SAMPLE LOG - Co-located Sediments

Date: 10/16/02

Time	Station	Rep	Pen (cm)	Texture	Color	Debris	Odor	Sample Quality/Comments
1055	02R015	1	9.5	sand with wood debris	dark gray/black	wood chips sticks	NONE	~~good~~ undisturbed surface, ~~[illegible]~~
1119	02R015	2	16.5	brown silty sand layer (<1cm) overlies dark gray sandy material	Brown Dark gray	limited wood chips sticks	NONE	good penetration, grab sealed, undist. surface
1140	02R015	3	11.0	silty brown layer (<1cm) at surface over dark gray sand, chunk of riprap	Brown over dark gray	some wood debris	NONE	one side of grab slightly washed, sample taken from other side
1248	05R001	1	12.0	med sand, reddish brown - uniform to depth	reddish brown	NONE	NONE	minor washing of surface seds
1258	05R001	2	14.0	med sand (2-3cm) discontinuous underlain by clay (gray) - 2cm	brown gray clay some dark sand	Rocks	NONE	good / full penetration ~~SE~~
1310	05R001	3	11.0cm	reddish/orangish sand, coarse to bottom	red/orange black flecks	NONE	NONE	some minor washing
1404	04R002	1	15cm	fines (brown, thin) over coarse black sand, finer sand at bottom	brown over black	1 lg piece ~~None~~ wood	slight non-identifiable	good penetration
1436	04R002	2	16cm	brown silt layer (<1cm) on top overlies coarse dark sand	brown over black	wood	slight as rep 1	Sheen in grab
1509	04R002	3	18cm	brown silt with pockets of coarsed-grained	brownish black	Minor, ~~[illegible]~~ wood	slight	deep penetration
1551	05R020	1	18cm	brownish/gray silty sand, pockets of black sand, coarser with depth	brown black	wood at bottom of grab	NONE	deep penetration

Comments:

SAMPLE LOG : Co-Located Sediments

Date: 10/16/02

Time	Station	Rep	Pen (cm)	Texture	Color	Debris	Odor	Sample Quality/Comments
1559	05R020	2	18 cm	Brown silt/ ~~[illegible]~~ sand only in pockets, clay plant debris at depth	grayish green, brown	plantg material v. fine	Organic smell at depth	full penetration
1608	05Q020	3	15 cm	Brown silt with wood debris (small), some pockets of sand with organic odor	brown ~~[illegible]~~ ~~[illegible]~~ clarke sand pockets	wood debris	organic odor at depth	

Comments:

SAMPLE LOG

Date: 10/17/02

Time	Station	Rep	Pen (cm)	Texture	Color	Debris	Odor	Sample Quality/Comments
0815	03R003 R1	1	10 cm	Silt/Sand mixture, pockets of coarser/black sand	grayish/ ~~black~~ green	small wood, small rocks, shellfish	NONE	
0827	03R003 R1	2	13.5 cm	Sand, well-sorted, minor organic	brownish gray		NONE	
0837	03R003 R2	3	11 cm	sand overlying mud at about 9cm	brownish gray	[illegible] wood	NONE	slightly washed on one side
0844	03R003	4	11cm	sand	brownish reddish	few RX, wood	NONE	slightly washed on one side
0938	03R003 R2	1	14cm	sand/organic-rich layer at depth (finer	reddish brown	wood cobbles, shell	NONE	
0948	03R003 R2	2	13	mostly sand		some (shell) wood debris	NONE	Small sheen at surface of gab
1000	03R003 R2	3	10	sand, underlain by clayey fine layer (at 8cm	brownish	wood, cobbles	NONE	slightly washed on one side - ~~[illegible]~~ not subsample there
1012	03R003 R2	4	12.5	sand to bottom - some darker pockets	brown to dark gray	wood, Rocks	NONE	~~Sh~~ small florets (sheen
1039	03R003 R3	1	12	sand over clay layer at 10cm	brownish to dark gray	wood rocks	NONE	
1055	03R003 R3	2	11.5	~~sand [illegible]~~ all sand	brown reddish	wood Rocks	NONE	

Comments:

SAMPLE LOG

Date: 10/17/02

Time	Station	Rep	Pen (cm)	Texture	Color	Debris	Odor	Sample Quality/Comments
1102	03R003 Rep3	3	13	shellfrags at surface, brown, sorted sand throughout grab	Brown	Rx, wood	NONE	
1110	03R003 Rep3	4	14.5	sand with clay layer at 8-10cm	Brown, some gray	wood, cobbles, goodant.	NONE	
1221	03R032	1	16.5	silt, mostly, thin brown layer at	greenish brown		NONE	Sample from "sheltered?" area under pier
1228	03R032	2	16.5	silty, lots of wood ~~de~~ debris thrubut, thin brown layer at surface	greenish brown, gray & depth	wood	none	
1248	03R032	3	16.5	brown/gray silt, lots of wood chips	Brownish gray	wood	None	
1411	08R002	1	13	sand - specked red, green, white, finer at depth	dark gray	specked, brick fragments?	slight organic	
1415	08R002	2	8*	sand in fines, some speckled, ~~color~~	gray/brown	speckled CS sp. stuff	slight organic	*minimal penetration, but kept due to limited access inside boom at this locale
1420	08R003	3	13	sand, specked grains red, green, white	dark gray/br	specked grains	slight organic	~~slight sheen~~ Slight sheen
~~150~~ 1456	03R001	1	13	thin silt over sand	reddish gray sand brown silt	None	NONE	
	03R001	2	13	sand, muddy layer at 10cm, rock intermixed black organic pots	brown sand, some gray/black areas	Sticks/Rocks	NONE	

Comments:

SAMPLE LOG

Date: 10/17/02

Time	Station	Rep	Pen (cm)	Texture	Color	Debris	Odor	Sample Quality/Comments
1512	0 3/2001	3	15	mostly sand, with brown silt on top, organic dark pockets / silt underlying	brown sands gray silt +	~~some~~ wood, sticks	organic	
~~[illegible]~~	~~[illegible]~~	~~[illegible]~~	~~[illegible]~~ cm	~~[illegible]~~	~~brown~~ gray	~~wood~~	~~N~~	

Comments:

Date: 10/18/02

SAMPLE LOG -Co-located Seds

Page 1 of 2 (for 10/18/02)

Time	Station	Rep	Pen (cm)	Texture	Color	Debris	Odor	Sample Quality/Comments
0935	06R031	1	16	silt, green (algae?) on surface,	Brown to gray	wood	None	Sheen (floret on surface) and water
0944	06R031	2	16	Brown sand (med/fine), some silt	"	wood, NAPL at depth 35cm	hydro-carbons	Sheen, ~~[illegible]~~
0956	06R031	3	13	sand/silt mixture, sheen at surface + throughout	Brown to gray	shell frags/ wood, Rocks	Hydrocarb	Hydrocarbons evident throughout
1104	03R002	1	17.5	silt throughout, Brown layer on top ~1-2 cm, lt. grey beneath	brown/ gray	shell (some) plastic bag, wood	none	Sheen (≈ 3.5
1125	03R002	2	17	silt throughout	Brown/ gray	wood (lots)	NONE	
1133	03R002	3	15	silt throughout, some cohesiveness	Brown over gray	lots of sticks	NONE	Sheen/florets, some streaks, on homogenate
1242	03R004	1	16	sand over silt (at 6cm) at start ~~[illegible]~~ transition	Brown sand, some blacker, over silt/gray	some wood	moderate organic odor	
1250	03R004	2	15	Sand (2cm) over dark gray sand, silt at 8cm	Brown/ gray, sd gray silt	some wood in sand	NONE	
~~1257~~ 1257	03R004	3	17	all silt	Brown over gray	rocks, sticks shell	None	Sheen on composite
1357	03R004 R2	1	16cm	sand throughout - fairly coarse	brownish, orangey	wood	NONE	

Comments:

ANC02020
BZTO104(e)002020

SAMPLE LOG

Date: 10/18/02

Time	Station	Rep	Pen (cm)	Texture	Color	Debris	Odor	Sample Quality/Comments
1405	03Rock Rep 2	2	14	Brownish sand over ~~silt (gray)~~ — at 3cm blackish sand, to gray silt 5cm	Brown to black gray silt	Sticks, Shell	None	
1413	03R004 Rep 2	3	14 cm	Brown/orange sand to 2cm, transition to gray/black sand, silt at 5-6 cm depth	Brown/blackish sands, gray silt	wood	None	sheen (slight on homogenate in bowl)
1430	03R004 Rep 3	1	14 cm	Reddish/Brownish sand pockets of gray/black sand - sand throughout	Brown, gray	wood	None	
1437	03Rock Rep 3	2	14 cm	Sand throughout brownish		Sticks		
1447	03R004 Rep 3	3	17cm	Brown silt/over greenish gray silt, plant material (green) at silt	brown to greenish gray	None	None	full penetration

Comments:

SAMPLE LOG

Date: 10/22/02

Co-located seds

	Time	Station	Rep	Pen (cm)	Texture	Color	Debris	Odor	Sample Quality/Comments
PG	0935	06R004	1	26	~~Black~~ Brownish/black sand, dark gray, sand throughout	red, 2/ Brown to black at depth at 10cm	glass, rocks	NONE	good, undisturbed
PG	0950	06R004	2	22	Sand throughout, some gravel	Brown black at 6-7cm	sticks,	NONE	"
PG	1007	06R004	3	20	Sand, minor silt fraction	Brown/ Black	wood	NONE	slight sheer on composite
VV	1059	07R003	1	10cm	silty with sand specs, organic, plant material	greenish gray dark ~~dark~~	wood	organic odor	
VV	1121	07R003	2	16cm	greenish/gray silt, black specs, sand under surface fines at 8cm	gray/green	Rocks, wood	slight organic	
VV	1128	07R003	3	14cm	silt at peat-like subsurface with some sand, silty sand	greenish, gray	wood	slight organic	
VV	1050	07R003	Benthos	12CM	~~same as~~ greenish/ gray silt, black specs		wood		sieved thru 0.5 MM sieve for taxonomy
VV	1311	08R001	Benthos	14cm	sandy (fine)/silt	dark gray	wood	organic	Sieved thru 0.5mm for taxonomy
	1316	08R001	1	15cm	silt/sand mixture vf	brown/olive over gray	~~none~~ minor wood	NONE	
	1339	08R001	2	16.5	silt/sand (vf) mix	brown over gray			

Comments:

PG = power grab
VV = van veen

SAMPLE LOG - cotlocated seds

Page 2 of 2

Date: 10/22/02

	Time	Station	Rep	Pen (cm)	Texture	Color	Debris	Odor	Sample Quality/Comments
W	1407	08R001	3	17	Silt throughout,	brown dark gray	None	organic	slightly over penetrated, 18th attempt - kept
W	1439	09R002	Benthos	14	sandy silt thin/out	browns gray	wood chips	None	~~[illegible]~~
W	1454	09R002	1	16.5	Brown/gray silt, algae on surface/gray/black at depth silt throughout	brown/gray/black	wood	Slight organic	more cohesive at depth
W	1506	09R002	2	15cm	Silt/throughout algae on surface	Brown	wood	organic	
W	1515	09R002	3	15cm	olive/brown silt with black specs/layer of sand at ~8cm	olive/brown to gray	wood	None	
PG	1557	08R003	Benthos	12cm 4x0.25cm	silty sand with clay infusions,	olive/brown brown/dark gray	wood rocks	~~none~~ organic	small sheens on surface
PG	1620	08R003	1	26	Silty sand, red specs, over gray clay layer at 5cm (with sheen	brown sd over gray clay	Wood rocks	None	small sheen spots on surface
PG	1641	08R003	2	21.5	predominately sand, clay layer at abt 6cm	gray sand, gray clay	large wood debris clam shells	None	small sheens on surface green algae
PG	1718 ~~[illegible]~~	08R003	3	26	Brown ~~gray~~ sand, some silt	brown to gray	wood	None	florets in gray sand

Comments:

ANC02023
BZTO104(e)002023

SAMPLE LOG - Co-located Seds

Date: 10/23/02

Time	Station	Rep	Pen (cm)	Texture	Color	Debris	Odor	Sample Quality/Comments
0914	06R001	Benthos	16.5	~~gr~~ brown/gray silt	brown/gray, black flecks	leaf litter	none	Sheen [illegible]
0919	06R001	1	16.5	silt, throughout	brownish to gray at about 5cm	leaf litter	none	
0929	06R001	2	16.5	silt, 0-15cm ~~throughout~~, a little sand below 15cm	olive/brown to gray at 8cm	woody debris/leaf	none	
0937	06R001	3	17	silt, throughout 0-15, sand @ 15cm	olive/brown to gray	leaf litter	none	Sheen on homogenate
VV 1018	06R002	Benthos	8	Sand, sand silt, wood	brown/gray	wood	none	Minimal [illegible] ~~good~~ [illegible] surface
PG 1046	06R002 rep 1	1	29	silt, Δ to clayey at about 8cm	brown and gray	wood chips, sticks	none	Sheen [illegible]
1103	06R002 rep 1	2	14 cm	sand throughout reddish flecks	brownish gray	sticks, odor	none	
1137	06R002 Rep 1	3	29	sand-reddish/brown on top, throughout 0-15cm	reddish brown	wood debris	none	
1203	06R002 Rep 2	1	29	olive brown silt	brownish, gray	wood debris	none	
	06R002 Rep 2	2	20	reddish brown green alga on ~~top~~ surface, sand throughout		wood debris shell	none	

Comments:

Date: 10/23/02

SAMPLE LOG - Co-located Sds

pge 2 of 3

	Time	Station	Rep	Pen (cm)	Texture	Color	Debris	Odor	Sample Quality/Comments
PG	1227	06R002 rep2	3	20	brown sand throughout	brown reddish	wood ~~clay~~	NO	small florets in homogenate
PG	1240	06R002 rep 3	1	29	silt/sand	olive/brown gray	wood	none	
PG	1303	rep3 06R002	2	28	brown sand, sand throughout		sticks, wood,	none	sheen in composite
PG	1323	06R002	3	26	reddish/brown sand, throughout	reddish brown	wood, large sticks	NONE	
VV	1429	05R003	Benthos	12	silty, green algae small sheen on surface	Brown over gray	wood sticks	NONE	slightly washed in one edge but good undisturbed surface
	1436	05R003	1	11.5	~~[illegible]~~/sand/silt mixture	olive gray under brown	wood	NONE	
	1443	05R003	2	8	veneer of brown/sand over gray sand over silt	browns to gray	wood cobbles	NONE	good gray minimal penetration, but good surface
	1457	05R003	3	9.5	same as rep 2 with algae at surface	→	→	→	some washy in one corner, lots of wood debris at location
	1533	04R003	Benthos	8cm	silt/over clay	olive gray			slightly washed, lots of tubes at surface
	1545	04R003	1	15cm	sand throughout	brown over gray/dark gray	woody debris	organic	slight sheen

Comments:

ANC02025
BZTO104(e)002025

0/23/02

SAMPLE LOG Co-located Solids

Station	Rep	Pen (cm)	Texture	Color	Debris	Odor	Sample Quality/Comments
04R003	2	14	sand throughout, red flecks	Brown to gray to black	wood	NONE	
04R003	3	11	sand ~~throughout~~ on top, black specs, at 5-6 cm cohesive clay layer	brown to dark gray sand gray clay	wood	NONE	slight water on side, sample taken from other
04R004	Center	16	silt, lots of leaf litter, small wood chips	brown to dark gray	wood plant debris	none	
04R004	1	18	silt throughout	Olive/brown on top	plant debris	NONE	small flecks of sheen
04R004	2	15	silt throughout, but more elastic (silky) at 8-10 cm	olive brown over gray	Rocks lots of wood debris	NONE	sheen
04R004	3	12	sand throughout	red/brown over gray	plant debris	none	

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Date: 10/24/02

SAMPLE LOG -Co-located Seds

Page: 1 of 2

Time	Station	Rep	Pen (cm)	Texture	Color	Debris	Odor	Sample Quality/Comments
0842	09R001	Bentley	16	silt throughout	olive/brown gray	plastic cup	None	Sheen
0854	09R001 Rep1	1	11.5	v. coarse sd, gravel	gray/brown black specs	leaf litter sticks clam shells	None	
0939	09R001 Rep 1	2	11	sand, gravel, pebbles	brown/gray	lots of wood leaf litter	None	
0948	09R001 Rep1	3	17.5	silt, throughout	olive brown over olive gray	wood	None	Sheen
1014	09R001 Rep2	1	11	coarse sand, gravel	brown over black	wood leaf	None	
1019	09R001 Rep2	2	17	silt thru/out	olive tan too live gray	wood	None	
1035	09R001 Rep2	3	14	sand/gravel throughout	brown over gray/black	wood	None	sheen
1056	09R001 Rep 3	1	12	silt over sand	brown/gray	wood leaf	None	slight floret
1108	09R001 Rep3	2	17	silt throughout	olive brown black red specks	sticks,	None	very slight sheen
1121	09R001 Rep 3	3	15.5	silt/lots of wood debris	brown sand over gray	wood	None	

Comments:

ANC02027
BZTO104(e)002027

Date: 10/24/02

SAMPLE LOG Co. Located sediments

Time	Station	Rep	Pen (cm)	Texture	Color	Debris	Odor	Sample Quality/Comments
1253	02R001	Benthos	14	silt throughout	olive tan over olive gray	Plant debris	none	
1300	02R001	1	14	silt with ~~deeper~~ ~~rocks~~ sand layer at 8cm	olive tan over olive gray	plant debris	None	
1305	02R001	2	17	silt throughout	brown over gray	None	none	
1312	02R001	3	17	silt with sand layer at 8 cm	brown over gray/black	none	None	
1354	03R005	Benthos	18	silt with "calcite" type deposit ~~[illegible]~~	medium brown	Rocks	strong chemical odor	sheens, acidic smell
1400	03R005	1	15	silt throughout	brown over gray	wood	mild organic	
1408	03R005	2	18	very low density, firms ~~[illegible]~~ precipitates?, firms with depth to pale sandible material	light gray. brown	leaf sticks	strong chemical odor	
1419	03R005	3	~~[illegible]~~ 17	Sand thru/out	Brownish gray sand over gray/black sand	sticks	none	sheens on homogenate

Comments:

12/5/02 Benthic Sampling of 10 additional stations **SAMPLE LOG**

Station	Rep	Pen (cm)	Texture	Color	Debris	Odor	Sample Quality/Comments
5R040	1	15	silt over sand	olive/brown → gray silt, dk gray sand	some wood chunks of a tar-like substance	none	good, lots of oily sheen
6R040	1	7	sand	brown w/ red, black specks	some wood	none	good
3R040	1	14	silt	olive brown over olive gray	some wood	none	good
7R040	1	17	silt	olive brown over olive gray	none	none	good
R041	1	17	silt	olive brown over olive gray	none	none	good
8R040	1	17	silt	olive brown over lt gray	none	none	slightly o/p
1R041	1	15	silt	olive brown over olive gray	none	none	good
5R041	1	14	silt over sand	olive brown silt over olive gray silt over gray sand	some wood	none	good
R041	1	18	silt	olive brown silt over olive gray	none	none	slightly o/p
3R040	1	16	silt over sand	olive brown silt over olive gray silt over dk gray sand	lots of wood	none	good, some oily sheen on screen after rinsing benthic sample

s:

SAMPLE LOG

Date: 10/28/02

Page: 1/3

Time	Station	Rep	Pen (cm)	Texture	Color	Debris	Odor	Sample Quality/Comments
0904	06R040	1	15	sand, some silt	red brown	some wood	none	good
0911	06R040	2	14	sand, some silt	red brown, gray	some wood	none	good
0920	06R040	3	15	sand, some silt	red-brown, pockets of gray-blk	some wood	none	good, * some florets of oily sheen on the composite
0955	07R040	1	18	silt	olive-brown over olive gray	stick in jaws	none	slightly o/p
1004	07R040	2	18	silt	olive-brown over olive gray	some wood	none	slightly o/p, some sheen
1022	07R040	3	18	silt	olive-brown over olive gray	some wood	none	slightly o/p
1041	08R040	1	16	silt over w/ black specks of sand sandy silt	olive-brown over olive gray silt olive gray sandy silt	some wood	none	good
1047	08R040	2	16	silt w/ black specks of sand over sandy silt	olive brown over olive gray silt olive gray sandy silt	some wood	none	good some oily sheen
1054	08R040	3	17	silt w/ black specks of sand over sandy silt	olive brown over olive gray silt, olive gray sandy silt	some wood, trash	none	good some oily sheen
1123	08R041	1	17.5	silt	olive brown over olive gray	some wood	none	good some oily sheen

Comments:

SAMPLE LOG

Date: 10/28/02

Page: 2/3

Time	Station	Rep	Pen (cm)	Texture	Color	Debris	Odor	Sample Quality/Comments
1129	08R041	2	17.5	silt	olive brown over olive gray	none	none	good, some oily sheen
1139	08R041	3	18	silt	olive brown over olive gray	none	none	slightly o/p, some oily sheen
1233	09R041	1	15	silt over sandy silt	olive brown over olive gray silt, lt/dk gray sandy silt	none	none	good
1238	09R041	2	14	silt over sandy silt	olive brown over olive gray silt, lt/dk gray sandy silt	none	none	good
1243	09R041	3	10	silt over sandy silt	olive brown over olive gray silt lt/dk gray sandy silt	none	none	good
1301	09R040	1	17.5	silt over sandy silt at ~8cm	olive brown over gray silt, dk gray sandy silt	none	none	good, slightly o/p
1312	09R040	2	17.5	silt	olive brown ~~of~~ over lt olive gray	some plant	none	good, slightly o/p
1319	09R040	3	17.5	silt	olive brown over olive gray	some plant	none	good, slightly o/p
1405	05R040	1	16.5	silt over silty sand	olive brown over lt gray silt, blk-dk gray sand	none	none	good
1411	05R040	2	15	silt over sand sand is very clumpy some clumps of clay (brown, gray)	olive brown over lt gray silt, black sand	some wood	none	good, some oily sheen

Comments:

SAMPLE LOG

Date: 10/28/02

Time	Station	Rep	Pen (cm)	Texture	Color	Debris	Odor	Sample Quality/Comments
1441	05R041	1	16	silt w/ black sand specks over sand	brown over olive gray silt over black sand	some wood	none	good, some oily sheen
1447	05R041	2	16.5	silt over sand	olive brown silt over olive gray silt, dk gray black sand	some wood	none	good
1458	05R041	3	15.5	silt over sand	olive brown w/ black specks over lt gray silt, black sand	some wood	none	good
1529	03R040	1	15	silt over sandy silt	olive brown over olive gray silt lt/dk gray sandy silt	none	none	good
Could not get an acceptable sample at this station using vanVeen grab sampler. Sediment collected in rep #1 was discarded on site and we will attept to resample this station at another time.								
1602	03R041	1	18	silt	olive brown over olive gray	none	none	slightly o/p
1609	03R041	2	18	silt	olive brown over olive gray	none	none	slightly o/p
1618	03R041	3	18	silt	olive brown over olive gray	none	none	slightly o/p

Comments:

SAMPLE LOG

Date: 10/29/02

Page: 1 of 1

Time	Station	Rep	Pen (cm)	Texture	Color	Debris	Odor	Sample Quality/Comments
0831	03R040	1	28	silt over ~~sand~~ sandy silt	olive brown over olive gray	lots of wood	none	good
0841	03R040	2	26	silt/sandy silt over silt	olive brown over olive to lt gray	wood, some metal	none	good
0905	03R040	3	20	sandy silt over sand	olive brown over olive gray silt, dk gray sand	lots of wood, trash	none	discontinuous sediment surface due to large amount of wood

Comments:

SAMPLE LOG

Date: 11/05/02

Page: 1 of 1

Time	Station	Rep	Pen (cm)	Texture	Color	Debris	Odor	Sample Quality/Comments
1111	07R030	1	10cm	sand over silty sand	olive brown w/ black specks sand over olive gray silty sand	lots of wood	none	good, some oily sheen
1126	07R030	2	11 cm	sand over silty sand	same as previous, white specks in silty sand	some wood	none	good, some oily
1133	07R030	3	10 cm	sand over silty sand	olive brown sand over olive gray silty sand	some wood, rocks	none	good

Comments:

SAMPLE LOG - Co-Located Sediments

Date: 11-12-02

Time	Station	Rep	Pen (cm)	Texture	Color	Debris	Odor	Sample Quality/Comments
0956	03R034	1	10	Med. Sand throughout Well sorted w/ gravel and cobble	brown - m. grey	Rocks	NO	
1004	03R034	2	16	Med. Sand throughout Well sorted w/ less gravel	brown - m grey		No	
1011	03R034	3	11.5	Thin silt over sand, Minor sheen cobbles in sand, mud chunks (lg)	brn - m gr	bubbles mudchunk	NO	
1039	03R034	4	11	Lg clay balls in same well sorted sands, rks, fin silt on top (thin) lg. debris (slag)	brn - m grey	slag	no	sheen on comp.
1141	07R006	1	15.5	Silt on sfc. f. sand after 10cm	brown - med dk. grey	None present	No	no clams
1151	07R006	2	14	Silt/clay throughout v. little sand thin brown sfc layer < 1cm	med-grey olive-gry	very little	NO	
1201	07R006	3	16	Thin brown over mud silt/clay v. little fine sand soft matrix stiffening w/ depth	thin brown over ol. gy mud	stick	NO	sm. sheen on comp.
1245	07R004	1	12.5	well sorted sand; some gravel cobble, woodchip, distinct 1cm tan layer @ sfc over dk gry	1cm tan sfc over dk gry layer	woodchip cobble gravel	~~NO~~ slight organic	
1254	07R004	2	14.5	well sorted sand, a little finer than previous station	brown on top of med-dk gy	twigs plant mat'l woodchips plastic bag	NO	sm. sheen on water over grab
1307	07R004	3	17	silt/clay - no sand sm. sheen on grab stiffer matrix at depth	thin brn over med-gry	sm. wood chips	NO	Sheen on comp.

Comments:

LWG
LOWER WILLAMETTE GROUP

ROUND 1 FIELD SAMPLING REPORT
PORTLAND HARBOR RI/FS

March 14, 2003

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Submitted to:
Lower Willamette Group

Submitted by:
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LIST OF ACRONYMS

CORS	Continuously Operating Reference Station
DGPS	Differential Global Positioning System
EES	Ellis Environmental Services
EPA	Environmental Protection Agency
ERA	Ecological Risk Assessment
FES	Fishman Environmental Services
FSP	Field Sampling Plan
FL	fillet with skin and belly flap
FS	skinless fillet
HHRA	human health risk assessment
ISA	initial study area
GIS	Geographical Information System
GPS	Global Positioning System
MSS	Marine Sampling Systems
MTS	Marine Taxonomic Services, Ltd.
NSTS	National Sample Tracking System
LWG	Lower Willamette Group
RI/FS	Remedial Investigation/Feasibility Studies
PSEP	Puget Sound Estuary Program
QA	quality assurance
QC	quality control
SEA	Striplin Environmental Associates. Inc.
SOP	standard operating procedure
WE	Windward Environmental, LLC

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EXECUTIVE SUMMARY

This Round 1 Field Sampling Report (FSP) summarizes the Portland Harbor RI/FS Round 1/1A field sampling and reconnaissance activities that were conducted from June 24 through December 20, 2002.

Except where noted in the FSP or as modified by subsequent correspondence between the Lower Willamette Group (LWG) and the U.S. Environmental Protection Agency (EPA) (e.g., EPA letter dated September 20, 2002), all sample collection activities followed the procedures described in the Round 1A and Round 1 FSPs (SEA et al. 2002a,b) and the Fish Tissue Sampling Standard Operating Procedure (SOP) (SEA et al. 2002c). Fish tissue sample processing, including compositing, homogenization, and shipping, followed the procedures detailed in the Fish Tissue Compositing and Homogenization SOPs (SEA 2002a, SEA et al. 2002d). All laboratory analyses follow the EPA-approved project Quality Assurance Project Plan (QAPP) (SEA 2002b).

SUMMARY OF ROUND 1A FIELD ACTIVITIES

The following tasks were carried out according to the Round 1A FSP, which was approved by EPA on May 5, 2002:

- **Juvenile Salmonid Mark/Recapture Pilot Study**. A pilot study to gather information on mark/recapture methods was conducted July 8-9, 2002. When it was evident that water temperatures in the ISA had increased to levels that were stressful to juvenile salmonids when held in buckets prior to being marked, the study was terminated. There were no agency representatives present as observers during the brief study.
- **Collection of Fish Tissue for Chemical Analysis**. The fish tissue collection program was approved as part of Round 1A. Juvenile salmonids were collected for tissue analysis on June 24-27, 2002. The collection of other fish and crayfish occurred between July 22 and November 10, 2002. Details, including agency observers, are provided below.
- **Hard-bottom Benthos Sampling Using Multiplates**. Multiplates were deployed July 15-16, 2002 and were retrieved August 27-28, 2002. No regulatory agency representatives were present as observers.
- **Aquatic Plant and Amphibian/Reptile Reconnaissance**. The survey was conducted June 26-28, 2002. David Terpening and Joseph Goulet from EPA, Helen Hillman from NOAA, and Jeremy Buck from USFWS, observed the

nighttime frog call procedures at one sampling location on the evening of June 26.

- **Adult Lamprey Harvest Reconnaissance Survey.** LWG consultants observed lamprey harvests by the Confederated Tribes of Siletz on June 26, 2002, and by the Yakama Nation on July 22, 2002. Because these harvest dates were not fixed in advance and required attendance on very short notice, neither DEQ nor EPA technical staff were able to observe.
- **Nearshore Deposition/Erosion Monitoring Using Sediment Stakes.** Stakes were installed in July and measured once a month from July 17 to December 12, 2002. No regulatory agency representatives were present as observers.
- **Summer 2002 Bathymetry Survey.** The summer 2002 bathymetric survey was conducted in two phases. RM 2 to 11 were surveyed between July 3 and 18, 2002. Following a review of these data, river mile (RM) 0 to 2.5 and 10.5 to 15.6 were surveyed between September 16 and 20, 2002. This bank-to-bank survey was conducted during the low water season to obtain summertime riverbed elevations for comparison with the riverbed elevation data collected during December 2001 and January 2002. No regulatory agencies were present during the surveys.

In addition, the following two activities were performed:

- **Seep Reconnaissance Survey**. As requested by EPA in a letter dated September 20, 2002, the LWG conducted a seep reconnaissance survey on October 7 and 8, 2002. Eric Blischke from the Oregon Department of Environmental Quality (DEQ) and Renee Fuentes from the EPA accompanied representatives of the LWG on a subsequent tour of the identified seep areas on October 24, 2002.
- **Juvenile Lamprey and Benthic Infaunal Biomass Reconnaissance Surveys**. During the fish tissue sampling program, the LWG became concerned that juvenile lamprey were not being collected using proposed techniques. The LWG conducted a reconnaissance grab sampling survey on September 16 and 17, 2002 for juvenile lamprey at 21 of the 22 co-located sediment and tissue sampling stations originally identified in the June 2002 LWG Field Sampling Plan. Concurrently, the LWG

collected benthic samples to assess the potential success of the benthic infauna tissue collection program. On October 8 and 9, 2002, a field team consisting of two lamprey biologists from the Umatilla tribe (Aaron Jackson and Brandon Trelor), Helen Hillman of NOAA, and LWG consultants visited 11 lower Willamette sites for a follow-up reconnaissance using specialized lamprey electroshocking equipment.

Details of the sampling associated with most of the tasks listed above have been described in individual task reports that are being provided to EPA under separate cover. The status of these reports is:

- Aquatic Plant and Amphibian/Reptile Reconnaissance Survey (Windward 2003a)
- Benthic Macroinvertebrate Community Sampling (Windward 2003b)
- Adult Lamprey Reconnaissance Survey Technical Memorandum (Kennedy/Jenks 2003)
- Sediment Stake Erosion/Accretion Analysis (Anchor Environmental in prep.)
- Lower Willamette River Multibeam Bathymetric Survey, Summer 2002 (DEA 2003)
- Results of Seep Reconnaissance Survey RM 2-10.5 Lower Willamette River (GSI 2002)
- Technical Memorandum: Lamprey Ammocoete and Benthic Infaunal Biomass Reconnaissance Surveys of the Lower Willamette River (SEA and Windward 2003).

Fish tissue data will be reported in the Round 1 Site Characterization Report.

SUMMARY OF ROUND 1 FIELD ACTIVITIES

Round 1 field activities included the following tasks, which were approved by EPA in a letter dated September 20, 2002:

- Collection of sediments at sculpin, crayfish, and benthic infauna stations
- Collection of composited beach sediments
- Collection of benthic infauna
- Collection of clams for tissue analysis.

Each of these activities is described in more detail in the following section. Results of these tasks will be provided in the Round 1 Site Characterization Report.

SEDIMENT SAMPLING

To support the human health risk assessment (HHRA), composite surface beach sediment samples were collected at 20 beaches in the Initial Study Area (ISA) as described in the Round 1 FSP and EPA's letter of September 20, 2002. Beach sediment sampling occurred from October 9 through 14. At each beach, samples were generated by combining randomly selected, individual 0- to 15-cm surface samples into a single composite. All sediments were collected using stainless-steel hand corers. Mike Poulsen (DEQ) participated in the beach sediment collection and modified the definition (start or end point) of some target beaches during the field sampling.

Surface sediments (0-15 cm) collected for chemical analyses to support the ecological risk assessment (ERA) were collected at two types of stations. First, as described in the FSP, co-located sediments were collected at all nearshore sculpin and/or crayfish tissue sampling stations (12 of these stations also included infauna sampling stations). Second, surface sediments for chemical analysis were also collected at 10 additional benthic infauna stations to provide additional information on the distribution of benthic infauna in the ISA. These stations were situated in both nearshore areas and in the navigation channel to supplement the distribution of the 27 sculpin/crayfish co-located stations. The co-located surface sediment samples were collected from October 16 through 25, with an additional sampling day on November 12, 2002.

All surface sediments were collected using either a 0.1-m^2 van Veen grab sampler provided by SEA or a 0.3-m^2 hydraulic power grab sampler provided by Marine Sampling Systems. Co-located surface sediment sample collection procedures were observed by Dana Davoli (EPA), Helen Hillman (NOAA), and Jennifer Peterson (DEQ).

BENTHIC INFAUNA/CLAM SAMPLING

Soft-bottom benthic samples were collected from 22 stations in the ISA from October 22-25, 2002. Benthic infauna were collected at 12 of the sculpin/crayfish co-located sediment stations and at the 10 additional stations in both nearshore areas and in the navigation channel. Infauna were collected with a 0.1-m^2 van Veen grab sampler and sieved through a 0.5-mm sieve box. For the ecological risk assessment, a single replicate was collected at each location to provide a qualitative indication of the benthic infaunal assemblages throughout the harbor.

During the juvenile lamprey/benthic infauna reconnaissance survey conducted in September 2002 (reported under separate cover), it was determined that the non-native bivalve species *Corbicula fluminea* was the largest and most widespread benthic invertebrate in the ISA. In some locations, *Corbicula* appeared to be abundant enough to allow for the collection of sufficient biomass for tissue chemical analyses. In October and November, clam collection was attempted by repeated casts of a 0.1 m^2 van Veen grab sampler at five target locations. Also, at one location, an unsuccessful attempt was made to rake clams from a shallow subtidal beach. Clam collection was attempted over multiple sampling days at each location. After considerable total effort (over 500 van Veen casts), two locations near the center of the ISA yielded more than 150 grams of tissue, which is the minimum biomass required to conduct tissue analyses for a full suite of target analytes. Fifty-three grams were collected at a third station, while the remaining two stations yielded only nominal amounts. Clam sampling occurred from October 29 through November 5, with an additional day on November 12.

FISH AND CRAYFISH SAMPLING

Before fish tissue sampling began, the LWG established a fish sample processing field laboratory and field equipment storage area, located in former laboratory space at the decommissioned ATOFINA plant in Portland. This field laboratory was outfitted with a water de-ionizing unit, venting hood, two sinks, and all laboratory safety equipment listed in the SOP. David Terpening (EPA) visited and approved the use of the field laboratory space. In addition, he observed a "dry run" of the fish processing procedures and approved the methodology being used. EPA project managers Wallace Reid, Chip Humphrey, and Tara Martich conducted a final visit to the laboratory, where the fish processing team from Fishman Environmental Services (FES) clarified any additional questions about fish processing procedures.

For the ERA and the HHRA, 11 fish species and one crayfish species were targeted for tissue analyses. The target species for the ERA were northern pikeminnow, smallmouth bass, sculpin, subyearling chinook salmon, peamouth, largescale sucker, Pacific lamprey ammocoetes, and crayfish. For the HHRA, the target species were carp, black crappie, bullhead, smallmouth bass, and crayfish. In addition, walleye and largescale sucker were collected as alternative species for bullhead and carp, respectively. These alternate species were not used for tissue analyses because adequate numbers of bullhead and carp were collected.

During the Round 1A collection of subyearling chinook salmon from June 24 through June 27, 2002, beach seining and dip netting were the only fishing techniques used. The beach seining procedure was observed by David Terpening and Joseph Goulet from EPA, Helen Hillman from NOAA, and Jeremy Buck from USFWS. The intended mark and recapture pilot program for subyearling

chinook salmon was halted after signs of heat stress were observed in fish held in buckets prior to marking.

During the Round 1 collection of all remaining species from July 22 through November 10, 2002, six fishing techniques were used. These included beach seining, boat electrofishing, backpack electrofishing, trot line, angling, and crayfish traps. At the beginning of the Round 1 field program, fishing techniques, sample handling, and fish processing were observed in the field by David Terpenning of EPA and Eric Blischke from DEQ. Subsequent visits were made by Joseph Goulet (EPA) and Helen Hillman (NOAA), who, along with LWG consultant field managers and field crew, helped clarify issues such as station definitions and appropriate fishing methods.

The LWG field teams collected fish in the ISA, both day and night, over 79 days. A total of 1,870 fish were collected, including 863 sculpin, 419 crayfish, 128 largescale sucker, 90 smallmouth bass, 78 carp, 92 subyearling chinook salmon, 64 brown bullhead, 35 northern pikeminnow, 48 black crappie, 30 peamouth, 18 yellow bullhead, 3 lamprey ammocoetes, and 2 walleye. Forty-two individuals participated in the fish tissue collection effort. Striplin Environmental Associates staff coordinated the effort, which was carried out by personnel from Ellis Ecological Services, Fishman Environmental Services, Windward Environmental, Kennedy/Jenks Consultants, and Anchor Environmental. All people directly involved with the fishing effort were authorized to collect fish under the scientific taking permit granted by the Oregon Department of Fish and Wildlife to Ellis Ecological Services. With the exception of juvenile lamprey, the 2002 fish sampling program was successful in collecting all target species at all target locations in the ISA to satisfy the Round 1 data needs of the human health and ecological risk assessments.

Fish samples were processed at the field laboratory by a field laboratory staff led by Fishman Environmental personnel. Fish specimen sample handling and processing procedures followed those detailed in EPA-approved project SOPs and QAPP. Following final agreement with EPA on fish sample compositing schemes, frozen samples were shipped to Axys Analytical Services Ltd. (Sidney, B.C., Canada) for tissue homogenization.

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1.0 INTRODUCTION

This document describes field operations carried out during Round 1A and Round 1 (2002) of the Portland Harbor RI/FS from June 24 to December 20, 2002. Except where noted in the sections that follow, all field activities, including navigational positioning, data management, sample collection, and sample handling and processing, followed guidelines specified in the Round 1 Work Plan (SEA et al. 2002), Round 1A and 1 field sampling plans (SEA et al. 2002a,b), and Fish Tissue Sampling Standard Operating Procedure (SOP) (SEA et al. 2002c).

The 2002 Round 1A and Round 1 Portland Harbor RI efforts described here include collection of the following samples:

- Sediments at sculpin, crayfish and benthic infauna stations (co-located sediments)
- Composited beach sediments
- Benthic infauna
- Clams for tissue chemistry analyses
- Crayfish for tissue chemistry analyses
- Fish for tissue chemistry analyses
- Juvenile salmonids for the mark/recapture pilot Study

The results of additional 2002 investigation efforts described in the Round 1A FSP are provided as individual reports under separate cover. These activities included the following:

- Aquatic plant and amphibian/reptile reconnaissance (Windward 2003a)
- Hard-bottom benthos sampling using multiplates (Windward 2003b)
- Lamprey harvest reconnaissance survey (Kennedy/Jenks 2003)
- Nearshore deposition/erosion monitoring using sediment stakes (Anchor in prep.)
- Summer 2002 river-wide bathymetry survey (DEA 2003).

In addition, the following three activities were performed:

- Juvenile lamprey reconnaissance (SEA and Windward 2003)
- Soft-bottom benthos tissue reconnaissance (SEA and Windward 2003)
- Seep reconnaissance survey (GSI 2002).

Figures 1-1a-b show the general locations of all stations where sediment, tissue (fish, crayfish, and clams) and benthic infauna were collected in 2002 and include a station-by-station summary of the collected media, species, and planned laboratory analyses. Table 1-1 is an index of all field notebooks associated with

this nearly 5-month sampling program. Originals and copies of all field notes are stored in the LWG Project Library at Striplin Environmental Associates' (SEA) Olympia, WA office.

2.0 CHRONOLOGY OF FIELD OPERATIONS

Table 2-1 summarizes the chronology of the 2002 field operations described in this report. The collection of subyearling chinook salmon in the ISA took place from June 24-27, 2002 during Round 1A sampling. The Juvenile Salmonid Mark/Recapture Pilot Study occurred on July 8 and 9, 2002. The collection of all other fish species and crayfish was performed during Round 1 sampling from July 22 to November 10, 2002. Beach sediment sampling occurred from October 9-14, 2002 and co-located surface sediments were collected from October 16-25, 2002 with an additional sampling day on November 12, 2002. Benthic infauna were sampled from October 22-25, 2002 and clams were collected from October 29 to November 5, 2002, with and additional day on November 12, 2002.

3.0 SEDIMENT SAMPLING

Surface (0-15 cm) sediments for chemical analyses were collected at nearshore sculpin and/or crayfish tissue sampling locations and benthic infauna stations located adjacent to and in the main channel stations to support the ecological risk assessment (ERA). Composite surface beach sediment samples were collected for chemical analyses to support the human health risk assessment (HHRA). All sample logs are provided in Appendix A.

3.1 CO-LOCATED SURFACE SEDIMENTS

Co-located sediments were collected from 27 stations in the ISA from October 16 to November 12, 2002 (Figures 3-1a-b, Tables 3-1 and 3-2). Field operations were conducted using a 29-foot aluminum-hulled research boat provided and operated by John Vlastelicia (Scapoose, OR), or the *R/V Nancy Anne* provided and operated by Marine Sampling Systems (Burley, WA).

3.1.1 Navigation and Station Coordinates

SEA subcontractor, David Evans & Associates, provided computer-integrated navigation aboard John Vlastelicia's boat using a Trimble 4000SE Differential Global Positioning System (DGPS). Differential corrections were obtained real-time via radio broadcasts from the Continuously Operating Reference Station (CORS) site at Appleton, WA. Positions were recorded in Coastal Oceanographics Hypack Max for real-time stationing and monitoring of sampling operations. Hypack allows the raw coordinates (WGS84 geodetic) to be displayed in project coordinates (U.S. State Plane, North American Datum 1983, Oregon North Zone).

Marine Sampling Systems provided its own computer-integrated navigation system for operations aboard the *R/V Nancy Anne*. Horizontal positions were acquired using a Trimble AG132 DGPS. Real-time differential corrections were obtained from the CORS site at Appleton, WA. Positions were logged in Mapsite Navigational Software. In addition, at the start and conclusion of each survey day aboard the *R/V Nancy Anne*, the vessel was piloted to a known, fixed location and the vessel position recorded. This served as a daily check on navigation system accuracy.

Geographic information system (GIS) coordinates with observed depths for each grab sample can be found in Table B-1 (Appendix B).

3.1.2 Collection Methods

All sample collection was conducted in accordance with procedures described in the Round 1 FSP (SEA 2002b).

Co-located surface sediments were collected from a total of 27 stations. A summary of sample types collected from each station is presented in Table 3-2. All surface sediments were collected using either a 0.1-m^2 single van Veen grab sampler provided by SEA or a 0.3-m^2 hydraulic power grab sampler provided by Marine Sampling Systems. The target surface sediment-sampling interval was from 0-15 cm below the sediment-water interface. In fine-grained sediments, a 0- to 15-cm sediment sample was routinely obtained. In sandy areas, some samples less than 15 cm in depth were obtained using the van Veen and accepted per the Puget Sound Estuary Program guidelines (PSEP 1986) cited in the Round 1 FSP (SEA 2002b). In all cases, the penetration depth of all samples retained was recorded on sample collection log sheets.

Upon retrieval of the grab sampler, a SEA staff geologist described the contents of the grab and recorded the description onto a sample log sheet. The following parameters of each grab were described:

- **Time.** The time (local) when the grab sampler reached the river bottom was recorded.
- **Penetration Depth.** The maximum penetration from the center of the grab sampler into the sediment was measured.
- **Texture/Grain Size.** The average grain size, including any noticeable changes in particle size with depth was described. Any sedimentary layering within was also noted.
- **Sediment Color.** The color of the sediment was noted, including any variations in color with depth.
- **Notable Odors.** Any odor emanating from the sediment was described. The relative strength of the odor was also noted.
- **Debris.** Any debris, including organic debris such as wood, contained within the sediment was described.
- **Sample Quality.** Any other notable features of the grab contents were described.

Copies of all sample log sheets are provided in Appendix A. Original sample log sheets are on file in the LWG Project Library at SEA's office in Olympia, WA.

Only sediment that did not come into contact with the walls or top screens of the grab sampler was collected for chemical analyses. A minimum of three casts of the grab sampler was taken at each station to generate a composite. Sample compositing proceeded as described in the Round 1A FSP (SEA 2002d). A representative volume of sediment from each grab was scooped into a stainless-steel bowl using a stainless-steel spoon. Once sediment was collected from the final grab, the sediment was stirred to form a homogenate that was consistent in both texture and color. The sediment was then scooped into individual sample

jars (see below). Sediment samples for volatile organics analysis were collected immediately upon retrieval from an undisturbed, randomly chosen grab.

3.1.3 Sample Handling and Processing

As described above, homogenized sediment at an individual station was transferred to glass sample jars provided by the analytical laboratories. Care was taken to transfer the sediment from the mixing bowl to the jars as quickly as possible following homogenization to minimize the potential for contamination from an outside source. Sample jars were capped, labeled, bagged individually, and stored in a cooler on ice until the end of the sampling day. At the end of each field day, samples were transported by the field crew to the LWG field lab at the ATOFINA Chemicals. facility in Portland, OR. There, samples that could be frozen were transferred to a chest freezer. Those samples that could not be frozen (grain size, volatile organics) were held on ice for up to 4 days until they could be transported to SEA's office in Olympia, WA.

Frozen sample jars were immediately transferred into a chest freezer upon arrival at the SEA office in Olympia. Grain-size and volatile organic sample jars were transferred into refrigerators. Sample jars were wrapped in bubble-wrap and placed with ice in coolers for shipment to the analytical laboratories. All chain-of-custody requirements outlined in the FSP (SEA 2002b) were followed.

3.2 BEACH SEDIMENTS

Sediments from 20 beaches were collected along the ISA from October 10-14, 2002 (Figures 3.1a-b, Table 3-2). FES provided a 20-foot vessel for transport to the target beaches and navigation/station positioning on the beaches.

3.2.1 Navigation and Station Coordinates

Representatives from FES recorded station coordinates for beach sediment collection using a Corvallis MicroTechnology (CMT) hand-held unit, model MC-GPS. Once data gathering in the field was completed, the GPS technician differentially corrected the GPS points and converted them to GIS points. The GPS points could then be overlaid on aerial photographs or project maps. GPS data typically yield 95% precisions ranging from 0.277 to 0.469 meters (0.91 to 1.54 feet).

3.2.2 Collection Methods

Beach sediments were collected from a total of 20 stations. A summary of types of samples collected from each station is presented in Table 3-2. Beach sediments consisted of sediments from 0-15 cm below the ground surface. All sediments were collected using stainless-steel hand corers.

To collect beach sediment, field personnel were transported to a given beach by boat. A FES technician recorded the GPS coordinates at a pre-determined starting location on the beach. Each beach was sub-divided into three transects parallel to the shoreline, as described in the FSP (SEA 2002b). The river water-line was set as the bottom of the beach (transect 1). The vegetation of the upland edge of the sand was set as the top of the beach (transect 3), and one-half the distance between these transects was set as the mid-beach (transect 2). Each beach was sampled using the stainless-steel hand-corers at a minimum of three locations, depending on the total length of the beach. FES technicians measured off a pre-determined distance from the starting location where the first beach coordinates were recorded. A pre-determined randomly-selected transect (1, 2, or 3) was then sampled at each pre-determined measured distance from the starting point. Sediment retained in the hand-corer was transferred into a foil-covered stainless steel bowl. Subsequent sampling of the beach proceeded in this manner until the preset number of randomly chosen locations (both along and up or down the beach) was sampled to form a composite.

3.2.3 Sample Handling and Processing

Homogenized sediment from each beach composite was transferred into glass jars (provided by the analytical laboratories) immediately after mixing. Labeled sample jars were then placed inside resealable plastic bags and placed in a cooler with ice. At the end of each field day, samples were transported by the field crew to the LWG field lab at ATOFINA. There, samples that could be frozen were transferred to a chest freezer. Those samples that could not be frozen (grain size) were held on ice, up to four days, until they could be transported to SEA's office in Olympia.

Frozen sample jars were immediately transferred into a chest freezer upon arrival at the SEA office in Olympia. Grain-size sample jars were transferred into refrigerators. Sample jars were wrapped in bubble-wrap and placed with ice in coolers for shipment to the analytical laboratories. All chain-of-custody requirements were followed as outlined in the FSP (SEA 2002b).

3.3 OTHER SURFACE SEDIMENTS

Sediment was collected from 10 additional nearshore and in-channel stations in the ISA from October 28-29, 2002 (Figures 3-1a-b, Table 3-2). All field operations were conducted onboard the *R/V Nancy Anne*. These 10 stations were placed at both nearshore and channel locations that supplemented the distribution of the 27 co-located stations.

3.3.1 Navigation and Station Coordinates

Horizontal positions were acquired onboard the *R/V Nancy Anne* using a Trimble AG132 DGPS as described above in Section 3.1.1.

3.3.2 Collection Methods

All sample collection was conducted according to guidelines outlined in the FSP (SEA 2002b). A summary of types of samples collected from each station is included in Table 3-2. Sediments were collected and handled, as described above (Sections 3.1.2 and 3.1.3), using a van Veen grab. A hydraulic power grab was used once because of the presence of wood debris, which precluded the closing of the van Veen grab.

4.0 BENTHIC INFAUNA/CLAM SAMPLING

4.1 SOFT-BOTTOM BENTHIC INFAUNA

Soft-bottom benthic infauna samples were collected from 22 stations in the ISA (12 co-located stations, 10 nearshore/channel stations) over a non-consecutive period from October 22-29, 2002 (Tables 3-1 and 3-2, Figures 3-1a-b). All benthic infauna sampling was conducted onboard the *R/V Nancy Anne.*

4.1.1 Navigation and Station Coordinates

Horizontal positions were acquired onboard the *R/V Nancy Anne* as described in Section 3.1.1. GIS coordinates with observed depths for each grab sample can be found in Table B-1 (Appendix B).

4.1.2 Collection Methods

A summary of the types of samples collected from each station is presented in Table 3-2. Benthic infauna collections were paired with either co-located sediment stations or with the 10 additional nearshore and channel sediment stations. Upon arrival at each benthos/sediment station, the first cast of the 0.1-m^2 single van Veen grab sampler was designated as a benthos grab. A benthic ecologist onboard would first make a determination concerning the suitability of the grab for processing. If the contents of the grab were deemed acceptable, the entire contents of the grab were emptied into a 0.5-mm sieve box. The contents of the grab were then gently washed through the sieve box using site water. The material retained from each screen was rinsed into separate, labeled polyethylene bags. To preserve the infaunal samples in the field, a solution of 88.3 % ethyl alcohol was added to each sample bag after removing most of the overlying water from the sample.

Three additional grabs were then collected from each location to form a composite sample for sediment chemical analyses as described in Section 3.1.2.

4.1.3 Sample Handling and Processing

At the end of each field day, the benthic infauna samples and co-located sediment samples were transported by the field crew to the LWG field lab at ATOFINA. There, infauna samples were stored in coolers until they could be transported to the SEA office in Olympia. Sediment samples were handled and stored as described in Section 3.1.3.

Benthic infaunal samples were shipped to Howard Jones of Marine Taxonomic Services, Ltd. in Corvallis, OR in a single batch for sorting by major taxonomic groups. Samples were then sent to EcoAnalysts, Inc. in Moscow, ID for species identification or determination to the lowest practical taxonomic level. All chain-of-custody requirements outlined in the FSP (SEA 2002b) were followed.

4.2 CLAMS

During a reconnaissance of the site in September 2002 (SEA and Windward 2003), the non-native bivalve species, *Corbicula fluminea,* was determined to be the largest, most widespread, and abundant soft-bottom organism for tissue chemical analyses in the ISA.

4.2.1 Clam Reconnaissance

Additional clam reconnaissance information was gathered during the co-located sediment and benthic infauna station sampling conducted from October 10-23, 2002. During this period, the presence of *C. fluminea* specimens was noted to estimate which stations might have relatively high abundances of clams. Based on these observations, five locations were estimated to have relatively high clam densities (Table 3-3, Figures 3-1a-b). Also during this sampling, clams representing a range of sizes were collected and measured along their two major axes, dissected, and their soft tissue weighed. By measuring and weighing clams across the range of observed sizes, a correlation was made between the length of the clams and their wet-tissue weight. This relationship was used to estimate total clam tissue biomass collected during the follow-on clam collections.

4.2.2 Clam Collection

Between October 24 and November 12, 2002, clam tissue collection was attempted at the five target locations listed in Table 3-3. At each station, replicate drops of a 0.1-m^2 single van Veen grab sampler were repeated in an effort to collect the required estimated total combined weight of *C. fluminea* for tissue analyses (150 g/station) (An additional ~110 g of *C. fluminea* [total 260 g] were collected at station 06R002 for laboratory QC analyses). Following retrieval of each grab, the contents of the grab were emptied onto a sampling table or tray and searched for *C. fluminea.* Only organisms with a maximum shell-width greater than 1.5 cm were retained for processing and analyses as smaller clams were determined to have negligible tissue biomass. The bottom of the sampling tray aboard the *R/V Nancy Anne* was modified with a 1-cm steel mesh screen. Sediment from the grab that was emptied onto the tray was washed using site water, and clam specimens retained by the screen were thoroughly washed to remove as much sediment from the outer shell as possible. Clams were measured along their longest axis, and counted.

At the end of each sampling effort at a given station, *C. fluminea* specimens were wrapped together in aluminum foil and placed in a plastic bag. The name of the station and the date were recorded on the outside of each plastic bag, and the bags were placed in a cooler with ice onboard the sampling vessel until they could be transported to the ATOFINA lab at the end of each sampling day.

Table 3-3 summarizes the effort required to collect *C. fluminea* tissue at the five target stations. Spatial variability was high as indicated by the numerous grab

deployments (from 54 to 219 grabs) at each station requiring up to four sampling days per station. Clam collection at station 07R003 proved most difficult. Grab sampling at this station first took place on October 29, 2002, yielding 12 clams (approx. 18 g) after 91 grabs and 2.5 hours. Subsequently, attempts were made to collect *C. fluminea* on the beach and shallow sand spit adjacent to 07R003 (both beach raking and grab sampling efforts were made). Station 07R030 was later defined as a new location adjacent to station 07R003 due to the expanded search area (Figure 3-1b); minimal clam biomass (14.5 g) was obtained in this location.

4.2.2 Sample Handling and Processing

At the end of each field day, clams were transported by the field crew to the LWG field lab at ATOFINA. There, samples were frozen in a chest freezer until they could be transported to the SEA office in Olympia. Upon arrival at the SEA office, frozen samples were immediately transferred from coolers into a chest freezer.

5.0 FISH AND CRAYFISH SAMPLING

Collection of fish and crayfish tissue from the ISA followed guidelines outlined in the Fish Tissue Sampling SOP (SEA et al. 2002c). Eleven fish species and one crayfish species were identified for tissue analyses for the ecological and human health risk assessments. The target species for the ERA were:

- Northern pikeminnow (*Ptychocheilus oregonensis*)
- Smallmouth bass (*Micropterus dolomieui*)
- Sculpin (*Cottus sp.*)
- Subyearling chinook salmon (*Oncorhynchus tshawytscha*)
- Peamouth (*Mylocheilus caurinus*)
- Largescale sucker (*Catostomus macrocheilus*)
- Lamprey ammocoetes
- Crayfish.

Of these species, only lamprey ammocoetes could not be found in sufficient numbers for tissue analyses.[1]

The target species for the HHRA were:

- Carp (*Cyprinus carpio carpio)*
- Black crappie (*Pomoxis nigromaculatus)*
- Bullhead (*Ameiurus nebulosus*)
- Smallmouth bass (*Micropterus dolomieui*)
- Crayfish.

In addition, walleye and largescale sucker were collected as alternative species for brown bullhead and carp, respectively. These alternate species were not used for tissue analyses because adequate numbers of bullhead and carp were caught.

Beach seining and dip netting were the only sampling techniques used during Round 1A for the collection of subyearling chinook salmon. Six sampling techniques were used during Round 1 to collect fish: beach seining, boat electrofishing, backpack electrofishing, trot line, angling, and crayfish traps. The sampling techniques, amount of effort, and number of fish caught per station are summarized in Table 5-1; the actual locations fished using the various methods are shown in Figures 5-1a through 5-1e.

[1] A concerted effort was made to locate lamprey ammocoetes in the ISA by LWG and tribal biologists over four days in September and October 2002 without success. Methods tested and observations made during this effort are reported in SEA and Windward (2003).

A total of 1,870 fish were collected in 79 days. Tables C-1 and C-2 (Appendix C) provide an information record of each fish caught during the Round 1A and Round 1 sampling effort. The fish included 863 sculpin (Figures 5-2a, b, and c), 419 crayfish (Figures 5-3a, b, and c), 128 largescale sucker (Figures 5-4a and b), 90 smallmouth bass (Figures 5-5a and b), 78 carp (Figures 5-6a and b), 92 subyearling chinook salmon (Figures 5-7a and b), 64 brown bullhead (Figures 5-8a and b), 35 northern pikeminnow (Figures 5-9a and b), 48 black crappie (Figures 5-10a, and b), 30 peamouth (Figures 5-11a, and b), 18 yellow bullhead (Figures 5-8a and b), 3 lamprey ammocoetes (Figures 5-12a, and b), and 2 walleye (Figure 5-12a).

Fishing efforts required a substantial amount of resources and personnel. SEA staff coordinated the overall effort, which was carried out primarily by personnel from Ellis Environmental Services (EES), with assistance from FES, Windward Environmental (Windward), Kennedy/Jenks Consultants (Kennedy/Jenks), and Anchor Environmental. Table 5-2 lists the names of the 42 individuals who participated in the fish tissue collection effort.

All people directly involved with the fishing effort were authorized to collect fish under the scientific taking permit granted to ESS by the Oregon Department of Fish and Wildlife.

5.1 NAVIGATION AND STATION COORDINATES

Trimble GeoExplorer 3 Global Positioning System (GPS) units were used to record coordinate data, the time and date of each sampling effort, and the numbers of fish collected, retained, or released. A data dictionary and menu-driven data collection system were developed by EES and programmed into the GPS units to facilitate consistent data collection techniques and to minimize data entry errors. Handwritten field notebooks were also used to duplicate data collected using the GPS units and make note of any other field observations. The coordinate data were downloaded periodically from the GPS units at EES, differentially corrected (using Portland State University base station data), and projected from geographic coordinates to the state plane coordinate system. Handwritten field notebooks also were collected periodically from the field crew to accompany the GPS data. These data were reviewed immediately after periodic downloads to communicate and correct any data entry errors with the field crew.

Prior to September 19, 2002 all positional data were obtained using point coordinates. This included boat electrofishing, backpack electrofishing, beach seining, trot lines, and angling efforts. Sampling points, representing a particular sampling effort, were derived by averaging coordinates collected each second by the GPS unit. The area sampled during each effort was dependent upon the sampling objectives for the species being collected and the sampling gear used.

The field crew used hardcopy maps describing the general location of each sampling location or area to determine where to focus sampling efforts.

To address U.S. Environmental Protection Agency (EPA) concerns regarding the area sampled while electrofishing, methods used to record positional data were modified on September 20, 2002 to include the collection of line data. Once the GPS units were reprogrammed and field crew retrained, boat and backpack electrofishing efforts were represented by line data consisting of "vertices", or points of inflection, collected every 5 seconds and "nodes" collected at the beginning and end of each sampling run. Data processing methods were not significantly altered. Electrofishing runs were then limited to 500 seconds to reduce the spatial area covered.

Once all of the data had been differentially corrected, projected, and compiled at EES, quality assurance checks were made using digital aerial photography for positional data and the handwritten field notebooks for numeric and categorical data. The resulting spatial database was stored using GIS. Spatial data and associated attributes were also exported and compiled in spreadsheets for reporting purposes. All GPS coordinates were e-mailed to SEA office in Olympia and incorporated into the Fish Tissue Data Master Table (Appendix C, Table C-1).

On October 7, 2002, the fishing effort was doubled in order to increase the fish catch per day. Operations increased from two boats and five people in the field to five boats and 14 people a day. A sufficient amount of GPS units necessary for every team to directly record their positional data was unavailable. The three existing GPS units were assigned to the fishing teams that required constant navigation records, such as the boat electrofishers. Teams without GPS units were assigned to collect fish at fixed and marked nearshore stations, such as crayfish and sculpin stations, which already had GPS coordinates on record. Field notebook entries from non-GPS teams were transferred to the Fish Tissue Data Master Table (Appendix C, Table C-1), and the coordinates necessary for each specific event were copied from a previous GPS record for each respective station. Each fish assigned previously recorded coordinates received a "NA" qualifier under GPS date and time columns in Table C-2 (Appendix C).

FES provided an additional GPS unit, which was used during beach seining and trot line settings. The FES GPS unit was a Corvallis Micro Technology MC-GPS unit. This GPS data typically yield 95% precisions ranging from 0.277 to 0.469 meters (0.91 to 1.54 feet). FES used C/A code so their accuracy was 1-3 meters.

5.2 TARGET STATION MODIFICATIONS

Three stations proved to be poor habitat for the collection of sculpin, and alternative stations with better sculpin habitat were selected as close to the

original station as possible. On July 26, 2002, station 03R034 was added as an alternative to station 03R003. On August 27, 2002, station 05R020 became the alternative to station 05R002. On November 7, 2002, station 07R006 was added as an alternative to station 07R001 (Figure 1-1, Figures 5-2a-b, and Tables C-1 and C-2 [Appendix C]). All new stations were approved by EPA.

On October 7, 2002, an additional sculpin and crayfish station, station 02R015 located downstream from the Multnomah Channel, was added at the request of EPA (Figure 1-1, Figure 5-2a, and Tables C-1 and C-2 [Appendix C]).

5.3 EQUIPMENT DECONTAMINATION

All field equipment used to collect and process fish was decontaminated according to the Fish Tissue Sampling SOP. No deviations were made from that protocol. Equipment described under fishing methods in Section 5.4 below was always decontaminated prior to sampling a new station. All dip nets, buckets, measuring boards, handheld scales, and coolers used to retrieve and store fish were also decontaminated at each new station. The beach seine was simply washed in site water during deployment and retrieval. Due to its large size and volume, the beach seine could not be practically decontaminated using the same protocol as other sampling equipment. However, all fish caught by beach seine were placed for a few minutes in a decontaminated bucket containing site water and therefore rinsed before being handled and processed.

5.4 FISHING METHODS

5.4.1 Beach Seine

A 100-foot-long pole-seine was used for beach seining. It required an 18-foot boat with a 30-HP outboard engine and three people to deploy and retrieve the net. After the net was placed surrounding the fish, technicians on the beach hauled in the "wings" of the net. As the net approached the beach, fish were driven into the net and hauled up on shore. All fish were handled with powder-free nitrile gloves, dip nets, and buckets. A total fish count was taken, and only target species were sorted into a bucket. The remaining fish were returned to the water. The bucket with fish was then handed over to the fish-processing team. If fish were to be held for more than 30 minutes before being transferred to the processing team, they were placed in resealable plastic bags and stored in a cooler with wet ice. Each bag was marked with the date, time, station number, fishing technique code, event number, and initials of the sampler.

5.4.2 Trot Line

Trot lines were built with 50- to 80-lb braided Dacron line with nylon monofilament leaders. Each trot line was 100 to 150 feet long with 25-30 # 4 and

6 hooks. Hooks were baited with earthworms purchased from D & G Bait Co[2]. Trot lines were attached to a piling above the water line, slowly stretched out with the help of a boat and anchored at the other end with a lead weight. They were occasionally attached between two pilings or spread out at the bottom with both ends attached to lead weights, which in turn were attached by a line to floats at the surface. Trot lines were left on site overnight and retrieved the following day. Technicians wearing powder-free nitrile gloves slowly retrieved the line unhooking the fish and placing them inside a plastic bucket. Often times, it was difficult to remove a hook without damaging a fish sample. It was necessary to cut the nylon leader as far away from the mouth making it easy to identify a fish in need of hook removal during sample processing at the laboratory. All fish containing hooks were noted in the field notebook. The bucket with fish was then handed over to the fish-processing team. If fish were to be held for more than 30 minutes before being transferred to the processing team, fish were placed in resealable plastic bags and stored in a cooler with wet ice. Each bag was marked with date, time, station number, fishing technique code, event number, and initials of the sampler.

5.4.3 Angling

Angling was conducted using a standard rod and reel with monofilament line (6-12 lb test). A variety of lures was used depending on the target species. Black crappie were caught using lead-weighted hooks with an attached rubber crappie jig. White-rubber tailed crappie jigs were the most successful and therefore were used almost exclusively. Smallmouth bass were caught with a variety of lures, depending on the desired sampling depth. Lead-weighted hooks with attached green-rubber tube jigs were used to fish the bottom, while plastic crank baits resembling small fish or crayfish were used to fish the shallower surface waters (0-3 m). Electric trolling motors were used to more accurately access specific smallmouth angling locations and enable the complete coverage of selected areas. Angling for black crappie was done primarily between dusk and 3:00 AM. Angling teams sampled predominantly near pier/dock structures where existing facility lights illuminated the water surface. Coleman™ gas lanterns were used to provide light around pier/dock structures without existing facility lights. Crappie jigs were placed on weighted hooks and lowered between pilings or adjacent to floating dock structures to an average depth of 10 m. Angling for smallmouth bass was conducted primarily at dawn and dusk. Smallmouth bass were sampled at the surface and near the bottom. Crank baits were used to sample surface waters at depths ranging from 0-4 m, while rubber tube jigs were used to sample the river bottom at an average depth of 10 m. Once caught, fish were handled using powder-free nitrile gloves, unhooked, and immediately placed into individual resealable bags. Each bag was marked with the date, time, station number, fishing technique code, event number, and initials of the sampler.

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[2] D & G Bait Co, 15981 SE 122nd Ave, Clackamas, OR 97015, (503) 557-2248.

Bagged fish were then placed in coolers with wet ice for transport to the LWG laboratory for processing.

5.4.4 Crayfish Traps

Standard minnow traps were used for capturing crayfish. Bait consisted of commercially available canned cat food, frozen smelt, and frozen shad. Numerous small holes were punched in the cat food cans to allow diffusion of the food scent into the water while preventing crayfish from ingesting the can contents. Frozen smelt or shad were cut into small pieces and placed into perforated plastic canisters with screw-on plastic lids. Canisters were attached to the inside of the traps using plastic zip ties. Crayfish traps were deployed within 100 feet of the shoreline at marked sculpin stations. Sculpin stations were marked in 100-foot widths along the shoreline. Depth of deployment varied according to station bathymetry. Traps were retrieved and carefully rinsed before being placed inside the boat. Technicians wearing powder-free nitrile gloves retrieved crayfish from traps and placed them inside resealable plastic bags. Plastic bags containing crayfish were then stored inside coolers with wet ice until ready for processing. Each bag was marked with the date, time, station number, fishing technique code, event number, and initials of the sampler.

5.4.5 Boat Electrofishing

Boat electrofishing was conducted from a 20-foot jet sled equipped with a Smith Root Model 5.0 GPP electrofisher. Typically, 3-4 amps of output current were applied, and the pulse rate varied between 30-80 % of 60-120 volts direct current. Pulse rate and width were adjusted periodically depending on conductivity, fish species, and behavior. Conductivity, dissolved oxygen and water temperature conditions were independently collected using an YSI Model 85 multi-parameter water quality probe each sampling day. The electrofisher typically attracted fish from 10-15 feet away. Electrofishing was conducted for periods of at least 500 seconds, at which point the location and effort were recorded. The boat electrofishing team consisted of a pilot and two people wearing chest waders and electrical safety gloves holding long dip nets at the bow of the boat and secured by a safety rail. Stunned fish were collected with the dip nets and placed inside large open coolers containing site water.

Handling of fish was done using powder-free nitrile gloves. Fish were counted and placed on a decontaminated measuring board. Any target fish that met the size range requirement was then transferred to a plastic tote with an interlocking lid to prevent the fish from jumping out. The tote was then transferred over to the processing team. If fish were to be held for more than approximately 30 minutes before being transferred to the processing team, fish were placed in resealable plastic bags and stored in a cooler with wet ice. Each bag was marked with the date, time, station number, fishing technique code, event number, number of electrofishing seconds, and initials of the sampler.

5.4.6 Backpack Electrofishing

Backpack electrofishing was done with a gas-generator-powered Smith-Root Model 15-D Backpack Electrofisher. Settings were generally in the standard pulse range of I-4 (60 Hz at 4 ms) to K-6 (80 Hz at 8 ms), and varied in voltage power from 100 volts to 400 volts as per effectiveness. Settings in the Programmable Output Waveform range were used in some instances. Electrofishing was also done with a Smith-Root Model 12 with a 24-volt battery. The output voltage range varied from 300-400 volts, depending on fish behavior and water conditions. The pulse range varied between I-4 (60 Hz at 4 ms) and K-6 (80 Hz at 8 ms). Effort was recorded in seconds at electroshocking stations to determine catch per effort.

The backpack electrofishing team consisted of two technicians wearing chest waders and insulated electrical safety gloves. One technician carried the backpack unit holding the anode wand in one hand and cathode "tail" dragging behind in the water. The other technician held a dip net and a plastic bucket. Once a fish was stunned, it was scooped by a dip net carried by the second technician and placed inside the plastic bucket. The bucket with fish was then handed over to the fish-processing team. If fish were to be held for more than approximately 30 minutes before being transferred to the processing team, fish were placed in resealable plastic bags and stored in a cooler with wet ice. Each bag was marked with the date, time, station number, fishing technique code, event number, number of electrofishing seconds, and initials of the sampler.

5.5 FIELD SAMPLE HANDLING AND PROCESSING

Fish samples were handled with powder-free nitrile gloves. All equipment was decontaminated prior to processing samples at each new station and between different species (Section 5.3). Fish were first measured for total length and, if appropriate, fork length by placing them flat on a measuring board. The total length of a fish was measured from the front of the jaw, which is most anterior to the end of the longest caudal ray when the rays are squeezed together, but excluding the caudal filaments, to the end of the tail. Fork length was measured from the tip of the snout to the posterior end of the middle caudal rays (FishBase 2002). The total length of crayfish specimens was measured from the rostrum, the flat "horn" between the crayfish's eyes to the telson, to the last center segment of the tail (Pennak 1989). After length measurements, fish were weighed using a handheld scale suited for the weight of the fish (Pesola® 60 g x 0.5 g, Pesola® 1000 g x 10 g, and Chatillon™ 6 kg x 50 g). Once weighed, the fish sample was placed on aluminum foil (dull side towards fish), wrapped and placed inside a resealable plastic bag. A label was written on Rite-in-the-Rain™ paper, placed inside another resealable plastic bag, and, in turn, placed inside the bag containing the fish sample. This was to ensure that no chemicals present in the treated label paper would contact the fish sample. The processed fish sample was then placed inside a cooler containing wet ice. At the end of each day, the cooler was brought

back to the LWG laboratory. All fish were then removed from the cooler, counted, and stored in the 4°C refrigerator. The refrigerator was then locked, and a total fish number was entered in the LWG laboratory storage logbook and signed. Beginning on October 3, 2002, it was found to be more efficient to process the fish in the laboratory than in the field immediately after fish capture. All fish caught in the field were placed in resealable plastic bags, marked with the date, time, station number, fishing technique code, event number, number of electrofishing seconds, initials of the sampler and placed in a cooler with ice. At the end of the field work, the fish samples were then processed by the field crew at the LWG laboratory at ATOFINA following the same procedures as described above.

5.5.1 Data Management

Four different groups of notebooks were generated from a total of 38 notebooks during Round1A and Round1 fish tissue collection (Table 1-1). The first group, FES Lab Books (11 books), included information about fish tissue processed at the LWG laboratory at ATOFINA. The second group, SEA Field Books (11 books), included information about fish tissue collection and processing. The third group, EES Field Books (8 books), included information about fish tissue collection and water quality. The fourth group was the Auxiliary Field Books (8 books), which included information about fish tissue collection and lamprey surveys.

Once fish were processed in the field and stored at the LWG refrigerator for further tissue processing by the laboratory team, the field notebooks were scanned and e-mailed daily to SEA. The data were received at SEA office in Olympia, and the Fish Tissue Data Master Table (Appendix C, Table C-1) was updated manually into an Excel spreadsheet. In addition to the field fish processing data, the locations where the fish were caught were recorded with a GPS unit by the EES crew in the field and post-processed at their office and delivered electronically either as a Text File or as an ArcView™ Shape file to SEA via e-mail. This information was then transferred into the Fish Tissue Data Catch Coordinates table (Appendix C, Table C-2). This table contains the X and Y locations for fishing events and locations for specific fish catch. The coordinates were then matched to specific fish based on date, time, station, key day, sampler, method, recorded catch, and effort, and copied into the Fish Tissue Data Master Table. After new field data were added, the table was checked for duplicate sample codes to identify any mislabeled samples. If duplicates were identified, the field collectors and the lab were notified and the appropriate actions were taken to correct the problem.

As described in Section 5.1, on October 7, 2002, field efforts were doubled and the number of GPS instruments was insufficient for every team to directly record their positional data. It was also unnecessary because many stations, such as all of the co-located crayfish/sculpin stations, were established as fixed points with

GPS coordinates previously recorded and also marked with fluorescent orange spots at both ends of the delineated 100-ft shoreline. The three existing GPS units were assigned to the fishing teams that required constant navigation records, such as the boat electrofishers. All other teams were assigned to collect fish at fixed stations, which already had GPS coordinates on record. Field notebook entries from non-GPS teams were transferred to the Fish Tissue Data Master Table (Appendix C, Table C-1), and the coordinates necessary for each specific event were copied from a previous GPS record for each respective station. Each fish assigned previously recorded coordinates received a "NA" qualifier under GPS date and time columns in Table C-2 (Appendix C).

Some trot line and angling efforts lacking field GPS coordinates were located visually on a map based on field notes by the sampler, and a coordinate was assigned to a specific location using ArcMap™. Boat electrofishing and backpack electrofishing were collected as lines. Crayfish and trot line events were collected as points. After September 20 2002, GPS files were being delivered as line and point shape files (instead of text files). The coordinates for the line files were converted to a centroid using an ArcView™ extension. The coordinate from the centroid was then substituted into the catch coordinate for boat electrofishing and backpack electrofishing events.

5.6 ANALYSES OF FIELD FISH SAMPLING TECHNIQUES

It is important to report some factors that may have improved fish sampling techniques with the goal of better preparing future fish sampling events.

Crayfish were noted to be of larger size in deeper water (30-40 feet) than closer to shore. They preferred sandier than muddier substrates and were collected most successfully with traps that had long bodies (approximately 30 inches) and long entry cones. The best bait used was frozen smelt.

In certain areas, it was difficult and potentially hazardous to obtain sculpin by electrofishing because the terrain was too steep and the water too deep. As the water deepened, it became more difficult to visually detect a sculpin and scoop it out of the water with a net, even if it had been stunned by the electrodes from either a boat or a backpack. It was equally difficult to retrieve any sculpin that may have fallen into the large gaps between stones of a riprap area. Trot lines proved efficient in catching sculpin at locations sharing the physical characteristics mentioned above. Any delay in retrieving overnight trot lines would increase the chances for crayfish to partially consume sculpin bodies caught on lines set close to the bottom. Sculpin were infrequently caught with crayfish traps.

Black crappie were collected most successfully by trot lines and/or jigging with a white plastic lure at depths of 30 - 40 feet in quiescent bodies of water such as

Swan Island Lagoon. Most black crappies were caught at night between 5:00 and 10:30 PM. Electrofishing proved inefficient since black crappies tend to live in waters deeper than the electric field of a boat electrofisher can reach (i.e. approximately 10 feet).

Carp and smallmouth bass were more difficult to catch at lower water temperatures.

5.7 LABORATORY SAMPLE HANDLING AND PROCESSING

5.7.1 Laboratory Location

The LWG laboratory for fish processing was located in a separate, locked set of rooms inside the gated and guarded decommissioned ATOFINA plant at 6400 NW Front Ave, Portland, OR. The laboratory was thoroughly cleaned by a professional team before any installations occurred. The laboratory room ceilings and some wall openings were sealed with plastic sheeting, and all air vents were fitted with micro-filters. A positive pressure system was created with plastic drapes separating the inner laboratory rooms from the outer workroom. Additionally, an "air-lock" entrance room was built to prevent direct transport of airborne particles from the outside into the laboratory. This room was also used to store all field equipment. The laboratory was outfitted with a water de-ionizing unit, venting hood, two sinks, and all laboratory safety equipment listed in the SOP.

5.7.2 Monitoring of Personnel in Laboratory

Upon entering the LWG laboratory, all personnel were required to sign in with their name, date, time and purpose on the sign-in sheet located at a table by the front door. The numbered sheets were kept in a binder for a record of all entrances, and the originals are stored in the LWG Project Library at the SEA office in Olympia, WA.

5.7.3 Laboratory Opening Procedures

Upon entering the laboratory, several tasks were performed each day:

A. Freezers and refrigerators were unlocked, and the temperature was monitored for all units. Temperature readings were noted in the bound refrigeration logbook with date and time. Any unit with a temperature reading out of compliance (+4 °C ± 2 °C for refrigerators or -20 °C ± 4 °C for freezers) was adjusted and the adjustment noted in the logbook.
B. The digital balance was calibrated.
C. The numbers of fish in the refrigeration units (Units R1 & R2) were compared to the number of fish logged in by the field crew in the chain-of-custody logbook after field processing. Any

discrepancies were immediately noted and the field manager contacted.

D. Printed scanned field notes by field crew were reviewed prior to laboratory processing.

E. All working surfaces were covered with aluminum foil, shiny side down, as per SOP.

5.7.4 Fish Processing Procedures

Decontamination of laboratory equipment and laboratory fish handling followed the instructions of the Fish Tissue Sampling SOP. All surfaces were covered with clean aluminum foil with the dull side up prior to contact with fish samples.

A. Whole-body HHRA Fish

1. Fish were weighed on the calibrated digital balance.
   a. Any hooks noted in the fish, due to being caught on a trotline, were removed prior to weighing in the processing laboratory. Hook removal was noted in the condition section of the laboratory notebook entry
   b. Any fish that exceeded the capacity of the digital balance (3000 g) were weighed on a seed scale (Morris Scale Model 20, 20 lbs x 1 oz, temperature compensated) and the weights converted to metric. The accuracy of the seed scale was tested and found to be ±7 g at 2000 g NSTS (0.35 % error).
   c. Beginning on October 3, 2002, it was found to be more efficient to process the fish in the laboratory than in the field immediately after fish capture (Section 5.5). Therefore, unless hook removal was necessary for fish caught on a trotline, fish were not re-weighed by the laboratory crew.
   d. The weight was noted in the laboratory processing notebook and the sample processing form.
2. The fish was examined for observable anomalies, using the Fish Health Examination Sheet (SEA et al. 2002c) as a guide, and the condition was noted in the laboratory notebook (Field Laboratory Notebooks, Table 1-1). Entries were descriptive (e.g. "2 mm red spot on distal end of caudal fin ray 2").
3. Whole-body fish were then re-wrapped in clean aluminum foil, shiny side away from the fish, and put into an appropriately sized bag with the bagged sample label that was written by the field crew. The bag with fish and label was sealed according to the Fish Tissue Sampling SOP.

B) Whole-body ERA Fish:

Whole-body ERA fish were not unwrapped and inspected unless caught on a trotline, at which point they were unwrapped, inspected for the presence of a hook and re-weighed if the hook was removed. Removal of the hook and the new weight were noted in the laboratory notebook under the condition

entry and on the sample processing form, and the fish was re-wrapped in clean aluminum foil similar to the whole-body HHRA fish.

C) Fillet HHRA Fish:

1. Fish were weighed on the calibrated digital balance according to instructions in the Fish Tissue Sampling SOP.
   a. Any hooks present in the fish, due to being caught on a trotline, were noted but not removed, due to the subsequent filleting process.
   b. Any fish that exceeded the capacity of the digital balance (3000 g) were weighed on a seed scale (Morris Scale Model 20, 20 lbs x 1 oz, temperature compensated) and the weights converted to metric. The accuracy of the seed scale was tested and found to be ±7 g at 2000 g NSTS (0.35 % error).
   c. Beginning October 3, 2002, all fish caught were weighed by the field crew in the laboratory. Therefore, unless hook removal was necessary for fish caught on a trotline, fish were not re-weighed by the laboratory crew.
   d. The weight was noted in the laboratory processing notebook and the sample processing form.
2. Fish length was measured on a measuring board covered in aluminum foil.
   a. Total length was measured from the tip of the snout to the end of the caudal fin, when compressed dorsal-ventrally. The length was determined by marking the end of the tail with a sharp object and folding the aluminum foil at that point to read the ruler.
   b. Fork length was measured from the tip of the snout to the fork of the caudal fin, with the fin extended. The length was determined by marking the end of the tail with a sharp object and folding the aluminum foil at that point to read the ruler. For fish with a highly preyed upon or eroded caudal fin, the fork length measurement represented a best estimate of length.
3. As described in the Fish Tissue Sampling SOP, the fish were scaled prior to filleting. For fish without scales (i.e., yellow and brown bullhead), the skin was removed from the entire fish prior to filleting, in accordance with the SOP and EPA (2000) guidance. Prior to September 5, 2002, scaleless fish were processed so that only one side of the scaleless fish was skinned and this skinned side was filleted for the skin off without belly flap (labeled as FS) tissue sample. Because the entire fish was not skinned prior to September 5, 2002, the fillet samples processed prior to September 5, 2002 (5 samples in total), had the skin left on with the belly flap included (labeled as FL). After September 5, 2003, scaleless fish were processed consistent with the SOP and EPA guidance such that the entire fish was skinned prior to filleting. The FL samples processed after September 5, 2002, were skinless, but included the belly flap, while the FS samples were skinless without the belly flap.

4. Fish were filleted according to instructions found in the Fish Tissue Sampling SOP.
5. Weights of each fillet was measured on clean aluminum foil on the digital balance and was recorded in the laboratory processing notebook and the sample processing form.
6. A new sample label was made for each fillet. Starting near the end of September, the original label was placed in a folder. Prior to that, the original label was included in the bag with one of the new fillet labels. It was thought that including both the original and fillet-specific labels in one label bag with one fillet may create undue confusion and delay at the homogenization and analysis laboratory, hence the change in label practice.
7. Each fillet was wrapped in clean aluminum foil, shiny side away from the tissue, and packaged as for the whole-body HHRA and ERA fish.

5.7.5 Sample Storing Procedures

In order to keep track of each fish caught and having the capability of quickly retrieving samples for compositing or for a possible corrective action, it was necessary to keep a detail record of each fish as described below.

- Each fish sample, after being sealed as per the Fish Tissue Sampling SOP, (was color-coded with colored duct tape according to the color scheme in Table 5-3.
- Each sample was placed in a freezer unit, and the location (freezer unit number and shelf), date, time of storage and processor were noted in the storage notebook (Figure 5-13). The data were then transferred to a spreadsheet (Table C-3, Appendix C).
- The sample storage log was entered into the laboratory computer at the end of the day, and any samples moved or shipped were updated on the electronic version.

5.7.6 Corrective Actions

Any discrepancies or problems were noted on a corrective action form, as well as the proposed and actual actions taken (forms are stored in the LWG Project Library at SEA). The information was given to the field manager who approved the action. The form was then signed by the laboratory personnel and the field manager. Problems included dropped fish (subsequently discarded); piercing the gut cavity during filleting (procedures in the Fish Tissue Sampling SOP followed); temperature non-compliance (samples were retained, but a note was made referring to the fact that FES notified the people responsible for fish compositing, so that they could consider the non-compliance issues, which may not affect tests for some of the fish); inability to remove trotline hooks from samples (subsequently discarded); unsuitability of sample due to extreme

predation (subsequently discarded); errors in reported measurements that were checked and corrected; and delay in processing/extended hold times; any freezer unit with a temperature reading out of compliance (+4 °C ± 2 °C for refrigerators or -20 °C ± 4 °C for freezers); and any discrepancies on numbers of fish in the refrigeration units (Units R1 & R2) when compared to the number of fish logged in by the field crew in the chain-of-custody logbook after field processing. Most of the corrective action forms were forwarded to Windward and Kennedy/Jenks for consideration in compositing schemes. Original and copies of all corrective action forms are stored in the LWG Project Library at SEA office in Olympia, WA.

Occasionally, a sample was mislabeled in the field or in the laboratory, and the data on the sample label needed to be updated (Table C-4, Appendix C). This may have occurred when the most up-to-date information on sample numbering was not available in the field, GPS coordinates determined that the sample was caught in a different area than assumed, or incorrect data/error on the part of the field or laboratory crew. Errors and necessary corrections were confirmed with the field manager and/or database manager to facilitate correction on all pieces of data pertaining to the sample (i.e., laboratory notebook, laboratory processing form, field notebook, data master table, label, and sample storage log). After confirmation, the sample was located, custody seal removed, and sample label removed. All errors were crossed out with a single line, and the change was then dated and initialed. The sample label was then returned to the sample bag, which was re-sealed according to the Fish Tissue Compositing and Shipping SOP (SEA et al. 2002d) and returned to the freezer. A record of the correction was kept on the re-labeling check sheet starting on September 24, 2002 (Figure 5-14). Prior to this date, records of requests for corrections were kept in a notebook, and the appropriate changes were made to the laboratory notebook, laboratory processing form and sample storage log. The laboratory crew then notified SEA of the changes.

5.7.7 Data Management

Field data was logged in and transmitted to SEA on a daily basis as follows.

- At the end of each day, data from the sample processing forms were entered into the most recent Fish Tissue Data Master Table (weight, fork length, total length, FS weight and FL weight). The updated master table was e-mailed from the laboratory account to database managers at SEA.
- All pages in the laboratory notebook were scanned into the laboratory computer and e-mailed to Windward, SEA, Kennedy/Jenks and FES for review and off-site storage.
- The storage log was entered and updated.

- Any corrective action forms were scanned and e-mailed to Windward and Kennedy/Jenks.

5.7.8 Laboratory Closing Procedures

Before leaving the laboratory each work day, several tasks were performed:

- Verified that all freezer and refrigerator units were monitored
- Verified that all freezers were re-locked
- Decontaminated all used utensils and cutting boards
- Cleaned all work surfaces
- Scanned and stored laboratory notebook pages, e-mailed data to SEA, Windward, Kennedy/Jenks and FES, and updated the sample storage log
- Signed out on sign-in sheet located near door
- Turned off all lights and locked the main door.

5.7.9 Shipping

All sample handling and equipment preparation followed the Fish Tissue Compositing and Shipping SOP (SEA et al. 2002d). These procedures included the following:

- Composite information was received from Windward or Kennedy/Jenks and added into the data master table by SEA.
- Staff and supplies were coordinated, including dry ice arrangements.
- The sample storage log was referenced by the laboratory crew to aid in finding fish samples.
- Fish from the appropriate species were pulled from the freezers and sorted into "composite", "archive", and "non-use" clean bins. Samples that were not being used were returned to the freezer. Individual tissue samples were grouped together into the appropriate composite and then double-checked by one person calling out the fish ID and the other person checking off the fish sample ID on the composite list.
- Composited samples were then bundled together into one appropriately sized bag, and a new label reflecting the composite code was created. The label was placed into a zippered plastic bag and included in the bag with the composited fish samples. The bag of composites was sealed and returned to the freezer until ready to be placed into a cooler prepared with dry ice for shipping.

- Coolers were prepared for shipping and packed; two hazardous material placards with dry ice information were attached, in addition to the placards noted in the Fish Tissue Compositing and Shipping SOP.
- Prior to November 20, 2002, coolers were taken to the FedEx office at Swan Island and shipped to the Axys laboratory in Sydney, BC. Starting on November 20, 2002, coolers were placed into the care of SEA chemistry QA manager who drove the coolers to the border, meeting with an agent from the homogenizing laboratory, to ensure and expedite delivery.
- Copies of all shipping forms were made and stored at FES and SEA.
- The sample storage log was updated to reflect the transfer of samples from the laboratory and the movement of samples for archiving.
- The laboratory was cleaned and locked after completing shipping preparation.

6.0 JUVENILE SALMONID MARK/RECAPTURE PILOT STUDY

The study of residence time of subyearling chinook salmon was originally scheduled to begin in May 2002 and continue through the peak period of downstream migration (i.e., late May through June). However, between the submission of the Section 10 fishing permit and research startup, the proposed research was required to be reviewed and approved by the EPA. EPA decided that instead of emphasizing residence time of subyearling chinook in the 2002 season, emphasis should be placed on the collection of fish for tissue analysis. The scope of the residence time study was reduced to a pilot study to evaluate the efficacy of using fluorescent elastomer tags for marking subyearlings and developing an estimate of recovery efficiency. These changes in priorities were discussed with NOAA Fisheries in May 2002.

Due to the time required for the EPA review and approval, startup of the pilot study was delayed until mid-July. By that time, water temperature in the ISA had increased to levels that were stressful to juvenile salmonids. Juvenile salmonids were captured by beach seine on July 8 and 9, 2002. Field personnel found that the stress of handling at the ambient water temperatures was too high to allow meaningful results for a tag-recovery-efficiency estimate. Therefore, sampling for these purposes was discontinued, and no information was developed in 2002 on the residence time of subyearling chinook.

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APPENDIX A: GRAB SAMPLE LOG SHEETS

APPENDIX B: SEDIMENT AND BENTHIC INFAUNA STATION SAMPLING COORDINATES

Table B-1. Sediment And Benthic Infauna Station Sampling Coordinates.

APPENDIX C: TABULATED FISH TISSUE DATA

Table C-1. Fish Tissue Data Master Table.
Table C-2. Fish Catch Coordinates.
Table C-3. Storage Log Of Fish Samples In LWG Laboratory Freezers.
Table C-4. Record Of Change On Fish Labels.

	A	B	C	D
1	Table 1-1 Index of Field Notebooks.			
2				
3	**Field Notebook Groups**			**Time Period**
4	**FES FIELD FISH PROCESSING LABORATORY NOTEBOOKS**			
5	Book 1	Fish Processing		6/25/02 to 7/27/02
6	Book 2	Fish Processing		7/29/02 to 8/7/02
7	Book 3	Fish Processing		8/8/02 to 8/10/02
8	Book 4	Fish Processing		8/13/02 to 8/27/02
9	Book 5	Fish Processing		8/27/02 to 9/17/02
10	Book 6	Fish Processing		9/18/02 to 10/1/02
11	Book 7	Fish Processing		10/1/02 to 10/8/02
12	Book 8	Fish Processing		10/8/02 to 10/22/02
13	Book 9	Fish Processing		10/23/02 to 10/31/02
14	Book 10	Fish Processing		11/1/02 to 11/27/02
15	Book 11	Fish Processing		11/28/02 to 2/28/03
16				
17	**SEA FIELD FISH SAMPLING NOTEBOOKS**			
18	Book 1	Beach Seining, Dip Netting, Boat Electrofishing		6/24/02 to 7/25/02
19	Book 2	Boat Electrofishing, Crayfish Trapping		7/25/02 to 8/7/02
20	Book 3	Boat Electrofishing, Crayfish Trapping		8/7/02 to 8/16/02
21	Book 4	Boat Electrofishing, Crayfish Trapping, Angling, Backpack E-fishing, Trot line		8/16/02 to 9/10/02
22	Book 5	Boat Electrofishing, Crayfish Trapping, Backpack E-fishing, Trot line		9/11/02 to 9/25/02
23	Book 6	Boat Electrofishing, Crayfish Trapping, Backpack E-fishing, Trot line		9/25/02 to 10/7/02
24	Book 7	Boat Electrofishing, Crayfish Trapping, Backpack E-fishing, Trot line		10/7/02 to 10/15/02
25	Book 8	Boat Electrofishing, Crayfish Trapping, Backpack E-fishing, Trot line		10/15/02 to 10/24/02
26	Book 9	Beach Seining, Boat Electrofishing, Crayfish Trapping, Angling, Backpack E-fishing, Trot line		10/24/02 to 11/1/02
27	Book 10	Beach Seining, Boat Electrofishing, Crayfish Trapping, Angling, Backpack E-fishing, Trot line		10/28/02 to 11/9/02
28	Book 11	Cray Fish Trapping, Angling, Backpack E-fishing, Trot line		11/10/2002
29				
30	**EES FIELD FISH SAMPLING NOTEBOOKS**			
31	Book 1	Boat Electrofishing, Water Quality, Crayfish Trapping		7/23/02 to 8/26/02
32	Book 2	Boat Electrofishing, Water Quality, Trot line, Crayfish Trapping		8/29/02 10/16/02
33	Book 3	Boat Electrofishing, Water Quality, Trot line, Crayfish Trapping		9/11/02 to 9/18/02
34	Book 4	Boat Electrofishing, Water Quality, Trot line		9/23/02 to 10/21/02
35	Book 5	Boat Electrofishing, Water Quality, Trot line, Crayfish Trapping		9/25/02 to 10/09/02
36	Book 6	Boat Electrofishing, Water Quality		10/14/02 to 10/25/02
37	Book 7	Boat Electrofishing, Water Quality, Trot line		10/25 to 11/08/02
38	Book 8	Boat Electrofishing, Water Quality, Trot line		10/28/02 to 11/4/02

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	A	B	C	D
1	Table 1-1 Index of Field Notebooks.			
2				
3	**Field Notebook Groups**			**Time Period**
39				
40	**AUXILIARY FIELD FISH SAMPLING NOTEBOOKS**			
41	Book 1	Crayfish Trapping, Angling, Backpack E-fishing, Trot line		10/7/02 to 11/6/02
42	Book 2	Backpack E-fishing		10/7/02 to 10/10/02
43	Book 3	Crayfish Trapping, Backpack E-fishing, Trot line		10/13/02 to 11/8/02
44	Book 4	Angling, Backpack E-fishing, Gut Content		10/14/02 to 11/8//02
45	Book 5	Crayfish Trapping, Trot line		10/15/02 to 10/25/02
46	Book 6	Trot line		10/21/02 to 11/11/02
47	Book 7	Beach Seining, Trot line		10/21/02 to 11/08/02
48	Book 8	Beach Seining		10/17/2002
49				
50	**SEA FIELD SEDIMENT SAMPLING NOTEBOOKS**			
51	Book 1	Lamprey/Benthos and Colocated Sediments Recon		9/16/02 to 9/23/02
52	Book 2	Notes on Stations to Have Colocated Sediments Collected		10/15/2002
53	Book 3	Beach Sediments Composites (book 1 of 4)		10/10/02 to 10/14/02
54	Book 4	Beach Sediments Composites and Co-Located Sediment Sampling (book 2 of 4)		10/14/02 to 10/02/18
55	Book 5	Co-Located Sediment Sampling (book 3 of 4)		10/22/02 to 10/25/02
56	Book 6	Channel Sediment Sampling (book 4 of 4)		10/28/02 to 11/12/02
57				
58	Legend:			
59	FES = Fishman Environmental Services; SEA = Striplin Environmental Associates; EES = Ellis Environmental Associates			

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	A	B	C
1	Table 2-1. Chronology of Field Operations.		
2			
3	**Date**	**Site**	**Activity**
4	24-Jun	Lower Willamette	Beach Seining, Dip Netting, Boat Electrofishing
5	25-Jun	Lower Willamette	Beach Seining, Dip Netting, Boat Electrofishing
6	27-Jun	Lower Willamette	Beach Seining, Dip Netting, Boat Electrofishing
7	22-Jul	Lower Willamette	Boat Electrofishing, Crayfish Trapping
8	23-Jul	Lower Willamette	Boat Electrofishing, Crayfish Trapping
9	24-Jul	Lower Willamette	Boat Electrofishing, Crayfish Trapping
10	25-Jul	Lower Willamette	Boat Electrofishing, Crayfish Trapping
11	26-Jul	Lower Willamette	Boat Electrofishing, Crayfish Trapping
12	27-Jul	Lower Willamette	Boat Electrofishing, Crayfish Trapping
13	28-Jul	Lower Willamette	Boat Electrofishing, Crayfish Trapping
14	29-Jul	Lower Willamette	Boat Electrofishing, Crayfish Trapping
15	30-Jul	Lower Willamette	Boat Electrofishing, Crayfish Trapping
16	31-Jul	Lower Willamette	Boat Electrofishing, Crayfish Trapping
17	1-Aug	Lower Willamette	Boat Electrofishing, Crayfish Trapping
18	5-Aug	Lower Willamette	Boat Electrofishing, Crayfish Trapping
19	6-Aug	Lower Willamette	Boat Electrofishing, Crayfish Trapping
20	7-Aug	Lower Willamette	Boat Electrofishing, Crayfish Trapping
21	8-Aug	Lower Willamette	Boat Electrofishing, Crayfish Trapping
22	9-Aug	Lower Willamette	Boat Electrofishing, Crayfish Trapping
23	12-Aug	Lower Willamette	Boat Electrofishing, Crayfish Trapping
24	13-Aug	Lower Willamette	Boat Electrofishing, Crayfish Trapping
25	14-Aug	Lower Willamette	Boat Electrofishing, Crayfish Trapping
26	15-Aug	Lower Willamette	Boat Electrofishing, Crayfish Trapping
27	16-Aug	Lower Willamette	Boat Electrofishing, Crayfish Trapping
28	26-Aug	Lower Willamette	Boat Electrofishing
29	27-Aug	Lower Willamette	Boat Electrofishing, Crayfish Trapping
30	28-Aug	Lower Willamette	Boat Electrofishing, Crayfish Trapping, Angling
31	29-Aug	Lower Willamette	Boat Electrofishing, Crayfish Trapping, Backpack E-fishing
32	30-Aug	Lower Willamette	Boat Electrofishing, Crayfish Trapping, Backpack E-fishing
33	3-Sep	Lower Willamette	Boat Electrofishing, Backpack E-fishing
34	4-Sep	Lower Willamette	Crayfish Trapping, Angling
35	5-Sep	Lower Willamette	Crayfish Trapping, Trot line
36	9-Sep	Lower Willamette	Boat Electrofishing
37	10-Sep	Lower Willamette	Boat Electrofishing, Crayfish Trapping
38	11-Sep	Lower Willamette	Boat Electrofishing, Crayfish Trapping, Trot line
39	12-Sep	Lower Willamette	Boat Electrofishing, Crayfish Trapping, Backpack E-fishing
40	13-Sep	Lower Willamette	Boat Electrofishing, Crayfish Trapping

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	A	B	C
1	Table 2-1. Chronology of Field Operations.		
2			
3	**Date**	**Site**	**Activity**
41	16-Sep	Lower Willamette	Boat Electrofishing, Crayfish Trapping, Backpack E-fishing, Trot line
42	17-Sep	Lower Willamette	Boat Electrofishing, Crayfish Trapping, Backpack E-fishing, Trot line
43	18-Sep	Lower Willamette	Boat Electrofishing, Crayfish Trapping, Backpack E-fishing, Trot line
44	19-Sep	Lower Willamette	Boat Electrofishing, Crayfish Trapping, Angling
45	20-Sep	Lower Willamette	Crayfish Trapping, Angling, Trot line
46	23-Sep	Lower Willamette	Boat Electrofishing, Crayfish Trapping, Trot line
47	24-Sep	Lower Willamette	Boat Electrofishing, Crayfish Trapping, Backpack E-fishing, Trot line
48	25-Sep	Lower Willamette	Crayfish Trapping, Backpack E-fishing, Trot line
49	26-Sep	Lower Willamette	Boat Electrofishing, Crayfish Trapping, Backpack E-fishing, Trot line
50	27-Sep	Lower Willamette	Boat Electrofishing, Crayfish Trapping, Backpack E-fishing, Trot line
51	30-Sep	Lower Willamette	Crayfish Trapping, Backpack E-fishing, Trot line
52	1-Oct	Lower Willamette	Boat Electrofishing, Crayfish Trapping, Backpack E-fishing, Trot line
53	2-Oct	Lower Willamette	Boat Electrofishing, Crayfish Trapping, Backpack E-fishing, Trot line
54	3-Oct	Lower Willamette	Boat Electrofishing, Crayfish Trapping, Backpack E-fishing, Trot line
55	4-Oct	Lower Willamette	Boat Electrofishing, Crayfish Trapping, Backpack E-fishing, Trot line
56	7-Oct	Lower Willamette	Boat Electrofishing, Crayfish Trapping, Backpack E-fishing, Trot line
57	8-Oct	Lower Willamette	Boat Electrofishing, Crayfish Trapping, Backpack E-fishing, Trot line
58	9-Oct	Lower Willamette	Boat Electrofishing, Crayfish Trapping, Backpack E-fishing, Trot line, Beach sediment collection
59	10-Oct	Lower Willamette	Boat Electrofishing, Crayfish Trapping, Angling, Backpack E-fishing, Trot line, Beach sediment collection
60	11-Oct	Lower Willamette	Boat Electrofishing, Crayfish Trapping, Angling, Backpack E-fishing, Trot line, Beach sediment collection
61	13-Oct	Lower Willamette	Crayfish Trapping
62	14-Oct	Lower Willamette	Boat Electrofishing, Crayfish Trapping, Backpack E-fishing, Trot line, Beach sediment collection
63	15-Oct	Lower Willamette	Boat Electrofishing, Crayfish Trapping, Backpack E-fishing, Trot line
64	16-Oct	Lower Willamette	Boat Electrofishing, Crayfish Trapping, Backpack E-fishing, Trot line, Co-located seciment collection
65	17-Oct	Lower Willamette	Boat Electrofishing, Crayfish Trapping, Backpack E-fishing, Trot line, Co-located seciment collection
66	18-Oct	Lower Willamette	Boat Electrofishing, Crayfish Trapping, Backpack E-fishing, Trot line, Co-located seciment collection
67	21-Oct	Lower Willamette	Beach Seining, Boat Electrofishing, Crayfish Trapping, Backpack E-fishing, Trot line
68	22-Oct	Lower Willamette	Boat Electrofishing, Crayfish Trapping, Backpack E-fishing, Trot line, Co-located seciment collection, Benthos

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	A	B	C
1	Table 2-1. Chronology of Field Operations.		
2			
3	**Date**	**Site**	**Activity**
69	23-Oct	Lower Willamette	Boat Electrofishing, Crayfish Trapping, Backpack E-fishing, Trot line, Co-located seciment collection, Benthos
70	24-Oct	Lower Willamette	Boat Electrofishing, Crayfish Trapping, Backpack E-fishing, Trot line, Co-located seciment collection, Benthos, Clam tissue collection
71	25-Oct	Lower Willamette	Boat Electrofishing, Crayfish Trapping, Backpack E-fishing, Trot line, Co-located seciment collection, Channel Benthos
72	28-Oct	Lower Willamette	Beach seining, Boat Electrofishing, Crayfish Trapping, Angling, Backpack E-fishing, Trot line, Channel sediment collection
73	29-Oct	Lower Willamette	Beach seining, Boat Electrofishing, Crayfish Trapping, Angling, Backpack E-fishing, Trot line, Channel sediment, Clam tissue collection
74	30-Oct	Lower Willamette	Beach seining, Boat Electrofishing, Crayfish Trapping, Angling, Backpack E-fishing, Trot line, Clam tissue collection
75	31-Oct	Lower Willamette	Beach seining, Boat Electrofishing, Angling, Backpack E-fishing, Trot line
76	1-Nov	Lower Willamette	Boat Electrofishing, Crayfish Trapping, Angling, Backpack E-fishing, Trot line
77	4-Nov	Lower Willamette	Boat Electrofishing, Angling, Clam tissue collection
78	5-Nov	Lower Willamette	Boat Electrofishing, Crayfish Trapping, Angling, Backpack E-fishing, Trot line, Clam tissue collection
79	6-Nov	Lower Willamette	Boat Electrofishing, Crayfish Trapping, Trot line
80	7-Nov	Lower Willamette	Boat Electrofishing, Angling, Backpack E-fishing, Trot line
81	8-Nov	Lower Willamette	Boat Electrofishing, Crayfish Trapping, Angling, Trot line
82	9-Nov	Lower Willamette	Crayfish Trapping, Angling, Trot line
83	10-Nov	Lower Willamette	Crayfish Trapping, Trot line
84	12-Nov	Lower Willamette	Co-located sediment, clam tissue collection

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Table 3-2. Summary Of Sample Types Composited For Round 1 Sediment, Benthic Infauna, and Clam Tissue Collection, 2002.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
2	Species[a]	Whole Body or Depth[b]	Station	Matrix	Type	Conventionals[1,2]	Metals[3,4]	PCB-Ar[5]	Pesticides[6]	SVOC[7]	PCB-cong[8]	Dioxins/Furans	TBT	Homogenization	Composite Sample ID	Notes
3	CA	WB	03R004	TS	ERA	■	■	■	■	□	□	□		■	LWG0103R004TSCAWBC00	27g
4	CA	WB	06R002	TS	ERA	■	■	■	■	□				■	LWG0106R002TSCAWBC00	
5	CA	WB	07R003	TS	ERA	■	■	■	■	□				■	LWG0107R003TSCAWBC00	Hold
6	CA	WB	07R006	TS	ERA	■	■	■	■	□				■	LWG0107R006TSCAWBC00	
7	S	015	EBBSD	SD	BEACH	■	■	■	■	■					EBBSD	
8	S	015	EBCLSD1	SD	COLOC	■	■	■	■	■	■	■			EBCLSD1	
9	S	015	EBCLSD2	SD	COLOC	■	■	■	■	■	■	■			EBCLSD2	
10	S	015	02R001	BN	BENTH										LWG0102R001BNS015S00	
11	S	015	02R001	SD	COLOC	■	■	■	■	■	■	■			LWG0102R001SDS015C00	
12	S	015	02R015	SD	COLOC	■	■	■	■	■					LWG0102R015SDS015C00	
13	S	015	03B030	SD	BEACH	■	■	■	■	■					LWG0103B030SDS015C00	
14	S	015	03B031	SD	BEACH	■	■	■	■	■					LWG0103B031SDS015C00	
15	S	015	03B033	SD	BEACH	■	■	■	■	■					LWG0103B033SDS015C00	
16	S	015	03R001	SD	COLOC	■	■	■	■	■					LWG0103R001SDS015C00	
17	S	015	03R002	SD	COLOC	■	■	■	■	■					LWG0103R002SDS015C00	
18	S	015	03R003	SD	COLOC	■	■	■	■	■	■	■			LWG0103R003SDS015C10	
19	S	015	03R003	SD	COLOC	■	■	■	■	■	□	□			LWG0103R003SDS015C20	
20	S	015	03R003	SD	COLOC	■	■	■	■	■	□	□			LWG0103R003SDS015C31	
21	S	015	03R003	SD	COLOC	■	■	■	■	■	□	□			LWG0103R003SDS015C32	
22	S	015	03R004	SD	COLOC	■	■	■	■	■	■	■	■		LWG0103R004SDS015C11	
23	S	015	03R004	SD	COLOC	■	■	■	■	■	□	□	■		LWG0103R004SDS015C12	
24	S	015	03R004	SD	COLOC	■	■	■	■	■	□	□	■		LWG0103R004SDS015C20	
25	S	015	03R004	SD	COLOC	■	■	■	■	■	□	□	■		LWG0103R004SDS015C30	
26	S	015	03R005	BN	BENTH										LWG0103R005BNS015S10	
27	S	015	03R005	BN	BENTH										LWG0103R005BNS015S20	
28	S	015	03R005	SD	COLOC	■	■	■	■	■	■	■	■		LWG0103R005SDS015C00	

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Table 3-2. Summary Of Sample Types Composited For Round 1 Sediment, Benthic Infauna, and Clam Tissue Collection, 2002.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
2	Species[a]	Whole Body or Depth[b]	Station	Matrix	Type	Conventionals[1,2]	Metals[3,4]	PCB-Ar[5]	Pesticides[6]	SVOC[7]	PCB-cong[8]	Dioxins/Furans	TBT	Homogenization	Composite Sample ID	Notes
29	S	015	03R032	SD	COLOC	■	■	■	■	■					LWG0103R032SDS015C00	
30	S	015	03R034	SD	COLOC	■	■	■	■	■	□	□			LWG0103R034SDS015C00	
31	S	015	03R040	BN	BENTH										LWG0103R040BNS015S00	
32	S	015	03R040	SD	SED	■	■	■	■	■					LWG0103R040SDS015C00	
33	S	015	03R041	BN	BENTH										LWG0103R041BNS015S00	
34	S	015	03R041	SD	SED	■	■	■	■	■					LWG0103R041SDS015C00	
35	S	015	04B023	SD	BEACH	■	■	■	■	■					LWG0104B023SDS015C00	
36	S	015	04B024	SD	BEACH	■	■	■	■	■					LWG0104B024SDS015C00	
37	S	015	04R002	SD	COLOC	■	■	■	■	■					LWG0104R002SDS015C00	
38	S	015	04R003	BN	BENTH										LWG0104R003BNS015S00	
39	S	015	04R003	SD	COLOC	■	■	■	■	■					LWG0104R003SDS015C00	
40	S	015	04R004	BN	BENTH										LWG0104R004BNS015S10	
41	S	015	04R004	BN	BENTH										LWG0104R004BNS015S20	
42	S	015	04R004	SD	COLOC	■	■	■	■	■					LWG0104R004SDS015C00	
43	S	015	05B018	SD	BEACH	■	■	■	■	■					LWG0105B018SDS015C00	
44	S	015	05B019	SD	BEACH	■	■	■	■	■					LWG0105B019SDS015C00	
45	S	015	05R001	SD	COLOC	■	■	■	■	■					LWG0105R001SDS015C00	
46	S	015	05R003	BN	BENTH										LWG0105R003BNS015S00	
47	S	015	05R003	SD	COLOC	■	■	■	■	■					LWG0105R003SDS015C00	
48	S	015	05R020	SD	COLOC	■	■	■	■	■					LWG0105R020SDS015C00	
49	S	015	05R040	BN	BENTH										LWG0105R040BNS015S00	
50	S	015	05R040	SD	SED	■	■	■	■	■					LWG0105R040SDS015C00	
51	S	015	05R041	BN	BENTH										LWG0105R041BNS015S00	
52	S	015	05R041	SD	SED	■	■	■	■	■					LWG0105R041SDS015C00	
53	S	015	06B022	SD	BEACH	■	■	■	■	■					LWG0106B022SDS015C00	
54	S	015	06B025	SD	BEACH	■	■	■	■	■					LWG0106B025SDS015C00	

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Table 3-2. Summary Of Sample Types Composited For Round 1 Sediment, Benthic Infauna, and Clam Tissue Collection, 2002.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
2	Species[a]	Whole Body or Depth[b]	Station	Matrix	Type	Conventionals[1,2]	Metals[3,4]	PCB-Ar[5]	Pesticides[6]	SVOC[7]	PCB-cong[8]	Dioxins/Furans	TBT	Homogenization	Composite Sample ID	Notes
55	S	015	06B026	SD	BEACH	■	■	■	■	■					LWG0106B026SDS015C00	
56	S	015	06B029	SD	BEACH	■	■	■	■	■					LWG0106B029SDS015C00	
57	S	015	06B030	SD	BEACH	■	■	■	■	■					LWG0106B030SDS015C00	
58	S	015	06R001	BN	BENTH										LWG0106R001BNS015S00	
59	S	015	06R001	SD	COLOC	■	■	■	■	■					LWG0106R001SDS015C00	
60	S	015	06R002	BN	BENTH										LWG0106R002BNS015S00	
61	S	015	06R002	SD	COLOC	■	■	■	■	■	■	■	■		LWG0106R002SDS015C10	
62	S	015	06R002	SD	COLOC	■	■	■	■	■	■	■	■		LWG0106R002SDS015C20	
63	S	015	06R002	SD	COLOC	■	■	■	■	■	■	■	■		LWG0106R002SDS015C31	
64	S	015	06R002	SD	COLOC	■	■	■	■	■	■	■	■		LWG0106R002SDS015C32	
65	S	015	06R004	SD	COLOC	■	■	■	■	■	■	■	■		LWG0106R004SDS015C00	
66	S	015	06R031	SD	COLOC	■	■	■	■	■					LWG0106R031SDS015C00	
67	S	015	06R040	BN	BENTH										LWG0106R040BNS015S00	
68	S	015	06R040	SD	SED	■	■	■	■	■					LWG0106R040SDS015C00	
69	S	015	07B022	SD	BEACH	■	■	■	■	■					LWG0107B022SDS015C00	
70	S	015	07B023	SD	BEACH	■	■	■	■	■					LWG0107B023SDS015C00	
71	S	015	07B024	SD	BEACH	■	■	■	■	■					LWG0107B024SDS015C00	
72	S	015	07R003	BN	BENTH										LWG0107R003BNS015S00	
73	S	015	07R003	SD	COLOC	■	■	■	■	■			■		LWG0107R003SDS015C00	
74	S	015	07R004	SD	COLOC	■	■	■	■	■					LWG0107R004SDS015C00	
75	S	015	07R006	SD	COLOC	■	■	■	■	■	■	■	■		LWG0107R006SDS015C00	
76	S	015	07R030	SD	SED	■	■	■	■	■					LWG0107R030SDS015C00	
77	S	015	07R040	BN	BENTH										LWG0107R040BNS015S00	
78	S	015	07R040	SD	SED	■	■	■	■	■					LWG0107R040SDS015C00	
79	S	015	08B032	SD	BEACH	■	■	■	■	■					LWG0108B032SDS015C00	
80	S	015	08R001	BN	BENTH										LWG0108R001BNS015S00	

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Table 3-2. Summary Of Sample Types Composited For Round 1 Sediment, Benthic Infauna, and Clam Tissue Collection, 2002.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
2	Species[a]	Whole Body or Depth[b]	Station	Matrix	Type	Conventionals[1,2]	Metals[3,4]	PCB-Ar[5]	Pesticides[6]	SVOC[7]	PCB-cong[8]	Dioxins/Furans	TBT	Homogenization	Composite Sample ID	Notes
81	S	015	08R001	SD	COLOC	■	■	■	■	■					LWG0108R001SDS015C00	
82	S	015	08R002	SD	COLOC	■	■	■	■	■					LWG0108R002SDS015C00	
83	S	015	08R003	BN	BENTH										LWG0108R003BNS015S00	
84	S	015	08R003	SD	COLOC	■	■	■	■	■	■	■			LWG0108R003SDS015C00	
85	S	015	08R040	BN	BENTH										LWG0108R040BNS015S00	
86	S	015	08R040	SD	SED	■	■	■	■	■					LWG0108R040SDS015C00	
87	S	015	08R041	BN	BENTH										LWG0108R041BNS015S00	
88	S	015	08R041	SD	SED	■	■	■	■	■					LWG0108R041SDS015C00	
89	S	015	09B024	SD	BEACH	■	■	■	■	■					LWG0109B024SDS015C00	
90	S	015	09B026	SD	BEACH	■	■	■	■	■					LWG0109B026SDS015C00	
91	S	015	09B027	SD	BEACH	■	■	■	■	■					LWG0109B027SDS015C10	
92	S	015	09B027	SD	BEACH	■	■	■	■	■					LWG0109B027SDS015C20	
93	S	015	09B027	SD	BEACH	■	■	■	■	■					LWG0109B027SDS015C31	
94	S	015	09B027	SD	BEACH	■	■	■	■	■					LWG0109B027SDS015C32	
95	S	015	09B028	SD	BEACH	■	■	■	■	■					LWG0109B028SDS015C00	
96	S	015	09R001	BN	BENTH										LWG0109R001BNS015S00	
97	S	015	09R001	SD	COLOC	■	■	■	■	■					LWG0109R001SDS015C10	
98	S	015	09R001	SD	COLOC	■	■	■	■	■					LWG0109R001SDS015C20	
99	S	015	09R001	SD	COLOC	■	■	■	■	■					LWG0109R001SDS015C31	
100	S	015	09R001	SD	COLOC	■	■	■	■	■					LWG0109R001SDS015C32	
101	S	015	09R002	BN	BENTH										LWG0109R002BNS015S00	
102	S	015	09R002	SD	COLOC	■	■	■	■	■	■	■			LWG0109R002SDS015C00	
103	S	015	09R040	BN	BENTH										LWG0109R040BNS015S00	
104	S	015	09R040	SD	SED	■	■	■	■	■					LWG0109R040SDS015C00	
105	S	015	09R041	BN	BENTII										LWG0109R041BNS015S00	
106	S	015	09R041	SD	SED	■	■	■	■	■					LWG0109R041SDS015C00	

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Table 3-2. Summary Of Sample Types Composited For Round 1 Sediment, Benthic Infauna, and Clam Tissue Collection, 2002.

Species[a]	Whole Body or Depth[b]	Station	Matrix	Type	Conventionals[1,2]	Metals[3,4]	PCB-Ar[5]	Pesticides[6]	SVOC[7]	PCB-cong[8]	Dioxins/Furans	TBT	Homogenization	Composite Sample ID	Notes

□ = Analysis not yet approved

[a] = CA-Clam is an ERA Species

[b] = In the case of sediment this designates the surface/subsurface depth in cm

[1] = Conventionals in Sediment contain: Total Solids, Grain Size, and Total Organic Carbon

[2] = Conventionals in Tissue contain: Total Solids and Lipids

[3] = Metals for sediment contain: Ag, Al, As, Cd, Cr, Cu, Ni, Pb, Sb, Se, Zn, and Hg

[4] = Metals for tissue contain: Ag, Al, As, Cd, Cr, Cu, Mn, Ni, Pb, Sb, Se, Tl, Zn, and Hg

[5] = PCB-Ar sediment and tissue contain: 1016, 1221, 1232, 1242, 1248, 1254, and 1260

[6] = Lipids are extracted and run with the Pesticides

[7] = Sediment and tissue full scan and SIMs. LVI may be used to achieve project limits.

[8] = BZ077, BZ105, BZ114, BZ118, BZ123, BZ126, BZ156, BZ157, BZ167, BZ169, BZ170, BZ180, and BZ189

Ar = Arochlors
BENTH = Benthic Infauna
BN = Benthic Taxonomy
BSD = Beach Sediment
BTS = Benthic Tissue
CA = Clam
COLOC = Co-located sediment with sculpin and crayfish
Cong = Congeners
EB = Equipment Blank (Rinsates)
EBBSD = Equipment Blank (Rinsates) for Beach Sediment
EBCLSD =Equipment Blank (Rinsates) for Co-located Sediment
TBT = Tributyltin
SVOC = Semivolatile Organic Compounds

ANC02089
BZTO104(e)002089

Cell: P2
Comment: Brooks Smith:
Table Update 2/21
Based on Laura Jones Comments.

ANC02090
BZTO104(e)002090

	A	B	C
1	Table 3-1. Field Operation Schedule For Round 1 Sediment, Benthic infauna, and Clam Tissue Collection, 2002.		
2			
3	**Date**	**Site**	**Activity**
4	October 10	Lower Willamette	Beach sediment collection
5	October 11	Lower Willamette	Beach sediment collection
6	October 14	Lower Willamette	Beach sediment collection
7	October 15	SEA Office, Olympia	Meeting of sampling team to discuss co-located sampling location, strategy
8	October 16	Lower Willamette	Co-located seciment collection
9	October 17	Lower Willamette	Co-located seciment collection
10	October 18	Lower Willamette	Co-located seciment collection
11	October 22	Lower Willamette	Co-located seciment collection, benthos
12	October 23	Lower Willamette	Co-located seciment collection, benthos
13	October 24	Lower Willamette	Co-located seciment collection, benthos, clam tissue collection
14	October 25	Lower Willamette	Channel benthos
15	October 28	Lower Willamette	Channel sediment
16	October 29	Lower Willamette	Channel sediment, clam tissue collection
17	October 30	Lower Willamette	Clam tissue collection
18	November 4	Lower Willamette	Clam tissue collection
19	Novermber 5	Lower Willamette	Clam tissue collection
20	Novermber 12	Lower Willamette	Co-located sediment, clam tissue collection

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	A	B	C	D	E	F	G
1	Table 3-3. Summary of Collection Effort for the Clam *Corbicula fluminea.*						
2							
3	Station	Approximate Total Tissue Weight Collected (g)	Sampling Date	Number of Grabs	Total Grabs per Station	Length of Sampling Time (hours)	Total Length of Time Sampling per Station (hours)
4	06R002		10/24/2002	28		1	
5			10/29/2002	40		1.5	
6			10/30/2002	81		2.5	
7		260	11/4/2002	70	219	3	8
8							
9	07R003		10/29/2002	91		2.5	
10			10/30/2002	35		1	
11			11/4/2002	15		1	
12		53	11/5/2002	22	163	1	5.5
13							
14	03R004	27	10/30/2002	71	71	1.5	1.5
15							
16	07R006	160	11/12/2002	54	54	2	2
17							
18	07R030*		10/30/2002	-	-	2	
19			11/4/2002	-	-	1	
20		14.5	11/5/2002	-	-	3	6
21	* Station 07R030 was sampled by walking the beach, see text.						

ANC02092
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Table 5-1 Station by Station Fishing Effort and Catch.

Station	Activity	Days	Units Set	Seconds	Hours	Total # fish	BB	BC	CP	CR	LA	LS	NP	PM	SB	SC	SP	WE	YB
02R001	EF	1	1	1575	0.44	25											25		
	CT	6	6			8				8									
	TL	2	3			0													
	Total	10		1575	0.44	33				8							25		
02R015	EB	9	10	7771	2.16	25											25		
	CT	9	9			13				13									
	TL	1	1			0													
	Total	13		7771	2.16	38				13							25		
02R102	BS	3	9			15										15			
	Total	3				15										15			
02R112	BS	1	5			14										14			
	Total	1				14										14			
02R113	BS	3	5			15										15			
	Total	3				15										15			
03R001	EF	3	6	5829	1.62	16											16		
	EB	4	4	5603	1.56	13											13		
	Total	7		11432	3.18	29											29		
03R002	EF	5	11	3971	1.10	22											22		
	EB	9	10	12068	3.35	59											59		
	TL	1	1			2											2		
	Total	15		16039	4.46	83											83		
03R003	EF	3	4	2079	0.58	5											5		
	EB	3	3	1419	0.39	0													
	CT	5	5			27				27									
	TL	1	1			0													
	Total	12		3498	0.97	32				27							5		
03R004	EF	2	3	1767	0.49	17											17		
	EB	6	7	7567	2.10	44				1							43		
	AG	1				0													
	CT	16	17			15				15									
	TL	3	3			0													
	Total	28		9334	2.59	76				16							60		
03R005	EF	4	5	3802	1.06	0													
	EB	4	4	1237	0.34	0													
	AG	1	2			0													

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Table 5-1 Station by Station Fishing Effort and Catch.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
3	**Station**	**Activity**	**Days**	**Units Set**	**Seconds**	**Hours**	**Total # fish**	**BB**	**BC**	**CP**	**CR**	**LA**	**LS**	**NP**	**PM**	**SB**	**SC**	**SP**	**WE**	**YB**
48		CT	10	12			9				9									
49		TL	16	30			17											17		
50		Total	35		5039	1.40	26				9							17		
51																				
52	03R008	CT	9	9			17				17									
53		Total	9				17				17									
54																				
55	03R009	CT	8	9			21				21									
56		Total	8				21				21									
57																				
58	03R014	EF	3	13	6210	1.73	37						10	13		14				
59		BS	4	42			5								5					
60		Total	7		6210	1.73	42						10	13	5	14				
61																				
62	03R032	EB	12	12	11741	3.26	40											40		
63		CT	1	1			19				19									
64		Total	13		11741	3.26	59				19							40		
65																				
66	03R034	EF	1	1	1878	0.52	16											16		
67		EB	1	1	383	3.26	12											12		
68		Total	2		2261	3.78	28											28		
69																				
70	03R118	BS	1	2			11										11			
71		Total	1				11										11			
72	03R125	BS	1	1			13										13			
73		Total	1				13										13			
74																				
75																				
76	04R002	EF	1	2	1300	0.36	0													
77		EB	8	8	5617	1.56	23											23		
78		CT	8	9			18				18									
79		TL	2	2			0													
80		Total	19		6917	1.92	41				18							23		
81																				
82																				
83	04R003	EF	2	3	5154	1.43	22											22		
84		EB	13	13	9461	2.63	23											23		
85		CT	4	4			8				8									
86		TL	5	6			3											3		
87		Total	24		14615	4.06	56				8							48		
88																				
89																				
90	04R004	EF	5	6	4764	1.32	10					1						9		
91		EB	15	15	12007	3.34	11				1							10		

ANC02094
BZTO104(e)002094

Table 5-1 Station by Station Fishing Effort and Catch.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
3	**Station**	**Activity**	**Days**	**Units Set**	**Seconds**	**Hours**	**Total # fish**	**BB**	**BC**	**CP**	**CR**	**LA**	**LS**	**NP**	**PM**	**SB**	**SC**	**SP**	**WE**	**YB**
92		CT	11	11			20				20									
93		TL	1	1			7											7		
94		Total	32		16771	4.66	48				21	1						26		
95																				
96																				
97	04R023	EF	11	85	51670	14.35	17							1		16				
98		AG	3	3			0													
99		TL	3	5			1								1					
100		Total	17		51670	14.35	18							1	1	16				
101																				
102																				
103																				
104	04R126	BS	1	1			12										12			
105		Total	1				12										12			
106	05R001	EF	1	2	1735	0.48	22											22		
107		EB	1	1	179	0.05	2											2		
108		CT	6	6			16				16									
109		Total	8		1914	0.53	40				16							24		
110																				
111																				
112	05R003	CT	4	7			9				9									
113		Total	4				9				9									
114																				
115																				
116	05R006	EF	17	66	56606	15.72	26						7	4	5	10				
117		BS	3	6			0													
118		TL	1	1			2							1	1					
119		Total	21		56606	15.72	28						7	5	6	10				
120																				
121																				
122	05R020	EF	1	2	2800	0.78	21											21		
123		EB	10	10	8119	2.26	37											37		
124		Total	11		10919	3.03	58											58		
125																				
126																				
127	06R001	EF	2	4	2774	0.77	11											11		
128		EB	9	11	2706	0.75	10											10		
129		CT	17	20			14				14									
130		TL	1	1			1											1		
131		Total	29		5480	1.52	36				14							22		
132																				
133																				
134	06R002	EF	2	3	3070	0.85	21											21		
135		EB			4514	1.25	30											30		

ANC02095
BZTO104(e)002095

Table 5-1 Station by Station Fishing Effort and Catch.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
3	**Station**	**Activity**	**Days**	**Units Set**	**Seconds**	**Hours**	**Total # fish**	**BB**	**BC**	**CP**	**CR**	**LA**	**LS**	**NP**	**PM**	**SB**	**SC**	**SP**	**WE**	**YB**
136		CT	3	5			29				29									
137		Total	5		7584	2.11	80				29							51		
138																				
139																				
140	06R004	EB	4	4	2739	0.76	25											25		
141		CT	6	6			26				26									
142		Total	10		2739	0.76	51				26							25		
143																				
144																				
145	06R024	EF	8	44	24031	6.68	5							1		4				
146		AG	1	1			0													
147		TL	1	1			1							1						
148		Total	10		24031	6.68	6							2		4				
149																				
150																				
151	07R001	EF	2	2	1480	0.41	2											2		
152		Total	2		1480	0.41	2											2		
153																				
154																				
155	07R002	EF	5	6	6500	1.81	24					2						22		
156		CT	1	1			1											1		
157		TL	3	3			0													
158		Total	9		6500	1.81	25					2						23		
159																				
160																				
161	07R003	EF	2	3	1677	0.47	8											8		
162		EB	11	11	9402	2.61	5											5		
163		CT	6	7			9				9									
164		TL	2	4			6											6		
165		Total	21		11079	3.08	28				9							19		
166																				
167																				
168	07R004	CT	8	9			9				9									
169		Total	8				9				9									
170																				
171																				
172																				
173																				
174	07R006	EF	1	1	8718	2.42	0													
175		EB	1	1	1776	0.49	1											1		
176		CT	3	3			14				12							2		
177		TL	3	4			12											12		
178		Total	8		10494	2.92	27				12							15		
179																				

ANC02096
BZTO104(e)002096

Table 5-1 Station by Station Fishing Effort and Catch.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
3	**Station**	**Activity**	**Days**	**Units Set**	**Seconds**	**Hours**	**Total # fish**	**BB**	**BC**	**CP**	**CR**	**LA**	**LS**	**NP**	**PM**	**SB**	**SC**	**SP**	**WE**	**YB**
180																				
181	07R009	EF	8	19	21580	5.99	28						7	3	3	15				
182		BS	4	19			0													
183		TL	2	2			4							3	1					
184		Total	14		21580	5.99	32						7	6	4	15				
185																				
186																				
187	08R001	EF	3	5	4646	1.29	25											25		
188		EB	5	6	4260	1.18	31				2							29		
189		CT	17	24			15				15									
190		TL	1	1			0													
191		Total	26		8906	2.47	71				17							54		
192																				
193																				
194	08R002	EF	1	3	2783	0.77	14											14		
195		EB	5	5	6968	1.94	27											27		
196		CT	17	18			21				21									
197		TL	1	1			0													
198		Total	24		9751	2.71	62				21							41		
199																				
200																				
201	08R003	EF	2	4	3476	0.97	24											24		
202		EB	3	15	12567	3.49	16				4							12		
203		CT	21	23			29				29									
204		TL	8	8			11											11		
205		Total	34		16043	4.46	80				33							47		
206																				
207																				
208	08R010	EF	27	145	83485	23.19	30						7	3	6	14				
209		BS	3	7			0													
210		AG	4	5			0													
211		TL	5	10			1								1					
212		Total	39		83485	23.19	31						7	3	7	14				
213																				
214																				
215	08R032	EF	2	4	4867	1.35	10									10				
216		AG	1	1			0													
217		TL	1	1			1							1						
218		Total	4		4867	1.35	11							1		10				
219																				
220																				
221	09R001	EF	4	5	5520	1.53	10											10		
222		EB	9	11	11943	3.32	32				1							31		
223		CT	9	9			25				25									

ANC02097
BZTO104(e)002097

Table 5-1 Station by Station Fishing Effort and Catch.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
3	**Station**	**Activity**	**Days**	**Units Set**	**Seconds**	**Hours**	**Total # fish**	**BB**	**BC**	**CP**	**CR**	**LA**	**LS**	**NP**	**PM**	**SB**	**SC**	**SP**	**WE**	**YB**
224		TL	2	2			2											2		
225		Total	24		17463	4.85	69				26							43		
226																				
227																				
228	09R002	EF	1	1	1935	0.54	21											21		
229		EB	1	1	600	0.17	7											7		
230		CT	2	2			0													
231		Total	4		2535	0.70	28											28		
232																				
233																				
234	09R003	CT	12	12			22				22									
235		TL	3	3			1				1									
236		Total	15				23				23									
237																				
238																				
239	09R006	EF	11	64	33923	9.42	32						18	1	7	6				
240		TL	3	5			4							3		1				
241		Total	14		33923	9.42	36						18	4	7	7				
242	20R001	EF	15	312	154596	42.94	62			17			30	1		14				
243		TL	7	33			18	12		1				3		2				
244		Total	22		154596	42.94	80	12		18			30	4		16				
245																				
246																				
247	26R111	DN	1	1			12										12			
248		Total	1				12										12			
249																				
250	28R001	EB	1	1	378	0.11	0													
251		BS	1	6			0													
252		TL	12	118			70	8					13	23		17				9
253		Total	14		378	0.11	70	8					13	23		17				9
254																				
255	FZ0306	EF	5	12	14532	4.04	85	3	2	32			45						2	1
256		AG	4	21			13		13											
257		CT	1	1			1													1
258		TL	22	56			42	27	8											7
259		Total	32		14532	4.04	141	30	23	32			45						2	9
260																				
261																				
262	FZ0609	EF	4	9	13669	3.80	85	3	2	46			34							
263		AG	6	21			17		17											
264		TL	23	55			46	31	6											9
265		Total	33		13669	3.80	148	34	25	46			34							9
266																				
267	Note: EF = boat electrofishing; EB = backpack electrofishing; AG = angling; CT = crayfish trap; TL = trot line, DN = dip net																			

ANC02098
BZTO104(e)002098

Cell: C3
Comment: Ian Stupakof
Total fishing days is corrected for any activities that occurred on a same day.

Cell: D3
Comment: Ian Stupakoff:
Units set reflects the number of times each activity was performed at that station (e.g. at station 02R102 a total of 9 beach seining deployements in 3 days).

Crayfish traps indicate how many times traps were deployed at a station. It does not indicate how many traps per deployment.

ANC02099
BZTO104(e)002099

	A	B	C	D	E	F
1	Table 5-2. List of Participants During Round 1A and Round 1 of Fish Tissue Collection.					
2						
3	**Consultants**					**Initials Used in Report/Field Notebooks**
4	**Anchor Environmental LLC**					
5	Timothy Stone				TSt	
6	Alicia Wick				AW	
7	Elizabeth Appy				EA	
8						
9	**Ellis Environmental Services**					
10	Robert Ellis				BE	
11	Joseph Krieter				JK	
12	Belus Schoneck				BS	
13	Peter Kaczynski				PK	
14	Andrew Clodfelter				AC	
15	Gwen Alley				GA	
16	Caleb Houck				CH	
17	Larry Ellis				LE	
18	Timothy Klink				TK	
19						
20	**Fishman Environmental Services**					
21	Steve Novotny				SN	
22	Elizabeth French				EF	
23	Steve Johnson				SJ	
24	Laurie Wyatt				LW	
25	Jonas Moiel				JM	
26	Paul Fishman				PF	
27	Kim Gould				KG	
28	Johndavid Storn				JS	
29						
30	**Jones & Stokes**					
31	Glen Mejia				GM	
32	April Zohn				AZ	
33	Sloan Gordon				SG	
34	Erin Vanderhey				EV	
35						
36	**Kennedy/Jenks Consultants**					
37	Brian Timmins				BT	
38	John DeLorie				JD	
39	Michael Godinho				MG	
40	Zachary Sprute				ZS	

ANC02100
BZTO104(e)002100

	A	B	C	D	E	F
1	Table 5-2. List of Participants During Round 1A and Round 1 of Fish Tissue Collection.					
2						
3	**Consultants**					**Initials Used in Report/Field Notebooks**
41	Don Zilstra				DZ	
42	Shane Scrimshire				SS	
43	Shayne Pasek				SPk	
44	Deonne Knill				DK	
45						
46	**Striplin Environmental Associates, Inc.**					
47	Ian Stupakoff				IS	
48	Tom Schulz				TS	
49	Janet Cloutier				JCl	
50						
51	**Windward Environmental LLC**					
52	Robert Complita				BC	
53	Jenee Colton				JC	
54	Joanna Florer				JF	
55	Shannon Pierce				SP	
56	Matt Luxon				ML	
57	Dereck Pelletier				DP	
58	Mariah Meek				MM	

ANC02101
BZTO104(e)002101

	A	B
1	Table 5-3. Color Coding Scheme for Storage of Fish Samples.	
2		
3	**ERA**	
4	Crayfish	Grey/Green/Red
5	Lamprey ammocoetes	Grey/Yellow/Grey
6	Largescale sucker	Grey/Red/Grey
7	Peamouth	Grey/Green
8	Sculpin	Grey/Red
9	Smallmouth bass	Yellow
10	Northern pikeminnow	Grey/Green/Grey
11	Benthic invertebrates	Grey/Yellow/Red
12		
13	**HHRA**	
14	Bullhead	Green
15	Black crappie	Grey
16	Smallmouth bass	Yellow
17	Common carp	Red
18	Walleye	Green/Grey
19	Largescale sucker	Red/Grey

ANC02102
BZTO104(e)002102

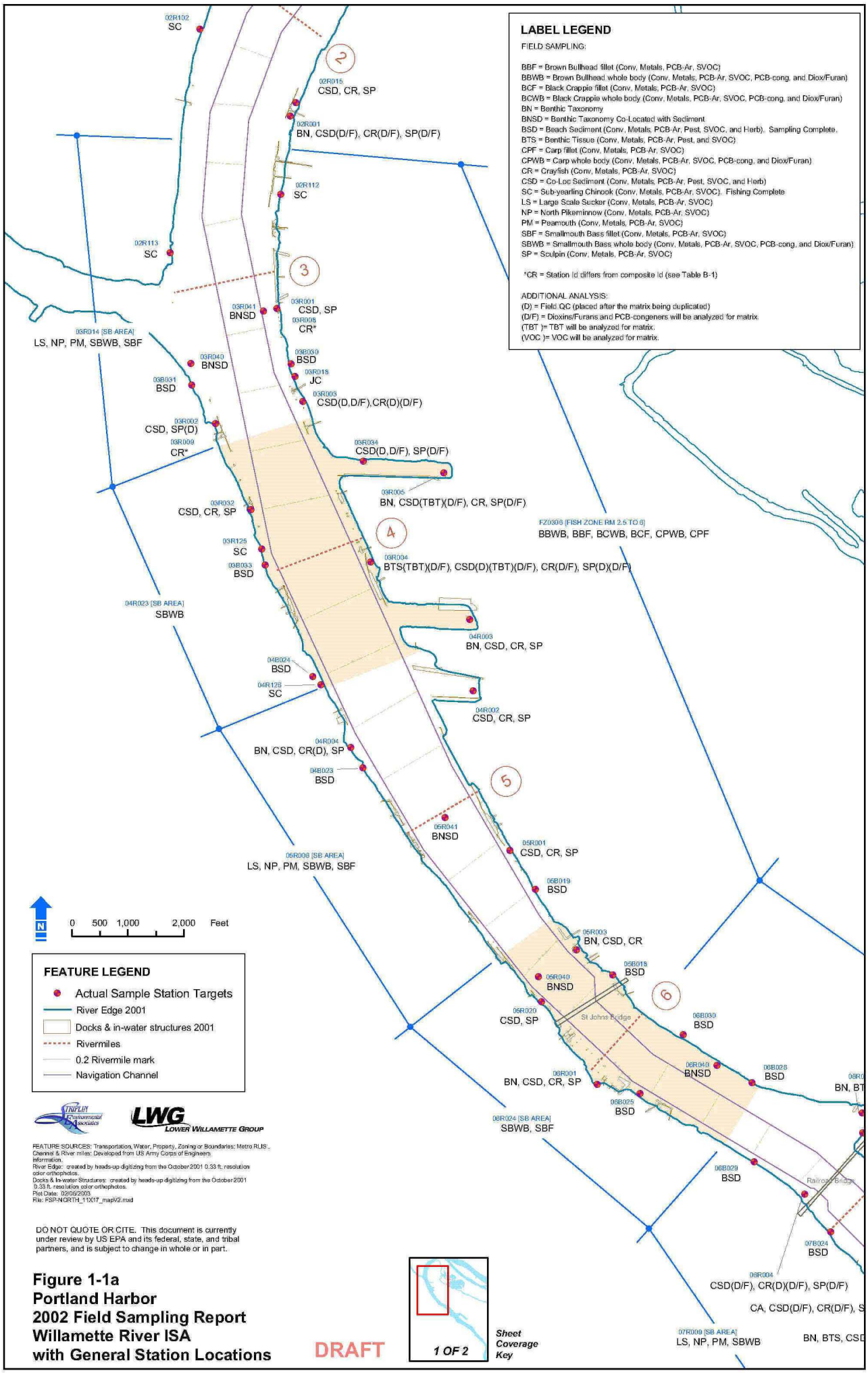


Figure 1-1a
Portland Harbor
2002 Field Sampling Report
Willamette River ISA
with General Station Locations

ANC02103
BZTO104(e)002103

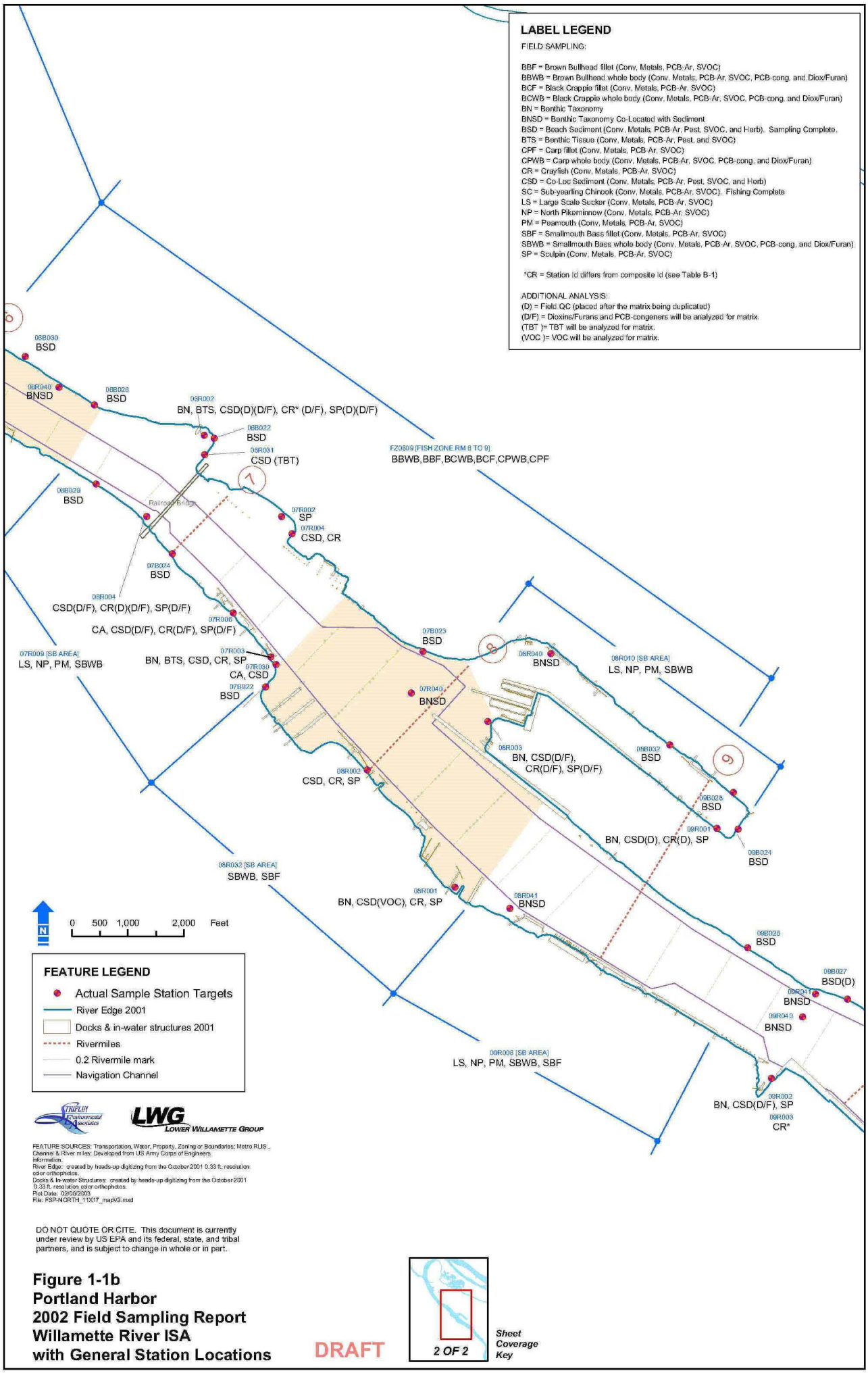
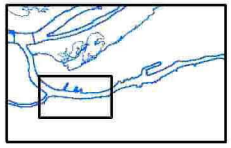


Figure 1-1b
Portland Harbor
2002 Field Sampling Report
Willamette River ISA
with General Station Locations



LWG
Lower Willamette Group

Triplin Environmental Associates

0 500 1,000 2,000 Feet

FEATURE SOURCES:
Transportation, Water, Property, Zoning or Boundaries: Metro RLIS .
Channel & River miles. Developed from US Army Corps of Engineers information.
River Edge: created by heads-up digitizing from the October 2001 0.33 ft. resolution color orthophotos.
Sediment Locations: GPS Navigation Files from DEA, MSS & FES

File name: \Final_sediment_tissue_benthos_1216.mxd
Map Date: 02/05/2003

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Draft

Figure 3-1a
Portland Harbor
2002 Field Sampling Report
Sediment Composite, Benthos, Clams, and Beach Composite Actual Sampling Locations

LWG
Lower Willamette Group

Triplin Environmental Associates

0 500 1,000 2,000 Feet

FEATURE SOURCES:
Transportation, Water, Property, Zoning or Boundaries: Metro RLIS .
Channel & River miles. Developed from US Army Corps of Engineers information.
River Edge: created by heads-up digitizing from the October 2001 0.33 ft. resolution color orthophotos.
Sediment Locations: GPS Navigation Files from DEA, MSS & FES

File name: \Final_sediment_tissue_benthos_1216.mxd
Map Date: 02/05/2003

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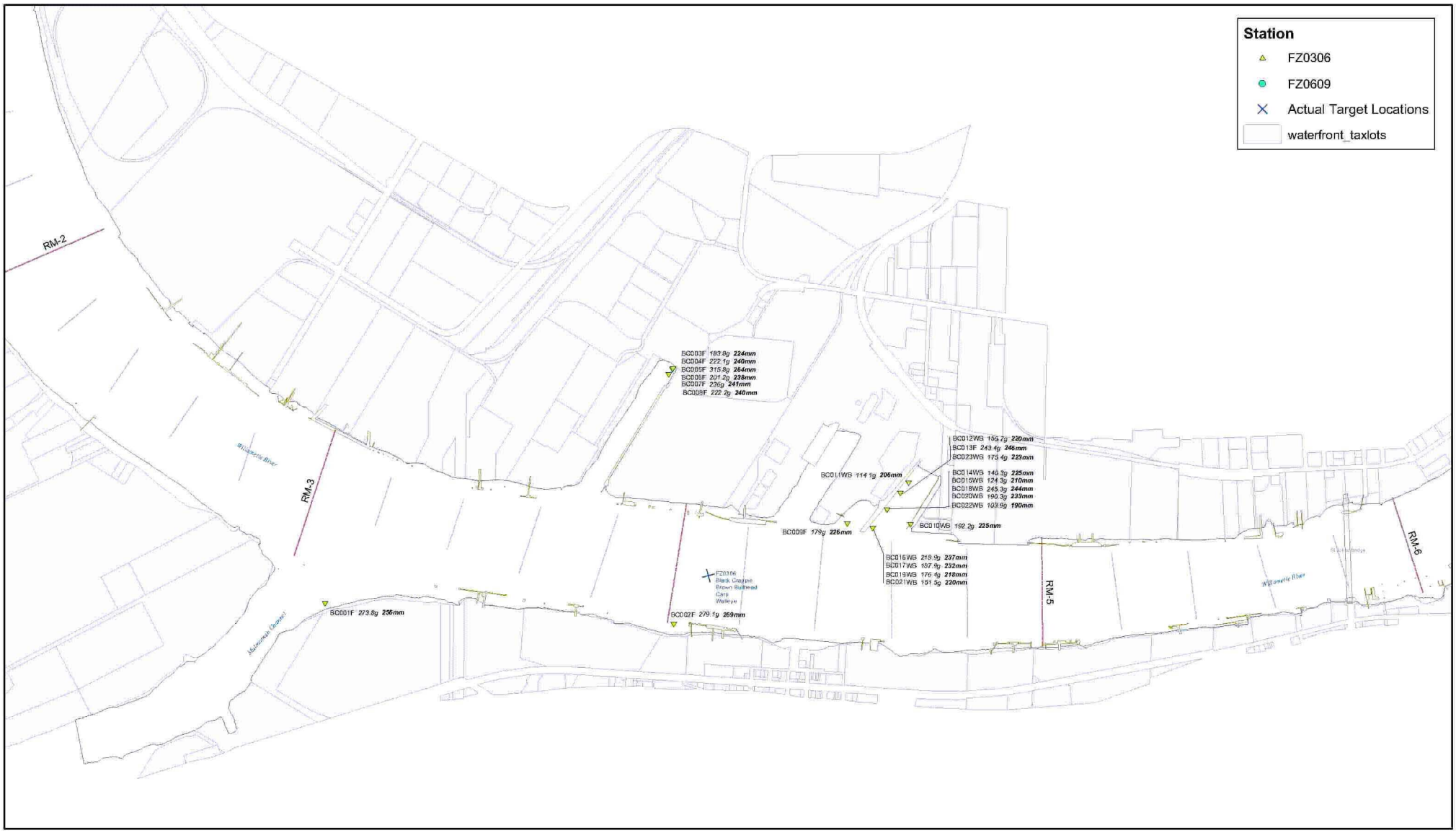
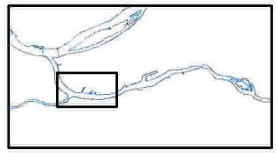
Figure 3-1b
Portland Harbor
2002 Field Sampling Report
Sediment Composite, Benthos, Clams, and Beach Composite Actual Sampling Locations





LWG Lower Willamette Group

TRIPLIN Environmental Associates

0 500 1,000 2,000 Feet

FEATURE SOURCES:
Transportation, Water, Property, Zoning or Boundaries: Metro RLIS.
Channel & River miles: Developed from US Army Corps of Engineers information.
River Edge: created by heads-up digitizing from the October 2001 0.33 ft. resolution color orthophotos.
Fish Data. Table B-1: Fish Tissue Data Master Table.

