1012	~TPSW 350	A_1	~~47~~	D ~~42~~ 39	9.4	29.2	7.5	20	—
1013	~~30' EAST~~		44	M 22	9.4	28.9	7.5	2.6	—
1014	225 545			S 3	9.4	28.3	7.4	2.6	—
	Acc = 4.7	Actual = 30'/PM							
1018	TPS (350)	A	(42)	D 37	9.4	29.2	7.6	1.3	—
1019	246 579			M 21	9.4	29.0	7.3	2.0	—
1020	Acc = 4.7			S 3	9.4	28.4	7.4	2.5	—
1026	TPS 300	A	(42)	D 37	9.4	29.1	7.5	1.0	—
1027	254 565			M 21	9.4	29.0	7.5	1.8	030128/TPS(300)/M/A
1027	Acc = 5.0			S 3	9.4	28.2	7.5	3.2	—
1034	TPSE(300)	A	(44)	D 39	9.4	29.2	7.6	0.7	—
1035 DB	297 580			M 22	9.4	29.0	7.6	1.5	030128/TPSE(300)/M/A
1035	Acc = 4.7			S 3	9.4	28.2	7.5	3.8	—
1044	TPN (300)	A	(44)	D 39	9.4	29.1	7.6	0.8	—
1045	396 501			M 22	9.4	29.0	7.6	1.6	030128/TPN(300)/M/A
1046	Acc = 5.1			S 3	9.3	27.0	7.7	3.5	—
				INFORMATIONAL READINGS					
1054	TPSW (350)		(45)	D 40	9.4	29.2	7.6	30.0	—
1055	209 535	A_2		M 22	9.4	29.0	7.5	2.6	—
1055	Acc = 5.0'			S 3	9.4	28.2	7.5	2.6	—

Continued on Page

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030128

1200 - HURLEN & MANSON BREAK

1230 MANSON RESUMES FILTER CAP PLACEMENT ON SOUTH END PLACING & SOUNDING BETWEEN BUCKETS. (IE RATE OF PLACEMENT LESS THAN 1 BUCKET / 15 MINUTES)

1255 ACCORDING TO HURLEN (MARK) THEY ARE OUT OF MATERIAL VERY LITTLE MATERIAL WAS PLACED, AND NO ADDITIONAL MATERIAL WILL BE PLACED TODAY.

1305
* 223 562 = APPROXIMATE EDGE OF TURBIDITY @ ≈ 100' EAST OF TFSW (350) AS DETERMINED BY LOWERING PROBE UNTIL TURB REGISTERS. ~14 @ TFSW 362 @ 35' THEN MOVING EAST UNTIL TURBIDITY DROPS TO 1-2 AT THE ABOVE COORDINATES.

325 AFTER REPAIR OF A SIMM MANSON RESUMES PLACING MATERIAL AT A RATE OF ≈ 1 BUCKET / 2 MINUTES.

PO ANALYSIS 1610 R. M. Lloyd

Replicate #1 = 362/100 × .02 × 100 = 7.2 mg/L

#2 = 364 × 0.02 = 7.3 mg/L

Continued on Page

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Signed — Date

PROJECT Tilt Fess

-30/28

TIME	LOCATION	CLOUD	D.B	SAMPLE DEPTH	TEMP	SAL	FLOW DO	TURB	TSS
				INFORMATIONAL READINGS					
1105	TPSW (300) A2		46	D 41	9.3	29.2	7.6	30.5	—
1108	224 528			M 23	9.4	29.0	7.5	3.8	—
1109	Acc = 7.0			S 3	9.4	27.0	7.6	3.6	—
1111	~TPSW (150) A2		46	D 41	9.3	29.2	7.6	45.0	—
1112	257 526			M 23	9.4	29.0	7.6	6.5	—
1112	Acc = 8.1			S 3	9.3	27.9	7.6	3.0	—
	AGAINST BOOM								
1117	~~EAST OF~~ A2		45	D 41	9.3	29.2	7.6	24.0	—
1119	TPSW (350)			M 23	9.4	29.0	7.5	6.5	—
1118	213 565			S 3	9.3	27.5	7.6	3.0	—
	Acc = 7.0'								
				INFORMATIONAL READINGS SLACK					
1235	TPSW (300) A3		47	D 41	9.4	29.2	7.4	14.4	—
	224 528			M 23	9.4	29.9	7.4	1.5	—
	Acc = 7.2			S 3	9.4	28.2	7.4	2.2	—
1241	TPSW (350) A3		47	D 41	9.4	29.2	7.4	14.2	—
1242	209 535			M 23	9.4	29.0	7.4	1.6	—
1242	Acc = 5.9'			S 3	9.4	28.3	7.5	2.1	—
				SLACK => EBB					
1325	TPSW (300) A4		47	D 41	9.4	29.2	7.4	12.9	—
1326	224 528			M 23	9.4	29.0	7.4*	5.7	—
1327	Acc = 5.7			S 3	9.4	28.2	7.4	3.0	—
1358	TPSW (300) A4		47	D 41	9.4	29.2	7.3	9.9	—
1359	~~204 529~~ 535 DB			M 23	9.4	29.0	7.3	7.9	—
1359	535 Acc = 5.7			S 3	9.5	27.9	7.4	2.8	—

* SIMPLE SPOT CHK. FOR CITY & LBA WAS

Continued on Page

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T. Michael Floyd 1/28/03 — Signed — Date

PROJECT

Notebook No.

Continued From Page

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Signed	Date	Signed	Date

030128

TIME	LOCATION	EVENT	DTB	SAMPLE DEPTH	TEMP	SAL	DO	TURB	TSS
						EBB			
1405	TPS (350)	B	42	D37	9.4	29.2	7.4	4.0	—
1406	246 579			M21	9.4	29.0	7.4	3.4	—
1407	Acc = 5.6			S 3	9.5	28.1	7.4	2.6	—
					DB	EBB			
1410	TPS (300)	B	43	D 37	9.4	29.2	7.3	6.9	—
1411	254 565			M 21	9.4	29.0	7.3	5.7	—
1412	Acc = 6.5			S 3	9.5	29.5	7.4	2.4	—
						EBB			
1417	TPNE (350)	B	45	D 40	9.4	29.2	7.4	3.7	—
1418	390 556			M 23	9.4	29.1	7.4	4.0	—
1419	Acc 5.3			S 3	9.4	28.4	7.4	2.1	—
						EBB			
1423	TPNE (300)	B	44	D 40	9.4	29.2	7.3	5.9	—
1424	378 545			M 23	9.4	29.1	7.4	8.2	—
1424	Acc = 5.2			S 3	9.4	28.3	7.4	2.6 (2.1) DB	—
						MAX EBB			
1430	TPN (350)		44	D 40	9.4	29.2	7.5	10.3	—
1431	411 502			M 23	9.4	29.1	7.4	1.6	—
1432	Acc = 5.8			S 3	9.5	22.5	7.7	8.0	—
						MAX EBB			
1450	TPN (300)		42	D 37	9.4	29.2	7.3	17.5	—
1451	396 501			M 21	9.4	29.1	7.3	5.6	—
1451	Acc = 6.2'			S 3	9.4	28.4	7.4	2.5	—
						MAX EBB			
1455	TPN (150)		42	D 37	9.4	29.2	7.3	15.0	—
1456	350 496			M21	9.4	29.1	7.3	15.5	—
1457	Acc = 5.9'			S 3	9.5	28.3	7.3	2.4	—
	*ACTUAL 374 496 - AGAINST MANSON BARGE								
						MAX EBB			
1505	TPNW (300)		43	D 37	9.4	29.2	7.4	16.6	—
1506	389 454			M 21	9.4	29.1	7.3	3.0	—
1507	Acc = 5.4			S 3	9.5	29.3	7.3	2.4	—

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PROJECT TIIEA FOSS

Notebook No. _____

Continued From Page _____

030128

1535 CALIBRATION CHECK IN MOIST AIR OVER TAP WATER

DO = 98.8%

Continued on Page

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Signed: [illegible] Date: 1-28

PROJECT THEA FOSS

030128

TIME	LOCATION	EVENT	DTB	SAMPLE DEPTH	TEMP	SAL	DO	MAX EBB TURB	TSS
1510	TPNW(350)	B	43	D 38	9.4	29.2	7.3	12.5	—
1511	403 447			M 21	9.4	29.1	7.3	3.0	—
1512	ACC = 5.5'			S 3	9.5	28.0	7.3	2.8	—

END

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American Civil Constructors

Hurlen Construction

PO Box 80945
700 S. Riverside Dr.
Seattle, WA 98108
(206) 763-1230
FAX (206) 762-1854

FAX TRANSMITTAL

Date:	1/28	Number of Pages Including this Sheet:	A BUNCH
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Fax Number:	253-272-2412		

From:	
Company:	ACC / Hurlen Construction
Fax Number:	206-762-1854
Subject	WQ DAILY REPORT

Lloyd & Associates, Inc.
38210 SE 92nd Street, Snoqualmie, Washington 98065 425-888-1905 rml@centurytel.net

January 29, 2003

TSS Updated 2/8/03
RML

TRANSMITTAL

To: Iain Wingard
John O'Loughlin

Subject: Compliance Monitoring / Thea's Park 1/29/03
Preliminary Data Transmittal (no TSS)

Attached please find results from compliance monitoring for the following work activity:

- Filter Cap Placement at Thea's Park

Thea's Park – Filter Material Placement.

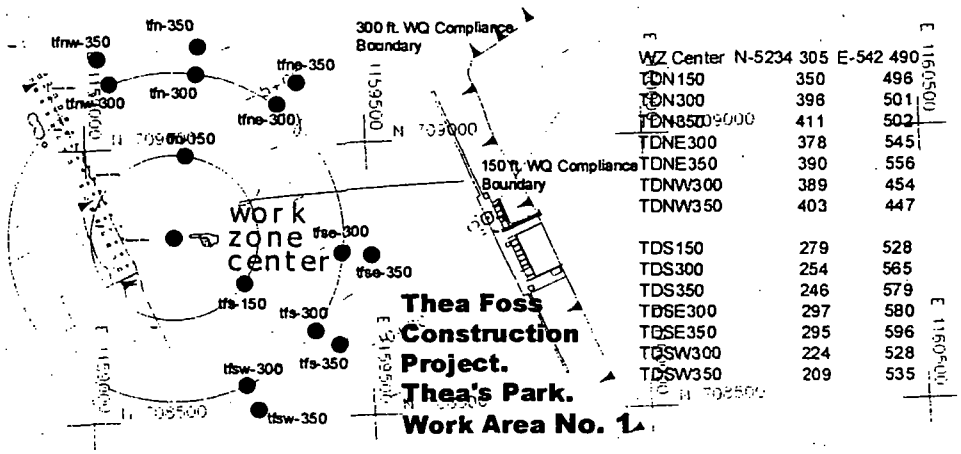
Water quality monitoring today followed the placement of filter material at the south end adjacent to the end berm. Approximately 500 tons of material was place in the morning on the slope. The placement rate was approximately 1.5 to 2 minutes per bucket. This material was placed on top of existing riprap and filter material that was installed yesterday. Most of the filter cap material was placed in the morning with occasional breaks for checking elevations. Work stopped late morning to early afternoon.

Minimal turbidity was observed throughout the day. Although the work was spread across most of the day the lower turbidity may be a result of not disturbing bottom sediments. As noted previously, the filter material currently being placed appears to contain fewer fines.

QA/QC.

Field duplicate data looked very good. Some variability was observed in turbidity. A Winkler titration was conducted on sample 030129/TPN300/M/A. The YSI yielded a result of 7.1 mg/L and the Winkler titration gave results of 7.2 and 7.1 mg/L on laboratory replicates.

Michael Lloyd
Lloyd & Associates, Inc.



Construction Compliance Monitoring Date: JAN 29 Thea's Park - Flood to Ebb Tide

Station/Sample	Depth/D TB (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
TPN300 (Up-current)	3	29.3	7.6	2.2	9.4		5,234,411	542,502	941	Manson placing filter material
	21	30.0	7.6	1.2	9.4				941	on second lift and filling low
	37/42	30.2	7.6	0.9	9.4				940	spots at rate of 1.5 to 2 min
TPSW150 (down-current)		Depth = 30 - 43'					5,234,264	542,509	959	Turbidity variability with
Deep	44	Range = 5 - 34 NTU							1020	depth see page 88 of notebook
TPSW250 (down-current)		Depth = 20 - 42'					5,234,236	542,521	1026	Turbidity variability with
Deep	44	Range = 2.5 - 8.0 NTU							1029	depth see page 90 of notebook
TPSW300 (Down-Current)	3	28.2	7.6	2.5	9.4		5,234,224	542,528	1045	
030129/TPSW300/M/A	22	30.0	7.6	4.0	9.4	2			1044	
Deep	38/44	28.2	7.7	9.2	9.4				1044	turbidity at depth
TPSW350 (Down-Current)	3	29.0	7.6	2.8	9.5		5,234,209	542,535	1050	
Mid	22	30.1	7.6	3.2	9.4				1049	Manson stops placing to sound
Deep	38/44	30.2	7.7	10.9	9.4				1049	Rigging repair
TPS300	3	28.4	7.1	2.4	9.5		5,234,254	542,565	1427	**Slack Tide**
030129/TPS300/M/A	23	30.1	7.3	0.6	9.4	2			1426	Resumption of work about 1401
Deep	39/45	30.1	7.3	0.8	9.4				1425	
TPSE300	3	28.8	7.2	2.4	9.4		5,234,297	542,580	1438	
030129/TPSE300/M/A	22	30.1	7.2	0.6	9.4	2			1438	
Deep	38/44	30.1	7.2	2.6	9.4				1437	
TPNE300	3	29.6	7.1	2.2	9.4		5,234,378	542,545	1445	**Ebb tide**
030129/TPNE300/M/A	22	30.1	7.2	0.6	9.4	4			1445	
Deep	38/44	30.1	7.1	0.9	9.4				1444	
TPN150	3	29.4	7.1	2.5	9.4		5,234,396	542,501	1521	
Mid	22	30.2	7.1	1.0	9.4				1521	
Deep	38/43	30.2	7.2	1.1	9.4				1520	
TPN300	3	29.8	7.2	1.4	9.4		5,234,396	542,501	1451	
030129/TPN300/M/A	23	30.1	7.2	0.9	9.4	2U			1450	
Deep	41/46	30.2	7.2	0.8	9.4				1450	
TPNW300	3	29.0	7.1	2.4	9.4		5,234,389	542,454	1458	Manson stops placing to sound,
030129/TPN300/M/A	22	30.2	7.1*	0.7	9.4	5			1457	Move barges, set lines for
Deep	38/44	30.2	7.1	0.7	9.4				1457	tomorrow
TPNW300	*3*	*29.4*	*7.0*	*2.5*	*9.4*				*1458*	*Field Duplicate*
030129/TPN300/M/A-Dup	*22*	*30.2*	*7.1*	*1.4*	*9.4*	2			*1457*	*Field Duplicate*
Deep	*38/43*	*30.2*	*7.1*	*1.1*	*9.4*				*1457*	*Field Duplicate*
Station SP 7+00	3	28.5	7.6	2.6	9.5		5,234,940	542,955	900	
030129/SP7/M/A	21	29.9	7.6	2.6	9.4	2			859	
Deep	37/42	30.1	7.6	1.8	9.4				858	

Calibration = 101.2% in saturated air. 10 ntu Standard measured at 10.0 ntu

Final Calibration Check = 100.3 %

Manson worked at a good pace in the morning after a late start for equipment repairs. Stopped early morning for soundings and conferences with KPFF/COT

*Winker results for 030129/TPN300/M/A = 7.2 and 7.1 mg/L. YSI = 7.1 mg/L

Prepared By/Date: M. Lloyd 1/29

TSS Updated: M Lloyd 1/29/03

L&AI

STL Seattle

Client Name	Lloyd & Assoc. Inc.
Project Name	Thea Foss
Date Received	01-29-03

General Chemistry Parameters

Client Sample ID 030129/SP7+00/M/A
Lab ID 111598-01

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-31-03	mg/L	2	2

Client Sample ID 030129/TPSW(300)/M/A
Lab ID 111598-02

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-31-03	mg/L	2	2

Client Sample ID 030129/TPS(300)/M/A
Lab ID 111598-03

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-31-03	mg/L	2	2

Client Sample ID 030129/TPSE(300)/M/A
Lab ID 111598-04

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-31-03	mg/L	2	2

Client Sample ID 030129/TPNE(300)/M/A
Lab ID 111598-05

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-31-03	mg/L	4	2

STL Seattle

Client Sample ID	030129/TPN(300)/M/A
Lab ID	111598-06

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-31-03	mg/L	ND	2

Client Sample ID	030129/TPNW(300)/M/A
Lab ID	111598-07

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-31-03	mg/L	5	2

Client Sample ID	030129/TPNW(300)/M/A
Lab ID	111598-08

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	01-31-03	mg/L	2	2

STL Seattle

QUALITY CONTROL REPORT

Client Sample ID: Batch QC
Lab ID: 111614-9
QC Batch Number: 1159-036

Method Blank

Parameter	Result (mg/L)	PQL
Total Suspended Solids	ND	2

Duplicate

Parameter	Sample Result (mg/L)	Duplicate Result (mg/L)	RPD (%)	Flag
Total Suspended Solids	7.6	6.2	20.3	X4a

2/8/03

PROJECT THEA FOSS

Notebook No. _____

Continued From Page _____

030129

0710 MANSON STARTS PLACEMENT OF FILTER CAP MATERIAL AT A SLOW RATE. ≈ 0950 SOUNDING AREA. DISCONTINUED PLACEMENT

0920 MANSON RESUMES PLACEMENT OF FILTER CAP MATERIAL WITH CLAMSHELL BUCKET AT A RATE OF ≈ 1 BUCKET / 2 MINUTES

CALIBRATION NOTES: BAROMETRIC PRESSURE = 769.1 mmHg

DO: - CALIBRATED IN MOIST AIR OVER TAP WATER

CALIBRATION CHECK = 101.2%

TURBIDITY: CALIBRATION USEING MANUFACTURERS 2 POINT METHOD, 1) 0.0 NTU = D.I. WATER 2) 10.0 NTU = CALIBRATION STANDARD SOLUTION

CONDUCTIVITY: CALIBRATION WITH YSI 50 ms STANDARD SOLUTION LOT 02L0423 (EXPIRES 05/2004)

TFSW (150) SUPPLEMENTAL READINGS:

TIME	DEPTH	TURB
0959	30'	5
	32'	8
	34'	27
	36'	34
1000	38'	33
	40'	31
	42'	18
	43'	9.0
1004		
1018	42'	8.2
	40'	15.3
1019	38'	27.0
	36'	32.0
	34'	27.0
1020	32'	15.0
	30'	6.3

ACTIVITY (@ 36' DEPTH (PLACING FILTER CAP MATERIAL AT ≈ 1 BUCKET / 2 MIN.)

	TIME	TURB		TIME	TURB
PLACED →	1004	35	PLACED	1012	19
	1005	36		1012:30	25
PLACED →	1005:30	37		1013:00	31
	1006:30	30		1013:30	34
	1007:30	25	PLACED	1014:00	35
	1008:30	19		1014:30	38
	1009:00	12		1015:00	36
PLACED	1009:30	22	PLACED	1015:30	37
	1010:30	11		1016:00	34
PLACED	1010:45	4		1016:30	37
	1011:00	17	PLACED	1017:00	27
	1011:30	21		1017:30	30

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Daniel A. Berta 01/29/30 — Signed — Date

[signature] 1/29/03 — Signed — Date

PROJECT THEA FOSS

Notebook No. _____

Continued From Page _____

030129

SUPPLEMENTAL READINGS:

TPSW (250) 236 521

TURBIDITY @ 36'

TIME	DEPTH	TURB		TIME	TURB		TIME	TURB
1026	42	2.5	PLACED	1030	13		1030	4
	40	1.9		1030:30	14		1030:30	7
	38	4.1		1031	16	PLACED	1037	6
1027	36	8.0		1031:30	18		1037:30	10
	34	7.4	PLACED	1032	15		1038	20
	32	7.4		1032:30	13	PLACED	1038:30	19
	30	1.0		1033	7		1039	17
1028	28	1.5	PLACED	1033:30	4		1039:30	20
	26	1.4		1034	2	PLACED	1040	19
	24	1.5		1034:30	3		1040:30	20
	22	1.4	PLACED	1035	3		1041:	17
1029	20	1.4		1035:30	4	PLACED	1041:30	19

1045 MANSON BREAKS (~~COFFEE BREAK~~?) SOUNDING? - RIG REPAIR?

1400 MANSON RIG OPERATING MOVING MATERIALS ALREADY PLACED IN WORK ZONE #1

~1500 STOPPED IN WATER ACTIVITY

AFTERNOON CALIBRATION NOTES:

1420

BAROMETRIC PRESSURE = 766.9

DO CALIBRATED IN MOIST AIR OVER TAP WATER

DO CALIBRATION CHECK = 100.3 %

TURBIDITY CALIBRATED USING MANUFACTURERS 2 POINT METHOD. 1) 0.0 NTU = D.I. WATER. 2) 10.0 NTU = STANDARD SOLUTION. CALIBRATION CHECK IN D.I. WATER = 0.1 NTU

* SPLIT SAMPLE FOR DO. BY WINKLER METHOD.
1) CITY OF TACOMA 2) J&A LAB.

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PROJECT THEA FOSS

Notebook No. _____ 89

Continued From Page _____

030129

WORK ZONE #1 @ THEAS PARK

TIME	LOCATION	EVENT	DTB	SAMPLE DEPTH	TEMP	SAL	SLACK DO	SLACK TURB	TSS
0858	SP 7+00	A	42	D 37	9.4	30.1	7.7	1.8	—
0859	940 955			M 21	9.4	29.9	7.6	2.6	030129/SP 7+00/M/A
0900	ACC = 17.2'			S 3	9.5	28.8 DB (5)	7.6	2.6	—
								FLOOD	
0940	TPN (350)	A	42	D 37	9.4	30.2	7.6	0.9	—
0941	411 502			M 21	9.4	30.0	7.6	1.2	—
0941	ACC 17.4'			S 3	9.4	29.3	7.6	2.2	—
	TPSW (150)	A	46	~~D~~	SEE SUPREMENTAL READINGS				
	264 509			~~M~~	ON PAGE # 88				
	ACC = 8.8			~~S 3~~					
	TPSW (250) A		44						
	236 521			SEE SUPREMENTAL READINGS					
	ACC = 5.7'			ON PAGE # 90					
								FLOOD	
44	TPSW (300) A		44	D 38	9.4	30.2	7.6	9.2	—
14	224 528			M 22	9.4	30.0	7.6	4.0	030129/TPSW(300)/M/A
1045	ACC = 5.3			S 3	9.4	28.2	7.6	2.5	—
1049	TPSW (350) A		44	D 38	9.4	30.2	7.7	10.9	—
1049	209 535			M 22	9.4	30.1	7.6	3.2	—
1050	ACC = 6.5'			S 3	9.4	29.0	7.6	2.8	—
							DB EBB		
1425	TPS ~~150~~ 300 DB A		45	D 39	9.4	30.1 ~~EBB~~	7.3	0.8	—
1426	~~277 525~~			M 23	9.4	30.1	7.3	0.6	030129/TPS(300)/M/A
1427	ACC = 5.2'			S 3	9.5	28.4	7.1	2.4	—
	254 565 DB								
1437	TPSE (300)		44	D 38	9.4	30.1	7.2	2.6	—
1438	297 580			M 22	9.4	30.1	7.2	0.6	030129/TPSE(300)/M/A
1438	ACC = 6.3			S 3	9.4	28.8	7.2	2.4	—

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Daniel A. Burke 01/29/30 — Signed — Date

[signature] 1/29/03 — Signed — Date

THEA'S PARK – WORK ZONE #1

030129 EBB

SAMPLE

TIME	LOCATION	EVENT	DTB	DEPTH	TEMP	SAL	DO	TURB	TSS
1444	TPNE(300)	A	(44)	D 38	9.4	30.1	7.1	0.9	—
1445	378 545			M 22	9.4	30.1	7.2	0.6	030129/TPNE(300)/M/A
1445	Acc=6.0			S 3	9.4	29.6	7.1	2.2	—
							EBB		
1450	TPN(300)	A	(44)	D 38	9.4	30.2	7.2	0.8	—
1450	396 501			M 22	9.4	30.1	7.2	0.9	030129/TPN(300)/M/A
1451	Acc=5.8			S 3	9.4	29.8	7.2	1.4	—
							EBB		
1457	TPNW(300)	A	(44)	D 38	9.4	30.2	7.1	0.7	—
1457	384 454			M 22 ★	9.4	30.2	7.1	0.7	030129/TPNW(300)/M/A★
1458	Acc=5.9			S 3	9.4	29.0	7.1	2.4	—
			— DUPLICATE —				EBB		
1511	TPNW(300)	A	(43)	D 38	9.4	30.2	7.1	1.1	—
1512	389 454			M 22	9.4	30.2	7.1	1.4	030129/TPNW(300)/M/DUP
1513	Acc=4.1			S 3	9.4	29.4	7.0	2.5	—
							EBB	(~~[illegible]~~ ~START MAX)	
[illegible]20	TPN(150)		(43)	D 38	9.4	30.2	7.2	1.1	—
[illegible]21	350 496			M 22	9.4	30.2	7.1	1.0	—
1521	Acc=4.4			S 3	9.4	29.4	7.1	2.5	—

END

1615 – CALIBRATION CHECK D.O. = 89.2%

ACCORDING TO MANSON FOREMAN THEY WILL REPOSITION ~~[illegible]~~ BARGE, AND MAY PLACE SOME ADDITIONAL MATERIAL. LATE IN AFTERNOON OR EARLY EVENING THEY WILL REPORTEDLY STOP WORK @ 1800

DO Analysis 030129/TPNW300/M/A 1/29/03 1620

Rep #1 = 361 × 0.02 × 100 = 7.2

#2 = 100 357 × 0.02 = 7.1

Continued on Page

Read and Understood By

[illegible] 01/29/03 [illegible] 1/29/03

Signed Date Signed Date

American Civil Constructors

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700 S. Riverside Dr.
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(206) 763-1230
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Hurlen Construction

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From:	M. LLOYD
Company:	ACC / Hurlen Construction
Fax Number:	206-762-1854
Subject	WQ 1/29/03

CC. ANDERSON
ACC-HURLEN (FILE)
MANSON
L+AI.

Lloyd & Associates, Inc.
38210 SE 92nd Street, Snoqualmie, Washington 98065 425-888-1905 rml@centurytel.net

January 30, 2003

TSS updated 2/8/03
RML

TRANSMITTAL

To: Iain Wingard
John O'Loughlin

Subject: Compliance Monitoring / Thea's Park 1/30/03
Complaince Monitoring / Totem Marine 1/30/03
Preliminary Data Transmittal (no TSS)

Attached please find results from compliance monitoring for the following work activity:

- Filter Cap Placement at Thea's Park
- Rock Placement at Totem Marine

Thea's Park – Filter Material Placement.

Water quality monitoring today followed the placement of filter material at the south end adjacent to the end berm and further north along the slope. Approximately 500 tons of material was placed after divers were in the water evaluating site conditions. Only one round of sampling was conducted because they ran out of material and would have to reposition and bring in a barge for riprap work tomorrow. There were no water quality issues during this ebb tide monitoring event.

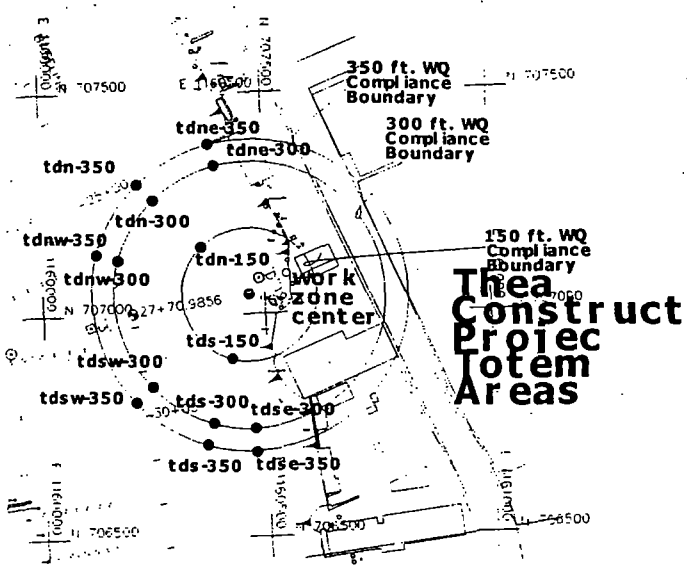
Totem Marine.

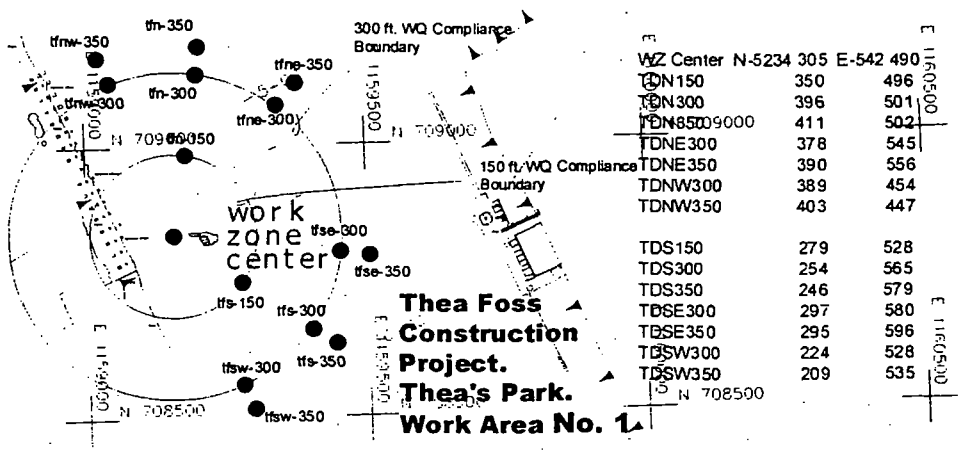
As Hurlen workedto close out in-water work, they were placing rock on the north side. In major part the work was above the water line, but some in-water work was conducted. Monitoring results for this flood tide event was uneventful and all water quality criteria were met. Monitoring for afternoon work went much the same except that the tide was changing from a flood to slack tide (high tide). Higher turbidities were observed at TDS150, and these diminished to the south and monitoring station TDSE350 along the shoreline.

QA/QC.

Field duplicate data looked very good. A Winkler titration was conducted on sample 030130/TF2/M/A. The YSI yielded a result of 7.5 mg/L and the Winkler titration gave results of 7.3 and 7.3 mg/L on L&AI replicates.

Michael Lloyd
Lloyd & Associates, Inc.





WZ Center	N-5234 305	E-542 490
TDN150	350	496
TDN300	396	501
TDN85	411	502
TDNE300	378	545
TDNE350	390	556
TDNW300	389	454
TDNW350	403	447
TDS150	279	528
TDS300	254	565
TDS350	246	579
TDSE300	297	580
TDSE350	295	596
TDSW300	224	528
TDSW350	209	535

Construction Compliance Monitoring Date: JAN 30 Thea's Park - Ebb Tide

Station/Sample	Depth/DTB (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
TPS300 (Up-Current)	3	29.0	7.6	2.0	9.6		5,234,254	542,565	917	Ebb Tide
030130/TPS300/M/A	21	30.0	7.5	1.0	9.5	2			916	Manson placing filter material at
Deep	37/42	30.1	7.6	2.4	0.4				915	end of cap over rock on slope
TPN150 (Down-Current)	3	28.9	7.4	2.0	9.4		5,234,350	542,496	1002	Manson takes morning break
Mid	20	29.9	7.4	6.0	9.4				1001	Low turbidity at early warning
Deep	34/40	30.1	7.4	3.0	9.4				1000	
TPN300	3	29.5	7.4	1.9	9.4		5,234,396	542,501	948	TDN Stations were inside
030130/TPN300/M/A	20	29.9	7.4	5.0	9.4	4			947	of debris boom as configured
Deep	34/39	30.1	7.4	1.6	9.4				946	by Manson
TPN350	3	29.3	7.4	1.6	9.4		5,234,411	542,502	955	
Mid	20	29.9	7.4	2.1	9.4				954	
Deep	34/40	30.0	7.4	2.1	9.4				953	
TPNW300 (down-current)	3	29	7.5	5.9	9.4		5,234,389	542,454	932	No visible plume or debris on
030130/TPNW300/M/A	22	30.0	7.4	2.0	9.3	2			931	water
Deep	39/44	30.0	7.4	**37.5**	9.3				930	Elevated turbidity at depth
TPNW350	3	28.9	7.5	4.3	9.3		5,234,403	542,447	938	
Mid	23	29.9	7.4	1.6	9.3				937	
Deep	40/45	30.0	7.4	2.3	9.3				936	
TPNE300 (down-current)	3	29.2	7.4	1.8	9.4		5,234,378	542,545	1013	
030130/TPNE300/M/A	22	29.9	7.3	3.1	9.4	2			1012	
Deep	38/44	30.2	7.3	1.5	9.4				1011	
TPNE350	3	29.2	7.4	1.6	9.4		5,234,390	542,556	1009	
Mid	22	30.0	7.4	1.1	9.3				1008	
Deep	38/43	30.2	7.5	1.3	9.3				1007	
Station TF 2+00	3	29.0	7.6	2.0	9.6		5,234,940	542,955	849	
030130/TF2/M/A	21	30.0	7.5*	1.0	9.5	5			849	
Deep	37/42	30.1	7.6	2.4	9.4				848	
Station TF 2+00	3	29.5	7.6	1.7	9.6		5,234,940	542,955	853	
030130/TF2/M/A-DUP	21	29.9	7.6	1.0	9.5	4			852	
Deep	37/42	30.1	7.6	2.4	9.4				852	

Pre-Survey Calibration D. Berta 1/30 101.2% Final = 102.8 mild, drizzle, cloudy weather, some clearing

DO Calibration as per manufacturer's specifications.

Survey work conducted by D. Berta. Divers in water until about 8:30 AM. Work started at 8:35 AM

Turbidity Calibration as per manufacturer's specifications. Calibration at 0, 10NTU's

*Winkler titration for DO for sample 030130/TF2/M/A = 7.3 and 7.3 mg/L. YSI Sonde = 7.5 mg/L

Prepared By/Date:

M. Lloyd 1/30

TSS Data Update: M. Lloyd 2/8/03

L&AI

Construction Compliance Monitoring **Date: JAN 30** **Totem Marine - Flood Tide**

Station/Sample	Depth/D TB (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
TDN300 (Up-Current)	3	27.7	7.3	2.3	9.4		5,233,836	542,840	1032	Hurlen placing riprap
030130/TDN300/M/A	19	30.0	7.2	1.8	9.4	2			1031	on north end above and in
Deep	33/38	30.1	7.2	1.4	9.4				1030	water
TDS150 (Down-Current)	3	29.0	7.2	2.4	9.4		5,238,727	542,894	1101	Started placing material about
Mid	13	29.8	7.2	1.4	9.4				1101	9:45 AM 1box/4min
Deep	20/25	30.0	7.2	1.6	9.4				1100	
TDS350	3	28.8	7.2	2.9	9.4		5,233,669	542,878	1052	
030130/TDS350/M/A	19	30.0	7.2	1.7	9.4	3			1051	Samplie mislabled as TDS300
Deep	33/39	30.1	7.2	2.0	9.4				1050	
TDSE300 (down-current)	3	28.5	7.2	3.9	9.4		5,233,680	542,910	1045	Slight sheen on water does
030130/TDSE300/M/A	17	30.0	7.2	1.4	9.4	2			1044	not arise from work zone
Deep	29/34	30.1	7.2	2.7	9.4				1043	
TDSW300 (down-current)	3	28.6	7.2	2.0	9.4		5,238,708	542,841	1108	
030130/TDSW300/M/A	19	30.1	7.3	1.4	9.4	3			1107	
Deep	33/38	30.2	7.5	1.4	9.4				1106	

Pre-Survey Calibration D. Berta 1/30 101.2% cool, cloudy weather, rain

DO Calibration as per manufacturer's specifications.

Survey work conducted by D. Berta

Turbidity Calibration as per manufacturer's specifications. Calibration at 0, 10NTU's.

Hurlen was placing rock fairly quickly above water line on bank.

Prepared By/Date: M. Lloyd 1/30

TSS Data Update [illegible] 2/8/03

L&AI

Construction Compliance Monitoring

Date: JAN 30 Totem Marine - Flood to Slack Tide

Station/Sample	Depth/DTB (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
TDN300 (Up-Current)	3	29.0	6.8	1.7	9.4		5,233,836	542,840	1317	
030130/TDN300/M/B	20	29.9	6.7	1.3	9.4				1316	Hurlen placing rock at rate
Deep	35/40	30.1	6.8	2.3	9.4				1315	of 1 box/4 min.
TDS150 (Down-Current)	3	28.1	7.6	6.1	9.4		5,238,727	542,894	1416	
Mid	17	29.9	7.5	20.4	9.4				1416	Moderate turbidity at early
Deep	30/35	30.0	7.5	16.2	9.4				1415	warning station
TDS300	3	29.0	7.6	3.3	9.4		5,233,683	542,882	1405	
Mid	20	30.0	7.5	1.9	9.4				1405	
Deep	35/40	30.2	7.5	1.6	9.3				1404	Rock being place above water
TDS350	3	28.2	7.6	2.5	9.5		5,233,669	542,878	1401	line and in water.
Mid	20	29.9	7.5	1.1	9.3				1400	
Deep	35/40	30.1	7.5	0.7	9.3				1359	
TDSE300 (down-current)	3	28.8	6.8	5.2	9.4		5,233,680	542,910	1325	
Mid	19	29.9	6.9	21.0	9.4				1324	
Deep	32/37	30.1	6.8	2.4	9.4				1323	
TDSE350	3	28.3	6.8	3.0	9.4		5,233,784	542,911	1328	
Mid	19	29.9	6.7	12.2	9.4				1328	
Deep	32/37	30.1	6.8	2.5	9.4				1327	Slight turbicity elevation
TDSW300 (down-current)	3	27.8	7.7	3.3	9.5		5,238,708	542,841	1413	Fresh water input
Mid	20	29.9	7.5	1.4	9.3				1412	
Deep	35/41	30.1	7.6	1.3	9.3				1412	
TDSW350	3	28.7	7.6	3.8	9.5		5,238,696	542,830	1410	Slack tide
Mid	20	29.9	7.6	2.7	9.3				1410	
Deep	35/40	30.1	7.6	1.1	9.3				1409	

Pre-Survey Calibration D. Berta 1/27 101.1% Final = 99.6% cool, cloudy weather, rain

DO Calibration as per manufacturer's specifications.

Survey work conducted by D. Berta

Turbidity Calibration as per manufacturer's specifications. Calibration at 0, 10NTU's.

Calibration check on 10 ntu standard = 10.0 ntu

Prepared By/Date:

M. Lloyd 1/30

TSS Data Update 2/8/03

L&AI

STL Seattle

Client Name	Lloyd & Assoc. Inc.
Project Name	THEA FOSS
Date Received	01-30-03

General Chemistry Parameters

Client Sample ID 030130/SP7+00/M/A
Lab ID 111620-01

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	02-03-03	mg/L	5	2

Client Sample ID 030130/SP7+00/M/DUP
Lab ID 111620-02

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	02-03-03	mg/L	4	2

Client Sample ID 030130/TPS(300)/M/A
Lab ID 111620-03

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	02-03-03	mg/L	2	2

Client Sample ID 030130/TPNW(300)/M/A
Lab ID 111620-04

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	02-03-03	mg/L	2	2

Client Sample ID 030130/TPN(300)/M/A
Lab ID 111620-05

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	02-03-03	mg/L	4	2

Client Sample ID 030130/TPNE(300)/M/A
Lab ID 111620-06

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	02-03-03	mg/L	2	2

STL Seattle

Client Sample ID	030130/TDN(300)/M/A
Lab ID	111620-07

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	02-03-03	mg/L	2	2

Client Sample ID	030130/TDSE(300)/M/A
Lab ID	111620-08

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	02-03-03	mg/L	2	2

Client Sample ID	030130/TDS(300)/M/A
Lab ID	111620-09

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	02-03-03	mg/L	3	2

Client Sample ID	030130/TDSW(300)/M/A
Lab ID	111620-10

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	02-03-03	mg/L	3	2

STL Seattle

QUALITY CONTROL REPORT

Client Sample ID:	Batch QC
Lab ID:	111640-2
QC Batch Number:	1159-039

Method Blank

Parameter	Result (mg/L)	PQL
Total Suspended Solids	ND	2

Duplicate

Parameter	Sample Result (mg/L)	Duplicate Result (mg/L)	RPD (%)	Flag
Total Suspended Solids	4.4	4.22	4.18	

2/8/03

030130

CALIBRATION NOTES:

DO: CALIBRATED IN MOIST AIR OVER TAP WATER
CALIBRATION CHECK = 101.2%

TURBIDITY: CALIBRATED USEING MANUFACTURERS:
2 POINT METHOD WITH 1) 0.0 NTU = DI WATER
2) 10.0 NTU - USEING YSI 6073 LOT K07240R
TURBIDITY STANDARD SOLUTION - EXPIRES JULY 24, 2004 (SAME STANDARD SOLUTION LOT AS ON PREV. CALIBRATIONS)
TURBIDITY CALIBRATION CHECK IN 10.0 NTU SOLUTION = 9.9
BAROMETRIC PRESSURE = 770.2 mm Hg
TEMP = 10°C

0730 MANSON RIG NOT OPERATING - DIVER IN THE WATER*
0535 MANSON STARTS PLACING FILTER CAP MATERIAL

0915 SOUTH SIDE OF WORK AREA WATER APPEARS CLEAR, NO FLOAT. DEBRIS OR TURBIDITY PLUME OBSERVED

PLACING MATERIAL 1 BUCKET / 1.5-2.0 MINUTES
0925 @ TDNW (300) INSIDE DEBRIS BOOM WATER APPEARS GENERALLY CLEAR WITH NO FLOAT. DEBRIS OR TURBIDITY PLUME OBSERVED

* NOTE: MONITORING DIVERS CONVERSATION ON RADIO.
"SILT LAYER" WAS EASILY PENETRATED 4"-10" WITH HIS HAND IN THEAS PARK WORK AREA

1000 MANSON TAKES BREAK

NOTE: TDNW 300, TDNW 350 & ~~TDNW~~ TDN 150 WERE INSIDE DEBRIS BOOM

Continued on Page

Read and Understood By

Daniel A. Burke 01/30/03 — Signed — Date
[signature] 1/30 — Signed — Date

03/30/30

SAMPLE

Time	Location	Event	DTB	Depth	Temp	Sal	DO	Turb	TSS	
								EBB		
0948	SP 7100	A	42	D 37	9.4	30.1	7.6	2.4	—	
0949	940 955			M 21	9.5	30.0	7.5	1.0		030130/SP 7100/m/A
0949	Acc = 4.8			S 3	9.6	29.0	7.6	2.0	—	
								EBB		
0952	SP 7100	A	41	D 37	9.4	30.1	7.6	2.4	—	
0952	940 955			M 21	9.5	29.9	7.6	1.2		030130/SP 7100/m/2A*
0953	Acc = 5.1			S 3	9.6	29.5	7.6	1.7	—	

★ SPLIT SAMPLE FOR DO BY WINKLER METHOD 1) CITY OF TACOMA 2) L&A LAB

					TITUS PARK - WORK ZONE #1				EBB	
0915	TPS (300)	A	41	D 37	9.4	30.2	7.5	1.1	—	
0916	254 565			M 21	9.4	29.9	7.5	1.2		030130/TPS(300)/m/A
0917	Acc = 6.2			S 3	9.4	28.9	7.5	1.7	—	
								EBB		
0930	TPNW (300)	A	44	D 39	9.4	30.0	7.4	37.5	—	
0931	399 454			M 22	9.4	30.0	7.4	2.0		030130/TPNW(300)/m/A
0932	6.4'			S 3	9.4	29.0	7.5	5.4	—	
								EBB		
0936	TPNW (350)	A	45	D 40	9.4	30.2	7.4	2.3	—	
0937	403 447			M 23	9.4	29.9	7.4	1.6	—	
0938	Acc = 8.9'			S 3	9.4	28.9	7.5	4.3	—	
								EBB => SLACK		
0946	TPN (300)		39	D 34	9.4	30.1	7.4	1.6	—	
0947	396 501			M 20	9.4	29.9	7.4	5.0		030130/TPN(300)/m/A
0948	Acc = 8.4			S 3	9.4	29.5	7.4	1.9	—	
								SLACK		
0953	TPN (350)		40	D 34	9.4	30.0	7.4	2.1	—	
0954	411 502			M 20	9.4	29.9	7.4	2.1	—	
0955	Acc = 5.0			S 3	9.4	29.3	7.4	1.6	—	
								SLACK		
1000	TPN (450)		40	D 34	9.4	30.1	7.4	3.0	—	
1001	350 496			M 20	9.4	29.9	7.4	6.0	—	
1002	Acc = 6.7			S 3	9.4	29.9	7.4	2.0		

Continued on Page

Read and Understood By

Signed	Date	Signed	Date
Daniel A Burke	03/30/03	[illegible]	1/30

PROJECT THEA FOSS

Notebook No. _____
Continued From Page _____

030130
0945
ACCORDING TO RADIO CONVERSATION HURLEN STARTED PLACING MATERIALS @ ≈ 0945
PLACING QUARRY SPALLS AT A ≈ RATE OF 1 BOX/4 MINUTES

1030 ON NORTH SIDE OF WORK ZONE NO FLOAT. DEBRIS OR TURB. PLUME OBSERVED WATER APPEARS CLEAR

1040 ON SOUTH SIDE OF WORK ZONE SAME AS ABOVE WITH SCATTERED SHEEN ON WATER SURFACE DOES NOT APPEAR TO BE IN WORK ZONE OR COMING FROM WORK ZONE

1045-1100 MANSON RESUMES MATERIAL PLACEMENT

1200 MANSON BREAKS FOR LUNCH & TO SWITCH OUT BARGES
1230 RAIN STARTS

DO Winkler TITRATION 1150 1/30/03
030130/SP7/M/A
Replicate #1 = 365 × 0.02 = 7.3 mg/L
REPLICATE #2 = 368 × 0.02 = 7.3 mg/L

Continued on Page

Read and Understood By

Daniel H. Burke 01/30/03 _____ T M Floyd 1/30
Signed Date Signed Date

PROJECT THEA FOSS

030130

SAMPLE THEA PARK SLACK - WORK ZONE #1

TIME	LOCATION	EVENT	DTB	SAMPLE DEPTH		TEMP	SAL	DO	TURB	TSS
1007	TPNE(350)	A	43	D	38	9.4	30.2	7.5	1.3	—
1008	390 556			M	22	9.4	30.0	7.4	1.1	—
1009	Acc = 4.6			S	3	9.4	29.2	7.4	1.6	—
								SLACK		
1011	TPNE(300)	A	44	D	38	9.4	30.2	7.3	1.5	—
1012	378 545			M	22	9.4	29.9	7.3	3.1	030130/TPNE(300)/M/A
1013	Acc = 4.8			S	3	9.4	29.2	7.4	1.8	—

TOTEM MARINE DOCK WORK ZONE #5

TIME	LOCATION	EVENT	DTB	SAMPLE DEPTH		TEMP	SAL	DO	TURB	TSS
1030	TDN(300)	A	38	D	33	9.4	30.1	7.2	1.4	FLOOD —
1031	836 840			M	19	9.4	30.0	7.2	1.8	030130/TDN(300)/M/A
1032	Acc = 4.4			S	3	9.4	27.7	7.3	2.3	—
										FLOOD
1043	TDSE(300)	A	34	D	29	9.4	30.1	7.3	2.7	—
1044	680 910			M	17	9.4	30.0	7.2	1.4	030130/TDSE(300)M/A
1045	Acc = 6.7			S	3	9.4	28.5	7.3	3.9	—
										FLOOD
1050	TDS(300)	A	35	D	33	9.4	30.1	7.2	2.0	—
1051	DB ~~575~~ 669 ~~6~~ 878			M	19	9.4	30.0	7.2	1.7	030130/TDS(300)/M/A
1052	Acc = 4.9			S	3	9.4	28.8	7.2	2.9	—
										FLOOD
1100	TDS(150)	A	25 ~~26~~	DB D	20 ~~25~~	9.4	30.0	7.2	1.6	—
1101	727 894			M	13	9.4	29.8	7.2	1.4	—
1101	Acc = 8.5			S	3	9.4	29.0	7.2	2.4	—
										FLOOD
1106	TDSW(300)	A	38	D	33	9.4	30.2	7.5	1.4	—
1107	708 841			M	19	9.4	30.1	7.3	1.4	030130/TDSW(300)/M/A
1108	Acc = 4.5			S	3	9.4	28.6	7.2	2.0	—
										FLOOD
1315	TDN 300	B	40	D	35	9.4	30.1	6.8	2.3	—
1316	836 840			M	20	9.4	29.9	6.7	1.3	—
1317	Acc = 5.7			S	3	9.4	29.0	6.8	1.7	—

Continued on Page

Read and Understood By

Daniel A. Baker 01/30/03 — Signed — Date

[signature] 1/30/03 — Signed — Date

PROJECT THEA FOSS

Notebook No. _____
Continued From Page _____

030130

1315 SAMPLING EVENT: B - HURLEN CONTINUES
PLACE MATERIAL WITH BOX AT ~1 BOX/4 MINUTES

1335 CALIBRATION NOTES:
DO - CALIBRATED IN MOIST AIR OVER TAP WATER
BAROMETRIC PRESSURE = 769.0 mm Hg
CALIBATION CHECK = 101.1

TURB CALIBRATED AS DESCRIBED ON PAGE 92
CALIBRATION CHECK = 10.0

1400 ADVISED OFFICE OF RESULTS @ TDSE LOCATIONS

1520 MANSON CHANGING LOCATIONS & SET UP IN WORK AREA 2-3 FOR TOE BERM PLACEMENT. THE CONTRACTORS FOREMAN INDICATED THEY MAY PLACE A MINOR AMOUNT OF TOE BERM LATE IN AFTERNOON - EARLY EVE. BUT WERE SETTING UP FOR EARLY AM (~0630 - 0700) PLACEMENT ON FRIDAY.