File Name: Final_Crappie_1216.mxd

Map Date: 02/04/2003

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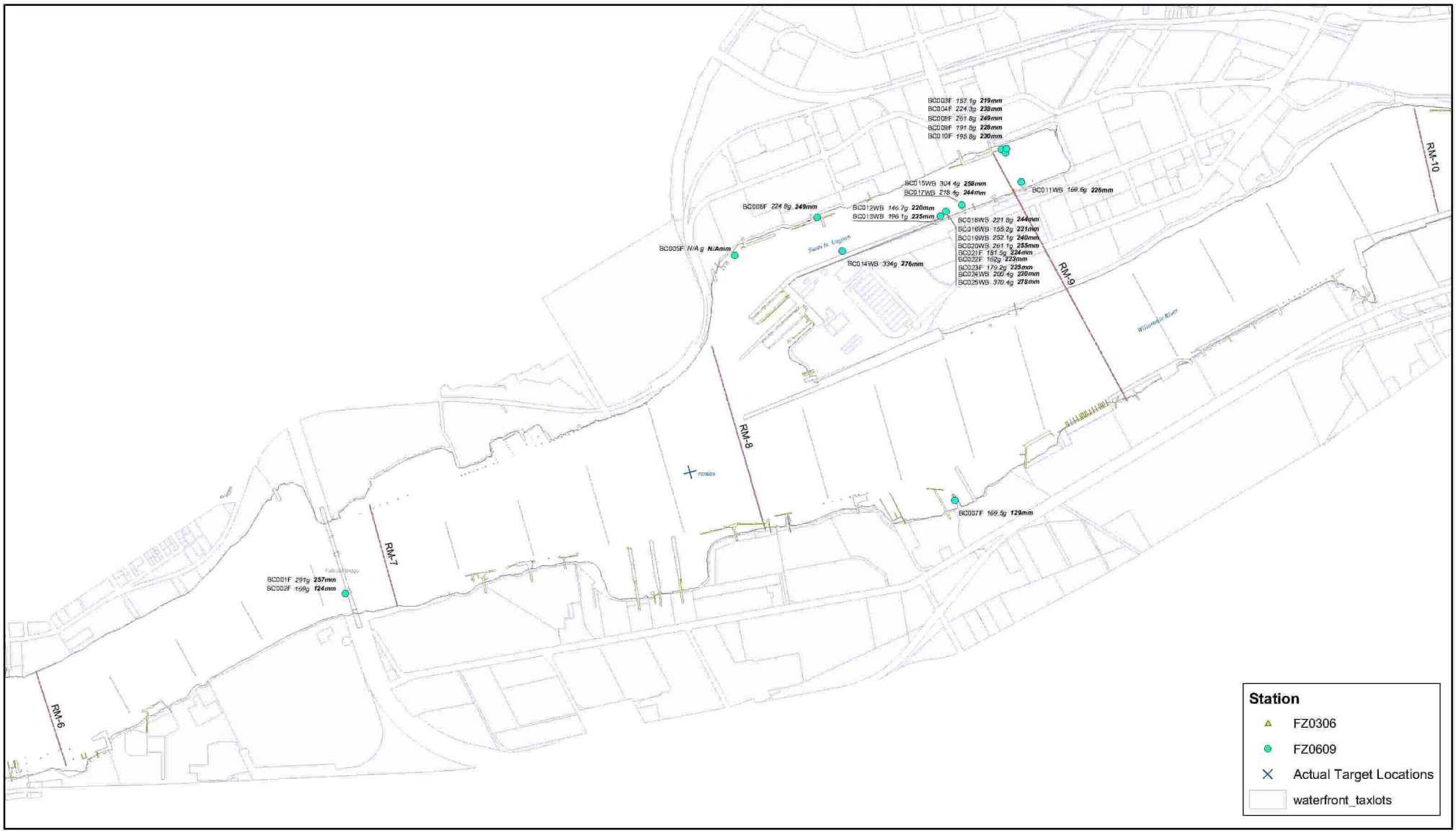
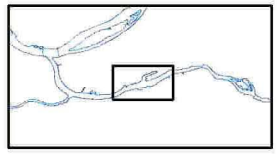
Figure 5-10a
Portland Harbor
2002 Field Sampling Report
Black Crappie
with Weight (g) & Length (mm)

ANC02107
BZTO104(e)002107





LWG
LOWER WILLAMETTE GROUP

TRIPLIN Environmental Associates

0 500 1,000 2,000 Feet

FEATURE SOURCES:
Transportation, Water, Property, Zoning or Boundaries: Metro RLIS.
Channel & River miles: Developed from US Army Corps of Engineers information.
River Edge: created by heads-up digitizing from the October 2001 0.33 ft. resolution color orthophotos.
Fish Data. Table B-1: Fish Tissue Data Master Table.

File Name: Final_Crappie_1216.mxd

Map Date: 02/04/2003

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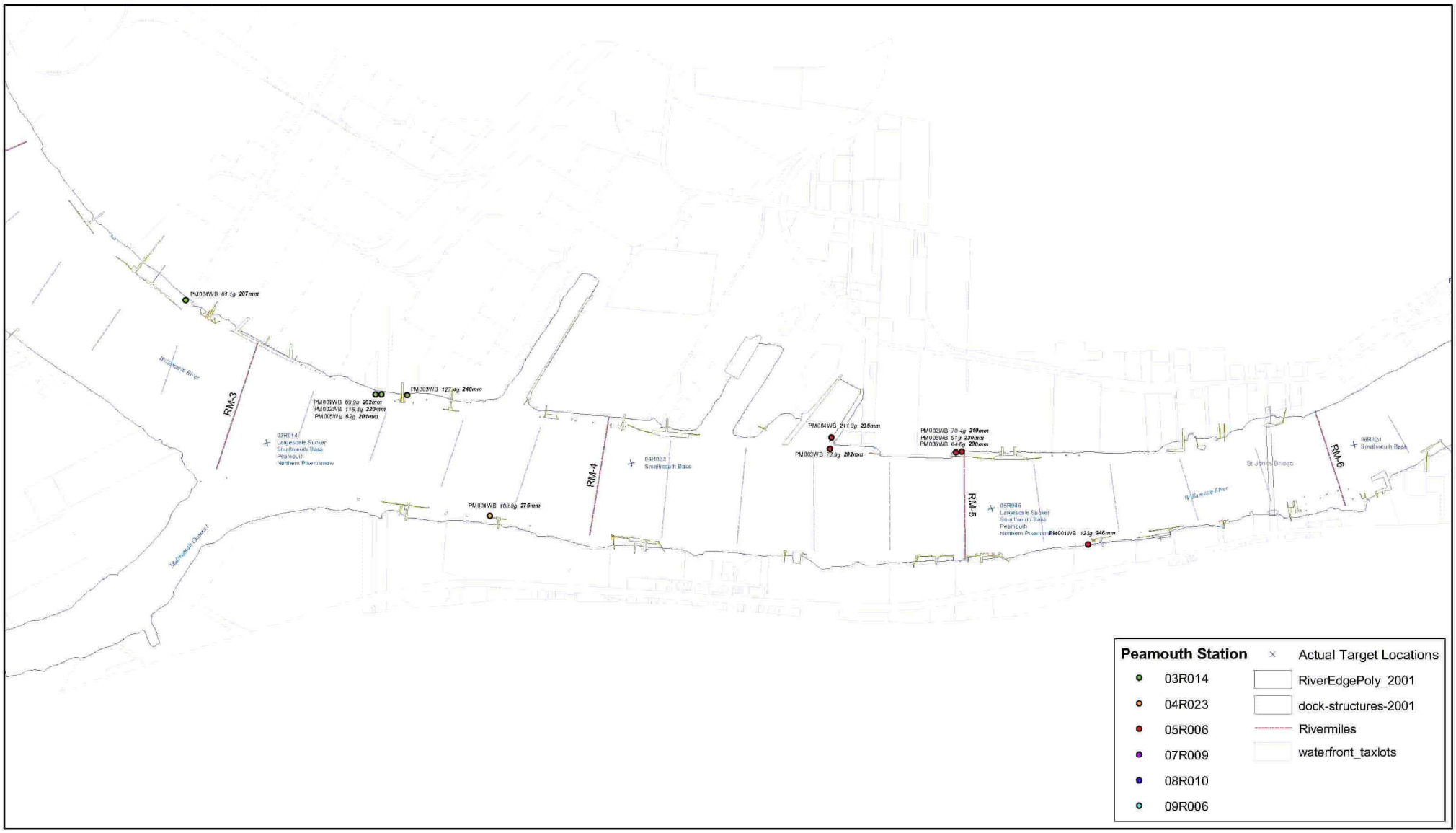
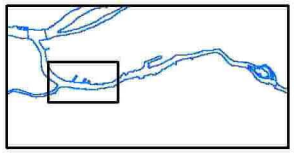
Figure 5-10b
Portland Harbor
2002 Field Sampling Report
Black Crappie
with Weight (g) & Length (mm)

ANC02108
BZTO104(e)002108





LWG
Lower Willamette Group

Triplin Environmental Associates

0 500 1,000 2,000 Feet

FEATURE SOURCES:
Transportation, Water, Property, Zoning or Boundaries: Metro RLIS.
Channel & River miles: Developed from US Army Corps of Engineers information.
River Edge: created by heads-up digitizing from the October 2001 0.33 ft. resolution color orthophotos.
Fish Data: Table B-1: Fish Tissue Data Master table.

File Name: Final_Peamouth_1216.mxd

Map Date: 02/05/2003

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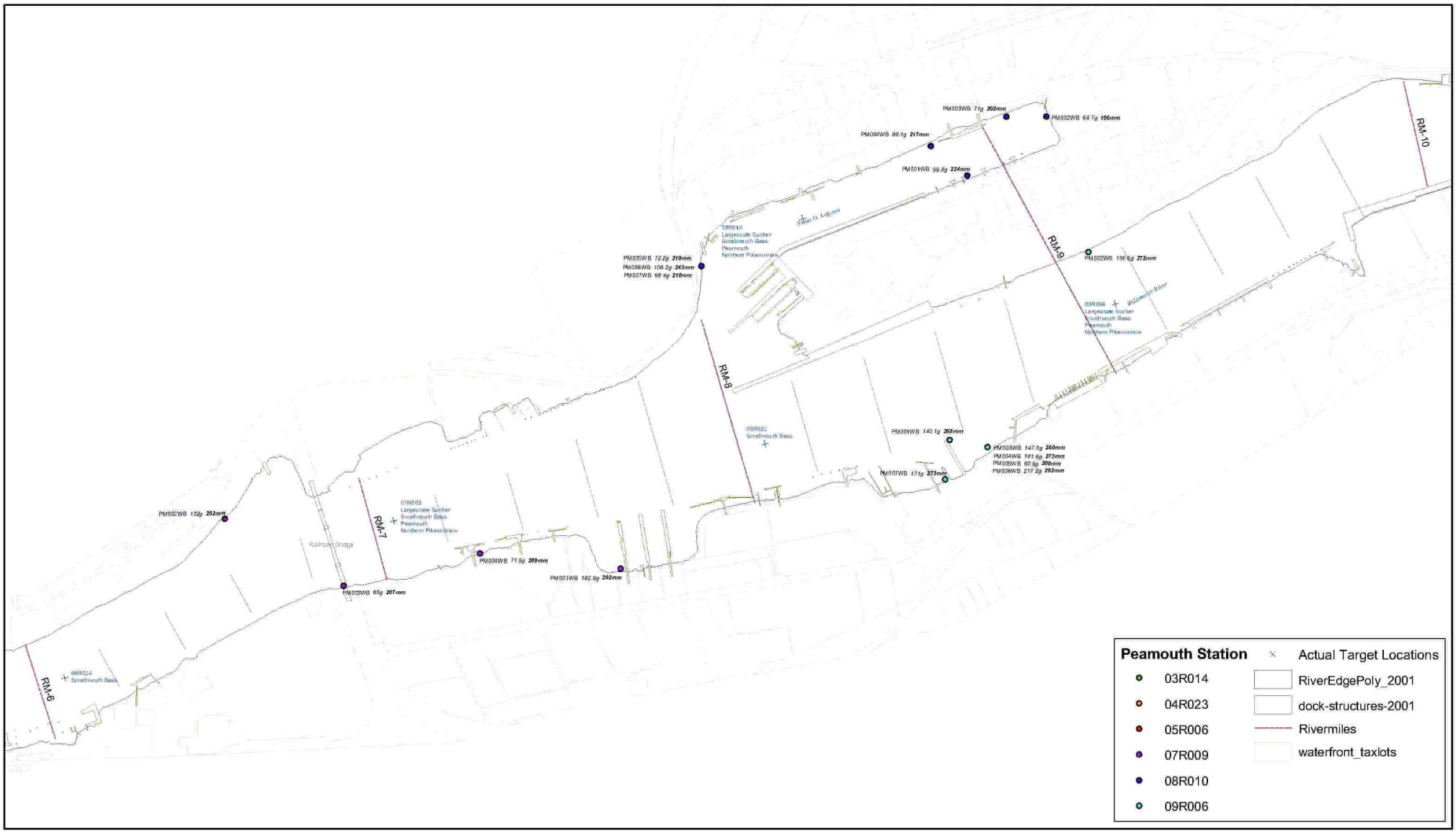
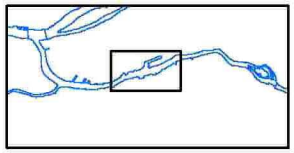
Figure 5-11a
Portland Harbor
2002 Field Sampling Report
Peamouth
with Weight (g) & Length (mm)

ANC02109
BZTO104(e)002109





LWG
LOWER WILLAMETTE GROUP

TRIPLIN Environmental Associates

0 500 1,000 2,000 Feet

FEATURE SOURCES:
Transportation, Water, Property, Zoning or Boundaries: Metro RLIS.
Channel & River miles: Developed from US Army Corps of Engineers information.
River Edge: created by heads-up digitizing from the October 2001 0.33 ft. resolution color orthophotos.
Fish Data: Table B-1: Fish Tissue Data Master table.

File Name: Final_Peamouth_1216.mxd

Map Date: 02/05/2003

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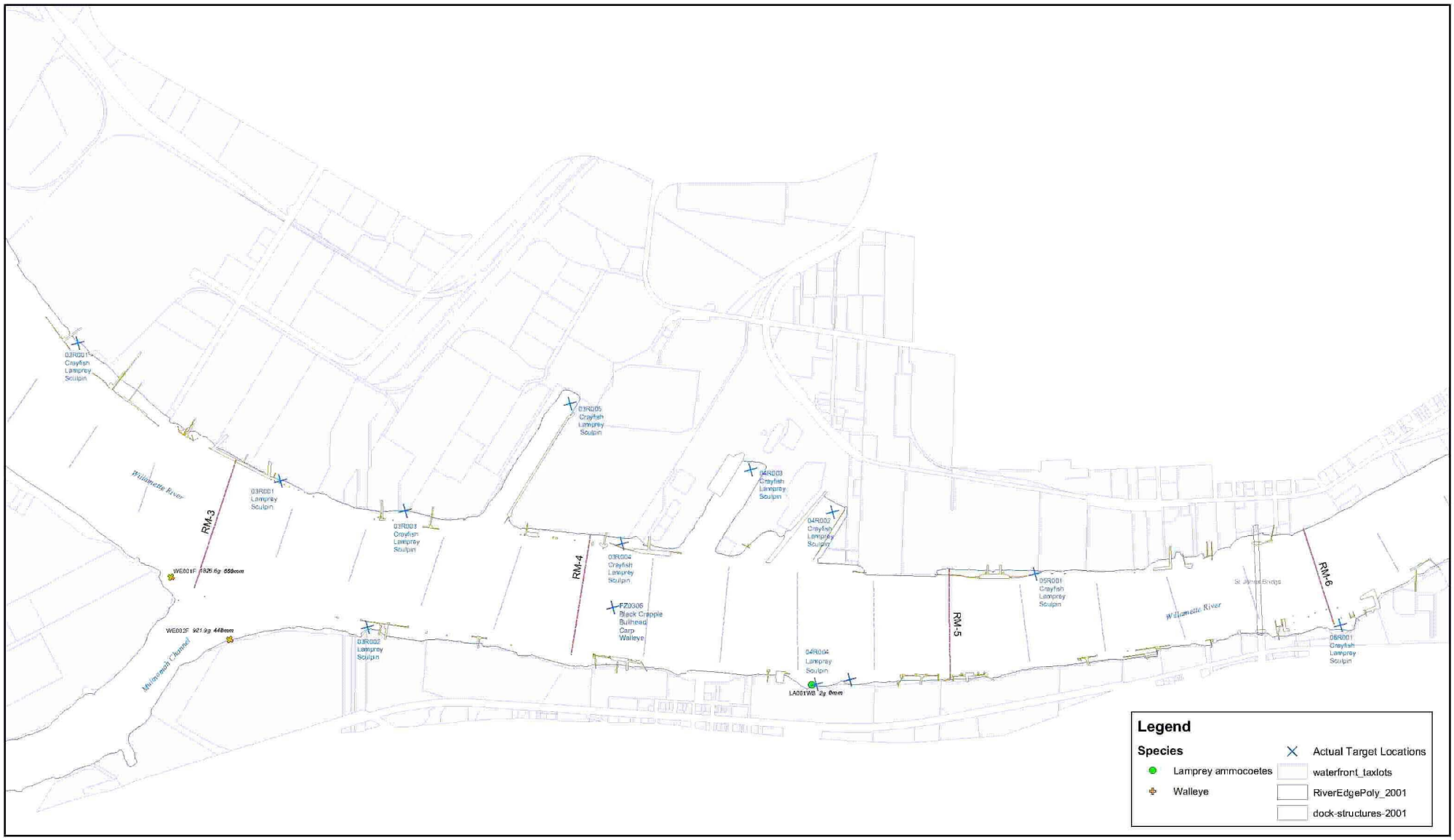
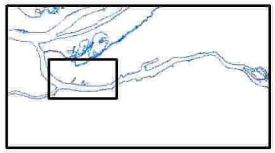
Figure 5-11b
Portland Harbor
2002 Field Sampling Report
Peamouth
with Weight (g) & Length (mm)





LWG
Lower Willamette Group

Triplin Environmental Associates

0 500 1,000 2,000 Feet

FEATURE SOURCES:
Transportation, Water, Property, Zoning or Boundaries: Metro RLIS .
Channel & River miles: Developed from US Army Corps of Engineers information.
River Edge: created by heads-up digitizing from the October 2001 0.33 ft. resolution color orthophotos.
Fish Data: Table B-1: Fish Tissue Data Master Table.

File Name: Final_Walleye_Lamp_1216.mxd

Map Date: 02/05/2003

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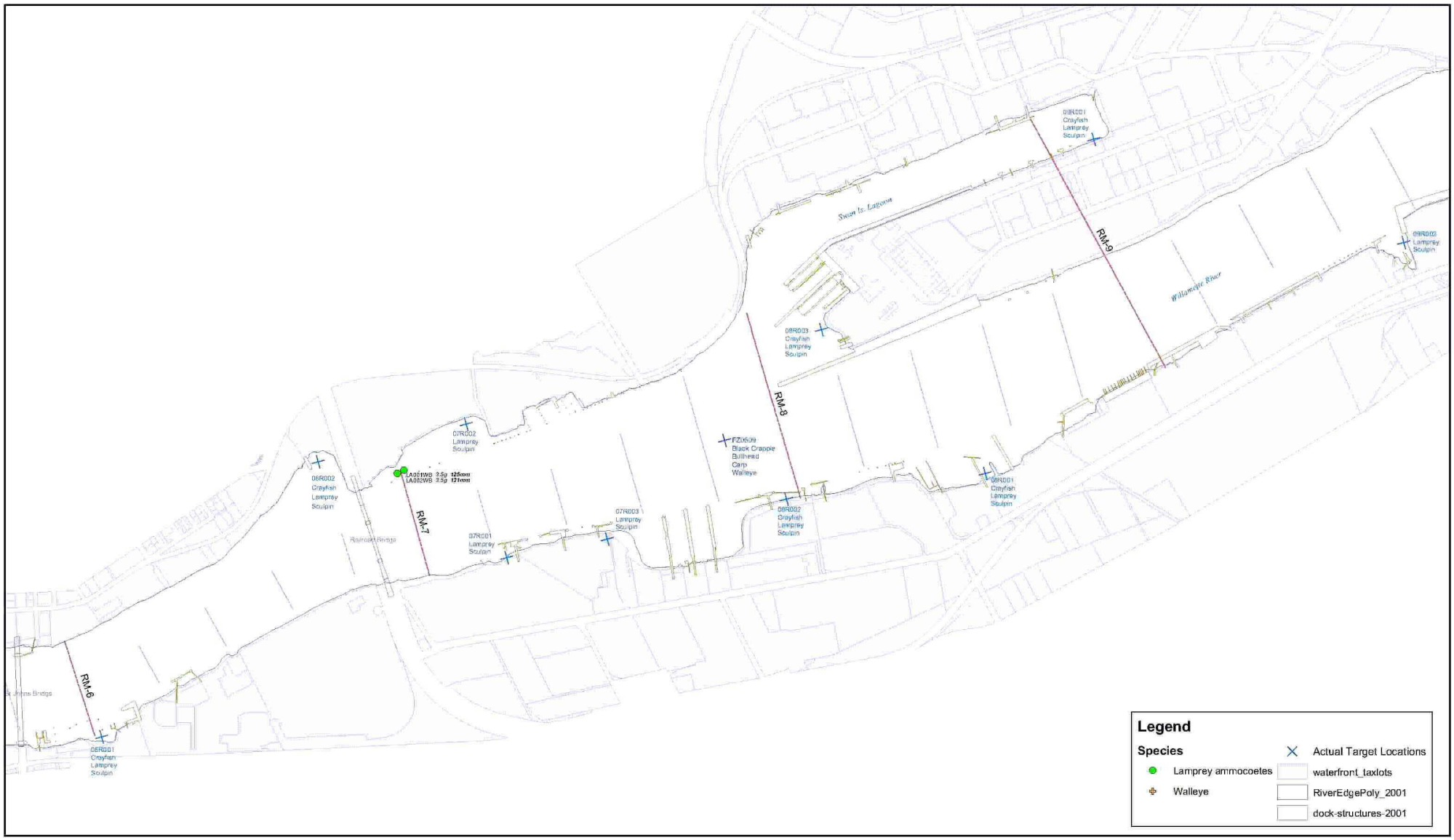
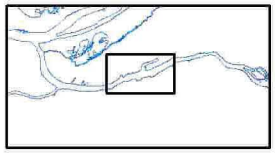
Draft

Figure 5-12a
Portland Harbor
2002 Field Sampling Report
Walleye & Lamprey ammocoetes
with Weight (g) & Length (mm)





LWG
Lower Willamette Group

Triplin Environmental Associates

0 500 1,000 2,000 Feet

FEATURE SOURCES:
Transportation, Water, Property, Zoning or Boundaries: Metro RLIS .
Channel & River miles: Developed from US Army Corps of Engineers information.
River Edge: created by heads-up digitizing from the October 2001 0.33 ft. resolution color orthophotos.
Fish Data: Table B-1: Fish Tissue Data Master Table.

File Name: Final_Walleye_Lamp_1216.mxd

Map Date: 02/05/2003

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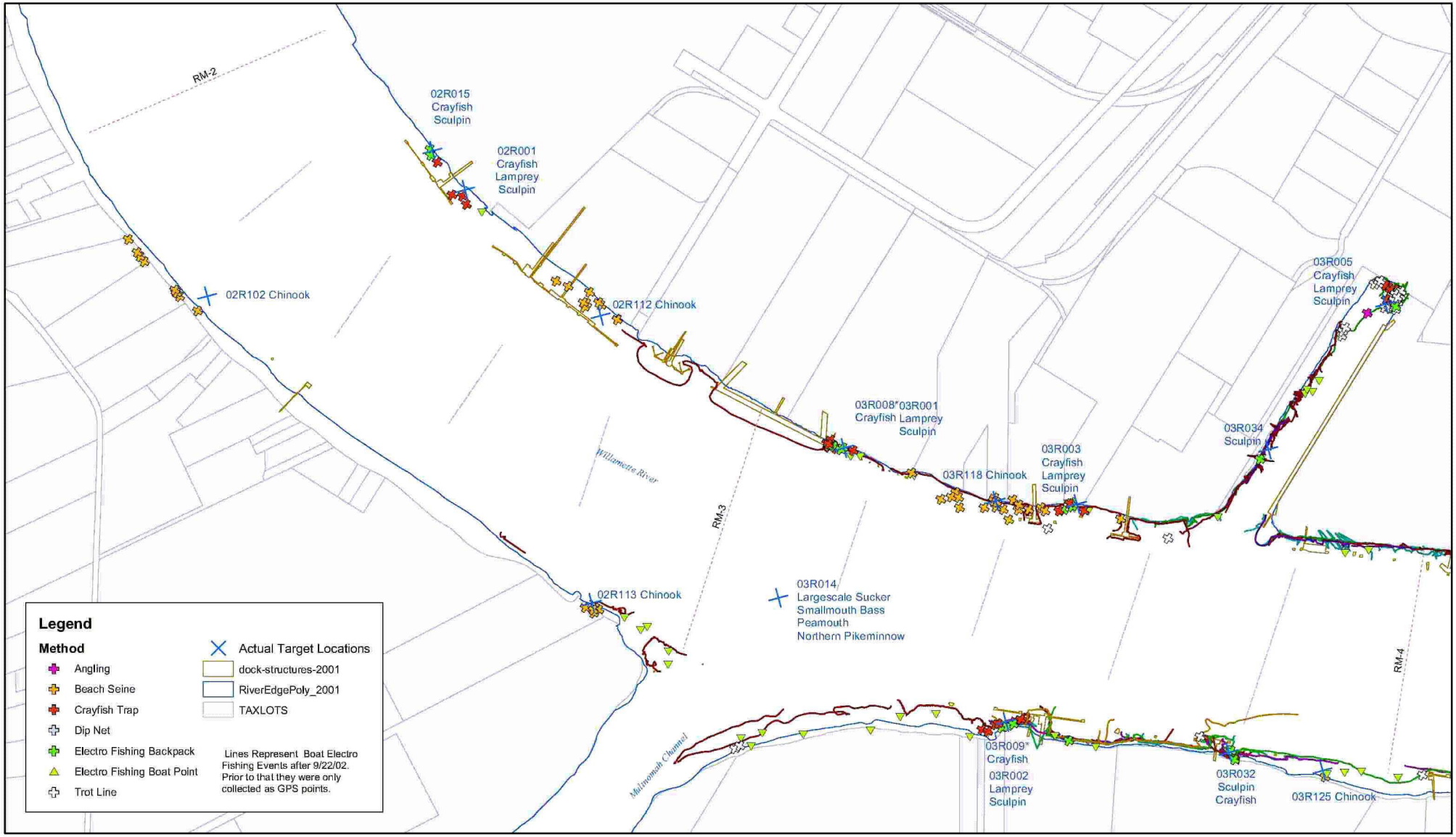
Draft

Figure 5-12b
Portland Harbor
2002 Field Sampling Report
Walleye & Lamprey ammocoetes
with Weight (g) & Length (mm)



LWG
Lower Willamette Group

Triplin Environmental Associates

0 250 500 1,000 Feet

FEATURE SOURCES:
Transportation, Water, Property, Zoning or Boundaries: Metro RLIS.
Channel & River miles: Developed from US Army Corps of Engineers information.
River Edge: created by heads-up digitizing from the October 2001 0.33 ft. resolution color orthophotos.
Fish Effort Data: Table B-2: Fish Catch Coordinate Table.
* Field Station Label Ids differ from Composite Label Ids, see Table B-1.

File Name: \Final_Fish_Effort_1216_UP.mxd

Map Date: 02/04/2003

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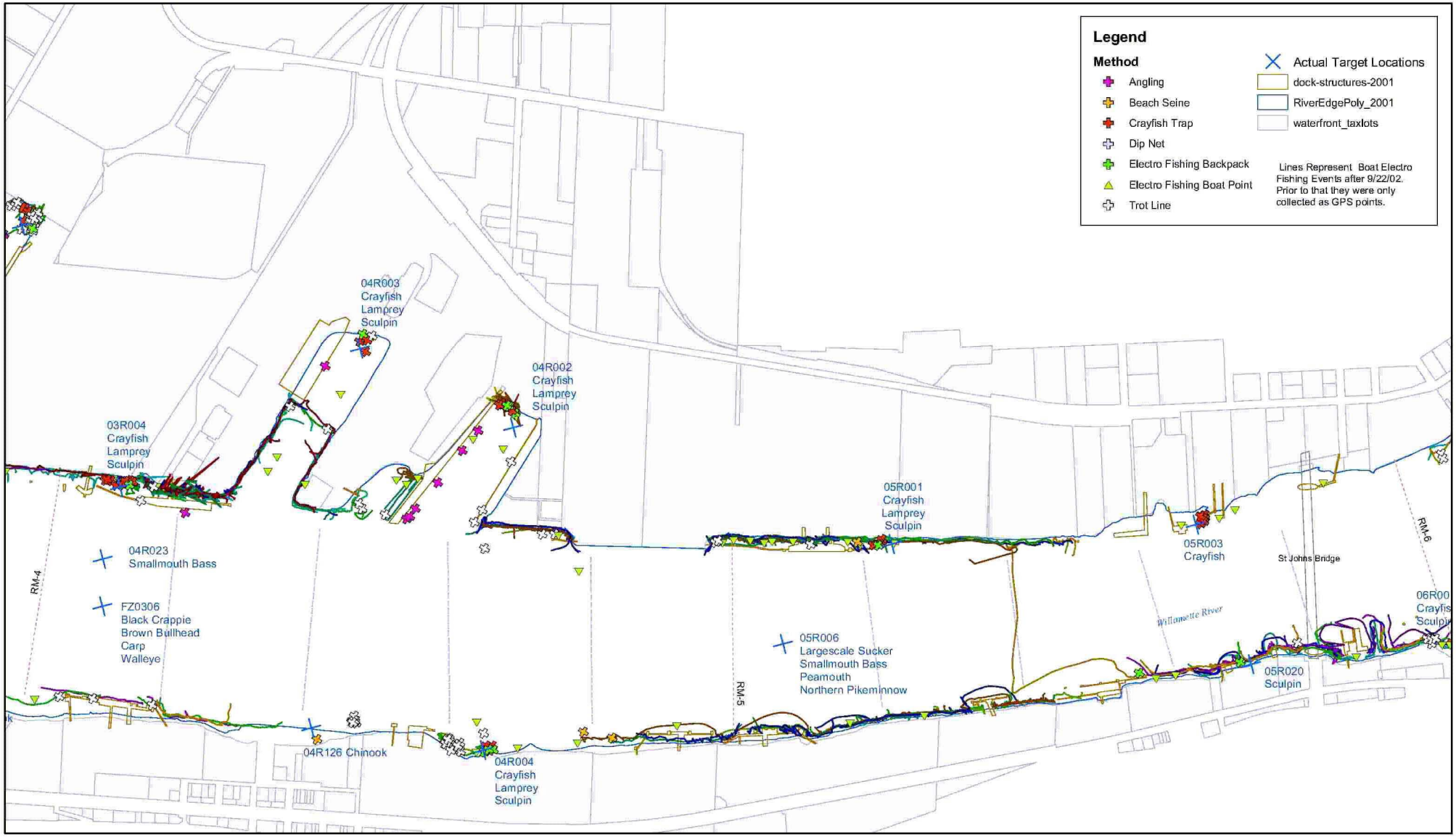
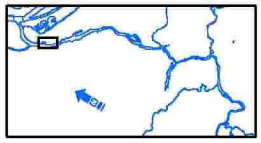
Draft

Figure 5-1a
Portland Harbor
2002 Field Sampling Report
Fishing Efforts RM 2 to 4





LWG
LOWER WILLAMETTE GROUP

TRIPLIN Environmental Associates

0 250 500 1,000 Feet

FEATURE SOURCES:
Transportation, Water, Property, Zoning or Boundaries: Metro RLIS.
Channel & River miles: Developed from US Army Corps of Engineers information.
River Edge: created by heads-up digitizing from the October 2001 0.33 ft. resolution color orthophotos.
Fish Effort Data: Table B-2: Fish Catch Coordinate Table.
* Field Station Label Ids differ from Composite Label Ids, see Table B-1.

File Name: \Final_Fish_Effort_1216_UP.mxd

Map Date: 02/04/2003

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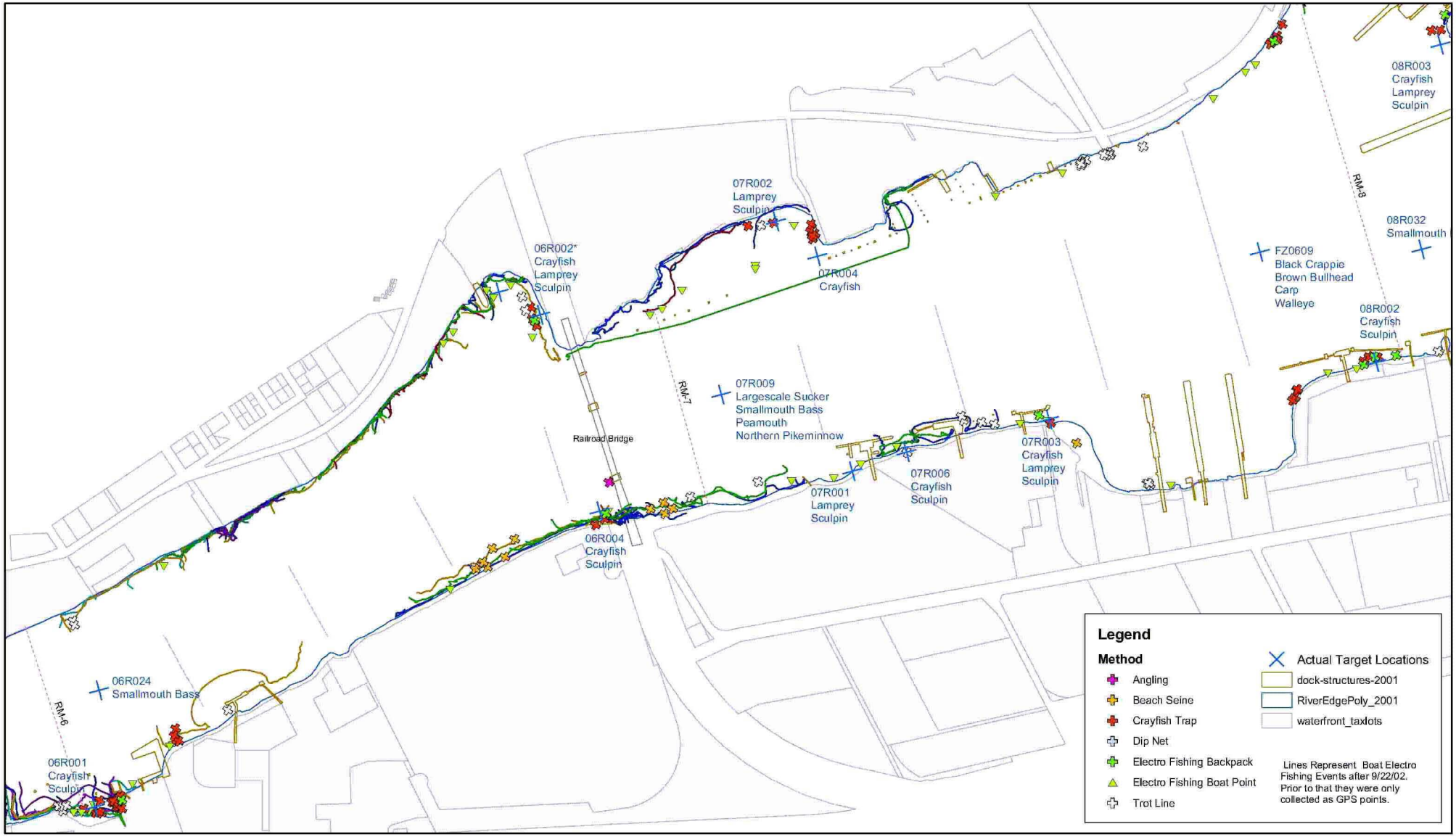
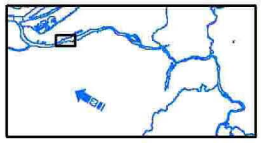
Figure 5-1b
Portland Harbor
2002 Field Sampling Report
Fishing Efforts RM 4 to 6

ANC02114
BZTO104(e)002114





LWG
LOWER WILLAMETTE GROUP

TRIPLIN Environmental Associates

0 250 500 1,000 Feet

FEATURE SOURCES:
Transportation, Water, Property, Zoning or Boundaries: Metro RLIS.
Channel & River miles: Developed from US Army Corps of Engineers information.
River Edge: created by heads-up digitizing from the October 2001 0.33 ft. resolution color orthophotos.
Fish Effort Data: Table B-2: Fish Catch Coordinate Table.
* Field Station Label Ids differ from Composite Label Ids, see Table B-1.

File Name: \Final_Fish_Effort_1216_UP.mxd

Map Date: 02/04/2003

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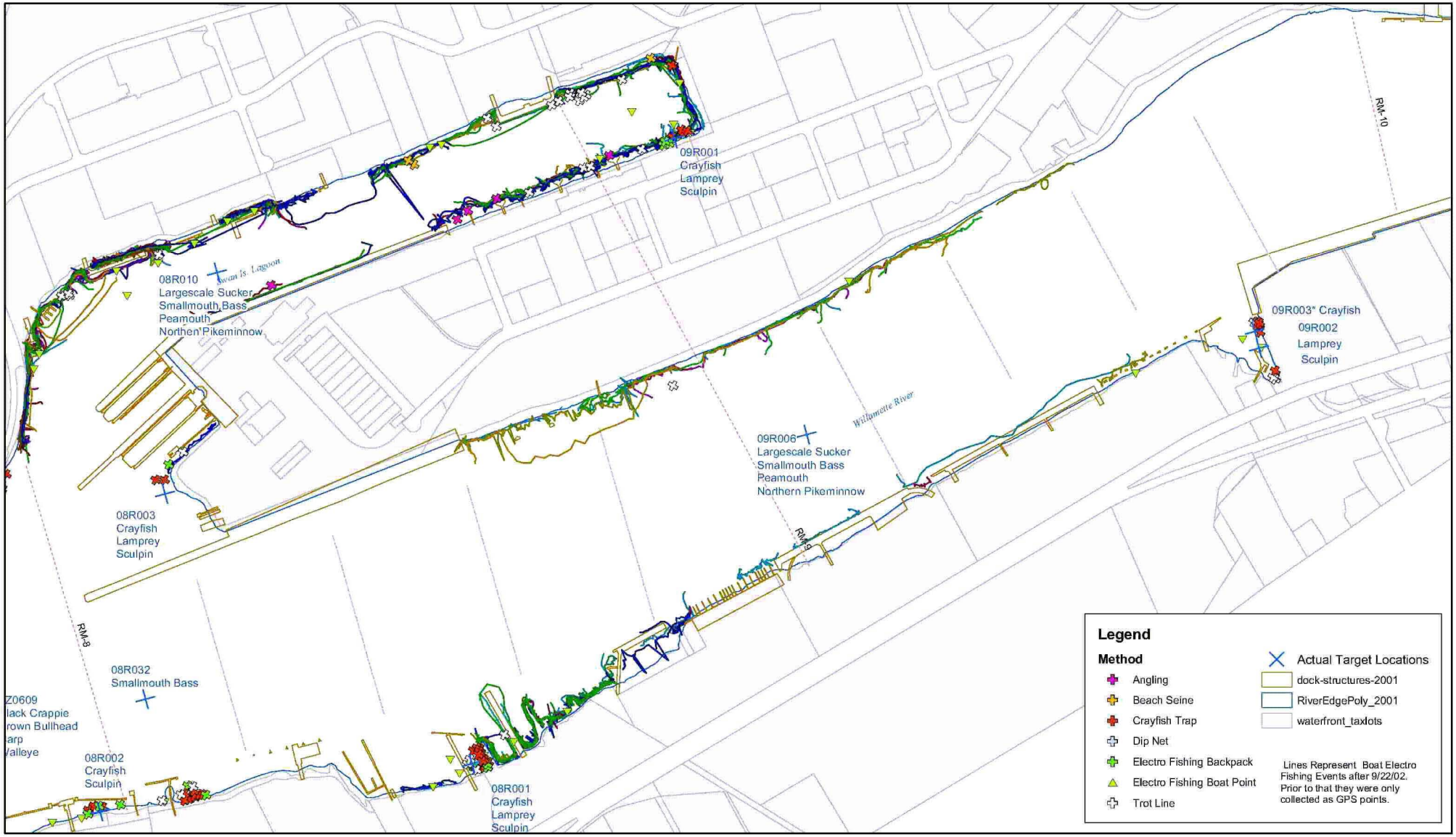
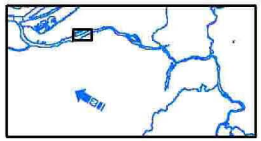
Figure 5-1c
Portland Harbor
2002 Field Sampling Report
Fishing Efforts RM 6 to 8





LWG
Lower Willamette Group

Triplin Environmental Associates

0 250 500 1,000 Feet

FEATURE SOURCES:
Transportation, Water, Property, Zoning or Boundaries: Metro RLIS.
Channel & River miles: Developed from US Army Corps of Engineers information.
River Edge: created by heads-up digitizing from the October 2001 0.33 ft. resolution color orthophotos.
Fish Effort Data: Table B-2: Fish Catch Coordinate Table.
* Field Station Label Ids differ from Composite Label Ids, see Table B-1.

File Name: \Final_Fish_Effort_1216_UP.mxd

Map Date: 02/04/2003

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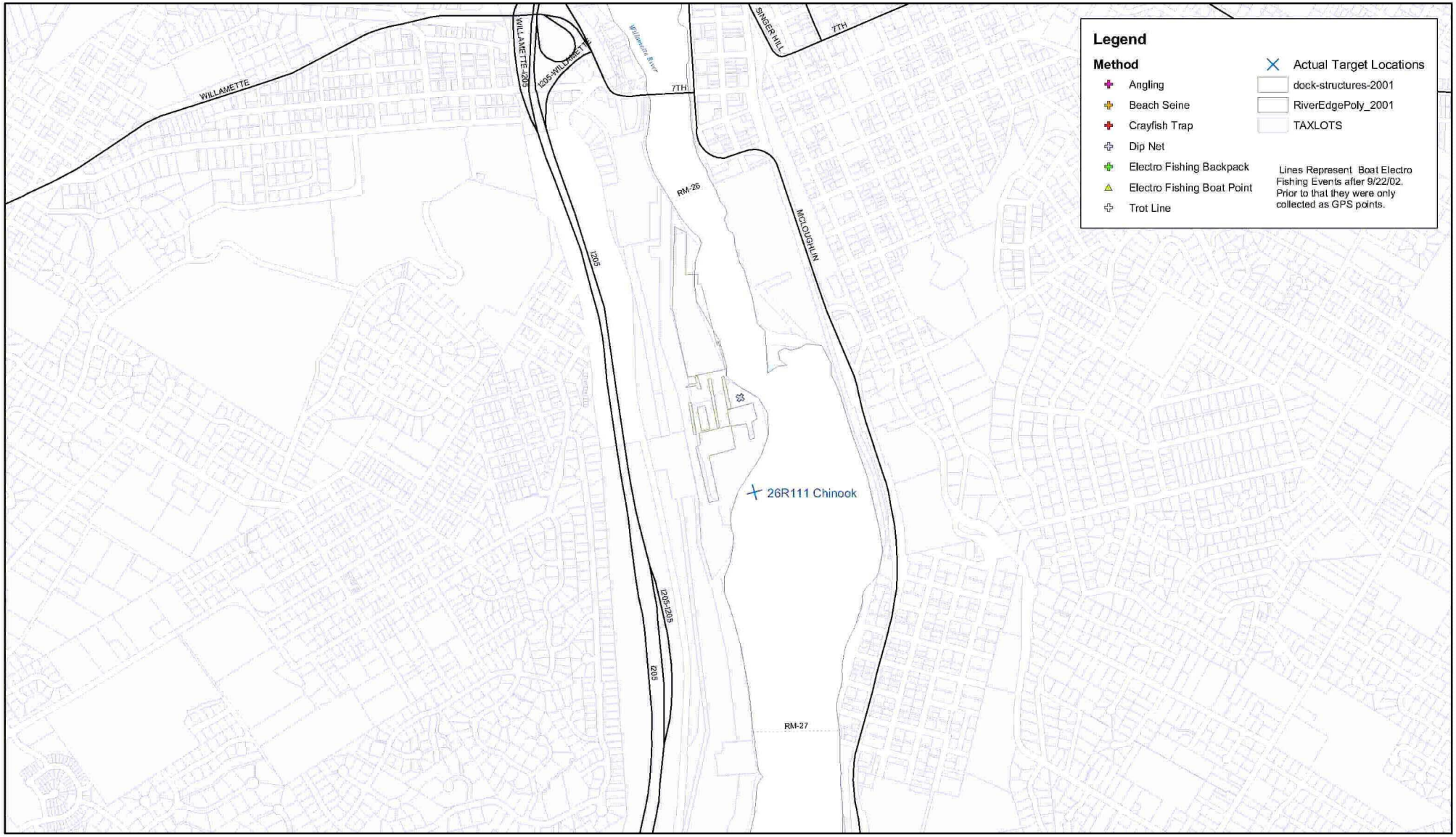
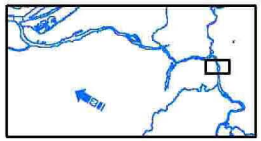
Figure 5-1d
Portland Harbor
2002 Field Sampling Report
Fishing Efforts RM 8 to 10

ANC02116
BZTO104(e)002116





LWG Lower Willamette Group

Triplin Environmental Associates

0 250 500 1,000 Feet

FEATURE SOURCES:
Transportation, Water, Property, Zoning or Boundaries: Metro RLIS.
Channel & River miles: Developed from US Army Corps of Engineers information.
River Edge: created by heads-up digitizing from the October 2001 0.33 ft. resolution color orthophotos.
Fish Effort Data: Table B-2: Fish Catch Coordinate Table.
* Field Station Label Ids differ from Composite Label Ids, see Table B-1.

File Name: \Final_Fish_Effort_1216_UP.mxd

Map Date: 02/04/2003

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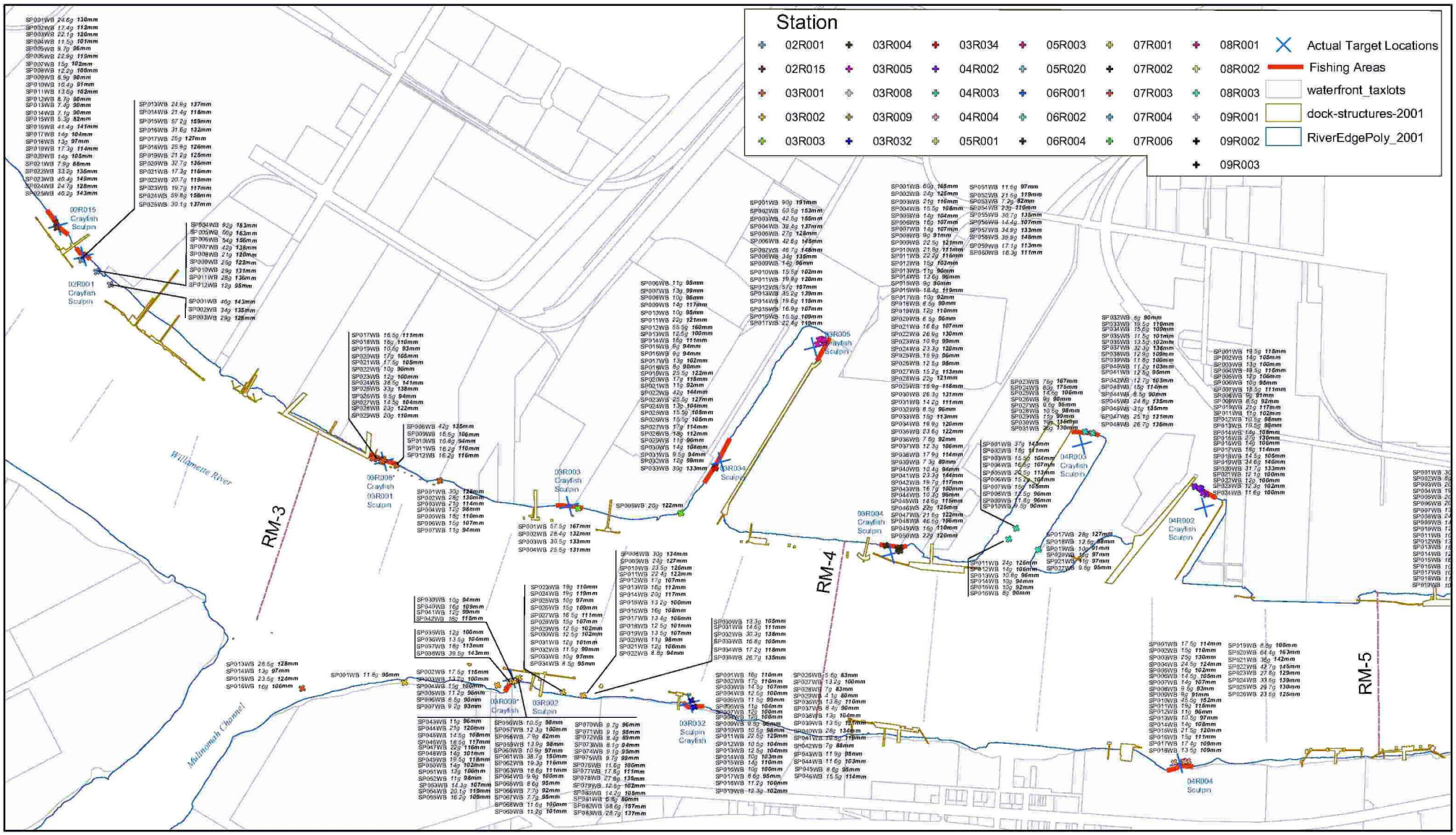
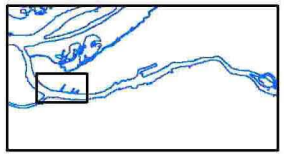
Figure 5-1e
Portland Harbor
2002 Field Sampling Report
Fishing Efforts RM 26

ANC02117
BZTO104(e)002117





LWG Lower Willamette Group

Triplett Environmental Associates

0 250 500 1,000 Feet

FEATURE SOURCES:
Transportation, Water, Property, Zoning or Boundaries: Metro RLIS.
Channel & River miles: Developed from US Army Corps of Engineers information.
River Edge: created by heads-up digitizing from the October 2001 0.33 ft. resolution color orthophotos.
Fish Data: Table B-1, Fish Tissue Data Master Table.
* Field Station Label Ids differ from Composite Label Ids, see Table B-1.

File Name: Final_Sculpin_1216.mxd

Map Date: 02/03/2003

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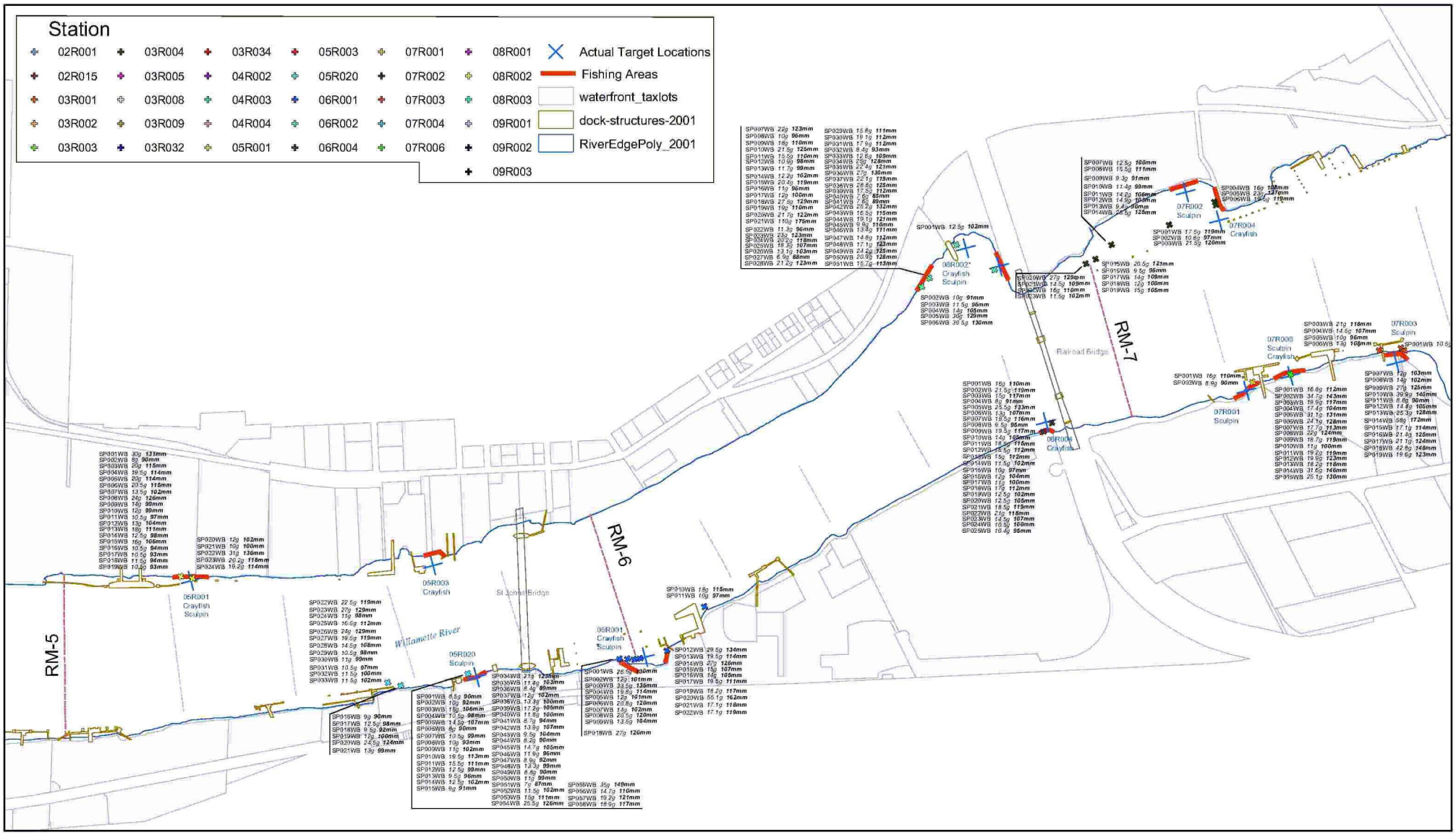
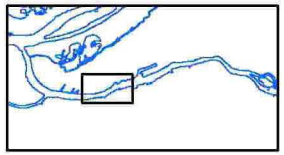
Figure 5-2a
Portland Harbor
2002 Field Sampling Report
Sculpin
with Weight (g) & Length (mm)





LWG Lower Willamette Group

Triplex Environmental Associates

0 250 500 1,000 Feet

FEATURE SOURCES:
Transportation, Water, Property, Zoning or Boundaries: Metro RLIS.
Channel & River miles: Developed from US Army Corps of Engineers information.
River Edge: created by heads-up digitizing from the October 2001 0.33 ft. resolution color orthophotos.
Fish Data: Table B-1, Fish Tissue Data Master Table.
* Field Station Label Ids differ from Composite Label Ids, see Table B-1.

File Name: Final_Sculpin_1216.mxd

Map Date: 02/03/2003

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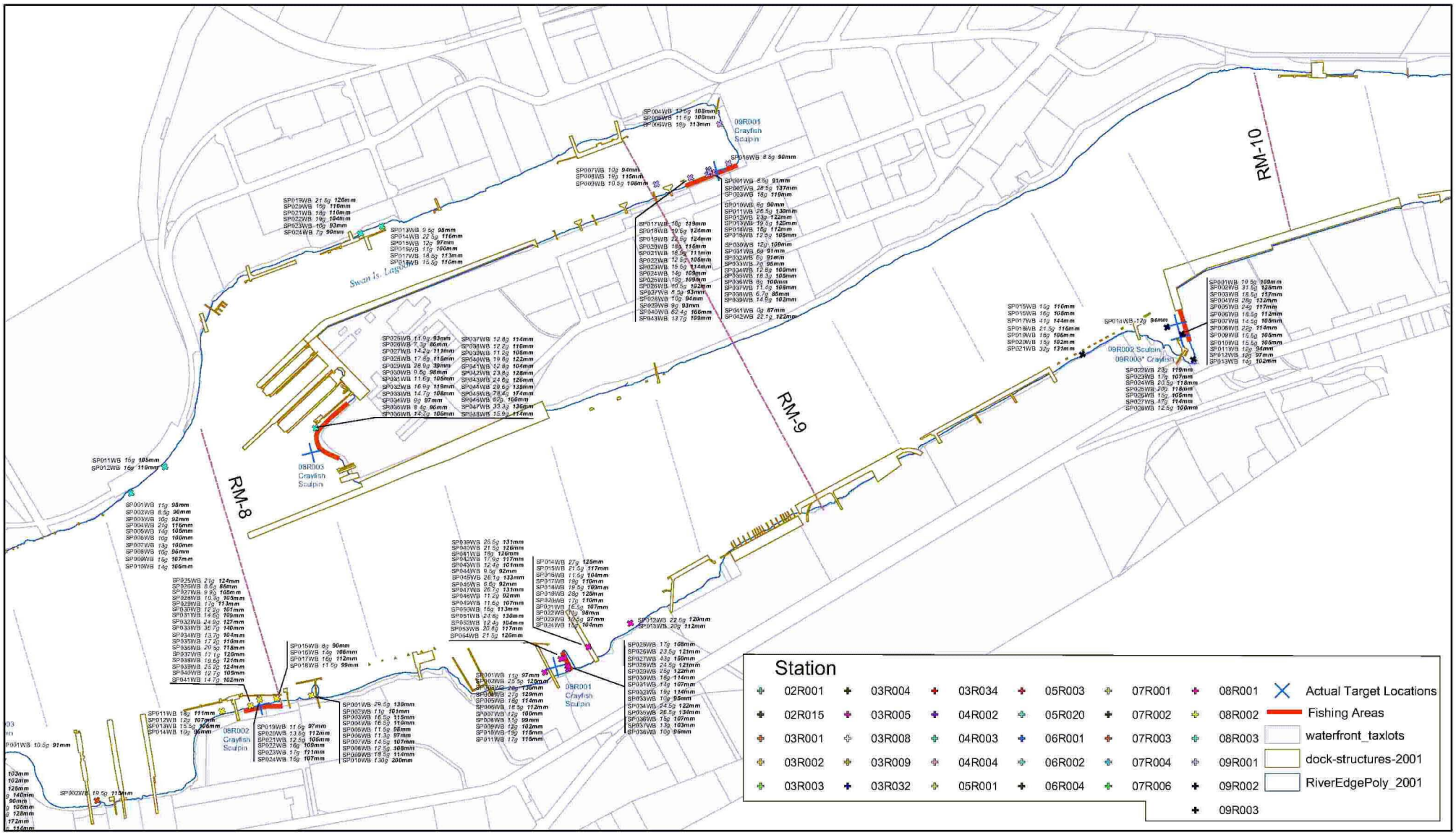
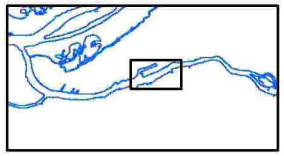
Figure 5-2b
Portland Harbor
2002 Field Sampling Report
Sculpin
with Weight (g) & Length (mm)

ANC02119
BZTO104(e)002119





LWG Lower Willamette Group

Triplex Environmental Associates

0 250 500 1,000 Feet

FEATURE SOURCES:
Transportation, Water, Property, Zoning or Boundaries: Metro RLIS.
Channel & River miles: Developed from US Army Corps of Engineers information.
River Edge: created by heads-up digitizing from the October 2001 0.33 ft. resolution color orthophotos.
Fish Data: Table B-1, Fish Tissue Data Master Table.
* Field Station Label Ids differ from Composite Label Ids, see Table B-1.

File Name: Final_Sculpin_1216.mxd

Map Date: 02/03/2003

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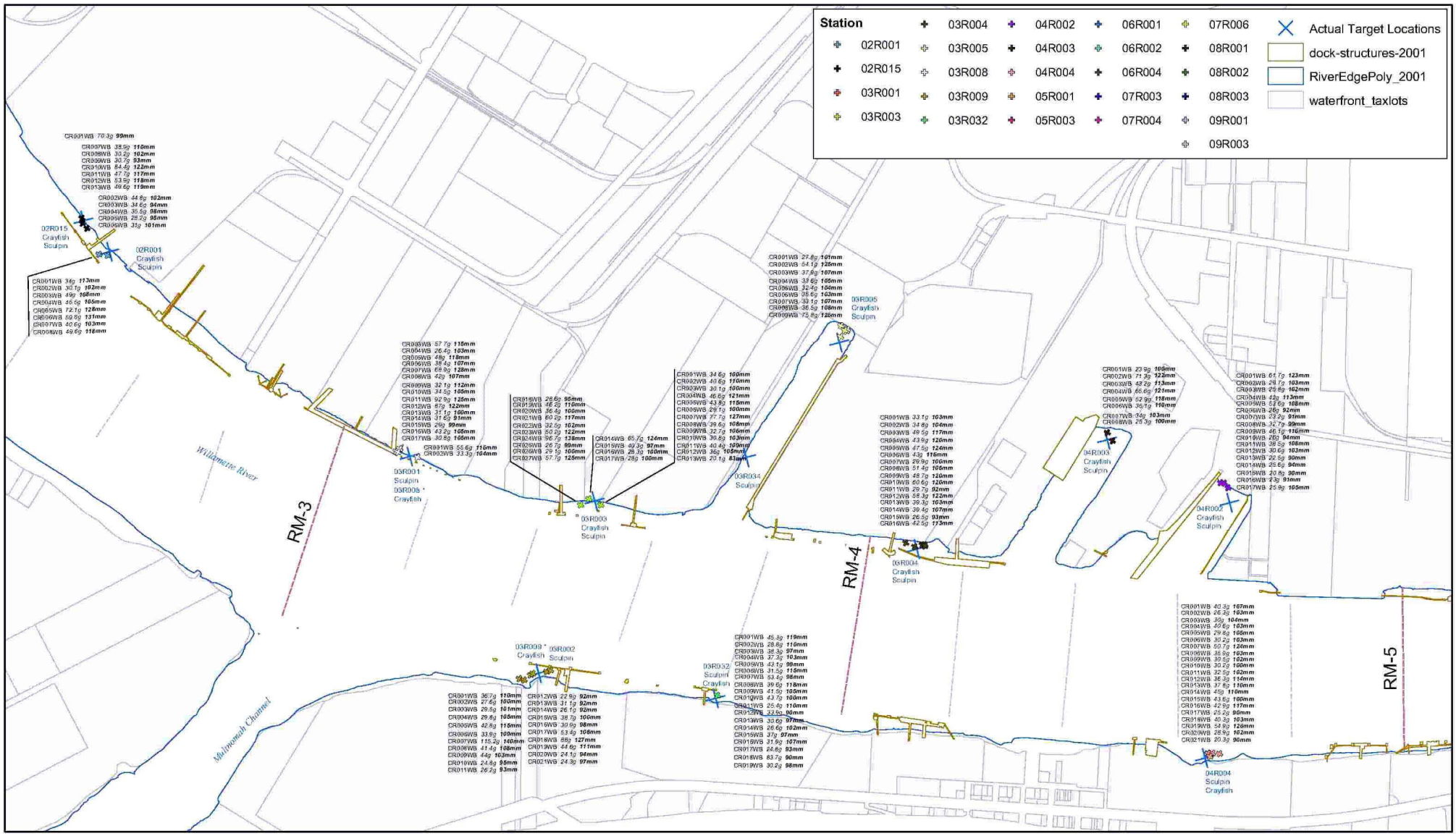
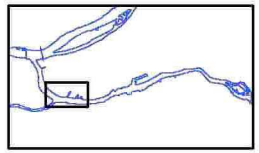
Figure 5-2c
Portland Harbor
2002 Field Sampling Report
Sculpin
with Weight (g) & Length (mm)

ANC02120
BZTO104(e)002120





LWG Lower Willamette Group

Triplin Environmental Associates

0 250 500 1,000 Feet

FEATURE SOURCES:
Transportation, Water, Property, Zoning or Boundaries. Metro RLIS.
Channel & River miles. Developed from US Army Corps of Engineers information.
River Edge: created by heads-up digitizing from the October 2001 0.33 ft. resolution color orthophotos.
Fish Data: Table B-1: Fish Tissue Data Master Table.
* Field Station Label Ids differ from Composite Label Ids, see Table B-1.

File Name: Crayfish_Final.mxd

Map Date: 02/03/2003

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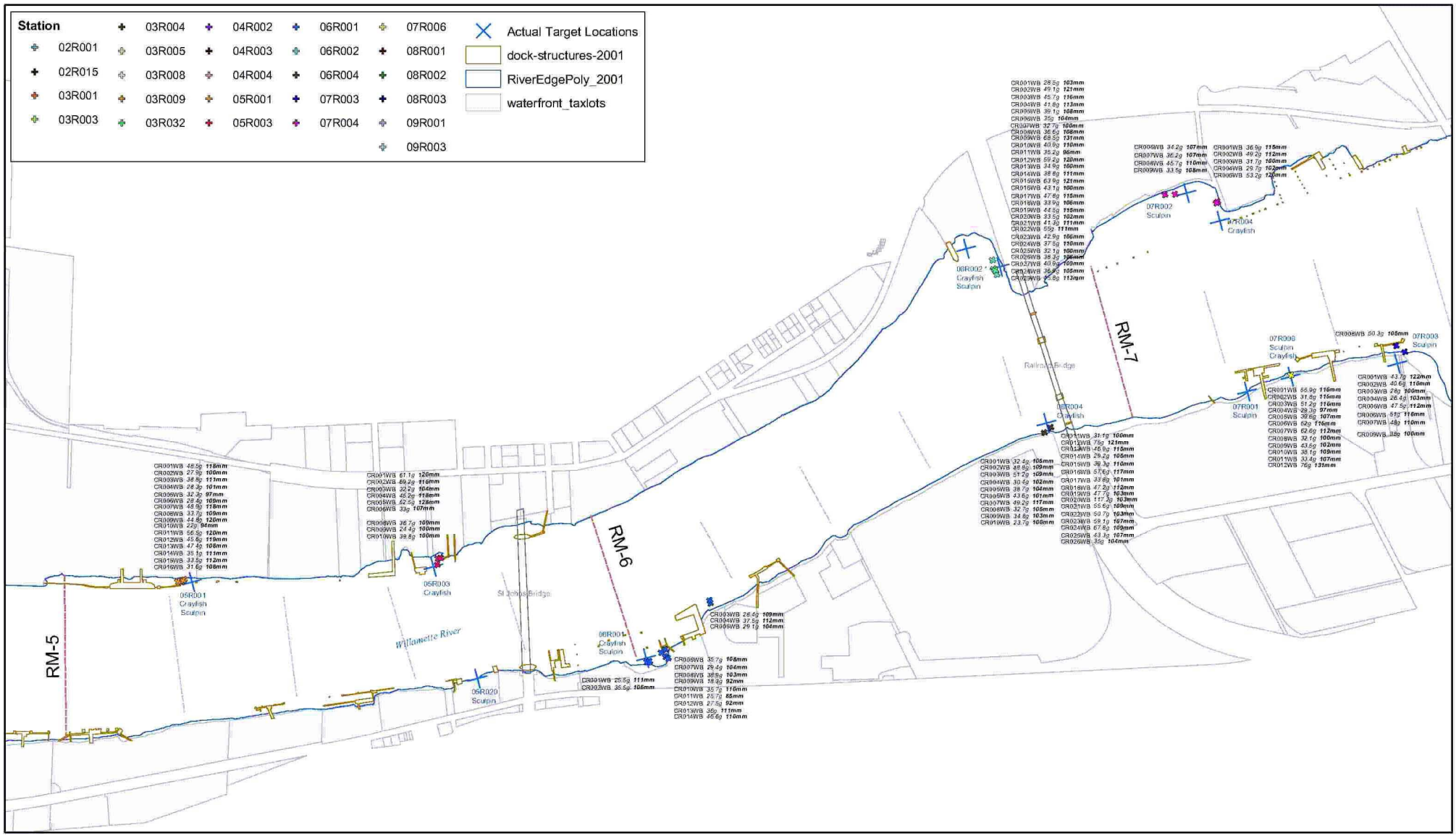
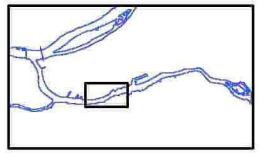
Figure 5-3a
Portland Harbor
2002 Field Sampling Report
Crayfish
with Weight (g) & Length (mm)

ANC02121
BZTO104(e)002121





LWG Lower Willamette Group

Triplin Environmental Associates

0 250 500 1,000 Feet

FEATURE SOURCES:
Transportation, Water, Property, Zoning or Boundaries. Metro RLIS.
Channel & River miles. Developed from US Army Corps of Engineers information.
River Edge: created by heads-up digitizing from the October 2001 0.33 ft. resolution color orthophotos.
Fish Data: Table B-1: Fish Tissue Data Master Table.
* Field Station Label Ids differ from Composite Label Ids, see Table B-1.
File Name: Crayfish_Final.mxd
Map Date: 02/03/2003

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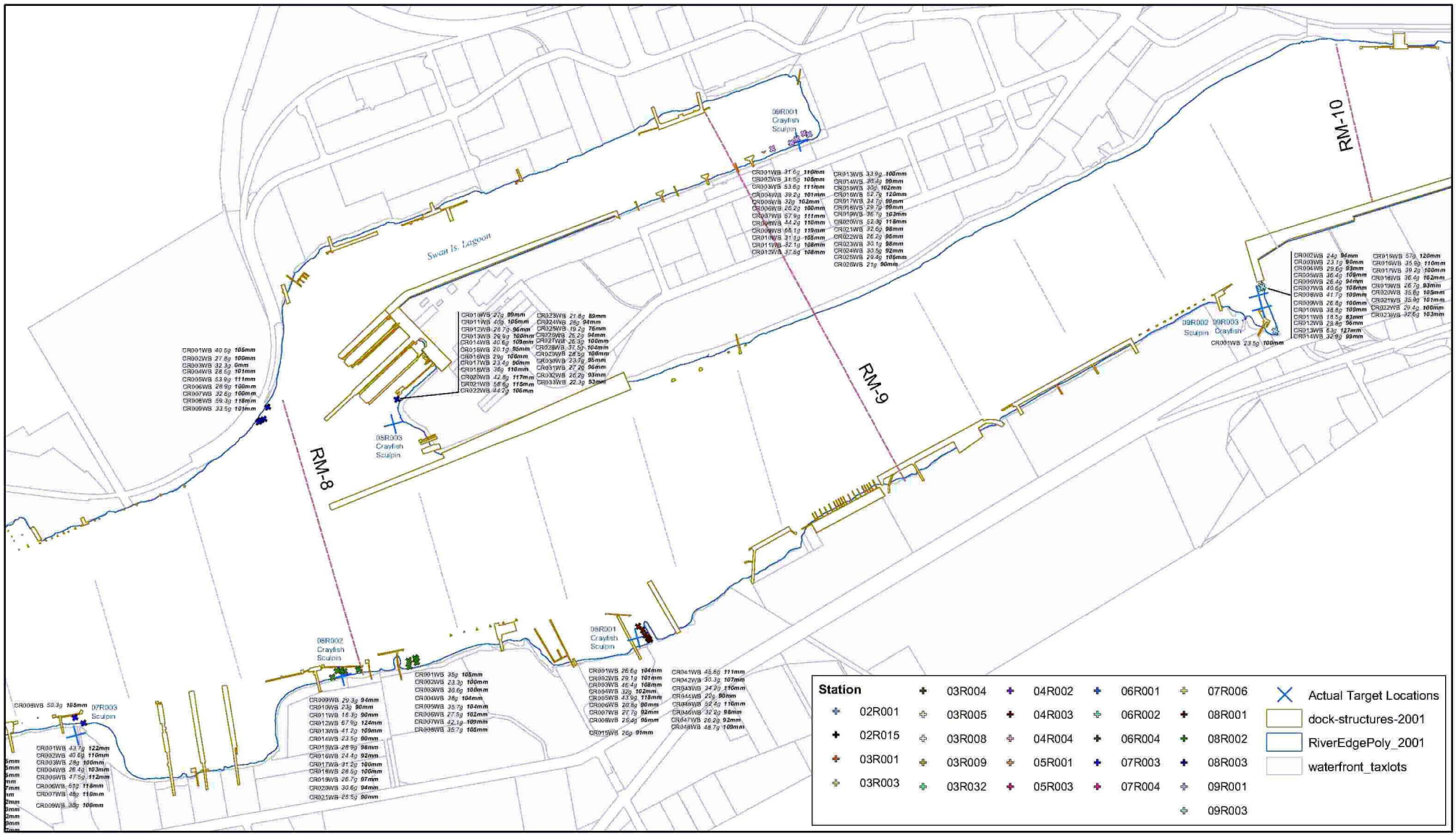
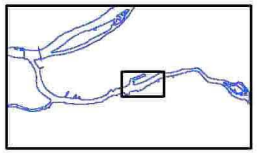
Figure 5-3b
Portland Harbor
2002 Field Sampling Report
Crayfish
with Weight (g) & Length (mm)

ANC02122
BZTO104(e)002122





LWG
Lower Willamette Group

Triplin Environmental Associates

0 250 500 1,000 Feet

FEATURE SOURCES:
Transportation, Water, Property, Zoning or Boundaries. Metro RLIS.
Channel & River miles. Developed from US Army Corps of Engineers information.
River Edge: created by heads-up digitizing from the October 2001 0.33 ft. resolution color orthophotos.
Fish Data: Table B-1: Fish Tissue Data Master Table.
* Field Station Label Ids differ from Composite Label Ids, see Table B-1.
File Name: Crayfish_Final.mxd
Map Date: 02/03/2003

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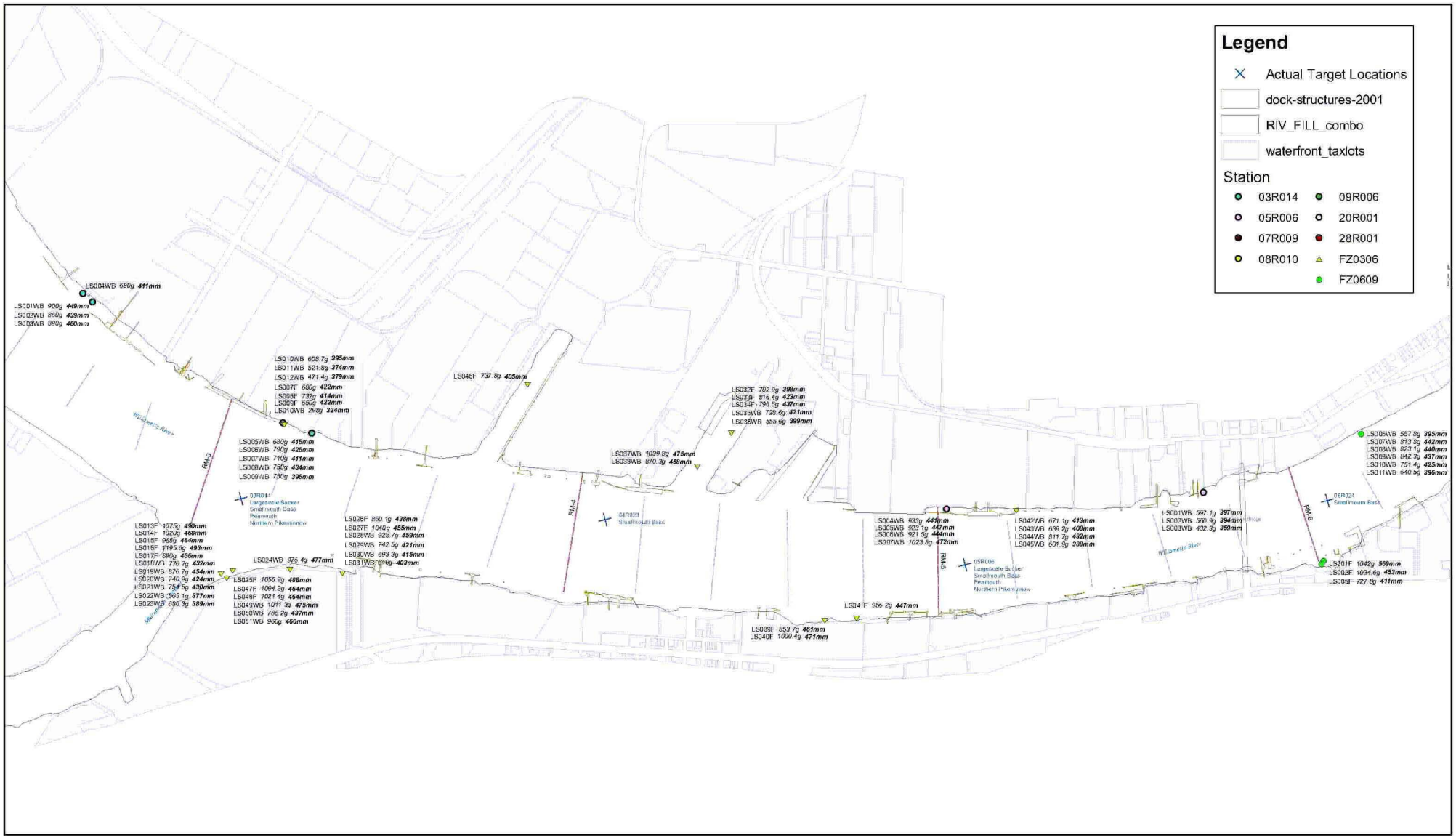
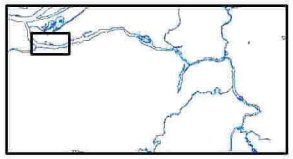
Figure 5-3c
Portland Harbor
2002 Field Sampling Report
Crayfish
with Weight (g) & Length (mm)

ANC02123
BZTO104(e)002123





LWG
Lower Willamette Group

Triplis Environmental Associates

0 500 1,000 2,000 Feet

FEATURE SOURCES:
Transportation, Water, Property, Zoning or Boundaries: Metro RLIS .
Channel & Rivermiles: Developed from US Army Corps of Engineers information.
River Edge: created by heads-up digitizing from the October 2001 0.33 ft. resolution color orthophotos.
Fish Data: Table B-1 Fish Tissue Data Master Table.

File Name: Final_Large_Scale_Sucker_1215.mxd

Map Date: 02/03/2003

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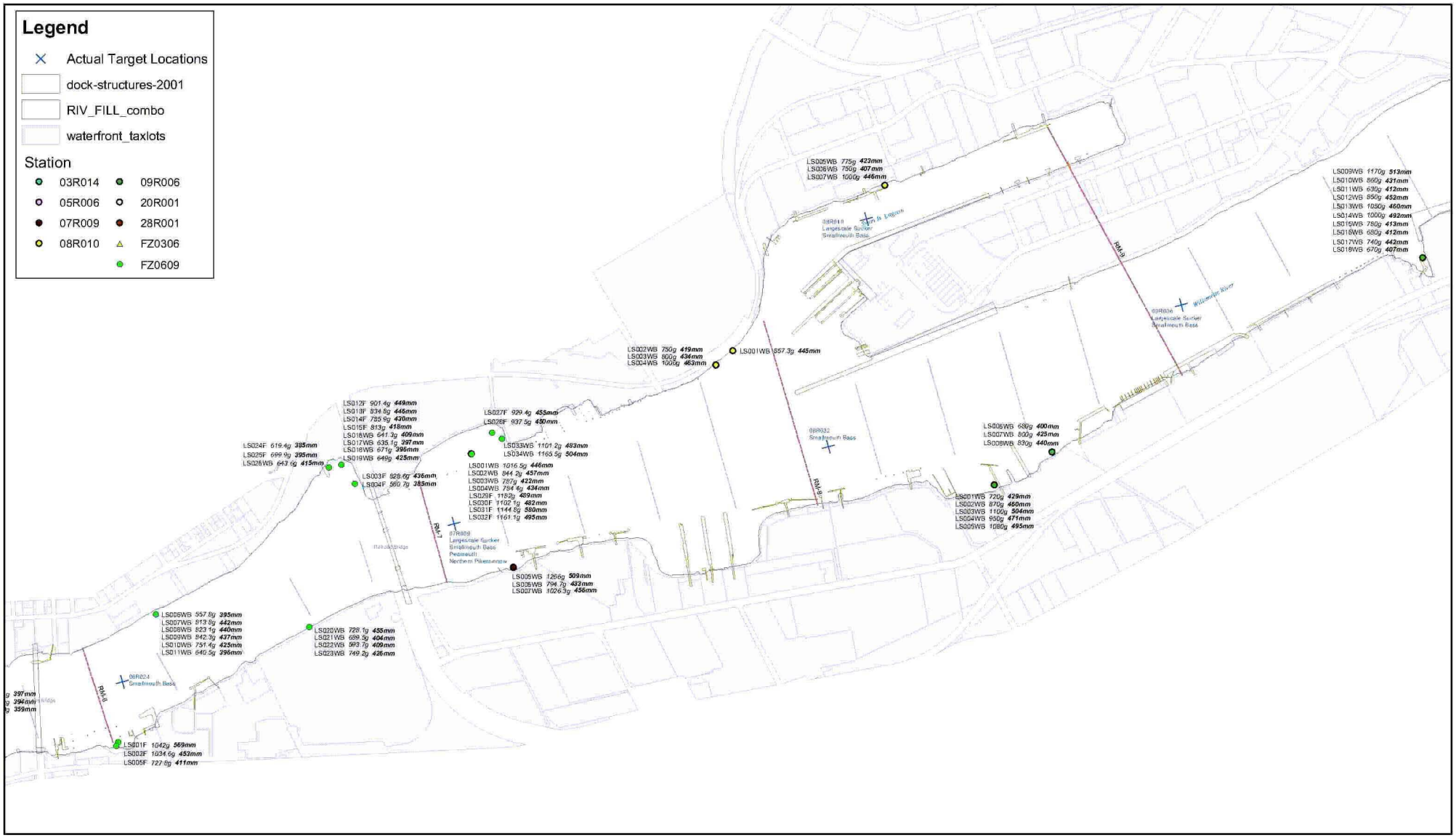
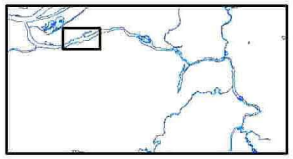
Figure 5-4a
Portland Harbor
2002 Field Sampling Report
Large Scale Sucker
with Weight (g) & Length (mm)

ANC02124
BZTO104(e)002124





LWG
Lower Willamette Group

Triplis Environmental Associates

0 500 1,000 2,000 Feet

FEATURE SOURCES:
Transportation, Water, Property, Zoning or Boundaries: Metro RLIS .
Channel & Rivermiles: Developed from US Army Corps of Engineers information.
River Edge: created by heads-up digitizing from the October 2001 0.33 ft. resolution color orthophotos.
Fish Data: Table B-1 Fish Tissue Data Master Table.

File Name: Final_Large_Scale_Sucker_1215.mxd

Map Date: 02/03/2003

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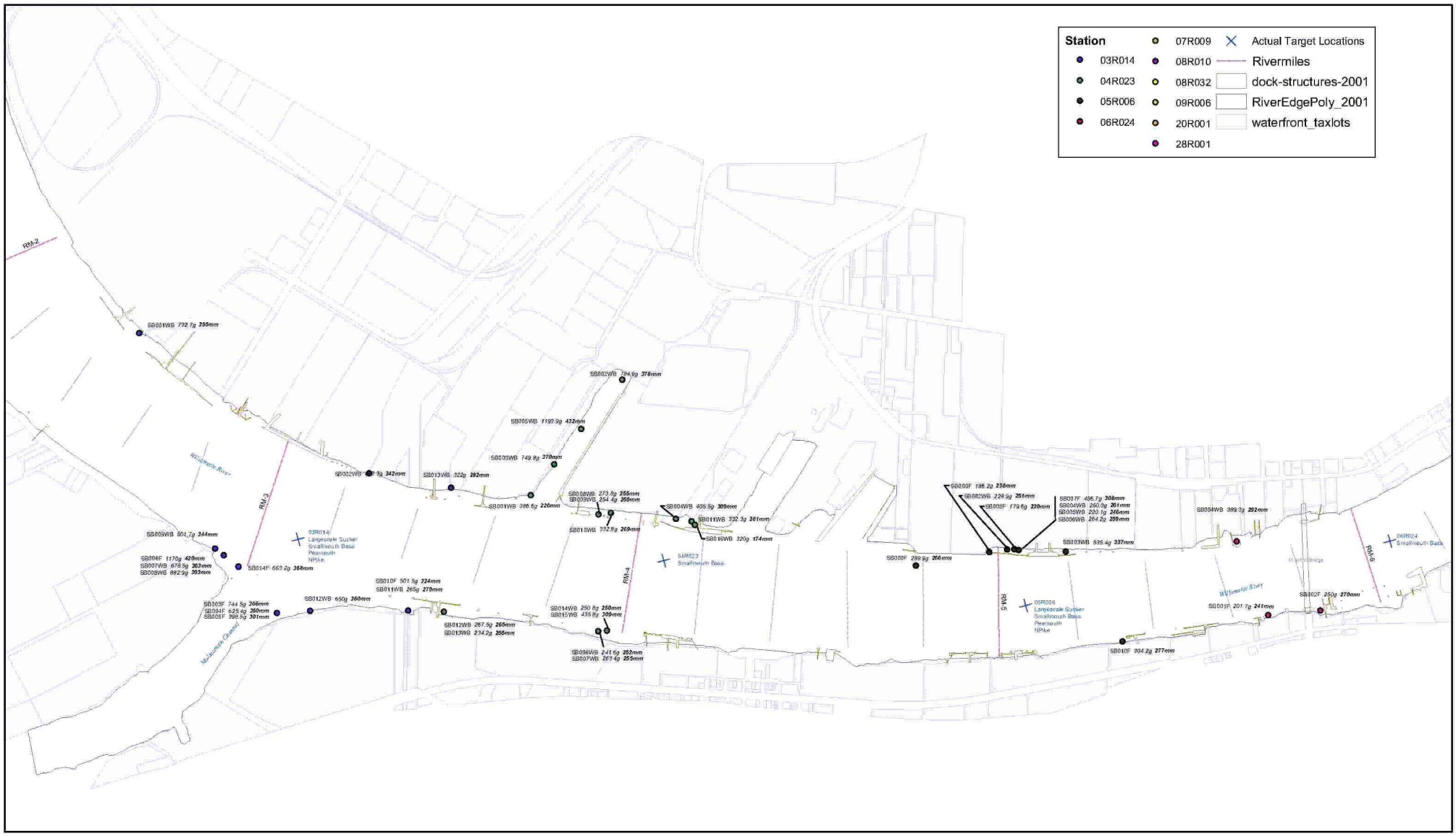
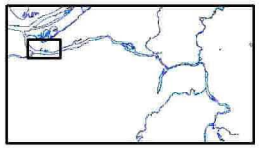
Figure 5-4b
Portland Harbor
2002 Field Sampling Report
Large Scale Sucker
with Weight (g) & Length (mm)

ANC02125
BZTO104(e)002125





LWG Lower Willamette Group

TRIPLIN Environmental Services

0 500 1,000 2,000 Feet

FEATURE SOURCES:
Transportation, Water, Property, Zoning or Boundaries: Metro RLIS.
Channel & River miles. Developed from US Army Corps of Engineers information.
River Edge: created by heads-up digitizing from the October 2001 0.33 ft. resolution color orthophotos.
Fish Data: Table B-1: Fish Tissue Data Master Table.

File Name: Final_Smallmouth Bass_1216.mxd

Map Date: 02/03/2003

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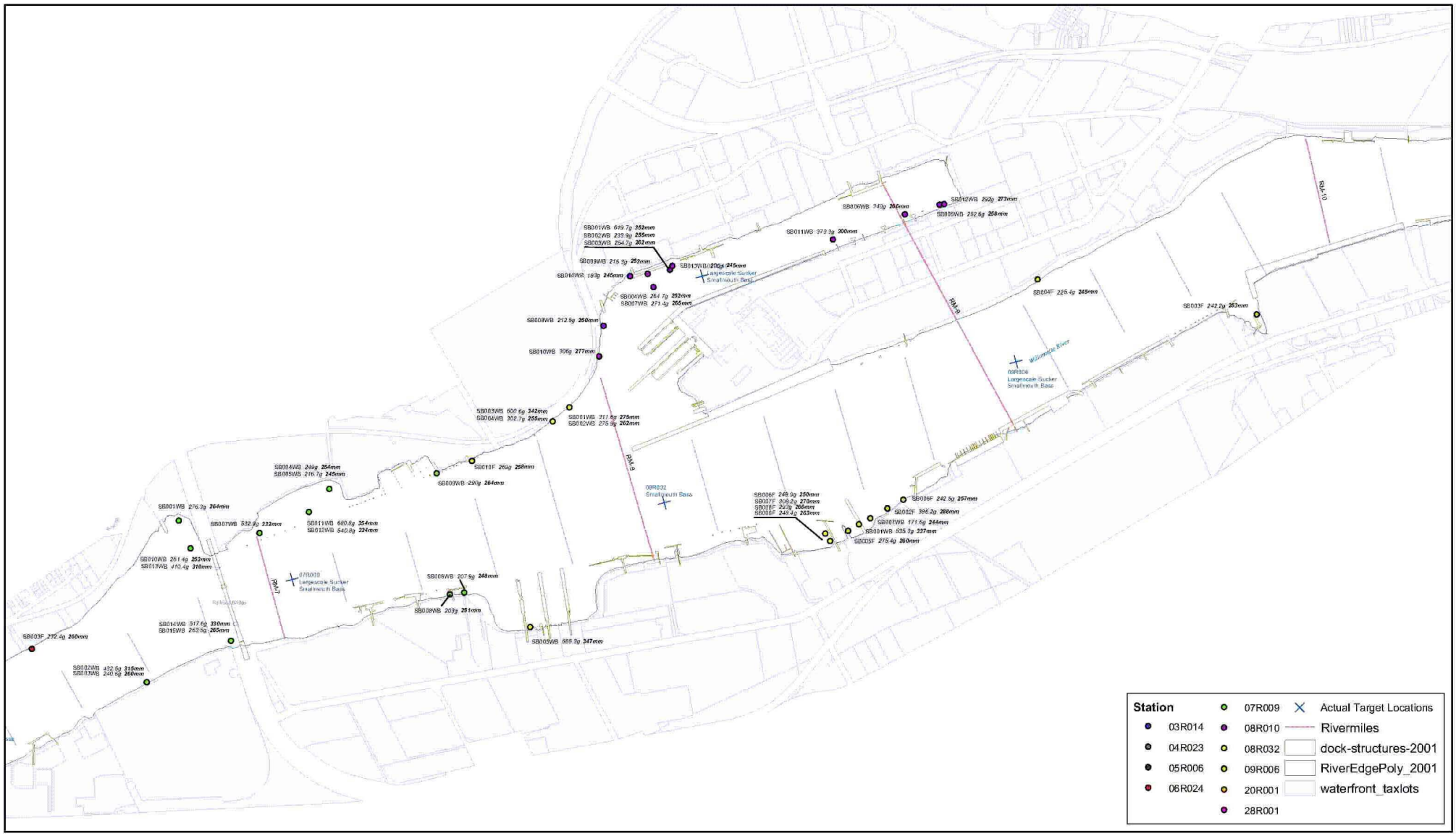
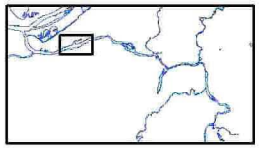
Figure 5-5a
Portland Harbor
2002 Field Sampling Report
Smallmouth Bass
with Weight (g) & Length (mm)





LWG
Lower Willamette Group

TRIPLIN Environmental Services

0 500 1,000 2,000 Feet

FEATURE SOURCES:
Transportation, Water, Property, Zoning or Boundaries: Metro RLIS.
Channel & River miles. Developed from US Army Corps of Engineers information.
River Edge: created by heads-up digitizing from the October 2001 0.33 ft. resolution color orthophotos.
Fish Data: Table B-1: Fish Tissue Data Master Table.

File Name: Final_Smallmouth Bass_1216.mxd

Map Date: 02/03/2003

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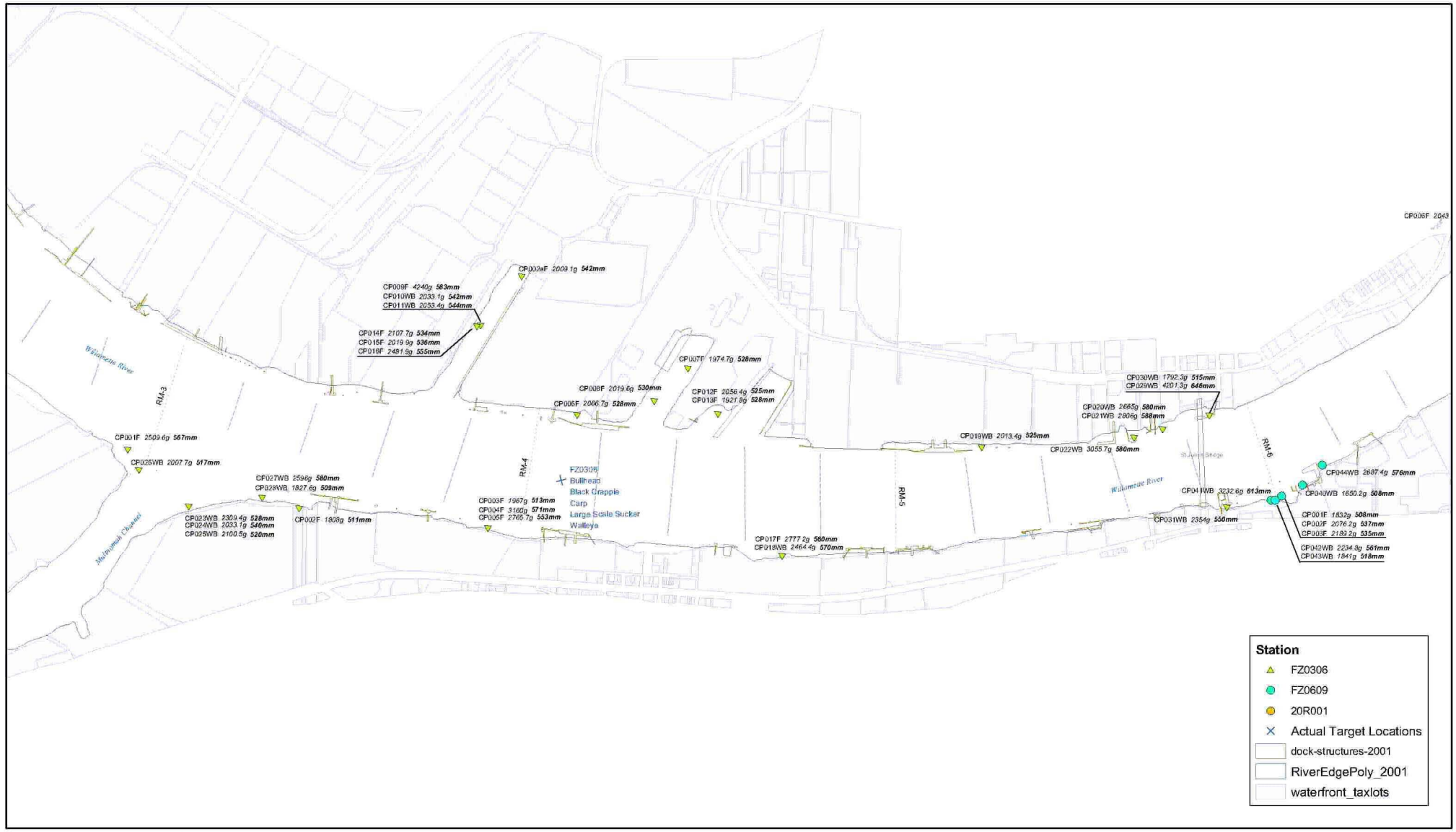
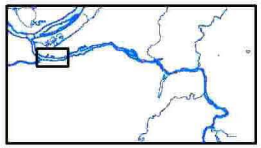
Draft

Figure 5-5b
Portland Harbor
2002 Field Sampling Report
Smallmouth Bass
with Weight (g) & Length (mm)





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FEATURE SOURCES:
Transportation, Water, Property, Zoning or Boundaries: Metro RLIS.
Channel & River miles: Developed from US Army Corps of Engineers information.
River Edge: created by heads-up digitizing from the October 2001 0.33 ft. resolution color orthophotos.
Fish Data: Table B-1: Fish Tissue Data Master Table.

File name: \Final_Carp_1216.mxd
Map Date: 02/03/2003

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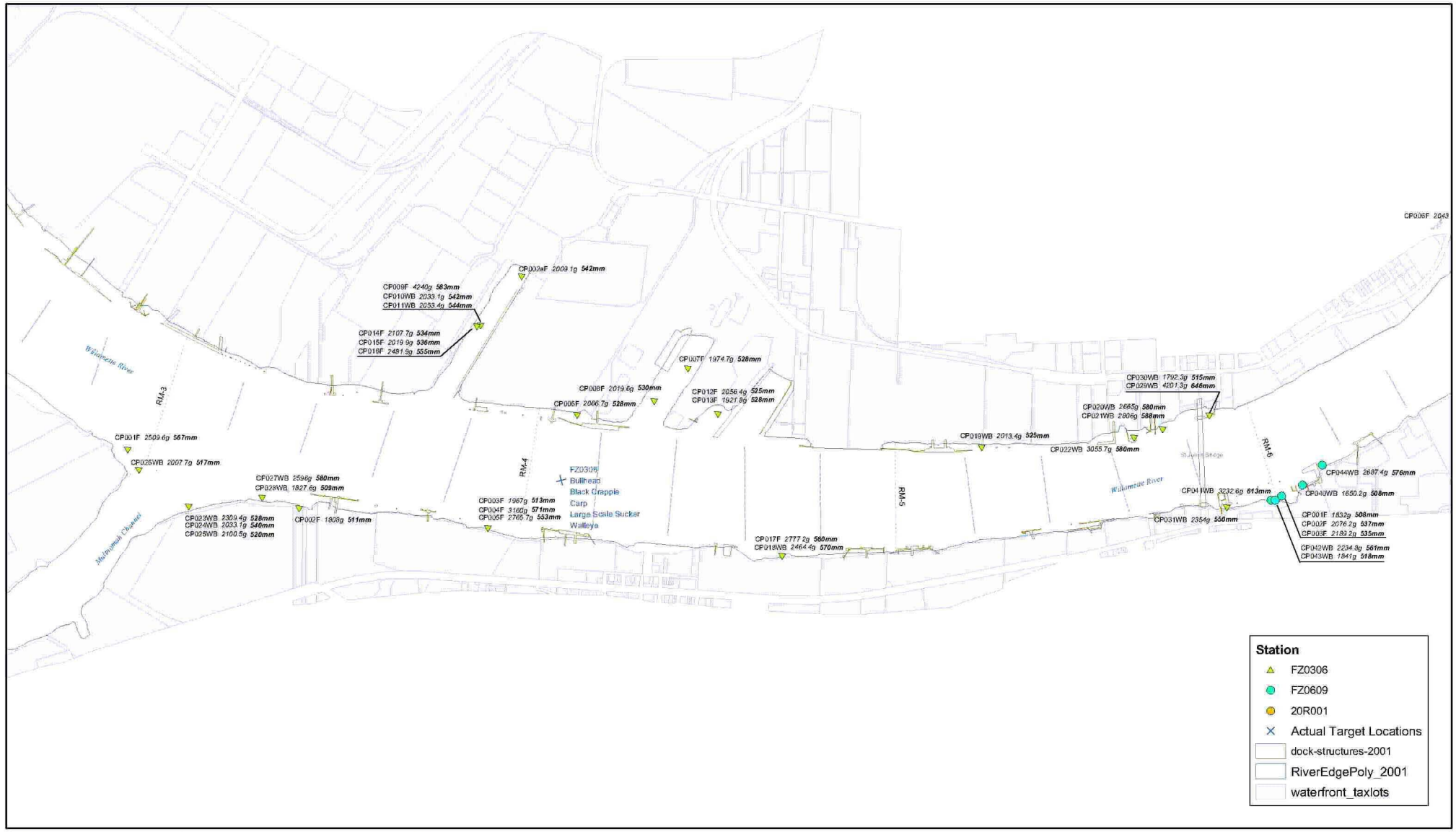
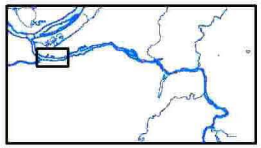
Draft

Figure 5-6a
Portland Harbor
2002 Field Sampling Report
CARP
with Weight (g) & Length (mm)

ANC02128
BZTO104(e)002128





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0 500 1,000 2,000 Feet

FEATURE SOURCES:
Transportation, Water, Property, Zoning or Boundaries: Metro RLIS.
Channel & River miles: Developed from US Army Corps of Engineers information.
River Edge: created by heads-up digitizing from the October 2001 0.33 ft. resolution color orthophotos.
Fish Data: Table B-1: Fish Tissue Data Master Table.

File name: \Final_Carp_1216.mxd
Map Date: 02/03/2003

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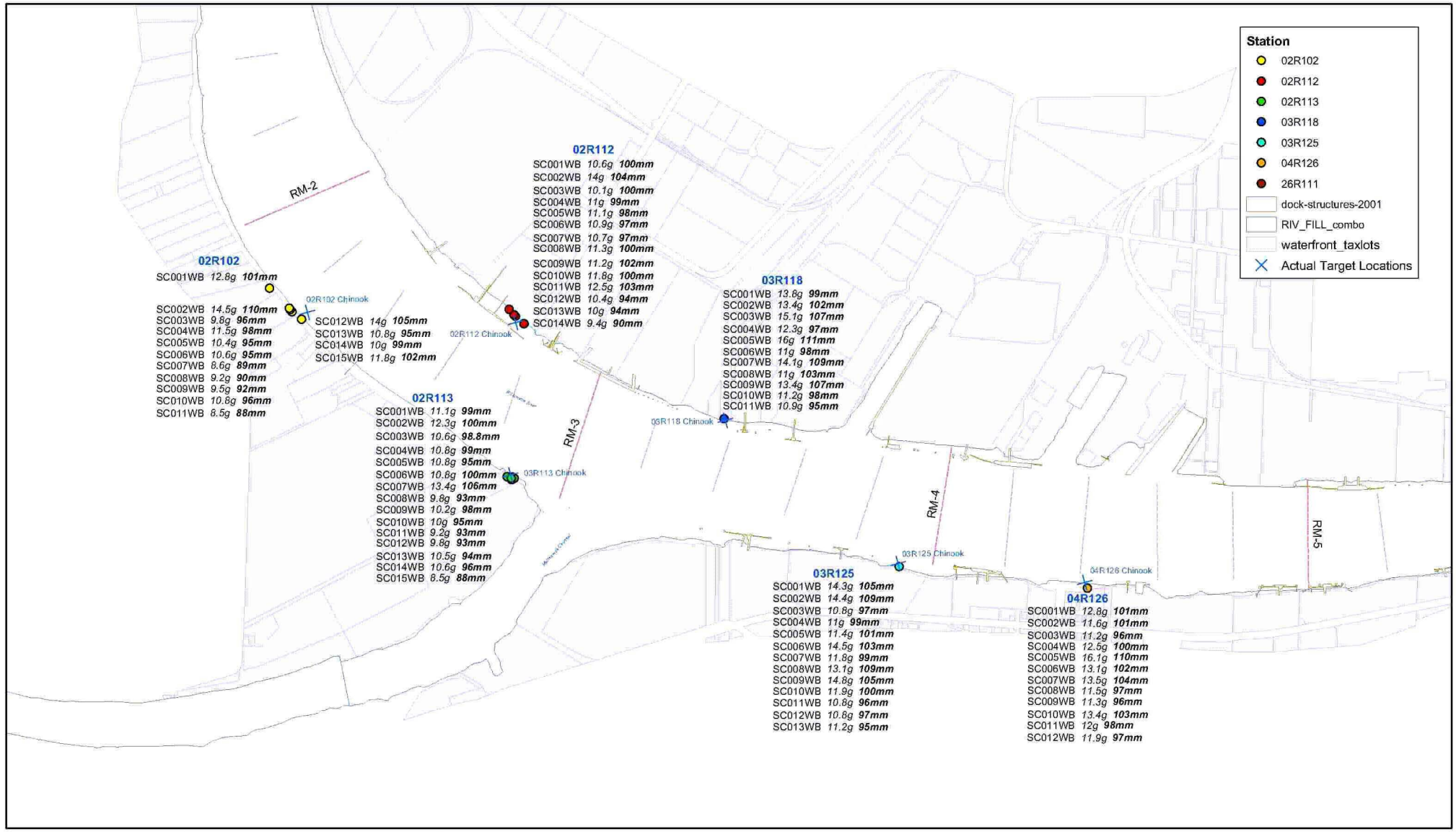
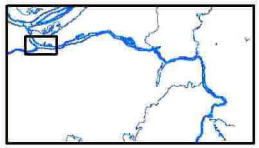
Draft

Figure 5-6b
Portland Harbor
2002 Field Sampling Report
CARP
with Weight (g) & Length (mm)





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FEATURE SOURCES:
Transportation, Water, Property, Zoning or Boundaries: Metro RLIS.
Channel & River miles: Developed from US Army Corps of Engineers information.
River Edge: created by heads-up digitizing from the October 2001 0.33 ft. resolution color orthophotos.
Fish Data: Table B-1. Fish Tissue Data Master Table.

File name: \Final_Chinook_1216.mxd
Map Date: 02/03/2003

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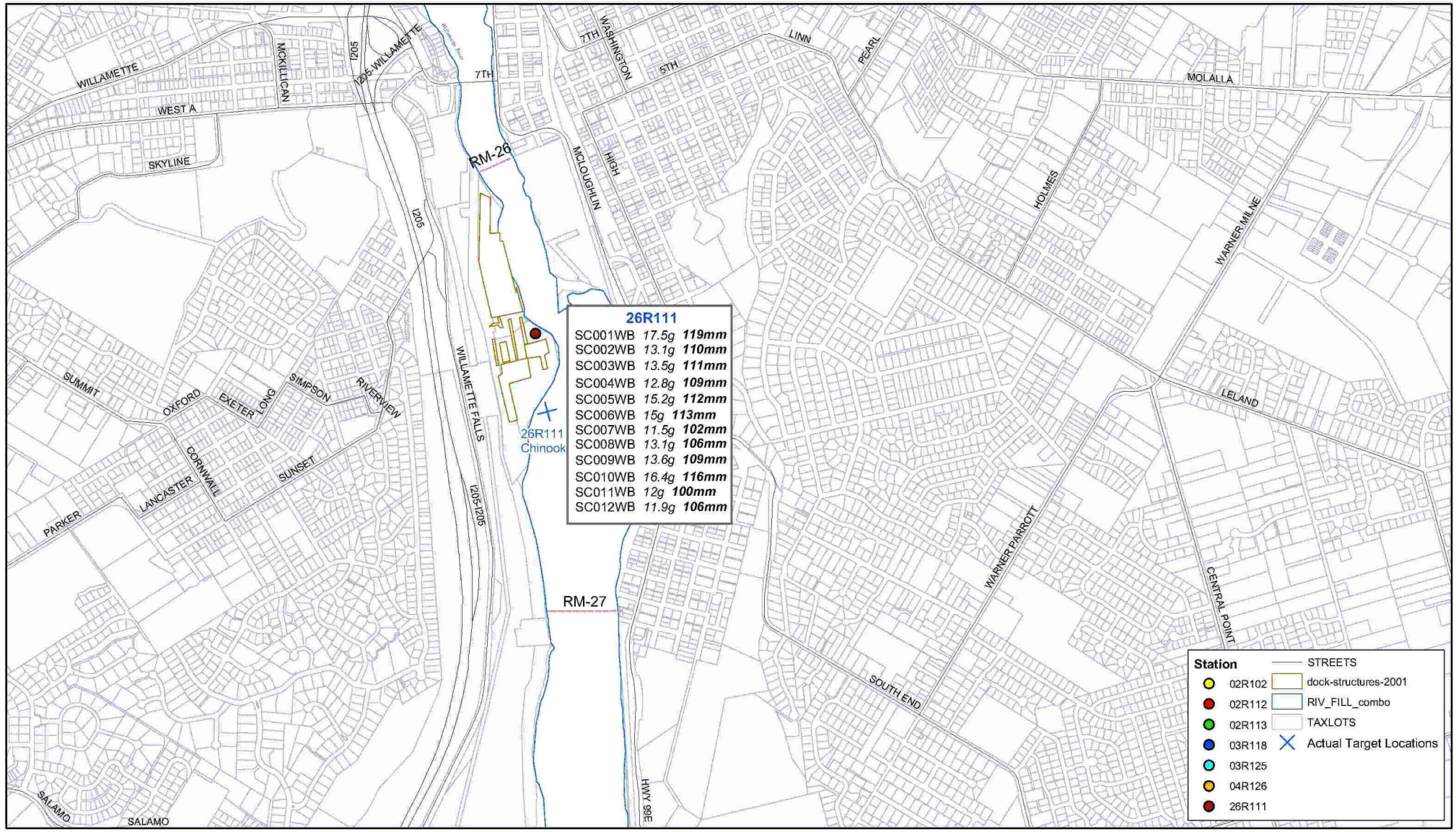
Figure 5-7a
Portland Harbor
2002 Feild Sampling Report
Sub-yearling Chinook
with Weight (g) & Length (mm)

ANC02130
BZTO104(e)002130



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0 500 1,000 2,000 Feet

FEATURE SOURCES:
Transportation, Water, Property, Zoning or Boundaries: Metro RLIS.
Channel & River miles: Developed from US Army Corps of Engineers information.
River Edge: created by heads-up digitizing from the October 2001 0.33 ft. resolution color orthophotos.
Fish Data: Table B-1. Fish Tissue Data Master Table.

File name: \Final_Chinook_1216.mxd
Map Date: 02/03/2003

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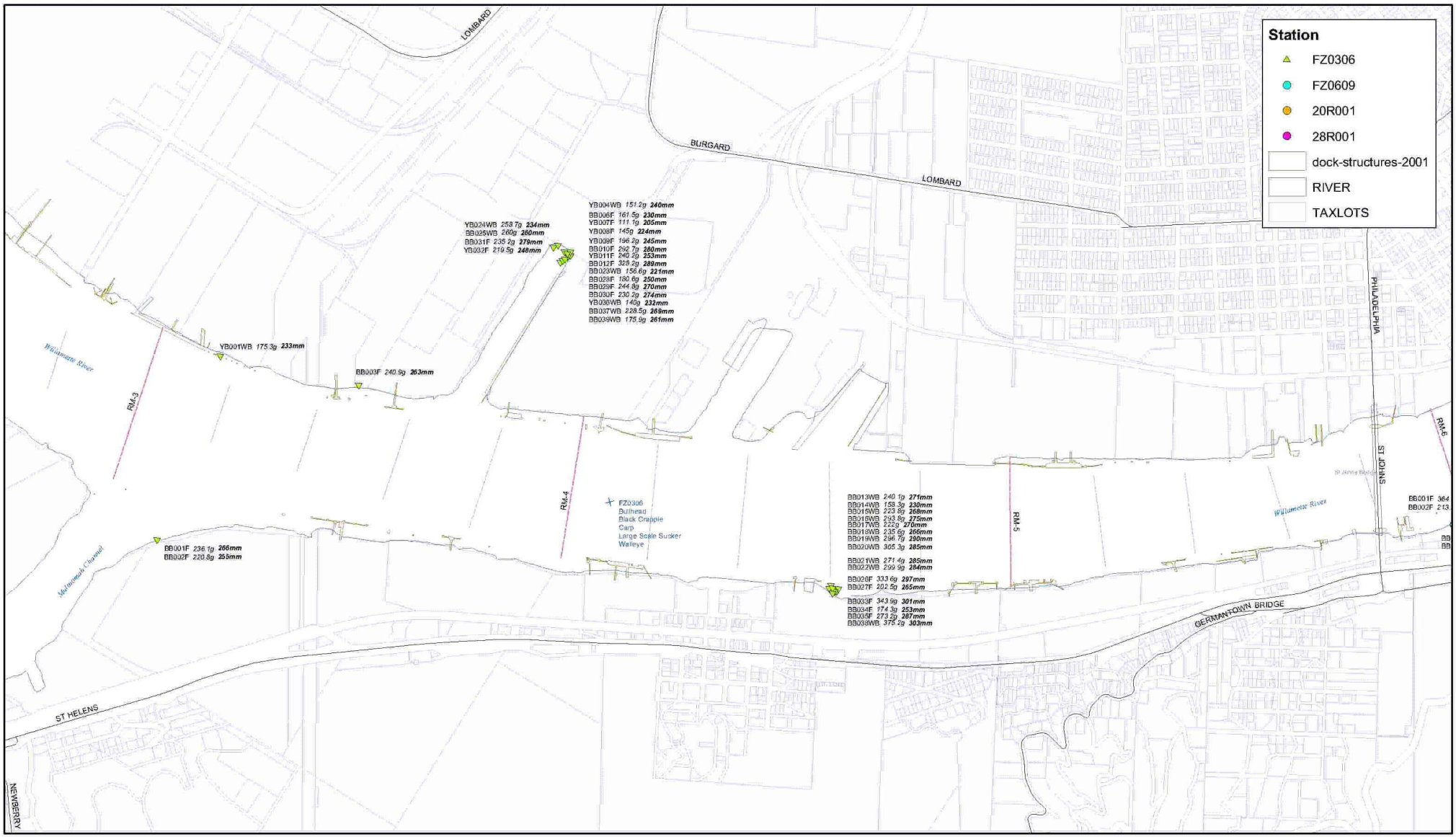
Draft

Figure 5-7b
Portland Harbor
2002 Feild Sampling Report
Sub-yearling Chinook
with Weight (g) & Length (mm)

ANC02131
BZTO104(e)002131



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Triflin Environmental Associates

0 500 1,000 2,000 Feet

FEATURE SOURCES:
Transportation, Water, Property, Zoning or Boundaries: Metro RLIS.
Channel & River miles: Developed from US Army Corps of Engineers information.
River Edge: created by heads-up digitizing from the October 2001 0.33 ft. resolution color orthophotos.
Fish Data: Table 5-1: Fish Tissue Data Master Table.

File Name: Bullhead1112.mxd

Map Date: 02/04/2003

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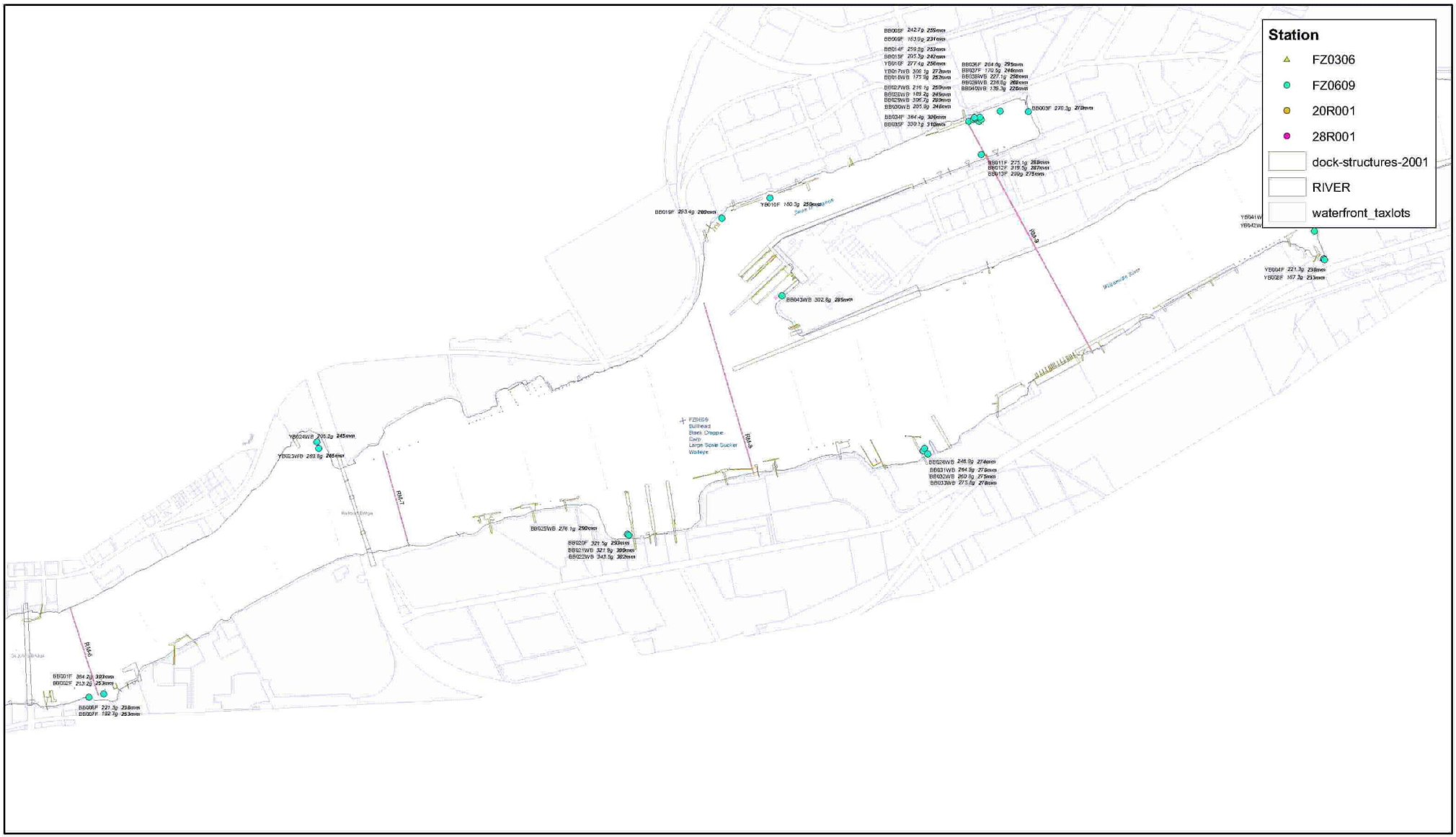
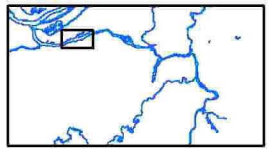
Draft

Figure 5-8a
Portland Harbor
2002 Field Sampling Report
Bullhead
with Weight (g) & Length (mm)

ANC02132
BZTO104(e)002132





LWG Lower Willamette Group

Triflin Environmental Associates

0 500 1,000 2,000 Feet

FEATURE SOURCES:
Transportation, Water, Property, Zoning or Boundaries: Metro RLIS.
Channel & River miles: Developed from US Army Corps of Engineers information.
River Edge: created by heads-up digitizing from the October 2001 0.33 ft. resolution color orthophotos.
Fish Data: Table 5-1: Fish Tissue Data Master Table.

File Name: Bullhead1112.mxd

Map Date: 02/04/2003

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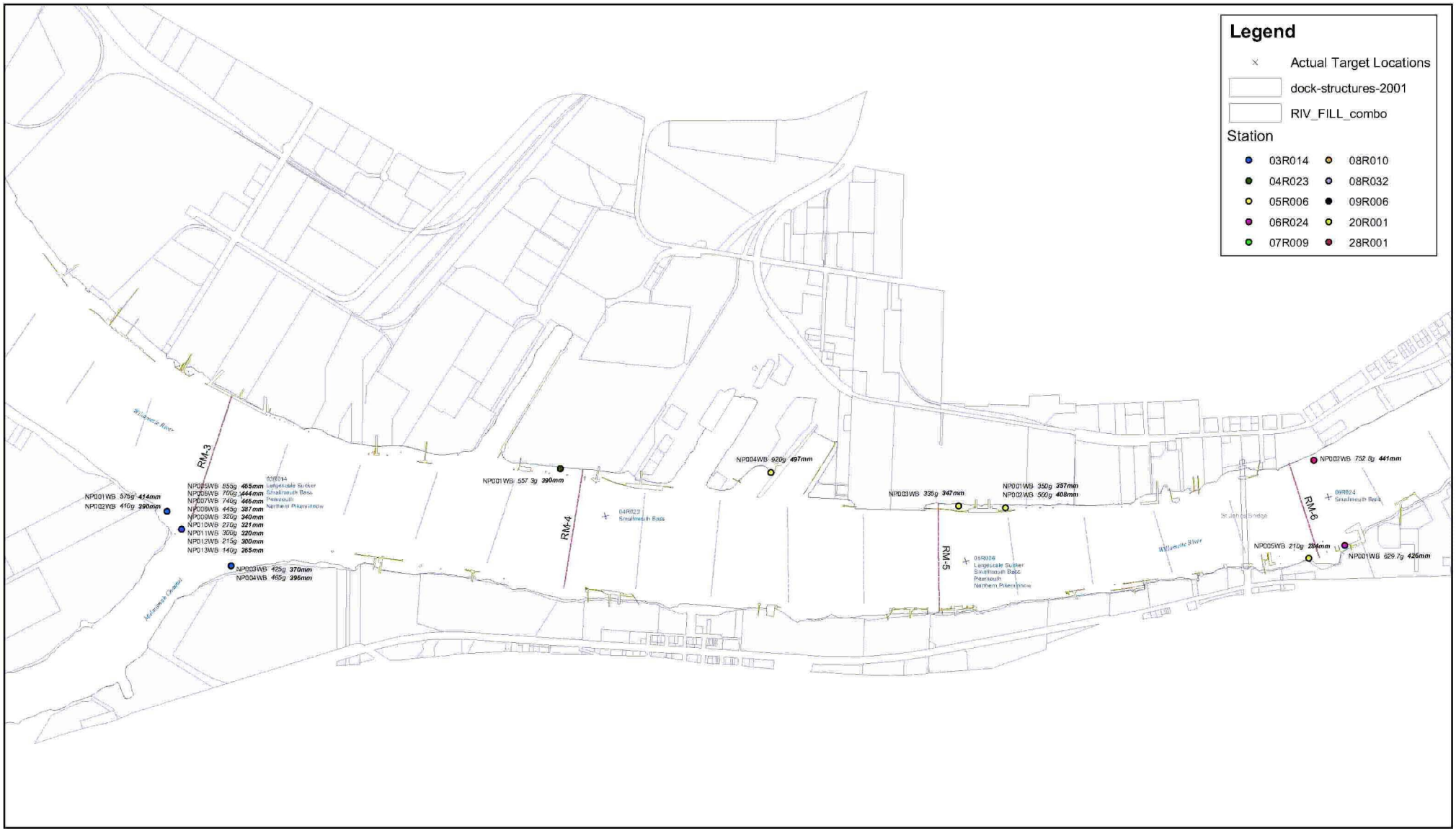
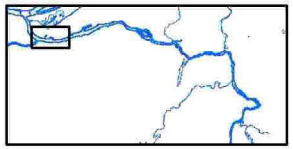
Draft

Figure 5-8b
Portland Harbor
2002 Field Sampling Report
Bullhead
with Weight (g) & Length (mm)

ANC02133
BZTO104(e)002133





LWG
LOWER WILLAMETTE GROUP

TRIPLIN Environmental Associates

0 500 1,000 2,000 Feet

FEATURE SOURCES:
Transportation, Water, Property, Zoning or Boundaries: Metro RLIS.
Channel & River miles: Developed from US Army Corps of Engineers information.
River Edge: created by heads-up digitizing from the October 2001 0.33 ft. resolution color orthophotos.
Fish Data: Table B-1 FishTissue Data Master Table.

File Name: Final_N_Pikeminnow_1215.mxd

Map Date: 02/04/2003

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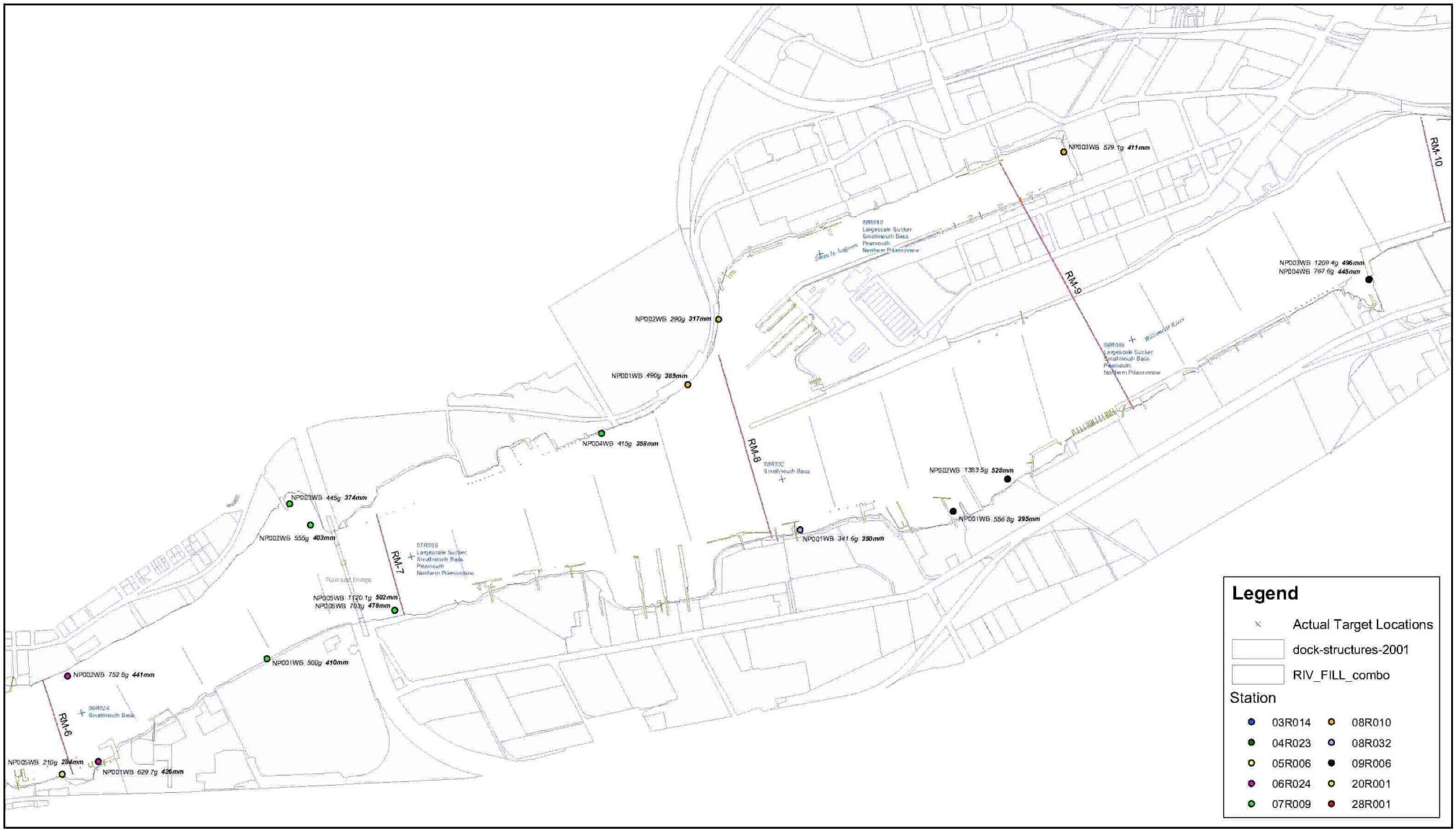
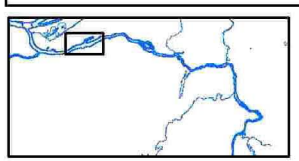
Figure 5-9a
Portland Harbor
2002 Field Sampling Report
Northern Pikeminnow
with Weight (g) & Length (mm)





LWG
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0 500 1,000 2,000 Feet

FEATURE SOURCES:
Transportation, Water, Property, Zoning or Boundaries: Metro RLIS.
Channel & River miles: Developed from US Army Corps of Engineers information.
River Edge: created by heads-up digitizing from the October 2001 0.33 ft. resolution color orthophotos.
Fish Data: Table B-1 FishTissue Data Master Table.

File Name: Final_N_Pikeminnow_1216.mxd

Map Date: 02/04/2003

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Figure 5-9b
Portland Harbor
2002 Field Sampling Report
Northern Pikeminnow
with Weight (g) & Length (mm)

ANC02135
BZTO104(e)002135

Figure 5-13. Lab Sample Storage Log Data Sheet.

ID						HHRA or ERA	Date Stored	Time Stored	Unit	Shelf	Date Shipped	Comments	Recorder
Phase	Location	Matrix	Species	Fish #	Tissue Type (FL, FS, WB)								
LWG01		TS											
LWG01		TS											
LWG01		TS											
LWG01		TS											
LWG01		TS											
LWG01		TS											
LWG01		TS											
LWG01		TS											
LWG01		TS											
LWG01		TS											
LWG01		TS											
LWG01		TS											
LWG01		TS											
LWG01		TS											
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LWG01		TS											
LWG01		TS											
LWG01		TS											
LWG01		TS											
LWG01		TS											
LWG02		TS											
LWG03		TS											
LWG04		TS											
LWG05		TS											
LWG06		TS											
LWG07		TS											
LWG08		TS											
LWG09		TS											

ANC02136
BZTO104(e)002136

Figure 5-14. Species Relabeling Check Sheet.

Date from	Old Species Code	New Species Code	Date Changed	Items to change				
				Label?	Process Sheet?	Storage Log?	Log Book?	Master Table?

ANC02137
BZTO104(e)002137

LWG
LOWER WILLAMETTE GROUP

PORTLAND HARBOR RI/FS

ROUND 2 SAMPLING OF BENTHIC INVERTEBRATE TISSUE FIELD SAMPLING REPORT

DRAFT

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February 20, 2006

Prepared for:
The Lower Willamette Group

Prepared by:
Windward Environmental LLC
Integral Consulting Inc.

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Appendix B. Field and Laboratory Notebooks and Clam Collection Forms (separate PDF document on accompanying CD)

Appendix C. Chain-of-Custody Forms (separate PDF document on accompanying CD)

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LIST OF ACRONYMS

Alta	Alta Analytical Laboratory
Axys	Axys Analytical Services Ltd.
CAS	Columbia Analytical Services, Inc.
DEQ	Oregon Department of Environmental Quality
DGPS	differential global positioning system
EDD	electronic data deliverable
EPA	US Environmental Protection Agency
ERA	ecological risk assessment
FSP	field sampling plan
GPS	global positioning system
HO	high output
hp	horsepower
Integral	Integral Consulting Inc.
LWG	Lower Willamette Group
NOAA	National Oceanic and Atmospheric Administration
PAH	polycyclic aromatic hydrocarbon
PCB	polychlorinated biphenyl
QAPP	quality assurance project plan
QA/QC	quality assurance and quality control
RI/FS	remedial investigation/feasibility study
RM	river mile
SDG	sample delivery group
STL	Severn Trent Laboratories
Study Area	Portland Harbor Superfund site study area
SVOC	semivolatile organic compound
EPA	US Environmental Protection Agency
VOC	volatile organic compound
Windward	Windward Environmental LLC
ww	wet weight

1.0 INTRODUCTION

Assessment of risk to invertebrates is an integral part of the ecological risk assessment (ERA) as outlined in the *Portland Harbor Remedial Investigation/ Feasibility Study Programmatic Work Plan* (Integral et al. 2004a). The primary line of evidence to assess risk to benthic invertebrates is the benthic toxicity testing program (Windward 2005b). A secondary line of evidence is the evaluation of invertebrate tissue chemical loading from the site. The Round 1 sampling effort included the collection of crayfish and a limited number (n=3) of clam samples for tissue chemical analysis (Integral 2004). Based on a review of these data, the Lower Willamette Group (LWG) and the US Environmental Protection Agency (EPA) determined that additional benthic invertebrate chemistry data were needed for several components of the ERA. LWG reviewed a number of potential sampling approaches for collecting sufficient tissue for invertebrates predominantly exposed through sediment and conducted a reconnaissance survey with a benthic sledge (Windward 2005a). Based on this effort, LWG concluded that the use of the benthic sledge in locations throughout the Portland Harbor Superfund site study area (Study Area) for collecting clams (*Corbicula* sp.) would provide the best opportunity to collect the mass of tissue required to meet analytical goals. Bioaccumulation testing would be conducted on freshwater oligochaetes (*Lumbriculus variegatus*) to estimate tissue concentrations for other common sediment-exposed benthic invertebrates. Bioaccumulation testing would also be conducted using *Corbicula fluminea* to facilitate the evaluation of the two difference exposure regimes (field and lab) and the subsequent tissue concentrations.

This field sampling report describes the objectives, methods, and procedures that were followed for collecting clams and sediment samples within the Study Area.

1.1 OBJECTIVES OF SAMPLING EFFORT

The specific objectives of the Portland Harbor Round 2 benthic invertebrate tissue sampling effort are to:

- Measure constituents in benthic invertebrate tissue samples that represent benthic invertebrate prey organisms within the Study Area for use in the ERA fish, bird, and mammalian dietary exposure models. It is expected that clams will be the predominate biomass and will be a surrogate for other species.
- Measure constituents in benthic invertebrate tissue samples that represent benthic organisms within the Study Area for use in

evaluating risk to benthic invertebrate organisms using the tissue-residue line-of-evidence in the ERA.

- Measure constituents in benthic invertebrate tissue samples that represent benthic organisms within the Study Area for use in calibrating the food web model.
- Use information from both field-collected and laboratory bioaccumulation tests to calculate a site-specific biota-sediment accumulation factor.

1.2 SUMMARY OF SAMPLING EFFORT

The benthic invertebrate tissue sampling effort was conducted as a series of sampling events. The first event was the field collection of clams. The collection was initiated November 28, 2005. A week later, on December 5, 2005, sediment collection was initiated by sampling at stations where the collection of clams had been completed. The sediment sampling at each station used a location-specific sampling approach, which was based on locations where clams had been successfully collected. Sediment was collected for both chemical analysis and bioaccumulation testing with two organisms, the clam *Corbicula fluminea* and the worm *Lumbriculus variegatus*. The clam sampling effort at the 33 locations was completed on December 14; and the sediment sampling effort was completed on December 20, 2005.

1.3 REPORT ORGANIZATION

The remaining sections of this document describe the field procedures used during the clam and sediment sampling efforts. Sections 2.0 and 3.0 present the clam sampling program and sampling procedures. Sections 4.0 and 5.0 present the sediment sampling program and collection procedures. Laboratory analyses are described in Section 6.0. Data management is described in Section 7.0, and reporting is described in Section 8.0. Cited references are listed in Section 9.0. Figures that show the tow lines and sampling locations for the 33 sampling stations are provided in Appendix A. Supporting information, which consists of field and laboratory notebooks and clam collection forms, is provided in Appendix B. Chain-of-custody forms for delivery of the sediment samples to the bioaccumulation laboratory are provided in Appendix C.

2.0 CLAM SAMPLING PROGRAM

The sampling of clams (*Corbicula* sp.) at the 33 EPA-approved locations (Figure 2-1) within the Study Area between River Mile (RM) 2 and RM 10 was conducted between November 28 and December 14, 2005 (Table 2-1). Sampling procedures for the collection of clams followed those detailed in the field sampling plan (FSP) (Windward and Integral 2005), the Round 2 quality assurance project plan (QAPP) (Integral and Windward 2004), and QAPP Addendum 6 (Integral 2005) (see Section 3.0). As stated in the FSP, all mussels and lamprey ammocoetes collected at the 33 stations were retained for possible chemical analysis.

Members of the regulatory agencies and trustees were present on November 28, 29, and 30, 2005, and on December 1, 5, 6, 7, 8, 9, 12, 13, and 14, 2005, to oversee field operations. Observers were Jennifer Peterson from the Oregon Department of Environmental Quality (DEQ), Joe Goulet and Eric Blishke from EPA, Jeremy Buck and Mike Szumscki from the US Fish and Wildlife Service, Chris Thompson and Aron Borok from Environmental International Ltd., and David Gillingham, Andrew Somes, and Jessie Bennett from Parametrix Inc.

0 0.375 0.75 1.5 Miles

0 0.5 1 2

N

Figure 2-1. Portland I
and sediment sampli

Table 2-1. Clam sampling dates by station

SAMPLING STATION	RM	LOCATION DESCRIPTION	SAMPLING DATE
LW2-BT001	2.0	downstream end of Oregon Steel Mill	Dec. 13, 2005
LW2-BT002	2.3	upstream end of Oregon Steel Mill	Dec. 13, 2005
LW2-BT003	3.0	south bank at mouth of Multnomah Channel	Dec. 13, 2005
LW2-BT004	3.2	near Time Oil	Dec. 12 and 13, 2005
LW2-BT005	3.6	navigation channel at mouth of the International Slip	Dec. 12, 2005
LW2-BT006	3.8	head of the International Slip (Schnitzer Slip)	Dec. 12, 2005
LW2-BT007	4.2	property line between Schnitzer and Terminal 4	Dec. 9 and 12, 2005
LW2-BT008	4.4	bottom of Terminal 4, Slip 1	Dec. 9, 2005
LW2-BT009	4.5	Wheeler Bay	Dec. 8 and 9, 2005
LW2-BT010	4.7	Terminal 4 upstream of Slip 3	Dec. 8, 2005
LW2-BT011	4.7	adjacent to Linnton Plywood	Dec. 8 and 13, 2005
LW2-BT012	4.8	Downstream of Arco seawall	Dec. 8, 2005
LW2-BT013	5.7	near Cathedral Park	Dec. 7, 2005
LW2-BT014	6.0	US Moorings embayment	Dec. 7 and 14, 2005
LW2-BT015	6.5	near Gasco	Dec. 5, 7, and 14, 2005
LW2-BT016	6.8	Willamette Cove	Dec. 5, 2005
LW2-BT017	6.9	downstream end of Arkema (near railroad bridge)	Dec. 5 and 7, 2005
LW2-BT018	7.2	adjacent to Arkema	Dec. 2, 2005
LW2-BT019	7.5	Reidell Cove (embayment at Triangle Park)	Dec. 2 and 14, 2005
LW2-BT020	7.6	Mouth of Salzman Creek	Dec. 1, 2005
LW2-BT021	7.8	McCall, upstream of Willbridge Docks	Dec. 5 and 7, 2005
LW2-BT022	8.2	mouth of Swan Island Lagoon (near the Coast Guard facility)	Nov. 29 and Dec. 6, 2005
LW2-BT023	8.2	adjacent to Portland Shipyard	Nov. 29 and Dec. 6, 2005
LW2-BT024	8.2	adjacent to Front Avenue	Dec. 1 and 6, 2005
LW2-BT025	8.3	Shaver Transportation/City of Portland outfall	Dec. 2 and 7, 2005
LW2-BT026	8.5	Mid-point of Swan Island Lagoon	Nov. 28 and 29 and Dec. 6 and 7, 2005
LW2-BT027	8.7	upstream of Portland Shipyard	Nov. 30, 2005
LW2-BT028	8.8	adjacent to Gunderson	Dec. 1 and 6, 2005

Table 2-1. Clam sampling dates by station

SAMPLING STATION	RM	LOCATION DESCRIPTION	SAMPLING DATE
LW2-BT029	9.2	west shore of Swan Island Lagoon	Nov. 28 and 29 and Dec. 2, 2005
LW2-BT030	9.5	downstream of "fireboat cove"	Nov. 30 and Dec. 1 and 6, 2005
LW2-BT031	9.6	upstream of Portland Shipyard, across from "fireboat cove"	Nov. 30 and Dec. 6, 2005
LW2-BT032	9.7	in "fireboat cove"	Nov. 29 and 30, 2005
LW2-BT033	10.0	Goldendale Aluminum	Nov. 30 and Dec. 6, 2005

RM – river mile

2.1 SAMPLING VESSELS

Clam sampling was conducted from a 25-ft-long Wooldridge jet boat with a hard top and a 454 high output (HO) engine. The aft deck had a hydraulic davit for maneuvering the benthic sledge in and out of the water and a large aluminum tray that was used when bringing the sledge on board. The forward covered deck space included a dry work area for the navigation system.

Processing of the clam samples was conducted on the vessel *Ross Island Sampler "1,"* provided by Benthic, LLC, of Portland, Oregon. The vessel was a 29-ft-long pontoon boat equipped with a 120-horsepower (hp) outboard engine. The forward deck space had two stainless steel tabletops for processing clam samples. The covered aft deck space included a dry work area for tables and seating for maintaining and completing paperwork (e.g., field forms).

2.2 NAVIGATION AND STATION POSITIONING

On-board navigation equipment was provided and operated by Integral Consulting Inc. (Integral) during deployment and retrieval. Horizontal control was obtained using a computer-integrated, differential global positioning system (DGPS). The horizontal projection used for all sampling activities was the North American Datum of 1983 (NAD83).

The navigation system on the sampling vessel consisted of a Trimble® (Pro XRS) DGPS unit that received real-time differential corrections from the continuously operating reference station at Appleton, Washington. The Trimble DGPS antenna was secured on top of the davit to achieve the most accurate position for each sample. Positional accuracies on the order of ± 2 to 3 meters were achieved with this system. The Trimble® DGPS receiver output was displayed to and recorded (in

real time) by an integrated navigation software package (Trimble® TerraSync™ v. 2.50) on a laptop computer.

The integrated navigation system displayed the vessel's position relative to the target sampling location in plan view on the laptop screen. The screen display and numeric navigation data, including range and bearing to the target sampling location, assisted the vessel operator in approaching a station position.

For each benthic sledge sampling attempt, global positioning system (GPS) data logging was initiated once the sledge touched river bottom. Cable was let out to a length of approximately four times the water depth. Water depth and cable length were recorded in the logbook. Once the cable winch was locked, the time for starting the tow was noted, and the navigation system continued to record the boat's positions for the duration of 1 minute. The actual tow location was corrected by subtracting the distance traveled without towing from the total tow length recorded by the GPS. Using simple trigonometry, the length subtracted was calculated from the point when the benthic sledge touched the river bottom and the time when the cable winch was locked for towing. The actual tow lines were corrected and plotted on a map using GIS software.

Sampling at each station was initiated by performing a tow with the benthic sledge at the target coordinates presented in the FSP. If no clams were found in the initial tow, the search area was expanded until clams were found. The remaining tows were then performed in close proximity to the successful tow. Each tow with the benthic sledge was tracked using the GPS. The approximate GPS coordinates for each sampling station are presented in Table 2-2, and the tows performed at each station are presented in Appendix A (Figures A-1 through A-33).

Table 2-2. Clam (*Corbicula* sp.) sampling stations

Sampling Station	RM	Latitude	Longitude	Location Description
LW2-BT001	2.0	45.63295395	122.7841927	downstream end of Oregon Steel Mill
LW2-BT002	2.3	45.62952908	122.7862422	upstream end of Oregon Steel Mill
LW2-BT003	3.0	45.61889279	122.8001467	south bank at the mouth of Multnomah Channel
LW2-BT004	3.2	45.6174134	122.7869734	near Time Oil
LW2-BT005	3.6	45.61126461	122.7830297	navigation channel at the mouth of the International Slip
LW2-BT006	3.8	45.61147137	122.7762645	head of the International Slip (Schnitzer Slip)
LW2-BT007	4.2	45.60521512	122.7796498	property line between Schnitzer and Terminal 4
LW2-BT008	4.4	45.60379764	122.7734671	bottom of Terminal 4, Slip 1
LW2-BT009	4.5	45.60234552	122.7770336	Wheeler Bay
LW2-BT010	4.7	45.59866512	122.7751594	Terminal 4, upstream of Slip 3

Table 2-2. Clam (*Corbicula* sp.) sampling stations

Sampling Station	RM	Latitude	Longitude	Location Description
LW2-BT011	4.7	45.59829985	122.7815199	adjacent to Linnton Plywood
LW2-BT012	4.8	45.5956608	122.7794175	Downstream of Arco seawall
LW2-BT013	5.7	45.58683554	122.7638528	near Cathedral Park
LW2-BT014	6.0	45.58273904	122.7635069	US Moorings embayment
LW2-BT015	6.5	45.57942816	122.7557269	near Gasco
LW2-BT016	6.8	45.58031554	122.746216	Willamette Cove
LW2-BT017	6.9	45.57548255	122.7480653	downstream end of Arkema (near railroad bridge)
LW2-BT018	7.2	45.57260817	122.7435026	adjacent to Arkema
LW2-BT019	7.5	45.57326388	122.7354583	Reidell Cove (embayment at Triangle Park)
LW2-BT020	7.6	45.56780577	122.740097	Mouth of Salzman Creek
LW2-BT021	7.8	45.56527984	122.7369542	McCall, upstream of Willbridge Docks
LW2-BT022	8.2	45.57008062	122.722990	mouth of Swan Island Lagoon (near the US Coast Guard facility)
LW2-BT023	8.2	45.56709331	122.7251289	adjacent to Portland Shipyard
LW2-BT024	8.2	45.56250001	122.7307168	adjacent to Front Avenue
LW2-BT025	8.3	45.55889776	122.7256773	Shaver Transportation/City of Portland outfall
LW2-BT026	8.5	45.56702991	122.7156668	Mid-point of Swan Island Lagoon
LW2-BT027	8.7	45.56035162	122.716782	upstream of Portland Shipyard
LW2-BT028	8.8	45.55662704	122.7201691	adjacent to Gunderson
LW2-BT029	9.2	45.56348112	122.7084414	west shore of Swan Island Lagoon
LW2-BT030	9.5	45.552813	122.710452	downstream of "fireboat cove"
LW2-BT031	9.6	45.55492489	122.7048278	upstream of Portland Shipyard across from "fireboat cove"
LW2-BT032	9.7	45.54967632	122.7048357	in "fireboat cove"
LW2-BT033	10.0	45.55108521	122.6953983	Goldendale Aluminum

RM – river mile

3.0 CLAM SAMPLING PROCEDURES

The following sections summarize the sampling and processing procedures used to collect clam samples with the benthic sledge. The procedures followed those detailed in the FSP for the Round 2 sampling of benthic invertebrate tissue (Windward and Integral 2005).

3.1 CLAM SAMPLE COLLECTION

Clams (*Corbicula* sp.) were collected at each of the 33 locations by towing a benthic sledge over the river bottom. Each tow was initiated by lowering the sledge to the bottom, letting out sufficient cable to maintain a scope of approximately 1:4 throughout the tow, and initiating the navigation system to track the tow line.[1] The sledge was then towed over the bottom for approximately 1 minute before it was slowly winched to the surface of the water. The contents of the sledge bag were sieved outboard by moving the sledge back and forth through the water. When the contents had been sieved as much as possible in the bag, the sledge was lifted on board, and the contents in the bag were transferred into a large 1.0- or 2.0-mm sieve. At this point, the sieve was transferred to the processing boat, and another tow was initiated. Tow information for each station, including the number of tows, tow durations, scopes, and sampling depths are summarized in Table 3-1.

Table 3-1. Clam (*Corbicula* sp.) sampling information

Sampling Station	RM	Location Description	Number of Tows	Sampling Depth (ft)	Scope[a]	Duration (minutes)
LW2-BT001	2.0	downstream end of Oregon Steel Mill	10	6 – 18	1:3 – 1:7	0.9 – 1
LW2-BT002	2.3	upstream end of Oregon Steel Mill	10	15 – 30	1:4 – 1:6	0.5 – 1
LW2-BT003	3.0	south bank at mouth of Multnomah Channel	10	25 – 30	1:4 – 1:5	0.5 – 1
LW2-BT004	3.2	near Time Oil	10	10 – 16	1:3 – 1:6	0.3 – 1
LW2-BT005	3.6	navigation channel at mouth of the International Slip	15	40 – 50	1:4	1 – 1.1
LW2-BT006	3.8	head of the International Slip (Schnitzer Slip)	10	8 – 17	1:4 – 1:5	0.7 – 1
LW2-BT007	4.2	property line between Schnitzer Slip and Terminal 4	11	12 – 45	1:3 – 1:4	0.5 – 1
LW2-BT008	4.4	bottom of Terminal 4, Slip 1	8	40	1:4	0.3 – 1
LW2-BT009	4.5	Wheeler Bay	17	5 – 15	1:3 – 1:8	0.5 – 1
LW2-BT010	4.7	Terminal 4, upstream of Slip 3	12	30 – 50	1:3 – 1:4	0.5 – 1

[1] The scope is the ratio of water depth to the length of the rope let out (i.e., a 1:4 scope is 1 m water depth to 4 m of rope let out).

Table 3-1. Clam (*Corbicula* sp.) sampling information

Sampling Station	RM	Location Description	Number of Tows	Sampling Depth (ft)	Scope[a]	Duration (minutes)
LW2-BT011	4.7	adjacent to Linnton Plywood	24	5 – 40	1:3 – 1:5	0.75 – 1
LW2-BT012	4.8	Downstream of Arco seawall	11	6 – 20	1:2 – 1:4	0.5 – 1
LW2-BT013	5.7	near Cathedral Park	15	5 – 50	1:2 – 1:5	0.3 – 1
LW2-BT014	6.0	US Moorings embayment	20	8 – 40	1:4 – 1:5	0.4 – 1
LW2-BT015	6.5	near Gasco	24	15 – 50	1:3 – 1:4	0.25 – 1
LW2-BT016	6.8	Willamette Cove	12	20 – 40	1:2 – 1:4	0.9 – 1.1
LW2-BT017	6.9	downstream end of Arkema (near railroad bridge)	11	15 – 25	1:4 – 1:5	0.75 – 1
LW2-BT018	7.2	adjacent to Arkema	11	20 – 35	1:3 – 1:6	0.75
LW2-BT019	7.5	Reidell Cove (embayment at Triangle Park)	16	10 – 20	1:4 – 1:6	0.5 – 1.25
LW2-BT020	7.6	Mouth of Salzman Creek	10	11 – 30	1:4	0.75 – 1
LW2-BT021	7.8	McCall, upstream of Willbridge Docks	15	10 – 30	1:3 – 1:7	1
LW2-BT022	8.2	mouth of Swan Island Lagoon (near the US Coast Guard facility)	14	20 – 30[b]	1:3 – 1:6[b]	0.5 – 1
LW2-BT023	8.2	adjacent to Portland Shipyard	14	20 – 40[b]	1:4 – 1:5[b]	0.5 – 1.2
LW2-BT024	8.2	adjacent to Front Avenue	16	5 – 15	1:4 – 1:7	0.7 – 1
LW2-BT025	8.3	Shaver Transportation/City of Portland outfall	16	11 – 20	1:3 – 1:7	1
LW2-BT026	8.5	Mid-point of Swan Island Lagoon	23	20 – 30[b]	1:4 – 1:5[b]	1
LW2-BT027	8.7	upstream of Portland Shipyard	12	23 – 40	1:4 – 1:5	0.5 – 1
LW2-BT028	8.8	adjacent to Gunderson	16	40	1:3	0.7 – 1
LW2-BT029	9.2	west shore of Swan Island Lagoon	20	18 – 25[b]	1:4[b]	1
LW2-BT030	9.5	downstream of "fireboat cove"	16	20 – 30	1:4 – 1:6	0.5 – 1
LW2-BT031	9.6	upstream of Portland Shipyard across from "fireboat cove"	14	25 – 35	1:4 – 1:5	0.6 – 1
LW2-BT032	9.7	in "fireboat cove"	11	3 – 20[b]	1:4 – 1:13[b]	0.75 – 1
LW2-BT033	10.0	Goldendale Aluminum	15	35 – 41	1:4 – 1:5	1

a The scope is the ratio of water depth to the length of the rope let out.

b Depth not available for all tows because depth sounder was not working the first couple of days.

RM – river mile

3.2 CLAM SAMPLE PROCESSING

In the processing boat, each clam was taken out of the sieve and rinsed with site water. The width of the clam was measured to estimate the soft tissue biomass using the equation presented in the FSP (Windward and Integral 2005) which was based on the site-specific clam width-biomass relationship established during the Round 1 benthic tissue sampling effort, and the clam was placed in a clean glass jar. The clams from each tow were kept in separate glass jars. The width

measurements and the estimated weights were recorded on the field collection forms (Appendix B). The clam samples were placed in a cooler with ice and transported to the field laboratory, where they were stored frozen until shipped to the chemical laboratory for shucking, compositing, and homogenization (see Section 6.2).

A composting approach was developed in cooperation with EPA and its partners regarding which tows should be included in the composited tissue sample from each station. During the field operations, the minimum required biomass as stated in the FSP (62 g ww) was reduced to 35 g ww based on conversations between the laboratories, project managers, and field crew. Based on the biomass estimates from the field the revised minimum biomass requirement was met at 24 stations. Table 3-2 presents the number of tows and the estimated biomass and numbers of clams included in the composited clam tissue samples collected at the 33 stations.

Table 3-2. Numbers of tows and clams (*Corbicula* sp.) and estimated biomass included in the composited sample by station

Station ID	Location	Total Number of Tows	Excluded from Sample			Included in Sample			Comments
			Tow Number	Number of Clams	Estimated Biomass (g ww)[a]	Tow Number	Number of Clams	Estimated Biomass (g ww)[a]	
BT001	downstream of Oregon Steel Mill	10	n	n	n	all tows with clams	106	64.82	
BT002	upstream of Oregon Steel Mill	10	n	n	n	all tows with clams	96	97.76	
BT003	Multnomah Channel	10	n	n	n	all tows with clams	71	81.80	
BT004	Time Oil	10	n	n	n	all tows with clams	102	76.14	
BT005	mouth of International Slip	15	n	n	n	all tows with clams	56	48.28	
BT006	head of International Slip	10	n	n	n	all tows with clams	171	217.57	
BT007	Schnitzer Slip and Terminal 4	11	2, 4	3	3.52	6, 7, 8, 9, 10, 11	39	52.66	Excluded tows were outside pilings.
BT008	Terminal 4, Slip 1	8[c]	n	n	n	all tows with clams	62	103.64	
BT009	Wheeler Bay	17	2, 3	3	0.28	4, 5, 6, 7, 8, 9, 10, 12, 13, 14, 15, 16, 17	63	42.84	Excluded tows were in the middle of the bay, not near the pilings.
BT010	Terminal 4, upstream of Slip 3	12	2	1	1.89	5, 7, 8, 9, 10, 11, 12	108	176.00	Excluded tow was further away from all other tows with clams.
BT011	Linnton Plywood	24	n	n	n	all tows with clams	32	18.23	
BT012	downstream of Arco seawall	11	n	n	n	all tows with clams	50	56.68	
BT013	Cathedral Park	15	n	n	n	all tows with clams	89	43.88	

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Table 3-2. Numbers of tows and clams (*Corbicula* sp.) and estimated biomass included in the composited sample by station

Station ID	Location	Total Number of Tows	Excluded from Sample			Included in Sample			Comments
			Tow Number	Number of Clams	Estimated Biomass (g ww)[a]	Tow Number	Number of Clams	Estimated Biomass (g ww)[a]	
BT014	US Moorings embayment	20	2, 3, 6, 7, 16	8	3.23	9, 10, 11, 12, 13, 14, 17, 18, 19, 20	36	49.80	The station was moved from the inner bay to outside the pilings.
BT015	Gasco	24	n	n	n	all tows with clams	32	29.24	
BT016	Willamette Cove	12	n	n	n	all tows with clams	34	27.68	
BT017	downstream of Arkema	11	n	n	n	all tows with clams	37	44.60	
BT018	Arkema	11	n	n	n	all tows with clams	16	22.10	
BT019	Reidell Cove	16	n	n	n	all tows with clams	41	35.38	
BT020	Saltman Creek	11	6	4	5.06	2, 3, 4, 5, 7, 8, 9, 10, 11	52	61.09	The excluded tow was at the mouth of the bay.
BT021	upstream of Willbridge Docks	15	n	n	n	all tows with clams	37	39.55	
BT022	US Coast Guard facility	14	n	n	n	all tows with clams	49	47.47	
BT023	Portland Shipyard	14	n	n	n	all tows with clams	35	17.25	
BT024	Front Avenue	16	n	n	n	all tows with clams	110	60.85	
BT025	Shaver Transportation	16	n	n	n	all tows with clams	22	36.50	

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Table 3-2. Numbers of tows and clams (*Corbicula* sp.) and estimated biomass included in the composited sample by station

Station ID	Location	Total Number of Tows	Excluded from Sample			Included in Sample			Comments
			Tow Number	Number of Clams	Estimated Biomass (g ww)[a]	Tow Number	Number of Clams	Estimated Biomass (g ww)[a]	
BT026	middle of Swan Island Lagoon	23	5, 7, 9, 13	11	5.87	8, 10, 12, 14, 15, 17, 18, 19, 20, 21, 23	50	33.69	Excluded tows were exploratory tows further way from the area where a patch of clams was found.
BT027	upstream of Portland Shipyard (replicate station)	12	n	n	n	all tows with clams	75	119.10	
BT028	Gunderson	16	n	n	n	all tows with clams	42	55.45	
BT029	end of Swan Island Lagoon	20	1, 5, 6	4	3.24	10, 13, 14, 15, 16, 19, 20	10	11.96	The station was moved to the other side of the lagoon.
BT030	downstream of "fireboat cove"	16	n	n	n	all tows with clams	69	58.84	
BT031	upstream of Portland Shipyard, across from "fireboat cove"	14	n	n	n	all tows with clams	41	56.03	
BT032	"fireboat cove"	11	n	n	n	all tows with clams	5	1.40	
BT033	Goldendale Aluminum	15	n	n	n	all tows with clams	14	20.81	

[a] Biomass estimated based on the equation: $y = 0.1841\ x^{(2.003)}$ (Windward and Integral 2005)

[b] Clams were not collected in every tow; therefore, total number of tows is not the sum of excluded and included tows at all stations.

ww – wet weight

n – no tow; clam or biomass was excluded

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3.3 MUSSEL SAMPLE COLLECTION AND PROCESSING

Two species of mussels, tentatively identified as *Margaritifera falcata* and *Anodonta nuttalliana,* were collected incidentally during the clam sampling effort and were retained for possible chemical analyses. Each mussel was taken out of the sieve, rinsed with site water, and placed in a clean glass jar. The amount of mussel soft tissue could not be estimated because an equation linking width and biomass was not available. Instead the width of the mussels was measured to indicate the size of the mussels and recorded on the field collection forms (Appendix B). The mussel samples were placed in a cooler with ice and transported to the field laboratory where they were stored frozen at the field laboratory pending possible shipment at a later date to the chemical laboratory for shucking, compositing, and homogenization. Table 3-3 presents number and size of the mussels collected at the 33 stations.

Table 3-3. Mussel sample collection information

Sampling Station	RM	Location Description	Number of Mussels	Tentative Identification	Mussel Width (mm)
LW2-BT001	2.0	downstream end of Oregon Steel Mill	3	Western pearlshell mussels (*Margaritifera falcata*)	81, 83, 89
LW2-BT002	2.3	upstream end of Oregon Steel Mill	2	Western pearlshell mussels (*Margaritifera falcata*)	73, 84
LW2-BT003	3.0	south bank at mouth of Multnomah Channel	1	Western pearlshell mussel (*Margaritifera falcata*)	81
LW2-BT004	3.2	near Time Oil	5	Western pearlshell mussels (*Margaritifera falcata*)	13, 14, 18, 25, 100
LW2-BT006	3.8	head of the International Slip (Schnitzer Slip)	3	Western pearlshell mussels (*Margaritifera falcata*)	81, 79, 34
LW2-BT007	4.2	property line between Schnitzer Slip and Terminal 4	1	Winged floater (*Anodonta nuttalliana*)	92
LW2-BT009	4.5	Wheeler Bay	4	Winged floaters (*Anodonta nuttalliana*)	82, 89, 92, 95
LW2-BT010	4.7	Terminal 4, upstream of Slip 3	1	Western pearlshell mussel (*Margaritifera falcata*)	92
LW2-BT011	4.7	adjacent to Linnton Plywood	1	Western pearlshell mussel (*Margaritifera falcata*)	110
LW2-BT012	4.8	Downstream of Arco seawall	1	Western pearlshell mussel (*Margaritifera falcata*)	58
LW2-BT013	5.7	near Cathedral Park	1	Western pearlshell mussel (*Margaritifera falcata*)	108
LW2-BT014	6.0	US Moorings embayment	1	Western pearlshell mussel (*Margaritifera falcata*)	76

Table 3-3. Mussel sample collection information

Sampling Station	RM	Location Description	Number of Mussels	Tentative Identification	Mussel Width (mm)
LW2-BT015	6.5	near Gasco	1	Western pearlshell mussel (*Margaritifera falcata*)	78
LW2-BT017	6.9	downstream end of Arkema (near railroad bridge)	1	Western pearlshell mussel (*Margaritifera falcata*)	85
LW2-BT021	7.8	McCall, upstream of Willbridge Docks	7	Western pearlshell mussels (*Margaritifera falcata*)	15, 76, 84, 87, 87, 91, 97
LW2-BT022	8.2	mouth of Swan Island Lagoon (near the US Coast Guard facility)	1	Western pearlshell mussel (*Margaritifera falcata*)	51
LW2-BT025	8.3	Shaver Transportation/City of Portland outfall	3	Western pearlshell mussels (*Margaritifera falcata*)	74, 97, 130
LW2-BT028	8.8	adjacent to Gunderson	1	Western pearlshell mussel (*Margaritifera falcata*)	75
LW2-BT033	10.0	Goldendale Aluminum	2	Western pearlshell mussels (*Margaritifera falcata*)	87, 94

RM – river mile

3.4 LAMPREY AMMOCOETE SAMPLE COLLECTION AND PROCESSING

Incidental Pacific lamprey ammocoetes collected during the clam sampling effort were retained for possible chemical analyses. Each ammocoete was taken out of the sieve, rinsed with site water, and placed in a clean glass jar. The ammocoete catch was recorded on the field collection forms (Appendix B) and the samples were placed in a cooler with ice and transported to the field laboratory. In the field laboratory, the ammocoetes were weighed, photographed, and the physical appearances were described briefly (Table 3-4). The samples were stored frozen at the field laboratory pending possible shipment at a later date to the chemical laboratory for compositing and homogenization.

Table 3-4. Information on lamprey ammocoetes collected during the clam sampling effort

Sampling Station	RM	Location Description	Biomass (g ww)	Color	Eyes	Teeth	Skin Condition/ Other Comments
LW2-BT001	2.0	downstream end of Oregon Steel Mill	1.8	pink/brown	dark spots and indentation where eyes should be (eyes appear to be beginning to form)	not visible (mouth closed)	nothing notable
LW2-BT003	3.0	south bank at mouth of Multnomah Channel	< 0.1[a]	pink/brown	not visible	not visible	nothing notable
LW2-BT005	3.6	navigation channel at mouth of International Slip	0.3	pink/brown	not visible	not visible	nothing notable
LW2-BT010	4.7	Terminal 4, upstream of Slip 3	1.1	pink/brown	not visible	not visible	two red bumps on anterior body side; may be result of freezing;
LW2-BT011	4.7	adjacent to Linnton Plywood	0.3	pink/brown	not visible	not visible	nothing notable
LW2-BT020	7.6	mouth of Salzman Creek	2.3	silver – darker on dorsal fin; lateral row of seven red dots posterior to each eye	present	present	nothing notable for skin condition; caudal fin visible
LW2-BT025	8.3	Shaver Transportation/ City of Portland outfall	0.8	pink/brown	not visible	not visible	nothing notable
LW2-BT027	8.7	upstream of Portland Shipyard	3.0	silver – darker on dorsal fin; lateral row of seven red dots posterior to each eye	present	present	nothing notable
LW2-BT027	8.7	upstream of Portland Shipyard	3.6	Silver – darker on dorsal fin; lateral row of seven red dots posterior to each eye	present	present	nothing notable
LW2-BT028	8.8	adjacent to Gunderson	0.8	pink/brown	not visible	not visible	nothing notable

[a] The accuracy of the scale was 0.1 g
RM – river mile
ww – wet weight

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3.5 EQUIPMENT DECONTAMINATION

The benthic sledge, sieves, and calipers were washed with Alconox™ soap and rinsed in site water before the sampling effort was initiated at each station.

3.6 TISSUE SAMPLE IDENTIFICATION SCHEME

All samples were assigned a unique identification code, as described in Section 2.4.2 of the FSP (Windward and Integral 2005), based on a sample designation scheme designed to meet the needs of field personnel, data management, and data users. This code indicates the project phase and sample type. The field-collected clam samples were shipped to the analytical laboratory in separate jars per tow for each station. The jars were labeled with the station (LW2-BTFC001 through LW2-BTFC033), tow, and collection time and date. The final composited samples created in the analytical laboratory will be labeled BTFC001 through BTFC033. The replicate clam tissue samples from stations BT006 and BT027 were created in the analytical laboratory and identified with "-1" or "-2" after the sample code. The field-collected mussel and lamprey samples will be shipped to the analytical laboratories at a later date labeled as LW2-BTFM0XX and LW2-BTFA00X, according to the analytical approach that will be developed by LWG and EPA and its partners.

3.7 FIELD QUALITY CONTROL/QUALITY ASSURANCE

Replicate clam samples were collected at two stations (BT027 and BT006) in compliance with the 5% frequency rate. The clams were not processed further in the field laboratory, so no rinse blanks were collected at the field laboratory.

Temperature blanks were used to measure and ensure cooler temperature during shipment to the analytical laboratory. One temperature blank was prepared and submitted with each cooler. The temperature blank consisted of a 50-mL plastic vial containing deionized water that was packed into the cooler in the same manner as the rest of the samples and labeled "temp blank."

3.8 TISSUE SAMPLE HANDLING, STORAGE, AND TRANSPORTATION

The clams collected in each tow were kept in separate glass jars. The clam samples were placed in a cooler with ice and transported to the field laboratory, where they were stored frozen until shipped at a later date to the analytical laboratory (CAS). For shipment, the clam samples were packed to prevent breakage and separated in the shipping container (ice cooler) by bubble wrap and/or other shock-absorbent material. Loose ice was placed in the cooler to help keep the samples frozen. Clam tissue samples were hand-delivered to CAS on January 17, 2006, with the exception of samples from station BT026, which were shipped the following day by overnight courier. Samples were placed in the freezer at the laboratory upon receipt. In the analytical laboratory, the clams were shucked, composited, and homogenized in accordance with the agreement reached with EPA and its partners about which tows to include in the composited tissue sample from each station.

The mussel and lamprey ammocoete samples were handled in a manner similar to that of the clam samples. The mussels and ammocoetes collected in each tow were kept in separate glass jars and stored frozen in the field laboratory. The mussel and ammocoete samples will be shipped to the analytical laboratory when an agreement on the composite and analytical approach has been reached with EPA and its partners.

3.9 CHAIN OF CUSTODY

Sample chain-of-custody procedures followed the guidelines provided in Section 3.2.2 of the FSP (Windward and Integral 2005). The chain-of-custody form was placed into a zip-lock bag and taped on the inside lid of each cooler. Each ice cooler was sealed with shipping tape and three chain-of-custody seals, which included the project name, date of shipment, and the name of the person sealing the cooler.

3.10 FIELD DOCUMENTATION

All field activities and observations were noted in bound field logbooks (Appendix B). Information included the personnel, date, time, station designation, number of tows, number of clams collected in each tow, and general observations. Any changes that occurred at the site (e.g., personnel, responsibilities, deviations from the FSP) and the reasons for these changes were documented in the field logbook.

A sample chain-of-custody form was established in the field laboratory for each tissue sample before it was shipped from the field laboratory to the analytical chemical laboratory. The chain-of-custody forms for the field-collected clam tissue samples are kept at Windward Environmental LLC's (Windward's) Seattle, Washington, office. The chain-of-custody forms for other tissue samples will be kept in the project file at Integral's Olympia, Washington, office.

4.0 SEDIMENT SAMPLING PROGRAM

Sediment sampling at the 33 EPA-approved locations within the Study Area between RM 2 and RM 11 was conducted between December 5 and 20, 2005 (Table 4-1). The sampling effort was conducted from one vessel during the first 8 days and from two vessels during the remaining 4 days. Sample processing was performed on a separate vessel. Sediment sampling procedures followed those detailed in the FSP (Windward and Integral 2005) (see Section 5.0).

Members of the regulatory agencies and trustees were present on December 8, 15, 16, and 20, 2005, to oversee field operations. Observers were Andrew Somes from Parametrix Inc. and Chris Thompson from Environmental International Ltd.

Table 4-1. Sediment sampling dates by station

SAMPLING STATION	RM	LOCATION DESCRIPTION	SAMPLING DATE
LW2-BT001	2.0	downstream end of Oregon Steel Mill	Dec. 19, 2005
LW2-BT002	2.3	upstream end of Oregon Steel Mill	Dec. 19, 2005
LW2-BT003	3.0	south bank at mouth of Multnomah Channel	Dec. 15, 2005
LW2-BT004	3.2	near Time Oil	Dec. 15, 2005
LW2-BT005	3.6	navigation channel at mouth of the International Slip	Dec. 16, 2005
LW2-BT006	3.8	head of the International Slip (Schnitzer Slip)	Dec. 16, 2005
LW2-BT007	4.2	property line between Schnitzer Slip and Terminal 4	Dec. 14, 2005
LW2-BT008	4.4	bottom of Terminal 4, Slip 1	Dec. 14, 2005
LW2-BT009	4.5	Wheeler Bay	Dec. 14, 2005
LW2-BT010	4.7	Terminal 4 upstream of Slip 3	Dec. 16, 2005
LW2-BT011	4.7	adjacent to Linnton Plywood	Dec. 15, 2005
LW2-BT012	4.8	Downstream of Arco seawall	Dec. 16, 2005
LW2-BT013	5.7	near Cathedral Park	Dec. 13, 2005
LW2-BT014	6.0	US Moorings embayment	Dec. 19, 2005
LW2-BT015	6.5	near Gasco	Dec. 20, 2005
LW2-BT016	6.8	Willamette Cove	Dec. 19, 2005
LW2-BT017	6.9	downstream end of Arkema (near railroad bridge)	Dec. 13, 2005
LW2-BT018	7.2	adjacent to Arkema	Dec. 16, 2005
LW2-BT019	7.5	Reidell Cove (embayment at Triangle Park)	Dec. 20, 2005
LW2-BT020	7.6	Mouth of Salzman Creek	Dec. 5 and 12, 2005
LW2-BT021	7.8	McCall, upstream of Willbridge Docks	Dec. 13, 2005
LW2-BT022	8.2	mouth of Swan Island Lagoon (near the US Coast Guard facility)	Dec. 8, 2005
LW2-BT023	8.2	adjacent to Portland Shipyard	Dec. 20, 2005
LW2-BT024	8.2	adjacent to Front Avenue	Dec. 12, 2005
LW2-BT025	8.3	Shaver Transportation/City of Portland outfall	Dec. 12, 2005

Table 4-1. Sediment sampling dates by station

SAMPLING STATION	RM	LOCATION DESCRIPTION	SAMPLING DATE
LW2-BT026	8.5	mid-point of Swan Island Lagoon	Dec. 12, 2005
LW2-BT027	8.7	upstream of Portland Shipyard	Dec. 6 and 12, 2005
LW2-BT028	8.8	adjacent to Gunderson	Dec. 8, 2005
LW2-BT029	9.2	west shore of Swan Island Lagoon	Dec. 9, 2005
LW2-BT030	9.5	downstream of "fireboat cove"	Dec. 9, 2005
LW2-BT031	9.6	upstream of Portland Shipyard, across from "fireboat cove"	Dec. 9, 2005
LW2-BT032	9.7	in "fireboat cove"	Dec. 7, 2005
LW2-BT033	10.0	Goldendale Aluminum	Dec. 19, 2005

RM – river mile

4.1 SAMPLING VESSELS

The research vessel *Peter R*, a flat-deck, 26-ft-long catamaran with twin 120-hp engines, was used for sediment sampling. The vessel was equipped with a hydraulically operated A-frame with a boom, a 1,000-lb-capacity hydraulic winch, and a computer-integrated DGPS.

The second sediment sampling vessel used December 15, 16, 19, and 20 was a 25-ft-long Wooldridge jet boat with a hardtop and a 454 HO engine. The aft deck had a hydraulic davit for maneuvering a Van Veen grab sampler in and out of the water and a large aluminum tray that was used when bringing the grab sampler on board. The forward covered deck space included a dry work area for the navigation system.

Two processing boats, the merchant vessels *Cutlass* and *Flasher*, were used on separate days during the sampling effort. The *Cutlass* was a 28-ft-long Monak with a 350 Chevy inboard engine; the *Flasher* was a 36-ft-long jet boat built by L&J Hydraulics with a twin 460 Ford engine and 10 by 10 Hamilton power jets.

4.2 NAVIGATION AND STATION POSITIONING

The same navigation equipment was used for the sediment sampling as for the clam sampling effort (see Section 2.2).

The sediment sampling at each location was based on a location-specific sampling approach developed in consultation with the EPA agency team. At each station where clams were successfully collected, the riverbed area actually trawled by the

benthic sledge during the clam collection defined the target sampling area. These areas varied in their size and shape from location to location as a function of the search effort needed to collect sufficient clam biomass. Based on a map that showed the tow lines along which the clams were collected at each station, a maximum of eight sampling targets were selected in consultation with EPA. An effort was made to situate the target grab locations proportionally to the subareas where the clams were collected. The individual grab samples were combined to generate one composite sediment sample per station. The individual GPS coordinates for each sampling location (subarea) within a station are presented in Table 4-2. If several samples were taken within a sampling location, the average value for each coordinate was calculated and included in the table. The grab sampling locations at each station are presented in Appendix A (Figures A-1 through A-33)

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Table 4-2. Individual GPS coordinates for each sampling location within the 33 stations

	Subarea A		Subarea B		Subarea C		Subarea D		Subarea E		Subarea F		Subarea G	
Station	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y
LW2-BT001	7617949.15	725219.56	7617917.24	725181.55	7617911.32	725144.15	7617843.75	725125.82	7617859.28	725092.91	7617835.87	725026.15	7617818.77	725049.56
LW2-BT002	7617344.76	723971.95	7617341.66	723942.01	7617319.18	723913.016	7617311.42	723920.44	7617266.35	723814.69	7617245.27	723773.57	na	na
LW2-BT003	7613609.92	720127.64	7613595.24	720107.473	7613657.22	720131.70	7613648.67	720112.25	7613701.23	720110.354	7613716.88	720091.58	na	na
LW2-BT004	7616983.26	719530.28	7617015.33	719530.28	7617007.94	719489.90	7617004.78	719476.67	7617013.18	719440.59	7617008.67	719442.40	na	na
LW2-BT005	7617999.64	717197.06	7617983.65	717194.99	7617966.19	717211.50	7617944.74	717198.03	7617927.88	717211.64	7617895.90	717212.30	na	na
LW2-BT006	7619613.22	717233.56	7619637.09	717222.795	7619666.15	717230.761	7619675.74	717242.862	7619716.35	717241.96	7619793.62	717229.39	na	na
LW2-BT007	7618731.07	715020.81	7618749.88	714986.96	7618713.21	715027.24	7618734.90	714998.11	7618778.53	714925.24	7618785.27	714884.56	na	na
LW2-BT008	7620358.65	714391.56	7620378.37	714398.24	7620329.68	714403.74	7620312.98	714426.34	7620310.48	714412.98	7620282.79	714452.73	7620279.50	714431.30
LW2-BT009	7619406.75	713932.39	7619442.40	713893.69	7619405.38	713912.85	7619400.75	713884.89	7619365.92	713920.89	7619332.79	713937.15	na	na
LW2-BT010	7619849.89	712507.7	7619840.08	712549.04	7619827.27	712530.62	7619823.19	712581.01	7619816.64	712553.90	7619803.78	712576.69	na	na
LW2-BT011	7618275.42	712449.64	7618259.02	712503.54	7618201.43	712551.43	7618233.02	712480.50	7618197.90	712433.65	7618146.37	712496.93	7618132.08	712400.92
LW2-BT012	7618735.99	711447.47	7618725.79	711491.28	7618713.49	711533.21	7618704.01	711530.07	7618709.23	711500.046	7618718.29	711485.29	na	na
LW2-BT013	7622548.58	708225.93	7622594.48	708193.212	7622569.92	708194.39	7622620.35	708152.48	7622596.89	708149.49	7622642.53	708144.14	7622672.59	708115.64
LW2-BT014	7622758.10	706551.23	7622682.40	706637.61	7622665.57	706660.45	7622647.02	706675.51	7622621.34	706704.13	7622555.12	706802.46	na	na
LW2-BT015	7624707.19	705363.12	7624653.83	705415.13	7624632.75	705396.93	7624614.12	705385.60	7624577.38	705457.62	7624564.35	705422.00	7624533.95	705442.61
LW2-BT016	7627101.64	705634.61	7627133.8	705552.96	7627076.38	705691.22	7627071.66	705719.32	7626988.56	705728.01	7626984.95	705682.09	na	na
LW2-BT017	7626447.52	703958.26	7626499.02	703961.96	na	na	7626528.00	703924.32	7626574.09	703885.68	7626626.04	703847.15	na	na
LW2-BT018	7627627.83	702901.03	7627664.33	702849.87	7627706.36	702859.82	7627651.74	702818.18	7627682.13	702823.72	7627732.66	702761.58	na	na

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Table 4-2. Individual GPS coordinates for each sampling location within the 33 stations

	Subarea A		Subarea B		Subarea C		Subarea D		Subarea E		Subarea F		Subarea G	
Station	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y	X	Y
LW2-BT019	7629768.14	703082.17	7629758.37	703042.46	7629756.52	703011.11	7629744.82	702985.01	7629710.97	702950.77	7629690.35	703029.76	na	na
LW2-BT020	7628574.39	701206.14	7628518.77	701093.215	7628493.70	701060.079	7628490.07	701018.72	7628441.57	701021.01	7628436.31	700985.47	na	na
LW2-BT021	7629342.42	700160.58	7629282.58	700136.88	7629312.89	700124.01	7629265.42	700111.28	7629220.37	700078.42	7629255.69	700089.00	na	na
LW2-BT022	7633035.54	701873.47	7632844.59	701809.91	7632955.22	701795.38	7632846.97	701759.51	7632982.18	701736.10	7632735.63	701663.67	na	na
LW2-BT023	7632385.31	700677.18	7632344.38	700665.29	7632334.87	700679.30	7632292.63	700698.09	7632282.99	700719.99	7632265.87	700734.02	na	na
LW2-BT024	7630718.61	699169.49	7630772.73	699126.11	7630770.82	699095.76	7630896.42	699060.87	7630867.05	699020.70	7630947.72	698983.83	7630919.17	698986.56
LW2-BT025	7632114.15	697781.24	7632167.10	697782.94	7632090.25	697744.32	7632065.62	697710.84	7632119.56	697675.37	7632036.54	697600.94	na	na
LW2-BT026	7634734.48	700663.559	7634758.40	700623.93	7634708.48	700630.23	7634761.91	700595.81	7634783.87	700556.06	7634735.31	700593.02	na	na
LW2-BT027	7634288.71	698267.20	7634361.77	698232.74	7634304.42	698166.61	7634383.02	698159.41	7634432.85	698157.77	7634488.74	698155.38	7634458.11	698068.64
LW2-BT028[a]	7633504.99	696929.64	7633443.63	696864.03	7633522.99	696866.89	7633609.84	696842.92	7633452.36	696834.61	7633391.32	696828.02	7633496.97	696804.75
LW2-BT029	7636439.04	699415.40	7636490.66	699380.55	7636589.52	699268.61	7636520.06	699232.82	7636671.97	699187.02	7636567.04	699154.93	7636614.55	699118.56
LW2-BT030	7635733.29	695507.77	7635819.06	695450.65	7635886.63	695426.12	7635932.58	695370.88	7635985.77	695378.24	7636042.32	695328.13	7636163.82	695250.76
LW2-BT031	7637229.60	696231.44	7637377.38	696178.95	7637353.01	696149.83	7637406.74	696121.49	7637427.59	696073.26	7637475.35	696053.30	7637508.10	696018.54
LW2-BT032	7637407.77	694320.67	7637350.41	694246.67	7637351.61	694180.09	7637267.62	694107.90	na	na	na	na	na	na
LW2-BT033	7639816.35	694621.14	7639818.61	694534.46	7639736.91	694643.85	7639797.12	694663.31	7639749.21	694722.24	7639706.57	694726.20	na	na

[a] One additional subarea was collected with the following coordinates: X 7633431.16, Y 696788.87.

na – not available (subarea not sampled)

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5.0 SEDIMENT SAMPLING PROCEDURES

The following sections summarize the sampling and processing procedures used to collect sediment samples for chemical analysis and bioaccumulation tests using *Lumbriculus variegatus* and *Corbicula fluminea*. The procedures followed those detailed in the FSP for the Round 2 sampling of benthic invertebrate tissue (Windward and Integral 2005).

5.1 SEDIMENT SAMPLE COLLECTION

Surface sediment samples were collected with a stainless steel 0.3-m^2 hydraulic power grab sampler from the *Peter R* and a stainless steel 0.1-m^2 Van Veen grab sampler from the Wooldridge jet boat.

At each station, sediments were collected at up to eight target locations with either the power grab or Van Veen grab sampler. Once the sampler was brought on board, it was placed on a stand or a sediment tray. The overlying water in the sampler was siphoned out, and a visual characterization of the sediment surface was performed to ensure that the sample met the acceptability criteria described in Appendix F of the Round 2 sediment FSP (Integral et al. 2004b). The top 10 cm of sediment were collected from each acceptable grab sample for chemical analysis and bioaccumulation testing. Sediment samples for VOC and TPH-G analyses were taken directly out of the grab sampler and placed in small glass jars. The remaining sediment was then collected and stored in a 100-qt stock pot prior to homogenization. Once the required sediment volume had been collected, the stock pot was transferred to the processing boat for homogenization and separation into chemistry and bioaccumulation sample containers.

A minimum of three consecutive casts of the grab were attempted at each sampling location within a station. If a successful grab could not be taken (e.g., due to bottom debris or obstructed access by a barge), the sampling effort was moved to an alternate location that was still within the overall defined target sampling area approved by EPA and its partners. The target and actual sampling locations at each of the 33 sampling stations are shown in Figures A-1 through A-33 (appendix A).

5.2 SEDIMENT SAMPLE PROCESSING

The sediment was homogenized using a combination of hand and power mixing. The approximately 70 L and 5 L required for the bioaccumulation testing and chemical analyses, respectively, were separated into labeled sample containers. The chemistry sediments were placed in clean 1-L glass jars and stored in a cooler with ice. The bioaccumulation sediments were placed in 5-gal food-grade high-density polyethylene buckets and stored on deck. The sediment samples were transported

to the field laboratory as needed (when the buckets took up too much space on the processing boat) or at the end of the day.

5.3 EQUIPMENT DECONTAMINATION

Decontamination procedures for all equipment used to collect and process the sediment samples followed the procedures detailed in Sections 2.3 and 3.1 of the FSP (Windward and Integral 2005).

5.4 SEDIMENT SAMPLE IDENTIFICATION SCHEME

All samples were assigned a unique identification code, as described in Section 2.4.2 of the FSP (Windward and Integral 2005), based on a sample designation scheme designed to meet the needs of field personnel, data management, and data users. This code indicates the project phase and sample type. The analytical laboratories and bioaccumulation laboratory received the sediment samples labeled as LW2-GBT001 through LW2-GBT033. The replicate sediment samples from stations BT006 and BT027 were identified with "-1" or "-2" after the sample code.

5.5 FIELD QUALITY ASSURANCE/QUALITY CONTROL

Field replicate and split sediment samples were collected for chemical analysis and field replicate samples were collected for bioaccumulation testing at two stations (BT027 and BT006) in compliance with the 5% frequency rate.

Two sediment equipment rinsate blanks were collected in compliance with the FSP (Windward and Integral 2005) and QAPP (Integral 2005).

Temperature blanks were used for refrigerated sediment samples to measure cooler temperature upon arrival at the chemical laboratories. One temperature blank was prepared and submitted with each cooler. The temperature blank consisted of a 50-mL plastic vial containing deionized water that was packed into the cooler in the same manner as that used for the rest of the samples and labeled "temp blank." The cooler temperature for frozen sediment samples was measured at the laboratory by enclosing a thermometer in the cooler for at least 10 minutes prior to reading the temperature.

5.6 SEDIMENT SAMPLE HANDLING, STORAGE, AND TRANSPORTATION

The chemistry sediment samples were placed in a cooler with ice and transported to the field laboratory, where they were stored under refrigeration. Samples for STL (herbicides) and Alta (PCB congeners) were stored frozen and the remaining sediment chemistry samples were refrigerated at 4°C. For shipment, the samples were packed to prevent breakage and separated in the shipping container (ice cooler) by bubble wrap and/or other shock-absorbent material. Loose ice was placed in the cooler to maintain a temperature of approximately 4°C for CAS's samples, or to help keep the samples for STL and Alta frozen. A temperature blank was added to each cooler for CAS. Samples were transported to the analytical laboratories directly by courier or by an overnight shipping service.

The sediment samples for bioaccumulation testing were transported to the field laboratory, where they were stored at 4°C in a refrigerator truck until they were hand-delivered on December 10, 17, and 21, 2005 to the bioaccumulation laboratory.

5.7 CHAIN OF CUSTODY

Sample chain-of-custody procedures followed the guidelines provided in Section 3.2.2 of the FSP (Windward and Integral 2005). For the chemistry sediment samples, the chain-of-custody form was placed into a zip-lock bag and taped on the inside lid of each cooler. Each ice cooler was sealed with shipping tape and three chain-of-custody seals, which included the project name, date of shipment, and the name of the person sealing the cooler. For the bioaccumulation sediment samples, the chain-of-custody forms were handed over to and signed by the laboratory personnel at the time of delivery (see Appendix C).

5.8 FIELD DOCUMENTATION

All field activities and observations were noted in bound field logbooks (Appendix B). Information included the personnel, date, time, station designation, sampler, types of samples collected, and general observations. Any changes that occurred at the site (e.g., personnel, responsibilities, deviations from the FSP) and the reasons for these changes were documented in the field logbook.

A sample chain-of-custody form was established in the field laboratory for each tissue and sediment sample before it was shipped from the field laboratory to the analytical chemical laboratories. The chain-of-custody forms for the chemistry sediment samples are kept in the project file at Integral's Olympia, Washington, office. The chain-of-custody forms for the bioaccumulation sediment samples are kept at Windward Environmental LLC's (Windward's) Seattle, Washington, office.

6.0 LABORATORY ANALYSES

The following sections summarize the bioaccumulation test procedures for *Lumbriculus variegatus* and *Corbicula fluminea* and the tissue and sediment chemical analyses. The test procedures and analyses followed those detailed in the Round 2 FSP (Windward and Integral 2005) and QAPP Addendum 6 (Integral 2005).

6.1 BIOACCUMULATION TESTS

The 28-day freshwater oligochaete (*Lumbriculus variegatus*) and clam (*Corbicula fluminea*) bioaccumulation tests were performed on a total of 35 sediment samples, which included replicate samples at stations BT006 and BT027. The test conditions, acceptability criteria, and QA procedures are presented in detail in Attachments 1, 2, and 3 of the QAPP (Integral 2005). Table 6-1 summarizes the test initiation and termination dates. The *Corbicula* test was performed in two batches (Rounds 1 and 2), whereas the *Lumbriculus* test was performed in 13 batches over two rounds because of the labor-intensive test termination. To accommodate the project schedule, the bioaccumulation tests were performed with three replicates for every sediment sample. The tissue from the three replicates will be composited to yield one tissue sample per station for chemical analysis. The tissue samples will be frozen at the bioaccumulation laboratory and shipped on ice to CAS for sample preparation and homogenization.

Table 6-1. Bioaccumulation test initiation and termination dates

Testing Round	*Lumbriculus* Test		*Corbicula* Test	
	Initiation Date	Termination Date	Initiation Date	Termination Date
Round 1	Dec. 14, 15, 16, 19, 20, and 21, 2005	Jan. 11, 12, 13, 16, 17, and 18, 2006	Dec. 22, 2005	Jan. 19, 2005
Round 2	Feb. 1, 2, 3, 6, 7, 8, and 9, 2006	Mar. 1, 2, 3, 6, 7, 8, and 9, 2006	Jan. 27, 2006	Feb. 24, 2006

6.2 TISSUE CHEMICAL ANALYSIS

This section summarizes the chemical analyses to be performed on the field-collected clam (and potentially the mussel and lamprey ammocoete) tissue samples and the laboratory bioaccumulation clam and oligochaete tissue samples.

The chemical analyses of all tissue samples will be performed by two laboratories. Columbia Analytical Services, Inc. (CAS), of Kelso, Washington, will shuck, composite, and homogenize the tissue samples and complete analyses for

phthalates and selected semivolatile organic compounds (SVOCs), polycyclic aromatic hydrocarbons (PAHs), mercury, other metals, butyltin compounds, and percent moisture. Axys Analytical Services Ltd. (Axys), of Sidney, BC, Canada, will complete analyses of lipids, organochlorine pesticides, polychlorinated biphenyl (PCB) congeners, and dioxins and furans.

Sufficient clam tissue biomass (> 35 g ww) is expected to have been collected in the field at the majority the stations (24), and the analyses will be conducted according to the QAPP (Integral 2005). At the remaining nine stations, it is expected that insufficient clam biomass has been collected, and a revised analytical approach has been developed in cooperation with EPA and its partners. Table 6-2 lists the analyses to be conducted on each of the nine field-collected clam tissue samples. CAS is currently in the process of compositing, homogenizing, and weighing the tissue samples for each of the 33 stations. If, based on the laboratory weight, additional samples are determined to have insufficient tissue biomass, a revised analytical approach similar to the approach presented in Table 6-2 will be developed for these tissue samples in cooperation with EPA and its partners.

Table 6-2. Analytical approach for field-collected clam samples with insufficient biomass

Station ID	Location	Estimated Biomass (g ww)[a]	Amount of Biomass Required and Apportioned for each Analysis							Total Biomass Consumed (g ww)
			Axys Analyses (g ww)[b]	PAHs (g ww)	Mercury (g ww)	Phthalates/ SVOCs (g ww)	Other Metals (g ww)	TBTs (g ww)	Percent Moisture (g ww)	
BT011	Linnton Plywood	18.23	**10**/10	na	na	**5**/5	na	na	**2**/2	17
BT015	Gasco	29.24	**10**/10	**5**/5	na	**5**/5	**5**/5	na	**2**/2	27
BT016	Willamette Cove	27.68	**10**/10	**5**/5	**3**/3	**5**/5	**5**/5[c]	na	na	28
BT018	Arkema	22.10	**10**/10	**5**/5	**3**/3	na	**5**/5[c]	na	na	23
BT023	Portland Shipyard	17.25	**10**/10	na	na	na	na	**5**/5	**2**/2[c]	17
BT026	Swan Island Lagoon middle	33.69	**10**/10	**5**/5	**3**/3	**5**/5	**5**/5[c]	**5**/5	na	33
BT029	Swan Island Lagoon bottom	11.96	**10**/10	na	na	na	na	na	na	10
BT032	"Fireboat cove"	1.40	**10**/1.4	na	na	na	na	na	na	1.4
BT033	Goldendale Aluminum	20.81	**10**/10	**5**/5	na	na	na	na	**2**/2	17

[a] Biomass estimated based on the equation: $y = 0.1841\ x^{(2.003)}$.
[b] Axys analyses includes PCBs, dioxins and furans, organochlorine pesticides, and lipids.
[c] Only analyzed if sufficient tissue is available.
Bold indicates the amount required for each analysis.
na – no analysis due to biomass availability
PAH – polycyclic aromatic hydrocarbon
SVOC – semivolatile organic compound
ww – wet weight

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Chemical analyses of the tissue samples from the bioaccumulation tests with the oligochaete (*Lumbriculus variegatus*) and clam (*Corbicula fluminea*) will be conducted in accordance with the QAPP (Integral 2005). If insufficient tissue mass (< 35 g ww) is derived for any of the 33 samples in the two bioaccumulation tests, an analytical approach will be developed in cooperation with EPA and its partners.

The analytical approach for the mussel and lamprey ammocoete tissue samples will be developed at a later date in cooperation with EPA and its partners.

6.3 SEDIMENT CHEMICAL ANALYSIS

Chemical analysis of sediment samples from the 33 stations will be completed by three laboratories, CAS, Alta, and STL, in accordance with the QAPP (Integral 2005). CAS will complete the analyses for conventional constituents, metals (including mercury), butyltin compounds, petroleum hydrocarbons, volatile organic compounds (VOCs), SVOCs, organochlorine pesticides, PCB Aroclors, and chlorinated dioxins and furans. Alta will complete PCB congener analyses and STL will complete herbicide analyses.

7.0 DATA MANAGEMENT

Once the chemical laboratories have completed their internal quality assurance and quality control (QA/QC) checks, they will submit the data in electronic format to Integral. Additional QA/QC checks are performed at Integral; and if any problems are found in the electronic data deliverables (EDDs), the laboratory is notified and asked to correct the problem and resubmit the EDD. When the EDD is correct and complete, the data are checked again electronically by loading them into the temporary section of Integral's LWG project database. Any error prevents the EDD from loading until the error is corrected. Each EDD is tracked until it is successfully loaded into the LWG project database.

Each verified and accurate EDD is provided to the Round 2 data validation contractor (EcoChem of Seattle, Washington) for data review and validation. As EcoChem completes validation of the data by sample delivery group (SDG) or small groups of SDGs, the validated data are then merged into the permanent project database. During the merging process, all previously performed electronic checks are repeated to ensure that nothing was incorrectly modified with the application of the validation results.

Several queries have been set up in the permanent project database to translate the data structure to a form compatible with the National Oceanic and Atmospheric Administration's (NOAA's) Query Manager. The translated data are imported into an Access file provided by NOAA that contains template tables for the Query Manager structure.

8.0 REPORTING

LWG-validated analytical laboratory data will be provided to EPA in an electronic format within 175 days of completion of the sampling event.

A data report covering chemical analysis results for field collected clam tissue and associated sediment will be developed and submitted within 60 days of the completion of sediment and clam tissue sampling and chemical analyses. A data report covering laboratory bioaccumulation (28-day *Lumbriculus variegatus* and *Corbicula fluminea* test) testing and chemical analysis results for the associated tissue samples will be developed and submitted within 60 days of the completion of the tissue chemical analyses. Tissue and sediment chemistry results will be reported in tabular format in these data report. These reports will be followed by an invertebrate (field sampling and laboratory bioaccumulation) interpretation report, which will be submitted 90 days after the lab bioaccumulation testing and associated tissue analyses are complete. These data will also be incorporated into the RI report and baseline risk assessments, which will be prepared after all sampling and analysis rounds for the project are complete.

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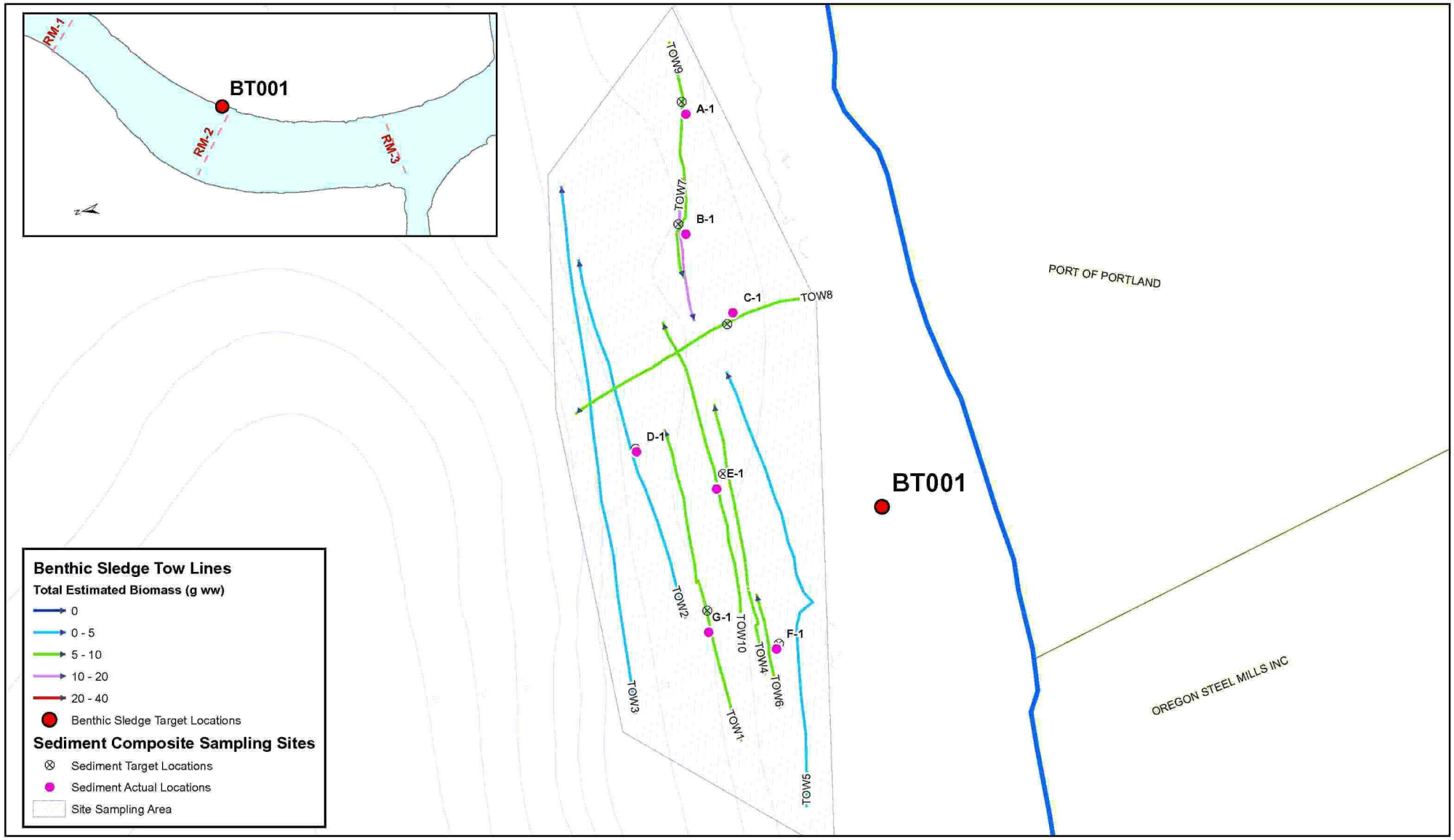

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11/28/05 A. Rodriguez

1000 Arrive at field lab to load all supplies & equipment

1045 Arrive at Swan Island Boat ramp

Sledging Crew: Helle Anderson (WW)
Kathleen Hurley (WW)
Dave Mullins (Boat driver)
Brian Painter & Ian Stynskoff (Integral)

Processing Crew: Thai Do (WW)
Angelita Rodriguez (WW)
Mike May (Rossland Boat driver)
Joe Gaulet (EPA oversight)
Jennifer Peterson (DEQ oversight)
Chris Thompson (EI oversight)

1110 Health & Safety Meeting

1130 Called Coast Guard & Sheriff about sampling in Swan Island Lagoon

1149 Motor to Station LW2-BTC029, west shore of Swan Island
Set up benthic sledge & assess water depth

1209 Tow 1 at LW2-BTC029

1213 Begin processing sample LW2-BTFC029

1220 Complete processing LW2-BTFC029
Collect 1 clam (53mm width) 20.12g WW
Presence of large empty clamshells & chironomids
Silt

11/28/05 A. Rodriguez

1221 Begin Tow 2 at LW2-BTC029

1230 Begin processing sample LW2-BTFC029
Tow 2

~~1233 Begin~~ AR

1235 Complete processing sample LW2-BTFC029
Tow 2
No clams collected
Presence of clam shells & chironomids
Silt with a sheen

1241 Begin processing sample LW2-BTFC029
Tow 3

1245 Complete processing sample LW2-BTFC029
Tow 3
No clams collected
Presence of 1 clam (small) shell, chironomids, silt

1250 Begin processing sample LW2-BTFC029
Tow 4

1252 Complete processing sample LW2-BTFC029
Tow 4
No clams collected.
Presence of juvenile ~~crappie~~ Banded Killifish, chironomids
Silt & plant debris

1301 Begin processing sample LW2-BTFC029
Tow 5

11/28/05 A Rodriguez

1306 Complete processing of LW2-BTFC029
Tow 5
Collect 1 clam (5mm width) ~ 0.05g ww
Presence of chironomids & silt

1309 Begin processing LW2-BTFC029
Tow 6

1311 Complete processing sample LW2-BTFC029
Tow 6, presence of chironomids & silt
Collect 2 clams
24 mm width ~ 1.06 g ww
33 mm width ~ 2.01 g ww

1321 Begin processing sample LW2-BTFC029
Tow 7

1324 Complete processing sample LW2-BTFC029
Tow 7
No clams collected, presence of chironomids
silt
2 ~~USFW~~ AR personnel (oversight) arrive
Aron Borok (EI)
Jeremy Buck (USFW)

1335 Begin processing sample LW2-BTFC029
Tow 8

1337 Complete processing sample LW2-BTFC029
Tow 8, No clams collected
Presence of 1 clam shell, chironomids & silt

11/28/05 A. Rodriguez

1355 Begin processing sample LW2-BTFC029
Tow 9
Collect large volume of sand & silt
with a sheen. Distribute into
2 sieves to expedite processing
time.
Mike Szumski (USFWS)
oversight arrives
Collect 3 clams
21 mm width ~ 0.31 g ww
32 mm width ~ 1.89 g ww
29 mm width ~ 1.55 g ww

1430 Complete processing sample
LW2-BTFC029 Tow 9

1431 Begin processing sample
LW2-BTFC029 Tow 10, No clams

1433 Complete processing sample
LW2-BTFC029 Tow 10

1433 Begin processing sample
LW2-BTFC029 Tow 11

1434 Complete processing sample
LW2-BTFC029 Tow 11
No clams collected
2 juv. Banded Killi fish present
Chironomids

11/28/05 A. Rodriguez

1453 Begin processing sample LW2-BTFC029 Tow 12

1455 Complete processing sample LW2-BTFC029 Tow 12
Organic debris and silt
Collect 1 clam (14mm width) ~0.36 g ww

1456 Begin processing sample LW2-BTFC029 Tow 13

1458 Complete processing sample LW2-BTFC029 Tow 13
Organic debris, silt and Cosophium
collect 1 clam (11mm width) ~0.22 g ww

1500 Joe, Mike & Jeremy (oversight) personnel depart from processing crew
Joe informed (WW) Windward that the following oversight personnel will join the field crew:
(11/29-11/30) Parametrix person
(12/1-12/2) Joe, EPA

1514 Motor to station LW2-026, in channel of Swan Island

1515 Begin processing sample LW2-BTFC026 Tow 1

1521 Complete processing sample LW2-BTFC026 Tow 1

11/28/05 A. Rodriguez

1521 No clams present, observe shell fragments, organic debris, paint chips, silt, and oyster (1) shell ~~deans~~ sheen observed

1532 Begin processing sample LW2-BTFC026 Tow 2

1534 Complete processing sample LW2-BTFC026 Tow 2
No clams collected, presence of organic debris, shell fragments, and silt with a sheen, paint chips.

1553 Begin processing sample LW2-~~BTFC026~~ BTFC026 Tow 3

1555 Complete processing sample LW2-BTFC026 Tow 3
Collect 1 clam (19mm width) ~0.67 g
Presence of organic material, shell fragment and silt with a sheen, paint chips.

1607 Begin & complete processing sample LW2-BTFC026 Tow 4
Oyster shell fragments, paint chips and silt with a sheen.
No clams collected

11/28/05 A. Rodriguez

1618 Begin processing sample LW2-BTFC026 Tow 5

1620 Complete processing sample LW2-BTFC026 Tow 5
Collect 1 clam (7mm width) 0.09 g ww
Shell fragments, organic debris, silt and paint chips.

1630 Head back to Swan Island boat ramp; sledge boat made one more tow.

1640 Begin processing sample LW2-BTFC026 Tow 6.

1642 Back at Swan Island boat ramp.

1645 Complete processing sample LW2-BTFC026
Collect 10 clams

24 mm (1.06 g)	15 mm (0.41 g)
26 mm (1.25 g)	13 mm (0.31 g)
29 mm (1.55 g)	10 mm (0.15 g)
16 mm (0.47 g)	7 mm (0.09 g)
17 mm (0.53 g)	7 mm (0.09 g)

Shell fragments, organic debris, silt, sand.

1700 Unload boat; return to field lab.

1705 Returned to field lab. End of sampling day.

[signature] 11.28.05 TDB

11.29.05 TDB

0700 Arrive at field lab to load supplies and equipment.

0730 Arrive at Swan Island boat launch

Sledging crew: Helle Andersen (WW)
Kathleen Hurley (WW)
Dave Mullins (boat driver)
Brian Pointer (Integral)
Ian Stupakoff (Integral)

Processing crew: Angelita Rodriguez (WW)
Thai Do (WW)
Mike Mays (Ross Island boat)
David Gillingham (Parametrix - weight)

0745 Health and safety meeting.
Loading equipment onto boats

0800 Motor to station LW2-BT026

0820 Begin Tow 7 @ station LW2-BT026

0827 Begin processing sample BTFC026 Tow 7
Processing entails:
1) ~~Rinsing~~ Sieving sample with 2mm or 1mm sieve and site water
2) Rinse clam(s) with site water and measure width with calipers and record
3) Record observations of sledge sample on field collection form

11/29/05 A. Rodriguez

4) Keep clams organized by each tow per
* Jennifer Peterson (DEQ) & Joe Gouley (EPA) oversight on 11/28/05
This suggestion increases processing time for each sample at each tow
5) All clams are placed in glass jar or wrapped in foil, labeled and placed in cooler with ice.

Note * All samples from 11/28/05 were organized by tow, placed in separate containers by tow and ~~refrigerated~~ frozen (AR). This method will be followed in the field until further notice.

0830 Complete processing LW2-BTFC026 tow ~~8~~ 7
Collect 1 clam (27 mm width) ~ 1.35 g ww
Presence of shell fragments, organic debris, and silt with a sheen.

0835 Begin processing sample LW2-BTFC026 Tow 8

0841 Complete processing sample LW2-BTFC02 Tow 8
Collect 4 clams:
24 mm width ~ 1.06 g ww

11/29/05 A. Rodriguez

14 mm width ~ 0.36 g ww
7 mm width ~ 0.09 g ww
12 mm width ~ 0.27 g ww
Observe sand, organic debris, shell fragments, paint chips and a sheen.

0848 Begin & complete processing sample LW2-BTFC026 Tow 9
No clams collected, presence of rocks, shell fragments and asphalt.

0859 Begin ~~&~~ AR processing sample LW2-BTFC026 Tow 10

0904 Complete processing sample LW2-BTFC026 Tow 10
Collect 3 clams
16 mm width ~ 0.47 g ww
6 mm width ~ 0.07 g ww
8 mm width ~ 0.12 g ww
Sand, organic debris, shell fragments, paint chips & sheen.

0907 Begin processing sample LW2-BTFC026 Tow 11

0919 Complete processing sample LW2-BTFC026 ~~Scu~~ AR Tow 11
Total weight for all tows = 14.25 g ww

11/29/05 A. Rodriguez

Collect 8 clams at LW2-BTFC026 Tow 11:
10 mm width ~0.18 g ww
11 mm width ~0.22 g ww
20 mm width ~0.74 g ww
20 mm width ~0.74 g ww
23 mm width ~0.98 g ww
14 mm width ~0.36 g ww
12 mm width ~0.27 g ww
12 mm width ~0.27 g ww
Sand, organic debris, shell fragments, paint chips and sheen.

0938 Begin processing sample LW2-BTFC022 Tow 1

0946 Complete processing sample LW2-BTFC022 Tow 1
Collect 4 clams:
23 mm width ~0.98 g ww
11 mm width ~0.22 g ww
7 mm width ~0.09 g ww
7 mm width ~0.09 g ww
Sand, organic debris, red brick, paint chips, shell fragments, chironomids, and sheen.

0952 Begin processing sample LW2-BTFC022 Tow 2

11/29/05 A. Rodriguez

0955 Complete processing sample LW2-BTFC022 Tow 2
Collect 2 clams:
8 mm width ~0.12 g ww
16 mm width ~0.47 g ww
Silt, organic debris, shell fragments, and chironomids.

1000 Begin processing sample LW2-BTFC022 Tow 3

1003 Complete processing sample LW2-BTFC022 Tow 3
Collect 3 clams:
7 mm width ~0.09 g ww
19 mm width ~0.67 g ww
24 mm width ~1.06 g ww
Silt, organic debris, shell fragments, and a shrimp.

1011 Begin processing sample LW2-BTFC022 Tow 4

1016 Complete processing sample LW2-BTFC022 Tow 4
Collect 4 clams:
8 mm width ~~3.91~~ 0.12 AR g ww
11 mm width ~0.22 g ww

11/29/05 A. Rodriguez

LW2-BTFC022 Tow 4 cont'd:
26 mm width ~ 1.25 g ww
34 mm width ~ 2.14 g ww
Silt, sheen, organic debris, and shell fragments

1020 Begin processing sample LW2-BTFC022 Tow 5

1022 Complete processing sample LW2-BTFC022 Tow 5
No clams collected.
Silt, organic debris, shell fragments, and chironomids.

1030 Begin processing sample LW2-BTFC022 Tow 6

1038 Complete processing sample LW2-BTFC022 Tow 6
Collect 7 clams:
14 mm width ~ 0.36 g ww
14 mm width ~ 0.36 g ww
18 mm width ~ 0.6 g ww
20 mm width ~ 0.74 g ww
27 mm width ~ 1.35 g ww
28 mm width ~ 1.45 g ww
31 mm width ~ 1.78 g ww

11/29/05 A. Rodriguez

Tow 6, silt, organic debris, wood stump, bolt, Chironomids, leach, paint chips and sheen

1041 Begin processing sample LW2-BTFC022 Tow 7

1045 Complete processing sample LW2-BTFC022 Tow 7
Collect 7 clams:
12 mm width ~ 0.27 g ww
20 mm width ~ 0.71 g ww
20 mm width ~ 0.74 g ww
21 mm width ~ 0.81 g ww
26 mm width ~ 1.25 g ww
30 mm width ~ 1.66 g ww
34 mm width ~ 2.14 g ww
Silt with sheen, organic debris, shell fragments, Chironomids, paint chips, and 3 shrimp.

1053 Begin processing sample LW2-BTFC022 Tow 8

1057 Complete processing sample LW2-BTFC022 Tow 8
Collect 10 clams:
(3x) 13 mm width ~ 0.31 g ww each

11/29/05 A. Rodriguez

LW2-BTFC022 Tow 8 cont'd:
18 mm width ~0.6 g ww
20 mm width ~0.74 g ww
25 mm width ~1.15 g ww
27 mm width ~1.35 g ww
29 mm width ~1.55 g ww
31 mm width ~1.78 g ww
33 mm width ~2.01 g ww
Collect 1 mussel 51 mm width
Silt with sheen, organic debris, shell fragments, paint chips, and mussel.

1104 Begin processing sample LW2-BTFC022 Tow 9

1106 Complete processing sample LW2-BTFC022 Tow 9
No clams collected, organic debris, silt and shell fragments.

1118 Begin processing sample LW2-BTFC022 Tow 10

1122 Complete processing sample LW2-BTFC022 Tow 10
Collect 1 clam:
21 mm width ~0.81 g ww

11/29/05 A. Rodriguez

LW2-BTFC022 Tow 10
Observe silt with sheen, organic debris, Chironomids, shell fragments and dragonfly larvae (38 clams)
Total for all tows = 32.69 g ww

1130 Break for lunch

1200 Motor to station LW2-BT023 which is located near Portland Shipyard.

1224 Begin processing sample LW2-BTFC023 Tow 1

1226 Complete processing sample LW2-BTFC023 Tow 1
Collect 2 clams:
12 mm width ~0.27 g ww
29 mm width ~1.55 g ww
Observe silt sheen, organic debris, paint chips, chironomids, and 3 shrimp

1232 Begin processing sample LW2-BTFC023 Tow 2

1237 Complete processing sample LW2-BTFC023 Tow 2
Collect 1 clam 25 mm width ~1.15 g ww

11/29/05 A. Rodriguez

Tow 2 LW2-BTFC023
observe silt, organic debris, shell fragments, chironomids and 1 shrimp

1249 Begin processing sample LW2-BTFC023 Tow 3

1251 Complete processing sample LW2-BTFC023 Tow3
No clams collected
Presence of silt with sheen, chironomids, shell fragments, organic debris and 4 shrimp.

1301 Begin processing sample LW2-BTFC023 Tow 4

1302 Complete processing sample LW2-BTFC023 Tow4
Collect 2 clams:
14 mm width ~ 0.36 g ww
6 mm width ~ 0.07 g ww
silt, organic debris, chironomids, paint chips and shell fragments

1313 Begin processing sample LW2-BTFC023 Tow 5

1315 Complete processing sample

11/29/05 A. Rodriguez

LW2-BTFC023 Tow 5
Collect 1 clam 17 mm width ~ .53g
Silt with sheen, organic debris, shell fragments, chironomids, paint chips and 4 shrimp.

1323 Begin processing sample LW2-BTFC023 Tow 6

1325 Complete processing sample LW2-BTFC023 Tow6
No clams collected
silt, organic debris, shell fragments, chironomids, paint chips and 3 shrimp

1333 Begin processing sample LW2-BTFC023 Tow 7

1334 Complete processing sample LW2-BTFC023 Tow 7
No clams collected
Silt, organic debris, shell fragments, chironomids, & 5 shrimp.

1344 Begin processing sample LW2-BTFC023 Tow 8

1346 Complete processing sample LW2-BTFC023 Tow 8

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11/29/05 A. Rodriguez

Collect 1 clam 6mm width ~0.07 g ww
Observe silt, chironomids, rope, asphalt, organic debris, shell fragments
Begin processing sample
1355 LW2-BTFC023 Tow 9
1358 Complete processing sample LW2-BTFC023 Tow 9
Collect 5 clams:
10 mm width ~0.18 g ww
12 mm width ~0.27 g ww
16 mm width ~0.47 g ww
(2x) 17 mm width ~0.53 g ww per clam
silt with sheen, organic debris, shell fragments, chironomids, dragonfly larvae & 1 shrimp.
1404 Begin processing sample LW2-BTFC023 Tow 10
1410 Complete processing sample LW2-BTFC023 Tow 10
Collect 8 clams:
(3x) 6 mm width ~0.07 g ww per clam
8 mm width ~0.12 g ww
9 mm width ~0.15 g ww
13 mm width ~0.31 g ww

11/29/05 A. Rodriguez

Cont'd LW2-BTFC023 Tow 10
22 mm width ~0.89 g ww
24 mm width ~1.06 g ww
Total weight for all tows = 8.72 g ww
20 clams total collected
1420 Motor to station LW2-BT032, EPA requested in fireboat cove ~9.7 RM west side
1428 Begin processing sample LW2-BTFC032 Tow 1
1443 Complete processing sample LW2-BTFC032 Tow 1
Sledge sample of large volume consisting of sand, silt, organic debris that makes sieving ~~the~~ AR very difficult & time consuming.
No clams
1444 AR LW2-BTFC032 Tow 2 sample is the same as Tow 1 with coarse sand.
Sledge boat crew keeps processes Tow 2 sample - No clams
Tow 2 sample rejected by Helle & Oversight and decide to redo Tow 2
1455 Begin processing sample LW2-BTFC032 Tow 2

11/29/05 A. Rodriguez

1458 Complete processing sample
LW2-BTFC032 Tow 2 (redo)
No clams, woody debris, shell fragments, and paint chips

1502 Begin processing sample
LW2-BTFC032 Tow 3

1504 Complete processing sample
LW2-BTFC032 Tow 3
No clams, silt, gravel, organic debris, shell fragments, and paint chips.
Both sides of fire boat cove have recently been dredged which may have an effect on the clam collection.

1510 Begin processing sample
LW2-BTFC032 Tow 4
Another large volume sledge sample of organic debris, shell fragments and silt. Photos taken.

1525 Complete processing sample
LW2-BTFC032 Tow 4
No clams

1526 Begin processing sample
LW2-BTFC032 Tow 5
Large volume sledge sample same as Tow 4

11/29/05 A. Rodriguez

1547 Complete processing sample
LW2-BTFC032 Tow 5
Collect 2 clams:
13 mm width ~ 0.31 g ww
14 mm width ~ 0.36 g ww
Silt with sheen, organic debris

1549 Begin processing sample
LW2-BTFC032 Tow 6

1556 Complete processing sample
LW2-BTFC032 Tow 6
Collect 1 clam 17 mm width ~ 0.53 g

1601 Begin processing sample
LW2-BTFC032 Tow 7
Large volume sledge sample with organic debris, silt & sand

1617 Complete processing sample
LW2-BTFC032 Tow 7
No clams, silt, sand, sheen, organic debris

1618 Motor to station LW2-BT029

1645 Arrive at Swan Island Boat ramp and jar clams from Tow 14 & Tow 15 at station LW2-BT029
Tow 14 LW2-BTFC029 collect 1 clam 12 mm width ~ 0.27 g ww

11/29/05 A. Rodriguez

Tow 15 LW2-~~BT029~~ BTFC029
Collect 2 clams:
31 mm width ~ 1.78 g ww
43 mm width ~ 3.42 g ww
Total weight for 11/28/05 & 11/29/05
Clam collection 13.54 g ww
1700 Complete sampling and unload boat and drive back to field lab
1730 Return to field lab and unload.
End of day.

11/29/05

11/30/05 A. Rodriguez

0700 Arrive at field lab to load supplies & equipment
0730 Arrive at Swan Island boat ramp and load supplies
Sledging Crew: Dave Mullins (Boat driver)
Helle Andersen (WW)
Kathleen Hurley (WW)
Brian Pointer (Integral)
Dave Gillingham (Parametrix oversight)
Processing Crew:
Thai Do (WW)
Angelita Rodriguez (WW)
Mike May (Boat driver, Ross Island)
0745 Call US Coast Guard & Sheriff's office & notify of sampling area & activities for the day
0750 Motor to station LW2-BT032, in fireboat cove ~ 9.7 RM
* Note: Rejected tows not recorded for previous two days of sampling (11/28-11/29) but will be from now on.
0807 Arrive at station LW2-BT032 and begin Tow 8
0813 Begin processing sample LW2-BTF032 Tow 8

11/30/05 A. Rodriguez

0814 Complete processing sample
LW2-BTFC032 Tow 8
No clams, silt, gravel, organic debris, chironomids, screw

0824 Begin processing sample
LW2-BTFC032 Tow 9

0826 Complete processing sample
LW2-BTFC032 Tow 9
No clams, silt, gravel, organic debris, chironomids, plastic, paint chips

0833 Begin processing sample
LW2-BTFC032 Tow 10

0836 Complete processing sample
LW2-BTFC032 Tow 10
Collect 2 clams:
5 mm width ~0.05 g ww
9 mm width ~0.15 g ww
Silt, gravel, organic debris, paint chips
Total weight for all tows is ~1.4 g ww and total of 5 clams collected at this EPA requested location.

0838 Motor to LW2-BT033 location, ~RM 10.0 on east side of river. Another EPA requested site near Goldendale Aluminum

11/30/05 A. Rodriguez

0855 Begin processing sample
LW2-BTFC033 Tow 1

0857 Complete processing sample
LW2-BTFC033 Tow 1
No clams, silt, ~~gr~~ chironomids, organic debris, shell fragments

0908 Begin processing sample
LW2-BTFC033 Tow 2

0910 Complete processing sample
LW2-BTFC033 Tow 2

LW2-BTFM033 Collect 1 Mussel 87 mm width, Photo taken
No clams, silt with sheen, organic debris, chironomids, plastic, paint chips

0915 Begin processing sample
LW2-BTFC033 Tow 3

0917 Complete processing sample
LW2-BTFC033 Tow 3
Collect 3 clams:
29 mm width ~1.55 g ww
32 mm width ~1.89 g ww
36 mm width ~2.4 g ww
Silt with sheen, organic debris, shell fragments, chironomids, plastic, paint chips

11/30/05 A. Rodriguez

0928 Begin processing sample LW2-BTFC033 Tow 4

0929 Complete processing sample LW2-BTFC033 Tow 4
No clams, silt with sheen, organic debris, shell fragments, chironomids, plastic, paint chips

0940 Begin processing sample LW2-BTFC033 Tow 5

0943 Complete processing sample LW2-BTFC033 Tow 5
Collect 1 clam 39 mm width ~2.81 g ww
Silt with sheen, wood debris, shell fragments, plastic, paint chips

0954 Begin processing sample LW2-BTFC033 Tow 6

0955 Complete processing sample LW2-BTFC033 Tow 6
Collect 2 clams:
32 mm width ~ 1.89 g ww
33 mm width ~ 2.01 g ww
Silt with sheen, chironomids, shell fragments, organic debris, shrimp

11/29/05 A. Rodriguez

1007 Begin & complete processing sample LW2-BTFC033 Tow 7
Collect 1 clam 6 mm width ~0.07 g ww
silt, organic debris, Chironomids, plastic, shell fragments

1019 Begin processing sample LW2-BTFC033 Tow 8

1020 Complete processing sample LW2-BTFC033 Tow 8
Collect 1 clam 6 mm width ~ 0.07 g ww
Silt, chironomids, shell fragments, organic debris, plastic

1032 Begin processing sample LW2-BTFC033 Tow 9

1034 Complete processing sample LW2-BTFC033 Tow 9
No clams, silt with sheen, gravel, chironomids, organic debris, plastic

1043 Begin processing sample LW2-BTFC033 Tow 10

1045 Complete processing sample LW2-BTFC033 Tow 10
No clams, silt with slight sheen, chironomid organic debris, shell fragments, paint chips

11/30/05 H. Rodriguez

LW2-BTFC033 sample
total weight for all tows = 1269 g ww
and 8 clams collected

1050 Motor to station LW2-BT031 at
RM 9.6 on east side of river and
across from fireboat cove.

1115 Begin processing sample
LW2-BTFC031 Tow 1

1118 Complete processing sample
LW2-BTFC031 Tow 1
Collect 2 clams:
38 mm width ~ 2.67 g ww
41 mm width ~ 3.11 g ww
silt, sand, chironomids, shell fragments,
organic debris, 4 shrimp

1128 Begin ~~sampling~~ (AR) processing sample
LW2-BTFC031 Tow 2

1130 Complete processing sample
LW2-BTFC031 Tow 2
Collect 5 clams:
24 mm width ~ 1.06 g ww
(2x) 27 mm width ~ 1.35 g ww each clam
(2x) 28 mm width ~ 1.45 g ww each clam

11/30/05 A. Rodriguez

LW2-BTFC031 Tow 2 observe
silt, chironomids, shell fragments,
organic debris, plastic, 3 shrimp

1137 Begin processing sample
LW2-BTFC031 Tow 3

1138 Complete processing sample
LW2-BTFC031 Tow 3
Collect 1 clam 17 mm width ~ 0.53 g ww
silt, chironomids, shell fragments, organic
debris, plastic

1147 Begin processing sample
LW2-BTFC031 Tow 4

1148 Complete processing sample
LW2-BTFC031 Tow 4
Collect 9 clams: Photos taken
12 mm width ~ 0.27 g ww
13 mm width ~ 0.31 g ww
26 mm width ~ 0.25 g ww
30 mm width ~ 1.66 g ww
(3x) 32 mm width ~ 1.89 g ww each clam
33 mm width ~ 2.01 g ww
38 mm width ~ 2.67 g ww
silt, chironomids, shell fragments,
organic debris, plastic, 19 shrimp

11/30/05 A. Rodriguez

1154 Begin processing sample
LW2-BTFC031 Tow 5

1158 Begin processing sample
LW2-BTFC031 Tow 5
Collect 4 clams:
17 mm width ~ 0.53 g ww
25 mm width ~ 1.15 g ww
27 mm width ~ 1.35 g ww
30 mm width ~ 1.66 g ww
silt, chironomids, shell fragments, organic debris, plastic, 6 shrimp

1200 Break for lunch & Helle participates
~~123~~ (AR) in conference call with Lisa to report project progress, specifically the daily clam total weight per station and completed sampling locations.

1234 Begin processing sample
LW2-BTFC031 Tow 6

1244 Complete processing sample
LW2-BTFC031 Tow 6
silt and sand with sheen, shell fragments, organic debris, chironomids, 4 shrimp
Collect 3 clams: 5 mm width ~ 0.05 g ww
6 mm width ~ 0.07 g ww, 18 mm width ~ 0.6 g ww

11/30/05 A. Rodriguez

1248 Begin processing sample
LW2-BTFC031 Tow 7

1250 Complete processing sample
LW2-BTFC031 Tow 7
Silt, shell fragments, plastic, 52 shrimp, chironomids, organic debris
Collect 4 clams:
12 mm width ~ 0.27 g ww
13 mm width ~ 0.31 g ww
33 mm width ~ 2.01 g ww
36 mm width ~ 2.4 g ww

1258 Begin processing sample
LW2-BTFC031 Tow 8

1300 Complete processing sample
LW2-BTFC031 Tow 8
silt, chironomids, shell fragments, organic debris, plastic, paint chips, 41 shrimp
Collect 1 clam 31 mm width ~ 1.78 g ww

1308 Begin processing sample
LW2-BTFC031 Tow 9

1313 Complete processing sample
LW2-BTFC031 Tow 9 - No clams
Silt, sand with sheen, shell fragments, organic debris, 8 shrimp

11/30/05 A. Rodriguez

1318 Begin processing sample
LW2-BTFC031 Tow 10

1319 Complete processing sample
LW2-BTFC031 Tow 10
Silt, sand, shell fragments, organic debris, plastic, 39 shrimp
Collect 45 clams:
15 mm width ~ 0.41 g ww
(2x) 30 mm width ~ 1.66 g ww
31 mm width ~ 1.78 g ww
32 mm width ~ 1.89 g ww
Total weight for all tows is ~46.39 g ww and 34 clams collected.

1326 Motor to station LW2-BT027, upstream from Portland Shipyard on east side of the river ~ 8.7 RM

1338 Begin processing sample
LW2-BTFC027 Tow 1

1340 Complete processing sample
LW2-BTFC027 Tow 1

~~1347~~ No clams, silt with sheen, organic debris

1347 Begin processing sample
LW2-BTFC027 Tow 2

11/30/05 A. Rodriguez

1350 Complete processing sample
LW2-BTFC027 Tow 2
Silt, organic debris, plastic, paint chips, 17 shrimp, female crayfish (photos taken)
Collect 8 clams:
10 mm width ~ 0.18 g ww
13 mm width ~ 0.31 g ww
30 mm width ~ 1.66 g ww
(2x) 31 mm width ~ 1.78 g ww each clam
33 mm width ~ 2.01 g ww
(2x) 35 mm width ~ 2.26 g ww each clam

1356 Begin processing sample
LW2-BTFC027 Tow 3

1359 Complete processing sample
LW2-BTFC027 Tow 3
Silt, organic debris, plastic, paint chips, 11 shrimp
Collect 5 clams:
25 mm width ~ 1.15 g ww
28 mm width ~ 1.45 g ww
32 mm width ~ 1.89 g ww
(2x) 35 mm width ~ 2.26 g ww

1406 Begin processing sample
LW2-BTFC027 Tow 4

11/30/05 A. Rodriguez

1410 Complete processing sample
LW2-BTFC027 Tow 4
Silt, organic debris, shell fragments, plastic, paint chips, 23 shrimp
Collect 23 clams:
12 mm width ~ 0.27 g ww
(2x) 18 " " ~ 0.6 g ww each clam
21 " " ~ 0.81 g ww
22 " " ~ 0.89 g ww
(3x) 25 " " ~ 1.15 g ww each clam
26 " " ~ 1.25 g ww
(3x) 29 " " ~ 1.55 g ww each clam
(3x) 33 " " ~ 2.01 g ww each clam
(3x) 34 " " ~ 2.14 g ww each clam
35 " " ~ 2.26 g ww
(2x) 37 " " ~ 2.53 g ww each clam
38 " " ~ 2.67 g ww
39 " " ~ 2.81 g ww

1416 Begin & complete processing of sample LW2-BTFC027 Tow 5
No clams, silt, organic debris, plastic, 19 shrimp

1423 Begin processing sample
LW2-BTFC027 Tow 6*

11/30/05 A. Rodriguez

1427 Complete processing sample
LW2-BTFC027 Tow 6
Silt, organic debris, shell fragments, plastic, paint chips, 12 shrimp
Collect 8 clams:
20 mm width ~ 0.74 g ww
26 " " ~ 1.25 g ww
28 " " ~ 1.45 g ww
30 " " ~ 1.66 g ww
(2x) 31 " " ~ 1.78 g ww each clam
(2x) 34 " " ~ 2.14 g ww each clam

1435 Begin processing sample
LW2-BTFC027 Tow 7*

1440 Complete processing sample
LW2-BTFC027 Tow 7
Silt, organic debris, shell fragments, plastic, paint chips
Collect 4 clams:
29 mm width ~ 1.55 g ww
33 mm width ~ 2.01 g ww
34 mm width ~ 2.14 g ww
36 mm width ~ 2.4 g ww

Note* This extra biomass may be used for replicate.

11/30/05 A. Rodriguez

1447 Begin processing sample
LW2-BTFC027 Tow 8 #

1455 Complete processing sample
LW2-BTFC027 Tow 8
Collect 13 clams:
11 mm width ~0.22 g ww
18 " " ~0.60 g ww
22 " " ~0.89 g ww
(2x) 27 " " ~1.35 g ww
(2x) 29 " " ~1.55 g ww
30 " " ~1.66 g ww
32 " " ~1.89 g ww
34 " " ~2.14 g ww
36 " " ~2.4 g ww
(2x) 37 " " ~2.53 g ww
Silt, organic debris, shell fragments, 4 shrimp, paint chips, plastic, gravel

1458 Begin processing sample
LW2-BTFC027 Tow 9 #

1503 Complete processing sample
LW2-BTFC027 Tow 9
silt with sheen, organic debris, shell fragments, 6 shrimp, plastic, paint chips

11/30/05 A. Rodriguez

Collect 6 ~~8~~ (AR) clams:
11 mm width ~0.22 g ww
23 " " ~0.98 g ww
(2x) 25 " " ~1.15 g ww each
28 " " ~1.45 g ww
33 " " ~2.01 g ww
Tow 10 at station LW2-BT027 rejected due a stick in the sledge.

1505 Begin processing sample
LW2-BTFC027 Tow 11

1507 Complete processing sample
LW2-BTFC027 Tow 11
silt, organic debris, shell fragments, 4 shrimp, plastic, paint chips
Collect 2 clams:
24 mm width ~1.06 g ww
43 mm width ~3.42 g ww

1523 Begin processing sample
LW2-BTFC027 Tow 12

1527 Complete processing sample
LW2-BTFC027 Tow 12
~~Cotte~~ (AR) silt, organic debris, shell fragments, plastic, paint chips

ANC02200
BZTO104(e)002200

11/30/05 A. Rodriguez

Collect 6 clams @ LW2-BT~~027~~ AR027 Tow 12
7 mm width ~0.09 g WW
9 " " ~0.12 g WW
11 " " ~0.22 g WW
29 " " ~1.55 g WW
35 " " ~2.26 g WW
38 " " ~2.67 g WW

1530 Total weight for all tows is 119.07 g WW (75 clams) & includes replicate sample

1537 Arrive at station LW2-BT030, downstream of fireboat cove on west side of river 9.5 RM, elevated PCB concs in sediment

1542 Begin processing sample LW2-BTFC030 Tow 1

1546 Complete processing sample LW2-BTFC030 Tow 1
Clay, gravel, silt, sheen, organic debris, shell fragments, plastic, paint chips, 1 shrimp
Collect 2 clams:
11 mm width ~0.22 g WW
13 mm width ~0.31 g WW

11/30/05 A. Rodriguez

1553 Begin processing sample LW2-BTFC030 Tow 2

1600 Complete processing sample LW2-BTFC030 Tow 2
Clay, gravel, sheen, organic debris, shell fragments, glass, paint chips, plastic, 2 shrimp
Collect 5 clams:
6 mm width ~0.07 g WW
(2x) 7 mm width ~0.09 g WW each
22 mm width ~0.89 g WW
32 mm width ~1.89 g WW

1402 Begin processing sample LW2-BTFC030 Tow 2 AR 3

1407 Complete processing sample LW2-BTFC030 Tow 3
Clay, gravel, sheen, organic debris, shell fragments, metal, plastic, ~~paint chips~~, AR glass, 3 shrimp
Collect Ø clams.

1409 Begin processing sample LW2-BTFC030 Tow 4

1415 Complete processing sample LW2-BTFC030 Tow 4

11/30/05 A. Rodriguez

Clay, silt, gravel, sheen, organic debris, shell fragments, paint chips, plastic

Collect 10 clams:

8 mm width ~0.12 g ww
15 " " ~0.41 g ww
17 " " ~0.53 g ww
18 " " ~0.6 g ww
20 " " ~0.74 g ww
21 " " ~0.81 g ww
28 " " ~1.45 g ww
31 " " ~1.78 g ww
33 " " ~2.01 g ww
35 " " ~2.26 g ww

1420 Begin processing sample LW2-BTFC030 Tow 5

1430 Complete processing sample LW2-BTFC030 Tow 5

Clay, gravel, silt, sheen, organic debris, metal, glass, plastic, paint chips, 2 shrimp

Collect 4 clams:

(2x) 9 mm width ~0.12 g ww
24 mm width ~1.06 g ww
38 mm width ~2.67 g ww

11/30/05 A. Rodriguez

1631 Head back to Swan Island boat ramp

1700 Arrive at field lab to unload gear and put samples in freezer. Make copies of GPS (sledge crew) and daily biomass catch (processing crew) field notes.

ANC02202
BZTO104(e)002202

11/30/~~00~~ 12/1/05 A. Rodriguez

0700 Arrive at field lab and load up supplies

0730 Arrive at Swan Island Boat Ramp

Sledging Crew:
- Helle Andersen (WW)
- Thai Do (WW)
- Brian Pointer (Integral)
- Dave Mullins (Boat driver)

Processing Crew:
- Angelita Rodriguez (WW)
- Kathleen Hurley (WW)
- Joe Goulet (EPA oversight)
- Mike May (Ross Island boat driver)

0745 Contact Coast Guard & Sheriff to inform of sampling activities on west side of river (8-9.5 RM).

0751 Motor to station LW2BT030, downstream of fireboat cove on west side river

0820 Begin processing sample LW2-BTFC030 Tow 6

0824 Complete processing sample LW2-BTFC030 Tow 6

clay, silt, organic woody debris, shell fragments, metal

12/1/05 A. Rodriguez

LW2-BTFC030 Tow 6

Collect 1 clam w/ 15mm width ~0.41gw

0829 Begin processing sample LW2-BTFC030 Tow 7

Complete processing sample

0831 LW2-BTFC030 Tow 7

clay, silt, gravel, organic woody debris, shell fragments, paint chips, plastic, glass, metal, 1 shrimp

No clams

0840 Begin processing sample LW2-BTFC030 Tow 8

0848 Complete processing sample LW2-BTFC030 Tow 8

sand & gravel with sheen, small amts. of clay & silt, organic woody debris, glass

Collect 6 clams:
- 6 mm width
- 26 mm width
- 28 mm width
- (2x) 29 mm width
- 33 mm width

0849 Begin processing sample LW2-BTFC030 Tow 8

12/1/05 A. Rodriguez

0852 Complete processing sample
LW2-BTFC030 Tow 9
sand and gravel, small amts. of clay & silt, organic woody debris, shell fragments, glass
Collect 5 clams:
11 mm width 0.22 g ww
13 " " 0.31 g ww
19 " " 0.67 g ww
24 " " 1.06 g ww
20 " " .74 g ww

0900 Begin processing sample
LW2-BTFC030 Tow 10

0905 Complete processing sample
LW2-BTFC03 Tow 10
silt, clay, sheen, organic woody debris, 2 shrimp, shell fragments, plastic, glass
Collect 6 clams:
8 mm width ~0.12 g ww
9 " " ~0.15 g ww
11 " " ~0.22 g ww
12 " " ~0.27 g ww
19 " " ~0.67 g ww
28 " " ~1.45 g ww

12/01/05 A. Rodriguez

0908 Begin processing sample
LW2-BTFC030 Tow 11

0912 Complete processing Tow 11
LW2-BTFC030
clay, silt, gravel, organic woody debris, shell fragments, plastic glass
Collect 7 clams:
11 mm width ~0.22
18 " " ~0.80 g ww
28 " " ~1.45 g ww
32 " " ~1.89 g ww
33 " " ~2.01 g ww
37 " " ~2.53 g ww
38 " " ~2.67 g ww
Total weight for all tows is 43.84 g ww
Total clams collected 46

0921 Arrive at station BT028, adjacent to Gunderson but do not sample because do not have permission to do so. Motor to station BT024, adjacent to Front Ave ~8.2 KM

0935 Arrive at station BT024

48

12/1/05 A. Rodriguez

0947 Begin processing sample
LW2-BTFC024 Tow 1

0951 Complete processing sample
LW2-BTFC024 Tow 1
silt with sheen, organic debris,
empty mussel shells, shell fragments
Collect 10 clams.

5	mm width	~ 0.05	g ww
(3x) 6	" "	~ 0.07	g ww
(2x) 7	" "	~ 0.09	g ww
8	" "	~ 0.12	g ww
27	" "	~ 1.35	g ww
33	" "	~ 2.01	g ww
41	" "	~ 3.11	g ww

0957 Begin processing sample
LW2-BTFC024 Tow 2

1000 Complete processing sample
LW2-BTFC024 Tow 2
silt with sheen, organic debris, plastic,
chironomids, 3 shrimp, shell fragments
Collect 9 clams:

(3x) 6	mm width	~ 0.07	g ww
(2x) 7	mm width	~ 0.09	g ww
8	mm width	~ 0.12	g ww

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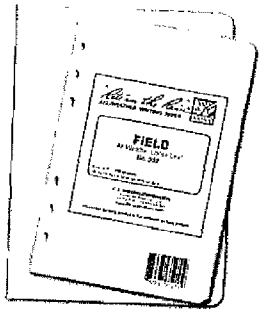
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Book 2 of 5

4 5/8" x 7" - 48 Numbered Pages

ANC02206
BZTO104(e)002206

12/1/05 ARodriguez

LW2-BTFC024 Tow 2 cont'd
26 mm width ~ 1.25 g ww
29 " " ~ 1.55 g ww
37 " " ~ 2.53 g ww

1005 Begin processing sample LW2-BTFC024 Tow 3

1008 Complete processing sample LW2-BTFC024 Tow 3
silt, organic wood debris, shell fragments, plastic
Collect 12 clams:
6 mm width 0.07 g ww
7 " " 0.09 g ww
(2x) 8 " " 0.12 g ww
9 " " 0.15 g ww
10 " " 0.18 g ww
19 " " 0.67 g ww
20 " " 0.74 g ww
21 " " 0.81 g ww
27 " " 1.35 g ww
~~26~~ " " AR
36 " " 2.4 g ww
39 " " 2.81 g ww

12/1/05 A. Rodriguez

1014 Begin processing sample LW2-BTFC024 Tow 4

1018 Complete processing sample LW2-BTFC024 Tow 4
silt, sand, organic woody debris, paint chips, plastic, shell fragments, 4 shrimp
Collect 3 clams:
8 mm width ~ 0.12 g ww
31 " " ~ 1.78 g ww
32 " " ~ 1.89 g ww

1022 Begin processing sample LW2-BTFC024 Tow 5

1025 Complete processing sample LW2-BTFC024 Tow 5
silt with sheen, Chironomids organic woody debris, paint chip, 1 shrimp, shell fragments
Collect 9 clams:
(2x) 6 mm width ~ 0.07 g ww 33 mm width
7 " " ~ 0.09 g ww ~ 2.01 g ww
(2x) 9 " " ~ 0.15 g ww 35 mm width
11 " " ~ 0.22 g ww ~ 2.26 g ww
24 " " ~ 1.06 g ww

12/1/05 A. Rodriguez

1036 Tow 6 BT024 Rejected

1043 Begin processing sample
LW2-BTFC024 Tow 7

1048 Complete processing sample
LW2-BTFC024 Tow 7
Silt, organic woody debris, plastic,
Shell fragments, chironomids
Collect 18 clams:
(4x) 7 mm width ~ 0.09 g ww
8 " " ~ 0.12 g ww
9 " " ~ 0.15 g ww
11 " " ~ 0.22 g ww
(2x) 13 " " ~ 0.31 g ww

1052 Begin processing sample
LW2-BTFC024 Tow 8

1056 Complete processing sample
LW2-BTFC024 Tow 8
Silt, woody debris, shell fragments,
plastic, 3 shrimp, chironomids
Collect 1 clam 30mm width - 1.66 g ww

1100 Begin processing sample
LW2-BTFC024 Tow 9

1106 Complete processing sample

12/1/05 A. Rodriguez

LW2-BTFC024 Tow 9
Silt, clay, organic woody debris,
Shell fragments, plastic
Collect 7 clams:
7 mm width ~ 0.09 g
8 " " ~ 0.12 g
(2x) 10 " " ~ 0.18 g
(2x) 18 " " ~ 0.6 g
35 " " ~ 2.26 g

1109 Begin processing sample
LW2-BTFC024 Tow 10

1111 Complete processing sample
LW2-BTFC024 Tow 10
Silt, organic woody debris,
shell fragments, plastic,
1 shrimp
Collect 1 clam 10mm width 0.18 g

1112 Begin processing sample
LW2-BTFC024 Tow 11

1116 Complete processing sample
LW2-BTFC024 Tow 11
Silt, organic woody debris, plastic,
1 shrimp
Collect 12 clams

12/1/05 H. Rodriguez

LW2-BTFC024 Tow 11
5 mm width 0.05 g
(2x) 6 mm " ~0.07 g
(2x) 7 mm ~0.09 g
(4x) 8 mm " ~0.12 g
9 mm " ~0.15 g
17 mm " ~0.53 g
34 mm " ~2.14 g
Total weight for all tows 43.93 g
Total clams 73

1122 Motor to station BT028, adj to Gunderson now have permission to sample
1135 Begin processing sample
LW2-BTFC028 Tow 1
1137 Complete processing sample
LW2-BTFC028 Tow 1
silt, organic debris, algae, chironomids, 6 shrimp, plastic, shell fragments, paint chips
Collect 5 clams:
27 mm width ~1.35 g
30 mm width ~1.66 g
37 mm width ~2.53 g
31 mm width ~1.78 g
32 mm width ~1.89 g

12/1/05 A. Rodriguez

1142 Begin processing sample
LW2-BTFC028 Tow 2
1144 Complete processing sample
LW2-BTFC028 Tow 2
silt, shell fragments, chironomids, paint chips, organic woody debris
Collect 6 clams:
(2x) 30 mm width ~1.66 g
(2x) 31 " " ~1.78 g
32 " " ~1.89 g
33 " " ~2.01 g
1152 Begin processing sample:
LW2-BTFC028 Tow 3
1154 Complete processing sample
LW2-BTFC028 Tow 3
silt, algae, woody debris, chironomids, shell fragments, plastic
Collect 1 clam 30 mm width ~1.66 g
1200 Lunch break & call Laura Jones about refrig. truck
1240 Begin processing sample
LW2-BTFC028 Tow 4
1245 Complete processing sample
LW2-BTFC028 Tow 4

12/1/05 A. Rodriguez

LW2-BTFC028 Tow 4
silt, woody debris, shell fragments, plastic, paint chips, aluminum foil, 3 shrimp, Chironomids
Collect 4 clams:
30 mm width ~1.66 g
32 " " ~1.89 g
(2x) 33 " " ~2.01 g

1249 Begin processing sample
LW2-BTFC028 Tow 5

1251 Complete processing sample
LW2-BTFC028 Tow 5
silt, woody debris, shell fragments, chironomids, algae, plastic, paint chips, glass, 68 shrimp
No clams

1255 Begin processing sample
LW2-BTFC028 Tow 6

1259 Complete processing sample
LW2-BTFC028 Tow 6
silt, organic debris, chironomids, shell fragments, paint chips, plastic, algae, foil, 4 shrimp

12/1/05 A. Rodriguez

LW2-BTFC028 Tow 6
Collect 3 clams:
12 mm width ~ 0.27 g WW
15 " ~ 0.41 g WW
18 " " ~ 0.60 g WW

1303 Begin processing sample
LW2-BTFC028 Tow 7

1307 Complete processing sample
LW2-BTFC028 Tow 7
silt, woody debris, shell fragments, plastic, paint chips, foil, glass, Chironomids, algae, 1 shrimp
Collect 2 clams: 24 mm width ~ 1.06 g WW
34 mm width ~ 2.14 g WW

1311 Begin processing sample
LW2-BTFC028 Tow 8

1315 Complete processing sample
LW2-BTFC028 Tow 8
silt, woody debris, paint chips, plastic, shell fragments, 1 shrimp,
Collect 4 clams:
14 mm width ~ 0.36 g 36 mm ~ 2.40 g
8 mm width ~ 0.12 g 37 mm ~ 2.53 g

ANC02210
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12/1/05 H. Rodriguez

1317 Tow 9 @ BT028 Rejected b/c bag flipped over

1324 Begin processing sample LW2-BTFC028 Tow 10

1325 Complete processing sample LW2-BTFC028 Tow 10
silt, organic debris, chironomids, algae, 4 shrimp
No clams
1 Mussel 75mm width, LW2-BTFM028

1331 ~~Begin~~ AR Tow 11 @ station BT028
Rejected b/c the sledge net broke and needs to be replaced with the back up sledge. Sledge crew repairs sledge.

1354 Begin processing sample LW2-BTFC028 Tow 12

1358 Complete processing sample LW2-BTFC028 Tow 12
silt, woody debris, shell fragments, chironomids, plastic, paint chips
Collect 4 clams: 7mm width ~0.09 g ww
30 mm ~ 1.66g ww
(2x) 32 mm ~ 1.89g ww
Total weight for all tows ~ 45.18 g ww
Total clams = 29 collected

12/1/05 A. Rodriguez

1403 Motor to station BT021, EPA requested site; PAH Contamination on west side of the river ~ 7.8 RM

1410 Barges are blocking station BT021 and will be moving in and out of area. Therefore, can not access sampling location until further notice.

1414 Motor to station BT020, located near mouth of Salzman Creek with potential outfall contamination. EPA requested site at ~ 7.6 RM on west side.

1430 Begin processing sample LW2-BTFC020 Tow 1*

1433 Complete processing sample LW2-BTFC020 Tow 1
sand, gravel, shell fragments, glass, plastic, paint chips,
No clams

1439 Begin processing sample LW2-BTFC020 Tow 2

1445 Complete processing sample LW2-BTFC020 Tow 2

ANC02211
BZTO104(e)002211

12/1/05 A. Rodriguez

LW2-BTFC020 Tow 2 cont'd
silt, sheen, woody debris, shell fragments, gravel, chironomids
Collect 4 clams:
5 mm ~ 0.05 g ww
(2x) 6 mm ~ 0.07 g ww
19 mm ~ 0.67 g ww

* Note: Sledge crew is sledging closest to the beach area and working their way away from the beach with each tow.

1450 Begin processing sample LW2-BTFC020 Tow 3

1454 Complete processing sample LW2-BTFC020 Tow 3
silt, sand, shell fragments, woody debris, paint chips, gravel
collect 2 clams:
5 mm ~ 0.05 g ww & 7 mm ~ 0.09 g ww

1459 Begin processing sample LW2-BTFC020 Tow 4

Complete processing sample LW2-BTFC020 Tow 4
Sand, silt, woody debris, shell fragments, plastic, gravel

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1502 LW2-BTFC020 Tow 4 Cont'd
Collect 1 clam @ 6 mm ~ 0.07 g ww

1506 Begin processing sample LW2-BTFC020 Tow 5

1509 Complete processing sample LW2-BTFC020 Tow 5
silt, sheen, shell fragments, woody debris
Collect 3 clams:
6 mm ~ 0.07 g ww
(2x) 20 mm ~ 0.74 g ww

1519 Begin processing sample LW2-BTFC020 Tow 6

1527 Complete processing sample LW2-BTFC020 Tow 6
silt, organic debris, dragonfly larvae, shell fragments
Collect 4 clams:
12 mm ~ 0.27 g ww 30 mm ~ 1.66 g
18 mm ~ 0.60 g ww 37 mm ~ 2.53 g

1537 Begin processing sample LW2-BTFC020 Tow 7

1543 Complete processing sample LW2-BTFC020 Tow 7

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1619 Begin processing sample LW2-BTFC020 Tow 11
Complete processing sample
1625 LW2-BTFC020 Tow 11
Sand, gravel, silt, sheen, woody debris, plastic, roofing tiles
Collect 11 clams:
18mm ~0.60g
(2) 22mm ~0.89g
24mm ~1.06g
27mm ~1.35g
28mm ~1.45g
31mm ~1.78g
32mm ~1.89g
34mm ~2.14g
35mm ~2.26g
37mm ~2.53g
1630 Contact Coast Guard & Sheriff's office to inform them we're done sampling for the day
1645 Arrive at Swan Island Boat ramp
1700 Arrive at field lab and unload samples & make copy of notes & correct sample id's from 11/28 & 11/29 after

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correcting tow numbers, which include all tows (rejected & successful).

End of day.

Angelith 12/1/05

12/2/05 A. Rodriguez

0700 Arrive at field lab and load up supplies.

0730 Arrive at Cathedral Park boat ramp and load up boats.

Sledging crew:
Helle Andersen (WW)
Kathleen Hurley (WW)
Dave Mullins (Boat driver)

Processing crew:
Angelita Rodriguez (WW)
Thai Do (WW)
Mike May (Boat driver) Ross Island

0745 Contact Coast Guard to broadcast a "No Wake Call" for the area where will be sampling.

Proposed sampling locations:
1 BT025, Shaver and Swan Island area.

0748 Motor to BT025, an EPA requested site where there is potential PCB contamination @ ~ 8.3 RM west side.

0818 Begin processing sample LW2-BTFC025 Tow 1

0820 Complete processing sample

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LW2-BTFC025 Tow 1
silt, sheen, organic debris, shell fragments, paint chips, plastic
No clams

0829 Begin processing sample LW2-BTFC025 Tow 2

0832 Complete processing sample LW2-BTFC025 Tow 2
silt with sheen, organic debris, chironomid plastic, shell fragments, paint chips
No clams
Collect 1 mussel 97 mm width
LW2-BTFM025 sample id

0839 Begin processing sample LW2-BTFC025 Tow 3

0844 Complete processing sample LW2-BTFC025 Tow 3
Silt and gravel, shell fragments, paint chips, organic debris, plastic, 1 shrimp

0847 Begin processing sample LW2-BTFC025 Tow 4

0851 Complete processing sample LW2-BTFC025 Tow 4

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LW2-BTFC025 Tow 4 cont'd
silt with sheen, chironomids, shell fragments, plastic, paint chips
No clams

0858 Begin processing sample
LW2-BTFC025 Tow 5

0905 Complete processing sample
LW2-BTFC025 Tow 5
Silt with sheen, organic debris (woody), shell fragments, gravel, metal foil, paint chips, chironomids, plastic, algae
Collect 4 clams:
17 mm ~0.53g (2x) 31 mm ~1.78g
33 mm ~2.01

0907 Begin processing sample
LW2-BTFC025 Tow 6

0909 Complete processing sample
LW2-BTFC025 Tow 6
Silt, gravel, organic debris, shell fragments, plastic, paint chips, 3 shrimp, algae
No clams

0917 Begin processing sample
LW2-BTFC025 Tow 7

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0921 Complete processing sample
LW2-BTFC025 Tow 7
silt & gravel with sheen, woody debris, shell fragments, paint chips,
Collect 5 clams:
8mm ~0.09g 31 mm ~1.78g
10 mm ~0.18g 33 mm ~2.01g
25 mm ~1.15g

0926 Begin processing sample
LW2-BTFC025 Tow 8

0927 Complete processing sample
LW2-BTFC025 Tow 8
silt & gravel with sheen, algae, woody debris, shell fragments, plastic, paint chips, chironomids
No clams

0936 Begin processing sample
LW2-BTFC025 Tow 9

0938 Complete processing sample
LW2-BTFC025 Tow 9
silt with sheen, woody debris, algae, plastic, shell fragments, paint chips, chironomids

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LW2-BTFC025 Tow 9
Collect 2 clams:
30mm ~ 1.66g 35mm ~ 2.26g

0947 Begin processing sample
LW2-BTFC025 Tow 10

0952 Complete processing sample
LW2-BTFC025 Tow 10
silt with sheen, gravel, woody debris, glass, paint chips, shell fragments
1 shrimp
Collect 1 clam 27mm ~ 1.35g ww

0958 Begin processing sample
LW2-BTFC025 Tow 11

1002 Complete processing sample
LW2-BTFC025 Tow 11
silt with sheen, gravel, woody debris, shell fragments, chironomids, paint chips, plastic
Collect 6 clams:
22mm ~ 0.89g
23mm ~ 0.98g
31mm ~ 1.78g
(2x) 32mm ~ 1.89g
37mm ~ 2.53g

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Total weight for all tows @ station BT025 is ~ 26.54g ww

1010 Motor to station BT029 in Swan Island lagoon on east side to take minimum of 3 tows, possibly more to collect more clam biomass as discussed by Helle Andersen & Joe Goulet on 12/1/05.

1024 Arrive at station BT029

1028 Begin processing sample
LW2-BTFC029 Tow 17

1029 Complete processing sample
LW2-BTFC029 Tow 17
silt with sheen, woody debris, chironomids, shell fragments
No clams

1037 Begin processing sample
LW2-BTFC029 Tow 18

1038 Complete processing sample
LW2-BTFC029 Tow 18
silt with sheen, organic debris, shell fragments, chironomids, plastic
No clams

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1050 Begin processing sample
LW2-BTFC029 Tow 19

1052 Complete processing sample
LW2-BTFC029 Tow 19
silt w/sheen, woody debris,
shell fragments
Collect 1 clam 27mm ~1.35g

1100 Begin processing sample
LW2-BTFC029 Tow 20

1104 Complete processing sample
LW2-BTFC029 Tow 20
silt w/sheen, woody debris, shell
fragments, cam, paint chips, chironomids,
plastic
Collect 1 clam 13mm ~.3g
Total weight for total tows ~15.20g ww

1108 Motor to station BTO19, EPA requested
site at ~7.5RM on east side of river.

1141 Begin processing sample
LW2-BTFC019 Tow 1

1143 Complete processing sample
LW2-BTFC019 Tow 1
Collect 2 clams: 7mm ~0.09g 18mm ~0.12g

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LW2-BTFC019 Tow 1
silt, organic debris, shell fragments,
gravel

1149 Begin processing sample
LW2-BTFC019 Tow 2

1150 Complete processing sample
LW2-BTFC019 Tow 2
silt, organic debris, chironomids,
shell fragments, paint chips, plastic
No clams

1157 Begin processing sample
LW2-BTFC019 Tow 3

1159 Complete processing sample
LW2-BTFC019 Tow 3
silt with sheen, woody debris, chironomids,
paint chips, shell fragments
Collect 2 clams: 6mm ~0.07g ww
28mm ~1.45g ww

1212 Begin processing sample
LW2-BTFC019 Tow 4

1218 Complete processing sample
LW2-BTFC019 Tow 4
silt w/sheen, paint chips, organic debris,

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LW2-BTFC019 Tow 4
Collect 7 clams: 27mm~1.35g
12mm~0.27g 15mm~0.41g
13mm~0.31g 18mm~0.60g
16mm~0.47g 26mm~1.25g

1224 Begin processing sample
LW2-BTFC019 Tow 5

1230 Complete processing sample
LW2-BTFC019 Tow 5
sand, organic debris, shell fragments, plastic
Collect 3 clams:
7mm~0.07g & (2x) 26mm~1.25g ww

1231 Lunch break and call Ian Stupakoff

1307 Begin processing sample
LW2-BTFC019 Tow 6

1310 Complete processing sample
LW2-BTFC019 Tow 6
sand & silt w/sheen, chironomids, shell fragments, paint chip, organic debris, plastic
No clams

1319 Begin processing sample
LW2-BTFC019 Tow 7

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1320 Complete processing sample
LW2-BTFC019 Tow 7
Silt w/sheen, organic debris, shell fragments
Collect 1 clam 43mm~3.42g ww

1327 Begin processing sample
LW2-BTFC019 Tow 8

1330 Complete processing sample
LW2-BTFC019 Tow 8
Silt, sand w/sheen, paint chips, organic debris
No clams

1338 Begin processing sample
LW2-BTFC019 Tow 9

1341 Complete processing sample
LW2-BTFC019 Tow 9
sand & silt w/sheen, organic debris, shell fragments
Collect 1 clam 6mm~0.07g ww

1351 Begin processing sample
LW2-BTFC019 Tow 10

1359 Begin processing sample
LW2-BTFC019 Tow 10
Sand & silt w/sheen, organic debris, paint chips

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LW2-BTFC019 Tow 10 Cont'd
chironomids, shell fragments
Collect 3 clams: 30 mm ~ 6.66 g
12 mm ~ .27 g ww
24 mm ~ 1.06 g ww
Total weight for all tows ~ 15.46 g

1400 Arrive at station BTO18, EPA requested site that has DDT & PCB contamination located near Arkema ~ 7.2 RM on west side

1418 Begin processing sample
~~B~~ AR LW2-BTFC018 Tow 1

1420 Complete processing sample
LW2-BTFC018 Tow 1
silt with sheen, fishing line, plastic, shell fragments, paint chips, 4 shrimp
Collect 1 clam 33 mm ~ 2.01 g ww

1428 Begin processing sample
LW2-BTFC018 Tow 2

1431 Complete processing sample
LW2-BTFC018 Tow 2
silt w/sheen, organic debris, shell fragments

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LW2-BTFC018 Tow 2 Cont'd
Collect 2 clams: 26 mm ~ 1.25 g ww
31 mm ~ 1.78 g ww

1439 Begin processing sample
LW2-BTFC018 Tow 3

1441 Complete processing sample
LW2-BTFC018 Tow 3
Silt w/sheen, organic debris, shrimp shell fragments, paint chips, chironomids
No clams

1451 Begin processing sample
LW2-BTFC018 Tow 4

1455 Complete processing sample
LW2-BTFC018 Tow 4
Sand & silt w/sheen, organic debris, shell fragments, metal washer, 1 shrimp
Collect 4 clams: 8 mm ~ 0.12 g
29 mm ~ 1.55 g & 32 mm ~ 1.89 g
38 mm ~ 2.67 g

1507 Begin processing sample
LW2-BTFC018 Tow 5

1512 Complete processing sample
LW2-BTFC018 Tow 5

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LW2-BTFC018 Tow 5 cont'd
silt w/sheen, organic debris,
shell fragments, chironomids
Collect 3 clams: 33mm ~ 2.01g
6mm ~ 0.07g & 27mm ~ 1.35g

1521 Begin processing sample
LW2-BTFC018 Tow 6

1524 Complete processing sample
LW2-BTFC018 Tow 6
Silt w/sheen, organic debris, chironomids,
shell fragments
No clams

1530 Laurie Warner, OR State Lands Dept.
Calls to inquire about a State
Removal Permit to collect Clams
from the Willamette River.
Call Sandy w/ Integral Olympia
office who confirms we have a
permit as part of the agreement
to conduct RI/FS in Portland
Harbor. Sandy will contact
Laurie Warner with info.

1534 Begin processing sample
LW2-BTFC018 Tow 7

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1536 Complete processing sample
LW2-BTFC018 Tow 7
silt w/sheen, organic debris,
shell fragments, chironomids
No clams

1543 Begin processing sample
LW2-BTFC018 Tow 8

1547 Complete processing
sample LW2-BTFC018 Tow 8
Silt w/sheen, organic debris,
shell fragments, chironomids,
collect 1 clam 25mm ~ 1.15g ww

1552 Begin processing sample
LW2-BTFC018 Tow 9

1559 Complete processing sample
LW2-BTFC018 Tow 9
silt w/sheen, organic debris, shell
fragments, chironomids, paint chips
leach
Collect 1 clam 35mm ~ 2.26g

1600 Begin processing sample
LW2-BTFC018 Tow 10

16 Complete processing sample
LW2-BTFC018 Tow 10

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LW2-BTFC018 Tow 10
silt w/sheen, organic debris, shell fragments, chironomids

Collect 1 clam 25mm ~1.15

1611 Begin processing sample LW2-BTFC018 Tow 11

1612 Complete processing sample LW2-BTFC018
Sand, organic debris, paint chips, plastic, shell fragments
Collect 3 clam
7mm ~0.09g
11mm ~0.22g
37mm ~2.53g
Total weight for all tows ~22.10g ww

Contact Coast Guard & sheriff to inform we're off water.

1616 Head back to Cathedral Park

1645 Arrive at field lab and unload samples and supplies. Coordinate field logistics for bioaccumulation & clam sledging (12/5-12/9) with Ian.

1730 End of day

Angelita 12/2

12/5/05 A. Rodriguez

0700 Arrive at field lab and load up minivan with supplies

0730 Meet boat drivers at Cathedral Park boat ramp

Sledging Crew:
Helle Andersen (WW)
Linda Marsh (WW)
David Gillingham (oversight, Parametrix)
Dave Mullins (boat driver)

Processing Crew:
Angelita Rodriguez (WW)
Jane Sund (Integral)
Mike May (boat driver, Ross Island)

0800 Contact Coast Guard & Sheriff's office to inform about sampling area (6-7.5 RM) and to broadcast a "No Wake Zone"

0810 Arrive at station BT021 near Willbridge ~7.8RM on west side, EPA requested site PAH contamination

0817 Reject Tow1 at station BT021 b/c of poor sledge set-up & sample not collected

0828 Begin processing sample LW2-BTFC021 Tow2

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0834 Complete processing sample
LW2-BTFC021 Tow 2
silt w/florette sheen, wood
fragments, paint chips, No clams
Collect 1 mussel 87 mm width
LW2-BTFM021

0837 Begin processing sample
LW2-BTFC021 Tow 3
Complete processing sample

0842 LW2-BTFC021 Tow 3
silt w/ florettes of sheen, wood
fragments, paint chips
Collect 1 mussel 87 mm width
LW2-BTFM021 Tow 3
Collect 1 clam 27 mm ~1.35 gww

0847 Begin processing sample
LW2-BTFC021 Tow 4

0850 Complete processing sample
LW2-BTFC021 Tow 4
silt w/florettes of sheen, wood
fragments, paint chips, litter
No clams

0855 Begin processing sample
LW2-BTFC021 Tow 5

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901 Complete processing sample
LW2-BTFC021 Tow 5
silt, abundant wood debris,
plastic litter, slight sheen
Collect 1 clam 35 mm ~2.26 gww
Collect 2 mussel
84 mm width
91 mm width

0905 Begin processing sample
LW2-BTFC021 Tow 6

0918 Complete processing sample
silt & sand w/ clumps of clay
and ~~slight~~ moderate AR sheen, large wood debris
mostly, shell fragments, paint chips,
plastic trash, organic debris, gravel,
riprap, shrimp
slight TPH odor
Collect 6 clams

Collect 1 mussel 76 mm

0921 Begin processing sample
LW2-BTFC021 Tow 7
Complete processing sample

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0930 LW2-BTFC021 Tow 7
Mostly wood debris, silt w/clay nodules, paint chips, leaf litter, shell fragments, 19 shrimp, dragonfly larvae
Collect 3 clams: 10 mm ~ 0.18g
(2x) 7mm ~ 0.09g
2 mussels 97mm & 15mm

0931 Begin processing sample
LW2-BTFC021 Tow 8

0939 Complete processing sample
LW2-BTFC021 Tow 8
Mostly wood debris, silt w/clay nodules, leaf litter, trash (plastic, fishing line), shell fragments, paint chips, 4 shrimp
Collect 6 clams:

32 mm ~ 1.89g	23mm ~ .98g
34 mm ~ 2.14g	8 mm ~ 0.12g
25mm ~ 1.55g	10 mm ~ 0.18g

0940 Begin processing sample
LW2-BTFC021 Tow 9

0945 Complete processing sample
LW2-BTFC021 Tow 9
Mostly wood debris, sand w/silt, gravel

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LW2-BTFC021 Tow 9
organic plant debris, clay nodules, slight sheen
A few juvenile clams < 4 mm in width that are not sufficient to collect.

0950 Begin processing sample
LW2-BTFC021 Tow 10

0957 Complete processing sample
LW2-BTFC021 Tow 10
Mostly wood debris, sand & silt, leaf litter, trash, paint chips, clay nodules, shell fragments, 1 shrimp, gravel
Collect 2 clams: 10 mm ~ 0.18g ww
6 mm ~ 0.07g ww

0958 Begin processing sample
LW2-BTFC021 Tow 11

1004 Complete processing sample
LW2-BTFC021 Tow 11
Mostly wood debris, silt & sand w/slight sheen, leaf litter, clay nodules, shell fragments, paint chips, gravel, wire dragonfly larvae, 2 shrimp

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LW2-BTFC021 Tow 11
Collect 7 clams:
36mm ~2.40g 25mm ~1.15g
37mm ~2.53g (2x)28mm ~1.45g
33mm ~2.01 12mm ~0.27g

1008 Begin processing sample
LW2-BTFC021 Tow 12

1015 Complete processing sample
LW2-BTFC021 Tow 12
wood debris w/sand & silt, clay nodules, shell fragments, paint chips, plant debris, gravel, slight sheen, 5 shrimp, metal
Collect 4 clams: (2x)10mm ~0.18gww
7mm ~0.09g ww 5mm ~0.05g ww
Total weight for all tows ~29.80g ww

1020 Motor to station BT017, near Railroad Bridge ~6.9 RM on west side downstream end of Arkema.

1034 Begin processing sample
LW2-BTFC021 Tow 1

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1039 Complete processing sample
LW2-BTFC017 Tow 1
Wood debris, gravel, plastic trash, shell fragments
Collect 5 clams:
37mm ~2.53g ww 11mm ~0.22gww
14mm ~0.36gww 9mm ~0.15g ww
12mm ~0.27gww

1045 Begin processing sample
LW2-BTFC017 Tow 2

1050 Complete processing sample
LW2-BTFC017 Tow 2
Silty sand w/wood debris, gravel, 20 shrimp, shell fragments
Collect 6 clams: 37mm ~2.53gww
36mm ~2.40gww 16mm ~0.47gww
28mm ~1.45g ww 7mm ~0.09gww
20mm ~0.74g ww

1056 Begin processing sample
LW2-BTFC017 Tow 3

1102 Complete processing sample
LW2-BTFC017 Tow 3
Mostly wood debris, sandy silt, clay nodules, shell fragments, paint chips, gravel
2 shrimp

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LW2-BTFC017 TOW 3
Collect 2 clams:
22mm ~ 0.89 gww 24mm ~ 1.06 gww

1105 Begin processing sample
LW2-BTFC017 TOW 4

1109 Complete processing sample
LW2-BTFC017 TOW 4
Wood debris, gravel, shell fragments, paint chips, some silty sand, 28 shrimp
Collect 4 clams: 6 mm ~ 0.07 g ww
8 mm ~ 0.12 g ww
13 mm ~ 0.31 g ww
33 mm ~ 0.33 g ww

1111 Begin processing sample
LW2-BTFC017 TOW 5

1120 Complete processing sample
LW2-BTFC017 TOW 5
Mostly wood debris, silt w/sand, large wood fragments, gravel, plastic debris, shell fragments, 22 shrimp
Collect 4 clams: 37 mm ~ 2.53 gww, 30 mm ~ 1.66, 25 mm ~ 1.15 g, 16 mm ~ 0.47 g

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LW2-BTFC017 TOW 5
Collect 1 mussel 85 mm width

1125 Begin processing sample
LW2-BTFC017 TOW 6

1128 Complete processing sample
LW2-BTFC017 TOW 6
Mostly wood debris, silt w/sand, shell fragments, gravel, plastic debris, 11 shrimp
No clams

1133 Begin processing sample
LW2-BTFC017 TOW 7

1136 Complete processing sample
LW2-BTFC017 TOW 7
silt w/sand, abundant wood debris, shell fragments, plastic debris, plant material, 1 shrimp, leech
No clams

1143 Begin processing sample
LW2-BTFC017 TOW 8

1146 Complete processing sample
LW2-BTFC017 TOW 8
Silt w/ trace wood fragments, gravel, isolated sheen, 2 shrimp

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LW2-BTFC017 Tow 8 cont'd
Collect 1 clam 33mm ~ 2.01 gww
1152 Begin processing sample
LW2-BTFC017 Tow 9
1158 Complete processing sample
LW2-BTFC017 Tow 9
Wood debris, paint chips, shell fragments, sand, gravel, plant debris, 1 shrimp
Collect 2 clams: 30mm ~ 1.66 gww
18mm ~ 0.60 g ww
1205* Begin processing sample
LW2-BTFC017 Tow 10
1214 Complete processing sample
LW2-BTFC017 Tow 10
mostly wood debris, trace silt & sand, paint chips, 11 shrimp
Collect 8 clams:
17mm ~ 0.53g 24mm ~ 1.06g
20mm ~ 0.74g 25mm ~ 1.15g
15mm ~ 0.41g 30mm ~ 1.66g
23mm ~ 0.98g 33mm ~ 2.01g
Total weight for all tows ~ 34.29 gww
* Note: Sledging crew motors to Cathedral Park boat ramp to pickup field supplies,

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exchange field crew (Jane Sund is replaced by Kathleen Hurley, WW) and lunch.
1231 Motor to station BTO16, Willamette Cove @ RM 6.8 on east side of river. EPA requested site.
1235 lunch break
1259 Begin processing sample
LW2-BTFC016 Tow 1
1305 Complete processing sample
LW2-BTFC016 Tow 1
woody debris, shell fragments, silt, bits of gravel, 12 shrimp
Collect 3 clams: 41mm ~ 3.11g ww
10mm ~ 0.18g ww, 7mm ~ 0.09g ww
1306 Begin processing sample
LW2-BTFC016 Tow 2
Complete processing sample
LW2-BTFC016 Tow 2
woody debris, gravel w/ silt, 15 shrimp, glass
Collect 13 clams: 32mm ~ 1.89g
30mm ~ 1.66 22mm ~ 0.89g (2x) 9mm ~ 0.15g
24mm ~ 1.06 (3x) 11mm ~ 0.22g 8mm ~ 0.12g
23mm ~ 0.98 12mm ~ 0.27g 6mm ~ 0.07g

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1314 Begin processing sample
LW2-BTFC016 Tow 3

1316 Complete processing sample
LW2-BTFC016 Tow 3
No clams, sledge was snagged.
Woody debris, silt w/gravel,
shell fragments, 6 shrimp

1321 Begin processing sample
LW2-BTFC016 Tow 4

1328 Complete processing sample
LW2-BTFC016 Tow 4
woody debris, shell fragments,
silt w/gravel, 5 shrimp
Collect ~~#~~ 6 AR clams:
33 mm ~ 2.01g (2x) 12 mm ~ 0.27g
28 mm ~ 1.45g 13 mm ~ 0.31g
16 mm ~ 0.47g

1339 Begin processing sample
LW2-BTFC016 Tow 5

1342 Complete processing sample
LW2-BTFC016 Tow 5
Woody debris, shell fragments,
10 shrimp
No clams

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1351 Begin processing sample
LW2-BTFC016 Tow 6

1354 Complete processing sample
LW2-BTFC016 Tow 6
silt w/woody debris, 3 shrimp
Collect 3 clams: 41mm ~ 3.11g
34mm ~ 2.14g & 23mm ~ 0.98g
2 juvenile clams < 5mm in width
that are insufficient to collect

1358 Begin processing sample
LW2-BTFC016 Tow 7

1400 Complete processing sample
LW2-BTFC016 Tow 7
Fine silt, some woody debris, shell
fragments, 6 shrimp
Collect 1 clam 30mm ~ 1.66g ww

1407 Begin processing sample
LW2-BTFC016 Tow 8

1410 Complete processing sample
LW2-BTFC016 Tow 8
Sand, gravel, wood debris, 6 shrimp,
shell fragments
1 clam < 5mm in width that is
insufficient to collect

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LW2-BTFC016 Tow 8
Collect 2 clams:
13mm ~0.31g & 10mm ~0.18g ww

1415 Begin processing sample
LW2-BTFC016 Tow 9

1418 Complete processing sample
LW2-BTFC016 Tow 9
Wood ~~debris~~ debris, sand, diesel odor,
shell fragments
No clams

1423 Begin processing sample
LW2-BTFC016 Tow 10

1425 Complete processing sample
LW2-BTFC016 Tow 10
Woody debris, sand, shell fragments,
5 shrimp
No clams

1430 Begin processing sample
LW2-BTFC016 Tow 11

1435 Complete processing sample
LW2-BTFC016 Tow 11
Sandy silt, woody debris, shell
fragments, 2 shrimp

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Collect 6 clams: LW2-BTFC016 Tow 11
38mm ~2.67g ww
12mm ~0.27g ww
(3x) 6mm ~0.07g ww
7mm ~0.09g ww

1439 Begin processing sample
LW2-BTFC016 Tow 12

1442 Complete processing sample
LW2-BTFC016 Tow 12
Sandy gravel, some woody debris
& shell fragments, very coarse
No clams
Total weight for all tows is ~27.68g

1447 Motor to station BT015 - RM 6.5 on west
side near Gasco.

1458 Begin processing sample
LW2-BTFC016 Tow 1

1500 Complete processing sample
LW2-BTFC015 Tow ~~2~~ AR 1
Silt, organic debris, algae, paint
chips, shell fragments
Collect 1 clam 25mm ~1.25g ww

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~~15 Begin processing sample AR~~
~~LW2-BTFC015 Tow 2~~

~~15 Complete processing sample AR~~

1506 LW2-BTFC015 Tow 2 Reject b/c got snagged on bottom.

1516 Begin processing sample
LW2-BTFC015 Tow 3

1518 Complete processing sample
LW2-BTFC015 Tow 3
Woody debris, leaf litter, trace silt, gravel, paint drips, shell fragments
No clams

1530 Begin processing sample
LW2-BTFC015 Tow 4

1534 Complete processing sample
LW2-BTFC015 Tow 4
Algae, organic plant material, Chironomid, 4 shrimp
Collect 2 clams:
5 mm ~ 0.05g ww, 22mm ~ 0.89g ww

1537 Begin processing sample
LW2-BTFC015 Tow 5

1540 Complete processing sample
LW2-BTFC015 Tow 5

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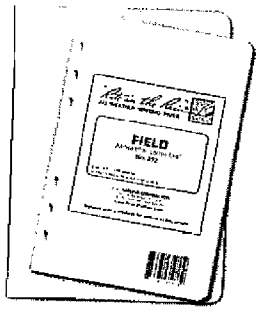
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"Rite in the Rain"®
ALL-WEATHER WRITING PAPER

FIELD

All-Weather Notebook
No. 351

Portland RI/FS
Benthic Tissue Clam Sledging
Dec 5, 2005 - Dec 8, 2005
Book 3 of 5

4 5/8" x 7" - 48 Numbered Pages

ANC02230
BZTO104(e)002230

12/5/05 A. Rodriguez

LW2-BTFC015 Tow 5 cont'd
silt, wood debris, plant debris, algae, some gravel, 12 shrimp, shell fragments
No clams
1550 Begin processing sample
LW2-BTFC015 Tow 6
1554 Complete processing sample
LW2-BTFC015 Tow 6
Trace silt, wood debris, algae, shell fragments, plastic debris, chironomids
Collect 4 clams: 5mm ~ 0.05g ww
(2x) 7mm ~ 0.09g ww & 26mm ~ 1.25g ww
1 juv. clam < 5mm in width insufficient to collect
1558 Begin processing sample
LW2-BTFC015 Tow 7
1601 ~~1610~~ AR Complete processing sample
LW2-BTFC015 Tow 7
Woody debris, leaf litter, algae, plastic debris, 1 shrimp
Collect 1 clam 6mm ~ 0.07g ww
1610 Begin processing sample
LW2-BTFC015 Tow 8
1613 Complete processing sample

12/5/05 A. Rodriguez

LW2-BTFC015 Tow 8
Abundant gravel, shell fragments, woody debris, hydrocarbon odor
Collect 2 clams: 34mm ~ 2.14g ww
21mm ~ 0.81g ww
1620 Begin processing sample
LW2-BTFC015 Tow 9
1622 Complete processing sample
LW2-BTFC015 Tow 9
silt w/ woody debris, slight sheen, shell fragments, gravel
Collect 1 AR clam 29mm ~ 1.55g ww
~~1605~~ AR 1625 Contact Coast Guard & Sheriff's office to inform sampling has been completed for the day.
1630 Motor back to Cathedral Park
1645 Arrive at field lab & unload supplies & samples.
1700 End of the day.

Angelita PS

12/6/05 A. Rodriguez

0700 Arrive at field lab to load up supplies and gear.

0730 Arrive at Swan Island boat ramp

Sledging crew:
Helle Andersen (WW)
Linda Marsh (WW)
Dave Gillingham (oversight, Parametrix)
Dave Mullins (boat driver)

Processing crew:
Angelita Rodriguez (WW)
Kathleen Hurley (WW)
Mike May (boat driver, Ross Island)

0800 Contact US Coast Guard & sheriff's office about sampling activities in Swan Island lagoon & RM 10 - RM 8. Ask to broadcast a "No Wake Zone" for us on the river.

0805 Motor to station BT024 ~ RM 8.2 on west side to collect additional biomass as agreed upon with EPA & DEQ on 12/5/05 discussion with WW & Integral.

0825 Begin processing sample LW2-BTFC024 Tow 12

0828 Complete processing sample

12/6/05 A. Rodriguez

LW2-BTFC024 Tow 12
Silt w/some woody debris, 10 shrimp
Collect 1 clam 6mm ~ 0.07g ww
~~Discard~~ AR Discard 1 juv. clam < 5mm in width b/c insufficient to collect.

AR
*~~08~~ 0900 Begin processing sample LW2-BTFC024 Tow 13

0905 Complete processing sample LW2-BTFC024 Tow 13
Silt, woody debris, 3 shrimp

* Note Navigation system on the sledging boat is experiencing technical difficulties. No sampling for ~ 30 minutes.

Observe several juv. clams < 5mm in width insufficient to collect.
Collect 5 clams: (3x) 6mm ~ 0.07gww
7mm ~ 0.09gww & 8mm ~ 0.12gww

0909 Begin processing sample LW2-BTFC024 Tow 14

12/6/05 A. Rodriguez

0917 Complete processing sample
LW2-BTFC024 Tow 14
Sandy silt w/woody debris, slight sheen, shell fragments
Several juv. clams < 5mm in width insufficient to collect.
Collect 14 clams: 34mm ~ 2.14g
8mm ~ 0.12
(6x) 7mm ~ 0.09 5mm ~ 0.05g
(5x) 6mm ~ 0.07

0918 Begin processing sample
LW2-BTFC024 Tow 15

0924 Complete processing sample
LW2-BTFC024 Tow 15
silt w/wood debris
Collect 10 clams: 25mm ~ 1.15g
10mm ~ .18g (3x) 8mm ~ 0.12g
9mm ~ 0.15g 6mm ~ 0.07g
(3x) 7mm ~ 0.09g

0927 Begin processing sample
LW2-BTFC024 Tow 16

0932 Complete processing sample

12/6/05 A. Rodriguez

LW2-BTFC024 Tow 16
Sandy silt, woody debris, 1 shrimp
Several juv. clams < 5mm in width
Collect 6 clams:
(2x) 47mm ~ 4.09g
36mm ~ 2.40g
13mm ~ 0.31g
7mm ~ 0.09g
6mm ~ 0.07g
Total weight for all tows ~ 60.85g ww

0935 Motor to station BTO28, adj. to Gunderson ~ RM 8.8 westside of river.

0941 Begin processing sample
LW2-BTFC028 Tow 13

0947 Complete processing sample
LW2-BTFC028 Tow 13
Woody debris, organic material, sandy silt, 10 shrimp
Collect 3 clams: 30mm ~ 1.66g
23mm ~ 0.98g & 8mm ~ 0.12g

12/6/05 A. Rodriguez

0951 Begin processing sample
LW2-BTFC028 Tow 14
Complete processing sample
0955 LW2-BTFC028 Tow 14
organic matter, aquatic plants,
leaf litter, duct tape, gravel,
8 shrimp
Collect 1 clam 17 mm ~0.53 g
1000 Begin processing sample
LW2-BTFC028 Tow 15
1006 Complete processing sample
LW2-BTFC028 Tow 15
woody debris, petroleum odor,
sandy silt, plastic litter, gravel
Collect 6 clams:
31 mm ~ 1.78 g 19 mm ~ 0.67 g
21 mm ~ 0.81 g 10 mm ~ 0.18 g
23 mm ~ 0.98 g 6 mm ~ 0.07 g
1008 Begin processing sample
LW2-BTFC028 Tow 16
1012 Complete processing sample
LW2-BTFC028 Tow 16
Woody debris, leaf litter, petroleum
odor, plastic litter

12/6/05 A. Rodriguez

LW2-BTFC028 Tow 16
Collect 3 clams:
30 mm ~ 1.66 g
20 mm ~ 0.74 g
7 mm ~ 0.09 g
Total weight for all tows ~ 55.45 g

Collect 1 eel

1014 Motor to BT030, downstream of
firehoat cove ~ 9.5 RM west side
1020 Begin processing sample
LW2-BTFC030 Tow 12
1023 Complete processing sample
LW2-BTFC030 Tow 12
silt, large woody debris, shell
fragments, 10 shrimp, plastic
No clams
1028 Begin processing sample
LW2-BTFC030 Tow 13
1030 Complete processing sample
LW2-BTFC030 Tow 13
Fine silt, woody debris, 5 shrimp
No clams

12/6/05 A. Rodriguez

1036 Begin processing sample
LW2-BTFC030 Tow 14

1045 Complete processing sample
LW2-BTFC030 Tow 14
sandy silt w/sheen, wood debris,
shell fragments, clumps of clay
Collect 6 clams: (3x) 10mm ~ 0.18g
28mm ~ 1.45g & 16mm ~ 0.47g
11mm ~ 0.22g

1047 Begin processing sample
LW2-BTFC030 Tow 15

1055 Complete processing sample
LW2-BTFC030 Tow 15
Clay clumps, woody debris, shell
fragments, slight sheen, 4 shrimp
Collect 9 clams: (3x) 8mm ~ 0.12g
32mm ~ 1.89g 12mm ~ 0.27g
21mm ~ 0.81g 13mm ~ 0.31g
27mm ~ 1.35g 9mm ~ 0.15g

1056 Begin processing sample
LW2-BTFC030 Tow 16

1105 Complete processing sample
LW2-BTFC030 Tow 16
Clay clumps, woody debris, shell

12/6/05 A. Rodriguez

LW2-BTFC030 Tow 16 cont'd
fragments, slight sheen, 3 shrimp

Collect 8 clams: 33mm ~ 2.01g
(2x) 26mm ~ 1.25g 11mm ~ 0.22g
20mm ~ 0.74g 9mm ~ 0.15g
19mm ~ 0.67g
22mm ~ 0.~~22~~ 89g
Total weight for all tows
~ 58.84g ww

1113 Begin processing sample
LW2-BTFC031 Tow 11

1115 Complete processing sample
LW2-BTFC031 Tow 11
Woody debris,
Collect 1 clam 31mm ~ 1.78g ww

1120 Begin processing sample
LW2-BTFC031 Tow 12

1121 Complete processing sample
LW2-BTFC031 Tow 12

1134 Begin processing sample
LW2-BTFC031 Tow 13

1135 Complete processing sample

12/6/05 A. Rodriguez

LW2-BTFC031 Tow 13
silt, woody debris, shell fragments
Collect 2 clams:
34mm~2.14g & 30mm~1.66g

1141 Begin processing sample
LW2-BTFC031 Tow 14

1145 Complete processing sample
LW2-BTFC031 Tow 14
woody debris, shell fragments, leaf litter, 3 shrimp
Collect 4 clams: 34mm~2.14g
14mm~0.36g, 22mm~0.89g & 19mm~0.67g
Total weight for all ~~clams~~ AR tows
~56.03g ww

1150 Arrive at station BTO33, ~RM 10 on east side; EPA requested site to collect additional biomass.

1203 Begin processing sample
LW2-BTFC033 Tow 11

1205 Complete processing sample
LW2-BTFC033 Tow 11

12/6/05 A. Rodriguez

LW2-BTFC033-Tow 11 cont'd
woody debris, leaf litter, shell fragments
Collect 2 clams: 36mm~2.40g ww
32mm~1.89g ww

1240 AR ~~Eliminated~~ Completed stations as ~~agreed~~ agreed upon by Joe & Helle.
BTO20
BTO24
BTO28
BTO30
BTO31
BTO32 "Fireboat cove" station is completed as agreed upon by Joe (EPA) Helle and WW & Integral.
BTO23, Portland Shipyard location will be sampled again to obtain 10g ww of biomass as agreed upon by Joe (EPA) & Helle.