DO CALIBRATION CHECK = 99.6 %
IN MOIST AIR OVER TAP WATER

Continued on Page

Read and Understood By

Daniel R. Burke 01/30/03 _____ [signature] 1/30/03
Signed Date Signed Date

PROJECT Thea Foss

Notebook No. _____ 97

Continued From Page _____

030130

Time	Location	Event	DTB	Sample Depth	Temp	Sal	DO	Turb	TSS
								Flood	
1323	TDSE(300)	B	37	D 32	9.4	30.1	6.8	2.4	—
1324	680 910			M 19	9.4	29.9	6.9	21.0	—
1325	Acc = 5.7			S 3	9.4	28.8	6.8	5.2	—
								Flood	
1327	TDSE(350)	B	37	D 32	9.4	30.1	6.8	2.5	—
1328	665 912			M 19	9.4	29.9	6.7	12.2	—
1328	Acc 6.9			S 3	9.4	28.3	6.8	3.0	—
	Recheck after recalibration							Flood	
1356	TDSE(350)	B	38	D 32	9.4	30.1	7.5	1.9	—
1357	665 912			M 19	9.4	29.8	7.4	13.0	—
1358	Acc = 5.8			S 3	9.4	28.5	7.5	1.6	—
								Flood	
1359	TDS(350)	B	40	D 35	9.4	30.1	7.5	0.7	—
1360	669 878			M 20	9.4	29.9	7.5	1.1	—
1361	Acc = 6.2			S 3	9.4	28.2	7.6	2.5	—
								Flood	
1404	TDS(300)	B	40	D 35	9.4	30.2	7.5	1.6	—
1405	683 882			M 20	9.4	30.0	7.5	1.9	—
1405	Acc = 5.5			S 3	9.4	29.0	7.6	3.3	—
								Flood	
1409	TDSW(350)		40	D 35	9.4	30.1	7.6	1.1	—
1410	696 830			M 20	9.4	29.9	7.6	2.7	—
1410	Acc = 6.0			S 3	9.4	28.7	7.6	3.8	—
								Flood - Slack	
1412	TDSW(300)		41	D 35	9.4	30.1	7.6	1.3	—
1412	708 841			M 20	9.4	29.9	7.5	1.4	—
1413	Acc = 5.9			S 3	9.4	27.8	7.7	3.3	—
								Slack	
1415	TDS(150)		35	D 30	9.4	30.0	7.5	16.2	—
1416	727 894			M 17	9.4	29.9	7.5	20.4	—
1416	Acc = 6.2			S 3	9.4	28.1	7.6	6.1	—

End of work

Continued on Page

Read and Understood By

Daniel A Burk 01/30/03 — Signed — Date

P M Lloyd — Signed — 1/30/03 — Date

American Civil Constructors

Hurlen Construction

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Company:	COT		
Fax Number:	253-272-2412		

From:	M. LLOYD
Company:	ACC / Hurlen Construction
Fax Number:	206-762-1854
Subject	WQ 1/30/03

Lloyd & Associates, Inc.
38210 SE 92nd Street, Snoqualmie, Washington 98065 425-888-1905 rml@centurytel.net

January 31, 2003

TSS Update 2/8/03

TRANSMITTAL

To: Iain Wingard
John O'Loughlin

Subject: Compliance Monitoring / Thea's Park 1/31/03
Preliminary Data Transmittal (no TSS)

Attached please find results from compliance monitoring for the following work activity:

- Toe Berm Construction at Thea's Park

Thea's Park – Filter Material Placement.

Water quality monitoring was conducted during a morning ebb tide and and afternoon flood tide while Manson was constructing the toe berm on the north end. Although Manson worked quickly, there were frequent stops to check elevations. Approximately 500 tons of rock was placed. No water quality problems were detected. The rock appeared to be relatively clean.

Totem Marine.

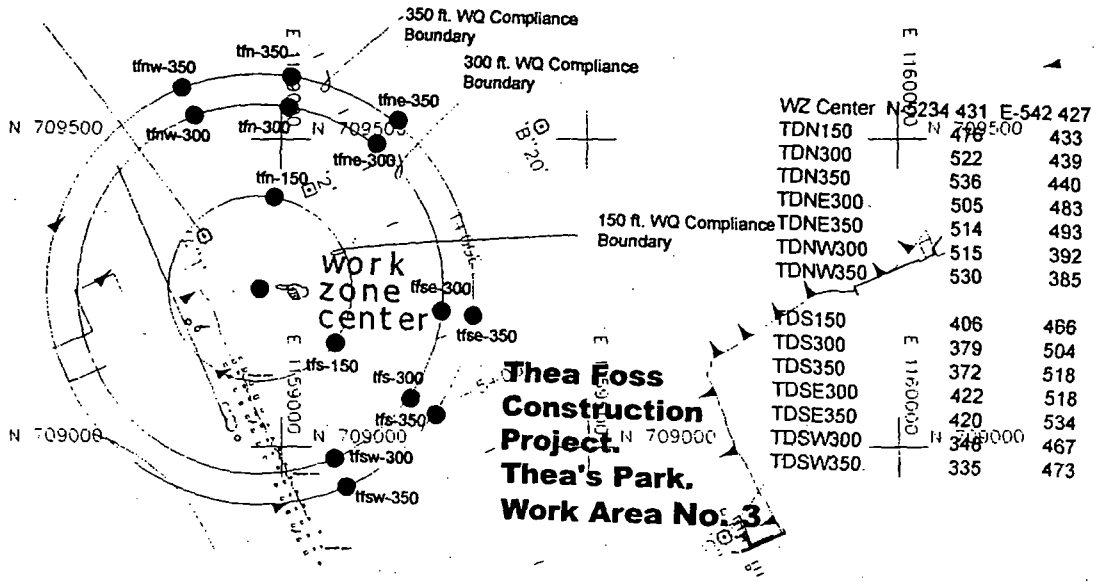
Hurlen placed a few loads of rock on the north slope in and out of water at Totem during a span of about 25 minutes. Water quality monitoring was not conducted. As soon as the barge was empty, they stopped to move to Thea's Park for morning work placing filter material.

QA/QC.

Field duplicate data looked very good. A Winkler titration was conducted on sample 030131/TF2/M/A. The YSI yielded a result of 7.5 mg/L and the Winkler titration gave results of 7.3 and 7.2 mg/L on L&AI replicates.

Michael Lloyd
Lloyd & Associates, Inc.

WQM 1 31 03.doc


350 ft. WQ Compliance Boundary
300 ft. WQ Compliance Boundary
150 ft. WQ Compliance Boundary
tfnw-350
tfn-350
tfne-350
tfnw-300
tfn-300
tfne-300
tfn-150
tfse-300
tfse-350
tfs-150
tfs-300
tfs-350
tfsw-300
tfsw-350
N 709500
N 709000
E 1160000
E 1159000
Work zone center
Thea Foss Construction Project.
Thea's Park.
Work Area No. 3
WZ Center N-5234 431 E-542 427
TDN150 476 433
TDN300 522 439
TDN350 536 440
TDNE300 505 483
TDNE350 514 493
TDNW300 515 392
TDNW350 530 385
TDS150 406 466
TDS300 379 504
TDS350 372 518
TDSE300 422 518
TDSE350 420 534
TDSW300 346 467
TDSW350 335 473

Construction Compliance Monitoring **Date: JAN 31** **Thea's Park - Ebb Tide**

Station/Sample	Depth/DTB (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
TPS300 (Up-Current)	3	29.4	7.3	1.5	9.4		5,234,319	542,537	915	Ebb Tide
030131/TPS300/M/A	20	29.7	7.2	1.7	9.4	3			914	Manson placing riprap
Deep	35/40	30.0	7.1	1.6	9.4				913	for toe berm
TPN150 (Down-Current)	3	29.3	7.6	1.4	9.5		5,234,476	542,433	954	
Mid	24	29.9	7.5	0.8	9.4				954	Low turbidity at early warning
Deep	43/48	30.0	7.5	2.2	9.4				953	
TPN300	3	29.4	7.5	1.6	9.4		5,234,522	542,439	943	Turbidity okay at 300'
030131/TPN300/M/A	32	29.9	7.4	2.1	9.4	3			942	
Deep	59/64	30.1	7.4	5.8	9.4				942	
TPNW300 (down-current)	3	29.5	7.6	1.4	7.5		5,234,515	542,392	925	No visible plume or debris on
030131/TPNW300/M/A	40	30.0	7.5	3.2	7.4	2			924	water
Deep	75/80	30.2	7.5	1.3	2.5				923	Turbidity okay at 300'
TPNE300 (down-current)	3	29.3	7.6	1.4	9.4		5,234,505	542,483	1003	
030131/TPNE300/M/A	22	29.9	7.5	0.8	9.4	3			1002	Turbidity okay at 300'
Deep	39/44	30.0	7.5	2.2	9.3				1001	
Station TF 2+00	3	29.3	7.5	1.6	9.6		5,234,940	542,955	1019	
030131/TF2/M/A	20	29.9	7.5	1.4	9.5	4			1018	
Deep	34/39	30.0	7.5	1.1	9.4				1017	
Station TF 2+00	3	28.9	7.5	1.9	9.6		5,234,940	542,955	1024	Field Duplicate
030131/TF2/M/A-DUP	21	29.9	**7.5***	1.3	9.5	2			1024	Field Duplicate
Deep	37/42	30.1	7.5	1.6	9.4				1023	Field Duplicate

Pre-Survey Calibration D. Berta 1/31 100.3% Final = 100.8 mild, drizzle, cloudy weather

DO Calibration as per manufacturer's specifications.

Survey work conducted by D. Berta. Work started at 7:40 AM

Turbidity Calibration as per manufacturer's specifications. Calibration at 0, 10NTU's

*Winkler titration for DO for sample 030131/TF2/M/A = 7.3 and 7.2 mg/L. YSI Sonde = 7.5 mg/L

Prepared By/Date:	TSS Data Update	
M. Lloyd 1/31	RM Lloyd 2/8/03	**L&AI**

Construction Compliance Monitoring **Date: JAN 31** **Thea's Park - Flood Tide**

Station/Sample	Depth/DTB (ft)	7.6	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
TPN300 (Up-Current)	3	29.6	7.8	1.5	9.4		5,234,522	542,439	1324	Manson placing riprap
Mid	35	30.1	7.6	1.3	9.4				1323	on north end of toe berm
Deep	63/69	30.2	7.7	0.9	9.4				1322	water
TPS150 (Down-Current)	3	28.9	7.8	1.8	9.4		5,234,406	542,466	1311	
Mid	21	30.1	7.7	3.2	9.4				1318	
Deep	37/43	30.2	7.7	1.3	9.4				1317	
TPS300	3	28.5	7.8	1.8	9.4		5,234,379	542,504	1305	
Mid	21	30.1	7.7	3.2	9.4				1304	
Deep	37/42	30.2	7.7	1.3	9.4				1303	
TDSE300 (down-current)	3	28.9	7.9	1.4	9.4		5,234,422	542,518	1319	
Mid	21	30.0	7.8	1.1	9.4				1318	
Deep	37/42	30.2	7.7	0.9	9.4				1317	
TDSW300 (down-current)	3	28.2	7.7	2.4	9.4		5,238,708	542,841	1108	
Mid	21	30.1	7.6	7.2	9.4				1107	
Deep	37/42	30.2	7.5	9.0	9.4				1106	

Pre-Survey Calibration D. Berta 1/31 100.8% Final = 102.1 cool, cloudy weather, rain

DO Calibration as per manufacturer's specifications.

Survey work conducted by D. Berta

Turbidity Calibration as per manufacturer's specifications. Calibration at 0, 10NTU's.

Manson was placing rock fairly quickly at toe berm. 2 min./bucket

Prepared By/Date: M. Lloyd 1/31

TSS Data Update: M. Lloyd 2/8/03

L&AI

STL Seattle

Client Name	Lloyd & Assoc. Inc.
Project Name	Thea Foss
Date Received	01-31-03

General Chemistry Parameters

Client Sample ID 030131/TPS(300)/M/A
Lab ID 111644-01

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	02-03-03	mg/L	3	2

Client Sample ID 030131/TPNW(300)/M/A
Lab ID 111644-02

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	02-03-03	mg/L	2	2

Client Sample ID 030131/TPN(300)/M/A
Lab ID 111644-03

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	02-03-03	mg/L	3	2

Client Sample ID 030131/TPNE(300)/M/A
Lab ID 111644-04

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	02-03-03	mg/L	3	2

Client Sample ID 030131/SP7+00/M/A
Lab ID 111644-05

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	02-03-03	mg/L	4	2

Client Sample ID 030131/SP7+00/DUP
Lab ID 111644-06

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	02-03-03	mg/L	2	2

STL Seattle

QUALITY CONTROL REPORT

Client Sample ID: Batch QC
Lab ID: 111640-2
QC Batch Number: 1159-039

Method Blank

Parameter	Result (mg/L)	PQL
Total Suspended Solids	ND	2

Duplicate

Parameter	Sample Result (mg/L)	Duplicate Result (mg/L)	RPD (%)	Flag
Total Suspended Solids	4.4	4.22	4.18	

2/8/03

PROJECT THEA FOSS

Notebook No. _____
Continued From Page _____

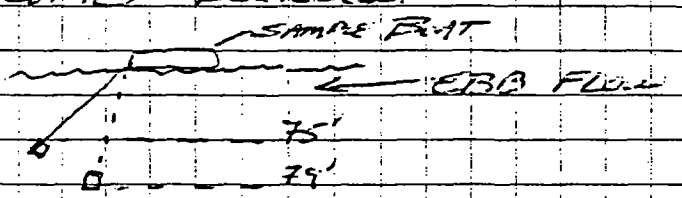
30131

CALIBRATION NOTES:
BAROMETRIC PRESSURE 766.1 mm Hg
D.O. CALIBRATED IN MOIST AIR OVER D.I. WATER
D.O. CHECK = 100.3

TURB CALIBRATED USEING MANUFACTURERS 2 POINT METHOD 1) 0.0 NTU = DI WATER 2) 10.0 NTU = CALIBRATION STANDARD.
CALIBRATION CHECK ON STANDARD SOLUTION = 9.9

0746 MANSON STARTS PLACEMENT OF QUARRY SPALLS FOR TOE BERM AT # WORK AREA # ~~2~~ 3 DB FOR THEAS PARK
- NO IN WATER ACTIVITY ON HURLEN - TOTEM MARINE SITE
RAIN, MODERATE WIND
0940 @ THEAS PARK - WATER CHOPPY, NO FLOAT. DEBRIS OR TURB PLUMES OBSERVED

NOTE: 0923



WHEN REPOSITIONING SAMPLE BOAT DURING MEASUREMENT PROBE DEPTH DROPPED FROM 75' - 79' AT TIME OF READING IE READING WAS OBTAINED BETWEEN 75' AND 79'

DO Analysis / Hach-Winkler Titration 1130

Rep. #1 = 365 × 0.02 = 7.3 mg/L (100 ml sample)
" #2 = 362 × 0.02 = 7.2 mg/L (100 ml sample)

Continued on Page

Read and Understood By

[signature] 01/31/03 — Signed — Date
[signature] 1/31/03 — Signed — Date

ROJECT THEA FOSS

Notebook No. _____

Continued From Page _____

030131 WORK ZONE #3 - THEA'S PARK

TIME	LOCATION	EVENT	DTB	SAMPLE DEPTH	TEMP	SAL	DO	TURB	TSS
								MAX EBB	
0913	TPS(300)		(40)	D 35	9.4	30.0	7.1	1.6	—
0914	319537	A		M 20	9.4	29.7	7.2	1.7	030131/TPS(300)/M/A
0915	Acc=5.7			S 3	9.4	29.4	7.3	1.5	—
								EBB	
0923	TPNW(300)	A	(~~84~~) 80	D ~~79~~ 75	9.4	30.2	7.5	1.3	—
0924	515392			M ~~42~~ 40	9.4	30.0	7.4	3.2	030131/TPNW(300)/M/A
0925	Acc=5.6			S 3	9.5	29.5	7.5	1.4	—
	(NOTE: PROBE DROPED TO 79' AT TIME OF READING SEE COMMENTS PAGE 2)								
0942	TPN(300)	A	(64)	D 59	9.4	30.1	7.4	5.8	—
0942	522439			M 32	9.4	29.9	7.4	2.1	030131/TPN(300)/M/A
0943	Acc=6.2			S 3	9.4	29.4	7.5	1.6	—
								EBB	
0953	TPN(150)	A	(48)	D 43	9.4	30.0	7.5	2.2	—
0954	476433			M 24	9.4	29.9	7.5	0.8	—
0954	Acc=5.1			S 3	9.5	29.3	7.6	1.4	—
[illegible]1	TPNE(300)		(44)	D 39	9.4	30.0	7.5	2.5	—
[illegible]2	505483			M 22	9.4	29.9	7.5	2.0	030131/TPNE(300)/M/A
1003	Acc=6.2			S 3	9.5	29.3	7.5	2.1	—
1017	~~T~~SP 7+00		(39) 2 ~~39~~	D 34	9.4	30.1	7.5	1.1	—
1018	940955			M 20	9.4	29.9	7.5	1.4	030131/SP7+00/M/A
1019	Acc=4.4			S 3	9.5	29.2	7.5	1.6	—
1023	SP 7+00		(39)	D 34	9.4	30.1	7.5	1.6	—
1024	940955			M 20	9.4	29.9	7.5	1.3	030131/SP7+00/M/DUP A
1024	Acc=4.2			S 3	9.5	28.9	7.5	1.9	—

SAMPLE SPLIT FOR DO BY WINKLER 1) CITY OF TACOMA
2) L&A LAB

Continued on Page

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[signature] 1/31/03 — Signed — Date

[signature] 1/31/03 — Signed — Date

PROJECT THEA FOSS

Notebook No. _____
Continued From Page _____

03 01 31

1145 - MANSON BREAKS FOR LUNCH

1235 MANSON PLACING TOE BERM @ ~ 1 BUCKET/1.5-2.0 MIN

CALIBRATION NOTES:

1245 BAROMETRIC PRESSURE 765.9 mm Hg
CALIBRATED DO, IN MOIST AIR OVER TAP WATER.
CALIB CHECK = 100.8 %

- TURB. CHECK = 10.0 NTU ON STANDARD SOLUTION

1300 MODERATE WIND, OCCASIONAL RAIN, WATER CHOPPY
NO VISIBLE TURBIDITY PLUMES OR FLOAT. DEBRIS
OBSERVED DURING W.Q MONITORING AT THEAS
PARK WORK AREA #3 SITE

~1320 - 1350 DURING FLOOD TIDE HURLEN PLACING REMAINING
QUARRY SPALLS OFF GALENA-BARGE ONTO S NORTH
END OF TOTEM MARINE WORK AREA ~4-7 BOXS
PLACED ON TOP OF SLOPE* - INFORMATIONAL
READINGS OF TURB @ TDS150 FROM 31'-3'
RANGED FROM 1.0 - 3.2 DURING PLACEMENT

* (IE MAJORITY OF ROCK PLACED OUT OF WATER)

1400 MANSON STOPS PLACING MATERIAL IN WATER.
REPORTEDLY TO PERFORM SOUNDING AND
MOVE THE BARGE & RIG.

1400 CALIBRATION CHECK:
D.O. 102.1 % IN AIR OVER TAP
WATER

Continued on Page

Read and Understood By

Daniel A. Berta 01/31/03 — Signed — Date

R. Michael Floyd 1/31/03 — Signed — Date

PROJECT THEA FOSS

Notebook No. _____

Continued From Page _____

030131 THEA'S PARK WORK AREA 3

TIME	LOCATION EVENT	DTB	SAMPLE DEPTH	TEMP	SAL	FLOOD DO	TURB	TSS
1252	TPSW(300)	42	D 37	9.4	30.2	7.5	9.0	—
1253	348 467 B		M 21	9.4	30.1	7.6	7.2	—
1254	ACC = 6.1		S 3	9.4	28.2	7.7	2.4	—
					FLOOD			
1303	TPS(300)	42	D 37	9.4	30.2	7.7	DB (7.5) ~~7.5~~	—
1304	379 504		M 21	9.4	30.1	7.7	2.1	—
1305	ACC = 5.9		S 3	9.4	28.5	7.8	1.9	—
					FLOOD			
1310	TPS(150)	43	D 37	9.4	30.2	7.7	1.3	—
1311	406 466		M 21	9.4	30.1	7.7	3.2	—
1311	ACC = 5.5		S 3	9.4	28.9	7.8	1.8	—
					FLOOD			
1317	TPSE(300)	42	D 37	9.4	30.2	~~7.8~~ 7.7	0.9	—
1318	422 518		M 21	9.4	30.0	7.8	1.1	—
1319	ACC = 5.3'		S 3	9.4	28.9	7.9	1.4	—
					FLOOD			
1322	TPN(300)	69	D 63	9.4	30.2	7.7	0.9	—
1323	522 439		M 35	9.4	30.1	7.6	~~1.6~~ 1.3 DB	—
1324	ACC = 5.5'		S 3	9.4	29.6	7.8	1.5	—

— END —

Continued on Page

Read and Understood By

[signature] 01/31/03 — Signed — Date

[signature] 1/31/03 — Signed — Date

American Civil Constructors

Hurlen Construction

PO Box 80945
700 S. Riverside Dr.
Seattle, WA 98108
(206) 763-1230
FAX (206) 762-1854

FAX TRANSMITTAL

Date:	1/31	Number of Pages Including this Sheet:	9
Deliver To:	O'LOUGHLIN/WINGARD		
Company:	CDT		
Fax Number:	1-253-272-2412		

From:	M. LLOYD
Company:	ACC / Hurlen Construction / L+AI
Fax Number:	206-762-1854
Subject	WQ 1/31/03

Lloyd & Associates, Inc.
38210 SE 92nd Street, Snoqualmie, Washington 98065 425-888-1905 rml@centurytel.net

February 1, 2003

TSS updated 2/8/03 PML.

TRANSMITTAL

To: Iain Wingard
John O'Loughlin

Subject: Compliance Monitoring / Thea's Park 2/1/03
Preliminary Data Transmittal (no TSS)

Attached please find results from compliance monitoring for the following work activity:

- Filter Cap Construction at Thea's Park

Thea's Park – Filter Material Placement.

For the first time in this project we had overlapping workzones. ACC-Hurlen and Manson derrick were placing filter cap material at Thea's Park. Manson worked from the south end and Hurlen worked at the north end. In the morning session, Hurlen was mostly getting set up, placing debris boom, and sweeping the bottom for broken piles and larger debris. They also placed filter material during the morning monitoring event. In the afternoon both Manson and Hurlen were placing filter material on a flood tide. No water quality problems were detected, although there were two unusual trends in the data that we have not seen before:

- Dissolved oxygen levels were higher at depth than at the surface during the flood tide.
- Turbidity levels were higher at depth and up-current than during the flood tide

The very large turbidity plume originating from the Puyallup River, and the storm events that caused the plume are likely contributors to both the unusual dissolved oxygen and turbidity observations. Elevated and TPSW350 (down-current) were also unusual during the flood tide in that turbidity at both TPSW300 and TPSW150 were lower, suggesting that turbidity was not arising from the work zone.

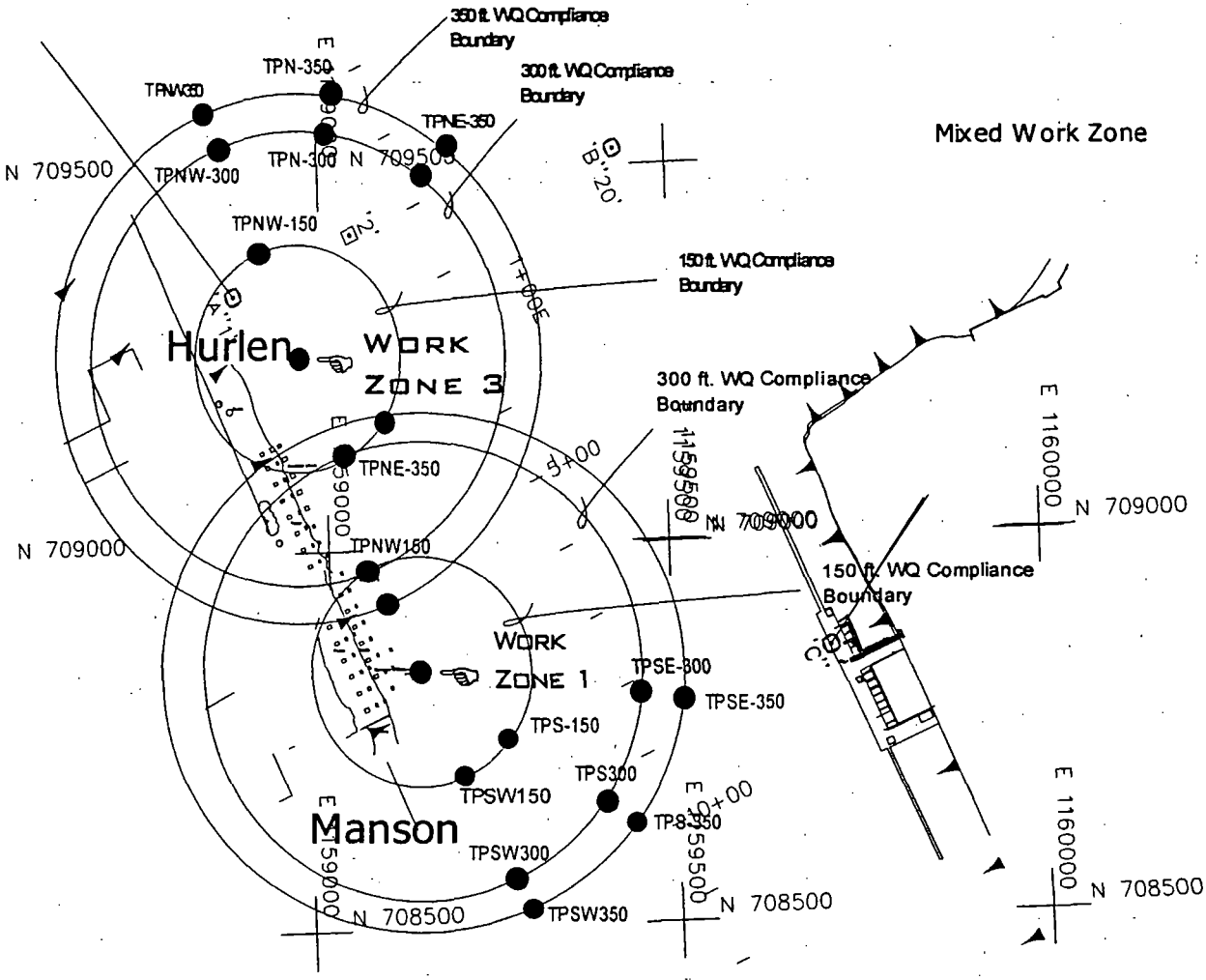
The sampling rose on the next page may seem a bit confusing at first, but notations in the data forms should clarify the origin of data for Work Zone 3 (WZ3-where Hurlen was working) and Work Zone 1 (WZ1-where Manson was working.

QA/QC.

Field duplicate data again looked very good. A Winkler titration was conducted on sample 030201/TPNE350/M/A. The YSI yielded a result of 6.6 mg/L, and the Winkler titration gave results of 7.1 and 7.2 mg/L on L&AI replicates.

Michael Lloyd
Lloyd & Associates, Inc.

WQM 1 31 03.doc


350 ft. WQ Compliance Boundary
300 ft. WQ Compliance Boundary
Mixed Work Zone
TPN-350
TPNW350
TPNE-350
TPNW-300
TPN-300
N 709500
N 709500
TPNW-150
150 ft. WQ Compliance Boundary
Hurlen
WORK ZONE 3
300 ft. WQ Compliance Boundary
TPNE-350
N 709000
N 709000
TPNW150
150 ft. WQ Compliance Boundary
WORK ZONE 1
TPSE-300
TPSE-350
TPS-150
TPSW150
TPS300
TPSE-350
Manson
TPSW300
N 708500
N 708500
TPSW350
E 1160000
N 709000
E 1160000
N 708500

Overlapping mixing zones **Date: FEB 1** **Thea's Park - Ebb Tide**

Station/Sample	Depth/DTB (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
TPN350 (Up-Current/WZ3)	3	29.8	6.9	0.7	9.4		5,234,536	542,440	757	North of Hurlen, Work Zone-3
Mid	35	30.1	6.9	0.6	9.4				756	Manson placing filter material
Deep	64/69	30.1	7.1	2.6	9.4				755	Hurlen moving piling/debris boom
TPN300 (Down-Current/WZ3)	3	29.8	6.9	6.8	9.5		5,234,522	542,439	800	Work Zone-3
030201/TPN300/M/A	32	30.1	6.8	2.7	9.4	6			801	
Deep	60/64	30.1	6.9	2.8	9.4				801	
TPNW350 (down-current/WZ3)	3	29.3	6.8	2.4	9.3		5,234,530	542,385	827	No visible plume or debris on
030201/TPNW300/M/A	50	30.1	6.8	1.2	9.3	7			825	water from work zones
Deep	93/98	30.1	6.7	5.6	9.4				823	
TPNE350 (down-current/WZ3)	3	28.2	6.8	4.7	9.1		5,234,513	542,494	912	Work Zone-3
030201/TPNE300/M/A	27	30.0	6.6	0.6	9.4	4			911	
Deep	50/55	30.1	6.6	1.2	9.4				910	
TPNE350 (down-current/WZ3)	3	28.9	6.6	2.4	9.3		5,234,513	542,494	919	Field Duplicate
030201/TPNE300/M/A-Dup	27	30.0	6.6*	0.8	9.4	3			918	Field Duplicate
Deep	50/55	30.1	6.6	0.9	9.3				917	Field Duplicate
TPN350 (Up-current/WZ1)	3	29.5	6.7	2.1	9.3		5,234,411	542,502	937	Work Zone-1
030201/TPN300/M/WZ1/A	20	29.9	6.5	0.6	9.4	3			936	
Deep	37/41	30.1	6.5	1.6	9.4				935	
TPS150 (Up-current/WZ1)	3	29.2	6.6	3.1	9.3		5,234,279	542,528	952	Work Zone-1
Mid	21	30.0	6.5	0.3	9.4				951	
Deep	37/41	30.1	6.5	1.7	9.4				950	
TPS350 (Up-current/WZ1)	3	28.9	6.5	2.2	9.4		5,234,246	542,579	957	Work Zone-1
030201/TPS350/M/WZ1/A	30	29.9	6.4	1.6	9.4	3			956	
Deep	35/39	30.1	6.4	0.6	9.4				955	
Station SP7+00	3	29.6	6.8	2.4	9.6		5,234,940	542,955	847	Reference Station
030201/SP72/M/A	21	30.0	6.7	1.0	9.5	7			846	
Deep	39/42	30.1	6.7	5.0	9.5				845	

Pre-Survey Calibration S. High 100.1% Final = 100.8 mild, drizzle, cloudy weather

DO Calibration as per manufacturer's specifications.

Survey work conducted by D. Berta. Work started at 7:40 AM

Turbidity Calibration as per manufacturer's specifications. Calibration at 0, 10NTU's

*Winkler titration for DO for sample 030201/TPNE350/M/A = 7.1 and 7.2 mg/L. YSI Sonde = 7.5 mg/L

Prepared By/Date:

M. Lloyd 2/1/03

TSS Data Update 2/8/03 M Lloyd 2/8/03

L&AI

Construction Compliance Monitoring

Date: FEB 1 **Thea's Park - Flood Tide**

Station/Sample	Depth/DTB (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
TPN350 (Up-Current/WZ3)	3	29.5	6.4	7.8	9.4		5,234,536	542,440	1347	Manson placing riprap
Mid	34	30.1	6.7	6.4	9.4				1346	on south end of toe berm
Deep	36/68	30.1	7.6	9.3	9.4				1345	Hurlen on the north with filter
TPNW350 (Up-current/WZ3)	3	29.6	6.6	2.9	9.4		5,234,530	542,385	1351	
Mid	46	30.1	7.0	2.6	9.4				1350	
Deep	87/92	30.2	7.6	19.4	9.4				1349	Elevated turbidity at 350'
TPNW300 (Up-current/WZ3)	3	29.5	6.9	3.3	9.4		5,234,515	542,392	1355	Lower turbidity at 300'
Mid	36	30.1	7.0	4.9	9.3				1354	(closer to work zone)
Deep	68/73	30.2	7.6	8.1	9.4				1353	
TPNW150 (Up-current/WZ3)	3	29.6	6.7	2.2	9.4		5,234,476	542,433	1404	Lower turbidity at 150'
Mid	24	30.1	7.1	0.2	9.4				1403	(closer to work zone)
Deep	43/48	30.2	7.6	5.0	9.4				1402	Point moved to boom
TPNE350 (Up-current/WZ3)	3	29.5	6.9	0.3	9.4		5,234,514	542,493	1408	Flood Tide
Mid	30	30.1	7.1	4.1	9.4				1407	
Deep	55/60	30.2	7.6	3.4	9.4				1406	
TPNE350 (Mid-Current/WZ1)	3	29.1	6.7	1.2	9.4		5,234,390	542,556	1422	South Work Zone
Mid	21	30.1	7.1	2.6	9.4				1421	
Deep	38/43	30.2	7.5	2.8	9.4				1420	
TPSE350 (down-current/WZ1)	3	29.5	6.8	1.5	9.4		5,234,295	542,596	1428	
Mid	21	30.0	7.3	3.3	9.4				1427	
Deep	38/43	30.1	7.6	4.7	9.4				1426	
TPS350 (down-current/WZ1)	3	28.0	7.1	1.3	9.4		5,238,246	542,579	1432	
Mid	21	30.1	7.2	2.8	9.4				1431	
Deep	38/41	30.2	7.5	4.1	9.4				1430	
TPSW350 (down-current/WZ1)	3	27.8	6.8	3.1	9.4		5,238,209	542,535	1440	Hurlen and Manson placing filter
Mid	22	30.0	7.2	12.2	9.4				1439	material on slope
Deep	39/44	30.1	7.5	17.3	9.4				1438	
TPSW300 (down-current/WZ1)	3	28.6	6.8	1.9	9.4		5,238,224	542,528	1443	
Mid	22	29.9	7.3	5.0	9.4				1442	
Deep	39/43	30.1	7.6	9.3	9.4				1441	turbidiity at 150 and 300' stations
TPSW150 (down-currentWZ1)	3	28.6	6.8	2.0	9.4		5,238,267	542,501	1500	are lower than 350' station
Mid	22	29.9	7.3	4.2	9.4				1449	
Deep	39/43	30.1	7.6	11.0	9.4				1448	

Pre-Survey Calibration S. High 2/1 100.8% Final = 96.4% cloudy weather, sun breaks in afternoon

DO Calibration as per manufacturer's specifications.

Survey work conducted by D. Berta & S. High

Turbidity Calibration as per manufacturer's specifications. Calibration at 0, 10NTU's.

Up-Current points from WZ3 on north end. Down-current points from WZ1 on south end.

Dissolved oxygen levels consistently higer at depth than surface.

Prepared By/Date: M. Lloyd 2/1/03

TSS Data Update MK 2/8/03

L&AI

STL Seattle

Client Name	Lloyd & Assoc. Inc.
Project Name	Thea Foss
Date Received	02-03-03

General Chemistry Parameters

Client Sample ID 030201/TPN(300)/M/A
Lab ID 111666-01

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	02-05-03	mg/L	6	2

Client Sample ID 030201/SP7+00/M/A
Lab ID 111666-02

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	02-05-03	mg/L	7	2

Client Sample ID 030201/TPNW(350)/M/A
Lab ID 111666-03

Parameter	Method	Date Analyzed	Units	Result	PQL
ɔtal Suspended Solids	EPA 160.2	02-05-03	mg/L	7	2

Client Sample ID 030201/TPNE(350)/M/A
Lab ID 111666-04

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	02-05-03	mg/L	4	2

Client Sample ID 030201/TPNE(350)/M/DUP
Lab ID 111666-05

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	02-05-03	mg/L	3	2

Client Sample ID 030201/TPS(350)/M/A
Lab ID 111666-06

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	02-05-03	mg/L	3	2

STL Seattle

Client Sample ID	030201/TPN(350)/M/A
Lab ID	111666-07

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	02-05-03	mg/L	3	2

STL Seattle

QUALITY CONTROL REPORT

Client Sample ID: Batch QC
Lab ID: 111584-02
QC Batch Number: 1159-045

Method Blank

Parameter	Result (mg/L)	PQL
Total Suspended Solids	ND	2

Duplicate

Parameter	Sample Result (mg/L)	Duplicate Result (mg/L)	RPD (%)	Flag
Total Suspended Solids	ND	ND	0.0	

TM Floyd
2/8/03

0930 Calibration Bp = 768.2 mm Hg
DO sum DI = 100.1

Turbidity 0, 10.0

Manson & Hurlen Rigs are both working.
Thea's Park; Manson on the south end &
Hurlen on the north end. ∴
We are monitoring the S½ of WZ #1
& the N½ of WZ #3.
Note: general "flow" from Puyallup River
is marked today.
0930 Collect DO sample for analysis ⇒

DO Analysis/RM Lloyd 1145
030201/PNNE350/M/A-Dups
100ml #1 355 × 0.02 = 7.1 mg/L
100ml #2 = 362 × 0.02 = 7.2 mg/L

Continued on Page

Read and Understood By

RM Lloyd 2/1/03 030201

Signed Date Signed Date

030201 Thin film, Ebb flow

Time	Location	Event	OTB	Sample Depth	t	Sal	DO	Temp	TBS
0755	TPN 350								
0756	536 440	A	69	0	64	9.4	30.1	7.1	2.6 —
0757	acc 21	WZ3		M	36	9.4	30.1	6.9	0.6 —
				S	3	9.4	29.8	6.9	0.7 —
0801	TPN 300								
0802	522 439	A	64	D	60	9.4	30.1	6.9	3.8 —
	acc	WZ3		M	32	9.4	30.1	6.8	2.7 030201/TPN300/
				S	3	9.4	29.8	6.9	1.8 — /A
0823	TPNW350		98	D	93	9.4	30.1	6.7	5.6 —
0825	530 385	A		M	59	9.3	30.1	6.8	1.2 030201/TPNW300
0827	acc 5.3	WZ3		S	3	9.3	29.3	6.8	2.4 /M/A
0845	SP7+00		42	D	39	9.4	30.1	6.7	5.0 —
0846	940 955	A		M	21	9.4	30.0	6.7	1.0 030201/SP7+00/
0847	acc 5.0	Ambient		S	3	9.5	29.6	6.8	2.4 — /M/A
0910	TPNE 350		55	D	50	9.4	30.1	6.6	1.2 —
0911	~~517 445~~	A		M	27	9.4	30.0	6.6	0.4 030201/TPNE350
0912	494 513	WZ3		S	3	9.1	28.2	6.8	4.7 — /M/A
	Duplicate →								
0917	TPNE 350		55	D	50	9.4	30.1	6.6	0.9 —
0918	494 513	A		M	27	9.4	30.0	6.6	0.8 030201/TPNE350
0919	acc 6.3	WZ3		S	3	9.3	28.9	6.6	2.4 — /M/Dupe
0935	TPN 350	A	41	D	37	9.4	30.1	6.5	1.6 —
0936	401 582	WZ1		M	20	9.4	29.9	6.5	0.6 030201/TPN350
0937	acc 5.5			S	3	9.3	29.5	6.7	2.1 — WZ1/M/A
0950	TPS150		42	D	37	9.4	30.1	6.5	1.7 —
0951	274 528	A		M	21	9.4	30.0	6.5	0.3 —
0952	acc 4.8	WZ1		S	3	9.3	29.2	6.6	3.1 —

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Read and Understood By

Signed	Date	Signed	Date
[illegible] 7/1/03		030201	

PROJECT

Notebook No.

Continued From Page

1300 Recalibrate. DO replace membrane, sand electrodes, replace KCl
Burn-in for 20 min @ 0.13 sec/sample in DI
Calibrate @ bp = 769.9 mm Hg over ~~DI~~ Temp Hr
DO chg before = 32 chg after = 49
Turb calib. @ 0, 10.0 ntu

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[signature] 2/1/03 | [signature] 030201

Signed | Date | Signed | Date

030201

Thea's Park Ebb Tide

time	Location	Event	DTB	sample depth		t	sal	DO	turb	TSS
0955	TPS 350			D	35	9.4	30.1	6.4	0.6	—
0956	246 579	A	39	M	20	9.4	29.9	6.4	1.6	030201/TPS 350
0957	acc 4.9			S	3	9.4	28.9	6.5	2.2	—

Event B Thea's Park. ~~Ebb~~ Flood Tide

time	Location	Event	DTB	sample depth		t	sal	DO	turb	TSS
1345	TPN 350			D	63	9.4	30.1	7.6	9.3	—
1346	536 440		68	M	34	9.4	30.1	6.7	6.4	—
1347	acc 5.1	B	WZ 3	S	3	9.4	29.5	6.4	4.8	—
1349	TPNW 350		92	D	87	9.4	30.2	7.6	19.4	—
1350	530 385	B		M	46	9.4	30.1	7.0	2.6	—
1351	acc 5.1	WZ 3		S	3	9.4	29.6	6.6	2.9	—
1353	TPNW 300	B	~~73~~	D	~~77~~ 68	9.4	30.2	7.6	8.1	—
1354	515 392		73	M	36	9.3	30.1	7.0	4.9	—
1355	acc 6.1	WZ 3		S	3	9.4	29.5	6.9	3.3	—
1402	TPNW 150	B	45	D	43	9.4	30.2	7.6	5.0	—
1403	460 425			M	24	9.4	30.1	7.1	0.2	—
1407	acc 6.3	WZ 3		S	3	9.4	29.4	6.7	2.2	—
1406	TPNE 350	B	60	D	55	9.4	30.2	7.6	3.4	—
1407	514 493			M	30	9.4	30.1	7.1	4.1	—
1408	acc 5.3	WZ 3		S	3	9.4	29.5	6.9	0.3	—
1420	TPNE 350	B	43	D	38	9.4	30.2	7.5	2.8	—
1421	390 556	WZ 1		M	21	9.4	30.1	7.1	2.6	—
1422	acc 5.1			S	3	9.4	29.1	6.7	1.2	—

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[signature] 2/6/03 [signature] 030201

Signed Date Signed Date

PROJECT

Notebook No.