1301 Begin processing sample
LW2-BTFC033 Tow 12

12/6/05 A. Rodriguez

1305 Complete processing sample
LW2-BTFC033 Tow 12
silt, woody debris, leaf litter,
plastic, shell fragments
Collect 1 clam

1310 Begin processing sample
LW2-BTFC033 Tow 13

1311 Complete processing sample
LW2-BTFC033 Tow 13
Woody debris, plastic, leaf litter
Mussel station
Collect 1 mussel LW2-BT~~FA033~~ FM033 AR
94 mm width
No clams

1320 Begin processing sample
LW2-BTFC033 Tow 14

1322 Complete processing sample
LW2-BTFC033 Tow 14
silt, woody debris, leaf litter,
plastic, chironomid
Collect 2 clams: 29mm ~ 1.55 g
24mm ~ 1.06 g ww

1330 Begin processing sample

12/6/05 A. Rodriguez

LW2-BTFC033 Tow 15

1332 Complete processing sample
LW2-BTFC033 Tow 15
silt, woody debris, leaf litter
Collect 1 clam 15mm ~ 0.41 g ww
Total weight for all tows
~ 20.81 g ww

1336 Motor to station BT023, Portland
shipyard area & TBT location
for additional sampling.

1346 Begin processing sample
LW2-BTFC023 Tow 12

1350 Complete processing sample
LW2-BTFC023 Tow 12
Silt ~~w/stick~~, AR shell fragments,
woody debris
Collect 2 clams: 18mm ~ 0.60 g ww
26mm ~ 1.25 g ww

1357 Begin processing sample
LW2-BTFC023 Tow 13

12/6/05 A. Rodriguez

1358 Complete processing sample
LW2-BTFC023 Tow 13
woody debris, shell fragments,
leaf litter
No clams

1408 Begin processing sample
LW2-BTFC023 Tow 14
Complete processing sample
LW2-BTFC023 Tow 14
silt, wood debris, gravel, shell
fragments
Collect 13 clams: (3x) 23mm ~ 0.98g
(2x) 18mm ~ 0.60g 17mm ~ 0.53g
24mm ~ 1.06g 11mm ~ 0.22g
(3x) 10mm ~ 0.18g 8mm ~ 0.12g
6mm ~ 0.07g
Total weight for all tows
~ 17.25 gww

1428 Arrive at station BTO~~25~~ 26 AR, at
~~the mouth of Swan Island lagoon~~
~ RM 8.2, EPA requested site.
Sampling for additional biomass
currently have ~~32~~ 14 AR gww

12/6/05 A. Rodriguez

1431 Begin processing sample
LW2-BTFC026 Tow 14
1437 Complete processing sample
LW2-BTFC026 AR Tow 14
silt w/sheen, sand, paint chips,
leaf litter, Collect 5 clams
1438 Begin processing sample
LW2-BTFC026 Tow 15
1442 Complete processing sample
LW2-BTFC026 Tow ~~15~~ AR 5
woody debris, paint chips,
plastic wrappers, metal
Collect 3 clams: 28mm ~ 1.45g
23mm ~ 0.98g & 26mm ~ 1.25g
~~Begin~~ AR
1445 Tow 16 @ station BTO26
rejected b/c sledge flipped
& no sample collected
1452 Begin processing sample
LW2-BTFC026 Tow 17
1455 Complete processing sample
LW2-BTFC026 Tow 17
Sandy, sheen, woody debris,
paint chips

12/6/05 A. Rodriguez

LW2-BTFC026 Tow 17
Collect 6 clams: 25mm~1.15g
29mm~1.55g (2x)23mm~0.98g
15mm~0.41g 18mm~0.60g

1500 Begin processing sample
LW2-BTFC026 Tow 18

1503 Complete processing sample
LW2-BTFC026 Tow 18
woody debris, silt, paint chips, plastic, golf ball
Collect 10 clam ~0.18g

1507 Begin processing sample
LW2-BTFC026 Tow 19

1512 Complete processing sample
LW2-BTFC026 Tow 19
sandy silt w/sheen, woody debris, paint chips, leaf litter, shell fragments
Collect 5 clams: 26mm
25mm~1.15g 11mm~0.22g
17mm~0.53g 10mm~0.18g

1515 Begin processing sample
LW2-BTFC026 Tow 20

1519 Complete processing sample

12/6/05 A. Rodriguez

LW2-BTFC026 Tow 20
woody debris, gravel, paint chips, shell fragments, sandy
Collect 8 clams: 9mm~0.15g
8mm~0.12g 30mm~1.66g
22mm~0.89g (2x)18mm~0.60g
20mm~0.74g 15mm~0.41g
Total weight for all tows ~35.84g ww

1526 Arrive at station 22 at mouth of Swan Island lagoon; EPA requested site. Add'l sampling to collect more biomass currently have ~32g ww

1533 Begin processing sample
LW2-BTFC022 Tow 11

1538 Complete processing sample
LW2-BTFC022 Tow 11
sandy, woody debris, shell fragments
Collect 2 clams:
33mm~2.01g
30mm~1.66g

12/6/05 A. Rodriquez

1542 Begin processing sample LW2-BTFC022 Tow 12

1544 Complete processing sample LW2-BTFC022 Tow 12
Woody debris, gravel, some silt
Collect 1 clam 30 mm ~1.66g ww

1608 Begin processing sample LW2-BTFC022 Tow 13

1609 Complete processing sample LW2-BTFC022 Tow 13
Woody debris, leaf litter
No clams

1610 Begin processing sample LW2-BTFC022 Tow 14

1614 Complete processing sample LW2-BTFC022 Tow 14
Wood chips, silty, gravel
Collect 8 clams.

1620 Contact Coast guard & Sheriff's office to inform we have completed sampling & off the water

12/6/05 A. Rodriguez

1542 Begin processing sample LW2-BTFC022 Tow 12

1544 Complete processing sample LW2-BTFC022 Tow 12
Woody debris, gravel, some silt
Collect 1 clam 30 mm ~1.66g ww

1608 Begin processing sample LW2-BTFC022 Tow 13

1609 Complete processing sample LW2-BTFC022 Tow 13
Woody debris, leaf litter
No clams

1610 Begin processing sample LW2-BTFC022 Tow 14

1614 Complete processing sample LW2-BTFC022 Tow 14
Wood chips, silty, gravel
Collect 8 clams.

1620 Contact Coast guard & Sheriff's office to inform we have completed sampling & off the water

1645 Arrive at fieldlab, unload supplies, secure samples, & copy fieldnotes.

1700 End of day

Angelita

12/7/05 A. Rodriguez

0700 Arrive at field lab & load up supplies

0730 Arrive at Cathedral Park boat ramp
Sledging Crew:
Helle Andersen (WW)
Emily Duffield (WW)
Dave Gillingham (oversight)
Dave Mullins (boat driver)
Processing Crew:
Angelita Rodriguez (WW)
Linda Marsh (WW)
Mike May (boat driver, Ross Island)

0841 Contact US Coast Guard & Sheriff's office to inform about sampling from RM 9 - RM 6 & in Swan Island lagoon.

0844 Arrive at station BT025, Shaver area & sledging crew is sampling in Swan Island lagoon at station BT026 to collect add'l biomass.

ANC02241
BZTO104(e)002241

12/7/05 A. Rodriguez

0841 Begin processing sample
LW2-BTFC026 Tow 22

0842 Complete processing sample
LW2-BTFC026 Tow 22
wood, leaf debris, paint chips,
some gravel
NO clams

0842 Begin processing sample
LW2-BTFC026 Tow 21

0846 Complete processing sample
LW2-BTFC026 Tow 21
wood debris, leaf litter, paint
chips, some silt & clay
Collect 2 clams: 23mm ~ 0.98 g ww
22mm ~ 0.89 g ww

0847 Begin processing sample
LW2-BTFC026 Tow 23

0858 Complete processing sample
LW2-BTFC026 Tow 23
sand, silt w/ sheen, metal, gravel,
wood debris, gravel AR, clumps of clay,
plastic
Total weight for all trws ~ 39.56 gww

12/7/05 A. Rodriguez

0901 Begin processing sample
LW2-BTFC025 Tow 12

0904 Complete processing sample
LW2-BTFC025 Tow 12
sand, silt, wood debris, gravel,
shell fragments, 1 shrimp
No clams

0906 Begin processing sample
LW2-BTFC025 Tow 13

0909 Complete processing sample
LW2-BTFC025 Tow 13
sand, silt, wood debris, leaf litter,
shell fragments, foil
Collect 2 clams: 34mm ~ 2.14 g
38mm ~ 2.67 g ww

0915 Begin processing sample
LW2-BTFC025 Tow 14

0916 Complete processing sample
LW2-BTFC025 Tow 14
sand, silt, wood debris, leaf
litter, gravel
No clams

0924 Begin processing sample
LW2-BTFC025 Tow 15

12/7/05 A. Rodriguez

0930 Complete processing sample
LW2-BTFC025 Tow 15
Collect 1 lamprey
1 mussel 74 mm in width
sand, silt, wood debris, paint chips,
shell fragments,
No clams

0934 Begin processing sample
LW2-BTFC025 Tow 16

0936 Complete processing sample
LW2-BTFC025 Tow 16
sand, silt, wood debris, leaf litter,
shell fragments
1 Mussel 130 mm in width
2 clams: 42 mm ~ 3.26 & 32 mm ~ 1.89 g ww
Total weight for all tows ~ 36.50 g ww

0941 Motor to station BTO21, near
Willbridge area ~ RM7.8 on
west side of the river for add'l
collection of biomass currently have ~ 29 g

0950 Begin processing sample
LW2-BTFC021 Tow 13

0952 Complete processing sample

12/7/05 A. Rodriguez

LW2-BTFC021 Tow 13
sand & silt w/sheen, wood
debris, leaf litter, plastic,
paint chips
No clams

0958 Begin processing sample
LW2-BTFC021 Tow 14

1001 Complete processing sample
LW2-BTFC021 Tow 14
wood debris, shell fragments,
paint chips
Collect 2 clams: 41 mm ~ 3.11 g ww
13 mm ~ 0.31 g ww

1006 Begin processing sample
LW2-BTFC021 Tow 15

1010 Complete processing sample
LW2-BTFC021 Tow 15
wood debris, small gravel, paint
chips, leaf litter, some silt & sand
Collect 4 clams: (2x) 35 mm ~ 2.26 g
14 mm ~ 0.36 g 28 mm ~ 1.45 g
Total weight for all tows ~ 39.55 g ww

12/7/05 A. Rodriguez

1016 Motor to station BTO17 ~ RMC.9 on the west side of the river to collect add'l biomass. Currently at ~ 34 gww.

1026 Begin processing sample LW2-BTFC017 Tow 11

1031 Complete processing sample LW2-BTFC017 Tow 11
sand, silt, woody debris, leaf litter, shell fragments, 8 shrimp
Collect 5 clams: 31 mm ~ 1.78g
34 mm ~ 2.14g 33 mm ~ 2.01g
46 mm ~ 3.91g 16 mm ~ 0.47g
Total weight for all tows ~ 44.60 gww

1038 Arrive at station BTO15 near Gasco

1041 Begin processing sample LW2-BTFC015 Tow 10

1042 Complete processing sample LW2-BTFC015 Tow 10
wood debris, gravel, shell fragments,

12/7/05 A. Rodriguez

LW2-BTFC015 Tow 10
leaf litter, sheen
No clams

1049 Begin processing sample LW2-BTFC015 Tow 11

1051 Complete processing sample LW2-BTFC015 Tow 11
gravel, wood debris, leaf litter, shell fragments
Collect 3 clams: 22 mm ~ 0.89 g ww
27 mm ~ 1.35 g ww 29 mm ~ 1.55 g ww

1100 Begin processing sample LW2-BTFC015 Tow 12

1102 Complete processing sample LW2-BTFC015 Tow 12
silt, wood debris, leaf litter, gravel
Collect 1 clam 29 mm ~ 1.55 g ww

1109 Begin processing sample ~~LW~~ LW2-BTFC015 Tow 13

1110 Complete processing sample LW2-BTFC015 Tow 13
wood debris, leaf litter, paint chips
No clams

12/7/05 A. Rodriguez

1120 Begin processing sample
LW2-BTFC015 Tow 14

1122 Complete processing sample
LW2-BTFC015 Tow 14
wood debris, leaf litter, aquatic plant, shell fragments
Collect 1 Mussel 78 mm in width
No clams

1129 Begin processing sample
LW2-BTFC015 Tow 15

1130 Complete processing sample
LW2-BTFC015 Tow 15
wood debris, leaf litter, aquatic plant fragments, shell fragments
No clams
Total weight for all tows
~ 13.58 g ww

1132 Motor to Cathedral Park boat ramp which will be the staging area for processing samples from station BTO1W3 ~ RM 5.7 on the east side of the river.

12/7/05 A. Rodriguez

1159 Begin processing sample
LW2-BTFC013 Tow 1

1200 Complete processing sample
LW2-BTFC013 Tow 1
woody debris, some sand & silt, plastic debris, leaf litter
No clams

1205 Begin processing sample
LW2-BTFC013 Tow 2

1207 Complete processing sample
LW2-BTFC013 Tow 2
woody debris, leaf litter, shell fragments
Collect 1 clam 27 mm ~ 1.35 g ww

1212 Begin processing sample
LW2-BTFC013 Tow 3

1215 Complete processing sample
LW2-BTFC013 Tow 3
silt, wood debris, leaf litter, 5 shrimp
Collect 2 clams: 29 mm ~ 1.55 g
18 mm ~ 0.60 g

1219 Begin processing sample
LW2-BTFC013 Tow 4

12/7/05 A. Rodriguez

1224 Complete processing sample
LW2-BTFC013 Tow 4
silt & sand, wood debris, leaf litter, riprap
Collect 6 clams: 26 mm ~ 1.25g
30mm ~ 1.66g 6mm ~ 0.07g
22mm ~ 0.89g 7mm ~ 0.09g
9mm ~ 0.15g 8mm ~ 0.12g

1226 Lunch break

1254 Begin processing sample
LW2-BTFC013 Tow 5
1257 Complete processing sample
LW2-BTFC013 Tow 5
sand, silt, wood debris, paint chips
Collect 13 clams: 19mm ~ 0.67g
(2x) 18mm ~ 0.60g (2x) 8mm ~ 0.12g
(4x) 6mm ~ 0.07g (2x) 7mm ~ 0.09g
5mm ~ 0.05g 10mm ~ 0.18g
1301 Begin processing sample
LW2-BTFC013 Tow 6
1305 Complete processing sample

12/7/05 A. Rodriguez

~~1~~ AR 1305 LW2-BTFC013 Tow 6
sand, silt, wood debris, 2 shrimp, paint chips
Collect 3 clams: 43mm ~ 3.42g
16mm ~ 0.47g, 13mm ~ 0.31g
1309 Begin processing sample
LW2-BTFC013 Tow 7
1312 Complete processing sample
LW2-BTFC013 Tow 7
Silt, sand, wood debris, leaf litter, paint chips, shell fragments, gravel, 1 shrimp
Collect 5 clams: 22mm ~ 0.89g
17mm ~ 0.53g, 10mm ~ 0.18g
7mm ~ 0.09g, 6mm ~ 0.07g
1316 Begin processing sample
LW2-BTFC013 Tow 8
1319 Complete processing sample
LW2-BTFC013 Tow 8
Silty sand w/sheen, wood debris, leaf litter
Collect 4 clams: 31mm ~ 1.78g
9mm ~ 0.15g, 13mm ~ 0.31g
25mm ~ 1.15g

12/7/05 A. Rodriguez

1323 Begin processing sample
LW2-BTFC013 Tow 9
Complete processing sample
1325 LW2-BTFC013 Tow 9
Sand & silt w/sheen, wood debris, paint chips, 3 shrimp
Collect 1 clam 18mm ~ 0.60g
1330 Begin processing sample
LW2-BTFC013 Tow 10
1333 Complete processing sample
LW2-BTFC013 Tow 10
Sand, silt, wood debris, leaf litter, gravel, 1 shrimp, shell fragments
Collect 3 clams: 29mm ~ 1.55g
8mm ~ 0.12g, 9mm ~ 0.15g
1338 Begin processing sample
LW2-BTFC013 Tow 11
1340 Complete processing sample
LW2-BTFC013 Tow 11
Trace sand & silt, wood debris, shell fragments, 2 shrimp, leaf litter
Collect 5 clams: 26mm ~ 1.25g
27mm ~ 1.35g, 15mm ~ 0.41g, 12mm ~ 0.27g
9mm ~ 0.15g, 8mm ~ 0.12g

12/7/05 A. Rodriguez

1347 Begin processing sample
LW2-BTFC013 Tow 12
1352 Complete processing sample
LW2-BTFC013 Tow 12
Sand & silt, wood debris, paint chips, 2 shrimp
Collect 10 clams: 25mm ~ 1.15g
19mm ~ 0.67g 17mm ~ 0.53g
(2x) 10mm ~ 0.18g 7mm ~ 0.09g
18mm ~ 0.60g 6mm ~ 0.07g
1 Mussel 108mm in width
1354 Begin processing sample
LW2-BTFC013 Tow 13
1359 Complete processing sample
LW2-BTFC013 Tow 13
Sand, silt, shell fragment, wood debris, leaf litter, paint chips
Collect 5 clams: 19mm ~ 0.67g
6mm ~ 0.07g 8mm ~ 0.12g (2x) 9mm ~ 0.15g
1402 Begin processing sample
LW2-BTFC013 Tow 13 #4
1406 Complete processing sample
LW2-BTFC013 Tow 13 #4

ANC02247
BZTO104(e)002247

12/7/05 A. Rodriguez

LW2-BTFC013 Tow 14 cont'd
Sand, silt, wood debris leaf litter, paint chips
Collect 5 clams: 21mm ~ 0.81g
14mm ~ 0.36g, 7mm ~ 0.09, 6mm ~ 0.03g

1413 Begin processing sample
LW2-BTFC013 Tow 15

1425 Complete processing sample
LW2-BTFC013 Tow 15
Sand & silt, wood debris, leaf litter,
Collect 24 clams.
Total weight for all tows ~ 43.88g ww

1426 Motor to station BTO14, US moorings area ~ RM 7.0 on west side of river. EPA requested site.

1435 Begin processing sample
LW2-BTFC014 Tow 1

1437 Complete processing sample
LW2-BTFC014 Tow 1
Sand, silt, wood debris, leaf litter, plastic debris,
No clams

12/7/05 A. Rodriguez

1441 Begin processing sample
LW2-BTFC014 Tow 2

1443 Complete processing sample
LW2-BTFC014 Tow 2
matted ~~leaf litter~~ grass material, aquatic plant fragments
Collect 1 clam 38mm ~ 2.67g ww

1449 Begin processing sample
LW2-BTFC014 Tow 3

1452 Complete processing sample
LW2-BTFC014 Tow 3
Slight sheen, sand & silt, wood debris, matted ~~leaf litter~~ grass material, shell fragments
Collect 4 clams: (3x) 6mm ~ 0.07g
5mm ~ 0.05g

1456 Begin processing sample
LW2-BTFC014 Tow 4

1459 Complete processing sample
LW2-BTFC014 Tow 4
slight sheen, sand & silt, wood debris, matted grass material, shell fragments
No clams

12/7/05 A. Rodriguez

1505 Begin processing sample
LW2-BTFC014 Tow 5
Complete processing sample
LW2-BTFC014 Tow 5
AR ~~light~~ moderate sheen, sand & silt, matted grass material, nuts, bolts, petroleum odor, 1 shrimp
1513 ~~B~~ AR No clams
~~1513~~ 1513 AR Begin processing sample
1514 LW2-BTFC014 Tow 6
~~1514~~ 1514 AR Complete processing sample
LW2-BTFC014 Tow 6
sand & silt, matted grass material, shell fragments
Collect 1 clam 8mm ~ 0.12g
1519 Begin processing sample
LW2-BTFC014 Tow 7
Complete processing sample
1522 LW2-BTFC014 Tow 7
sand & silt, matted grass material, wood debris, shell fragments, plastic
Collect 1 clam 7mm ~ 0.09g
1525 ~~Begin processing sample~~ AR
* LW2-BTFC014 Tow 8

12/7/05 A. Rodriguez

~~Complete processing sample~~ AR
LW2-BTFC014 Tow 8
Rejected b/c was snagged
1532 Begin processing sample
LW2-BTFC014 Tow 9
* Note: Dave Gillingham (oversight) is taking the lead in finding the clam beds & directing Helle Andersen & sledge crew as to the area to sample.

1535 Complete processing sample
LW2-BTFC014 Tow 9
some sand & silt, slight sheen, gravel, wood debris, ~~g~~ AR matted grass material, plastic, shell fragments
Collect 4 clams: 7mm ~ 0.09g
14~~g~~ mm ~ 0.36, 25mm ~ 1.15g
30mm ~ 1.66g
1543 Begin processing sample
LW2-BTFC014 Tow 10

1549 Complete processing sample

ANC02249
BZTO104(e)002249

12/7/05 A. Rodriguez

LW2-BTFC014 Tow 10
silt, sheen, wood debris, shell fragments
Collect 1 Mussel 76 mm
Collect 7 clams: 40 mm ~ 2.96g
33mm ~ 2.01g 24mm ~ 1.06g
30 mm ~ 1.66g 11 mm ~ 0.22g
25 mm ~ 1.15g 12 mm ~ 0.27g

1555 Begin processing sample
LW2-BTFC014 Tow 11

1600 Complete processing sample
LW2-BTFC014 Tow 11
Sand & silt, wood debris, shell fragments, glass, gravel
Collect 6 clams.

As agreed upon by Dave Gillingham & Helle Andersen, keep clams collected from Tows 2 & 4 separate from Tows 8 and on ble can be a potentially new station.

1607 Begin processing sample
LW2-BTFC014 Tow 12

12/7/05 A. Rodriguez

1608 Complete processing sample
LW2-BTFC014 Tow 12
Sand & silt, leaf litter, wood debris, shell fragments
Collect 1 clam 13 mm ~ 0.31g

1618 Begin processing sample
LW2-BTFC014 Tow 13

1623 Complete processing sample
LW2-BTFC014 Tow 13
silt w/slight sheen, matted grass material, wood debris, shell fragments
Collect 1 Mussel 85 mm
Collect 4 clams: 28mm ~ 1.45g
41mm ~ 3.11g, 30mm ~ 1.66g, 7mm ~ .04g

1626 Begin processing sample
LW2-BTFC014 Tow 14

1630 Complete processing sample
LW2-BTFC014 Tow 14
Silt & sand, wood debris, shell fragments, matted grass material, leech
Collect 3 clams: 8mm ~ 0.12g
31mm ~ 1.78g, 34mm ~ 2.14g

ANC02250
BZTO104(e)002250

12/7/05 A. Rodriguez

LW2-BTFC014
Total weight for all trows
~ 35.15 g ww
- 3.00 g ww (Tow2 & 4 & 7)
33.15 g ww

1635 Arrive at Cathedral Park boat ramp.

1645 Contact Coast Guard & Sheriffs Office to inform the sampling has been completed & off the water.

1700 Arrive at the field lab unload supplies & samples.

1730 End of day

Angelita RG

12/8/05 A. Rodriguez

0715 Arrive at field lab to load up supplies.

0730 Call in lunch order & pick up & head to Fred's Marina

0800 Arrive at Fred's Marina
Sledging Crew:
Jessie Barrett (oversight)
Helle Andersen (WW)
Linda Marsh (WW)
Dave Mullins (boat driver)
Processing Crew:
Angelita Rodriguez (WW)
Emily Duffield (WW)
Mike May (boat driver Ross Island)

0810 Health & Safety meeting
Give Chris (oversight) bioaccumulation sampling location info & field phone WW2 number & he departs for Swan Island

0815 Motor to station BTO12, ~RM4.8 near Arco seawall on west side of the river. EPA Requested site.

0820 Contact US Coast Guard & Multnomah

12/8/05 A. Rodriguez

Sheriff's office to inform about sampling from ~RM 4 to RM 5 on both west & east sides of the river. Ask for a "No Wake" broadcast.

0842 Begin processing sample LW2-BTFC012 Tow 1

Complete processing sample

0848 LW2-BTFC012 Tow 1

sand & silt, mostly wood chips, leaf litter

Collect 10 clams: 38mm ~ 2.67g

36mm ~ 2.40g 13mm ~ 0.31g 6mm ~ 0.07g

33mm ~ 2.01g 11mm ~ 0.22g

31mm ~ 1.78g 8mm ~ 0.12g

21mm ~ 0.81g 7mm ~ 0.09g

0849 Begin processing sample LW2-BTFC012 Tow 2

0854 Complete processing sample LW2-BTFC012 Tow 2

Sand & silt, ~~g~~ clay balls, big piece of plastic, mostly woodchips, leaf litter, slight sheen

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LW2-BTFC012 Tow 2

Collect 5 clams: 35mm ~ 2.26g

31mm ~ 1.78g 17mm ~ 0.53g

28mm ~ 1.45g 12mm ~ 0.27g

0855 Begin processing sample LW2-BTFC012 Tow 3

0900 Complete processing sample LW2-BTFC012 Tow 3

Sand & silt, mostly wood chips, paint chips, shell fragments, leaf litter

Collect 7 clams: 34mm ~ 2.14g

25mm ~ 1.15g (Dx) 30mm ~ 1.66g

23mm ~ 0.98g 17mm ~ 0.53

0905 Tow 4 is the last sledge taken b/c denied access to area.

0911 Begin processing sample LW2-BTFC012 Tow 4

0915 Complete processing sample LW2-BTFC012 Tow 4

sand & silt, slight sheen, mostly wood chips, leaf litter, shell fragments, plastic

ANC02252
BZTO104(e)002252

12/8/05 A. Rodriguez

LW2-BTFC012 Tow 4
Collect 2 clams: 34mm ~ 2.14g
15mm ~ 0.41g
Total weight after 4 tows
~ 27.66g ww

0918 Motor to station BTO11, ~RM4.7
on west side, adjacent to Linnton
Plywood

0925 Begin processing sample
LW2-BTFC011 Tow 1

0926 Complete processing sample
LW2-BTFC011 Tow 1
sand & silt, wood chips, shell fragments,
plastic
Collect 2 clams: 5mm ~ 0.05g
6mm ~ 0.07g

0934 Begin processing sample
LW2-BTFC011 Tow ~~X~~ 2

0937 Complete processing sample
LW2-BTFC011 Tow 2
clay, ~~wod~~ some wood chips, shell
fragments

12/8/05 A. Rodriguez

~~0942~~ LW2-BTFC011 Tow 2
Collect 3 clams: 22mm ~ 0.89g
15mm ~ 0.41g, 18mm ~ 0.60g

0942 Begin processing sample
LW2-BTFC011 Tow 3

0949 Complete processing sample
LW2-BTFC011 Tow 3
abundant wood chips, shell
fragments, leaf litter
Collect 6 clams: 44mm ~ 3.58g
(2x) 9mm ~ 0.15, (2x) 6mm ~ 0.07g
8mm ~ 0.12g

0951 Begin processing sample
LW2-BTFC011 Tow 4

0956 Complete processing sample
LW2-BTFC011 Tow 4
clay, sand, silt, shell fragment,
small amt. of wood debris
Collect 1 lamprey
Collect 3 clams: 30mm ~ 1.66g
(2x) 5mm ~ 0.05g

0959 Begin processing sample
LW2-BTFC011 Tow 5

ANC02253
BZTO104(e)002253

12/8/05 A. Rodriguez

1001 Complete processing sample
LW2-BTFC011 Tow 5
Clay, sand, silt, slight sheen, wood chips, shell fragments
No clams

1006 Begin processing sample
LW2-BTFC011 Tow 6

1009 Complete processing sample
LW2-BTFC011 Tow 6
Sand, silt, wood debris, wire, shell fragments
No clams

1017 Begin processing sample
LW2-BTFC011 Tow 7

1019 Complete processing sample
LW2-BTFC011 Tow 7
sand & silt, clay, some wood debris, leaf litter, shell fragments
Collect 1 Mussel 110 mm in width
Collect 1 Clam 12mm ~ 0.27 g

1026 Begin processing sample
LW2-BTFC011 Tow 8

1028 Complete processing sample
LW2-BTFC011 Tow8

12/8/05 A. Rodriguez

LW2-BTFC011 Tow 8 Cont'd
sand & silt, small amt. of wood debris, shell fragments
Collect 2 clams: 33mm ~ 2.01 g
7mm ~ 0.09 g

1036 Begin processing sample
LW2-BTFC011 Tow 9

1039 Complete processing sample
LW2-BTFC011 Tow 9
sand & silt, wood chips, slight sheen.
1 shrimp
No clams

1046 Begin processing sample
LW2-BTFC011 Tow 10

1049 Complete processing sample
LW2-BTFC011 Tow 10
sand & silt, wood debris, leaf litter, shell fragments, slight sheen,
1 shrimp
Collect 2 clams: 12 mm ~ 0.27 g
9 mm ~ 0.15 g

1053 Begin processing sample
LW2-BTFC011 Tow 11

48

12/8/05 A. Rodriguez

1056 Complete processing sample
LW2-BTFC011 Tow 11
Sand & silt, wood debris, 3 shrimp
Shell fragments, leaf litter
No clams

1103 Begin processing sample
LW2-BTFC011 Tow 12

1105 Complete processing sample
LW2-BTFC011 Tow 12
sand & silt, leaf litter, small amt. of
wood chips, shell fragments, 1 shrimp

1111 Begin processing sample
LW2-BTFC011 Tow 13

1113 Complete processing sample
LW2-BTFC011 Tow 13
sand & silt, wood debris, shell
fragments, 1 shrimp
Collect 1 clam 9mm ~ 0.15

1121 Begin processing sample
LW2-BTFC011 Tow 14

1122 Complete processing sample
LW2-BTFC011 Tow 14
Sand & silt, wood debris, shell
fragments
No clams

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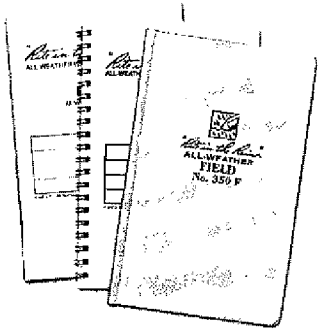
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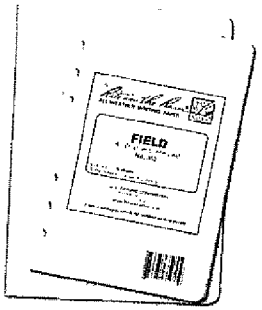
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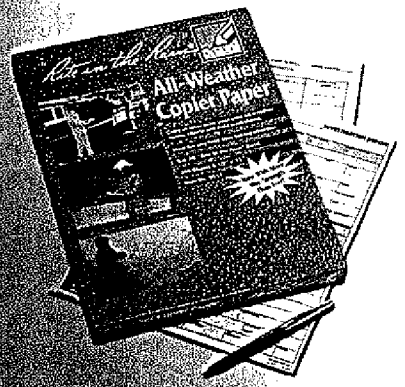
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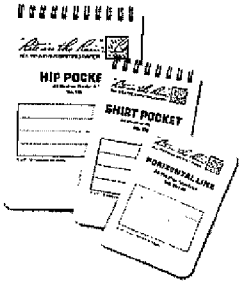
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Benthic Tissue Clam Sledging
Dec 8, 2005 - Dec 13, 2005
Book 4 of 5

4 5/8" x 7" - 48 Numbered Pages

ANC02256
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1128 Begin processing sample
LW2-BTFC011 Tow 15

1131 Complete processing sample
LW2-BTFC011 Tow 15
sand & silt, wood debris, leaf litter,
shell fragments
No clams
Total weight for all tows ~ ~~10.86~~ 10.86 g WW

1135 Bathroom break

1151 Motor to station BTO10, ~ RM 4.7
on East side near Terminal 4. EPA
requested site.

1154 Begin processing sample
LW2-BTFC010 Tow 1

1156 Complete processing sample
LW2-BTFC010 Tow 1
sand & silt, shell fragments, wood chips,
1 shrimp
No clams

1205 Begin processing sample
LW2-BTFC010 Tow 2

1209 Complete processing sample

12/8/05 A. Rodriguez

LW2-BTFC010 Tow 2
sand & silt, shell fragments, slight
sheen, leaf litter
Collect 1 Mussel 92mm in width
Collect 1 clam 32mm 1.89g
~~Begin processing sample~~ AR

1212 LW2-BTFC010 Tow 3 Reject
b/c sledge did not collect
a sample on bottom.

1220 Begin processing sample
LW2-BTFC010 Tow 4

1222 Complete processing sample
LW2-BTFC010 Tow 4
silt, wood debris, leaf litter
No clams

1225 Lunch break & Helle discusses field logistics
with Shannon for sampling on 12/9/05.

1310 Begin processing sample
LW2-BTFC010 Tow 5

1315 Complete processing sample
LW2-BTFC010 Tow 5
sand, silt, wood debris, shell fragments, gravel

12/8/05 A. Rodriguez

Continue ~~Begin~~ processing sample
LW2-BTFC010 Tow ~~6~~ 5
Collect 1 lamprey
Collect 15 clams

1316 Tow 6 LW2-BTFC010 Reject b/c did not collect a sample on bottom.

1324 Begin processing sample
LW2-BTFC010 Tow 7

1330 Complete processing sample
LW2-BTFC010 Tow 7
sand, silt, wood chips, leaf litter, shell fragments
Collect 12 clams

1333 Begin processing sample
LW2-BTFC010 Tow 8

1337 Complete processing sample
LW2-BTFC010 Tow 8
sand, silt, large wood debris, leaf litter, shell fragments
Collect 2 clams: 32 mm & 21 mm

1341 Begin processing sample
LW2-BTFC010 Tow 9

12/8/05 A. Rodriguez

1353 Complete processing sample
LW2-BTFC010 Tow 9
sand, silt, gravel, large wood debris, abundant shell fragments, leaf litter, glass, rocks, 2 shrimp
Collect 27 clams

1355 Begin processing sample
LW2-BTFC010 Tow 10

1401 Complete processing sample
LW2-BTFC010 Tow 10
sand, silt, rocks, abundance of glass, shell fragments, leaf litter, 2 shrimp
Collect 15 clams

1404 Begin processing sample
LW2-BTFC010 Tow 11

1410 Complete processing sample
LW2-BTFC010 Tow 11
sand, silt, rocks, abundant glass, shell fragments, leaf litter, wood debris, gravel
Collect ~~20~~ 19 clams

12/8/05 A. Rodriguez

1413 Begin processing sample
LW2-BTFC010 Tow 12

1425 Complete processing sample
LW2-BTFC010 Tow 12
sand, silt, rocks, glass, shell fragments, leaf litter, wood debris
Collect 17 clams
Total weight for all tows ~ 177.90g ww

Motor to station BT012, have permission to finish up sampling from the morning.

1428 Begin processing sample
LW2-BTFC012 Tow 5

1430 Complete LW2-BTFC012 sample

Sand, silt, wood chips, shell fragments
1 Mussel 58 mm
4 clams collected

1435 Begin processing sample
LW2-BTFC012 Tow 6
Complete processing sample

12/8/05 A. Rodriguez

1440 LW2-BTFC012 Tow 6
slight sheen, sand & silt, wood debris, shell fragments, leaf litter
Collect 6 clams

1443 Begin processing sample
LW2-BTFC012 Tow 7

1446 Complete processing sample
LW2-BTFC012 Tow 7
clay, shell fragments, gravel, wood debris, collect
2 clams: 23mm & 24mm

1450 Begin processing sample
LW2-BTFC012 Tow 8

1455 Complete processing sample
LW2-BTFC012 Tow 8
clay, moderate sheen, wood debris, shell fragments, leaf litter
Collect 10 clams

12/8/05 A. Rodriguez

1455 Tow 9 LW2-BT~~FC~~012

Reject b/c snagged & did not collect a sample.

1502 Begin processing sample LW2-BTFC012 Tow 10

1505 Complete processing sample LW2-BTFC012 Tow 10

sand, silt, wood debris, slight sheen, 5 shrimp

collect 2 clamps

1509 Begin processing sample LW2-BTFC012 Tow 11

1511 Complete processing sample LW2-BTFC012 Tow 11

sand, silt, woody debris, leaf litter, shell fragments, 5 shrimp, red gravel

Collect 2 clams

Total weight for all tows ~ 56.68 g ww

12/8/05 A. Rodriguez

1515 Motor to station BT009, ~RM4.5 on east side. EPA requested site also known as Wheeler Bay area.

1522 Begin processing sample LW2-BTFC009 Tow 1

1523 Complete processing sample LW2-BTFC009 Tow 1

sand, silt, leaf litter, wood debris

No clams

1530 Begin processing sample LW2-BTFC009 Tow 2

1531 Complete processing sample LW2-BTFC009 Tow 2

sand, silt, wood debris, shell fragments

Collect 1 clam 8mm ~ 0.12g ww

1538 Begin processing sample LW2-BTFC009 Tow 3

1543 Complete processing sample LW2-BTFC009 Tow 3

sand, silt, clay, wood debris, leaf litter, shell fragments

Collect 2 clams

ANC02260
BZTO104(e)002260

12/8/05 A. Rodriguez

1546 Begin processing sample
LW2-BTFC009 Tow 4

1549 Complete processing sample
LW2-BTFC009 Tow 4
Wood Chips, some sand & silt,
shell fragments, plastic
Collect 5 clams

1554 Begin processing sample
LW2-BTFC009 Tow 5

1559 Complete processing sample
LW2-BTFC009 Tow 5
sand, silt, some clay, wood debris,
shell fragments, plastic debris
Collect 1 clam 29mm

1600 Contact US Coast Guard & Sheriff's
office to inform sampling has
been completed for the day.
Motor back to Fred's Marina

1605 Eric Blischke, oversight phoned
to discuss meeting time & place
for sampling tomorrow. He plans
to come out with clam boat to

12/8/05 A. Rodriguez

oversee activities for both
sledging & processing crew.

1630 Helle Andersen participates
on conference call.

1645 Arrive at field lab, unload
supplies & secure samples.
Make copy of field notes.

1700 End of day.

Angel Ti RG

12/9/05 A. Rodriguez

0700 Arrive at field lab & load up supplies.

0730 Arrive at Fred's Marina & load up boats.

Sledging crew:
Shannon Pierce (WW)
Linda Marsh (WW)
Eric Blishcke (oversight)
Dave Mullins (boat driver)

Processing Crew:
Angelita Rodriguez (WW)
Emily Duffield (WW)
Andrew Sommes (oversight, Parametrix)
Jessie Bennett (oversight, Parametrix)
Mike May (boat driver, Ross Island)

0800 Health & safety meeting with all new oversight personnel & both boat drivers.

0810 Contact US Coast Guard & Sheriff's office to inform about sampling on the east side of the river ~ RM4 – RM5 in Terminal 4 area.

0820 Arrive at station BT009 to continue sampling for biomass.

12/9/05 A. Rodriguez

0833 Begin processing sample LW2-BTFC009 Tow 6

0836 Complete processing sample LW2-BTFC009 Tow 6

sand, silt, clay, small wood chips, shell fragments, leaf litter, plastic

Collect 2 clams: 18 mm ~ 0.60 g
11 mm ~ 0.22 g

0842 Begin processing sample LW2-BTFC009 Tow 7

0845 Complete processing sample LW2-BTFC009 Tow 7

sand, silt, abundant wood debris, rope, shell fragments

Collect 1 clam 31 mm ~ 1.78 g

0850 Begin processing sample LW2-BTFC009 Tow 8

0855 Complete processing sample LW2-BTFC009 Tow 8

sand, silt, abundant woody debris, aerosol can, (2) golf balls, shell fragments

2 winged Floatics (Antidanti sp) Mussels as identified by Jessie Bennett

Mussels 95 mm & 92 mm

12/9/05 A. Rodriguez

LW2-BTFC009 Tow 8
Collect 6 clams: 6mm
(4x) 14mm 13mm
(2x) 16mm

0900 Begin processing sample
LW2-BTFC009 Tow 9

0905 Complete processing sample
LW2-BTFC009 Tow 9
sand, silt, abundant wood debris, leaf litter, plastic debris
Collect 4 clams: 13mm ~ 3.42g
(2x) 6mm ~ 0.07g 8mm ~ 0.12g

Collect 2 winged mussels
39 mm & 82 mm

0907 Begin processing sample
LW2-BTFC009 Tow 10

0914 Complete processing sample
LW2-BTFC009 Tow 10
sand, silt, wood debris, leaf litter, shell fragments, plastic debris, rubber
Collect 1 clam 5mm ~ 0.05g

12/9/05 A. Rodriguez

0916 Begin processing sample
LW2-BTFC009 Tow 11

0919 Complete processing sample
LW2-BTFC009 Tow 11
Sand, silt, wood debris, leaf litter, shell fragments, chironomids
No clams

0925 Begin processing sample
LW2-BTFC009 Tow 12

0927 Complete processing sample
LW2-BTFC009 Tow 12
abundant wood debris, some sand & silt, shell fragments
Collect 2 clams: 1mm ~ 0.15g
34 mm ~ 2.14g

0935 Begin processing sample
LW2-BTFC009 Tow 13

0940 Complete processing sample
LW2-BTFC009 Tow 13
sand, silt, abundant wood debris, shell fragments, 1 shrimp, chironomids, 1 crayfish
Collect 7 clams

12/9/05 A. Rodriguez

0941 Begin processing sample
LW2-BTFC009 Tow 14

0946 Complete processing sample
LW2-BTFC009 Tow 14
coarse sand, some silt, leaf litter, shell fragments
Collect 5 clams: 18mm ~.60g
11mm ~0.22g (2x) 7mm ~0.09g
6mm ~0.07g

0951 Begin processing sample
LW2-BTFC009 Tow 15

0958 Complete processing sample
LW2-BTFC009 Tow 15
sand & silt, wood debris, leaf litter, shell fragments, chironomids
Collect 8 clams: 35mm ~ 2.26g
(2x) 32mm ~1.89g 27mm ~1.35g
16mm ~0.47g 10mm ~0.18g
2x) 7mm ~0.09g

0959 Begin processing sample
LW2-BTFC009 Tow 16

1006 Complete processing sample
LW2-BTFC009 Tow 16
Sand, silt, wood debris, gravel, leaf litter

A. Rodriguez A. Rodriguez

LW2-BTFC009 Tow 16
shell fragments, 1 shrimp
Collect 14 clams: 5mm ~0.05g
30mm ~ 1.66g (1x) 8mm ~0.12g
10mm ~0.18g 4x) 6mm ~0.07g
(4x) 9mm ~0.15g 7mm ~0.09g

1008 Begin processing sample
LW2-BTFC009 Tow 17

1013 Complete processing sample
LW2-BTFC009 Tow 17
sand, silt, abundant wood debris, shell fragments, plastic
Collect 7 clams: 40 mm ~ 2.96g
29 mm ~1.55g (2x) 8mm ~0.12g
13mm ~0.31g 9mm ~0.15g
7mm ~0.09g
Total weight for all tows
~ 43.12 g ww

1027 Begin processing sample
LW2-BTFC008 Tow 1

1031 Complete processing sample
LW2-BTFC008 Tow 1
abundant wood debris, shell fragments, leaf litter, plastic debris

12/9/05 A. Rodriguez

LW2-BTFC008 Tow 1
Collect 4 clams: 39mm ~ 2.31g
18mm 29mm
(2x) 32mm 23mm
34mm

1036 Begin processing sample
LW2-BTFC008 Tow 2

1043 Complete processing sample
LW2-BTFC008 Tow 2
sand, silt, wood debris, shell fragments, leaf litter, plastic
Collect 17 clams.

1045 Begin processing sample
LW2-BTFC008 Tow 3

1055 Complete processing sample
LW2-BTFC008 Tow 3
sand, silt, wood debris (mulch like), leaf litter, shell fragments
Collect 10 clams: 26mm, 33mm (2x), 32 (2x)

1057 Begin processing sample
LW2-BTFC008 Tow 4

12/9/05 A. Rodriguez

1100 Complete processing sample
LW2-BTFC008 Tow 4
sand, silt, mulch like wood debris, leaf litter, shell fragments
Collect 4 clams.

1105 Begin processing sample
LW2-BTFC008 Tow 5

1109 Complete processing sample
LW2-BTFC008 Tow 5
Sand, silt, mulch like wood debris, shell fragments, leaf litter
Collect 12 clams

1114 Begin processing sample
LW2-BTFC008 Tow 6

1117 Complete processing sample
LW2-BTFC008 Tow 6
Slight sheen, sand & silt, wood debris, shell fragments
Collect 3 clams. 29mm, 35mm, 23mm

1123 Begin & complete processing sample LW2-BTFC008 Tow 7
Sand, silt, wood debris, leaf litter, shell fragments
No clams

ANC02265
BZTO104(e)002265

12/9/05 A. Rodriguez

1131 Begin processing sample
LW2-BTFC008 Tow 8

1133 Complete processing sample
LW2-BTFC008 Tow 8
sand, silt, wood debris, shell fragments, leaf litter, gravel
Collect 3 clams: 35mm
33mm 38mm

* Total weight for all 10 WS ~103.64g ww

1145 Lunch break & bathroom break
Discuss stations & status Angelita, Shannon & Eric.

1230 Arrive at station BT007, ~RM4.2
property line b/w Schnitzer & Terminal 4; EPA requested site.

1240 Begin processing sample
LW2-BTFC007 Tow 1
Complete processing sample
LW2-BTFC007 Tow 1
sand, silt, wood debris, shell fragments
paint chips, chironomids
No clams

12/9/05 A. Rodriguez

* Note: Complete sampling at station BT007 with Tow 8 b/c Eric agreed w/ Angelita Rodriguez (WW) that the biomass (~103 gww) is sufficient. Therefore, the minimum of 10 tows is not necessary for this station.

1249 Begin processing sample
LW2-BTFC007 Tow 2

1252 Complete processing sample
LW2-BTFC007 Tow 2
sand, silt, wood debris, leaf litter, shell fragments, chironomids, paint chips
Collect 2 clams: 30mm ~1.66g
28mm ~1.45g

1257 Begin processing sample
LW2-BTFC007 Tow 3

1258 Complete processing sample
LW2-BTFC007 Tow 3
silt, sand, wood debris, shell fragments, 1 shrimp
No clams

12/9/05 A. Rodriguez

1307 Begin processing sample
LW2-BTFC007 Tow 4

1308 Complete processing sample
LW2-BTFC007 Tow 4
sand, silt, wood debris, leaf litter, shell fragments, plastic
Collect 1 clam 15mm ~ 0.41g

1311 Tow 5 @ station BT007 Rejected b/c snagged & sample not collected.
~~Begin~~ (AR) Sampling underneath dock at the property line of Schnitzer & Terminal 4 near several submerged pilings closest to the shore.

1316 Begin processing sample
LW2-BTFC007 Tow ~~4~~ (AR) 6

1324 Complete processing sample
LW2-BTFC007 Tow 6
sand, silt, shell fragments, wood debris, leaf litter, 1 shrimp
Collect 1 Winged Floater Mussel 92mm
Collect 13 clams

12/9/05 A. Rodriguez

1325 Begin processing sample
LW2-BTFC007 Tow 7

1327 Complete processing sample
LW2-BTFC007 Tow 7
Coarse sand, silt, gravel, wood debris, shell fragments, leaf litter
Collect 11 clams

1329 Begin processing sample
LW2-BTFC007 Tow 8

1334 Complete processing sample
LW2-BTFC007 Tow 8
Collect 4 clams: 37mm ~ 2.53g
31mm ~ 1.78g, 25mm ~ 1.15g, 19mm ~ 0.67g

1340 Begin processing sample
LW2-BTFC007 Tow 9
Complete processing sample
LW2-BTFC007 Tow 9
sand, silt, wood debris, shell fragments, glass, 1 shrimp
2 clams 31mm
24mm
Total weight ~ 13.60g

12/9/05 A. Rodriguez

Eric Blischke needs to look at map of tow lines & corresponding biomass to decide whether to include all tows for station BT007. Angelita Rodriguez, Shannon Pierce & Eric Blischke have agreed the crew will return to station BT007 & do 2 tows only & move on to another station on Monday, 12/12/05.

1355 Brian Pointer (Integral) informs crew we have approval to sample Schnitzer on Monday 12/12/05.

1400 Dave Mullins & Mike May are working on the Mullins boat to repair the water pump. Sampling is completed for the day.

1420 Head back to Fred's Marina

1445 Contact Sheriff & US Coast Guard to inform we have completed sampling & heading off the water.

12/9/05 A. Rodriguez

1500 Pick up lab key from Thai at Swan Island boat ramp.

1545 Arrive at field lab, unload supplies & secure samples. Organize field equipment & supplies for Monday sampling.

1630 End of day

Angelita R

ANC02268
BZTO104(e)002268

12/12/05 A. Rodriguez

0700 Arrive at the field lab & load up supplies.

0730 Pick up lunch

0750 Arrive at Fred's Marina
Sledging Crew:
Kathleen Hurley (WW)
Linda Marsh (WW)
Brian Pointer (Integral)
Dave Mullins (boat driver)

0 Processing Crew:
Shannon Pierce (WW)
Angelita Rodriguez (WW)
Andrew Sommes (Oversight, Parametrix)
Mike May (boat driver, Ross Island)

0810 Health & Safety meeting to address the hazards of using the rope attached to the sledge. Dave modified the length of the rope (~6ft) to eliminate the risk of the rope getting tangled around the body part or the shaft of the pump. In addition, the crew signed the HSP modification form that states the hazards of operating the benthic sledge.

12/12/05 A. Rodriguez

0818 Motor to station BT007 to finish up collection of biomass.

0843 Begin processing sample LW2-BTFC007 Tow 10

0849 Complete processing sample LW2-BTFC007 Tow 10
coarse sand gravel, some wood debris, shell fragments, leaf litter
Collect 6 clams: (2ea) 33mm ~ 2.01g
30mm ~ 1.66, 32mm ~ 1.89, 20mm ~ 0.74g,
10mm ~ 0.16g

0852 Begin processing sample LW2-BTFC007 Tow 11

0855 Complete processing sample LW2-BTFC007 Tow 11
abund. woody debris, leaf litter, glass, man-made debris
Collect 3 clams: 31mm ~ 1.78g
26mm ~ 1.25g 24mm ~ 1.06g

Total weight for all tows ~ 56.18g ww

ANC02269
BZTO104(e)002269

12/12/05 A. Rodriguez

0900 Motor to station BT006, Schnitzer ~RM 3.8 east side. EPA requested location.

0916 Begin processing tow #2 sample LW2-BTFC006 Tow1

0918 Complete processing sample LW2-BTFC006 Tow1
silt, slight sheen, gravel, shell fragments, leaf litter, glass
collect 1 clam 30mm ~ 1.66g

0924 Begin processing sample LW2-BTFC006 Tow2

0930 Complete processing sample LW2-BTFC006 Tow 2
Clay nodules, wood debris, shell fragments, leaf litter, concrete
Collect 10 clams

0931 Begin processing sample LW2-BTFC006 Tow 3

0935 Complete processing sample LW2-BTFC006 Tow3
Clay nodules, wood debris, shell fragments leaf litter

12/12/05 A. Rodriguez

LW2-BTFC006 Tow 3
Collect 21 clams

0938 Begin processing sample LW2-BTFC006 Tow 4

0947 Complete processing sample
silt, fine to coarse sand, moderate sheen, wood debris, clay, gravel, leaf debris
Collect 21 clams
Collect 1 mussel 81mm

0948 Begin processing sample LW2-BTFC006 Tow5

0953 Complete processing sample LW2-BTFC006 Tow5
Clay balls, coarse sand, fine gravel, leaf litter, ~~rocks~~, shell fragments
Collect 16 clams

0955 Begin processing sample LW2-BTFC006 Tow6

1004 Complete processing sample LW2-BTFC006 Tow6
Clay balls, coarse sand, gravel, leaf litter, shell fragments

12/12/05 A. Rodriguez

LW2-BTFC006 Tow 6
Collect 30 clams

1005 Begin processing sample
LW2-BTFC006 Tow 7

1015 Complete processing sample
LW2-BTFC006 Tow 7
Clay balls, dragonfly larvae,
wood debris, shell fragments,
Coarse sand, gravel
Collect 42 clams

1021 Begin processing sample
LW2-BTFC006 Tow 8

1025 Complete processing sample
LW2-BTFC006 Tow 8
Collect 9 clams

1026 Begin processing sample
LW2-BTFC006 Tow 9

1028 Complete processing
sample LW2-BTFC006 Tow 9
silt, coarse sand, wood debris,
leaf litter, fine-med gravel, shell
fragments

12/12/05 A. Rodriguez

LW2-BTFC006 Tow 9
Collect 14 clams
Collect 1 mussel 79 mm

1030 Begin processing sample
LW2-BTFC006 Tow 10

1039 Complete processing sample
LW2-BTFC006 Tow 10
Coarse sand, fine-med gravel,
shell fragments, leaf litter, clay
Collect 17 clams
Collect 1 Mussel 34 mm
Total weight for all tows ~217.57g

1040 Motor to station BT005,
moorings & Int'l slip

1049 Begin processing sample
LW2-BTFC005 Tow 1

1050 Complete processing sample
LW2-BTFC005 Tow 1
silt, fine sand, some clay,
gravel, leaf litter, shell fragments,
Chironomids, metal, slight petroleum
odor — No clams

ANC02271
BZTO104(e)002271

12/12/05 A. Rodriguez

1057 Begin processing sample
LW2-BTFC005 Tow 2
Complete processing sample.
LW2-BTFC005 Tow 2
silt, wood debris, fine sand,
slight sheen
No clams

1100 Begin processing sample
LW2-BTFC005 Tow 3

1110 Complete processing sample
LW2-BTFC005 Tow 3
Collect 7 clams
silt, wood debris, shell fragments,
leaf litter, moderate sheen,
Coarse sand

1117 Begin processing sample
LW2-BTFC005 Tow 4

1120 Complete processing sample
LW2-BTFC005 Tow 4
silt, wood debris, shell fragments,
leaf litter, moderate sheen,
Coarse sand, clay balls, chironomid

12/12/05 A. Rodriguez

LW2-BTFC005 Tow 4
Collect 5 clams

1125 Tow 5 @ station BT005
rejected b/c of an empty tow.

1133 Begin processing sample
LW2-BTFC005 Tow 6

1135 Complete processing sample
LW2-BTFC005 Tow 6
silt, wood debris, leaf litter,
fine gravel, coarse sand, asphalt,
clay balls, 2 shrimp, chironomids
Collect 1 clam 25mm ~15 g wet

~~Begin processing sample~~ (AR)
~~LW2-BTFC005 Tow 7~~
~~Complete processing sample~~

1140 LW2-BTFC005 Tow 7
is rejected b/c of an empty tow.

1148 Begin processing sample
LW2-BTFC005 Tow 8

12/12/05 A. Rodriguez

1151 Complete processing sample
LW2-BTFC005 Tow 8
moderate petro odor, wood debris, shell fragments, mostly silt, fine to medium gravel, chironomids, fish bone remains
No clams

1158 Begin processing sample
LW2-BTFC005 Tow 9

1200 Complete processing sample
LW2-BTFC005 Tow 9
mostly silt, wood debris, clay balls, fine to medium gravel, chironomids, concrete
Collect 1 clam 23mm ~ 0.89g

1205 Lunch break & contact Helle Andersen about EPA decision to have us return to station BT019 to sample for ~ 23-25g & 5 tows. If unsuccessful move station downstream of the crane in Riedell Cove.

12/25/05 A. Rodriguez

1252 Begin processing sample
LW2-BTFC005 Tow 10

1259 Complete processing sample
LW2-BTFC005 Tow 10
slight sheen, silt, fine-coarse-med sand, cobble, clay balls, fine-coarse gravel, wood debris, slight petroleum odor
Collect 8 clams

1302 Begin processing sample
LW2-BTFC005 Tow 11

1304 Complete processing sample
LW2-BTFC005 Tow 11
silt, fine-coarse gravel, clay balls, nail, shrimp
Collect 2 clams 7mm

1309 Begin processing sample
LW2-BTFC005 Tow 12

1313 Complete processing sample
LW2-BTFC005 Tow 12
silt, fine-coarse gravel, shrimp, wood debris, shell fragments
Collect 12 clams

12/12/05 A. Rodriguez

1318 Begin processing sample
LWZ-BTFC005 Tow 13

1322 Complete processing sample
LWZ-BTFC005 Tow 13
silt, med-fine gravel, coarse sand, shell fragments (traces), leaf litter, wood debris
Collect 1 lamprey
Collect 5 clams

1328 Begin processing sample
LWZ-BTFC005 Tow 14

1333 Complete processing sample
LWZ-BTFC005 Tow 14
clay balls, moderate sheen, silt, fine sand, wood debris, leaf litter, slight petroleum odor
Collect 11 clams

1339 Begin processing sample
LWZ-BTFC005 Tow 15

1342 Complete processing sample
LWZ-BTFC005 Tow 15
silt, fine-med-coarse gravel, coarse sand, trace cobble, leaf litter, shell frags, chironomids

12/12/05 A. Rodriguez

LWZ-BTFC005 Tow 15
Collect 4 clams
Total weight for all tows ~ 48.28 g ww

1345 Motor to station BT004 ~ RM 3.2 east side of the river near Lime Oil.

1358 Begin processing sample
LWZ-BTFC004 Tow 1

1402 Complete processing sample
LWZ-BTFC004 Tow 1
silt, fine-coarse sand, fine-med gravel, wood debris, shell fragments, chironomids, glass
Collect 10 clams

1408 Begin processing sample
LWZ-BTFC004 Tow 2

1415 Complete processing sample
LWZ-BTFC004 Tow 2
silt, fine-coarse sand, woody debris, shell fragments, fine-coarse gravel, metal debris, leaf litter
Collect 20 clams
2 mussels 18 mm & 14 mm

12/12/05 A. Rodriguez

1416 Begin processing sample
LW2-BTFC004 Tow 3

1422 Complete processing sample
LW2-BTFC004 Tow 3
slight sheen, mostly fine-med sand, wood debris, shell fragments, trace fine gravel
Collect 8 clams
Collect 1 mussel 26mm

1428 Begin processing sample
LW2-BTFC004 Tow 4

1430 Complete processing sample
LW2-BTFC004 Tow 4
silt, fine sand, coarse-med-fine gravel, leaf litter, shell fragments, glass, wood debris
Collect 17 clams
2 mussels 100 mm & 13 mm
1 ~~lamprey~~ leech

1432 Begin processing sample
LW2-BTFC004 Tow 5

12/12/05 A. Rodriguez

1436 Complete processing sample
LW2-BTFC004 Tow 5
silt, fine sand, coarse-med-fine gravel, leaf litter, shell fragments, wood debris, 3 shrimp
Collect 12 Clams

1440 Begin processing sample
LW2-BTFC004 Tow 6

1443 Complete processing sample
LW2-BTFC004 Tow 6
silt, fine sand, woody debris, trace fine gravel, leaf litter
Collect 4 clams

1459 Begin processing sample
LW2-BTFC004 Tow 7

1501 Complete processing sample
LW2-BTFC004 Tow 7
wood debris, leaf litter, fine sand, silt, fine-med gravel, trace coarse gravel
Collect 5 clams

12/12/05 A. Rodriguez

1503 Begin processing sample LW2-BTFC004 Tow 8

1506 Complete processing sample LW2-BTFC004 Tow 8
wood debris, leaf litter, fine sand, silt, trace fine gravel, shell fragments
Collect 8 clams

1530 Arrive at Fred's Marina unload supplies & demob

1545 Arrive at field lab unload supplies, secure samples.

1600 Contact Coast Guard & Sheriff's office to inform we have completed our sampling for the day & ~~heading~~ AR off water.

End of day
Angelita 12/8

12/13/05 A. Rodriguez

0700 Arrive at the field lab and load up supplies

0740 Arrive at Fred's Marina & have a Health & Safety meeting to address the icy conditions on the docks, boats and water.

0800 Motor to station BT004
Sledging crew:
Kathleen Hurley (UW)
Linda Marsh (UW)
Brian Pointer (Integral)
Dave Mullins (boat driver)
Processing Crew:
Angelita Rodriguez (UW)
Shannon Pierce (UW)
Andrew Sommers (Oversight, Parametrix)
Mike May (boat driver, Ross Island)

0819 Begin processing sample LW2-BTFC004 Tow 9

12/13/05 A. Rodriguez

0823 Complete processing sample
LW2-BTFC004 Tow 9
silt, abund. wood chips, fine-med. gravel, fine sand, leaf litter, shell fragments
Collect 2 clams 7mm ~ 0.09g each

0824 Begin processing sample
LW2-BTFC004 Tow 10

0828 Complete processing sample
LW2-BTFC004 Tow 10
silt, abund. wood chips, fine-med gravel, fine sand, leaf litter, trace shell fragments
Collect 16 clams
Total weight for all trows ~ 76.14 g ww

0830 Motor to station BT001, downstream of Oregon Steel Mill ~ RM2 on east side of the river.

0845 Begin processing sample
LW2-BTFC001 Tow 1
Complete processing sample
LW2-BTFC001 Tow 1
silt, fine sand, wood debris, leaf litter, shell fragments

12/13/05 A. Rodriguez

LW2-BTFC001 Tow 1 Cont'd
Collect 15 clams

0852 Begin processing sample
LW2-BTFC001 Tow 2

0856 Complete processing sample
LW2-BTFC001 Tow 2
mostly silt, fine sand, wood debris, shell fragments, leaf litter, plastic, Chironomids
Collect 8 clams

0904 Begin processing sample
LW2-BTFC001 Tow 3

0907 Complete processing sample
LW2-BTFC001 Tow 3
slight H_2S odor, pockets of sheen, fine sand, wood debris, shell fragments, leaf litter
Collect 2 clams: 35mm & 6mm

0910 Begin processing sample
LW2-BTFC001 Tow 4

0914 Complete processing sample
LW2-BTFC001 Tow 4

12/13/05 A. Rodriguez

LW2-BTFC001 Tow 4
mostly silt, wood debris, shell fragments
Collect 19 clams

0917 Begin processing sample
LW2-BTFC001 Tow 5

0920 Complete processing sample
LW2-BTFC001 Tow 5
silt, leaf litter, wood debris, trace
course gravel, shell fragments
Collect 4 clams

0925 Begin processing sample
LW2-BTFC001 Tow 6

0928 Complete processing sample
LW2-BTFC001 Tow 6
silt, leaf litter, wood debris, shell fragments
shrimp
Collect 22 clams

0933 Begin processing sample
LW2-BTFC001 Tow 7

0937 Complete processing sample
LW2-BTFC001 Tow 7

12/13/05 A. Rodriguez

LW2-BTFC001 Tow 7
abund. wood debris, silt,
leaf litter, shell fragments,
Chironomids, leech
Collect 6 clams
Collect 1 mussel 83 mm

0942 Begin processing sample
LW2-BTFC001 Tow 8

0946 Complete processing sample
LW2-BTFC001 Tow 8
silt, wood debris, leaf litter, slight pockets
of sheen, chironomids, rootlets, shell fragments,
unidentified trash
Collect 4 clams

0952 Begin processing sample
LW2-BTFC001 Tow 9

0956 Complete processing sample
LW2-BTFC001 Tow 9
silt, wood debris, leaf litter, shell fragments,
Chironomids
Collect 4 clams
1 mussel 89 mm

12/13/05 A. Rodriguez

1000 Begin processing sample
LW2 - BTFC001 Tow 10

1005 Complete processing sample
LW2-BTFC001 Tow 10
silt, fine sand, some wood debris, shell fragments
Collect 22 clams
Collect 1 Mussel 81 mm
Total weight for all tows ~ 64.82 g ww

1007 Arrive at station BT002 ~ RM2.3 on east side, upstream of Oregon Steel Mill

1010 Begin processing sample
LW2-BTFC002 Tow 1

1010 Complete processing sample
LW2-BTFC002 Tow 1
silt, wood debris, shell fragments
No clams
Tow was snagged

1019 Begin processing sample
LW2-BTFC002 Tow 2

12/13/05 A. Rodriguez

1019 Complete processing sample
LW2-BTFC002 Tow 2
silt, wood chips, leaf litter
No clams

1104 Begin processing sample
LW2-BTFC002 Tow 3

1107 Complete processing sample
LW2-BTFC002 Tow 3
Med-coarse sand, fine gravel, leaf litter, shell fragments, wood debris, 1 shrimp
Collect 8 clams

1113 Begin processing sample
LW2-BTFC002 Tow 4

1117 Complete processing sample
LW2-BTFC002 Tow 4
med-coarse sand, fine gravel, leaf litter, shell fragments, wood debris, paint chips
Collect 1 Mussel 73 mm
Collect 10 clams

12/13/05 A. Rodriguez

LW2-BTFC002 Tow 5

1120 Begin processing sample

1125 Complete processing sample
LW2-BTFC002 Tow 5
Collect 13 clams
med-coarse sand, fine gravel, trace
coarse gravel, leaf litter, shell
fragments, wood debris, paint
chips

1129 Begin processing sample
LW2-BTFC002 Tow 6

1133 Complete processing sample
LW2-BTFC002 TOW 6
med-coarse sand, fine gravel, trace
~~coarse~~ med gravel, leaf litter, ~~[illegible]~~ shell
fragments, wood debris, paint chips,
1 shrimp
Collect 15 clams

1136 Begin processing sample
LW2-BTFC002 Tow 7

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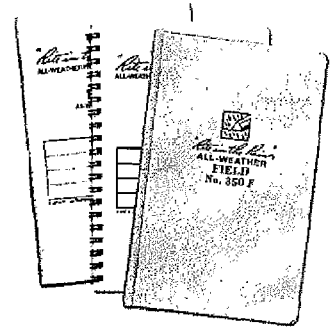

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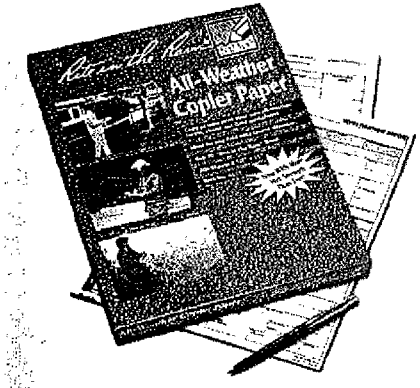

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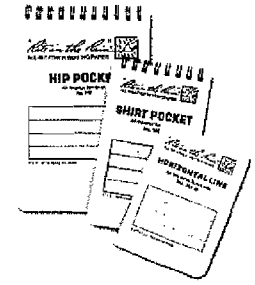

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No. 311

Portland Harbor RI/FS
Benthic Tissue Clam Sledging
Dec 13, 2005 – Dec 14, 2005
Book 5 of 5

4 5/8" x 7" - 48 Numbered Pages

ANC02281
BZTO104(e)002281

12/13/05 A. Rodriguez

LW2-BTFC003 Tow 2
Gravid female crayfish, 5 shrimp
silt, abund. wood debris, shell
fragments, algae, med-fine gravel (trace),
dragonfly larvae, (3) gastropods, bryozoan
- Photos taken -
Collect 7 clams

1312 Begin processing sample
LW2-BTFC003 Tow 3

1318 Complete processing sample
LW2-BTFC003 Tow 3
Wood debris, silt, 1 shrimp, leaf litter,
shell fragments, 8 gastropods,
Collect 10 clams

1320 Begin processing sample
LW2-BTFC003 Tow 4

1324 Complete processing sample
LW2-BTFC003 Tow 4
wood debris, silt, leaf litter, shell
fragments, 6 gastropods
Collect 7 clams

12/13/05 A. Rodriguez

1326 Begin processing sample
LW2-BTFC003 Tow 5

1333 Complete processing sample
LW2-BTFC003 Tow 5
3 shrimp, 11 Gastropods
Collect 7 clams
wood debris, silt, leaf litter,
shell fragments

1334 Begin processing sample
LW2-BTFC003 Tow 6

1339 Complete processing sample
LW2-BTFC003 Tow 6
8 shrimp, lot gastropods,
wood debris, wood chunks, leaf
litter, silt, shell fragments
Collect 10 clams

1342 Begin processing sample
LW2-BTFC003 Tow 7
Complete processing sample
LW2-BTFC003 Tow 7
Wood debris, wood chunks, leaf litter, silt,
shell fragments, 1 shrimp, 5+ gastropods,
algae

A. Rodriguez 12/13/05
LW2-BTFC003 Tow 7
Collect 1 lamprey
Collect 5 clams

1349 Begin processing sample
LW2-BTFC003 Tow 8
1357 Complete processing sample
LW2-BTFC003 Tow 8
Silt, wood debris, algae, 18+ gastropods,
shell fragments, leaf litter, juv crayfish
Collect 1 AK 5 clams
1 shrimp

1400 Begin processing sample
LW2-BTFC003 Tow 9
1405 Complete processing sample
LW2-BTFC003 Tow 9
wood debris, wood chunks, algae,
shell fragments, leaf litter, 7 shrimp
Mussel 81mm
18+ gastropods
Collect 7 clams
1409 Begin processing sample
LW2-BTFC003 Tow 10

12/13/05 A. Rodriguez
1419 Complete processing sample
LW2-BTFC003 Tow 10
silt, abund. wood debris, wood chunks,
shell fragments, leaf litter, algae
8 shrimp, 5+ gastropods, 10 shrimp
Collect 2 clams
Total weight for all tows ~ 81.80 g ww

1430 Return to station BTO11, hunton plywood
to try to collect an add'l
7 grams of biomass

1435 Begin processing sample
LW2-BTFC011 Tow 16
1439 Complete processing sample
LW2-BTFC011 Tow 16
Wood debris, leaf litter, wood chunks,
shell fragments, trace med gravel
leech
Collect 4 clams

1440 Tow 17 @ station BTO11 reject
b/c it flipped

12/13/05 A. Rodriguez

1445 Begin processing sample
LW2-BTFC011 Tow 18

1450 Complete processing sample
LW2-BTFC011 Tow 18
wood chunks, leaf litter, trace med gravel, silt, shell fragments
Collect 2 clams

1454 Begin processing sample
LW2-BTFC011 Tow 19

1456 Complete processing sample
LW2-BTFC011 Tow 19
fine-med sand, silt, wood debris, leaf litter, shell fragments
Collect 2 clams

1459 Begin processing sample
LW2-BTFC011 Tow 20

1501 Complete processing sample
LW2-BTFC011 Tow 20
silt, shell fragments, wood debris, spongy porous debris, trace wood chunks
No clams

12/13/05 A. Rodriguez

1508 Begin processing sample
LW2-BTFC011 Tow 21

1511 Complete processing sample
LW2-BTFC011 Tow 21
slight H_2S odor, shell fragments, wood debris, silt, wood chunks, trace spongy trash
No clams

1515 Begin processing sample
LW2-BTFC011 Tow 22

1518 Complete processing sample
LW2-BTFC011 Tow 22
wood debris, leaf litter, shell fragments,

1524 Begin processing sample
LW2-BTFC011 Tow 23

1527 Complete processing sample
LW2-BTFC011 Tow 23
silt, wood debris, leaf litter, shell fragments, wood chunks

1530 Begin processing sample
LW2-BTFC011 Tow 24

12/13/05 A. Rodriguez

1534 Complete processing sample
LW2 - BTFC011 Tow 24
mostly silt, wood debris, leaf litter,
slight H_2S odor, gravel, shell fragments
No clams
Total weight with add'l 9 trows
~18.23 g wet

1550 Arrive at Fred's Marina
Contact US Coast Guard & Sheriff's
office to inform sampling is completed
for the day.

1620 Arrive at field lab, unload supplies,
secure samples & make copies of
the field notes.

1645 End of day.

Angelita RR

12/14/05 A. Rodriguez

0700 Arrive at field lab & load
up supplies

0730 Arrive at Cathedral Park
Sledging Crew:
Kathleen Hurley (WW)
Linda Marsh (WW)
Brian Pinter (Integral)
Dave Mullins (boat driver)

Processing Crew:
Angelita Rodriguez (WW)
Shannon Pierce (WW)
Andrew Sommers (oversight)
Mike May (boat driver, Ross (Island))

Contact US Coast Guard &
Sheriffs office to inform about
sampling activities

0809 Arrive at station BT014, US Moorings
Begin processing sample
LW2 - BTFC014 Tow 15
silt, wood debris, shell fragments,
slight pockets of sheen, plastic litter
Station has been moved 100 m east (towards the shipping channel)

12/14/05 A. Rodriguez

0811 Complete processing sample
LW2-BTFC014 Tow 15
No clams

0819 Begin processing sample
LW2-BTFC014 Tow 16

0821 Complete processing sample
LW2-BTFC014 Tow 16
silt, wood debris, shell fragments,
plastic litter, glass
Collect 1 clamm

0828 Begin processing sample
LW2-BTFC014 Tow 17

0831 Complete processing sample
LW2-BTFC014 Tow 17
Silt, wood debris, shell fragments,
glass, fine-med gravel
Collect 4 clams

0838 Begin processing sample
LW2-BTFC014 Tow 18
silt, slight pocket of sheen, wood debris,
trace course gravel, shell fragments, med gravel,
plastic litter, algae

12/14/05 A. Rodriguez

0841 Complete processing sample
LW2-BTFC014 Tow 18
Collect 2 clams

0847 Begin processing sample
LW2-BTFC014 Tow 19

0851 Complete processing sample
LW2-BTFC014 Tow 19
silt, wood debris, shell fragments,
algae, plastic litter, 4 shrimp
Collect 4 clams

0858 Begin processing sample
LW2-BTFC014 Tow 20

0905 Complete processing sample
LW2-BTFC014 Tow 20
silt, wd debris, shell fragments,
algae
collect 1 clam
Total weight for the 11 tows on the
new proposed station BTO14 location
45° 34' 57.989 & 122° 45' 48.712
~50 g ww
Discard tows 15 & 16 not w/i new station
location.

12/14/05 A. Rodriguez

0915 # Tow 16 BTFC15 station reject b/c it was snagged on the bottom

0925 Begin processing sample LW2 - BTFC015 Tow 17

0929 Complete processing sample LW2-BTFC015 Tow 17 silt, wood debris, leaf litter, shell fragments, trace fine gravel
Collect 2 clams

* Note: BT015, Gasco area we need a total of 17g ww as agreed upon by Eric Blischke & Shannon Pierce & Angelita Rodriguez. Currently have 13.58gww & 15 tows.

1001 Begin processing sample LW2-BTFC015 Tow 18

1003 Complete processing sample LW2-BTFC015 Tow 18 silt, slight H_2S odor, wood debris, wood chunks, shell fragments, algae, plastic, trace fine-med gravel
Collect 1 clam

12/14/05 A. Rodriguez

1004 Tow 19 @ station BT015, reject b/c snagged at the bottom & empty tow.

1005 # Begin processing sample LW2-BTFC015 Tow 20

1008 Complete processing sample LW2-BTFC015 Tow 20 med gravel, fine gravel, shell fragments, wood debris, silt, 2 shrimp, strong petroleum odor
Collect 2 Clams

* Note: sledge material is cap material used in Gasco clean-up according to Andrew Sommers EPA, oversight.

1009 Docked at Cathedral Park boat ramp b/c generator on boat is dead & waiting for Ross Island mechanics to help fix the boat. This will be staging area to process the samples from BT015.

12/14/05 A. Rodriguez

1042 Begin processing sample
LW2-BTFC015 Tow 21

1046 Complete processing sample
LW2-BTFC015 Tow 21
wood debris, mostly med gravel, ~~fine~~
~~gravel~~, trace fine gravel, shell fragments,
algae, ~~slight~~ moderate AR petroleum odor,
less cap material
Collect 2 clams

1049 Begin processing sample
LW2-BTFC015 Tow 22

1055 Complete processing sample
Mostly cap material, med gravel, fine
gravel, silt, wood fragments, algae,
Strong petroleum odor, 1 shrimp, shell frags
Collect 9 clams

Total weight for all tows ~28.18 g ww

1110 Ross Island boat up & running.
Motor to station BTO19, Riedell Cove
Currently at ~~[illegible]~~ 15.46 g ww & 10 tows.
Sampling will commence in the center

12/14/05 A. Rodriguez

of the sampling location &
5 tows will be attempted to
collect add'l 8-10 g ww as
agreed upon by Eric Blischke,
Shannon Pierce & Angelita
Rodriguez. If not successful, will
sample downstream of crane, which
~~Begin~~ AR will be a new station

1146 Begin processing sample
LW2-BTFC019 Tow 11

1148 Complete processing sample
LW2-BTFC019 Tow 11
silt, wood debris, shell fragments, string,
Chironomids
Collect 3 clams

1155 Begin processing sample
LW2-BTFC019 Tow 12

1158 Complete processing sample
LW2-BTFC019 Tow 12
silt, wood debris, shell fragments, misc.
trash (paper & plastic), leaf litter,
Chironomids
Collect 3 clams

12/14/05 A. Rodriguez

1204 Begin processing sample
LW2-BTFC019 Tow 13

1206 Complete processing sample
LW2-BTFC019 Tow 13
silt, wood debris, shell fragments, leaf litter, chironomids
Collect 3 clams

1213 Begin processing sample
LW2-BTFC019 Tow 14

1216 Complete processing sample
LW2-BTFC019 Tow 14
wood debris, shell fragments, silt, golf ball, plastic, chironomids
Collect 4 clams

1222 Begin processing sample
LW2-BTFC019 Tow 15

1228 Complete processing sample
LW2-BTFC019 Tow 15
silt, wood debris, wood chunks (some), slight sheen, shell fragments, leaf litter, fine sand, med-fine gravel, plastic, chironomids, 1 shrimp
Collect 7 clams

12/14/05 A. Rodriguez

1230 Lunch break & contact Helle Andersen to report field progress for the day

1305 Begin ~~proc~~ AR processing sample
LW2-BTFC019 Tow 16

1308 Complete processing sample
LW2-BTFC019 Tow 16
silt, abund. wood debris, shell fragments, leaf litter, chironomids
Collect 2 clams

Total weight for all tows
~ 35.38 g ww

1310 motor back to Gasco station BT015 to collect add'l biomass ~2-7 g ww & ~~collect~~ AR attempt a total of 30-35 g ww with 2 tows only.

1327 Begin processing sample
LW2-BTFC015 Tow 23

1330 Complete processing sample
silt, wood debris, algae, 1 shrimp, shell fragments No clams

12/14/05 A. Rodriguez

LW2-BTFC015 Tow 24

1338 Begin processing sample

1342 Complete processing sample
LW2-BTFC015 Tow 24
Mostly med gravel, coarse & fine gravel trace, wood debris, shell fragments, moderate ~~shell fragments~~ AR petroleum odor,
Collect 1 clam

Total weight for all tows ≈ 29.24 g ww

1345 Head back to Cathedral Park

1420 Arrive at field lab and demob supplies

1515 Prepare clean room to process lamprey samples.
1) Decon room & table with Alconox
2) Foil table top
3) Turn off AC on vent in clean room & enter with Tyvek suits on.
#

12/14/05 A. Rodriguez

1545 Use a Denver Instrument XP-3000 digital balance to weigh the total of 9 lamprey collected during the benthic tissue effort.

LW2-BT005 Tow 13
Lamprey weight = 0.3 g ww
LW2-BT003 Tow 7
Lamprey weight 40.1 g ww
LW2-BT010 Tow 5
Lamprey weight = 1.1 g ww
LW2-BT011 Tow 4
Lamprey weight = 0.3 g ww
LW2-BT025 Tow 15
Lamprey weight = 0.8 g ww
LW2-BT028 Tow 16
Lamprey weight = 0.8 g ww
LW2-BT020 Tow 10
Lamprey weight = 2.3 g ww
LW2-GBT027-1 Subarea C
Lamprey weight = 3.0 g ww
LW2-GBT027-1 AR B Subarea D
Lamprey weight = 3.6 g ww

ANC02290
BZTO104(e)002290

12/14/05 A. Rodriquez

1630 Finished lamprey weights + pictures. Bagged samples together + returned samples to freezer. Clean up + finish.

1640 Repvepared Room for picture taking of mussel species. room already deconed, foiled table turn on vent, enter room in Tyvek.

1655 Completed taking pictures of the mussels and returned samples to freezer.

1700 End of day

Angelita RD

12/20/05 S. Pierce

Lamprey processing + physical description.

1705 - Prep clean room for processing.
1) Decon room w/ alconox
2) Foil table top
3) Turn on vent in clean room + enter in Tyvek suits.

Previously weighed lamprey 12/20
GBT001-A - lamprey weight = 1.8g

Physical descriptions:

LW2-BT003
color: pink/brown
eyes: not visible
teeth: not visible
skin condition: nothing notable

LW2-BT005
color: pink/brown
eyes + teeth: not visible
skin condition: nothing notable

Field Notebook Scan Mask (this side up)

Cover ←

12/20/05 S. Pierce

LW2-BT010
color: pink/brown
eyes: not visible
teeth: not visible
skin condition: ~~nothing notable~~ SP
two red bumps anterior ~~side~~ SD body side; may be result of freezing; took two photos

LW2-BT011
color: pink/brown
eyes + teeth: not visible
skin condition: nothing notable

LW2-BT025
color: pink/brown
eyes + teeth: not visible
skin condition: nothing notable

LW2-BT028
color: pink/brown
eyes + teeth: not visible
skin condition: nothing notable

LW2-BT001-A
color: pink/brown teeth: not visible (mouth closed)
eyes: drk. spots + indentation where eyes are; beginning to form
skin condition: nothing notable

12/20/05 S. Pierce

LW2-BT020 w/ darker dorsal side
color: silver, lateral row of 7 red dots posterior to eye
eyes + teeth: present
other: caudal fins ~~present~~ visible SD
skin condition: nothing notable

LW2-BT027-1-C w/ darker dorsal side
color: silver, lateral row of 7 red dots posterior to eyes
eyes + teeth: present
other: none
skin condition: nothing notable

LW2-BT027-1-D w/ darker dorsal side
color: silver, lateral row of 7 red dots posterior to eyes
eyes + teeth: present
skin condition: nothing notable
other: none

1748 Finish lamprey processing. Leave lab.

S Pierce SMP 12.20.05

Field Notebook Scan Mask (this side up)

Cover

12/13/05 A. Rodriguez

1534 Complete processing sample
LWZ - BTFC011 Tow 24
mostly silt, wood debris, leaf litter,
slight H_2S odor, gravel, shell fragments
No clams
Total weight with add'l 9 trows
~ 18.23 g wet

1550 Arrive at Fred's Marina
Contact US Coast Guard & Sheriff's
office to inform sampling is completed
for the day.

1620 Arrive at field lab, unload supplies,
secure samples & make copies of
the field notes.

1645 End of day.

Angelita RG

12/14/05 A. Rodriguez

0700 Arrive at field lab & load
up supplies

0730 Arrive at Cathedral Park
Sledging Crew:
Kathleen Hurley (WW)
Linda Marsh (WW)
Brian Pinter (Integral)
Dave Mullins (boat driver)

Processing Crew:
Angelita Rodriguez (WW)
Shannon Pierce (WW)
Andrew Sommes (oversight)
Mike May (boat driver, Ross (Island))

Contact US Coast Guard &
Sheriffs office to inform about
sampling activities

0809 Arrive at station BTO14, US Moorings
Begin processing sample
LWZ - BTFC014 Tow 15
silt, wood debris, shell fragments,
slight pockets of sheen, plastic litter
Station has been moved 100m east (towards the shipping channel)

12/14/05 A. Rodriguez

0811 Complete processing sample
LW2-BTFC014 Tow 15
No clams

0819 Begin processing sample
LW2-BTFC014 Tow 16

0821 Complete processing sample
LW2-BTFC014 Tow 16
silt, wood debris, shell fragments,
plastic litter, glass
Collect 1 clam

0828 Begin processing sample
LW2-BTFC014 Tow 17

0831 Complete processing sample
LW2-BTFC014 Tow 17
Silt, wood debris, shell fragments,
glass, fine-med gravel
Collect 4 clams

0838 Begin processing sample
LW2-BTFC014 Tow 18
silt, slight pocket of sheen, wood debris,
trace course gravel, shell fragments, med gravel,
plastic litter, algae

12/14/05 A. Rodriguez

0841 Complete processing sample
LW2-BTFC014 Tow 18
Collect 2 clams

0847 Begin processing sample
LW2-BTFC014 Tow 19

0851 Complete processing sample
LW2-BTFC014 Tow 19
silt, wood debris, shell fragments,
algae, plastic litter, 4 shrimp
Collect 4 clams

0858 Begin processing sample
LW2-BTFC014 Tow 20

0905 Complete processing sample
LW2-BTFC014 Tow 20
silt, wd debris, shell fragments,
algae
collect 1 clam
Total weight for the 11 tows on the
new proposed station BTO14 location
45° 34' 57.989 & 122° 45' 48.712
~50 g ww
Discard tows 15 & 16 not w/i new station
Location.

12/14/05 A. Rodriguez

0915 * Tow 16 BT~~EF~~AR15 station reject b/c it was snagged on the bottom

0925 Begin processing sample LW2 - BTFC015 Tow 17

0929 Complete processing sample LW2-BTFC015 Tow 17
silt, wood debris, leaf litter, shell fragments, trace fine gravel
Collect 2 clams

* Note: BT015, Gasco area we need a total of 17 gww as agreed upon by Eric Blischke & Shannon Pierce & Angelita Rodriguez. Currently have 13.58 gww & 15 tows.

1001 Begin processing sample LW2-BTFC015 Tow 18

1003 Complete processing sample LW2-BTFC015 Tow 18
silt, slight H_2S odor, wood debris, wood chunks, shell fragments, algae, plastic, trace fine-med gravel
Collect 1 clam

12/14/05 A. Rodriguez

1004 Tow 19 @ station BT015, reject b/c snagged at the bottom & empty tow.

1005 * Begin processing sample LW2-BTFC015 Tow 20

1008 Complete processing sample LW2-BTFC015 Tow 20
med gravel, fine gravel, shell fragments, wood debris, silt, 2 shrimp, strong petroleum odor
Collect 2 Clams

* Note: Sledge material is cap material used in Gasco clean-up according to Andrew Sommes EPA, oversight.

1009 Docked at Cathedral Park boat ramp b/c generator on boat is dead & waiting for Ross Island mechanics to help fix the boat. This will be staging area to process the samples from BT015.

12/14/05 A. Rodriguez

1042 Begin processing sample
LW2-BTFC015 Tow 21

1046 Complete processing sample
LW2-BTFC015 Tow 21
wood debris, mostly med gravel, ~~fine~~
~~gravel~~, trace fine gravel, shell fragments,
algae, ~~slight~~ moderate petroleum odor,
less cap material
Collect 2 clams

1049 Begin processing sample
LW2-BTFC015 Tow 22

1055 Complete processing sample
Mostly cap material, med gravel, fine
gravel, silt, wood fragments, algae,
Strong petroleum odor, 1 shrimp, shell frags
Collect 9 clams

Total weight for all tows ~28.18 g ww

1120 Ross Island boat up & running.
Motor to station BT019, Riedell Cove
Currently at ~~[illegible]~~ 15.46 g ww & 10 tows.
Sampling will commence in the center

12/14/05 A. Rodriguez

of the sampling location &
5 tows will be attempted to
collect add'l 8-10 g ww as
agreed upon by Eric Blischke,
Shannon Pierce & Angelita
Rodriguez. If not successful, will
sample downstream of crane, which
~~Begin~~ MR will be a new station

1146 Begin processing sample
LW2-BTFC019 Tow 11

1148 Complete processing sample
LW2-BTFC019 Tow 11
silt, wood debris, shell fragments, string,
Chironomids
Collect 3 clams

1155 Begin processing sample
LW2-BTFC019 Tow 12

1158 Complete processing sample
LW2-BTFC019 Tow 12
silt, wood debris, shell fragments, misc.
trash (paper & plastic), leaf litter,
chironomids
Collect 3 clams

12/14/05 A. Rodriguez

1204 Begin processing sample
LW2-BTFC019 Tow 13

1206 Complete processing sample
LW2-BTFC019 Tow 13
silt, wood debris, shell fragments, leaf litter, chironomids
Collect 3 clams

1213 Begin processing sample
LW2-BTFC019 Tow 14

1216 Complete processing sample
LW2-BTFC019 Tow 14
wood debris, shell fragments, silt, golf ball, plastic, chironomids
Collect 4 clams

1222 Begin processing sample
LW2-BTFC019 Tow 15

1228 Complete processing sample
LW2-BTFC019 Tow 15
silt, wood debris, wood chunks (some), slight sheen, shell fragments, leaf litter, fine sand, med-fine gravel, plastic, chironomids, 1 shrimp
Collect 7 clams

12/14/05 A. Rodriguez

1230 Lunch break & contact Helle Andersen to report field progress for the day

1305 Begin ~~proc~~ processing sample
LW2-BTFC019 Tow 16

1308 Complete processing sample
LW2-BTFC019 Tow 16
silt, abund. wood debris, shell fragments, leaf litter, chironomids
Collect 2 clams

Total weight for all tows
~ 35.38 g ww

1320 motor back to Gasco station BT015 to collect add'l biomass ~2-7 g ww & ~~collect~~ attempt a total of 30-35 g ww with 2 tows only.

1327 Begin processing sample
LW2-BTFC015 Tow 23

1330 Complete processing sample
silt, wood debris, algae, 1 shrimp, shell fragments No clams

ANC02297
BZTO104(e)002297

12/14/05 A. Rodriguez

LW2-BTFC015 Tow 24

1338 Begin processing sample

1342 Complete processing sample
LW2-BTFC015 Tow 24
Mostly med gravel, coarse + fine gravel (trace), wood debris, shell fragments, moderate ~~shell fragments~~ AR petroleum odor,
Collect 1 clam

Total weight for all tows ≈ 29.24 g ww

1345 Head back to Cathedral Park

1420 Arrive at field lab and demob supplies

1515 Prepare clean room to process lamprey samples.
1) Decon room & table with Alconox
2) Foil table top
3) Turn ~~off~~ AC on vent in clean room & enter with Tyvek suits on.
#

12/14/05 A. Rodriguez

1545 Use a Denver Instrument XP-3000 digital balance to weigh the total of 9 lamprey collected during the benthic tissue effort.

LW2-BT005 Tow 13
Lamprey weight = 0.3 g ww
LW2-BT003 Tow 7
Lamprey weight < 0.1 g ww
LW2-BT010 Tow 5
Lamprey weight = 1.1 g ww
LW2-BT011 Tow 4
Lamprey weight = 0.3 g ww
LW2-BT025 Tow 15
Lamprey weight = 0.8 g ww
LW2-BT028 Tow 16
Lamprey weight = 0.8 g ww
LW2-BT020 Tow 10
Lamprey weight = 2.3 g ww
LW2-GBT027-1 Subarea C
Lamprey weight = 3.0 g ww
LW2-GBT027-1 ~~B~~ AR subarea D
Lamprey weight = 3.6 g ww

ANC02298
BZTO104(e)002298

12/14/05 A. Rodriquez

1630 Finished lamprey weights + pictures. Bagged samples together + returned samples to freezer. Clean up + finish.

1640 Repvepared Room for picture taking of mussel species. room already deconed, foiled table turn on vent, enter room in Tyvek.

1655 Completed taking pictures of the mussels and returned samples to freezer.

1700 End of day

Angelita RD

12/20/05 S. Pierce

Lamprey processing + physical description.

1705 - Prep clean room for processing.
1) Decon room w/ alconox
2) Foil table top
3) Turn on vent in clean room + enter in Tyvek suits.

Previously weighed lamprey 12/20
GBT001-A - lamprey weight = 1.8g

Physical descriptions:

LW2-BT003
color: pink/brown
eyes: not visible
teeth: not visible
skin condition: nothing notable

LW2-BT005
color: pink/brown
eyes + teeth: not visible
skin condition: nothing notable

Field Notebook Sign Mask (this side up)

Cover ←

Field Notebook Fan Mask
(this side up)

Cover

12/20/05 S. Pierce

LW2-BT010
color: pink/brown
eyes: not visible
teeth: not visible
skin condition: ~~nothing notable~~ SP
two red bumps anterior ~~side~~ SP body side; may be result of freezing; took two photos

LW2-BT011
color: pink/brown
eyes + teeth: not visible
skin condition: nothing notable

LW2-BT025
color: pink/brown
eyes + teeth: not visible
skin condition: nothing notable

LW2-BT028
color: pink/brown
eyes + teeth: not visible
skin condition: nothing notable

LW2-BT001-A
color: pink/brown teeth: not visible (mouth closed)
eyes: drk. spots + indentation where eyes are; beginning to form
skin condition: nothing notable

12/20/05 S. Pierce

LW2-BT020 w/ darker dorsal side
color: silver, lateral row of 7 red dots posterior to eye
eyes + teeth: present
other: caudal fins ~~present~~ visible SP
skin condition: nothing notable

LW2-BT027-1-C w/ darker dorsal side
color: silver, lateral row of 7 red dots posterior to eyes
eyes + teeth: present
other: none
skin condition: nothing notable

LW2-BT027-1-D w/ darker dorsal side
color: silver, lateral row of 7 red dots posterior to eyes
eyes + teeth: present
skin condition: nothing notable
other: none

1748 Finish lamprey processing. Leave lab.

S Pierce SMP 12.20.05

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Portland Harbor RI/FS
Benthic Sledge/Bioaccumulation
and sediment chemistry
Nov. 28, 2005 – December 2, 2005

4 5/8" x 7" - 48 Numbered Pages

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Project PORTLAND HARBOR RI/FS
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ANC02302
BZTO104(e)002302

11/28/05 I. STUPAKOFF / B. POINTER

0830 B Ponter retrieved Rugged laptop from PDX office
0930 Arrived at Field lab and loaded coordinates & data targets onto Rugged laptop.
1045 Arrived at Swan Island boat ramp.
1145 I am arrived at Swan Island boat ramp.
1130 Set up GPS unit. Dave Mullins GPS settings are not supported on TerraSync. Switched to Geoline GPS rental unit. All works. Set target nav. to station LW2-BT029.
Called Coast Guard and Sheriff.
Crew: Helle Andersen, Kathleen Hurley, Brian Painter, Ian Stupakoff, Dave Mullins.
Crew R.I. boat: Angelita Rodriguez, Thai Do, Mike May, Joe Gaulet, Jennifer Pettersen, Chris Thompson.
Weather: overcast, windy, cold
1149 left boat dock.
1210 Bottom time for Tow 1

11/28/05 I. Stupakoff / B. Painter

1211 Start Tow 1
1212 End Tow 1 - No snags
Cable Length: 80 ft
Waterdepth: 20 ft.
BP 11-28-05 ~~1214~~ Approx tow length - 60m
1217 Sledge on deck. Sediment is a silty mud, greenish brown color, no odor
1224 Bottom time for tow 2
1224:30 Start Tow 2
1225:30 End Tow 2 - No snags
Cable Length: 80 ft
1230 Sledge on deck. Sediment is silty mud greenish-brown. no odor.
1234 Bottom time for Tow 3. 80 feet paid out
1235:15 Start Tow 3
1236:15 End Tow 3 - no snags
1239 Sledge on deck. Silty mud. Slight odor of sulfur.
1245 Bottom for Tow 4
1246:30 Start Tow 4
1248:30 End Tow 4
Cable Length = 80 ft
1249 Sledge on deck. Silty/clayey mud no odor.

11/28/05 I. STRAKOFF / B. POINTER

1255 Bottom for Tow 5
1255:45 Start Tow 5 Cable paid out = 80 ft
1256:45 End Tow 5 no snags
1259 Sledge on deck. Silty mud. no odor
1303 Bottom for tow 6 80 ft of line paid out
1304:11 Start Tow 6
1305:11 End Tow 6 no snags.
1307 Sledge on deck. Silty mud. Slight Sulfur odor.
1310 Heading back to station. will now start collecting tows in a general NW verly direction (Have been collecting in SW direction.
1314 Bottom for tow 7. 80 ft of line paid out.
1314:55 Start Tow 7
1315:55 End Tow 7 no snags
1318 Sledge on Deck. Silty mud. Grey-Green color. Slight Sulfur odor.
BP 11-28-05 ~~1320~~
1329 Bottom for tow 8 - 80 ft paid out
1330:10 Start tow 8
1331:10 End Tow 8 no snags.
1334 Sledge on deck. Silty mud. no odor.
1335 Insufficient number of clams at this station. Talked to Joe Gorlet and Jennifer Petterson and Helle Andersen about

11/28/05 I. STREAKOFF / B. POINTER

attempting clam collection near dock area on east side of Swan Island Lagoon where clams and mussels were collected before.
1339 Bottom - 50 ft cable out
Depth 8 ft
1339 Towing. tow #9
1341 stop Tow
1341 Reject tow. Bag was inside out and did not collect mud.
1344 Sledge at bottom - 60 ft cable out
1344:50 start tow #10
1345:50 stop tow
water depth 8 ft.
13:47 Hit snag but sledge is full of mud. Did not stop logging for 17m distance going back into tow track line.
Silty sand with wood debris, twigs and leaves.
1359 sledge at bottom - 80 ft cable out
14:00:43 ~~1359:53~~ start tow #11 - water depth 20 ft
~~14:00:53~~ stop tow
14:00:43

11/28/05 I. STUPAKOFF / B. REINVOR

1406 Sledge on deck
silty sand w/wood debris, twigs and leaves. Some oily sheen.

1420 Consulting with J. Gorlet and Jennifer Petersen, Hetle Anderson decided to return to mid channel and tow parallel to tow #6.

1422 Bottom for tow #12. Paid out 90 ft

1423:15 Start Tow 12

1424:15 End tow 12 no snags.

1426 Sledge on deck. Silty mud. Fine. Some woody debris. No Odor.

1435 After consulting with J. Gorlet it was determined to do two more tows near dock area on east shore where tows # 10 & 11 were done.

1440 Bottom for tow 13 - 30 ft paid out

1440:50 Start Tow 13

1441:50 End Tow 13

1442 Sledge on deck. Gravelly bottom w/wood & organic debris. Some clay balls
BP 11-28-05

1444 Bottom for Tow 14 50 ft paid out

11/28/05 I. Stupakoff / B. Pointer

1445:27 Start tow 14

1446:27 End Tow 14

1449 Sledge on deck.

1456 Head to next station LW2-BTO26
Approximately 8 grams of tissue were collected at combined both sides of Lagoon.
Will start sampling at BTO26 to survey clam population and gauge sampling success.

1506 On station BTO26

1507 Sledge deployed

1508 Sledge on bottom for Tow 1 (30 ft depth)

1509:05 Start Tow 1 90 ft out

1510:08 End Tow 1 no snags.

1512 Sledge on deck. Fine silty mud greenish-grey. Sulfur smell.

1518 Bottom for Tow 2 90 ft out

1519:10 Start Tow 2 (depth = 30 ft)

1520:10 End Tow 2 no snags
No material collected. Rejected.
Will try to duplicate same location.

1523 Bottom for tow 3 90 ft paid out

1524:23 Start Tow 3 depth = 30 ft

1525:23 End Tow 3

11/28/05 I. Stupakoff / B. Pointer

1528 Sledge on deck (Tow 3). Fine Silty Mud. no odor. Sheen Flourettes

1534 Bottom for Tow 4 . 90 ft out

1535:00 Start Tow 4 (depth finder not working)

1536:00 End Tow 4

1538 Sledge on deck. Very little material. Mostly wood debris. Some Fine sediment. Rejected.

1544 Bottom for tow 5 Paid 170' out

1545:30 Start Tow 5

1546:30 End Tow 5

1550 Sledge on deck. Fine Silt Sediment. No odour.

1556 Bottom for Tow 6 170' paid out.

1557:30 Start Tow 6

1558:30 End Tow 6

1601 Sledge on Deck. Fine Mud, some organic wood debris. Sheen Flourettes present. No odor.

1610 Bottom for Tow 7 (120' out)

1612:09 Start Tow 7

1612:12 End Tow 7

1617 Sledge on deck. Fine Sediments. Sheen Flourettes. Faint smell reminiscent of sewage. Some large wood debris pieces.

11/28/05 I. Stupakoff / B. Pointer

1622 Bottom for Tow 8 (120' paid out)

1623:34 Start Tow 8

1624:21 End Tow 8 snagged. Good tow

1629 heading back to boat ramp.

1635 At boat ramp on Swan Island Lagoon.

1649 Loaded van and left boat ramp. Called Coast Guard.

1704 ~~1504~~ BP 11-28-05 At field lab unloading.

1720 Depart field lab

End of Day

11-28-05

11-29-05 B. Pointer / I. Stepakoff

0700 Arrive at Field Lab to begin loading/Prep.
0735 Arrive at Swan Island Lagoon Boat Ramp
0800 I. Stepakoff arrives at Swan Island. Health & Safety briefing takes place. Coast guard + Sheriff notified.
0805 On water and underway to Station BT026. Crew: Dave Mullins, I. Stepakoff, B. Pointer, Helle Anderson (WW), Kathleen Hurley (WW) Dave Gillingham (Pnametrics). Crew on Processing boat: Angelita Rodriguez, Mike May, Thea Do. Weather - overcast, cold, light winds.
0814 Depth Finder appears to still be malfunctioning possible a bad transducer.
0816 Still on station BT026. BP 11-29-05
0817 Bottom for Tow 9 (~25 ft deep)*
0818:00 Start Tow 9 90' line paid out
0819:00 End Tow 9 snag - bent sledge.
0823 Sledge on deck. Silty mud. some wood + refuse debris. No odor.
0830 Bottom for Tow 10 90' paid out
0831:45 Start Tow 10
0832:45 End Tow 10
0834 Note - feature on Nav. software was

* Note all depths approximated by amt. of line paid out before bottom.

BP 11-29-05 accid't 11/29/05 B. Pointer
accidentally created as a point rather than as a line. Point appears to have been generated at the midpoint of our tow-line track.
0836 Sledge on deck. Sandy sediment w/ wood + plastic debris.
0842 Bottom for tow 11 (~25' deep)
0843:18 Start Tow 11 100' line paid out.
0844:18 End Tow 11
0846 Sledge on deck. Gravel - mix of rounded & angular. Some wood debris. No odor.
0851 Bottom - Tow 12 (depth ~25') 100' paid out
0851:55 Start Tow 12
0852:55 End Tow 12
0856 sledge on deck. Silty Sand. wood debris. no odor
0901 Bottom - Tow 13 (~30' deep) 120' paid out.
0902:05 Start Tow 13
0903:05 End Tow 13
0904 Weather: wind has increased + getting more rain.
0907 Sledge on deck. Silty mud w/ wood debris and 3 large cobbles. Sheen. Floccles
0910 Tied up to nearby barge to use head and discuss plans.

11/29/05 B. Pointer

0917 I. Stepanoff called USCG to notify them that we would be sampling off of their site.
0918 Proceeding to station BT-022
0930 Equipment Deconned and on station
0930 Bottom - Tow 1 (~30' deep) 120 paid out
0932:00 Start Tow
0933:00 End Tow Some small snags felt.
0936 Sledge on deck. Silty Sand. lots of wood debris + bricks. Some sheen. No odor.
0941 Bottom - Tow 2 (~20' deep) 90' paid out
0942:26 Start Tow 2
0943:27 End Tow 2
0947 Sledge on deck. Silty mud w/ some wood debris - No odor.
0952 Bottom - Tow 3 (~30' deep) 90' paid out
0953:25 Start Tow 3
0954:25 End Tow 3
0956 Sledge on deck. Silt w wood + refuse debris. sheen florettes. no odor
1002 Bottom - Tow 4 (~20' deep) 90' paid out
1003:07 Start Tow 4
1004:07 End Tow 4
1009 Sledge on deck. Silt w/ some gravel. Small sheen florettes. no odor

11/29/05 B. Pointer

1014 Bottom Tow 5 (~20 ft deep) 90' paid out
1015:11 Start Tow 5
1016:11 End Tow 5
1018 Sledge on deck. Silt w/ some wood debris no odor.
1023 Bottom - Tow ~~5~~ 6 (~30 ft deep) BP 11-29-05
1023:53 Start Tow ~~5~~ 6 120' paid out.
1024:54 End Tow 6
1030 Sledge on deck. Silt Fine w/ wood debris. no odor.
1035 Bottom - Tow 7 120' paid out.
1036:04 Start Tow 7
1037:04 End Tow 7
1039 Sledge on deck Silty mud. lots of sheen florettes. very slight petroleum odor. some wood debris
1044 Bottom - Tow 8 (~25' deep) 120' paid out
1046:06 Start Tow 8
1047:03 End Tow 8 snagged at about 55 sec.
1050 Sledge on deck. Sandy silt. lots of wood debris no odor.
1056 Bottom - Tow 9 (~20 ft deep) 120' paid out
1057:15 Start Tow 9
1058:44 End Tow 9 snagged up. Good tow. Accepted.

11/29/05 B. Pointer

1102 Sledge on deck (Tow 9) Coarse woody debris (Silt washed away) No odor.

1107 Bottom tow 10 (~20' deep) 110' paid out

1108:05 Start tow 10

1109:05 End tow 10 no snags.

1115 Sledge on deck. Sandy Silt/Clay. Coarse Wood debris, Slight Sulfur odor.

1120 Break for lunch / restroom break.

1200 underway to Station BTO23.

1207 At station BTO23. Re-coring Sledge.

1214 Bottom - Tow 1 (~30' deep) 120' paid out

1215:50 Start Tow 1

1216:50 End Tow 1 no snags

1222 Sledge on deck. Sandy Silt. No Odor. Some wood debris. Some Sheen Floccules. Clay balls w/ sheen.

1226 Bottom - Tow 2 120' paid out

1227:30 Start Tow 2

1227:55 ~~Sto~~ End Tow 2 snagged up. Sledge full
BP 11-29-05
Accepted.

1233 Sledge on deck. Sandy Silt. Some Sheen + wood debris. no odor.

1236 Bottom - Tow 3 (~20' deep) 100' paid out.

1237:27 Start Tow 3

11/29/05 B. Pointer

1237:55 End Tow 3 snagged up again. Net flipped
— Rejected —

1242 ~~Begin~~ Bottom - Tow 4 100' paid out

1243:12 Start Tow 4

1244:12 End Tow 4 felt a few snags, but not boundup.

1247 Sledge on deck. Sandy Silt. Some clay. Sheen Floccules. no odor.

1254 Bottom Tow 5 (~40 ft deep) ~~paid out~~ BP 11-29-05

1255:33 Start Towing 5 160' paid out

1255:34 End Towing 5 no snags.

1300 Sledge on deck. Sandy silt mud. Wood debris, no odor.

1305 Bottom - Tow 6 (~30' deep) 150' paid out

1308:20 Start Tow 6

1308:20 End Tow 6 no snags

1313 Sledge on deck. Silt. Sheen Floccules no odor

1315 Bottom - Tow 7 (~20' deep) 100' paid out

1316:55 Start Tow 7

1317:55 End Tow 7

1321 Sledge on deck. Fine Silt. Slight Sulfur odor. Sheen. Some reddish brown oxidized sed.

1327 Bottom - Tow 8* 120' paid out

1328:01 Start Tow 8

1329:02 End Tow 8

*Note: feature BTO23-tow8 was stopped too short. The feature BTO23, tow08 is the correct feature.

11/29/05 B. Painter

1332 Sledge on deck (Tow 8). Silt, no odor
2 medium sized shrimp. no sheen
1335 Bottom-Tow 9 ~40' deep. 170' out
1338:15 Start Tow 9
1338:15 End Tow 9 no snags.
BP 11-29-05
~~1341~~ 1342 Sledge on deck. Sandy silt, Some sheen spots. Some Refuse debris.
1346 Bottom-Tow 10 (~25-30' deep) 110' paid out
1348:15 Start Tow 10
1349:05 End Tow 10 snagged up. sledge full. accept.
1352 Sledge on deck. No odor. Sandy Silt. Some sheen spots + wood debris.
1358 Bottom-Tow 11 (~25' deep) 100' paid out
1359 Start Tow 11 – snagged right away. ~~Noted~~ BP 11-29-05
~~End Tow 11~~ BP 11-29-05
1402 Sledge surface – bag is half full. Tow accepted..
1404 Sledge on deck. Sandy Silt. Some Sheen spots. No odor.
1408 It is decided to go to Fireboat Cove (BTO32) because of the wind and lack of peepers. Decon-ing equipment while underway.
1421 On Station BTO32
1422 Bottom Tow 1 (~3 feet deep) 40' out
1423:20 Start Tow 1

11/29/05 B. Painter

1424:20 End Tow 1
1426 Sledge on deck. Sandy silt w/ lots of wood debris. No odor.
1430 Bottom-Tow 2 40' paid out
1431 Start Tow 2 – snagged after ~10 secs.
1431 End Tow 2 bag completely full.
1433 Sledge on deck. Sandy gravel & silt mix w/ lots of course woody debris.
BP 11-29-05 ~~No odor~~. Some petroleum odor.
Sediment is too course and was taken from too shallow depth. Tow Rejected
1451 Bottom-Tow 3 (~4' deep) 40' out
Start logging
1452:12 Start Tow 3
1452:13 End Tow 3 no snags
1455 Sledge on deck. All course wood debris
1458 Begin Logging - Bottom Tow 4 40' paid out
1458:50 Start Tow 4
1459:50 End Tow 4 no snags
1501 Sledge on deck. Wood debris w/ some clay no odor.
1503 Bottom-Start logging Tow 5 (~10' deep) 50' paid out
1504:22 Start Tow 5
1505:22 End Tow 5 no snags.
Sledge on deck. Silt/Clay with lots of wood/organic debris. Mild sewage smell

11/29/05 B. Pointe

1514 Begin logging - Bottom Tow 6 (~5' deep) 60' paid out
1514:55 Start Towing 6
1515:55 End Towing 6
1518 Sledge on deck. Largely wood debris w/ some mud/silt. Some Sheen Present. Slight putrid odor reminiscent of sewage.
1524 Begin logging - Bottom Tow 7 (20' deep) 80' out
1530.28 Start towing 7
1531.16 End Towing 7
decided to do 45 second tows because of excessive woody material filling bag and not rinsing out.
1536 Sledge on deck. Silty Sand w/ lots of wood debris. Some fecal odor in the tow.
1549 Begin logging - Bottom Tow 8 (~30' deep) 80' paid out
1549:54 Start Tow 8
1550:38 End Tow 8
1552 Sledge on deck. Silt w/ lots of wood + leaves debris. Strong odor of horse dung.
1605 Departing Station BT 032 - will finish tomorrow. underway to Swan Island boat ramp. On the way, we will do one tow at BTO29 to try to find more clams. Decontaminating equipment while underway.

1620 Arrived @ BTO29
1621 Begin logging Bottom Tow 15 (~20' deep) 80' out
1622:52 Start Tow 15
1622.53 End Tow 15
1625 Sledge on deck. Silty mud. Small amts of wood debris, twigs, leaves, no odor. BP 1 clam ~~no~~
1628 Begin logging Bottom tow 16 (~20 ft deep)
1629:20 Start Tow 16 80' paid out
1630:22 End Tow 16 *lost GPS signal at :55 into tow. Used Bad Satellite geometry BP 11-29-05
1636 Sledge on deck. Some wood debris. Processed ~~tows~~ Sledge BP 11-29-05 on this boat. ~~2 clams~~ 2 BP clams.
1643 Tied up to dock. Unloading. Transferred samples from BTO29 Tow 15 & 16 to processing crew
1658 Depart boat launch for Field lab.
1515 Arrive Field Lab and unload.
1525 Depart Field Lab.

End of day.

11-29-05

11/30/05 B. Pointer

0700 arrive at Field lab to load.

0730 arrive at Swan Island Boat ramp. loading & boarding.

0746 On water and underway to Fireboat cove, (Station BTO32). Crew: Dave Mullings, Helle Andersen, Kathleen Hurley, Brian Pointer, David Gillingham. Angelita Rodriguez (processing boat) has called USCG + Sheriff. Weather overcast calm & cold. Visibility > 3 mi.

0758 Depth finder working properly – Replaced transducer. Depth readings will be read from this instrument forewith.

0803 On station BTO32. Starting w/ Tow 9.

0806 Logging/on bottom Tow 9 (10ft deep) 40' paid out

0807:08 Start Tow 9

0808:09 End Tow 9

0811 Sledge on deck. Silt/clay w/ lots of wood debris. no odor/sheen.

0814 Bottom/Logging Tow 10 (12' deep) 40' out

0815:08 Start Tow 10

0816:08 End Tow 10

0822 Sledge on deck. Gravel w/ silt (mostly rinsed out). wood + plastic debris.

0826 Bottom/Logging tow 11 (4' deep) [illegible]' paid out

11/30/05 B. Pointer

0827:05 Start tow 11

0828:06 End tow 11

0830 Sledge on deck, Fine gravel + wood debris mix. Any fines washed out. no odor/sheen.

0834 Underway to station BTO33. Equipment decon-ed.

0835 It should be noted that all tows previous were noted differently on the processing boat logs. This log numbers tows consecutively regardless of a rejected tow. The processing boat was numbering consecutive successful tows. Henceforth, all tows will be numbered consecutively on both logs and any rejected tows will be noted accordingly.

0840 On station BTO33. Steep embankment close to shore. Plan on taking tows parallel to shoreline. Shore full of rip-rap.

0846 Bottom Logging Tow 1 (39-40' deep) 160' paid out

0847:35 Start Tow 1

0848:35 End Tow 1

0854 Sledge on deck. Silt clay w/ wood + plastic debris. no odor/sheen.

0856 We are using the boat motion to wash out the bag, dragging the sledge while motoring back and forth. This is very effective at washing out fines.

11/30/05 B. Pointer

0857 Bottom/logging Tow 2 (38' deep) 160' paid out
0859:02 Start Tow 2
0900:03 End Tow 2. Bag full of mud.
0902 Rinsing bag on ~~towing~~ pulling side slowly behind stern.
0904 Sledge on deck. Silty clay. Some oxidized sediment. Slight odor of sulfides. no sheen.
0907 Bottom/Logging Tow 3 (37' deep) 160' paid out
0908:42 Start Tow 3
0909:43 End Tow 3. Bag net full.
0913 Sledge on deck. Silt w/ some organic/wood debris. no sheen/odor.
0919 Logging at Bottom Tow 4 (41' deep) 160' paid out
0920:55 Start Tow 4
0921:57 End Tow 4. Bag/net full.
0923 Rinsing.
0927 Sledge on deck. Silty mud wood debris. no sheen/odor.
0930 Logging @ bottom Tow 5 (41' deep) 160' paid out
0932:14 Start Tow 5
0933:14 End Tow 5 Net full
0936 Rinsing net.
0940 Sledge on deck. Silt. Some wood debris no sheen/odor

11/30/05 - B. Pointer.

0943 Begin logging @ bottom Tow 6 (36' deep) 160' paid out
0944:50 Start Tow 6
0945:50 End Tow 6. net full.
0947 Rinsing net.
0952 Sledge on deck. Silt w/ wood + leaf debris. no odor/sheen.
0956 Logging @ bottom Tow 7 (38 ft deep) 160' paid out
0958:17 Start Tow 7
0959:17 End Tow 7, net full.
1000 Rinsing Sledge
1005 Sledge on deck Silt w/ wood debris. no sheen/odor
1010 Logging @ Bottom Tow 8 (40' deep) 160' paid out
1012:15 Start Tow 8.
1013:05 End Tow 8. net full.
1014 Rinsing sledge
1017 Sledge on deck. Silt + wood debris no odor/sheen. 2 med. shrimp.
1021 Logging @ bottom Tow 9. (39' deep) 160' paid out
1022:38 Start Tow 9
1023:38 End Tow 9. net 3/4 full
1026 Rinsing Sledge
1030 Sledge on deck. Silt mud. slight sulfide odor. no sheen.

11/30/05 B. Poirier

1034 Logging @ bottom - Tow 10 (38' deep) 160' paid out

1035:53 Start Tow 10

1036:05 End Tow. net full.

1038 Rinsing Sledge

1042 Sledge on deck. Some small sheen spots. silt w/ small amt. of wood debris. no odor.

1045 Break for restroom on beach nearby.

1055 Underway to BT031. Deconning equipment.

1102 Arrive @ station BT031.

1106 Logging at Bottom - Tow 1 (31' deep) paid out

1107:20 Start Tow 1

1107:58 Snagged up. End Tow 1. net 3/4 full.

1111 Rinsing Sledge

1114 Sledge on deck. Sandy silt + woody debris. no sheen/odor.

1118 Logging @ bottom Tow 2 (28' deep) 120' paid out

1120:10 Start Tow 2

1121:12 End Tow 2. Sledge full

1125 Rinsing sledge.

1126 Sledge on deck. course wood & leaf debris. no odor/sheen. all sediment was washed out.

1131 Logging @ bottom - Tow 3 (30' deep) 120' paid out

1131:50 Start Tow 3

1132:51 End Tow 3

11/30/05 B. Poirier

1134 Rinsing Sledge

1136 Sledge on deck, Silt + wood debris. 3 med. shrimp. no odor/sheen.

1139 logging @ bottom - Tow 4 (28' deep) 120' paid out

1141:20 Start Tow 4

1142:20 End Tow 4, net 3/4 full

1144 rinsing sledge.

1145 sledge on deck. silt washes easily out. numerous shrimp + clams. wood debris. no odor/sheen.

1149 logging @ bottom - Tow 5 (30' deep)

1150:19 Start tow 5

1151:20 End tow 5 net full

1153 rinsing sledge. most sediment rinsed out

1154 Sledge on deck. silt + wood debris. few shrimp + clams. no odor + sheen.

1159 Break for lunch.

1225 Resuming work. Finishing Station BT031

1226 On Station BT031

1227 logging on bottom - Tow 6 (25' deep) 100' paid out

1227:54 Start Tow 6

1228:48 End Tow. Snagged a long really heavy. was heavy enough to stop us.

1230 Rinsing. Sledge was full.

11/30/05 B. Pointer

1233 Sledge on deck, Sandy silt + some wood debris. no odor/sheen.

1238 logging GPS on bottom - Tow 7 (25' deep) 120' paid out

1239:17 Start tow 7

1240:20 End tow 7. Sledge full.

1242 Raising Sledge

1246 Sledge on deck. coarse wood + coarse debris all that's left after washing. numerous shrimp. no odor/sheen.

1251 Logging GPS @ bottom (27' deep) 120' paid out

1252:50 Start Tow 8

1253:44 End Tow 8. Sledge full.

1256 Raising Sledge

1257 Sledge on deck. no sed - all washed. wood debris + numerous shrimp. no sheen/odor

1300 Logging GPS @ bottom - Tow 9 (28' deep) 120' paid out

1301:29 ~~1305~~ Start Tow 9

1301:31 End Tow 9 sledge full.

1304 Raising sledge

1307 Sledge on deck. Sandy silt. some wood debris. very slight odor of sulfides. no sheen.

1311 Logging GPS @ bottom - Tow 10 (30' deep) 120' paid out

1312:15 Start Tow 10

1313:12 End Tow 10 Sledge ½ full at surface

11/30/05 B. Pointer

1315 Raising Sledge

1316 Sledge on deck. Small amt of silt left. wood debris. no sheen/odor.

1321 Lead - to station BTO27.

1329 On station.

1331 Logging GPS on bottom Tow 1 (35' deep)

1332:25 Snagged right away. bag ¼ full. bent frame

1334 sledge on deck. fine silt. sheen. no odor.

1336 Dave reports that there are many trees & underwater obstructions near target for BTO27. We may try to go closer to shore

1339 Logging on bottom - Tow 2 (25' deep) 110' paid out

1340:45 Start Tow 2

1341:45 End Tow 2 no snags. 3/4 full

1343 Raising

1345 sledge on deck, coarse wood debris, sticks, leaves. no odor/sheen.

1348 Logging on bottom - Tow 3 (30' deep) 120' paid out

1350:00 Start Tow 3

1351:01 End Tow 3. 3/4 full at surface.

1352 Raising out

1354 Sledge on deck. Coarse wood debris no sheen/odor. numerous shrimp.

11/30/05 B. Pinter

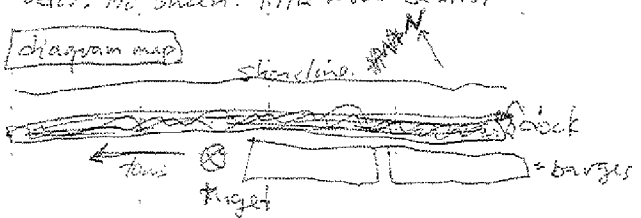
1357 logging on bottom - Tow 4 (30' deep) 120' paid out
1358:49 Start Tow 4
1359:51 End Tow 4. sledge full
1401 Rinsing
1405 Sledge on deck wood debris. many shells.
no odor / sheen. some
1408 logging on bottom - Tow 5 (25' deep) 120' paid out
1410.04 Start Tow 5
1410 37 End Tow 5 - hit a snag @ :33 seconds
net is 1/8 full.. no need to wash.
1413 sledge on deck, sandy silt. large sticks.
(maybe what we got hung on?) many shrimp
no sheen/odor.
1416 logging on bottom - Tow 6 (30' deep) 120' paid out
1417.20 Start Tow 6
1418:20 End Tow 6 sledge 2/3 full
1420 Rinsing sledge.
1422 Sledge on deck. coarse wood debris. some
pebbles, shrimp. no odor / sheen.
1428 Logging on bottom - Tow 7 (40' deep) 120' paid out.
1429:38 Start Tow 7
1430:38 End Tow 7. Bag 1/2 full w/ big branch...
1433 Sledge on deck. wood debris. silt.
odor - smells like wet dog (?!) no sheen.

11/30/05 B. Pinter

1438 logging GPS on bottom (30' deep) 120' paid out
1438:59 Start Tow 8
1439:45 End Tow 8 - snagged up w/ full - no forward motion.
very full at surface.
1442 Rinsing sledge. Silt + woody debris
1444 Sledge on deck. coarse woody debris + silt.
no odor / sheen.
1449 Bottom logging GPS Tow 9 (30' deep) 120' paid out
1450 Terrasync crashed. restarting. no apparent data lost.
1453:00 Start Tow 9
1454:00 End Tow 9 1/2 full
1458 sledge on deck. Silty mud w/ wood debris
no sheen / odor
1502 Bottom logging GPS - Tow 10
Snagged up immediately. Did not stop
logging until approx :30 seconds after.
1506 Rejected Tow 10 - hung up on stick.
+ No material.
1507 Bottom logging GPS Tow 11 (30' deep) 120' out
1508:40 Start Tow 11
1509:00 End Tow 11, sledge 3/4 full. + large branch.
1511 Rinsing
1513 Sledge on deck, coarse wood debris
no odor / sheen.

11/30/05 B. Pointer

1516 bottom Tow 12 (23' deep) 110' out
1517:37 Start Tow 12
1517:39 End Tow 12 3/4 full
1519 Rinsing sledge.
1522 Sledge on deck. Silt + woody debris no odor/sheen
1525 Underway to Station BT030. Decon-ing equip.
1530 On station BT030. Station is right next to Barges (to the north) we will start towing at Station (next to barges, and head SE parallel to Dock Structure. Also having a hard time w/ GPS reception too close to dock. We will do best.
1533 bottom-tow 1 (30' deep) 110' paid out.
1534:46 Start Tow 1
1535:46 End Tow 1
1538 Sledge on deck: Clayey silt. some petroleum odor. no sheen. little wood debris.



(I am a bad artist.)

1545 bottom-Tow 2 GPS logging (30' deep)

11/30/05 B. Pointer

1546:30 Start Tow 2 120' paid out
1547:30 End Tow 2 2/3 full
1549 Rinsing
1551 Sledge on deck. clay/silt. some wood/refuse debris. no sheen, some petroleum odor. shrimp/clams.
1553 bottom Tow 3 (25' deep) 120' paid out
1555:25 Start tow 3
1556:25 End tow 3. 1/2 full.
1558 Rinsing dredge
1559 Sledge on deck. silt w/ clay balls. shell fragments + wood debris. no odor/sheen.
1602 bottom logging GPS Tow 4 (25' deep) 120' out
1604:08 Start Tow 4
1605:08 End Tow 4 3/4 full.
1607 Rinsing Sledge
1608 Sledge on deck: Silt + wood debris & refuse no sheen/odor.
1610 Start GPS/On Bottom - Tow 5 (22' deep) 120' paid out
1612:08 Start Tow 5
1613:08 End Tow 5 2/3 full.
1614 Rinsing Sledge.
1616 Sledge on deck, Silt w/ clay balls + wood debris, Refuse. No odor + sheen.
1618 Last tow of day. Heading back to Swan Island boat ramp.

11/30/05 S. Pomeroy

1639 Arrive at Boat Ramp. Unload.
1647 Depart Swan Is. Boat Ramp.
JS 1703 Arrive Field Lab. Make 2 copies of
BP this log.
1720 Depart Field Lab.

End of Day

11-30-05

12/1/05 B. Pointer (Station BTO30)

0700 Arrive Field Lab
0730 Arrive Swan Island Boat Ramp. Did Quick Head Pat Safety Briefing.
0745 On water & underway to station BTO30.
Crew on board: Dave Mulling, Brian Pointer, Kelley Anderson, Kathleen Hurley, Joe Goulet (EPA).
Weather - overcast, cold, light rain/snow mix. light variable winds.
0803 On Station BTO30. Barges have moved so we will be able to tow from the target downstream.
0810 Begin Logging GPS/Bottom Tow 6 (BTO30) (20' deep) 120' paid out
0811:52 Start Tow 6
0812:52 End Tow 6 3/4 full.
0816 Begin Sieving
0818 Sludge on deck. Coarse woody debris + clay/silt no odor/sheen.
0822 Bottom Tow 7 (20' deep) 110' paid out
0823:47 Start Tow 7
0824:47 End Tow 7
0828 Sludge on deck. Clay/silt/coarse wood debris shell fragments. no sheen/odor.
0831 Bottom Tow 8 (26' deep) 120' paid out
0832:22 Start Tow 8
0832:52 End Tow 8 - snagged good. 1/2 full

12/1/05 B Pointer (BT030)-(BT028)

0832 Sledge on deck. Tow 8. Silty Sand + wood debris, no sheen/odor. Tow accepted.
0842 Bottom Tow 9. (27' deep) 120' paid out
0843:25 Start Tow 9
0844:25 End Tow 9
0847 Sledge on deck. Silt w clay balls, some wood debris, Shell fragments. no sheen. Odor of wet clay.
0851 Bottom Tow 10. (26' deep) 120' out
0852:50 Start Tow 10
0853:23 End Tow 10 - snagged up. 2/3 full
0857 Sledge on deck. Silt + lots clay balls. Some wood debris. no sheen/odor.
0900 Bottom Tow 11 (26' deep) 120' paid out
0901:49 Start Tow 11
0902:50 End Tow 11 3/4 full.
0905 Rinsing Sledge
0906 Sledge on deck. Silt/clay w/ [illegible] glass refuse debris. no odor/sheen.
0910 Underway to Station BT028
0920 Helle is on phone with Gene Revelas + Sandy Browning to inquire about access.
0923 Access is uncertain, so we will wait to hear back from Sandy before ~~your~~ BP sampling
0925 Underway to BT024.

12/1/05 B. Pointer BT024

0932 On Station BT024. Starting Tow 1.
0939 Bottom Tow 1 (8' deep)
0940:20 Start Tow 1 (40' paid out
0941:22 End Tow 1 sledge full almost to overflowing
0943 Rinsing sledge
0946 Sledge on deck. Silty mud 3 large shell fragments (mussels) no odor/sheen.
0948 Bottom Tow 2 (6' deep) 40' out
0949:21 Start Tow 2
0950:10 End Tow 2. Sledge full (We decided to do short tows due to excess material. 0:45 sec tows.
0951 Rinsing Sledge
0954 Sledge on deck. Silt + wood/refuse debris. no sheen/odor.
0958 Bottom Tow 3 (7' deep) 40' paid out
0959:54 Start Tow 3
0959:29 End tow 3 sledge full
1000 Rinsing Sledge
1003 Sledge on deck. All sed washed out. Wood debris + refuse. >5 drums
1007 Bottom Tow 4
1007:44 Start Tow 4
1008:45 End Tow 4
1010 Rinsing Sledge
1011 Sledge on deck. Wood debris. No sheen/odor

12/1/05 B. Pointer BT024

1015 Bottom Tow 5 (6' deep) 40' paid out
1016:16 Start Tow 5
1017:16 End Tow 5 sledge full
1019 Rinsing Sledge
1020 Sledge on deck. Sandy silt. + wood debris. no odor/sheen.
1022 Quick Bathroom break
1032 Bottom Tow 6 (5' deep) 25' out
1033:15 Start Tow 6
1034:15 End Tow 6 very little material - Rejected. we think the sledge didn't have enough line
1037 begin logging bottom Tow 7 (6' deep) 30' paid out
1037:59 Start Tow 7
1038:59 End Tow 7 sledge full.
1040 Rinsing
1142 Sledge on deck. Silt + wood debris no odor/sheen.
1144 Ian Stipetoff just called and asked me to try a different method for recording GPS tracks I will set a war target and read the distance from it and measure 100 ft from where we set the sledge on bottom. ~~Silt and~~ BP Hope it work..
1045 We will continue using the old method until we come to a consensus model.

B. Pointer 12/1/05 BT024 ~~BT070~~ BT

1046 Begin Bottom Tow 8 (7' deep) 40' out
1047:35 Start Towing 8
1048:35 End towing 8
1049 Rinsing
1051 Sledge on deck, silt. no odor/sheen
1054 Bottom Tow 9 (8' deep)
1055:25 Start Tow 9
1056:25 End Tow 9
1059 Sledge on deck, Silt/Clay wood debris no odor/sheen.
1101 Bottom Tow 10 (8' deep) 40' paid out
1102:15 Start Tow 10
1103:15 End Tow 10 sledge full.
1104 Rinsing sledge
1105 Sledge on deck, All sediment washed out wood debris. no odor/sheen.
1107 Bottom Tow 11. (5' deep) 25' paid out.
1108:20 Start Tow 11
1109:18 End Tow 11. Sledge full.
1110 Rinsing
1111 Sledge on deck. All sed washed out wood debris. no odor/sheen. many tiny clams.
1114 Returning to BT028 Hele received a call from Gene Revelas and got permission to access the site.

12/1/05 B. Pointer BTO28

1127 On Station BTO28. Dolphins obstructing station will start from nearby

1128 Bottom - Tow 1 (10' deep) ~~40'~~ 90' out

1130:25 Start Tow 1

1131:27 End Tow 1 sledge 3/4 full

1133 Rinsing Sledge

1134 Sledge on deck. Sed washed out. course wood debris, no odor/sheen.

1137 Bottom Tow 2 (10' deep)* 120' out (*depth increases to ~40 feet at end of tow)

1138:20 Start Tow 2

1139:21 End Tow 2. Sledge full.

1141 Rinsing

1142. Sledge on deck. Sed washed out. Course wood debris. no sheen/odor.

1145 Bottom - Tow 3 (10' deep - and deepening) 120' paid out.

1146:25 Start Tow 3

1147:26 End Tow 3. Sledge full

1149 Rinsing

1151 ~~E~~ Sledge on deck. Sed. washed out. Some red worms/shrimp. no sheen/odor.

1154 Break for lunch.

1230 Resume work. Setting up for Tow 4.

1234 Bottom - Tow 4 (10' deep) 110' paid out

1235:49 Start Tow 4

1236:42 End Tow 4 Sledge very full.

12/1/05 B. Pointer BTO28

1238 Rinsing Sledge

1239 Sledge on deck. Sed. washed out wood debris + refuse. no odor/sheen. few shrimp/plankton

1242 Bottom - Tow 5 (10' deep - 40' deep) 110' paid out

1243:10 Start Tow 5

1244:10 End Tow 5 very full.

1246 Rinsing Sledge

1247 Sledge on deck. Some silt left. course wood debris, many shrimp. no odor/sheen.

1249 Bottom - Tow 6 (10' - 40' deep) 110' paid out

1250:45 Start Tow 6

1251:45 End Tow 6 3/4 full

1253 Rinsing sledge

1254 Sledge on deck. Sed. washed out. Some wood debris. Sheen + petroleum odor.

1257 Bottom Tow 7 (10' - 40' deep) 110' paid out

1258:23 Tow 7 Start

1259:23 End Tow 7 sledge full.

1301 Rinsing Sledge

1302 Sledge on deck. Course wood debris. darker in color than previous. Petroleum odor + Sheen.

1304 Bottom - Tow 8 (10' - 40' deep) 120' paid out

1306:05 Start Tow 8

1307:06 End Tow 8 Sledge full

12/1/05 B. Pointer BTO20

1309 Rinsing Sledge (Tow 8)

1310 Sledge on deck. Coarse wood debris, darker in color. Petroleum odor. Sheen on wood debris

1312 Bottom - Tow 9 (10' deep - 40') 120' out

1314:40 Start Tow 9.

1315:10 End Tow 9 Bag flipped over. REJECTED

1318 Bottom Tow 10 (10' deep → 40') 120' paid out

1319:56 Start Tow 10

1320:56 End Tow 10 sledge full.

1322 Rinsing sledge

1323 Sledge on deck. Sed. washed out. coarse wood debris no odor/sheen. one large mussell, some debris.

1326 Bottom Tow 11 (10' deep - 40')

1327:15 Start Tow 11

1328:16 End Tow 11 net 1/4 full w/ crash hanging off. net rippled at seam. - Rejected.

1340 Replaced Sledge. Bag is slightly smaller w/ smaller screen (1mm). We may do shorter tows therefore.

1342 Bottom Tow 12 (5' deep - 40' deep)

1348:03 Start Tow 12 120' paid out

1349:03 End Tow 12 sledge full.

1351 Rinsing sledge

1353 Sledge on deck. Some silt left in bag. coarse wood debris. Petroleum odor & sheen on wood debris

12/1/05 B. Pointer BTO20

1355 Underway to BTO21. Decontaminating equipment & replacing net on primary sledge.

1406 Coming on station BTO21. Barges are in the way we are going to check on BTO20 to see if it is clean.

1414 On Station BTO20 All clean. Readying to sample.

1421 Bottom - Tow 1 (6' deep → 24') 100' out → towing down a slope

1422:05 Start Tow 1

1422:48 End Tow 1. Net full.

1425 Rinsing sledge

1427 Sledge on deck. Silty Sand & wood debris. no odor/sheen.

1431 Bottom Tow 2 (16' deep → 30' deep)

1432:58 Start Tow 2

1433:43 End tow 2 bag full.

1437 Sledge on deck. Sandy silt + woody debris no sheen/odor

1442 Bottom Tow 3 (23' deep)

1443:25 Start Tow 3 100' paid out

1444:20 End Tow 3 bag very full

1446 Rinsing

1448 Sledge on deck. Silt/sand mix + wood debris no odor/sheen.

1452 Bottom - Tow 4 (22' deep) 100' paid out

1453:02 Start Tow 4

1454:00 End Tow 4 Sledge full.

12/1/05 B. Painter BTO20

1456 Sledge on deck (Tow 4). Sand/silt mix w/some gravel + wood debris no odor/sheen

1501 Bottom (Tow 5) 11' deep. 45' paid out

1502:30 Start Tow 5

1503:15 End Tow 5

1505 Sledge on deck. Silt w/small amt of sand. Sheen Floccks. no odor.

1510 Bottom Tow 6

1510:45 Start Tow 6

1512:39 End Tow 6 - Towing up a "hill" underwater. Bathymetry is challenging. Tow Accepted sledge full.

1516. Sledge on deck. Course woody debris + some pea gravel. Slight petrol odor + sheen.

1530 Bottom Tow 7 - (10' → 20' deep) 120' paid out

1531:52 Start Tow 7

1532:38 End Tow 7 bag 3/4 full

1534 Rinsing

1535 Sledge on deck. Course woody Debris. Slight sheen + petrol odor.

1539 Bottom Tow 8 (20' deep) 80' paid out

1540:43 Start Tow 8

1541:32 End Tow 8 Sledge full. Rinsing

1544 Sledge on deck. Sand + wood debris no odor. very slight sheen.

12/1/05 B. Painter BTO20

1548 Bottom - Tow 9 (11' deep → 30' deep)

1548:50 Start Tow 9 110' paid out

1549:35 End Tow 9 sledge full. Rinsing

1553 Sledge on deck. Sandy Silt + wood debris. Slight Petrol odor + slight sheen.

1600 Bottom - Tow 10 (20' deep → 30' deep)

1601:06 Start Tow 10 110' paid out

1601:52 End Tow 10 bag very full. Rinsing

1605 Sledge on deck. Sand + woody debris. 1 ammocoete lamprey. no odor/sheen

1611 Bottom - Tow 11 (16' deep - 30' deep) 110' paid out

1612:30 Start Tow 11

1613:15 End Tow 11 not full. Rinsing

1616 Sledge on deck. Silt/sand mix w/ wood debris Slight Petrol Odor + Sheen.

1620 Underway to boat dock/restrooms. decon-ing equipment.

1640 Depart Swan Island Boat Ramp

1658 Arrive Field Lab.

1721 Depart Field Lab

End of Day

12-1-05

12/2/05 B. Pointer BT025

0700 Arrive Field Lab.
0740 Arrive ~~Sea~~ BP Cathedral Park Boat Ramp.
0750 On water and underway to station BT025. Crew: Dave Mulling, Helle Anderson, Kathleen Hearley, Brian Pointer. Weather - rain over cast. cold. light to moderate NW winds.
0810 On Station BT025. Investigating Bathy in area.
0813 Logging @ bottom Tow1. (10' → ~~20'~~ 15' BP deep.) 70' paid out
0814/:15 Start Tow1
0815:15 End Tow1 Sledge full. Rinsing
0818 Sledge on deck. fine Silt. no odor no sheen. Some red worms present.
0820 Bottom Tow2. (~15 deep) 60' out
0821:29 Start Tow2
0822:29 End Tow2 Sledge full. Rinsing
0828 Sledge on deck. Fine Silt + ~~a~~ some course wood debris. Sheen Flavettes. no odor
0831 Bottom Tow3 - 16' deep. 80' paid out
0831:15 Start Tow3
0832:15 End Tow3 Sledge full. Rinsing
0837 Sledge on deck. Silt + subangular gravel. no sheen/odor.
0840 Bottom Tow4 (8-15' deep) 40' paid out
0841:08 Start Tow4

12/2/05 B. Pointer BT025

0842:10 End Tow4. Sledge 3/4 full. Rinsing
0846 Sledge on deck. Fine silt + some organic debris. no sheen/odor
0849 Bottom (20' deep) Tow5 80' out
0849:43 Start Tow5
0850:43 End Tow5. sledge full. rinsing
0857 Sledge on deck. Silt + gravel mix + wood debris. no sheen/odor
0859 Bottom Tow6 (20 deep). 80' paid out
0900:44 ~~0~~ Start Tow6
0901:45 End Tow6. sledge full. Rinsing
0905 Sledge on deck. Silt + course wood debris. no sheen Sulfide odor
0908 Bottom Tow7 (15 → 20' deep.) 80' out
0909:06 Start Tow7
0910:06 End Tow7. sledge full.
0916 Sledge on deck. Silt + clay balls + angular gravel + course wood debris. no sheen/odor
0918 Bottom Tow8. (20' deep) 80' out
0918:55 Towing - 8
0919:55 End Tow-8. 3/4 full. rinsing
0924 Sledge on deck. Silt mud + course wood debris. no odor/sheen.
0927 Bottom Tow9 (10 → 20 deep) 80' paid out
0928:37 Start Tow9
0929:37 End Tow9. Sledge full - rinsing sed. Sheen

ANC02324
BZTO104(e)002324

12/2/15 B. Pointer BT025 - BT029

0933 Sledge on deck (Tow 9) Silt + gravel + wood debris no odor or sheen on what sediment was left after rinse

0937 Bottom Tow 10 (15' → 20' deep) 60' pard out

0940:01 Start Tow 10

0941:00 End Tow 10 Sledge full. rinsing

0946 Sledge on deck. Angular gravel + coarse wood debris. no odor/sheen.

0949 Bottom Tow 11 (15' deep) 80' out

0950:38 Start Tow 11

0957:41 End Tow 11 Full. Rinsing

0956 Sledge on deck. Silt + gravel mix + wood debris no odor/sheen.

0958 Underway to swain Island station BT029 to collect a few more tows.

1017 On station BT029.

1018 Bottom Tow 17 (25' deep) 100' out

1019:25 Start Tow 17

1020:25 End Tow 17. sledge full. Rinsing

1024 Sledge on deck. Silt + wood/organic debris. no sheen/odor

1030 Bottom Tow 18 (18' deep) 80' out

1030:45 Start Tow 18

1031:45 End Tow 18 Sledge full. Rinsing

1035 Sledge on deck Silt + some organic debris. no odor/sheen

12/2/05 B. Pointer BT029 - BT019

1039 Bottom Tow 19 (25' deep) 100' pard out

1040:20 Start Tow 19

1041:22 End Tow 19. sledge full. Rinsing

1047 Sledge on deck. Fine Silt mud + some organic debris. Sulfide odor no sheen.

1053 Bottom Tow 20 (20' deep) 80' pard out

1054:03 Start Tow 20

1055:02 End Tow 20. Full. Rinsing

1059 Sledge on deck. Silt + wood debris + reduce. Some shell fragments. no sheen/odor.

1103 Tied up at nearby bridge for restroom break.

1118 Underway to BT019.

1131 On station BT019. Readying.

1133 Bottom Tow 1 (14' deep) 80' pard out

1134:05 Start Tow 1

1135:05 End Tow 1. 3/4 full. Rinsing

1138 Sledge on deck. Fine Silt. no odor no sheen.

1142 Bottom Tow 2 (20' deep) 80' pard out

1143:16 Start Tow 2

1144:13 End Tow 2 sledge full.

1147 Sledge on deck. fine silt + some organic debris. no sheen/odor.

12/2/05 B. Pa inter BTO19

1151 Bottom Tow 3 (18' deep) 80' out

1152:07 Start Tow 3

1152:51 End tow 3. Full. Rinsing

1156 Sledge on deck. Fine silt. no odor no sheen.

1159 Bottom - Tow 4 (15' deep)

1200.30 Start Tow 4 80' paid out

1201:15 End Tow 4 1/2 full. rinsing

Plastic guard on ~~to~~ off sledge face on bottom.

1204 Sledge on deck. silty sand + organic/wood debris. no odor/sheen.

1206 Buoy float attached to instrument/guard is stuck on ~~[illegible]~~ something at bottom. Trying to pull up. Successfully.

1210 Switched to smaller sledge w/ 1mm screen.

1214 Bottom - Tow 5 (10' deep → 20' deep) 80' paid out

~~1214:35~~ Start Tow 5

1215:35

1216:20 - End Tow 5. Full. Rinsing

1222 Sledge on deck. Silt w/ coarse sand no odor/sheen

1225 Break for Lunch. Tearing up w/ processing boat.

Notes continue in vol. 2.

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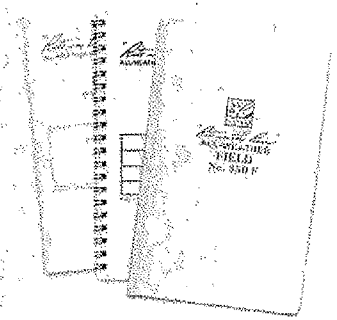
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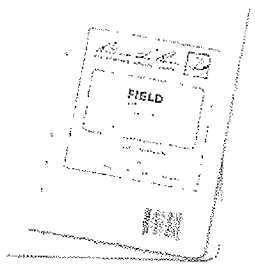
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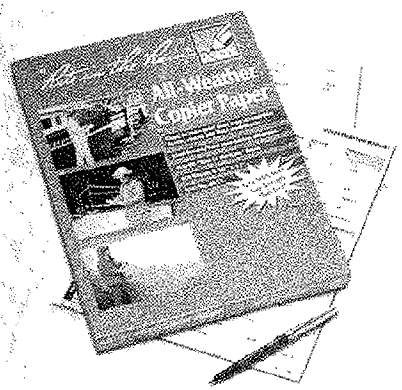
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CONTENTS

PAGE	REFERENCE	DATE

ANC02328
BZTO104(e)002328

12/2/2005 B. Pointer BTO19

~ Continued from volume 1 ~

1256 Lunch break over. Resuming tows on station BTO19.

1300 Bottom-Tow 6 (20' deep)

1301:00 Start Tow 6

1301:45 End Tow 6. Sledge full. Rinsing

1306 Sledge on deck. Sediment washed out course wood debris. no odor/sheen.

1311 Bottom Tow 7 (20' deep)

1312:04 Start Tow 7 80' out

1312:49 End tow 7 Full, Rinsing

1317 Sledge on deck. Fine silt + wood debris. no sheen/odor.

1322 Bottom-Tow 8 (16' deep) 80' pendent

1322:42 Start Tow 8

1323:28 End Tow 8. Sledge 1/4 full resurface. Rinsing

1326 Sledge on deck. Silt/Fine Sand mix. no odor BP Sheen Florettes (few)

1330 Bottom-Tow 9 (16' deep) 80' pendent

1331:14 Start Tow 9

1331:59 End Tow 9. Full. Rinsing

1336 Sledge on deck, sand + fine silt + wood debris. no odor/sheen

1341 Begin-Tow 10-Bottom (16' deep)

12/2/05 B. Pointer BTO19 - BTO18

1342:34 Start Tow 10

1343:30 End Tow 10. Full. Rinsing

1349 Sledge on deck. Silty sand. no odor. little sheen florettes

1353 On our way to station BTO18.

1349 On Station BTO18. Investigating bathy and dock structures to plan towing spots. Towing parallel to shore/docks & perpendicular

1406 Bottom Tow 1 (20 deep.) 120' out

1407:43 Start Tow 1

1408:29 End tow 1. Full. Rinsing

1416 Sledge on deck. Silt + clay balls + refuse. no sheen + odor.

1419 Bottom-Tow 2 (25' deep)

1420:55 Start Tow 2

1421:39 End Tow 2. Full. Rinsing

1427 Sledge on deck. silt shell fragment. no odor. Sheen florettes

1429 Bottom-Tow 3 (33' deep). 120' out

1430:45 Start Tow 3

1431:31 End Tow 3. Stopped GPS logging 15 sec too late. Sledge full. Rinsing

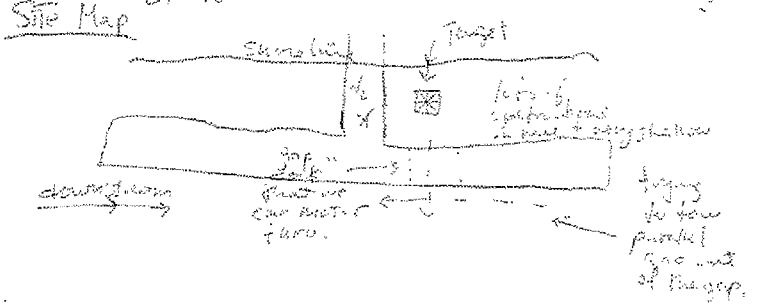
1438. Sledge on deck. Silt. no odor sheen florettes

12/2/05 B. Painter BTO.3

1441 Bottom Tow 4 (30' deep.) 120' paid out
1442:46 Start Tow 4
1443:31 End Tow 4. Full. Rinsing
1449 Sledge on deck. silt + wood, metal debris. no odor/sheen.
1454 Bottom Tow 5 (30' deep) 120' out
1455:32 Start Tow 5. GPS reception real spotty due to deep
1456:20 End Tow 5. Full. Rinsing.
1505 Sledge on deck Fine silt. no odor sheen florettes.
1509 Bottom Tow 6 (27' deep) 120' paid out
1510:35 Start Tow 6
1511:20 End Tow 6 Full. Rinsing
1519 Sledge on deck. Fine Silt. Sheen + Petroleum odor.
1523 Bottom Tow 7 (30' deep)
1524:30 Start Tow 7
1525:15 End Tow 7. Full Rinsing

BTO18

Site Map



12/2/05 B. Painter BTO.3

1529 Sledge on deck (Tow 7). Fine silt holds water. Sulfide odor. Sheen florettes.
1536 Bottom (Tow 8) 33' deep 120' out
1537:45 Start Tow 8
1538:30 End Tow 8. Full Rinsing
1540 Sledge on deck. Fine Silt. no odor light sheen.
~~1544~~ 1545 BP Bottom Tow 9 (30' deep) 120' paid out
1545:47 Start Tow 9
1546:29 End Tow 9. Full. Rinsing
1550 Sledge on deck. Very fine silt sheen. sulfide + petrol odor.
1553 Bottom Tow 10 (10' → 35' deep) 110' out
1554:30 Start Tow 10
1555:15 End Tow 10. Sledge 3/4 full. chain is twisted.
1559 Sledge on deck. Fine Sticky Silt. Sheen Petrol. + Sulfide odor.
1603 Bottom Tow 11 (10 → 30' deep)
1604:45 Start Tow 11 110' out
1605:30 End Tow 11 Full Rinsing
1609 Sledge on deck. Sandy Silt w/ wood/organic debris + refuse. no sheen/odor. some shell fragments.

12/2/05 B Pointer

1614 Underway to Cathedral Park Boat Launch.

1622 Arrive @ Cathedral Park Boat Ramp. Unloading.

1630 Depart Cathedral Park.

1645 Arrive Field Lab.

1510 Depart Field Lab

End of Day

12-2-05

12/3/05 B. Pointer BTO21

0700 Arrive at ~~lab~~ Field Lab and load gear and personnel.

0730 Arrive at Cathedral Park Boat Launch.

0748 On water and underway to Station BTO21 to check if there are still barges in the way of sampling target. Crew: Dave Mullins, Nelly Anderson, Linda Hansen, Brian Pointer, David Gillingham. Health and Safety briefing was conducted and new field members ~~signed~~ BP signed HASP.

0800 On Station BTO21. Barges were moved over weekend and there is now clear near the target for sampling.

0805 Quick Health & Safety Briefing about the winch.

0811 Bottom Tow 1 (BTO21) 15' deep (60' Pend out)

0814:09 Start Tow 1

0815:10 End Tow 1 almost no material. Tow Rejected. we assume the sledge did not get set right on bottom.

0819 Bottom Tow 2 (15' deep) 60' out

0820:40 Start Tow 2

0821:41 End Tow 2 3/4 full - rinsing.

ANC02331
BZTO104(e)002331

12/5/05 B. Painter BTO21

0826 Sledge on deck. Silt - course wood debris. Sheen Flocelles + mild solvent "swampy" odor.

0830 Angelina Em called Shannon + USCG second 0800 to notify them of our presence

0830 Bottom Tow 3 (14' deep) 60' out

0830:18 Start Tow 3

0831:18 End Tow 3 3/4 full. Rinsing

0835 Sledge on deck. Silt + course woody debris. Foul "swampy" odor. no sheen.

0838 Bottom Tow 4 10' deep 60' out

0839:23 Start Tow 4

0840:22 End Tow 4 + Sledge full. rinsing

0845 Sledge on deck. Silt + course wood debris. Swampy odor. no sheen

0848 Bottom Tow 5 (12' feet deep) 50' paid out

0849:37 Start Tow 5

0850:37 End Tow 5. Sledge full. Rinsing

0854 Sledge on deck. Silt + course wood debris some fine sand. light swampy odor, no sheen

0857 Bottom Tow 6* (30' deep) 90' out

0858:25 Start Tow 6 * Did not start logging GPS until we started towing. Operator error.

0859:30 End Tow 6. 3/4 full

0901 Rinsing sledge.

0903 Sledge on deck. Silty Sand + course wood debris/bark. Sheen Flocelles + strong petrol odor

12/5/05. B. Painter BTO21

0906 Bottom Tow 7 (26' deep) 90' out

0907:19 Start Tow 7

0908:18 End Tow 7 2/3 full. Rinsing

0912 Sledge on deck. Silt + course wood debris. Sheen Flocelles + strong petrol odor.

0916 Bottom Tow 8 (20' deep) 90' out

0917:25 Start Tow 8

0918:25 End Tow 8 2/3 full Rinsing

0921 Sledge on deck. Silt + heavy course wood with Sheen + strong petrol odor.

0925 Bottom Tow 9 (20' deep) 90' out

0926:45 Begin Tow 9.

0927:45 End Tow 9 2/3 full. Rinsing

0930 Sledge on deck. Silty Sand w/ wood debris no odor. very light sheen.

0942 Bottom Tow 10 (25' deep) 90' paid out

0943:20 Start Tow 10*

0944:20 End Tow 10 3/4 full. Rinsing

0947 Sledge on deck. Course wood debris. Sand + silt mix. no odor. Slight Sheen.

0951 Bottom Tow 11 (18' deep) 90' out.

0952:40 Start Tow 11

0953:40 End Tow 11. 3/4 full. Rinsing

0956 Sledge on deck. Silty Sand + wood debris. Slight petrol odor + Sheen.

* Photos were taken of this tow on the Windward Field camera. (Canon Elph 3.2 MP)

12/5/05 B. Painter BTO24 - BTO17

0959 Bottom Tow 12 (12' deep) 90' out
1000:23 Start Tow 12
1001:23 End Tow 12. 3/4 full. Rising
1004 Sledge on deck. Silty Sand + wood debris
mild petrol odor. many sheen flocks.
1008 Quick Restroom Break.
1011 Underway to Station BTO17.
1021 On Station BTO17.
1025 Bottom Tow 1 (15' deep) 80' paid out
1026:56 Start Tow 1 (BTO17)
1027:56 End Tow 1. Full. Rising
1031 Sledge on deck. Silt + wood debris
no sheen. faint woody debris.
1036 Bottom-Tow 2 (15' deep) 80' paid out
1036:45 Start Tow 2 BTO17
1037:46 End Tow 2 1/2 full. Rising
1043 Sledge on deck. Sand + brown silt mix.
no sheen. musty organic odor. some wood debris
1047 Bottom Tow 3 (21' deep) 100' out
1048:10 Start Tow 3 BTO17
1049:00 End Tow 3, snagged up. 3/4 full. Rising
1052 Sledge on deck. Silt + cobbles. coarse woody
debris. Musty odor. no sheen.
1058 Bottom Tow 4 (20' deep) 85' out
1059:06 Start Tow 4 BTO17

12/5/05 B. Painter BTO17

1100:08 End Tow 4 3/4 full. Rising
1103 Sledge on deck. Coarse wood debris.
Sandy brown silt. no sheen. no odor.
1107 Bottom-Tow 5 (25' deep) 90' out
1108:10 Start Tow 5
1109:10 End Tow 5. 3/4 full. Rising
1112 Sledge on deck. Brown silt + wood debris.
no sheen. light musty odor few shrimp.
1116 Bottom-Tow 6 (25' deep) 100' paid out
1117:05 Start Tow 6
1118:05 End Tow 6. Full. Rising
1123 Sledge on deck. Brown Silt/Fine Sand w/
some brown clay balls + wood debris. no sheen/odor.
1126 Bottom Tow 7. 25' deep 100' out
1127:37 Start Tow 7
1128:15 End Tow 7 Snagged. 3/4 full. Rising
1132 Sledge on deck. Fine Brown silt + wood
debris no odor / sheen
1136 Bottom Tow 8 (22' deep) 80' out
1137:19 Start Tow 8
1138:19 End Tow 8 3/4 full Rising
1141 Sledge on deck Fine gray silt. slight odor.
couple sheen flocks.
1145 Bottom Tow 9 (25' feet deep) 100' out
1146:25 Start Tow 9

12/5/05 B. Pointer BT0.7 - BT016

1147:25 End Tow 9 (BT0.7). 3/4 full. Rinsing

1151 Sledge on deck. Silt + fine sand/gravel + wood debris. no Sheen/Smell

1155 Bottom - Tow 10 (20' deep) 100' out

1156:05 Start Tow 10

1157:05 End Tow 10 2/3 full.

1200 Sledge on deck, Brown Silty Sand + wood debris. no sheen. light musty odor.

1203 Heading back to Cathedral Park Boat Launch to pick up lunch. Jane Sund from processing boat is on board and will be left at dock in trade for a windward person.

1213 Alongside boat Ramp. Jane Sund departed for field lab. Kathleen Hurley aboard and will join processing crew. Taking quick restroom break.

1224 Departing boat ramp to join others; delivering lunch at processing boat.

1231 Arrive at willamette cove near station BT016 Break for lunch.

1246 Lunch over. Setting up for tows.

1252 Bottom Tow 1 (10'-~~20'~~ 30'-40' deep) 120' out

1253:30 Start Tow 1 BT016

1254:20 End Tow 1 snag. sledge full. Rinsing

12/5/05 B. Pointer BT016

1258 Sledge on deck (Tow 1-BT016). Silt - wood debris. no sheen. Slight ~~fet~~ fecal/sulfide odor.

1300 Bottom Tow 2 (10'-38' deep) 100' out

1301:19 Start Tow 2 BT016

1302:19 End Tow 2. Sledge full Rinsing

1305 Sledge on deck. Sand/gravel w/ clay balls + wood debris. many shrimp/clams. no odor slight sheen

1307 Bottom Tow 3 (10-30' dep.) 100' out

1308:00 Start tow 3 BT016

1309:00 End tow 3 1/3 full. Rinsing

1311 Sledge on deck. wood debris. no odor/sheen. few shrimp.

1313 Bottom Tow 4 (10'-27' deep) 100' out

1314:40 Start Tow 4 - BT016

1315:31 End Tow 4. snag. 1/2 full. rinsing

1320 Sledge on deck. Silty sand w/ course wood debris no odor. very light sheen.

1322 Net has developed a frayed section. To prevent ripping, we are switching to the smaller sledge while Helle replaces the net on the primary sledge.

1329 Bottom Tow 5 (12'-40' deep) 100 pnd out

1330:32 Start Tow 5 - BT016

1331:41 End Tow 5. Sledge full. Rinsing

~~Sledge on deck~~
BP

12/5/05 B. Pointer (Tow 5) BT016

1336 Sledge on deck. Sand + fine gravel + wood debris. no odor/sheen.

1345 Bottom-Tow 6 (18'-21' deep) 100' out

1346:00 Start Tow 6

1346:56 End Tow 6. snag. Sledge full. Rinsing

1351 Sledge on deck. Fine grey silt + some wood debris. few shrimp/clams. no sheen. sulfide odor

1353 Bottom Tow 7 (20' deep) 80' out

1354:50 Start Tow 7 BT016

1355:50 End Tow 7. Sledge ½ full. Rinsing

1358 Sledge on deck. Fine grey silt. no sheen. mild sulfide odor.

1401 Bottom Tow 8 (11' deep → 20) 80' out

1402:10 Start Tow 8 (BT016)

1403:10 End Tow 8. Sledge full. Rinsing

1406 Sledge on deck. Course sand + some silt + refuse. Some shrimp + unknown sp. of fish. no sheen/odor

1408 Bottom-Tow 9 (14' deep → 40) 90' out

1409:49 Start Tow 9 BT016

1410:50 End Tow 9. very full. Rinsing.

1414 Sledge on deck. Sand + fine organic debris. Slight petrol odor + light sheen.

1417 Bottom-Tow 10 (10'-28' deep) 90' out

1418:20 Start Tow 10 BT016

1419:20 End Tow 10. Full. Rinsing

12/5/05 B. Pointer BT016 · BT015

1422 Sledge on deck (Tow 10). Course sand + some silt. no odor/sheen. many shrimp/crawfish (one).

1424 Bottom-Tow 11. 10'-35' deep) 100' paid out

1426:10 Start Tow 11 BT016

1427:10 End Tow 11. ½ full. Rinsing

1430 Sledge on deck. Course sand + clay balls. no sheen/odor.

1432 Bottom-Tow 12 (12' → 35' deep) 120' out

1434:00 Start Tow 12

1435:01 End Tow 12. Full. Rinsing

1438 Sledge on deck. Course sand + shell fragments. no sheen/odor.

1440 Underway to station BT015 (Busco)

1446 On Station BT015

1448 Bottom-Tow 1 (40' deep) 160' out

1449:56 Start Tow 1

1450:25 End Tow 1. snag. Rinsing

1455 Sledge on deck. Silt + course wood/organic debris. Mild petrol. odor + light sheen

1500 Bottom-Tow 2 (40' deep) 160 out

1501:48 Start Tow 2

1502:10 End Tow 2. Snagged Right away ¼ full. — Rejected — saw 1 crawfish + sheen

1507 Begin Tow 3 (40' deep) 160' out.

1509:15 Start Tow 3

12/5/05 B. Painter BTO15

1510:16 End Tow 3. Sledge full Rinsing
1515 Sledge on deck. Course wood/organic material. Slight petrol odor. light sheen.
1518 Bottom Tow 4 (40' deep) 160' out
1520:02 Start Tow 4
1521:03 End Tow 4 ½ full. Rinsing Freeing buoy from snag
1529 Sledge on deck. Course wood/organic debris, no sheen. pleasant odor.
1532 Bottom Tow 5 (15' deep) 60' out
1533:22 Start Tow 5 (BTO15)
1533:55 End Tow 5 Snag. ½ full. Rinse
1536 Sledge on deck. course wood debris + silt. no odor/sheen. Shrimp. no tans.
1541 Bottom Tow 6 (40 deep) 160' out
1543:00 Start Tow 6
1544:00 End Tow 6. 3/4 full. Rinsing
1548 Sledge on deck. course wood debris. no sheen/odor.
1552 Bottom Tow 7 (40' deep) 160' out
1554:10 Start Tow 7 BTO15
1554:47 End Tow 7. Snag ⅓ full.
1557 Sledge on deck. course wood/organic debris shrimp + crayfish. no odor/sheen.
1602 Bottom Tow 8 (40' deep) 160' out
1604:05 Start Tow 8

12/5/05 B. Painter BTO15

1605:08 End Tow 8. Full.
1609 Sledge on deck. Wood debris + gravel. Strong petrol odor + sheen
1612 Bottom Tow 9 40' deep. 160 pad out
1613:45 Start Tow 9
1614:45 End Tow 9. very full. Rinsing
1620 Sledge on deck. Silt w/ wood debris
~~1620~~ BTO slight petrol. odor. no sheen observed
1623 Underway to Cathedral Park Boat Dock to unload.
1630 Arrive @ Cathedral Pk. Boat Ramp. unloading.
1640 Departing Cathedral Park.
1655 Arrive Field Lab. Change GPS batteries
1710 End of Day. Depart Lab.

12-5-05

12/6/05 B. Painter. BTO24

0700 Arrive at Field Lab. Loading.

0730 Arrive at Swan Island boat Ramp. Loading and getting GPS setup. Arrangements: calling USCG and Sheriff to notify them of our whereabouts.

0801 Underway to Station BTO24. We are returning to some selected stations to attempt to recover more tissue to assist EPA in making decisions for Bioaccumulation studies.
Crew: Dave Mullins, Helle Anderson, Linda Menoh, David Gillingham, Brian Painter.
Weather: Partly cloudy, calm, cold, good visibility.

0812 On Station BTO24. Resembling best tow line from previous station occupation.
Bottom Tow 12. *unable to log GPS file.*

0819:15 Start Tow 12 (15' deep) (80' paid out

0820:00 End Tow 12 Snagged Rinsing

0822 Attempting to fix GPS. No tissue in Tow 12. not logged in GPS.

0856 Bottom - Tow 13 (10' deep) 40' out

0856:50 Start Tow 13

0857:52 End Tow 13

0900 Sludge on deck. Fine silt mud decay odor no sheen.

* A new new file was created and renumbered sludge locations 2. All subsequent tracks will be recorded in it. However, previous tow tracks will not be recorded in this new file.

12/6/05 B. Painter BTO24 - BTO28

0904 Bottom Tow 14 (5' deep) 25' out

0905:20 Start Tow 14 BTO24

0906:19 End Tow 14

0908 Sludge on deck. Fine silty mud. no odor/sheen.

0910 Bottom - Tow 15 (5' deep) 25' out

0911:15 Start Tow 15

0912:15 End Tow 15. Full. Rinsing

0914 Sludge on deck. Silt + fine sand. decay odor. no sheen.

0920 Bottom Tow 16 (6' deep) 25' out

0921:20 Start Tow 16

0922:20 End Tow 16. Full. Rinsing

0925 Sludge on deck. fine sand + silt mud. sulfide odor; no sheen.

0927 We have enough material. Moving on to station BTO28. Good Tows from earlier are Tows 1, 2, 4, 8.

0935 Bottom Tow 13 (15' → 40' deep) 110' out

0937:20 Start Tow 13 (BTO28)

0938:20 End Tow 13. Full Rinsing

0941 Sludge on deck. Fine silty mud + wood + plastic debris. light petrol odor. light sheen.

0945 Begin Tow 14. 15' → 40' deep) 110' out

0946:53 Start Tow 14 (BTO28)

0947:52 End Tow 14 very full. Rinsing

12/6/05 B. Painter BTO28 - BTO30

0952 Sledge on deck (Tow 14). Silt w/ wood/organic debris. no sheen/odor. few shrimp & worms.

0953 Bottom Tow 15 (15-40' deep) 110 out

0954:12 Start Tow 15 (BTO28)

0955:15 End Tow 15. Full. Rinsing Sheen observed while Rinsing

0959. Sledge on deck. Course wood debris. Strong petrol odor. Sheen.

1002 Bottom Tow 16 (15'-40' deep) 110 out

1003:22 Start Tow 16

1004:01 End Tow 16. Snagged. 2/3 full. Rinsing

1006 Sledge on deck. Course wood debris strong petrol odor. Sheen. one lamprey collected.

1008 Enough material collected. Moving on to BTO30. Best tows from previous effort were Tows 4, 8, 11. 5 & 10 were ok tows too.

1016 Bottom Tow 12 (23' deep) 100' out

1016:43 Start Tow 12 (BTO30)

1017:11 End Tow 12 - Snagged. 1/2 full. Rinsing

1019 Sledge on deck. Silt + wood debris + clay balls. no particular odor. sheen observed.

1022 Bottom Tow 13 (30' deep) 120' paid out

1023:25 Towing - 13 (BTO30)

1024:25 End Tow 13. very little material

1025 Sledge on deck. Sandy silt. no odor/sheen. Seems like the sledge did not scrape bottom good.

12/6/05 B. Painter BTO30 - BTO31

1029 Bottom - Tow 14 (20' deep) 120' out

1030:50 Start Tow 14 (BTO30)

1031:50 End Tow 14. 1/2 full.

1034 Sledge on deck. Silt. clay balls + some sand. no odor. Sheen observed.

1040 Bottom Tow 15 (25' deep) 120' out

1041:13 Start Tow 15 (BTO30)

1042:14 End Tow 15. Full. Rinsing

1047 Sledge on deck. Silt + clay balls + wood debris. mild petrol odor + sheen.

1049 Bottom - Tow 16 (20' deep). 120' out.

1050:30 Start Tow 16 (BTO30)

1051:30 End Tow 16 2/3 full. Rinsing

1054 Sledge on deck. Sandy silt w/ clay balls + wood debris. slight petrol odor + sheen.

1057 Enough material at this station. Moving on to station BTO31. Best tows from previous area: tow 4 (11:54) 1, 2, 5, 7, 10.

1104 Bottom - Tow 11 (35' deep) 130' out

1105:40 Start Tow 11 (BTO31)

1106:39 End Tow 11. Full. Rinsing

1110 Sledge on deck. Silt + course wood debris no odor/sheen.

1112 Bottom - Tow 12 (30' deep) 120' out

1114:02 Start Tow 12 (BTO31)

1114:54 End Tow 12. Snagged. Full Rinsing

12/6/05 B. Pointer BTO31 - BTO33

1119 Sledge on deck (Tow 2 - BTO31). Coarse wood debris + clay balls. no sheen/odor.

1127 Bottom Tow 13 (35' deep) 130' paid out

1128:15 Start Tow 13 (BTO31)

1129:15 End Tow 13. very full Rinsing

1132 Sledge on deck. Silt w/ wood debris. no sheen/odor.

1135 Bottom 14 (30' deep) 120' paid out

1136:36 Start Tow 14 (BTO31)

1137:25 End Tow 14. Snag. very full. Rinsing

1140 Sledge on deck. Coarse wood debris. no sheen/odor. shrimp + clams present.

1142 Enough tissue. Moving to BTO33. Good tows are 3, 5, 6.

1157 Bottom Tow 11 (35' deep) 160' out

1157:25 Start Tow 11 BTO33

1158:25 End Tow 11. Full Rinsing

12 Sledge on deck. Coarse wood debris. lighter sheen. no odor

1205 Break for lunch.

1245 Break over. Resuming with Tow 12 - BTO33

1253 Bottom Tow 12 (40' deep) 140' out

1255:30 Start Tow 12 BTO33

1256:30 End Tow 12 Full. Rinsing

12/6/05 B. Pointer BTO33 - BTO23

1259 Sledge on deck. Fine silt & clay + wood debris. no sheen/odor

1303 Bottom Tow 13 - (40' deep) 150' out

1304:57 Start Tow 13 BTO33

1305:58 End Tow 13. Full Rinsing

1309 Sledge on deck. Coarse wood debris and mussels. no sheen/odor.

1313 Bottom - Tow 14. (40' deep) 150' out

1314:55 Start Tow 14 BTO33

1315:56 End Tow 14. 1/2 full. Rinsing

1319 Sledge on deck. Fine silt + wood debris. sulfide odor. no sheen.

1322 Bottom Tow 15. (40' deep) 160' out

1323:41 Start Tow 15 BTO33

1324:41 End Tow 15. 2/3 full. Rinsing

1328 Sledge on deck. Fine silt mud - refuse. no sheen/light sulfide odor.

1330 We have exhausted effort on this station. moving on to Portland Shipyard - BTO23. "Good" tows are 11 (2.74g) 12, 10 (each close to 2g)

1340 Bottom - Tow 12 (32' deep) 120' out

1342:05 Start Tow 12 BTO23

1342:30 End Tow 12. Snag 1/2 full. Rinsing.

1346 Sledge on deck. fine silt mud. no odor/sheen.

12/6/05 B. Painter BTO23 - BTO26

1349 Bottom - Tow 13 (BTO23) (30' deep) (130' out)
1351:03 Start Tow 13 BTO23
1352:02 End Tow 13 Full. Rinsing
1356 Sledge on deck. Silt + wood debris shell fragments + red worms. no odor/sheen
1359 Begin Tow 14 (30' deep) 130' out
1401:15 Start Tow 14
1402:28 End Tow - 14. Full. Rinsing
1407 Sledge on deck. fine silt med. sulfide odor. no sheen
1409 Equipment exhausted on this station. Under way to station BTO26. Good tows for BTO26 are: 8, 13.
1426 Bottom Tow 14 (20' deep) 80' out
1426:50 Start Tow 14 (BTO26)
1427:50 End Tow 14. ½ Full. Rinsing
1430 Sledge on deck. Silty Sand, some sheen Pennies no odor.
1432 Bottom Tow 15 (21' deep) 85 out
1433:18 Start Tow 15 (BTO26)
1434:19 End Tow 15. Full. rinsing
1437 Sledge on deck. Silt w/ coarse wood debris. slight petrol odor + light sheen
1440 Bottom Tow 16 (22' deep) 100' out
1441:30 Start Tow 16 (BTO26)

12/6/05 B. Painter BTO26

1441:30 End Tow 16. - Rejected - Sledge folded inside out.
1445 Bottom Tow 17 (20' deep.) 100' out
1446:48 Start Tow 17
1447:49 End Tow 17. ⅔ full. rinsing
1450 Sledge on deck. dark grey sand. no odor/sheen.
1453 Bottom Tow 18. (20' deep) 100' out.
1454:50 Start Tow 18. BTO26
1455:50 End Tow 18. Full. Rinsing
1459 Sledge on deck. Silt + wood debris no odor/sheen.
1501 Bottom - Tow 19. (20' deep) 100 out
1502:53 Start Tow 19. BTO26.
1503:54 End Tow 19. ¾ full
1506 Sledge on deck. dark grey sand + wood debris. heavy odor. no sheen
1509 Bottom - Tow 20 (22' deep) 100' out
1510:20 Start Tow 20
1511:21 End Tow 20 ¾ full. Rinsing
1515 Sledge on deck. Sand w/ some silt mild odor (petrol) no sheen.
1517 Exhausted effort here. Moving on to USCG station BTO22. Good Tows are: 6, 7, 8.

12/6/05 B Pointer BTO22

1522 On Station BTO22

1524 Bottom-Tow 11 (30' deep) 120' out

1526.10 Start Tow 11 BTO22

1527:11 End Tow 11. Full. Rinsing

1531 Sledge on deck. Brown slightly gooey sand + weed debris. Slightly petrol odor. no sheen.

1536 Bottom-Tow 12 (30' deep) 120 out

1536:25 Start-Tow 12 BTO22

1537:28 End Tow 12. Full. Rinsing

1540 Sledge on deck. Coarse wood debris + pea gravel. Mostly woody odor. no sheen.

1545 Bottom-Tow 13 (26' deep) 86' out

1546:25 Start Tow 13

1546:50 End Tow 13. Snagged. ½ full. Rinsing

1549 Sledge on deck. Coarse wood debris some shell fragments. no odor/sheen.

1551 Bottom-Tow 14. (26' deep) 86' out

1552:52 Start Tow 14 (BTO22)

1553:52 End Tow 14. Full. Rinsing

1557 Sledge on deck. Coarse wood debris. + silt. no odor/sheen.

1558 On our way to boat ramp (Swan Island)

1607 The drop off Swan Island Boat Ramp. Unloading.

12/6/05 B. Pointer

1630 Arrive Field Lab. Charging batteries for GPS. Making Copies of Log

1650 Depart Lab. End of Day

ANC02341
BZTO104(e)002341

12/7/05 B. Painter BTO26

0700 Arrive field lab. Loading up. Printing target locations for sediment crew.

0735 Arrive Cathedral Park Boat Ramp.

0747 On water! underway. We are going to ferry Angelita Rodriguez and Emily to processing boat located at Shawn's property.

0750 Alongside Processing boat & Transferred personell.

0802 Underway to Station BTO26 to take 2-3 tows to try to increase our tissue totals. Crew on board: Dave Mullins, Helle Henderson, Linda Marsh, David Gillingham, Brian Painter. Weather: Overcast high stratus clouds. Cold + windy. SE. Visibility unlimited.

0809 On station BTO26.

0811 Bottom Tow 21 (20' deep) 80' out

0812:25 Start Tow 21 - BTO26

0813:21 End Tow 21. 3/4 full. Rinsing

0816 Sludge on deck. Coarse wood debris decaying odor. No sheen.

0819 Bottom Tow 22 (25' deep) 100 out

0821:30 Start Tow 22 - BTO26

0823:30 End Tow 22. Full. Rinsing

0826 Sludge on deck. Course wood debris + silt mod. no odor/sheen.

12/7/05 B. Painter BTO26 BTO25

0827 Bottom Tow 23 (25' deep) 100' out

0829:05 Start Tow 23 (BTO26)

0830:05 End Tow 23 Full. Rinsing.

0834 Sludge on deck. Underway to processing boat. near Shawn property. Once we deliver samples and describe tow 23, we will begin sampling at BTO25 to try to gather more tissue. Good tows at BTO25 are. 5, 7, 11.

0843 Description of Tow 23. Dark grey sand + course wood debris. no odor. Some sheen flocculles.

0848 Bottom Tow 12 (12' deep) 70' out

0849:40 Start Tow 12 - BTO25

0850:40 End Tow 12. Fr. 1. Rinsing

0854 Sludge on deck. Silt + gravel mix + wood debris. no odor/sheen.

0859 Bottom 13 (15' deep) 80' out *Started nav. recording at 14 late.

0900:00 Start Tow 13 BTO25.

0901:02 End Tow 13. Full. Rinsing

0904. Sludge on deck. Silt + some gravel + wood debris. decaying odor + light sheen

0908 Bottom Tow 14 (11' deep) 80' out

0909:30 Start Tow 14 (BTO25)

0910:30 End Tow 14 Full. Rinsing

12/7/05 B. Pointer BT025 BT021

0914 Sledge on deck (Tow14-BT025). Silt mud + wood debris, decay odor. no sheen

0917 Bottom Tow15 (14' deep) 80' out

0918:05 Start Tow15 BT025

0919:05 End Tow15. Full. Rinsing.

0922 Sledge on deck: Fine clayey silt + wood debris. no odor/sheen. one mussell + one lamprey

0926 Bottom Tow16 (11' deep) 80' out

0926:55 Start Tow16 (BT025)

0927:55 End Tow16. Full. Rinsing.

0931 Sledge on deck. silt + gravel. + some wood debris. 1 mussels. no sheen/odor.

0934 Exhausted effort here. Moving on to station BT021. Good tows were: 6,8, especially 11 (11.26 g). Decanting equipment.

0943 Bottom Tow13 (15' deep) 60' out

0944:50 Start Tow13 (BT021)

0945:50 End Tow13 3/4 full. Rinsing

0948 Sledge on deck. Sandy silt. olive color w/ some rust colored spots. no odor. sheen flocks.

0952 Bottom Tow14. (10' deep) 60' out

0953:56 Start Tow14 (BT021)

0954:58 End Tow14. Full. Rinsing

12/7/05 B. Pointer BT021 - BT017

0957 Sledge on deck. Course wood debris. no sheen/odor.

1000 Bottom Tow15 (12' deep) 70' out

1001:27 Start Tow15 BT021

1002:27 End Tow15. Full. Rinsing

1005 Sledge on deck: Course wood debris no odor/sheen.

1007 Exhausted effort here. Moving on to BT017. Good tows were: 1,2,5,10.

1015 Dusration BT017

1018 Bottom Tow11 (13' 25' deep) 90' out

1019:15 Start Tow11. (BT017)

1020:16 End Tow11. Full Rinsing

1023 Sledge on deck. Brown sand + wood debris. wet-dog odor. No sheen. at least 5 clams.

1026 Underway to BT015. Best Tow from Monday was Tow18 (2.95g).

1032 On Station BT015 ~~for~~ BP

1034 Bottom Tow10 (38' deep) 110' out

1035:40 Start Tow10 BT015

1036:42 End Tow10. 3/4 full. Rinsing.

1039 Sledge on deck. Silt + gravel mix. Course wood debris & shell fragments. mild petrol odor. no sheen.

12/7/05 B. Pointer BTO15

1042 Bottom - Tow 11 (45' deep) 140' out
1043:45 Start Tow 11 (BTO15)
1044:20 End Tow 11. Strong. 3/4 full. Rinsing
1048 Sledge on deck. Silt w/ lots of gravel
Strong petrol. odor. Light sheen. Shell fragments
1053 Bottom Tow 12 (45' deep) 160' out
1054:52 Start Tow 12 (BTO15)
1055:22 End Tow 12. Strong. Full. Rinsing
1059 Sledge on deck. Fine green silt. no odor
no sheen.
1102 Bottom - Tow 13 (40' deep) 130 out
1103:54 Start Tow 13 (BTO15)
1104:45 End Tow 13. Strong. Full
1108 Sledge on deck. Silt + wood debris
mild petrol odor. no sheen.
1111 Bottom - Tow 14 (40' deep) 130 out
1112:10 Start Tow 14 (*Accidentally stopped GPS too early. Two lines were created Tow 14 + Tow 14-2.)
1113:05 End Tow 14. Full
1118 Sledge on deck. Course wood debris seaweed
petrol odor. light sheen. 1 mussell.
1021 Bottom. Tow 15 (40' deep) 140 out
1022:35 Start Tow 15 BTO15
1023:36 End Tow 15. Full
1026 Sledge on deck. Silt + some wood debris
& shell fragments. no odor/sheen.

12/7/05 B. Pointer BTO13

1130 Effort exhausted on this station BTO15. Underway to Station BTO13. (Cathedral Point)
1139 Restroom Break
1145 Back @ sea. Setting up for towing BTO13
1151 Bottom - Tow 1 (50' deep) 200' out
1153:05 Start Tow 1 - BTO13. GPS is sketchy as we go under St Johns Bridge
1154:06 End Tow 1. Full.
1157 sledge on deck. Sand + course wood debris. petrol odor no sheen.
1200 Bottom - Tow 2 (27' deep) 80' out
1201:10 Start Tow 2. BTO13
1201:30 End Tow 2. Strong 1/4 full.
1204 Sledge on deck. Course wood debris
1 clam. no odor/sheen.
1207 Bottom Tow 3 (17' deep) 60' out
1208:40 Start Tow 3 BTO13
1209:20 End Tow 3. Strong 3/4 Full.
1213 Sledge on deck. Fine silty sand - gray
no odor/sheen.
1214 Bottom - Tow 4 (15' deep) 40' out
1215:18 Start Tow 4 (BTO13)
1215:54 End Tow 4. Full.
1218 Sledge on deck. Fine Sandy silt
+ woody debris. no odor/sheen.

12/7/05 B. Painter BTO13

1220 Tied up at Boat launch for Lunch break.
1245 Lunch over. Resuming work with Tow 5.
1249 Bottom Tow 5. (5' deep) 25' paid out
1249:45 Start Tow 5 BTO13
1250:32 End Tow 5. Snag. 2/3 full.
1253 Sledge on deck. Brown fine sand + wood debris: no odor, very light sheen.
1256 Bottom Tow 6. (7' deep) 25' paid out
1257:20 Start Tow 6 (BTO13)
1258:19 End Tow 6. 1/2 full.
1301 Sledge on deck. Fine silty sand. Some wood debris. no odor/sheen.
1303 Bottom - Tow 7. (5' deep) 25' out
1304:22 Start Tow 7 BTO13
1305:18 End Tow 7. Snag at end. 1/3 full.
1307 Sledge on deck. Fine Silty Sand. brown. Some cobbles no sheen/odor.
1310 Bottom - Tow 8 (10' deep.) 30' out
1311:20 Start. Tow 8 BTO13
1311:50 End Tow 8. Snag. 2/3 full.
1314 Sledge on deck. Dark grey fine silty Sand. no odor/sheen. Some wood debris.
1318 Bottom - Tow 9 (5' deep) 20' out
1318:45 Start Tow 9
1319:20 End Tow 9. Snag 1/2 full

12/7/05 B. Painter BTO13

1322 Sledge on deck (Tow 9) Dark grey & brown fine silty Sand. no sheen/odor.
1325 Bottom - Tow 10 (5' deep) (20' out)
1325:45 Start Tow 10 BTO13
1326:45 End Tow 10. 1/3 full.
1328 Sledge on deck. Brown fine silty sand + wood debris. no sheen/odor.
1333 Bottom - Tow 11 (5' deep) 25' out
1333:35 Start Tow 11 - BTO13
1334:35 End Tow 11. 2/3 full.
1338 Sledge on deck. Coarse wood debris no sheen/odor.
1341 Bottom - Tow 12 (10' → 25' deep) 50' out
13 43:03 Start Tow 12 BTO13
1344:02 End Tow 12. 2/3 full.
1347 Sledge on deck. Fine Sand. no odor/sheen
1350 Bottom Tow 13 (14' deep) 40' out
1351:20 Start Tow 13
1351:40 End Tow 13 Snag. 1/2 full.
1354 Sledge on deck. Brown sand + coarse wood debris. no odor/sheen.
1357 Bottom - Tow 14. (10' deep → 20 feet deep) 40' out
1358:30 Start Tow 14. (BTO13)
1359:05 End Tow 14. 1/3 full
1401 Sledge on deck. Grey Silty sand. + wood debris no odor/sheen

12/7/05 B. Pointer BTO.3 - BTO.4

1408 ~~1404~~ Bottom - Tow 15 (5' deep) 25' out
1409:53 Start Tow 15 BTO.3
1410:15 End Tow 15. Snag ½ full.
1412. Sledge on deck. Brown silty sand. no sheen/odor.
1415 Underway to station BTO.4. (no Moorings)
1425 On Station BTO.4
1428 Bottom - Tow 1 (9' deep) 40' out
1428:55 Start Tow 1. BTO.4
1429:55 End Tow 1. very full
1433 Sledge on deck. fine silt w/ organic debris. no sheen. sulfide odor.
1434 Bottom Tow 2 (10' deep) 40' out
1436:48 Start Tow 2 BTO.4
1437:47 End Tow 2. Full. Rinsing
1440 Sledge on deck. Silt (grey) + organic debris no sheen. sulfide odor.
1442 Bottom Tow 3 (10' deep) 40' out
1443:20 Start Tow 3 BTO.4
1444:20 End Tow 3. Full.
1448 Sledge on deck. Silt + organic debris. no sheen/odor.
1450 Bottom - Tow 4 30' out (8' deep)
1451:23 Start Tow 4 BTO.4
1452:23 End Tow 4. Full

12/7/05 B. Pointer BTO.4

1455 Sledge on deck. Silt + organic debris. no sheen/odor.
1458 Bottom - Tow 5. (15' deep) 80' out
1459:25 Start Tow 5. BTO.4
1500:25 End Tow 5. Full
1504 Sledge on deck. Silt + organic debris. some black sediment. petrol odor. sheen.
1506 Bottom Tow 6 (10' deep) 40' out
1507:08 Start Tow 6
1508:06 End Tow 6. Full.
1511 Sledge on deck. organic debris. some shell fragments. no sheen/odor
1514 Bottom Tow 7 - (9' deep) (40' out)
1514:30 Start Tow 7 BTO.4
1515:28 End Tow 7. Full.
1518 Sledge on deck. Organic debris no sheen/odor.
1521 Bottom - Tow 8 (30' deep) 120' out
1522:50 Start Tow 8 (BTO.4)
1523:14 End Tow 8 - Swing. Empty.
1526 Bottom - Tow 9 (30' deep) 120' out
1526:35 Start Tow 9 BTO.4
1527:55 End Tow 9. Full.
1531 Sledge on deck. Silt w/ organic debris no sheen/odor. Shell fragments

12/7/05 B. Pointer BTO14

1536 Bottom - Tow 10 (30' deep) 120' out
1539:15 Start Tow 10 BTO14
1539:42 End Tow 10. Snag. 1/2 full.
1542 Sledge on deck. Silt + some clay balls green floccules + unidentified unpleasant odor.
1547 Bottom - Tow 11 (30' deep) 120' out.
1548:25 Start Tow 11 BTO14
1549:30 End Tow 11 Full.
1553 Sledge on deck. Silt + clay balls + organic debris. Some sheen. no odor.
1559 Bottom - Tow 12 (30' deep) 120' out
1600:55 Start Tow 12 BTO14
1601:55 End Tow 12. Full.
1605 Sledge on deck. grey/green silt + organic debris. no sheen/odor.
1609 Bottom - Tow 13 (30' deep) 120' out
1610:25 Start - Tow 13
1610:27 End - Tow 13 - Snagged up good.
we are just going to lay it back down + go again without bringing it back up.
1612:33 Start 13-2 (BTO14)
1613:33 End 13-2. Full.
1616 Sledge on deck. grey green silt + organic debris. Sheen observed. decay odor
1617 For this station. Tows 1-8 were in the area near the station. we got very few clams

12/7/05 B. Pointer BTO14

1617 (cont) Tows 9-13 are bottom offshore near the dredge shelf. These tows are far more productive and there is talk of moving the station to compensate.
1620 Bottom - Tow 14 (30' deep) 120' out
1621:03 Start - Tow 14. BTO14
1622:03 End Tow 14. Full. Rinsing
1625 Sledge on deck. Silt + organic debris. no sheen. decay odor.
1627 Underway to Cathedral Park Boat Ramp. Decontaminating equipment.
1632 Alongside Boat Dock. Unloading
1640 Depart Cathedral Park Boat Ramp.
~~1715~~ 1720 Arrive Field Lab. Unload + charge GPS batteries. Make phone calls...
1720 Depart Field Lab.

End of Day

12-7-05

ANC02347
BZTO104(e)002347

12/8/05 B. Pointer BTO:2

0700 Arrive at Field Lab. Loading + Printing paperwork.
0745 Arrive Fred's Marina & Load boats. Getting Setup.
0810 On water and underway to station BTO:2. Crew: Dave Mullins, Helle Anderson, Linda Marsh Jesse Bennet, Brian Pointer. J. Bennet is from Parametrix and is oversight representing USEPA. He has reviewed and signed our HASP. Weather: clear skies, light to moderate winds. Visibility is excellent.
0825 On station BTO:2. Surveying bathymetry and underwater obstructions.
0834 BTO12-Tow1-Bottom (20 deep) 40' out
0835:30 Start Tow1
0836:15 End Tow1. Snag. Full.
0840 Sledge on deck. Silt + coarse wood debris petrol. odor. sheen observed.
0842 Bottom-Tow2 (10' deep) 40' out
0842:50 Start Tow2 (BTO12)
0843:54 End Tow2. Full. Rinsing
0848 Sledge on deck. Fine grey sandy silt + coarse wood material. petrol. odor + sheen.
0849 Bottom-Tow3 (12' deep) 40 out
0849:40 Start Tow3 BTO:2
0850:20 End Tow3. Snag. Full. Rinsing

12/8/05 B. Pointer BTO:2-BTO11

0853 Sledge on deck (Tow 3). Silt + wood debris & refuse. petrol. odor. sheen.
0856 Dave just got a call from Dale Dickenson ~~Cattel~~ saying that we have been reported to USCG by Arco facility personnel. We will continue working until we get
0859 Bottom Tow 4 (10' deep) 40' out
0900:25 Start Tow 4
0901:10 End Tow 4
0905 Sledge on deck. Fine silt.
0912 After consultation with Gene Renebs in Oly we decided to move off of station BTO12 until the access aggreement gets ironed out.
0916 On Station BTO11.
0917 Bottom-Tow 1 (17' deep) 80' out.
0918:45 Start Tow1. (BTO11)
0919:45 End Tow 1. Full.
0924 Sledge on deck. Fine silt mud + wood debris. no sheen/smell.
0927 Bottom-Tow 2 (20' deep) 80' out
0928:57 Start Tow 2 (BTO11)
0929:57 End Tow 2. Full
0933 Sledge on deck. Fine grey silt mud + wood debris. Slight Sulfide odor. no sheen

12/8/05 B. Pointer BTO11

0936 Bottom - Tow 3 (10' deep) 40' out
0937:15 Start Tow 3 (BTO11)
0938:15 End Tow 3. Full. Rinsing
0942 Sledge on deck. Abundant woody debris no sheen/odor.
0944 Bottom - Tow 4 (15' deep) 60' out
0945.23 Start Tow 4 (BTO11)
0946:23 End Tow 4. Full. Rinsing.
0951 Sledge on deck. Silt + wood debris. silt has odor + no sheen.
0953 Bottom - Tow 5. (17' deep) 80' out
0954:05 Start - Tow 5 (BTO11)
0955:05 End - Tow 5 Full Rinsing
0958 Sledge on deck. Fine grey-green silt. no sheen/odor
1001 Bottom - Tow 6 (15' deep) 80' out
1002:45 Start Tow 6 (BTO11)
1003:45 End Tow 6. Full. Rinsing
1007 Sledge on deck. Coarse wood debris + silt. no odor/sheen.
1007 Bottom - Tow 7. (23' deep) 60' out
1010.00 Start Tow 7
1011:00 End Tow 7. Full Rinsing
1013 Sledge on deck grey-green silt. + wood debris. no odor/sheen.

12/8/05 B. Pointer BTO11

1019 Bottom Tow 8 (30 feet deep) 120' out
1020:25 Start Tow 8
1021:29 End Tow 8.
1024 Sledge on deck. Fine silt no sheen/odor.
1028 Bottom - Tow 9 (30' deep) 120' out
1029:15 Start Tow 9
1030:15 End Tow 9. Full. Rinsing
1034 Sledge on deck. Fine silt. no odor/sheen.
1038 Bottom - Tow 10 (25' deep)
1039.10 Start Tow 10 BTO11
1040:11 End Tow 10
1043 Sledge on deck. grey green silt + organic debris. no odor/sheen
1047 Bottom - Tow 11 (30' deep) 120' out
1048:35 Start Tow 11
1049 38 End Tow 11. Full Rinsing
1053 Sledge on deck. Fine grey-green silt. very little organic debris. no odor/sheen
1055 Bottom - Tow 12 (30' deep) 120' out
1057.10 Start Tow 12
1058.10 End Tow 12. Full. Rinsing
1102 Sledge on deck. Fine grey-green silt + organic debris. no sheen/odor.
1105 Bottom - Tow 13. (30' deep) 120' out

ANC02349
BZTO104(e)002349

12/8/05 B. Painter BTO11 - BTO10

1106:55 Start Tow 13. BTO1
1107:30 End Tow 13 Snag. Sledge full.
1110 Sledge on deck. Some silt, no sheen/odor.
1113 Bottom Tow 14. 30' deep 120' out
1115:00 Start Tow 14 BTO1
1116:00 End Tow 14. Full. Raising
1119 Sledge on deck. Some silt no odor/sheen.
1122 Bottom - Tow 15 (10' deep.) 40' out
1123:35 Start Tow 15
1124:35 End Tow 15. Full. Same silt, no odors/sheen. 1 mussell.
1130 Exhausted effort. Underway to restroom and BTO10
1134 On station. Quick Restroom Break.
1145 Back on water. Surveying Buoy at site BTO10
1148 Bottom - Tow 1 (30' deep.) 120' out
1148:50 Start Tow 1 (BTO10)
1149:50 End Tow 1. Full. Raising.
1152 Sledge on deck. Fine grey green silt mud + wood debris. no sheen outside odor. shell frags
1157 Bottom - Tow 2 (40' deep) 160' out
1158:55 Start Tow 2 BTO10
1159:56 End Tow 2. Full Raising
1203 Sledge on deck Fine grey-green silt + sponge wooding debris. no odor/sheen. 1 mussell

12/8/05 B. Painter BTO10

1207 Bottom - Tow 3 (50' deep) 160' out
1209:09 Start Tow 3 BTO10
1210:09 End Tow 3. Empty. Sledge hooked up. large limb came up with it. *Rejected*
1213 Bottom Tow 4. (40' deep) 140' out
1215:10 Start Tow 4 BTO10
1216:11 End Tow 4. Full.
1219 Sledge on deck. Silt + wood debris no sheen/odor.
1222 Break for Lunch.
1300 Break over. Moving to Station BTO10 continued.
1303 Bottom - Tow 5 (40' deep) 110' out
1304:50 Start Tow 5 BTO10
1305:50 End Tow 5. Full. Raising
1309 Sledge on deck. Silt + gravel + wood debris. shell fragments. no odor. light sheen observed.
1312 Bottom - Tow 6 (40 deep)
1313:50 Start Tow 6
1314:15 End Tow 6. Snag Tow empty *Rejected*
1316 Bottom - Tow 7 40' deep 130' out
1318:05 Tow 7 Start
1318:06 End Tow 7. Full.
1323 Sledge on deck. Fine silt + gravel + wood debris, shell fragments no odor. light sheen.

ANC02350
BZTO104(e)002350

12/8/05 B. Pointer BTO10

1326 Bottom - Tow 8 BP (~~40~~ 34 BP deep) 120' out
1327:35 Start Tow 8 BP (BTO10)
1328:20 End Tow 8 BP. Snagged. Sledge Full. Rinsing
1331 Sledge on deck. Silt + gravel + wood debris + refuse. Shell fragments no odor/sheen.
* Tow 8 was logged in GPS as tow 9. I will log the true tow 9 as Tow 9 in GPS.
1335 Bottom Tow 9 (40' deep) 120' out
1336:10 Start Tow 9 (BTO10)
1337:56 End Tow 9. Snag. Full. Rinsing
1340 Sledge on deck: Silt w/ gravel + wood/refuse debris. many shell fragments. no odor/sheen.
1343 Begin Tow 10 (40' deep) 120' out
1344:45 Start Tow 10 (BTO10)
1345:45 End Tow 10. Full.
1350 Sledge on deck. Silt + gravel + wood debris no odor/sheen.
1353 Bottom - Tow 11 (40' deep) 120' out
1354:03 Start - Tow 11
1355:03 End Tow 11. Felt snagged at end of tow. Full.
1358 Sledge on deck. Silty gravel + shell fragments no odor/sheen.
1403 Bottom - Tow 12 (40' deep) 120' out
1404:55 Start - Tow 12
1405:30 End - Tow 12. Snag Full

12/8/05 B. Pointer BTO10

1409 Sledge on deck (Tow 12). Silty gravel w/ some rip-rap cobble. no sheen/odor.
1412 We received work from Scott Bowden earlier that we had permission to sample at Station BTO12 (BP/Arco) We are now returning to finish sampling the site. Called URS consultant for BP/Arco and left a message letting them know we were going to start sampling.
1418 On Station BTO12
1419 Bottom - Tow 5 (12' deep) 40' out
1419:56 Start Tow 5 BTO12
1420:53 End Tow 5. Full.
1424 Sledge on deck. Coarse wood debris, unidentified sweet odor. no sheen.
1426 Bottom - Tow 6 40' out (15' deep)
1426:58 Start Tow 6 BTO12
1427:57 End Tow 6. Full.
1432 Sledge on deck. Silt + wood debris. no odor/sheen.
1435 Bottom - Tow 7 (8' deep) 30' out
1435:45 Start - Tow 7
1436:16 End Tow 7. Snag. 1/4 full. rinsing
1438 Sledge on deck. Fine sticky green silt. no sheen. sulfide odor.

48

12/8/05 B. Pointer BT002 - BT009

1441 Bottom Tow 8 (14' deep) 40' out
1442:55 Start Tow 8
1443:46 End Tow 8. Full.
1449 Sledge on deck. Gray green silt w clay balls + angular cobbles. No sheen. Sulfide odor.
1453 ~~Start~~ Bottom - Tow 9 (6 deep) 25' out
1454:02 Start Tow 9
1454:22 End Tow 9. Snagged. Sledge empty & Rejected
1456 Bottom Tow 10 (30' out) 8' deep
1456:20 Start Tow 10
1457:20 End Tow 10 3/4 full. Rinsing
1500 Sledge on deck. Silt + wood debris. ~~No sheen~~ Sweet smell, light sheen.
1503 Bottom - Tow 11 (16' deep) 50' out
1503:35 Start - Tow 11 BT010
1504:35 End - Tow 11. Sledge 3/4 full. Sledge on deck. Coarse wood debris. Sweet smell. No sheen.
1509 Underway to investigate station BT009.
1515 On Station BT009.
1516 Bottom Tow 1 (15' deep) 60' out
1517:45 Start Tow 1 BT009
1518:45 End Tow 1. Full. Rinsing.

— continued in Volume 3 —

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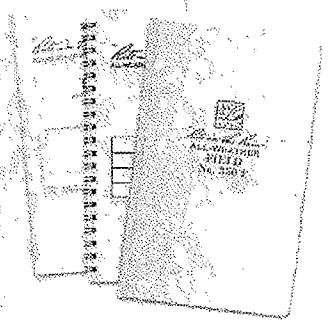
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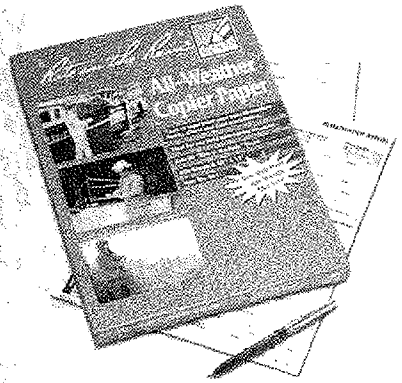

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Portland Harbor RI/FS
Benthic Study Bioaccumulation and
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8 December 2005 - 14 December 2005

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ANC02354
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2 continued (from volume 2)

12/8/05 B. Pointer BT009

1521 Sledge on deck (BT009-Tow1). Grey-green silt mud. sulfide odor. no sheen.

1524 Bottom - Tow 2 (15' deep) 60' out

1525:15 Start Tow2 (BT009)

1526:16 End Tow2. Full. Rinsing

1529. Sledge on deck. All sediment + material washed out. very small amount of wood debris.

1532 Bottom - Tow 3 (13' deep) 60' out

1533:30 Start Tow 3 (BT009)

1534:30 End Tow 3. Full. Rinsing

1538 Sledge on deck. green-grey silt + wood debris. sulfide odor no sheen.

1540 Bottom - Tow 4. (10' deep) 40' out

1541:14 Start Tow 4 (BT009)

1542:14 End Tow 4. Full.

1545 Sledge on deck. Fine silt + woody debris. no odor. no sheen. shell fragments

1547 Bottom - Tow 5 (12' deep) 40' out

1548:40 Start Tow 5 (BT009)

1549:09 End Tow 5. Smaggged. 3/4 full.

1553 Sledge on deck. Fine sandy silt — wood debris. no sheen/odor.

1557 Days work over. on deck on way to boat deck. Helle Anderson is riding back on the processing boat to update a spreadsheet.

12/8/05 B. Pointer

1617 Alongside at Boat launch.

1645 Arrive Field Lab

1710 Depart Field Lab. End of day

12-8-05

ANC02355
BZTO104(e)002355

12/9/05 B. Pointer BTO:9

0705 Arrive Field lab. Load up + print coordinates for sediment crew. Buy lunches.

0735 Arrive at Fred's Marina Boat Launch.

0800 In water & underway to Station BTO09. Crew: Dave Mulling, Shannon Pierce, Linda March, Brian Pointer, Eric Blische (EPA). Weather: clear, cold, light wind. Angelita Rodriguez (BP Processing boat) is calling USCG and Sunrif.

0812 On Station BTO09. Dave Mulling is doing a quick training on running the davit with Shannon Pierce.

0825 Bottom Tow 6 (10' deep)

0826:03 Start Tow 6 BTO09

0826:53 End Tow 6 Full. Rinsing

0831 Sledge on deck. Silt + course wood debris no odor/Sheen. 3 dead mussells

0835 Bottom Tow 7 (11' deep) 40' out

0836:08 Start Tow 7 BTO09.

0837:11 End Tow 7. 3/4 full.

0840 Sledge on deck. Silt + wood debris no odor/Sheen.

0844 Bottom Tow 8 (10' deep) 40' out

0844:33 Start Tow 8

0845:33 End Tow 8. 3/4 Full.

12/9/05 B Pointer BTO09

0849 Course wood debris. Refuse. mussells. no Sheen/odor.

0852 Bottom Tow 9 (10' deep) 40' out

0852:48 Start Tow 9 BTO09

0853:49 End Tow 9. Full. Rinsing

0857 Sledge on deck. Course wood debris no Sheen/odor.

0901 Bottom Tow 10 (8' deep) 40' out

0901:51 Start Tow 10 BTO09

0902:42 End Tow 10. sheen. 1/3 full. Rinsing

0905 Sledge on deck. Sandy Silt. + wood debris & refuse. no sheen. unidentified pleasant woody odor.

0908 Bottom Tow 11 (10 deep) 40' out

0909:30 Start Tow 11

0910:20 End Tow 11. 3/4 full. Rinsing

0915 Sledge on deck. Course woody debris no sheen / faint woody odor.

0918 Bottom Tow 12 - (10' deep) 40' out

0919:30 Start Tow 12 BTO09

0920:30 End Tow 12. 3/4 full.

0923 Sledge on deck. Silt + wood debris no odor / Sheen.

0927 Bottom - Tow 13 (8' deep) 25' out

0928:17 Start Tow 13 BTO09

0929:17 End Tow 13 1/2 full. Rinsing

12/9/05 B. Pointer BTO07

0933 Sledge on deck (Tow 13). Coarse wood debris no sheen/odor. 1 crayfish.
0936 Bottom - Tow 14 (8-10' deep) 40' out
0936:45 Start Tow 14 (BTO07)
0937:18 End Tow 14 Submerged. 1/3 full.
0938 Sledge on deck. Brown sand. mothball odor. no sheen.
0942 Bottom - Tow 15 (10' deep) 40' out
0943:10 Start - Tow 15 BTO07
0944:10 End Tow 15. Full. Rinsing
0948 Sledge on deck. Silt + coarse wood debris. no sheen. mothball-like odor.
0952 Bottom - Tow 16 (5' deep) 40' out
0953:30 Start Tow 16 (BTO07)
0954:30 End Tow 16. Full. Rinsing
0957 Sledge on deck. Silt w/ coarse wood debris + rounded cobbles. no odor/sheen.
1000 Bottom - Tow 17. (10' deep) 40' out
1001:30 Start Tow 17 BTO07
1002:30 End Tow 17. Full. Rinsing
1006 Sledge on deck. Silty sand + wood debris no sheen. mothball odor. shell fragments.
1009 Effort exhausted on this station. Moving on to station BTO08

12/9/05 B. Pointer BTO08

1017 On station BTO08. Deconning equipment.
1020 Bottom - Tow 1 (40' deep) 160' out
1021:43 Start Tow 1 BTO08
1022:44 End Tow 1. Full. Rinsing
1026 Sledge on deck. Coarse wood debris light petrol. odor. no sheen.
1029 Bottom - Tow 2 (40' deep) 160' out
1030:23 Tow 2 Start BTO08
1031:24 End Tow 2. very full. Rinsing
1035 Sledge on deck. Coarse wood debris + some silt/sand mix. no odor. light sheen.
1038 Bottom - Tow 3 (40' deep) 160' out
1039:40 Start Tow 3 BTO08
1040:40 End Tow 3. Full.
1044 Sledge on deck. Coarse wood debris silt. mild petrol. odor. no sheen.
1047 Eric Bische is transferring to processing boat and Andrew Somes + Jesse Bennett has joined our boat.
1050 Bottom - Tow 4 (40' deep) 160' out
1051:23 Start - Tow 4 (BTO08)
1052:23 End - Tow 4. Full. Rinsing
1055 Sledge on deck. Coarse wood debris + silt mild petrol/sulfide odor. no sheen

ANC02357
BZTO104(e)002357

12/9/05 B. Painter BTO08

1058 Bottom - Tow 5 (40 deep) 160 out
1059:14 Start Tow 5 BTO08
1100:14 End Tow 5. 3/4 full.
1103 Sledge on deck. Silt + coarse wood debris light sheen. mild sulfide / petrol. odor.
1106 Bottom Tow 6 (40' deep) 160' out
1107:28 Start Tow 6 BTO08
1108:30 End Tow 6 Full.
1113 Sledge on deck. Silt + coarse wood debris no sheen / sulfide odor.
1116 Bottom Tow 7 (40' deep) 160' out
1117:26 Start Tow 7. BTO08
1118:20 End Tow 7. Full.
1121 Sledge on deck. Silt + wood debris. no sheen. sulfide odor.
1125 Bottom - Tow 8 (40' deep) 160' out
1126:30 Start Tow 8
1126:50 End Tow 8 - Snag 1/4 full. Rinsing
1130 Sledge on deck. Coarse wood debris + silt. no odor / sheen.
1132 Eric Bleiche approved enough tissue + towels for this station. Underway to lunch break + restroom stop. Then BTO07.
1135 Break for Lunch.

12/9/05 B. Painter BTO07

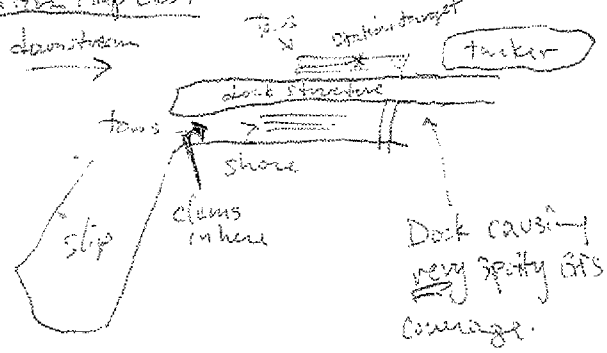
1229 Break over. On Station BTO07 Deploying equipment.
1233 Bottom - Tow 1 (42' deep). 160' out
GPS is real spotty because of dock right next to us. Bouncing errors
1235:10 Start Tow 1 BTO07
1236:10 End Tow 1. Full. Rinsing
1239 Sledge on deck. Silt + organic debris. no odor / sheen.
1241 Bottom - Tow 2 (40' deep) 160' out.
1243:06 Start Tow 2 BTO07
1244:06 End Tow 2. Forgot to End track till ~30 sec after tow ended. Line should stop at end of forward progress. Sledge Full. Rinsing
1248 Sledge on deck. Silt + organic debris. sulfide odor / no sheen.
1250 Bottom - Tow 3 (40' deep) 160' out
1251:43 Start Tow 3 BTO07
1252:43 End Tow 3. 3/4 full.
1256 Sledge on deck. Silt + organic debris. no sheen / odor.
1258 Bottom Tow 4 (45' deep) 200' out
1259:55 Start Tow 4 BTO07
1300:55 End Tow 4. Full.
1305 Sledge on deck. Fine silt + organic debris no sheen. sulfide odor.

ANC02358
BZTO104(e)002358

12/9/05 B. Pointer BT007

1308 Bottom - Tow 5 (12' deep) 50' out
1309:08 Start Tow 5 BT007 GPS real spotty
1310:20 End Tow 5 Snagged right away Empty Sledge!
* Rejected *
1311 Bottom - Tow 6 (12 feet deep) 50' out
1312:51 Start Tow 6 GPS real real spotty.
1313:29 End Tow 6. 1/3 full.
1316 Sledge on. Brown Silty Sand. no sheen/odor.
1 mussell.
1318 Bottom - Tow 7 (15' deep) 50' out
1319:03 Start Tow 7 BT007
1320:05 End Tow 7. 1/3 full.
1322 Sledge on deck. Brown silty Sand + rounded cobbles. no odor/sheen.
1324 Bottom - Tow 8 (16' deep) 60' deep.
1325:13 Start Tow 8 BT007
1326.00 End Tow 8. 1/4 full.

Station Map BT007



12/9/05 B. Pointer BT007

1328 Sledge on deck. Coarse sand/fine gravel. no odor/sheen shrimp (To 8)
1330 Bottom - Tow 9 (12' deep) 50' out
1331:05 Start Tow 9 BT007.
1332:06 End Tow 9. 1/4 full. Snag rope got sucked into jet pump on boat. Motoring slowly over to processing boat to hand over sample and try to repair.
1340 Sledge on deck. Silt + wood debris & cobble. no odor/sheen.
1345 Dave is repairing boat at rear of boat. Rest of crew is mustered at bow to keep the stern high so little/no water comes in.
1425 Repairs done. Underway to Fred's marine boat dock.
1440 Alongside boat dock unloading.
1450 Depart Fred's Marine
1455 Fuel up Previa van.
1505 Arrive Field Lab. Leaving batteries for GPS to charge over weekend. Make phone calls to office.
1555 Depart Field Lab. End of day.

12-9-05

ANC02359
BZTO104(e)002359

12/12/05 C Pointer BT007

0700 Arrive Field lab. Start loading.
0725 Stop at Subway to get Lunch.
0750 Arrive at Fred's Marina Boat Launch
Load up.
0805 Health & Safety Briefing. Dave has replaced the longer rope with the float with a shorter length of rope that is not long enough to get bound up into the jet/engine components. Addendum/modification to HASP was briefed and signed.
0814 On water + underway to station BT007 to collect a few more tows inside behind the dock.
0834 On Station BT007. Setting up sampling gear/winch.
0838 Bottom-Tow 10 (12' deep) 50' out
0839:08 Start Tow 10 BT007
0839:40 End Tow 10. Snag. 1/3 full. Rinsing
0842 Sledge on deck. Course sand/gravel + wood debris. Fishy odor. no sheen.
0845 Bottom Tow 11 (12' deep) 50 out
0846:15 Start Tow 11 (BT007)
0847:07 End Tow 11. Snag. 2/3 full. Rinsing
0849 Sledge on deck. Silt + wood debris. no sheen/odor

12/12/05 B. Pointer BT006

0852 Effort exhausted + tissue requirement fulfilled for BT007. Moving on to station BT006. I called Mat Cusma (Shnitzer Steel) to BP and left message to notify them we would be sampling off of their property.
0902 Called Mat Cusma again to let him know we are starting sampling. Decoming equipment.
0905 On station BT006. Surveying Bathy.
0910 Bottom-Tow 1 (17' deep) 60' out.
0911:22 Start Tow 1 ~~BT007~~ BT006 BP
0911:45 End Tow 1. Snag. Full. Rinsing
0914 Sledge on deck. Sandy Silt, grey green. Sulfide/petrol odor. few florettes of sheen.
0919 Bottom-Tow 2 (15' deep) 60' out.
0920:01 Start Tow 2. BT006
0921:01 End Tow 2. Full.
0924 Sledge on deck. Silt + gravel + clay balls. no sheen/odor. wood debris + many clams
0926 Bottom-Tow 3 60' out (15' deep)
0927:14 Start Tow 3 BT006
0928:15 End Tow 3. Full. Sheen observed while rinsing
0930 Sledge on deck. Brown silt + grey clay balls. petrol. odor. sheen.
0933 Bottom-Tow 4 (15' deep) 60' out
0933:55 Start Tow 4. BT006.
0934:56 End Tow 4. Full.

12/12/05 B. Pointer BTO06

0937 Sledge on deck (Tow 4.) grey silt & brown sand. sheen + petrol/solvent odor.

0941 Bottom Tow 5 (13' deep) 60' out

0942:01 Start Tow 5 BTO06.

0942:42 End Tow 5 ½ full. Snag

0945 Sledge on deck. Sandy silt + gravel & clay balls. no odor. few sheen flocks.

0947 Bottom Tow 6 (13' feet deep) 60' out.

0948:03 Start Tow 6 BTO06

0949:02 End Tow 6. very full. Rinsing

0952 Sledge on deck. Silt + gravel clay balls. petrol/solvent odor. no sheen.

0955 Bottom-Tow 7. (15' deep) 60' out

0956:45 Start Tow 7 BTO06

0957:45 End Tow 7. Full.

1001 Sledge on deck. Silt + clay balls. sheen. no odors. heavy clay.

1004 Bottom-Tow 8 (15' deep) 60' out.

1005:35 Start Tow 8 BTO06

1006:37 End Tow 8. Full.

1010 Sledge on deck. Silt + wood debris petrol odor + sheen.

1016 Bottom Tow 9 (8' deep) 40' out

1017:00 Start Tow 9. BTO06

1017:43 End Tow 9 Snag. Full. Rinsing

12/12/05 B. Pointer BTO06 - BTO05

1020 Sledge on deck. (Tow 9) Brown silty sand + wood debris. no odor/sheen.

1023 Bottom-Tow 10. (16' deep) 60' out

1024:22 Start Tow 10 BTO06

1025:22 End Tow 10. Full. Rinsing

1027 Sledge on deck. Coarse brown/tan sand + clay balls. no sheen/odor.

1030 Effort exhausted and tissue requirements exceeded. Moving onto station BTO05

1035 On station BTO05. Decontaminating equipment + surveying bathymetry.

1040 Bottom-Tow 1 (50' deep) 200' out

1041:36 Start Tow 1 BTO05

1042:36 End Tow 1. ¾ full. Rinsing

1047 Sledge on deck. Olive colored silt + dark grey clay. petrol odor + sheen flocks

1051 Bottom-Tow 2 (40' deep) 160' out

1052:24 Start Tow 2 BTO05

1053:24 End Tow 2. ¼ full. Rinsing

1055 Sledge on deck. Silt (olive) + dark grey silt. petroleum odor. + sheen flocks.

1101 Bottom-Tow 3 (50' deep) 200' out

1102:43 Start Tow 3 BTO05

1103:43 End Tow 3. Full. Rinsing

ANC02361
BZTO104(e)002361

12/12/05 B. Pointer BTOOS

1107 Sledge on deck - (Tow 3) Olive silt + dark grey sand. petrol odor + sheen.
1110 Bottom - Tow 4 (40' deep) 160' out.
1111:25 Start Tow 4 BTOOS
1112:25 End Tow 4. 3/4 full.
1116 Sledge on deck. silt + gravel + wood debris. no odor/sheen.
1119 Bottom - Tow 5 (40' deep) 160' out
1120:20 Start Tow 5. BTOOS
1121:20 End Tow 5. Mostly empty.
* Rejected *
1125 Bottom - Tow 6 (50' deep) 200' out
1126:37 Start Tow 6 BTOOS
1127:43 End Tow 6. Full.
1132 Sledge on deck. grey-green silt + clay balls. unidentified odor. sheen present.
1135 Bottom - Tow 7. (50' deep) 200' paid out
1136:51 Start Tow 7 BTOOS.
1137:51 End Tow 7. Sledge empty.
* Rejected *
1141 ~~Start~~ Bottom Tow 8. 50' deep. 200' out
1143:17 Start Tow 8 BTOOS.
1144:18 End Tow 8. Full.
1147 Sledge on deck. grey-green fine silt strong unpleasant unidentified odor sheen observed

12/12/05 B. Pointer BTOOS

1151 Bottom - Tow 9 (40' deep) 170' out
1152:48 Start Tow 9 BTOOS
1153:50 End Tow 9. Full.
1156 Sledge on deck. ~~Sand~~ clayey silt + wood debris & gravel. no odor/sheen.
1158 Knocking off lunch + bathroom.
1242 Break Over - Resuming sampling
1246 Bottom - Tow 10 (40' deep) 160' deep
1248:18 Start Tow 10 BTOOS
1249:20 End Tow 10. 1/2 full.
1251 Sledge on deck. dark grey silty sand. Some unpleasant odor. Sheen observed.
1255 Bottom - Tow 11. (40' deep.) 160' out
1257:00 Start Tow 11 BTOOS
1258:00 End Tow 11. Full
1300 Sledge on deck. Silt + gravel. no sheen/odor.
1303 Bottom Tow 12. (40' deep) 160' out
1304:54 Start Tow 12 (BTOOS)
1305:56 End Tow 12. Full.
1308 Sledge on deck. Silt + gravel. no odor/sheen.
1311 Bottom - Tow 13 (40' deep) 160' out
1312:45 Start Tow 13 BTOOS
1313:46 End Tow 13. Full.

ANC02362
BZTO104(e)002362

12/12/05 B. Pointer BT005 - BT004

1317 Sledge on deck (Tow 13). Silty orange sand + gravel. no odor/sheen.

1319 Bottom Tow 14. (50' deep) 200' out

1321:02 Start Tow 14. BT005

1322:02 End Tow 14. Full

1326 Sledge on deck. Silt + sand + wood debris. unpleasant odor. no sheen.

1332 Bottom - Tow 15 (50' deep) 200' out

1334:11 Start Tow 15 (BT005)

1335:11 End Tow 15 Full.

1339 Sledge on deck. Silt + gravel. no odor/sheen.

1341 Moving on to station BT004. Deploying equipment.

1348 On station on BT004. Surveying Bathy.

1351 Bottom - Tow 1 (16' deep) 60' out

1352:58 Start Tow 1. BT004

1353:15 End Tow 1. Snag. ½ Full.

1356 Sledge on deck. Brown silty sand + some cobbles. no sheen/odor

1403 Bottom - Tow 2. (15' deep) 60 out

1403:40 Start Tow 2 BT004

1404:30 End Tow 2. Full

1407 Sledge on deck, Brown/tan sand + wood debris. no odor/sheen.

12/12/05 B. Pointer BT004

1410 Bottom Tow 3 (15' deep) 60 out

1411:35 Start Tow 3. BT004

1412:35 End Tow 3. Full.

1414 Sledge on deck. dark grey sand + wood debris. Sheen observed. mild petrol odor.

1417 Bottom - Tow 4 (14' deep) 80' out

1418:48 Start Tow 4 BT004

1419:48 End Tow 4. 3/4 full. Rising.

1422 Sledge on deck. Brown sand + wood debris. no sheen/odor.

1425 Bottom - Tow 5 (10 deep) 40' out

1426:03 Start Tow 5 BT004

1426:57 End Tow 5. snag. full.

1429 Sledge on deck. Dark brown sand + wood debris. no sheen/odor

1433 Bottom - Tow 6 (12' deep) 40' out

1434:04 Start Tow 6 BT004

1435:04 End Tow 6 1/3 full.

1437 Sledge on deck. Wood debris. no odor no sheen.

1441 Bottom - Tow 7 (11' deep) 40' out

1442:42 Start Tow 7 BT004

1443:42 End Tow 7. 1/3 full.

1444 Sledge on deck. Gravel + clay balls + wood debris. no sheen/odor.

12/12/05 B.Pointer BT004

1445 Bottom-Tow 8. (15' deep) 80' out
1446:55 Start Tow 8. BT004
1447:53 End Tow 8. 1/4 full.
1450 Sledge on deck. woody debris no sheen/odor.
1451 Motoring back to Fred's Marina. Ending the day early due to Mike Mey (captain of processing boat) not feeling well.
1503 Alongside dock at Fred's Marina. Unloading and using time to remark 10' increments on wire.
1530 Leave Fred's Marina.
1548 Arrive Field Lab. Change batteries and transfer data from processing boat computer.
1553 Depart Field Lab

End of Day

12-12-05

12/13/05 B. Pointer BT001-BT004

0700 Arrive at Field Lab. Grab batteries + pick up lunch.
0745 Arrive at Fred's Marina Boat Launch. Load up boats & get set up for the day.
0756 On water + underway to BT004: Crew on board - Dave Mullins, Linda Marsh, Kathleen Hurley, Brian Pointer. Weather - Cold, calm overcast. Some fog. visibility ~1 mile.
0807 On station BT004.
0808 Bottom-Tow 9. (11' deep) 50' out
0809:04 Start Tow 9 BT004
0809:05 End Tow 9. 1/3 full.
0812 Sledge on deck. Brown sand + clay balls. no sheen/odor.
0814 Bottom-Tow 10 (14' deep) 40' out
0815:14 Start Tow 10 BT004
0816:15 End Tow 10. 1/2 full.
0818 Sledge on deck. ~~1/2 full~~ BP Coarse sand, gravel + wood debris no sheen/odor
0820 Effort exhausted: tissue requirements met. Moving on to station ~~BT003~~ BP BT001
0832 On station BT001. Surveying Bathy.
0838 Bottom-Tow 1 - (12' deep) 40' out

12/13/05 B. Pointer BTO1

0838:45 Start Tow 1 BTO1
0839:45 End Tow 1. 3/4 full.
0844 Sledge on deck. Brown silt/fine sand + wood debris. no sheen/odor.
0847 Bottom - Tow 2 (10 deep) 40 out
0847:49 Start Tow 2 BTO1
0848:49 End Tow 2. 2/3 full.
0851 Sledge on deck. Dark Brown silt/fine sand mix + wood debris. no odor/sheen.
0856 Bottom - Tow 3 (18' deep)
0857:43 Start Tow 3 BTO1 80 out
0858:44 End Tow 3. Full.
0902 Sledge on deck. Grey silt. no odor. Some sheen, pyrites
0905 Bottom - Tow 4 (6' deep) 40 out
0906:05 Start Tow 4 BTO1
0907:05 End Tow 4. 3/4 full.
0910 Sledge on deck. Sand + wood debris. no sheen/odor.
0912 Bottom Tow 5 (10 deep) 40 out
0913:12 Start Tow 5 BTO1
0914:14 End Tow 5. 1/4 full.
0916 Sledge on deck. Fine Brown Sand no sheen/odor. Shell fragments

12/13/05 B. Pointer BTO1

0919 Bottom Tow 6 (10 deep) 40 ~~deep~~ 60 out
0920:25 Start Tow 6 BTO1
0921:19 End Tow 6. Snag. 2/3 full.
0924 Sledge on deck. Fine Brown silty sand + wood debris. no sheen/odor.
0927 Bottom Tow 7 (10' deep) 40 out
0928:58 Start Tow 7 BTO1
0929:58 End Tow 7. Full.
0933 Sledge on deck. Sand/silt + abundant wood debris
0935 Bottom - Tow 8 (15' deep) 50 out
0936:15 Start Tow 8 BTO1
0937:15 End Tow 8. 2/3 full.
0941 Sledge on deck. Sandy Silt (Brown) + abundant wood debris. no sheen/odor. This tow was done perpendicular to shore in a trough-like depression in bathymetry.
0946 Bottom - Tow 9 (10 deep) 40 out
0946:45 Start Tow 9 BTO1
0947:46 End Tow 9. Full Rinsing
0951 Sledge on deck. Grey-brown silty sand + abundant wood/organic debris no sheen/odor.
0954 Bottom - Tow 10 (10 deep) 40 out
0955:12 Start Tow 10 BTO1
0956:13 End Tow 10 2/3 full.

12/13/05 B. Pointer BT001 - BT002

0959 Sledge on deck (Tow 0) Silty Brown sand + wood debris no sheen/odor.

1001 Underway to Station BT002

1004 On station BT002

1005 Bottom - Tow 1 (25' deep) 120 out

1008:30 Start Tow 1 BT002

1007:14 End Tow 1 - Snag. 1/8 full

1010 Sledge on deck. wood debris + shell debris. no sheen/odor.

1011 Bottom - Tow 2 (15-30' deep) 120 out

1013:17 Start Tow 2 BT002

1014:17 End Tow 2. 2 full. Rinsing

1016 Sledge on deck. Fine grey-green silt. mild sulfide odor. no sheen.

1019 Restroom Break - Cedar Marina

1055 Break over. Resuming with Tow 3.

1059 Bottom - Tow 3 (15' deep) 60' out

1059:52 Start Tow 3 BT002

~~1100~~ BP 1100:52 End Tow 3. Full.

1103 Sledge on deck. Course sand + gravel no sheen/odor

1106 Bottom - Tow 4 (15' deep) 90' out

1107:22 Start Tow 4 BT002

1108:24 End Tow 4. Full

12/13/05 B. Pointer BT002

1112 Sledge on deck. Fine gravel (black) some wood debris. no sheen/odor

1114 Bottom - Tow 5 (20 deep) 80' out

1115:25 Start Tow 5 BT002

1116:29 End Tow 5. Full. Sheen observed while Rinsing

1119 Sledge on deck. Course sand + gravel. light sheen. no odor.

1121 Bottom - Tow 6 (20' deep) 80' out

1122:42 Start - Tow 6 BT002

1123:44 End Tow 6. Full.

1128 Sledge on deck. dark grey/black sand/fine gravel mix. no sheen/odor.

1130 Bottom - Tow 7. (20' deep) 80' out

1131:14 Start Tow 7 BT002

1132:12 End Tow 7. Full

1135 Sledge on deck. Sandy silt + wood debris. no odor/sheen.

1137 Bottom - Tow 8 (20' deep) 80' out

1138:25 Start - Tow 8 BT002.

1139:25 End Tow 8. 3/4 Full - Sheen observed while Rinsing

1143 Sledge on deck. Course wood debris + pebbles. no odor/no sheen.

1145 Bottom Tow 9 (20' deep) 80 out

1146:35 Start Tow 9 BT002

1147:35 End Tow 9 Full.

12/13/05 B. Painter BT1:2 BT003

1150 Sledge on deck. Sandy silt + gravel no odor/no sheen

1152 Bottom - Tow 1C (22' deep) 80' out.

1153:23 Start Tow 1C BT003

1154:25 End Tow 1C full

1153 Sledge on deck. Fine gravel + sand. no odor. no sheen.

1200 Next station is BT003, nearby Fred's Marina. We will tie up at Fred's to have lunch and move on to station afterwards. Underway

1202 Alongside @ Fred's Lunch

1250 End Lunch Break. Underway to BT003

1253 On station BT003. A patch of floating logs is right over the station target. We will work around it.

1254 Bottom - Tow 1 (20' deep) 80 out

1255:15 Start Tow 1 BT003

1256:15 End Tow 1 Empty Sledge + Reject #

1258 Bottom - Tow 2 (25' deep) 100 out

1258.35 Start Tow 2 BT003

1259.35 End Tow 2. 1/2 full.

1300 Sledge on deck. Silty Sand + wood debris. no odor/sheen. Crayfish eggs

1305 Bottom - Tow 3 (30' deep) 120' out.

12/13/05 B. Painter BT003

1300.36 Start Tow 3 (BT003)

1307:36 End Tow 3. 3/4 full.

1311 Sledge on deck. Abundant wood debris no odor/sheen. shrimps.

1314 Bottom - Tow 4 (30' deep), 120' out

1315:15 Start Tow 4 BT003

1315:41 End Tow 4. Snag. Full. Rinsing.

1319 Sledge on deck. wood debris. no sheen. woody odor.

1321 ~~1421~~ BP Bottom - Tow 5 (25' deep) 120' out

1322:56 Start Tow 5 (BT003)

1323:20 End Tow 5. Snag. 2/3 full. rinsing

1325 Sledge on deck. Course wood debris. no sheen/odor.

1328 Bottom - Tow 6 (30' deep) 120 out

BP ~~1414~~ 1329.43 Start Tow 6 BT003

1330.15 End Tow 6 3/4 Full. Rinsing

1333 Sledge on deck. Wood debris no sheen/odor.

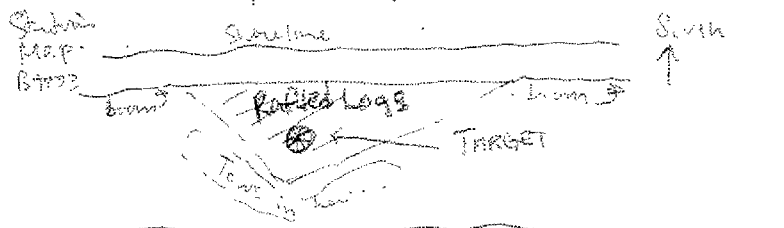
1335 Bottom - Tow 7. (30 deep) 120 out

1336:54 Start Tow 7 BT003.

1337:40 End Tow 7. Snag. 2/3 full.

1340 Sledge on deck. Course wood debris. no sheen/odor.

12/13/05 B. Powers BT003 - BTO11



1348 Bottom - Tow 8 (30' deep) 120' out
1344:24 Start - Tow 8 BT003
1345:01 End - Tow 8. Spray, 3/4 Full.
1348 Sledge on deck. Dark grey silt + abundant wood debris.
1352 Bottom - Tow 9 (30' deep) 120 out
1353:08 Start Tow 9 BT003
1354:08 End Tow 9 1/2 Full
1357 Sledge on deck. Brown silty sand + abundant wood debris. no odor/sheen.
1401 Bottom - Tow 10 (30' deep) 120 out
1402:59 Start Tow 10 BT003
1403:58 End Tow 10 1/2 full. Brown sandy silt + coarse wood debris. no odor/sheen.
1410 Moving onto station BTO11 to try to get more tissue from that station.
1425 On Station BTO11.
1429 Bottom - Tow 16 (13' deep) 40' out
1429:30 Start Tow 16 BTO11
1430:30 End Tow 16 Full. Rinsing

12/13/05 B. Pointer BTO11

1433 Sledge on deck. Wood debris. mild petrol odor. no sheen.
1437 Bottom - Tow 17. (5' deep) 20' out
1437:39 Start Tow 17 BTO11
1438:38 End Tow 17. Sledge empty Flipped over * Reject *
1439 Bottom - Tow 18 (20' deep) 40' out
1440:30 Start Tow 18 BTO11
1441:30 End Tow 18. 1/2 Full.
1445 Sledge on deck. Brown sand + wood debris. no sheen/odor.
1447 Bottom - Tow 19 (10 deep) 40 out
1447:33 Start Tow 19 BTO11
1448:53 End Tow 19. Full.
1450 Sledge on deck. Dark grey silty sand + wood debris. no sheen/odor.
1454 Bottom - Tow 20. (16' deep) 60' out
1454:38 Start Tow 20 (BTO11)
1455:40 End Tow 20 Full.
1458 Sledge on deck. Grey-green silt no sheen. Sulfide odor
1501 Bottom - Tow 21 15' deep. 10' out
1502:06 Start Tow 21 BTO11
~~End~~ End Tow 21, very Full. Rinsing
BP 1503:06 Sheen observed.

12/13/05 B. Pointer BT011

1506 Sledge on deck (Tow 21). Silt + wood debris. mild Petrol. odor. no sheen.
1509 Bottom - Tow 22 (10 deep) 40 out
1510:09 Start Tow 22 BT011
1511:09 End Tow 22 Full.
1515 Sledge on deck. Coarse wood debris. no sheen. mild petrol. odor.
1518 Bottom - Tow 23 (11' deep) 40' out
1518:30 Start Tow 23. BT011
1519:31 End Tow 23. 3/4 full.
1522 Sledge on deck. dark grey silty sand + wood debris. no sheen/odor.
1524 Bottom Tow 24 (21 deep) 80' out
~~1525:25~~ 1525:25 Start Tow 24 BT011
1526:25 End Tow 24. Full.
1529 Sledge on deck. Fine olive color silt sulfide odor/no sheen.
1531 Effort exhausted. Motoring to Fred's Marine Boat Dock.
1540 ~~Depart~~ Alongside Boat Dock
1558 Depart Boat Dock
1610 Arrive Field Lab. Charge up GPS batteries
1630 Depart Field Lab End of Day

12-13-05

12/14/05 B. Pointer BT014

0700 Arrive Field Lab for loading.
0720 Depart field lab on way to Cathedral Park Boat launch.
0730 Return to field lab to look up.
0748 Arrive at Cathedral Park boat launch. load + get setup Quick Health + Safety briefing.
0754 On water and underway to station ~~BT011~~ BT014. Previous tows outside delfine were productive with clams. Therefore the station was moved.
0759 On station BT014.
0802 Bottom - Tow 15 (35' deep) 140' out
0803:30 Start Tow 15. BT014
0804:30 End Tow 15. Full. Rising
0808 Sledge on deck. Silt + wooden debris. Petrol/sulfide odor. no sheen
0811 Bottom - Tow 16. 20 deep. 90' deep
0812:40 Start Tow 16 BT014
0813:45 End Tow 16. Full.
0817 Sledge on deck silt + organic debris no sheen. sulfide odor.
0821 Bottom - Tow 17 (40' deep) 160' out
0823:53 Start Tow 17 BT014
0824:49 End Tow 17. Sharp at end

12/14/05 B. Pointer BTO14-BTO15

0827 Sledge on deck. Silt + woody organic debris petrol. tar odor. no sheen.
0830 Bottom - Tow 18 (40 deep) 160' out
0831:34 Start Tow 18 (BTO14)
0832:36 End Tow 18. Full
0837 Sledge on deck. Silt + organic debris. no odor sheen floretts.
0840 Bottom - Tow 19 (30 deep)
0841:34 Start Tow 19 BTO14 120' out
0842:35 End Tow 19 Full
0846 Sledge on deck. Silt + organic debris no sheen. petrol. odor.
0849 Bottom Tow 20 (40 deep) 160' out
0850:43 Start Tow 20 BTO14
0851:43 End Tow 20. Full.
0856 Sledge on deck. Silt + wood debris. petrol odor. light sheen.
0859 Effort exhausted. Moving on to station ~~BTO14~~ BTO15 (Gasco). Previous good tows here were 8, 9, 11, 12.
0911 Bottom - Tow 16 (15' deep) 60' out
0912:13 Start Tow 16 BTO15
0912:35 End Tow 16 - Snag Empty
* Rejected *

B. Pointer BTO15

0916 Bottom Tow 17 (5' deep) 60' out)
0917:40 Start Tow 17 BTO15
0917:41 End Tow 17. Snagged. Bag is full...
I thought the snag would ruin the tow so I cancelled the GPS track. This tow almost exactly mirrored tow 5, I will notify the GIS crew that this is the case.
0921 Sledge on deck. Silt + woody organic debris. no sheen / odor.
0928 Dropped off USB drive with previous days tow data to Esopt in Cathedral Park.
0935 Bottom - Tow 18 (40' deep) 110' out
0937:57 Start Tow 18 BTO15
0938:57 End Tow 18. Full.
0942 Sledge on deck. Silt w/ refuse + wood debris petrol. odor. ~~no~~ light sheen
0944 Bottom Tow 19 (15' deep) 60' out
0945:32 Start Tow 19 BTO15
0945:34 End Tow 19. Snag right away. Empty
* Rejected *
0950 Bottom - Tow 20 (50' deep) 20' out
0952:05 Start Tow 20 BTO15
0952:55 End Tow 20. Snag. Full

12/14/05 B. Pointer BT015

0958 Sledge on deck (Tow 20). Silt + non ne ane gravel. Some wood debris. Strong petrol odor — heavy sheen.

1002 Towing Mike May's boat to Cathedral Park dock. He is having engine problems.

1013 Motoring back to station to collect 2 tows & ferry back to processing boat.

1017 Bottom - Tow21 (40' deep) 160' out

1019:04 Start Tow21 BT015

1020:02 End Tow21. Strong at end. Sledge Full.

1027 Sledge on deck. Silt + wood debris + and many sheen flowettes. petrol odor.

1030 Bottom - Tow22 (35' deep) 140' out

1031:40 Start Tow22 (BT015)

1032:04 End Tow22. Snag. Sledge Full.

1039 Sledge on deck. Silt + gravel + wood debris. Strong petrol odor. heavy sheen.

1043 Restroom break. + Repairs to Mike May's boat. Cathedral Park Boat Ramp.

1117 Underway to Station BT019. On way - we will dump gasco material at Gasco site. Good tows at BT019 (Zidell) are ~~BT01~~ BP 4, 5, 7, 10.

1121 Dumped course material collected at Gasco site at the Gasco site near collection area

12/14/05 B. Pointer BT019

1135 On Station BT019. Recovering equipment and surveying area

1140 Bottom - Tow11 (15' deep) 60' out

1141:04 Start - Tow11 BT019

1142:04 End Tow11. 3/4 full.

1145 Sledge on deck. Fine silt. Mild fishy odor. Sheen flowette.

1148 Bottom Tow12 (15' deep) 60 out

1149:22 Start Tow12 BT019

1150:26 End Tow12 Full. Rinsing

1153 Sledge on deck. Silt + wood debris no sheen/no odor.

1158 Bottom Tow13 (10' deep) 60' out

1158:47 Start Tow13 BT019

1159:47 End Tow13. Full.

1203 Sledge on deck. Silt + wood debris no odor/sheen.

1207 Bottom - Tow14 (10 → 15' deep) 60' out

1207:55 Start Tow14 BT019

1208:22 End Tow14. Snag. 2/3 Full. Rinsing

1212 Sledge on deck. Abundant woody debris. no odor, no sheen.

1216 Bottom - Tow15 (10 → 15' deep) 60' out

1217:04 Start Tow15 BT019

1218:05 End Tow15. 3/4 full Rinsing

12/14/05 B. Pointer BTO.9

1220 Sledge on deck (Tow 15). Brown foundry silt + wood debris. no odor. Sheen [illegible]

1223 Lunch Break.

1256 Lunch Break over. Continuing on of Tow 16.

1257 Bottom - Tow 16 (10 - 15' deep) 60' out

1258:17 Start Tow 16 (BTO.9)

~~12~~ 1259:30 End Tow ~~8~~ BSP 16. Sledge full.

1304 Sledge on deck. Silt + woody debris. no odor. no sheen.

1306 Effort exhausted. Going back to Station BTO.5 (basco) to try for a few more tows.

1319 On station BTO.5.

1320 Bottom - Tow 23 (40' deep) 160' out

1322:23 Start Tow 23 BTO.5

1322:40 End Tow 23. Snag. 3/4 full. Rinsing

1327 Sledge on deck. Silt + woody debris petrol. odor. light sheen.

1330 Bottom - Tow 24 (40' deep) 160' out

1332:00 Start Tow 24 BTO.5

1332:45 End Tow 24. Full.

1337 Sledge on deck. Silt + angular gravel Strong petrol. odor + heavy sheen

1337 Effort exhausted. Heading back to Cathedral Park Boat launch. Decoming equipment.

12/14/05 B. Pointer BTO.9

1352 Alongside at Cathedral Park Boat launch. Unloading.

1410 Depart Cathedral Park.

1420 Arrive ~~Cathedral~~ BSP Field Lab. Unload.

1555 Depart Field Lab. End of Day

12-14-05

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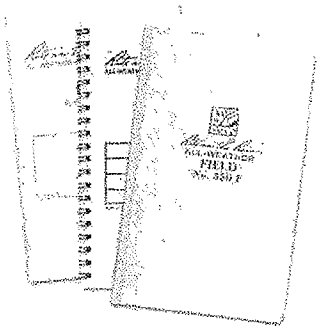
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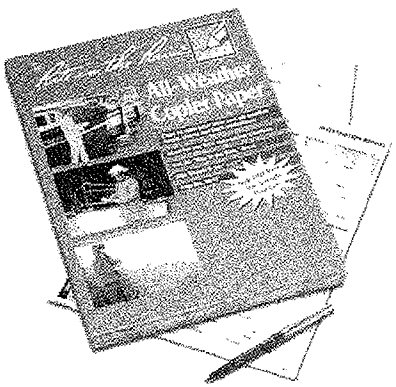
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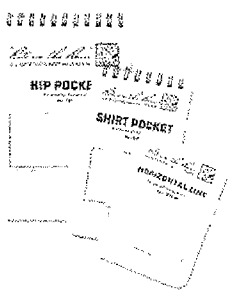
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ANC02373
BZTO104(e)002373

Field Collection Form

Project Name: LWG RA-Round 2 Benthic Invertebrate (Clam Sledge) Sampling

Project no. 03-28-04-31

Date: 11/28/05

Crew: TDo, AR, MM
Oversight JP, JG, AB, JB, MS, CT

Sample ID	Width of *Corbicula* sp.	Estimated Biomass (g ww)	Comments
LW2-BTFC029	8 mm	0.12	Tow 1, Presence of large empty Corbicula
			shells, gravel & chironomids
		∅	Tow 2, No clams collected. Presence of
			clam shells, chironomids & silt with sheen
		∅	Tow 3, No clams collected. Presence of
			1 clam shell, chironomids & silt
		∅	Tow 4, No clams collected. Presence of
	~~5 mm~~ AR	~~0.05~~ AR	(AR) Banded Killifish juv. ~~crappie~~, chironomids & silt
	5 mm	0.05	Tow 5, Presence of chironomids & silt
	24 mm	1.06	Tow 6, Presence of chironomids & silt
	33 mm	2.01	Tow 6
			Tow 7, No clams collected, presence
			of chironomids
		∅	Tow 8, No clams collected, presence
			of chironomids & silt
	21 mm	0.81	Tow 9, ~~[illegible]~~ (AR) Presence of organic
	32 mm	1.89	debris, paint chips, sand & silt
	29 mm	1.55	↓
		∅	Tow 10, No clams collected, presence
			of dragon fly larvae and silt
		∅	Tow 11, No clams collected, presence
			of 2 juv. Banded Killi Fish pre
			chironomids & organic material
	14 mm	(AR) ~~0.36~~ 0.36	Tow 12, Organic debris, silt
			↓
	11 mm	0.22	Tow 13, Organic debris, ~~[illegible]~~ (AR) corophium

silt
Total weight for all tows 8.07 g ww
(9 clams)

Field Collection Form

Project Name: LWG RA-Round 2 Benthic Invertebrate (Clam Sledge) Sampling

Project no. 03-28-04-31

Date: 11/28/05

Crew: AR, TDa, MM, AB, JP, CT (oversight)

Sample ID	Width of *Corbicula* sp.	Estimated Biomass (g ww)	Comments
LW2-BTFC026		0	Tow 1 No clams collected, presence of shell fragments, organic debris, paint chips, silt & oysters
		0	Tow 2, No clam collected, presence of shell fragments, organic debris, and silt with a sheen.
	19mm	0.67	Tow 3, Presence of organic material, shell fragments, paint chips, and silt with a sheen.
			Tow 4, No clams collected, presence of oyster shell fragments, paint chips, and silt with a sheen.
	7mm	0.09	Tow 5 shell fragments, organic debris, silt, paint chips
	24 mm	1.06	Tow 6, shell fragments, organic debris, silt, sand
	26 mm	1.25	
	29 mm	1.55	
	16 mm	0.47	
	17 mm	0.53	
	15 mm	0.41	
	13 mm	0.31	
	10 mm	0.18	
	7 mm	0.09	
	7 mm	0.09	

Field Collection Form

Project Name: LWG RA-Round 2 Benthic Invertebrate (Clam Sledge) Sampling

Project no. 03-28-04-31

Date: 11/29/05

Crew: AR, TDO, MM
D.G. (oversight)

Sample ID	Width of *Corbicula* sp. (mm)	Estimated Biomass (g ww)	Comments
LW2-BTFC026	27	1.35	Tow 7, shell fragments, organic debris & silt with a sheen.
	24	1.06	Tow 8, sand, organic debris, shell fragments,
	14	0.36	paint chips, and a sheen.
	7	0.09	↓
	12	0.27	↓
	0	0	Tow 9, no clams collected, rocks, shell fragments,
	0	0	and asphalt.
	16	0.47	Tow 10, presence of sand, organic debris,
	6	AR ~~0.39~~ 0.07	shell fragments, paint chips and sheen.
	8	0.12	↓
	10	0.18	Tow 11, presence of sand, organic debris,
	11	0.22	shell fragments, paint chips and sheen.
	20	0.74	↓
	20	0.74	
	23	0.98	
	14	0.36	
	12	0.27	
	12	0.27	↓ Total for all tows 14.25 g ww (28 clams)
LW2-BTFC022	23	0.98	Tow 1, sand, organic debris, red brick,
	11	0.22	paint chips, shell fragments, chironomids,
	7	0.09	and sheen.
	7	0.09	↓
	8	0.12	Tow 2, silt, organic debris, shell fragments,
	16	0.47	and chironomids.
	7	0.09	Tow 3, silt, organic debris, and shell
	19	0.67	fragments, shrimp.
	24	1.06	↓
	8	0.12	Tow 4, silt, sheen, organic debris, and

Field Collection Form

Project Name: LWG RA-Round 2 Benthic Invertebrate (Clam Sledge) Sampling

Project no. 03-28-04-31

Date: 11/29/05

Crew: AR, TDo, MPM DG (oversight)

Sample ID	Width of *Corbicula* sp. (mm)	Estimated Biomass (g ww)	Comments
LW2-BTFC022	AR 211	0.22	Shell fragments. Tow 4
	26	1.25	↓
	34	2.14	↓
	0	0	Tow 5, No clams collected
	14	0.36	Tow 6, silt, organic debris, wood stump,
	14	0.36	bolt, chironomids, leach. paint chips,
	18	0.6	sheen
	20	0.74	↓
	27	1.35	↓
	28	1.45	↓
	31	1.78	↓
	12	0.27	Tow 7, silt with sheen, organic debris,
	20	0.74	shell fragments, chironomids, paint
	20	0.74	chips, and 3 shrimp.
	21	0.81	↓
	26	1.25	↓
	30	1.66	↓
	34	2.14	↓
	13	0.31	Tow 8, silt with sheen, organic debris,
	13	0.31	shell fragments, paint chips & mussel.
	13	0.31	mussel width 51 mm
	18	0.6	↓
	20	0.74	↓
	25	1.15	↓
	27	1.35	↓
	29	1.55	↓
	31	1.78	↓
	33	2.01	↓

Field Collection Form

Project Name: LWG RA-Round 2 Benthic Invertebrate (Clam Sledge) Sampling

Project no. 03-28-04-31

Date: 11/29/05

Crew: AR, TDO, MM
DG (oversight)

Sample ID	Width of *Corbicula* sp. (mm)	Estimated Biomass (g ww)	Comments
LW2-BTFC022	0	0	Tow 9 No clams collected
	21	0.81	Organic debris, silt, shell fragments
			Tow 10, silt with sheen, organic debris,
			chironomids, shell fragments,
			and dragonfly larvae.
			Total for all tows 32.69 g ww (30 clams)
LW2-BTFC023	12	0.27	Tow 1, silt sheen, organic debris, paint
	29	1.55	chips, Chironomids, and 3 shrimp.
	25	1.15	Tow 2, silt, organic debris, shell fragments,
			chironomids and 1 shrimp
	0	0	Tow 3, silt with sheen chironomids,
			organic debris, shell fragments and
			4 shrimp. No clams collected
	14	0.36	Tow 4, silt, organic debris, Chironomids,
	6	0.07	shell fragments and paint chips.
	17	0.53	Tow 5, silt with sheen, organic debris,
			shell fragments, chironomids, paint chips,
			and 4 shrimp.
	0	0	Tow 6, No clams collected. Silt, organic
			debris, shell fragments, chironomids, paint
			chips, and 3 shrimp.
	0	0	Tow 7, ND clams, silt, organic debris,
	~~6~~ MR	~~0.07~~ AR	shell fragments, chironomids & 5 shrimp.
	6	0.07	Tow 8, silt, rope, asphalt, chironomids,
			organic debris, & shell fragments.
	10	0.18	Tow 9, silt with sheen, organic debris,
	12	0.27	shell fragments, chironomids, dragonfly
	16	0.47	larvae & 1 shrimp

Field Collection Form

Project Name: LWG RA-Round 2 Benthic Invertebrate (Clam Sledge) Sampling

Project no. 03-28-04-31

Date: 11/29/05

Crew: AR, TDO, MM
DG (oversight)

Sample ID	Width of *Corbicula* sp.	Estimated Biomass (g ww)	Comments
LW2-BTFC023	17	0.53	Tow 9
	17	0.53	Tow 9
	6	0.07	Tow 10, silt with sheen, organic
	6	0.07	debris, shell fragments, paint chips
	6	0.07	Tow 10
	8	0.12	Tow 10
	9	0.15	↓
	13	0.31	
	22	0.89	Total clams collected 20
	24	1.06	Total weight for all tows: 8.72 g ww
LW2-BTFC032	0	0	Tow 1, silt with sheen, organic debris, sand,
			shell fragments, paint chips, No clams
	0	0	Tow 2, No clams, coarse sand & organic
			debris, processed by sledge crew - Rejected
	0	0	Tow 2 (redo), No clams, woody debris, shell
			fragments and paint chips
	0	0	Tow 3, No clams, silt, gravel, organic
			debris, shell fragments & paint chips
	0	0	Tow 4, No clams, silt and organic
			debris
	13	0.31	Tow 5, silt with sheen, organic debris
	14	0.36	Tow 5
	17	0.53	Tow 6, silt with sheen, sand, organic debris
	0	0	Tow 7, silt with sheen, sand, organic debris
LW2-BTFC029	12	0.27	Tow 14
	31	1.78	Tow 15
	43	3.42	↓

Field Collection Form

Project Name: LWG RA-Round 2 Benthic Invertebrate (Clam Sledge) Sampling

Project no. 03-28-04-31

Date: 11/30/05

Crew: AR, TDO, MM
DG (oversight)

Sample ID	Width of *Corbicula* sp.	Estimated Biomass (g ww)	Comments
LW2-BTFC032	0	0	Tow 8, no clams, silt, gravel, organic debris,
			chironomids, screw
	0	0	Tow 9, no clams, silt, gravel, organic debris,
			chironomids, plastic, paint chips
	5	0.05	Tow 10, silt, gravel, organic debris, paint chips
	9	0.15	Total weight for all tows ~ 1.4 g ww (5 clams)
LW2-BTFC033	0	0	Tow 1, no clams, silt, chironomids, organic debris,
			shell fragments
	0	0	Tow 2, no clams, silt with sheen, organic
			debris, chironomids, plastic, paint chips
			~~Tow 3,~~ (AR) Mussel width 87 mm
	(AR) ~~29~~ 29	(AR) 0 1.55	Tow 3, silt with sheen, organic debris, shell
	32	1.89	fragments, chironomids, plastic, paint chips
	36	2.4	~~Tow 4,~~ (AR)
	0	0	Tow 4, no clams, silt with sheen, organic
			debris, shell fragments, chironomids, plastic,
			paint chips, shrimp
	39	2.81	Tow 5, silt with sheen, wood debris, shell
			fragments, paint chips
	32	1.89	Tow 6, silt with sheen, chironomids, shell
	33	2.01	fragments, organic debris, shrimp
	6	0.07	Tow 7, silt, chironomids, shell fragments, organic debris
	6	0.07	Tow 8, silt, chironomids, shell fragments, organic debris, plastic
	0	0	Tow 9, silt with sheen, chironomids, gravel, organic
	0	0	debris, plastic
	0	0	Tow 10, silt with slight sheen, chironomids, organic
			debris, shell fragments, paint chips
			Total weight for all tows = 12.69 g ww (8 clams)

Field Collection Form

Project Name: LWG RA-Round 2 Benthic Invertebrate (Clam Sledge) Sampling

Project no. 03-28-04-31

Date: 11/30/05

Crew: AR, TDo, MM
DG (Oversight)

Sample ID	Width of *Corbicula* sp.	Estimated Biomass (g ww)	Comments
LW2-BTFC031	38	2.67	Tow 1, silt, sand, Chironomids, Shell fragments,
	41	3.11	organic debris, 4 shrimp
	24	1.06	Tow 2, silt, Chironomids, shell fragments, organic
	27	1.35	debris, plastic, 3 shrimp
	27	1.35	
	28	1.45	
	28	1.45	
	17	0.53	Tow 3, silt, Chironomids, shell fragments, organic
			debris, plastic
	12	0.27	Tow 4, silt, chironomids, shell fragments, organic
	13	0.31	debris, plastic, 19 shrimp
	26	1.25	
	30	1.66	
	32	1.89	
	32	1.89	
	32	1.89	
	33	~~1.89~~ 2.01	
	38	2.67	
	17	0.53	Tow 5, silt, chironomids, shell fragments, organic
	25	1.15	debris, plastic, 6 shrimp
	27	1.35	
	30	1.66	
	5	0.05	Tow 6, silt & sand with sheen, shell fragments,
	6	0.07	organic debris, chironomids, 4 shrimp
	18	0.60	
	12	0.27	Tow 7, silt, chironomids, shell fragments, organic
	13	0.31	debris, plastic, 52 shrimp
	33	2.01	

Field Collection Form

Project Name: LWG RA-Round 2 Benthic Invertebrate (Clam Sledge) Sampling

Project no. 03-28-04-31

Date: 11/30/05

Crew: AR, TDo, MM
DG (oversight)

Sample ID	Width of *Corbicula* sp.	Estimated Biomass (g ww)	Comments
LW2-BTFC031	36	2.4	Tow 7 cont'd
	31	1.78	Tow 8, silt, chirnomids, shell fragments, organic
			debris, plastic, paint chips, 41 shrimp
	0	0	Tow 9, silt & sand with sheen, shell fragments,
	18 AR		organic debris, 8 shrimp, No clams
	30	AR ~~0.66~~ 1.66	Tow 10, silt, sand, shell fragments, organic
	30	1.66	debris, plastic, 39 shrimp
	31	AR ~~1.66~~ 1.78	
	32	~~1.84~~	
	15	0.41	
LW2-BTFC027	0	0	Tow 1, No clams, silt with sheen, organic debris
	10	0.18	Tow 2, silt, organic debris, plastic, paint chips,
	13	0.31	17 shrimp, female crayfish
	30	1.66	
	31	1.78	
	31	1.78	
	33	2.01	
	35	2.26	
	35	2.26	
	25	1.15	Tow 3, silt, organic debris, plastic, paint
	28	1.45	chips, 11 shrimp
	32	1.89	
	35	2.26	
	35	2.26	
	12	~~0.6~~ AR 0.27	Tow 4, silt, organic debris, plastic, paint
	18	0.6	chips, shell fragments, 23 shrimp
	18	0.6	
	21	0.81	

Field Collection Form

Project Name: LWG RA-Round 2 Benthic Invertebrate (Clam Sledge) Sampling

Project no. 03-28-04-31

Date: 11/30/05

Crew: AR, TDO, MM
DG (oversight)

Sample ID	Width of *Corbicula* sp.	Estimated Biomass (g ww)	Comments
LW2-BTFC027	22	0.89	
	25	1.15	
	25	1.15	
	25	1.15	
	26	1.25	
	29	1.55	
	29	1.55	
	29	1.55	
	33	2.01	
	33	2.01	
	33	2.01	
	34	2.14	
	34	2.14	
	34	2.14	
	35	2.26	
	37	2.53	
	37	2.53	
	38	2.67	
	39	2.81	
			Tow 5, no clams, silt, organic debris,
			plastic, 19 shrimp
	20	0.74	Tow 6, silt, organic debris, shell fragments,
	26	1.25	plastic, paint chips, 12 shrimp
	28	1.45	
	30	1.66	
	31	1.78	
	31	1.78	
	34	2.14	

Field Collection Form

Project Name: LWG RA-Round 2 Benthic Invertebrate (Clam Sledge) Sampling

Project no. 03-28-04-31

Date: 11/30/05

Crew: AR, TDo, MM
TDG (oversight)

Sample ID	Width of *Corbicula* sp.	Estimated Biomass (g ww)	Comments
LW2-BTFC027	34	2.14	
	29	1.55	Tow 7, silt, organic debris, shell fragments,
	33	2.01	plastic, paint chips
	34	2.14	
	36	2.4	
	11	0.22	Tow 8, silt, gravel, organic debris, shell fragments,
	18	0.60	4 shrimp, plastic, paint chips
	22	0.89	
	27	1.35	
	27	1.35	
	29	1.55	
	29	1.55	
	30	1.66	
	32	1.89	
	34	2.14	
	36	2.40	
	37	2.53	
	37	2.53	
	11	0.22	Tow 9, silt with sheen, organic debris,
	23	0.98	shell fragments, 6 shrimp, plastic, paint chips
	25	1.15	
	25	1.15	
	28	1.45	
	33	2.01	
			Tow 10 Rejected due to a large stick
			caught in sledge
	24	1.06	Tow 11, silt, organic debris, shell fragments,
	43	3.42	4 shrimp, plastic, paint chips

Field Collection Form

Project Name: LWG RA-Round 2 Benthic Invertebrate (Clam Sledge) Sampling

Project no. 03-28-04-31

Date: 11/30/05

Crew: AR, TDo, MM
DG (oversight)

Sample ID	Width of *Corbicula* sp.	Estimated Biomass (g ww)	Comments
LW2-BTFC027	7	0.09	Tow 12, silt, organic debris, shell fragments,
	9	0.15	plastic, paint chips
	11	0.22	
	29	1.55	
	35	2.26	
	38	2.67	Total weight for all tows is 119.07 g ww (75 clams)
LW2-BTFC030	11	0.22	Tow 1, clay, silt, gravel, sheen, organic debris,
	13	0.31	shell fragments, plastic, paint chips, shrimp
	6	0.07	Tow 2, clay, gravel, sheen, organic debris,
	7	0.09	shell fragments, plastic, paint chips, glass,
	7	0.09	2 shrimp
	22	0.89	
	32	1.89	
	0	0	Tow 3, clay, gravel, sheen, organic debris,
	AR 8		shell fragments, metal, glass, plastic 3 shrimp
	AR 15 8	0.12	Tow 4, clay, silt, gravel, sheen, organic
	AR 17 15	0.41	debris, shell fragments, paint chips, glass
	AR 18 17	0.53	
	AR 18	0.6	
	20	0.74	
	21	0.81	
	28	1.45	
	31	1.78	
	33	2.01	
	35	2.26	
	9	0.15	Tow 5, clay, silt, gravel, sheen, organic
	9	0.15	debris, shell fragments, paint chips, plastic,
	24	1.06	glass, metal, 2 shrimp
	38	2.67	

Field Collection Form

Project Name: LWG RA-Round 2 Benthic Invertebrate (Clam Sledge) Sampling

Project no. 03-28-04-31

Date: ~~11/30/05~~ AR 12/1/05

Crew: AR, TDO, MM
JG (Oversight)

Sample ID	Width of *Corbicula* sp.	Estimated Biomass (g ww)	Comments
~~LW2-BTFC030~~	~~38~~	~~2.68~~	~~Tow 5~~ AR
LW2-BTFC030	15	0.41	Tow 6, clay, silt, organic woody debris, shell fragments, metal
	0	0	Tow 7, no clams, clay, silt, gravel, organic woody debris, shell fragments, glass, metal, paint chips, plastic, 1 shrimp
	6	0.07	Tow 8, sand & gravel with sheen, small amts. of clay & silt, organic woody debris, glass
	26	1.25	
	28	1.45	
	29	1.55	
	29	1.55	
	33	2.01	
	11	0.22	Tow 9, sand & gravel, small amts. of clay & silt, organic woody debris, shell fragments, glass
	13	0.31	
	19	0.67	
	24	1.06	
	20	0.74	
	8	0.12	Tow 10, silt, clay, sheen, organic woody debris, 2 shrimp, shell fragments, plastic, glass
	9	0.15	
	11	0.22	
	12	0.27	
	19	0.67	
	28	1.45	
	11	0.22	Tow 11, clay, silt, gravel, woody debris, shell fragments, plastic, glass
	13	0.60	
	28	1.45	
	32	1.89	
	33	2.01	

Field Collection Form

Project Name: LWG RA-Round 2 Benthic Invertebrate (Clam Sledge) Sampling

Project no. 03-28-04-31

Date: 12/1/05

Crew: AR, TD, MM
JG (oversight)

Sample ID	Width of *Corbicula* sp.	Estimated Biomass (g ww)	Comments
LW2-BTFC030	37	2.53	Tow 11 Total weight for all tows 4384g ww
	38	2.67	Total clams 46
LW2-BTFC024	5	0.05	Tow 1, silt with sheen, organic debris, empty
	6	0.07	mussel shells, shell fragments
	6	0.07	
	6	0.07	
	7	0.09	
	7	0.09	
	8	0.12	
	27	1.35	
	33	2.01	
	41	3.11	
	6	0.07	Tow 2, silt with sheen, organic debris,
	6	0.07	
	6	0.07	
	7	0.09	
	8	0.12	
	7	0.09	
	26	1.25	
	29	1.55	
	37	2.53	
	6	0.07	Tow 3, silt, organic woody debris, shell
	7	0.09	fragments, plastic
	8	0.12	
	8	0.12	
	9	0.15	
	10	0.18	

Field Collection Form

Project Name: LWG RA-Round 2 Benthic Invertebrate (Clam Sledge) Sampling

Project no. 03-28-04-31

Date: 12/1/05

Crew: AR, TRO, MM
JG (oversight)

Sample ID	Width of *Corbicula* sp.	Estimated Biomass (g ww)	Comments
LW2-BTFC024	19	0.67	Tow 3 Cont'd
	20	0.74	
	21	0.81	
	27	1.35	
	36	2.4	
	39	2.81	
	8	0.12	Tow 4, silt, sand, organic woody
	31	1.78	debris, paint chips, plastic, shell
	32	1.89	fragments, 4 shrimp
	6	0.07	Tow 5, silt with sheen, chironomids,
	6	0.07	organic woody debris, paint chips,
	7	0.09	1 shrimp, shell fragments
	9	0.15	
	9	0.15	
	11	0.22	
	24	1.06	
	33	2.01	
	35	2.26	
	0	0	Tow 6 Reject
	7	0.09	Tow 7, silt, woody debris, plastic, shell
	7	0.09	fragments, chironomids
	7	AR ~~0.09~~ 0.09	
	7	0.09	
	8	0.12	
	9	0.15	
	11	0.22	
	13	0.31	
	13	0.31	

Field Collection Form

Project Name: LWG RA-Round 2 Benthic Invertebrate (Clam Sledge) Sampling

Project no. 03-28-04-31

Date: 12/1/05

Crew: AR, JDo, MM
JG (oversight)

Sample ID	Width of *Corbicula* sp.	Estimated Biomass (g ww)	Comments
LW2-BTFC024	30	1.66	Tow 8, silt, woody debris, shell fragments, plastic, 3 shrimp, Chironomids
	7	0.09	Tow 9, silt, clay, woody debris, shell fragments, plastic
	8	0.12	
	10	0.18	
	10	0.18	
	18	0.6	
	18	0.6	
	35	2.26	
	10	0.18	Tow 10, silt, woody debris, shell fragments, plastic
	5	0.05	Tow 11, silt, woody debris, plastic, 1 shrimp, paint chips
	6	0.07	
	6	0.07	
	7	0.09	
	7	0.09	
	8	0.12	
	8	0.12	
	8	0.12	
	8	0.12	
	9	0.15	
	17	0.53	Total weight for all tows 43.94 g ww
	34	2.14	Clams total 73
LW2-BTFC028	27	1.35	Tow 1, silt, organic debris, algae, Chironomids, 6 shrimp, plastic, shell fragments, paint chips
	30	1.66	
	31	1.78	
	32	1.89	
	37	2.53	
	30	1.66	Tow 2, silt, woody debris, shell fragments, chironomids, ~~shell fra~~ paint chips

Field Collection Form

Project Name: LWG RA-Round 2 Benthic Invertebrate (Clam Sledge) Sampling

Project no. 03-28-04-31

Date: 12/1/05

Crew: AR, TDo, MM
JG (oversight)

Sample ID	Width of *Corbicula* sp.	Estimated Biomass (g ww)	Comments
LW2-BTFC028	31	1.78	Tow 2 Cont'd
	31	1.78	↓
	30	1.66	
	32	1.89	
	33	2.01	↓
	30	1.66	Tow 3, silt, organic woody debris, algae,
	30 AR		chironomids, shell fragments, plastic
	30	1.66	Tow 4, silt, woody debris, shell fragments,
	32	1.89	plastic, paint chips, can, pieces of foil,
	33	2.01	3 shrimp, chironomids
	33	2.01	↓
	0	0	Tow 5, silt, woody debris, shell fragments,
			chironomids, algae, plastic, paint chips, glass
			68 shrimp, No clams
	12	0.27	Tow 6, silt, organic debris, shell fragments,
	15	0.41	chironomids, algae, plastic, paint chips, foil,
	18	0.60	4 shrimp
	24	1.06	Tow 7, silt, woody debris, shell fragments,
	34	2.14	plastic, paint chips, foil, glass, chironomids,
			algae, 1 shrimp
	14	0.36	Tow 8, silt, woody debris, paint chips, plastic,
	8	0.12	shell fragments, 1 shrimp
	36	2.40	↓
	37	2.53	↓
	0	0	Tow 9, Rejected b/c bag flipped over.
	0	0	Tow 10, silt, organic debris, chironomids, algae,
			4 shrimp, No clams
LW2-BTFM028			Mussel 75 mm width

Field Collection Form

Project Name: LWG RA-Round 2 Benthic Invertebrate (Clam Sledge) Sampling

Project no. 03-28-04-31

Date: 12/1/05

Crew: AR, TDo, MM
JG (oversight)

Sample ID	Width of *Corbicula* sp.	Estimated Biomass (g ww)	Comments
LW2-BTFC028	0	0	Tow 11 Rejected b/c sledge net breaks
			and needs to be replaced backup sledge
	7	0.09	Tow 12, silt, woody debris, shell fragments
	30	1.66	chironomids, plastic, paint chips
	32	1.89	
	32	1.89	Total clams collected = 29
			Total weight for all tows ~45.18g
LW2-BTFC020	0	0	Tow 1, sand, gravel, shell fragments, glass,
			plastic, paint chips, No clams
	5	0.05	Tow 2, silt, sheen, woody debris, shell fragments,
	6	0.07	gravel, chironomids
	6	0.07	↓
	19	0.67	↓
	5	0.05	Tow 3, silt, sand, gravel, woody debris, shell,
	7	0.09	fragments, paint chips
	6	0.07	Tow 4, sand, silt, gravel, woody debris,
			shell fragments, plastic
	6	0.07	Tow 5, silt with sheen, shell fragments,
	20	0.74	woody debris
	20	0.74	↓
	12	0.27	Tow 6, silt, organic debris, dragonfly larvae,
	18	0.60	shell fragments, algae
	30	1.66	↓
	37	2.53	↓
	7	0.09	Tow 7, silt, woody debris, shell fragments,
	12	0.27	plastic, gravel, algae
	16	0.47	↓
	19	2.14	↓

Field Collection Form

Project Name: LWG RA-Round 2 Benthic Invertebrate (Clam Sledge) Sampling

Project no. 03-28-04-31

Date: 12/1/05

Crew: AR, TDO, MM JG (oversight)

Sample ID	Width of *Corbicula* sp.	Estimated Biomass (g ww)	Comments
LW2-BTFC020	34	2.14	Tow 7 cont'd
	15	0.41	Tow 8, silt, organic woody debris,
	21	0.81	shell fragments, plastic, paint chips,
	23	0.98	algae
	23	0.98	
	23	0.98	
	28	1.45	
	30	1.66	
	32	1.89	
	35	2.26	
	40	2.96	
	15	0.41	Tow 9, sand, silt, gravel, woody
	20	0.74	debris, dragonfly larvae, sheen, glass
	22	0.89	
	25	1.15	
	26	1.25	
	27	1.35	
	28	1.45	
	31	1.78	
	32	1.89	
	31	1.78	
	34	2.14	
	36	2.4	
	17	.53	Tow 10, Eel
	25	1.15	Sand, gravel, silt, sheen, wood debris
	32	1.89	
	39	2.81	

Field Collection Form

Project Name: LWG RA-Round 2 Benthic Invertebrate (Clam Sledge) Sampling

Project no. 03-28-04-31

Date: 12/1/05

Crew: AR, TDo, MM

Sample ID	Width of *Corbicula* sp.	Estimated Biomass (g ww)	Comments
LW2-BTFC020	18	0.60	Tow 11, sand, gravel, silt with sheen.
	22	0.89	woody debris, plastic, roofing tiles
	24	1.06	
	~~24~~		
	22	0.89	
	27	1.35	
	28	1.45	
	31	1.78	
	32	1.89	
	34	2.14	
	35	2.26	
	37	2.53	

Field Collection Form

Project Name: LWG RA-Round 2 Benthic Invertebrate (Clam Sledge) Sampling

Project no. 03-28-04-31

Date: 12/2/05

Crew: ARL, TDO, MM

Sample ID	Width of *Corbicula* sp.	Estimated Biomass (g ww)	Comments
LW2-BTFC025	0	0	Tow1, No clams, silt with sheen, organic debris, shell fragments, paint chips, plastic
	0	0	Tow 2, silt with sheen, organic debris, chironomids, plastic, shell fragments, paint chips, No clams
LW2-BTFM025			1 Mussel 97 mm width
	0	0	Tow 3, silt & gravel, shell fragments, paint chips, organic debris, plastic, 1 shrimp. No clams
	0	0	Tow 4, silt with sheen, chironomids, shell fragments, plastic, paint chips. No clams
	17	0.55	Tow 5, silt with sheen, woody debris, shell fragments,
	33	2.01	gravel, metal, foil, paint chips, chironomids,
	31	1.78	plastic, algae
	31	1.78	↓
	0	0	Tow 6, No clams, silt, gravel, organic
			debris, shell fragments, plastic, paint
			chips, 3 shrimp, algae
	8	0.09	Tow 7, silt & gravel w/sheen, woody debris, shell
	10	0.18	fragments, paint chips
	25	1.15	↓
	31	1.78	↓
	33	2.01	↓
	0	0	Tow 8, silt & gravel, sheen, algae, woody debris
			shell fragments, plastic, paint chips, chironomids
			No clams
	30	1.66	Tow 9, silt with sheen, woody debris, algae, plastic,
	35	2.26	shell fragments, paint chips, chironomids
	27	1.35	Tow 10, silt & gravel w/sheen, woody debris,
			glass, paint chips, shell fragments

Field Collection Form

Project Name: LWG RA-Round 2 Benthic Invertebrate (Clam Sledge) Sampling **Project no.** 03-28-04-31

Date: 12/2/05 **Crew:** AR, TDa, mm

Sample ID	Width of *Corbicula* sp.	Estimated Biomass (g ww)	Comments
LW2-BTFC025	22	0.89	Tow 11, silt w/sheen, gravel, woody debris, shell
	23	0.98	fragments, chironomids, paint chips, plastic
	31	1.78	↓
	32	1.89	
	32	1.89	
	37	2.53	✓
LW2-BTFC029	0	0	Tow 17, No clams, silt w/sheen, woody debris,
			chironomids, shell fragments,
	0	0	Tow 18, silt w/sheen, organic debris, shell
			fragments, chironomids, plastic
			No clams
	27	1.35	Tow 19, silt w/sheen, woody debris, shell
			fragments
	13	0.31	Tow 20, silt w/sheen, woody debris, shell fragments,
			cam, paint chips, chironomids, plastic
LW2-BTFC019	7	0.09	~~silt~~ AR Tow 1, silt & gravel, organic debris,
	8	0.12	shell fragments
	0	0	Tow 2, silt, organic debris, chironomids, shell
			fragments, paint chips, plastic No clams
	6	0.07	Tow 3, silt w/sheen, woody debris, chironomids,
	28	1.45	paint chips, shell fragments
	12	0.27 AR	Tow 4, silt w/sheen, paint chips, organic debris
	13	0.~~5~~31	↓
	16	0.47	
	15	0.41	
	~~18~~ 18	0.6	
	26	1.25	
	27	1.35	✓

Field Collection Form

Project Name: LWG RA-Round 2 Benthic Invertebrate (Clam Sledge) Sampling

Project no. 03-28-04-31

Date: 12/2/05

Crew: AR, TD, MM

Sample ID	Width of *Corbicula* sp.	Estimated Biomass (g ww)	Comments
LW2-BTFC019	7	0.09	Tow 5, sand, organic debris, shell fragments,
	26	1.25	plastic
	26	1.25	
	0	0	Tow 6, sand & silt w/sheen, chironomids,
			shell fragments, paint chips, organic debris,
			plastic No clams
	43	3.42	Tow 7, silt w/sheen, organic debris, shell fragments
	0	0	Tow 8, silt & sand w/sheen, paint chips, organic
			debris, No clams
	6	0.07	Tow 9, sand & silt w/sheen, organic debris,
			shell fragments
	12	0.27	Tow 10, sand & silt w/sheen, organic debris,
	24	1.06	shell fragments, chironomids, paint chips
	30	1.66	↓
			Total weight ~15.46 g ww for all tows (10)
LW2-BTFC018	33	2.01	Tow 1, silt w/sheen, fishing line, plastic, shell
			fragments, paint chips, 4 shrimp
	26	1.25	Tow 2, silt w/sheen, organic debris, shell fragments
	31	1.78	↓
	0	0	Tow 3, silt w/sheen, organic debris, shell fragments,
			paint chips, chironomids, No clams, 1 shrimp
	8	0.12	Tow 4, sand & silt w/sheen, organic debris, shell
	29	1.55	fragments, 1 shrimp, metal washer
	32	1.89	↓
	38	2.67	↓
	6	0.07	Tow 5, silt w/sheen, organic debris, shell
	27	1.35	fragments, chironomids
	33	2.01	

Field Collection Form

Project Name: LWG RA-Round 2 Benthic Invertebrate (Clam Sledge) Sampling **Project no.** 03-28-04-31

Date: 12/2/05 **Crew:** AR, TDo, MM

Sample ID	Width of *Corbicula* sp.	Estimated Biomass (g ww)	Comments
LW2-BTF0018	0	0	Tow 6, silt w/sheen, organic debris, shell fragments, chironomids, No clams
	0	0	Tow 7, No clams, silt w/sheen, organic debris, shell fragments, chironomids
	25	1.15	Tow 8, silt w/sheen, organic debris, shell fragments, chironomids,
	35	2.26	Tow 9, silt w/sheen, organic debris, shell fragments, chironomids, paint chips Leach
	25	1.15	Tow 10, silt w/sheen, organic debris, shell fragments, chironomids
	7	0.09	Tow 11, sand, organic debris, paint chips, plastic, shell fragments
	11	0.22	
	37	2.53	

Field Collection Form

Project Name: LWG RA-Round 2 Benthic Invertebrate (Clam Sledge) Sampling **Project no.** 03-28-04-31

Date: 12/5/05 **Crew:** AR, JS, MM

Sample ID	Width of *Corbicula* sp.	Estimated Biomass (g ww)	Comments
LW2-BTFC021	0	0	Tow 1, Reject due to poor sledge setup & no grab sample collected
LW2-BTFM021	0	0	Tow 2, silt w/ florettes of sheen, wood fragments, paint chips, No clams
			1 Mussel 87 mm width
	27	1.35	Tow 3, silt w/ florettes of sheen, wood fragments, paint chips
LW2-BTFM021			1 Mussel 87 mm width
	0	0	Tow 4, silt w/ florettes of sheen, wood fragments, paint chips, litter No clams
	35	2.26	Tow 5, silt w/ abundant wood debris, plastic litter slight sheen
			2 mussels 87 mm & 91 mm
	25	1.15	Tow 6, silt & sand w/ clumps of clay, ~~slight~~ moderate AR sheen, large wood debris (mostly), shell fragments,
	25	1.15	paint chips, plastic, organic debris, gravel, riprap
	26	1.25	
	28	1.45	~~Tow~~ 8 shrimp
	28	1.45	Mussel 76 mm
	14	0.36	↓
	9	0.15	↓
	10	0.18	Tow 7, mostly wood debris, silt w/ clay nodules,
	7	0.09	slight sheen, paint chips, leaf litter, shell fragments
	7	0.09	19 shrimp, dragonfly larvae
			Mussel 97 mm + mussel 15 mm
	32	1.89	Tow 8, mostly wood debris, silt w/ clay nodules,
	34	2.14	leaf litter, trash (plastic, fishing line), shell
	29	1.55	fragments, paint chips, 4 shrimp
	23	0.98	↓

Field Collection Form

Project Name: LWG RA-Round 2 Benthic Invertebrate (Clam Sledge) Sampling

Project no. 03-28-04-31

Date: 12/5/05

Crew: AR, JS, MM

Sample ID	Width of *Corbicula* sp.	Estimated Biomass (g ww)	Comments
LW2-BTFC021	8	0.12	Tow 8
	10	0.18	↓
LW2-BTFC021	0	0	Tow 9, Few juvenile clams < 4mm insufficient to collect.
			Mostly wood debris, sand w/ silt, gravel, organic plant debris, clay nodules, slight sheen
	10	0.18	Tow 10, mostly wood debris, sand & silt, leaf
	6	0.07	litter, trash, paint chips, clay nodules, shell
			fragments, 1 shrimp, gravel
	36	2.40	Tow 11, wood debris, silt & sand w/ slight sheen,
	37	2.53	leaf litter, clay nodules, shell fragments,
	33	2.01	paint chips, gravel, dragonfly larvae, 2 shrimp
	25	1.15	↓
	28	1.45	
	28	1.45	
	12	0.27	↓
	10	0.18	Tow 12, wood debris, sand & silt, clay
	10	0.18	nodules, shell fragments, paint chips, plant
	7	0.09	debris, gravel, slight sheen, 5 shrimp, metal
	5	0.05	
LW2-BTFC017	37	2.53	Tow 1, wood debris, gravel, plastic trash,
	14	0.36	shell fragments, 40 shrimp
	12	0.27	↓
	11	0.22	
	9	0.15	↓
	37	2.53	Tow 2, silty sand w/ wood debris, gravel,
	36	2.40	20 shrimp, shell fragments

Field Collection Form

Project Name: LWG RA-Round 2 Benthic Invertebrate (Clam Sledge) Sampling **Project no.** 03-28-04-31

Date: 12/5/05 **Crew:** AR, JS, MM

Sample ID	Width of *Corbicula* sp.	Estimated Biomass (g ww)	Comments
LW2-BTFC017	28	1.45	Tow 2
	20	0.74	↓
	16	0.47	
	7	0.09	
	22	0.89	Tow 3, wood debris, sandy silt, clay nodules,
	24	1.06	shell fragments, paint chips, gravel, 2 shrimp
	6	0.07	Tow 4, wood debris, gravel, shell fragments,
	8	0.12	paint chips, some silty sand, 28 shrimp
	13	0.31	↓
	33	2.01	
	37	2.53	Tow 5, wood debris & large wood fragments,
	30	1.66	silt w/sand, gravel, plastic debris, shell
	25	1.15	fragments, 22 shrimp
	16	0.47	Mussel 85 mm width
	0	0	Tow 6, No clams, mostly wood debris, silt
			w/sand, shell fragments, gravel, plastic debris,
			11 shrimp
	0	0	Tow 7, silt w/sand, abundant wood debris,
			shell fragments, plastic debris, plant debris,
			1 shrimp, leech, No clams
	3333	2.01	Tow 8, silt w/ trace wood fragments, gravel,
			isolated sheen, 2 shrimp
	30	1.66	Tow 9, wood debris, paint chips, shell
	18	0.60	fragments, sand, gravel, plant debris,
			1 shrimp
	17	0.53	Tow 10, mostly wood debris, trace silt & sand,
	20	0.74	gravel, paint chips, 11 shrimp
	AR ~~X~~15	0.41	↓

Field Collection Form

Project Name: LWG RA-Round 2 Benthic Invertebrate (Clam Sledge) Sampling

Project no. 03-28-04-31

Date: ~~12/5~~ AR 12/5/05

Crew: AR, JS, MM

Sample ID	Width of *Corbicula* sp.	Estimated Biomass (g ww)	Comments
LW2-BTFC017	23	0.98	Tow 10
	24	1.06	
	25	1.15	
	30	1.66	
	33	2.01	
LW2-BTFC016	41	3.11	Tow 1, woody debris, shell fragments, silt, bits
	10	0.18	of gravel, 12 shrimp
	7	0.09	↓
	32	1.89	Tow 2, woody debris, gravel w/silt, 15 shrimp,
	30	1.66	glass
	24	1.06	
	23	0.98	
	22	0.89	
	11	0.22	
	11	0.22	
	12	0.27	
	11	0.22	
	9	0.15	
	9	0.15	
	8	0.12	
	6	0.07	↓
	0	0	Tow 3, No clams, woody debris, silt w/gravel,
			shell fragments, 6 shrimp
	33	2.01	Tow 4, woody debris, shell fragments,
	28	1.45	silt w/gravel, 5 shrimp
	16	0.47	↓
	12	0.27	↓

Field Collection Form

Project Name: LWG RA-Round 2 Benthic Invertebrate (Clam Sledge) Sampling

Project no. 03-28-04-31

Date: 12/5/05

Crew: AR, KH, MM

Sample ID	Width of *Corbicula* sp.	Estimated Biomass (g ww)	Comments
LW2-BTFC016	13	0.31	Tow 4
	0	0	Tow 5, woody debris, shell fragments, 10 shrimp No clams
	41	3.11	Tow 6, silt w/woody debris, 3 shrimp
	34	2.14	2 juv. clams < 5mm in width insufficent to collect
	23	0.98	↓
	30	1.66	Tow 7, fine silt, some woody debris, shell fragments, 6 shrimp
	13	0.31	Tow 8, sand, gravel, wood debris, 6 shrimp,
	10	0.18	shell fragments
	0	0	Tow 9, Wood debris, sand, diesel odor, shell fragments, No clams
	0	0	Tow 10, woody debris, sand, shell fragments, 5 shrimp, No clams
	38	2.67	Tow 11, sandy silt, woody debris, shell
	12	0.27	fragments, 2 shrimp
	6	0.07	↓
	7	0.09	
	6	0.07	
	6	0.07	↓
	0	0	Tow 12, No clams, sandy gravel, some woody debris, shell fragments, very coarse
LW2-BTFC015	26	1.25	silt, organic debris, algae, shell fragment, paint chips Tow 1
	0	0	Tow 2, Reject b/c snagged on bottom.
	0	0	Tow 3, No clams, woody debris, leaf litter, trace silt, gravel, shell fragments, paint chips

Field Collection Form

Project Name: LWG RA-Round 2 Benthic Invertebrate (Clam Sledge) Sampling **Project no.** 03-28-04-31

Date: 12/5/05 **Crew:** AR, KH, MM

Sample ID	Width of *Corbicula* sp.	Estimated Biomass (g ww)	Comments
LW2-BTFC015	5	0.05	Tow 4, Algae, organic plant debris,
	22	0.89	chironomid, 4 shrimp
	0	0	Tow 5, silt, wood debris, plant debris,
			algae, some gravel, shell fragments, 12 shrimp
	5	0.05	Tow 6, trace silt, wood debris, algae, shell
	7	0.09	fragments, plastic debris, chironomids
	7	0.09	
	26	1.25	
	6	0.07	Tow 7, woody debris, leaf litter, algae,
			plastic debris, 1 shrimp
	34	2.14	Tow 8, abundant gravel, shell fragments,
	21	0.81	woody debris, hydrocarbon odor
	29	1.55	Tow 9, silt w/ woody debris, slight
			sheen, shell fragments, gravel

Field Collection Form

Project Name: LWG RA-Round 2 Benthic Invertebrate (Clam Sledge) Sampling

Project no. 03-28-04-31

Date: 12/6/05

Crew: AR, KH, MM

Sample ID	Width of *Corbicula* sp.	Estimated Biomass (g ww)	Comments
LW2-BTF024	6	0.07	Tow 12, silt w/some woody debris, 10 shrimp
	6	0.07	Tow 13, silt, woody debris, 3 shrimp
	6	0.07	
	6	0.07	
	7	0.09	
	8	0.12	
	34	2.14	Tow 14, sandy silt w/woody debris, slight
	8	0.12	sheen, shell fragments
	7	0.09	
	7	0.09	
	6	0.07	
	7	0.09	
	7	0.09	
	7	0.09	
	5	0.05	
	6	0.07	
	6	0.07	
	7	0.09	
	6	0.07	
	6	0.07	
	25	1.15	Tow 15, silt w/woody debris
	10	0.18	
	9	0.15	
	7	0.09	
	8	0.12	
	8	0.12	
	7	0.09	
	8	0.12	

Field Collection Form

Project Name: LWG RA-Round 2 Benthic Invertebrate (Clam Sledge) Sampling **Project no.** 03-28-04-31