Continued From Page

1505 Post Sampling D3 Cal = 96.4% over Tap Hold

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[signature] 2/1/03 [signature] DT0201

Signed Date Signed Date

PROJECT Thea Foss

Notebook No. _____ 11

Continued From Page _____

030201

Thea's Park – Flood tide

time	location	event	DTB	sample depth	t	Sal	DO	Turb	TSS
1426	TPSE350	B	43	D 38	9.4	30.1	7.6	4.7	–
1427	245 596		WZ1	M 21	9.4	30.0	7.3	3.3	–
1428	acc 4.3			S 3	9.4	29.5	6.8	1.5	–
1430	TPS350		41	D 38	9.4	30.2	7.5	4.1	–
1431	346 579	B	WZ1	M 21	9.4	30.1	7.2	2.8	–
1432	acc 6.0			S 3	9.4	28.5	7.1	1.3	–
1438	TPSW350		44	D 39	9.4	30.1	7.5	17.3	–
1439	209 535	B	WZ1	M 22	9.4	30.0	7.2	12.2	–
1440	acc 6.2			S 3	9.4	27.8	6.8	3.1	–
1441	TPSW300	B	43	D 39	9.4	30.2	7.5	9.3	–
1442	224 528		WZ1	M 22	9.4	30.0	7.2	5.0	–
1443	acc 5.8			S 3	9.4	28.5	6.9	1.9	–
1448	TPSW150		43	D 39	9.4	30.1	7.6	11.0	–
1449	267 501	B	WZ1	M 22	9.4	29.9	7.3	4.2	–
1500	acc 5.6			S 3	9.4	28.6	6.8	2.0	–

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[signature] 2/1/03 [signature] 030201

Signed Date Signed Date

TRANSMISSION VERIFICATION REPORT

TIME : 08/30/1997 17:41
NAME : L&AI
FAX : 425-888-1905
TEL : 425-888-1905

DATE,TIME	08/30 17:38
FAX NO./NAME	12532722412
DURATION	00:03:20
PAGE(S)	10
RESULT	OK
MODE	STANDARD ECM

Lloyd & Associates, Inc.
38210 SE 92nd Street, Snoqualmie, Washington 98065 425-888-1905 rml@centurytel.net

February 2, 2003

TSS Updated 2/8/03 RML.

TRANSMITTAL

To: Iain Wingard
John O'Loughlin

Subject: Compliance Monitoring / Thea's Park 2/2/03
Preliminary Data Transmittal (no TSS)

Attached please find results from compliance monitoring for the following work activity:

- Filter Cap Construction at Thea's Park

Thea's Park – Filter Material Placement.

ACC-Hurlen and Manson derricks were placing filter cap material at Thea's Park. Manson worked from the south end and Hurlen worked near the middle of the capping area. For most of the afternoon both companies worked from the same barge of filter cap material. Water quality monitoring was conducted in three events. The morning event monitored an ebb tide, and the afternoon sessions covered a flood tide.

Elevated turbidity (36 ntu) was observed up-current at TPSW350 during the morning ebb tide monitoring event. High tide occurred prior to placement of any filter material (0638 HOURS), so it is unlikely that this turbidity arose from construction activity at Thea's Park. Water quality monitoring was also conducted between the barges at "mid-zone" (between the two work zones). Turbidity levels were nominal.

In the afternoon sessions Hurlen had moved to Work Zone 2, generating a new sampling mixed sampling rose for these sampling events. Elevated turbidity was also observed at depth during the afternoon session at TP350 during a flood tide event when this station was down-current.

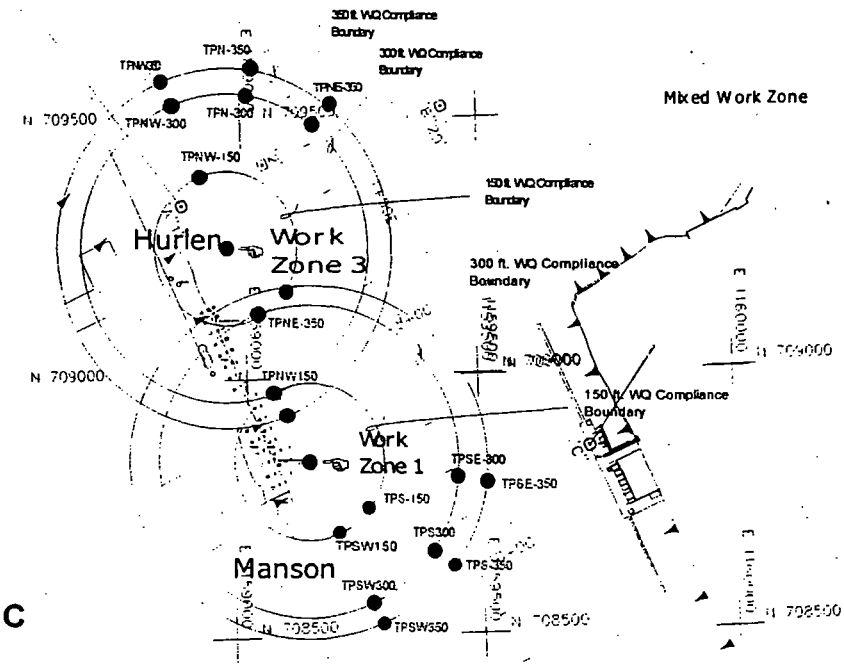
The sampling roses on the next page may seem a bit confusing at first, but notations in the data forms should clarify the origin of data for Work Zone 3 (WZ3-where Hurlen was working) and Work Zone 1 (WZ1-where Manson was working during sampling event A and WorkZone 2 and Work Zone 1 during the afternoon

QA/QC.

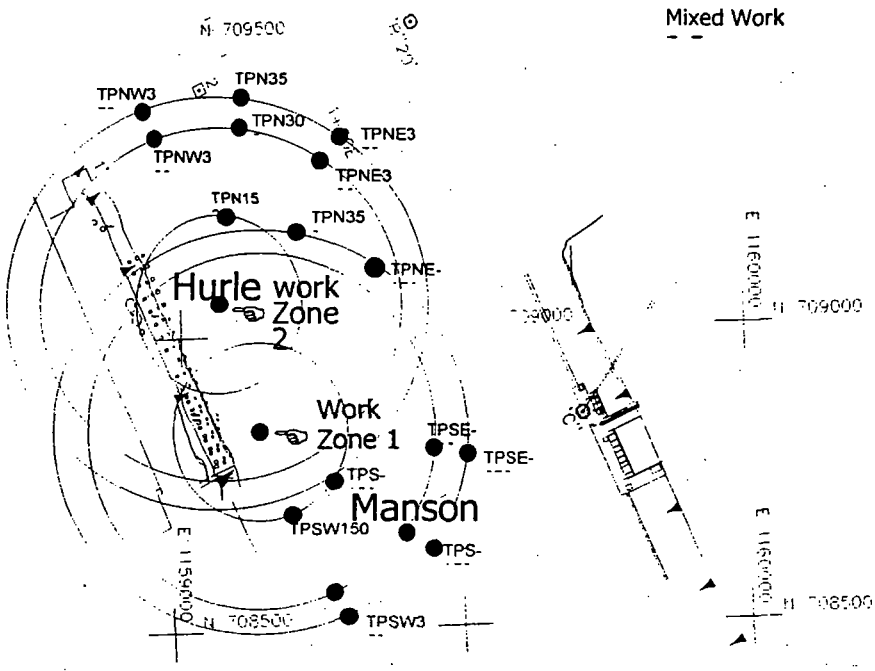
Field duplicate data again looked very good. A Winkler titration was conducted on sample 030202/TPNW350/M/A. The YSI yielded a result of 7.7 mg/L, and the Winkler titration gave results of 7.0 and 7.3 mg/L on L&AI replicates.

Michael Lloyd
Lloyd & Associates, Inc.

Morning Session – Event A



Afternoon Session – Events B & C



Overlapping mixing zones **Date: FEB 2** **Thea's Park - Ebb Tide**

Station/Sample	Depth/DTB (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
TPS350 (Up-current/WZ1)	3	28.9	8.3	4.7	9.3		5,234,346	542,579	857	Work Zone-1
030202/TPS350/M/WZ1/A	20	29.9	8.1	2.8	9.4	4			856	Manson placing filter material
Deep	36/41	30.1	7.8	2.1	9.4				855	up slope near toe berm
TPSE350 (Up-current/WZ1)	3	27.4	8.0	7.7	9.3		5,234,295	542,596	908	Work Zone-1
Mid	22	30.0	7.9	9.5	9.4				907	Turbidity up-current observed
Deep	38/42	30.1	7.7	3.5	9.4				906	in main channel
TPSW350 (Up-current/WZ1)	3	28.2	8.2	6.0	9.3		5,234,209	542,535	903	Work Zone-1
Mid	22	30.0	8.0	11.0	9.4				902	Turbidity up-current observed
Deep	38/43	30.1	7.8	**36.0**	9.4				901	Elevated turbidity up-current
TPS350 (Mid-zone/WZ3)	3	28.4	8.0	6.3	9.3		5,234,372	542,518	913	Work Zone-3
Mid	20	29.9	7.8	4.8	9.3				912	
Deep	37/41	30.0	7.8	6.7	9.4				911	
TPSE350 (Mid-zone/WZ3)	3	28.4	7.9	3.5	9.4		5,234,420	542,534	947	Work Zone-3
Mid	20	29.8	7.7	3.0	9.4				916	Manson placing filter material
Deep	37/41	30.1	7.6	3.1	9.4				915	up slope near toe berm
TPNE350 (down-current/WZ3)	3	28.3	7.9	5.3	9.3		5,234,514	542,493	920	
030202/TPNE300/M/A	30	29.9	7.8	3.4	9.4	4			919	
Deep	57/61	30.1	7.5	4.7	9.3				918	
TPN350 (Up-Current/WZ3)	3	27.6	7.9	5.4	9.4		5,234,536	542,440	926	North of Hurlen, Work Zone-3
030202/TPN300/M/A	34	30.0	7.8	2.7	9.4	7			925	
Deep	63/68	30.1	7.6	4.3	9.4				924	
TPNW350 (down-current/WZ3)	3	29.2	7.9	4.4	9.3		5,234,530	542,385	932	
030202/TPNW300/M/A	46	30.1	7.7	2.0	9.4	3			931	
Deep	86/92	30.1	7.5	4.3	9.4				930	
TPNW350 (down-current/WZ3)	3	29.2	7.9	4.4	9.3		5,234,530	542,385	940	Field Duplicate
030202/TPNW300/M/A-Dup	46	30.1	7.7*	2.0	9.4	4			939	Field Duplicate
Deep	87/92	30.1	7.5	4.3	9.4				938	Field Duplicate
TPNW150 (down-current/WZ3)	3	29.3	7.8	5.4	9.3		5,234,466	542,428	949	
Mid	23	29.9	7.8	8.0	9.4				948	
Deep	43/46	30.0	7.6	4.1	9.4				947	
Station SP7+00	3	29.0	7.6	5.4	9.4		5,234,940	542,955	1011	Reference Station
030202/SP7/M/A	20	29.9	7.7	3.4	9.4	5			1010	
Deep	35/40	30.1	7.6	2.0	9.4				1009	

Pre-Survey Calibration S. High 100.7% Final = 92% mild, drizzle, cloudy weather

DO Calibration as per manufacturer's specifications. 13.8°C

Survey work conducted by D. Berta and S. High.

Turbidity Calibration as per manufacturer's specifications. Calibration at 0, 10NTU's

*Winkler titration for DO for sample 030202/TPNW350/M/A = 7.0 and 7.3 mg/L. YSI Sonde = 7.7 mg/L

Prepared By/Date:

M. Lloyd 2/2/03

TSS Data Update 2/8/03

L&AI

Construction Compliance Monitoring

Date: FEB 2 **Thea's Park - Flood Tide**

Station/Sample	Depth/DTB (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
TPSW350 (down-current/WZ1)	3	28.5	7.5	3.7	9.4		5,238,209	542,535	1327	Hurlen and Manson placing filter
Mid	22	29.8	7.5	10.0	9.4				1326	material on slope
Deep	39/44	30.0	7.3	6.0	9.4				1325	Hurlen in WZ2/Manson WZ1
TPS350 (down-current/WZ1)	3	29.1	7.3	3.4	9.4		5,238,246	542,579	1332	
Mid	19	29.9	7.3	10.8	9.4				1331	
Deep	33/38	30.1	7.3	3.8	9.4				1330	
TPSE350 (down-current/WZ1)	3	29.1	7.2	4.2	9.4		5,234,297	542,580	1336	
Mid	20	29.9	7.1	12.7	9.4				1335	
Deep	35/40	30.0	7.1	3.2	9.4				1334	
TPNE350 (Mid Zone/WZ1)	3	29.1	7.0	3.9	9.4		5,234,390	542,556	1340	Location between derricks
Mid	20	29.9	7.0	2.3	9.4				1339	
Deep	35/40	30.1	6.8	2.3	9.4				1338	
TPN350 (Mid Zone/WZ1)	3	28.4	6.9	4.3	9.4		5,234,411	542,502	1347	Location between derricks
Mid	20	30.0	6.9	2.4	9.4				1346	
Deep	35/40	30.1	6.8	1.8	9.4				1345	
TPNE350 (Up-current/WZ2)	3	28.7	6.8	3.3	9.4		5,234,456	542,526	1353	
Mid	21	30.0	6.9	1.5	9.4				1352	
Deep	36/42	30.1	6.8	2.7	9.4				1351	
TPN350 (Up-current/WZ2)	3	29.3	6.9	3.3	9.4		5,234,477	542,473	1357	
Mid	21	30.0	6.9	2.4	9.3				1356	
Deep	36/41	30.1	6.9	2.2	9.4				1354	
TPNW350 (Up-current/WZ2)	3	25.8	7.0	11.0	9.4		5,234,470	542,418	1400	Probable fresh water input
Mid	23	30.0	6.8	2.1	9.4				1359	
Deep	42/46	30.1	6.9	2.8	9.4				1358	

Pre-Survey Calibration S. High 2/2 102% drizzle,cloudy weather, sun breaks in afternoon

DO Calibration as per manufacturer's specifications.

Survey work conducted by D. Berta & S. High

Turbidity Calibration as per manufacturer's specifications. Calibration at 0, 10NTU's.

Up-Current points from WZ2 on north end. Down-current points from WZ1 on south end.

Replace DO membrane at 1500 hours.

Prepared By/Date:
M. Lloyd 2/2/03

TSS Data Update 2/8/03
M. Lloyd

L&AI

Construction Compliance Monitoring

Date: FEB 2 **Thea's Park - Flood Tide**

Station/Sample	Depth/DTB (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
TPNW350 (Up-current/WZ2)	3	28.2	7.3	7.7	9.4		5,234,470	542,418	1503	Manson and Hurlen working
Mid	23	30.0	7.2	2.2	9.4				1504	off same barge
Deep	42/47	30.0	7.2	2.4	9.4				1501	
TPN350 (Up-current/WZ2)	3	28.1	7.6	7.5	9.4		5,234,477	542,473	1506	Manson and Hurlen placing
Mid	22	30.0	7.5	1.1	9.4				1505	filter material off same barge
Deep	38/43	30.0	7.5	1.2	9.4				1504	
TPNE350 (Up-current/WZ2)	3	27.3	7.5	5.1	9.4		5,234,456	542,526	1513	
Mid	22	30.0	7.5	1.2	9.4				1512	
Deep	38/43	30.0	7.6	1.9	9.4				1511	
TPN350 (Mid Zone/WZ1)	3	27.4	7.5	3.7	9.4		5,234,411	542,502	1517	Location between derricks
Mid	22	30.0	7.4	1.3	9.4				1516	
Deep	38/42	30.0	7.5	1.7	9.4				1515	
TPNE350 (Mid Zone/WZ1)	3	27.6	7.4	3.6	9.4		5,234,390	542,556	1520	Location between derricks
Mid	22	30.0	7.4	1.1	9.4				1519	
Deep	38/42	30.1	7.5	1.2	9.4				1518	
TPSE350 (down-current/WZ1)	3	28.2	7.3	3.0	9.4		5,234,297	542,580	1523	
Mid	22	30.0	7.3	2.6	9.4				1522	
Deep	37/41	30.0	7.5	2.4	9.4				1521	
TPS350 (down-current/WZ1)	3	28.7	7.2	2.6	9.5		5,238,246	542,579	1526	
Mid	20	29.9	7.3	6.7	9.4				1525	
Deep	35/40	30.1	7.3	2.8	9.4				1524	
TPSW350 (down-current/WZ1)	3	28.3	7.2	7.0	9.4		5,238,209	542,535	1530	
Mid	22	30.0	7.2	23.3	9.4				1529	Elevated turbidity at TPSW350'
Deep	38/43	30.1	7.2	8.7	9.4				1528	
TPSW150 (down-current/WZ1)	3	24.8	7.7	14.0	9.4		5,238,267	542,528	1534	
Mid	23	29.9	7.3	35.0	9.4				1533	High turbidity
Deep	40/45	30.0	7.4	22.0	9.4				1532	
TPS150 (down-current/WZ1)	3	24.2	7.5	17.0	9.4		5,238,279	542,528	1538	
Mid	22	29.9	7.2	17.0	9.4				1537	
Deep	38/43	30.1	7.5	10.2	9.4				1536	

Pre-Survey Calibration S. High 2/2 102% drizzle,cloudy weather

DO Calibration as per manufacturer's specifications.

Survey work conducted by D. Berta & S. High

Turbidity Calibration as per manufacturer's specifications. Calibration at 0, 10NTU's.

Up-Current points from WZ2 on north end. Down-current points from WZ1 on south end.

Replace DO membrane at 1400 hours.

Prepared By/Date:
M. Lloyd 2/2/03

TSS Data Update 2/8/03
M. Lloyd

L&AI

STL Seattle

Client Name	Lloyd & Assoc. Inc.
Project Name	Thea Foss
Date Received	02-03-03

General Chemistry Parameters

Client Sample ID 030202/TPS(350)/M/A
Lab ID 111665-01

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	02-05-03	mg/L	4	2

Client Sample ID 030202/TPNE(350)/M/A
Lab ID 111665-02

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	02-05-03	mg/L	4	2

Client Sample ID 030202/TPN(350)/M/A
Lab ID 111665-03

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	02-05-03	mg/L	7	2

Client Sample ID 030202/TPNW(350)/M/A
Lab ID 111665-04

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	02-05-03	mg/L	3	2

Client Sample ID 030202/TPNE(350)/M/DUP
Lab ID 111665-05

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	02-05-03	mg/L	4	2

Client Sample ID 030202/SP7+00/M/A
Lab ID 111665-06

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	02-05-03	mg/L	5	2

STL Seattle

QUALITY CONTROL REPORT

Client Sample ID: Batch QC
Lab ID: 111584-02
QC Batch Number: 1159-045

Method Blank

Parameter	Result (mg/L)	PQL
Total Suspended Solids	ND	2

Duplicate

Parameter	Sample Result (mg/L)	Duplicate Result (mg/L)	RPD (%)	Flag
Total Suspended Solids	ND	ND	0.0	

DMLloyd
2/8/03

Tacoma, Commencement Bay
based on Seattle, Washington (NOAA)

Lat 47°15.30' N Lon 122°25.90' W
Station ID: 1077

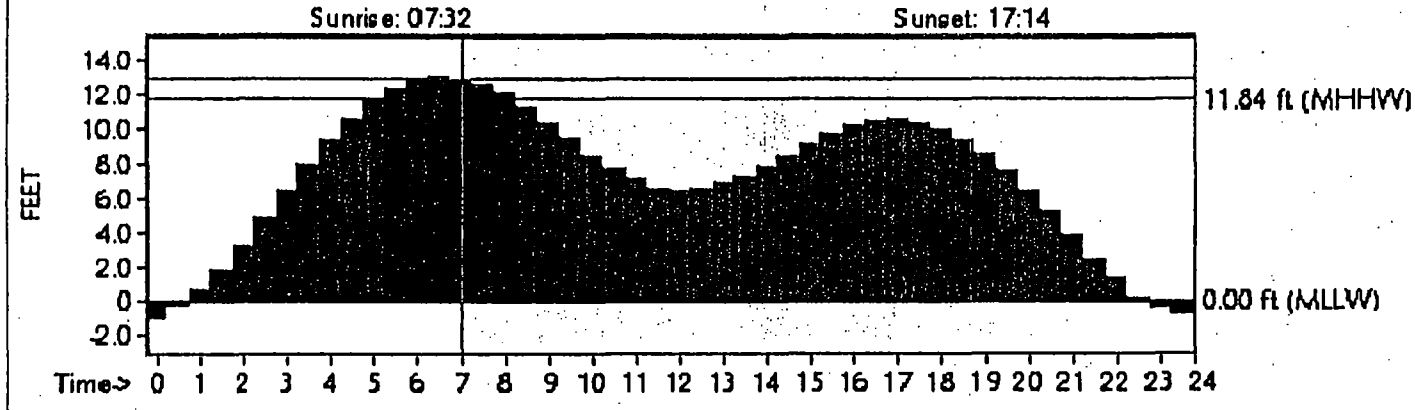
Moonrise: 08:56
Moonset: 18:49
Spring Tide
New moon yesterday

Daily Highs & Lows:

High	06:38	13.1 ft
Low	12:06	6.6 ft
High	16:54	10.7 ft
Low	23:50	-0.9 ft

Average Tides:
Mean Range: 8.10 ft
MHHW: 11.84 ft
Mean Tide: 6.91 ft

Pacific Standard Time



Sunday, February 2, 2003 - 07:00 13.1 ft

Tide Table:

03:15	7.3 ft
03:30	8.1 ft
03:45	8.8 ft
04:00	9.5 ft
04:15	10.1 ft
04:30	10.7 ft
04:45	11.2 ft
05:00	11.7 ft
05:15	12.1 ft
05:30	12.4 ft
05:45	12.7 ft
06:00	12.9 ft
06:15	13.1 ft
06:30	13.1 ft
06:45	13.1 ft
07:00	13.1 ft

PROJECT

Notebook No.

Continued From Page

Calibrate bp 775.5 mm Hg
DO 101.7 % @ 13.8 °C

Munson & Hurlen working in work zones 1 & 3 respect
Munson placing filter material (ground) behind lean.
Hurlen " " " " " "

Continued on Page

Read and Understood By

[signature] 2/2/03 — Signed — Date

030202 — Signed — Date

PROJECT 030202 Thea Fass

Notebook No. _____ 13

Continued From Page _____

030202

Thea's pack Ebb Tide

time	location	Current	DTB	Sample depth	t	Sal	DO	turb	TSS
0855	TPS350	A	41	D 36	9.4	30.1	7.8	2.1	—
0856	346 579			M 20	9.4	29.9	8.1	2.8	030202/TPS350/
0857	acc 5.7	WZ1		S 3	9.3	28.9	8.3	4.7	— M/L
0906	TPSE350		42	D 38	9.4	30.1	7.7	3.5	—
0907	295 596	A		M 22	9.4	30.0	7.9	9.5	—
0908	acc 6.3	WZ1		S 3	9.2	27.4	8.0	7.7	—
0901	TPSW350		43	D 38	9.4	30.1	7.8	36.0	—
0902	209 535	A		M 22	9.4	30.0	8.0	11.2	—
0903	acc 8.7	WZ1		S 3	9.3	28.2	8.2	6.0	—
0911	TPS350		41	D 37	9.4	30.0	7.6	6.7	—
0912	372 518	A		M 20	9.3	29.9	7.8	4.8	—
0913	acc 8.8	WZ3		S 3	9.3	28.4	8.0	6.3	—
0915	TPSE350		41	D 37	9.4	30.1	7.6	3.1	—
0916	420 534	A		M 20	9.4	29.3	7.7	3.0	—
0917	acc 9.4	WZ3		S 3	9.4	28.4	7.9	3.5	—
0918	TPNE350	A	61	D 57	9.4	30.1	7.5	4.7	—
0919	514 493	WZ3		M 30	9.4	29.9	7.8	3.4	030202/TPNE350
0920	acc 6.1			S 3	9.3	28.3	7.9	5.3	M/A
0924	TPN350	A	68	D 63	9.4	30.1	7.6	4.3	—
0925	536 440	WZ3		M 34	9.3	30.0	7.8	2.7	030202/TPN350
0926	acc 6.3			S 3	9.3	27.6	7.9	5.4	— M/A
0930	TPNW350	A	92	D 86	9.4	30.1	7.5	4.3	—
0931	530 385	WZ3		M 46	9.4	30.1	7.7	2.0	030202/TPNW350
0932	acc 6.6			S 3	9.3	29.2	7.9	4.4	M/A

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Read and Understood By

[signature] 2/2/03 [signature] 030202

Signed Date Signed Date

Collect DO 3 ... for analysis by us.
@ 0945

RESULTS: 1) 350 x 0.02 = 7.0 mg/L
2) 365 x 0.02 = 7.3 mg/L

1017 Post Sampling DO Cal ✓ = 97%

Calibration DO @ 11.3°C bp = 776.3 mm Hg over tap H2O
= 101%

Thrb 0, 10.0 mtn

Manson & Hunter both placing filter gravel
off of Same barge.

Continued on Page

Read and Understood By

T Michael Lloyd 2/2/03 [signature] 07 02 02

Signed Date Signed Date

PROJECT Thea Foss

Notebook No. _____ 15

Continued From Page _____

030202 Thea's Park Ebb Flow (cont'd)

Time	Location	Event	DTB	Sample depth		T	Sal	DO	Turb	TSS
Duplicate										
0938	TPNW350	A	92	D	87	9.4	30.1	7.6	4.1	–
0939	530 385	WZ3		M	46	9.4	30.1	7.7	2.4	030202/TPNW350/M/Dupe
0940	acc 5.8			S	3	9.3	29.0	7.9	4.8	–
0947	TPNW150	A	46	D	43	9.4	30.0	7.6	4.1	–
0948	466 428	WZ3		M	23	9.4	29.9	7.8	3.0	–
0949	acc 4.6			S	3	9.3	29.3	7.8	5.4	–
1009	SP7+00	A	40	D	35	9.4	30.1	7.6	2.0	–
1010	940 955	Ambient		M	20	9.4	29.9	7.7	3.4	030202/SP7+00/M/A
1011	acc 4.7			S	3	9.4	29.	7.6	5.4	–
	Puyallup River			D						
				M						
	acc			S						
				Flood Tide						
1325	TPSW350		40	D	35	9.4	30.0	7.3	6.0	–
1326	209 535	B		M	20	9.4	29.8	7.5	10.0	–
1327	acc 5.8	WZ1		S	3	9.4	28.5	7.5	3.7	–
1330	TPS 350	B	38	D	33	9.4	30.1	7.2	3.8	–
1331	246 579	WZ1		M	19	9.4	29.9	7.3	10.8	–
1332	acc = 5.2			S	3	9.4	29.1	7.3	3.4	–
1334	TPSE 350	B	40	D	35	9.4	30.0	7.1	3.2	–
1335	247 580	WZ1		M	20	9.4	29.9	7.1	12.7	–
1336	acc 5.2			S	3	9.4	29.1	7.2	4.2	–
1338	TPNE 350	B	40	D	35	9.4	30.1	6.8	2.3	–
1339	390 556	WZ1		M	20	9.4	29.9	7.0	2.3	–
1340	acc 5.2			S	3	9.4	29.1	7.0	3.9	–

Continued on Page

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[signature] 2/2/03 — Signed — Date

030202 — Signed — Date

1700 Replaced D_2 membrane. DUCal at 102%

Continued on Page

Read and Understood By

Signed	Date	Signed	Date
[illegible]	2/2/83	[illegible]	

PROJECT Theafogs Notebook No. 17

Continued From Page

Thea's Park Flood Tide

Time	Location	Event	DTB	Sample depth	t	Sal	DO	Turb	TSS	
1345	TPN 350	B	40	D 35	9.4	30.1	6.8	1.8	—	Petaluma clarifies
1346	411 502	WZ1		M 20	9.4	30.0	6.9	2.4	—	
1347	acc 5.1			S 3	9.4	28.4	6.9	4.3	—	DLL
1351	TPNE 350	B	42	D 36	9.4	30.1	6.8	2.7	—	
1352	456 526	WZ2		M 21	9.4	30.0	6.9	1.5	—	
1353	acc 6.6			S 3	9.4	28.7	6.8	3.3	—	
1354	TPN 350	B	41	D 36	9.4	30.1	6.9	2.2	—	
1356	477 473	WZ2		M 21	9.4	30.0	6.9	2.4	—	
1357	acc 6.1			S 3	9.4	29.3	6.9	3.3	—	
1358	TPNW 350	B	44	D 42	9.4	30.1	6.9	2.8	—	
1359	470 418	WZ2		M 23	9.4	30.0	6.8	2.1	—	
1400	acc 5.7			S 3	9.4	25.8	7.0	11.0	—	
		C								
1501 ~~1439~~	TPNW 350	C	47	D 42	9.4	30.0	7.2	2.4	—	
1502 ~~1440~~	470 418	WZ2		M 23	9.4	30.0	7.2	2.2	—	
1503 ~~1441~~	acc 5.5			S 3	9.4	28.2	7.3	7.7	—	
1504	TPN 350	C	43	D 38	9.4	30.0	7.5	1.2	—	
1505	477 473	WZ2		M 22	9.4	30.0	7.5	1.1	—	
1506	acc 4.6			S 3	9.4	28.1	7.6	7.5	—	
1511	TPNE 350	C	43	D 38	9.4	30.0	7.6	1.9	—	
1512	456 526	WZ2		M 22	9.4	30.0	7.5	1.2	—	
1513	acc 5.1			S 3	9.4	27.3	7.5	5.1	—	
1515	TPN 350	C	42	D 38	9.4	30.1	7.5	1.7	—	
1516	411 502	WZ1		M 22	9.4	30.0	7.4	1.3	—	
1517	acc 4.6			S 3	9.4	27.4	7.5	3.7	—	

Continued on Page

Read and Understood By

DM Floyd 2/2/02 — Signed — Date

[signature] 030202 — Signed — Date

PROJECT Thea Foss

Notebook No. _____
Continued From Page _____

030202

Calibration Check:

D.O. check in moist air over tap water = 94.0 %

Continued on Page

Read and Understood By

[signature] 2/2/03 [signature] -03020-

Signed Date Signed Date

PROJECT Thea Foss

Notebook No. _____ 19

Continued From Page _____

030202 Thea's Park Flood Tide

time	location	event	DTB	source depth	t	sal	DO	turb	TSS
1518	TPNE350	C	42	D 38	9.4	30.1	7.5	1.2	—
1519	390 556	WZ1		M 22	9.4	30.0	7.4	1.1	—
1520	acc 5.4			S 3	9.4	27.6	7.4	3.6	—
1521	TPSE350		41	D 37	9.4	30.0	7.5	2.4	—
1522	~~420~~ 247 580	C		M 22	9.4	30.0	7.3	2.6	—
1523	acc 6.1	WZ1		S 3	9.4	28.2	7.3	3.0	—
1524	TPS350	C	40	D 35	9.4	30.1	7.3	2.8	—
1525	246 579	WZ1		M 20	9.4	29.9	7.3	6.7	—
1526	acc 1.9			S 3	9.5	28.7	7.2	2.6	—
1528	TPSW350	C	43	D 38	9.4	30.1	7.2	8.7	—
1529	204 535	WZ1		M 22	9.4	30.0	7.2	23.3	—
1530	acc ~~6.1~~ 5.2			S 3	9.4	28.3	7.2	7.0	—
1532	TPSW150	C	45	D 40	9.4	30.0	7.4	22	—
1533	267 501	WZ1		M 23	9.4	29.9	7.3	35	—
1534	acc 4.5			S 3	9.4	24.8	7.7	14	—
1536	TPS150	C	43	D 38	9.4	30.1	7.5	10.2	—
1537	274 528	WZ1		M 22	9.4	29.9	7.2	17	—
1538	acc 6.3			S 3	9.4	24.2	7.5	17	—

Continued on Page

Read and Understood By 030202

[signature] 2/2/03 [signature]

Signed Date Signed Date

Lloyd & Associates, Inc.
38210 SE 92nd Street, Snoqualmie, Washington 98065 425-888-1905(v/f) rml@centurytel.net

February 3, 2003

TRANSMITTAL

To: John O'loughlin
Iain Wingard

From: Michael Lloyd

RE: Weekly Water Quality Monitoring Report 2/3/03

This weekly water quality monitoring provides updated water quality reports with included TSS data. The following water quality report updates include:

January 20 – Totem Marine
January 21 – Totem Marine & Wheeler-Osgood
January 22 – Totem Marine & Wheeler-Osgood
January 23 – Totem Marine & Wheeler-Osgood
January 24 – Totem Marine & Wheeler-Osgood
January 25 – Totem Marine & Thea's Park
January 26 – Thea's Park
January 27 – Totem Marine & Thea's Park
January 28 – Thea's Park

In general work has gone well at both the Wheeler-Osgood and Thea's Park construction areas. Totem Marine is nearly complete and only minor in-water work remains. Currently, our project team will continue monitoring at Thea's' Park as slope capwork is completed. Channel capping should be starting next week. Water quality at Thea's Park remains quite good considering the volume of material being placed.

Michael Lloyd
Lloyd & Associates, Inc.

Cc: CQC, ACC-Hurlen, Manson, File

HURLEN CONSTRUCTION COMPANY

Contractor Reg. Number 223-01 HU-RL-EC*307B6

P.O. Box 80945
700 South Riverside Drive
Seattle, Washington 98108
(206) 763-1230
FAX (206) 762-1854

LETTER OF TRANSMITTAL

DATE 2/3/03	JOB NO. 2002-3
ATTENTION OLOUGHLIN / WINGARD	
RE:	

Phone 763-1230

TO CITY of TACOMA

GENTLEMEN:

WE ARE SENDING YOU ☒ Attached ☐ Under separate cover via _____ the following items:

☐ Shop drawings ☐ Prints ☐ Plans ☐ Samples ☐ Specifications

☐ Copy of letter ☐ Change order ☐ _____

COPIES	DATE	NO.	DESCRIPTION
1	2/3/03		Weekly WQ Report 2/3/03

THESE ARE TRANSMITTED as checked below:

☐ For approval ☐ Approved as submitted ☐ Resubmit _____ copies for approval

☐ For your use ☐ Approved as noted ☐ Submit _____ copies for distribution

☒ As requested ☐ Returned for corrections ☐ Return _____ corrected prints

☐ For review and comment ☐ _____

☐ FOR BIDS DUE _____ 19 _____ ☐ PRINTS RETURNED AFTER LOAN TO US

REMARKS

SENT / RMH

COPY TO _____

SIGNED: R Michael Floyd

If enclosures are not as noted, kindly notify us at once.

Lloyd & Associates, Inc.
38210 SE 92nd Street, Snoqualmie, Washington 98065 425-888-1905 rml@centurytel.net

February 3, 2003

TRANSMITTAL

To: Iain Wingard
John O'Loughlin

Subject: Compliance Monitoring / Thea's Park 2/3/03
Preliminary Data Transmittal (no TSS)

Attached please find results from compliance monitoring for the following work activity:

- Slope Cap Construction at Thea's Park

Thea's Park – Cap Construction.

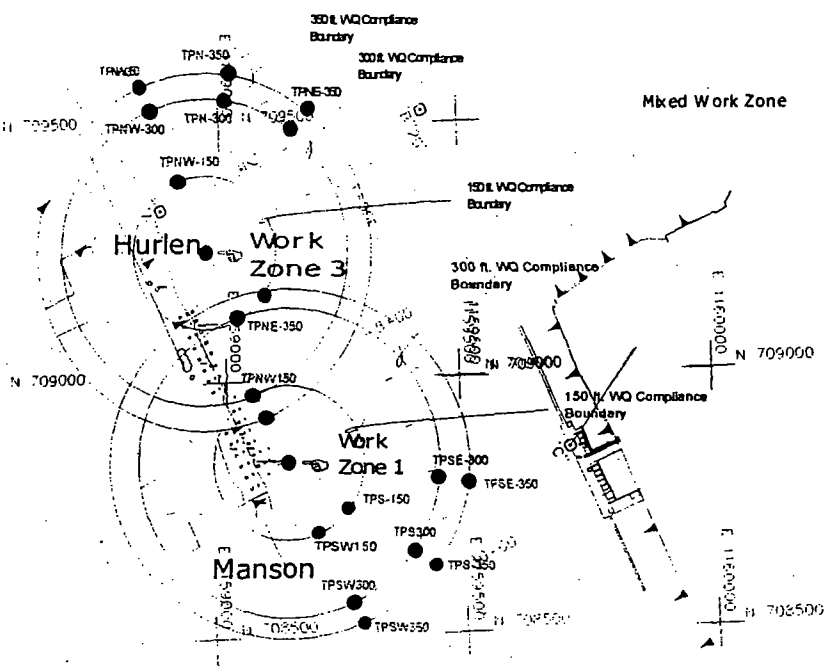
ACC-Hurlen and Manson derricks were working at Thea's Park. Manson worked from the south end and Hurlen worked at the north end of the capping area. Manson Construciton was placing rock over the filter cap material that was previously placed, and ACC-Hurlen was placing filter cap material on the north end

Our project team monitored an ebb tide in the morning session and a flood tide in the afternoon. Because of equipment problems on the Ranier, ACC-Hurlen did not place filter cap material in the afternoon. ACC-Hurlen's derrick was back in operation late in the afternoon. There were no water quality problems observed in the morning session. Minor turbidity was detected in the afternoon at TPSW350 at 14.4 ntu. Turbidity results closer to the work zone at TPS150 were nominal during the afternoon flood tide.

QA/QC.

Field duplicate data again looked very good for sample TPNW350. Typically, there is some variability in turbidity data.

Michael Lloyd
Lloyd & Associates, Inc.



WQM 2 3 03.doc

Overlapping mixing zones **Date: FEB 3** **Thea's Park - Ebb Tide**

Station/Sample	Depth/DTB (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
TPNW350 (down-current/WZ3)	3	28	7.3	4.4	9.1		5,234,530	542,385	912	Manson placing rock on south at
030203/TPNW300/M/A	31	30.0	7.1	3.0	9.4	3			911	WZ1 and Hurlen sweeping piling
Deep	57/62	30.1	7.1	3.9	9.4				910	in WZ3
TPNW350 (down-current/WZ3)	*3*	*28.8*	*7.2*	*3.5*	*9.2*		*5,234,530*	*542,385*	*928*	*Field Duplicate*
030203/TPNW300/M/A-Dup	*34*	*30.1*	*7.1*	*1.1*	*9.4*	*5*			*925*	*Field Duplicate*
Deep	*63/68*	*30.1*	*7.1*	*9.0*	*9.4*				*924*	*Field Duplicate*
TPNW350 (down-current/WZ3)B	3	25.2	7.1	3.6	9.1		5,234,530	542,385	1103	TPNW350-WZ3 revisited
Mid	32	29.9	7.0	3.0	9.4				1102	Fresh water input in shallow
Deep	59/64	30.0	7.0	8.8	9.4				1101	
TPNW150 (down-current/WZ3)	3	29.2	7.1	4.0	9.2		5,234,466	542,425	1107	Work Zone 3
Mid	34	29.8	7.1	5.0	9.4				1106	
Deep	63/68	29.9	7.1	9.3	9.4				1105	
TPN350 (Up-Current/WZ3)	3	28.4	7.2	3.7	9.3		5,234,536	542,440	944	North of Hurlen, Work Zone-3
030203/TPN300/M/A	34	29.9	7.1	1.8	9.3	4			943	
Deep	62/67	30.1	7.1	4.9	9.4				942	
TPNE350 (down-current/WZ3)	3	28.6	7.2	3.3	9.3		5,234,514	542,493	1005	
030203/TPNE300/M/A	23	29.7	7.1	2.0	9.3	3			1003	
Deep	41/46	29.9	7.1	5.8	9.3				1002	
TPSE350 (Mid Zone-WZ3)	3	28.6	7.2	2.4	9.3		5,234,420	542,534	1014	Work Zone-3
Mid	20	29.8	7.1	1.8	9.3				1013	
Deep	35/40	30.0	7.1	2.6	9.3				1012	
TPS350 (Mid Zone-WZ3)	3	28.2	7.2	4.5	9.3		5,234,372	542,518	1019	Work Zone-3
Mid	20	29.4	7.1	2.3	9.4				1018	Manson placing filter material
Deep	35/40	30.0	7.1	2.3	9.4				1017	up slope near toe berm
TPNE350 (Mid-zone/WZ1)	3	28.5	7.1	3.6	9.4		5,234,390	542,556	1025	Work Zone-1
Mid	20	29.8	7.1	2.2	9.4				1024	Manson placing filter material
Deep	35/40	30.0	7.1	2.0	9.4				1023	up slope near toe berm
TPSE350 (Up-Current/WZ1)	3	27.0	7.3	4.1	9.4		5,234,295	542,596	1029	Work Zone-1
Mid	20	29.6	7.2	1.9	9.4				1028	Minor turbidity up-current
Deep	35/39	30.0	7.1	2.2	9.4				1027	
TPS350 (Up-Current/WZ1)	3	28.2	7.3	3.6	9.2		5,234,372	542,518	1033	Work Zone-3
030203/TPS350/M/A	19	29.7	7.2	1.8	9.3	4			1032	Minor turbidity up-current
Deep	34/37	30.0	7.2	2.3	9.4				1031	
TPSW350 (Up-current/WZ1)	3	27.8	7.3	5.8	9.3		5,234,209	542,535	1041	Work Zone-1
Mid	22	29.8	7.2	3.5	9.4				1040	Minor turbidity up-current
Deep	35/40	30.0	7.3	4.2	9.3				1039	
Station SP7+00	3	28.2	7.2	4.3	9.3		5,234,940	542,955	1056	
030203/SP7/M/A	16	29.7	7.1	3.1	9.4	13			1055	
Deep	28/32	29.9	7.3	2.3	9.3				1054	

Pre-Survey Calibration S. High 2/3 102% Final = 102.3% cool, cloudy with some clearing

DO Calibration as per manufacturer's specifications.

Survey work conducted by S. High.

Turbidity Calibration as per manufacturer's specifications. Calibration at 0, 10NTU's 10 ntu check = 9.9 ntu

Very low turbidity throughout survey area

Prepared By/Date:

M. Lloyd 2/3/03

TSS Data Update

M. Lloyd 2/8/03

L&AI

Construction Compliance Monitoring

Date: FEB 3 **Thea's Park - Flood Tide**

	Station/Sample	Depth/DTB (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
Up-Current Monitoring Stations	TPNW350 (Up-current/WZ3)	3	29.0	7.6	3.6	9.5		5,234,530	542,385	1512	Work Zone 3 near Hurlen
	Mid	32	29.9	7.4	1.9	9.4				1511	Hurlen stops work for repairs
	Deep	60/65	30.0	7.5	2.3	9.4				1510	at 1400
	TPN350 (Up-current/WZ3)	3	29.5	7.5	3.1	9.4		5,234,477	542,473	1519	Manson placing riprap
	Mid	34	30.0	7.4	2.1	9.4				1518	over filter material
	Deep	65/69	30.0	7.4	2.3	9.4				1517	
	TPNE350 (Up-current/WZ3)	3	29.1	7.7	4.5	9.5		5,234,514	542,413	1525	
	Mid	28	29.9	7.5	2.7	9.4				1524	
	Deep	50/55	30.0	7.6	2.3	9.4				1523	
Mid-Zone Stations	TPSE350 (Mid Zone/WZ3)	3	29.0	7.6	4.0	9.4		5,234,420	542,534	1533	
	Mid	20	29.8	7.6	1.9	9.4				1532	
	Deep	35/40	30.0	7.6	2.5	9.4				1531	
	TPNE350 (Mid Zone/WZ1)	3	28.5	7.9	4.2	9.5		5,234,390	542,556	1541	Location between derricks
	Mid	20	29.8	7.6	1.7	9.4				1540	
	Deep	35/40	30.0	7.6	1.7	9.4				1539	
Down-Current Monitoing Stations	TPSE350 (Up-current/WZ2)	3	28.4	7.8	4.8	9.5		5,234,295	542,596	1545	
	Mid	20	29.8	7.8	2.0	9.4				1544	Manson placing riprap
	Deep	35/40	30.0	7.8	2.8	9.4				1543	on slope over filter material
	TPS350 (down-current/WZ1)	3	28.8	7.7	3.0	9.5		5,238,246	542,579	1550	
	Mid	20	29.8	7.7	2.6	9.4				1549	
	Deep	35/39	30.0	7.7	3.0	9.4				1545	
	TPSW350 (down-current/WZ1)	3	28.0	7.8	8.9	9.4		5,238,209	542,535	1555	
	Mid	20	29.8	7.7	14.4	9.4				1554	Slight turbidity elevation
	Deep	35/40	29.9	7.7	10.8	9.4				1553	
	TPS150 (Down-Current/WZ1)	3	29.3	7.8	3.2	9.4		5,234,411	542,502	1620	Lower turbidity at 150' than
	Mid	20	29.8	7.8	2.0	9.4				1619	SW350
	Deep	36/41	30.0	7.8	2.1	9.4				1618	

Pre-Survey Calibration D. Berta 102.3% Final = 99.7% warm, partly cloudy, sun breaks in afternoon

DO Calibration as per manufacturer's specifications.

Survey work conducted by D. Berta

Turbidity Calibration as per manufacturer's specifications. Calibration at 0, 10NTU's.

Up-Current points from WZ3 on north end.. Down-current points from WZ1 on south end.

Prepared By/Date:
M. Lloyd 2/3/03

TSS Data Update: M Lloyd 2/8/03

L&AI

STL Seattle

Client Name	Lloyd & Assoc. Inc.
Project Name	Thea Foss
Date Received	02-04-03

General Chemistry Parameters

Client Sample ID 030203/TPNW(350)/M/A
Lab ID 111703-01

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	02-06-03	mg/L	3	2

Client Sample ID 030203/TPNW(350)/M/DUP
Lab ID 111703-02

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	02-06-03	mg/L	5	2

Client Sample ID 030203/TPN(350)/M/A
Lab ID 111703-03

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	02-06-03	mg/L	4	2

Client Sample ID 030203/TPNE(350)/M/A
Lab ID 111703-04

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	02-06-03	mg/L	3	2

Client Sample ID 030203/TPS(350)/M/A
Lab ID 111703-05

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	02-06-03	mg/L	4	2

STL Seattle

Client Sample ID	030203/SP7+00/M/A
Lab ID	111703-06

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	02-06-03	mg/L	13	2

STL Seattle

QUALITY CONTROL REPORT

Client Sample ID: Batch QC
Lab ID: 111751-4
QC Batch Number: 1159-049

Method Blank

Parameter	Result (mg/L)	PQL
Total Suspended Solids	ND	2

Duplicate

Parameter	Sample Result (mg/L)	Duplicate Result (mg/L)	RPD (%)	Flag
Total Suspended Solids	4.4	4	9.52	

AM Lloyd
2/8/03

030203

CALIBRATION NOTES: Bp = 777.1 mm Hg

D.O.: - CALIBRATED IN MOIST AIR OVER TAP WATER
CALIB. CHECK = 102%

TURBIDITY: - CALIBRATED USING MANUFACTURERS 2 POINT METHOD 1) 0.0 NTU = D.I. WATER. 2) 10.0 NTU = CALIBRATION STANDARD SOLUTION.
CALIB. CHECK =

0930 Collect DO sample for TES1, results = 7.6

0730 MANSON in WZ #1 ~~[illegible]~~ Hunter in WZ #3
Hunter removing bottom debris from N ½ of near shore full area

Manson spoil room at Southeast

Continued on Page

Read and Understood By

Daniel A Bate 02/03/03 — Signed — Date

[signature] 030207 — Signed — Date

30 2003 Thurs Pm Light Tide

TIME	LOCATION	EVENT	DTB	SAMPLE DEPTH	TEMP	SAL	DO	TURB	TSS
0910	TPNW350	A	62	D 57	9.4	30.1	7.1	3.9	—
0911	530 385			M 31	9.4	30.0	7.1	3.0	030203/TPNW350/4/1
0912	acc 6.1	WZ3		S 3	9.1	28.0	7.3	4.4	—
Duplicate									
0924	TPNW350	A	68	D 63	9.4	30.1	7.1	9.0	—
0925	530 385			M 34	9.4	30.1	7.1	1.1	030203/TPNW350/4/Dupe
0928	acc 6.1	WZ3		S 3	9.2	28.8	7.2	3.5	—
0942	TPN350	A	67	D 62	9.4	30.1	7.1	4.9	—
0943	536 440			M 34	9.3	29.9	7.1	1.8	030203/TPN350/4/1
0944	acc 7.3	WZ3		S 3	9.3	28.4	7.2	3.7	—
1002	TPNE350	A	44	D 41	9.3	29.9	7.1	5.8	—
1003	514 493			M 23	9.3	29.7	7.1	2.0	030203/TPNE350/4/2
1005	acc 4.7	WZ3		S 3	9.3	28.6	7.2	3.3	—
1012	TPSE350	A	40	D 35	9.3	30.0	7.1	2.6	—
1013	522 578			M 20	9.3	29.8	7.1	1.8	—
1014	acc 4.9	WZ3		S 3	9.3	28.6	7.2	2.7	—
1017	TPS350	A	40	D 35	9.4	30.0	7.2	2.2	—
1018	377 578	WZ3		M 20	9.3	29.4	7.1	2.3	—
1019	acc 5.8			S 3	9.3	28.2	7.2	4.5	—

SP 7400 A
940 385 S
acc

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PROJECT

Notebook No.

Continued From Page

1330 12 4 1 - Low Fill
1 2:15 18000 11161 11FE
15.45 minutes
1415

466 428

Continued on Page

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030203

Signed | Date | Signed | Date

Thins Pavin — Ebb tide

Time	Location	Event	DTB	Sample depth	C	Sal	Do	Turb	TSS
1023	TPNE350	A	40	D 35	9.4	30.0	7.1	2.0	—
1024	340 556			M 20	9.4	29.8	7.1	2.2	—
1025	over 6.3	[WZ1]		S 3	9.4	28.5	7.1	3.6	—
1027	TPSE350	A	39	D 35	9.4	30.0	7.1	2.2	—
1028	~~247 576~~			M 20	9.4	29.6	7.2	1.9	—
1029	295 574 over 5.4	[WZ1]		S 3	9.4	27.0	7.3	4.1	—
	TPS350	A	38						
1031	SET 246 574A			D 34	9.4	30.0	7.2	2.3	—
1032	over 5.4	SET [WZ1]		M 19	9.3	29.7	7.2	1.5	0302 03/TPS350 M/A
1033	~~295 576~~			S 3	9.2	28.2	7.3	3.6	—
	over 4.9								
	246 574								
1039	TPSW350	A	40	D 35	9.3	30.0	7.3	4.2	—
1040	209 535			M 20	9.4	29.8	7.2	3.5	—
1041	over 6.1	[WZ1]		S 3	9.3	27.8	7.3	5.8	—
							~~7.7~~ 7.3		
1054	SP7+00	A	32	D 28	9.4	29.9	~~7.7~~	2.3	—
1055	940 955	Ambient		M 16	9.4	29.7	7.1	3.1	0302 03/SP7+00 M/A
1056	over 9.5			S 3	9.4	28.2	7.2	4.3	—
1101	TPNW350	B	~~78~~ 64	D 59	9.3	30.0	7.0	5.5	—
1102	530 395	[WZ3]		M 32	9.4	29.9	7.0	3.0	—
1103	over 10.0			S 3	9.4	28.2	7.1	3.6	—
1105	TPNW150	B	46	D 42	9.4	29.9	7.1	9.3	—
1106	466 425	[WZ3]		M 23	9.4	29.8	7.1	5.0	—
1107	over 10			S 3	9.3	29.2	7.1	4.0	—

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PROJECT THEA FOSS

Notebook No. _____
Continued From Page _____

030203

1348 - MANSON TURNS BARGE & STARTS PLACING QUARRY SPALLS @ WZ #1 OF THEA'S PARK ~~@~~ RIG REPOSITIONED ≈50' NORTH OF AM POSITION
- PLACING @ ≈ 1 BUCKET (CLAM SHELL) / 1.5-2.0 MINUTES

1400 CALIBRATION NOTES:
BAROMETRIC PRESSURE = 777.9 mm Hg

D.O. CALIBRATED IN MOIST AIR OVER TAP WATER
CALIB CHECK = 102.3%

TURB CALIBRATED WITH MANUFACTURERS 2 POINT METHOD
1) 0.0 NTU = DI WATER 2) 10.0 NTU = CALIB STANDARD SOLUTION.
TURB CHECK = 9.9 IN STAND. SOLUTION AFTER CALIBRATION

- HURLEY NOT PLACING MATERIAL IN AFTERNOON
BARGE HAS FILTER CAP MATERIAL ON BOARD.

- 1415 - 1630 NO VISIBLE TURBIDITY PLUMES OR FLOATABLE DEBRIS ~~[illegible]~~ PB OBSERVED FROM DOCK OR BOAT.

Continued on Page

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Daniel H. Bute 02/03/03 — Signed — Date

D. Michael Floyd 3/2/03 — Signed — Date

PROJECT Thea Foss

Notebook No. _____

Continued From Page _____

030203

Time	Location	Event	DTB	Sample Depth	Temp	Sal	Do	Turb	Flood - Theas Park TSS
		W23							
1510	530 385	C	(65)	D 60	9.4	30.0	7.5	2.3	—
1511	TPNW(350)			M 32	9.4	29.9	7.4	1.9	—
1512	Acc=4.7			S 3	9.5	29.0	7.6	3.6	—
1517	TPN(350)	C	(69)	D 65	9.4	30.0	7.5	2.3	—
1518	536 440	W23		M 34	9.4	30.0	7.4	2.1	—
1519	Acc= 4.6			S 3	9.4	29.5	7.5	3.1	—
1523	TPNE(350)	C	(55)	D 50	9.4	30.0	7.6	2.3	—
1524	390514 715	W23		M 28	9.4	29.9	7.5	2.7	—
1525	Acc= 4.6			S 3	9.5	29.1	7.7	4.5	—
1531	TPSE(350)	C	(40)	D 35	9.4	30.0	7.7	2.5	—
1532	420 ~~[illegible]~~ 518	W23		M 20	9.4	29.8	7.6	1.9	—
1533	Acc= 534 DB 5.31			S 3	9.4	29.0	7.6	4.0	—
1539	TPNE(350)	C	(40)	D 35	9.4	~~29~~ 30.0	7.6	1.7	—
1540	390556	W21		M 20	9.4	29.8	7.6	1.7	—
1541	Acc= 6.5			S 3	9.5	28.5	7.9	4.2	—
1543	TPSE(350)	C	(40)	D 35	9.4	30.0	7.8	2.8	—
1544	295 596	W21		M 20	9.4	29.8	7.8	2.0	—
1545	Acc=6.5			S 3	9.5	28.4	7.8	4.8	—
1548	TPS (350)	C	(39)	D 35	9.4	30.0	7.7	3.0	—
1549	246 579	W21		M 20	9.4	29.8	7.7	2.6	—
1550	Acc= 7.0			S 3	9.5	28.8	7.7	3.0	—
1553	TPSW(350)	C	(40)	D 35	9.4	29.9	7.7	10.8	—
1554	209 535	W21		M 20	9.4	29.8	7.7	14.4	—
1555	Acc= 7.6			S 3	9.4	28.0	7.8	8.9	—

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[signature] 3/2/02 — Signed — Date

PROJECT THEA FOSS

Notebook No. _____
Continued From Page _____

030203

- CALIBRATION NOTES:

DO CHECK = 99.7 % @ 1610

1630 MANSON PLACING QUARRY SPALLS ≈ 30-40 x10³
(REMAING BASED ON A VISUAL ESTIMATE)

Continued on Page

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Daniel H Burk 02/03/03 — Signed — Date

[signature] 3/2/03 — Signed — Date

PROJECT THEA FOSS / 030203

Notebook No. _____

Continued From Page _____

TIME	LOCATION	EVNT	DTB	SAMPLE DEPTH	TEMP	SAL	DO	TURB	TSS
[illegible]	TPS (152)		(41)	D 36	9.4	30.0	7.8	2.1	—
16[illegible]	279 528	WZ-1		M 20	9.4	29.8	7.8	2.0	—
1620	Acc 90	C		S 3	9.4	29.3	7.8	3.2	—

Continued on Page

Read and Understood By

Daniel H. Burke 02/03/03 _____ [signature] 3/2/03

Signed Date Signed Date

American Civil Constructors

Hurlen Construction

PO Box 80945
700 S. Riverside Dr.
Seattle, WA 98108
(206) 763-1230
FAX (206) 762-1854

FAX TRANSMITTAL

Date:	2/4/03	Number of Pages Including this Sheet:	11 pages
Deliver To:	O'LOUGHLIN / WINGARD		
Company:	COT		
Fax Number:	253-272-2412		

From:	M. LLOYD
Company:	ACC / Hurlen Construction
Fax Number:	206-762-1854
Subject	WQ Report 1/3/03

Lloyd & Associates, Inc.
38210 SE 92nd Street, Snoqualmie, Washington 98065 425-888-1905 rml@centurytel.net

February 4, 2003

TSS Update
2/8/03 RML

TRANSMITTAL

To: Iain Wingard
John O'Loughlin

Subject: Compliance Monitoring / Thea's Park 2/4/03
Preliminary Data Transmittal (no TSS)

Attached please find results from compliance monitoring for the following work activity:

- Slope Cap Construction at Thea's Park

Thea's Park – Cap Construction.

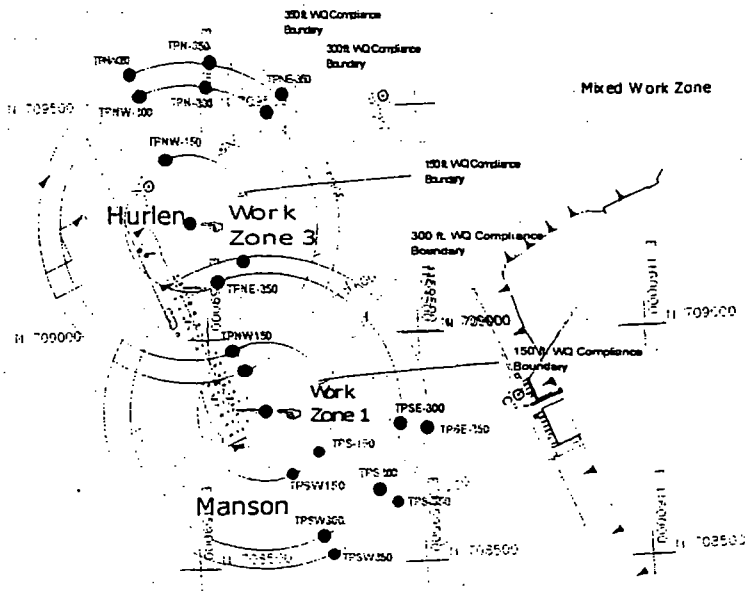
ACC-Hurlen and Manson derricks were working at Thea's Park. Manson worked from the south end and Hurlen continues to work at the north end of the capping area. Manson Construction was placing rock over the filter cap material that was previously placed. ACC-Hurlen was placing filter cap material on the north end. Our project team monitored an ebb tide in the morning session. There were no water quality problems observed in the morning session. However, up-current turbidity was observed at station TPSW350 (32.6 ntu, near the piling for Dock Street) during the morning ebb tide. This data suggests that there may be a source of turbidity that is separate form construction activity at Thea's Park.

Minor turbidity was detected in the afternoon at down-current station TPSW350 at 13.7 ntu At TPSW450 turbidity levels were lower and well within water quality criteria. Very low salinity was also observed at these stations during the flood tide in the afternoon. Turbidity results closer to the work zone at TPSW150 during the afternoon flood tidal event. This sampling station is directly down-current from rock placement on the slope cap of Thea's Park. As expected turbidity levels were lower at greater distances at TPSW400 and TPSW450.

QA/QC.

Field duplicate data again looked very good for sample TPNW350. Winkler titration results (dissolved oxygen) for TPS350 were 7.4 and 7.4 mg/L

Michael Lloyd
Lloyd & Associates, Inc.



Construction Compliance Monitoring

Date: FEB 4 **Thea's Park - Ebb+L23 Tide**

	Station/Sample	Depth/DTB (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
Up-Current Monitoring Stations	**TPSW350 (Up-current/WZ1)**	3	28.6	8.3	3.0	9.3		5,234,209	542,535	1038	Manson placing riprap in WZ1
	Mid	18	29.7	8.2	3.0	9.3				1037	Hurlen placing filter cpa in WZ3
	Deep	31/36	29.9	8.2	32.6	9.3				1036	High turbidity upgradient
	TPS350 (Up-current/WZ1)	3	27.9	8.2	3.0	9.3		5,234,246	542,579	1016	
	030204/TPS350/M/A	20	29.9	8.2	0.3	9.3	3			1015	
	Deep	34/39	30.0	8.2	2.0	9.3				1014	
	TPS350 (Up-current/WZ1	*3*	*29.0*	*8.5*	*2.9*	*9.3*		*5,234,246*	*542,579*	*1016*	*Field Duplicate*
	030204/TPS350/M/A-Dup	*20*	*29.7*	*8.6*	*2.0*	*9.3*	*4*			*1015*	*Field Duplicate*
	Deep	*34/40*	*29.9*	*8.6*	*2.5*	*9.3*				*1014*	*Field Duplicate*
Mid-Zone Stations	**TPNE350 (Mid Zone/WZ3)**	3	28.5	8.0	3.8	9.4		5,234,390	542,556	1010	
	Mid	22	29.5	8.1	2.4	9.4				1009	
	Deep	36/41	30.0	8.1	1.7	9.4				1009	
	TPSE350 (Up-current/WZ1)	3	28.9	8.1	3.2	9.3		523,420	542,534	1005	
	Mid	22	29.6	8.1	3.4	9.3				1004	
	Deep	36/41	30.0	8.2	1.6	9.3				1003	
Down-Current Monitoing Stations	**TPNW350 (Down-current/WZ3)**	3	29.2	8.1	5.2-15.6	9.3		5,234,530	542,385	856	Variable turbidity in channel
	030204/TPNW350/M/A	47	30.0	8.0	2.4	9.3	4			855	Manson placing riprap
	Deep	89/94	30.0	7.9	5.6	9.4				854	*on slope over filter material*
	TPN350 (Down-current/WZ3)	3	28.9	8.1	6.7	9.3		5,234,536	542,440	916	
	030204/TPN350/M/A	36	30.0	8.1	2.3	9.4	*3*			915	Manson stops work briefly for
	Deep	67/72	30.1	8.1	4.1	9.4				914	repairs
	TPNE350 (down-current/WZ3)	3	25.0	8.3	3.5	9.3		5,234,514	542,493	928	
	030204/TPNE350/M/A	20	29.8	8.2	2.2	9.3	*3*			927	
	Deep	54/59	30.1	8.1	1.8	9.3				926	
	TPN150 (Down-Current/WZ1)	3	28.4	7.9	6.0	9.3		5,234,476	542,433	956	
	Mid	23	29.7	8.0	4.8	9.3				955	
	Deep	41/46	29.9	8.0	3.0	9.4				954	
Reference	**Station SP7+00**	3	29.0	8.5	2.9	9.4		5,234,940	542,955	1117	Reference Station
	030204/SP7/M/A	21	29.7	8.6	2.0	9.5	4			1116	
	Deep	39/42	29.9	8.6	2.5	9.4				1115	

Pre-Survey Calibration D. Berta 2/4 102.2% Final = 99.7% cool, cloudy, sun breaks in afternoon

DO Calibration as per manufacturer's specifications.

Survey work conducted by S. High

Turbidity Calibration as per manufacturer's specifications. Calibration at 0, 10NTU's.

Down-Current points from WZ3 on north end. Up-current points from WZ1 on south end.

*Winkler titration on sample 030204/TPS350/M/A = 7.4 and 7.4 mg/L

Prepared By/Date: M. Lloyd 2/4/03

TSS Data Update 2/8/03 PMLloyd 2/8/03

L&AI

Construction Compliance Monitoring

Date: FEB 4 **Thea's Park - Flood Tide**

	Station/Sample	Depth/DTB (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
Up-Current	**TPN350 (Up-current/WZ3)**	3	27.6	7.4	4.9	9.3		5,234,536	542,440	1514	Manson placing riprap
	Mid	32	29.2	7.3	1.9	9.3				1512	over filter material
	Deep	60/65	29.2	7.3	3.7	9.3				1510	
Mid-Zone Stations	**TPSE350 (Mid Zone/WZ3)**	3	27.4	7.3	5.0	9.4		5,234,420	542,534	1519	
	Mid	20	29.1	7.1	4.1	9.3				1518	
	Deep	35/39	29.2	7.2	3.2	9.4				1517	
	TPNE350 (Mid Zone/WZ1)	3	25.5	7.4	5.5	9.4		5,234,390	542,556	1528	Location between derricks
	Mid	20	29.1	7.0	5.1	9.3				1524	
	Deep	35/40	29.2	7.1	3.7	9.4				1522	
Down-Current Monitoing Stations	**TPSE350 (Down-current/WZ1)**	3	27.4	7.3	5.5	9.4		5,234,295	542,596	1528	
	Mid	19	29.1	7.0	2.6	9.4				1524	Manson placing riprap
	Deep	33/38	29.2	7.1	6.7	9.4				1522	on slope over filter material
	TPS350 (down-current/WZ1)	3	27.9	7.2	5.3	9.4		5,234,246	542,579	1543	
	Mid	18	29.1	7.1	2.3	9.4				1542	
	Deep	32/37	29.2	7.2	5.4	9.4				1541	
	TPS150 (Down-Current/WZ1)	3	28.3	7.2	11.1	9.2		5,234,279	542,578	1547	
	Mid	20	29.1	7.1	7.7	9.3				1546	
	Deep	35/39	29.2	7.2	**17.0**	9.3				1545	Turbidity near work zone
	TPSW350 (down-current/WZ1)	3	26.6	7.5	6.2	9.2		5,234,209	542,535	1555	
	Mid	20	29.1	7.0	5.0	9.3				1554	
	Deep	35/39	29.2	7.1	**13.7**	9.3				1553	Slight turbidity elevation
	TPSW150 (down-current/WZ1)	3	28.2	7.3	**38.0**	9.2		5,234,267	542,501	1551	Elevated turbidity at work zone
	Mid	20	29.1	7.1	13.6	9.3				1550	near shoreline where rock
	Deep	35/39	29.2	7.0	**34.0**	9.3				1549	is being placed
	TPSW400 (down-current/WZ1)	3	**24.2**	7.9	7.9	9.1		5,234,267	542,501	1601	Very low salinity/fresh water
	Mid	20	29.0	7.2	5.3	9.4				1605	
	Deep	35/39	29.2	7.1	6.6	9.4				1559	
	TPSW450 (down-current/WZ1)	3	**24.6**	7.7	7.4	9.2		5,234,181	542,548	1605	Very low salinity/fresh water
	Mid	20	28.9	7.1	4.9	9.4				1604	
	Deep	35/40	29.2	7.1	6.5	9.4				1603	

Pre-Survey Calibration (DO) S. High 2/4 102% Final = 94% warm, partly cloudy, sun breaks in afternoon

DO Calibration as per manufacturer's specifications.

Survey work conducted by D. Berta

Turbidity Calibration as per manufacturer's specifications. Calibration at 0, 10NTU's.

Up-Current points from WZ3 on north end. Down-current points from WZ1 on south end.

Fresh water input apparent south of TPSW350.

Prepared By/Date:

M. Lloyd 2/3/03

TSS Data Update 2/8/03 R M Lloyd 2/8/03

L&AI

STL Seattle

Client Name	Lloyd & Assoc. Inc.
Project Name	Thea Foss
Date Received	02-04-03

General Chemistry Parameters

Client Sample ID 030204/TPNW(350)/M/A
Lab ID 111701-01

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	02-06-03	mg/L	4	2

Client Sample ID 030204/TPN(350)/M/A
Lab ID 111701-02

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	02-06-03	mg/L	3	2

Client Sample ID 030204/TPNE(350)/M/A
Lab ID 111701-03

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	02-06-03	mg/L	3	2

Client Sample ID 030204/TPS(350)/M/A
Lab ID 111701-04

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	02-06-03	mg/L	3	2

Client Sample ID 030204/TPS(350)/M/DUP
Lab ID 111701-05

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	02-06-03	mg/L	4	2

STL Seattle

Client Sample ID	030204/SP7+00/M/A
Lab ID	111701-06

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	02-06-03	mg/L	4	2

STL Seattle

QUALITY CONTROL REPORT

Client Sample ID: Batch QC
Lab ID: 111751-4
QC Batch Number: 1159-049

Method Blank

Parameter	Result (mg/L)	PQL
Total Suspended Solids	ND	2

Duplicate

Parameter	Sample Result (mg/L)	Duplicate Result (mg/L)	RPD (%)	Flag
Total Suspended Solids	4.4	4	9.52	

3/8/03

PROJECT THEA FOSS

Notebook No. _____
Continued From Page _____

030204

0745 CALIBRATION NOTES: BAROMETRIC PRESSURE = 778.7 mm Hg
DO - CALIBRATED IN MOIST AIR OVER TAP WATER
CALIBRATION CHECK = 102.2%

TURB - CALIBRATED USEING MANUFACTURERS 2 POINT METHOD 1) 0.0 NTU = D.I. WATER 2) 10.0 NTU = CALIBRATION STANDARD SOLUTION.
CALIBRATION CHECK = 10.2 IN STANDARD SOLUTION AFTER CALIBRATION

0730 MANSON PLACING ROCK - QUARRY SPALLS IN WORK ZONE #1 OF THEAS PARK HURLEN PLACING FILTER CAP(?) IN WORK ZONE #3

0900 TPNW (352) SURFACE WATER APPEARS GENERALLY HIGHER TURBIDITY IE NO DISTINCT TURBIDITY PLUME AND VERY MINOR AMOUNTS OF FLOAT DEBRIS
0915 TPN (352) SURFACE WATER APPEARS LESS TURBID THAN NOTED ABOVE NO FLOATABLE DEBRIS OR TURBIDITY PLUME OBSERVED.
0952 CALIBRATION CHECK ON DO. -
CALIB ~~OVER~~ IN MOIST AIR OVER TAP WATER
CHECK BEFORE CAL = 104.2 %
CHECK AFTER CALIBRATION
= 102.5 %

NOTE: ≈ 0915 - OBSERVED BROKEN CABLE? ON MANSON RIG - MANSON STOPS PLACING MATERIAL

Continued on Page

Read and Understood By

Daniel A. Burke 02/04/03 | 030204

Signed | Date | Signed | Date

PROJECT THEA FOSS

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030204

COMBINED

TIME	LOCATION	EVENT & WZ	DTB	SAMPLE DEPTH	THEA'S PARK TEMP	SAL	DO	TURB	EBB TIDE WORK ZONES TSS
0854	TPNW(350)	WZ-3	94	D 89	9.4	30.0	7.9	5.6	—
0855	530 335	A		M 47	9.3	30.0	8.0	2.4	030204/TPNW(350)/M/A
0856	Acc=6.6			S 3	9.3	29.2	8.1	15.6	—
	NOTE: SURFACE READING RANGED FROM 5.2-15.6								
0914	TPN(350)	WZ-3	72	D 67	9.4	30.1	8.1	4.1	—
0915	530 ~~546~~ 440	A		M 36	9.4	30.0	8.1	2.3	030204/TPN(350)/M/A
0916	Acc=6.3			S 3	9.3	28.9	8.1	6.7	—
0926	TPNE(350)	WZ-3	59	D 54	9.3	30.1	8.1	1.8	—
0927	514 493	A		M 30	9.3	29.8	8.2	2.2	030204/TPNE(350)/M/A
0928	Acc=6.1			S 3	9.3	25.0	8.3	3.5	—
0954	TPN(150)	WZ-3	46	D 41	9.3	29.9	8.0	3.0	—
0955	476 433	A		M 23	9.3	29.7	8.0	4.8	—
0956	Acc=6.8			S 3	9.2	28.4	7.9	6.0	—
1003	TPSE(350)	WZ-3	41	D 36	9.3	30.0	8.2	1.6	—
1004	420 534	A		M 22	9.3	29.6	8.1	3.4	—
1005	Acc=5.2			S 3	9.3	28.9	8.1	3.2	—
1008	TPNE(350)	WZ-1 A	41	D 36	9.3	30.0	8.1	1.7	—
1009	390 556			M 22	9.3	29.5	8.1	2.4	—
1010	Acc=6.1			S 3	9.3	28.5	8.0	3.8	—
1014	TPS(350)	WZ-1	39	D 34	9.3	30.0	8.2	2.0	—
1015	246 579	A		M 20	9.3	29.9	8.2	2.3	030204/TPS(350)/M/A
1016	Acc=6.8			S 3	9.3	27.9	8.2	3.0	—
1036	TPSW(350)	WZ-1	36	D 31	9.3	29.9	8.2	32.6	—
1037	209 535	A		M 18	9.3	29.7	8.2	3.0	—
1038	Acc=6.6			S 3	9.3	28.6	8.3	3.0	—

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PROJECT THEA FOSS
Notebook No.
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030204

TPS (352)/M/DUP

★ SPLIT SAMPLE FOR DO BY WINKLER METHOD 1) CITY OF TACOMA 2) EPA LAB

1105 HURLEN RIG PLACING HABITAT MIX - FILTER CAP? MATERIAL AFTER SHUT DOWN PERIOD 0915 - 1105

D.O. CALIBRATION CHECK = 103.7%

WINKLER TITRATION RESULTS:

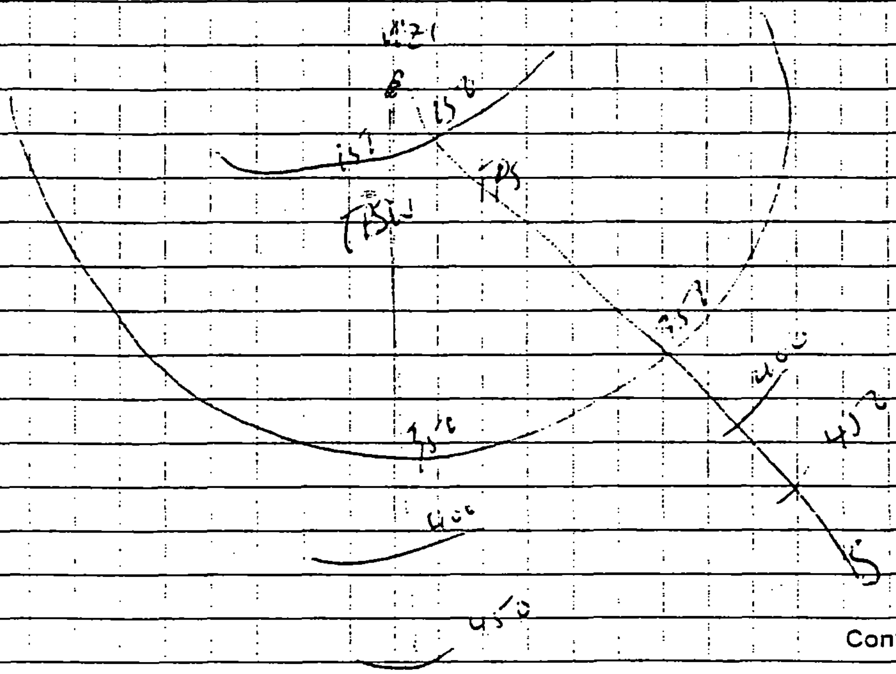
0220

1) 370 × 0.2 = 7.4 mg/L
2) 368 × 0.2 = 7.4 mg/L

1420 Recalibrate: Sp. Cond @ 50 mS; DO @ DO const. [illegible] = 102%; Turb [illegible] = 778. [illegible]

1230 - 1430 Hurlen & Manson "setting up", changing bunges & [illegible] & doing maintenance & [illegible] elevations

1445 Both rigs begin placing material: Hurlen rap @ NZ 3 ([illegible] peak) & Manson [illegible] material ~ NZ 1



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Daniel A. Berke 02/04/03
Signed

Date

SW 030204
Signed

Date

PROJECT THEA FOSS

Notebook No. _____

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030204

Thea's Park – Ebb Tide

Time	Location	WZ Event	DTB	Sample Depth		Temp Sal	Sal	DO	TURB	TSS
1031	TPS(350)	WZ-1	40	D	34	9.3	30.0	8.3	2.1	—
1032	246 579	A		M	20	9.3	29.5	8.3	4.2	030204/TPS(350)/M/DUP
1033	Acc=8.0			S	3	9.3	28.6	8.2	2.3	—
1115	SP 7100	A	37	D	32	9.4	29.9	8.6	2.5	—
1116	940 955			M	19	9.5	29.7	8.6	2.0	030204/SP 7100/M/A
1117	Acc=11.2			S	3	9.4	29.0	8.5	2.9	—

Thea's Park – Flood Tide

1510	TPN350	B	65	D	60	9.3	29.2	7.3	3.7	—
1512	536 440			M	32	9.3	29.2	7.3	1.9	—
1514	acc 5.7	WZ3		S	3	9.3	27.6	7.4	4.9	—
1517	TPSE350	B	39	D	35	9.4	29.2	7.2	3.2	—
1518	420 534	WZ3		M	20	9.3	29.1	7.1	4.1	—
1519	acc 7.0			S	3	9.4	27.4	7.3	5.0	—
1522	TPNE350	B	40	D	35	9.4	29.2	7.1	3.7	—
1524	390 556			M	20	9.3	29.1	7.0	5.1	—
1525	acc 6.8	WZ1		S	3	9.4	25.5	7.4	5.5	
1526	TPSE350	B	38	D	33	9.4	29.2	7.1	6.7	—
1527	295 594	WZ1		M	19	9.4	29.1	7.0	2.6	—
1528	acc 6.7			S	3	9.4	27.4	7.3	5.5	—
1534 41	TPS350	B	37	D	32	9.4	29.2	7.2	5.4	—
1534 42	246 579			M	18	9.4	29.1	7.1	2.3	—
1534 43	acc 9.6	WZ1		S	3	9.4	27.9	7.2	5.3	—
1553	TPSW350	B	39	D	35	9.3	29.2	7.1	13.7	—
1554	209 535	WZ1		M	20	9.3	29.1	7.0	5.0	—
1555	acc 7.5			S	3	9.2	26.6	7.5	6.2	—

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PROJECT

Notebook No.

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1615 Post Sampling Calibration on DO = 94% @ 10°C

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PROJECT Thea Foss

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030204

Thea's Park – Flood Tide

Time	Location	Event	DTB	Sampler depth	Temp	Sal.	DO	Turb	TSS
1545	TPS 150	B	39	D 35	9.4	29.2	7.2	17.0	—
1546	279 578			.4 20	9.4	29.1	7.1	7.7	—
1547	acc 7.1	WZ1		S 3	9.3	28.3	7.2	11.1	—
1549	TPSW150	B	39	D 35	9.3	29.2	7.0	34.0	—
1550	267 501			.4 20	9.3	29.1	7.1	13.6	—
1551	acc 7.3	WZ1		S 3	9.3	28.2	7.3	38.0	—
1532	TPS 450	B	37	D 32	9.3	29.2	7.2	7.1	—
1533	227 603			.4 18	9.4	29.1	7.3	3.3	—
1534	acc 7.1	WZ1		S 3	9.3	26.9	7.3	5.8	—
1535	TPS 400	B	37	D 32	9.3	29.2	7.2	6.0	—
1536	236 590			.4 18	9.4	29.1	7.0	3.2	—
1537	acc 7.3	WZ1		S 3	9.4	27.8	7.2	5.4	—
1559	TPSW400	B	39	D 35	9.4	29.2	7.1	6.6	—
1600	195 541	WZ1		.4 20	9.4	29.0	7.2	5.3	—
1601	acc 7.3			S 3	9.1	24.2	7.9	7.9	—
1603	TPSW 450	B	40	D 35	9.4	29.2	7.1	6.5	—
1604	181 548	WZ1		.4 20	9.4	28.9	7.1	4.9	—
1605	acc 8.2			S 3	9.2	24.6	7.7	7.4	—

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[signature] 2/4/03 — 030204

Signed Date Signed Date

American Civil Constructors

Hurlen Construction

PO Box 80945
700 S. Riverside Dr.
Seattle, WA 98108
(206) 763-1230
FAX (206) 762-1854

FAX TRANSMITTAL

Date:	2/5/03	Number of Pages Including this Sheet:	
Deliver To:	O'LOUGHLIN/WINGARD		
Company:	COT.		
Fax Number:	253-272-2412		

From:	MICHAEL LLOYD
Company:	ACC / Hurlen Construction
Fax Number:	206-762-1854
Subject	WQ Report 2/4/03

Lloyd & Associates, Inc.
38210 SE 92nd Street, Snoqualmie, Washington 98065 425-888-1905 rml@centurytel.net

February 5, 2003

TRANSMITTAL

TSS Data Updated
2/11/03
RML

To: Iain Wingard
John O'Loughlin

Subject: Compliance Monitoring / Thea's Park 2/5/03
Preliminary Data Transmittal (no TSS)

Attached please find results from compliance monitoring for the following work activity:

- Slope Cap Construction at Thea's Park
- Ambient Monitoring Revisited

Thea's Park – Cap Construction.

ACC-Hurlen and Manson derricks were working at Thea's Park. Manson worked in the middle portion of the cap and Hurlen continued to work at the north end of the capping area. Manson Construction was placing rock over the filter cap material that was previously placed. ACC-Hurlen was placing filter cap material on the north end. Our project team monitored a flood in the afternoon. During the morning, the crews were frequently stopped to do depth soundings and reposition derricks and barges. There were no water quality problems observed in the afternoon session.

Minor turbidity was detected at down-current station TPSW350 below water quality criteria.

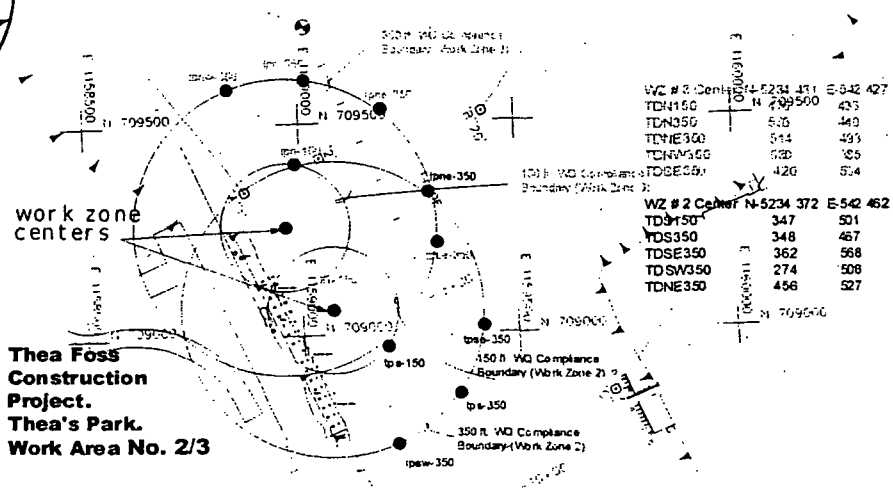
Ambient Water Quality Monitoring Revisited.

Ambient water quality was monitored at all stations in Thea Foss and St. Paul Waterways while work was stopped or minimal at Thea's Park. As expected dissolved oxygen levels were generally 1.5 to 2 mg/L higher than work conducted at the beginning of December. There was a slight increase in overall turbidity from December. Salinity levels have also dropped substantially since early December.

QA/QC.

Field duplicate data again looked very good for sample TPS350. Winkler titration results (dissolved oxygen) for TPS350 were 7.4 and 7.2 mg/L

Michael Lloyd
Lloyd & Associates, Inc.



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Ambient Monitoring - Revisited **Date: FEB 5** **Thea Foss/St. Paul Waterways**

	Station/Sample	Depth/DTB (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	GPS Coordinates (N/E, m - NAD83)		Time	Comment
Station Thea Foss 60+00	Shallow	3	26.5	7.9	3.5	9.2	5,233,780	542,933	946	Lower salinity indicative of
	Mid	17	28.8	7.3	2.5	9.4			945	fresh water input in shallow
	Deep	28/33	28.8	7.5	2.8	9.4			945	
	Station Averages		*28.0*	*7.6*	*2.9*	*9.3*				*Water appears to be somewhat*
	Station Maximums		*28.8*	*7.9*	*3.5*	*9.4*	*TSS Data Not Collected*			*cloudy. Temperature is 7.5 ° C*
	Station Minimums		*26.5*	*7.3*	*2.5*	*9.2*				
Station Thea Foss 30+00	Shallow	3	26.8	8.2	3.1	9.2	5,233,688	542,888	949	Station located near Totem
	Mid	20	29.0	7.9	1.8	9.3			949	Marine compliance monitoring
	Deep	34/39	29.1	8.2	3.8	9.3			948	stations
	Station Averages		*28.3*	*8.1*	*2.9*	*9.3*				*No oil sheen or debris in water*
	Station Maximums		*29.1*	*8.2*	*3.8*	*9.3*	*TSS Data Not Collected*			
	Station Minimums		*26.8*	*7.9*	*1.8*	*9.2*				
Station Thea Foss 2+00	Shallow	3	27.8	8.1	2.6	9.2	5,234,465	542,492	1021	Station located near Thea's Park
	Mid	21	28.8	8.1	2.3	9.3			1020	Manson/Hurlen not working
	Deep	37/42	29.2	8.1	1.6	9.3			1019	while depth survey is conducted
	Station Averages		*28.6*	*8.1*	*2.2*	*9.3*				*No oil sheen or debris in water*
	Station Maximums		*29.2*	*8.1*	*2.6*	*9.3*	*TSS Data Not Collected*			
	Station Minimums		*27.8*	*8.1*	*1.6*	*9.2*				
Station St. Paul 7+00	Shallow	3	27.9	8.1	2.6	9.4	5,234,465	542,492	1033	Station located near piling
	Mid	20	29.1	8.1	2.3	9.4			1032	removal area between St. Paul
	Deep	35/40	29.1	8.0	1.6	9.3			1031	and Middle Waterway.
	Station Averages		28.7	8.1	2.2	9.4				
	Station Maximums		29.1	8.1	2.6	9.4	030205/SP7/M/A = 4 mg/L ✓			
	Station Minimums		27.9	8.0	1.6	9.3				
Survey Summary	Survey Ambient Averages		28.4	8.0	2.5	9.3				
	Survey Ambient Maximums		29.2	8.2	3.8	9.4				
	Survey Ambient Minimums		26.5	7.3	1.6	9.2				

Pre-Survey Calibration S. High 2/5 102% Final = 100% cool, cloudy, sun breaks in afternoon

DO/Turbidity calibration as per manufacturer's (YSI) specifications.

Saturated air for DO and two point (0.0 and 10.0 ntu standards) for turbidity with YSI Sonde.

Water quality monitoring survey conducted while work was stopped at Thea's Park for depth survey.

Turbidity averages similar to start of project with 0.5 increase in the average turbidity

Salinity has dropped significantly since beginning of project work

Prepared By/Date:

M. Lloyd 2/5/03

M Lloyd 2/11/03

L&AI

Construction Compliance Monitoring

Date: FEB 5 **Thea's Park - Flood Tide**

	Station/Sample	Depth/DTB (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
Up-Current Monitoring Stations	**TPNW350 (Up-current/WZ3)**	3	27.1	8.3	3.6	9.1		5,234,536	542,440	1428	Manson placing riprap
	Mid	45	29.1	8.0	8.0	9.3				1427	over filter material
	Deep	84/89	29.3	8.3	4.4	9.3				1426	
	TPN350 (Up-current/WZ3)	3	27.8	8.2	3.8	9.1		5,234,536	542,440	1441	Hurlen placing filter material
	030205/TPN350/MB	32	29.0	8.0	4.5	9.3	4			1440	up slope
	Deep	59/64	29.2	8.0	8.4	9.3				1439	
	TPNE350 (Up-current/WZ3)	3	28.2	8.1	2.4	93.0		5,234,536	542,440	1452	
	Mid	26	29.0	7.8	1.5	9.5				1451	
	Deep	47/52	29.2	7.9	3.8	9.3				1450	
Mid-Zone Stations	**TPSE350 (Mid Zone/WZ3)**	3	26.9	8.1	2.9	9.3		5,234,420	542,534	1500	
	Mid	18	28.8	7.9	1.6	9.4				1458	
	Deep	31/36	29.1	7.9	2.9	9.3				1457	
	TPNE350 (Mid Zone/WZ2)	3	26.5	8.2	2.8	9.3		5,234,456	542,527	1503	Location between/near derricks
	Mid	19	28.9	7.9	1.6	9.4				1502	
	Deep	31/36	29.0	7.9	3.3	9.3				1501	
Down-Current Monitoing Stations	**TPSE350 (Down-current/WZ2)**	3	27.7	7.9	3.1	9.3		5,234,362	542,568	1507	
	030205/TPSE350/MB	18	28.8	7.9	1.4	9.4	2			1506	Manson placing riprap
	Deep	31/36	29.1	7.9	2.4	9.3				1505	on slope over filter material
	TPS350 (down-current/WZ2)	3	27.4	7.9	2.7	9.3		5,234,312	542,550	1519	Hurlen placing filter material
	030205/TPS350/MB	17	28.8	7.8	5.2	9.4	3			1518	
	Deep	30/35	29.1	7.8	4.8	9.3				1517	
	TPS350 (down-current/WZ2)	*3*	*27.9*	*7.9*	*2.7*	*9.3*		*5,234,312*	*542,550*	*1525*	*Field Duplicate*
	030205/TPS350/MB-Dup	*17*	*28.8*	*7.8**	*5.2*	*9.4*	*4*			*1524*	*Field Duplicate*
	Deep	*30/35*	*29.1*	*7.8*	*4.8*	*9.3*				*1523*	*Field Duplicate*
	TPSW350 (Down-Current/WZ2)	3	27.7	7.7	5.1	9.3		5,234,274	542,506	1536	
	030205/TPSW350/MB	20	28.9	7.8	7.6	*9.3*	*18*			1535	
	Deep	35/39	29.1	7.8	3.6	*9.3*				1534	
	TPS150 (Down-Current/WZ2)	3	27.4	7.9	**13.3**	*9.3*		5,234,347	542,501	1547	
	Mid	19	28.8	7.7	**27.7**	*9.3*				1546	Elevated turbidity at work zone
	Deep	32/37	29.1	7.9	9.1	*9.3*				1545	WZ-1 during flood tide

Pre-Survey Calibration (DO) S. High 2/4 102% Final = 100% cool, cloudy, sun breaks in afternoon

DO Calibration as per manufacturer's specifications.

Survey work conducted by D. Berta

Turbidity Calibration as per manufacturer's specifications. Calibration at 0, 10NTU's.

Up-Current points from WZ3 on north end. Down-current points from WZ2 on south end.

*Winkler titration on sample 030205/TPS350/M/B-Dup = 7.4 and 7.2 mg/L.