Date: 12/6/05 **Crew:** AR, KH, MM

Sample ID	Width of *Corbicula* sp.	Estimated Biomass (g ww)	Comments
	7	0.09	Tow 15
	6	0.07	
	47	4.09	Tow 16, sandy silt, woody debris,
	47	4.09	1 shrimp
	36	2.40	
	13	0.31	
	7	0.09	
	6	0.07	
LW2-BTFC028	30	1.66	Tow 13, woody debris, organic material,
	23	0.98	sandy silt, 10 shrimp
	8	0.12	
	17	0.53	Tow 14, organic matter, aquatic plants,
			leaf litter, duct tape, gravel, 8 shrimp
	31	1.78	Tow 15, woody debris, petroleum odor, sandy silt,
	21	0.81	plastic litter, 3 shrimp, gravel
	23	0.98	
	19	0.67	
	10	0.18	
	6	0.07	
	30	1.66	Tow 16, woody debris, leaf litter, petroleum
	20	0.74	odor, plastic litter
	7	0.09	
			1 EEL
LW2-BTFC030	0	0	Tow 12, silt, large woody debris, shell
			fragments, 10 shrimp, plastic, No clams
	0	0	Tow 13, fine silt, woody debris, 5 shrimp
			No clams
	28	1.45	Tow 14, sandy silt, sheen, wood debris,
			shell fragments, lumps of clay

Field Collection Form

Project Name: LWG RA-Round 2 Benthic Invertebrate (Clam Sledge) Sampling

Project no. 03-28-04-31

Date: 12/6/05

Crew: AR, KH, MM

Sample ID	Width of *Corbicula* sp.	Estimated Biomass (g ww)	Comments
LW2-BTFC030	16	0.47	Tow 14
	11	0.22	
	10	0.18	
	10	0.18	
	10	0.18	
LW2-BTFC030	32	1.89	Tow 15, clay clumps, woody debris, shell fragments, slight sheen, 4 shrimp
	21	0.81	
	27	1.35	
	12	0.27	
	13	0.31	
	9	0.15	
	8	0.12	
	8	0.12	
	8	0.12	
	AR ~~33~~ 33	2.01	Tow 16, clay clumps, woody debris, shell fragments, slight sheen, 3 shrimp
LW2-BTFC031	31	1.78	Tow 11, woody debris (small)
	0	0	Tow 12, woody debris (small) No clams
	34	2.14	Tow 13, silt, woody debris, shell fragments
	30	1.66	
	34	2.14	Tow 14, Woody debris, shell fragments, leaf litter, 3 shrimp
	14	0.36	
	22	0.89	
	19	0.67	
AR ~~TO~~ LW2-BTFC033	36	1.40	Tow 11, woody debris, leaf litter, shell fragments
	32	1.89	
	21	0.81	Tow 12, silt, woody debris, leaf litter, plastic, shell fragments

Field Collection Form

Project Name: LWG RA-Round 2 Benthic Invertebrate (Clam Sledge) Sampling **Project no.** 03-28-04-31

Date: 12/6/05 **Crew:** AR, KH, MM

Sample ID	Width of *Corbicula* sp.	Estimated Biomass (g ww)	Comments
LW2-BTFM033	0	0	Tow 13, Woody debris, plastic, leaf litter
			1 Mussel 94mm width
LW2-BTFC033	29	1.55	Tow 14, silt, woody debris, leaf litter,
	24	1.06	plastic, chironomid
	15	0.41	Tow 15, silt, woody debris, leaf litter
LW2-BTFC028	18	.60	Tow 12, silt, woody debris, shell fragments
	26	1.25	
	0	0	Tow 13, no clams, woody debris, shell fragments,
			leaf litter
	23	.098	Tow 14, silt, wood debris, gravel, shell fragments
	23	0.98	
~~LW2-BTFC022~~	23	0.98	~~Tow 11,~~
	18	0.60	
	18	0.60	
	24	1.06	
	10	0.18	
	10	0.18	
	10	0.18	
	6	0.07	
	17	0.53	
	11	0.22	
	8	0.12	
LW2-BTFL026	8	0.12	Tow 14, silt w/ sheen, sand, paint chips,
	26	1.25	leaf litter
	24	1.06	
	18	0.60	

Field Collection Form

Project Name: LWG RA-Round 2 Benthic Invertebrate (Clam Sledge) Sampling **Project no.** 03-28-04-31

Date: 12/6/05 **Crew:** AR, KH, MM

Sample ID	Width of *Corbicula* sp.	Estimated Biomass (g ww)	Comments
LW2-BTFC026	17	0.53	Tow 14
	28	1.45	Tow 15, woody debris, paint chips,
	23	0.98	plastic wrappers, metal
	26	1.25	
	0	0	Tow 16 rejected b/c sledge flipped
			& no sample collected
	25	1.15	Tow 17. Sandy, sheen, woody debris
	29	1.55	paint chips
	23	0.98	
	15	0.41	
	23	0.98	
	18	0.60	
	10	0.18	Tow 18, woody debris, silt,
	26	1.25	paint chips, plastic, golf ball
	25	1.15	Tow 19, sandy silt w/ sheen, woody debris,
	17	0.53	paint chips, leaf litter, shell fragments
	11	0.22	
	10	0.18	
	9	0.185 AR	Tow 20, woody debris, sandy, gravel,
	8	0.12	paint chips, shell fragments
	22	0.89	
	20	0.74	
	30	1.66	
	18	0.60	
	15	0.41	
	18	0.61	
LW2-BTFC022	33	2.01	Tow 11, sandy, woody debris, shell
	30	1.66	fragments

Field Collection Form

Project Name: LWG RA-Round 2 Benthic Invertebrate (Clam Sledge) Sampling

Project no. 03-28-04-31

Date: 12/6/05

Crew: AR, KH, MM

Sample ID	Width of *Corbicula* sp.	Estimated Biomass (g ww)	Comments
LW2-BTFC022	30	1.66	Tow 12, woody debris, gravel, some silt
	0	0	Tow 13
	31	1.78	Tow 14
	32	1.89	
	32	1.89	
	32	1.89	
	19	0.67	
	20	0.74	
	15	0.41	
	10	0.18	

Field Collection Form

Project Name: LWG RA-Round 2 Benthic Invertebrate (Clam Sledge) Sampling

Project no. 03-28-04-31

Date: 12/7/05

Crew: AR, ED, MM

Sample ID	Width of *Corbicula* sp.	Estimated Biomass (g ww)	Comments
LW2-BTFC026	22	0.89	Tow 21, wood debris, leaf litter, paint chips,
	23	0.98	some silt & clay
	0	0	Tow 22, wood debris, leaf debris, paint chips,
			some gravel No clams
	29	1.55	Tow 23, sand (coarse), silt w/sheen, metal, gravel,
	9	0.05	wood debris, chunks of clay, plastic
	9	0.15	
LW2-BTFC025	0	0	No clams, sand, silt, wood debris, shell
			fragments, 1 shrimp Tow 12
	34	2.14	Tow 13, sand, silt, wood debris, leaf litter,
	38	2.67	shell fragments, foil
	0	0	Tow 14, sand, silt, wood debris, leaf litter,
			gravel No clams
	0	0	Tow 15, Collect 1 lamprey
	0	0	1 Mussel 74 mm width
			sand, silt, wood debris, paint chips, shell fragments
			No clams
	42	3.26	Tow 16, sand, silt, wood debris, leaf litter,
	32	1.89	shell fragments
			1 Mussel 130mm in width
LW2-BTFC021	0	0	Tow 13, silt, some sand, sheen, wood debris,
			leaf litter, plastic, paint chips, No clams
	41	3.11	Tow 14, wood debris, shell fragments, paint
	13	0.31	chips
	14	0.36	Tow 15 wood debris, small gravel, paint chips,
	35	2.26	some silt & sand, leaf litter
	28	1.45	

Field Collection Form

Project Name: LWG RA-Round 2 Benthic Invertebrate (Clam Sledge) Sampling **Project no.** 03-28-04-31

Date: 12/7/05 **Crew:** AR, ED, MM

Sample ID	Width of *Corbicula* sp.	Estimated Biomass (g ww)	Comments
LW2-BTFC021	35	2.26	Tow 15
LW2-BTFC0~~13~~17	31	1.78	Tow 11, sand, silt, woody debris, leaf litter,
	34	2.14	Shell fragments, B shrimp
	46	3.91	
	33	2.01	
	16	0.47	
LW2-BTFC015	0	0	Tow 10, No clams, wood debris, gravel,
			Shell fragments, leaf litter
	22	0.89	Tow 11, gravel, wood debris, leaf litter, shell
	27	1.35	fragments
	29	1.55	
	29	1.55	Tow 12, silt, wood debris, leaf litter, gravel
	0	0	Tow 13, woody debris, leaf litter, paint chips
	0	0	Tow 14, wood debris, leaf litter, aquatic plants,
			Shell fragments, No clams
			1 mussel 78 mm in width
	0	0	Tow 15, No clams, wood debris, leaf litter,
			aquatic plant fragments, shell fragments
LW2-BTFC0~~13~~16	0	0	Tow 1, woody debris, some sand & silt, plastic,
			leaf litter, No clams
	27	1.35	Tow 2, wood debris, leaf litter, shell fragments
	29	1.55	Tow 3, silt wood debris, leaf litter
	18	0.60	
	26	1.25	Tow 4, silt, sand, wood debris, leaf litter,
	30	1.66	riprap

Field Collection Form

Project Name: LWG RA-Round 2 Benthic Invertebrate (Clam Sledge) Sampling

Project no. 03-28-04-31

Date: 12/7/05

Crew: AR, ED, MM

Sample ID	Width of *Corbicula* sp.	Estimated Biomass (g ww)	Comments
LW2-BTFC013	22	0.89	Tow 4
	6	0.07	
	7	0.09	
	8	0.12	
	9	0.15	
	19	0.67	Tow 5, sand, silt, wood debris, paint chips
	18	0.60	
	18	0.60	
	10	0.18	
	8	0.12	
	6	0.07	
	7	0.09	
	7	0.09	
	6	0.07	
	6	0.07	
	6	0.07	
	5	0.05	
	13	0.31	Tow 6, sand, silt, wood debris, 2 shrimp,
	16	0.47	paint chips
	43	3.42	
	22	0.89	Tow 7, silt, sand, wood debris, leaf litter,
	17	0.53	paint chips, shell fragments, gravel,
	10	0.18	1 shrimp
	7	0.09	
	6	0.07	
	9	0.15	Tow 8, silty sand w/sheen, wood debris,
	13	0.31	leaf litter
	25	1.15	

Field Collection Form

Project Name: LWG RA-Round 2 Benthic Invertebrate (Clam Sledge) Sampling

Project no. 03-28-04-31

Date: 12/7/05

Crew: AR, ED, MM

Sample ID	Width of *Corbicula* sp.	Estimated Biomass (g ww)	Comments
LW2-BTFC013	31	1.78	Tow 8
	18	0.60	Tow 9, sand & silt w/sheen, wood debris, paint
			Chips, 3 shrimp
	29	1.55	Tow 10, sand, silt, wood debris, leaf litter,
	8	0.12	gravel, 1 shrimp, shell fragments
	9	0.15	
	26	1.25	Tow 11, trace sand & silt, wood debris, shell
	27	1.35	fragments, 2 shrimp, leaf litter
	15	0.41	
	12	0.27	
	9	0.15	
	7	0.09	
	25	1.15	Tow 12, sand, silt, wood debris, paint chips,
	19	0.67	2 shrimp
	18	0.60	1 Mussel 108 mm in width
	AR ~~18~~ 17	0.53	
	10	0.18	
	10	0.18	
	8	0.12	
	8	0.12	
	7	0.09	
	6	0.07	
	19	0.67	Tow 13, sand & silt, wood debris, shell
	9	0.15	fragments, leaf litter, paint chips
	9	0.15	
	8	0.12	
	6	0.07	
	21	0.81	Tow 14, sand & silt, wood debris, leaf litter

Field Collection Form

Project Name: LWG RA-Round 2 Benthic Invertebrate (Clam Sledge) Sampling

Project no. 03-28-04-31

Date: 12/7/05

Crew: AR, ED, MM

Sample ID	Width of *Corbicula* sp.	Estimated Biomass (g ww)	Comments
LW2-BTF-013	21	0.81	Tow 14 Cont'd
	14	0.36	paint chips
	7	0.09	
	6	0.07	
	35	2.26	Tow 15, sand, silt, wood debris, leaf litter
	34	2.14	
	22	0.89	
	19	0.67	
	21	0.81	
	19	0.67	
	21	0.81	
	16	0.47	
	15	0.41	
	12	0.27	
	12	0.27	
	11	0.22	
	9	0.15	
	9	0.15	
	8	0.12	
	8	0.12	
	7	0.09	
	7	0.09	
	7	0.09	
	6	0.07	
	6	0.07	
	6	0.07	
	6	0.07	
	6	0.07	

Field Collection Form

Project Name: LWG RA-Round 2 Benthic Invertebrate (Clam Sledge) Sampling **Project no.** 03-28-04-31

Date: 12/7/05 **Crew:** AR, ED, MM

Sample ID	Width of *Corbicula* sp.	Estimated Biomass (g ww)	Comments
LW2-BTFC014	0	0	Tow 1, No clams, sand, silt, wood debris, leaf litter, plastic debris
	38	2.67	Tow 2, matted ~~leaf litter~~ grass material, aquatic plant fragments
	6	0.07	Tow 3, slight sheen, sand & silt, wood debris,
	6	0.07	matted ~~leaf litter~~ grass material, shell fragments
	6	0.07	
	5	0.05	
	0	0	Tow 4, slight sheen, sand & silt, wood debris, matted grass material, shell fragments No clams
	0	0	Tow 5, No clams, moderate sheen, sand, silt, matted grass material, nuts, bolts, petroluem odor, 1 shrimp
	8	0.12	Tow 6, sand & silt, matted grass material, shell fragments
	7	0.09	Tow 7, sand & silt, matted grass material, wood debris, shell fragments, plastic
	0	0	Tow 8, Rejected b/c snagged.
	7	0.09	Tow 9, Some sand & silt, slight sheen, gravel,
	14	0.36	wood debris, matted grass material,
	25	1.15	plastic, shell fragments
	30	1.66	
	40	2.96	Tow 10, silt, sheen, wood debris, shell
	33	2.01	fragments
	30	1.66	
	25	1.15	
	24	1.06	
	11	0.22	

Field Collection Form

Project Name: LWG RA-Round 2 Benthic Invertebrate (Clam Sledge) Sampling

Project no. 03-28-04-31

Date: 12/7/05

Crew: AR, ED, MM

Sample ID	Width of *Corbicula* sp.	Estimated Biomass (g ww)	Comments
LW2-BTFE014	12	0.27	Tow 10, CONT'D
	29	1.55	Tow 11, sand & silt, wood debris, shell
	26	1.25	fragments, gravel, glass
	24	1.06	
	34	2.14	
	31	1.78	
	23	0.98	
	13	0.31	Tow 12, sand & silt, leaf litter, wood
			debris, shell fragments
	28	1.45	Tow 13, silt w/ slight sheen, matted grass
	41	3.11	material, wood debris, shell fragments
	30	1.66	1 Mussel 85 mm
	7	0.09	
	8	0.12	Tow 14, sand & silt, matted grass
	31	1.78	material, shell fragments, wood debris,
	34	2.14	leech

Field Collection Form

Project Name: LWG RA-Round 2 Benthic Invertebrate (Clam Sledge) Sampling

Project no. 03-28-04-31

Date: 12/8/05

Crew: AR, ED, MM

Sample ID	Width of *Corbicula* sp.	Estimated Biomass (g ww)	Comments
LW2-BTFC012	38	2.67	Tow 1, sand & silt, mostly wood chips, leaf litter
	36	2.40	
	33	2.01	
	31	1.78	
	21	0.81	
	13	0.31	
	11	0.22	
	8	0.12	
	7	0.09	
	6	0.07	
	35	2.26	Tow 2, sand & silt, mostly wood chips, leaf litter,
	31	1.78	clay balls, plastic, slight sheen
	28	1.45	
	17	0.53	
	12	0.27	
	34	2.14	Tow 3, sand & silt, mostly wood chips, leaf litter,
	25	1.15	paint chips, shell fragments
	30	1.66	
	30	1.66	
	23	0.98	
	17	0.53	
	11	0.22	
	34	2.14	Tow 4, sand & silt, slight sheen, mostly wood
	15	0.41	chips, leaf litter, shell fragments, plastic
LW2-BTFC011	5	0.05	Tow 1, sand & silt, wood chips, shell fragments,
	6	0.07	plastic
	22	0.89	Tow 2, clay, some wood chips, shell fragments

Field Collection Form

Project Name: LWG RA-Round 2 Benthic Invertebrate (Clam Sledge) Sampling

Project no. 03-28-04-31

Date: 12/8/05

Crew: AR, ED, MM

Sample ID	Width of *Corbicula* sp.	Estimated Biomass (g ww)	Comments
LW2-BTFC011	15	0.41	Tow 2 CONT'D
	18	0.60	
	44	3.58	Tow 3, abundant wood chips, shell fragments,
	9	0.15	leaf litter
	9	0.15	
	6	0.07	
	6	0.07	
	8	0.12	
	30	1.66	Tow 4, clay, sand, silt, shell fragments,
	5	0.05	Small amt. of wood debris
	5	0.05	1 lamprey
	0	0	Tow 5, No clams, clay, sand, silt, slight
			sheen, small amt. of wood debris, shell fragments
	0	0	Tow 6, No clams, sand & silt, wood debris, wire,
			shell fragments
	12	0.27	Tow 7, clay, sand & silt, small amt. of wood
			debris, shell fragments, leaf litter
			1 mussel 110 mm
	33	2.01	Tow 8, sand & silt, small amt. of wood debris,
	7	0.09	shell fragments
	0	0	Tow 9, No clams, sand & silt, wood chips (small
			amt.) slight sheen, 1 shrimp
	12	0.27	Tow 10, sand & silt, wood debris, leaf litter,
	9	0.15	shell fragments, slight sheen, 1 shrimp
	0	0	Tow 11, sand & silt, wood debris, 3 shrimp,
			shell fragments, leaf litter No clams
	0	0	Tow 12, No clams, sand & silt, leaf litter, small
			amt. of wood chips, shell fragments, 1 shrimp

Field Collection Form

Project Name: LWG RA-Round 2 Benthic Invertebrate (Clam Sledge) Sampling **Project no.** 03-28-04-31

Date: 12/8/05 **Crew:** AR, ED, MM

Sample ID	Width of *Corbicula* sp.	Estimated Biomass (g ww)	Comments
LW2-BTFC011	9	0.15	Tow 13, sand & silt, wood debris, shell fragments, 1 shrimp
	0	0	Tow 14, sand & silt, wood debris, shell fragments No clams
	0	0	Tow 15, sand & silt, wood debris, leaf litter, shell fragments
LW2-BTFC010	0	0	Tow 1, sand, silt, shell fragments, wood chips, 1 shrimp, No clams
	32	1.89	Tow 2, sand & silt, shell fragments, slight sheen, leaf litter
	0	0	Tow 3, Mussel 92mm in width
	0	0	Tow 3, Reject ble did not collect a sample on bottom.
	0	0	Tow 4, No clams, silt, wood debris, leaf litter
	0	0	Tow 5, Collect 1 Lamprey
	41	3.11	sand, silt, wood debris, shell fragments, gravel
	41	3.11	
	38	2.67	
	31	1.78	
	30	1.66	
	30	1.66	
	29	1.55	
	27	1.35	
	27	1.35	
	27	1.35	
	24	1.06	
	27	1.35	

Field Collection Form

Project Name: LWG RA-Round 2 Benthic Invertebrate (Clam Sledge) Sampling **Project no.** 03-28-04-31

Date: 12/8/05 **Crew:** AR, ED, MM

Sample ID	Width of *Corbicula* sp.	Estimated Biomass (g ww)	Comments
LW2-BTF010	27	1.35	Tow 5 cont'd
	26	1.26	
	28	1.45	
	0	0	Tow 6, Reject b/c did not collect sample on the bottom
	30	1.66	Tow 7, sand, silt, wood chips, leaf litter, shell fragments
	40	2.96	
	32	1.89	
	31	1.78	
	29	1.55	
	28	1.45	
	27	1.35	
	26	1.25	
	27	1.35	
	21	0.81	
	21	0.81	
	8	0.12	
	32	1.89	Tow 8, sand, silt, large wood debris, leaf litter, shell fragments
	21	0.81	
	38	2.67	Tow 9, sand, silt, gravel, rocks, large wood debris, abundant shell fragments, leaf litter, glass
	39	2.81	
	34	2.14	
	31	1.78	
	32	1.89	
	29	1.55	
	28	1.45	
	30	1.66	
	31	1.78	

Field Collection Form

Project Name: LWG RA-Round 2 Benthic Invertebrate (Clam Sledge) Sampling

Project no. 03-28-04-31

Date: 12/8/05

Crew: AR, ED, MM

Sample ID	Width of *Corbicula* sp.	Estimated Biomass (g ww)	Comments
LW2-BTFC010	26	1.25	Tow 9 Cont'd
	29	1.55	
	28	1.45	
	30	1.66	
	32	1.89	
	28	1.45	
	31	1.78	
	28	1.45	
	33	2.01	
	26	1.25	
	28	1.45	
	29	1.55	
	27	1.35	
	28	1.45	
	25	1.15	
	20	0.74	
	40	2.96	Tow 10
	41	3.11	
	44	3.58	
	29	1.55	
	29	1.55	
	32	1.89	
	29	1.55	
	30	1.66	
	28	1.45	
	26	1.25	
	30	1.66	
	24	1.06	

Field Collection Form

Project Name: LWG RA-Round 2 Benthic Invertebrate (Clam Sledge) Sampling

Project no. 03-28-04-31

Date: 12/8/05

Crew: AR, ED, MM

Sample ID	Width of *Corbicula* sp.	Estimated Biomass (g ww)	Comments
LW2-BTFC010	23	0.98	
	27	1.35	
	16	0.47	
	41	3.11	Tow 11,
	43	3.42	
	32	1.89	
	30	1.66	
	31	1.78	
	28	1.45	
	31	1.78	
	29	1.55	
	27	1.35	
	28	1.45	
	28	1.45	
	30	1.66	
	30	1.66	
	27	1.35	
	28	1.45	
	25	1.15	
	26	1.25	
	27	1.35	
	28	1.45	
	37	2.53	Tow 12,
	30	1.66	
	34	2.14	
	32	1.89	
	28	1.45	
	32	1.89	

Field Collection Form

Project Name: LWG RA-Round 2 Benthic Invertebrate (Clam Sledge) Sampling **Project no.** 03-28-04-31

Date: 12/8/05 **Crew:** AR, ED, MM

Sample ID	Width of *Corbicula* sp.	Estimated Biomass (g ww)	Comments
LW2-BTFC010	33	2.01	Tow 12 cont'd
	29	1.55	
	27	1.35	
	33	2.01	
	29	1.55	
	29	1.55	
	27	1.35	
	29	1.55	
	26	1.25	
	25	1.15	
	20	0.74	
LW2-BTFC012	38	2.67	Tow 5, sand, silt, wood chips, shell fragments
	37	2.53	Mussel 58 mm
	31	1.78	
	32	1.89	
	32	1.89	Tow 6, slight sheen, sand & silt, wood
	24	1.06	debris, shell fragments, leaf litter
	23	0.98	
	13	0.31	
	13	0.31	
	9	0.15	
	23	0.98	Tow 7, clay, shell fragments, gravel, wood
	24	1.06	debris
	20	0.74	Tow 8 ~~sand, silt, la~~
	24	1.06	clay, moderate sheen, wood debris, shell
	24	1.06	fragments, leaf litter
	24	1.06	
	20	0.74	

Field Collection Form

Project Name: LWG RA-Round 2 Benthic Invertebrate (Clam Sledge) Sampling

Project no. 03-28-04-31

Date: 12/8/05

Crew: AR, ED, MM
JB (oversight)

Sample ID	Width of *Corbicula* sp.	Estimated Biomass (g ww)	Comments
LW2-BTFC012	19	0.67	Tow 8 cont'd
	19	0.67	
	17	0.53	
	16	0.47	
	14	0.36	
	0	0	Tow 9, rejected b/c snagged
	33	2.01	Tow 10, sand & silt, wood debris, slight
	31	1.78	sheen, 5 shrimp
	8	0.12	Tow 11, sand, silt, woody debris, leaf litter,
	34	2.14	shell fragments, 5 shrimp
LW2-BTFC009	0	0	Tow 1, No clams sand, silt, leaf litter,
			wood debris
	8	.12	Tow 2, sand, silt, wood debris, shell fragments
	6	0.07	Tow 3, sand, silt, clay, wood debris, leaf litter,
	7	0.09	shell fragments
	35	2.26	Tow 4, mostly wood chips, some sand & silt,
	33	2.01	shell fragments, plastic debris
	20	0.74	
	15	0.41	
	15	0.41	
			Tow 5,

Field Collection Form

Project Name: LWG RA-Round 2 Benthic Invertebrate (Clam Sledge) Sampling

Project no. 03-28-04-31

Date: 12/9/05

Crew: AR, EM, MM
AS, JB (oversight)

Sample ID	Width of *Corbicula* sp.	Estimated Biomass (g ww)	Comments
LW2-BTFC009	18	0.60	Tow 6, sand, silt, clay, small wood chips, shell
	11	0.22	fragments, leaf litter, plastic
	31	1.78	Tow 7, sand, silt, abundant wood debris, rope,
			shell fragments
	6	0.07	Tow 8, sand, silt, abundant wood debris, aeresol
	14	0.36	can, 2 golf balls, shell fragments
	14	0.36	2 winged mussels 95 mm & 92 mm
	16	0.47	
	13	0.31	
	16	0.47	
	43	3.42	Tow 9, sand, silt, abundant wood debris, shell
	6	0.07	fragments, leaf litter, plastic
	8	0.12	
	6	0.07	
	5	0.05	Tow 10, sand, silt, abundant wood debris,
			shell fragments, leaf litter, plastic, rubber
	0	0	Tow 11, sand, silt, abundant wood debris, shell
			fragments, leaf litter, chironomids, No clams
	9	0.15	Tow 12, abundant wood debris, some sand & silt,
	34	2.14	shell fragments
	31	1.78	Tow 13, sand, silt, abundant wood debris, shell
	37	2.53	fragments, chironomids, 1 shrimp, 1 crayfish
	28	1.45	
	22	0.89	
	12	0.27	
	8	0.12	
	6	0.07	
	18	0.60	Tow 14, coarse sand, some silt, leaf litter

Field Collection Form

Project Name: LWG RA-Round 2 Benthic Invertebrate (Clam Sledge) Sampling

Project no. 03-28-04-31

Date: 12/9/05

Crew: AR, ED, MM
AS, JB (oversight)

Sample ID	Width of *Corbicula* sp.	Estimated Biomass (g ww)	Comments
LW2-BTF2009	11	0.22	Tow 14 cont'd
	7	0.09	Shell fragments
	7	0.09	
	6	0.07	
	35	2.26	Tow 15, sand & silt, wood debris,
	32	1.89	leaf litter, shell fragments, chironomids
	32	1.89	
	27	1.35	
	16	0.47	
	10	0.18	
	7	0.09	
	7	0.09	
	30	1.66	Tow 16, sand, silt, wood debris, gravel
	10	0.18	leaf litter, shell fragments, 1 shrimp
	9	0.15	
	9	0.15	
	9	0.15	
	8	0.12	
	6	0.07	
	6	0.07	
	8	0.12	
	7	0.09	
	6	0.07	
	6	0.07	
	5	0.05	
	9	0.15	~~Tow 17~~ (AR)
	40	2.96	Tow 19, sand, silt, abundant wood
	29	1.55	debris, shell fragments, plastic

Field Collection Form

Project Name: LWG RA-Round 2 Benthic Invertebrate (Clam Sledge) Sampling

Project no. 03-28-04-31

Date: 12/9/05

Crew: AR, ED, MM
AS, JB, EB (oversight)

Sample ID	Width of *Corbicula* sp.	Estimated Biomass (g ww)	Comments
LW2-BTFC009	8	0.12	Tow 17 cont'd
	13	0.31	
	9	0.15	
	8	0.12	
	7	0.09	
LW2-BTFC008	18	0.60	Tow 1, sand, silt, abundant wood debris,
	39	2.81	shell fragments, plastic, leaf litter
	32	1.89	
	34	2.14	
	32	1.89	
	29	1.55	
	23	0.~~89~~98	
	16	0.47	Tow 2, sand, silt, abundant wood debris, shell
	25	1.15	fragments, leaf litter, plastic
	14	0.36	
	14	0.36	
	45	3.74	
	40	2.96	
	33	2.01	
	32	1.89	
	34	2.14	
	32	1.89	
	31	1.78	
	30	1.66	
	32	1.89	
	28	1.45	
	29	1.55	

Field Collection Form

Project Name: LWG RA-Round 2 Benthic Invertebrate (Clam Sledge) Sampling

Project no. 03-28-04-31

Date: 12/9/05

Crew: AR, ED, MM
AS, JB, EB (oversight)

Sample ID	Width of *Corbicula* sp.	Estimated Biomass (g ww)	Comments
LW2-BTFC008	25	1.15	
	24	1.06	
	26	1.25	Tow 3, sand, silt, wood debris (mulchlike),
	33	2.01	shell fragments, leaf litter
	34	2.14	Tow 4, sand, silt, wood debris (mulchlike),
	39	2.81	shell fragments, leaf litter
	31	1.78	
	33	2.01	
	32	1.89	
	32	1.89	
	25	1.15	
	25	1.15	
	9	0.15	
	41	3.11	Tow 5, abundant sand & silt, mulchlike
	33	2.01	wood debris, shell fragments, leaf litter
	33	2.01	
	31	1.78	
	28	1.45	
	26	1.~~06~~ 25 AR	
	28	1.45	
	28	1.45	
	25	1.15	
	24	1.06	
	25	1.15	
	22	0.89	
	29	1.55	Tow 6, slight sheen, sand & silt, wood
	35	2.26	debris, shell fragment
	23	0.98	

Field Collection Form

Project Name: LWG RA-Round 2 Benthic Invertebrate (Clam Sledge) Sampling

Project no. 03-28-04-31

Date: 12/9/05

Crew: AR, ED, MM EB, AS, JB (oversight)

Sample ID	Width of *Corbicula* sp.	Estimated Biomass (g ww)	Comments
LW2-BTFC008	0	0	Tow 7, No clams, sand, silt, wood debris, leaf litter, shell fragments
	35	2.26	Tow 8, sand, silt, wood debris, shell fragments, leaf litter, gravel
	33	2.01	
	38	1.45	
LW2-BTFC007	0	0	Tow 1, no clams, sand, silt, wood debris, shell fragments, paint chips, chironomids
	30	1.66	Tow 2, sand, silt, wood debris, leaf litter, shell fragments, chironomids, paint chips
	28	1.45	
	0	0	Tow 3, No clams, sand, silt, wood debris, shell fragments, 1 shrimp
	15	0.41	Tow 4, sand, silt, wood debris, leaf litter, shell fragments, plastic
	0	0	Tow 5, Reject b/c snagged.
	34	2.14	Tow 6, sand, silt, shell fragments, wood debris, leaf litter, 1 shrimp
	36	2.40	
	38	2.67	
	38	2.67	
	31	1.78	
	31	1.78	
	29	1.55	
	26	1.25	
	25	1.15	
	22	0.89	
	21	0.81	
	17	0.53	
	7	0.09	

Field Collection Form

Project Name: LWG RA-Round 2 Benthic Invertebrate (Clam Sledge) Sampling

Project no. 03-28-04-31

Date: 12/9/05

Crew: AR, ED, MM
AS, JB, EB (oversight)

Sample ID	Width of *Corbicula* sp.	Estimated Biomass (g ww)	Comments
LW2-BTF007	35	2.26	Tow 7, coarse sand, silt, gravel, wood debris,
	40	2.96	shell fragments, leaf litter
	26	1.25	
	26	1.25	
	27	1.35	
	26	1.25	
	16	0.47	
	11	0.22	
	10	0.18	
	7	0.09	
	8	0.12	
	37	2.53	Tow 8, sand, silt, shell fragments, leaf
	31	1.78	litter
	25	1.15	
	19	0.67	
	31	1.78	Tow 9, sand, silt, wood debris, shell
	24	1.06	fragments, glass, 1 shrimp

Field Collection Form

Project Name: LWG RA-Round 2 Benthic Invertebrate (Clam Sledge) Sampling

Project no. 03-28-04-31

Date: 12/12/05

Crew: AR, SP, MM
AS (oversight)

Sample ID	Width of *Corbicula* sp.	Estimated Biomass (g ww)	Comments
LW2-BTFC007	33	2.01	Tow 10, coarse sand, gravel, some wood, shell
	33	2.01	fragments, leaf litter
	30	1.66	
	32	1.89	
	20	0.74	
	10	0.18	
	31	1.78	Tow 11, abund. woody debris, leaf litter, glass,
	26	1.25	man-made debris
	24	1.06	
LW2-BTFC006	30	1.66	Tow 1, silt, slight sheen, gravel, shell fragments,
			leaf litter, glass
	45	3.24	Tow 2, clay nodules, wood debris, shell
	33	2.01	frags, leaf litter, concrete,
	35	2.26	
	31	1.78	
	30	1.66	
	30	1.66	
	29	1.55	
	14	0.36	
	15	0.41	
	8	0.12	
	47	4.09	Tow 3 - clay nodules, wood debris, shell
	36	2.40	frags, leaf litter
	34	2.14	
	32	1.89	
	36	2.40	
	32	1.89	

Field Collection Form

Project Name: LWG RA-Round 2 Benthic Invertebrate (Clam Sledge) Sampling

Project no. 03-28-04-31

Date: 12/12/05

Crew: AR, SP, MM
As oversight

Sample ID	Width of *Corbicula* sp.	Estimated Biomass (g ww)	Comments
	33	2.01	Tow 3 cont'd
	32	1.89	
	39	2.81	
	29	1.55	
	31	1.78	
	28	1.45	
	32	1.89	
	28	1.45	
	27	1.35	
	26	1.25	
	29	1.55	
	21	0.81	
	17	0.53	
	12	0.27	
	41	3.11	Tow 4 - silt, fine to coarse sand, moderate sheen,
	40	2.96 ~~2.96~~	wood debris clay, gravel, leaf litter
	38	2.67	1 mussel 81 mm
	38	2.67	
	30	1.66	
	31	1.78	
	27	1.35	
	33	2.01	
	30	1.66	
	26	1.25	
	27	1.35	
	25	1.15	
	30	1.66	
	29	1.55	

Field Collection Form

Project Name: LWG RA-Round 2 Benthic Invertebrate (Clam Sledge) Sampling

Project no. 03-28-04-31

Date: 12/12/05

Crew: AK, SB, MM, AS*oversight

Sample ID	Width of *Corbicula* sp.	Estimated Biomass (g ww)	Comments
	28	1.45	
	25	1.15	
	24	1.06	
	24	1.06	
	12	0.27	
	12	0.27	
	11	0.22	
	32	1.89	Tow 5 - clay balls, coarse sand, fine
	32	1.89	gravel, leaf litter, shell frags,
	30	1.66	
	25	1.15	
	28	1.45	
	22	0.89	
	6	0.07	
	44	2.58	Tow 6 - clay balls, coarse sand,
	42	3.26	gravel, leaf litter, shell frags
	41	3.11	
	37	2.53	
	31	1.78	
	36	2.40	
	32	1.89	
	33	2.01	
	34	2.14	
	32	1.89	
	30	1.66	
	32	1.89	
	30	1.66	
	29	1.55	

Field Collection Form

Project Name: LWG RA-Round 2 Benthic Invertebrate (Clam Sledge) Sampling

Project no. 03-28-04-31

Date: 12/12/05

Crew: AR, SP, MM
AS Oversight

Sample ID	Width of *Corbicula* sp.	Estimated Biomass (g ww)	Comments
	27	1.35	
	26	1.25	
	24	1.06	
	27	1.35	
	24	1.06	
	20	0.74	
	27	1.35	
	21	0.81	
	19	0.67	
	21	0.81	
	17	0.53	
	17	0.53	
	17	0.53	
	11	0.22	
	11	0.22	
	10	0.18	
	37	2.53	Tow 7 - clay balls, dragonfly larvae,
	39	2.81	wood debris, shell frags, coarse sand,
	34	2.14	gravel
	30	1.66	
	30	1.66	
	29	1.55	
	30	1.66	
	32	1.89	
	27	1.35	
	37	2.53	
	32	1.89	
	30	1.66	

Field Collection Form

Project Name: LWG RA-Round 2 Benthic Invertebrate (Clam Sledge) Sampling

Project no. 03-28-04-31

Date: 12/12/05

Crew: AR, SP, MM
AS - oversight

Sample ID	Width of *Corbicula* sp.	Estimated Biomass (g ww)	Comments
	32	1.89	
	31	1.78	
	26	1.25	
	28	1.45	
	27	1.35	
	29	1.55	
	23	0.98	
	29	1.55	
	29	1.55 ~~1.35~~	
	27	1.35 ~~1.15~~	
	25	1.15 ~~0.89~~	
	22	0.89 ~~0.81~~	
	21	0.81 ~~1.06~~	
	24	1.06 ~~0.81~~	
	21	0.81 ~~0.67~~	
	19	0.67 ~~0.53~~	
	17	0.53 ~~0.31~~	
	13	0.31 ~~0.27~~	
	12	0.27 ~~0.27~~	
	12	0.27 ~~0.27~~	
	12	0.27	
	11	0.22	
	11	0.22	
	11	0.22	
	11	0.22	
	10	0.18	
	10	0.18	
	10	0.18	

Field Collection Form

Project Name: LWG RA-Round 2 Benthic Invertebrate (Clam Sledge) Sampling

Project no. 03-28-04-31

Date: 12/12/05

Crew: AR, SP, MM
AS-oversight

Sample ID	Width of *Corbicula* sp.	Estimated Biomass (g ww)	Comments
	9	0.15	
	8	0.12	
	9	0.15	
	38	2.67	TOW 8 - silt, coarse sand
	29	1.55	wood debris, ~~slu~~ petroleum
	29	1.55	odor (moderate) leaf litter
	27	1.37	fine sand
	27	1.37	
	14	0.36	
	9	0.15	
	9	0.15	
	8	0.12	
	31	1.78	TOW 9 - silt, coarse sand, wood debris
	29	1.55	leaf litter, friemed gravel,
	27	1.35	shell frags
	23	0.98	1 Mussel 79mm
	25	1.15	
	21	0.81	
	23	0.98	
	19	0.67	
	15	0.41	
	10	0.18	
	10	0.18	
	7	0.09	
	7	0.09	
	7	0.09	Foot to AR
	37	2.53	TOW 10 - coarse sand, fine-med gravel,
	32	1.89	shell frags, leaf litter, clay
			1 mussel - 34 mm

Field Collection Form

Project Name: LWG RA-Round 2 Benthic Invertebrate (Clam Sledge) Sampling

Project no. 03-28-04-31

Date: 12/12/05

Crew: AR, SP, MM
AS - oversight

Sample ID	Width of *Corbicula* sp.	Estimated Biomass (g ww)	Comments
	32	1.89	
	29	~~1.89~~ 1.55	
	26	1.25	
	24	1.06	
	23	0.98	
	19	0.67	
	19	0.67	
	18	0.60	
	17	0.53	
	16	0.47	
	10	0.18	
	8	0.12	
	8	0.12	
	8	0.12	
	7	0.09	
LW2-BTRC005	0	0	Tow 1 - silt, fine sand, some clay + gravel, metal leaf litter, shell frags, chironomids, slight petroleum odor
	0	0	Tow 2, silt, wood debris, fine sand, slight sheen
	28	1.45	Tow 3 - silt, wood ~~frag~~ debris, shell frags, leaf litter - moderate sheen coarse sand
	27	1.35	
	22	0.89	
	20	0.74	
	18	0.60	
	20	0.74	
	8	0.12	
	28	1.45	Tow 4, silt, wood debris, shell fragments, leaf litter, moderate sheen, coarse sand, clay balls, chironomid
	26	1.25	

Field Collection Form

Project Name: LWG RA-Round 2 Benthic Invertebrate (Clam Sledge) Sampling

Project no. 03-28-04-31

Date: 12/12/05

Crew: AR, SP, MM
AS-oversight

Sample ID	Width of *Corbicula* sp.	Estimated Biomass (g ww)	Comments
	26	1.25	Tow 4
	21	0.81	
	13	0.31	
	0	0	Tow 5, rejected b/c of an empty tow.
	25	1.15	Silt, wood debris, leaf litter, fine gravel, coarse
			sand, asphalt, clay balls, 2 shrimp, Chironomids
			Tow 6
	0	0	Tow 7, rejected b/c of an empty tow.
	0	0	Tow 8, moderate petroleum odor, silt, wood debris,
			shell fragments, fine to medium gravel,
			chironomids, fish bone remains
	23	0.89	Tow 9, mostly silt, wood debris, clay balls,
			fine to med. gravel, chironomids, concrete
	25	1.15	Tow 10, slight sheen, silt, fine-coarse-med sand,
	27	1.35	cobble, clay balls, fine to coarse gravel, wood debris,
	22	0.89	slight petroleum odor
	24	1.06	
	20	0.74	
	20	0.74	
	13	0.31	
	9	0.15	
	7	0.09	Tow 11, silt, fine to coarse gravel, clay balls,
	7	0.09	nail, shrimp
	28	1.45	Tow 12
	27	1.35	
	28	1.45	
	24	1.06	
	26	1.25	

Field Collection Form

Project Name: LWG RA-Round 2 Benthic Invertebrate (Clam Sledge) Sampling

Project no. 03-28-04-31

Date: 12/12/05

Crew: AR, SP, MM
AS-oversight

Sample ID	Width of *Corbicula* sp.	Estimated Biomass (g ww)	Comments
LW2-BTFC005	20	0.74	
	21	0.81	
	15	0.41	
	12	0.27	
	7	0.09	
	6	0.07	
	6	0.07	
	31	1.78	Tow 13, silt, med-fine gravel, coarse sand,
	25	1.15	shell fragments, leaf litter, wood debris
	23	0.98	1 Lamprey
	25	1.15	
	18	0.60	
	30	1.66	Tow 14, moderate sheen, clay balls, silt,
	29	1.55	fine sand, wood debris, leaf litter, slight
	27	1.35	petroleum odor
	26	1.25	
	25	1.15	
	24	1.06	
	22	0.89	
	19	0.67	
	19	0.67	
	17	0.53	
	9	0.15	
	30	1.66	Tow 15, silt, fine-med-coarse gravel,
	20	0.74	coarse sand, trace cobble, leaf litter, shell
	16	0.47	fragments, chironomids
	9	0.15	

Field Collection Form

Project Name: LWG RA-Round 2 Benthic Invertebrate (Clam Sledge) Sampling

Project no. 03-28-04-31

Date: 12/12/05

Crew: AR, SP, MM
AS (oversight)

Sample ID	Width of *Corbicula* sp.	Estimated Biomass (g ww)	Comments
LW2-BTFC004	30	1.66	Tow 1, silt, fine-med gravel, fine-coarse
	31	1.78	sand, wood debris, shell fragments, chironomids,
	27	1.35	glass
	24	1.06	
	22	0.89	
	15	0.41	
	10	0.18	
	10	0.18	
	11	0.22	
	9	0.15	
	36	2.40	Tow 2, silt, fine/coarse gravel, fine-coarse
	37	2.53	sand, wood debris, shell frags, leaf litter
	39	2.81	2 mussels - 18mm, 14mm metal debris
	27	1.35	
	25	1.15	
	28	1.45	
	20	0.74	
	17	0.53	
	17	0.53	
	15	0.41	
	15	0.41	
	10	0.18	
	11	0.22	
	8	0.12	
	9	0.15	
	7	0.09	
	8	0.12	
	6	0.07	

Field Collection Form

Project Name: LWG RA-Round 2 Benthic Invertebrate (Clam Sledge) Sampling

Project no. 03-28-04-31

Date: 12/12/05

Crew: AR, SP, MM
AS-oversight

Sample ID	Width of *Corbicula* sp.	Estimated Biomass (g ww)	Comments
	6	0.07	
	5	0.05	
	33	2.01	Tow 3- slight sheen, mostly fine-med sand,
	31	1.78	wood debris, shell frags, trace-fine gravel
	28	1.45	1 mussel -25 mm
	31	1.78	
	27	1.35	
	21	0.81	
	14	0.36	
	7	0.09	
	29	1.55	Tow 4- silt, fine sand, coarse-fine gravel,
	27	1.35	leaf litter, shell frag, grass, wood
	27	1.35	debris, 1 leach
	26	1.25	2 mussels - 100 mm, 13 mm
	24	1.06	
	24	1.06	
	21	0.81	
	19	0.67	
	16	0.47	
	14	0.36	
	14	0.36	
	11	0.22	
	10	0.18	
	8	0.12	
	9	0.15	
	8	0.12	
	6	0.07	

SP

Field Collection Form

Project Name: LWG RA-Round 2 Benthic Invertebrate (Clam Sledge) Sampling

Project no. 03-28-04-31

Date: 12/12/05

Crew: AR, SP, MM
AS - oversight

Sample ID	Width of *Corbicula* sp.	Estimated Biomass (g ww)	Comments
	30	1.66	Tow 5 - silt, fine sand, coarse-fine gravel
	29	1.55	leaf litter, shell frags, wood debris
	22	0.89	3 shrimp
	18	0.60	
	12	0.27	
	10	0.18	
	8	0.12	
	7	0.09	
	8	0.12	
	7	0.09	
	7	0.09	
	6	0.07	
	30	1.66	Tow 6 - silty fine sand, wood debris,
	28	1.45	trace fine gravel, leaf litter
	8	0.12	
	8	0.12	
	31	1.78	Tow 7, silt, fine sand wood debris, trace
	27	1.35	course gravel, leaf litter, fine-med gravel
	25	1.15	
	8	0.12	
	8	0.12	
	34	2.14	Tow 8 - silt, fine sand, woody debris,
	29	1.55	trace fine gravel, leaf litter, shell
	20	0.74	frags
	14	0.36	
	14	0.36	
	9	0.15	
	7	0.09	
	5	0.05	

Field Collection Form

Project Name: LWG RA-Round 2 Benthic Invertebrate (Clam Sledge) Sampling

Project no. 03-28-04-31

Date: 12/13/05

Crew: AR, SP, MM
AS (oversight)

Sample ID	Width of *Corbicula* sp.	Estimated Biomass (g ww)	Comments
LW2-BTFC004	7	0.09	Tow 9, silt, abund. wood chips, fine sand, fine-med
	7	0.09	gravel, leaf litter, shell fragments
	36	2.40	Tow 10, silt, abund wood chips, fine sand, fine-med
	36	2.40	gravel, leaf litter, trace shell fragments
	35	2.26	
	29	1.55	
	27	1.35	
	19	0.67	
	19	0.67	
	15	0.41	
	10	0.18	
	11	0.22	
	10	0.18	
	10	0.18	
	9	0.15	
	7	0.09	
	7	0.09	
	7	0.09	
LW2-BTFC001	40	2.96	Tow 1, silt, fine sand, wood debris, leaf litter,
	31	2.14	shell fragments
	28	1.45	
	22	0.89	
	20	0.74	
	15	0.41	
	11	0.22	
	10	0.18	
	9	0.15	

Field Collection Form

Project Name: LWG RA-Round 2 Benthic Invertebrate (Clam Sledge) Sampling

Project no. 03-28-04-31

Date: 12/13/05

Crew: AR, SP, MM
AS (oversight)

Sample ID	Width of *Corbicula* sp.	Estimated Biomass (g ww)	Comments
LW2-BTFc001	9	0.15	
	8	0.12	
	9	0.15	
	7	0.09	
	7	0.09	
	7	0.09	
	32	1.89	Tow 2, silt, fine sand, wood debris, leaf litter,
	21	0.81	shell fragments
	15	0.41	
	18	0.60	
	10	0.18	
	6	0.07	
	7	0.09	
	7	0.09	
	35	2.26	Tow 3, slight H_2S odor, pockets of sheen, fine
	6	0.07	sand, wood debris, shell fragments, leaf litter
	34	2.14	Tow 4, mostly silt, wood debris, shell
	30	1.66	fragments
	28	1.45	
	24	1.06	
	20	0.74	
	18	0.60	
	10	0.18	
	9	0.15	
	8	0.12	
	8	0.12	
	7	0.09	
	7	0.09	

Field Collection Form

Project Name: LWG RA-Round 2 Benthic Invertebrate (Clam Sledge) Sampling

Project no. 03-28-04-31

Date: 12/13/05

Crew: AR, SP, MM
AS oversight

Sample ID	Width of *Corbicula* sp.	Estimated Biomass (g ww)	Comments
LW2-BTFC001	7	0.09	Tow 4 Cont'd
	7	0.09	
	7	0.09	
	6	0.07	
	6	0.07	
	6	0.07	
	6	0.07	
	13	0.31	Tow 5, silt, leaf litter, wood debris, trace
	13	0.31	coarse gravel, shell fragements
	9	0.15	
	7	0.09	
	29	1.55	Tow 6, silt, leaf litter, wood debris, shell fragments,
	29	1.55	1 shrimp
	22	0.89	
	20	0.74	
	18	0.60	
	15	0.41	
	9	0.15	
	9	0.15	
	9	0.15	
	8	0.12	
	8	0.12	
	8	0.12	
	8	0.12	
	7	0.09	
	7	0.09	
	7	0.09	
	7	0.09	

Field Collection Form

Project Name: LWG RA-Round 2 Benthic Invertebrate (Clam Sledge) Sampling

Project no. 03-28-04-31

Date: 12/13/05

Crew: AR, SP, MM
AS oversight

Sample ID	Width of *Corbicula* sp.	Estimated Biomass (g ww)	Comments
LW2-BTFC001	6	0.07	Tow 6 Cont'd
	6	0.07	
	6	0.07	
	7	0.09	
	8	0.12	
	41	3.11	Tow 7, abund. wood debris, silt, leaf litter,
	38	2.67	shell fragments, chironomids, leech
	40	2.96	1 mussel 83mm
	34	2.81	
	15	0.41	
	7	0.09	
	34	2.14	Tow 8, silt, wood debris, leaf litter, pockets
	31	1.78	of sheen, chironomids, rootlets, shell fragments,
	28	1.45	unidentified trash
	6	0.07	
	31	1.78	Tow 9, silt, wood debris, leaf litter, shell
	29	1.55	fragments, chironomids
	29	1.55	
	19	0.67	Mussel 89mm
	39	2.81	Tow 10, silt, fine sand, some wood debris, shell
	31	1.78	fragments
	27	1.35	Mussel 81mm
	17	0.53	
	9	0.15	
	9	0.15	
	9	0.15	
	7	0.09	
	7	0.09	

Field Collection Form

Project Name: LWG RA-Round 2 Benthic Invertebrate (Clam Sledge) Sampling

Project no. 03-28-04-31

Date: 12/13/05

Crew: AR, SP, MM
AS oversight

Sample ID	Width of *Corbicula* sp.	Estimated Biomass (g ww)	Comments
LW2-BTFC001 AR	7	0.09.	Tow 10 Cont'd
	7	0.09	
	7	0.09	
	7	0.09	
	7	0.09	
	7	0.09	
	7	0.09	
	7	0.09	
	7	0.09	
	7	0.09	
	7	0.09	
	7	0.09	
	7	0.09	
LW2-BTFC002	0	0	Tow 1, No clams, silt, wood debris, shell fragments.
	0	0	Tow 2 No Clams, silt, wood chips, leaf litter
	37	2.53	Tow 3, med-coarse sand, fine gravel, leaf litter, shell fragments, wood debris, 1 shrimp
	30	1.66	
	28	1.45	
	18	0.60	
	16	0.47	
	9	0.15	
	7	0.09	
	7	0.09	
	30	1.66	Tow 4, med-coarse sand, fine gravel, leaf litter, shell fragments, wood debris, paint chips
	25	1.15	
	21	0.81	1 Mussel 73 mm

Field Collection Form

Project Name: LWG RA-Round 2 Benthic Invertebrate (Clam Sledge) Sampling

Project no. 03-28-04-31

Date: 12/13/05

Crew: AR, SP, MM
AS oversight

Sample ID	Width of *Corbicula* sp.	Estimated Biomass (g ww)	Comments
LW2-BTFC002	20	0.74	Tow 4 Cont'd
	20	0.74	
	16	0.47	
	15	0.41	
	14	0.36	
	23	0.98	
	7	0.09	
	35	2.26	Tow 5, med-coarse sand, fine gravel, trace
	32	1.89	coarse gravel, leaf litter, shell fragments,
	26	1.25	wood debris, paint chips
	25	1.15	
	24	1.06	
	26	1.25	
	21	0.81	
	21	0.81	
	21	0.81	
	7	0.09	
	27	1.35	
	6	0.07	
	5	0.05	
	32	1.89	Tow 6, med-coarse sand, fine gravel, trace
	31	1.78	med gravel, leaf litter, shell fragments,
	30	1.66	wood debris, paint chips, 1 shrimp
	21	0.81	
	18	0.60	
	25	1.15	
	21	0.81	
	15	0.41	

Field Collection Form

Project Name: LWG RA-Round 2 Benthic Invertebrate (Clam Sledge) Sampling

Project no. 03-28-04-31

Date: 12/13/05

Crew: AR, SP, MM
AS (oversight)

Sample ID	Width of *Corbicula* sp.	Estimated Biomass (g ww)	Comments
LW2-BTFC002	7	0.09	Tow 6 cont'd
	6	0.07	
	18	0.60	
	11	0.22	
	6	0.07	
	8	0.12	
	36	2.40	Tow 7, silt, wood debris, fine gravel, leaf litter,
	30	1.66	Coarse sand, shell fragments
	27	1.35	
	36	2.40	Tow 8, silt, abund. wood debris, fine gravel,
	33	2.01	shell fragments, misc. trash, leaf litter
	31	1.78	
	30	1.66	
	31	1.78	
	27	1.35	
	28	1.45	
	20	0.74	
	20	0.74	
	7	0.09	
	7	0.09	
	6	0.07	
	34	2.14	Tow 9, fine gravel, coarse sand, trace wood
	30	1.66	debris, shell fragments, leaf litter, slight pocket of sheen
	30	1.66	Mussel 84mm
	28	1.45	
	27	1.35	
	25	1.15	
	25	1.15	

Field Collection Form

Project Name: LWG RA-Round 2 Benthic Invertebrate (Clam Sledge) Sampling

Project no. 03-28-04-31

Date: 12/13/05

Crew: AR, SP, MM
AS Coversights

Sample ID	Width of *Corbicula* sp.	Estimated Biomass (g ww)	Comments
LW2-BTFC002	25	1.15	Tow 9 Cont'd
	19	0.67	
	29	1.55	
	29	1.55	
	24	1.06	
	6	0.07	
	33	2.01	
	12	0.27	
	40	2.96	Tow 10, fine gravel, mostly coarse sand,
	31	1.78	wood debris, shell fragments, leaf litter,
	32	1.89	slight pockets of sheen, 1 shrimp
	29	1.55	
	29	1.55	
	25	1.15	
	27	1.35	
	27	1.35	
	23	0.98	
	24	1.06	
	20	0.74	
	15	0.41	
	30	1.66	
	29	1.55	
	23	0.98	
	11	0.22	
	9	0.15	
	8	0.12	
	8	0.12	
	7	0.09	
	6	0.07	

Field Collection Form

Project Name: LWG RA-Round 2 Benthic Invertebrate (Clam Sledge) Sampling

Project no. 03-28-04-31

Date: 12/13/05

Crew: AR, SP, MM
AS Oversight

Sample ID	Width of *Corbicula* sp.	Estimated Biomass (g ww)	Comments
LW2-BTFC003	0	0	Tow 1, reject b/c is an empty tow.
	42	3.26	Tow 2, silt, abund. wood debris, shell fragments,
	35	2.26	algae, med-fine gravel (trace), dragonfly
	33	2.01	larvae, 3 gastropods, bryozoan
	33	2.01	
	27	1.35	
	27	1.35	
	31	1.78	
	29	1.55	Tow 3, wood debris, silt, 1 shrimp, leaf
	26	1.25	litter, 3 gastropods
	22	0.89	
	21	0.81	
	21	0.81	
	20	0.74	
	18	0.60	
	9	0.15	
	9	0.15	
	5	0.05	
	31	1.78	Tow 4, wood debris, silt, leaf litter, shell
	31	1.78	fragments, 6 gastropods
	28	1.45	
	20	0.74	
	20	0.74	
	20	0.74	
	6	0.07	
	29	1.55	Tow 5, wood debris, silt, leaf litter, shell
	25	1.15	fragments, 3 shrimp, 11 gastropods
	20	0.74	

Field Collection Form

Project Name: LWG RA-Round 2 Benthic Invertebrate (Clam Sledge) Sampling

Project no. 03-28-04-31

Date: 12/13/05

Crew: AR, SP, MM
AS (oversight)

Sample ID	Width of *Corbicula* sp.	Estimated Biomass (g ww)	Comments
LW2-BTF0003	19	0.67	Tow 5 Cont'd
	8	0.12	
	7	0.09	
	7	0.09	
	32	1.89	Tow 6, wood debris, wood chunks, leaf
	30	1.66	litter, silt, shell fragments, 8 shrimp,
	26	1.25	10+ gastropods
	28	1.45	
	25	1.15	
	15	0.41	
	16	0.47	
	10	0.18	
	7	0.09	
	9	0.15	
	35	2.26	Tow 7, wood debris, wood chunks, leaf
	36	2.40	litter, silt, shell fragments, 1 shrimp,
	17	0.53	5+ gastropods, algae
	29	1.55	1 lamprey
	7	0.09	
	38		Tow 8, mostly silt, wood debris, algae,
	34		15+ gastropods, shell fragments, leaf litter,
	33		juv. crayfish, 1 shrimp
	38		
	32		
	35		
	28		
	27		
	26		

Field Collection Form

Project Name: LWG RA-Round 2 Benthic Invertebrate (Clam Sledge) Sampling

Project no. 03-28-04-31

Date: 12/13/05

Crew: AR, SP, MM, AS (oversight)

Sample ID	Width of *Corbicula* sp.	Estimated Biomass (g ww)	Comments
	27		Tow 8 cont'd
	28		
	13		
	9		
	6		
	33		
	9		
	30		Tow 9, wood debris, wood chunks, algae, shell
	30		fragments, leaf litter, 7 shrimp, 18+ gastropods
	23		
	22		Mussel 81 mm
	21		
	26		
	19		
	36		Tow 10
	6		
LW2-BTE-C041	36	2.40	Tow 16, wood debris, leaf litter, wood chunks, shell
	30	1.66	fragments, trace med gravel, leech
	24	1.06	
	8	0.12	
	0	0	Tow 17, Reject b/c it flipped
	8	0.12	Tow 18, wood chunks, leaf litter, trace med gravel,
	5	0.05	silt, shell fragments
	7	0.09	Tow 19, fine-med sand, silt, wood debris, leaf litter,
	8	0.12	shell fragments
	0	0	Tow 20, silt, shell fragments, wood debris, spongy porous debris, trace wood chunks NO clams

Field Collection Form

Project Name: LWG RA-Rd 2 Benthic Invert (clam sledge) sampling
Project no. 03-28-04-31
Date: 12/13/05
Crew: AR, SP, MM
AS (oversight)

Sample ID	Width of *Corbicula* sp.	Estimated Biomass (g ww)	Comments
LW2-BTFC011	0	0	Tow 21, No clams, slight H_2S odor, shell fragments, wood debris, silt, wood chunks, trace spongy trash
	5	0.05	Tow 22, wood debris, leaf litter, shell fragments
	29	1.55	Tow 23, silt, wood debris, leaf litter, shell fragments, wood chunks
	7	0.09	
	6	0.07	
	0	0	Tow 24, mostly silt, wood debris, leaf litter, slight H_2S odor, gravel, shell fragments No clams

Field Collection Form

Project Name: LWG RA - Rd 2 Benthic ~~sampling~~ invertebrate (clamsledge) sampling

Project no. 03-28-04-31

Date: 12/14/05

Crew: AR, SP, MM (AS oversight)

Sample ID	Width of *Corbicula* sp.	Estimated Biomass (g ww)	Comments
LW2-BTFC014	0	0	Tow 15, No clams, silt, wood debris, shell fragments, slight pockets of sheen, plastic litter
	7	0.09	Tow 16, silt, wood debris, shell fragments, plastic litter, glass
	35	2.28	Tow 17, silt, wood debris, shell fragments, glass, fine-med gravel
	30	1.66	
	28	1.45	
	19	0.67	
	37	2.53	Tow 18, silt, slight pocket of sheen, wood debris, trace coarse gravel, shell fragments, med gravel, plastic litter, algae
	34	2.14	
	32	1.89	Tow 19, silt, wood debris, shell fragments, plastic litter, algae, 4 shrimp
	30	1.66	
	29	1.55	
	17	0.53	
	28	1.45	Tow 20, silt, wood debris, shell fragments, algae
LW2-BTFC015	0	0	Tow 16, reject b/c it was snagged.
	27	1.35	Tow 17, silt, wood debris, leaf litter, shell fragments, trace fine gravel
	7	0.09	
	24	1.06	Tow 18, silt, slight H_2S odor, wood debris, wood chunks, shell fragments, algae, plastic, trace fine-med gravel
	0	0	Tow 19, reject b/c snagged.
	23	0.98	Tow 20, med. gravel, fine gravel, shell fragments, wood debris, silt, 2 shrimp, strong petro odor
	16	0.47	
	26	1.25	Tow 21, wood debris, mostly med gravel, trace fine gravel, shell fragments, algae, moderate petroleum odor
	22	0.89	
	27	1.35	Tow 22, med gravel, fine gravel, silt, wood fragments, algae, shell fragments, strong petroleum odor, 1 shrimp
	27	1.35	
	26	1.25	
	25	1.15	

Field Collection Form

Project Name: LWGRA-Rd 2 Benthic Invertebrate (clam sledge) sampling

Project no. 03-28-04-31

Date: 12/19/05

Crew: AR, SP, MM (As: Lower sight)

Sample ID	Width of *Corbicula* sp.	Estimated Biomass (g ww)	Comments
LW2-BTFC015	26	1.25	Tow 22 cont'd
	25	1.15	
	17	0.53	
	15	0.41	
	6	0.07	
LW2-BTFC019	29	1.55	Tow 11, silt, wood debris, shell fragments, string,
	8	0.12	chironomids
	6	0.07	
	28	1.45	Tow 12, silt, wood debris, shell fragments, misc.
	20	0.74	trash (paper + plastic), leaf litter, chironomids
	8	0.12	
	31	1.78	Tow 13, silt, wood debris, shell fragments, leaf
	13	0.31	litter, chironomids
	6	0.07	
	43	3.42	Tow 14, silt, wood debris, shell fragments,
	43	3.42	chironomids, golf ball, plastic
	21	0.81	
	6	0.07	
	39	2.81	Tow 15, silt, wood debris, some wood chunks,
	9	0.15	slight sheen, shell fragments, leaf litter, fine
	14	0.36	sand, med-fine gravel, plastic, chironomids
	14	0.36	1 shrimp
	17	0.53	
	12	0.27	
	27	1.35	Tow 16, silt, abund. wood debris, shell fragments,
	7	0.09	leaf litter, chironomids
LW2-BTFC015	0	0	Tow 23, silt, wood debris, algae, 1 shrimp, shell
			fragments No clams
	24	1.06	Tow 24, mostly med gravel, trace coarse & fine
			gravel, wood debris, shell fragments, moderate petroleum odor.

Field Collection Form

Page _____ of _____

Project Name: _____ **Project no.** _____

Date: _____ **Crew:** _____

Sample ID	Width of *Corbicula* sp.	Estimated Biomass (g ww)	Comments

B2. Bioaccumulation

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All-Weather Notebook
No. 311

Portland RI/FS Round 2
Bioaccumulation sampling - Power grab (boat 1)
Book 1 of 1
December 05 - 20, 2005

4 5/8" x 7" - 48 Numbered Pages

ANC02459
BZTO104(e)002459

J.Florer 12/5/05

Bioaccumulation Sampling-Sediment

Processing boat: Captain: Scott Miller -Fred Devine
(Fred Denne) Thai Do, Emily Duffield -Windward

Grab boat: "Peter R" Captain: Dale Dickinson
(MSS) Darrell Yates- MSS
Joss Moore - Integral
Joanna Florer - Windward

13:15 - Arrive Swan Island boat launch
load gear
13:30 - Joss called Coast Guard + Sheriff
13:40 - Health and safety meeting

FRS radio - channel #9
VHF radio - #16 general

14:00 - Depart Swan Island boat launch
14:20 - Arrive BT020, called Will bridge
16:00 - finish grab sampling
16:30 - Joss called Coast guard, sheriff +
Will bridge to let them know we finished
gm7

J.Florer 12/5/05

Bioaccumulation Sampling - Sediment

Processing boat: "Cutlass" captain: Ryan Boett - chter
(Fred Devine)
Thai Do, Emily Duffield

Grab boat: "Peter R" Captain: Dale Dickinson
Darrell Yates - MSS
Joss Moore - Integral
Joanna Florer - Windward

07:45 - Arrive Swan Island - load gear
08:10 - Joss called Coast guard + Sheriff
08:15 - Depart Swan Island
08:35 - ARRIVE OPS AREA, STATION GBT027
08:40 - GBT027a-g1 45° 33.63565'N
ACCEPT 27 FT DEPTH 122° 43.03376'W
08:57 - GBT027a-g2 45° 33.63631'N
ACCEPT 26 FT DEPTH 122° 43.03119'W
09:13 - GBT027b-g1 45° 33.63022'N
ACCEPT 24 FT DEPTH 122° 43.01414'W
09:27 - GBT027b-g2 REJECT - LOG IN WATER
0930 GBT027b-g3 45° 33.62975'N
ACCEPT 23 FT DEPTH 122° 43.01387'W
09:48 GBT027c-g1 45° 33.61867'N
ACCEPT 41 FT DEPTH 122° 43.02656'W

J. Flower 12/06/05

BIOACCUMULATION SAMPLING - SEDIMENT

10:12 GBT027c-g2 45°33.61958'N
ACCEPT 42 FT DEPTH 122°43.02729'W

10:30 GBT027d-g1 45°33.61871'N
ACCEPT 32 FT DEPTH 122°43.00860'W

10:47 GBT027d-g2 REJECT - ~~ROPE~~ CABLE IN JAWS

10:52 GBT027d-g3 45°33.~~61806~~ 61766'N
ACCEPT 35 FT DEPTH 122°43.~~00790~~ 00871'W

11:11 GBT027e-g1 REJECT - LOG IN JAW ??

11:17 GBT027e-g2 45°33.61751'N
ACCEPT 25 FT DEPTH 122°42.99518'W

11:38 GBT027e-g3 45°33.61806'N
ACCEPT 21 FT DEPTH 122°42.99687'W

12:08 GBT027f-g1 45°33.61741'N
ACCEPT 22 FT DEPTH 122°42.98427'W

12:20 GBT027f-g2 45°33.61823'N
ACCEPT 20 FT DEPTH 122°42.98327'W

J. Flower 12/06/05

BIOACCUMULATION SAMPLING - SEDIMENT

12:38 GBT027-g1 REJECT - EMPTY

12:44 GBT027-g2 REJECT - EMPTY

12:48 GBT027-g3 REJECT - INSUFF. MATERIAL

MOVE STATION TARGET 20 FT OFFSHORE

12:52 GBT027-g4 45°33.60339'N
ACCEPT 41 FT DEPTH 122°42.99033'W

13:09 GBT027-g5 45°33.60326'N
ACCEPT 40 FT DEPTH 122°42.98979'W

13:30 Joss called Willbridge to get clearance to re-sample BT020, not granted

13:35 Joss called again based on visual observation at terminal + clearance was obtained

13:42 GBT020a-g1 45°34.09243'N
ACCEPT 13.5 FT 122°44.38886'W

13:56 GBT020a-g2 45°34.09301'N
ACCEPT 13.0 FT 122°44.38749'W

14:12 GBT020b-g1 45°34.07389'N
ACCEPT 21.5 FT DEPTH 122°44.40131'W

J. Flower 12/06/05

BIOACCUMULATION SAMPLING - SEDIMENT

14:26 GBT020b-g2 45° 34.07389'N
ACCEPT 22 FT DEPTH 122° 44.39962'W

14:40 GBT020c-g1 45° 34.06858'N
ACCEPT 20 FT DEPTH 122° 44.40727'W

1451 GBT020c-g2 45° 34.06807'N
ACCEPT 21 FT DEPTH 122° 44.40498'W

15:02 GBT020d-g1 45° 34.06154'N
ACCEPT 20 FT DEPTH 122° 44.40751'W

15:11 GBT020d-g2 45° 34.06148'N
ACCEPT 20 FT DEPTH 122° 44.40589'W

15:21 GBT020e-g1 45° 34.06206'N
ACCEPT 19 FT DEPTH 122° 44.41806'W

15:32 GBT020e-g2 45° 34.06126'N
ACCEPT 19 FT DEPTH 122° 44.41809'W

15:45 GBT020f-g1 45° 34.05556'N
ACCEPT 18 FT DEPTH 122° 44.41806'W

J. Flower 12/06/05

BIOACCUMULATION SAMPLING - SEDIMENT

15:55 GBT020f-g1 45° 34.05602'N
ACCEPT 18 FT DEPTH 122° 44.41909'W

16:07 END SEDIMENT SAMPLING, DEPART FOR SWAN ISLAND BOAT RAMP.

16:25 ARRIVE RAMP, OFF LOAD

17:30 Joss called ~~the~~ will bridge, sheriff, + coast guard for end of activities

J. SUND Bioaccumulation Sampling-Sediment 12/7/05

0800 Processing Boat:
Scott Miller: Fred Devine
Thai Do, Joanna Flores: Windward
Power Grab:
Dale Dickinson } MSS
Darrell Yates
J. Moore, T. Sund - Integral
0805 Call Coast Guard
Shemp
Head to GBT027.
0834 ARRIVE AT GBT027, BEGIN GRAB SAMPLING

0839 GBT027a-g3 REJECT, INSUFF. MATERIAL

08:44 GBT027a-g4 45° 33.63440'N
ACCEPT 24 FT DEPTH 122° 43.03072'W

08:56 GBT027a-g5 REJECT- LOG IN JAW

09:05 GBT027a-g6 45° 33.
ACCEPT 25 FT DEPTH 122° 43

09:18 GBT027b-g4 45° 33.62977'N
ACCEPT 20 FT DEPTH 122° 43.01191'W

J. Sund 12/07/05

BIOACCUMULATION SAMPLING - SEDIMENT

09:32 GBT027b-g5 45° 33.62966'N
ACCEPT 23 FT DEPTH 122° 43.01464'W

09:46 GBT027c-g3 45° 33.61734'N
ACCEPT 42 FT DEPTH 122° 43.02782'W

09:59 GBT027c-g4 45° 33.61933'N
ACCEPT 42 FT DEPTH 122° 43.02496'W

10:15 GBT027d-g4 45° 33.61776'N
ACCEPT 34 FT DEPTH 122° 43.00787'W

10:30 GBT027d-g5 45° 33.61747'N
ACCEPT 35 FT DEPTH 122° 43.00766'W

10:59 GBT027e-g4 45° 33.61732'N
ACCEPT 26 FT DEPTH 122° 42.99707'W

11:17 GBT027e-g5 45° 33.61853'N
ACCEPT 24 FT DEPTH 122° 42.99700'W

11:30 GBT027f-g 45° 33.61709'N
ACCEPT 22 FT DEPTH 122° 42.98262'W

J. Sund — BIOACCUMULATION SAMPLING - SEDIMENT — 12/07/05

11:43	GBT027f-g4	45° 33.61814'N
	ACCEPT 21 FT DEPTH	122° 42.98355'W
12:02	GBT027g-g6	45° 33.60246'N
	ACCEPT 42 FT DEPTH	122° 42.98923'W
12:23	GBT027g-g7	45° 33.60406'N
	ACCEPT 43 FT DEPTH	122° 42.99139'W
12:42	GBT027g-g8	45° 33.60337'N
	ACCEPT 41 FT DEPTH	122° 42.98945'W
1327	AT LOCATION GBT032	
1332	GBT032a-g1	45° 32.99907'N
	Accept 17 ft depth	122° 42.27426'W
13:46	GBT032a-g2	45° 33.00080'N
	ACCEPT 17 FT DEPTH	122° 42.27572'W
13:55	GBT032a-g3	45° 33.00029'N
	ACCEPT 17 FT DEPTH	122° 42.27577'W
14:08	GBT032b-g1	45° 32.98750'N
	ACCEPT 8 FT DEPTH	122° 42.28820'W

J. Sund — BIOACCUMULATION SAMPLING - SEDIMENT — 12/07/05

1419	GBT032b-g2	45° 32.98773'N
	Accept 8 ft depth	122° 42.28929'W
1432	GBT032b-g3	45° 32.98764'N
	ACCEPT 8 FT DEPTH	122° 42.28749'W
14:49	GBT032c-g1	45° 32.97601'N
	ACCEPT 13 FT DEPTH	122° 42.28825'W
15:05	GBT032c-g2	45° 32.97729'N
	ACCEPT 12 FT DEPTH	122° 42.28739'W
15:18	GBT032c-g3	45° 32.97673'N
	ACCEPT 12 FT DEPTH	122° 42.28722'W
15:31	GBT032d-g1	45° 32.96424'N
	ACCEPT 3 FT DEPTH	122° 42.30646'W
15:48	GBT032d-g2	45° 32.96468'N
	ACCEPT 3 FT DEPTH	122° 42.30708'W
16:03	GBT032d-g3	45° 32.96435'N
	ACCEPT 3 FT DEPTH	122° 42.30693'W

J.Sund

BIOACCUMULATION SAMPLING - SEDIMENT 12/07/05

16:17 END SEDIMENT SAMPLING, DEPART OPS AREA FOR SWAN ISLAND BOAT RAMP.

1645 Call Coast Guard + Sheriff
Depart Swan Island

12/7/05

J.Sund

BIOACCUMULATION SEDIMENT SAMPLING 12/8/05

Weather: sunny, cold (30s) windy

0800 At Cathedral Park

Power Grab: J.Moore } Integral
J.Sund }
D.Dickinson } MSS
D.Yates }

Processing Boat:
J.Do } Windward
J.Florer }
R.Boett - Fred Devine

Call Coast Guard + Sheriff

0813 Head to Gunderson GBT028.

08:28 ARRIVE OPS AREA, BEGIN GRAB SAMPLING

0839 GBT028a-g1 45° 33.41164'N
ACCEPT 35 FT DEPTH 122° 43.20590'W

09:06 GBT028b-g1 45° 33.40057'N
ACCEPT 35 FT DEPTH 122° 43.21984'W

09:22 GBT028c-g1 45° 33.40140'N
ACCEPT 35 FT DEPTH 122° 43.20128'W

14 J Sund 12/08/05

BIOACCUMULATION SAMPLING - SEDIMENT

09:46 GBT028d-g1 45°33.39785'N
ACCEPT 35 FT DEPTH 122°43.18079'W

10:06 GBT028e-g1 45°33.39577'N
ACCEPT 33 FT DEPTH 122°43.21761'W

10:30 GBT028f-g1 REJECT - CABLE IN JAWS
10:34 GBT028f-g2 45°33.30441'N
ACCEPT 21 FT DEPTH 122°43.23186'W
1044 CHRIS (tribe rep.) on board.
10:51 GBT028g-g1 45°33.30106'N
ACCEPT 32.5 FT DEPTH 122°43.20697'W

11:11 GBT028h-g1 45°33.38815'N
ACCEPT 17 FT DEPTH 122°43.22228'W
1130 HEAD TO GBT022

11:48 GBT022a-g1 REJECT - INSUFF. MTRL
12:10 GBT022a-g2 REJECT - COBBLE/RIPRAP
12:15 GBT022a-g3 45°34.22243'N
ACCEPT 24 FT DEPTH 122°43.34844'W
MOVED 12 FT NORTH OF TARGET
STRAIGHTEN JAWS, LUNCH BREAK

DB

J Sund 12/8/05 15

BIOACCUMULATION SAMPLING Sediment

12:42 GBT022a-g4 REJECT - COBBLE IN JAW
13:11 GBT022a-g5 45°34.22309'N
ACCEPT 20.5 FT DEPTH 122°43.34690'W

13:23 CHRIS OFF BOAT

13:32 GBT022b-g1 45°34.21144'N
ACCEPT 28 FT DEPTH 122°43.39198'W

13:51 GBT022c-g1 45°34.20955'N
ACCEPT 35 FT DEPTH 122°43.36598'W

14:11 GBT022d-g1 45°34.20316'N
ACCEPT 32.5 FT DEPTH 122°43.39110'W

14:28 GBT022e-g1 45°34.19992'N
ACCEPT 37 FT DEPTH 122°43.35928'W

14:46 GBT022f-g1 45°34.18689'N
ACCEPT 42 FT DEPTH 122°43.41656'W

15:00 END SEDIMENT SAMPLING, RETURN TO RAMP
Call Coast Guard + Sheriff
15:10 ARRIVE AT RAMP, OFFLOAD SAMPLING CREW

DB

J. Sund

Bioaccumulation Sampling 12/07/05
SEDIMENT

0745 Arrive @ Swan Island
Call Coast Guard + Sheriff
Power Grab: D. Dickinson } MSS
(Peter R) D. Yates }
J. Moore } Integral
J. Sund }
Processing: T. Do } windward
"The Cadillac" J. Florer }
S. Miller - Fred Devine

0805 Head to GBT-031

0835 GBT031a-g1 45° 33.31357'N
ACCEPT 25 FT DEPTH 122° 42.32930'W

09:02 GBT031b-g1 45° 33.30560'N
ACCEPT 19 FT DEPTH 122° 42.29436'W

09:19 GBT031c-g1 45° 33.30070'N
ACCEPT 29 FT DEPTH 122° 42.29988'W

09:40 GBT031d-g1 45° 33.29628'N
ACCEPT 29 FT DEPTH 122° 42.28712'W

DD

J. Sund

BIOACCUMULATION SAMPLING - SEDIMENT 12/07/05

09:57 GBT031e-g1 45° 33.28844'N
ACCEPT 34 FT DEPTH 122° 42.28193'W

10:15 GBT031f-g1 45° 33.28537'N
ACCEPT 31 FT DEPTH 122° 42.27062'W

10:31 GBT031g-g1 45° 33.27980'N
ACCEPT 34.5 FT DEPTH 122° 42.26273'W

10:50 SHIFT TO STATION GBT030

10:59 GBT030a-g1 45° 33.18780'N
ACCEPT 22 FT DEPTH 122° 42.67502'W

11:25 GBT030b-g1 45° 33.17879'N
ACCEPT 24 FT DEPTH 122° 42.65457'W

11:43 GBT030c-g1 45° 33.17506'N
ACCEPT 25 FT DEPTH 122° 42.63859'W

12:25 GBT030d-g1 REJECT - INSUFF MATERIAL
12:28 GBT030d-g2 45° 33.16618'N
ACCEPT 25 FT DEPTH 122° 42.62748'W

DD

ANC02467
BZTO104(e)002467

J Sand

BIOACCUMULATION SAMPLING - SEDIMENT 12/09/05

12:44 GBT030e-g1 45° 33.16763'N
ACCEPT ~~25~~ 27 FT DEPTH 122° 42.61507'W

12:59 GBT030f-g1 REJECT - CABLE IN JAWS
13:06 GBT030f-g2 45° 33.15964'N
ACCEPT 26 FT DEPTH 122° 42.60151'W

13:22 GBT030g-g1 45° 33.14746'N
ACCEPT 27 FT DEPTH 122° 42.57257'W

13:34 SHIFT TO STATION GBT029

14:06 GBT029a-g1 45° 33.83377'N
ACCEPT 22 FT DEPTH 122° 42.53479'W

14:26 GBT029b-g1 45° 33.82827'N
ACCEPT 16 FT DEPTH 122° 42.52248'W

14:40 GBT029c-g1 45° 33.81030'N
ACCEPT 19.5 FT DEPTH 122° 42.49861'W

14:58 GBT029d-g1 45° 33.80410'N
ACCEPT 22 FT DEPTH 122° 42.51465'W

J Sand

BIOACCUMULATION SAMPLING - SEDIMENT 12/09/05

15:10 GBT029e-g1 45° 33.79725'N
ACCEPT 20 FT DEPTH 122° 42.47878'W

15:25 GBT029f-g1 45° 33.79150'N
ACCEPT 22 FT DEPTH 122° 42.50315'W

15:43 GBT029g-g1 45° 33.78573'N
ACCEPT 20 FT DEPTH 122° 42.49179'W

END SEDIMENT SAMPLING

1610 : ARRIVE JOHN ISLAND BOAT RAMP, CALL COAST GUARD/SHERIFF, MOBE TO FIELD LAB.

ANC02468
BZTO104(e)002468

20 J Florer 12/12/05

Bioaccumulation sampling

Weather: overcast, cold (30s°F)
Crew:
Powergrab: "Peter 8"
Jane Sund - Integral
Joanna Florer - Windward
Dale Dickenson } MSS
Darrell Yates }
Processing: "Cutlass"
Thai Do } Windward
Emily Duffield }
SCOM - Fred Devine

0745 - Arrive Swan Island boat ramp called coastguard, sheriff + Shaver for clearance
0830 - depart boat launch, heading to station BT024

08:45 ARRIVE AT STATION GBT024

08:53 GBT024a-g1 45° 33.76746'N
ACCEPT 7.0 FT DEPTH 122° 43.87282'W

J. FLORER 21

BIOACCUMULATION SAMPLING - SEDIMENT 12/12/05

~~09:12~~

09:12 GBT024b-g1 45° 33.76057'N
ACCEPT 7.0 FT DEPTH 122° 43.85987'W

09:28 GBT024c-g1 45° 33.75557'N
ACCEPT 4.0 FT DEPTH 122° 43.86012'W

09:44 GBT024d-g1 45° 33.75040'N
ACCEPT 9.5 FT DEPTH 122° 43.83048'W

10:00 GBT024e-g1 45° 33.74366'N
ACCEPT 3.5 FT DEPTH 122° 43.83710'W

10:17 GBT024f-g1 45° 33.73796'N
ACCEPT 5.0 FT DEPTH 122° 43.81797'W

10:34 GBT024g-g1 45° 33.73828'N
ACCEPT 4.5 FT DEPTH 122° 43.82467'W

10:51 MOVE TO STATION GBT025

10:59 GBT025a-g1 45° 33.54543'N
ACCEPT 13 FT DEPTH 122° 43.53706'W

11:20 GBT025b-g1 45° 33.54595'N
ACCEPT 11 FT DEPTH 122° 43.52467'W

J. FLORER

BIOACCUMULATION SAMPLING-SEDIMENT 12/12/05

11:36 GBT025d-g1 45°33.53925'N
ACCEPT 13.5 FT DEPTH 122°43.54242'W

11:51 GBT025d-g1 45°33.53363'N
ACCEPT 14 FT DEPTH 122°43.54797'W

12:07 GBT025e-g1 45°33.52804'N
ACCEPT 11.5 FT DEPTH 122°43.53511'W

12:22 GBT025g-g1 45°33.51542'N
ACCEPT 13.0 FT DEPTH 122°43.55407'W

12:38 MOVE TO STATION GBT026

12:59 GBT026a-g1 45°34.03141'N
ACCEPT 21.5 FT DEPTH 122 42.94199'W

13:18 GBT026b-g1 REJECT - ROCKS IN JAWS
13:22 GBT026b-g2 45°34.02500'N
ACCEPT 23.5 FT DEPTH 122° 42.93613'W

13:39 GBT026c-g1 45°34.02581'N
ACCEPT 25.5 FT DEPTH 122°42.94786'W

J. FLORER

BIOACCUMULATION SAMPLING-SEDIMENT 12/12/05

13:57 GBT026d-g1 45°34.02039'N
ACCEPT 28 FT DEPTH 122° 42.93513'W

14:16 GBT026e-g1 45°34.01395'N
ACCEPT 32 FT DEPTH 122° 42.92973'W

14:32 GBT026f-g1 45°34.01981'N
ACCEPT 29 FT DEPTH 122° 42.94134'W

15:00 ARRIVE AT SWAN ISLAND BOAT RAMP
NOTIFY COAST GUARD & SHERIFF THAT OPS
HAVE ENDED

DD

T.DO BIOACCUMULATION SAMPLING-SEDIMENT 12.13.05

Weather: overcast, cold (~30°F)

Grab Crew - Peter R
Dale Dickinson (MSS)
Darrell Yates (MSS)
Jane Sund (Integral)
Thai Do (WW)

Process crew - Cutlass
Scott Miller (FDOS)
Joanna Flaver (WW)
Emily Duffield (WW)

0800 Arrive Cathedral Park boat ramp. Called Coast Guard, Sheriff, and clients for clearance.

0820 Head to station LW2-GBT017

0829 Arrive at station LW2-GBT017

08:39 GBT017a-g1 45° 34.53571'N
ACCEPT 12.5 FT DEPTH 122° 44.90422'W

08:59 GBT017b-g1 45° 34.53639'N
ACCEPT 20.5 FT DEPTH 122° 44.89235'W

09:18 GBT017b-g2 45° 34.53672'N
ACCEPT 21.5 FT DEPTH 122° 44.89202'W

T.DO BIOACCUMULATION SAMPLING-SEDIMENT 12/13/

09:30 GBT017c-g1 REJECT-LUMBER IN JAW

09:35 GBT017c-g2 45° 34.53672'N
ACCEPT 23 FT DEPTH 122° 44.89202'W

09:51 GBT017d-g1 REJECT-ROCKS IN JAW

09:54 GBT017d-g2 45° 34.53077'N
ACCEPT 20 FT DEPTH 122° 44.88619'W

10:10 GBT017d-g3 45° 34.53022'N
ACCEPT 20.5 FT DEPTH 122° 44.88416'W

10:27 GBT017e-g1 45° 34.52435'N
ACCEPT 20.5 FT DEPTH 122° 44.87410'W

10:47 GBT017f-g1 REJECT-RIPRAP IN JAWS

10:53 GBT017f-g2 45° 34.51825'N
ACCEPT 25 FT DEPTH 122° 44.86168'W

11:15 MOVE TO STATION GBT021

11:26 GBT021a-g1 45° 33.92423'N
ACCEPT 12 FT DEPTH 122° 44.20152'W

11:44 GBT021b-g1 45° 33.92006'N
ACCEPT 12.5 FT DEPTH 122° 44.21538'W

T.DO BIOACCUMULATION SAMPLING - SEDIMENT 12/13/05

11:59 GBT021c-g1 45° 33.91808'N
ACCEPT 12.0 FT DEPTH 122° 44.20820'W

12:12 GBT021d-g1 45° 33.91577'N
ACCEPT 12.5 FT DEPTH 122° 44.21923'W

12:27 GBT021e-g1 45° 33.91016'W
ACCEPT 13.5 FT DEPTH 122° 44.22957'W
17 FT SE OF TARGET DUE TO BARGE OBSTRUCTING

12:41 GBT021f-g1 45° 33.91206'N
ACCEPT 12.5 FT DEPTH 122° 44.22137'W

12:55 MOVE TO STATION GBT013
13:19 GBT~~02~~013a-g1 45° 35.21980'N
ACCEPT 10.0 FT DEPTH 122° 45.84548'W

13:32 GBT013b-g1 REJECT - INSUFF MATERIAL
13:44 GBT013b-g2 REJECT - DEBRIS IN JAW
13:46 GBT013b-g3 REJECT - WOOD IN JAW
13:48 GBT013b-g4 45° 35.~~21477~~ 21463'N
ACCEPT 6 FT DEPTH 122° 45.~~84027~~ 83451'W

DD

T.DO BIOACCUMULATION SAMPLING - SEDIMENT 12/13/05

14:06 GBT013c-g1 45° 35.21471'N
ACCEPT 14 FT DEPTH 122° 45.84027'W

14:29 GBT013d-g1 45° 35.20805'N
ACCEPT 9.5 FT DEPTH 122° 45.82818'W

14:41 GBT013e-g1 45° 35.20678'N
ACCEPT 7.5 FT DEPTH 122° 45.82293'W

15:00 GBT013g-g1 45° 35.20223'N
ACCEPT 6.5 FT DEPTH 122° 45.81570'W

15:16 GBT013e-g1 45° 35.20745'N
ACCEPT 18.5 FT DEPTH 122° 45.83366'W

15:30 RETURN TO CATHEDRAL PARK BOAT LAUNCH.
NOTIFIED COAST GUARD & SHERIFF OPS
HAVE ENDED.

T.DO
12.13.05

DD

J. Florer 12/14/05

Bioaccumulation Sed Sampling
weather: overcast, cold (~30°F)
grab crew - Peter R - MSS
Dale Dickinson } MSS
Dorre Yates }
Jane Sund - Integral
Joanna Florer - Integral
Process crew - Cutlass: Fred Devine
Thai Do } Windward
Emily Duffield }
Scott Miller - Fred Devine

0745 - Arrive Cathedral Park, mob.
called coast guard + Sheriff
0800 - Headed to BT007

08:27 GBT007a - g1 45° 36.31984' N
ACCEPT 16.5 FT DEPTH 122° 46.78474' W

08:50 GBT007b - g1 REJECT - RIPRAP IN JAWS
08:55 GBT007b - g2 REJECT - RIP RAP IN JAWS
09:00 GBT007b - g3 45° 36.31436' W
ACCEPT 23.5 FT DEPTH 122° 46.78011' W

08:22 GBT007c - g1 45° 36.32108' N
ACCEPT 22 FT DEPTH 122° 46.78912' W

J. FLORER BIOACCUMULATION SAMPLING - SEDIMENT 12/14/05

09:32 GBT007c - g2 45° 36.32055' N
ACCEPT 21 FT DEPTH 122° 46.78882' W

09:45 GBT007d - g1 45° 36.31562' N
ACCEPT 17.5 FT DEPTH 122° 46.78395' W

09:56 GBT007d - g2 45° 36.31663' N
ACCEPT 18.5 FT DEPTH 122° 46.78344' W

10:14 GBT007e - g1 45° 36.30434' N
ACCEPT 12 FT DEPTH 122° 46.77299' W

10:32 GBT007f - g1 REJECT - RIPRAP IN JAWS
10:36 GBT007f - g2 REJECT - RIPRAP
10:42 GBT007f - g3 45° 36.29768' N
ACCEPT 15 FT DEPTH 122° 46.77114' W
STATIONS MOVED 20 FT S DUE TO ROCKY SLOPES

11:21 GBT008a - g1 45° 36.22388' N
ACCEPT 37.5 FT DEPTH 122° 46.39917' W

11:41 GBT008b - g1 45° 36.22507' N
ACCEPT 37 FT DEPTH 122° 46.39459' W

J. FLORER — BIOACCUMULATION SAMPLING - SEDIMENT — 12/14/05

11:55	GBT008c-g1	45° 36.22575'N
	ACCEPT ~~38~~ 39 FT DEPTH	122° 46.40604'W
12:21	GBT008d-g1	45° 36.22939'N
	ACCEPT 38 FT DEPTH	122° 46.41010'W
12:34	GBT008e-g1	45° 36.22718'N
	ACCEPT 39 FT DEPTH	122° 46.41060'W
12:46	GBT008f-g1	45° 36.23358'N
	ACCEPT 38 FT DEPTH	122° 46.41735'W
12:58	GBT008g-g1	45° 36.23005'N
	ACCEPT 38.5 FT DEPTH	122° 46.41798'W
13:07	MOVE TO STATION GBT009	
13:17	GBT009a-g1	45° 36.14394'N
	ACCEPT 6.5 FT DEPTH	122° 46.61921'W
13:35	GBT009b-g1	45° 36.13774'N
	ACCEPT 13 FT DEPTH	122° 46.61060'W

J. FLORER — BIOACCUMULATION SAMPLING - SEDIMENT — 12/14/05

13:49	GBT009c-g1	45° 36.14072'N
	ACCEPT 11.5 FT DEPTH	122° 46.61940'W
14:03	GBT009d-g1	45° 36.13610'N
	ACCEPT 15 FT DEPTH	122° 46.62030'W
14:17	GBT009e-g1	45° 36.14186'N
	ACCEPT 12 FT DEPTH	122° 46.62870'W
14:32	GBT009f-g1	45° 36.14438'N
	ACCEPT 10 FT DEPTH	122° 46.63657'W

14:45 DEPART OPS AREA FOR BOAT RAMP

15:00 ARRIVE AT RAMP, CALL COAST GUARD & SHERIFF

S. Pierce 12/15/05

Bioaccumulation sed sampling
Weather: overcast, cool, breezy
grab crew: Peter R. – MSS
Dale Dickinson } MSS
Darrell Yates
Jane Sand – Integral
Shannon Pierce – WW
Process. Crew: Cutlass: Fred Devine
Thai Do → WW
Emily Duffield
Scott Miller – Fred Devine

0745 – Meet @ Cathedral park, load mob
called Coast Guard + Sheriff
Debrief Safety/hazards on Sed boat

0815
~~0800~~ – Head to BT011. wx: cloudy, 30°F, wind 5-15 kts @ E

08:30 GBT011a-g1 45° 35.89429'N
ACCEPT 21.5 FT DEPTH 122° 46.87451'W

08:50 GBT011b-g1 45° 35.90358'N
ACCEPT 25 FT DEPTH 122° 46.87871'W

BIOACCUMULATION SAMPLING - SEDIMENT 12/15/05

09:10 GBT011c-g1 45° 35.91119'N
ACCEPT 18 FT DEPTH 122° 46.89252'W

09:19 S. PIERCE OFF, KATHLEEN HURLEY ON

09:31 GBT011d-g1 45° 35.89967'N
ACCEPT 17.5 FT DEPTH 122° 46.88465'W

09:50 GBT011e-g1 45° 35.89180'N
ACCEPT 13 FT DEPTH 122° 46.89257'W

10:05 GBT011f-g1 45° 35.90197'N
ACCEPT 10 FT DEPTH 122° 46.90506'W

10:23 GBT011g-g1 45° 35.88611'N
ACCEPT 9.0 FT DEPTH 122° 46.90777'W

10:40 MOVE TO STATION GBT003

11:04 GBT003a-g1 REJECT - WATER GRAB
11:08 GBT003a-g2 REJECT - WOOD IN JAWS
11:11 GBT003a-g3 REJECT - WOOD IN JAWS
11:16 GBT003a-g4 45° 37.13601'N
ACCEPT 27 FT DEPTH 122° 48.01932'W
12 FT EAST OF TARGET

BIOACCUM. SED SAMPLING 12/15/05

11:32 GBT003a-g5 REJECT - INSUFF. MATERIAL
11:36 GBT003a-g6 45° 37.13595'N
ACCEPT 31 FT DEPTH 122° 48.01858'W

11:58 GBT003b-g1 45° 37.13264'N
ACCEPT 19 FT DEPTH 122° 48.02177'W

12:10 GBT003b-g2 45° 37.13255'N
ACCEPT 23.5 FT DEPTH 122° 48.02272'W

1230 GBT003c - made 5 attempts w/in a radius of 15' Most no recovery (all water) or wood debris
~~1243 G~~ Move to GBT003d
1243 GBT003d-g1 reject wood debris
1246 GBT003d-g2 - reject wood debris.
1250 GBT003d-g3 45°
ACCEPT 26 FT DEPTH 122°
1314 GBT003d-g4
REJECT - LARGE LOG IN JAWS

RD

BIOACCUMULATION
SEDIMENT SAMPLING 12/15/05

1328 GBT003d-g5 45° 37.13404'N
ACCEPT 25.6 FT DEPTH 122° 48.01210'W

14:02 GBT003e-g1 REJECT - INSUFF. MATERIAL
14:09 GBT003e-g2 REJECT - CABLE IN JAWS
14:14 GBT003e-g3 45° 37.13332'N
ACCEPT 27 FT DEPTH 122° 47.99764'W

14:26-14:50 8 ATTEMPTS W/IN A RADIUS OF 35 FT.
MOST NO RECOVERY OR WOOD DEBRIS.
14:53 GBT003e-g12 45° 37.13159'N
ACCEPT 28 FT DEPTH 122° 47.99249'W

15:09 GBT003f-g1 REJECT - WOOD IN JAWS
15:13 GBT003f-g2 REJECT - DEBRIS IN JAWS
15:18 GBT003f-g3 45° 37.13055'N
ACCEPT 27 FT DEPTH 122° 47.99364'W

15:40 GBT003e-g6 REJECT - LOG IN JAWS
15:51 GBT003e-g7 45° 37.13687'N
ACCEPT 30 FT DEPTH 122° 48.00789'W

1607 END SAMPLING, RETURN TO BOAT RAMP
1645 ARRIVE AT RAMP. OFFLOAD, CALL COAST GUARD & SHERIFF

RD

J. SUND

BIOACCUMULATION SEDIMENT SAMPLING 12/16/05

0745 Arrive @ Cathedral Park
weather: clear, cold (20's)
crew: Power Grab (Peter R)
T. Do - Windward
T. Sund - Integral
D. Dickinson - MSS
Processing boat (Cutlass)
S. Miller - Fred Devine
K. Hurley } Windward
E. Duffield }
Call Coast Guard + Sheriff and Matt Cues w/ Schnitzer - all a go.
0800 Head to GBT006

08:29 GBT006a-g1 45° 36.68818'N
ACCEPT 18 FT DEPTH 122° 46.59270'W

08:57 GBT006b-g1 45° 36.68664'N
ACCEPT 17 FT DEPTH 122° 46.58730'W

09:01 GBT006c-g1 45° 36.68808'N
ACCEPT 15.5 FT DEPTH 122° 46.57969'W

DD

J. SUND BIOACCUMULATION SEDIMENT SAMPLING 12/16/05

09:16 GBT006d-g1 45° 36.68995'N
ACCEPT 12.5 FT DEPTH 122° 46.57790'W

09:32 GBT006e-g1 45° 36.69000'N
ACCEPT 12.5 FT DEPTH 122° 46.56805'W

09:49 GBT006f-g1 45° 36.68826'N
ACCEPT 16 FT DEPTH 122° 46.55037'W
BEGIN REPLICATE SAMPLES

10:04 GBT006a-g2 45° 36.68764'N
ACCEPT 17.5 FT DEPTH 122° 46.59255'W

10:23 GBT006b-g2 45° 36.68586'N
ACCEPT 17.5 FT DEPTH 122° 46.58662'W

10:37 GBT006c-g2 45° 36.68731'N
ACCEPT 17 FT DEPTH 122° 46.58071'W

10:58 GBT006d-g2 45° 36.68951'N
ACCEPT 14 FT DEPTH 122° 46.57817'W

11:16 GBT006e-g2 45° 36.68954'N
ACCEPT 10.5 FT DEPTH 122° 46.56897'W

DD

J. SUND — BIOACCUMULATION SEDIMENT SAMPLING — 12/16/05

11:31 GBT006f-g2 45° 36.68786'N
ACCEPT 15.5 FT DEPTH 122° 46.55026'W

MOVE TO STATION GBT010

12:07 GBT010a-g1 REJECT - DAMS BENT
12:39 GBT010a-g2 REJECT - RIPRAP
12:45 GBT010a-g3 45° 35.94459'N
ACCEPT 30 FT DEPTH 122° 46.50596'W

13:04 GBT010b-g1 REJECT - RIPRAP
13:23 GBT010b-g2 45° 35.91840'N
ACCEPT 31.5 FT DEPTH 122° 46.50853'W

13:46 GBT010c-g1 45° 35.91531'N
ACCEPT 32.5 FT DEPTH 122° 46.51141'W

14:04 GBT010d-g1 45° 35.92358'N
ACCEPT 26 FT DEPTH 122° 46.51270'W

14:23 GBT010e-g1 45° 35.91909'N
ACCEPT 31 FT DEPTH 122° 46.51406'W

14:41 GBT010f-g1 45° 35.92278'N
ACCEPT 30 FT DEPTH 122° 46.51722'W

J. SUND — BIOACCUMULATION SEDIMENT SAMPLING 12/16/05

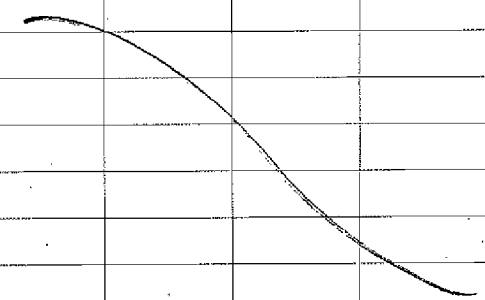
1515 MOVE TO STATION GBT018
1536 GBT018b-g1 45° 34.35895'N
ACCEPT 20.0 FT DEPTH 122° 44.61200'W

15:50 GBT018c-g1 45° 34.36078'N
ACCEPT 25 FT DEPTH 122° 44.60222'W

16:04 GBT018d-g1 45° 34.35368'N
ACCEPT 22 FT DEPTH 122° 44.61474'W

16:22 GBT018e-g1 REJECT - DEBRIS
16:25 GBT018e-g2 45° 34.35473'N
ACCEPT 25.5 FT DEPTH 122° 44.60766'W

16:43 END SEDIMENT SAMPLING, RETURN TO BOAT RAMP
CALL COAST GUARD + SHERIFF.



02.19.05 BIOACCUMULATION SEDIMENT SAMPLING T.DO

0730 Arrived at Swan Island boat ramp.

0745 Began unloading supplies

Grab crew 1: "Peter E"

Dale Dickinson (MSS)

Darrell Yates (MSS)

Joss Moore (Underwat)

Thai Do (WW)

Process ~~Grab~~ crew 2: "Flasher" 12.19.05 TD

Scott Miller (FDDS)

Kathleen Hurley (WW)

Emily Duffield (WW)

Grab crew 2: Mullins Guide Service

Dave Mullins (Mullins)

Scott Painter (Underwat)

Shannon Pierce (WW)

Joanna Flaw (WW)

0802 Called Coast Guard & Sheriff - all a go.

Headed to LWZ - GBT033

08:29 GBT033a-g1 45° 33.04602'N

ACCEPT 36 FT DEPTH 122° 41.71337'W

08:43 GBT033b-g1 45° 33.~~04426~~ 04602'N

ACCEPT 39 FT DEPTH 122° 41.71228'W

T.DO BIOACCUMULATION SEDIMENT SAMPLING 12/19/

GBT033c-g1 REJECT - OVERPENN

09:00 GBT033c-g2 45° 33.06365'N

ACCEPT 39 FT DEPTH 122° 41.73211'W

09:14 GBT033d-g1 45° 33.06712'N

ACCEPT 37 FT DEPTH 122° 41.71814'W

09:26 GBT033e-g1 45° 33.07660'N

ACCEPT 38 FT DEPTH 122° 41.72973'W

0939 GBT033f-g1 REJECT - OVERPENN

09:46 GBT033f-g2 45° 33.07706'N

ACCEPT 39 FT DEPTH 122° 41.73974'W

09:58 MOVE TO STATION GBT016

10:26 GBT016f-g1 45° 34.82173'N

ACCEPT 34 FT DEPTH 122° 44.78957'W

10:39 GBT016e-g1 REJECT - GRAB EMPTY ~~INSUFF MATL~~

10:45 GBT016e-g2 REJECT - GRAB EMPTY

10:32 GBT016e-g3 45° 34.82930'N

ACCEPT 34 FT DEPTH 122° 44.78902'W

MOVED 35 FT NE OF TARGET

11:05 MOVE TO STATION GBT001

ANC02479
BZT0104(e)002479

11:44	GBT001a-g1	45° 37.99380'N
	ACCEPT 11 FT DEPTH	122° 47.03556'W
12:04	GBT001b-g1	45° 37.98740'N
	ACCEPT 14 FT DEPTH	122° 47.04279'W
12:15	GBT001c-g1	45° 37.98122'N
	ACCEPT 10.5 FT DEPTH	122° 47.04393'W
12:36	GBT001d-g1	45° 37.97789'N
	ACCEPT 19 FT DEPTH	122° 47.05865'W
12:50	GBT001e-g1	45° 37.97255'N
	ACCEPT 11 FT DEPTH	122° 47.05579'W
13:02	GBT001f-g1	45° 37.96146'N
	ACCEPT 6 FT DEPTH	122° 47.06084'W
13:16	GBT001g-g1	45° 37.96523'N
	ACCEPT 15 FT DEPTH	122° 47.06500'W

13:35 MOVE TO STATION GBT014

14:15	GBT014a-g1	REJECT - OVERPEN
14:26	GBT014a-g2	45° 34.94529'N
	ACCEPT 35.5 FT DEPTH	122° 45.78540'W

14:45	GBT014b-g1	45° 34.95915'N
	ACCEPT 38 FT DEPTH	122° 45.80370'W
14:59	GBT014c-g1	45° 34.96283'N
	ACCEPT 37 FT DEPTH	122° 45.80779'W
15:19	GBT014d-g1	45° 34.96522'N
	ACCEPT 40 FT DEPTH	122° 45.81224'W
15:36	GBT014e-g1	REJECT - DEBRIS
15:41	GBT014e-g2	REJECT - OVERPEN
15:45	GBT014e-g3	45° 34.96981'N
	ACCEPT 41 FT DEPTH	122° 45.81844'W
16:10	GBT014f-g1	REJECT - OVERPEN
16:18	GBT014f-g2	45°
	ACCEPT 47 FT DEPTH	122°

16:30 END OF SAMPLING. HEAD BACK TO SWAN ISLAND BOAT RAMP. TO OFFLOAD SAMPLES AND SUPPLIES TO TAKE TO FIELD LAB.

1700 ARRIVE AT SWAN ISLAND BOAT RAMP. CALLED COAST GUARD & SHERIFF. END OF SAMPLING DAY.

TDD 12-19-05

12.20.05 BIOACCUMULATION SEDIMENT SAMPLING T.DO

0800 ARRIVE AT CATHEDRAL PARK TO OFFLOAD EQUIPT & SUPPLIES.

GRAB CREW 1 "PETER R"

DAVE DICKINSON (MSS)

DARRYL YATES (MSS)

JOSS MOORE (INTERN)

TRAN DO (WDW)

GRAB CREW 2 "MULLINS RESEARCH"

DAVE MULLINS

JOANNA FLORES (WDW)

SHANNON PIERCE (WDW)

BRIAN POINTER (INTERN)

ANDREW JONES (PARAMETRIX - EPA OVERSIGHT)

PROBES CREW "FLASHER"

SCOTT MILLER (EDDS)

KATHLEEN HURLEY (WDW)

EMILY DUFFIELD (WDW)

0815 CALLED COAST GUARD AND SHERIFF - ALL A GO

0820 HEADED TO LWZ - GBT023

08:44 GBT023a-g1 45° 34.02303'N
ACCEPT 36 FT DEPTH 122° 43.49224'W

09:02 GBT023b-g1 45° 34.02089'N
ACCEPT 33.5 FT DEPTH 122° 43.50175'W

12.20.05 BIOACCUMULATION SEDIMENT SAMPLING T.DO

09:14 GBT023c-g1 45° 34.02315'N
ACCEPT 38 FT DEPTH 122° 43.50407'W

09:28 GBT023d-g1 45° 34.02605'N
ACCEPT 39 FT DEPTH 122° 43.51408'W

09:42 GBT023e-g1 45° 34.02961'N
ACCEPT 47 FT DEPTH 122° 43.51648'W

09:58 GBT023f-g1 45° 34.03184'N
ACCEPT 45 FT DEPTH 122° 43.52058'W

1008 MOVE TO STATION GBT015

10:26 GBT015a-g1 45° 34.75882'N
ACCEPT 45 FT DEPTH 122° 45.32104'W

10:46 GBT015b-g1 45° 34.76713'N
ACCEPT 46 FT DEPTH 122° 45.33388'W

10:58 GBT015c-g1 45° 34.76404'N
ACCEPT 42 FT DEPTH 122° 45.33870'W

11:11 GBT015d-g1 REJECT - WOOD IN JAWS
11:16 GBT015d-g2 REJECT
11:21 GBT015d-g3 REJECT
11:25 GBT015d-g4 REJECT

46
T.DO

BIOACCUMULATION SEDIMENT SAMPLING

12/20/05

11:42 GBT015d-g5 45° 34.76209'N
ACCEPT 36.5 FT DEPTH 122° 45.34299'W

11:58 GBT015e-g1 45° 34.77377'N
ACCEPT 51.5 FT DEPTH 122° 45.35207'W

12:12 GBT015f-g1 45° 34.76785'N
ACCEPT 43 FT DEPTH 122° 45.35489'W

12:29 GBT015g-g1 45° 34.77110'N
ACCEPT 43 FT DEPTH 122° 45.36214'W

12:42 END SEDIMENT SAMPLING, RETURN TO RAMP
13:00 UNLOAD EQUIPMENT AND SUPPLIES.
CALLED COAST GUARD AND SHERIFF.
END OF BIOACCUMULATION SEDIMENT
SAMPLING EVENT

T.DO
12.20.05

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All-Weather Notebook
No. 311

Portland Harbor RI/FS
Bioaccumulation - Grab Boat 2
Dec 15, 2005 - Dec. 20, 2005
Book 1 of 2

4 5/8" x 7" - 48 Numbered Pages

ANC02483
BZTO104(e)002483

12/15/05 A. Rodriguez

0730 Arrive at field lab, load up supplies and discuss field strategy for both crews.

0830 Arrive at Fred's Marina, set up single Van Veen Grab
Grab Crew:
Angelita Rodriguez (WW)
Kathleen Hurley (WW)
Brian Pointer (Integral)
Andrew Sommes (EPA oversight, ParaMetrix)
Dave Mullins (boat driver)

0900 Contact US Coast Guard & Sheriff's office to inform of sampling activities at Rm 2 - Rm 4

0920 Motor to station BT011, Linnton Plywood to exchange crew members. Shannon Pierce replaces Kathleen Hurley on Dave Mullins boat. Pick up supplies.

0927 Motor to station BT004, near Time Oil

12/15/05 A. Rodriguez

0940 Experience GPS technical difficulties

1056 Grab 1 station LW2-GBT004c
Subarea A
45.617548 Lat
122.787496 Long

1112 Grab 2 station GBT004 Subarea A
45.617565 Lat
122.787078 Long

1122 Grab 3 station GBT004 Subarea A
45 617560
122 787060

1139 GBT004 Subarea B Grab 1
45.617456
122.786937
Unsuccessful grab, empty grab

1142 Redo Grab 1
45.617463
122.786935
Unsuccessful grab insufficient penetration

1146 Redo again
45.617453 lat 122.786926 long
Unsuccessful grab insufficient penetration

12/15/05 A. Rodriguez

GBT004 Subarea B

1148 45.617447
122.786925
Unsuccessful grab insufficient penetration

1150 45.617453 Grab 5
122.786940
Grab 6

1158 45.617464
122.786926
Unsuccessful grab insufficient penetration

1201 Grab 7
45.617451
122.786971

1204 Grab 8
45.617462
122.786917
Unsuccessful grab insufficient penetration

1207 Grab 9
45.617444
122.786913

12/15/05 A. Rodriguez

1213 Grab 10 GBT004 Subarea B
45.617455
122.
Unsuccessful grab b/c it flipped empty grab.

1215 Grab 11
45.617449
122.786945
Unsuccessful grab, b/c it flipped empty grab.

1217 Grab 12
45.617451
122.786941

1225 Motor to processing boat to unload sediment for station GBT004 Subarea A & B

1235 lunch break

1300 Pick up decontaminated pots from processing crew

1320 Arrive at station GBT004 Subarea C

12/15/05 A. Rodriguez

1321 GBT004 Subarea C Grab 1
45.617436
122.786966

1328 Grab 2
45.617435
122.786963
Unsuccessful grab insufficient penetration

1331 Grab 3
45.617431
122.786975

1337 Grab 4
45.617439
122.786975

1343 Grab 5
45.617428
122.786962

1348 GBT004 Subarea D Grab 1
45.617419
122.786977

1355 Grab 2
45.617412
122.786995
Unsuccessful grab washout.

12/15/05 A. Rodriguez

GBT004 Subarea D

1357 Grab 3
45.617412
122.786983

1402 Grab 4
45.617407
122.786983

1406 Motor to processing boat to unload sediment from station GBT004 Subarea C & D

1431 GBT004 Subarea E Grab 1
45.617322
122.786916
Unsuccessful grab b/c it flipped.

1434 Grab 2
45.617330
122.786915
Unsuccessful grab ~~too~~ AR insufficient penetration.

1438 Grab 3
45.617329
122.786942
Unsuccessful grab b/c it flipped.

12/15/05 A. Rodriguez

1440 Grab 4 GBT004 Subarea E
45.617335
122.786941
Unsuccessful grab washout.

1442 Grab 5
45.617308
122.786975

1449 Grab 6
45.617311
122.786935

1453 Grab 7
45.617311
122.786942
Unsuccessful grab insufficient penetration

1457 Grab 8
45.617313
122.786945

1503 Grab 9
45.617321
122.786926
Unsuccessful grab b/c it flipped.

1509 Grab 10
45.617311
122.786931

12/15/05 A. Rodriguez

GBT004 Subarea E

1514 Grab 11
45.617329
122.786935

1520 GBT004 Subarea F
Grab 1: 45.617315
122.786976

1526 Grab 2: 45.617312
122.786954

1533 ~~4~~ AR Grab 3: 45.617321
122.786954

1538 Grab 4: 45.617324
122.786966
Unsuccessful grab insufficient penetration

1540 Grab 5: 45.617328
122.786964

1545 Complete Station GBT004

1549 Motor back to processing boat to unload sediment from GBT004 Subarea ~~E~~ & F

ANC02487
BZTO104(e)002487

12/15/05 A. Rodriguez

1600 Discuss field progress with Ian Stupakoff
Must call Scott Vawter (Anco) at 503.209.3153 ~730 AM on 12/16/05 to obtain permission to sample BT012

1630 Arrive at Fred's Marina
Unload gear & discuss field logistics for sampling 12/16/05

1700 Arrive at field lab and unload gear

End of day

Angelita

12/16/05 A. Rodriguez

0700 Arrive at field lab and load up supplies

0730 Arrive at Fred's Marina
Grab Crew:
Angelita Rodriguez (WW)
Shannon Pierce (WW)
Brian Pointer (Integral)
Dave Mullins (boat driver)
Andrew Somes (Coversight, Parametrix)

0740 Contact US Coast Guard & Sheriff's office to inform of sampling activities from RM 2 - RM 7
proposed stations BT005, BT006, BT010, BT012, BT001 & BT002

0800 Motor to station BT005, RM 3.6 at the mouth of the International Slip

820 GBT005 Grab 1 Subarea ~~A~~ AR a
45.611281
122.782839
Unsuccessful grab b/c rocks in jaws.

12/16/05 A. Rodriguez

GBT005 Subarea a Grab 2

822 45.611286
122.782825
Unsuccessful grab b/c rocks in the jaws.

825 Grab 3 Unsuccessful grab b/c of insufficient penetration
45.611285
122.782843

828 Grab 4 45.611281 122.782848
Unsuccessful grab b/c of insufficient penetration

832 Grab 5
45.611276
122.782820
Unsuccessful grab b/c of insufficient penetration

836 Grab 6
45.611266
122.782847
Unsuccessful grab b/c of insufficient penetration

841 GBT005 Subarea f Grab 1
45.611289
122.783262
Collect VOCs in 2oz jars

12/16/05 A. Rodriguez

GBT005 Subarea f

852 Grab 2
45.611260
122.783239

901 Grab 3
45.611273
122.783248

GBT005 Subarea e

0910 Grab 1
45.611279
122.783134
Unsuccessful grab empty.

0913 Grab 2
45.611273
122.783131

0920 Grab 3
45.611289
122.783117
Unsuccessful grab b/c rocks caught in jaws.

0922 Grab 4
45.611283
122.783131
Unsuccessful grab b/c if misfired.

12/16/05 A. Rodriguez

0925 Grab 5 GBT005 Subarea ~~f~~ e
45.611259
122.783117

0932 Grab 6
45.611292
122.783126

0939 Motor to processing area to drop off sediment from station GBT005 subarea e & f

GBT005 ~~Subarea~~ Subarea d

1000 Grab 1
45.611241
122.783054

1008 Grab 2
45.611234
122.783076
Overpenetration-unsuccessful grab.

1011 Grab 3
45.611235
122.783065

12/16/05 A. Rodriguez

GBT005 Subarea d

1017 Grab 4
45.611240
122.783053

~~GBT~~ GBT005 Subarea c

1023 Grab 1
45.611289
122.783982

1030 Grab 2
45.611276
122.783978

1037 Grab 3
45.611267
122.783965

GBT005 Subarea b

1058 45.611229 Grab 1
122.782897

1105 Grab 2
45.611246
122.~~782~~923
Unsuccessful grab water grab.

1107 Grab 3
45.611241 122.782915

12/16/05 A. Rodriguez

GBT005 Subarea b

1113 Grab 4
45.611230
122.782903

1119 GBT005 Subarea a ~18 ft south
45.611293 Unsuccessful grab
122.782923 wood in grab.

1122 Grab 2
45.611290
122.782919
Unsuccessful grab insufficient penetration.

1125 Grab 3
45.611296
122.782825

1129 Grab 4
45.611226
122.782850

1134 Grab 5
45.611253
122.782849

1141 Complete Station GBT005
Motor to Fred's Marina to drop off

12/16/05 A. Rodriguez

Andrew Somes b/c he needs to get back to office.

1150 Crew takes a lunch break.

1225 Meet processing crew near station GBT010 to drop off remaining sediment from subareas a & b station GBT005.

1231 Motor to station BT012 near Arco

GBT012 Subarea a

1236 Grab 1
45.595521
122.779334

1245 Grab 2
45.595537
122.779333

1253 Grab 3
45.595544
122.779330

12/16/05 A. Rodriguez

GBT~~005~~ 012 Subarea b

1301 Grab 1
45.595666
122.779376

1308 Grab 2
45.595648
122.779378
Successful grab with scrap metal caught in jaws.

1316 Grab 3
45.595658
122.779367

1320 Motor to processing boat to drop off sediment from subareas a & b station GBT012.

GBT~~005~~ 012 Subarea c

1336 Grab 1
45.595775
122.779425

1343 Grab 2
45.595761
122.779435

12/16/05 A. Rodriguez

GBT012 Subarea d

1351 Grab 1
45.595754
122.779466

1357 Grab 2
45.595760
122.779472

1403 Grab 3
45.595762
122.779462

1408 Motor to ~~stat~~ processing boat to unload sediment from subareas c & d station GBT012.

GBT012 subarea e

1426 Grab 1
45.595670
122.779431
Unsuccessful grab insufficient penetration.

1428 Grab 2
45.595676
122.779451

ANC02492
BZTO104(e)002492

12/16/05 A. Rodriguez

GBT012 Subarea e

1433 45.595666 Grab 3
122.779444

1439 Grab 4
45.595685
122.779445

GBT012 Subarea f

1445 45.595586 Grab 1
122.779442
Unsuccessful grab b/c of washout.

1447 Grab 2
45.595587
122.779422
Unsuccesful grab b/c of washout.

1448 Grab 3
45.595581
122.779401
Unsuccessful grab b/c of washout.

1450 Grab 4
45.595600
122.779396

1456 Grab 5
45.595603
122.779406

12/16/05 A. Rodriguez

GBT012 Subarea f Grab 6

1502 45.595708
122.779416
Complete station GBT012

1505 Motor to processing boat to drop off sediment from subarea e & f station GBT012.

1514 Motor to station GBT018, near Arkema on west side to attempt grabs at subarea a & f.

GBT018 Subarea a

AR ~~1525~~ Grab 1
~~45.595660~~
~~122.748343~~

1535 45.572723
122.743745
Unsuccessful grab b/c overpenetration.

1539 Grab 2
45.572788
122.743754
Unsuccesful grab b/c over penetration.

12/16/05 A. Rodriguez

GBT018 Subarea a

1541 Grab 3
45.572762
122.743726
½ grab overpenetrated not kept.

1547 Grab 4 add float to top of Van Veen.
45.572756
122.743729
Unsuccessful grab b/c overpenetration.

1553 Grab 5
45.572794
122.743659

1557 Grab 6
45.572802
122.743672
Unsuccessful grab b/c overpenetration.

1600 Grab 7
45.572804
122.743659
Remove weights from grab.
GBT018 Subarea f

1615 Grab 1
45.572~~42~~436
122.743269
Unsuccessful grab b/c overpenetration.

12/16/05 A. Rodriguez

GBT018 Subarea f

1619 Grab 2
45.572411
122.743263

1624 Grab 3
45.572418
122.743282
Unsuccessful grab b/c misfired & came up empty.

1626 Grab 4
45.572421
122.743284
Unsuccessful grab b/c misfired.

1627 Grab 5
45.572419
122.743249

1632 Grab 6
45.572407
122.743259

1640 Motor to processing boat & drop off sediment from subarea a & f station GBT018.

12/16/05 A. Rodriguez

1657 Head back to Fred's Marina

1700 Contact US Coast Guard & Sheriff's office to inform sampling has been completed for the day.

1710 Arrive at Fred's Marina

1730 Arrive at field lab and unload supplies.

1800 End of the day.

Angelita

12/19/05 S. Pierce

0700 - Meet @ field lab & set up.

0745 - Meet @ Swan Island lagoon
Grab crew:
Joanna Flores > WW
Shannon Pierce
Brian Pointer - Integral
Dave Mullins - Boat Driver

0800 - Hand over to BTO16
Contact Coast Guard + Sherriff. Andrew Somes (oversight, Parametrix) will not be joining us. b/c of access difficulty to boat launch (snow + ice on roads).

Weather: cold (+32°F), raining, windy

12/19/05 S. Pierce

0826 GBT016 Grab 1 Subarea A

SP ~~0826~~ ~~45~~ SP 45.58025022
122.74603410
wood debris in jaws - washout + insufficient penetration

0830 GBT016 Grab 2 SubArea A
45.5802440
122.74603841 [Kept grab]

0840 GBT016 Grab 3 SubArea A
45.58024039
122.74601751
rejected - triggered @ platform

0842 GBT016 Grab 4 SubArea A
45.58024231
122.74604276
overpenetration - no good

0845 GBT016 Grab 5 SubArea A
45.58024083
122.74603025 [Kept grab]

12/19/05 S. Pierce

~~[illegible]~~ SP

0852 GBT016 Grab 6 Subarea A
45.58023779
122.74602754 [Kept grab]
finished subarea A

0900 GBT016 Grab 1 Subarea B
~~45.58~~ SP 45.57997552
122.74588412
rejected - overpenetration

0903 GBT016 Grab 2 Subarea B
45.57997541 No grab
122.74589355 did not release

0909 GBT016 Grab 3 SubArea B
~~45.57800832~~ 45.58004991
SP ~~122.7459 3222~~ 122.74590252
[Kept grab]

0917 GBT016 Grab 4 SubArea B
45.57997405 water grab -
122.74599262 no sediment
rejected

ANC02496
BZT0104(e)002496

0921 GBT016 Grab 5 SubArea B
45.57999008
122.74588408
overpenetration - rejected

0924 GBT016 Grab 6 SubArea B
45.58000276
122.74586809
overpenetration - rejected

0929 GBT016 Grab 7 SubArea B
45.57998906
122.74589277
½ overpenetration - rejected
½ OK - Kept

0940 finished subarea B. took off weights on Van Veen b/c of soft sediment

0955 GBT016 Grab 1 SubArea C
45.58039502 Kept Grab
122.74612776

1005 GBT016 Grab 2 SubArea C
45.58039330
122.74614590 Kept Grab

1010 finished subarea C ~~[illegible]~~ SP
called other Boat - on their way (finished w/ station GBT033). Headed to Subarea D

1017 GBT016 Grab 1 SubArea D
45.5804 ~~[illegible]~~ 8053
122.7461 ~~[illegible]~~ 6280
Kept Grab

1023 Met other grab boat - they will do station GBT016 - subarea F
we'll complete subarea D and E.

1026 GBT016 Grab 2 SubArea D
45.5804 6113
122.7461 5377
Kept Grab
finished subarea D

1035 gave samples to processing boat, on to Subarea E

ANC02497
BZT0104(e)002497

12/19/05 S. Pierce

SP

~~Grab 1 SubArea E~~

SP

SP

1040 - Other grab boat is doing Subarea E; headed to processing boat to get deconed buckets for stations GBT001 + GBT002

1050 - Talked to Ian on phone; EPA has given coordinates for stations BT014, BT015, and BT019. We will meet someone at Fred's Marina to pick up a printout of coordinates for those stations. We are still waiting for coords for station BT023.

1100 Head downstream to station BT002

1120 - Arrived at station GBT002

12/19/05 S. Pierce

1122 GBT002 Grab 1 SubArea A

~~45.62975349~~ SP

~~122.78613279~~ SP

45.62974583

122.78611763

Kept grab

1130 GBT002 Grab 2 SubArea A

45.6297 4465

122.7861 1508

rejected - wash out; rock in jaws

1133 GBT002 Grab 3 SubArea A

45.62973544

122.78609786

rejected - wash out; rock in jaws

1135 GBT002 Grab 4 SubArea A

45.62975818

122.78614596

grab flipped - did not trigger

1137 GBT002 Grab 5 SubArea A

45.62974210

122.78614264

rejected no sed. in grab

1139 GBT002 Grab 6 SubArea A
45.62977981
122.78618202
moved ~20 ft out from station b/c of unsuccessful grabs in previous attempts
Kept grab

1148 GBT002 Grab 7 SubArea A
45.62976509
122.78616168
insufficient penetration ~11cm

1150 GBT002 Grab 8 SubArea A
45.62976916
122.78616573
rejected - wash out ~can in jaws (paint.)

1152 GBT002 Grab 9 SubArea A
45.62972776
122.78615885
wash out - corbicula caught in jaws ~ changed over to weighted van Veen for more weight in sandy debris

1204 GBT002 Grab 10 SubArea A
45.62971204
122.78623207
overpenetrated - rejected

1207 GBT002 Grab 11 SubArea A
45.62974642
122.78615530
SP (sand)
rejected - insufficient penetration
1210 moved onto subarea B - sufficient effort at A; only 2 successful grabs out of 11.

1213 GBT002 Grab 1 SubArea B
45.62966803
122.78615920
Kept grab

1222 GBT002 Grab 2 Subarea B
45.62970982
122.78613735
grab flipped did not trigger

1224 GBT002 Grab 3 SubArea B
rejected - ~~[illegible]~~ chain caught.

1225 GBT002 Grab 4 SubArea B
45.62969549
122.78615576
Kept grab

1233 GBT002 Grab 5 SubArea B
45.62967794
122.78616085
Kept grab

1235 ~~[illegible]~~ Finished SubArea B, headed to processing boat gave sed. buckets. Headed to Fred's Manna to pick up coordinates for remaining stations fm. Heather @ Integral.

1250 - Picked up coordinates fM. Freds Manna - handed off to processing boat

1300 - Head to Subarea C (BT002)

1307 GBT002 Grab 1 Subarea C
45.62958613
122.78620430
rejected - wood debris caught in jaws

1309 GBT002 Grab 2 SubArea C
45.62959134
122.78620837
rejected - chain caught - grab did not fire

1311 GBT002 Grab 3 SubArea C
45.62958023
122.78624993
Kept grab

1317 GBT002 Grab 4 SubArea C
45.62959260
122.78622849
rejected - washed out

1319 GBT002 Grab 5 SubArea C
45.62960420
122.78624173
kept grab

1327 GBT002 Grab 6 SubArea C
45.62961338
122.78623823
kept grab
Finished SubArea C

1336 GBT002 Grab 1 SubArea D
45.62960815
122.78627978
kept grab

1340 - other boat going to station BT014.
1343 GBT002 Grab 2 SubArea D
45.6296 2991
122.7862 6904
kept grab

Finished SubArea D. Back to processing boat. Head to SubArea E

1401 GBT002 Grab 1 Subarea E
45.62932000
122.78634150
rejected - wash out

1403 GBT002 Grab 2 Subarea E
45.62932800
122.78636402
rejected - washout; think we're hitting rip-rap; backed up a little ways fm shore

1405 GBT002 Grab 3 SubArea E
45.62932063
122.78639902
chain caught - grab did not close

1407 GBT002 Grab 4 SubArea E
45.62932076
122.78639382
did not fire

1409 GBT002 Grab 5 SubArea E
45.62933556
122.78638300
washout - rock caught in jaws

ANC02501
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1410 GBT002 Grab 6 SubArea E
45.62933213
122.78642844
45.62933213
*moved further away fm. shore to avoid rip-rap.
kept grab

1416 GBT002 Grab 7 SubArea E
45.62933344
122.78643651
kept grab

1422 GBT002 Grab 8 SubArea E
45.62931127
122.78645154
kept grab

1425 Finished SubArea E; on to SubArea F

1431 GBT002 Grab 1 SubArea F
45.62926861
122.78640703
wash out - rejected

1433 GBT002 Grab 2 SubArea F
45.62922997
122.78646756
chain caught - did not grab
jaws did not close. Think we are hitting rip-rap even though we are away fm. shore

1434 GBT002 Grab 3 SubArea F
45.62923314
122.78645794
wash out - wood debris in jaws

1436 GBT002 Grab 4 SubArea F
45.62923768
122.78650301
moved ~30 ft fm target away fm riprap (approx. 60 m fm shoreline)
wash out - no sediment

1439 GBT002 Grab 5 SubArea F
45.62923046
122.78649202
grab flipped - jaws did not trigger

ANC02502
BZT0104(e)002502

12/19/05 S. Pierce

1440 GBT002 Grab 6 SubArea F
45.62920660
122.78652826
Note: target appears to be on shore in rip rap - trying to move away from rip rap.
rocks in jaws - wash out

1442 GBT002 Grab 7 Sub Area F
45.62921707
122.78656513
overpenetrated - rejected

1445 GBT002 Grab 8 SubArea F
45.62922582
122.78653671
overpenetrated - rejected

1449 GBT002 Grab 9 SubArea F
45.62920933
122.78652627
1/2 overpenetrated - rejected
1/2 kept

12/19/05 S. Pierce

1455 GBT002 Grab 10 SubArea F
45.62920067
122.78655591
overpenetrated - rejected

1457 changed batteries on GPS computer

1457 GBT002 Grab 11 sub Area F
45.62921315
122.78650698
kept grab

1505 Finished Subarea F and station GBT002! Head over to station GBT014 to help out other boat.

1520 - Pass off sediment to processing boat; head to station ~~GBT014~~ GBT014 F

1533 GBT014 Grab 1 Subarea F
45.58309695
122.76896854
overpenetration - rejected

12/19/05 S. Pierce

1536 GBT014 Grab 2 SubArea F
45.58308961
122.76394682
overpenetrated - rejected.
switched to unweighted van Veen

1546 GBT014 Grab 3 SubArea F
45.58309444
122.76385838
overpenetrated - rejected

1550 GBT014 Grab 4 SubArea F
45.58312901
122.76389655
did not trigger - jaws did not close

1552 GBT014 Grab 5 SubArea F
45.58306470
122.76397248
overpenetrated - rejected

1554 GBT014 Grab 6 SubArea F
45.58309177
122.76394772
overpenetrated - rejected

12/19/05 S. Pierce

1557 GBT014 Grab 7 SubArea F
45.58307671
122.76390568
rejected - overpenetrated

1559 GBT014 Grab 8 SubArea F
45.58310882
122.76399450
rejected - overpenetrated

1602 GBT014 Grab 9 SubArea F
45.58305056
122.76387665
moved out into channel slightly
hoping for less soft substrate.
did not release

1605 GBT014 Grab 10 SubArea F
45.58312889
122.76377800
did not release

1606 GBT014 Grab 11 SubArea F
45.58309800
122.76377720
did not release

ANC02504
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12/19/05 S. Pierce

1607 - other boat will attempt to get GBT014F. Head to Processing Boat.

1648 - Head back to SW. Island boat launch to unload + demob

1745 leave lab and pick up field supplies

S. Pierce 12.19.05

12/20/05 S. Pierce

0715 - Head to Integral field lab; get gear + load up

0800 - Arrive @ Cathedral Park grab crew:
Joanna Florer → WW
Shannon Pierce
Brian Pointer - Integral
Dave Mullins - Boat Driver
Andrew Somes (oversight, Parametrix)

Weather - cool, overcast, light ppt.

0820 - Head to station BT019; other boat will be @ BT023 and we'll finish-up w/ BT015 (Gasco)

0830 - Arrive @ BT019; decon + prep for sampling

0835 GBT019 Grab 1 SubArea A
45.57345175
122.73535136
Kept grab

ANC02505
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12/20/05 S. Pierce

0845 GBT019 Grab 2 SubArea A
45.57344774
122.73534619
overpenetrated - rejected

0847 GBT019 Grab 3 SubArea A
45.57344096
122.73535134
kept grab

0855 GBT019 Grab 4 SubArea A
45.57344507
122.73533504
½ overpenetrated - rejected
½ grab kept
finished subarea A

0904 GBT019 Grab 1 SubArea B
45.57334118
122.73541009
overpenetrated - rejected

0906 GBT019 Grab 2 SubArea B
45.57332928
122.73544003
overpenetrated - rejected

12/20/05 S. Pierce

0908 GBT019 Grab 3 SubArea B
45.57334139
<8 ~~122.73541942~~ 2341 122.73538507
kept grab

0918 GBT019 Grab 4 SubArea B
45.57333057 did not
122.73536569 trigger

0919 GBT019 Grab 5 SubArea B
45.57333126
122.73537437
kept grab
finished subarea B

0925 GBT019 Grab 1 SubArea C
45.57325045
122.73538825
kept grab

0931 GBT019 Grab 2 SubArea C
45.57325004
122.73537886
kept grab
finished subarea C

48

12/20/05 S. Pierce

0937 - Headed to processing boat to hand off GBT019: A, B, and C

0955 GBT019 Grab 1 Subarea D
45.57319521
122.73544586
underpenetration - rejected

0957 GBT019 Grab 2 SubArea D
45.57319366
122.73544070
underpenetration - rejected

0959 GBT019 Grab 3 SubArea D (SP)
45.57318661 ~~[illegible]~~
122.73549558
jaws didn't close; didn't trigger

1000 GBT019 Grab 4 SubArea D
45.57318670
122.73549532
washout - rejected.

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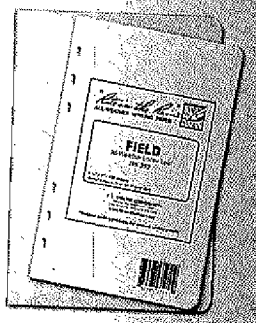
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Dec. 20, 2005 - Dec. 20, 2005
Book 2 of 2

4 5/8" x 7" - 48 Numbered Pages

ANC02508
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12/20/05 (con't) S. Pierce

1002 GBT019 Grab 5 SubArea D
45.57320106
122.73540985
overpenetration - rejected

1003 GBT019 Grab 6 SubArea D
45.57319519
122.73544047
overpenetration - rejected

1005 GBT019 Grab 7 Subarea D
45.57320075
122.73543317
underpenetration - water only

1007 GBT019 Grab 8 SubArea D
45.57320988
122.73541449
overpenetration - rejected

1009 GBT019 Grab 9 SubArea D
45.57314470
122.73545681
kept grab

12/20/05 S. Pierce

1014 GBT019 Grab 10 SubArea D
45.57313181
122.73542178
overpenetration - rejected

1016 GBT019 Grab 11 SubArea D
45.57313763
122.73546570
overpenetrated - rejected

1024 moved closer to station GBT019 - SubArea C

1026 GBT019 Grab 12 SubArea D
45.57317578
122.73531059
underpenetration - wash out

1028 GBT019 Grab 13 SubArea D
45.57320529
122.73532677
overpenetrated - rejected

ANC02509
BZT0104(e)002509

12/20/05 S. Pierce

1030 GB019 Grab 14 SubArea D
45.57329414
122.73548313
overpenetration - rejected

1033 GB019 Grab 15 SubArea D
(88) ~~45.57321~~1086 45.57321086
(88) ~~122.7355~~9613 122.73539613
moved closer to subArea C
kept grab
finished SubArea D!

1041 GBT019 Grab 1 SubArea E
45.57306907
122.73550664
overpenetrated - rejected

1042 GBT019 Grab 2 SubArea E
45.57308541
122.73557233
underpenetrated - rejected

1045 GBT019 Grab 3 SubArea E
45.57310069
122.73561535
kept Grab

12/20/05 S. Pierce

1053 GBT019 Grab 4 SubArea E
45.57311192
122.73557034
underpenetration - 8 cm rejected

1055 GBT019 Grab 5 SubArea E
45.57310534
122.73554440
wash out - rejected

1057 GBT019 Grab 6 SubArea E
45.573 overpenetrated
122.735 GPS readings not working
~~GBT019~~ Quick break for a bite to eat + wait for satellites.

1126 GBT019 Grab 7 SubArea E
45.57307351
122.73552444
kept grab

1133 GBT019 Grab 8 SubArea E
45.57308672
122.73550815
overpenetrated - rejected.

ANC02510
BZT0104(e)002510

12/20/05 S. Pierce

1134 GBT019 Grab 9 SubArea E
45.57306984
122.73552488
kept grab

1140 GBT019 Grab 1 SubArea F
45.57329556
122.73565182
kept grab

1146 GBT019 Grab 2 SubArea F
45.57329246
122.73565341
kept grab

1153 GBT019 Grab 3 SubArea F
45.57329666
122.73564465
overpenetrated - rejected

1155 GBT019 Grab 4 SubAreaF
45.57329839
122.73564334
overpenetrated - rejected

12/20/05 S. Pierce

1157 GBT019 Grab 5 SubArea F
45.57330057
122.73564097
moved slightly off station to get away fm. soft sediment overpenetration - rejected

1200 GBT019 Grab 6 SubArea F
45.57330488
122.73563558
½ rejected - overpenetrated
½ kept grab

1206 GBT019 Grab 7 SubArea F
45.57330594
122.73563772
kept grab

1214 Finished SubArea F. Head to Processing Boat.

1232 Other boat completed w/ station GBT015. All stations completed.

ANC02511
BZT0104(e)002511

12/20/05 S. Pierce

1240 - Head back to Cathedral Park to demob + unload.

1330 - Demobilization + cleanup @ field lab

1340 called Ian + left msg to get scale for lamprey processing

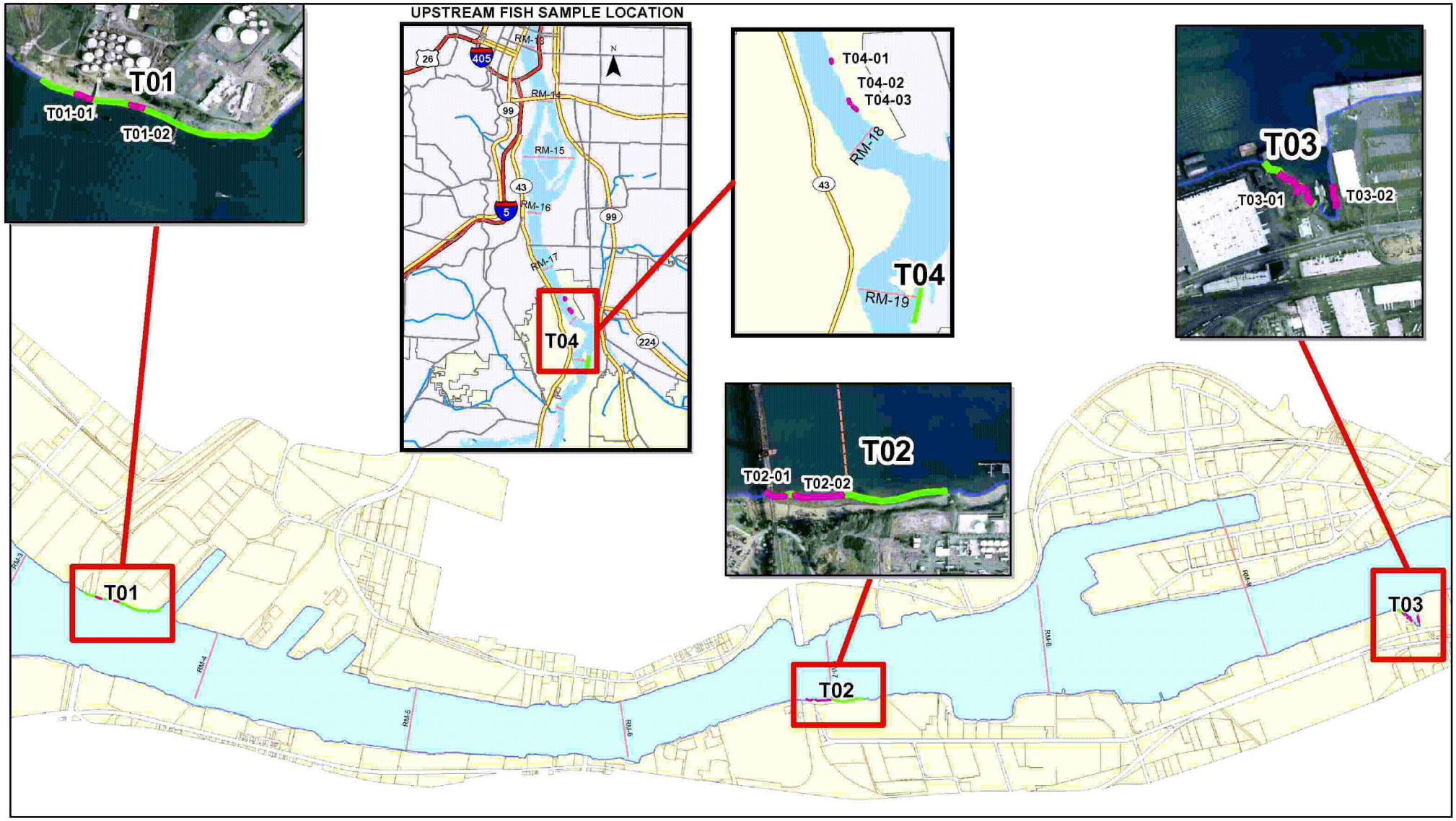
1410 picture of lamprey collected @ GBT001a in clean room of field lab

1430 Head to Fishman ~~Bayview~~ (SP) to weigh lamprey using their scale as per direction fm. Ian @ Integral

1455 Arrive @ Fishman
weigh lamprey GBT001a
weight = 1.8g

1505 Bring lamprey back to field lab; finish for the day. Finish sampling event.

SPierce
SMP 12.20.05



LWG Lower Willamette Group

integral consulting inc

FEATURE SOURCES
Channel & River miles: Developed from US Army Corps of Engineers information
Map Document: (G:\Projects\Portland_Harbor\LWG-Map-Projects\FSP_Q4\R2_fish_sampling_plan_Figure2-1.mxd)
7/12/2005 -- 3:09:54 PM

0 0.125 0.25 0.5 Miles

Fish Sampling Locations

- Actual Locations
- Target Locations

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Figure 3-1
Portland Harbor RI/FS
Subyearling Chinook Tissue Collection Field Sampling Report
Target and Actual Sample Locations

Table 2-1. Subyearling Chinook Tissue Sampling Stations and Sampling Methods.

			Sampling Method
Station ID[1]	**River Mile**	**Sampling Station Description**	**Beach Seine**
T01	Mile 3-4	Downstream ISA-East Bank	X
T02	Mile 6-7	Midstream ISA-West Bank	X
T03	Mile 9-10	Upstream ISA-West Bank	X
T04*	Mile 17-18	Upriver Reference- East Bank	X

Notes:
[1] Field replicates were collected at all stations.
* Actual sampling station is 1,684 m downstream of target station.
ISA = initial study area

Table 2-2. Precipitation, River Flow, Stream Velocity, and Gage Height during Subyearling Chinook Tissue Collection Event.

Sampling Dates	Gage height (ft.)[1]			Average Stream velocity (ft/s)[1]	Precipitation (in)[2]	River Flow (ft^3/s)[3,4]
	Min	Max	Avg.			
5/10/2005	--	--	7.23	--	0.25	23,400
5/11/2005	--	--	7.55	--	0	30,900
5/12/2005	--	--	8.45	--	0	42,100

Notes:

[1] USGS Water Resources Web Page - USGS 14211720 Willamete River at Portland, OR - http://waterdata.usgs.gov/nwis.

[2] National Weather Service Forecast Office, Portland, OR - http://newweb.wrh.noaa.gov/climate/index.php?wfo=pqr.

[3] River flow data are estimated daily mean values.

[4] USGS Water Resources Department, Portland, OR.

-- Data not available for these dates.

ANC02515
BZTO104(e)002515

Table 3-1. Actual Sampling Station GPS Coordinates and Number of Beach Seine Runs.