Prepared By/Date:
M. Lloyd 2/3/03

TSS Data Update 2/11/03 [illegible] 2/11/03

L&AI

2/13/03

STL Seattle

Client Name	Lloyd & Assoc. Inc.
Project Name	Thea Foss
Date Received	02-06-03

General Chemistry Parameters

Client Sample ID 030205/SP7+00/M/A
Lab ID 111762-01

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	02-07-03	mg/L	4	2

Client Sample ID 030205/TPN(350)/M/B
Lab ID 111762-02

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	02-07-03	mg/L	4	2

Client Sample ID 030205/TPSE(350)/M/B
Lab ID 111762-03

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	02-07-03	mg/L	2	2

Client Sample ID 030205/TPS(350)/M/B
Lab ID 111762-04

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	02-07-03	mg/L	3	2

Client Sample ID 030205/TPS(350)/M/DUP
Lab ID 111762-05

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	02-07-03	mg/L	4	2

Client Sample ID 030205/TPSW(350)/M/B
Lab ID 111762-06

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	02-07-03	mg/L	18	2

STL Seattle

QUALITY CONTROL REPORT

Client Sample ID: Batch QC
Lab ID: 111775-9
QC Batch Number: 1159-050

Method Blank

Parameter	Result (mg/L)	PQL
Total Suspended Solids	ND	2

Duplicate

Parameter	Sample Result (mg/L)	Duplicate Result (mg/L)	RPD (%)	Flag
Total Suspended Solids	6	5.96	0.669	

2/11/03

PROJECT THEA FOSS

Notebook No. _____
Continued From Page _____

030205
WEATHER: CLEAR-SUNNY, AM FOG / FLAT WATER SURF. NO BREEZE
CALIBRATION NOTES:

D.O. CALIBRATION - CALIBRATED IN MOIST AIR OVER TAP WATER -
BAROMETRIC PRESSURE = 777.8 mm Hg
CALIB. CHECK = 102.0 %

TURB CALIBRATION - CALIBRATED USEING MANUFACT. 3 POINT METHOD 1) 0.0 NTU = D.I. WATER
2) 10.0 NTU = CALIBRATION STANDARD SOLUTION
CALIBRATION CHECK =

0900 MANSON PLACING OCCASIONAL BUCKETS OF HABITAT MIX/FILTER CAP? IE GRAVEL

0800 THEA FOSS BACKGROUND STATIONS WATER APPEARS CLEAR NO FLOT. DEBRIS.

MANSON STOPS PLACING MATERIAL - MOVING BARGE.

1110 CALIBRATION CHECK = 102.0 % FOR D.O.

13-1400 Manson moving habitat mix on intermittent basis (Hulen not dredging material)
1400 — " (" " " ")

1420 Recal DO = 102 % Turb 0, 10.0
14 30 Hulen placing gravel.

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Read and Understood By

[signature] 030205 | [signature] 030205
Signed | Date | Signed | Date

030205

Time	Location	Event WZ	DTB	Sample Depth	Temp	Sal	DO	Turb		TSS
0945	TF-60+00	A	(33)	D 28	9.4	28.8	7.5	2.8		—
0945	780 833			M 17	9.4	28.8	7.3	2.5		—
0946	Acc 7.2			S 3	9.2	26.5	7.9	3.5		—
0948	TF 30+00	A	(34)	D 37	9.3	29.1	8.2	3.8		—
0949	658 833			M 20	9.3	29.0	7.9	1.8		—
0949	Acc=6.9			S 3	9.2	26.8	8.2	3.1		—
1019	TF 2+00	A	(42)	D 37	9.3	29.2	8.0	1.6		—
1020	465 442			M 21	9.3	28.8	8.1	2.3	~~030~~	—
1021	Acc=5.9			S 3	9.2	27.8	8.1	2.6		—
1031	SP 7+00	A	(40)	D 35	9.3	29.1	8.4	2.0		—
1032	940 955			M 20	9.4	29.1	8.2	2.0	030205/SP 7+00/M/A	
1033	Acc=6.1			S 3	9.4	27.9	8.0	2.3		—
				Flood Tide						
1426	TPNW350		(89)	D 84	9.3	29.3	8.0	4.4		—
1427	530 355	B		M 45	9.3	29.1	8.0	8.0		—
1428	acc 5.7	WZ3		S 3	9.3	27.1	8.3	3.6		—
1439	TPN350	B	(64)	D 59	9.3	29.2	8.0	8.4		—
1440	~~33~~ 536 ~~551~~	WZ1		M 32	9.3	29.0	8.0	4.5	030205/TPN350/M/B	
1441	acc 5.5 440			S 3	9.1	27.8	8.2	5.8		—
1450	TPNE350		(52)	D 47	9.3	29.2	7.9	3.8		—
1451	514 493	WZ3		M 26	9.5	29.0	7.8	1.5		—
1452	acc 4.8			S 3	9.3	28.2	8.1	2.4		—
1457	TPSE		(36)	D 31	9.3	29.1	7.9	2.0		—
1458	420 534	WZ3		M 18	9.4	28.8	7.9	1.6		—
1500	acc 5.2			S 3	9.3	26.9	8.1	2.9		—

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[signature] 030205 — Signed — Date

[signature] 030205 — Signed — Date

1530 DO sample for IN Water 7.4
" " " 7.2

Post sampling DO calc = 100 %

Continued on Page

Read and Understood By

R Michael Floyd 2/5/03 030705

Signed Date Signed Date

030205 Thea's Park – Flood Tide

	location	event	DTB	Sample depth		Temp	Sal	DO	Turb	TSS
1501	TPNE350	B	38	D	33	9.4	29.0	7.9	3.3	–
1502	456 527			M	19	9.4	28.9	7.9	1.6	–
1503	acc 5.2	WZ2		S	3	9.3	26.5	8.2	2.8	–
1505	TPSE350	B	36	D	31	9.3	29.1	7.9	2.4	–
1506	~~2~~ 362/568			M	18	9.4	28.8	7.9	1.4	030205/TPSE350/M/B
1507	~~274 506~~	WZ2		S	3	9.3	27.7	7.9	3.1	–
	acc = 4.7									
1517	TPS350	B	35	D	30	9.3	29.1	7.8	4.8	–
1518	312 550			M	17	9.4	28.8	7.8	5.2	030205/TPS350/M/B
1519	acc 8.2	WZ2		S	3	9.3	27.4	7.9	2.7	–
Duplicate										
1523	TPS350	B	35	D	30	9.3	29.0	7.8	4.7	–
1524	312 550			M	17	9.4	28.8	7.8	4.2	030205/TPS350/M/Dupe
1525	acc 9.6	WZ2		S	3	9.3	27.9	7.8	2.5	–
1[illegible]4	TPSW350	B	39	D	35	9.3	29.2	7.8	3.6	–
1535	274 506			M	20	9.3	28.9	7.8	7.6	030205/TPSW350/M/B
1536	acc 7.4	WZ2		S	3	9.3	27.7	7.7	5.1	–
1545	TPS150	B	37	D	32	9.3	29.1	7.9	9.1	–
1546	347 501			M	19	9.4	28.8	7.7	27.7	–
1547	acc 7.0	WZ2		S	3	9.3	27.4	7.9	13.3	–

Continued on Page

Read and Understood By 030205

[signature] 2/5/03

Signed Date Signed Date

American Civil Constructors

Hurlen Construction

PO Box 80945
700 S. Riverside Dr.
Seattle, WA 98108
(206) 763-1230
FAX (206) 762-1854

FAX TRANSMITTAL

Date:	2/6/03	Number of Pages Including this Sheet:	8
Deliver To:	O'LOUGHLIN / WINGARD		
Company:	COT		
Fax Number:	272-2417		

From:	M. LLOYD
Company:	ACC / Hurlen Construction
Fax Number:	206-762-1854
Subject	WQ Report 2/5/03

FILE
CQC
MANSON
L+AI

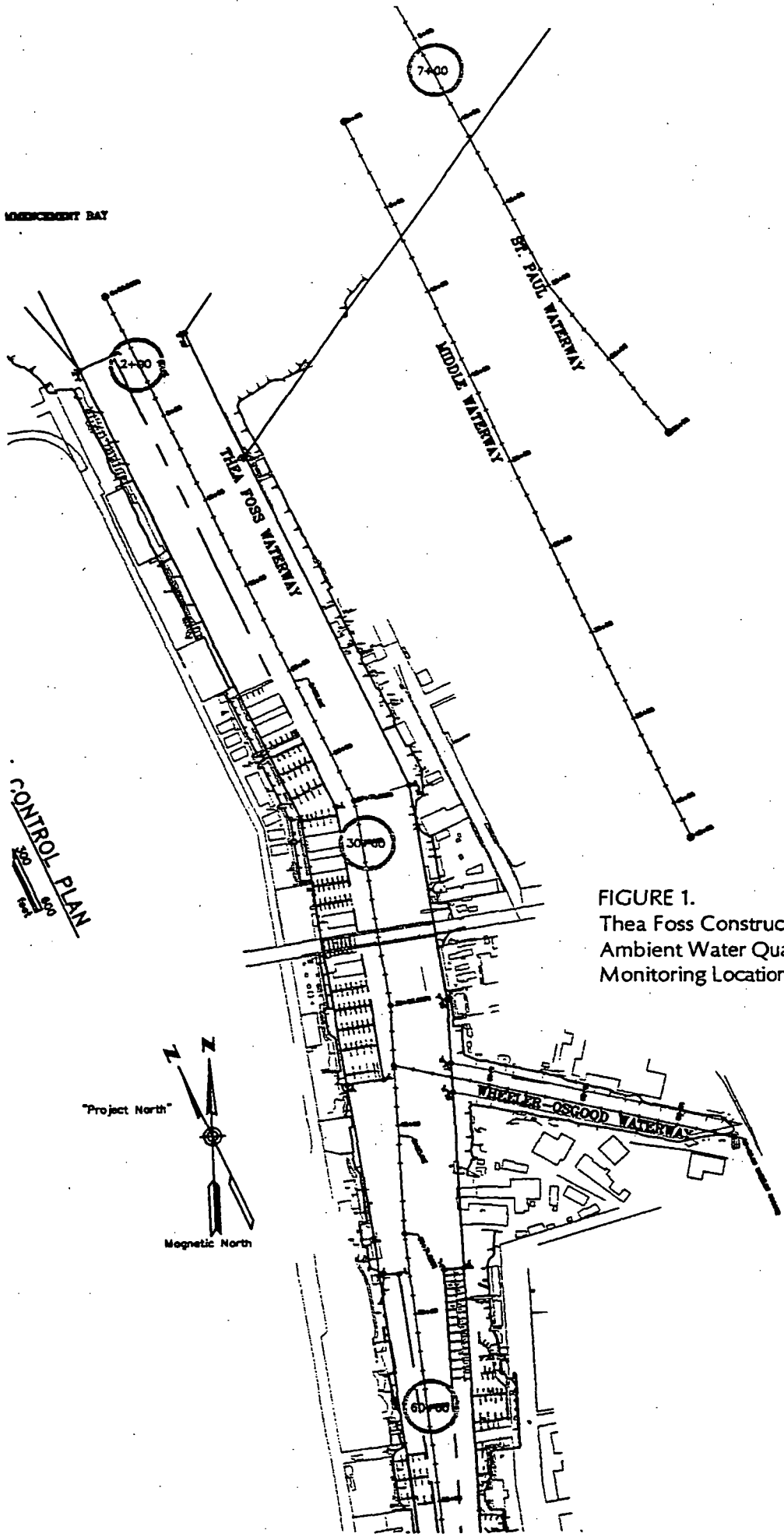


FIGURE 1.
Thea Foss Construction Project;
Ambient Water Quality
Monitoring Locations

Lloyd & Associates, Inc.
38210 SE 92nd Street, Snoqualmie, Washington 98065 425-888-1905 rml@centurytel.net

February 6, 2003

TSS Data Updated 2/11/03 RML

TRANSMITTAL

To: Iain Wingard
John O'Loughlin

Subject: Compliance Monitoring / Thea's Park 2/6/03
Preliminary Data Transmittal (no TSS)

Attached please find results from compliance monitoring for the following work activity:

- Slope Cap Construction at Thea's Park
- Ambient Monitoring Revisited

Thea's Park – Cap Construction.

ACC-Hurlen was working at Thea's Park in the morning. Manson worked in the middle portion of the cap. In the afternoon Hurlen returned from Totem to place filter material at the north end of the capping area. Manson Construction was placing rock over the filter cap material that was previously placed. ACC-Hurlen was placing filter cap material on the north end.

Water quality monitoring was conducted on an ebb tide in the morning and a flood tide in the afternoon. Water quality was very good during both monitoring events.

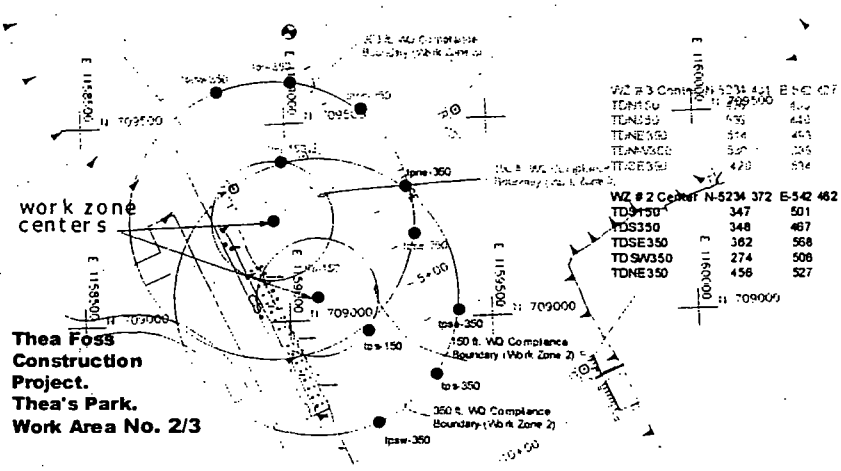
Totem Marine

ACC-Hurlen placed several loads of habitat mix on the north end of Totem Marine in the morning. Because of the small amount of material and short duration, water quality monitoring was not conducted. Visual observation of the activity indicated very little turbidity was generated, and this was of short duration and persistence. No visible turbidity plume was generated, and there was no floating debris or any indication of oil sheen during this activity.

QA/QC.

Field duplicate data again looked very good for sample TPS350 in the morning and for Station SP7+00 during the afternoon session. Winkler titration results (dissolved oxygen) for SP7 were 7.4 and 7.2 mg/L. YSI Sonde results for dissolved oxygen was 7.6 mg/L.

Michael Lloyd
Lloyd & Associates, Inc.



WQM 2 6 03.doc

Construction Compliance Monitoring **Date: FEB 6** **Thea's Park - Ebb Tide**

	Station/Sample	Depth/D TB (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
Up-Current Station	**TPS350 (Up-current/WZ2)**	3	26.5	8.7	2.5	9.0		5,234,312	542,550	943	Manson placing riprap in WZ-2
	030206/TP350/M/A	22	29.0	8.4	1.1	9.3	4			942	over filter material
	Deep	36/41	29.0	8.5	1.1	9.3				941	
Down-Current Monitoing Stations	**TPNW350 (Down-current/WZ3)**	3	28.5	8.5	9.0	9.2		5,234,470	542,418	952	Hurlen has moved their rig to
	030206/TPNW350/M/A	24	29.0	8.4	2.1	9.3	5			951	Totem to finish up their work
	Deep	42/47	29.1	8.5	2.6	9.4				950	Some wood chips in water
	TPN350 (Down-current/WZ3)	3	27.4	8.6	2.1	9.3		5,234,477	542,473	1000	
	030206/TPN350/M/A	22	29.1	8.5	0.9	9.4	2			959	
	Deep	38/43	29.1	8.4	2.7	9.4				958	Hurlen place a minor amount
	TPNE350 (down-current/WZ3)	3	27.2	8.6	2.2	9.1		5,234,456	542,526	1009	of habitat mix at Totem around
	030206/TPNE350/M/A	22	29.1	8.4	1.3	9.3	2U			1008	1000 after moving form Thea's
	Deep	38/43	29.2	8.4	2.1	9.3				1007	Park. L14
	TPN150 (Down-Current/WZ1)	3	27.9	8.3	2.2	9.2		5,234,416	542,466	1017	
	Mid	22	29.1	8.2	1.1	9.3				1016	
	Deep	39/44	29.1	8.2	3.4	9.3				1015	
Reference Station	**Station SP7+00**	3	28.1	7.6	2.3	9.2		5,234,940	542,955	1027	Reference Station
	030206/SP7/M/A	20	29.0	7.4	1.2	9.3	3			1026	
	Deep	34/39	29.0	7.5	1.7	9.3				1025	
	Station SP7+00	*3*	*28.1*	*7.9*	*2.7*	*9.3*		*5,234,940*	*542,955*	*1034*	*Field duplicate*
	030206/SP7/M/A-Dup	*20*	*29.0*	*7.6**	*1.6*	*9.3*	*3*			*1033*	*Field duplicate*
	Deep	*34/39*	*29.0*	*7.8*	*1.7*	*9.3*				*1032*	*Field duplicate*

Pre-Survey Calibration D. Berta 2/6 104.1% Final = 102% cold, cloudy, sun breaks in afternoon

DO Calibration as per manufacturer's specifications.

Survey work conducted by S. High/D. Berta

Turbidity Calibration as per manufacturer's specifications. Calibration at 0, 10NTU's.

All work conducted in the center portion of the site.

*Winkler titration on sample 030206/SP7/M/A = 7.4 and 7.2 mg/L. Sample submitted to City of Tacoma.

Prepared By/Date: M. Lloyd 2/6/03

TSS Data Update 2/11/03

L&AI

Construction Compliance Monitoring

Date: FEB 6 **Thea's Park - Flood Tide**

	Station/Sample	Depth/DTB (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
Up-Current Monitoring Stations	TPNW350 (Up-current/WZ3)	3	26.8	7.2	2.4	9.3		5,234,530	542,385	1517	Manson placing riprap
	Mid	45	29.2	7.0	2.5	9.3				1516	Hurlen returned to do filter
	Deep	84/89	29.4	6.8	6.0	9.3				1515	material
	TPN350 (Up-current/WZ3)	3	26.1	7.1	2.9	9.2		5,234,536	542,440	1529	
	Mid	32	29.1	6.7	3.5	9.3				1528	
	Deep	60/65	29.2	6.7	3.7	9.3				1527	
	TPNE350 (Up-current/WZ3)	3	26.1	7.1	2.8	9.2		5,234,514	542,493	1534	
	Mid	25	28.7	6.6	2.0	9.3				1533	
	Deep	46/51	29.3	6.5	7.0	9.3				1532	minor turbidity at depth
Mid-Zone Stations	TPSE350 (Mid Zone/WZ3)	3	24.6	7.3	3.7	8.9		5,234,420	542,534	1546	fresh water input to shallow
	Mid	18	27.3	6.6	2.9	9.2				1545	
	Deep	30/35	29.0	6.5	1.9	9.3				1544	
	TPNE350 (Mid Zone/WZ2)	3	25.1	7.2	3.7	9.1		5,234,456	542,527	1557	Location between derricks
	Mid	18	27.2	6.9	2.7	9.2				1556	
	Deep	31/36	28.9	6.8	1.1	9.3				1555	
Down-Current Monitoing Stations	TPSE350 (Down-current/WZ2)	3	25.8	7.2	3.1	9.1		5,234,362	542,568	1603	fresh water input to shallow
	Mid	18	27.9	6.9	2.9	9.3				1602	Manson placing riprap
	Deep	30/35	29.0	7.0	2.1	9.3				1601	on slope over filter material
	TPS350 (down-current/WZ2)	3	25.9	7.4	3.1	9.1		5,234,312	542,550	1607	fresh water input to shallow
	Mid	18	27.6	6.9	2.9	9.2				1606	
	Deep	30/34	29.0	7.1	2.1	9.3				1605	
	TPS350 (down-current/WZ2)	3	26.0	7.3	3.0	9.1		5,234,312	542,550	1607	Field Duplicate
	Mid	18	27.5	7.0	2.7	9.2				1606	Field Duplicate
	Deep	30/34	29.0	7.1	1.3	9.3				1605	Field Duplicate
	TPSW350 (down-current/WZ2)	3	26.5	6.8	5.1	9.2		5,234,347	542,501	1620	
	Mid	19	27.6	6.5	3.1	9.2				1619	
	Deep	32/37	29.0	6.5	2.5	9.3				1618	Slight turbidity elevation
	TPS150 (Down-Current/WZ2)	3	26.1	7.0	2.8	9.2		5,234,279	542,578	1616	
	Mid	18	27.6	6.7*	3.0	9.3				1615	Rip tide note below
	Deep	30/35	29.0	6.7	1.8	9.3				1614	

Pre-Survey Calibration (DO) S. High 2/6 102% Final = 100% cool, partly cloudy, sun breaks in afternoon

DO Calibration as per manufacturer's specifications.

Survey work conducted by Steven High

Turbidity Calibration as per manufacturer's specifications. Calibration at 0, 10NTU's.

Up-Current points from WZ3 on north end. Down-current points from WZ2 on south end.

*Observed with Sonde a rip tide that lasted approximately 1 minute during which time DO went from 6.7 to 7.6 mg/L

Prepared By/Date:
M. Lloyd 2/6/03

TSS Data Update 2/11/03

L&AI

STL Seattle

Client Name	Lloyd & Assoc. Inc.
Project Name	Thea Foss
Date Received	02-06-03

General Chemistry Parameters

Client Sample ID 030206/TPS(350)/M/A
Lab ID 111763-01

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	02-06-03	mg/L	4	2

Client Sample ID 030206/TPNW(350)/M/A
Lab ID 111763-02

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	02-06-03	mg/L	5	2

Client Sample ID 030206/TPN(350)/M/A
Lab ID 111763-03

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	02-06-03	mg/L	2	2

Client Sample ID 030206/TPNE(350)/M/A
Lab ID 111763-04

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	02-06-03	mg/L	ND	2

Client Sample ID 030206/SP7+00/M/A
Lab ID 111763-05

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	02-06-03	mg/L	3	2

Client Sample ID 030206/SP7+00/M/DUP
Lab ID 111763-06

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	02-06-03	mg/L	3	2

STL Seattle

QUALITY CONTROL REPORT

Client Sample ID: Batch QC
Lab ID: 111776-7
QC Batch Number: 1159-051

Method Blank

Parameter	Result (mg/L)	PQL
Total Suspended Solids	ND	2

Duplicate

Parameter	Sample Result (mg/L)	Duplicate Result (mg/L)	RPD (%)	Flag
Total Suspended Solids	29.6	27.6	6.99	

RMFloyd 2/11/03

030206

CALIBRATION NOTES:

DO CALIBRATED IN MOIST AIR OVER TAP WATER
D.O. CHECK =
BAROMETRIC PRESSURE = 779.2 mm Hg

TURB CALIBRATION OF TURBIDITY USING MANUFACTURERS
2 POINT METHOD 1) 0.0 = DI WATER 2) 10.0 NTU
= CALIBRATION STANDARD.
TURB CHECK IN 10.0 NTU STANDARD AFTER
CALIBRATION = 10.1

0830 MALISON PLACING MATERIAL @ THEAS PARK
QUARRY SPALLS
1015 TOOK OUT BARGE - EMPTY IE STOPPED PLACING
~~[illegible]~~ ~~[illegible]~~ ~~BARGE~~ / MATERIAL

- MINOR AMOUNT OF WOOD CHIPS (SMALL) NOTED &
SLIGHT GENERAL INCREASE IN TURBIDITY AT TPNW (350)
NO VISIBLE TURB. PLUME OBSERVED

1000 NOTED ACTIVITY AT TOTEM DOCK ON HURLEY BARGE
- 1120 - ACTIVITY STOPPED - IT APPEARED THAT
SOME GRAVEL MATERIAL WAS PLACED ON SHORE SINCE
OUR LAST OBSERVATION.

DUPLICATE SAMPLE - ★ SPLIT DO SAMPLE FOR
WINKLER METHOD 1) CITY OF TACOMA 2) L&A LAB

1110 D.O. CHECK = 104.1 %

+ 1200 RESULTS OF WINKLER METHOD D.O. @ L&A LAB
★ TRIAL 1) 370 × 0.2 = 7.4 mg/L
2) 361 × 0.2 = 7.2 mg/L

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Read and Understood By

[signature] 03/06/03 — Signed — Date

[signature] 030206 — Signed — Date

PROJECT THEA FOSS

Notebook No. _____ 39

Continued From Page _____

30206

EBB THEA'S PARK WORK ZONE 2

TIME	LOCATION	WZ/ EVENT	DTB	SAMPLE DEPTH		TEMP	SAL	DO	TURB	TSS
0941	TPS(350)	A	41	D	36	9.3	29.0	8.5	1.1	—
0942	312 550	WZ-2		M	22	9.3	29.0	8.4	1.1	030206/TPS(350)/M/A
0943	Acc=5.0			S	3	9.0	26.5	8.7	2.5	—
0950	TPNW(350)	A	47	D	42	9.3	29.1	8.5	2.6	—
0951	470 418	WZ-2		M	24	9.3	29.0	8.4	2.1	030206/TPNW(350)/M/A
0952	Acc=4.8			S	3	9.2	28.5	8.5	9.0	—
0958	TPN(350)	A	43	D	38	9.3	29.1	8.4	2.7	—
0959	477 473	WZ-2		M	22	9.3	29.1	8.5	0.9	030206/TPN(350)M/A
1000	Acc=12.0			S	3	9.1	27.4	8.6	2.1	—
1007	TPNE(350)	A	43	D	38	9.3	29.2	8.4	2.1	—
1008	456 526	WZ-2		M	22	9.3	29.1	8.4	1.3	030206/TPNE(350)/M/A
1009	Acc=4.9			S	3	9.1	27.2	8.6	2.2	—
[illegible]5	TPN(150)	A	44	D	39	9.3	29.1	8.2	3.4	—
[illegible]16	416 466	WZ-2		M	22	9.3	29.1	8.2	1.1	—
1017	Acc=5.9			S	3	9.2	27.9	8.3	2.2	—
1025	SP 7+00	A	39	D	34	9.3	29.0	7.5	1.9	—
1026	940 955			M	20	9.3	29.0	7.4	1.2	030206/SP 7+00/M/A
1027	Acc=5.4			S	3	9.2	28.1	7.6	2.3	—
1032	SP 7+00	A	39	D	34	9.3	29.0	7.8	1.7	— ★
1033	940 955			M	20	9.3	29.0	7.6	1.6	030206/SP 7+00/M/DUP
1034	Acc=5.0			S	3	9.3	28.1	7.9	2.7	—

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[signature] 02/06/03 — Signed — Date

[signature] 030206 — Signed — Date

1500 DO at the Pier = 102 % @ 12°C

Riptide (surface DO went from 6.9 to 7.6 in one minute) →

1540 Recal DO = 102 %

Continued on Page

Read and Understood By

Michael Floyd 2/6/03

Signed Date Signed Date

PROJECT Thea Foss

Notebook No. _____ 41

Continued From Page _____

030206 Thea's Park Flood Tide

Time	location	event	DTB	sample depth		temp	Sal	DO	Turb	TSS
1515	TPNW 350	B	89	D	84	9.3	29.4	6.8	~~6.8~~ 6.0	—
1516	530 385 N	$\boxed{WZ3}$		M	45	9.3	29.2	7.0	~~7.0~~ 2.5	—
1517	acc ~~4~~ 5.1			S	3	9.3	26.8	7.2	2.4	—
1527	TPN 350	B	65	D	60	9.3	29.2	6.7	3.7	—
1528	536 440	$\boxed{WZ3}$		M	32	9.3	29.1	6.7	3.5	—
1529	acc 6.9			S	3	9.2	26.1	7.1	2.9	—
1532	TPNE 350	B	51	D	46	9.3	29.3	6.5	7.0	—
1533	5M 493	$\boxed{WZ3}$		M	25	9.3	28.7	6.6	2.0	—
1534	acc 7.5			S	3	9.2	26.1	7.1	2.8	—
1544	TPSE 350	B	35	D	30	9.3	29.0	6.5	1.7	—
1545	420 534	$\boxed{WZ3}$		M	18	9.2	27.3	6.6	2.9	—
1546	acc 7.7			S	3	8.9	24.6	7.3	3.7	—
1555	TPNE 350	B	36	D	31	9.3	28.9	6.8	1.1	—
1556	456 527	$\boxed{WZ2}$		M	18	9.2	27.2	6.9	2.7	—
1557	acc 8.3			S	3	9.1	25.1	7.2	3.7	—
1601	TPSE 350	B	35	D	30	9.3	29.0	7.0	1.3	—
1602	362 568			M	18	9.3	27.9	6.9	3.0	—
1603	acc 8.5	$\boxed{WZ2}$		S	3	9.1	25.8	7.2	3.2	—
1605	TPS 350	B	34	D	30	9.3	29.0	7.1	2.1	—
1606	312 550			M	18	9.2	27.6	6.9	2.9	—
1607	acc 6.9	$\boxed{WZ2}$		S	3	9.1	25.9	7.4	3.1	—
Duplicate										
1608	TPS 350	B		D		9.3	29.0	7.1	1.3	—
1609	312 550		34	M		9.2	27.5	7.0	2.7	
1610	acc 6.5	$\boxed{WZ2}$		S		9.2	26.0	7.3	3.0	

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[signature] 2/5/03 [signature] 030206

Signed Date Signed Date

PROJECT

Notebook No.
Continued From Page

1630 Post - Sampling Cal ✓ for DO. 100.% @ 9.5°C

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[signature]	2/5/03	[signature] -030204	

ROJECT Thea Foss

Notebook No.

Continued From Page

030206 Thea's Park Flood Tide

time	location	event	DTB	sample depth		temp	sal	DO	turb	TSS
1618	TPSW350	B	37	D	32	9.3	29.0	6.5	2.5	—
1619	274 506	WZ2		M	19	9.2	27.6	6.5	3.1	—
1620	acc 5.9			S	3	9.2	26.5	6.8	5.1	—
1614	TPS150	B	35	D	30	9.3	29.0	6.7	1.8	—
1615	347 501	WZ2		M	18	9.3	27.6	6.7	3.0	—
1616	acc 6.6			S	3	9.1	26.1	7.0	2.8	—

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[signature] 2/5/03 — Signed — Date

[signature] 030206 — Signed — Date

American Civil Constructors

Hurlen Construction

PO Box 80945
700 S. Riverside Dr.
Seattle, WA 98108
(206) 763-1230
FAX (206) 762-1854

FAX TRANSMITTAL

Date:	3/7/0	Number of Pages Including this Sheet:	10
Deliver To:	O'LOUGHLIN / WINGART		
Company:	COT		
Fax Number:	253-272-2412		

From:	M. Lloyd
Company:	ACC / Hurlen Construction
Fax Number:	206-762-1854
Subject	WQ Report 3/6/03

Lloyd & Associates, Inc.
38210 SE 92nd Street, Snoqualmie, Washington 98065 425-888-1905 rml@centurytel.net

February 7, 2003

TSS Update 2/13/03
PML

TRANSMITTAL

To: Iain Wingard
John O'Loughlin

Subject: Compliance Monitoring / Thea's Park 2/7/03

Attached please find results from compliance monitoring for the following work activity:

- Slope Cap Construction at Thea's Park

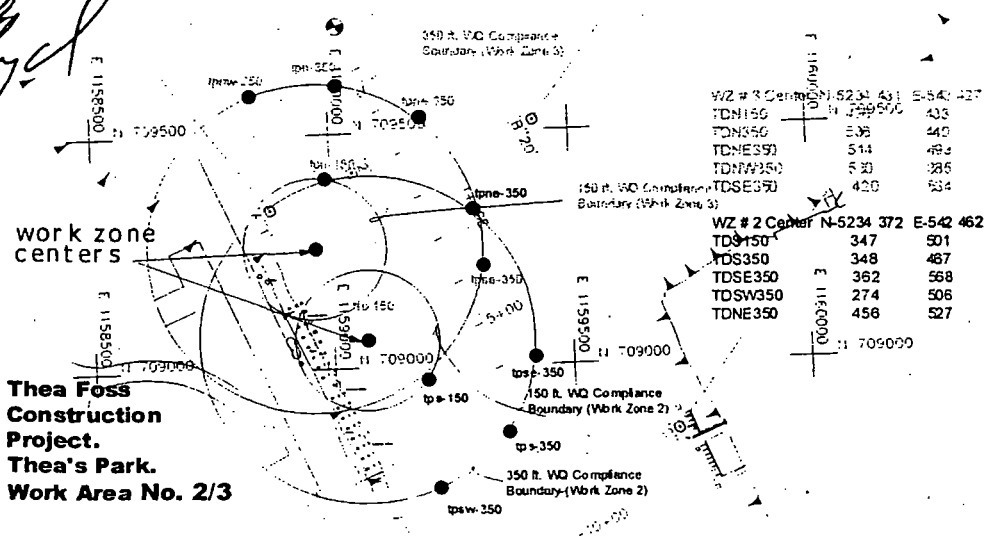
Thea's Park – Cap Construction.

ACC-Hurlen was working at Thea's Park placing filter material on the slope of the north end while Manson continued to work in the middle portion of the cap placing riprap. Water quality monitoring was conducted on an ebb tide in the morning and a ebb/slack tide in the afternoon. Water quality was very good during both monitoring events. Visual observation of operations showed that both Manson and Hurlen placing material at a relatively good pace of 1 bucket every 1.5 to 2 minutes. This pace was not constaant because of the necessity to stop and check/verify depth of placement. There is some visual turbidity at the point of contact with water, but otherwise the surface turbidity rapidly dissipates and does not spread laterally even at ebb tide event in morning.

QA/QC.

Field duplicate data was recorded for sample 030207/SP7/M/A-DUP. Field duplicate data was very good with excellent reproducibility. All calibrations were acceptable, and no instrumental problems were encountered. Winkler titration results (dissolved oxygen) for SP7 were 7.4 and 7.7 mg/L. YSI Sonde result for dissolved oxygen was 7.8 mg/L.

Michael Lloyd
Lloyd & Associates, In



WQM 2 7 03.doc

Construction Compliance Monitoring

Date: FEB 7 **Thea's Park - Ebb Tide**

	Station/Sample	Depth/DTB (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
Up-Current Station	**TPSW350 (Up-current/WZ2)**	3	27.4	8.3	1.9	8.9		5,234,275	542,506	1009	Manson placing riprap in WZ-2
	Mid	22	28.8	8.1	5.1	9.3				1008	Hurlen placing fritter material
	Deep	39/44	28.8	8.1	4.0	9.2				1007	
	TPS350 (Up-current/WZ2)	3	27.3	8.3	2.3	9.0		5,234,312	542,550	1014	
	Mid	20	28.8	8.0	1.8	9.3				1013	
	Deep	34/39	28.9	8.1	2.5	9.2				1012	
	TPSE350 (Up-current/WZ2)	3	28.0	8.0	1.8	9.2		5,234,300	542,567	1019	
	Mid	22	28.9	7.9	1.8	9.3				1018	
	Deep	38/43	28.9	8.2	1.7	9.3				1017	
Interzone Monitoing Station	**TPSE350 (Mid-Zone/WZ3)**	3	27.2	8.2	1.8	9.0		5,234,420	542,534	1025	
	Mid	21	28.9	8.0	1.9	9.3				1024	
	Deep	36/41	29.0	8.2	1.6	9.3				1023	
	TPNE350 (Down-current/WZ2)	3	27.2	8.2	1.9	9.2		5,234,456	542,526	1029	
	Mid	22	28.9	7.9	1.8	9.3				1028	
	Deep	39/44	29.0	8.1	1.3	9.3				1027	
Down-Current Monitoing Stations	**TPN350 (Down-current/WZ3)**	3	28.2	8.2	1.9	9.2		5,234,536	542,440	1034	
	Mid	34	28.9	7.9	1.8	9.3				1033	
	Deep	62/67	29.0	8.1	1.3	9.3				1032	
	TPN150 (Down-Current/WZ3)	3	28.2	7.9	**11.2**	9.2		5,234,483	542,433	1039	Actual location close to boom
	Mid	25	28.9	8.0	1.6	9.3				1038	Minor shallow turbidity near
	Deep	44/49	29.0	7.8	1.4	9.3				1037	work zone
	TPNW350 (Down-current/WZ3)	3	27.9	7.9	8.5	9.2		5,234,530	542,385	1046	
	Mid	46	29.0	7.8	1.9	9.3				1045	
	Deep	87/92	29.1	7.9	1.8	9.4				1044	Manson resumes placing rock
Reference Station	**Station SP7+00**	3	28.2	7.9	2.5	9.3		5,234,940	542,955	1100	Reference Station
	030207/SP7/M/A	20	28.8	7.8	1.8	9.3	4			1059	
	Deep	34/39	28.9	8.0	1.9	9.3				1058	
	Station SP7+00	*3*	*27.9*	*7.9*	*2.4*	9.3		*5,234,940*	*542,955*	*1109*	*Field duplicate*
	030207/SP7/M/A-Dup	*20*	*28.8*	*7.8**	*1.6*	*9.3*	*3*			*1108*	*Field duplicate*
	Deep	*34/39*	*28.9*	*8.0*	*2.0*	*9.3*				*1107*	*Field duplicate*

Pre-Survey Calibration S. High 2/7 102% Final = 98.2% cold, cloudy, sun breaks in afternoon

DO Calibration as per manufacturer's specifications.

Survey work conducted by S. High/D. Berta

Turbidity Calibration as per manufacturer's specifications. Calibration at 0, 10NTU's. Check on 10 ntu std. = 10.0 ntu

All work conducted in the center/north portion of the site.

*Winkler titration on sample 030206/SP7/M/A = 7.4 and 7.7 mg/L. Sample submitted to City of Tacoma.

Prepared By/Date:
M. Lloyd 2/7/03

TSS Data Update
T M Lloyd 2/13/03

L&AI

Construction Compliance Monitoring **Date: FEB 7** **Thea's Park - Ebb/Slack Tide**

	Station/Sample	Depth/DTB (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
Up-Current Stations	TPSW350 (Up-current/WZ2)	3	27.1	8.1	6.6	0.0		5,234,275	542,506	1416	Manson placing riprap in WZ-2
	Mid	18	28.4	7.9	9.7	9.2				1414	Hurlen placing friter material WZ3
	Deep	31/36	29.0	9.0	2.8	9.3				1412	
	TPS350 (Up-current/WZ2)	3	26.9	7.9	2.3	9.0		5,234,312	542,550	1426	
	Mid	16	28.4	7.7	2.4	9.3				1425	
	Deep	27/32	29.0	7.9	3.6	9.2				1424	
	TPSE350 (Up-current/WZ2)	3	26.9	8.0	2.8	9.2		5,234,300	542,567	1435	
	Mid	17	28.5	7.7	4.6	9.3				1434	
	Deep	30/34	28.9	7.5	2.5	9.3				1433	
Interzone Monitoing Station	TPSE350 (Mid-Zone/WZ3)	3	27.6	7.6	1.7	9.1		5,234,420	542,534	1439	
	Mid	17	28.6	7.7	2.3	9.3				1438	
	Deep	30/34	28.7	7.4	4.1	9.3				1437	
	TPNE350 (Down-current/WZ2)	3	27.3	7.6	2.6	9.1		5,234,456	542,526	1443	
	Mid	17	28.7	7.5	7.9	9.2				1442	
	Deep	30/35	28.7	7.6	3.4	9.2				1441	
Down-Current Monitoing Stations	TPNE350 (Down-current/WZ3)	3	27.2	7.8	3.0	9.1		5,234,514	542,493	1447	
	Mid	24	28.9	7.7	5.7	9.3				1446	
	Deep	43/48	28.9	7.7	7.5	9.3				1445	
	TPN150 (Down-Current/WZ3)	3	21.2	8.7	8.2	8.0		5,234,476	542,433	1511	Apparent fresh water input
	Mid	22	28.9	7.4	5.3	9.3				1510	
	Deep	40/44	29.0	7.8	6.5	9.3				1511	
	TPN350 (Down-current/WZ3)	3	27.9	7.6	3.0	9.1		5,234,536	542,440	1458	
	Mid	30	28.9	7.4	5.0	9.3				1457	
	Deep	55/60	29.2	7.7	6.6	9.3				1456	
	TPNW350 (Down-current/WZ3)	3	21.0	8.9	7.7	8.0		5,234,530	542,385	1501	minor turbidity observed
	Mid	43	29.1	7.4	3.5	9.3				1500	no visual turbidity outside of
	Deep	81/86	29.3	7.5	4.9	9.3				1459	work zone.

Pre-Survey Calibration S. High 2/7 98.2% Final = 98.6% cold, cloudy, sun breaks in afternoon

DO Calibration as per manufacturer's specifications.

Survey work conducted by S. High/D. Berta

Turbidity Calibration as per manufacturer's specifications. Calibration at 0, 10NTU's. Check on 10 ntu std. = 10.0 ntu

All work conducted in the center /north portion of the cap.

Rock/Filter Cap Placement rate 1 bucket every 1.5-2 minutes

Prepared By/Date: M. Lloyd 2/7/03

TSS Data Update

L&AI

STL Seattle

Client Name	Lloyd & Assoc. Inc.
Project Name	THEA FOSS
Date Received	02-07-03

General Chemistry Parameters

Client Sample ID	030207/SP7+00/M/A
Lab ID	111792-01

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	02-11-03	mg/L	4	2

Client Sample ID	030207/SP7+00/M/DUP
Lab ID	111792-02

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	02-11-03	mg/L	3	2

TMC

STL Seattle

QUALITY CONTROL REPORT

Client Sample ID: Batch QC
Lab ID: 111756-1
QC Batch Number: 1159-054

Method Blank

Parameter	Result (mg/L)	PQL
Total Suspended Solids	ND	2

Duplicate

Parameter	Sample Result (mg/L)	Duplicate Result (mg/L)	RPD (%)	Flag
Total Suspended Solids	17	15	13	

TMH 2/13

PROJECT

Notebook No.

Continued From Page

730 Hurler placing filter material in WZ 3
Manson placing rock over filter material in WZ 2
Decks of both dredges are clear of spills & contaminants.

0830 Hurler stops placing f.m. so that elevation measurements can be taken.
Manson continues placing rock

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Read and Understood By

[signature] 2/4/03 [signature] 030207

Signed Date Signed Date

PROJECT Iren Foss

Notebook No. _____

Continued From Page _____

030207 Thin Pack

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[signature] 030207 Signed _____ Date

[signature] Signed 2/7/03 Date

PROJECT THEA FOSS

Notebook No. _____
Continued From Page _____

030207 COOL IN AM MOD. FOG
CALIBRATION NOTES:

DO - CALIBRATED IN MOIST AIR OVER TAP WATER
CALIB CHECK = 102.0%
TEMP = 6.4°C
BAROMETRIC PRESSURE = 775.2 mmHg
TURB - CALIBRATED USEING MANUFACTURERS 2
POINT MEDTED. 1) 0.0 NTU = D.I WATER
2) 10.0 NTU = CALIBRATION STANDARD

TURBIDITY CHECK IN STANDARD SOLUTION
AFTER CALIBRATION: 10.0
THEA PARK
0745 MANSON PLACING QUARRY SPALLS IN WORK ZONE #2
HURLEN PLACING FILTER CAP IN WORK ZONE # 3

1000 MANSON STOPS PLACING QUARRY SPALLS
HURLEN PLACING FILTER CAP @ ~ 1 BUCKET / 15 MINUTES

50
- SLIGHT GENERAL - DISPERSE INCREASE IN TURB. @
TPN 150 @ SURFACE. NO VISIBLE TURB PLUMES
OR FLOATS. DEBRIS ~~(+)~~ OBSERVED @ ANY STATIONS.

Continued on Page

Read and Understood By

Daniel A. Burke 02/07/03 — Signed
[signature] 2/7/03 — Date
[signature] 07:207 — Signed
Date

Continued From Page

STATS on Page 44

930207 EBB

TIDES PARK COMBINED

WORK ZONE 2 & 3

TIME	LOCATION	WZ/EVENT	DOB	SAMPLE	DEPTH	TEMP	SAL	DO	TURB	TSS
1007	TPSW(35)	WZ 2 & 3	44	D	39	9.2	28.8	8.1	4.0	—
1008	275 506	A		M	22	9.3	28.8	8.1	5.1	—
1009	Acc=5.0'			S	3	8.9	27.4	8.3	1.9	—
1012	TPS(35)	WZ 2	31	D	34	9.2	28.9	8.1	2.5	—
1013	312 550	A		M	20	9.3	28.8	8.0	1.8	—
1014	Acc=5.0'			S	3	9.0	27.3	8.3	3.3	—
1017	TPSE(35)	WZ-2	43	D	38	9.3	29.0	8.2	1.7	—
1018	300 567	A		M	22	9.3	28.9	7.9	1.8	—
1019	Acc=5.4'			S	3	9.2	28.0	8.0	1.8	—
1023	TPSE(35)	WZ-3	41	D	36	9.3	29.0	8.2	1.6	—
1024	420 534	A		M	21	9.3	28.9	8.0	1.8	—
1025	Acc=4.9'			S	3	9.0	27.6	8.2	1.8	—
1027	TPNE(35)	WZ-2	44	D	39	9.3	29.0	8.1	1.3	—
1028	456 526	A		M	22	9.3	28.9	7.9	1.8	—
1029	Acc 5.3			S	3	9.2	27.2	8.2	1.9	—
1032	TPN(35)	WZ-2 (3)	67	D	62	9.3	29.0	7.9	1.8	—
1033	530 440	A		M	34	9.3	28.9	7.8	1.8	—
1034	Acc=4.6			S	3	9.2	28.2	7.9	6.1	—
1037	TPN(150)	WZ-3	49	D	44	9.3	29.0	7.8	1.4	—
1038	476 433	A		M	25	9.3	28.9	8.0	1.6	—
1039	Acc=6.8			S	3	9.1	28.2	7.9	11.2	—
RETURN WORK	453 433	- AGAINST DEBRIS BOOM ~15 NORTH OF BARGE								
1044	TPNW(35)	WZ-3	72	D	87	9.3	29.1	7.9	1.8	—
1045	530 385	A		M	46	9.3	29.0	7.8	1.9	—
1046	Acc=9.3			S	3	9.0	27.9	7.8	8.5	—

Continued on Page

Read and Understood By

Signed: [illegible] 02/07/03 Date: RW 2/7/03 Signed: [illegible] Date: [illegible]

PROJECT THEA FOSS

Notebook No. _____
Continued From Page _____

030207

1050 MANSON RESUMES PLACING QUARRY SPALLS IN WORK ZONE #2

1145
D.O. CALIBRATION CHECK : 98.2%

1150 DIVER BOAT SETS UP

DO Analysis at Office : 7.4, 7.7

Continued on Page

Read and Understood By

T Michael Lloyd 2/7/03 [signature] 030207

Signed Date Signed Date

030207

Time	Location	WZ/Event	DTB	Sample Depth	Temp	Sal	DO	Turb	TSS
1058	SP 7700	A	(34)	D 34	9.3	28.9	7.8	1.9	—
1059	940 955			M 20	9.3	28.8	7.7	1.8	030207/SP7700/M/A
1100	Acc = 8.9			S 3	9.3	28.2	7.8	2.5	—
1107	SP 7700	A	(34)	D 34	9.3	28.9	8.0	2.0	—
1108	940 955			M 20	9.3	28.8	7.8	1.6	030207/SP7700/M/DUP
1109	Acc = 5.1			S 3	9.3	27.9	7.9	2.4	— *

* SPLIT SAMPLE FOR D.O. BY WINKLER METHOD
1) CITY OF TACOMA 2) L&A LAB

Tide's Peak WZ 283 Ebb Tide

1412	TPSW 350		(36)	D 31	9.3	29.0	7.9	2.8	—
1414	275 506	B		M 18	9.2	28.4	7.9	9.7	—
1416	acc 5.8	WZ2		S 3	9.0	27.1	8.1	6.6	—
1424	TPS 350	B	(32)	D 27	9.3	28.8	7.9	3.8	—
1425	312 550		(32)	M 16	9.2	28.4	7.7	2.4	—
1426	acc 5.7	WZ2		S 3	9.0	26.9	7.9	2.3	—
1433	TPSE 350	B	34	D 30	9.3	28.7	7.5	2.5	—
1434	380 567			M 17	9.2	28.5	7.7	4.6	—
1435	acc 5.5	WZ2		S 3	8.9	26.9	8.0	2.8	—
1437	TPSE 350	B	34	D 30	9.3	28.7	7.4	4.1	—
1438	420 514			M 17	9.3	28.6	7.7	2.3	—
1439	acc 6.8	WZ3		S 3	9.1	27.4	7.4	1.7	—
1441	TPNE 350	B	35	D 30	9.2	28.7	7.7	3.4	—
1442	456 526	WZ2		M 17	9.2	28.7	7.5	7.9	—
1443	acc 4.2			S 3	9.1	27.3	7.8	2.6	—
1445	TPNE 350	514 493 B	48	D 43	9.3	28.9	7.7	7.5	—
1446	~~536 442~~			M 24	9.3	28.9	7.7	5.7	—
1447	acc 4.4	WZ3		S 3	9.1	27.2	7.8	3.0	

Continued on Page

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030207 [signature] 2/7/03

Signed Date Signed Date

PROJECT

Notebook No.

Continued From Page

Affect of riptide
over a 3-5 min
time period !!
(note diff in shallow readings)

[illegible] post-sampling [illegible] ✓ [illegible]

Continued on Page

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[signature] 2/7/05

Signed Date Signed Date

PROJECT Thea Foss

Notebook No. _____ 51

Continued From Page _____

~~030207~~

	Location	event	DTB	Sample depth	temp	Sal	DO	Turb	TSS
1509	TPN150	G	44	D 40	9.2	29.0	7.5	6.5	—
1510	476 433	WZ3		M 22	9.3	28.9	7.4	5.3	—
1511	wc 4.8			S 3	8.0	21.2	8.7	8.2	—
1456	TPN350	B	60	D 55	9.3	29.2	7.7	6.6	—
1457	536 440	WZ3		M 30	9.3	28.9	7.4	5.0	—
1458	wc 4.6			S 3	9.1	27.9	7.6	3.0	—
1459	TPNW350	B	86	D 81	9.3	29.3	7.5	4.9	—
1500	530 385	WZ3		M 43	9.3	29.1	7.4	3.5	—
1501	wc 4.5			S 3	8.0	21.0	8.9	7.7	—

Continued on Page

Read and Understood By

M Lloyd 2/7/03

Signed Date Signed Date

American Civil Constructors

Hurlen Construction

PO Box 80945
700 S. Riverside Dr.
Seattle, WA 98108
(206) 763-1230
FAX (206) 762-1854

FAX TRANSMITTAL

Date:	2/8/03	Number of Pages Including this Sheet:	12
Deliver To:	O'LOUGHLIN/WINGARD		
Company:	COT		
Fax Number:	253-272-2412		

From:	M. LLOYD
Company:	ACC / Hurlen Construction - L+AI
Fax Number:	206-762-1854
Subject	WQ REPORT 2/7/03

Lloyd & Associates, Inc.
38210 SE 92nd Street, Snoqualmie, Washington 98065 425-888-1905(v/f) rml@centurytel.net

February 8, 2003

TRANSMITTAL

To: John O'loughlin
Iain Wingard

From: Michael Lloyd

RE: Weekly Water Quality Monitoring Report 2/~~3~~1/03

10 RMM 3/28/03

This weekly water quality monitoring provides updated water quality reports for TSS data. The following water quality report updates include:

January 29 – Thea's Park
January 30 – Thea's Park & Totem Marine
January 31 – Thea's Park
February 1 – Thea's Park
February 2 – Thea's Park
February 3 – Thea's Park
February 4 – Thea's Park

Next week should close out the water quality monitoring aspect of this work if the work can be completed at Thea's Park. In general work has gone well at Thea's Park construction areas. Totem Marine is finally complete. No in-water work remains. Currently, our project team will continue monitoring at Thea's' Park as slope cap work is completed and progress with channel cap appears to be going well.

Water quality at Thea's Park remains quite good considering the volume of material being placed. No major problems were encountered in the past week of monitoring at Thea's Park.

Michael Lloyd
Lloyd & Associates, Inc.

Cc: CQC, ACC-Hurlen, Manson, File

HURLEN CONSTRUCTION COMPANY

Contractor Reg. Number 223-01 HU-RLEC*30786

P.O. Box 80945
700 South Riverside Drive
Seattle, Washington 98108
(206) 763-1230
FAX (206) 762-1854

Phone 763-1230

LETTER OF TRANSMITTAL

DATE 2/9/03	JOB NO. 2003-3
ATTENTION O'LOUGHLIN/WINGARD	
RE: Weekly Report 2/10/03	

TO CITY of TACOMA

GENTLEMEN:

WE ARE SENDING YOU ☒ Attached ☐ Under separate cover via _____ the following items:

☐ Shop drawings ☐ Prints ☐ Plans ☐ Samples ☐ Specifications

☐ Copy of letter ☐ Change order ☐ Weekly Report - WQ 2/10/03

COPIES	DATE	NO.	DESCRIPTION
1	2/10/03		Weekly Water Quality Report

THESE ARE TRANSMITTED as checked below:

☐ For approval ☐ Approved as submitted ☐ Resubmit _____ copies for approval

☐ For your use ☐ Approved as noted ☐ Submit _____ copies for distribution

☒ As requested ☐ Returned for corrections ☐ Return _____ corrected prints

☐ For review and comment ☐ _____

☐ FOR BIDS DUE _____ 19 _____ ☐ PRINTS RETURNED AFTER LOAN TO US

REMARKS _____

COPY TO CQC, MANSON, FILE

SIGNED: R Michael Lloyd

If enclosures are not as noted, kindly notify us at once.

Lloyd & Associates, Inc.
38210 SE 92nd Street, Snoqualmie, Washington 98065 425-888-1905 rml@centurytel.net

February 8, 2003

TSS Update 2/13/03
RML

TRANSMITTAL

To: Iain Wingard
John O'Loughlin

Subject: Compliance Monitoring / Thea's Park 2/8/03

Attached please find results from compliance monitoring for the following work activity:

- Slope Cap Construction at Thea's Park

Thea's Park – Cap Construction.

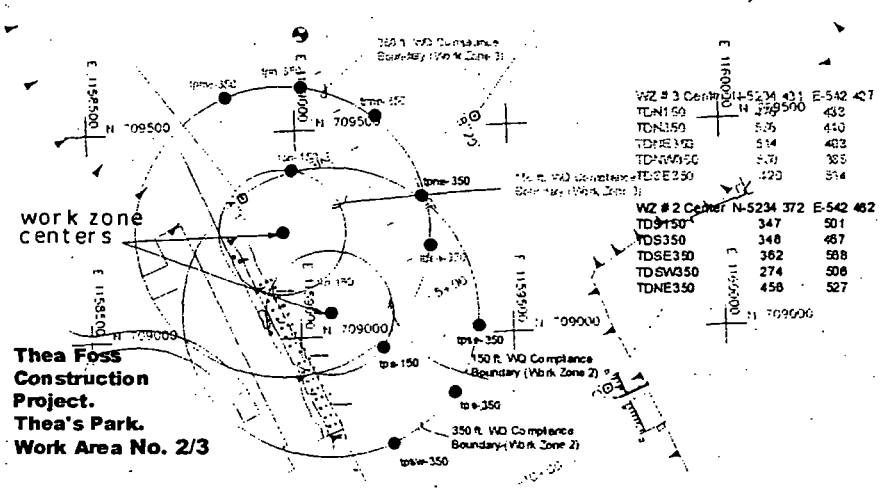
ACC-Hurlen was working at Thea's Park placing filter material on the slope of the north end while Manson continued to work in the middle portion of the cap placing riprap during the morning. Later in the afternoon during an ebb tide, Manson was placing channel cap. Water quality monitoring was conducted on a flood tide in the morning and an ebb tide in the afternoon. Water quality was very good during both monitoring events. Visual observation of operations showed that both Manson and Hurlen placing material at a relatively good pace of 1 bucket every 1.5 to 2 minutes. This pace was not constaant because of the necessity to stop and check/verify depth of placement. There is some visual turbidity at the point of contact with water, but otherwise the surface turbidity rapidly dissipates and does not spread laterally even at flood tide event in morning.

Channel capping seemed to go quite well with very little observable turbidity.

QA/QC.

Field duplicate data was recorded for sample 030208/TPSW350/M/A-DUP. Field duplicate data was very good with excellent reproducibility although turbidity dropped off during duplicate measuments. All calibrations were acceptable, and no instrumental problems were encountered. Winkler titration results (dissolved oxygen) for this sample were 8.0 and 8.0 mg/L. YSI Sonde result for dissolved oxygen was 7.7 mg/L.

Michael Lloyd
Lloyd & Associates, Inc.



WQM 2 8 03.doc

Construction Compliance Monitoring

Date: FEB 8 **Thea's Park - Flood/Slack Tide**

	Station/Sample	Depth/DTB (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
Up-Current Monitoring Stations	**TPNW350 (Up-current/WZ3)**	3	26.8	8.7	0.0	8.9		5,234,530	542,385	809	Manson placing riprap in
	Mid	46	28.8	8.4	0.1	9.2				808	WZ3/WZ2
	Deep	88/93	28.8	8.4	0.0	9.2				807	Hurlen placing filter material in
	TPN350 (Up-current/WZ3)	3	27.2	8.5	2.2	9.2		5,234,536	542,440	840	WZ3
	Mid	38	28.8	8.2	1.3	9.3				839	
	Deep	72/77	28.8	8.2	1.1	9.3				838	
	TPNE350 (Up-current/WZ3)	3	26.7	8.3	2.8	8.9		5,234,514	542,493	845	
	Mid	29	28.8	8.1	0.9	9.3				844	
	Deep	53/58	28.8	8.1	1.5	9.3				843	minor turbidity at depth
Inter work zone Sampling Stations	**TPSE350 (Mid Zone/WZ3)**	3	26.3	8.2	4.8	8.8		5,234,420	542,534	851	
	Mid	21	28.7	8.1	1.2	9.2				850	
	Deep	38/42	28.8	8.2	1.6	9.2				849	
	TPS150 (Mid Zone/WZ3)	3	26.7	8.0	4.3	8.9		5,234,406	542,466	856	Location very near Manson rig
	Mid	22	28.7	7.8	1.5	9.3				855	
	Deep	38/43	28.8	7.9	1.5	9.2				859	
	TPSW350 (Mid Zone/WZ3)	3	**24.5**	8.5	4.1	8.4		5,234,335	542,473	908	Fresh water input to shallow
	030208/TPSW350/M/A	22	28.6	7.8	**19.7**	9.2	5			907	Elevated turbidity at mid depth
	Deep	40/44	28.8	7.9	8.8	9.2				906	not observed in field duplicate
	TPSW350(Mid Zone/WZ3)-Dup	*3*	*25.2*	*8.2*	*3.7*	*8.4*		*5,234,335*	*542,473*	*922*	*Field Duplicate*
	Mid	22	28.8	7.7	*1.7*	9.2				*921*	*Field Duplicate*
	Deep	*40/44*	*28.8*	*7.5*	*6.6*	9.2				*920*	*Field Duplicate*
Down-Current Work Zone	**TPSW350 (down-current/WZ2)**	3	24.1	7.8	4.7	8.9		5,234,275	542,506	927	
	Mid	22	28.7	7.5	**19.0**	9.2				926	Moderate turbidity elevation
	Deep	40/44	28.8	7.6	5.4	9.2				925	
	TPSW150 (Down-Current/WZ1)	3	24.9	7.7	2.8	8.5		5,234,279	542,578	935	
	Mid	22	28.7	7.2	**17.6**	9.2				934	
	Deep	40/45	28.8	4.6	4.6	9.2				933	
	TPSW350 (down-current/WZ1)	3	26.8	7.9	5.6	8.7		5,234,209	542,535	932	Sampling location south of TPSW
	Mid	22	28.7	7.5	2.9	9.2				931	350 by about 180'
	Deep	40/44	28.8	7.7	3.9	9.2				930	

Pre-Survey Calibration (DO) S. High 2/6 102% Final = 100% cool, partly cloudy, sun breaks in afternoon

DO Calibration as per manufacturer's specifications.

Survey work conducted by Steven High

Turbidity Calibration as per manufacturer's specifications. Calibration at 0, 10NTU's.

Up-Current points from WZ3 on north end. Down-current points from WZ2 on south end.

Both Manson and Hurlen were working on north end at a very good work pace.

Winkler Titration on sample TPSW350 = 8.0 and 8.0 mg/L

Prepared By/Date:
M. Lloyd 2/8/03

TSS Data Update
M. Lloyd 2/13/03

L&AI

Construction Compliance Monitoring

Date: FEB 8 **Thea's Park - Ebb Tide**

	Station/Sample	Depth/DTB (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
Up-Current Station	TPSW350 (Up-current/WZ3)	3	24.8	7.7	5.5	8.4		5,234,335	542,473	1137	Manson placing channel cap
	Mid	22	28.3	7.1	12.2	9.2				1136	Hurlen placing filter cap material
	Deep	36/41	28.8	7.3	5.4	9.2				1135	Residual turbidity at mid-depth
	TPS350 (Up-current/WZ3)	3	26.2	7.5	2.6	9.0		5,234,372	542,518	1145	may be from morning work
	Mid	20	28.4	7.2	2.4	9.3				1144	during flood.
	Deep	34/39	28.8	7.5	3.3	9.2				1143	
	TPSE350 (Up-current/WZ3)	3	25.7	7.2	2.5	9.2		5,234,420	542,534	1149	
	Mid	22	28.5	7.1	1.4	9.3				1148	
	Deep	38/43	28.8	7.2	1.2	9.3				1147	
Down-Current Monitoing Stations	TPNE350 (Down-current/WZ3)	3	24.5	7.8	2.7	8.2		5,234,514	542,493	1154	
	Mid	29	28.8	7.1	1.0	9.2				1154	
	Deep	52/57	28.9	7.1	1.1	9.2				1153	
	TPN350 (Down-current/WZ3)	3	24.4	7.8	3.2	8.1		5,234,536	542,440	1200	
	Mid	35	28.8	7.1	1.2	9.2				1159	
	Deep	64/69	28.9	7.3	0.8	9.2				1158	
	TPNW350 (Down-current/WZ3)	3	25.1	7.0	6.5	9.2		5,234,530	542,385	1205	
	Mid	40	28.8	6.8	1.1	9.2				1205	
	Deep	75/80	28.9	6.8	3.0	9.4				1204	Manson resumes placing rock
	TPN150 (Down-Current/WZ3)	3	26.1	7.1	2.9	8.8		5,234,476	542,433	1217	Relatively low turbidity at 150'
	Mid	23	27.3	6.9	6.6	9.1				1216	early warning point
	Deep	40/45	28.8	7.0	8.7	9.2				1217	
Supplemental	TPSW350 (Up-current/WZ2)	3	25.1	7.5	8.6	8.6		5,234,275	542,506	1137	Station south of work zone
	Mid	20	27.9	7.1	7.4	9.2				1136	on Ebb tide (Upcurrent)
	Deep	35/40	28.8	7.2	1.9	9.2				1135	
Reference Station	*Station SP7+00*	*3*	*25.4*	*7.1*	*3.2*	8.6		*5,234,940*	*542,955*	*1228*	
	Mid	*19*	*27.5*	*6.6*	*2.6*	*9.1*				*1227*	
	Deep	*32/37*	*28.7*	*6.8*	*2.9*	*9.3*				*1226*	

Pre-Survey Calibration D. Berta 101.7% Final = 98.4% cold, cloudy, 7.3 °C

DO Calibration as per manufacturer's specifications.

Survey work conducted by D. Berta

Turbidity Calibration as per manufacturer's specifications. Calibration at 0, 10NTU's. Check on 10 ntu std. = 9.9 ntu

All work conducted in the center portion of the site.

*Winkler titration on sample 030206/SP7/M/A = 7.4 and 7.7 mg/L. Sample submitted to City of Tacoma.

Prepared By/Date: M. Lloyd 2/8/03

TSS Data Update

L&AI

STL Seattle

Client Name	Lloyd & Assoc. Inc.
Project Name	Thea Foss
Date Received	02-10-03

General Chemistry Parameters

Client Sample ID	030208/TPSW(350)/M/A
Lab ID	111825-01

Parameter	Method	Date Analyzed	Units	Result	PQL
Total Suspended Solids	EPA 160.2	02-11-03	mg/L	5	2

Turbidity = 19.7 ntu

STL Seattle

QUALITY CONTROL REPORT

Client Sample ID: 030208/TPSW(350)/M/A
Lab ID: 111825-01
QC Batch Number: 1159-054

Method Blank

Parameter	Result (mg/L)	PQL
Total Suspended Solids	ND	2

Duplicate

Parameter	Sample Result (mg/L)	Duplicate Result (mg/L)	RPD (%)	Flag
Total Suspended Solids	17	15	12.5	

PROJECT Thea Foss

Notebook No. _____
Continued From Page _____

030208

0800 PD cal @ 7.21°C = 102% R_p = 772.3 mmHg
Tumb cal @ 0 & 10.0

0730 – Thurber placing filter material @ Nord of WZ 3.
Manson placing rock at Sand of WZ 3.

0800 – 0900 Jon Newton does rig inspection at both rigs.

Continued on Page

Read and Understood By

Signed	Date	Signed	Date
[signature]	2/8/03	[signature]	03-2-08

PROJECT THEA FOSS

Notebook No. _____ 53

Continued From Page _____

Thor's Park

Flood Tide

30208

TIME	LOCATION	WZ/EVENT	DTB	SAMPLE DEPTH		TEMP	SAL	DO	TURB	TSS
0807	TPMW350	A	93	D	88	9.2	28.8	8.4	0.1	—
0808	53 - 385			M	46	9.2	28.8	8.4	0.1	—
0809	nec 7.1	WZ3		S	3	8.9	26.8	8.7	0.0	—
										—
0838	TPW 350	A	77	D	72	9.2	28.8	8.2	1.1	—
0839	53 440			M	38	9.2	28.8	8.2	1.3	—
0840	nec 6.1	WZ3		S	3	9.0	27.2	5.5	2.2	—
0843	TPWE350	A	58	D	53	9.2	28.8	8.1	1.5	—
0844	514 493			M	29	9.2	28.8	8.1	0.9	—
0845	nec 6.1	WZ3		S	3	8.9	26.7	8.3	2.8	—
				S						
0849	TPSE350	A	42	D	38	9.2	28.8	8.2	1.3	—
0850	420 534			M	21	9.2	28.7	8.1	1.2	—
0851	nec 6.8	WZ3		S	3	8.8	26.3	8.2	4.8	—
0854	TPS 350	A	41	D	37	9.2	28.8	8.1	1.8	—
0855	372 515			M	20	9.2	28.7	8.1	1.8	—
0856	nec 6.1	WZ3		S	3	8.6	25.7	8.0	4.7	—
0900	TPS 150	A	43	D	38	9.2	28.8	7.9	1.5	—
0901	466 466	WZ3		M	22	9.3	28.7	7.8	1.5	—
0902	nec 6.8			S	3	8.9	26.7	8.0	4.3	—
0906	TP SW350	A	44	D	40	9.2	28.8	7.9	8.8	—
0907	335 473			M	22	9.2	28.6	7.8	19.7	[illegible]
0908	nec 6.0	WZ3		S	3	8.4	24.5	8.5	4.1	—
	Dryer & collect DO									
0920	TPSW	A	44	D	40	9.3	28.8	7.8	6.6	—
0921	335 473			M	22	9.2	28.8	7.7	1.7	—
0922	nec 5.2	WZ3		S	3	8.4	25.2	8.2	3.7	—

Continued on Page

Read and Understood By

[signature] 30208 — Signed — Date

[signature] 2/8/03 — Signed — Date

The Mans in Rig may be working in WZ 2, so we sampled @ TPSW 350 for that Zone [illegible], Because we got high turb @ TPSW350, WZ 3 [illegible]

" for WZ 1 @ TPSW 350

" for WZ 1 @ TPSW 150

Post sampling cal for DO = 97% @ 7.3°C (772.4 [illegible]

*DO BY WINKLER METHOD
TRIALS 1) 8.0 mg/L
2) 8.0 mg/L

1120 CALIBRATION NOTES:

DO CALIBRATED IN MOIST AIR OVER TAP WATER
CALIB. CHECK = 101.7%

TURB CALIBRATED USEING MANUFACTURERS
2 POINT METHOD 1) 0.0 NTU = DI WATER
2) 10.0 NTU = CALIBRATION STANDARD
CALIB. CHECK IN STANDARD SOLUTION
AFTER CALIB = 9.9

BAROMETRIC PRESSURE = 774.0

Continued on Page

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[signature] 03.2.08 [signature] 2/18/03

Signed Date Signed Date

9 30 L03 Thea Park (Flood, cont)

Time	Location	event	DTB	sample depth		temp	sal	DO	Turb	TSS
0925	TPSW 350	A	44	D	40	9.2	28.8	7.6	5.1	—
0926	275 576			M	22	9.2	28.7	7.5	19.0	—
0927	acc 5.0	WZ2		S	3	8.9	24.1	7.8	4.7	—
0930	TPSW 350	A	44	D	40	9.2	28.8	7.7	3.9	—
0931	269 535			M	22	9.2	28.7	7.5	2.9	—
0932	acc 5.0	WZ1		S	3	8.7	26.8	7.9	5.6	—
0933	TPSW 350	A	45	D	40	9.2	28.8	7.6	4.6	—
0934	264 509			M	22	9.2	28.7	7.2	17.6	—
0935	acc 5.0	WZ1		S	3	8.5	24.9	7.7	2.8	—
1135	TPSW (350)	WZ-3	41	D	36	9.2	28.8	7.3	← 5.4 = TURB EBB	THEAS PART —
1136	335 473	B		M	22	9.2	28.3	7.1	12.2	—
1137	Acc = 6.2'			S	3	8.4	24.8	7.7	5.5	—
1143	TPS (350)	WZ-3	34	D	34	9.2	28.8	7.5	3.3	—
1144	372 518	B		M	20	9.2	28.4	7.2	2.4	—
1145	Acc = 6.1			S	3	8.6	26.2	7.5	2.6	—
1147	TPSE (350)	WZ-3	40	D	35	9.2	28.8	7.2	1.2	—
1148	420 534	B		M	20	9.2	28.5	7.1	1.4	—
1149	Acc = 6.2			S	3	8.9	25.7	7.2	2.5	—
1153	TPNE (350)	WZ-3	57	D	52	9.2	28.9	7.1	1.1	—
1154	514 493	B		M	29	9.2	28.8	7.1	1.0	—
1154	Acc = 6.4			S	3	8.2	24.5	7.8	2.7	—
1158	TPN (350)	WZ-3	69	D	64	9.2	28.9	7.3	0.8	
1159	536 440	B		M	35	9.2	28.8	7.1	1.2	
1200	Acc = 6.0			S	3	8.1	24.4	7.8	3.2	

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[signature] 2/8/03 — Signed — Date

1130
HURLEN CONTINUES PLACING GRAVEL - FILTER CAP
MANSON " " QUARRY SPALLS

BOTH RIGS PLACING @ ~ 1 BUCKET / 1.5-2.0 MINUTES

1205 - HURLEN SWITCHES OUT BARGES (MATERIAL) ie
STOPS PLACING MATERIAL.
- MANSON WORKS THROUGH LUNCH

1300 CALIBRATION CHECK

DO. = 98.4% IN MOIST AIR OVER
TAP WATER

1315 HURLEN EMPTY BARGE ~~ON~~ TIED TO RAINER
NO MATERIAL PLACEMENT SINCE 1205

Continued on Page

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Daniel A. Berta 02/08/03 — Signed — Date

Michael Floyd 2/8/03 — Signed — Date

PROJECT THEA FOSS

Notebook No. _____

Continued From Page _____

030208

ALL READINGS THIS PAGE IN EBB TIDE

ME	LOCATION	WZ/EVENT	DTB	SAMPLE DEPTH		TEMP	SAL	DO	TURB	TSS
1204	TPNW(35C)	WZ-3	80	D	75	9.2	28.9	6.8	3.0	—
1205	530 385	B		M	40	9.2	28.8	6.8	1.1	—
1205	Acc = 6.7			S	3	8.6	25.1	7.0	6.5	—
1215	TPN(15C)	WZ-3	45	D	40	9.2	28.8	7.0	8.7	—
1216	476 433	B		M	23	9.1	27.3	6.9	6.6	—
1217	Acc = 7.3			S	3	8.8	26.1	7.1	2.9	—
	*									
	ADDITIONAL READINGS									
243	TPSW 350	WZ-2	40	D	35	9.2	28.8	7.2	1.9	—
1244	275 506	B		M	20	9.2	27.9	7.1	7.4	—
1245	Acc = 7.0			S	3	8.6	25.1	7.5	8.6	—
249	TPSW 150	~~WZ-2~~ WZ-1	37	D	32	9.2	28.7	7.0	1.6	—
1250	264 509	B		M	19	9.1	27.3	7.1	6.3	—
1251	Acc = 5.5			S	3	~~9.4~~ 8.5	25.7	7.3	10.4	—
[illegible]	SP 7400	B	37	D	32	9.3	28.5	6.8	2.9	—
1227	940 955			M	19	9.1	27.5	6.6	2.6	—
1228	Acc = 5.6'			S	3	8.6	25.4	7.1	3.2	—

~~DUPLICATE~~: — DUPLICATE DATA ON PAGE #53 FOR TPSW (35C)

~~SP 7400~~ ~~B~~ ~~D~~

~~940 955~~ ~~M~~

~~Acc =~~ ~~S 3~~

Continued on Page

Read and Understood By

[signature] Signed 02/08/03 Date

[signature] Signed 2/8/03 Date

American Civil Constructors

Hurlen Construction

PO Box 80945
700 S. Riverside Dr.
Seattle, WA 98108
(206) 763-1230
FAX (206) 762-1854

FAX TRANSMITTAL

Date:	2/9/03	Number of Pages Including this Sheet:	10
Deliver To:	O'LOUGHLIN / WINGARD		
Company:	COT		
Fax Number:	253-272-2412		

From:	M. LLOYD
Company:	ACC / Hurlen Construction / L+AT
Fax Number:	206-762-1854
Subject	WQ REPORT 2/8/03

Lloyd & Associates, Inc.
38210 SE 92nd Street, Snoqualmie, Washington 98065 425-888-1905 mml@centurytel.net

February 9, 2003

TRANSMITTAL

To: Iain Wingard
John O'Loughlin

Subject: Compliance Monitoring / Thea's Park 2/9/03

Attached please find results from compliance monitoring for the following work activity:

- Slope Cap and Channel Cap Construction at Thea's Park

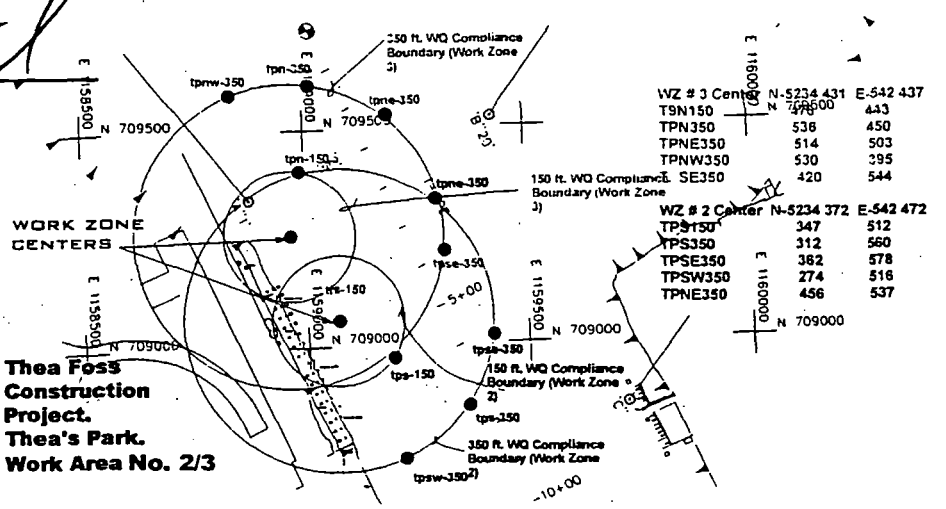
Thea's Park – Cap Construction.

ACC-Hurlen was working at Thea's Park placing filter material on the slope of the north end. Manson started placing channel cap on the south end. The channel cap material (basically just sand) was very clean and very little turbidity was visually observed on the surface. Water quality monitoring was conducted on an ebb tide in the morning and a flood tide in the afternoon. Water quality was very good during both monitoring events. Visual observation of operations showed that both Manson and Hurlen placing material at a relatively good pace of 1 bucket every 1.5 to 2 minutes. This pace was not constaant because of the necessity to stop and check/verify depth of placement on the slope cap. There is some visual turbidity at the point of contact with water on the slope with the filter cap material

QA/QC.

Field duplicate data was recorded for sample 030209/TPSE350/M/A-DUP. Field duplicate data was very good with excellent reproducibility although considerable variability was observed with turbidity. All calibrations were acceptable, and no instrumental problems were encountered. Winkler titration results (dissolved oxygen) for TPSE350 were 6.9 and 7.0 mg/L. YSI Sonde result for dissolved oxygen was 7.0 mg/L.

Michael Lloyd
Lloyd & Associates, Inc.



Construction Compliance Monitoring

Date: FEB 9 **Thea's Park - Flood Tide**

	Station/Sample	Depth/DTB (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
Up-Current Monitoring Stations	**TPNW350 (Up-current/WZ3)**	3	27.3	6.6	1.8	8.9		5,234,530	542,385	923	Manson placing riprap
	Mid	46	28.7	6.6	0.9	9.2				922	WZ3/WZ2
	Deep	85/91	28.9	6.5	1.9	9.2				921	Hurlen placing filter material in
	TPN350 (Up-current/WZ3)	3	27.9	7.0	1.3	8.9		5,234,536	542,440	920	WZ3
	Mid	36	28.8	6.6	1.4	9.2				919	
	Deep	65/71	28.9	6.7	1.8	9.3				918	
	TPNE350 (Up-current/WZ3)	3	27.8	6.9	1.4	9.0		5,234,514	542,493	908	
	Mid	32	28.8	6.7	3.5	9.2				907	
	Deep	58/63	28.9	6.9	1.4	9.2				906	minor turbidity at depth
Inter work zone Sampling Stations	**TPSE350 (Mid Zone/WZ3)**	3	28.2	7.0	1.5	8.8		5,234,420	542,534	854	
	Mid	22	28.7	7.0	7.8	9.2				854	
	Deep	36/41	28.7	6.9	**29.2**	9.2				850	FD result 9 minutes later at 7.9
	TPSE350 (Mid Zone/WZ3)-Dup	3	28.2	7.0	1.0	8.9		5,234,420	542,534	859	Field Duplicate
	Mid	22	28.7	7.0*	1.3	9.3				859	Field Duplicate
	Deep	36/41	28.7	7.0	**7.9**	9.2				855	Field Duplicate
	TPNE350(Mid Zone/WZ2)	*3*	*28.2*	*7.0*	*2.5*	*9.1*		*5,234,456*	*542,526*	*847*	
	Mid	*22*	*28.7*	*7.0*	*6.5*	*9.2*				*846*	
	Deep	*39/44*	*28.7*	*7.0*	*9.8*	*9.2*				*845*	*Stop 5-10 min for soundings*
Down-Current Stations'	**TPSW350 (down-current/WZ2)**	3	27.3	8.4	2.8	8.7		5,234,275	542,526	821	
	Mid	22	28.4	8.1	9.8	9.2				820	
	Deep	39/44	28.8	8.0	2.6	9.2				819	
	TPS350 (down-current/WZ2)	3	27.1	7.9	1.2	8.7		5,234,312	542,550	831	
	Mid	30	28.5	7.6	2.2	9.2				830	
	Deep	34/39	28.7	7.9	9.5	9.2				829	
	TPSE350 (Down-Current/WZ2)	3	28.0	7.6	1.2	8.9		5,234,360	542,567	836	
	Mid	21	28.5	7.6	1.5	9.2				835	
	Deep	37/42	28.7	7.7	2.8	9.2				834	
	TPS150 (Down-Current/WZ2)	3	27.7	7.7	7.4	9.0		5,234,346	542,499	842	Against boom near barge
	Mid	21	28.5	7.5	4.6	9.2				841	
	Deep	37/42	28.7	7.7	**29.8**	9.2				840	High turbidity at early warning
Reference Station	***Station SP7+00***	*3*	*28.2*	*6.6*	*1.3*	9.1		*5,234,940*	*542,955*	*937*	
	Mid	*22*	*28.5*	*6.5*	*1.6*	*9.2*				*936*	
	Deep	*36/41*	*28.8*	*6.6*	*1.2*	*9.2*				*935*	

Pre-Survey Calibration (DO) D. Berta 2/9 101.5% Final = 96.6% cold, cloudy, sun breaks in afternoon

DO Calibration as per manufacturer's specifications.

Survey work conducted by Steven High

Turbidity Calibration as per manufacturer's specifications. Calibration at 0, 10NTU's.

Up-Current points from WZ3 on north end. Down-current points from WZ2 on south end.

*Winkler titration results for TPSE350 (WZ3) = 6.9 and 7.0 mg/L. Sonde result = 7.0

Winkler Titration on sample TPSW350 = 8.0 and 8.0 mg/L

Prepared By/Date: M. Lloyd 2/9/03

TSS Data Update

L&AI

Construction Compliance Monitoring

Date: FEB 9 **Thea's Park - Ebb Tide**

	Station/Sample	Depth/DTB (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
Up-	TPSW350 (Up-current/WZ2)	3	27.4	7.0	3.1	8.4		5,234,275	542,516	1214	Manson placing channel cap
	Mid	22	28.6	6.5	10.4	9.2				1213	Hurlen placing filter cap material
	Deep	36/41	28.9	6.6	2.7	9.2				1212	
	TPS350 (Up-current/WZ2)	3	28.0	6.8	1.5	9.1		5,234,312	542,560	1209	Manson/Hurlen to to lunch
	Mid	19	28.6	6.6	2.3	9.2				1208	
	Deep	35/40	28.8	6.6	1.9	9.2				1207	
	TPSE350 (Up-current/WZ2)	3	28.1	6.7	1.4	9.2		5,234,360	542,577	1203	
	Mid	20	28.7	6.6	2.1	9.2				1202	
	Deep	35/40	28.8	6.6	1.5	9.2				1201	
Interzone Monitoing Stations	TPSE350 (Mid-Zone/WZ3)	3	27.6	6.8	3.6	9.1		5,234,420	542,544	1154	
	Mid	20	28.6	6.5	1.5	9.3				1153	
	Deep	35/40	28.8	6.5	1.6	9.3				1152	
	TPNE350 (Down-current/WZ2)	40	28.0	6.5	1.5	9.0		5,234,456	542,536	1200	
	Mid	22	28.6	6.6	5.7	9.2				1159	
	Deep	38/43	28.8	6.6	2.7	9.2				1158	
Down-Current Monitoing Stations	TPNE350 (Down-current/WZ3)	3	28.0	6.2	1.7	9.1		5,234,514	542,503	1145	
	Mid	28	28.6	6.2	4.2	9.2				1144	
	Deep	40/45	28.7	6.1	6.3	9.2				1143	
	TPN350 (Down-current/WZ3)	3	28.0	6.4	1.6	9.1		5,234,536	542,450	1134	WZ3 moved 10 m east
	Mid	32	28.6	6.5	2.8	9.2				1133	
	Deep	60/65	28.8	6.6	9.3	9.2				1132	
	TPN150 (Down-Current/WZ3)	3	27.9	6.2	2.5	8.8		5,234,476	542,443	1141	Hurlen stops for soundings
	Mid	23	28.6	6.2	2.0	9.1				1140	
	Deep	40/45	28.7	6.3	8.0	9.2				1139	
	TPNW350 (Down-current/WZ3)	3	28.0	6.3	1.5	9.1		5,234,530	542,395	1128	WZ3 moved 10 m east
	Mid	46	28.7	6.4	0.8	9.2				1127	
	Deep	86/91	28.9	6.4	3.3	9.2				1126	

Pre-Survey Calibration D. Berta 100.7% Final = 102.9% foggy, cold, cloudy, 7.3 °C

DO Calibration as per manufacturer's specifications.

Survey work conducted by D. Berta

Turbidity Calibration as per manufacturer's specifications. Calibration at 0, 10NTU's. Check on 10 ntu std. = 9.8 ntu

All work conducted in the center portion of the site.

Prepared By/Date: M. Lloyd 2/9/03

TSS Data Update

L&AI

PROJECT THEA FOSS

Notebook No. _____

Continued From Page _____

30209

FLOOD TIDE @ THEA'S PARK COMBINED WZ2 & 3

TIME	LOCATION	WZ EVENT	DTB	SAMPLE DEPTH		TEMP	SAL	DO	TURB	TSS
0819	TPSW 350	WZ-2	(44)	D	39	9.2	28.8	8.0	2.6	—
0820	375 526	~~44~~		M	22	9.2	28.4	8.1	9.8	—
0821	Acc = 8.1	A		S	3	8.7	27.3	8.4	2.8	—
							FLOOD			
0829	TPS 350	WZ-2	(39)	D	34	9.2	28.7	7.9	9.5	—
0830	312 552	A		M	20	9.2	28.5	7.6	2.2	—
0831	Acc = 6.2			S	3	9.0	27.1	7.9	1.2	—
							FLOOD			
0834	TPSE (350)	WZ-2	(42)	D	37	9.2	28.7	7.7	2.8	—
0835	360 567	A		M	21	9.2	28.5	7.6	1.5	—
0836	Acc = 6.5			S	3	8.9	28.0	7.6	1.2	—
							FLOOD			
0840	TPS (150)	WZ-2	(42)	D	37	9.2	28.7	7.7	29.8	—
0841	346 499 *	A		M	21	9.2	28.5	7.5	4.6	—
0842	Acc = 8.2			S	3	9.0	27.7	7.7	7.4	—
	* AGAINST SOUTH SIDE MANSON MATERIAL BARGE									FLOOD
0845	TPNE (350)	WZ-2	(44)	D	39	9.2	28.7	7.1	9.8	—
0846	456 526			M	22	9.2	28.7	7.0	6.5	—
0847	Acc = 5.7			S	3	9.1	28.2	7.0	1.7	—
							FLOOD			* (RANGE 12 = 35)
0850	TPSE (350)	WZ-3	(41)	D	36	9.2	28.7	6.9	29.2	
0854	420 534	A		M	22	9.2	28.7	7.0	7.8	—
0854 DB	Acc = 5.7			S	3	9.1	28.2	7.0	1.5	—
	DUPLICATE:									
0855	TPSE (350)	WZ-3	(41)	D	36	9.2	28.7	7.0	7.8	— *
0859 DB	420 534	A		M	22	9.2	28.7	7.0	1.3	—
0859	Acc = 9.2			S	3	9.2	28.2	7.0	1.0	—
0906	TPNE (350)	WZ-3	(63)	D	58	9.2	28.9	6.9	1.4	—
0907	514 493	A		M	32	9.2	28.8	6.7	3.5	
0908	Acc = 4.9			S	3	9.0	27.8	6.9	1.4	

Continued on Page

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[signature] 02/09/03 — Signed — Date

PROJECT THEA FOSS

Notebook No. _____
Continued From Page _____

030209

1115 CALIBRATION CHECK = 96.6 %
RECALIBRATED IN MOIST AIR OVER TAP WATER
773.8 = BAROMETRIC PRESSURE (mm Hg)
CALIBRATION CHECK = 100.7 %

1120 TURBIDITY CALIBRATION CHECK:
DI WATER = 0.0 NTU 9.8 IN 10 NTU STANDARD SOLUTION

*** RIGS MOVED ~ 10 m TO EAST - 10 METERS ADDED TO EASTING COORDINATES FOR COMBINED WZ-2 & WZ-3 LOCATIONS

NOTE: 1115 BOTH HURLEN & MANSON PLACING MATERIAL (~~HUR~~ MANSON RELOCATED TO EAST OF EVENT A READINGS)
1140 - HURLEN BREAKS FOR SOUNDINGS / MANSON CONTINUES PLACEMENT

* 0936 READINGS D.O. = 6.5 WINKLER
METHOD DO FROM YAB SAMPLES 1) 6.9 mg/L
2) 7.0 mg/L

Continued on Page

Read and Understood By

Daniel A. Burke 02/09/03 _____ [signature] 2/9/03
Signed Date Signed Date

30 Jan 09 — FLOOD (=> SLACK)

TIME	LOCATION	WZ/EVENT	DTB	SAMPLE DEPTH	TEMP	SAL	DO	TURB	TSS
0918	TPN(352)	WZ-2	74	D 65	9.2	28.9	6.7	1.8	—
0919	536 440	A		M 36	9.2	28.8	6.6	1.4	—
0920	Acc=5.2			S 3	8.9	27.9	7.0	1.3	—
0921	TPNW(350)	WZ-2	91	D 55	9.2	28.9	6.5	1.9	—
0922	530 385	A		M 46	9.2	28.7	6.6	0.9	—
0923	Acc = 4.5			S 3	8.7	27.3	6.6	1.8	—
0935	SP 7-10	A	41	D 36	9.2	28.8	6.6	1.2	—
0936	940 955			M 22	9.2	28.5	6.5	1.6	— *
0937	Acc=5.4			S 3	9.1	28.2	6.6	1.3	—
* SAMPLE OBTAINED FOR DB BY WHELER METHOD AT HA LAB									
*** 1126	TPNW(350)	WZ-3	91	D 56	9.2	28.9	6.4	3.3	— EBB
1127	530 395	B DB		M 46	9.2	~~28.3~~ 28.7 *	6.4	0.8	—
28	Acc=5.6			S 3	9.1	28.0	6.3	1.5	—
	* (28.7) DB								
			65 03				EBB		
1132	TPN(350)	DB WZ-2	~~65~~	D 68	9.2	28.8	6.6	9.3	DB —
1133	536 452	B 3		M 32 ~~34~~	9.2	28.6	6.5	2.8 (2.4)	—
1134	Acc 5.8			S 3	9.1	28.0	6.4	1.6	—
		DB WZ-3					EBB		
1139	TPN(150)	~~WZ-2~~	45	D 40	9.2	28.7	6.3	8.0	—
1140	476 443	B		M 23	9.2	28.6	6.2	2.0	—
1141	Acc = 6.8			S 3	9.1	27.9	6.2	2.5	—
		DB WZ-3					EBB		
1143	TPNE(350)	~~WZ-2~~	52	D 51	9.2	28.7	6.1	6.3	—
1144	514 503	B		M 28	9.2	28.6	6.2	4.2	—
1145	Acc = 7.0			S 3	9.1	28.0	6.2	1.7	—
							EBB		
1152	TPSE(352)	WZ-3	40	D 35	9.2	28.8	6.6	1.6	—
1153	420 544	B		M 20	9.2	28.6	6.5	1.5	—
1154	Acc = 7.2			S 3	9.0	27.6	6.8	5.6	

Continued on Page

Read and Understood By

Daniel H. Parker 02/09/03 — Signed — Date

T. Mahlzel — Signed — 2/9/03 — Date

PROJECT TIKEA FOSS

Notebook No. _____
Continued From Page _____

030209
1200 - FOG BURNS OFF - PRY CLOUDY
NOTE ALL SAMPLING POINTS IN AM. - NO FLOAT DEBRIS
OR TURBIDITY PLUMES NOTED

BOTH RIGS BREAK FOR LUNCH @ 1200 - MANSON
LOWERS BOOM ON DERICK - REPORTEDLY TO MOVE EAST

1230 DO CALIBRATION CHECK = 102.9 %

Continued on Page

Read and Understood By

Daniel A. Burk 02/4/03 _____ B M Lloyd 2/9/03
Signed Date Signed Date

030204 - COOL / FOG.