		GPS Coordinates for Each Area Sampled[2]				
Station[1]	**Date**	**X_Start**	**Y_Start**	**X_End**	**Y_End**	**Beach Seine Runs[3]**
T01-01	5/10/05	7617199.34	718766.50	7617250.68	718624.34	B1, B2 and B4
T01-02	5/10/05	7617411.57	718370.27	7617465.72	718255.75	B3
T02-01	5/10/05	7626350.53	704013.53	7626433.18	703890.04	B5
T02-02	5/10/05	7626477.04	703841.44	7626723.11	703550.64	B1-B4, B6-B8
T03-01	5/11-12/05	7637219.62	694321.94	7637212.13	694004.78	B1-B7, B9-B16, B17-B21
T03-02[4]	5/11/05	7637289.60	693858.94	7637394.60	693985.92	B8
T04-01	5/12/05	7649023.20	657877.63	7649038.90	657792.19	B4 and B5
T04-02	5/12/05	7649436.50	656915.59	7649485.54	656818.66	B1-B3
T04-03	5/12/05	7649531.92	656764.64	7649646.50	656653.34	B6 and B7

Notes:

[1] Each sampling station contained one to three beach seining areas, which are displayed in Figure 3-1.

[2] Coordinates given are in NAD_1983_HARN_StatePlane_Oregon_North_FIPS_3601_Feet_Intl

[3] Beach seine runs were numbered sequentially for each station.

[4] One beach seine run was attemped at this riprap area without success.

ANC02516
BZTO104(e)002516

Table 3-2. Capture and Release List of Fish Species during Subyearling Chinook Tissue Collection Event.

		Wild Chinook		Hatchery Chinook		Wild Springer Chinook		Banded Killifish		White Mountain Fish		Juv. Northern		Stickle Back	
Date	Station	Captured	Released	Captured	Released	Captured	Released	Captured	Released	Captured	Released	Captured	Released	Captured	Released
5/9/2005	T02		10												
5/10/2005	T01	97	7		5				2						
5/10/2005	T02	98	4						2				2		1
5/11/2005	T03	62							16				2		
5/12/2005	T04	95	8				1				4				
5/12/2005	T03	10							8		1				
	Total	362	29	0	5	0	1	0	28	0	5	0	4	0	1

		Smalmouth Bass		Pumpkin Seed		Steelhead Hatchery		Juvenile Carp		Largescale Sucker		Starry Flounder		Goldfish	
Date	Station	Captured	Released	Captured	Released	Captured	Released	Captured	Released	Captured	Released	Captured	Released	Captured	Released
5/9/2005	T02														
5/10/2005	T01														
5/10/2005	T02														
5/11/2005	T03		2		1		2		1		2		2		1
5/12/2005	T04														
5/12/2005	T03				1						1				
	Total	0	2	0	2	0	2	0	1	0	3	0	2	0	1

ANC02517
BZTO104(e)002517

Table 3-3. Measurements of Lengths and Weights of Whole-body and Stomach Contents of Subyearling Chinook.

Sample Type	Station	Replicate	Number of Fish	Total Length (mm) Mean	Total Length (mm) Min	Total Length (mm) Max	Fork Length (mm) Mean	Fork Length (mm) Min	Fork Length (mm) Max	Whole-Body Weight (g) Mean	Whole-Body Weight (g) Min	Whole-Body Weight (g) Max	Whole-Body Weight (g) Total	Stomach Contents Weight (g) Total
Tissue	T01	1	30	64	55	89	59	51	80	2.32	1.41	5.29	71.81	1.00
		2	30	66	55	80	61	51	75	2.40	1.25	3.93	71.94	0.59
		3	30	67	58	75	62	53	70	2.46	1.64	3.33	73.78	0.71
	T02	1	30	60	54	71	55	50	66	1.70	1.20	2.65	50.91	0.39
		2	30	60	54	74	56	50	68	1.84	1.25	3.35	55.26	0.86
		3	30	61	51	71	56	48	66	1.86	1.16	3.07	55.92	0.43
	T03	1	30/24[a]	67	55	88	62	51	80	2.55	1.26	5.31	76.42/59.28	0.77
		2	30/21[a]	68	53	90	63	50	81	2.71	1.27	6.3	81.44/58.64	1.07
		3	12/27[a]	61	55	78	57	51	72	1.89	1.22	3.93	22.67/58.87	0.18
	T04	1	30	67	53	85	62	50	79	2.54	1.17	5.45	76.20	1.58
		2	30	72	55	87	66	50	80	3.21	1.18	5.72	96.43	2.47
		3	30	67	54	88	62	50	80	2.67	1.17	5.67	80.11	1.87
Taxonomy	T01	-	7	65	61	71	62	57	75	2.27	2.03	2.86	15.91	-
	T02	-	8	61	54	69	57	51	63	1.85	1.41	2.54	14.80	-
	T04	-	5	60	49	83	55	45	76	2.36	0.91	4.74	11.79	-

Notes:

[a] The total of 72 fish for T03 was processed as the fish arrived at the lab. After the sampling effort ended, fish samples were redistributed among three replicates to achieve approximately 60 g of whole-body tissue sample per replicate.

ANC02518
BZTO104(e)002518

Table 3-4. Summary of Field QC Samples for Subyearling Chinook Tissue Collection Event.

Parameter	Samples[1,2]	Field Rinsate Blanks[3]	Total Number of Samples
Whole Body			
Percent Lipids	12		12
Percent Moisture	12		12
Total Metals	12	1	13
Butyltin Compounds	12	1	13
Organochlorine Pesticides	12	1	13
PAHs	12	1	13
SVOCs	12	1	13
Dioxins/Furans	12	1	13
PCB Congeners (all 209)	12	1	13
Stomach Contents			
PAHs	3		3
PCB Congeners (all 209)	3		3
Organochlorine Pesticides	3		3
Taxonomy	20		20

Notes:

[1] Field QC samples are included in the three sample replicates per station and counted as total sample numbers.

[2] Field split samples were not sampled because of fish catch limits.

[3] A field rinsate blank was collected at the end of the sampling event for all dissecting equipment.

Table 3-5. Subyearling Chinook Tissue Samples Collected, Dates Sampled, and Analyses Conducted.

		Stomach Contents				Whole Body								
Date Sampled	**Sample ID**	**PAHs**	**PCB Congeners (full 209)**	**Organo-chlorine Pesticides**	**Taxonomy**	**Percent Lipids**	**Percent Moisture**	**Total Metals**	**Butyltin Compounds**	**Organo-chlorine Pesticides**	**PAHs**	**SVOCs**	**Dioxin Furans**	**PCB Congeners (full 209)**
5/10/05	**LW2-T01-SCW-1**					x	x	x	x	x	x	x	x	x
5/10/05	**LW2-T01-SCW-2**					x	x	x	x	x	x	x	x	x
5/10/05	**LW2-T01-SCW-3**					x	x	x	x	x	x	x	x	x
5/10/05	**LW2-T01-SCG**	x	x	x	x									
5/10/05	**LW2-T02-SCW-1**					x	x	x	IS[2]	x	x	IS[2]	x	x
5/10/05	**LW2-T02-SCW-2**					x	x	x	x	x	x	IS[2]	x	x
5/10/05	**LW2-T02-SCW-3**					x	x	x	x	x	x	IS[2]	x	x
5/10/05	**LW2-T02-SCG**	x	x	x	x									
5/11-12/05	**LW2-T03-SCW-1**					x	x	x	x	x	x	x	x	x
5/11-12/05	**LW2-T03-SCW-2**					x	x	x	x	x	x	IS[2]	x	x
5/11-12/05	**LW2-T03-SCW-3**					x	x	x	x	x	x	x	x	x
5/11-12/05	**LW2-T03-SCG**	x	x	x	x									
5/12/05	**LW2-T04-SCW-1**					x	x	x	x	x	x	x	x	x
5/12/05	**LW2-T04-SCW-2**					x	x	x	x	x	x	x	x	x
5/12/05	**LW2-T04-SCW-3**					x	x	x	x	x	x	x	x	x
5/12/05	**LW2-T04-SCG**	x	x	x	x									
5/12/05	**LW2-T901***							x	x	x	x	x	x	x

Notes:
[1] Field samples were collected in triplicates at all stations.
* Field lab dissecting tools and tray rinsate.
[2] Insufficient Sample - Analysis not conducted because limited sample mass available.

ANC02520
BZTO104(e)002520

Table 4-1. Laboratory Methods for Fish Tissue Samples.

Analysis	Laboratory	Sample Preparation		Quantitative Analysis	
		Protocol	Procedure	Protocol	Procedure
Organochlorine Pesticides (Whole-body samples)	CAS	EPA 3540C	Soxhlet extraction	EPA 8081A	GC/ECD
		EPA 3640A	Gel permeation chromatography		
		EPA 3620B	Florisil® cleanup		
Lipids (Whole-body samples)	CAS	EPA 3540C[1]	Soxhlet extraction	CAS SOP	Balance
Butyltin Compounds (Whole-body samples)	CAS	Krone et al. 1988	Solvent extraction	Krone et al. 1988	GC/FPD
		Krone et al. 1988	Derivatization		
Polycyclic Aromatic Hydrocarbons (Whole-body samples)	CAS	EPA 3540C	Soxhlet extraction	EPA 8270C SIM	GC/MS SIM
		EPA 3640A	Gel permeation chromatography		
		EPA 3620B	Florisil® cleanup		
Semivolatile Organic Compounds (Whole-body samples)	CAS	EPA 3540C	Soxhlet extraction	EPA 8270C SIM	GC/MS SIM
		EPA 3640A	Gel permeation chromatography		
Metals (Whole-body samples)	CAS				
Aluminum, antimony, arsenic, cadmium, copper, lead, nickel, silver, zinc		EPA 3050B/PSEP	Acid digestion	EPA 6020	ICP/MS
Chromium		EPA 3050B/PSEP	Acid digestion	EPA 6010B	ICP/AES
Selenium		EPA 3050B/PSEP	Acid digestion	EPA 7742	AAS
		EPA 7742	Hydride generation		
Mercury		EPA 7470	Acid digestion/oxidation	EPA 7471A	CVAA
Chlorinated Dioxins and Furans (Whole-body samples)	Axys	EPA 1613B	Soxhlet extraction	EPA 1613B	HRGC/HRMS
			Gel permeation chromatography		
			Layered Acid/Base SiO_3 column		
			1% deactivated basic Alumina		
			Carbon celite		

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Table 4-1. Laboratory Methods for Fish Tissue Samples.

Analysis	Laboratory	Sample Preparation		Quantitative Analysis	
		Protocol	Procedure	Protocol	Procedure
PCB Congeners (Whole-body samples and stomach content samples)	Axys	EPA 1668A	Soxhlet extraction Acid silica gel Layered Acid/Base silica gel 1% deactivated basic Alumina Florisil® cleanup	EPA 1668A	HRGC/HRMS
Organochlorine Pesticides (Stomach content samples)	Axys	EPA 3540C EPA 3640A EPA 3620B	Soxhlet extraction Gel permeation chromatography Florisil® cleanup	Axys SOP	HRGC/HRMS
Polycyclic Aromatic Hydrocarbons (Stomach content samples)	Axys	EPA 3540C EPA 3640A EPA 3630C	Soxhlet extraction Gel permeation chromatography Silica gel cleanup	Axys SOP	HRGC/HRMS

Notes:
[1] A portion of the pesticide extract will be used for lipids determination.

AAS - Atomic absorption spectrometry
CAS - Columbia Analytical Services
CVAA - cold vapor atomic absorption
EPA - U.S. Environmental Protection Agency
GC/ECD - gas chromatography/electron capture detection
GC/FPD - gas chromatography/flame photometric detection
GC/MS - gas chromatography/mass spectrometry
HRGC/HRMS - high resolution gas chromatography/high resolution mass spectrometry
ICP/OES - inductively coupled plasma/optical emission spectrometry
ICP/MS - inductively coupled plasma - mass spectrometry
SIM - selected ion monitoring
SOP - standard operating procedure

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PORTLAND HARBOR RI/FS

SUBYEARLING CHINOOK TISSUE COLLECTION FIELD SAMPLING REPORT

DRAFT

DO NOT QUOTE OR CITE
This document is currently under review by US EPA and its federal, state, and tribal partners, and is subject to change in whole or in part.

July 18, 2005

Prepared for:
The Lower Willamette Group

Prepared by:
Integral Consulting Inc.
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IC05-0024

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LIST OF ACRONYMS

Axys	Axys Analytical Services
CAS	Columbia Analytical Services
CORS	continuously operating reference station
COI	chemical of interest
DGPS	differential global positioning system
EDD	electronic data deliverable
EES	Ellis Environmental Services
EPA	U.S. Environmental Protection Agency
EQuIS	Environmental Quality Information System
FSP	field sampling plan
ISA	initial study area
LWG	Lower Willamette Group
NAD	North American Datum
NEA	Northeast Analytical Laboratories
NOAA	National Oceanic Atmospheric Administration
PAHs	polycyclic aromatic hydrocarbons
PCBs	polychlorinated biphenyls
QA	quality assurance
QC	quality control
QAPP	quality assurance project plan
RI/FS	remedial investigation and feasibility study
RM	river mile
SVOCs	semivolatile organic compounds
SDG	sample delivery group
USFWS	U.S. Fish and Wildlife Service

1.0 INTRODUCTION

The remedial investigation and feasibility study (RI/FS) of the Portland Harbor Superfund Site includes several rounds of field sampling activities to investigate the nature and extent of contamination in the in-water portion of the Site, to assess potential risk to human health and the environment, and to develop cleanup alternatives. Round 1 chemical and biological sampling took place during the summer and fall of 2002, and these results as well as the results of physical studies that continued into the winter of 2004 (e.g., the February 2004 bathymetry survey) are described in the Round 1 Site Characterization Summary Report (Integral 2004a).

Round 2 sampling activities included beach sediment and riverbed surface sediment sampling for chemical and toxicity testing (Integral 2005c), subsurface sediment sampling for chemical analysis (Integral and Anchor 2005), fall 2004 and winter 2005 surface water sampling for chemical analysis (Integral 2005d,e), and a groundwater evaluation pilot study (Integral 2005a).

This Round 2 Subyearling Chinook Tissue Collection Field Sampling Report only describes subyearling chinook tissue collection activities that occurred from April 11 to May 12, 2005. Field sampling reports for other Round 2 sampling are being submitted under separate cover.

Except where noted, all Round 2 subyearling chinook tissue collection field activities, including navigational positioning, sample collection, sample handling and processing, and data management, followed guidelines specified in the *Portland Harbor RI/FS Field Sampling Plan Subyearling Chinook Tissue Collection* (Chinook Tissue FSP; Integral 2005b), the Round 2 Quality Assurance Project Plan (QAPP; Integral and Windward 2004); the Round 2 Quality Assurance Project Plan Addendum 4: Subyearling Chinook Tissue Collection (Integral 2005f); the Round 2 Quality Assurance Project Plan Supplement to Addendum 4: Subyearling Chinook Tissue Collection – Semivolatile Organic Compounds (Integral 2005g); and the Round 2 Health and Safety Plan (Integral 2004b).

1.1 ROUND 2 SAMPLING OBJECTIVES

The purpose of Round 2 sampling was to fill in data gaps for the RI and risk assessments as well initiate data collection for the FS. This sampling effort was intended to supplement data related to potential exposure of juvenile chinook salmon (*Oncorhynchus tshawytscha*) to site-related contaminants. The objectives of this study were to:

- Determine the extent to which subyearling chinook salmon in the Portland Harbor area may accumulate chemicals of interest (COIs)

- Help estimate exposure of subyearling chinook by characterizing COI concentrations in stomach contents.

Analytical results from the Round 2 sampling program will be summarized in a series of Round 2 site characterization reports, that will be published in 2005.

1.2 REPORT ORGANIZATION

The remaining sections of this document describe the field collection procedures used during Round 2 for subyearling chinook tissue samples. Section 2 provides a chronology of the sampling activities that took place during this phase of sampling. Section 3 describes the field sampling methods, quality assurance/quality control (QA/QC) samples, and deviations from the FSP, QAPP, and QAPP addenda. Laboratory sample handling and processing, and laboratory deviations from the FSP and QAPP, are described in Section 4. A summary of fish tissue sampling is described in Section 5. Finally, references cited are listed in Section 6.

Supporting information is provided in several appendices:

- **Appendix A:** Field Notebook and Field Lab Notebook
- **Appendix B:** Summary Report on Subyearling Chinook Salmon Reconnaissance Trip. Integral Internal Memorandum, April 12, 2005.
- **Appendix C:** Field Lab Sample Processing Forms.

2.0 CHRONOLOGY OF FIELD OPERATIONS

This report describes the Round 2 subyearling chinook tissue collection event that took place from May 10 through May 12, 2005. Two site reconnaissance surveys were undertaken on April 11 and May 9, 2005, prior to initiation of the Round 2 subyearling chinook tissue collection. The findings for the first reconnaissance survey of April 11, 2005 were reported as an internal memorandum (Appendix B). During this reconnaissance trip it was determined that wild subyearling chinook salmon were small in length and would not meet the FSP requirements for collecting fish in the size range between 50 and 80 mm. A followup reconnaissance trip on May 9, 2005 confirmed the presence of fish that met the target size requirements, and sampling was initiated the following day.

Regulatory agency and trustee members were present on May 10, 2005 to observe the first day of subyearling chinook collection and fish dissection. Observers included Eric Blishcke and Joe Goulet (EPA), Robert Neely (NOAA), Jeremy Buck (USFWS), Brent Finley (Environment International for the Tribes), Jeff Baker (CTGR) and Jean Zodrow (EPA). Brent Finley continued as an observer for the entire sampling event.

Subyearling chinook tissue samples were collected at four target locations in the Willamette River from river mile (RM) 2 to RM 18. All stations identified in the FSP, including three stations within the study area and one station up river from the initial study area (ISA), were sampled (Table 2-1). One station (T03) was occupied twice in subsequent days to collect enough fish to generate field replicates for chemical analyses (see Table 3-1).

Gage height on the Willamette River at Portland as well as local precipitation levels that occurred during the subyearling chinook tissue sampling period (May 10 - 12) are shown in Table 2-2.

3.0 FIELD SAMPLING PROCEDURES

The following sections summarize the procedures and methods used to collect Round 2 subyearling chinook tissue samples, including station navigation and positioning, sampling procedures, recordkeeping, sample handling, sample storage, and field QC procedures. Sampling procedures generally followed those detailed in the Chinook Tissue FSP (Integral 2005b). Deviations from the FSP are discussed in Section 3.9.

3.1 SAMPLING VESSEL

Ellis Environmental Services (EES) (Portland, OR) provided a 20-foot aluminum jet sled for the collection of subyearling chinook fish tissue samples.

3.2 NAVIGATION AND STATION POSITIONING

Navigation equipment aboard the sampling vessel was provided and operated by Integral. Horizontal control was obtained using a computer-integrated, differential global positioning system (DGPS). The horizontal projection used for all sampling activities was the North American Datum of 1983 (NAD83).

The navigation system consisted of a Trimble (Pro XRS) DGPS unit on the sampling vessel that received real-time differential corrections from the continuously operating reference station (CORS) at Appleton, WA. The Trimble DGPS antenna was secured on top of the handrail at the bow to achieve the most accurate position for each sample. Positional accuracies on the order of ± 2-3 meters were achieved with this system. The Trimble DGPS receiver output the real-time positions to an integrated navigation software package (Trimble TerraSync version 2.41) on a laptop computer.

The integrated navigation system displayed the vessel's position relative to the target sampling location in plan view on the laptop screen. The screen display and numeric navigation data, including range and bearing to the target sampling location, assisted the vessel operator in approaching and/or maintaining a station position while sampling. For beach seining stations, sampling was initiated once the vessel was positioned at one end of the beach, and the navigation system recorded the boat's positions throughout the sample collection effort until the boat reached the other end of the beach. The target sampling locations and the actual positions are included in Table 3-1. Figure 3-1 shows these actual locations as well as the target locations for all subyearling chinook samples collected.

3.3 FISH TISSUE SAMPLES

Round 2 subyearling chinook tissue collection and processing generally followed the procedures specified in the Chinook Tissue FSP (Integral 2005b) and associated QAPP and QAPP addenda (Integral and Windward 2004; Integral 2005f; Integral 2005g). Deviations from the FSP and QAPP are discussed in Sections 3.9 and 4.4.

3.3.1 Fish Sample Collection

EES performed the fish sample collection using a 100-foot-long pole-seine for beach seining. A two-person crew hauled the seine to shore. One person held one end of the seine standing on the beach while the boat maneuvered the net out into the middle of the river. The boat then brought the net back to the beach after moving in an arc shape trying to capture the fish swimming near the shoreline. The boat was beached, and a second person stepped out of the boat to bring the other end of the beach seine to shore. As the net approached the beach, fish were driven into the net and hauled up on shore. All fish were handled with powder-free nitrile gloves and decontaminated dip nets and plastic buckets. The total number of fish were counted (Table 3-2), and only target subyearling chinook salmon were sorted into buckets. The remaining non-target fish were returned to the water. The buckets with fish were then transferred to the fish-processing team.

The processing team quickly measured the fish fork lengths. If the fish were within the 50- and 80-mm target length, they were placed inside a large cooler with local river water and equipped with two small battery-powered portable aerators. All other fish were returned to the river.

The beach seining continued until 95 fish had been captured, to obtain three 30-fish composite sample replicates for chemical analyses and at least five additional fish for taxonomical analyses of stomach contents. The live juvenile subyearling chinook were transported to the Lower Willamette Group's (LWG) Portland field laboratory for further sample processing.

3.3.2 Fish Dissection and Sample Processing

Live fish were transported to the field laboratory and transferred to two laboratory technicians. The technicians carried the cooler inside a sample processing room with positive air pressure and a ventilation fan equipped with a HEPA filter, created at the LWG field laboratory. Technicians donned Tyvek® suits and booties. A sticky floor mat was placed at the door to remove any loose dirt particles from the feet before entering the clean room. The fish were removed from the cooler with a decontaminated dip net, euthanized by a quick blow to the head, wrapped in aluminum foil with the dull side touching the fish, enclosed in plastic bags, and placed in a refrigerator (+4°C) until further processing of each individual fish. Dissection of the fish was conducted under the supervision of Dr. Robert Ellis

(EES), an experienced fisheries biologist. Fish were processed on stainless-steel trays that were decontaminated between each station.
In the laboratory, each juvenile subyearling fish was measured and weighed using standard clean procedures (EPA 2000). Fish were first measured for total length and fork length by placing them flat on a measuring board. The total fish length was measured from the front of the jaw, which is most anterior to the end of the longest caudal ray when the rays are squeezed together, but excluding the caudal filaments, to the end of the tail. Fork length was measured from the tip of the snout to the posterior end of the middle caudal rays (Table 3-3).

After length measurements, fish were weighed, and the weight was recorded in the sample processing form (Appendix C). The scale used for all weight measurements had an accuracy of ±0.001g. A running total was maintained of the weights in the replicate, and the final weight per replicate was recorded in Table 3-3.

Once weighed, the internal organs were removed by carefully cutting the fish open from the esophagus to the anus using clean surgical techniques. The internal organs were removed, and the stomach was carefully separated from the other organs in the stainless-steel pan. The stomach was cut open, and a brief description of the contents was recorded in the sample processing form. The stomach contents were scraped out, weighed, and placed in a 100-mL amber glass vial kept on ice. The weight of the stomach contents was recorded in the sample processing form (Appendix C). The stomach content composite samples were frozen and stored at -20°C until analyzed. The remaining organs and the stomach tissue (i.e., empty, scraped out stomach) were returned into the body cavity and included in the whole-body chemistry analysis.

Each whole-body fish sample (without stomach contents) was wrapped in aluminum foil with the dull side touching the fish, enclosed in plastic bags with an identification label, and stored in a refrigerator (+4°C) until the remaining fish in the replicate sample were processed. At this point, all whole bodies in the replicate sample were unwrapped from their individual foil and wrapped together in aluminum foil with the dull side touching the fish. At stations T01, T02, and T04 more than 90 fish were collected, and each of the three replicates consisted of 30 fish (Table 3-3). At station T03, only 72 fish were collected. These fish were processed in the laboratory as they arrived from the field under the assumption that 90 fish would be collected. At the end of the field effort, the 72 fish were redistributed among the three replicates so that the whole-body weight in each replicate was close to 60 grams. The number of fish per replicate was 24, 21, and 27, respectively (Table 3-3). The fish were enclosed in a plastic bag with an identification label. Once packaged, the whole-body fish samples were frozen and stored at -20°C until homogenized and analyzed.

Taxonomic identification of prey items in the stomach contents was performed on randomly selected fish from the three stations where more than 90 fish were collected. The number of fish per station was as follows: seven fish at T01, eight fish at T02, and five fish at T04 (Table 3-3). Length measurements were performed on the fish as above, the fish were weighed, and the information was recorded in the sample processing form. A running total of the weights was maintained, and the final weight per station was recorded in Table 3-3. The stomach contents were scraped out, placed in a glass vial, and preserved with 90% denatured alcohol.

3.4 SAMPLE IDENTIFICATION SCHEME

All samples were assigned a unique identification code, as described in Section 2.5.2 of the Chinook Tissue FSP (Integral 2005b), based on a sample designation scheme designed to meet the needs of field personnel, data management, and data users. This code indicates the project phase, sample type, and level of replication/duplication. Station location identification numbers for each target location are listed in Table 2-1 and mapped in Figure 3-1.

3.5 EQUIPMENT DECONTAMINATION PROCEDURES

Decontamination procedures for all sample handling and compositing equipment followed procedures summarized below and detailed in Appendix A of the Chinook Tissue FSP (Integral 2005b).

3.6 FIELD QUALITY CONTROL/QUALITY ASSURANCE

Field QA/QC samples were collected in association with the subyearling chinook tissue sampling effort. The QC samples that were collected during this phase of the Round 2 sampling effort are described below.

3.6.1 Field Replicates

Three field whole-body tissue composite replicate samples were collected at all sampling stations. Field replicates were generated by collecting 30 subyearling chinook per composite at stations T01, T02, and T04. At station T03, 72 fish were collected and the three replicates had 24, 21, and 27 fish, respectively (Table 3-3). Field replicates of whole-body tissue were collected to assess the within-station heterogeneity associated with the overall sampling process from station positioning through sampling homogenization.

Stomach contents of all 30 fish in each replicate were composited into a single sample producing three replicate stomach contents samples per station (Table 3-3). At the laboratory, the three replicate stomach contents samples were further

composited and homogenized to create a single stomach content sample per station to obtain the approximately 2 grams necessary for chemical analyses.

3.6.2 Equipment Rinsates and Temperature Blanks

Inadvertent introduction of chemical contaminants during sampling and analytical activities is assessed by the analysis of rinsate blanks. Field QC samples for this study were limited to rinsate blanks for fish dissection equipment. Rinsate blanks, consisting of aqueous sampling equipment rinsates, were generated for all chemical parameter groups based on 5% of the subyearling chinook sampling stations and submitted for analysis to the laboratory (Table 3-4).

Temperature blanks were used to measure and ensure cooler temperature upon receipt to the laboratory. One temperature blank was prepared and submitted with each cooler shipped to the analytical laboratory. The temperature blank consisted of a 50-mL plastic vial containing deionized water that was packed into the cooler in the same manner as the rest of the samples and labeled "temp blank."

3.7 SAMPLE HANDLING, STORAGE, TRANSPORT, AND CUSTODY

Sample processing and storage, as well as sample transport and custody, are described in the following sections.

3.7.1 Fish Tissue Sample Handling and Storage

Fish tissue samples were processed and handled as described in Section 3.3. The fish were transported live in a cooler with battery-powered aerators from the field to the field laboratory. Composite whole-body tissue samples were processed and wrapped in foil, placed inside a plastic bag with a sample identification label, and frozen. Composite stomach contents were placed in jars, capped, labeled, and frozen. All frozen samples stored at the field laboratory were shipped on ice at a later date to the analytical laboratories. Stomach contents of five to eight fish per sampling station were placed in a jar with 90% denatured alcohol, capped, labeled and stored at the field laboratory. Alcohol-preserved samples were shipped to the taxonomical analytical laboratory at a later date.

3.7.2 Sample Transport and Custody

Sample custody procedures are described in Section B3 of the Round 2 QAPP (Integral and Windward 2004). In summary, samples were packed to prevent breakage and separated in the shipping container by bubble wrap and/or other shock-absorbent material. Loose ice was then placed in the cooler to maintain a temperature of approximately -20°C. A temperature blank was added to each cooler, and the associated chain-of-custody forms were placed into a zip-locked bag and taped on the inside lid of each cooler. Each ice cooler was sealed with shipping tape and three chain-of-custody seals, which included the project name,

date of shipment, and the name of the person sealing the cooler. Samples were transported to the analytical laboratories directly by courier, with the exception of the stomach content samples and subsamples of whole-body tissue, which were delivered directly to Axys Analytical Services by Integral and CAS staff. All other samples that were preserved in 90% denatured alcohol followed the same packing procedure as above, with the exception of adding ice and temperature blanks.

3.8 FIELD DOCUMENTATION

All field activities and observations were noted in bound field logbooks (Appendix A). Information included personnel, date, time, station designation, sampler, types of samples collected, and general observations. Any changes that occurred at the site (e.g., personnel, responsibilities, deviations from the Chinook Tissue FSP) and the reasons for these changes were documented in the field logbook.

A sample chain-of-custody form was established in the field lab for each sample before it was shipped from the field lab to the analytical laboratories. A complete set of the project chain-of-custody forms are kept in the project file at Integral's Olympia, WA office.

3.9 DEVIATIONS FROM THE SUBYEARLING CHINOOK FSP

This section discusses subyearling chinook tissue sampling deviations from the Chinook Tissue FSP (Integral 2005b).

3.9.1 Sampling Method Deviations

The fish were not anesthetized with MS-222 before being measured in the field. All fish that were visually estimated to be within the target size range were quickly transferred into the cooler without taking any measurements.

At sampling station T03, it was not possible to obtain the goal of 95 fish because of an absence of target-size fish in that area. Only 72 fish were collected at T03.

Fish sample identification labels were not included in the log forms as specified in the FSP (see field lab forms in Appendix C). Table 2-1 correctly shows sample identifications as specified in the FSP. All fish sample identifications will be corrected before being entered into the database.

3.9.2 Sampling Station Deviation

The upriver sampling station T04 was collected 1,684 meters north of the target sampling station site and 1,259 meters south of the alternate sampling station T09. The actual sampling station was labeled as T04 (Figure 3-1).

3.10 QUALITY ASSURANCE/QUALITY CONTROL

Any difficulties in sampling or inconsistencies and discrepancies from the approved FSP were discussed and resolved during daily teleconferences between key field staff and EPA agency team members.

Table 3-4 summarizes the number of fish tissue samples collected by analyte group. Overall, the field QC program was implemented as defined in the Chinook Tissue FSP (Integral 2005b), the Round 2 QAPP (Integral and Windward 2004), and addenda (Integral 2005f,g).

4.0 LABORATORY ANALYSES

This section summarizes the chemical analyses performed on whole-body tissue and stomach contents of subyearling chinook salmon. Analytical methods generally followed those described in the Round 2 QAPP (Integral and Windward 2004) and addenda (Integral 2005f,g). Deviations from the QAPP are detailed in Section 4.3. Table 3-5 lists the analyses conducted on each sample, and the analytical methods are compiled in Table 4-1.

The standard chemical suite for whole-body fish tissue included percent lipids, percent moisture, total metals, butyltin compounds, organochlorine pesticides, polycyclic aromatic hydrocarbons (PAHs), semivolatile organic compounds (SVOCs), dioxins and furans, and polychlorinated biphenyl (PCB) congeners (full list of 209 congeners).

The stomach (gut) contents of five to eight individuals from each fish composite were separated for identification and enumeration of prey species (Table 3-3). The remaining stomach contents were analyzed for PAHs, PCB congeners (full list of 209 congeners), and organochlorine pesticides.

4.1 CHEMICAL ANALYSES

Two laboratories are conducting the chemical analyses of subyearling chinook tissue samples. Columbia Analytical Services (CAS; Kelso, Washington) is conducting sample homogenization and analysis for percent lipids, percent moisture, total metals, butyltin compounds, organochlorine pesticides, and SVOCs in whole-body tissue. Axys Analytical Services, Ltd. (Axys; Sydney, B.C., Canada) is performing sample homogenization of the stomach content samples and conducting the analyses for dioxins and furans and PCB congeners (full list of 209 congeners) in whole-body tissue, and organochlorine pesticides, PCB congeners, and PAHs in stomach contents.

4.2 TAXONOMICAL ANALYSIS

The stomach contents of fish samples from all three sampling stations were shipped to EcoAnalysts Inc. (Moscow, Idaho) for taxonomical identification (Table 3-3).

4.3 DATA MANAGEMENT

Once the laboratories have completed their internal QA/QC checks, they will export the analytical data (sample, test, batch, and result information) into comma-delimited text files with data columns arranged in an order that is recognized by the project's Environmental Quality Information System (EQuIS) database. These electronic data deliverables (EDDs) are e-mailed to Integral where they are checked for proper EQuIS structure and appended with specific information that

was unknown by the labs, such as sampling location, composite information, and field replicate and split information. If any problems are found in the structure of the EDDs, then the laboratory is notified and asked to correct the problem and resubmit the EDD. Each emailed EDD transmission, with the original, unaltered EDD attachment, is stored to document and track the laboratories' delivery of electronic data to Integral.

When the EDD is corrected and complete, they are checked electronically by loading them into the temporary section of Integral's LWG project database. In the process of loading, EQuIS checks the EDDs for correct lookup codes (such as for analytes, test methods, and sample matrices); proper relationships for results, tests, batches, and samples (to ensure all results match with a test, tests with samples, and sample/test pairs with batches); and that all derived samples (such as replicates, splits, and matrix spikes) have corresponding parent samples.

In addition to these checks, EQuIS also checks "less important" characteristics, such as date and time formats and text field lengths, to ensure consistency throughout the database. Any error prevents the EDD from loading until the error is corrected. If errors are found that are related to the way the laboratory is reporting the data or constructing the EDD, then the laboratory is notified and asked to correct the problem and resubmit the EDD. If errors are related to Excel automatically formatting date and time fields, for example, then the error is corrected and steps are taken to avoid repeats of the problem (such as changing default settings in the software). Sucessfully loaded EDDs are saved to document and track the data that were loaded into Integral's LWG project database.

Each verified and accurate EDD is provided to the Round 2 data validation contractor (EcoChem, Seattle, WA) for data review and validation. These EDDs are also stored in a temporary section of the project database where they can be queried and examined, if desired, until validation is complete. As EcoChem completes validation of the data by sample delivery group (SDG) or small groups of SDGs, the validator qualifiers and reason codes are applied to the data in the temporary section of the database. The validated data are then merged into the permanent project database. During the merging process, all previously performed electronic checks are repeated to ensure nothing was incorrectly modified with the application of the validation results.

Several queries have been set up in the permanent project database to translate the data structure to a form compatible with National Oceanic Atmospheric Administration's (NOAA) Query Manager. The data translation includes creating station and sample identifiers, converting the sample type code, and changing the date format. The translated data are imported into an Access file provided by NOAA that contains template tables for the Query Manager structure.

Integral's LWG project database contains all of the data reported by the analytical laboratories. This includes field and lab replicates, lab dilutions, results for the same analyte from multiple analytical methods (SW8270 and SW8270-SIM, for example), and laboratory QA samples, such as matrix spikes, surrogates, and method blanks.

4.4 LABORATORY DEVIATIONS FROM THE QAPP

Samples were analyzed as described in the Round 2 QAPP (Integral and Windward 2004) and addenda (Integral 2005f,g). For selected whole-body samples, the total homogenized mass was less than 50 grams. Subsamples for chemical analysis were generated in order of priority defined in the Chinook Tissue FSP (Integral 2005b) and QAPP (Integral 2005 f,g).

Additional details regarding deviations of sample analyses and any specific difficulties encountered by the laboratories during analysis of the subyearling chinook tissue samples will be provided in the 2005 Round 2 Subyearling Chinook Tissue Data Report.

5.0 SUMMARY OF FISH TISSUE SAMPLING

As illustrated in Figure 3-1 and Tables 2-1, 3-1 through 3-5, and 4-1, the subyearling chinook tissue sampling program was conducted in close accordance with the sampling program described in the *Portland Harbor RI/FS Field Sampling Plan: Subyearling Chinook Tissue Collection* (Integral 2005b); the Round 2 QAPP (Integral and Windward 2004); the Round 2 Quality Assurance Project Plan Addendum 4: Subyearling Chinook Tissue Collection (Integral 2005f); and the Round 2 Quality Assurance Project Plan Supplement to Addendum 4: Subyearling Chinook Tissue Collection – Semivolatile Organic Compounds (Integral 2005g).

Deviations from the planned approaches are described above and were generally coordinated with the EPA team prior to their implementation.

The subyearling chinook tissue data being generated from this effort will be evaluated in conjunction with the data collected and reported in the 2005 Round 2 Subyearling Chinook Tissue Data Report.

6.0 REFERENCES

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PORTLAND HARBOR RI/FS

ROUND 2A ARCHIVED CORE SEDIMENT DATA REPORT

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May 8, 2006

Prepared for
Lower Willamette Group

Prepared by
Integral Consulting Inc.

IC06-0011

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LIST OF ACRONYMS

CAS	Columbia Analytical Services
ECD	electron capture detector
EDD	electronic data deliverable
EPA	U.S. Environmental Protection Agency
EQuIS	Environmental Quality Information System
FSP	field sampling plan
GC/MS	gas chromatograph/mass spectrometry
LWG	Lower Willamette Group
NOAA	National Oceanic & Atmospheric Administration
PAHs	polycyclic aromatic hydrocarbons
PCBs	polychlorinated biphenyls
PCDD/F	polychlorinated dibenzo-para-dioxins/polychlorinated dibenzofurans
QA	quality assurance
QC	quality control
QAPP	quality assurance project plan
RI/FS	remedial investigation and feasibility study
RM	river mile
SCRA	site characterization and risk assessment
SDG	sample delivery group
SIM	selected ion monitoring
SOPs	standard operating procedures
SVOCs	semivolatile organic compounds
TBT	tributyltin
VOCs	volatile organic compounds

1.0 INTRODUCTION

The remedial investigation/feasibility study (RI/FS) of the Portland Harbor Superfund Site in Portland, Oregon, is being conducted in three major sequences of investigative field work. Round 2 sediment sampling was performed during multiple field efforts in the summer and fall of 2004 (hereafter referred to as Round 2A). Round 2 sampling was intended to refine the understanding of the physical dynamics of the river system, to gather remaining data for the RI and risk assessments, and to initiate collection of data for the FS.

Subsurface core sediment samples were collected at numerous stations between river mile (RM) 2 and RM 11, as well as at several upstream locations between RM 16 and RM 25, and analyzed for a full suite of chemicals. A portion of each of the core sediment samples was frozen and archived for possible future analyses, in accordance with the subsurface (core) sampling approach in the Round 2 Field Sampling Plan (FSP) for Sediment Sampling and Benthic Toxicity Testing (Integral et al. 2004b).

After a review of the spatial vertical trends of the Round 2A analytical results for subsurface sediment, gaps were noted for several "indicator chemicals" in the data set. Therefore, a decision process was enacted to select archived subsurface samples for analysis to supplement the data set. The resulting list of selected samples and analyses was provided in the Round 2 FSP Addendum for Analysis of Archived Sediment Samples (Integral 2005b). The U.S Environmental Protection Agency (EPA), in their comments on the Round 2 FSP Addendum, requested additional archive samples and specific target analytes (EPA 2005, pers. comm.). This Round 2A Archived Core Sediment Data Report reviews the approach used to select the original list of archived core sediment samples, as well as those additional samples and analyses requested by EPA, and presents the results of all analyses. The PCB Congeners in Archived Round 2A Surface Sediment Data Report (Integral 2005a) was submitted under separate cover.

In addition to the Round 2 FSP Addendum (Integral 2005b), archived core sediment sample analyses followed guidelines in the Round 2 Quality Assurance Project Plan (QAPP; Integral and Windward 2004) as well as QAPP Addendum 2 (Integral 2004).

The remaining sections of this report describe the archived sample selection process (Section 2); chemical analyses, data quality, laboratory deviations, and data management (Section 3); archived core sediment sample results (Section 4); and references (Section 5).

Supporting information is provided in the following three appendices:

- **Appendix A**: Data Quality Summary

- **Appendix B**: SCRA (site characterization and risk assessment) Database, Excel Flat File Format (on CD)
- **Appendix C**: EcoChem Data Validation Report (on CD).

2.0 ARCHIVED SAMPLE SELECTION

This section describes the overall sampling objective and the sample selection approach that culminated in the selection of archived core sediment samples.

2.1 SAMPLE SELECTION OBJECTIVE

The overall objective of this archived sample selection and analysis effort was to further define the spatial vertical extent of contaminants in the study area. Archived sample selection was based on a review of the spatial vertical trends in the Round 2A sediment data, and data gaps for certain indicator chemicals such as polychlorinated dibenzo-para-dioxins/polychlorinated dibenzofurans (PCDD/Fs) and polychlorinated biphenyl (PCB) congeners. EPA requested the analysis of PCBs as congeners to assist with source identification and to develop a better understanding of the relationship between PCB Aroclors and congeners (EPA 2005, pers. comm.). Furthermore, due to the large number of analytes measured, it was not practicable to base the sample selection on all chemicals for which Round 2A data were available. Therefore, the selection process was based on a subset of the indicator chemicals presented in the Round 2A Sediment Site Characterization Data Summary Report (Integral 2005c) and the general decision guidelines detailed below.

2.2 SAMPLE SELECTION AND CHEMICAL SELECTION APPROACH

During Round 2A core sediment processing, 128 core segments were archived without analysis. Because the core processing sampling plan (Integral et al. 2004b) defaulted to the analysis of the top two core segments below the surface segment (i.e., core segments B and C), the archived segments were most often the core segments D, E, F, etc. These deeper segments typically occurred more than 5 feet below mudline. Also, because the collocated surface grab sample (0-30 cm) was analyzed to characterize the sediment surface layer for each location, the top 30 cm of the core, the "A" segment, was also typically archived. Consequently, in addition to the 128 core segments, approximately 200 "A" core segment samples were also archived (Integral 2005a).

The Round 2A surface and subsurface distributions of 27 indicator chemicals are mapped in the Round 2A Sediment Site Characterization Report (Integral 2005c). These indicator chemicals include contaminants that were frequently detected in the study area in both the historical sediment data sets and the Portland Harbor RI/FS Round 1 and 2 sampling events. These 27 chemicals include metals, butyltins, PCBs, pesticides, polycyclic aromatic hydrocarbons (PAHs), other semivolatile organic compounds (SVOCs), volatile organic compounds (VOCs), and PCDD/Fs. The historical distributions of most of these chemicals were mapped in the Portland Harbor RI/FS Programmatic Work Plan (Integral et al. 2004a).

For this archived sample selection process, a subset of 16 of the 27 chemicals mapped in the Round 2 data summary report was evaluated (Table 2-1). The 16 chemicals included those that can be analyzed in a frozen archived sample (i.e., VOCs were not included) and encompassed the major "archive-able" compound groups (metals, SVOCs, PCBs, pesticides, and PCDD/Fs). When possible, the summed parameters for a compound group (e.g., total PCBs) were included as the screening chemical rather than the individual chemicals (e.g., Aroclor 1260) to capture broad trends in contaminant nature and extent.

After examining the nature and extent chemical maps in the Round 2A Sediment Site Characterization Report, a set of guidelines was developed to select the archived samples for analysis. These guidelines, which were discussed in the Round 2 FSP Addendum (Integral 2005b), were then applied to the nature and extent maps for each of the 16 sample screening chemicals. A final list of archived samples was then developed.

2.3 SELECTED ARCHIVED SAMPLES AND SAMPLE ANALYSIS

A total of 113 archived core segment samples were identified based on the nature and extent evaluation described above. EPA requested additional spatial coverage and vertical delineation and, through negotiations, added 130 more samples to the original list, for an overall total of 243 archived samples. Table 2-1 lists the archived samples selected for analysis, the primary decision guideline used to select the sample (color coding), and the chemical analyses performed on each sample. In addition, the table identifies a few instances where archived samples were not available for analysis (C169-D, C283-D, C392-D, C397-C, C415-A, and C474-D) due to limited sample volume. An archived sample for G415 (a surface grab sample) was substituted for C415-A and analyzed. Selected archived core segment samples are shown spatially in Figure 2-1.

All analyses were conducted in accordance with the Round 2 QAPP and relevant QAPP addenda (Integral and Windward 2004, Integral 2004). With the exception of grain size, all samples were analyzed within the 1-year holding time for a frozen sample (see Section 3.4).

3.0 LABORATORY ANALYSIS AND DATA MANAGEMENT

This section describes the analytical methods, laboratory reporting, data validation, and data management for the analysis of Round 2A archived core sediment samples.

3.1 CHEMICAL ANALYSES

Selected archived samples were analyzed by Columbia Analytical Services (CAS) for all parameters except PCB congeners, which were performed by Alta Analytical (Alta).

All laboratory methods followed EPA-approved project analytical protocols. Laboratory methodology details are provided in the Round 2 QAPP (Integral and Windward 2004) and in the *Corrective Action Plan: SVOC Analyses in Sediment Core Samples* (Integral 2004, pers. comm.). Analytes, analytical concentration goals, project-specific reporting limits, and analytical methods for sediments are included in these documents. For SVOCs, a series of three analyses were used to optimize sensitivity and manage interferences. These included analysis of PAHs by gas chromatography/mass spectrometry (GC/MS) with selected ion monitoring (SIM), analysis of tri- through pentachlorinated phenols by GC/electron capture detector (ECD), and analysis of the remaining SVOCs by GC/MS in full scan mode.

Laboratory quality assurance (QA) was implemented as described in the Round 2 QAPP and according to the laboratories' respective QA programs, plans, and standard operating procedures (SOPs).

3.2 DATA VALIDATION

The data validation subcontractor for the Round 2 archived core sediment data was EcoChem, Inc., located in Seattle, WA. As required by the Round 2 QAPP and QAPP Addendum 2 (Integral and Windward 2004, Integral 2004), approximately 10 percent of the archived sediment data were fully validated, and the remaining data were subjected to Level 3 data validation, which includes the evaluation and assessment of the sample results and applicable quality control results reported by the laboratory. The data validation reports are provided in Appendix C.

3.3 DATA QUALITY AND USABILITY

Data generated in the field and at the laboratories were verified and validated according to the criteria and procedures described in the Round 2 QAPP and QAPP Addendum 2 (Integral and Windward 2004, Integral 2004). Data quality and usability were evaluated based on the results of the data validation and the data quality objectives (DQOs) for the Round 2 data. The performance criteria in the

QAPP included project analytical goals for precision, accuracy, representativeness, completeness, and comparibility (PARCC) of the Round 2 data.

The precision, accuracy, representativeness, and comparability of the data were assessed during data validation, as described in the *Data Validation* section (Section 2.1 of Appendix A) and in the Round 2 QAPP. Completeness was calculated by comparing the total number of acceptable data (non-rejected data) to the total number of data points generated. Completeness for the Round 2A archived core sediment data is summarized by parameter group in Appendix A, Table A-2. Completeness was >99% overall, which exceeds the QAPP completeness objective of 95%.

3.4 LABORATORY DEVIATIONS FROM ROUND 2 QAPP AND QAPP ADDENDUM 2

Archived core sediment samples were analyzed as described in the Round 2 QAPP and QAPP Addendum 2, with a few exceptions.

Some samples were extracted several days outside the holding time criterion of one year; however, as all sediment samples were placed in archive and preserved by freezing at or below -20 °C, no action was taken. All extracts were analyzed within the holding time criterion.

Mercury analyses were performed well beyond the QAPP-specified, 180-day holding time for frozen sediments. All results were positive and were estimated (J) to indicate a potential low bias. A total of fourteen (14) mercury results (2.7% of all archived sediment metals results) were estimated based on holding time outliers.

The QAPP-required holding time criterion for TOC for archived sediments is one year from date of sampling to date of analysis. The QAPP-required holding time criterion for grain size and specific gravity is 6 months from date of sampling to date of analysis. Some TOC analyses were performed outside the holding time of one year; however, as all sediment samples were stored frozen and the TOC content should be stable, no qualifiers were applied. All of the grain-size and specific gravity analyses were performed significantly beyond the 6-month holding time criterion. In addition, the sediment samples were frozen, which could potentially alter the results for these tests. Due to this, the results for grain size and specific gravity were estimated (J/UJ). A total of 2,197 data points (72% of all archived sediment conventional parameter results) were estimated based on holding time exceedances and sample preservation conditions.

The selected data qualified as noted above are fully usable for all data uses summarized in the Round 2 FSP and FSP addendum.

3.5 DATA MANAGEMENT

Once CAS and Alta completed their internal quality assurance/quality control (QA/QC) checks, they exported the analytical data (sample, test, batch, and result information) into comma-delimited text files with data columns arranged in an order that was recognized by the project's Environmental Quality Information System (EQuIS) database. These electronic data deliverables (EDDs) were e-mailed to Integral where they were checked for proper EQuIS structure and appended with specific information that was unknown by the lab, such as sampling location, composite information, and field replicate information. If any problems were found in the structure of the EDDs, then the laboratory was notified and asked to correct the problem and resubmit the EDD. Each emailed EDD transmission, with the original, unaltered EDD attachment, was stored to document and track the laboratories' delivery of electronic data to Integral.

When the EDD was corrected and complete, the EDD was checked electronically by loading it into the temporary section of Integral's Lower Willamette Group (LWG) project database. In the process of loading, EQuIS checked the EDDs for correct lookup codes (such as for analytes, test methods, and sample matrices); proper relationships for results, tests, batches, and samples (to ensure all results matched with a test, tests with samples, and sample/test pairs with batches); and that all derived samples (such as replicates and matrix spikes) had corresponding parent samples.

In addition to these checks, EQuIS also checked "less important" characteristics, such as date and time formats and text field lengths, to ensure consistency throughout the database. All EDDs were prevented from loading until the error was corrected. If errors were found that were related to the way the laboratory reported the data or constructed the EDD, then the laboratory was notified and asked to correct the problem and resubmit the EDD. If errors were related to Excel automatically formatting date and time fields, for example, then the error was corrected and steps were taken to avoid repeats of the problem (such as changing default settings in the software). Successfully loaded EDDs were saved to document and track the data that were loaded into Integral's LWG project database.

Each verified and accurate EDD was provided to the Round 2 data validation contractor (EcoChem, Seattle, WA) for data review and validation. These EDDs were also stored in a temporary section of the project database where they could be queried and examined, if desired, until validation was complete. As EcoChem completed validation of the data by sample delivery group (SDG) or small groups of SDGs, the validator qualifiers and reason codes were applied to the data in the temporary section of the database. The validated data were then merged into the permanent project database. During the merging process, all previously performed electronic checks were repeated to ensure nothing was incorrectly modified with the application of the validation results.

Several queries were set up in the permanent project database to translate the data structure to a form compatible with the National Oceanic & Atmospheric Administration's (NOAA's) Query Manager. The data translation included creating station and sample identifiers, converting the sample type code, and changing the date format. The translated data were imported into an Access file provided by NOAA that contained template tables for the Query Manager structure.

Integral's LWG project database contains all of the data reported by the analytical laboratories. This includes field and lab replicates, lab dilutions, results for the same analyte from multiple analytical methods (SW8270 and SW8270-SIM, for example), and laboratory QA samples such as matrix spikes, surrogates, and method blanks. The data handling rules described in *Guidelines for Data Averaging and Treatment of Non-detected Values for the Round 1 Database* (Kennedy Jenks et al. 2004) were used to create a data set for the site characterization and risk assessment (SCRA) data users that was simpler: the data set contained only one result per analyte per sample and excluded all of the laboratory QA results. This involved creating a SCRA database that excluded lab QA results, contained only the most appropriate dilution result and analytical method for each analyte, and contained the average of replicates. Excluding the lab QA results was a simple database querying step. Selection of the most appropriate dilution was either done by the reporting laboratory or by the data validator. Selection of the most appropriate analytical method was described in the guidelines document and was accomplished by flagging the appropriate method in the project database.

The guidelines document described the rules used for averaging data and carrying qualifiers. Because it was the most data-manipulation-intensive procedure, the data were divided into subgroups and approximately 40% of each subgroup was verified. If any problems were found with the averaging, then 100% of the subgroup was verified and problems were corrected. The preliminary SCRA database was compiled into a series of database-compatible Excel tables and distributed to the SCRA data users. The SCRA database is provided on CD in Appendix B.

4.0 ROUND 2A ARCHIVED SUBSURFACE SEDIMENT RESULTS

Round 2A chemistry results for the archived subsurface sediment samples are presented in Table 4-1. Review and evaluation of the archived data and spatial trends in the distribution of contaminants will be presented in the Comprehensive Round 2 Site Characterization Report.

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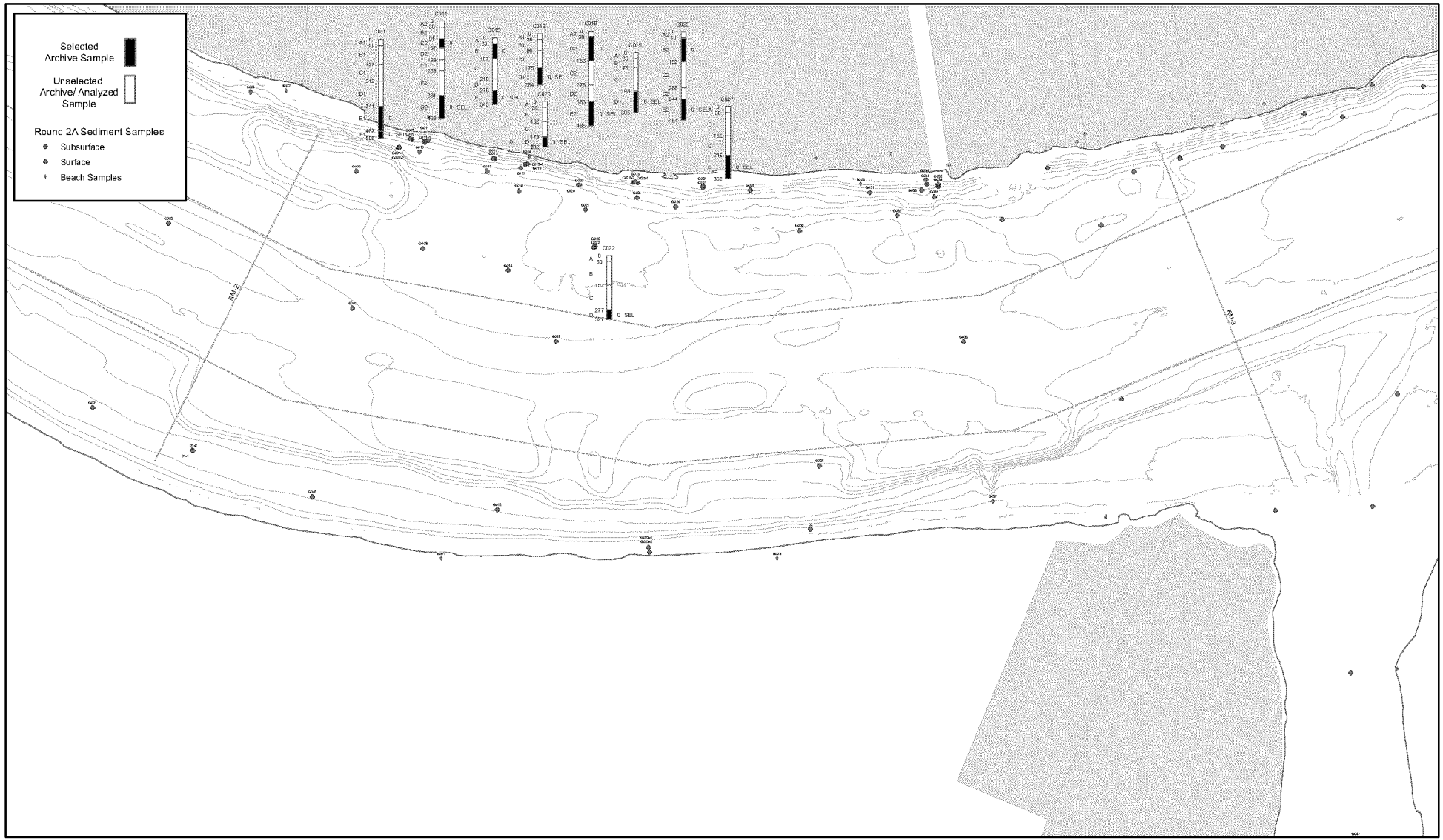

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FEATURE SOURCES:
Transportation, Property, or Boundaries: Metro RLIS .
Channel & River miles: US Army Corps of Engineers.
Bathymetric Information: David Evans and Associates, Inc.

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ECSI Sites
Outfalls
Navigation Channel
2004 5-foot Contours (NAVD88)
River miles

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Figure 2-1a
Portland Harbor RI/FS
Round 2A Archived Core Sediment Data Report
Mapped Distribution of Archived Samples Selected for Analysis

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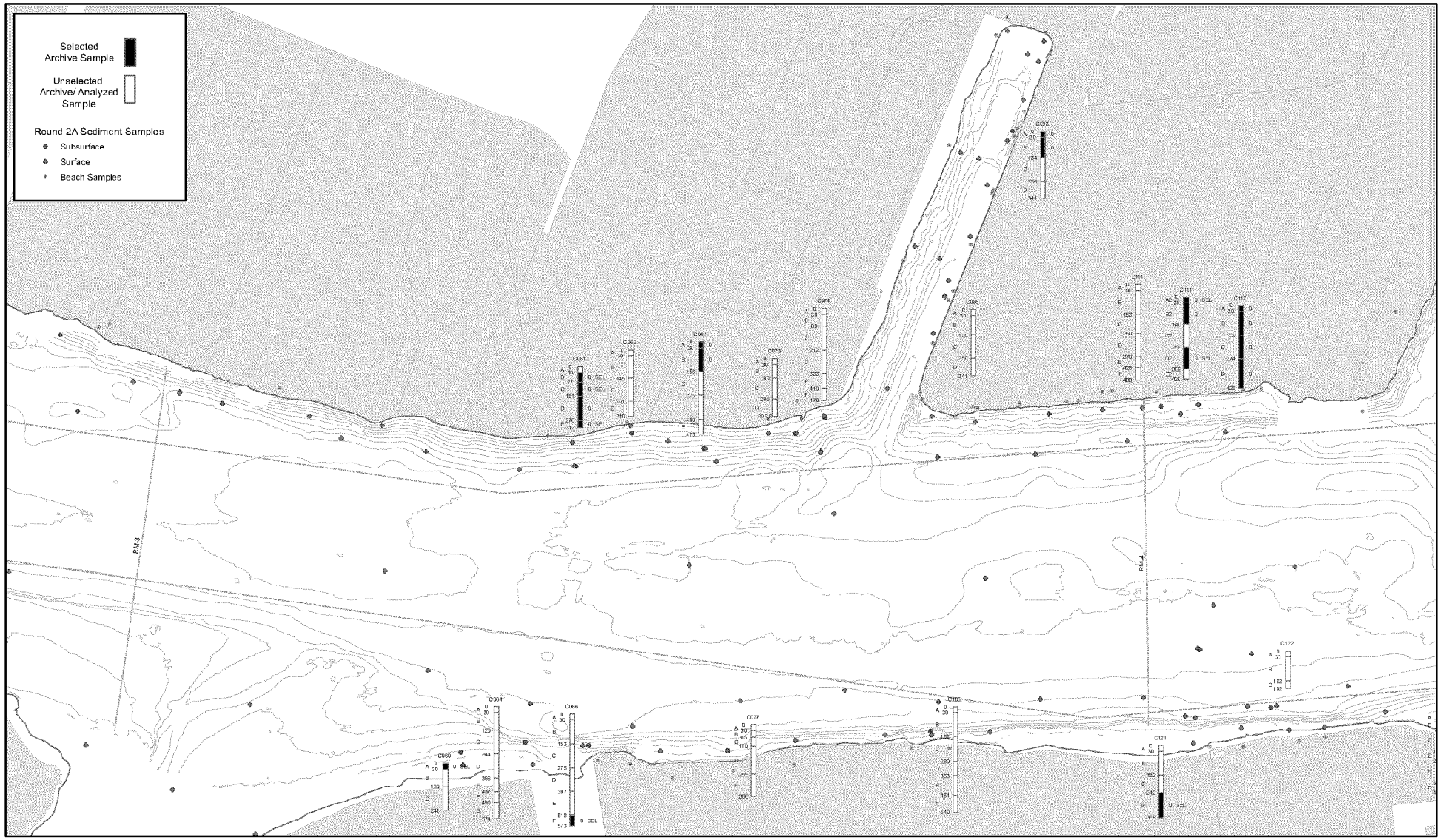

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FEATURE SOURCES:
Transportation, Property, or Boundaries: Metro RLIS .
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ECSI Sites
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Figure 2-1b
Portland Harbor RI/FS
Round 2A Archived Core Sediment Data Report
Mapped Distribution of Archived Samples Selected for Analysis

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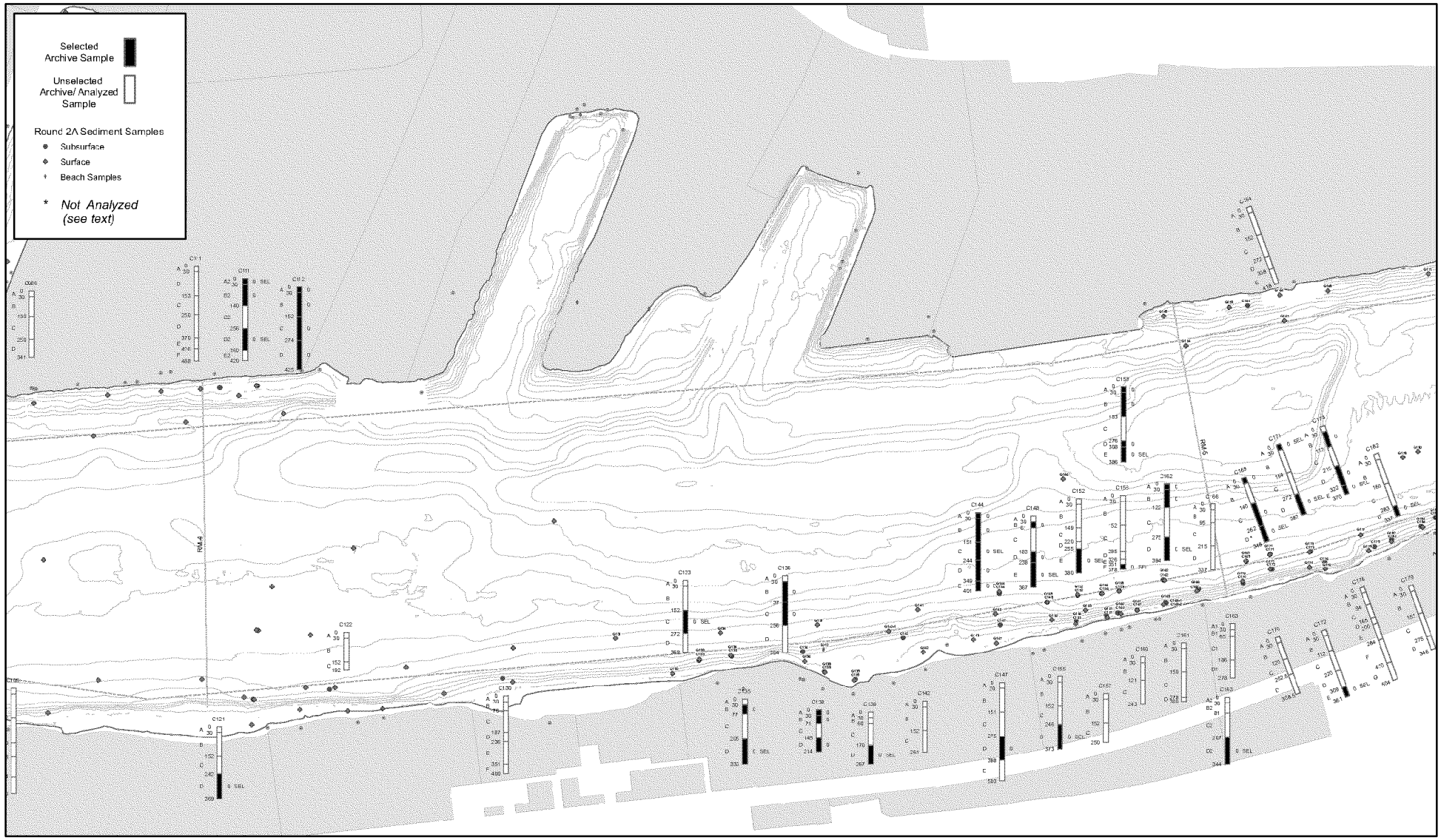

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Transportation, Property, or Boundaries: Metro RLIS .
Channel & River miles: US Army Corps of Engineers.
Bathymetric Information: David Evans and Associates, Inc.

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Figure 2-1c
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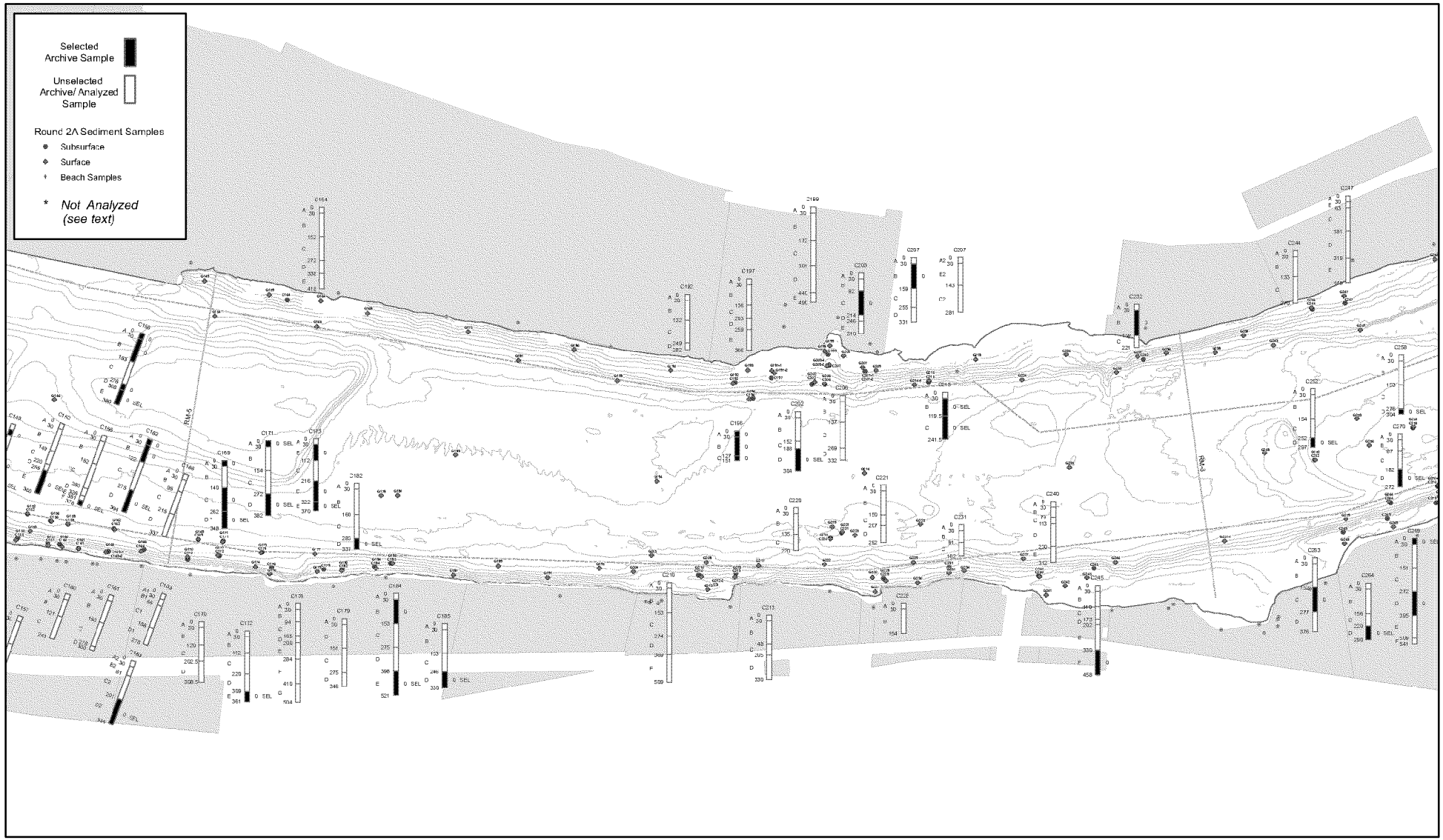

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Figure 2-1d
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Round 2A Archived Core Sediment Data Report
Mapped Distribution of Archived Samples Selected for Analysis

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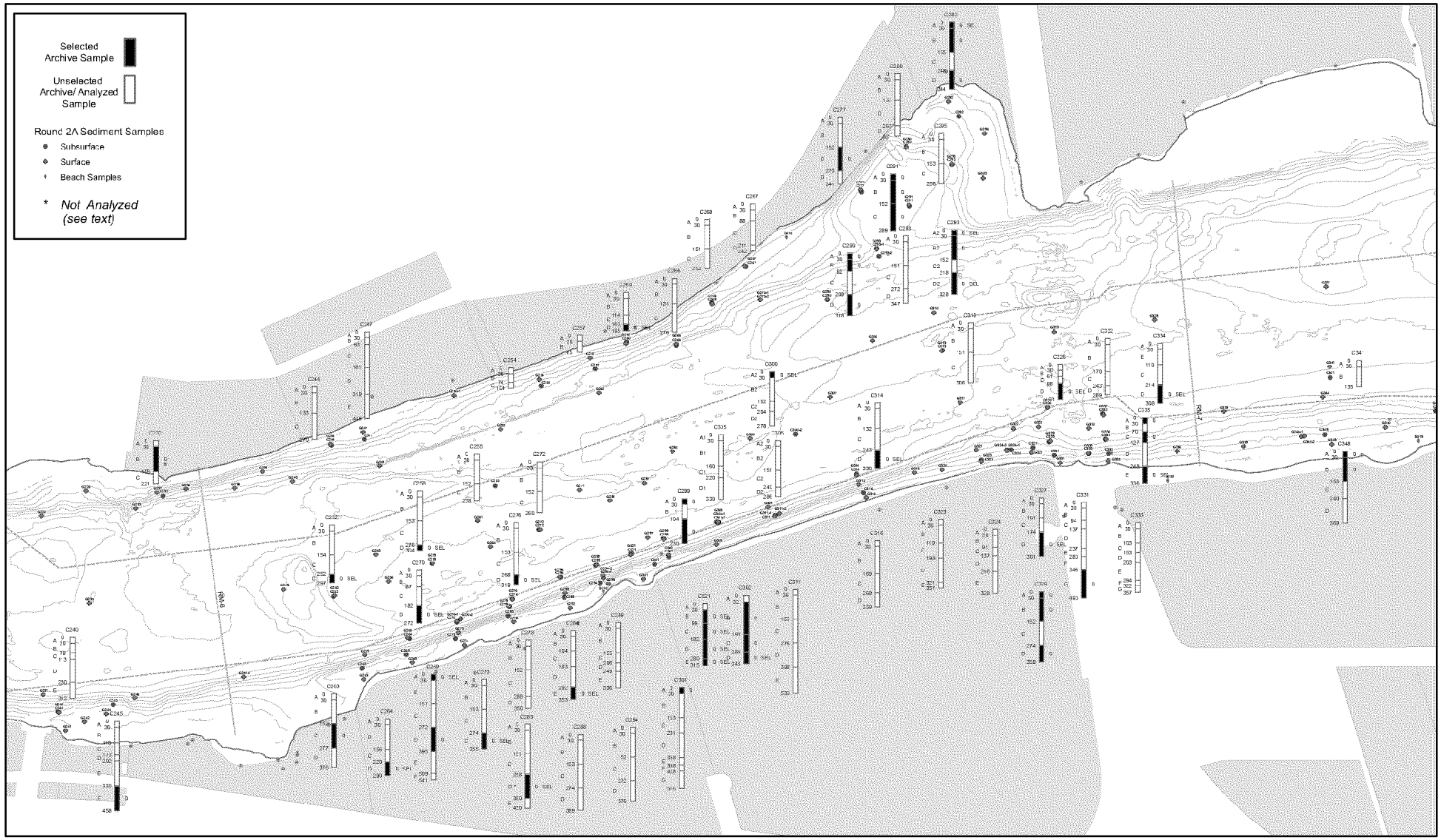

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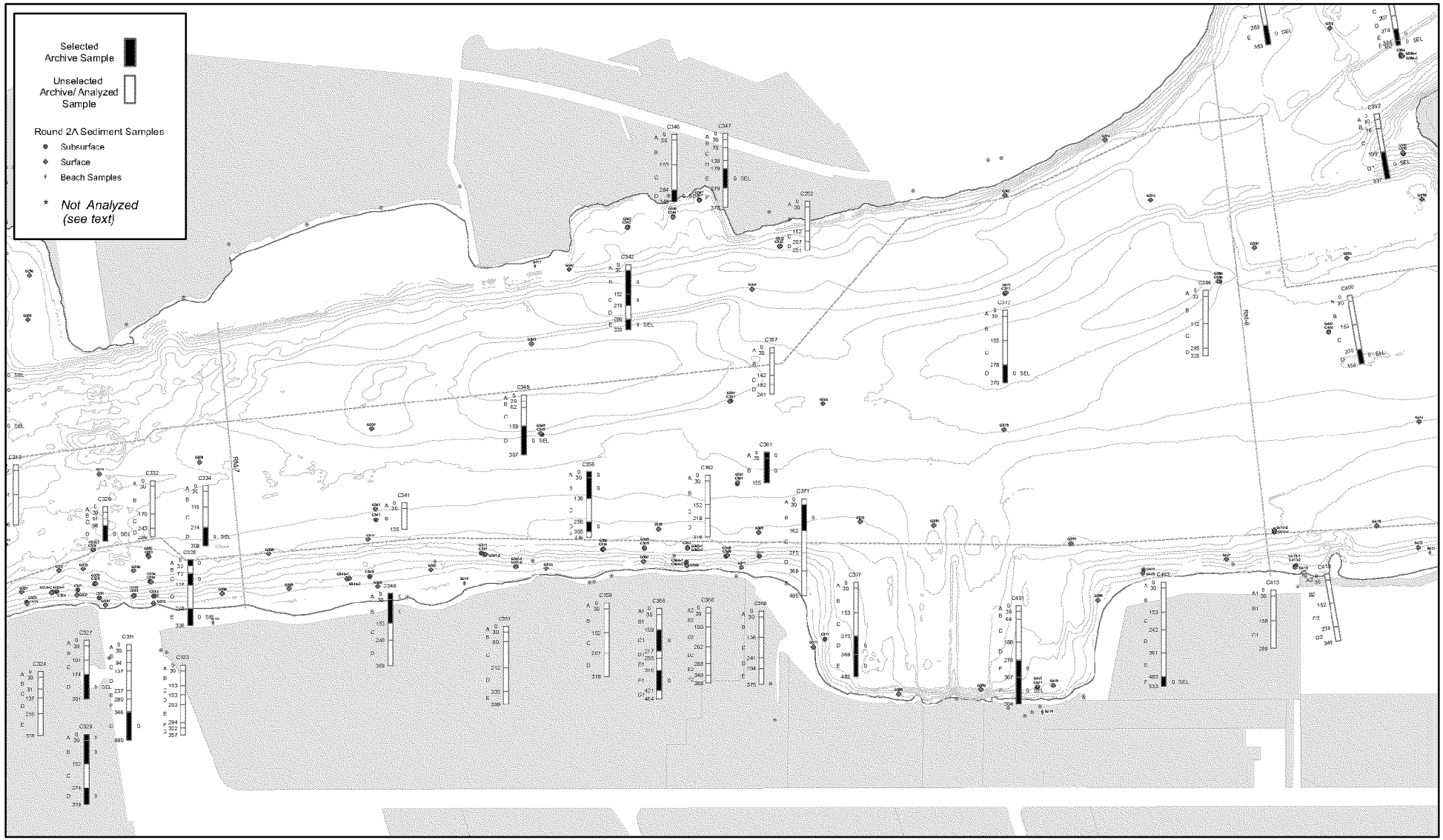
Figure 2-1e
Portland Harbor RI/FS
Round 2A Archived Core Sediment Data Report
Mapped Distribution of Archived Samples Selected for Analysis

ANC02562
BZTO104(e)002562



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3/14/2006 -- 3:13:34 PM

integral consulting inc.

LWG LOWER WILLAMETTE GROUP

FEATURE SOURCES:
Transporation, Property, or Boundaries: Metro RLIS .
Channel & River miles: US Army Corps of Engineers.
Bachymaric Information: David Evans and Associates, Inc.

N

0 250 500 750 Feet

ECSI Sites
Outfalls
Navigation Channel
2004 5-foot Contours (NAVD88)
River miles

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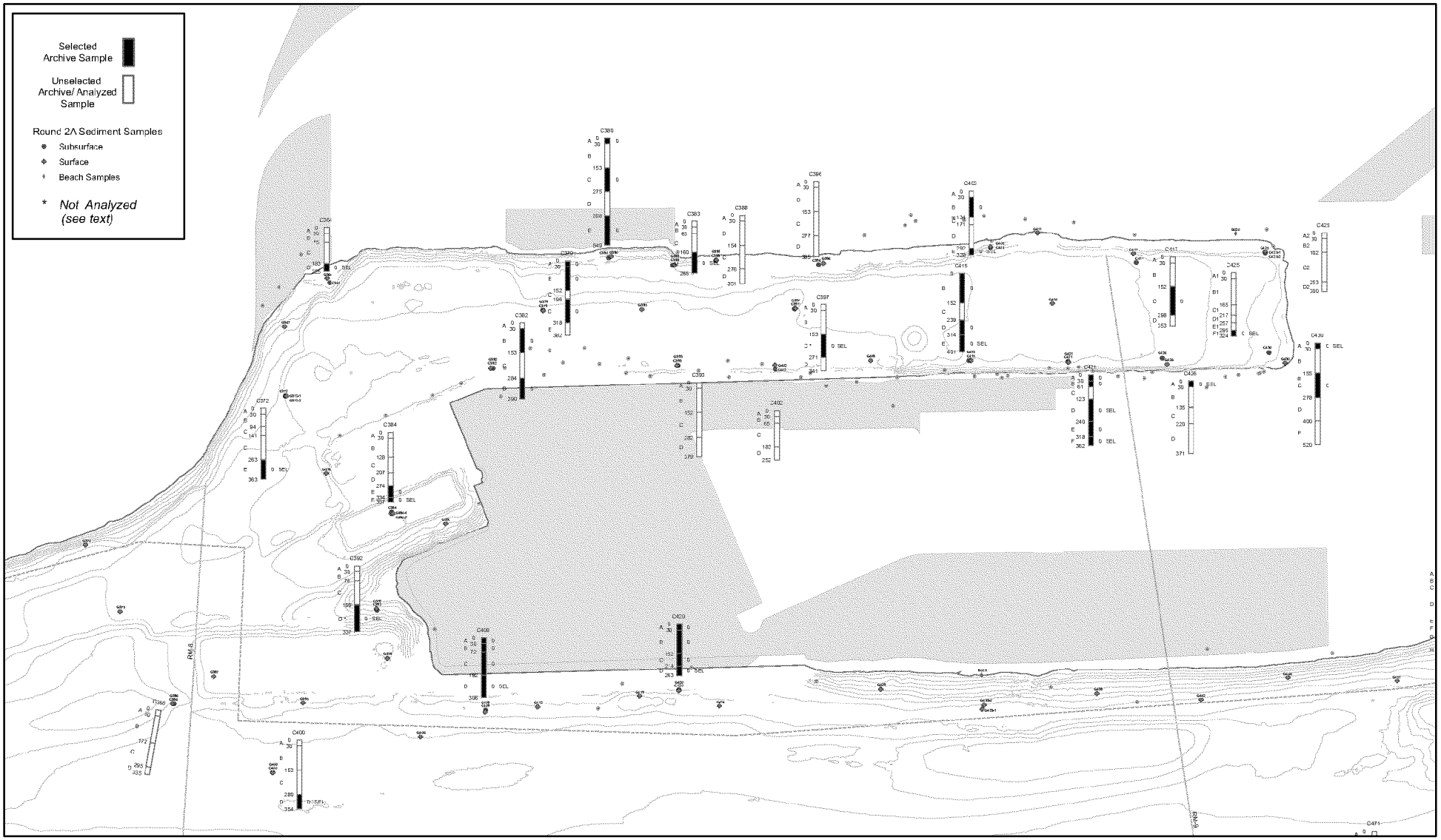
This document is currently under review by US EPA and its federal, state, and tribal partners, and is subject to change in whole or in part.

Figure 2-1f
Portland Harbor RI/FS
Round 2A Archived Core Sediment Data Report
Mapped Distribution of Archived Samples Selected for Analysis

ANC02563
BZTO104(e)002563



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LWG LOWER WILLAMETTE GROUP

FEATURE SOURCES:
Transporation, Property, or Boundaries: Metro RLIS .
Channel & River miles: US Army Corps of Engineers.
Bachymaric Information: David Evans and Associates, Inc.

N

0 250 500 750 Feet

ECSI Sites
Outfalls
Navigation Channel
2004 5-foot Contours (NAVD88)
River miles

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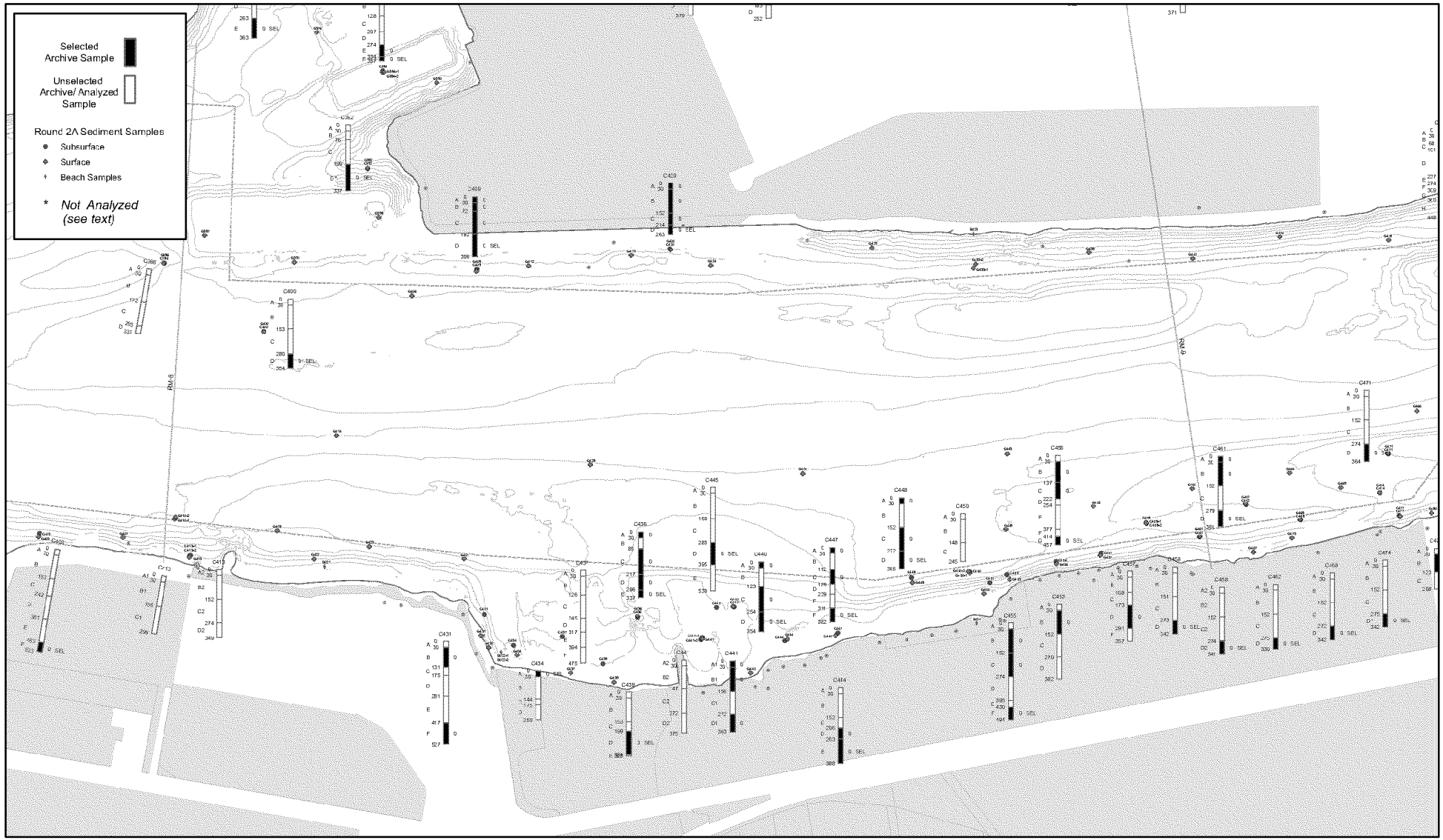
Figure 2-1g
Portland Harbor RI/FS
Round 2A Archived Core Sediment Data Report
Mapped Distribution of Archived Samples Selected for Analysis

ANC02564
BZTO104(e)002564



integral consulting inc.

LWG LOWER WILLAMETTE GROUP

FEATURE SOURCES:
Transporation, Property, or Boundaries: Metro RLIS .
Channel & River miles: US Army Corps of Engineers.
Bachymaric Information: David Evans and Associates, Inc.

0 250 500 750 Feet

ECSI Sites
Outfalls
Navigation Channel
2004 5-foot Contours (NAVD88)
River miles

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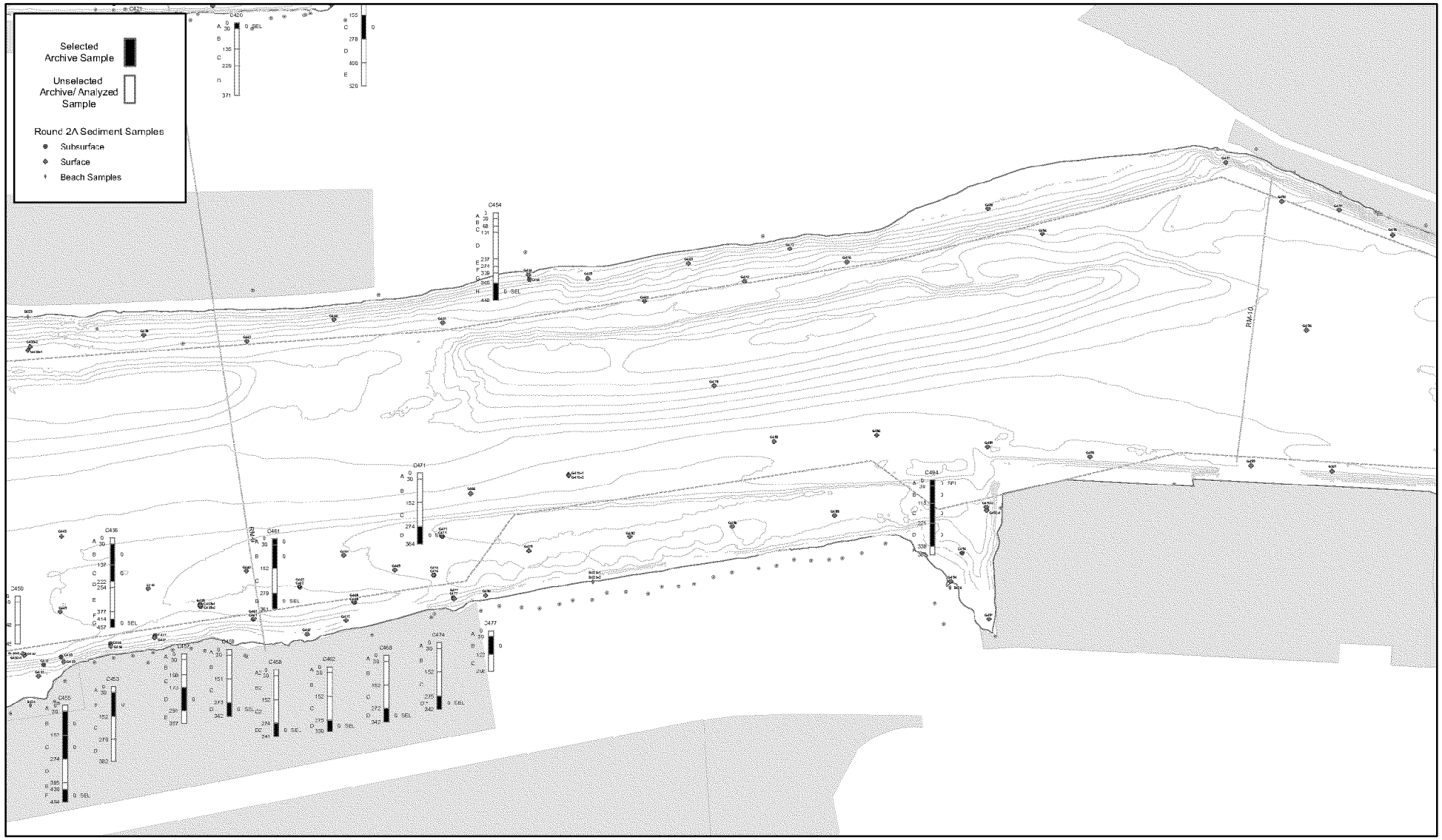
Figure 2-1h
Portland Harbor RI/FS
Round 2A Archived Core Sediment Data Report
Mapped Distribution of Archived Samples Selected for Analysis

ANC02565
BZTO104(e)002565



Map Document: (D:\Projects\Portland_Harbor\LWG-Map-Projects\Chemistry-Round_2\FSP_ARCHIVES\Revised20060706\R2_Report_05_ARCHIVE_Map_Global_REV.mxd)
3/14/2006 -- 3:13:34 PM

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LWG
LOWER WILLAMETTE GROUP

FEATURE SOURCES:
Transporation, Property, or Boundaries: Metro RLIS .
Channel & River miles: US Army Corps of Engineers.
Bachymaric Information: David Evans and Associates, Inc.

N

0 250 500 750 Feet

ECSI Sites
Outfalls
Navigation Channel
2004 5-foot Contours (NAVD88)
River miles

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Figure 2-1i
Portland Harbor RI/FS
Round 2A Archived Core Sediment Data Report
Mapped Distribution of Archived Samples Selected for Analysis

ANC02566
BZTO104(e)002566

Table 2-1. Archived Round 2A Subsurface Samples Selected for Analysis.

		METALS											PESTICIDES/PCBs						
Date	Core/Grab Sample	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Zinc	Metals Analyses	Hg Only Analysis	TBT	Butyltins Analyses	Total PCBs	PCB Congeners	Total DDTs	Total Chlordanes	PCBs Analyses	PCB Congeners	Pesticides Analyses
11/1/2004	LW2-C011-C2																		
11/1/2004	LW2-C011-E1						C011-E1			X									
11/1/2004	LW2-C011-F1												C011-F1		C011-F1		X		X
11/1/2004	LW2-C011-G2																		
9/24/2004	LW2-C015-B																		
9/24/2004	LW2-C015-E	C015-E	C015-E					C015-E	X				C015-E		C015-E		X		X
9/24/2004	LW2-C019-D1												C019-D1		C019-D1		X		X
11/2/2004	LW2-C019-B2													C019-B2				X	
11/2/2004	LW2-C019-E2		C019-E2			C019-E2		C019-E2	X				C019-E2		C019-E2		X		X
9/24/2004	LW2-C020-D		C020-D						X				C020-D		C020-D	C020-D	X		X
9/24/2004	LW2-C022-D							C022-D	X				C022-D				X		
9/24/2004	LW2-C025-D1												C025-D1				X		
11/2/2004	LW2-C025-B2													C025-B2				X	
11/2/2004	LW2-C025-E2												C025-E2				X		
9/29/2004	LW2-C027-D												C027-D				X		
9/29/2004	LW2-C034-F														C034-F				X
9/29/2004	LW2-C060-A				C060-A			C060-A	X				C060-A		C060-A		X		X
9/29/2004	LW2-C061-B												C061-B				X		
9/29/2004	LW2-C061-C												C061-C		C061-C		X		X
9/29/2004	LW2-C061-D						C061-D			X									
9/29/2004	LW2-C061-E												C061-E		C061-E		X		X
11/2/2004	LW2-C066-F															C066-F			X
11/2/2004	LW2-C067-A																		
11/2/2004	LW2-C067-B																		
10/20/2004	LW2-C093-A													C093-A				X	
10/20/2004	LW2-C093-B													C093-B				X	
11/3/2004	LW2-C111-A2												C111-A2				X		
11/3/2004	LW2-C111-B2													C111-B2				X	
11/3/2004	LW2-C111-D2																		
11/2/2004	LW2-C112-A																		
11/2/2004	LW2-C112-B																		
11/2/2004	LW2-C112-C																		
11/2/2004	LW2-C112-D																		
9/30/2004	LW2-C121-D												C121-D		C121-D		X		X
9/23/2004	LW2-C133-C												C133-C		C133-C		X		X
9/23/2004	LW2-C135-B														C135-B				X
9/23/2004	LW2-C135-D					C135-D		C135-D	X				C135-D		C135-D		X		X
11/3/2004	LW2-C136-B																		
11/3/2004	LW2-C136-C																		
9/30/2004	LW2-C138-A														C138-A				X
9/30/2004	LW2-C138-B														C138-B				X
9/30/2004	LW2-C138-D														C138-D				X
9/30/2004	LW2-C139-D							C139-D	X				C139-D		C139-D	C139-D	X		X
9/29/2004	LW2-C144-A												C144-A		C144-A		X		X
9/29/2004	LW2-C144-B												C144-B		C144-B		X		X
9/29/2004	LW2-C144-C																		
9/29/2004	LW2-C144-D												C144-D		C144-D		X		X
9/29/2004	LW2-C144-E																		
11/3/2004	LW2-C147-D												C147-D		C147-D		X		X
9/28/2004	LW2-C148-B												C148-B		C148-B		X		X
9/28/2004	LW2-C148-D												C148-D		C148-D		X		X
9/28/2004	LW2-C148-E					C148-E		C148-E	X										
9/28/2004	LW2-C152-E					C152-E	C152-E	C152-E	X	X									
10/5/2004	LW2-C155-D																		
9/28/2004	LW2-C156-F						C156-F	C156-F	X	X									
9/28/2004	LW2-C158-A												C158-A		C158-A		X		X
9/28/2004	LW2-C158-B												C158-B		C158-B		X		X

ANC02567
BZTO104(e)002567

Table 2-1. Archived Round 2A Subsurface Samples Selected for Analysis.

		METALS											PESTICIDES/PCBs						
Date	Core/Grab Sample	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Zinc	Metals Analyses	Hg Only Analysis	TBT	Butyltins Analyses	Total PCBs	PCB Congeners	Total DDTs	Total Chlordanes	PCBs Analyses	PCB Congeners	Pesticides Analyses
9/28/2004	LW2-C158-D												C158-D		C158-D		X		X
9/28/2004	LW2-C158-E																		
9/28/2004	LW2-C162-A												C162-A		C162-A		X		X
9/28/2004	LW2-C162-B												C162-B		C162-B		X		X
9/28/2004	LW2-C162-D					C162-D		C162-D	X				C162-D		C162-D		X		X
9/29/2004	LW2-C163-D2					C163-D2		C163-D2	X										
9/22/2004	LW2-C169-A												C169-A		C169-A		X		X
9/22/2004	LW2-C169-C												C169-C		C169-C		X		X
9/22/2004	LW2-C169-D*					C169-D		C169-D	X										
9/22/2004	LW2-C171-A												C171-A		C171-A		X		X
9/22/2004	LW2-C171-D												C171-D		C171-D		X		X
9/23/2004	LW2-C172-E					C172-E		C172-E	X				C172-E		C172-E	C172-E	X		X
9/23/2004	LW2-C173-B												C173-B		C173-B		X		X
9/23/2004	LW2-C173-D												C173-D		C173-D		X		X
9/23/2004	LW2-C173-E							C173-E	X										
9/23/2004	LW2-C182-D						C182-D			X			C182-D		C182-D		X		X
11/4/2004	LW2-C184-B													C184-B				X	
11/4/2004	LW2-C184-E																		
9/23/2004	LW2-C185-D																		
9/30/2004	LW2-C196-A												C196-A		C196-A		X		X
9/30/2004	LW2-C196-B												C196-B		C196-B		X		X
9/30/2004	LW2-C196-C												C196-C		C196-C		X		X
9/30/2004	LW2-C202-D	C202-D	C202-D	C202-D		C202-D	C202-D	C202-D	X	X			C202-D		C202-D		X		X
9/30/2004	LW2-C203-C													C203-C				X	
9/30/2004	LW2-C207-D													C207-D				X	
9/21/2004	LW2-C215-B												C215-B		C215-B		X		X
9/21/2004	LW2-C215-C												C215-C		C215-C	C215-C	X		X
11/8/2004	LW2-C232-B																		
10/28/2004	LW2-C245-F																		
9/23/2004	LW2-C252-D												C252-D		C252-D		X		X
9/23/2004	LW2-C258-D																		
10/5/2004	LW2-C260-D						C260-D			X					C260-D				X
10/1/2004	LW2-C263-C												C263-C	C263-C			X	X	
9/23/2004	LW2-C264-D												C264-D		C264-D		X		X
10/28/2004	LW2-C269-A												C269-A				X		
10/28/2004	LW2-C269-D						C269-D			X			C269-D		C269-D		X		X
9/21/2004	LW2-C270-D						C270-D	C270-D	X	X					C270-D				X
10/20/2004	LW2-C273-D														C273-D	C273-D			X
9/22/2004	LW2-C276-D														C276-D				X
10/19/2004	LW2-C277-C													C277-C				X	
11/11/2004	LW2-C282-A												C282-A				X		
11/11/2004	LW2-C282-B																		
11/11/2004	LW2-C282-D																		
11/5/2004	LW2-C283-D*																		
9/22/2004	LW2-C284-E																		
10/19/2004	LW2-C290-A												C290-A		C290-A		X		X
10/19/2004	LW2-C290-B												C290-B		C290-B		X		X
10/19/2004	LW2-C290-D												C290-D		C290-D		X		X
10/19/2004	LW2-C291-A												C291-A		C291-A		X		X
10/19/2004	LW2-C291-B												C291-B		C291-B		X		X
10/19/2004	LW2-C291-C												C291-C		C291-C		X		X
10/19/2004	LW2-C293-A2																		
10/19/2004	LW2-C293-B2													C293-B2				X	
10/19/2004	LW2-C293-D2																		
9/22/2004	LW2-C299-A												C299-A		C299-A		X		X
9/22/2004	LW2-C299-C												C299-C		C299-C		X		X
10/27/2004	LW2-C300-A												C300-A		C300-A		X		X

ANC02568
BZTO104(e)002568

Table 2-1. Archived Round 2A Subsurface Samples Selected for Analysis.

		METALS											PESTICIDES/PCBs						
Date	Core/Grab Sample	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Zinc	Metals Analyses	Hg Only Analysis	TBT	Butyltins Analyses	Total PCBs	PCB Congeners	Total DDTs	Total Chlordanes	PCBs Analyses	PCB Congeners	Pesticides Analyses
10/27/2004	LW2-C300-B												C300-B		C300-B		X		X
10/27/2004	LW2-C300-D												C300-D		C300-D		X		X
11/8/2004	LW2-C301-A							C301-A	X										
9/22/2004	LW2-C302-B													C302-B				X	
9/22/2004	LW2-C302-C													C302-C				X	
9/22/2004	LW2-C302-D												C302-D		C302-D		X		X
9/28/2004	LW2-C314-D						C314-D	C314-D	X	X			C314-D		C314-D	C314-D	X		X
9/27/2004	LW2-C326-D					C326-D			X										
9/27/2004	LW2-C327-D	C327-D	C327-D		C327-D	C327-D	C327-D	C327-D	X	X			C327-D	C327-D	C327-D		X	X	X
9/28/2004	LW2-C329-A																		
9/28/2004	LW2-C329-B																		
9/28/2004	LW2-C329-D																		
11/9/2004	LW2-C331-G																		
9/27/2004	LW2-C334-D																		
10/5/2004	LW2-C335-A																		
10/5/2004	LW2-C335-C																		
10/5/2004	LW2-C335-E																		
10/20/2004	LW2-C342-B													C342-B				X	
10/20/2004	LW2-C342-C													C342-C				X	
10/20/2004	LW2-C342-E																		
10/20/2004	LW2-C346-D																		
10/20/2004	LW2-C347-E				C347-E		C347-E	C347-E	X	X			C347-E		C347-E		X		X
11/9/2004	LW2-C348-A																		
11/9/2004	LW2-C348-B																		
10/4/2004	LW2-C349-D						C349-D	C349-D	X	X					C349-D	C349-D			X
11/9/2004	LW2-C356-A												C356-A				X		
11/9/2004	LW2-C356-B												C356-B				X		
11/9/2004	LW2-C356-D												C356-D				X		
10/4/2004	LW2-C361-A												C361-A				X		
10/4/2004	LW2-C361-B												C361-B				X		
10/26/2004	LW2-C364-D						C364-D			X									
11/9/2004	LW2-C366-C1													C366-C1				X	
11/9/2004	LW2-C366-F1												C366-F1				X		
11/10/2004	LW2-C371-B													C371-B				X	
10/7/2004	LW2-C372-E												C372-E				X		
10/20/2004	LW2-C373-D				C373-D			C373-D	X				C373-D				X		
11/10/2004	LW2-C377-D																		
11/10/2004	LW2-C377-E													C377-E				X	
10/7/2004	LW2-C379-A																		
10/7/2004	LW2-C379-B																		
10/7/2004	LW2-C379-D																		
11/10/2004	LW2-C380-A																		
11/10/2004	LW2-C380-C																		
11/10/2004	LW2-C380-E																		
10/21/2004	LW2-C382-B													C382-B				X	
10/21/2004	LW2-C382-D														C382-D				X
10/21/2004	LW2-C383-D			C383-D					X										
10/7/2004	LW2-C384-E												C384-E				X		
10/7/2004	LW2-C384-F				C384-F				X										
10/7/2004	LW2-C392-D*												C392-D				X		
10/7/2004	LW2-C397-C*													C397-C				X	
10/7/2004	LW2-C400-D				C400-D			C400-D	X				C400-D				X		
11/10/2004	LW2-C401-E													C401-E				X	
11/10/2004	LW2-C401-F												C401-F		C401-F		X		X
11/10/2004	LW2-C403-F			C403-F					X										
10/26/2004	LW2-C405-B																		
10/26/2004	LW2-C405-E		C405-E	C405-E		C405-E		C405-E	X				C405-E				X		

ANC02569
BZTO104(e)002569

Table 2-1. Archived Round 2A Subsurface Samples Selected for Analysis.

		METALS											PESTICIDES/PCBs						
Date	Core/Grab Sample	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Zinc	Metals Analyses	Hg Only Analysis	TBT	Butyltins Analyses	Total PCBs	PCB Congeners	Total DDTs	Total Chlordanes	PCBs Analyses	PCB Congeners	Pesticides Analyses
10/26/2004	LW2-C409-A										C409-A	X							
10/26/2004	LW2-C409-B										C409-B	X							
10/26/2004	LW2-C409-C													C409-C				X	
10/26/2004	LW2-C409-D				C409-D	C409-D			X				C409-D		C409-D		X		X
10/22/2004	LW2-G415-A**																		
11/10/2004	LW2-C415-B																		
11/10/2004	LW2-C415-D																		
11/10/2004	LW2-C415-E			C415-E					X										
10/26/2004	LW2-C417-C																		
10/6/2004	LW2-C420-A										C420-A	X							
10/6/2004	LW2-C420-B										C420-B	X							
10/6/2004	LW2-C420-C													C420-C				X	
10/6/2004	LW2-C420-D				C420-D			C420-D	X				C420-D		C420-D		X		X
10/7/2004	LW2-C421-A														C421-A				X
10/7/2004	LW2-C421-B														C421-B				X
10/7/2004	LW2-C421-D				C421-D	C421-D		C421-D	X						C421-D				X
10/7/2004	LW2-C421-E												C421-E				X		
10/7/2004	LW2-C421-F				C421-F	C421-F		C421-F	X										
10/26/2004	LW2-C425-F1												C425-F1				X		
10/25/2004	LW2-C426-A																		
11/10/2004	LW2-C430-A	C430-A	C430-A	C430-A	C430-A	C430-A		C430-A	X				C430-A				X		
11/10/2004	LW2-C430-C																		
11/10/2004	LW2-C431-B													C431-B				X	
11/10/2004	LW2-C431-F														C431-F				X
11/11/2004	LW2-C434-A																		
10/7/2004	LW2-C436-A															C436-A			X
10/7/2004	LW2-C436-C															C436-C			X
10/7/2004	LW2-C436-D						C436-D			X									
10/7/2004	LW2-C436-E	C436-E	C436-E	C436-E	C436-E	C436-E		C436-E	X				C436-E				X		
10/6/2004	LW2-C439-D		C439-D		C439-D	C439-D		C439-D	X				C439-D				X		
10/6/2004	LW2-C440-A														C440-A				X
10/6/2004	LW2-C440-C														C440-C				X
10/6/2004	LW2-C440-D	C440-D			C440-D	C440-D		C440-D	X				C440-D				X		
10/6/2004	LW2-C441-A1																		
10/6/2004	LW2-C441-B1																		
10/6/2004	LW2-C441-D1																		
10/6/2004	LW2-C444-D						C444-D			X									
10/6/2004	LW2-C444-F				C444-F	C444-F		C444-F	X				C444-F		C444-F		X		X
11/11/2004	LW2-C445-D	C445-D			C445-D	C445-D		C445-D	X										
10/6/2004	LW2-C447-A														C447-A				X
10/6/2004	LW2-C447-C														C447-C				X
10/6/2004	LW2-C447-F																		
10/26/2004	LW2-C448-A														C448-A				X
10/26/2004	LW2-C448-C														C448-C				X
10/26/2004	LW2-C448-D		C448-D		C448-D	C448-D		C448-D	X				C448-D				X		
10/6/2004	LW2-C453-B													C453-B				X	
10/28/2004	LW2-C454-H																		
11/11/2004	LW2-C455-B													C455-B				X	
11/11/2004	LW2-C455-C													C455-C				X	
11/11/2004	LW2-C455-F												C455-F				X		
10/28/2004	LW2-C456-B																		
10/28/2004	LW2-C456-C																		
10/28/2004	LW2-C456-G																		
10/6/2004	LW2-C457-D	C457-D	C457-D	C457-D	C457-D	C457-D		C457-D	X		C457-D	X	C457-D				X		
10/5/2004	LW2-C458-D1														C458-D	C458-D			X
10/5/2004	LW2-C458-D2												C458-D2				X		
10/5/2004	LW2-C461-A																		

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Table 2-1. Archived Round 2A Subsurface Samples Selected for Analysis.

		METALS											PESTICIDES/PCBs						
Date	Core/Grab Sample	Arsenic	Cadmium	Chromium	Copper	Lead	Mercury	Zinc	Metals Analyses	Hg Only Analysis	TBT	Butyltins Analyses	Total PCBs	PCB Congeners	Total DDTs	Total Chlordanes	PCBs Analyses	PCB Congeners	Pesticides Analyses
10/5/2004	LW2-C461-B																		
10/5/2004	LW2-C461-D				C461-D	C461-D			X				C461-D				X		
10/5/2004	LW2-C462-D												C462-D				X		
10/6/2004	LW2-C468-D												C468-D				X		
10/5/2004	LW2-C471-D												C471-D				X		
10/5/2004	LW2-C474-D*												C474-D				X		
10/28/2004	LW2-C477-B													C477-B				X	
10/28/2004	LW2-C494-A												C494-A				X		
10/28/2004	LW2-C494-B																		
10/28/2004	LW2-C494-C													C494-C				X	
10/28/2004	LW2-C494-D																		
10/19/2004	LW2-C521-B												C521-B		C521-B		X		X
10/19/2004	LW2-C521-C														C521-C				X
10/19/2004	LW2-C521-D												C521-D		C521-D		X		X
10/19/2004	LW2-C521-E																		
243 = Total No. of Samples Selected																			
	TOTALS/Analyte	8	11	8	19	24	16	35	43	16	5	5	99	30	85	11	99	30	88

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Table 2-1. Archived Round 2A Subsurface Samples Selected for Analysis.

		SVOCs					PAHs			DIOXINS		TPH		Conventionals			
Date	Core/Grab Sample	Dibenzofuran	Hexachlorobenzene	4-Methylphenol	Bis(2-ethylhexyl) phthalate	SVOCs Analyses (w/o PAHs)	LPAHs	HPAHs	PAHs Analyses	2,3,7,8-TCDD TEQ	Dioxins Analyses	Diesel & Oil	TPH (Diesel & Oil) Analyses	Grainsize	Total Solids	TOC	Specific Gravity
11/1/2004	LW2-C011-C2									C011-C2	X						
11/1/2004	LW2-C011-E1													X	X	X	X
11/1/2004	LW2-C011-F1	C011-F1				X	C011-F1	C011-F1	X					X	X	X	X
11/1/2004	LW2-C011-G2			C011-G2		X								X	X	X	X
9/24/2004	LW2-C015-B									C015-B	X						
9/24/2004	LW2-C015-E	C015-E		C015-E		X	C015-E	C015-E	X					X		X	X
9/24/2004	LW2-C019-D1				C019-D1	X	C019-D1	C019-D1	X					X		X	X
11/2/2004	LW2-C019-B2									C019-B2	X			X	X	X	X
11/2/2004	LW2-C019-E2				C019-E2	X								X	X	X	X
9/24/2004	LW2-C020-D						C020-D		X					X		X	X
9/24/2004	LW2-C022-D			C022-D		X								X		X	X
9/24/2004	LW2-C025-D1													X		X	X
11/2/2004	LW2-C025-B2									C025-B2	X			X	X	X	X
11/2/2004	LW2-C025-E2													X	X	X	X
9/29/2004	LW2-C027-D													X		X	X
9/29/2004	LW2-C034-F							C034-F	X					X		X	X
9/29/2004	LW2-C060-A		C060-A	C060-A		X	C060-A	C060-A	X	C060-A	X				X	X	
9/29/2004	LW2-C061-B																
9/29/2004	LW2-C061-C																
9/29/2004	LW2-C061-D													X	X	X	X
9/29/2004	LW2-C061-E																
11/2/2004	LW2-C066-F															X	
11/2/2004	LW2-C067-A									C067-A	X			X	X	X	X
11/2/2004	LW2-C067-B									C067-B	X						
10/20/2004	LW2-C093-A									C093-A	X	C093-A	X				
10/20/2004	LW2-C093-B									C093-B	X	C093-B	X				
11/3/2004	LW2-C111-A2				C111-A2	X				C111-A2	X			X	X	X	X
11/3/2004	LW2-C111-B2																
11/3/2004	LW2-C111-D2						C111-D2		X	C111-D2	X			X	X	X	X
11/2/2004	LW2-C112-A											C112-A	X	X	X	X	X
11/2/2004	LW2-C112-B									C112-B	X						
11/2/2004	LW2-C112-C											C112-C	X				
11/2/2004	LW2-C112-D											C112-D	X				
9/30/2004	LW2-C121-D	C121-D		C121-D		X	C121-D	C121-D	X			C121-D	X	X		X	X
9/23/2004	LW2-C133-C									C133-C	X			X	X	X	X
9/23/2004	LW2-C135-B																
9/23/2004	LW2-C135-D	C135-D			C135-D	X	C135-D	C135-D	X			C135-D	X	X		X	X
11/3/2004	LW2-C136-B									C136-B	X						
11/3/2004	LW2-C136-C									C136-C	X						
9/30/2004	LW2-C138-A													X	X	X	X
9/30/2004	LW2-C138-B													X		X	X
9/30/2004	LW2-C138-D													X		X	X
9/30/2004	LW2-C139-D				C139-D	X	C139-D	C139-D	X					X		X	X
9/29/2004	LW2-C144-A									C144-A	X				X	X	
9/29/2004	LW2-C144-B									C144-B	X						
9/29/2004	LW2-C144-C						C144-C		X						X	X	
9/29/2004	LW2-C144-D									C144-D	X						
9/29/2004	LW2-C144-E							C144-E	X							X	
11/3/2004	LW2-C147-D													X	X	X	X
9/28/2004	LW2-C148-B																
9/28/2004	LW2-C148-D													X	X	X	X
9/28/2004	LW2-C148-E						C148-E	C148-E	X					X		X	X
9/28/2004	LW2-C152-E	C152-E		C152-E		X	C152-E	C152-E	X			C152-E	X	X		X	X
10/5/2004	LW2-C155-D			C155-D		X	C155-D	C155-D	X					X		X	X
9/28/2004	LW2-C156-F	C156-F				X	C156-F	C156-F	X			C156-F	X	X		X	X
9/28/2004	LW2-C158-A													X	X	X	X
9/28/2004	LW2-C158-B																

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Table 2-1. Archived Round 2A Subsurface Samples Selected for Analysis.

		SVOCs					PAHs			DIOXINS		TPH		Conventionals			
Date	Core/Grab Sample	Dibenzofuran	Hexachlorobenzene	4-Methylphenol	Bis(2-ethylhexyl) phthalate	SVOCs Analyses (w/o PAHs)	LPAHs	HPAHs	PAHs Analyses	2,3,7,8-TCDD TEQ	Dioxins Analyses	Diesel & Oil	TPH (Diesel & Oil) Analyses	Grainsize	Total Solids	TOC	Specific Gravity
9/28/2004	LW2-C158-D																
9/28/2004	LW2-C158-E	C158-E				X	C158-E	C158-E	X					X		X	X
9/28/2004	LW2-C162-A													X	X	X	X
9/28/2004	LW2-C162-B																
9/28/2004	LW2-C162-D	C162-D				X	C162-D	C162-D	X					X		X	X
9/29/2004	LW2-C163-D2	C163-D2	C163-D2	C163-D2		X	C163-D2	C163-D2	X					X		X	X
9/22/2004	LW2-C169-A													X	X	X	X
9/22/2004	LW2-C169-C																
9/22/2004	LW2-C169-D*	C169-D	C169-D		C169-D	X	C169-D	C169-D	X					X		X	X
9/22/2004	LW2-C171-A													X	X	X	X
9/22/2004	LW2-C171-D	C171-D				X	C171-D	C171-D	X					X		X	X
9/23/2004	LW2-C172-E	C172-E	C172-E		C172-E	X	C172-E	C172-E	X					X		X	X
9/23/2004	LW2-C173-B																
9/23/2004	LW2-C173-D													X	X	X	X
9/23/2004	LW2-C173-E	C173-E	C173-E			X	C173-E	C173-E	X					X		X	X
9/23/2004	LW2-C182-D	C182-D	C182-D	C182-D		X	C182-D	C182-D	X			C182-D	X	X		X	X
11/4/2004	LW2-C184-B																
11/4/2004	LW2-C184-E			C184-E		X	C184-E	C184-E	X					X		X	X
9/23/2004	LW2-C185-D	C185-D	C185-D	C185-D	C185-D	X	C185-D	C185-D	X			C185-D	X	X		X	X
9/30/2004	LW2-C196-A									C196-A	X			X	X	X	X
9/30/2004	LW2-C196-B									C196-B	X						
9/30/2004	LW2-C196-C									C196-C	X						
9/30/2004	LW2-C202-D	C202-D		C202-D		X	C202-D	C202-D	X			C202-D	X	X		X	X
9/30/2004	LW2-C203-C									C203-C	X						
9/30/2004	LW2-C207-B																
9/21/2004	LW2-C215-B									C215-B	X						
9/21/2004	LW2-C215-C																
11/8/2004	LW2-C232-B									C232-B	X						
10/28/2004	LW2-C245-F							C245-F	X					X		X	X
9/23/2004	LW2-C252-D			C252-D		X	C252-D	C252-D	X					X		X	X
9/23/2004	LW2-C258-D						C258-D		X					X		X	X
10/5/2004	LW2-C260-D													X		X	X
10/1/2004	LW2-C263-C													X		X	X
9/23/2004	LW2-C264-D	C264-D				X	C264-D	C264-D	X					X		X	X
10/28/2004	LW2-C269-A													X	X	X	X
10/28/2004	LW2-C269-D													X	X	X	X
9/21/2004	LW2-C270-D	C270-D	C270-D			X	C270-D	C270-D	X					X	X	X	X
10/20/2004	LW2-C273-D	C273-D				X	C273-D	C273-D	X					X		X	X
9/22/2004	LW2-C276-D			C276-D	C276-D	X	C276-D	C276-D	X					X		X	X
10/19/2004	LW2-C277-C									C277-C	X						
11/11/2004	LW2-C282-A						C282-A	C282-A	X			C282-A	X	X	X	X	X
11/11/2004	LW2-C282-B											C282-B	X				
11/11/2004	LW2-C282-D											C282-D	X				
11/5/2004	LW2-C283-D*	C283-D				X								X	X	X	X
9/22/2004	LW2-C284-E						C284-E	C284-E	X					X		X	X
10/19/2004	LW2-C290-A									C290-A	X	C290-A	X	X	X	X	X
10/19/2004	LW2-C290-B									C290-B	X	C290-B	X				
10/19/2004	LW2-C290-D									C290-D	X	C290-D	X	X	X	X	X
10/19/2004	LW2-C291-A									C291-A	X					X	
10/19/2004	LW2-C291-B									C291-B	X						
10/19/2004	LW2-C291-C									C291-C	X						
10/19/2004	LW2-C293-A2						C293-A2	C293-A2	X					X	X	X	X
10/19/2004	LW2-C293-B2									C293-B2	X						
10/19/2004	LW2-C293-D2			C293-D2		X	C293-D2		X					X		X	X
9/22/2004	LW2-C299-A													X	X	X	X
9/22/2004	LW2-C299-C																
10/27/2004	LW2-C300-A													X	X	X	X

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Table 2-1. Archived Round 2A Subsurface Samples Selected for Analysis.

		SVOCs					PAHs			DIOXINS		TPH		Conventionals			
Date	Core/Grab Sample	Dibenzofuran	Hexachlorobenzene	4-Methylphenol	Bis(2-ethylhexyl) phthalate	SVOCs Analyses (w/o PAHs)	LPAHs	HPAHs	PAHs Analyses	2,3,7,8-TCDD TEQ	Dioxins Analyses	Diesel & Oil	TPH (Diesel & Oil) Analyses	Grainsize	Total Solids	TOC	Specific Gravity
10/27/2004	LW2-C300-B																
10/27/2004	LW2-C300-D																
11/8/2004	LW2-C301-A													X	X	X	X
9/22/2004	LW2-C302-B									C302-B	X						
9/22/2004	LW2-C302-C									C302-C	X						
9/22/2004	LW2-C302-D		C302-D	C302-D	C302-D	X	C302-D	C302-D	X					X		X	X
9/28/2004	LW2-C314-D			C314-D		X	C314-D	C314-D	X	C314-D	X			X		X	X
9/27/2004	LW2-C326-D													X		X	X
9/27/2004	LW2-C327-D			C327-D		X	C327-D	C327-D	X	C327-D	X			X		X	X
9/28/2004	LW2-C329-A											C329-A	X	X	X	X	X
9/28/2004	LW2-C329-B											C329-B	X				
9/28/2004	LW2-C329-D											C329-D	X				
11/9/2004	LW2-C331-G				C331-G	X								X		X	X
9/27/2004	LW2-C334-D									C334-D	X			X		X	X
10/5/2004	LW2-C335-A											C335-A	X	X	X	X	X
10/5/2004	LW2-C335-C											C335-C	X				
10/5/2004	LW2-C335-E			C335-E		X	C335-E	C335-E	X	C335-E	X	C335-E	X	X		X	X
10/20/2004	LW2-C342-B									C342-B	X						
10/20/2004	LW2-C342-C									C342-C	X						
10/20/2004	LW2-C342-E						C342-E	C342-E	X							X	
10/20/2004	LW2-C346-D			C346-D		X	C346-D		X					X		X	X
10/20/2004	LW2-C347-E						C347-E	C347-E	X					X	X	X	X
11/9/2004	LW2-C348-A									C348-A	X			X	X	X	X
11/9/2004	LW2-C348-B									C348-B	X						
10/4/2004	LW2-C349-D			C349-D		X								X		X	X
11/9/2004	LW2-C356-A													X	X	X	X
11/9/2004	LW2-C356-B																
11/9/2004	LW2-C356-D													X	X	X	X
10/4/2004	LW2-C361-A													X	X	X	X
10/4/2004	LW2-C361-B																
10/26/2004	LW2-C364-D			C364-D		X	C364-D	C364-D	X					X	X	X	X
11/9/2004	LW2-C366-C1									C366-C1	X						
11/9/2004	LW2-C366-F1													X	X	X	X
11/10/2004	LW2-C371-B																
10/7/2004	LW2-C372-E			C372-E		X	C372-E		X					X		X	X
10/20/2004	LW2-C373-D				C373-D	X	C373-D		X					X	X	X	X
11/10/2004	LW2-C377-D						C377-D	C377-D	X	C377-D	X			X	X	X	X
11/10/2004	LW2-C377-E																
10/7/2004	LW2-C379-A											C379-A	X	X	X	X	X
10/7/2004	LW2-C379-B											C379-B	X				
10/7/2004	LW2-C379-D											C379-D	X				
11/10/2004	LW2-C380-A											C380-A	X	X	X	X	X
11/10/2004	LW2-C380-C											C380-C	X				
11/10/2004	LW2-C380-E											C380-E	X	X	X	X	X
10/21/2004	LW2-C382-B									C382-B	X						
10/21/2004	LW2-C382-D													X		X	X
10/21/2004	LW2-C383-D													X		X	X
10/7/2004	LW2-C384-E													X	X	X	X
10/7/2004	LW2-C384-F							C384-F	X					X		X	X
10/7/2004	LW2-C392-D*													X		X	X
10/7/2004	LW2-C397-C*													X			X
10/7/2004	LW2-C400-D			C400-D	C400-D	X										X	
11/10/2004	LW2-C401-E																
11/10/2004	LW2-C401-F						C401-F	C401-F	X					X		X	X
11/10/2004	LW2-C403-F													X		X	X
10/26/2004	LW2-C405-B									C405-B	X						
10/26/2004	LW2-C405-E			C405-E	C405-E	X	C405-E	C405-E	X					X		X	X

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Table 2-1. Archived Round 2A Subsurface Samples Selected for Analysis.

		SVOCs					PAHs			DIOXINS		TPH		Conventionals			
Date	Core/Grab Sample	Dibenzofuran	Hexachlorobenzene	4-Methylphenol	Bis(2-ethylhexyl) phthalate	SVOCs Analyses (w/o PAHs)	LPAHs	HPAHs	PAHs Analyses	2,3,7,8-TCDD TEQ	Dioxins Analyses	Diesel & Oil	TPH (Diesel & Oil) Analyses	Grainsize	Total Solids	TOC	Specific Gravity
10/26/2004	LW2-C409-A													X	X	X	X
10/26/2004	LW2-C409-B																
10/26/2004	LW2-C409-C																
10/26/2004	LW2-C409-D	C409-D				X	C409-D	C409-D	X					X	X	X	X
10/22/2004	LW2-G415-A**											G415-A	X				
11/10/2004	LW2-C415-B											C415-B	X				
11/10/2004	LW2-C415-D											C415-D	X				
11/10/2004	LW2-C415-E													X	X	X	X
10/26/2004	LW2-C417-C									C417-C	X			X	X	X	X
10/6/2004	LW2-C420-A															X	
10/6/2004	LW2-C420-B																
10/6/2004	LW2-C420-C																
10/6/2004	LW2-C420-D				C420-D	X										X	
10/7/2004	LW2-C421-A													X	X	X	X
10/7/2004	LW2-C421-B																
10/7/2004	LW2-C421-D													X	X	X	X
10/7/2004	LW2-C421-E													X	X	X	X
10/7/2004	LW2-C421-F													X	X	X	X
10/26/2004	LW2-C425-F1				C425-F1	X								X		X	X
10/25/2004	LW2-C426-A							C426-A	X	C426-A	X			X	X	X	X
11/10/2004	LW2-C430-A						C430-A	C430-A	X					X	X	X	X
11/10/2004	LW2-C430-C									C430-C	X						
11/10/2004	LW2-C431-B									C431-B	X						
11/10/2004	LW2-C431-F			C431-F		X								X	X	X	X
11/11/2004	LW2-C434-A							C434-A	X					X	X	X	X
10/7/2004	LW2-C436-A													X	X	X	X
10/7/2004	LW2-C436-C																
10/7/2004	LW2-C436-D													X	X	X	X
10/7/2004	LW2-C436-E	C436-E		C436-E		X	C436-E		X					X	X	X	X
10/6/2004	LW2-C439-D			C439-D	C439-D	X		C439-D	X					X	X	X	X
10/6/2004	LW2-C440-A													X	X	X	X
10/6/2004	LW2-C440-C																
10/6/2004	LW2-C440-D			C440-D		X		C440-D	X					X	X	X	X
10/6/2004	LW2-C441-A1											C441-A1	X	X	X	X	X
10/6/2004	LW2-C441-B1											C441-B1	X				
10/6/2004	LW2-C441-D1											C441-D1	X	X		X	X
10/6/2004	LW2-C444-D													X	X	X	X
10/6/2004	LW2-C444-F		C444-F	C444-F		X								X		X	X
11/11/2004	LW2-C445-D							C445-D	X					X	X	X	X
10/6/2004	LW2-C447-A													X	X	X	X
10/6/2004	LW2-C447-C																
10/6/2004	LW2-C447-F			C447-F		X								X		X	X
10/26/2004	LW2-C448-A													X	X	X	X
10/26/2004	LW2-C448-C																
10/26/2004	LW2-C448-D				C448-D	X						C448-D	X	X		X	X
10/6/2004	LW2-C453-B									C453-B	X						
10/28/2004	LW2-C454-H			C454-H		X								X		X	X
11/11/2004	LW2-C455-B									C455-B	X						
11/11/2004	LW2-C455-C									C455-C	X						
11/11/2004	LW2-C455-F			C455-F		X	C455-F		X					X		X	X
10/28/2004	LW2-C456-B											C456-B	X				
10/28/2004	LW2-C456-C											C456-C	X				
10/28/2004	LW2-C456-G						C456-G	C456-G	X					X	X	X	X
10/6/2004	LW2-C457-D				C457-D	X	C457-D	C457-D	X					X	X	X	X
10/5/2004	LW2-C458-D1													X	X	X	X
10/5/2004	LW2-C458-D2													X	X	X	X
10/5/2004	LW2-C461-A											C461-A	X	X	X	X	X

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Table 2-1. Archived Round 2A Subsurface Samples Selected for Analysis.

		SVOCs					PAHs			DIOXINS		TPH		Conventionals			
Date	**Core/Grab Sample**	**Dibenzofuran**	**Hexachlorobenzene**	**4-Methylphenol**	**Bis(2-ethylhexyl) phthalate**	**SVOCs Analyses (w/o PAHs)**	**LPAHs**	**HPAHs**	**PAHs Analyses**	**2,3,7,8-TCDD TEQ**	**Dioxins Analyses**	**Diesel & Oil**	**TPH (Diesel & Oil) Analyses**	**Grainsize**	**Total Solids**	**TOC**	**Specific Gravity**
10/5/2004	LW2-C461-B											C461-B	X				
10/5/2004	LW2-C461-D			C461-D	C461-D	X						C461-D	X	X	X	X	X
10/5/2004	LW2-C462-D			C462-D		X								X	X	X	X
10/6/2004	LW2-C468-D			C468-D	C468-D	X								X	X	X	X
10/5/2004	LW2-C471-D															X	
10/5/2004	LW2-C474-D*			C474-D		X								X		X	X
10/28/2004	LW2-C477-B																
10/28/2004	LW2-C494-A											C494-A	X	X	X	X	X
10/28/2004	LW2-C494-B											C494-B	X				
10/28/2004	LW2-C494-C									C494-C	X						
10/28/2004	LW2-C494-D											C494-D	X				
10/19/2004	LW2-C521-B																
10/19/2004	LW2-C521-C																
10/19/2004	LW2-C521-D	C521-D		C521-D	C521-D	X		C521-D	X					X	X	X	X
10/19/2004	LW2-C521-E																
243																	
TOTALS/Analyte		23	10	38	22	62	54	54	64	54	54	45	45	144	84	154	144

Selection Rationale (see text for additional information)

1. Concentrations increase with depth above the archived segment.
2. Concentration in deepest analyzed segment appears to be locally elevated.
3. Vertical gap (several foot interval) between steep concentration gradient.
4. Core and surface grab locations substantially offset, and elevated concentrations evident in B core segment (analyze A segment).
5. LWG request.
6. EPA request.

Note, LW2-C221-D was deleted from initial list due to lack of archived volume.

* No archived sample jar available.

** No C415A archived sample, used G415 archive instead.

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Table 4-1a. R2A Archived Sediment Core Conventionals and Grain-Size Data.

Sample ID	Sample Type Code	Parent Sample	Analyte Group / CAS No / Chemical Name / Unit	Conventionals TSO Total solids percent	Conventionals TOC Total organic carbon percent	Conventionals SPEC_GRAV Specific Gravity NA	Grainsize GS_MG Medium gravel percent	Grainsize GS_FG Fine gravel percent	Grainsize GS_VCS Very coarse sand percent	Grainsize GS_CS Coarse sand percent	Grainsize GS_MS Medium sand percent	Grainsize GS_FS Fine sand percent
LW2-C011-E1	N			67.6 T	0.92	1.71 J	0 UJ	0 UJ	0.11 J	0.24 J	1.31 J	10.5 J
LW2-C011-F1	N			68.2	0.87	1.72 J	0 UJ	0 UJ	0.04 J	0.25 J	0.73 J	13.6 J
LW2-C011-G2	FR	LW2-C011-G1		68	1.06	1.72 J	0 UJ	0 UJ	0.29 J	0.07 J	0.46 J	10.7 J
LW2-C015-E	N				0.62	1.86 J	0.04 J	0.24 J	0.53 J	10.2 J	51.6 J	13.3 J
LW2-C019-B2	FR	LW2-C019-B1		67.7	1.99	1.72 J	0 UJ	0.87 J	1.77 J	7.73 J	28.9 J	13.7 J
LW2-C019-D1	N				0.64	1.93 JT	1.6 J	0.71 J	1.08 J	11.7 J	45.9 J	18.4 J
LW2-C019-E2	FR	LW2-C019-E1		69.2 T	0.84	1.73 J	0 UJ	0 UJ	0.07 J	1.56 J	22.8 J	10.6 J
LW2-C020-D	N				1.36	1.65 J	1.74 JT	0.513 JT	0.54 JT	3.67 JT	16.3 JT	5.84 JT
LW2-C022-D	N				2.36	1.5 J	0 UJ	0 UJ	0.44 J	0.96 J	0.66 J	1.21 J
LW2-C025-B2	FR	LW2-C025-B1		79.1 T	0.09	2.02 J	0 UJ	0.16 J	1.15 J	13.9 J	60 J	18 J
LW2-C025-D1	N				1.55	1.69 J	0 UJ	0 UJ	0.02 J	0.71 J	6.56 J	12.7 J
LW2-C025-E2	FR	LW2-C025-E1		66.3	1.27	1.7 J	0 UJ	0 UJ	0.18 J	0.35 J	3.34 J	11.4 J
LW2-C027-D	N				1.06	1.7 J	0 UJ	0 UJ	0.05 J	0.73 J	13.4 J	20.2 J
LW2-C034-F	N				0.93	1.82 J	0 UJ	0.02 J	0.15 J	1.11 J	11.5 J	25.8 J
LW2-C060-A	N			70.9	0.38							
LW2-C061-D	N			77.6	0.06	2.06 J	0 UJ	0 UJ	0.08 J	6.48 J	68.9 J	20.3 J
LW2-C066-F	N				2.21							
LW2-C067-A	N			55.5	1.92	1.54 J	1.06 J	0.33 J	0.46 J	1.55 J	4.83 J	8.16 J
LW2-C111-A2	FR	LW2-C111-A		53.6	1.83	1.53 J	0.18 J	1.08 J	0.11 J	0.56 J	0.76 J	2.92 J
LW2-C111-D2	FR	LW2-C111-D		60.5	4.25	1.59 J	0 UJ	0.25 J	0.89 J	0.94 J	1.06 J	2.27 J
LW2-C112-A	N			50.3	1.71	1.5 JT	0 UJT	0.04 JT	0.107 JT	0.447 JT	0.827 JT	2.7 JT
LW2-C121-D	N				0.18	1.88 J	0 UJT	0 UJT	0.0833 JT	0.177 JT	3.38 JT	22.5 JT
LW2-C133-C	N			58.1	2.77	1.52 J	0 UJ	0 UJ	0.14 J	0.27 J	1.91 J	3.31 J
LW2-C135-D	N				3.64	1.57 J	0 UJ	0.72 J	0.71 J	2.71 J	10.8 J	5.67 J
LW2-C138-A	N			30.4	24.9	1.24 J	6.83 J	11.1 J	15.5 J	11.8 J	5.38 J	5.69 J
LW2-C138-B	N				7.5	1.53 J	4.09 J	5.12 J	6.03 J	8.71 J	29.9 J	10.2 J
LW2-C138-D	N				0.09	1.91 J	0 UJ	0 UJ	0.12 J	0.54 J	0.84 J	1.45 J
LW2-C139-D	N				0.08	1.98 J	0 UJ	0.15 J	0.21 J	1.3 J	8.52 J	27.3 J
LW2-C144-A	N			49.9	2.51							
LW2-C144-C	N			54.1 T	2.08							
LW2-C144-E	N				0.06							
LW2-C147-D	N			58	2.5	1.59 J	0 UJ	0.33 J	0.32 J	0.54 J	2.49 J	14.8 J
LW2-C148-D	N			57.8	2.26 T	1.54 J	0 UJ	0.03 J	0.17 J	0.34 J	0.83 J	2.36 J
LW2-C148-E	N				1.61	1.67 J	0 UJ	0.3 J	0.17 J	0.46 J	4.73 J	11.8 J
LW2-C152-E	N				0.08	1.86 J	0 UJ	0 UJ	0.01 J	0.28 J	2.3 J	2.99 J
LW2-C155-D	N				0.2	1.84 J	0 UJ	0 UJ	0.22 J	1.89 J	2.22 J	2.9 J
LW2-C156-F	N				0.05	1.89 JT	0 UJ	0 UJ	0 UJ	0.08 J	3.21 J	33.1 J
LW2-C158-A	N			57.3 T	1.92	1.55 J	0 UJ	0.04 J	0.05 J	0.43 J	1.04 J	6.29 J
LW2-C158-E	N				0.0867 T	1.86 J	0 UJ	0 UJ	0.08 J	0.44 J	5.92 J	4.93 J
LW2-C162-A	N			57.6	1.73	1.57 J	0 UJ	0.06 J	0.14 J	2.4 J	9.92 J	6.74 J
LW2-C162-D	N				0.08	1.88 J	0 UJ	0 UJ	0 UJ	0.61 J	4.57 J	2.58 J
LW2-C163-D2	FR	LW2-C163-D1			0.07	1.85 JT	0 UJ	0 UJ	0.17 J	2.38 J	3.05 J	3.49 J
LW2-C169-A	N			52	1.98	1.42 J	0 UJ	0.17 J	0.75 J	1.34 J	5.2 J	5.01 J

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Table 4-1a. R2A Archived Sediment Core Conventionals and Grain-Size Data.

Sample ID	Sample Type Code	Analyte Group / CAS No / Chemical Name / Unit / Parent Sample	Conventionals TSO Total solids percent	Conventionals TOC Total organic carbon percent	Conventionals SPEC_GRAV Specific Gravity NA	Grainsize GS_MG Medium gravel percent	Grainsize GS_FG Fine gravel percent	Grainsize GS_VCS Very coarse sand percent	Grainsize GS_CS Coarse sand percent	Grainsize GS_MS Medium sand percent	Grainsize GS_FS Fine sand percent
LW2-C169-D	N				1.73 J	0 UJ	0 UJ	0.18 J	0.7 J	1.9 J	4.8 J
LW2-C171-A	N		45.6	2.27	1.36 J	0.02 J	0.11 J	0.44 J	0.85 J	3.37 J	4.66 J
LW2-C171-D	N			0.11 U	1.77 J	0 UJ	0 UJ	1.22 J	6.73 J	3.27 J	4.88 J
LW2-C172-E	N			0.16	1.85 JT	0 UJ	0 UJ	0.36 J	1.39 J	1.76 J	0.926 J
LW2-C173-D	N		76.1	0.05 J	1.93 J	0 UJ	0 UJ	0.02 J	0.22 J	8.24 J	46.5 J
LW2-C173-E	N			0.06	1.82 J	0 UJ	0 UJ	0.02 J	0.05 J	0.17 J	2.67 J
LW2-C182-D	N			2.78	1.55 J	0 UJ	0 UJ	0.11 J	0.2 J	1.3 J	2.68 J
LW2-C184-E	N			0.52	1.75 J	0.23 J	0.11 J	1.28 J	3.71 J	9.7 J	8.7 J
LW2-C185-D	N			0.24	1.88 J	6.91 J	2.72 J	2.67 J	4.53 J	14.7 J	30.7 J
LW2-C196-A	N		69.7	1.61	1.79 J	1.16 J	0.96 J	1.85 J	11 J	36.3 J	14 J
LW2-C202-D	N			0.18 T	2.09 J	0.74 J	1.01 J	2.69 J	31 J	57.6 J	6.64 J
LW2-C245-F	N			0.15	1.89 J	0 UJ	0.03 J	0.06 J	0.36 J	50.5 J	37.9 J
LW2-C252-D	N			2.23	1.57 J	0 UJ	0.14 J	0.2 J	0.75 J	5.12 J	11.7 J
LW2-C258-D	N			0.3	2.03 J	6.11 J	0.43 J	0.77 J	9.37 J	70.6 J	12.1 J
LW2-C260-D	N			0.11	2.04 J	0 UJ	2.91 J	4.16 J	5.51 J	7.27 J	7.41 J
LW2-C263-C	N			5.15	1.51 J	0 UJ	0.5 J	0.53 J	1.59 J	2.4 J	7.74 J
LW2-C264-D	N			0.15	1.99 J	0 UJ	0 UJ	0.03 J	2.07 J	62.7 J	27.3 J
LW2-C269-A	N		55.3	3.17	1.47 J	0 UJ	0 UJ	0.31 J	0.7 J	0.84 J	1.44 J
LW2-C269-D	N		58.9 T	4.92	1.53 J	0 UJ	0 UJ	0.36 J	0.73 J	1.91 J	5.97 J
LW2-C270-D	N		73.4	0.443 T	1.85 JT	0 UJT	0.143 JT	0.233 JT	0.433 JT	29.8 JT	37.8 JT
LW2-C273-D	N			2.2	1.6 JT	0 UJ	0.05 J	0.14 J	0.46 J	1.74 J	7.93 J
LW2-C276-D	N			0.4 T	1.83 J	0.01 J	0 UJ	0.02 J	0.15 J	10.5 J	53.4 J
LW2-C282-A	N		47.5 T	3.98	1.45 JT	0.39 J	2.59 J	1 J	1.2 J	2.8 J	3.47 J
LW2-C283-D	N		73	0.58							
LW2-C284-E	N			1.46	1.71 J	0 UJ	0 UJ	0.09 J	0.72 J	7.51 J	4.94 J
LW2-C290-A	N		79.8 T	0.34	1.94 J	1.76 J	0.35 J	1.57 J	29.4 J	52.9 J	6.17 J
LW2-C290-D	N		73.2	0.11	1.89 J	0 UJ	0 UJ	0.03 J	0.13 J	34.1 J	56.8 J
LW2-C291-A	N			2.35							
LW2-C293-A2	FR	LW2-C293-A	40.5	3.25	1.31 J	0 UJ	0.15 J	0.45 J	1.05 J	1.46 J	1.19 J
LW2-C293-D2	FR	LW2-C293-D		0.22	1.98 J	1.08 J	0.31 J	0.57 J	10.7 J	68.2 J	13.4 J
LW2-C299-A	N		56.1	2.34	1.37 J	0 UJ	0.01 J	0.11 J	0.58 J	9.62 J	10 J
LW2-C300-A	N		58.9 T	2.4	1.49 J	0 UJ	0.75 J	0.23 J	2.56 J	12.8 J	2.76 J
LW2-C301-A	N		53.5 T	2.36	1.56 J	0 UJ	0.22 J	0.67 J	3.38 J	9.74 J	9.62 J
LW2-C302-D	N			30.2	1.54 J	0 UJ	10.5 J	7.27 J	7.3 J	8.25 J	5.37 J
LW2-C314-D	N			0.68	1.8 J	0 UJ	0.02 J	0.07 J	0.45 J	23.6 J	39 J
LW2-C326-D	N			0.04 J	1.87 J	0 UJ	0 UJ	0.07 J	0.3 J	1.34 J	1.65 J
LW2-C327-D	N			0.88	1.78 J	0.64 J	0.42 J	0.79 J	1.88 J	17.9 J	39.5 J
LW2-C329-A	N		76.6	0.17	2.08 J	0.93 J	0.94 J	1.48 J	21 J	57.9 J	11 J
LW2-C331-G	N			0.02 J	1.98 J	0 UJ	0 UJ	0.02 J	0.14 J	10.9 J	52.2 J
LW2-C334-D	N			0.63	1.83 J	0 UJ	0.12 J	0.21 J	1.08 J	29.7 J	45.3 J
LW2-C335-A	N		72.2	0.62	1.81 J	0.02 J	1 J	1.01 J	7 J	37.2 J	33.1 J
LW2-C335-E	N			0.55	1.85 J	0 UJ	0 UJ	0.19 J	1.18 J	49.7 J	25.5 J
LW2-C342-E	N			0.14							

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Table 4-1a. R2A Archived Sediment Core Conventionals and Grain-Size Data.