0730 - MANSON PLACING IN WZ-2 / WITH CLAM SHELL (CHANNEL CAP)
HURLEN PLACING IN WZ-3 WITH "BOX" 3 - QUARRY SPALLS

CALIBRATION NOTES:
BAROMETRIC PRESSURE: 772.3 mm Hg TEMP 5.5°C
D.O. CALIBRATED IN MOIST AIR OVER TAP WATER.
CALIBRATION CHECK = 101.5%

TURBIDITY CALIBRATED USEING MANUFACTURERS
2-POINT METHOD 1) 0.0 = D.I WATER
2) 10.0 NTU = CALIBRATION STANDARD.
CALIBRATION CHECK = 10.0 NTU IN STANDARD
SOLUTION AFTER CALIBRATION

0845 PARAMETRIX ON SITE - BOTH RIGS DISCONTINUE MATERIAL PLACEMENT
0850 HURLEN RESUMES QUARRY SPALL PLACEMENT

* 0850 - TPSE 350 READINGS SONDE LEFT AT DEPTH 0850 - 0854 RANGE OF READINGS FROM 12-35 FOR TURBIDITY - STABILIZED NEAR 29.2
SAME AS DUPLICATE 0855-0859 - RANGE 2 - 7.8 NTU.

Continued on Page

Read and Understood By

Daniel A. Burke 02/09/03 — Signed — Date
R M Lloyd — Signed — 2/9/03 — Date

PROJECT TIKEA FOSS

Notebook No. _____ 63

Continued From Page _____

030209

EBB FLOW

TIME	LOCATION	WZ/EVENT	DTB	SAMPLE DEPTH		TEMP	SAL	DO	TURB	TSS
1158	TPNE(350)	WZ-2	(43)	D	38	9.2	28.8	6.6	2.7	—
1159	456 536	B		M	22	9.2	28.6	6.6	5.7	—
1200	Acc=8.1			S	3	9.0	28.0	6.5	1.5	—
							EBB			
1201	TPSE(350)	WZ-2	(40)	D	35	9.2	28.8	6.6	1.5	—
1202	360 577	B		M	20	9.2	28.6	6.6	2.1	—
1203	Acc=6.7			S	3	9.2	28.1	6.7	1.4	—
							EBB			
1207	TPS(350)	WZ-2	(38)	D	33	9.2	28.8	6.6	1.9	—
1208	312 560	B		M	19	9.2	28.6	6.6	2.3	—
1209	Acc=6.7			S	3	9.1	28.0	6.8	1.5	—
							EBB			
1212	TPSW(350)	WZ-2	(41)	D	36	9.2	28.9	6.6	2.7	—
1213	275 516	B		M	22	9.2	28.6	6.5	10.4	—
1214	Acc=5.9			S	3	8.9	27.4	7.0	3.1	—

Continued on Page

Read and Understood By

Daniel H. Beck 02/09/03 — Signed — Date

R M Lloyd — Signed — 2/9/03 — Date

American Civil Constructors

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700 S. Riverside Dr.
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Hurlen Construction

FAX TRANSMITTAL

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From:	M. LLOYD
Company:	ACC / Hurlen Construction
Fax Number:	206-762-1854
Subject	WQ Report 1/9/03

CC. FILE
MANSON
CQC
L+AI

Lloyd & Associates, Inc.
38210 SE 92nd Street, Snoqualmie, Washington 98065 425-888-1905 rml@centurytel.net

February 10, 2003

TRANSMITTAL

To: Iain Wingard
John O'Loughlin

Subject: Compliance Monitoring / Thea's Park 2/10/03

Attached please find results from compliance monitoring for the following work activity:

- Slope Cap and Channel Cap Placement at Thea's Park

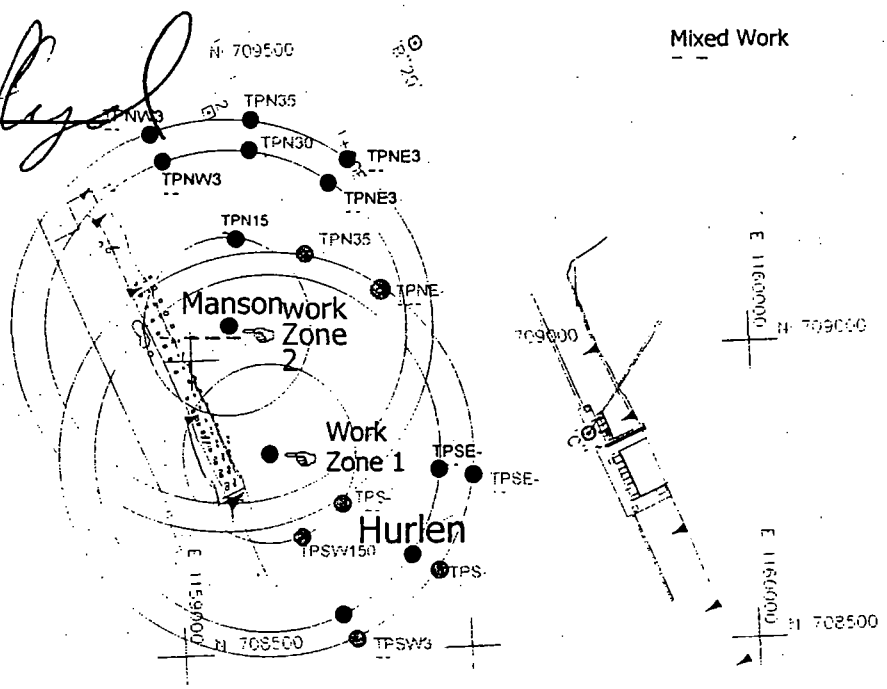
Thea's Park – Cap Construction.

ACC-Hurlen was working at Thea's Park placing rock on the slope of the south end. Manson started placing channel cap at the middle portion of the channel cap. The channel cap material (basically just sand) appeared to be very clean and, little turbidity was visually observed on the surface. Water quality monitoring was conducted on a short flood tide in the morning and an ebb tide in the afternoon. Water quality was very good during both monitoring events. Visual observation of operations showed that both Manson and Hurlen placing material at a relatively good pace Both crews stopped periodically to measure elevations. There is some visual turbidity at the point of contact with water on the slope with the filter cap material

QA/QC.

Field duplicate data was recorded for sample 030210/SP7+00. Field duplicate data was very good with excellent reproducibility although minor variability was observed with turbidity. All calibrations were acceptable, and no instrumental problems were encountered. Winkler titration results (dissolved oxygen) for station SP7+00 were 6.8 and 7.0 mg/L. YSI Sonde result for dissolved oxygen was 6.7 mg/L.

Michael Lloyd
Lloyd & Associates, Inc.



Construction Compliance Monitoring **Date: FEB 10** **Thea's Park - Flood Tide**

	Station/Sample	Depth/D TB (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
Up-Current Monitoring Stations	TPNW350 (Up-current/WZ2)	3	22.4	6.6	3.6	7.9		5,234,470	542,428	936	Manson placing channel cap
	Mid	23	28.6	6.2	1.2	9.2				935	WZ2 10 m East
	Deep	41/46	28.8	6.0	1.1	9.2				934	Hurlen light riprap in WZ1
	TPN350 (Up-current/WZ2)	3	22.7	6.2	3.1	7.9		5,234,427	542,483	941	
	Mid	21	28.7	5.8	3.4	9.2				940	
	Deep	37/42	28.7	5.9	2.3	9.3				939	
	TPNE350 (Up-current/WZ2)	3	24.6	6.3	2.7	8.4		5,234,456	542,536	950	
	Mid	22	28.7	6.0	2.8	9.2				949	
	Deep	39/44	28.7	6.1	1.9	9.2				948	
Inter work zone Sampling Stations	TPSE350 (Mid Zone/WZ2)	3	25.3	6.3	2.7	8.4		5,234,360	542,577	953	
	Mid	20	28.6	6.0	2.8	9.2				952	
	Deep	35/40	28.8	6.1	1.9	9.2				952	
	TPNE350(Mid Zone/WZ1)	*3*	*25.0*	*6.5*	*2.6*	*8.4*		*5,234,390*	*542,566*	*1004*	
	Mid	*21*	*28.6*	*6.4*	*3.2*	*9.2*				*1003*	
	Deep	*37/42*	*28.9*	*6.2*	*2.2*	*9.2*				*1002*	
Down-Current Stations'	TPSW350 (down-current/WZ1)	3	25.1	7.2	2.8	8.7		5,234,275	542,528	1018	WZ1 moved 10 m east for
	Mid	20	28.6	6.7	2.3	9.2				1017	channel cap work
	Deep	34/39	28.9	6.7	2.4	9.2				1016	
	TPS350 (down-current/WZ1)	3	25.6	6.9	2.6	8.5		5,234,246	542,589	1014	
	Mid	20	28.5	6.7	2.6	9.1				1013	
	Deep	35/40	28.8	6.8	1.6	9.2				1012	
	TPSE350 (Down-Current/WZ1)	3	25.7	6.5	2.7	8.5		5,234,295	542,606	1009	
	Mid	20	28.6	6.4	2.5	9.2				1008	
	Deep	34/39	28.9	6.6	2.2	9.2				1007	
Reference Station	*Station SP7+00*	*3*	*23.4*	*7.1*	*3.6*	8.0		*5,234,940*	*542,955*	*901*	
	Mid	*20*	*28.1*	*6.7**	*2.6*	9.2				*900*	
	Deep	*35/40*	*28.8*	*6.5*	*1.3*	9.2				*859*	
	Station SP7+00- Duplicate	*3*	*24.0*	*6.8*	*3.0*	9.1		*5,234,940*	*542,955*	*920*	*Field Duplicate*
	Mid	*20*	*28.3*	*6.4*	*2.6*	9.2				*919*	*Field Duplicate*
	Deep	*35/41*	*28.8*	*6.5*	*1.7*	*9.2*				*918*	*Field Duplicate*

Pre-Survey Calibration (DO) D. Berta 2/10 102.4% Final = 96.6% cold, cloudy, sun breaks in afternoon 9°C

DO Calibration as per manufacturer's specifications.

Survey work conducted by Steven High

Turbidity Calibration as per manufacturer's specifications. Calibration at 0, 10NTU's.

Up-Current points from WZ3 on north end. Down-current points from WZ2 on south end.

*Winkler titration results for 6.7SP7+00 = 6.8 and 7.0 mg/L. Sonde result = 6.7 mg/L

Winkler Titration on sample TPSW350 = 8.0 and 8.0 mg/L

Prepared By/Date:

M. Lloyd 2/10/03

L&AI

Construction Compliance Monitoring **Date: FEB 10** **Thea's Park - Ebb Tide**

	Station/Sample	Depth/DTB (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
Up-Current Station	**TPSW350 (Up-current/WZ1)**	3	25.5	6.1	2.0	8.7		5,234,209	542,545	1309	Manson placing channel cap
	Mid	20	28.1	6.4	2.7	9.1				1308	Hurlen placing riprap
	Deep	35/40	28.8	6.4	1.6	9.2				1305	
	TPS350 (Up-current/WZ1)	3	26.2	6.9	10.1	8.8		5,234,246	542,589	1451	
	Mid	17	27.8	6.7	13.8	9.1				1450	
	Deep	30/34	28.5	6.6	6.0	9.2				1449	
	TPSE350 (Up-current/WZ1)	3	27.0	6.7	7.0	8.9		5,234,295	542,606	1456	
	Mid	17	27.9	6..4	8.9	9.1				1455	
	Deep	30/34	28.4	6.5	3.0	9.2				1454	
Interzone Monitoing Station	**TPSE350 (Mid-Zone/WZ2)**	3	26.7	6.8	5.0	8.8		5,234,366	542,577	1512	
	Mid	17	28.0	6.6	2.2	9.1				1511	
	Deep	30/35	28.3	6.6	7.2	9.2				1510	
	TPNE350 (Down-current/WZ1)	3	25.7	6.8	3.7	8.7		5,234,390	542,566	1507	
	Mid	19	28.0	6.6	2.1	9.1				1506	
	Deep	32/37	28.7	6.6	2.2	9.2				1505	
Down-Current Monitoing Stations	**TPNE350 (Down-current/WZ2)**	3	26.0	6.9	4.8	8.7		5,234,456	542,536	1518	
	Mid	19	28.2	6.6	4.2	9.1				1517	
	Deep	32/37	28.6	6.5	1.3	9.2				1516	
	TPN350 (Down-current/WZ2)	3	27.2	7.1	3.4	9.1		5,234,477	542,483	1524	WZ2 moved 10 m east
	Mid	32	28.3	6.4	4.9	9.2				1523	
	Deep	60/65	28.7	6.5	2.7	9.2				1522	
	TPNW350 (Down-current/WZ2)	3	26.6	6.9	12.6	9.1		5,234,470	542,428	1532	WZ2 moved 10 m east
	Mid	28	28.5	6.5	3.0	9.2				1531	
	Deep	51/56	28.8	6.6	1.5	9.2				1530	

Pre-Survey Calibration S. High 2/10 102%* Final = 102.9% cool, partly cloudy, 11.7 °C

DO Calibration as per manufacturer's specifications.

Survey work conducted by S. High

Turbidity Calibration as per manufacturer's specifications. Calibration at 0, 10NTU's. Check on 10 ntu std. = 9.8 ntu

*1300: Bubble in DO probe. Replaced membrane, cleaned electrodes, replaced KCL, recalibrated in field prior to survey

Prepared By/Date:
M. Lloyd 2/10/03

L&AI

PROJECT THEA FOSS

Notebook No. _____
Continued From Page _____

[illegible]0210 OVERCAST / FOG IN AM

0715 - BOTH HURLEN & MANSON RIGS SETTING UP
HURLEN RELOCATED TO WZ-1/WZ-2

BAROMETRIC PRESSURE = 776.0 mmHg TEMP = 6.6 °C

CALIBRATION NOTES:

0800 (AFTER 0.5 HOUR WARM UP IN RUN MODE)

D.O. CALIBRATED IN MOIST AIR OVER TAP WATER.
CALIB. CHECK = 102.4%

TURB NEW TURBIDITY STANDARD SOLUTION USED.
YSI 6073 TURBIDITY STANDARD
100 NTU LOT CODE: K072402
ITEM #: 006073
EXP DATE: JULY 24, 2004

CALIBRATED USEING MANUFACTURERS 2 POINT METHOD.
1) 0.0 NTU = DI WATER 2) 10.0 NTU = STANDARD SOLUTION
TURB CALIB. CHECK = 10.0

0915 MANSON STARTS PLACING CHANEL CAP MATERIAL IN ~~CORRE~~ ADJUSTED WORK ZONE #2
(ADJUSTED EASTING 10 METERS TO EAST)

0942 DO CALIBRATION CHECK = 99.8%
RECALIBRATED IN MOIST AIR OVER TAP WATER
CALIB CHECK = 102.0 %

0946 HURLEN STARTS PLACING QUARRY SPALLS WITH "BOX" AT WORK ZONE #1

Continued on Page

Read and Understood By

Daniel A. Bake 02/10/03 _____ [signature] 03210 _____
Signed Date Signed Date

ROJECT Titea Foss

Notebook No. _____

Continued From Page _____

210 FLOOD - TITEAS PARK

TIME	LOCATION	WZ/ EVENT	DTB	SAMPLE DEPTH		TEMP	SAL	DO	TURB	TSS
859	SP 7+00	A	(40)	D	35	9.2	28.8	6.5	1.3	—
900	940 955			M	20	9.2	28.1	6.7	2.6	030210/SP 7+00/M/A*
901	Acc = 7.5			S	3	8.0	23.4	7.1	3.6	—

* NO TSS - SPLIT DO SAMPLE FOR WINKLER METHOD.
1) CITY OF TACOMA 2) L&A LAB. TCS DO = 6.8, 7.0
← DUPLICATE →

918	SP 7+00	A	(41)	D	35	9.2	28.8	6.5	1.7	—
919	940 955			M	20	9.2	28.3	6.4	2.6	—
920	Acc = 9.1			S	3	8.1	24.0	6.8	3.0	—
						FLOOD				
934	TPNW(350)	WZ-2	(46)	D	41	9.2	28.8	6.0	1.1	—
935	470 428	A		M	23	9.2	28.6	6.2	1.2	—
936	Acc 6.5'			S	3	7.9	22.4	6.6	3.6	—
949	TPN(350)	WZ-2	(42)	D	37	9.2	28.7	5.9	2.3	—
[illegible]	477 483	A		M	21	9.2	28.7	5.8	3.4	—
949	Acc = 7.7			S	3	7.9	22.7	6.2	3.1	—
948	TPNE(350)	WZ-2	(44)	D	39	9.2	28.7	6.1	1.9	—
949	456 536	A		M	22	9.2	28.7	6.0	2.8	—
950	Acc = 6.1			S	3	8.4	24.6	6.3	2.7	—
952	TPSE(350)	WZ-2	(40)	D	35	9.2	28.8	6.1	3.3	—
952	360 577	A		M	20	9.2	28.6	6.1	2.5	—
953	Acc = 4.8			S	3	8.4	25.3	6.7	2.6	—
002	TPNE(350)	WZ-1	(42)	D	37	9.2	28.9	6.2	2.2	—
003	390 566	A		M	21	9.2	28.6	6.4	3.2	—
004	Acc = 7.9			S	3	8.4	25.0	6.5	2.6	—

Continued on Page

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[signature] 02/10/03 — Signed — Date

[signature] 030210 — Signed — Date

PROJECT THEA FOSS

Notebook No. _____
Continued From Page _____

03 02 10

1000 [illegible] OF FILTER CAP MATERIAL
STARTS SET UP TO SWITCH BARGE

Post - Sampling calibration DO = 100% @ 7.5°C

1245 Calibrate for Event "B"
DO = 102% @ 11.7°C BP = 778.2 mm Hg
[illegible] @ 0.8 [illegible]

1300 Replace DO membrane, uncal, 20 mm burn-in
recal 102% @ 777.3 mmHg & @ 11°C

Continued on Page

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[signature] 2/10/03 [signature] 02 02 10

Signed Date Signed Date

30210 FLOOD - THEAS PARK

TIME	LOCATION	WZ/EVENT	DTB	SAMPLE DEPTH	TEMP	SAL	DO	TURB	TSS
1007	TPSE(350)	WZ-1	39	D 34	9.2	28.9	6.6	2.2	—
1008	295 606	A		M 20	9.2	28.6	6.4	2.5	—
1009	Acc = 8.2			S 3	8.5	25.7	6.5	2.7	—
					FLOOD				
1012	TPS(350)	WZ-1	40	D 35	9.2	28.8	6.8	1.6	—
1013	246 589	A		M 20	9.1	28.5	~~6.4~~*	2.6	—
1014	Acc = 5.0			S 3	8.5	25.6	6.9	2.6	—
					FLOOD		*6.7 DG		
1016	TPSW(350)	WZ-1	42	D 37	9.2	28.9	6.7	2.4	
1017	209 545	A		M 21	9.2	28.6	6.7	2.3	
1018	Acc = 7.6			S 3	8.3	25.1	7.2	2.8	
			Thea's Park		Ebb Tide				
305	TPSW 350	B	40	D 35	9.2	28.8	6.4	1.6	—
303	209 545			M 20	9.1	28.1	6.4	2.7	
1319	acc 18	WZ1		S 2	8.7	26.5	6.1	2.0	
1[illegible]9	TPS 350	B	34	D 30	9.2	28.5	6.6	6.0	—
1450	246 589			M 17	9.1	27.8	6.7	13.8	
1451	acc 4.8	WZ1		S 3	8.8	26.2	6.9	10.1	—
1454	TPSE 350	B	34	D 30	9.2	28.4	6.5	3.0	—
1455	295 606	WZ1		M 17	9.1	27.9	6.4	8.9	—
1456	acc 8.3			S 3	8.9	27.0	6.7	7.0	—
1505	TPNE 350	B	37	D 32	9.2	28.7	6.6	2.2	—
1506	390 566	WZ1		M 19	9.1	28.0	6.6	2.1	—
1507	acc 8.1			S 3	8.7	25.7	6.8	3.7	—
1510	TPSE 350	B	35	D 30	9.2	28.3	6.5	7.2	—
1511	346 577			M 17	9.1	28.0	6.5	2.2	—
1512	acc 7.2	WZ1		S 3	8.8	26.7	6.8	5.0	—

Continued on Page

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[signature] 03 02 10 — Signed — Date

[signature] 2/10/03 — Signed — Date

1600 Post Sampling Cal = 99°C 9°C BP = 774.7

Continued on Page

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PROJECT Thea Foss

Notebook No. _____ 69

Continued From Page _____

030210 Thea's Park Ebb Tide (cont)

Time	location	Event	DTB	sample depth	temp	Sal	DO	turb	TSS
1516	TP NE 350	B	37	D 32	9.2	28.6	6.5	1.3	—
1517	456 536	WZ2		M 19	9.1	28.2	6.6	4.2	—
1518	acc 9.4			S 3	8.7	26.0	6.9	4.8	—
1522	TPN 350	B	41	D 37	9.2	28.7	6.5	2.7	—
1523	477 483	WZ2		M 20	9.1	28.3	6.4	4.9	—
1524	acc 11.1			S 3	8.9	27.2	7.1	3.4	—
1530	TP NW 350	B	36	D 51	9.2	28.8	6.6	1.5	—
1531	470 428	WZ2		M 28	9.2	28.5	6.5	3.0	—
1532	acc 8.3			S 3	8.8	26.6	6.9	12.6	
1400	TPSW 350	B	39	D 35	9.2	28.8	6.6	2.1	—
1401	209 545	WZ1		M 20	9.0	27.7	6.5	1.9	—
1402	acc 10.8			S 3	8.8	26.0	6.9	2.3	—
1442	TPSW 350	B	35	D 30	9.2	28.6	6.6	4.0	—
1443	209 545	WZ1		M 18	9.1	28.1	6.6	4.0	—
1444	acc 9.0			S 3	8.5	25.3	7.1	2.8	—

Continued on Page

Read and Understood By

030210

Signed _____ Date _____ Signed [signature] Date 2/10/03

American Civil Constructors

Hurlen Construction

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Fax Number:	253-272-2412		

From:	M. Lloyd
Company:	ACC / Hurlen Construction
Fax Number:	206-762-1854
Subject	WQ Report 2/10/03

Lloyd & Associates, Inc.
38210 SE 92nd Street, Snoqualmie, Washington 98065 425-888-1905 rml@centurytel.net

February 11, 2003

TRANSMITTAL

To: Iain Wingard
John O'Loughlin

Subject: Compliance Monitoring / Thea's Park 2/11/03

Attached please find results from compliance monitoring for the following work activity:

- Slope Cap and Channel Cap Placement at Thea's Park

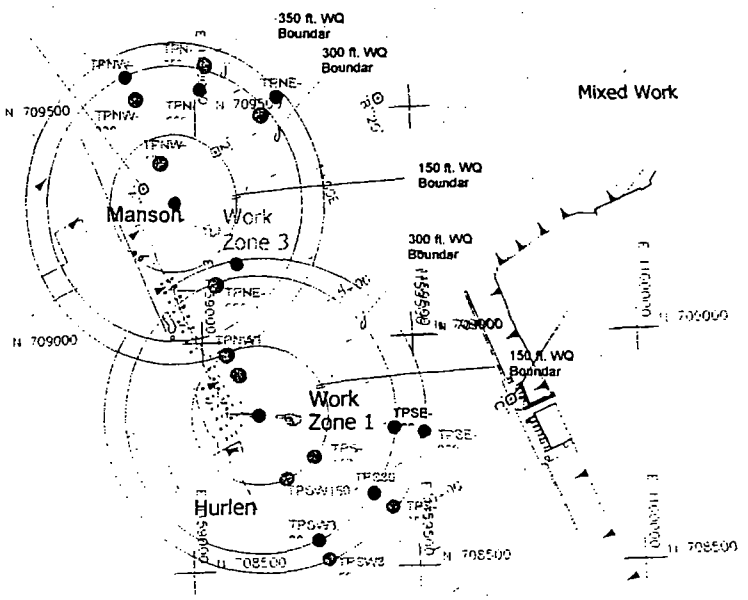
Thea's Park – Cap Construction.

Both Hurlen and Manson were working at a fairly quick pace throughout the day at Thea's Park. During the morning flood tide Hurlen was placing filter material and/or sand on the slope, while Manson was placing channel cap on the north end. Water quality monitoring was conducted on a short flood tide in the morning and an ebb tide in the afternoon. Water quality was very good during both monitoring events. Visual observation of operations showed that both Manson and Hurlen placing material at a relatively good pace Both crews stopped periodically to measure elevations. There was some visual turbidity at the point of contact with water on the slope with the filter cap/sand material, but otherwise turbidity problems were minimal at the compliance boundary. Channel cap material appeared to be very clean sand with virtually no turbidity.

QA/QC.

Field duplicate data was recorded for sample 030211/SP7+00. Field duplicate data was very good with excellent reproducibility (RPD's less than 2%) for all field duplicate measuments. All calibrations were acceptable, and only minor instrumental problems were encountered which were corrected in the field. Winkler titration results (dissolved oxygen) for station SP7+00 were 7.8 and 7.9 mg/L. YSI Sonde result for dissolved oxygen was 7.7 mg/L.

Michael Lloyd
Lloyd & Associates, Inc.



Construction Compliance Monitoring **Date: FEB 11** **Thea's Park - Flood Tide**

	Station/Sample	Depth/DTB (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
Up-Current Monitoring Stations	TPNW350 (Up-current/WZ3)	3	28.7	6.7	0.9	9.1		5,234,530	542,395	932	Manson placing channel cap
	Mid	45	29.3	6.8	1.1	9.2				931	WZ3 10 m East
	Deep	86/91	29.4	6.5	0.9	9.2				930	Hurlen light habitat in WZ1
	TPN350 (Up-current/WZ3)	3	28.8	6.7	0.9	9.0		5,234,536	542,450	936	
	Mid	32	29.3	6.7	0.7	9.2				935	
	Deep	60/64	29.3	6.8	12.0	9.3				934	
	TPNE350 (Up-current/WZ3)	3	28.7	6.5	1.1	9.0		5,234,514	542,503	946	
	Mid	32	29.2	6.6	1.0	9.2				945	
	Deep	60/63	29.4	6.6	4.0	9.2				944	
Inter work zone Sampling Stations	TPSE350 (Mid Zone/WZ2)	3	28.5	6.5	1.8	9.1		5,234,420	542,544	952	
	Mid	20	29.2	6.4	2.6	9.2				951	Both Manson & Hurlen moving
	Deep	35/40	29.4	6.7	0.6	9.2				950	at a quick pace of about 2
	TPNE350(Mid Zone/WZ1)	3	28.4	6.3	2.2	8.4		5,234,390	542,566	959	buckets every 3 minutes
	Mid	21	29.2	6.4	3.5	9.2				959	
	Deep	37/42	29.4	6.2	0.6	9.2				957	
Down-Current Stations'	TPSW350 (down-current/WZ1)	3	28.5	6.3	4.9	8.7		5,234,209	542,548	1026	WZ1 moved 10 m east for
	Mid	20	29.2	6.2	5.1	9.2				1028	channel cap work
	Deep	34/39	29.4	6.4	3.1	9.2				1024	
	TPS350 (down-current/WZ1)	3	28.4	6.5	2.7	9.1		5,234,246	542,589	1022	
	Mid	20	29.2	6.4	6.2	9.2				1021	
	Deep	35/40	29.5	6.5	1.5	9.2				1020	
	TPSE350 (Down-Current/WZ1)	3	28.7	6.5	2.0	9.1		5,234,295	542,606	1009	
	Mid	20	29.1	6.5	2.8	9.2				1008	
	Deep	35/40	29.4	6.5	10.0	9.2				1007	

Pre-Survey Calibration (DO) S. High 2/11 101% Final = 101% cold, bright, sunny in afternoon 7°C

DO Calibration as per manufacturer's specifications.

Survey work conducted by Steven High

Turbidity Calibration as per manufacturer's specifications. Calibration at 0, 10NTU's.

Up-Current points from WZ3 on north end. Down-current points from WZ1 on south end.

Prepared By/Date:
M. Lloyd 2/11/03 Michael Lloyd

L&AI

Construction Compliance Monitoring **Date: FEB 11** **Thea's Park - Ebb Tide**

	Station/Sample	Depth/DTB (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
Up-Current Station	TPSW350 (Up-current/WZ1)	3	26.7	7.9	1.8	8.9		5,234,209	542,535	1558	Both Hurlen and Mansonson
	Mid	16	28.3	7.7	1.9	9.2				1557	were placing sand and/or
	Deep	27/32	28.9	8.0	1.6	9.1				1556	filter material
	TPS350 (Up-current/WZ1)	3	26.7	8.0	2.8	8.9		5,234,246	542,579	1551	
	Mid	16	28.3	7.6	2.8	9.1				1551	
	Deep	27/32	28.9	7.7	3.1	9.2				1550	
	TPSE350 (Up-current/WZ1)	3	27.1	7.8	1.6	8.9		5,234,295	542,596	1650	
	Mid	16	28.4	7.7	1.5	9.1				1651	
	Deep	27/32	28.9	8.0	1.5	9.2				1651	
Interzone Monitoing Station	TPSE350 (Mid-Zone/WZ3)	3	26.6	7.9	1.7	9.0		5,234,420	542,534	1637	
	Mid	17	28.4	7.7	1.9	9.1				1636	
	Deep	39/34	28.9	7.9	1.5	9.2				1636	
	TPNE350 (Down-current/WZ1)	3	27.2	7.9	1.8	9.0		5,234,390	542,566	1648	
	Mid	17	28.7	7.8	2.4	9.1				1648	
	Deep	29/34	28.9	8.2	1.5	9.2				1647	
Down-Current Monitoing Stations	TPNE150 (Down-current/WZ3)	3	27.2	7.9	3.0	8.9		5,234,476	542,433	1643	
	Mid	20	28.5	7.7	10.5	9.1				1642	
	Deep	35/40	28.7	8.0	19.0	9.1				1641	Elevated turbidity at work zone
	TPNE350 (Down-current/WZ3)	3	27.3	7.8	1.7	8.9		5,234,514	542,493	1634	
	Mid	23	28.6	7.7	3.1	9.2				1633	Manson & Hurlen placing
	Deep	40/45	28.7	7.9	1.9	9.2				1632	material at 1.5-2 minutes/bucket
	TPN350 (Down-current/WZ3)	3	27.1	8.0	2.4	8.9		5,234,538	542,440	1630	
	Mid	30	28.6	7.7	7.0	9.1				1629	
	Deep	55/60	28.9	7.9	2.8	9.2				1629	
	TPNW350 (Down-current/WZ3)	3	27.3	8.0	1.0	8.9		5,234,530	542,385	1627	Parametrix surveying elevations
	Mid	45	28.9	7.5	1.9	9.2				1626	for about 5 minutes
	Deep	84/89	29.0	7.5	2.1	9.2				1625	
Reference Station	*Station SP7+00*	3	27.2	7.6	1.4	8.9		5,234,940	542,955	1552	*Recalibrated conductivity and*
	Mid	18	28.2	7.2	2.2	9.2				1551	*after running DO. Duplicate*
	Deep	31/36	28.7	7.1	2.6	9.2				1550	*data after correcting for salinity*
	Station SP7+00- Duplicate	3	27.1	8.0	1.3	8.9		5,234,940	542,955	1606	*Field Duplicate*
	030211/SP7/M/B	18	28.2	7.7*	2.3	9.2				1605	*Field Duplicate*
	Deep	31/36	28.7	8.1	1.8	9.2				1604	*Field Duplicate*

Pre-Survey Calibration D. Berta 2/11 101.3%* Final = 97.7% cool, partly cloudy, 9.7 °C

DO Calibration as per manufacturer's specifications.

Survey work conducted by D. Berta, M. Lloyd

Turbidity Calibration as per manufacturer's specifications. Calibration at 0, 10 nut. Check on 10 ntu std. = 10.1 ntu

*1500: Bubble in DO probe. Replaced membrane, cleaned electrodes, replaced KCL, recalibrated in field prior to survey

*Winkler titration on 030211/SP7/M/B = 7.8 mg/L, 7.9 mg/L

Prepared By/Date:
M. Lloyd 2/10/03

L&AI

0800 BP 769.4 DO 101 % @ 7 °C

DO meter reset @ 101 %

Cond meter & reset @ 50 mS

Turb meter & reset at 0.0 & 10.0 ntu

1110 hrs post sampling cal. of DO = 101% @ 12.4 °C BP = 770.7 mgHg

Continued on Page

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PROJECT Thea Foss

Notebook No. _____ 71

Continued From Page _____

030211 Thea's Park - Flood Tide

	location	Event	DTB	sample depth		temp	sal	DO	Turb	TSS
0930	TPNW350	A	91	D	86	9.2	29.4	6.5	0.9	—
0931	~~470~~ ~~428~~	~~530~~ 395		M	45	9.2	29.3	6.8	1.1	—
0932	acc 7.1	WZ3		S	3	9.1	28.7	6.7	0.9	—
0934	TPN350	A	64	D	60	9.2	29.3	6.8	12.0	—
0935	~~477~~ ~~483~~	536 450		M	32	9.2	29.3	6.7	0.7	—
0936	acc 6.3	WZ3		S	3	9.0	28.8	6.7	0.9	—
0944	TPNE350	A	63	D	60	9.2	29.4	6.6	4.0	—
0945	~~456~~ ~~570~~	574 503		M	32	9.2	29.2	6.6	1.0	—
0946	acc 5.8	WZ2		S	3	9.0	28.7	6.5	1.1	—
0950	TPSE350	A	40	D	35	9.2	29.4	6.7	0.6	—
0951	420 544			M	20	9.2	29.2	6.4	2.6	—
0952	acc 5.9	WZ3		S	3	9.1	28.5	6.5	1.8	—
0957	TPNE350	A	42	D	37	9.2	29.4	6.2	0.6	—
0958	390 566	WZ1		M	21	9.2	29.2	6.4	3.5	—
0959	acc 6.7			S	3	9.1	28.4	6.3	2.2	—
1007	TPSE350	A	40	D	35	9.2	29.4	6.5	10.0	—
1008	295 606	WZ1		M	20	9.1	29.1	6.5	2.8	—
1009	acc 6.8			S	3	9.1	28.7	6.5	2.0	—
1020	TPS350	A	40	D	35	9.2	29.5	6.5	1.5	—
1021	246 589	WZ1		M	20	9.2	29.2	6.4	6.2	—
1022	acc 10.3			S	3	9.1	28.4	6.5	2.7	—
1024	TPSW	A	41	D	36	9.2	29.4	6.4	3.1	—
1025	209 548	WZ1		M	20	9.2	29.2	6.2	5.4	—
1026	acc 9.6			S	3	9.1	28.5	6.3	4.9	—
	SP 7+00	~~A~~		D						
	940 955	~~amb. ent~~		M						
	acc			S						

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[signature] 030211 — Signed — Date

[signature] — Signed

2/11/03 — Date

INSTRUMENT CALIBRATION 1500 D. BERTA 030211

CONDUCTIVITY 50mS
LOT 0210425 5/04 400 ml in unit

DISSOLVED OXYGEN 1520

BP = 770.2 mmHg, T = 11.2°C REPLACED MEMBRANE
DO = 101.3% REPLACED KCl
CLEANED PROBE

TURBIDITY 1530
CALIBRATE at 0.0 NTU (DI) WATER
CALIBRATE at 10 NTU (TSI 6073 std 1:10)
10 NTU STD = 10.1 NTU

MANSON BOOMS DOWN @ 1500
CHANNEL CAP?
HURLEN PLACING FILTER MATERIAL 1 bucket/2 minutes
at SOUTH END OF THEA'S PARK

1553 - check conductivity + recalibrate as before
1605 - Manson raises boom and is placing CAP
MATERIAL NEAR SHORE ON NORTH END

1650 Breeze from NORTH is COLD! SUN DOWN
BELOW N TACOMA CLEAR, BRIGHT, NO CLOUDS

DISSOLVED OXYGEN - WINKLER TITRATION
030211/SP7/M/B
REPLICATE #1 = 391 x .02 = 7.8 mg/L
REPLICATE #2 = 397 x 0.02 = 7.9 mg/L

Continued on Page

Read and Understood By

R Michael Lloyd 2/11/03 Paul A. Berta 2/11/03
Signed Date Signed Date

TIME	LOCATION	DTG	DEPTH	TEMP	SAL	DO	TURB	TSS/DO
50	SP7+00	36	31	9.2	28.7	7.1	2.6	
1551	940/955	7/4	18	9.2	28.2	7.2	2.2	
1552	Accuracy = 7.4		3	8.9	27.2	7.6	1.4	
1604	SP7+00	36	31	9.2	28.7	8.1	1.8	
1605	Acc = 6.5	~~WZ3~~	18	9.2	29.2	7.7*	2.3	030211/SP7/M/A
1606	Duplicate		3	8.9	27.1	8.0	1.3	
1625	TPNW350	89	84	9.2	29.0	7.5	2.1	
1626	530/385	WZ3	45	9.2	28.9	7.5	1.9	
1627	A=5.8		3	8.9	27.3	8.0	1.0	
1629	TPN350	60	55	9.2	28.9	7.9	2.8	
1629	536/440	WZ3	30	9.1	28.6	7.7	7.0	
1630	A=5.3		3	8.9	27.1	8.0	2.4	
1634	TPNE350	45	40	9.2	28.7	7.9	1.9	
1633	514/493	WZ-3	23	9.2	28.6	7.7	3.1	
1632	A=5.0		3	8.9	27.3	7.8	1.7	
1637	TPSE350	~~WZ3~~ 34	29	9.2	28.9	7.9	1.5	
1636	420/534	WZ-3	17	9.1	28.4	7.7	1.9	
1639	Acc=5.4		3	~~8.0~~ 9.0	26.6	7.9	1.7	
1641	TPN150	WZ-3	40	35	9.1	28.7	8.0	19.0
1642	476/433			20	9.1	28.5	7.7	10.5
1643	Acc=4.8			3	8.9	27.2	7.9	3.0
						28.9		
1648	TPNE350	WZ1	34	29	9.1	28.9	8.2	1.5
1648	390/556			17	9.1	28.7	7.8	2.4
1647	Acc=4.7			3	9.0	27.2	7.9	1.8
	TPSE350	WZ1	32	27	9.2	28.9	8.0	1.5
1651	295/596			16	9.2	28.4	7.7	1.5
1651	Acc=4.8			3	8.9	27.1	7.8	1.6
1650								

Continued on Page

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Michael Floyd — Signed — 2/11/03 — Date

Daniel A. Bates — Signed — 2/11/03 — Date

PROJECT THEA'S PARK 030211 Notebook No. _____
Continued From Page _____

1600 HUTTEN PLACING FILTER MATERIAL AT SOUTH END of WZ1 ~~NER~~ NEAR SHORE
1 bucket / 3 MIN
1625 SURVEYOR CHECKS DEPTH at
1630 BACK PLACING FILTER/SAND
1710 DO CHECK = 97.7% 9.6°C

INSTRUMENT WORKED WELL DO's up in 78 RANGE.

WORK @ TP APPEARS TO BE GOING WELL
TEMP IS DROPPING w/ SUN GOING DOWN
STILL AT EBB TIDE

Continued on Page

Read and Understood By

R Michael Lloyd 03/02/03 Daniel A. Berk 02/11/03
Signed Date Signed Date

				TEMP	SAL	DO	TURB
TPS350							
1551	246/579	(32)	27	9.2	28.9	7.7	1.6
1551	Acc. = 5.1		16	9.1	28.3	7.6	1.9
1550		WZ-1	3	8.9	26.7	8.0	1.8
1558	TPSW350	(36)	31	9.1	28.9	8.0	3.1
1557	209/535	WZ	18	9.2	28.4	7.7	2.8
1556	Acc = 5.3	1	3	8.9	25.1	7.9	2.8

END OF SURVEY 1710

Continued on Page

Read and Understood By

Daniel A. Berta 02/11/03 — Signed — Date

[signature] 2/11/03 — Signed — Date

American Civil Constructors

Hurlen Construction

PO Box 80945
700 S. Riverside Dr.
Seattle, WA 98108
(206) 763-1230
FAX (206) 762-1854

FAX TRANSMITTAL

Date:	2/12/03	Number of Pages Including this Sheet:	
Deliver To:	O'LOUGHLIN/WINGARD		
Company:	COT		
Fax Number:	253-272-2414		

From:	M. LLOYD
Company:	ACC / Hurlen Construction
Fax Number:	206-762-1854
Subject	WQ REPORT 2/11/03

Lloyd & Associates, Inc.
38210 SE 92nd Street, Snoqualmie, Washington 98065 425-888-1905 rml@centurytel.net

February 12, 2003

TRANSMITTAL

To: Iain Wingard
John O'Loughlin

Subject: Compliance Monitoring / Thea's Park 2/12/03

Attached please find results from compliance monitoring for the following work activity:

- Slope Cap Construction at Thea's Park

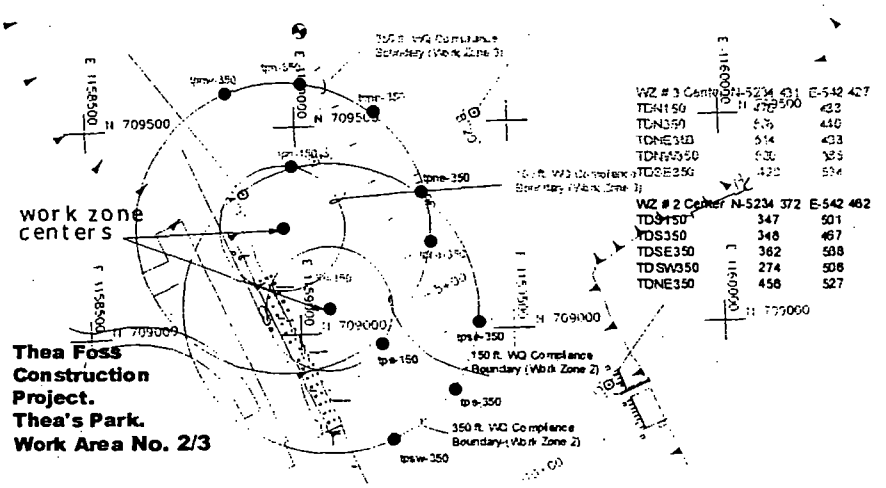
Thea's Park – Cap Construction.

Manson and ACC Hurlen are coming down to the end with caping at Thea's Park. Both derricks were working at a good pace throughout the day with breaks for depth soundings and derrick/barge movement. Water quality monitoring was conducted during a morning flood tide and an afternoon ebb tide. Manson worked on the north end while Hurlen place sand and filter cap material high on the slope. Some elevated, but transient, turbidity was observed in the afternoon at station TPN350 (WZ-3). This station was monitored as a field duplicate, but turbidity levels remained low. Dissolved oxygen levels were good at all stations, and there was no visible turbidity plume associated with construction activity. Visibility was excellent on this clear, calm, sunny day.

QA/QC.

Field duplicate data was recorded for samples 030212/SP7/M/B, 030212/TPN350/M/A-DUP. Field duplicate data was very good with excellent reproducibility with the exception of turbidity for sample TPN350. Elevated turbidity observed at this station was not observed in the field duplicate measument. All calibrations were acceptable, and no instrumental problems were encountered. Winkler titration results (dissolved oxygen) for this sample were 7.0 and 6.9 mg/L. YSI Sonde result for dissolved oxygen was 7.6 mg/L.

Michael Lloyd
Lloyd & Associates, Inc.



Construction Compliance Monitoring **Date: FEB 12** **Thea's Park - Flood Tide**

	Station/Sample	Depth/DTB (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
Up-Current Monitoring Stations	**TPNW350 (Up-current/WZ3)**	3	27.9	7.4	8.4	9.1		5,234,530	542,385	935	Manson placing channel cap
	Mid	46	28.9	6.9	1.8	9.3				934	WZ3
	Deep	87/92	29.2	6.9	2.9	9.3				934	Hurlen light habitat in WZ2.
	TPN350 (Up-current/WZ3)	3	27.7	7.5	8.9	9.0		5,234,536	542,440	943	
	Mid	33	28.6	7.2	0.5	9.2				942	
	Deep	61/66	29.0	7.2	2.5	9.3				942	
	TPNE350 (Up-current/WZ3)	3	28.2	7.7	4.7	9.1		5,234,514	542,493	946	
	Mid	33	28.7	7.2	1.2	9.2				946	
	Deep	49/54	28.9	7.2	1.6	9.2				945	
Inter work zone Sampling Stations	**TPSE350 (Mid Zone/WZ2)**	3	27.9	7.5	3.6	9.0		5,234,420	542,534	953	
	Mid	22	28.6	7.4	2.8	9.1				953	Both Manson & Hurlen moving
	Deep	36/41	28.8	7.5	1.3	9.1				952	at a quick pace of about 2
	TPNE350(Mid Zone/WZ2)	3	27.8	7.6	3.8	9.0		5,234,456	542,526	956	buckets every 3 minutes
	Mid	21	28.5	7.4	1.3	9.1				956	
	Deep	37/42	28.8	7.5	1.2	9.0				955	
	TPNE350(Mid Zone/WZ2)	3	28.1	7.5	3.1	9.0		5,234,456	542,526	1000	*Field Duplicate*
	Mid	21	28.6	7.4	0.9	9.1				959	*Field Duplicate*
	Deep	38/44	28.8	7.4	1.0	9.2				959	*Field Duplicate*
Down-Current Stations'	**TPSW350 (down-current/WZ2)**	3	27.8	7.8	4.5	9.0		5,234,275	542,506	1000	
	Mid	22	28.4	7.6	5.2	9.1				1000	
	Deep	38/43	28.8	7.6	5.0	9.1				1059	
	TPS350 (down-current/WZ2)	3	27.4	7.8	4.7	9.0		5,234,312	542,550	1057	
	Mid	20	28.4	7.6	7.8	9.1				1056	
	Deep	34/39	28.7	7.7	7.5	9.1				1055	
	TPSE350 (Down-Current/WZ2)	3	27.4	7.7	3.0	9.0		5,234,360	542,567	1051	
	Mid	22	28.5	7.6	3.6	9.1				1051	
	Deep	36/41	28.7	7.5	1.6	9.1				1050	
Reference Station	***Station SP7+00***	*3*	*27.9*	*7.6*	*0.8*	9.2		*5,234,940*	*542,955*	*905*	
	Mid	*20*	*28.6*	*7.5*	*0.6*	9.1				*904*	
	Deep	*34/39*	*28.7*	*7.6*	*1.7*	9.2				*904*	
	Station SP7+00- Duplicate	*3*	*28.1*	*7.6*	*0.7*	9.2		*5,234,940*	*542,955*	*920*	*Field Duplicate*
	030212/SP7/M/A	*20*	*28.6*	*7.6**	*0.6*	9.1				*919*	*Field Duplicate*
	Deep	*34/39*	*28.7*	*7.6*	*1.6*	9.2				*919*	*Field Duplicate*

Pre-Survey Calibration (DO) S. High 2/12 100.8% Final = 96% cold, bright, sunny in afternoon 7°C

DO Calibration as per manufacturer's specifications.

Survey work conducted by Steven High

Turbidity Calibration as per manufacturer's specifications. Calibration at 0, 10NTU's.

Up-Current points from WZ3 on north end. Down-current points from WZ1 on south end.

*Winkler titration for 030212/SP7-Dup = 7.0, 6.9 mg/L

Prepared By/Date:
M. Lloyd 2/12/03

L&AI

Construction Compliance Monitoring **Date: FEB 12** **Thea's Park - Ebb Tide**

	Station/Sample	Depth/DTB (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
Up-Current Station	TPSW350 (Up-current/WZ2)	3	27.7	7.9	5.8	8.9		5,234,275	542,506	1438	Both Hurlen and Mansonson
	Mid	20	28.2	7.5	2.3	9.1				1437	were placing sand and/or
	Deep	35/40	28.7	7.4	1.7	9.2				1436	filter material
	TPS350 (Up-current/WZ2)	3	27.2	8.0	2.4	8.9		5,234,312	542,550	1447	
	Mid	19	28.1	7.7	4.9	9.0				1446	
	Deep	33/38	28.7	7.5	0.7	9.1				1445	
	TPSE350 (Up-current/WZ2)	3	27.5	8.1	2.4	8.9		5,234,360	542,567	1452	
	Mid	20	28.2	7.7	3.6	9.1				1451	
	Deep	34/39	28.6	7.6	0.8	9.1				1450	
Interzone Monitoing Station	TPSE350 (Mid-Zone/WZ3)	3	27.7	7.8	1.4	1.4		5,234,420	542,534	1509	
	Mid	20	28.2	7.7	2.5	2.5				1508	
	Deep	34/39	28.6	7.7	0.9	0.9				1507	
	TPNE350 (Down-current/WZ2)	3	27.6	7.9	0.7	9.0		5,234,390	542,566	1502	Maximum Ebb
	Mid	22	28.2	7.6	1.4	9.1				1501	
	Deep	36/41	28.7	7.8	1.1	9.2				1500	
Down-Current Monitoing Stations	TPNE150 (Down-current/WZ3)	3	27.8	7.9	2.1	8.9		5,234,476	542,433	1547	
	Mid	20	28.2	7.6	9.4	9.1				1546	
	Deep	35/40	28.4	7.6	6.7	9.1				1545	
	TPNE350 (Down-current/WZ3)	3	27.6	7.9	1.0	8.9		5,234,514	542,493	1512	
	Mid	30	28.2	7.6	2.1	9.0				1511	Manson & Hurlen placing
	Deep	54/59	28.7	7.6	1.8	9.1				1510	material at 1.5-2 minutes/bucket
	TPN350 (Down-current/WZ3)	3	27.7	8.0	0.7	8.9		5,234,536	542,440	1519	*Elevated turbidity. Station
	030212/TPN350/M/B	35	28.4	7.5	16.0	9.1				1518	monitored for several minutes.
	Deep	65/69	28.6	7.8	13.8	9.1				1517	Elevated turbidity not detected
	TPN350(Down-current/WZ3)-dup	3	27.8	7.8	0.9	8.9		5,234,536	542,440	1538	*Field Duplicate*
	Mid	32	28.3	7.5	4.5	9.1				1534	*Field Duplicate*
	Deep	60/65	28.4	7.5	11.0	9.1				1533	*Field Duplicate*
	TPNW350 (Down-current/WZ3)	3	27.3	8.0	1.0	8.9		5,234,530	542,385	1542	
	Mid	45	28.9	7.5	1.9	9.2				1541	
	Deep	84/89	29.0	7.5	2.1	9.2				1540	

Pre-Survey Calibration D. Berta 2/12 96% Final = 100.7% cool, partly cloudy, 9.0 °C

DO Calibration as per manufacturer's specifications.

Survey work conducted by D. Berta, M. Lloyd

Turbidity Calibration as per manufacturer's specifications. Calibration at 0, 10 ntu. Check on 10 ntu std. = 10.0 ntu

Manson and Hurlen placing sand with clamshell

*Transient turbidity observed in TPN350-Work Zone 3, down-current

Prepared By/Date:
M. Lloyd 2/12/03

L&AI

PROJECT THEA FOSS

Notebook No. _____
Continued From Page _____

030212

0800 - HURLEN & MANSON RIGS PLACING CHANEL CAP MATERIAL.

0844 CALIBRATION NOTES:
BAROMETRIC PRESSURE: 766.4 mm Hg TEMP: 7.0 °C
DO CALIBRATED IN MOIST AIR OVER TAP WATER
DO. CALIB CHECK = 100.8 %

TURB CALIBRATION USEING 2 POINT METHOD.
1) 0.0 NTU = DI WATER 2) 10.0 NTU = STANDARD SOLUTION.
CALIBRATION CHECK IN STANDARD SOLUTION
(AFTER CALIB.) = 10.0 NTU

0855 MANSON SWITCHING BARGE OUT - STOPS PLACING MATERIAL
0915 HURLEN MOVES BARGE FROM W2-1 TO W2-3 & STOPS PLACING MATERIAL

★ SPLIT SAMPLE FOR D.O. BY WINKLER TITRATION METHOD.

1130 - DELIVERE SAMPLE TO CITY OF TACOMA REP. @ FIRE BOAT DOCK

RESULTS OF L & A D.O. TESTS:

TRIAL #1 352 x 0.2 = 7.0 mg/L
TRIAL #2 344 x 0.2 = 6.9 mg/L

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030212

TIME	LOCATION	WZ/ EVENT	DTB	SAMPLE DEPTH	TEMP	SAL	DO	TURB	TSS
									THEA FIELD - FLOCS
0904	SP 7400		39	D 34	9.2	28.7	7.7	1.7	—
0904	940 935	A		M 20	9.1	28.6	7.5	0.6	030212/SP7400/m/pt*
0905	Acc = 5.1			S 3	9.2	27.9	7.6	0.8	—
	* SPLIT SAMPLE FOR DO - WINKLER TITRATION								
0919	SP 7400	A	59	D 34	9.2	28.7	7.6	1.6	—
0919	940 935			M 20	9.1	28.6	7.6	0.6	—
0920	Acc = 5.5			S 3	9.2	28.1	7.6	0.7	—
0934	TPNW(350)	WZ 3	92	D 37	9.3	29.2	6.9	2.9	—
0934	530 355	A		M 46	9.3	28.9	6.9	1.8	—
0935	Acc = 4.5			S 3	9.1	27.9	7.4	9.4	—
0942	TPN(350)	WZ-3	66	D 61	9.2	29.0	7.2	2.5	—
0942	536 440	A		M 33	9.2	29.6	7.2	0.5	—
0943	Acc = 5.2			S 3	9.0	27.7	7.5	8.9	—
				DTZ					
0945	TPNE(350)	WZ-3	54	D 49	9.2	28.9	7.2	1.6	—
0946	514 493	A		M 27	9.2	28.7	7.2	1.2	—
0946	Acc = 6.2			S 3	9.1	28.2 (28.2)	7.7	4.7	—
0952	TPSE(350)	WZ-3	41	D 36	9.1	29.8	7.5	1.3	—
0953	420 534	A		M 22	9.1	29.6	7.4	2.8	—
0953	Acc = 6.4			S 3	9.0	27.9	7.5	3.6	—
0955	TPNE(350)	WZ-2	42	D 37	9.1	28.8	7.5	1.2	—
0956	456 526	A		M 21	9.1	29.5	7.4	1.3	—
0956	Acc = 6.5			S 3	9.0	27.8	7.6	3.8	—
			DUPLICATE						
0959	TPNE(350)	WZ-2	44	D 35	9.2	29.8	7.4	1.0	—
0959	456 526	A		M 22	9.1	28.6	7.4	0.9	—
1000	Acc = 5.1			S 3	9.0	29.1	7.5	3.1	—

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PROJECT THEA FOSS

Notebook No. _____
Continued From Page _____

030212

1040 - MANSON STARTS PLACING CHANEL CAP.
1045 - HURLEN PLACING CHANEL CAP

CALIBRATION CHECK = 96.0%
TEMP. = 6.0°C

1300 HURLEN & MASON CONTINUING CHANEL CAP PLACEMENT AT THEAS PARK

CALIBRATION NOTES:

BAROMETRIC PRESSURE = 766.2 mm Hg TEMP = 9.1°C
DO CALIBRATED IN MOIST AIR OVER TAP WATER.
CALIBRATION CHECK = 100.7%

TURBIDITY CALIBRATED USEING MANUFACTURERS 2 POINT METHOD 1) 0.0 NTU - D.I. WATER 2) 10.0 NTU = CALIBRATION STANDARD SOLUTION.

CALIBRATION CHECK = 10.0 NTU.
1345 - 1430: - BOTH RIGS BREAK FOR SOUNDINGS.
1440 - TPSW (350) ~~SLIGHTLY HIGHER~~ SURFACE HAS MINOR WOOD CHIPS & SMALL DEBRIS, WATER APPEARS GENERALLY MORE TURBID. NO VISIBLE DISTINCT TURBIDITY "PLUME"

NOTE: BOTH RIGS USEING CLAM SHELL BUCKETS.

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030212

TIME	LOCATION	WZ/ELEV	DTB	SAMPLE DEPTH		TEMP	SAL	DO	TURB	TSS
								FLOOD		
1050	TPSE(350)	WZ-2	41	D	36	9.1	28.7	7.5	1.6	—
1051	360 567	A		M	22	9.1	28.5	7.6	3.6	—
1051	Acc = 6.3			S	3	9.0	27.4	7.7	3.0	—
								FLOOD		
1055	TPS(350)	WZ-2	39	D	34	9.1	28.7	7.7	7.5	—
1056	312 550	A		M	20	9.1	28.4	7.6	7.8	—
1057	Acc = 11.1			S	3	9.0	27.4	7.8	4.7	—
								FLOOD		
1059	TPSW(350)	WZ-2	43	D	38	9.2	28.8	7.6	5.0	—
1100	275 506	A		M	22	9.1	28.4	7.6	5.2	—
1100	Acc = 5.3			S	3	9.0	27.8	7.8	4.5	—
						THEA'S PARK - EBB FLOW (MAX)				
1436	TPSW(350)	WZ-2	40	D	35	9.2	28.7	7.4	1.7	—
1437	275 506	B		M	20	9.1	28.2	7.5	2.3	—
[illegible]8	Acc = 12.8			S	3	8.9	27.7	7.9	5.8	—
								EBB (MAX)		
1445	TPS(350)	WZ-2	38	D	33	9.1	28.7	7.5	0.7	—
1446	312 550	B		M	19	9.0	28.1	7.7	4.9	—
1447	Acc = 4.8			S	3	8.9	27.2	8.0	2.4	—
								EBB (MAX)		
1450	TPSE(350)	WZ-2	39	D	34	9.1	28.6	7.6	0.8	—
1451	360 567	B		M	20	9.1	28.2	7.7	3.6	—
1452	Acc = 5.4			S	3	8.9	27.5	8.1	2.4	—
								EBB (MAX)		
1500	TPNE(350)	WZ-2	41	D	36	9.1	28.7	7.8	1.1	—
1501	456 526	B		M	22	9.1	28.2	7.6	1.4	—
1502	Acc = 7.3			S	3	9.0	27.6	7.9	0.7	—
								EBB (MAX)		
1507	TPSE(350)	WZ-3	39	D	34	9.1	28.6	7.7	0.9	—
1508	420 534	B		M	20	9.0	28.2	7.7	2.5	—
1509	8.1			S	3	8.9	27.7	7.8	1.4	—

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30212

1615
— DO CHECK = 81.0% IN MOIST AIR OVER TAP WATER

BAROMETRIC PRESSURE = 764.8 mm Hg TEMP = 9.0

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30212 EBB (MAX)

Time	Location	WZ / Event	DTB	Sample Depth	Temp	Sal	D.O.	Turb	TSS
1510	TPNE (350)	WZ-3	(59)	D 54	9.1	28.7	7.6	1.8	—
1511	514 493	B		M 30	9.0	28.2	7.6	2.1	—
1512	Acc = 11.6			S 3	8.9	27.6	7.9	1.0	—
								5:13 (MAX)	
1517	TPH (350)	WZ-3	(69)	D 65	9.1	28.6	7.5	13.3	—
1518	536 440	B		M 35	9.1	28.4	7.5	16.0	030212/TPH(350)M/B
1519	Acc = 7.8			S 3	8.9	27.7	8.0	0.7	—
				Duplicate			EBB (MAX)		
1533	TPH (350)	WZ-3	(65)	D 60	9.1	28.4	7.5	11.0	—
1534	536 440	B		M 32	9.1	28.3	7.5	4.5	—
1535	Acc = 8.4			S 3	8.4	27.8	7.8	0.9	—
							EBB (MAX)		
1540	TPHW (350)	WZ-3	(94)	D 89	9.2	28.4	7.4	2.7	—
1541	530 385	B		M 47	9.1	28.5	7.3	3.9	—
1542	Acc = 9.5			S 3	8.9	27.9	7.9	1.8	—
							EBB (MAX)		
1545	TPH (150)	WZ-3	(40)	D 35	9.1	28.4	7.6	6.7	—
1546	476 433	B		M 20	9.1	28.2	7.6	9.4	—
1547	Acc = 7.3			S 3	8.9	27.8	7.9	2.1	—

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American Civil Constructors

Hurlen Construction

PO Box 80945
700 S. Riverside Dr.
Seattle, WA 98108
(206) 763-1230
FAX (206) 762-1854

FAX TRANSMITTAL

Date:	2/13/03	Number of Pages Including this Sheet:	10
Deliver To:	O'LOUGHLIN/WINGARD		
Company:	COT		
Fax Number:	272-253-2412		

From:	
Company:	ACC / Hurlen Construction
Fax Number:	206-762-1854
Subject	WO Report 2/12/03

Lloyd & Associates, Inc.
38210 SE 92nd Street, Snoqualmie, Washington 98065 425-888-1905 rml@centurytel.net

February 13, 2003

TRANSMITTAL

To: John O'Loughlin
Iain Wingard

Subject: Compliance Monitoring / Thea's Park 2/13/03

Attached please find results from compliance monitoring for the following work activity:

- Slope Cap Construction at Thea's Park

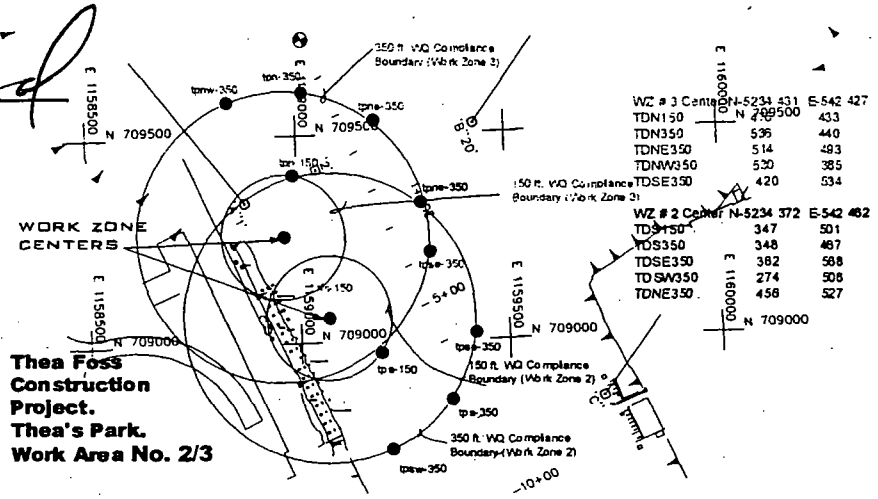
Thea's Park – Cap Construction.

Manson and ACC Hurlen are coming down to the end with caping at Thea's Park. Both derricks were working at a good pace for half the day with breaks for depth soundings and derrick/barge movement. Water quality monitoring was conducted during a morning flood tide. Manson worked on the north end while Hurlen place sand and filter cap material high on the slope. Some elevated, but transient, turbidity was observed at station TPSW350 (WZ-2). Turbidity was at or below ambient conditions at the early warning stations of TP150 (WZ-2). Historically, we have seensome turbidity at TPSW350 during both up- and down-current monitoring events. The monitoring team returned to this station after completing the survey, and turbidity levels were at or near background. Dissolved oxygen levels were good at all stations, and there was no visible turbidity plume associated with construction activity. Visibility was excellent on this clear, calm, sunny day.

QA/QC.

Field duplicate data was recorded for samples 030213/TPSW350/M/A. Field duplicate data was very good with excellent reproducibility with the exception of turbidity. Elevated turbidity observed at this station was not observed in the field duplicate measument. All calibrations were acceptable, and no instrumental problems were encountered.

Michael Lloyd
Lloyd & Associates, Inc.



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Construction Compliance Monitoring

Date: FEB 13 **Thea's Park - Flood Tide**

	Station/Sample	Depth/DTB (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
Up-Current Monitoring Stations	**TPNW350 (Up-current/WZ3)**	3	28.2	7.4	1.8	9.1		5,234,530	542,385	1017	Manson placing channel sand
	Mid	46	28.9	7.0	2.8	9.3				1016	in WZ3
	Deep	87/92	29.3	7.0	3.4	9.3				1015	Hurlen sand in WZ2
	TPN350 (Up-current/WZ3)	3	27.8	7.5	1.7	9.0		5,234,536	542,440	1013	
	Mid	30	28.7	7.1	1.7	9.1				1012	
	Deep	54/59	28.9	7.1	4.7	9.3				1011	
	TPNE350 (Up-current/WZ3)	3	28.1	7.3	1.4	9.1		5,234,514	542,493	1006	
	Mid	31	28.8	7.0	1.6	9.2				1005	
	Deep	56/61	29.0	7.1	3.6	9.2				1004	
Inter work zone Sampling Stations	**TPSE350 (Mid Zone/WZ2)**	3	28.0	7.3	1.6	9.1		5,234,420	542,534	1002	
	Mid	21	28.6	7.2	1.0	9.1				1001	Both Manson & Hurlen moving
	Deep	36/41	28.8	7.3	1.5	9.1				1000	at a quick pace of about 2
	TPNE350(Mid Zone/WZ2)	3	28.0	7.2	1.4	9.1		5,234,456	542,526	957	buckets every 3 minutes
	Mid	22	28.7	7.1	1.0	9.1				956	
	Deep	38	28.8	7.1	1.7	9.1				955	
Down-Current Stations'	**TPSW350 (down-current/WZ2)**	3	27.5	7.1	1.8	9.0		5,234,275	542,506	916	See re-analysis results below
	Mid	21	28.5	7.0	**16.3**	9.1				916	
	Deep	37/42	28.6	7.1	9.4	9.1				915	
	TPSW350 (down-current/WZ2)	*3*	*27.8*	*6.8*	*4.7*	*9.0*		*5,234,275*	*542,506*	*1034*	*Station reanalyzed after*
	Mid	*21*	*28.7*	*6.7*	*3.3*	*9.1*				*1033*	*completing the survey and after*
	Deep	*37/42*	*28.8*	*7.0*	*5.6*	*9.1*				*1032*	*recalibration*
	TPSW150 (down-current/WZ2)	3	27.7	7.3	1.6	9.0		5,234,332	531,499	953	Actual coordinates shown for
	Mid	21	28.6	7.1	1.3	9.1				952	poisition close to TP150 at
	Deep	36/41	28.7	7.2	1.9	9.1				951	debris/oil boom
	TPS350 (down-current/WZ2)	3	27.6	7.1	1.7	9.0		5,234,312	542,550	945	
	Mid	20	28.5	7.0	1.9	9.1				944	
	Deep	35/40	28.6	7.0	3.5	9.3				943	
	TPSE350 (Down-Current/WZ2)	3	27.8	7.2	1.4	9.0		5,234,360	542,567	947	
	Mid	21	28.6	7.1	1.5	9.4				946	
	Deep	36/41	28.7	7.1	2.2	9.1				945	
Reference Station	**Station SP7+00**	3	28.3	7.1	1.4	9.2		5,234,940	542,955	1027	
	Mid	20	28.7	7.2	0.8	9.1				1026	
	Deep	35/40	28.8	7.1	0.8	9.1				1025	

Pre-Survey Calibration (DO) D. Berta 12/13 100.1% Final = 96% cold, overcast 4.7°C

DO Calibration as per manufacturer's specifications.

Survey work conducted by Steven High

Turbidity Calibration as per manufacturer's specifications. Calibration at 0, 10NTU's. Recalibrate at 923, check = 10.0 ntu

Up-Current points from WZ3 on north end. Down-current points from WZ2 on south end.

Manson & Hurlen placing channel cap materials on slope of cap in shallow water.

Prepared By/Date:

M. Lloyd 2/13/03

L&AI

030213

0830 HURLEN PLACING CHANEL CAP. WZ-3
MANSON " " WZ-2

0852 LIGHT RAIN STARTS
BAROMETRIC PRESSURE = 760.3 mm Hg TEMP. = 4.7°C
CALIBRATION NOTES:

DO CALIBRATION 100.1% - IN MOIST AIR OVER TAP WATER

TURB CALIBRATION USEING MANUFACTURERS 2 POINT
METHOD 1) 0.0 NTU = D.I WATER 2) 10.0 NTU =
CALIBRATION SOLUTION. CALIB. CHECK = 10.0 NTU

0923 RECALIBRATION OF TURB AFTER TPSW(350)
MIDDLE DEPTH
USEING SAME 2 POINT
BAROMETRIC PRESSURE = 760.4 mm Hg TEMP = 6.2°C

TURBIDITY CHECK = 10.0 NTU

0935 - HURLEN & ~~MANSON~~ DB STORED PLACING MATERIAL

(PERIODIC LIGHT RAIN FROM 0852 - 1040)

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DB

302.3K

THEAS PARK - CHANNEL CAP

FLOOD TIDE

TIME	LOCATION	WZ/EVENT	DTB	SAMPLE DEPTH		TEMP	SAL	DO	TURB	TSS
0915	TPSW(350)	WZ-2	(42)	D	37	9.1	28.6	7.1	9.4	—
0916	275 506	A		M	21	9.1	28.5	7.0	16.3	—
0916	Acc = 4.7			S	3	9.0	27.5	7.1	1.8	—
	DB	REPEAT OF TPSW AFTER RECALIB.								
0934	TPSW(350)	WZ-2	(43)	D	37	9.1	28.7	6.6	8.1	—
0935	275 506	A		M	21	9.1	28.5	6.7	38.0	—
0936	Acc = 5.3			S	3	8.9	27.6	7.0	9.5	—
	DB							FLOOD		
0943	TPSE(350)	WZ-2	(40)	D	35	9.3	28.6	7.0	3.5	—
0944	312 550	A		M	20	9.1	28.5	7.0	1.9	—
0945	Acc = 4.9			S	3	9.0	27.6	7.1	1.7	—
								FLOOD		
0945	TPSE(350)	WZ-2	(41)	D	36	9.1	28.7	7.1	2.2	—
0946	360 527	A		M	21	9.4	28.6	7.1	1.5	—
0947	Acc = 5.9			S	3	9.0	27.8	7.2	1.4	—
								FLOOD		
[illegible]	TPNE(350)	WZ-2	(43)	D	38	9.1	28.8	7.1	1.7	—
0956	456 526	A		M	22	9.1	28.7	7.1	1.0	—
0957	Acc = 5.3			S	3	9.1	28.0	7.2	1.4	—
0951	TPS(150)	WZ-2	(41)	D	36	9.1	28.7	7.2	1.9	—
0952	Acc = 5.6	A		M	21	9.1	28.6	7.1	1.3	—
0953	316 499			S	3	9.0	27.7	7.3	1.6	—
	* 332 531	AGAINST BARGE = ACTUAL COORD.						FLOOD		
000	TPSE(350)	WZ-3	(41)	D	36	9.1	28.8	7.3	1.5	—
001	420 534	A		M	21	9.1	28.6	7.2	1.0	—
002	Acc = 8.2			S	3	9.1	28.0	7.3	1.6	—
								FLOOD		
004	TPNE(350)	WZ-3	(61)	D	56	9.2	29.0	7.1	3.6	—
005	514 493	A		M	31	9.2	28.8	7.0	1.6	—
006	Acc = 4.5			S	3	9.1	28.1	7.3	1.4	—

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THEA'S PARK - CHANNEL CAP

30213

FLOOD TIDE

TIME	LOCATION	WZ/EVENT	DTB	SAMPLE DEPTH	TEMP	SAL	DO	TURB	TSS
1011	TPN (352)	WZ-3	(59)	D 54	9.2	28.9	7.1	4.7	—
1012	530 440	A		M 30	9.1	28.7	7.1	1.7	—
1013	Acc = 6.1			S 3	9.0	27.8	7.5	1.7	—
						FLOOD TIDE			
1015	TPNW (352)	WZ-3	(97)	D 92	9.3	29.3	7.0	3.4	—
1016	530 385	A		M 48	9.2	28.9	7.0	2.8	—
1017	Acc = 6.1			S 3	9.1	28.2	7.4	1.8	—
						FLOOD TIDE			
1025	SP 700	WZ-3	(40)	D 35	9.1	28.8	7.1	0.8	—
1026	940 955	A		M 20	9.1	28.7	7.2	0.8	—
1027	Acc = 6.7			S 3	9.2	28.3	7.1	1.4	—
		REPEAT OF 0915 - 0936 READINGS.							FLOOD
1032	TPSW (352)	WZ-2	(42)	D 37	9.1	28.8	7.0 DB	5.6	—
1033	275 506	A		M 21	9.1	28.7	6.7	3.3	—
1034	Acc = 6.8			S 3	9.0	27.8	6.8	4.7	—

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Signed Date Signed Date

PROJECT THEA FOSS

Notebook No. _____
Continued From Page _____

030213
0945
MANSON PLACING CHANEL CAP MATERIAL w/
CLAMSHELL BUCKET @ ~ 1 BUCKET / 2-3 MIN.
(WITH PERIODIC 5-10 MIN BREAKS TO ~~[illegible]~~
CHECK PLACEMENT AREA GRADE?)

1040 DO
CALIBRATION CHECK: FB. 99.7%

Continued on Page

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Daniel A. Beutz 02/03/03 — Signed — Date

P Michael Lloyd 2/13/03 — Signed — Date

American Civil Constructors

Hurlen Construction

PO Box 80945
700 S. Riverside Dr.
Seattle, WA 98108
(206) 763-1230
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FAX TRANSMITTAL

Date:	2/14/03	Number of Pages Including this Sheet:	
Deliver To:	O'LOUGHLIN / WINGARD		
Company:	CDT		
Fax Number:	253-272-2413		

From:	M. Lloyd
Company:	ACC / Hurlen Construction
Fax Number:	206-762-1854
Subject	WQ REPORT 2/13/03

Lloyd & Associates, Inc.
38210 SE 92nd Street, Snoqualmie, Washington 98065 425-888-1905 rml@centurytel.net

February 14, 2003

TRANSMITTAL

To: John O'Loughlin
Iain Wingard

Subject: Compliance Monitoring / Thea's Park 2/14/03

Attached please find results from compliance monitoring for the following work activity:

- Slope Cap Construction at Thea's Park

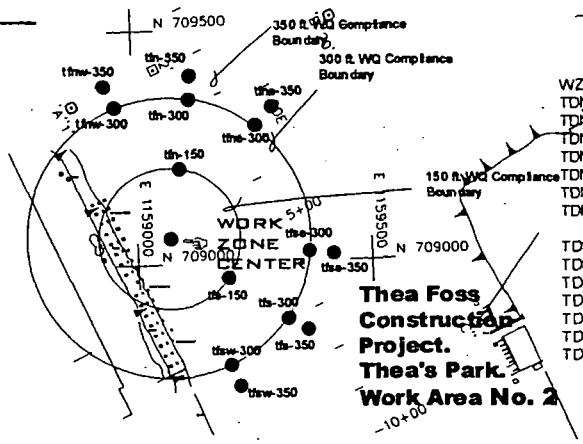
Thea's Park – Cap Construction.

Manson Construction completed the final day of capping at Thea's Park with the placement of sand and/or filter material in the center poart of the site on the slope. Water quality monitoring was conducted during a morning flood tide and an afternoon ebb tide. Dissolved oxygen levels were good at all stations, and there was no visible turbidity plume associated with construction activity. Elevated turbidity was detected at TPNW350 at 18.7 ntu on an ebb tide. This was the only ebb tide that turbidity was observed. Manson stopped work at 1510 shortly after this measurement was rechecked. Up-current turbidity averaged 3.5 mg/L at depth.

QA/QC.

Field duplicate data was recorded for samples 030214/TPSW350/M/A. Field duplicate data was very reproducible. All calibrations were acceptable, although dissolved oxygen readings were drifitng upward in the morning, so the membrane was changed and stable readings were obtain thereafter.

Michael Lloyd
Lloyd & Associates, Inc.



WZ Center	N-5234 371	E-542 461
TDN150	416	466
TDN300	462	473
TDN350	477	473
TDNE300	444	517
TDNE350	456	526
TDNW300	455	425
TDNW350	470	418
TDS150	346	499
TDS300	319	537
TDS350	312	550
TDSE300	363	551
TDSE350	360	567
TDSW300	288	500
TDSW350	275	506

Construction Compliance Monitoring

Date: FEB 14 **Thea's Park - Flood Tide**

	Station/Sample	Depth/DTB (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
Up-Current Station	TPSW350 (Down-current/WZ2)	3	27.9	7.9	2.0	9.0		5,234,275	542,506	927	Manson placing sand near shore
	Mid	21	28.4	7.7	8.9	9.1				927	
	Deep	37/42	27.9	7.6	2.6	9.2				925	
	TPS350 (Down-current/WZ2)	3	27.4	8.5	2.2	9.0		5,234,312	542,550	934	
	Mid	20	28.5	8.3	7.0	9.1				933	
	Deep	34/39	28.7	8.2	1.5	9.1				932	
	TPSE350 (Down-current/WZ2)	3	28.1	8.7	1.4	9.1		5,234,360	542,567	939	
	Mid	22	28.6	8.6	1.5	9.1				938	
	Deep	36/41	28.7	8.6	1.4	9.1				937	
	TPSE150 (Down-current/WZ2)	3	27.7	8.9	2.5	9.1		5,234,346	542,522	939	Against Manson barge
	Mid	20	28.6	8.8	6.8	9.1				938	Recalibrated DO after changing
	Deep	34/39	28.6	8.8	2.8	9.1				937	the membrane
Down-Current Monitoing Stations	TPNE350 (UP-current/WZ2)	3	28.0	7.9	1.5	9.1		5,234,456	542,526	1106	
	Mid	20	28.8	7.9	1.3	9.1				1105	
	Deep	35/40	28.9	8.0	1.7	9.2				1104	
	TPNE350 (Up-current/WZ2)-DUP	3	28.1	7.9	1.3	9.1		5,234,456	542,526	1110	Field Duplicate
	Mid	20	28.8	7.9	2.2	9.1				1109	Field Duplicate
	Deep	35/40	28.9	8.0	1.2	9.2				1108	Field Duplicate
	TPN350 (Up-current/WZ2)	3	28.3	7.8*	1.7	9.1		5,234,477	542,473	1055	*YSI 550 check after changing YSI
	Mid	20	28.8	7.7	1.0	9.1				1054	Sonde membrane = 7.7 mg/L
	Deep	35/40	28.8	7.9	1.0	9.1				1053	
	TPNW350 (Down-current/WZ2)	3	28.2	7.8	2.5	9.1		5,234,470	542,418	1102	
	Mid	28	28.8	7.7	1.5	9.2				1101	
	Deep	52/57	29.1	7.9	2.5	9.2				1100	
Reference Station	Station SP7+00	3	28.4	7.9	1.3	9.4		5,234,940	542,955	1114	
	Mid	20	28.7	7.9	1.4	9.2				1113	
	Deep	35/40	28.8	8.2	1.0	9.1				1113	

Pre-Survey Calibration D. Berta 2/14 101.7% Final = 100.8% cool, partly cloudy, 9.0 °C

DO Calibration as per manufacturer's specifications in saturated air.

Survey work conducted by D. Berta, J. Warter

Turbidity Calibration as per manufacturer's specifications. Calibration at 0, 10 ntu. Check on 10 ntu std. = 10.0 ntu

Manson and Hurlen placing sand with clamshell

Prepared By/Date:
M. Lloyd 2/14/03

L&AI

Construction Compliance Monitoring **Date: FEB 14** **Thea's Park - Ebb Tide**

	Station/Sample	Depth/DTB (ft)	Salinity (ppt)	DO (mg/L)	Turbidity (NTU)	Temp °C	TSS (mg/L)	GPS Coordinates (N/E, m)		Time	Comment
Up-Current Monitoring Stations	TPNW350 (Down-current/WZ2)	3	26.8	8.1	1.5	9.1		5,234,470	542,418	1412	Manson placing channel sand
	Mid	46	28.5	7.8	1.7	9.3				1411	at WZ2 on the slope
	Deep	87/92	28.6	7.8	18.7	9.3				1410	Turbidity = 25.2 after one hour
	TPN350 (Down-current/WZ2)	3	26.8	8.0	2.0	9.0		5,234,477	542,473	1415	
	Mid	23	28.3	7.7	1.2	9.1				1415	
	Deep	42	28.6	7.8	5.4	9.3				1414	
	TPN350 (Down-current/WZ2)	47	26.8	8.0	2.0	9.0		5,234,477	542,473	1415	
	Mid	30	28.3	7.7	1.2	9.1				1415	
	Deep	54/59	28.6	7.8	5.4	9.3				1414	
	TPN150 (Down-current/WZ2)	3	27.2	8.1	1.5	9.0		5,234,416	542,466	1421	
	Mid	22	28.4	7.9	11.3	9.1				1421	
	Deep	38/43	28.5	7.9	30.2	9.1				1420	High turbidity at depth near work
	TPNE350 (Down-current/WZ2)	3	27.6	8.0	1.8	9.0		5,234,456	542,526	1425	Zone
	Mid	22	28.3	7.8	2.4	9.1				1425	
	Deep	38/43	28.7	7.9	1.8	9.1				1424	
Down-Current Stations'	TPSW350 (Up-current/WZ2)	3	27.6	8.0	1.6	9.1		5,234,275	542,506	1449	Manson placing rock at a rate of
	Mid	22	28.5	7.7	2.0	9.1				1448	of 1 bucket every 1.5 - 2 min.
	Deep	39/44	28.9	7.8	2.7	9.2				1447	
	TPS350 (Up-current/WZ2)	3	27.4	8.1	1.7	9.1		5,234,312	531,550	1439	
	Mid	22	28.4	7.8	2.1	9.2				1439	
	Deep	35/40	28.8	7.8	2.3	9.1				1438	
	TPSE350 (Up-Current/WZ2)	3	27.5	8.0	1.9	9.1		5,234,360	531,567	1430	
	Mid	22	28.4	7.8	2.8	9.2				1429	
	Deep	36/41	28.7	7.9	5.5	9.1				1428	

Pre-Survey Calibration (DO) D. Berta 12/13 100.1%

cold, overcast 4.7°C
light rain/drizzle at 0850-1040

DO Calibration as per manufacturer's specifications.

Survey work conducted by Steven High

Turbidity Calibration as per manufacturer's specifications. Calibration at 0, 10NTU's. Recalibrate at 923, check = 10.0 ntu

Up-Current points from WZ3 on north end. Down-current points from WZ2 on south end.

Manson & Hurlen placing channel cap/filter material on slope in shallow water.

Prepared By/Date:
M. Lloyd 2/13/03

L&AI

PROJECT THEA FOSS

Notebook No. _____
Continued From Page _____

030214

0800 MANSON REPOSITIONING DERICK AFTER PLACING MINOR AMOUNTS OF MATERIAL

CALIBRATION NOTES:
BAROMETRIC PRESSURE: 768.3 mm Hg TEMP: 9.0°C
DO CALIBRATED IN MOIST AIR OVER TAP WATER
CALIB. CHECK = 101.1%

TURB CALIBRATED USEING MANUFACTURERS 2 POINT METHOD 1) 0.0 NTU = D.I WATER 2) 10.0 NTU = TURB. STANDARD SOLUTION.
CALIBRATION CHECK = 10.0 NTU ON STANDARD SOLUTION AFTER CALIBRATION

0930 SLIGHT, DISPERSE TURBIDITY @ SURFACE TPSW WITH MINOR FINE (SAWDUST-LIKE) MATERIAL AT SURFACE. NO DISTINCT VISIBLE TURBIDITY PLUMES OR FLOATABLE DEBRIS.

0850 CALIB. CHECK = 97.8%
BP 768.5 mm Hg TEMP = 9.7°C
CALIB. CHECK = 101.7%
1000 - AFTER STARTING MEAS. @ TPNE - DO. = 9.1
CHECKED CALIB. AGAIN = 100.6%
RECALIBRATED AS ABOVE CALIB. CHECK = 101.2%
VISUALLY INSPECTED MEMBRANE NO WRINKLES, DEFECTS OR AIR BUBBLES.

1050 AFTER MEMBRANE / D.O PROBE CHANGE
BAROMETRIC PRESSURE = 768.1 mm Hg TEMP 9.0
CALIBRATED IN MOIST AIR OVER TAP WATER
CALIB. CHECK = 101.7%

1054 * DUPLICATE READING WITH YSI - 550 DO BACKUP (AFTER CALIB) = 7.7 mg/L

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030214

SLACK ⇒ FLOOD - TIMES PARK

[illegible]	LOCATION	WZ/ELEMT	DTB	SAMPLE DEPTH		TEMP	SAL	DO	TURB	TSS
0925	TPSW(350)	WZ-2	(42)	D	37	9.2	28.7	7.6	2.6	—
0927	275 506	A		M	21	9.1	28.4	7.7	8.9	—
0927	Acc=5.8			S	3	9.0	27.9	7.9	2.0	—
								FLOOD		
0932	TPS(350)	WZ-2	(39)	D	34	9.1	28.7	8.2	1.5	—
0933	312 550	A		M	20	9.1	28.5	8.3	7.0	—
0934	Acc=5.8			S	3	9.0	27.4	8.5	2.2	—
								FLOOD		
0937	TPSE(350)	WZ-2	(41)	D	36	9.1	28.7	8.6	1.4	—
0938	360 567	A		M	22	9.1	28.6	8.6	1.5	—
0939	Acc=5.8			S	3	9.1	28.1	8.7	1.4	—
								FLOOD		
0941	TPS(150)	WZ-2	(39)	D	34	9.1	28.6	8.8	2.8	—
0942	346 499	A		M	20	9.1	28.6	8.8	6.8	—
0942	Acc=5.9			S	3	9.1	27.7	8.9	2.5	—
	* AGAINST MANSON BARGE ACTUAL = 346 522									
								FLOOD		
[illegible]	TPNE(350)	WZ-2	(42)	D	37	9.1	28.8	9.3	2.5	—
[illegible]	456 526	A		M	21	9.1	28.7	9.4	2.3	—
0006	Acc=5.0			S	3	9.1	28.3	9.5	1.9	—
012	TPSW(350)	RECHECK DO								
	275 506		DEPTH=21'			NA	NA	9.9	NA	
	Acc=5.8									
014	— ELECTED TO CHANGE DO. PROBE MEMBRANE									
								FLOOD		—
1053	TPN(350)	WZ-2	(40)	D	35	9.1	28.8	7.9*	1.0	—
1054	477 473	A		M	20	9.1	28.8	7.7	1.0	—
1055	Acc=5.8			S	3	9.1	28.3	7.8	1.7	—
								FLOOD		
1100	TPNW(350)	WZ-2	(57)	D	52	9.2	29.1	7.9	2.5	—
1101	470 418	A		M	28	9.2	28.8	7.7	1.5	—
1102	Acc=6.5			S	3	9.1	28.2	7.8	2.5	—

Continued on Page

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[illegible] A. Bak 02/14/03 — Signed — Date

[illegible] Lloyd 2/14/03 — Signed — Date

PROJECT THEA FOSS

Notebook No. _____
Continued From Page _____

030214
~1015 MANSON STOPS PLACING MATERIAL

1120
CALIBRATION CHECK IN DB MOIST AIR OVER TAP WATER = 103.7 %
1300 - CHANGED DO PROBE MEMBRANE
1405
CALIBRATED DO IN MOIST AIR OVER TAP WATER -
BAROMETRIC PRESSURE = 765.8 mm Hg TEMP = 11.9 °C
CALIBRATION CHECK = 100.7 %

TURB CHECK = 10.0 NTU IN CALIBRATION STANDARD SOLUTION
1400
MANSON PLACING MATERIAL (CHANEL CAP) IN WORK ZONE #2
@ ~ 1 BUCKET / 2 MINUTES

Continued on Page

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Daniel A. Burke 02/14/03 — Signed — Date

[signature] 2/14/03 — Signed — Date

30214

THEAS PARK - FLOOD WORK - ZONE 2

TIME	LOCATION	WZ/EVENT	DTB	SAMPLE DEPTH	TEMP	SAL	DO	TURB	TSS
1104	TPNE(350)	WZ-2	40	D 35	9.2	28.9	8.0	1.7	—
1105	456526	A		M 20	9.1	28.8	7.9	1.3	—
1106	Acc=6.5			S 3	9.1	28.0	7.9	1.5	—
		* DUPLICATE *				FLOOD			
1108	TPNE(350)	WZ-2	40	D 35	9.2	28.9	8.0	1.2	—
1109	456 526	A		M 20	9.1	28.8	7.9	2.2	—
1110	Acc=6.1			S 3	9.1	28.1	7.9	1.3	—
						FLOOD			
1113	SP 7+00	WZ-NA	40	D 35	9.1	28.8	8.2	1.0	—
1113	940 955	A		M 20	9.2	28.7	7.9	1.4	—
1114	Acc=5.7			S 3	9.4	28.4	7.9	1.3	—
						EBB			
1410	TPNW(350)	WZ-2	60	D 55	9.2	28.6	7.8	18.7	—
1411	470 418	B		M 30	9.1	28.5	7.8	1.7	—
1412	Acc=5.6			S 3	9.1	26.8	8.1	1.5	—
						EBB			
[illegible]	TPN(350)	WZ-2	43	D 38	9.1	28.6	7.8	5.4	—
1415	477 473	B		M 22	9.1	28.3	7.7	1.2	—
1415	Acc=5.8			S 3	9.1	26.8	8.0	2.0	—
						EBB			
1420	TPN(150)	WZ-2	43	D 38	9.1	28.50	7.9	30.2	—
1421	416 466	B		M 22	9.1	28.4	7.9	11.3	—
1421	Acc=4.9			S 3	9.0	27.2	8.1	1.5	—
						EBB			
1424	TPNE(350)	WZ-2	43	D 38	9.1	28.7	7.9	1.8	—
1425	456 526	B		M 22	9.1	28.3	7.8	2.4	—
1425	Acc=5.5			S 3	9.1	27.6	8.0	1.8	—
						EBB			
1428	TPSE(350)	WZ-2	41	D 36	9.1	28.7	7.9	5.5	—
1429	360 567	B		M 22	9.2	28.4	7.8	2.8	—
1430	Acc=5.8			S 3	9.1	27.5	8.0	1.9	—

Continued on Page

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PROJECT THEA FOSS

Notebook No. _____
Continued From Page _____

030214
1500
CALIBRATION CHECK: TEMP = 10.4°C
B.P. = 767.9
D.O. = 100.8 %

1515 MANSON STOPS PUMPING MATERIAL & STARTS CLEAN UP OF BARGE ETC..

Continued on Page

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Daniel A. Barta 02/14/03 — Signed — Date

T. Michael Floyd 2/14/03 — Signed — Date

030214

THEAS PARK

Time	Location	WZ/Event	DTB	Sample Depth	Temp	Sal	DO	Turb	TSS
						EBB		WORK ZONE #2	
1438	TPS (350)	WZ-2	(40)	D 35	9.1	28.8	7.8	2.3	—
1439	312 550	B		M 20	9.2	28.4	7.8	2.1	—
1439	Acc = 4.7			S 3	9.1	27.4	8.1	1.7	—
						EBB			
1447	TPSW (350)	WZ-2	(44)	D 39	9.2	28.9	7.8	2.7	—
1448	275 506	B		M 22	9.1	28.5	7.7	2.0	—
1449	Acc = 6.7			S 3	9.1	27.6	8.0	1.6	—
		RECHECK ON 1412 - 1410 READINGS							EBB
1453	TPNW (350)	WZ-2	(47)	D 42	9.1	28.5	8.0	25.2	—
1454	470 418	B		M 23 (WB) ~~29~~ *	9.2	28.5	7.9	1.0	—
1455	Acc = 7.0			S 3	9.1	27.7	8.0	1.3	—

* 23' DB

— END —

Continued on Page

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Daniel A. Bake 02/14/03 — Signed — Date

[signature] — Signed — 2/14/03 — Date

TRANSMISSION VERIFICATION REPORT

TIME : 09/12/1997 16:40
NAME : L&AI
FAX : 425-888-1905
TEL : 425-888-1905

DATE,TIME	09/12 16:36
FAX NO./NAME	12532722412
DURATION	00:03:30
PAGE(S)	09
RESULT	OK
MODE	STANDARD ECM