Sample ID	Sample Type Code	Analyte Group / CAS No / Chemical Name / Unit / Parent Sample	Conventionals TSO Total solids percent	Conventionals TOC Total organic carbon percent	Conventionals SPEC_GRAV Specific Gravity NA	Grainsize GS_MG Medium gravel percent	Grainsize GS_FG Fine gravel percent	Grainsize GS_VCS Very coarse sand percent	Grainsize GS_CS Coarse sand percent	Grainsize GS_MS Medium sand percent	Grainsize GS_FS Fine sand percent
LW2-C346-D	N			0.19	2.01 J	0 UJ	1.24 J	2.11 J	22.9 J	55.8 J	14.8 J
LW2-C347-E	N		71.9	0.21	1.8 J	0 UJ	0.09 J	0.09 J	0.74 J	4.05 J	38.4 J
LW2-C348-A	N		53.4	1.8 T	1.51 J	0.36 J	0.3 J	0.36 J	0.3 J	0.55 J	3.67 J
LW2-C349-D	N			0.25	2.14 J	0 UJ	0.12 J	0.37 J	9.36 J	72 J	15.4 J
LW2-C356-A	N		44.9	2.43	1.45 J	0 UJ	0 UJ	0.51 J	0.55 J	0.51 J	1.7 J
LW2-C356-D	N		56.9	3.05	1.54 JT	0.78 J	0.91 J	0.62 J	2.1 J	8.56 J	7.15 J
LW2-C361-A	N		51.5	0.17	1.46 JT	0 UJ	0 UJ	0.4 J	0.65 J	3.18 J	4.82 J
LW2-C364-D	N		68	1.4	1.68 J	0.11 J	0.18 J	0.43 J	0.96 J	3.08 J	14.9 J
LW2-C366-F1	N		77.8	0.05	2 J	0.28 J	1.55 J	0.81 J	12.3 J	63.2 J	15.8 J
LW2-C372-E	N			2.33	1.58 J	0 UJ	0 UJ	0.09 J	0.51 J	0.43 J	0.65 J
LW2-C373-D	N		58.1	2.21	1.52 J	0 UJ	0.13 J	0.32 J	0.61 J	0.85 J	1.87 J
LW2-C377-D	N		62.3	2.61	1.62 J	0 UJ	0.44 J	0.36 J	1.14 J	5.9 J	6.65 J
LW2-C379-A	N		41 T	2.73	1.34 J	0 UJ	0.03 J	0.1 J	0.51 J	2.27 J	4.15 J
LW2-C380-A	N		77.4	0.99	1.89 J	1.27 J	0.7 J	1.02 J	6.14 J	37 J	17.5 J
LW2-C380-E	N		66.3	0.94	1.66 J	0 UJ	0 UJ	0.11 J	0.28 J	0.33 J	0.28 J
LW2-C382-D	N			0.62	1.71 J	0 UJ	0 UJ	0.07 J	0.34 J	0.61 J	9.39 J
LW2-C383-D	N			0.79	1.75 J	0 UJ	0 UJ	0.06 J	0.27 J	0.28 J	1.1 J
LW2-C384-E	N		75.3	0.07	1.97 J	0 UJ	0 UJ	0.05 J	0.9 J	23.1 J	60.4 J
LW2-C384-F	N			0.37	1.89 J	0 UJ	0 UJ	0.05 J	0.64 J	8.08 J	40.5 J
LW2-C392-D	N			0.123 T							
LW2-C400-D	N			1.71							
LW2-C401-F	N			0.43	1.76 J	0 UJ	0 UJ	0.17 J	1.46 J	1.69 J	4.18 J
LW2-C403-F	N			1.65	1.62 J	0 UJ	0 UJ	0.44 J	0.55 J	0.56 J	0.62 J
LW2-C405-E	N			0.67	1.65 J	0 UJ	0 UJ	0.01 J	2.3 J	1.55 J	2.83 J
LW2-C409-A	N		62.5	1.45	1.54 J	0 UJ	0 UJ	0.04 J	0.44 J	2.99 J	12.2 J
LW2-C409-D	N		80.5	0.68	1.95 JT	1.07 JT	1 JT	2.03 JT	21.9 JT	58.7 JT	10.2 JT
LW2-C415-E	N		77.1 T	0.24	2 J	0 UJ	0.01 J	0.23 J	10.2 J	19.1 J	33.1 J
LW2-C417-C	N		52.1	2.83	1.49 J	0 UJ	0 UJ	0.58 J	2.23 J	4.04 J	3.14 J
LW2-C420-A	N			1.62							
LW2-C420-D	N			0.353 T							
LW2-C421-A	N		55.5	2.28	1.44 J	0.97 J	1.21 J	1.11 J	2.3 J	6.96 J	6.87 J
LW2-C421-D	N		70.2	0.64	1.79 J	0 UJ	0.09 J	0.29 J	0.38 J	5.72 J	21.9 J
LW2-C421-E	N		69.9	0.43	1.8 JT	0 UJT	0 UJT	0.113 JT	0.23 JT	3.65 JT	14.3 JT
LW2-C421-F	N		77.5	0.21	2.05 J	0 UJ	0.03 J	1.07 J	18.7 J	26.4 J	19.8 J
LW2-C425-F1	N			0.95	1.63 J	0 UJ	0 UJ	0.26 J	1.05 J	2.43 J	1.25 J
LW2-C426-A	N		40.9	2.91 T	1.32 J	0 UJ	0 UJ	0.13 J	0.35 J	0.99 J	1.42 J
LW2-C430-A	N		51.3	2.2	1.46 J	0 UJ	0 UJ	0.15 J	0.68 J	1.39 J	2.54 J
LW2-C431-F	N		73.5	0.05	1.83 J	0 UJ	0 UJ	0.14 J	0.51 J	1.8 J	2 J
LW2-C434-A	N		61.2	1.68	1.66 J	2.83 J	0.47 J	1.49 J	2.74 J	23 J	14.5 J
LW2-C436-A	N		57	1.36	1.56 J	0 UJ	0.29 J	0.93 J	1.12 J	3.45 J	7.76 J
LW2-C436-D	N		61.1	2.46	1.59 J	0 UJ	0.18 J	0.34 J	0.36 J	0.63 J	1.51 J
LW2-C436-E	N		76.8	0.08	1.94 J	0 UJ	0.11 J	0.1 J	0.89 J	69.1 J	24.8 J
LW2-C439-D	N		75.2 T	0.17	1.9 J	0.595 JT	0.14 JT	0.117 JT	1.23 JT	54 JT	34.5 JT

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Table 4-1a. R2A Archived Sediment Core Conventionals and Grain-Size Data.

Sample ID	Sample Type Code	Parent Sample	Conventionals TSO Total solids percent	Conventionals TOC Total organic carbon percent	Conventionals SPEC_GRAV Specific Gravity NA	Grainsize GS_MG Medium gravel percent	Grainsize GS_FG Fine gravel percent	Grainsize GS_VCS Very coarse sand percent	Grainsize GS_CS Coarse sand percent	Grainsize GS_MS Medium sand percent	Grainsize GS_FS Fine sand percent
LW2-C440-A	N		54.6	2.02	1.43 J	0 UJ	0 UJ	0.02 J	0.13 J	0.54 J	1.73 J
LW2-C440-D	N		57.4	2.1	1.6 J	0 UJ	0.1 J	0.23 J	0.63 J	0.76 J	3.73 J
LW2-C441-A1	N		56.8	1.61	1.51 J	0 UJ	0.02 J	0.14 J	0.73 J	2.18 J	4.52 J
LW2-C441-D1	N			0.04 J	1.82 J	0 UJ	0 UJ	0 UJ	0.17 J	0.22 J	2.75 J
LW2-C444-D	N		75.6 T	0.15	1.85 J	0 UJ	0.17 J	0.14 J	1.96 J	38.5 J	30.3 J
LW2-C444-E	N			0.05	1.82 J	0 UJ	0 UJ	0.05 J	1.05 J	1.16 J	4.44 J
LW2-C445-D	N		61.9	1.88	1.64 J	0 UJ	0.13 J	0.43 J	1.25 J	13.8 J	5.63 J
LW2-C447-A	N		57	1.87	1.47 J	0 UJ	0.32 J	0.31 J	0.65 J	4 J	4.7 J
LW2-C447-F	N			0.1	1.81 J	0 UJ	0 UJ	0.18 J	2.09 J	1.89 J	3.68 J
LW2-C448-A	N		47.8	2.22	1.42 J	0 UJ	0.77 J	0.17 J	0.99 J	0.95 J	3.59 J
LW2-C448-D	N			2.04	1.58 J	0 UJ	0.13 J	0.19 J	1.21 J	3.26 J	3.36 J
LW2-C454-H	N			2.3	1.71 J	0.38 J	0.62 J	1.13 J	1.03 J	16.6 J	43.9 J
LW2-C455-F	N			1.06	1.79 J	0.03 JT	0.0933 JT	0.293 JT	5.8 JT	34.8 JT	11 JT
LW2-C456-G	N		66	1.32	1.68 JT	0 UJ	0.22 J	0.2 J	0.48 J	3.2 J	3.31 J
LW2-C457-D	N		56.1	3.34	1.53 JT	0 UJ	0.13 J	0.25 J	0.55 J	0.69 J	1.5 J
LW2-C458-D	N		55	2.72	1.51 J	0 UJ	0 UJ	0.11 J	0.56 J	0.62 J	0.53 J
LW2-C458-D2	FR	LW2-C458-D	56.8	2.66	1.52 J	0 UJ	0 UJ	0.18 J	0.46 J	0.39 J	0.89 J
LW2-C461-A	N		43.4 T	2.63	1.36 J	0 UJ	0 UJ	0.29 J	0.49 J	0.4 J	0.75 J
LW2-C461-D	N		59.5	1.97	1.6 J	0 UJ	0.06 J	0.07 J	0.25 J	0.23 J	1.18 J
LW2-C462-D	N		58.4	2.61	1.56 J	0 UJ	0 UJ	0.2 J	0.48 J	0.32 J	1.62 J
LW2-C468-D	N		56.4	2.28	1.53 J	0 UJ	0 UJ	0 UJ	0.32 J	0.38 J	0.92 J
LW2-C471-D	N			2.83							
LW2-C474-D	N				1.53 JT	0 UJ	0 UJ	0.16 J	0.4 J	0.95 J	3.93 J
LW2-C494-A	N		64.8	2.45	1.68 J	1.04 J	0.53 J	1.45 J	3.14 J	6.44 J	11.3 J
LW2-C521-D	N		80.7	0.65	2.02 J	0.63 J	0.68 J	0.67 J	5.72 J	76.9 J	12.4 J

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Table 4-1a. R2A Archived Sediment Core Conventionals and Grain-Size Data.

Sample ID	Sample Type Code	Analyte Group / CAS No / Chemical Name / Unit / Parent Sample	Grainsize GS_VFS Very fine sand percent	Grainsize GS_CSILT Coarse silt percent	Grainsize GS_MSILT Medium silt percent	Grainsize GS_FSILT Fine silt percent	Grainsize GS_VFSILT Very fine silt percent	Grainsize GS_CCLAY 8-9 Phi clay percent	Grainsize GS_MFCLAY >9 Phi clay percent
LW2-C011-E1	N		15.2 J	21.1 J	22 J	10.6 J	6.5 J	4.1 J	9.93 J
LW2-C011-F1	N		12.4 J	23.7 J	19.6 J	9.84 J	7.19 J	3.03 J	10.1 J
LW2-C011-G2	FR	LW2-C011-G1	14.9 J	19.8 J	21.8 J	10.7 J	6.87 J	3.8 J	8.21 J
LW2-C015-E	N		3.88 J	3.27 J	4.98 J	4.12 J	2.6 J	1.44 J	3.67 J
LW2-C019-B2	FR	LW2-C019-B1	9.09 J	7.71 J	11.1 J	6.47 J	5.01 J	2.47 J	5.41 J
LW2-C019-D1	N		5.73 J	3.38 J	2.5 J	2.5 J	1.61 J	1.35 J	2.3 J
LW2-C019-E2	FR	LW2-C019-E1	5.3 J	11.6 J	16.9 J	11 J	6.4 J	3.69 J	8.75 J
LW2-C020-D	N		5.39 JT	11.8 JT	15.9 JT	16.7 JT	9.73 JT	5.04 JT	7.96 JT
LW2-C022-D	N		6.23 J	10.9 J	21.3 J	19.8 J	15.9 J	9.03 J	14.4 J
LW2-C025-B2	FR	LW2-C025-B1	3.49 J	0.9 J	0.7 J	0.42 J	0.32 J	0.23 J	0.59 J
LW2-C025-D1	N		6.45 J	11.6 J	20.1 J	14.7 J	9.89 J	5.15 J	11.5 J
LW2-C025-E2	FR	LW2-C025-E1	12.7 J	18.6 J	21.3 J	11.8 J	7.37 J	4.42 J	10.1 J
LW2-C027-D	N		7.43 J	12.5 J	16.1 J	10.6 J	5.85 J	3.76 J	7.94 J
LW2-C034-F	N		9.6 J	12.7 J	14.3 J	8.58 J	5.39 J	3.45 J	7.3 J
LW2-C060-A	N								
LW2-C061-D	N		1.31 J	0.42 J	0.33 J	0.12 J	0.26 J	0.06 J	0.28 J
LW2-C066-F	N								
LW2-C067-A	N		23 J	20 J	16.2 J	8.21 J	5.33 J	3.46 J	7.49 J
LW2-C111-A2	FR	LW2-C111-A	16.4 J	24.7 J	22.1 J	11.8 J	6.78 J	3.89 J	7.34 J
LW2-C111-D2	FR	LW2-C111-D	11.3 J	18.5 J	21.8 J	14.6 J	11.4 J	5.86 J	10.2 J
LW2-C112-A	N		13.9 JT	20.3 JT	25.1 JT	13.6 JT	7.38 JT	4.75 JT	9.27 JT
LW2-C121-D	N		27 JT	21.6 JT	11.9 JT	5.43 JT	2.63 JT	1.31 JT	2.08 JT
LW2-C133-C	N		10.4 J	19.7 J	21.5 J	13.6 J	9.6 J	6.46 J	11.7 J
LW2-C135-D	N		10.7 J	16.5 J	16.4 J	10.9 J	8.15 J	4.44 J	10.8 J
LW2-C138-A	N		7.59 J	10.6 J	8.49 J	5.43 J	3.54 J	2.38 J	3.37 J
LW2-C138-B	N		4.8 J	7.21 J	7.09 J	6.42 J	4.23 J	2.25 J	3.79 J
LW2-C138-D	N		3.46 J	22 J	24.6 J	19.7 J	10.7 J	5.58 J	9.87 J
LW2-C139-D	N		29.2 J	19.4 J	5.67 J	2.97 J	1.69 J	0.95 J	1.99 J
LW2-C144-A	N								
LW2-C144-C	N								
LW2-C144-E	N								
LW2-C147-D	N		13.2 J	9.41 J	18 J	12.7 J	10.4 J	6.48 J	11.7 J
LW2-C148-D	N		7.81 J	13.4 J	27.3 J	18 J	10.8 J	8.61 J	9.3 J
LW2-C148-E	N		12.4 J	11.9 J	16.2 J	16 J	9.05 J	5.1 J	10.6 J
LW2-C152-E	N		11.2 J	31 J	21.3 J	15.5 J	6.79 J	3.26 J	5.24 J
LW2-C155-D	N		6.13 J	16.3 J	22.9 J	20 J	9.58 J	5.09 J	12.3 J
LW2-C156-F	N		35.9 J	17.5 J	5.06 J	2.23 J	1.14 J	0.57 J	1.32 J
LW2-C158-A	N		17.7 J	17.7 J	22.3 J	15.1 J	8.99 J	5.15 J	8.54 J
LW2-C158-E	N		6.66 J	21.2 J	26.1 J	15.8 J	8.82 J	3.27 J	6.38 J
LW2-C162-A	N		16.1 J	13.4 J	18.5 J	12 J	8.63 J	4.63 J	8.8 J
LW2-C162-D	N		6.21 J	21 J	26.1 J	17.2 J	10.5 J	4.59 J	7.92 J
LW2-C163-D2	FR	LW2-C163-D1	13.4 J	22.6 J	20.3 J	15 J	8.25 J	4.76 J	9.14 J
LW2-C169-A	N		12.6 J	15.7 J	21.5 J	13 J	8.36 J	5.6 J	9.25 J

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Table 4-1a. R2A Archived Sediment Core Conventionals and Grain-Size Data.

Sample ID	Sample Type Code	Analyte Group / CAS No / Chemical Name / Unit / Parent Sample	Grainsize GS_VFS Very fine sand percent	Grainsize GS_CSILT Coarse silt percent	Grainsize GS_MSILT Medium silt percent	Grainsize GS_FSILT Fine silt percent	Grainsize GS_VFSILT Very fine silt percent	Grainsize GS_CCLAY 8-9 Phi clay percent	Grainsize GS_MFCLAY >9 Phi clay percent
LW2-C169-D	N		11.2 J	18.9 J	22 J	18.9 J	9.5 J	4.82 J	8.07 J
LW2-C171-A	N		13.3 J	18.9 J	22.5 J	12.7 J	8.84 J	5.32 J	8.41 J
LW2-C171-D	N		28.9 J	27.7 J	12.6 J	6.67 J	2.81 J	1.69 J	2.39 J
LW2-C172-E	N		1.41 J	8.4 J	30.6 J	21.7 J	15.4 J	6.34 J	11 J
LW2-C173-D	N		24.9 J	8.62 J	4.47 J	2.46 J	1.13 J	0.7 J	1.32 J
LW2-C173-E	N		20.8 J	41.7 J	17.1 J	7.51 J	3.51 J	1.68 J	3.91 J
LW2-C182-D	N		8.38 J	11.1 J	20.9 J	20.4 J	15.4 J	6.27 J	17.2 J
LW2-C184-E	N		10.7 J	16.7 J	17.2 J	9.51 J	8.41 J	4.77 J	10.6 J
LW2-C185-D	N		21.2 J	6.67 J	2.9 J	2.07 J	1.69 J	0.81 J	1.77 J
LW2-C196-A	N		6.59 J	4.94 J	6.31 J	5.49 J	3.88 J	2.61 J	4.59 J
LW2-C202-D	N		0.97 J	51 J	0.33 J	0.21 J	15 J	0.15 J	0.29 J
LW2-C245-F	N		3.07 J	0.82 J	2.58 J	1.46 J	1.03 J	0.75 J	1.57 J
LW2-C252-D	N		17.9 J	14.4 J	16.4 J	12.1 J	8.8 J	5.82 J	7.89 J
LW2-C258-D	N		0.65 J	0.31 J	0.26 J	0.14 J	0.17 J	0.08 J	0.31 J
LW2-C260-D	N		22.1 J	19.6 J	11.9 J	9.18 J	4.59 J	2.56 J	3.52 J
LW2-C263-C	N		9.79 J	11.2 J	16.9 J	16.8 J	10.6 J	7.8 J	15.3 J
LW2-C264-D	N		2.35 J	1.51 J	1.53 J	1.01 J	0.76 J	0.44 J	0.76 J
LW2-C269-A	N		4.42 J	4.96 J	28 J	20.5 J	14.8 J	12.5 J	12.8 J
LW2-C269-D	N		8.6 J	10 J	23.5 J	15.1 J	12.7 J	9.89 J	13.3 J
LW2-C270-D	N		7.32 JT	5.74 JT	5.52 JT	4.53 JT	2.84 JT	1.89 JT	3.56 JT
LW2-C273-D	N		15 J	19 J	19.1 J	13 J	6.6 J	5.47 J	10.5 J
LW2-C276-D	N		9.48 J	6.75 J	5.99 J	5.09 J	2.56 J	1.88 J	4.25 J
LW2-C282-A	N		6.03 J	12.2 J	19.9 J	19.5 J	11.1 J	6.12 J	12.3 J
LW2-C283-D	N								
LW2-C284-E	N		23.5 J	22 J	14.4 J	8.52 J	6.22 J	3.92 J	7.51 J
LW2-C290-A	N		1.38 J	1.49 J	2.3 J	1.67 J	1.39 J	1.14 J	1.52 J
LW2-C290-D	N		6.31 J	1.11 J	0.82 J	0.49 J	0.31 J	0.36 J	0.67 J
LW2-C291-A	N								
LW2-C293-A2	FR	LW2-C293-A	2.53 J	5.78 J	18.7 J	18.4 J	18 J	13.5 J	20.3 J
LW2-C293-D2	FR	LW2-C293-D	1.15 J	0.6 J	0.76 J	0.67 J	0.39 J	0.34 J	0.56 J
LW2-C299-A	N		5.73 J	12.4 J	20.4 J	17.2 J	10.3 J	4.65 J	8.47 J
LW2-C300-A	N		6.37 J	5.07 J	31.7 J	13.8 J	8.81 J	5.13 J	9.41 J
LW2-C301-A	N		13.7 J	10.8 J	16.3 J	13 J	7.69 J	4.67 J	9.29 J
LW2-C302-D	N		6.27 J	10.1 J	12.7 J	11.7 J	9.06 J	5.22 J	9.13 J
LW2-C314-D	N		7.46 J	5.36 J	6.76 J	6.72 J	4.27 J	2.53 J	4.85 J
LW2-C326-D	N		22.5 J	40.6 J	16.4 J	9.27 J	3.19 J	1.37 J	2.12 J
LW2-C327-D	N		14.3 J	6.59 J	3.79 J	3.29 J	1.88 J	1.33 J	2.56 J
LW2-C329-A	N		2.71 J	1.41 J	0.99 J	0.8 J	0.71 J	0.44 J	0.64 J
LW2-C331-G	N		27.9 J	6.76 J	1.16 J	0.42 J	0.25 J	0.15 J	0.43 J
LW2-C334-D	N		7.85 J	4.4 J	3.73 J	2.56 J	1.4 J	1.14 J	2.28 J
LW2-C335-A	N		9.38 J	3.51 J	2.15 J	1.45 J	1.31 J	1.05 J	0.97 J
LW2-C335-E	N		5.02 J	4.96 J	4.29 J	2.96 J	2.18 J	1.54 J	3.29 J
LW2-C342-E	N								

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Table 4-1a. R2A Archived Sediment Core Conventionals and Grain-Size Data.

Sample ID	Sample Type Code	Analyte Group / CAS No / Chemical Name / Unit / Parent Sample	Grainsize GS_VFS Very fine sand percent	Grainsize GS_CSILT Coarse silt percent	Grainsize GS_MSILT Medium silt percent	Grainsize GS_FSILT Fine silt percent	Grainsize GS_VFSILT Very fine silt percent	Grainsize GS_CCLAY 8-9 Phi clay percent	Grainsize GS_MFCLAY >9 Phi clay percent
LW2-C346-D	N		1.17 J	0.39 J	0.49 J	0.21 J	0.2 J	0.08 J	0.26 J
LW2-C347-E	N		26.3 J	10.3 J	5.96 J	3.16 J	2.83 J	1.98 J	6.02 J
LW2-C348-A	N		16.7 J	30.5 J	23.2 J	9.65 J	6.14 J	3.93 J	5.09 J
LW2-C349-D	N		1.27 J	0.23 J	0.2 J	0.18 J	0.11 J	0.14 J	0.24 J
LW2-C356-A	N		7.61 J	47 J	15.5 J	11.4 J	5.48 J	3.28 J	4.93 J
LW2-C356-D	N		10.9 J	10.7 J	17.4 J	12.2 J	10.5 J	6.17 J	12.9 J
LW2-C361-A	N		15.2 J	22.1 J	19.1 J	14.2 J	7.89 J	4.54 J	8.88 J
LW2-C364-D	N		28.7 J	16.6 J	6.79 J	3.17 J	3.39 J	3.62 J	15.2 J
LW2-C366-F1	N		2.11 J	0.97 J	0.63 J	0.35 J	0.26 J	0.35 J	1.64 J
LW2-C372-E	N		4.78 J	10.1 J	26.6 J	19.3 J	12.6 J	7.83 J	17.8 J
LW2-C373-D	N		11.9 J	19.7 J	22.9 J	14.4 J	10.7 J	6.05 J	11 J
LW2-C377-D	N		10.9 J	16.7 J	21.3 J	11.3 J	8.61 J	4.58 J	10.8 J
LW2-C379-A	N		4.89 J	5.92 J	17.6 J	16.9 J	17.5 J	13.8 J	18.9 J
LW2-C380-A	N		8.3 J	8.52 J	7.43 J	4.75 J	2.6 J	2.04 J	3.68 J
LW2-C380-E	N		3.37 J	15.9 J	24.9 J	18.1 J	13.4 J	9.53 J	15.6 J
LW2-C382-D	N		16.6 J	17.5 J	19.3 J	10.5 J	8.16 J	3.99 J	10.5 J
LW2-C383-D	N		19.7 J	34.1 J	19.1 J	7.51 J	5.44 J	3.51 J	8.13 J
LW2-C384-E	N		5.57 J	2.76 J	2.54 J	1.3 J	0.89 J	0.76 J	1.21 J
LW2-C384-F	N		14.7 J	11.4 J	8.12 J	5.64 J	2.8 J	2.07 J	5.33 J
LW2-C392-D	N								
LW2-C400-D	N								
LW2-C401-F	N		16.6 J	21.5 J	19.4 J	13.1 J	7.04 J	4.33 J	11 J
LW2-C403-F	N		1.78 J	14.5 J	24 J	22.6 J	9.43 J	6.68 J	13.4 J
LW2-C405-E	N		11.2 J	18.6 J	17.9 J	14.2 J	10.6 J	6.58 J	16 J
LW2-C409-A	N		22.9 J	19.5 J	15.8 J	9.49 J	6.68 J	3.48 J	6.41 J
LW2-C409-D	N		1.23 JT	0.44 JT	0.963 JT	0.66 JT	0.49 JT	0.323 JT	0.61 JT
LW2-C415-E	N		10.7 J	6.75 J	7.54 J	4.02 J	2.32 J	1.78 J	3.66 J
LW2-C417-C	N		2.86 J	3.68 J	22.9 J	19.8 J	14.1 J	11.4 J	17.9 J
LW2-C420-A	N								
LW2-C420-D	N								
LW2-C421-A	N		4.1 J	5.73 J	15 J	16.1 J	14.6 J	10.2 J	16.5 J
LW2-C421-D	N		18.3 J	14.9 J	15.1 J	9.69 J	5.03 J	3.19 J	6.36 J
LW2-C421-E	N		20.1 JT	19.1 JT	17.4 JT	9.19 JT	4.39 JT	2.64 JT	7.56 JT
LW2-C421-F	N		8.12 J	6.75 J	7.39 J	3.98 J	2.41 J	1.38 J	3.11 J
LW2-C425-F1	N		0.66 J	1.77 J	28.7 J	30.5 J	15.6 J	6.03 J	13.7 J
LW2-C426-A	N		2.03 J	9.44 J	23 J	18.6 J	16.5 J	10.2 J	16.8 J
LW2-C430-A	N		10.7 J	18.3 J	26.2 J	12.5 J	8.41 J	4.66 J	8.1 J
LW2-C431-F	N		5.64 J	31.6 J	23.3 J	15.4 J	9.1 J	4.9 J	7.66 J
LW2-C434-A	N		12.1 J	10.7 J	12 J	7.16 J	4.28 J	3.03 J	3.57 J
LW2-C436-A	N		17.1 J	28.9 J	16.9 J	9.04 J	4.13 J	2.51 J	3.53 J
LW2-C436-D	N		6.5 J	10.2 J	25.5 J	22.1 J	11.6 J	8.17 J	12.5 J
LW2-C436-E	N		2.89 J	1.59 J	0.81 J	0.71 J	0.48 J	0.49 J	0.53 J
LW2-C439-D	N		4 JT	1.79 JT	1.69 JT	1.05 JT	0.917 JT	0.643 JT	1.23 JT

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Table 4-1a. R2A Archived Sediment Core Conventionals and Grain-Size Data.

Sample ID	Sample Type Code	Analyte Group / CAS No / Chemical Name / Unit / Parent Sample	Grainsize GS_VFS Very fine sand percent	Grainsize GS_CSILT Coarse silt percent	Grainsize GS_MSILT Medium silt percent	Grainsize GS_FSILT Fine silt percent	Grainsize GS_VFSILT Very fine silt percent	Grainsize GS_CCLAY 8-9 Phi clay percent	Grainsize GS_MFCLAY >9 Phi clay percent
LW2-C440-A	N		10.8 J	23.1 J	29.8 J	14.8 J	6.92 J	5.37 J	9.21 J
LW2-C440-D	N		10.6 J	14.7 J	23.4 J	15.2 J	10.8 J	7.59 J	12 J
LW2-C441-A1	N		11.9 J	18.5 J	29.4 J	13.4 J	7.26 J	4.22 J	9.13 J
LW2-C441-D1	N		23.6 J	33.6 J	22.9 J	7.96 J	3.86 J	1.8 J	3.82 J
LW2-C444-D	N		5.75 J	7.29 J	5.86 J	2.91 J	2.04 J	1.44 J	2.86 J
LW2-C444-E	N		26.2 J	30 J	18 J	7.57 J	5 J	2.49 J	4.48 J
LW2-C445-D	N		7.65 J	10.6 J	17.5 J	15 J	10 J	8.09 J	11 J
LW2-C447-A	N		10.9 J	14.9 J	25.3 J	16.4 J	8.51 J	5.88 J	10.2 J
LW2-C447-F	N		15.6 J	20.8 J	24 J	11.7 J	7.58 J	4.51 J	6.94 J
LW2-C448-A	N		11.1 J	8.72 J	35.6 J	16.3 J	9.07 J	4.87 J	10.3 J
LW2-C448-D	N		7.35 J	3.9 J	33.7 J	17.3 J	11.7 J	6.75 J	11.8 J
LW2-C454-H	N		13.8 J	4.72 J	4.51 J	3.25 J	2.51 J	2.18 J	4.05 J
LW2-C455-F	N		9.46 JT	9.12 JT	10.8 JT	5.94 JT	4.58 JT	2.92 JT	5.82 JT
LW2-C456-G	N		8.05 J	23 J	30.1 J	13.5 J	6.7 J	2.63 J	5.45 J
LW2-C457-D	N		6.48 J	12.7 J	23.4 J	20 J	12.6 J	8.61 J	15.8 J
LW2-C458-D	N		7.16 J	15.6 J	26.7 J	17 J	12.2 J	8.23 J	13 J
LW2-C458-D2	FR	LW2-C458-D	7.2 J	15.5 J	25.4 J	18.7 J	11.3 J	8.58 J	13.4 J
LW2-C461-A	N		6.75 J	25.4 J	27.1 J	15.6 J	8.56 J	5.97 J	9.85 J
LW2-C461-D	N		8.77 J	19.2 J	23.4 J	18.4 J	11.2 J	6.39 J	12.1 J
LW2-C462-D	N		11.2 J	17.3 J	20.9 J	17.6 J	10.4 J	7.9 J	11.9 J
LW2-C468-D	N		6.61 J	15.2 J	31 J	16.9 J	10.8 J	7.65 J	12.5 J
LW2-C471-D	N								
LW2-C474-D	N		10.4 J	15.8 J	26.5 J	11.8 J	10.4 J	7.49 J	14.3 J
LW2-C494-A	N		24.5 J	35.3 J	11.9 J	1.78 J	1.57 J	0.48 J	2.63 J
LW2-C521-D	N		0.89 J	0.51 J	0.66 J	0.61 J	0.5 J	0.4 J	0.61 J

Notes:

- For all totals, zero is always used for non-detects. If any of the values included in a total are estimated (J qualified), then the total value is estimated (J qualified). If all analytes in a total are non-detects, then the highest detection limit is used for the total. A "T" qualifier is added to all results that are mathematically derived.
- Coordinate system for geographic coordinates is Oregon State Plane NAD83 HARN/HPGN, Intl. Feet.
- All concentration units are listed as dry weight.

J Estimate.
T Value is an average or selected result (see Kennedy Jenks et al. 2004).
U Not detected at value shown.

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Table 4-1b. R2A Archived Sediment Core Metals Data.

Sample ID	Sample Type Code	Parent Sample	Analyte Group / CAS No / Chemical Name / Unit	Metals 7429-90-5 Aluminum mg/kg	Metals 7440-36-0 Antimony mg/kg	Metals 7440-38-2 Arsenic mg/kg	Metals 7440-43-9 Cadmium mg/kg	Metals 7440-47-3 Chromium mg/kg	Metals 7440-50-8 Copper mg/kg	Metals 7439-92-1 Lead mg/kg	Metals 7439-97-6 Mercury mg/kg	Metals 7440-02-0 Nickel mg/kg	Metals 7782-49-2 Selenium mg/kg	Metals 7440-22-4 Silver mg/kg	Metals 7440-66-6 Zinc mg/kg
LW2-C011-E1	N										0.033 J				
LW2-C015-E	N			14600	0.23 J	3.03	0.309	18	19.7	9.33 J		17.5	0.1 U	0.075	70.2
LW2-C019-E2	FR	LW2-C019-E1		24000	0.1 J	3.25	0.193	28	31.2	5.68		26.5	0.15 U	0.072 J	67
LW2-C020-D	N			27700	0.22 J	4.71	0.735	30.6	40.3	38.9 J		23.9	0.17 U	0.251	212
LW2-C022-D	N			34700	0.15 J	3.99	0.537	37.8	50.3	24.7 J		27.4	0.21 U	0.33	139
LW2-C060-A	N			23100	0.07 J	4.01	0.14 U	25.9	23.2	11.1 J		23	0.12 U	0.074	81.2
LW2-C061-D	N										0.014 J				
LW2-C135-D	N			27100	0.24 J	4	0.424	32.4	42.4	31.1 J		25.2	0.07 U	0.302	205
LW2-C139-D	N			11800	0.08 J	3.02	0.156 U	12.9	16.9	5.6		15.2	0.09 U	0.049 J	54.8
LW2-C148-E	N			29200	0.13 J	5.01	0.555	30.2	37.6	33.1 J		24.5	0.14 U	0.283	162
LW2-C152-E	N			15800	0.13 J	5.18	0.259 U	17.2	23.6	9.58 J	0.02 J	18.1	0.18 U	0.083	77
LW2-C156-F	N			6890	0.08 J	2.96	0.199 U	9.5	12.8	5.06 J	0.01 J	11.9	0.06 U	0.04	46.1
LW2-C162-D	N			13100	0.14 J	4.4	0.281	15.7	23.9	9.42 J		18.3	0.09 U	0.09	77.5
LW2-C163-D2	FR	LW2-C163-D1		18100	0.22 J	9.1	0.166 U	19.5	25.6	11.9 J		18.5	0.15 U	0.1	75.7
LW2-C172-E	N			15800	0.26 J	12.9	0.185 U	17.5	27.4	14.7 J		19.5	0.07 U	0.071	77.7
LW2-C173-E	N			9720	0.13 J	2.94	0.212 U	12	18.5	6.27 J		14.9	0.07 U	0.056	59.8
LW2-C182-D	N										0.522 J				
LW2-C202-D	N			9680	0.06 J	2.3	0.121 U	15.3	15.2	3.92	0.076 J	15	0.04 U	0.037 J	49
LW2-C260-D	N										0.017 J				
LW2-C269-D	N										0.254 J				
LW2-C270-D	N			12100	0.07 J	2.4	0.147 U	16.5	18.9	3.48 J	0.047 J	18.3	0.06 U	0.058	44.3
LW2-C301-A	N			21200 T	0.215 JT	3.48 T	0.363 T	29.5 T	37.4 T	25.3 T		24.4 JT	0.16 UT	0.311 JT	126 T
LW2-C314-D	N			21000 T	0.07 JT	2.45 T	0.151 UT	22.8 T	25.1 T	8.82 JT	0.048 J	23.1 T	0.14 U	0.0795 T	60.7 T
LW2-C326-D	N			7640	0.09 J	3	0.157 U	9.2	15.8	5.7 J		12.1	0.05 U	0.051	51.9
LW2-C327-D	N			18300	0.3 J	3.04	0.497	21.5	23.7	33.7 J	0.057 J	21.3	0.05 U	0.166	159
LW2-C347-E	N			18600	0.09 J	1.56	0.129 U	26	28.2	6.14	0.034 T	23.9	0.11 U	0.045 J	56.4
LW2-C349-D	N			15000	0.06 J	2.05	0.108 U	16.7	16.3	3.1	0.023 J	19.2	0.03 U	0.038 J	52.3
LW2-C364-D	N										0.16 J				
LW2-C373-D	N			33800 T	0.145 JT	3.71 T	0.291 T	36.7 T	74 T	21 T		27.9 T	0.16 UT	0.276 JT	118 T
LW2-C383-D	N			25500	0.07 J	2.37	0.156 U	27.4	26.4	4.67		23.6	0.12 U	0.067 J	57.4
LW2-C384-F	N			24900	0.09 J	2.62	0.139 U	30.8	26.1	4.05		29.7	0.09 U	0.049 J	61.2
LW2-C400-D	N			33700	0.14 J	3.55	0.313	38.4	45.8	22.9		28.9	0.2 U	0.253 J	113
LW2-C403-F	N			30100	0.09 J	3.2	0.232	34.3	36.2	5.43		24.3	0.17 U	0.091 J	68
LW2-C405-F	N			35800	0.07 J	3.31	0.218	37.4	30.6	7.43		28.2	0.1 U	0.071 J	70.4
LW2-C409-D	N			10500	0.07 J	1.93	0.091 U	16.7	17.7	3.11		17.8	0.04 U	0.03 UJ	49.3
LW2-C415-E	N			12300	0.08 J	1.69	0.017 U	19.8	18.8	3		24.1	0.1 U	0.038 J	48.4
LW2-C420-D	N			23000	0.24 J	2.53	0.146 U	33.2	74.1	28.5		23.5	0.04 U	0.224 J	127
LW2-C421-D	N			16400	0.1 J	1.79	0.12 U	24.6	25.6	4.48		24.8	0.06 U	0.051 J	58
LW2-C421-F	N			16400	0.07 J	1.8	0.114 U	23.3	20.9	3.15		23.2	0.05 U	0.04 J	54.3
LW2-C430-A	N			23300	0.27 J	4.25	0.45	33.2	71.3	38.2		24.9	0.24 U	1.41 J	215
LW2-C436-D	N										0.25 J				
LW2-C436-E	N			16800	0.07 J	2.4	0.085 U	19.6	16.1	3.73		19.9	0.05 U	0.035 J	52.5
LW2-C439-D	N			14500	0.15 J	2.1	0.128 U	18	16.7	13.6		20.4	0.05 U	0.037 J	51.3
LW2-C440-D	N			36400	2.15 J	14.9	0.425	37	91	159		28.7	0.15 U	0.627 J	598
LW2-C444-D	N										0.019				
LW2-C444-E	N			15000	0.16 J	5.19	0.191	14.9	20.8	8.78		15.2	0.05 U	0.078 J	66.6
LW2-C445-D	N			28700 T	1.4 JT	4.42 T	0.391 T	40.3 T	79.4 T	36.3 T		25.2 T	0.19 UT	0.317 JT	202 T
LW2-C448-D	N			27900	0.38 J	3.98	0.403	35.6	52.1	42.9		26.7	0.13 U	0.377 J	194
LW2-C457-D	N			34000	0.23 J	4.19	0.557	38.7	56.2	31.7		28.6	0.16 U	0.801 J	160
LW2-C461-D	N			27600	0.4 J	4.19	0.4	34.1	52.6	36.6		26.7	0.11 U	0.218 J	190

Notes:
- For all totals, zero is always used for non-detects. If any of the values included in a total are estimated (J qualified), then the total value is estimated (J qualified). If all analytes in a total are non-detects, then the highest detection limit is used for the total. A "T" qualifier is added to all results that are mathematically derived.
- Coordinate system for geographic coordinates is Oregon State Plane NAD83 HARN/HPGN, Intl. Feet.
- All concentration units are listed as dry weight.

J Estimate.
T Value is an average or selected result (see Kennedy Jenks et al. 2004).
U Not detected at value shown.

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Table 4-1c. R2A Archived Sediment Core Butyltin Data.

Sample ID	Sample Type Code	Parent Sample	Analyte Group / CAS No / Chemical Name / Unit	Butyltins 78763-54-9 Butyltin ion ug/kg	Butyltins 14488-53-0 Dibutyltin ion ug/kg	Butyltins 36643-28-4 Tributyltin ion ug/kg	Butyltins 1461-25-2 Tetrabutyltin ug/kg
LW2-C409-A	N			3	34	88	0.13 U
LW2-C409-B	N			50	460	2300	21 J
LW2-C420-A	N			5.1	21	150	0.89 NJ
LW2-C420-B	N			17 U	470	27000	180 J
LW2-C457-D	N			0.084 U	0.25 J	0.67 U	0.12 U

Notes:

- For all totals, zero is always used for non-detects. If any of the values included in a total are estimated (J qualified), then the total value is estimated (J qualified). If all analytes in a total are non-detects, then the highest detection limit is used for the total. A "T" qualifier is added to all results that are mathematically derived.
- Coordinate system for geographic coordinates is Oregon State Plane NAD83 HARN/HPGN, Intl. Feet.
- All concentration units are listed as dry weight.

J	Estimate.
T	Value is an average or selected result (see Kennedy Jenks et al. 2004).
U	Not detected at value shown.

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Table 4-1d. R2A Archived Sediment Core Polycyclic Aromatic Hydrocarbon Data.

		Analyte Group	PAHs	PAHs	PAHs	PAHs	PAHs	PAHs	PAHs	PAHs	PAHs	PAHs
		CAS No	91-57-6	83-32-9	208-96-8	120-12-7	86-73-7	91-20-3	85-01-8	LPAH	53-70-3	56-55-3
	Sample Type	**Chemical Name**	2-Methylnaphthalene	Acenaphthene	Acenaphthylene	Anthracene	Fluorene	Naphthalene	Phenanthrene	Low Molecular Weight PAH	Dibenz(a,h)anthracene	Benz(a)anthracene
		Unit	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Sample ID	**Code**	**Parent Sample**										
LW2-C011-F1	N		0.5 U	0.24 U	0.33 U	0.41 U	0.28 U	1.3 U	0.92 J	0.92 JT	0.39 U	0.68 U
LW2-C015-E	N		14	140	21	95	66	56	720	1112 T	21	180
LW2-C019-D1	N		1.4 J	11	3.9	6.6	4.1	6.4 U	72	99 JT	3.1	28
LW2-C020-D	N		3.6	30	9.9	48	26	11	220	348.5 T	27	260
LW2-C034-F	N		1.4 J	1.8 J	0.86 U	8.7	2.8 U	2.5 U	41	52.9 JT	1 J	21
LW2-C060-A	N		3.9	5.9	27	15	3.4	18	51	124.2 T	27	140
LW2-C111-D2	FR	LW2-C111-D	250	300	43	180	230	320	1200	2523 T	39	240
LW2-C121-D	N		0.46 U	0.22 U	0.35 J	0.91 J	0.29 J	NA	6	7.55 JT	0.35 U	1.9
LW2-C135-D	N		37	240	46	140	160	50	630	1303 T	43	290
LW2-C139-D	N		0.44 U	0.21 U	0.28 U	0.65 J	0.36 J	1.3 U	3.6	4.61 JT	0.33 U	1.1 J
LW2-C144-C	N		18	65	23	44	47	48	270	515 T	30	160
LW2-C144-E	N		0.46 U	1.7 J	1.2 J	0.8 J	0.69 J	NA	5.9	10.29 JT	0.8 J	5.2
LW2-C148-E	N		47	410	64	110	250	110	1800	2791 T	72	390
LW2-C152-E	N		0.66 J	1.8 J	0.85 J	0.9 J	1.1 J	NA	8.8	14.11 JT	0.5 J	3.5
LW2-C155-D	N		0.47 U	2.5	1.1 J	1.4 J	0.58 J	NA	9.6	15.18 JT	0.36 U	2.4
LW2-C156-F	N		0.45 U	0.21 U	0.29 U	0.29 U	0.25 U	NA	0.73 J	0.73 JT	0.34 U	0.21 U
LW2-C158-E	N		1.4 J	6.5	1.5 J	2.9	3.8	NA	40	56.1 JT	1.6 J	10
LW2-C162-D	N		0.58 J	1.7 J	0.64 J	0.59 J	1.2 J	NA	8.3	13.01 JT	0.58 J	2.4
LW2-C163-D2	FR	LW2-C163-D1	0.49 U	0.31 J	0.33 J	1.1 J	0.49 J	NA	6.4	8.63 JT	0.37 U	1.1 J
LW2-C171-D	N		0.48 U	0.8 J	0.32 U	0.32 U	0.43 J	NA	3.7	4.93 JT	0.37 U	0.88 J
LW2-C172-E	N		3.9	11	2	4.1	4.3	13	65	103.3 T	1.3 J	16
LW2-C173-E	N		6.7	3.1	1.1 J	0.9 J	1 J	120	5.3	138.1 JT	0.34 U	0.66 J
LW2-C182-D	N		630	1100	110	720	670	330	4700	8260 T	110	810
LW2-C184-E	N		3.3	5.2	23	65	9	14	140	259.5 T	15	150
LW2-C185-D	N		4.9	86	18	39	34	41	400	622.9 T	34	220
LW2-C202-D	N		1.9	2.1	0.93 J	3.3	1.5 J	12	10	31.73 JT	0.59 U	3.1
LW2-C245-F	N		0.47 U	0.22 U	0.3 U	0.3 U	0.26 U	2.8 U	0.47 J	0.47 JT	0.36 U	0.22 U
LW2-C252-D	N		16	690	58	150	230	63	760	1967 T	81	480
LW2-C258-D	N		25	3200	590	2300	1800	120	2700	10735 T	350	2900
LW2-C264-D	N		3.6	32	4.8	11	13	40	210 J	314.4 JT	6.1	38
LW2-C270-D	N		9.4	430	54	230	250	46	1600	2619.4 T	47	350
LW2-C273-D	N		220	3900	290	5300	2100	840	24000	36650 T	540	5000
LW2-C276-D	N		80	250	51	110	130	580	640	1841 T	12	94
LW2-C282-A	N		23	21	41	24	24	140	120	393 T	8.2	130
LW2-C284-E	N		3.4	15	0.75 J	2.1	2.1	NA	12	35.35 JT	0.41 U	2.9
LW2-C293-A2	FR	LW2-C293-A	170	6700	41	2300	5500	140	14000	28851 T	47	1100
LW2-C293-D2	FR	LW2-C293-D	4.7	27	16	68	17	19	130	281.7 T	4.8	68
LW2-C302-D	N		1400000	1800000	530000	640000	740000	9200000	4100000	18410000 T	24000	310000
LW2-C314-D	N		18	48	16	130	39	55	640	946 T	41	340
LW2-C327-D	N		7.5	310	13	130	24	41	770	1295.5 T	21	200

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Table 4-1d. R2A Archived Sediment Core Polycyclic Aromatic Hydrocarbon Data.

		Analyte Group	PAHs	PAHs	PAHs	PAHs	PAHs	PAHs	PAHs	PAHs	PAHs	PAHs
		CAS No	91-57-6	83-32-9	208-96-8	120-12-7	86-73-7	91-20-3	85-01-8	LPAH	53-70-3	56-55-3
	Sample Type	**Chemical Name**	2-Methylnaphthalene	Acenaphthene	Acenaphthylene	Anthracene	Fluorene	Naphthalene	Phenanthrene	Low Molecular Weight PAH	Dibenz(a,h)anthracene	Benz(a)anthracene
	Code	**Unit**	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Sample ID		**Parent Sample**										
LW2-C335-E	N		5.9	13	20	47	10	20	100	215.9 T	11	120
LW2-C342-E	N		1.3 J	1 J	3.9	10	2.2	5.6 U	30	48.4 JT	1.6	23
LW2-C346-D	N		0.43 U	2.4	0.28 U	0.28 U	0.24 U	2.4 U	1.5 J	3.9 JT	0.33 U	0.49 J
LW2-C347-E	N		0.6 J	0.38 J	0.53 J	0.35 J	0.81 J	6.1 U	4.4	7.07 JT	0.37 U	0.81 J
LW2-C364-D	N		21	39	37	54	26	110	240	527 T	9.1	100
LW2-C372-E	N		28	17	36	33	22	90	120	346 T	7.2	56
LW2-C373-D	N		2.9	8.3	2.7	9.2	8.3	13	52	96.4 T	6.5	37
LW2-C377-D	N		92	58	23 U	100	140	44	530	964 T	8.8	110
LW2-C384-F	N		0.48 J	0.22 U	0.3 U	0.3 U	0.26 U	2.4 U	0.45 U	0.48 JT	0.36 U	0.22 U
LW2-C401-F	N		1.5 J	2.8	2.5	2.4	1.8 J	8.6 U	13	24 JT	1.1 U	6.8
LW2-C405-E	N		0.75 J	0.26 J	0.34 U	0.34 U	0.3 U	7.6 U	1.1 J	2.11 JT	0.4 U	1.1 J
LW2-C409-D	N		0.46 J	0.54 J	0.52 J	5.7	1.3 J	2.3 U	12	20.52 JT	1 J	4.5
LW2-C426-A	N		1.6 J	4.8	3.8	6.4	4.3	7.3 U	31	51.9 JT	5.3	32
LW2-C430-A	N		4.3	12	7	19	8.9	13	98	162.2 T	20	86
LW2-C434-A	N		3.7	12	5.9	22	11	9.4 U	62	116.6 T	6.6	60
LW2-C436-E	N		0.87 J	2.6	3.1	7.8	1.6 J	4.3 U	17	32.97 JT	4.2	43
LW2-C439-D	N		0.46 U	0.22 U	0.59 J	0.86 J	0.26 U	1.7 U	1.6 U	1.45 JT	0.6 J	5.9
LW2-C440-D	N		12	35	7.1	24	35	28	140	281.1 T	7.7	52
LW2-C445-D	N		8	17	5.7	9.1	14	15	67	135.8 T	3.9	28
LW2-C455-F	N		6.2	7.6	6.8	4.8	4.7	26	27	83.1 T	1.6 U	8.8
LW2-C456-G	N		1.6 J	1.7 J	2.2	1.7 J	1.1 J	16	8	32.3 JT	0.54 J	6.5
LW2-C457-D	N		22	22	33	30	22	83	150	362 T	7.3	50
LW2-C521-D	N		33000	20000	31000	22000	26000	240000	140000	512000 T	2000	18000

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Table 4-1d. R2A Archived Sediment Core Polycyclic Aromatic Hydrocarbon Data.

		Analyte Group	PAHs	PAHs	PAHs	PAHs	PAHs	PAHs	PAHs	PAHs	PAHs	PAHs
		CAS No	50-32-8	205-99-2	191-24-2	207-08-9	218-01-9	206-44-0	193-39-5	129-00-0	HPAH	130498-29-2
	Sample Type	**Chemical Name**									High Molecular Weight PAH	Polycyclic Aromatic Hydrocarbons
	Code	**Unit**	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Fluoranthene	Indeno(1,2,3-cd)pyrene	Pyrene		
Sample ID		**Parent Sample**	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
LW2-C011-F1	N		0.62 U	0.71 U	0.71 U	0.57 U	0.71 J	0.84 U	0.51 U	1 U	0.71 JT	1.63 JT
LW2-C015-E	N		260	130	260	120	210	650	210	1000	3041 T	4153 T
LW2-C019-D1	N		37	25	33	24	49	54	27	82	362.1 T	461.1 JT
LW2-C020-D	N		220	210	140	190	400	720	140	690	2997 T	3345.5 T
LW2-C034-F	N		11	5.9	8.1	3.9	31	29	4.1	53	168 JT	220.9 JT
LW2-C060-A	N		300	180	290	160	190	190	250	270	1997 T	2121.2 T
LW2-C111-D2	FR	LW2-C111-D	320	190	320	180	320	800	270	850	3529 T	6052 T
LW2-C121-D	N		2.1	1.3 J	2.2	1.7 J	2.6	7.1	1.7	9.4	30 JT	37.55 JT
LW2-C135-D	N		400	250	350	260	350	620	310	750	3623 T	4926 T
LW2-C139-D	N		0.93 J	0.82 J	1.2 J	0.58 J	1.4 J	4.1	0.99 J	5.3	16.42 JT	21.03 JT
LW2-C144-C	N		240	160	250	140	220	350	220	420	2190 T	2705 T
LW2-C144-E	N		8.3	4.8	7.9	5	6.8	9.9	6.3	16	71 JT	81.29 JT
LW2-C148-E	N		640	370	670	310	510	1300	570	1700	6532 T	9323 T
LW2-C152-E	N		5.4	3.7	5.8	3.1	5.2	10	4.1	18	59.3 JT	73.41 JT
LW2-C155-D	N		6.7	3.8	14	3.4	4.1	10	6.5	32	82.9 T	98.08 JT
LW2-C156-F	N		0.29 U	0.63 U	0.3 U	0.44 U	0.54 U	0.7 J	0.32 U	0.78 J	1.48 JT	2.21 JT
LW2-C158-E	N		14	10	15	9.3	14	37	12	49	171.9 JT	228 JT
LW2-C162-D	N		4.7	3	6.3	3.1	3.6	7	4.6	9.8	45.08 JT	58.09 JT
LW2-C163-D2	FR	LW2-C163-D1	1.2 J	0.87 J	1.4 J	0.77 J	1.4 J	7.5	1.1 J	9.7	25.04 JT	33.67 JT
LW2-C171-D	N		0.79 J	0.68 U	1.1 J	0.73 J	1.1 J	2.7	0.67 J	4.5	12.47 JT	17.4 JT
LW2-C172-E	N		18	12	16	14	22	51	12	70	232.3 JT	335.6 JT
LW2-C173-E	N		0.59 J	0.62 U	0.53 J	0.43 U	0.73 J	2.7	0.34 J	3.5	9.05 JT	147.15 JT
LW2-C182-D	N		1000	630	1100	510	1100	2900	910	3800	12870 T	21130 T
LW2-C184-E	N		160	78	97	96	170	240	85	330	1421 T	1680.5 T
LW2-C185-D	N		370	220	360	200	310	580	310	800	3404 T	4026.9 T
LW2-C202-D	N		3.8	2.5	4.8	2.3 U	4.8	8.6	3.2	14	44.8 T	76.53 JT
LW2-C245-F	N		0.3 U	0.66 U	0.32 U	0.45 U	0.56 U	0.47 U	0.33 U	0.49 U	0.66 UT	0.47 JT
LW2-C252-D	N		750	480	660	380	570	950	610	1200	6161 T	8128 T
LW2-C258-D	N		4000	2400	3500	1800	3400	11000	3200	14000	46550 T	57285 T
LW2-C264-D	N		76	44	87	36	54	170	66	260	837.1 T	1151.5 JT
LW2-C270-D	N		580	340	540	280	490	1100	460	1500	5687 T	8306.4 T
LW2-C273-D	N		9000	5100	9600	4600	7200	25000	7000	32000	105040 T	141690 T
LW2-C276-D	N		140	80	120	73	130	350	100	420	1519 T	3360 T
LW2-C282-A	N		110	88	110	73	130	210	84	270	1213.2 T	1606.2 T
LW2-C284-E	N		3.4	2.2	2.7	1.8 J	3.5	8.7	1.8 J	12	39 JT	74.35 JT
LW2-C293-A2	FR	LW2-C293-A	440	530	150	390	1200	6700	170	5200	15927 T	44778 T
LW2-C293-D2	FR	LW2-C293-D	73	33	40	44	78	140	37	200	717.8 T	999.5 T
LW2-C302-D	N		370000	230000	290000	220000	430000	1700000	270000	2000000	5844000 T	24254000 T
LW2-C314-D	N		560	280	490	300	450	900	430	1200	4991 T	5937 T
LW2-C327-D	N		190	140	130	130	260	660	130	780	2641 T	3936.5 T

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Table 4-1d. R2A Archived Sediment Core Polycyclic Aromatic Hydrocarbon Data.

		Analyte Group	PAHs	PAHs	PAHs	PAHs	PAHs	PAHs	PAHs	PAHs	PAHs	PAHs
		CAS No	50-32-8	205-99-2	191-24-2	207-08-9	218-01-9	206-44-0	193-39-5	129-00-0	HPAH	130498-29-2
	Sample Type	**Chemical Name**	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Fluoranthene	Indeno(1,2,3-cd)pyrene	Pyrene	High Molecular Weight PAH	Polycyclic Aromatic Hydrocarbons
	Code	**Unit**	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Sample ID		**Parent Sample**										
LW2-C335-E	N		130	60	62	78	140	160	63	250	1074 T	1289.9 T
LW2-C342-E	N		22	9.5	9.8	14	27	39	9.2	58	213.1 T	261.5 JT
LW2-C346-D	N		0.37 J	0.6 U	0.59 J	0.42 U	0.52 U	1.3 J	0.35 J	1.5 J	4.6 JT	8.5 JT
LW2-C347-E	N		0.6 J	0.67 U	0.73 J	0.46 U	1.1 J	2.8	0.46 J	4.8	11.3 JT	18.37 JT
LW2-C364-D	N		150	77	130	85	130	310	110	430	1531.1 T	2058.1 T
LW2-C372-E	N		83	53	83	52	78	170	63	210	855.2 T	1201.2 T
LW2-C373-D	N		43	41	35	36	50	80	33	83	444.5 T	540.9 T
LW2-C377-D	N		78	58	59	40	200	220	44	340	1157.8 T	2121.8 T
LW2-C384-F	N		0.3 U	0.65 U	0.32 U	0.45 U	0.56 U	0.46 U	0.33 U	0.49 U	0.65 UT	0.48 JT
LW2-C401-F	N		9.3	5.9	10	5.9	7.7	18	7.8	26	97.4 T	121.4 JT
LW2-C405-E	N		0.82 J	0.95 J	0.62 J	0.84 J	1.2 J	2 J	0.59 J	1.9 J	10.02 JT	12.13 JT
LW2-C409-D	N		5.7	5.5	4.6	5.2	7	5.2	3.8	9.9	52.4 JT	72.92 JT
LW2-C426-A	N		37	44	32	37	59	85	30	97	458.3 T	510.2 JT
LW2-C430-A	N		110	100	110	95	140	220	98	240	1219 T	1381.2 T
LW2-C434-A	N		63	49	47	41	79	120	45	140	650.6 T	767.2 T
LW2-C436-E	N		46	26	20	32	42	52	22	59	346.2 T	379.17 JT
LW2-C439-D	N		6.3	4.2	3.8	4.2	5.8 U	9.1	3.7	11	48.8 JT	50.25 JT
LW2-C440-D	N		57	46	46	39	66	140	41	140	634.7 T	915.8 T
LW2-C445-D	N		32	24	26	24	170	56	25	490	878.9 T	1014.7 T
LW2-C455-F	N		12	8.5	17	7.1	13	28	12	40	146.4 T	229.5 T
LW2-C456-G	N		8.6	4.7	8.3	5.5	8.4	13	6	20	81.54 JT	113.84 JT
LW2-C457-D	N		74	50	86	44	73	190	66	230	870.3 T	1232.3 T
LW2-C521-D	N		26000	14000	19000	12000	24000	77000	17000	83000	292000 T	804000 T

Notes:

- For all totals, zero is always used for non-detects. If any of the values included in a total are estimated (J qualified), then the total value is estimated (J qualified). If all analytes in a total are non-detects, then the highest detection limit is used for the total. A "T" qualifier is added to all results that are mathematically derived.
- Coordinate system for geographic coordinates is Oregon State Plane NAD83 HARN/HPGN, Intl. Feet.
- All concentration units are listed as dry weight.

J Estimate.
T Value is an average or selected result (see Kennedy Jenks et al. 2004).
U Not detected at value shown.
NA Napthalene data were generated from VOC samples submitted soon after collection for these samples. The results are not provided here but are available in the SCRA database.

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Table 4-1e. R2A Archived Sediment Core Total Petroleum Hydrocarbon Data.

Sample ID	Sample Type Code	Analyte Group / CAS No / Chemical Name / Unit / Parent Sample	Petroleum DRH Diesel Range mg/kg	Petroleum RRH Residual Range mg/kg
LW2-C093-A	N		1300 J	3600 J
LW2-C093-B	N		2300 JT	5500 JT
LW2-C112-A	N		76 J	370 J
LW2-C112-C	N		370 J	800 J
LW2-C112-D	N		780 J	1300 J
LW2-C121-D	N		4.6 U	15 U
LW2-C135-D	N		780 J	1600 J
LW2-C152-E	N		5.3 J	11 U
LW2-C156-F	N		4.5 U	6.6 U
LW2-C182-D	N		1400 J	1600 J
LW2-C185-D	N		50 J	140 J
LW2-C202-D	N		37 J	62 J
LW2-C282-A	N		620 J	1600 J
LW2-C282-B	N		24 J	57 J
LW2-C282-D	N		4.4 UT	4.1 UT
LW2-C290-A	N		18 J	60 J
LW2-C290-D	N		4.6 U	4.3 U
LW2-C329-A	N		30 JT	61 JT
LW2-C329-B	N		150 J	130 J
LW2-C329-D	N		1400 J	390 J
LW2-C335-A	N		34 J	140 J
LW2-C335-C	N		290 J	560 J
LW2-C335-E	N		27.5 JT	87 JT
LW2-C379-A	N		300 J	1200 J
LW2-C379-B	N		590 J	1500 J
LW2-C379-D	N		5 U	14 U
LW2-C380-A	N		38 J	130 J
LW2-C380-C	N		5.5 UT	31.5 JT
LW2-C380-E	N		5.2 U	28 J
LW2-C415-B	N		25 J	56 J
LW2-C415-D	N		4.6 U	13 U
LW2-C441-A1	N		96 J	370 J
LW2-C441-B1	N		360 J	840 J
LW2-C441-D1	N		4.9 U	4.6 U
LW2-C448-D	N		460 J	1300 J
LW2-C456-B	N		88 J	400 J
LW2-C456-C	N		410 J	1200 J
LW2-C461-A	N		160 J	770 J
LW2-C461-B	N		150 J	580 J
LW2-C461-D	N		180 J	540 J
LW2-C494-A	N		120 J	720 J
LW2-C494-B	N		220 J	850 J
LW2-C494-D	N		500 J	1600 J
LW2-G415	N		480 J	1700 J

Notes:

- For all totals, zero is always used for non-detects. If any of the values included in a tota are estimated (J qualified), then the total value is estimated (J qualified). If all analytes in a total are non-detects, then the highest detection limit is used for the total. A "T" qualifier is added to all results that are mathematically derived.
- Coordinate system for geographic coordinates is Oregon State Plan NAD83 HARN/HPGN, Intl. Feet.
- All concentration units are listed as dry weight.

J	Estimate.
T	Value is an average or selected result (see Kennedy Jenks et al. 2004).
U	Not detected at value shown.

Table 4-1f. R2A Archived Sediment Core Phthalate Data.

Sample ID	Sample Type Code	Analyte Group / CAS No / Chemical Name / Unit / Parent Sample	Phthalates 131-11-3 Dimethyl phthalate ug/kg	Phthalates 84-66-2 Diethyl phthalate ug/kg	Phthalates 84-74-2 Dibutyl phthalate ug/kg	Phthalates 85-68-7 Butylbenzyl phthalate ug/kg	Phthalates 117-84-0 Di-n-octyl phthalate ug/kg	Phthalates 117-81-7 Bis(2-ethylhexyl) ug/kg
LW2-C011-F1	N		2.7 U	5.2 U	3.9 U	2.2 U	1.8 U	5.4 U
LW2-C011-G2	FR	LW2-C011-G1	2.7 U	5.2 U	3.9 U	2.3 U	1.8 U	5.5 U
LW2-C015-E	N		4.9 U	9.5 U	7 U	4.1 U	3.3 U	4.6 U
LW2-C019-D1	N		2.4 U	4.7 U	3.7 U	2 U	6.9 U	8.9 U
LW2-C019-E2	FR	LW2-C019-E1	2.6 U	5.1 U	3.8 U	2.2 U	1.8 U	2.5 U
LW2-C022-D	N		3.3 U	6.3 U	5.5 U	2.7 U	2.2 U	34 U
LW2-C060-A	N		2.6 U	5 U	3.7 U	2.2 U	1.7 U	3.9 U
LW2-C111-A2	FR	LW2-C111-A	8.4 J	6.6 U	23	260	110	810
LW2-C121-D	N		2.4 U	4.7 U	3.5 U	2 U	1.6 U	4.1 U
LW2-C135-D	N		31 U	61 U	45 U	26 U	21 U	72 U
LW2-C139-D	N		2.3 U	4.5 U	4.4 J	1.9 U	1.6 U	170
LW2-C152-E	N		2.6 U	5 U	4.8 U	2.2 U	1.7 U	10 U
LW2-C155-D	N		R	R	8.5 UJ	R	R	5 UJ
LW2-C156-F	N		2.4 U	4.6 U	3.4 U	2 U	1.6 U	3.6 U
LW2-C158-E	N		2.6 U	4.9 U	3.7 U	2.1 U	1.7 U	5 U
LW2-C162-D	N		2.5 U	4.9 U	3.7 U	2.1 U	1.7 U	2.4 U
LW2-C163-D2	FR	LW2-C163-D1	2.6 U	5 U	3.7 U	2.2 U	1.8 U	8.8 U
LW2-C171-D	N		R	R	7.1 UJ	R	R	4.4 UJ
LW2-C172-E	N		2.5 U	4.8 U	5.1 U	2.1 U	1.7 U	5.6 U
LW2-C173-E	N		2.4 U	4.5 U	4.4 U	2 U	1.6 U	3.8 U
LW2-C182-D	N		30 U	59 U	44 U	25 U	20 U	29 U
LW2-C184-E	N		2.6 U	5 U	3.7 U	2.2 U	1.7 U	7.8 U
LW2-C185-D	N		4.9 U	9.5 U	7.1 U	4.1 U	3.3 U	6.5 U
LW2-C202-D	N		2.4 U	4.5 U	3.4 U	2 U	1.6 U	2.2 U
LW2-C252-D	N		6 U	12 U	8.6 U	5 U	4.9 J	48 U
LW2-C264-D	N		2.5 U	4.7 U	3.6 U	2.1 U	1.7 U	2.6 U
LW2-C270-D	N		13 U	24 U	18 U	11 U	8.2 U	12 U
LW2-C273-D	N		59 U	120 U	85 U	49 U	39 U	56 U
LW2-C276-D	N		R	R	4.6 UJ	R	R	2.4 UJ
LW2-C283-D	N		2.5 U	4.8 U	3.6 U	2.1 U	1.7 U	2.5 U
LW2-C293-D2	FR	LW2-C293-D	2.4 U	4.6 U	6.5	2 U	1.6 U	3.1 J
LW2-C302-D	N		2700 U	5200 U	3900 U	2300 U	1800 U	2600 U
LW2-C314-D	N		2.6 U	4.9 U	3.7 U	2.1 U	1.7 U	8.8 U
LW2-C327-D	N		2.6 U	5 U	3.7 U	2.2 U	1.7 U	31 U
LW2-C331-G	N		2.4 U	4.5 U	23	2 U	1.6 U	1300

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Table 4-1f. R2A Archived Sediment Core Phthalate Data.

Sample ID	Sample Type Code	Analyte Group / CAS No / Chemical Name / Unit / Parent Sample	Phthalates 131-11-3 Dimethyl phthalate ug/kg	Phthalates 84-66-2 Diethyl phthalate ug/kg	Phthalates 84-74-2 Dibutyl phthalate ug/kg	Phthalates 85-68-7 Butylbenzyl phthalate ug/kg	Phthalates 117-84-0 Di-n-octyl phthalate ug/kg	Phthalates 117-81-7 Bis(2-ethylhexyl) ug/kg
LW2-C335-E	N		2.5 U	4.8 U	7.3 U	2.1 U	1.7 U	5.1 U
LW2-C346-D	N		2.3 U	4.4 U	7.1 U	1.9 U	1.5 U	4.3 U
LW2-C347-E	N		2.6 U	4.9 U	7.9 U	2.1 U	1.7 U	2.5 U
LW2-C349-D	N		2.2 U	4.3 U	4.6 U	1.9 U	1.5 U	2.2 U
LW2-C364-D	N		2.7 U	5.2 U	7.7 U	2.3 U	1.8 U	2.5 U
LW2-C372-E	N		16 U	30 U	23 U	13 U	11 U	15 U
LW2-C373-D	N		3.1 U	6.1 U	14 U	20	2.1 U	200
LW2-C400-D	N		15 U	29 U	22 U	13 U	9.9 U	170
LW2-C405-E	N		2.8 U	5.4 U	8.1 U	2.3 U	1.9 U	5.8 U
LW2-C409-D	N		2.3 U	4.4 U	5.2 U	1.9 U	1.5 U	8.6 U
LW2-C420-D	N		2.3 U	4.5 U	4.9 J	1.9 U	1.6 U	18
LW2-C425-F1	N		2.8 U	5.4 U	4.1 U	2.4 U	1.9 U	6.1 U
LW2-C431-F	N		2.5 U	4.8 U	3.6 U	2.1 U	1.7 U	4.6 U
LW2-C436-E	N		2.4 U	4.6 U	3.8 J	2 U	1.6 U	2.4 J
LW2-C439-D	N		2.4 U	4.7 U	3.5 U	2 U	1.6 U	2.7 J
LW2-C440-D	N		16 U	31 U	23 U	14 U	11 U	25 J
LW2-C444-E	N		R	R	4.5 J	R	R	4.4 J
LW2-C447-F	N		2.6 U	5 U	3.7 U	2.2 U	1.7 U	9.8 J
LW2-C448-D	N		3 U	11	12 U	2.5 U	2 U	100
LW2-C454-H	N		2.7 U	5.3 U	12 U	2.3 U	1.8 U	2.6 U
LW2-C455-F	N		14 U	26 U	19 U	11 U	8.7 U	13 U
LW2-C457-D	N		33 U	63 U	47 U	27 U	22 U	330
LW2-C461-D	N		3.1 U	5.9 U	17 U	7.3 J	2.1 U	62
LW2-C462-D	N		3.1 U	6 U	14 U	2.6 U	2.1 U	87
LW2-C468-D	N		16 U	61	30 J	280	11 U	1400
LW2-C521-D	N		230 U	440 U	330 U	190 U	150 U	220 U

Notes:

- For all totals, zero is always used for non-detects. If any of the values included in a total are estimated (J qualified), then the total value is estimated (J qualified). If all analytes in a total are non-detects, then the highest detection limit is used for the total. A "T" qualifier is added to all results that are mathematically derived.
- Coordinate system for geographic coordinates is Oregon State Plane NAD83 HARN/HPGN, Intl. Feet.
- All concentration units are listed as dry weight.

J Estimate.
T Value is an average or selected result (see Kennedy Jenks et al. 2004).
U Not detected at value shown.

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Table 4-1g. R2A Archived Sediment Core Semivolatile Organic Compound Data.

		Analyte Group	SVOCs	SVOCs	SVOCs	SVOCs	SVOCs	SVOCs	SVOCs	SVOCs	SVOCs	SVOCs	SVOCs
		CAS No	120-82-1	95-50-1	541-73-1	106-46-7	103-33-3	121-14-2	606-20-2	91-58-7	88-74-4	91-94-1	99-09-2
	Sample Type	**Chemical Name**	1,2,4-Trichlorobenzene	1,2-Dichlorobenzene	1,3-Dichlorobenzene	1,4-Dichlorobenzene	Azobenzene	2,4-Dinitrotoluene	2,6-Dinitrotoluene	2-Chloronaphthalene	2-Nitroaniline	3,3'-Dichlorobenzidine	3-Nitroaniline
		Unit	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Sample ID	**Code**	**Parent Sample**											
LW2-C011-F1	N		2.2 U	2 U	2.4 U	2.8 U	3.6 U	4.2 U	4.2 U	5.3 U	4 U	5.5 U	3.9 U
LW2-C011-G2	FR	LW2-C011-G1	2.3 U	2 U	2.4 U	2.8 U	3.6 U	4.2 U	4.2 U	5.3 U	4 U	5.5 U	3.9 U
LW2-C015-E	N		4.1 U	3.5 U	4.4 U	5.2 U	6.5 U	7.6 U	7.6 U	9.7 U	7.3 U	10 U	7 U
LW2-C019-D1	N		2 U	1.8 U	2.2 U	2.6 U	3.2 U	3.8 U	3.8 U	4.8 U	3.6 U	5 U	3.5 U
LW2-C019-E2	FR	LW2-C019-E1	2.2 U	1.9 U	2.3 U	2.8 U	3.5 U	4.1 U	4.1 U	5.2 U	3.9 U	5.4 U	3.8 U
LW2-C020-D	N												
LW2-C022-D	N		2.7 U	2.4 U	2.9 U	3.4 U	4.3 U	5.1 U	5.1 U	6.5 U	4.9 U	6.7 U	4.7 U
LW2-C034-F	N												
LW2-C060-A	N		2.2 U	1.9 U	2.3 U	2.7 U	3.4 U	4 U	4 U	5.1 U	3.9 U	5.3 U	3.7 U
LW2-C061-C	N												
LW2-C061-E	N												
LW2-C066-F	N												
LW2-C111-A2	FR	LW2-C111-A	2.8 U	2.5 U	3 U	3.6 U	4.5 U	5.3 U	5.3 U	6.8 U	5.1 U	7 U	4.9 U
LW2-C111-D2	FR	LW2-C111-D											
LW2-C121-D	N		2 U	1.8 U	2.2 U		3.2 U	3.8 U	3.8 U	4.8 U	3.6 U	5 U	3.5 U
LW2-C133-C	N												
LW2-C135-B	N												
LW2-C135-D	N		26 U	23 U	28 U	33 U	42 U	49 U	49 U	62 U	47 U	64 U	45 U
LW2-C138-A	N												
LW2-C138-B	N												
LW2-C138-D	N												
LW2-C139-D	N		1.9 U	1.7 U	2.1 U	2.5 U	3.1 U	3.6 U	3.6 U	4.6 U	3.5 U	4.7 U	3.3 U
LW2-C144-A	N												
LW2-C144-B	N												
LW2-C144-C	N												
LW2-C144-D	N												
LW2-C144-E	N												
LW2-C147-D	N												
LW2-C148-B	N												
LW2-C148-D	N												
LW2-C148-E	N												
LW2-C152-E	N		2.2 U	1.9 U	2.3 U		3.4 U	4 U	4 U	5.1 U	3.8 U	5.2 U	3.7 U
LW2-C155-D	N		R	R	R		R	R	R	R	R	R	R
LW2-C156-F	N		2 U	1.7 U	2.1 U		3.2 U	3.7 U	3.7 U	4.7 U	3.6 U	4.9 U	3.4 U
LW2-C158-A	N												
LW2-C158-B	N												
LW2-C158-D	N												
LW2-C158-E	N		2.1 U	1.9 U	2.3 U		3.4 U	4 U	4 U	5.1 U	3.8 U	5.2 U	3.7 U
LW2-C162-A	N												
LW2-C162-B	N												
LW2-C162-D	N		2.1 U	1.9 U	2.3 U		3.4 U	3.9 U	3.9 U	5 U	3.8 U	5.2 U	3.7 U
LW2-C163-D2	FR	LW2-C163-D1	2.2 U	1.9 U	2.3 U		3.5 U	4 U	4 U	5.2 U	3.9 U	5.3 U	3.7 U
LW2-C169-A	N												
LW2-C169-C	N												
LW2-C171-A	N												
LW2-C171-D	N		R	R	R		R	R	R	R	R	R	R
LW2-C172-E	N		2.1 U	1.8 U	2.2 U		3.3 U	3.9 U	3.9 U	5 U	3.7 U	5.1 U	3.6 U
LW2-C173-B	N												
LW2-C173-D	N												
LW2-C173-E	N		2 U	1.7 U	2.1 U		3.1 U	3.6 U	3.6 U	4.7 U	3.5 U	4.8 U	3.4 U
LW2-C182-D	N		25 U	22 U	27 U	32 U	40 U	47 U	47 U	60 U	45 U	62 U	44 U

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Table 4-1g. R2A Archived Sediment Core Semivolatile Organic Compound Data.

		Analyte Group	SVOCs	SVOCs	SVOCs	SVOCs	SVOCs	SVOCs	SVOCs	SVOCs	SVOCs	SVOCs	SVOCs
		CAS No	120-82-1	95-50-1	541-73-1	106-46-7	103-33-3	121-14-2	606-20-2	91-58-7	88-74-4	91-94-1	99-09-2
	Sample Type	**Chemical Name**	1,2,4-Trichlorobenzene	1,2-Dichlorobenzene	1,3-Dichlorobenzene	1,4-Dichlorobenzene	Azobenzene	2,4-Dinitrotoluene	2,6-Dinitrotoluene	2-Chloronaphthalene	2-Nitroaniline	3,3'-Dichlorobenzidine	3-Nitroaniline
		Unit	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Sample ID	**Code**	**Parent Sample**											
LW2-C184-E	N		2.2 U	1.9 U	2.3 U		3.4 U	4 U	4 U	5.1 U	3.9 U	5.3 U	3.7 U
LW2-C185-D	N		4.1 U	3.6 U	4.4 U		6.5 U	7.6 U	7.6 U	9.8 U	7.3 U	10 U	7.1 U
LW2-C196-A	N												
LW2-C196-B	N												
LW2-C196-C	N												
LW2-C202-D	N		2 U	1.7 U	2.1 U		3.1 U	3.6 U	3.6 U	4.7 U	3.5 U	4.8 U	3.4 U
LW2-C215-B	N												
LW2-C215-C	N												
LW2-C245-F	N												
LW2-C252-D	N		5 U	4.3 U	5.3 U	6.3 U	8 U	9.3 U	9.3 U	12 U	9 U	13 U	8.6 U
LW2-C258-D	N												
LW2-C260-D	N												
LW2-C264-D	N		2.1 U	1.8 U	2.2 U		3.3 U	3.8 U	3.8 U	4.9 U	3.7 U	5 U	3.5 U
LW2-C269-D	N												
LW2-C270-D	N		11 U	8.9 U	11 U	13 U	17 U	20 U	20 U	25 U	19 U	26 U	18 U
LW2-C273-D	N		49 U	43 U	52 U		78 U	91 U	91 U	120 U	88 U	120 U	85 U
LW2-C276-D	N		R	R	R		R	R	R	R	R	R	R
LW2-C282-A	N												
LW2-C283-D	N		2.1 U	1.8 U	2.2 U	2.7 U	3.3 U	3.9 U	3.9 U	5 U	3.7 U	5.1 U	3.6 U
LW2-C284-E	N												
LW2-C290-A	N												
LW2-C290-B	N												
LW2-C290-D	N												
LW2-C291-A	N												
LW2-C291-B	N												
LW2-C291-C	N												
LW2-C293-A2	FR	LW2-C293-A											
LW2-C293-D2	FR	LW2-C293-D	2 U	1.7 U	2.1 U	2.5 U	3.1 U	3.7 U	3.7 U	4.7 U	3.5 U	4.8 U	3.4 U
LW2-C299-A	N												
LW2-C299-C	N												
LW2-C300-A	N												
LW2-C300-B	N												
LW2-C300-D	N												
LW2-C302-D	N		2300 U	2000 U	2400 U		3600 U	4200 U	4200 U	5300 U	4000 U	5500 U	3900 U
LW2-C314-D	N		2.1 U	1.9 U	2.3 U		3.4 U	3.9 U	3.9 U	5.1 U	3.8 U	5.2 U	3.7 U
LW2-C327-D	N		2.2 U	1.9 U	2.3 U		3.4 U	4 U	4 U	5.1 U	3.9 U	5.3 U	3.7 U
LW2-C331-G	N		2 U	1.7 U	2.1 U		3.1 U	3.6 U	3.6 U	4.7 U	3.5 U	4.8 U	3.4 U
LW2-C335-E	N		2.1 U	1.8 U	2.2 U		3.3 U	3.8 U	3.8 U	4.9 U	3.7 U	5 U	3.6 U
LW2-C342-E	N												
LW2-C346-D	N		1.9 U	1.7 U	2 U	2.4 U	3 U	3.5 U	3.5 U	4.5 U	3.4 U	4.7 U	3.3 U
LW2-C347-E	N		2.1 U	1.9 U	2.3 U	2.7 U	3.4 U	3.9 U	3.9 U	5.1 U	3.8 U	5.2 U	3.7 U
LW2-C349-D	N		1.9 U	1.6 U	2 U	2.3 U	3 U	3.4 U	3.4 U	4.4 U	3.3 U	4.5 U	3.2 U
LW2-C364-D	N		2.3 U	2 U	2.4 U	2.8 U	3.6 U	4.2 U	4.2 U	5.3 U	4 U	5.5 U	3.9 U
LW2-C372-E	N		13 U	12 U	14 U	17 U	21 U	24 U	24 U	31 U	24 U	32 U	23 U
LW2-C373-D	N		2.6 U	2.3 U	2.8 U	3.3 U	4.2 U	4.9 U	4.9 U	6.2 U	4.7 U	6.4 U	4.5 U
LW2-C377-D	N												
LW2-C382-D	N												
LW2-C384-F	N												
LW2-C400-D	N		13 U	11 U	14 U	16 U	20 U	23 U	23 U	30 U	23 U	31 U	22 U
LW2-C401-F	N												
LW2-C405-E	N		2.3 U	2 U	2.5 U	3 U	3.7 U	4.3 U	4.3 U	5.5 U	4.2 U	5.7 U	4 U

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Table 4-1g. R2A Archived Sediment Core Semivolatile Organic Compound Data.

		Analyte Group	SVOCs	SVOCs	SVOCs	SVOCs	SVOCs	SVOCs	SVOCs	SVOCs	SVOCs	SVOCs	SVOCs
		CAS No	120-82-1	95-50-1	541-73-1	106-46-7	103-33-3	121-14-2	606-20-2	91-58-7	88-74-4	91-94-1	99-09-2
	Sample Type	**Chemical Name**	1,2,4-Trichlorobenzene	1,2-Dichlorobenzene	1,3-Dichlorobenzene	1,4-Dichlorobenzene	Azobenzene	2,4-Dinitrotoluene	2,6-Dinitrotoluene	2-Chloronaphthalene	2-Nitroaniline	3,3'-Dichlorobenzidine	3-Nitroaniline
		Unit	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Sample ID	**Code**	**Parent Sample**											
LW2-C409-D	N		1.9 U	1.7 UJ	2 UJ	2.4 UJ	3 U	3.5 U	3.5 U	4.5 U	3.4 U	4.6 U	3.3 U
LW2-C420-D	N		1.9 U	1.7 U	2.1 U	2.5 U	3.1 U	3.6 U	3.6 U	4.6 U	3.5 U	4.7 U	3.3 U
LW2-C421-A	N												
LW2-C421-B	N												
LW2-C421-D	N												
LW2-C425-F1	N		2.4 U	2.1 U	2.5 U	3 U	3.7 U	4.4 U	4.4 U	5.6 U	4.2 U	5.8 U	4.1 U
LW2-C426-A	N												
LW2-C430-A	N												
LW2-C431-F	N		2.1 U	1.8 U	2.2 U	2.6 U	3.3 U	3.9 U	3.9 U	4.9 U	3.7 U	5.1 U	3.6 U
LW2-C434-A	N												
LW2-C436-A	N												
LW2-C436-C	N												
LW2-C436-E	N		2 U	1.7 U	2.1 U	2.5 U	3.2 U	3.7 U	3.7 U	4.7 U	3.6 U	4.9 U	3.4 U
LW2-C439-D	N		2 U	1.8 U	2.2 U	2.6 U	3.2 U	3.8 U	3.8 U	4.8 U	3.6 U	5 U	3.5 U
LW2-C440-A	N												
LW2-C440-C	N												
LW2-C440-D	N		14 U	12 U	14 U	17 U	21 U	25 U	25 U	32 U	24 U	33 U	23 U
LW2-C444-E	N		R	R	R		R	R	R	R	R	R	R
LW2-C445-D	N												
LW2-C447-A	N												
LW2-C447-C	N												
LW2-C447-F	N		2.2 U	1.9 U	2.3 U	2.7 U	3.4 U	4 U	4 U	5.1 U	3.8 U	5.2 U	3.7 U
LW2-C448-A	N												
LW2-C448-C	N												
LW2-C448-D	N		2.5 U	2.2 U	2.6 U	3.1 U	3.9 U	4.6 U	4.6 U	5.9 U	4.4 U	6 U	4.3 U
LW2-C454-H	N		2.3 U	2 U	2.4 U	2.9 U	3.6 U	4.2 U	4.2 U	5.4 U	4.1 U	5.6 U	3.9 U
LW2-C455-F	N		11 U	9.4 U	12 U	14 U	18 U	21 U	21 U	27 U	20 U	27 U	19 U
LW2-C456-G	N												
LW2-C457-D	N		27 U	24 U	29 U	34 U	43 U	50 U	50 U	65 U	49 U	66 U	47 U
LW2-C458-D	N												
LW2-C461-D	N		2.6 U	2.2 U	2.7 U	3.2 U	4.1 U	4.8 U	4.8 U	6.1 U	4.6 U	6.3 U	4.4 U
LW2-C462-D	N		2.6 U	2.3 U	2.8 U	3.3 U	4.2 U	4.8 U	4.8 U	6.2 U	4.7 U	6.4 U	4.5 U
LW2-C468-D	N		14 U	12 U	15 U	17 U	22 U	25 U	25 U	32 U	24 U	33 U	24 U
LW2-C521-B	N												
LW2-C521-C	N												
LW2-C521-D	N		190 U	170 U	200 U	240 U	300 U	350 U	350 U	450 U	340 U	460 U	330 U

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Table 4-1g. R2A Archived Sediment Core Semivolatile Organic Compound Data.

		Analyte Group	SVOCs	SVOCs	SVOCs	SVOCs	SVOCs	SVOCs	SVOCs	SVOCs	SVOCs	SVOCs	SVOCs
		CAS No	101-55-3	106-47-8	7005-72-3	100-01-6	62-53-3	65-85-0	100-51-6	111-91-1	111-44-4	86-74-8	132-64-9
	Sample Type	**Chemical Name**	4-Bromophenyl phenyl ether	4-Chloroaniline	4-Chlorophenyl phenyl ether	4-Nitroaniline	Aniline	Benzoic acid	Benzyl alcohol	Bis(2-chloroethoxy) methane	Bis(2-chloroethyl) ether	Carbazole	Dibenzofuran
Sample ID	**Code**	**Parent Sample** / **Unit**	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
LW2-C011-F1	N		2.1 U	3.1 U	3 U	5 U	2.2 U	150 U	5.5 U	2 U	3.6 U	2 U	0.25 U
LW2-C011-G2	FR	LW2-C011-G1	2.1 U	3.1 U	3 U	5 U	2.3 U	150 U	5.5 U	2 U	3.6 U	2 U	
LW2-C015-E	N		3.8 U	5.7 U	5.4 U	9.2 U	4.1 U	260 U	10 U	3.5 U	6.5 U	5.3 J	2.8
LW2-C019-D1	N		1.9 U	2.8 U	2.7 U	4.6 U	2 U	130 U	5 U	1.8 U	3.2 U	1.8 U	1 J
LW2-C019-E2	FR	LW2-C019-E1	2.1 U	3.1 U	2.9 U	4.9 U	2.2 U	140 U	5.4 U	1.9 U	3.5 U	1.9 U	
LW2-C020-D	N												4
LW2-C022-D	N		2.6 U	3.8 U	3.6 U	6.1 U	2.7 U	180 U	6.7 U	2.4 U	4.3 U	2.4 U	
LW2-C034-F	N												0.74 U
LW2-C060-A	N		2 U	3 U	2.9 U	4.8 U	R	R	5.3 U	1.9 U	3.4 U	3.9 J	1.1 J
LW2-C061-C	N												
LW2-C061-E	N												
LW2-C066-F	N												
LW2-C111-A2	FR	LW2-C111-A	2.7 U	4 U	3.8 U	6.4 U	2.8 U	180 U	7 U	2.5 U	4.5 U	6.4 J	
LW2-C111-D2	FR	LW2-C111-D											120
LW2-C121-D	N		1.9 U	2.8 U	2.7 U	4.6 U	2 U	130 U	5 U	1.8 U	3.2 U	1.8 U	0.23 U
LW2-C133-C	N												
LW2-C135-B	N												
LW2-C135-D	N		25 U	37 U	35 U	59 U	26 U	1700 U	64 U	23 U	42 U	23 U	70
LW2-C138-A	N												
LW2-C138-B	N												
LW2-C138-D	N												
LW2-C139-D	N		1.8 U	2.7 U	2.6 U	4.4 U	1.9 U	130 U	4.7 U	1.7 U	3.1 U	1.7 U	0.22 U
LW2-C144-A	N												
LW2-C144-B	N												
LW2-C144-C	N												18
LW2-C144-D	N												
LW2-C144-E	N												0.23 U
LW2-C147-D	N												
LW2-C148-B	N												
LW2-C148-D	N												
LW2-C148-E	N												43
LW2-C152-E	N		2 U	3 U	2.9 U	4.8 U	2.2 U	140 U	5.2 U	1.9 U	3.4 U	1.9 U	0.48 J
LW2-C155-D	N		R	R	R	R	R	140 U	5.2 U	R	R	R	0.24 U
LW2-C156-F	N		1.9 U	2.8 U	2.7 U	4.5 U	2 U	130 U	4.9 U	1.7 U	3.2 U	1.7 U	0.23 U
LW2-C158-A	N												
LW2-C158-B	N												
LW2-C158-D	N												
LW2-C158-E	N		2 U	3 U	2.8 U	4.8 U	2.1 U	140 U	5.2 U	1.9 U	3.4 U	1.9 U	0.64 J
LW2-C162-A	N												
LW2-C162-B	N												
LW2-C162-D	N		2 U	3 U	2.8 U	4.8 U	2.1 U	140 U	5.2 U	1.9 U	3.4 U	1.9 U	0.24 U
LW2-C163-D2	FR	LW2-C163-D1	2 U	3 U	2.9 U	4.9 U	2.2 U	140 U	5.3 U	1.9 U	3.5 U	1.9 U	0.25 U
LW2-C169-A	N												
LW2-C169-C	N												
LW2-C171-A	N												
LW2-C171-D	N		R	R	R	R	R	140 U	5.3 U	R	R	R	0.24 U
LW2-C172-E	N		2 U	2.9 U	2.8 U	4.7 U	2.1 U	140 U	5.1 U	1.8 U	3.3 U	1.8 U	1.2 J
LW2-C173-B	N												
LW2-C173-D	N												
LW2-C173-E	N		1.8 U	2.7 U	2.6 U	4.4 U	2 U	130 U	4.8 U	1.7 U	3.1 U	1.7 U	0.22 U
LW2-C182-D	N		24 U	35 U	34 U	57 U	25 U	1600 U	62 U	22 U	40 U	59 J	86

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Table 4-1g. R2A Archived Sediment Core Semivolatile Organic Compound Data.

		Analyte Group	SVOCs	SVOCs	SVOCs	SVOCs	SVOCs	SVOCs	SVOCs	SVOCs	SVOCs	SVOCs	SVOCs
		CAS No	101-55-3	106-47-8	7005-72-3	100-01-6	62-53-3	65-85-0	100-51-6	111-91-1	111-44-4	86-74-8	132-64-9
	Sample Type	**Chemical Name**	4-Bromophenyl phenyl ether	4-Chloroaniline	4-Chlorophenyl phenyl ether	4-Nitroaniline	Aniline	Benzoic acid	Benzyl alcohol	Bis(2-chloroethoxy) methane	Bis(2-chloroethyl) ether	Carbazole	Dibenzofuran
Sample ID	**Code**	**Unit** / **Parent Sample**	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
LW2-C184-E	N		2 U	3 U	2.9 U	4.9 U	2.2 U	140 U	5.3 U	1.9 U	3.4 U	2.4 J	1 J
LW2-C185-D	N		3.8 U	5.7 U	5.4 U	9.2 U	4.1 U	260 U	10 U	3.6 U	6.5 U	3.6 U	1.9
LW2-C196-A	N												
LW2-C196-B	N												
LW2-C196-C	N												
LW2-C202-D	N		1.8 U	2.7 U	2.6 U	4.4 U	2 U	130 U	4.8 U	1.7 U	3.1 U	1.7 U	0.85 J
LW2-C215-B	N												
LW2-C215-C	N												
LW2-C245-F	N												0.24 U
LW2-C252-D	N		4.7 U	7 U	6.7 U	12 U	5 U	320 U	13 U	4.3 U	8 U	39	21
LW2-C258-D	N												190
LW2-C260-D	N												
LW2-C264-D	N		1.9 U	2.9 U	2.7 U	4.6 U	2.1 UJ	130 UJ	5 U	1.8 U	3.3 U	1.8 U	1.1 J
LW2-C269-D	N												
LW2-C270-D	N		9.6 U	15 U	14 U	24 U	11 U	660 U	26 U	8.9 U	17 U	14 J	37
LW2-C273-D	N		46 U	69 U	65 U	120 U	49 U	3200 U	120 U	43 U	78 U	77 J	150
LW2-C276-D	N		R	R	R	R	R	140 U	5.1 U	R	R	67 J	19
LW2-C282-A	N												11
LW2-C283-D	N		2 U	2.9 U	2.8 U	4.7 U	2.1 U	140 U	5.1 U	1.8 U	3.3 U	1.8 U	
LW2-C284-E	N												0.37 J
LW2-C290-A	N												
LW2-C290-B	N												
LW2-C290-D	N												
LW2-C291-A	N												
LW2-C291-B	N												
LW2-C291-C	N												
LW2-C293-A2	FR	LW2-C293-A											2300
LW2-C293-D2	FR	LW2-C293-D	1.9 U	2.8 U	2.6 U	4.4 U	2 U	130 U	4.8 U	1.7 U	3.1 U	4 J	2.6
LW2-C299-A	N												
LW2-C299-C	N												
LW2-C300-A	N												
LW2-C300-B	N												
LW2-C300-D	N												
LW2-C302-D	N		2100 U	3100 U	3000 U	5100 U	2300 U	150000 U	5500 U	2000 U	3600 U	220000	100000
LW2-C314-D	N		2 U	3 U	2.8 U	4.8 U	2.1 U	140 U	5.2 U	1.9 U	3.4 U	2.4 J	4.2
LW2-C327-D	N		2 U	3 U	2.9 U	4.9 U	2.2 U	140 U	5.3 U	1.9 U	3.4 U	4.8 J	13
LW2-C331-G	N		1.8 U	2.7 U	2.6 U	4.4 U	2 U	130 U	4.8 U	1.7 U	3.1 U	1.7 U	
LW2-C335-E	N		1.9 U	2.9 U	2.8 U	4.6 U	2.1 U	130 U	5 U	1.8 U	3.3 U	1.8 U	1.4 J
LW2-C342-E	N												0.51 J
LW2-C346-D	N		1.8 U	2.7 U	2.5 U	4.3 U	1.9 U	120 U	4.7 U	1.7 U	3 U	1.7 U	0.22 U
LW2-C347-E	N		2 U	3 U	2.8 U	4.8 U	2.1 U	140 U	5.2 U	1.9 U	3.4 U	1.9 U	0.29 J
LW2-C349-D	N		1.7 U	2.6 U	2.5 U	4.2 U	1.9 U	120 U	4.5 U	1.6 U	3 U	1.6 U	
LW2-C364-D	N		2.1 U	3.1 U	3 U	5 U	2.3 U	150 U	5.5 U	2 U	3.6 U	3.8 J	8.2
LW2-C372-E	N		12 U	18 U	18 U	30 U	13 U	830 U	32 U	12 U	21 U	12 U	11
LW2-C373-D	N		2.5 U	3.7 U	3.5 U	5.9 U	2.6 U	170 U	6.4 U	2.3 U	4.2 U	5.1 J	4.3
LW2-C377-D	N												32
LW2-C382-D	N												
LW2-C384-F	N												0.23 U
LW2-C400-D	N		12 U	18 U	17 U	28 U	13 U	790 U	31 U	11 U	20 U	11 U	
LW2-C401-F	N												0.88 J
LW2-C405-E	N		2.2 U	3.3 U	3.1 U	5.2 U	2.3 U	150 U	5.7 U	2 U	3.7 U	2 U	0.26 U

ANC02598
BZTO104(e)002598

Table 4-1g. R2A Archived Sediment Core Semivolatile Organic Compound Data.

		Analyte Group	SVOCs	SVOCs	SVOCs	SVOCs	SVOCs	SVOCs	SVOCs	SVOCs	SVOCs	SVOCs	SVOCs
		CAS No	101-55-3	106-47-8	7005-72-3	100-01-6	62-53-3	65-85-0	100-51-6	111-91-1	111-44-4	86-74-8	132-64-9
	Sample Type	**Chemical Name**	4-Bromophenyl phenyl ether	4-Chloroaniline	4-Chlorophenyl phenyl ether	4-Nitroaniline	Aniline	Benzoic acid	Benzyl alcohol	Bis(2-chloroethoxy) methane	Bis(2-chloroethyl) ether	Carbazole	Dibenzofuran
Sample ID	**Code**	**Unit** / **Parent Sample**	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
LW2-C409-D	N		1.8 U	2.7 U	2.5 U	4.3 U	1.9 U	120 U	4.6 U	1.7 U	3 U	1.7 U	0.6 J
LW2-C420-D	N		1.8 U	2.7 U	2.6 U	4.4 U	1.9 U	130 U	4.7 U	1.7 U	3.1 U	1.7 U	
LW2-C421-A	N												
LW2-C421-B	N												
LW2-C421-D	N												
LW2-C425-F1	N		2.2 U	3.3 U	3.1 U	5.3 U	2.4 U	150 U	9.4	2.1 U	3.7 U	2.1 U	
LW2-C426-A	N												1.8 J
LW2-C430-A	N												4.8
LW2-C431-F	N		2 U	2.9 U	2.8 U	4.7 U	2.1 U	140 U	5.1 U	1.8 U	3.3 U	1.8 U	
LW2-C434-A	N												4
LW2-C436-A	N												
LW2-C436-C	N												
LW2-C436-E	N		1.9 U	2.8 U	2.7 U	4.5 U	2 U	130 U	4.9 U	1.7 U	3.2 U	1.7 U	0.71 J
LW2-C439-D	N		1.9 U	2.8 U	2.7 U	4.6 U	2 UJ	130 U	5 U	1.8 U	3.2 U	1.8 U	0.23 U
LW2-C440-A	N												
LW2-C440-C	N												
LW2-C440-D	N		13 U	19 U	18 U	30 U	14 U	840 U	33 U	12 U	21 U	12 U	14
LW2-C444-E	N		R	R	R	R	R	140 U	5.2 U	R	R	R	
LW2-C445-D	N												4
LW2-C447-A	N												
LW2-C447-C	N												
LW2-C447-F	N		2 U	3 U	2.9 U	4.8 U	2.2 U	140 U	5.2 U	1.9 U	3.4 U	1.9 U	
LW2-C448-A	N												
LW2-C448-C	N												
LW2-C448-D	N		2.3 U	3.4 U	3.3 U	5.6 U	2.5 U	160 U	6 U	2.2 U	3.9 U	2.2 U	
LW2-C454-H	N		2.1 U	3.2 U	3 U	5.1 U	2.3 U	150 U	5.6 U	2 U	3.6 U	3.8 J	
LW2-C455-F	N		11 U	16 U	15 U	25 U	11 U	700 U	27 U	9.4 U	18 U	9.4 U	1.9 J
LW2-C456-G	N												0.43 J
LW2-C457-D	N		25 U	38 U	36 U	61 U	27 U	1800 U	66 U	24 U	43 U	24 U	12
LW2-C458-D	N												
LW2-C461-D	N		2.4 U	3.6 U	3.4 U	5.8 U	2.6 U	170 U	6.3 U	2.2 U	4.1 U	3.8 J	
LW2-C462-D	N		2.4 U	3.6 U	3.5 U	5.9 U	2.6 U	170 U	6.4 U	2.3 U	4.2 U	2.3 U	
LW2-C468-D	N		13 U	19 U	18 U	31 U	14 U	860 U	33 U	12 U	22 U	12 U	
LW2-C521-B	N												
LW2-C521-C	N												
LW2-C521-D	N		180 U	270 U	250 U	430 U	190 U	12000 U	460 U	170 U	300 U	6700	3800

ANC02599
BZTO104(e)002599

Table 4-1g. R2A Archived Sediment Core Semivolatile Organic Compound Data.

		Analyte Group	SVOCs	SVOCs	SVOCs	SVOCs	SVOCs	SVOCs	SVOCs	SVOCs	SVOCs	SVOCs
		CAS No	118-74-1	87-68-3	77-47-4	67-72-1	78-59-1	98-95-3	62-75-9	621-64-7	86-30-6	39638-32-9
	Sample Type	**Chemical Name**	Hexachlorobenzene	Hexachlorobutadiene	Hexachlorocyclopentadiene	Hexachloroethane	Isophorone	Nitrobenzene	N-Nitrosodimethylamine	N-Nitrosodipropylamine	N-Nitrosodiphenylamine	Bis(2-chloroisopropyl) ether
		Unit	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Sample ID	**Code**	**Parent Sample**										
LW2-C011-F1	N		0.071 U	0.39 J	22 U	0.28 U	2.4 U	3 U	9 U	4.7 U	3.3 U	1.8 U
LW2-C011-G2	FR	LW2-C011-G1	3.1 U	2.1 U	23 U	3.3 U	2.4 U	3 U	9 U	4.8 U	3.3 U	1.8 U
LW2-C015-E	N		0.11 U	0.26 NJ	41 U	0.2 U	4.4 U	5.4 U	17 UJ	8.7 U	6 U	3.3 U
LW2-C019-D1	N		1 U	1.3 U	20 U	0.35 U	2.2 U	2.7 U	8.1 UJ	4.3 U	3 U	1.6 U
LW2-C019-E2	FR	LW2-C019-E1	0.069 U	0.28 U	22 U	0.34 U	2.3 U	2.9 U	8.8 U	4.6 U	3.2 U	1.8 U
LW2-C020-D	N		1.6 U	1.5 U		0.4 U						
LW2-C022-D	N		3.8 U	2.6 U	27 U	4 U	2.9 U	3.6 U	11 UJ	5.8 U	4 U	2.2 U
LW2-C034-F	N		0.13 J	0.44 UJ		0.57 J						
LW2-C060-A	N		0.068 U	2.5 NJ	22 U	0.2 UJ	2.3 U	2.9 U	8.7 U	4.6 U	3.2 U	1.7 U
LW2-C061-C	N		0.072 U	0.39 UJ		0.12 UJ						
LW2-C061-E	N		0.064 UJ	0.6 UJ		0.52 UJ						
LW2-C066-F	N		0.23 U	0.67 J		0.35 UJ						
LW2-C111-A2	FR	LW2-C111-A	4 U	2.7 U	28 U	4.2 U	3 U	3.8 U	12 U	6 U	4.2 U	2.3 U
LW2-C111-D2	FR	LW2-C111-D										
LW2-C121-D	N		0.064 U	0.26 UJ	20 U	0.2 UJ	2.2 U	2.7 U	8.2 U	4.3 U	3 U	1.6 U
LW2-C133-C	N		0.21 NJ	0.33 U		0.29 U						
LW2-C135-B	N		1.9 U			2 UJ						
LW2-C135-D	N		0.49 J	0.33 U	260 U	0.74 J	28 U	35 U	110 UJ	55 U	38 U	21 U
LW2-C138-A	N		0.16 U	0.63 U		0.18 U						
LW2-C138-B	N		0.087 U	0.35 U		0.22 U						
LW2-C138-D	N		0.066 U	0.26 UJ		0.4 UJ						
LW2-C139-D	N		0.061 U	0.25 UJ	19 U	0.29 UJ	2.1 U	2.6 U	7.8 U	4.1 U	2.8 U	1.6 U
LW2-C144-A	N		0.097 U	0.39 U		0.24 U						
LW2-C144-B	N		0.085 U	0.38 U		0.2 U						
LW2-C144-C	N											
LW2-C144-D	N		0.066 U	0.27 U		0.66						
LW2-C144-E	N											
LW2-C147-D	N		2 U	3.3 U		0.9 UJ						
LW2-C148-B	N		0.4 U	1.6 U		0.43 UJ						
LW2-C148-D	N		0.81 NJ	0.35 NJ		0.4 NJ						
LW2-C148-E	N											
LW2-C152-E	N		3 U	2 U	22 U	3.1 U	2.3 U	2.9 U	8.6 UJ	4.5 U	3.1 U	1.7 U
LW2-C155-D	N		R	R	R	R	R	R	R	R	R	R
LW2-C156-F	N		2.8 U	1.9 U	20 U	2.9 U	2.1 U	2.7 U	8 UJ	4.2 U	2.9 U	1.6 U
LW2-C158-A	N		0.085 U	0.65 U		0.32 U						
LW2-C158-B	N		0.092 U	0.37 U		0.1 UJ						
LW2-C158-D	N		0.2 U	0.47 U		0.52 J						
LW2-C158-E	N		3 U	2 U	21 U	3.1 U	2.3 U	2.8 U	8.6 U	4.5 U	3.1 U	1.7 U
LW2-C162-A	N		0.084 U	0.33 UJ		0.44 UJ						
LW2-C162-B	N		0.093 U	0.37 U		0.11 UJ						
LW2-C162-D	N		0.067 U	0.27 UJ	21 U	0.073 UJ	2.3 U	2.8 U	8.5 U	4.5 U	3.1 U	1.7 U
LW2-C163-D2	FR	LW2-C163-D1	3 U	2 U	22 U	3.2 U	2.3 U	2.9 U	8.7 U	4.6 U	3.2 U	1.8 U
LW2-C169-A	N		0.093 U	0.84 UJ		0.73 NJ						
LW2-C169-C	N		0.2 J	0.32 U		0.31 U						
LW2-C171-A	N		0.16 U	0.59 UJ		0.18 U						
LW2-C171-D	N		0.068 U	0.27 UJ	R	0.074 U	R	R	R	R	R	R
LW2-C172-E	N		0.13 UJ	0.26 U	21 U	0.54 J	2.2 U	2.8 U	8.4 UJ	4.4 U	3 U	1.7 U
LW2-C173-B	N		0.46 U	1.9 U		0.96 UJ						
LW2-C173-D	N		0.064 U	0.25 U		0.25 U						
LW2-C173-E	N		2.7 U	1.8 U	20 U	2.9 U	2.1 U	2.6 U	7.9 UJ	4.2 U	2.9 U	1.6 U
LW2-C182-D	N		1.8 U	6.4 U	250 U	1.8 U	27 U	34 U	110 UJ	54 U	37 U	20 U

ANC02600
BZTO104(e)002600

Table 4-1g. R2A Archived Sediment Core Semivolatile Organic Compound Data.

		Analyte Group	SVOCs	SVOCs	SVOCs	SVOCs	SVOCs	SVOCs	SVOCs	SVOCs	SVOCs	SVOCs
		CAS No	118-74-1	87-68-3	77-47-4	67-72-1	78-59-1	98-95-3	62-75-9	621-64-7	86-30-6	39638-32-9
	Sample Type	**Chemical Name**	Hexachlorobenzene	Hexachlorobutadiene	Hexachlorocyclopentadiene	Hexachloroethane	Isophorone	Nitrobenzene	N-Nitrosodimethylamine	N-Nitrosodipropylamine	N-Nitrosodiphenylamine	Bis(2-chloroisopropyl) ether
Sample ID	**Code**	**Parent Sample**	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
LW2-C184-E	N		3 U	2 U	22 U	3.2 U	2.3 U	2.9 U	8.7 U	4.6 U	3.2 U	1.7 U
LW2-C185-D	N		5.7 U	3.8 U	41 U	6 U	4.4 U	5.4 U	17 UJ	8.7 U	6 U	3.3 U
LW2-C196-A	N		0.19 U	0.28 UJ		0.13 UJ						
LW2-C196-B	N		0.18 U	0.48 NJ		0.2 UJ						
LW2-C196-C	N		0.063 U	0.25 U		0.2 U						
LW2-C202-D	N		0.062 U	0.25 U	20 U	0.17 U	2.1 U	2.6 U	7.9 U	4.2 U	2.9 U	1.6 U
LW2-C215-B	N		0.061 UJ	0.24 U		0.066 U						
LW2-C215-C	N		0.059 U	0.24 U		0.58 U						
LW2-C245-F	N											
LW2-C252-D	N		0.4 U	1.6 U	50 U	0.43 U	5.3 U	6.7 U	21 UJ	11 U	7.3 U	4 U
LW2-C258-D	N											
LW2-C260-D	N		0.062 U	0.25 UJ		0.3 U						
LW2-C264-D	N		0.065 U	0.26 U	21 U	0.28 U	2.2 U	2.7 U	8.2 UJ	4.3 U	3 U	1.7 U
LW2-C269-D	N		5.7	4 U		1.8 UJ						
LW2-C270-D	N		0.26 U	0.26 UJ	110 U	0.27 U	11 U	14 U	42 U	22 U	15 U	8.2 U
LW2-C273-D	N		0.81 U	0.77 U	490 U	0.41 U	52 U	65 U	200 U	110 U	72 U	39 U
LW2-C276-D	N		0.34 U	1.4 U	R	0.36 UJ	R	R	R	R	R	R
LW2-C282-A	N											
LW2-C283-D	N		2.9 U	2 U	21 U	3.1 U	2.2 U	2.8 U	8.4 U	4.4 U	3.1 U	1.7 U
LW2-C284-E	N											
LW2-C290-A	N		0.083 U	0.24 U		0.35 J						
LW2-C290-B	N		0.11 UJ	0.34 U		0.49 NJ						
LW2-C290-D	N		0.066 U	0.26 U		0.56 U						
LW2-C291-A	N		0.11 U	0.43 U		0.2 U						
LW2-C291-B	N		0.2 U	0.58 U		0.2 U						
LW2-C291-C	N		0.33 U	1.2		0.2 U						
LW2-C293-A2	FR	LW2-C293-A										
LW2-C293-D2	FR	LW2-C293-D	2.8 U	1.9 U	20 U	2.9 U	2.1 U	2.6 U	7.9 U	4.2 U	2.9 U	1.6 U
LW2-C299-A	N		2.9 NJ	3.4 U		0.93 UJ						
LW2-C299-C	N		9 U	8.5 U		4.8 UJ						
LW2-C300-A	N		0.082 U	0.33 UJ		0.18 UJ						
LW2-C300-B	N		0.45 U	1.8 UJ		0.68 U						
LW2-C300-D	N		1.2 NJ	1.3 UJ		0.34 U						
LW2-C302-D	N		71	38 U	23000 U	15 UJ	2400 U	3000 U	9000 UJ	4800 U	3300 U	1800 U
LW2-C314-D	N		0.13 U	0.79 J	21 U	0.29 UJ	2.3 U	2.8 U	8.5 U	4.5 U	3.1 U	1.7 U
LW2-C327-D	N		0.2 U	0.27 U	22 U	0.66	2.3 U	2.9 U	8.7 UJ	4.6 U	3.2 U	1.7 U
LW2-C331-G	N		2.7 U	1.8 U	20 U	2.9 U	2.1 U	2.6 U	7.9 U	4.2 U	2.9 U	1.6 U
LW2-C335-E	N		2.9 U	1.9 U	21 U	3 U	2.2 U	2.8 U	8.3 U	4.4 U	3 U	1.7 U
LW2-C342-E	N											
LW2-C346-D	N		2.7 U	1.8 U	19 U	2.8 U	2 U	2.5 U	7.7 U	4 U	2.8 U	1.5 U
LW2-C347-E	N		0.067 UJ	0.27 UJ	21 U	0.35 UJ	2.3 U	2.8 U	8.5 U	4.5 U	3.1 U	1.7 U
LW2-C349-D	N		0.059 U	0.23 UJ	19 U	0.32 U	2 U	2.5 U	7.4 U	3.9 U	2.7 U	1.5 U
LW2-C364-D	N		3.1 U	2.1 U	23 U	3.3 U	2.4 U	3 U	9 U	4.8 U	3.3 U	1.8 U
LW2-C372-E	N		18 U	12 U	130 U	19 U	14 U	18 U	53 U	28 U	19 U	11 U
LW2-C373-D	N		3.7 U	2.5 U	26 U	3.8 U	2.8 U	3.5 U	11 U	5.6 U	3.8 U	2.1 U
LW2-C377-D	N											
LW2-C382-D	N		0.15 U	0.28 UJ		0.075 UJ						
LW2-C384-F	N											
LW2-C400-D	N		18 U	12 U	130 U	18 U	14 U	17 U	50 U	27 U	18 U	9.9 U
LW2-C401-F	N		0.07 U	0.28 U		0.24 UJ						
LW2-C405-E	N		3.3 U	2.2 U	23 U	3.4 U	2.5 U	3.1 U	9.4 U	4.9 U	3.4 U	1.9 U

ANC02601
BZTO104(e)002601

Table 4-1g. R2A Archived Sediment Core Semivolatile Organic Compound Data.

Sample ID	Sample Type Code	Parent Sample	Analyte Group / CAS No / Chemical Name / Unit	SVOCs 118-74-1 Hexachlorobenzene ug/kg	SVOCs 87-68-3 Hexachlorobutadiene ug/kg	SVOCs 77-47-4 Hexachlorocyclopentadiene ug/kg	SVOCs 67-72-1 Hexachloroethane ug/kg	SVOCs 78-59-1 Isophorone ug/kg	SVOCs 98-95-3 Nitrobenzene ug/kg	SVOCs 62-75-9 N-Nitrosodimethylamine ug/kg	SVOCs 621-64-7 N-Nitrosodipropylamine ug/kg	SVOCs 86-30-6 N-Nitrosodiphenylamine ug/kg	SVOCs 39638-32-9 Bis(2-chloroisopropyl) ether ug/kg
LW2-C409-D	N			0.06 U	0.24 UJ	19 U	0.065 UJ	2 U	2.5 U	7.6 U	4 U	2.8 U	1.5 U
LW2-C420-D	N			0.31 U	1.3 U	19 U	0.35 UJ	2.1 U	2.6 U	7.8 U	4.1 U	2.8 U	1.6 U
LW2-C421-A	N			0.2 U	0.35 U		0.57 NJ						
LW2-C421-B	N			0.15 U	0.36 U		0.5 J						
LW2-C421-D	N			0.069 U	0.28 U		0.29 U						
LW2-C425-F1	N			3.3 U	2.2 U	24 U	3.4 U	2.5 U	3.1 U	9.4 U	5 U	3.4 U	1.9 UJ
LW2-C426-A	N												
LW2-C430-A	N												
LW2-C431-F	N			0.066 UJ	0.26 U	21 U	0.33 J	2.2 U	2.8 U	8.3 U	4.4 U	3 U	1.7 U
LW2-C434-A	N												
LW2-C436-A	N			0.26	0.34 U		0.29 U						
LW2-C436-C	N			0.39 UJ	1.6 U		0.42 U						
LW2-C436-E	N			2.8 U	1.9 U	20 U	2.9 U	2.1 U	2.7 U	8 U	4.2 U	2.9 U	1.6 U
LW2-C439-D	N			2.8 U	1.9 U	20 U	3 U	2.2 U	2.7 U	8.1 U	4.3 U	3 U	1.6 U
LW2-C440-A	N			0.14 J	0.35 U		0.55 J						
LW2-C440-C	N			0.19 U	0.33 U		0.71 NJ						
LW2-C440-D	N			19 U	13 U	140 U	20 U	14 U	18 U	54 U	28 U	20 U	11 U
LW2-C444-E	N			0.068 U	0.27 U	R	0.52 U	R	R	R	R	R	R
LW2-C445-D	N												
LW2-C447-A	N			0.085 U	0.34 U		0.28 U						
LW2-C447-C	N			0.094 U	0.3 U		0.2 U						
LW2-C447-F	N			3 U	2 U	22 U	3.1 U	2.3 U	2.9 U	8.6 U	4.5 U	3.1 U	1.7 U
LW2-C448-A	N			0.48	0.4 UJ		0.26 UJ						
LW2-C448-C	N			0.092 U	0.37 U		0.31 U						
LW2-C448-D	N			3.4 U	2.3 U	25 U	3.6 U	2.6 U	3.3 U	9.9 UJ	5.2 U	3.6 U	2 U
LW2-C454-H	N			3.2 U	2.1 U	23 U	3.3 U	2.4 U	3 U	9.2 UJ	4.8 U	3.3 U	1.8 U
LW2-C455-F	N			16 U	11 U	110 U	16 U	12 U	15 U	45 U	24 U	16 U	8.7 U
LW2-C456-G	N												
LW2-C457-D	N			38 U	25 U	270 U	40 U	29 U	36 U	110 U	58 U	40 U	22 U
LW2-C458-D	N			0.088 U	0.43 U		0.22 U						
LW2-C461-D	N			3.6 U	2.4 U	26 U	3.7 U	2.7 U	3.4 U	11 U	5.4 U	3.7 U	2.1 U
LW2-C462-D	N			3.6 U	2.4 U	26 U	3.8 U	2.8 U	3.5 U	11 U	5.5 U	3.8 U	2.1 U
LW2-C468-D	N			19 U	13 U	140 U	20 U	15 U	18 U	55 U	29 U	20 U	11 U
LW2-C521-B	N			2.9 U	3.1 U		0.83 U						
LW2-C521-C	N			2.3 U	2.6 U		0.71 U						
LW2-C521-D	N			3.8 U	2.4 U	1900 U	0.65 UJ	200 U	250 U	760 U	400 U	280 U	150 U

Notes:

- For all totals, zero is always used for non-detects. If any of the values included in a total are estimated (J qualified), then the total value is estimated (J qualified). If all analytes in a total are non-detects, then the highest detection limit is used for the total. A "T" qualifier is added to all results that are mathematically derived.
- Coordinate system for geographic coordinates is Oregon State Plane NAD83 HARN/HPGN, Intl. Feet.
- All concentration units are listed as dry weight.

J Estimate.
T Value is an average or selected result (see Kennedy Jenks et al. 2004).
U Not detected at value shown.

ANC02602
BZTO104(e)002602

Table 4-1h. R2A Archived Sediment Core Phenol Data.

		Analyte Group	Phenols	Phenols	Phenols	Phenols	Phenols	Phenols	Phenols	Phenols	Phenols
		CAS No	935-95-5	95-95-4	88-06-2	120-83-2	105-67-9	51-28-5	95-57-8	95-48-7	88-75-5
	Sample Type Code	**Chemical Name Unit**	2,3,5,6-Tetrachlorophenol ug/kg	2,4,5-Trichlorophenol ug/kg	2,4,6-Trichlorophenol ug/kg	2,4-Dichlorophenol ug/kg	2,4-Dimethylphenol ug/kg	2,4-Dinitrophenol ug/kg	2-Chlorophenol ug/kg	2-Methylphenol ug/kg	2-Nitrophenol ug/kg
Sample ID		**Parent Sample**									
LW2-C011-F1	N		0.62 U	0.49 U	0.37 U	2.7 U	8.1 U	53 UJ	2.5 U	5 U	3.9 U
LW2-C011-G2	FR	LW2-C011-G1	0.62 U	0.49 U	0.37 U	2.7 U	8.1 U	53 UJ	2.5 U	5 U	3.9 U
LW2-C015-E	N		0.57 U	0.45 U	0.34 U	4.9 U	15 U	97 U	4.6 U	9.2 U	7 U
LW2-C019-D1	N		0.56 U	0.44 U	0.34 U	2.4 U	7.3 U	48 U	2.3 U	4.6 U	3.5 U
LW2-C019-E2	FR	LW2-C019-E1	0.61 U	0.48 U	0.36 U	2.6 U	7.9 U	52 UJ	2.5 U	4.9 U	3.8 U
LW2-C022-D	N		0.76 U	0.6 U	0.45 U	3.3 U	9.9 U	65 U	3.1 U	6.1 U	4.7 U
LW2-C060-A	N		0.6 U	0.47 U	0.36 U	2.6 U	7.8 U	51 U	2.4 U	4.8 U	3.7 U
LW2-C111-A2	FR	LW2-C111-A	0.79 U	0.62 U	0.47 U	3.4 U	11 U	68 UJ	3.2 U	6.4 U	4.9 U
LW2-C121-D	N		5.6 U	4.4 U	3.4 U	2.4 U	7.4 U	48 U	2.3 U	4.6 U	3.5 U
LW2-C135-D	N		7.3 U	5.7 U	4.3 U	31 U	95 U	620 U	30 U	59 U	45 U
LW2-C139-D	N		0.54 U	0.42 U	0.32 U	2.3 U	7 U	46 U	2.2 U	4.4 U	3.3 U
LW2-C152-E	N		0.59 U	0.47 U	0.36 U	2.6 U	7.8 U	51 U	2.4 U	4.8 U	3.7 U
LW2-C155-D	N		0.58 U	0.46 U	0.35 U	2.5 U	7.6 U	50 UJ	2.4 U	4.7 U	3.6 U
LW2-C156-F	N		0.55 U	0.44 U	0.33 U	2.4 U	7.2 U	47 U	2.3 U	4.5 U	3.4 U
LW2-C158-E	N		0.59 U	0.47 U	0.35 U	2.6 U	7.7 U	51 U	2.4 U	4.8 U	3.7 U
LW2-C162-D	N		0.59 U	0.46 U	0.61 U	2.5 U	7.7 U	50 U	2.4 U	4.8 U	3.7 U
LW2-C163-D2	FR	LW2-C163-D1	0.6 U	0.47 U	0.52 U	2.6 U	7.9 U	52 U	2.5 U	4.9 U	3.7 U
LW2-C171-D	N		0.6 U	0.47 U	0.36 U	2.6 U	7.8 U	51 UJ	2.4 U	4.8 U	3.7 U
LW2-C172-E	N		0.58 U	0.45 U	0.35 U	2.5 U	7.5 U	50 U	2.4 U	4.7 U	3.6 U
LW2-C173-E	N		0.54 U	0.43 U	0.33 U	2.4 U	7.1 U	47 U	2.2 U	4.4 U	3.4 U
LW2-C182-D	N		7 U	5.5 U	4.2 U	30 U	92 U	600 U	29 U	57 U	44 U
LW2-C184-E	N		0.6 U	0.47 U	0.36 U	2.6 U	7.8 U	51 UJ	2.5 U	4.9 U	3.7 U
LW2-C185-D	N		0.57 U	0.45 U	0.34 U	4.9 U	15 U	98 U	4.6 U	9.2 U	7.1 U
LW2-C202-D	N		0.54 U	0.43 U	0.33 U	2.4 U	7.1 U	47 UJ	2.2 U	4.4 U	3.4 U
LW2-C252-D	N		3.5 U	2.8 U	2.1 U	6 U	19 U	120 U	5.7 U	12 U	8.6 U
LW2-C264-D	N		0.57 U	0.45 U	0.34 U	2.5 U	7.4 U	49 U	2.3 U	4.6 U	3.5 U
LW2-C270-D	N		0.58 U	0.98 U	0.35 U	13 U	38 U	250 UJ	12 U	24 U	18 U
LW2-C273-D	N		3.5 U	2.7 U	2.1 U	59 U	180 U	1200 UJ	56 U	120 U	85 U
LW2-C276-D	N		0.58 U	0.46 U	1.2 U	2.5 U	7.6 U	50 U	2.4 U	4.7 U	3.6 U
LW2-C283-D	N		0.58 U	0.46 U	0.35 U	2.5 U	7.6 U	50 UJ	2.4 U	4.7 U	3.6 U
LW2-C293-D2	FR	LW2-C293-D	0.55 U	0.43 U	0.33 U	2.4 U	7.1 UJ	47 U	2.2 U	4.4 U	3.4 U
LW2-C302-D	N		450	20 U	3.7 U	2700 U	8100 U	53000 U	2600 U	5100 U	3900 U
LW2-C314-D	N		0.59 U	0.46 U	0.56 U	2.6 U	7.7 U	51 U	2.4 U	4.8 U	3.7 U
LW2-C327-D	N		0.6 U	1.4 U	2.1 U	2.6 U	7.8 U	51 U	2.5 U	4.9 U	3.7 U
LW2-C331-G	N		0.54 U	0.43 U	0.33 U	2.4 U	7.1 U	47 UJ	2.2 U	4.4 U	3.4 U
LW2-C335-E	N		5.7 U	4.5 U	3.4 U	2.5 U	7.5 U	49 UJ	2.3 U	4.6 U	3.6 U
LW2-C346-D	N		0.53 U	0.42 U	0.32 U	2.3 U	6.9 U	45 UJ	2.2 U	4.3 U	3.3 U
LW2-C347-E	N					2.6 U	7.7 U	51 UJ	2.4 U	4.8 U	3.7 U
LW2-C349-D	N		0.51 U	0.4 U	0.31 U	2.2 U	6.7 U	44 UJ	2.1 U	4.2 U	3.2 U
LW2-C364-D	N		3.1 U	2.5 U	1.9 U	2.7 U	8.1 U	53 UJ	2.5 U	5 U	3.9 U
LW2-C372-E	N		0.72 U	5.7 U	0.43 U	16 U	48 UJ	310 U	15 U	30 U	23 U
LW2-C373-D	N		0.73 U	0.57 U	0.98 U	3.1 U	9.5 U	62 UJ	3 U	5.9 U	4.5 U
LW2-C400-D	N		5.9 U	3.7 U	0.41 U	15 U	45 UJ	300 U	14 U	28 U	22 U

ANC02603
BZTO104(e)002603

Table 4-1h. R2A Archived Sediment Core Phenol Data.

		Analyte Group	Phenols	Phenols	Phenols	Phenols	Phenols	Phenols	Phenols	Phenols	Phenols
		CAS No	935-95-5	95-95-4	88-06-2	120-83-2	105-67-9	51-28-5	95-57-8	95-48-7	88-75-5
	Sample Type	**Chemical Name**	2,3,5,6-Tetrachlorophenol	2,4,5-Trichlorophenol	2,4,6-Trichlorophenol	2,4-Dichlorophenol	2,4-Dimethylphenol	2,4-Dinitrophenol	2-Chlorophenol	2-Methylphenol	2-Nitrophenol
	Code	**Unit**	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg	ug/kg
Sample ID		**Parent Sample**									
LW2-C405-E	N		0.65 U	0.51 U	0.39 U	2.8 U	8.4 U	55 UJ	2.6 U	5.2 U	4 U
LW2-C409-D	N		0.53 U	0.41 U	0.32 U	2.3 U	6.9 U	45 UJ	2.2 U	4.3 U	3.3 U
LW2-C420-D	N		0.54 U	0.42 U	0.32 U	2.3 U	7 UJ	46 U	2.2 U	4.4 U	3.3 U
LW2-C425-F1	N		0.65 U	0.51 U	0.39 U	2.8 U	8.5 U	56 U	2.7 U	5.3 U	4.1 U
LW2-C431-F	N		0.58 U	0.45 U	0.35 U	2.5 U	7.5 U	49 UJ	2.4 U	4.7 U	3.6 U
LW2-C436-E	N		6.5 U	0.43 U	0.33 U	2.4 U	7.2 UJ	47 U	2.3 U	4.5 U	3.4 U
LW2-C439-D	N		0.56 U	0.44 U	0.34 U	2.4 U	7.3 UJ	48 U	2.3 U	4.6 U	3.5 U
LW2-C440-D	N		0.74 U	0.58 U	0.44 U	16 U	48 UJ	320 U	15 U	30 U	23 U
LW2-C444-E	N		0.59 U	0.47 U	0.35 U	2.6 U	7.7 UJ	51 U	2.4 U	4.8 U	3.7 U
LW2-C447-F	N		0.59 U	7 U	0.36 U	2.6 U	7.8 UJ	51 U	2.4 U	4.8 U	3.7 U
LW2-C448-D	N		3.4 U	2.7 U	2.1 U	3 U	8.9 U	59 U	2.8 U	5.6 U	4.3 U
LW2-C454-H	N		0.63 U	0.5 U	0.38 U	2.7 U	8.3 U	54 U	2.6 U	5.1 U	3.9 U
LW2-C455-F	N		0.61 U	0.48 U	0.37 U	14 U	40 U	270 UJ	13 U	25 U	19 U
LW2-C457-D	N		0.75 U	4.7 U	0.45 U	33 U	99 UJ	650 U	31 U	61 U	47 U
LW2-C461-D	N		0.71 U	0.56 U	0.43 U	3.1 U	9.3 U	61 UJ	2.9 U	5.8 U	4.4 U
LW2-C462-D	N		3.6 U	2.9 U	2.2 U	3.1 U	9.5 U	62 UJ	3 U	5.9 U	4.5 U
LW2-C468-D	N		0.75 U	2.9 U	0.45 U	16 U	49 UJ	320 U	16 U	31 U	24 U
LW2-C521-D	N		0.53 U	1.7 U	0.31 U	230 U	690 UJ	4500 U	220 U	430 U	330 U

ANC02604
BZTO104(e)002604

Table 4-1h. R2A Archived Sediment Core Phenoll Data.

Sample ID	Sample Type Code	Parent Sample	Analyte Group / CAS No / Chemical Name / Unit	Phenols 534-52-1 4,6-Dinitro-2-methylphenol ug/kg	Phenols 59-50-7 4-Chloro-3-methylphenol ug/kg	Phenols 106-44-5 4-Methylphenol ug/kg	Phenols 100-02-7 4-Nitrophenol ug/kg	Phenols 87-86-5 Pentachlorophenol ug/kg	Phenols 108-95-2 Phenol ug/kg	Phenols 4901-51-3 2,3,4,5-Tetrachlorophenol ug/kg
LW2-C011-F1	N			2.5 UJ	3.1 U	4.3 U	44 U	0.68 U	4.4 J	0.64 U
LW2-C011-G2	FR	LW2-C011-G1		2.5 UJ	3.1 U	4.3 U	45 U	0.68 U	4.4 J	0.64 U
LW2-C015-E	N			4.6 U	5.7 U	7.8 U	81 U	0.62 U	8.7 U	0.58 U
LW2-C019-D1	N			2.3 U	2.8 U	3.9 U	40 U	6.6 U	6.5 U	5.2 J
LW2-C019-E2	FR	LW2-C019-E1		2.5 UJ	3.1 U	4.2 U	44 U	0.66 U	3.9 J	0.62 U
LW2-C022-D	N			3.1 U	3.8 U	11	54 U	1.2 J	13 U	8.5 U
LW2-C060-A	N			2.4 U	5.5 U	9.4	43 U	0.65 U	2.7 U	0.61 U
LW2-C111-A2	FR	LW2-C111-A		3.2 UJ	4 U	5.6 J	56 U	4.4 J	13 J	9.4 U
LW2-C121-D	N			2.3 U	3.1 U	3.9 U	40 U	6.2 U	2.6 U	5.8 U
LW2-C135-D	N			30 U	37 U	50 U	520 U	8 U	33 U	7.4 U
LW2-C139-D	N			2.2 U	3 U	3.7 U	38 U	0.59 U	2.5 U	0.55 U
LW2-C152-E	N			2.4 U	3 U	4.1 U	43 U	0.65 U	2.7 U	0.61 U
LW2-C155-D	N			2.4 U	2.9 U	4 U	42 U	0.64 U	4.2 U	0.6 U
LW2-C156-F	N			2.3 U	2.8 U	3.8 U	40 U	0.6 U	4.6 U	0.57 U
LW2-C158-E	N			2.4 U	3.8 U	4.1 U	42 U	0.65 U	2.7 U	0.61 U
LW2-C162-D	N			2.4 U	3 U	4.1 U	42 U	0.64 U	2.7 U	0.6 U
LW2-C163-D2	FR	LW2-C163-D1		2.5 U	3.2 U	4.2 U	43 U	0.66 U	2.8 U	0.62 U
LW2-C171-D	N			2.4 U	3 U	4.1 U	43 U	0.65 U	4.8 U	0.61 U
LW2-C172-E	N			2.4 U	2.9 U	4 U	41 U	0.63 U	2.6 U	0.59 U
LW2-C173-E	N			2.2 U	2.7 U	3.8 U	39 U	0.6 U	2.5 U	0.56 U
LW2-C182-D	N			29 U	35 U	49 U	500 U	7.7 U	32 U	7.2 U
LW2-C184-E	N			2.5 UJ	3 U	4.2 U	43 U	0.66 U	2.7 U	0.61 U
LW2-C185-D	N			4.6 U	5.7 U	7.9 U	81 U	0.63 U	5.2 U	3.1 U
LW2-C202-D	N			2.2 UJ	2.7 U	3.8 U	39 U	0.59 U	3.5 J	0.56 U
LW2-C252-D	N			5.7 U	7 U	9.6 U	100 U	3.8 U	18 U	15 U
LW2-C264-D	N			2.3 U	2.9 U	3.9 U	41 U	0.62 U	3.1 U	1.3 U
LW2-C270-D	N			12 U	15 U	20 U	210 U	0.63 U	15 U	5.8 U
LW2-C273-D	N			56 U	69 U	110 J	980 U	3.8 U	69 U	3.5 U
LW2-C276-D	N			2.4 U	2.9 U	4 U	42 U	0.64 U	7.6 U	5.9 U
LW2-C283-D	N			2.4 UJ	2.9 U	6.7 J	42 U	0.64 U	3.1 J	0.59 U
LW2-C293-D2	FR	LW2-C293-D		2.2 U	2.8 U	10	39 U	0.6 U	3.4 J	0.56 U
LW2-C302-D	N			2600 U	3100 U	4300 U	45000 U	460	2800 U	68 U
LW2-C314-D	N			2.4 U	3 U	4.1 U	42 U	0.65 U	2.7 U	2.5 U
LW2-C327-D	N			2.5 U	3 U	12	43 U	0.65 U	6.2 U	1.9 U
LW2-C331-G	N			2.2 UJ	2.7 U	3.8 U	39 U	0.6 U	2.5 U	0.56 U
LW2-C335-E	N			2.3 U	2.9 U	5.6 J	41 U	6.3 U	6.5 U	5.9 U
LW2-C346-D	N			2.2 U	2.7 U	3.7 U	38 U	0.58 U	4.6 U	0.54 U
LW2-C347-E	N			2.4 U	3 U	4.1 U	42 U		5 U	
LW2-C349-D	N			2.1 U	2.6 U	3.6 U	37 U	0.56 U	5.2 U	0.52 U
LW2-C364-D	N			2.5 U	3.1 U	110	45 U	3.4 U	9 U	3.2 U
LW2-C372-E	N			15 U	18 U	180	260 U	0.79 U	17 U	0.74 U
LW2-C373-D	N			3 U	3.7 U	20	52 U	2.6 J	15 U	0.75 U
LW2-C400-D	N			14 U	18 U	42	250 U	0.76 U	16 U	8.1 U

ANC02605
BZTO104(e)002605

Table 4-1h. R2A Archived Sediment Core Phenoll Data.

Sample ID	Sample Type Code	Parent Sample	Analyte Group / CAS No / Chemical Name / Unit	Phenols 534-52-1 4,6-Dinitro-2-methylphenol ug/kg	Phenols 59-50-7 4-Chloro-3-methylphenol ug/kg	Phenols 106-44-5 4-Methylphenol ug/kg	Phenols 100-02-7 4-Nitrophenol ug/kg	Phenols 87-86-5 Pentachlorophenol ug/kg	Phenols 108-95-2 Phenol ug/kg	Phenols 4901-51-3 2,3,4,5-Tetrachlorophenol ug/kg
LW2-C405-E	N			2.6 U	3.3 U	4.5 U	46 U	0.71 U	4.5 U	0.66 U
LW2-C409-D	N			2.2 U	2.7 U	3.7 U	38 U	0.58 U	2.7 U	0.54 U
LW2-C420-D	N			2.2 U	2.7 U	3.7 U	38 U	2.2 J	3.5 J	0.55 U
LW2-C425-F1	N			2.7 U	3.3 U	4.5 U	47 U	0.71 U	3 U	3.3 U
LW2-C431-F	N			2.4 UJ	2.9 U	4 U	41 U	0.63 U	2.7 J	0.59 U
LW2-C436-E	N			2.3 U	2.8 U	3.8 U	40 U	0.6 U	3.3 J	0.56 U
LW2-C439-D	N			2.3 U	2.8 U	3.9 U	40 U	0.61 U	3.5 J	0.57 U
LW2-C440-D	N			15 U	19 U	28 J	270 U	1.6 J	17 U	0.75 U
LW2-C444-E	N			2.4 U	3 U	4.1 U	42 U	0.65 U	2.7 U	0.61 U
LW2-C447-F	N			2.4 U	3 U	4.1 U	43 U	0.65 U	3.4 J	0.61 U
LW2-C448-D	N			2.8 U	3.4 U	33	49 U	3.8 U	14 U	31 U
LW2-C454-H	N			2.6 U	3.2 U	160	45 U	1.5 J	22 J	7.4 U
LW2-C455-F	N			13 UJ	16 U	73	220 U	0.67 U	14 U	6.8 U
LW2-C457-D	N			31 U	38 U	300	540 U	0.82 U	34 U	0.77 U
LW2-C461-D	N			2.9 U	3.6 U	17	51 U	2.3 J	11 U	8.4 U
LW2-C462-D	N			3 U	3.6 U	18	52 U	4 U	25 J	3.7 U
LW2-C468-D	N			16 U	19 U	60	270 U	8.5 U	19 J	8.8 U
LW2-C521-D	N			220 U	270 U	360 U	3800 U	1.6 J	240 U	28 U

Notes:

- For all totals, zero is always used for non-detects. If any of the values included in a total are estimated (J qualified), then the total value is estimated (J qualified). If all analytes in a total are non-detects, then the highest detection limit is used for the total. A "T" qualifier is added to all results that are mathematically derived.
- Coordinate system for geographic coordinates is Oregon State Plane NAD83 HARN/HPGN, Intl. Feet.
- All concentration units are listed as dry weight.

J Estimate.
T Value is an average or selected result (see Kennedy Jenks et al. 2004).
U Not detected at value shown.

ANC02606
BZTO104(e)002606

Table 4-1i. R2A Archived Sediment Core PCB Aroclor Data.

Sample ID	Sample Type Code	Parent Sample	Analyte Group / CAS No / Chemical Name / Unit	Aroclors 12674-11-2 Aroclor 1016 ug/kg	Aroclors 11104-28-2 Aroclor 1221 ug/kg	Aroclors 11141-16-5 Aroclor 1232 ug/kg	Aroclors 53469-21-9 Aroclor 1242 ug/kg	Aroclors 12672-29-6 Aroclor 1248 ug/kg	Aroclors 11097-69-1 Aroclor 1254 ug/kg	Aroclors 11096-82-5 Aroclor 1260 ug/kg	Aroclors 37324-23-5 Aroclor 1262 ug/kg	Aroclors 11100-14-4 Aroclor 1268 ug/kg	Aroclors 12767-79-2 Aroclors ug/kg
LW2-C011-F1	N			1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 UT
LW2-C015-E	N			1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.8 J	1.5 U	1.5 U	1.8 JT
LW2-C019-D1	N			15 U	15 U	15 U	15 U	320 J	150	170 U	160 U	130 U	470 JT
LW2-C019-E2	FR	LW2-C019-E1		1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 UT
LW2-C020-D	N			17 U	17 U	17 U	17 U	950	390	210 U	260 U	200 U	1340 T
LW2-C022-D	N			2 U	2 U	2 U	2 U	17	32 J	32	2 U	2 U	81 JT
LW2-C025-D1	N			1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 UT
LW2-C025-E2	FR	LW2-C025-E1		1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 UT
LW2-C027-D	N			1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 UT
LW2-C060-A	N			1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	4.2 NJ	4.3	1.6 U	1.6 U	8.5 JT
LW2-C061-B	N			1.5 U	1.5 U	1.5 U	1.5 U	7.6	17 J	13	1.5 U	1.5 U	37.6 JT
LW2-C061-C	N			1.7 U	1.7 U	1.7 U	1.7 U	29	27 J	53	1.7 U	1.7 U	109 JT
LW2-C061-E	N			1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 UT
LW2-C111-A2	FR	LW2-C111-A		2.1 U	2.1 U	2.1 U	160 J	2.1 U	94 J	42	2.1 U	2.1 U	296 JT
LW2-C121-D	N			1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 UT
LW2-C133-C	N			1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	50 J	33	1.9 U	1.9 U	83 JT
LW2-C135-D	N			1.9 U	1.9 U	1.9 U	1.9 U	45 J	51 J	54	1.9 U	1.9 U	150 JT
LW2-C139-D	N			1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 UT
LW2-C144-A	N			2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	4.3 U	11 J	2.3 U	2.3 U	11 JT
LW2-C144-B	N			2 U	2 U	2 U	2 U	2 U	22	14	2 U	2 U	36 T
LW2-C144-D	N			1.6 U	1.6 U	1.6 U	1.6 U	7	9.4 J	9.4	1.6 U	1.6 U	25.8 JT
LW2-C147-D	N			1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	33 U	36 J	1.9 U	1.9 U	36 JT
LW2-C148-B	N			1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	9.7 U	8.3 U	1.9 U	1.9 U	9.7 UT
LW2-C148-D	N			2 U	2 U	2 U	2 U	30	74 J	49	2 U	2 U	153 JT
LW2-C158-A	N			2 U	2 U	2 U	2 U	2 U	15	9.3	2 U	2 U	24.3 T
LW2-C158-B	N			2.2 U	2.2 U	2.2 U	2.2 U	12 J	31 J	19	2.2 U	2.2 U	62 JT
LW2-C158-D	N			1.6 U	1.6 U	1.6 U	1.6 U	22	44 J	24	1.6 U	1.6 U	90 JT
LW2-C162-A	N			2 U	2 U	2 U	2 U	2 U	8.2 J	10	2 U	2 U	18.2 JT
LW2-C162-B	N			2.2 U	2.2 U	2.2 U	2.2 U	7	2.2 U	19 J	2.2 U	2.2 U	26 JT
LW2-C162-D	N			1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 UT
LW2-C169-A	N			2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	4.5 U	6.3	2.2 U	2.2 U	6.3 T
LW2-C169-C	N			1.9 U	1.9 U	1.9 U	1.9 U	27	43 J	42	1.9 U	1.9 U	112 JT
LW2-C171-A	N			2.5 U	2.5 U	2.5 U	2.5 U	2.5 U	5.5 U	8	2.5 U	2.5 U	8 T
LW2-C171-D	N			1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 UT
LW2-C172-E	N			1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	2.1 U	1.9 U	1.5 U	1.5 U	2.1 UT
LW2-C173-B	N			2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	16 U	9.1 U	2.1 U	2.1 U	16 UT
LW2-C173-D	N			1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 UT
LW2-C182-D	N			1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	150	1.9 U	1.9 U	150 T
LW2-C196-A	N			1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	18 NJ	31	1.6 U	12	61 JT
LW2-C196-B	N			1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	11	9.7	1.5 U	1.5 U	20.7 T
LW2-C196-C	N			1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 UT
LW2-C202-D	N			1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 UT
LW2-C215-B	N			1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 UT
LW2-C215-C	N			1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 UT
LW2-C252-D	N			1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	8.1 U	13	1.9 U	1.9 U	13 T
LW2-C263-C	N			16 U	18 U	47 U	18 U	9.9 U	22 U	44 U	33 U	15 U	47 UT
LW2-C264-D	N			1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 UT
LW2-C269-A	N			5 U	5 U	5 U	5 U	5 U	65 U	23 U	5 U	5 U	65 UT
LW2-C269-D	N			4.6 U	4.6 U	4.6 U	4.6 U	4.6 U	180 U	47 U	4.6 U	4.6 U	180 UT
LW2-C282-A	N			2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	5.4 J	2.3 U	2.3 U	5.4 JT
LW2-C290-A	N			2 U	2 U	2 U	2 U	2 U	5.3 U	2.9 U			5.3 UT
LW2-C290-B	N			2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	6.7 U	9.9			9.9 JT
LW2-C290-D	N			2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U			2.2 UT

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Table 4-1i. R2A Archived Sediment Core PCB Aroclor Data.

Sample ID	Sample Type Code	Parent Sample	Analyte Group / CAS No / Chemical Name / Unit	Aroclors 12674-11-2 Aroclor 1016 ug/kg	Aroclors 11104-28-2 Aroclor 1221 ug/kg	Aroclors 11141-16-5 Aroclor 1232 ug/kg	Aroclors 53469-21-9 Aroclor 1242 ug/kg	Aroclors 12672-29-6 Aroclor 1248 ug/kg	Aroclors 11097-69-1 Aroclor 1254 ug/kg	Aroclors 11096-82-5 Aroclor 1260 ug/kg	Aroclors 37324-23-5 Aroclor 1262 ug/kg	Aroclors 11100-14-4 Aroclor 1268 ug/kg	Aroclors 12767-79-2 Aroclors ug/kg
LW2-C291-A	N			3.7 U	3.7 U	3.7 U	3.7 U	3.7 U	7.6 U	19			19 JT
LW2-C291-B	N			3.1 U	3.1 U	3.1 U	3.1 U	3.1 U	19	17			36 JT
LW2-C291-C	N			3 U	3 U	3 U	3 U	3 U	66	120			186 JT
LW2-C299-A	N			77 U	20 U	20 U	54 U	38 U	37 U	71 U	20 U	20 U	77 UT
LW2-C299-C	N			480 U	580 U	340 U	260 U	160 U	320 U	230 U	50 U	50 U	580 UT
LW2-C300-A	N			1.9 U	1.9 U	1.9 U	93	1.9 U	110 J	100	1.9 U	1.9 U	303 JT
LW2-C300-B	N			2.1 U	2.1 U	2.1 U	2.1 U	57	75 J	72	2.1 U	2.1 U	204 JT
LW2-C300-D	N			1.5 U	1.5 U	1.5 U	1.5 U	8.5 NJ	19	21	1.5 U	1.5 U	48.5 JT
LW2-C302-D	N			89 U	260 U	240 U	110 U	81 U	79 U	64 U	22 U	22 U	260 UT
LW2-C314-D	N			1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	90 U	15 U	1.6 U	1.6 U	90 UT
LW2-C327-D	N			1.6 U	1.6 U	1.6 U	1.6 U	18 J	13 U	15	1.6 U	1.6 U	33 JT
LW2-C347-E	N			1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 UT
LW2-C356-A	N			26 U	31 U	45 U	25 U	24 U	28 U	35 U	36 U	16 U	45 UT
LW2-C356-B	N			22 U	22 U	22 U	22 U	520	460 NJ	200 J	22 U	22 U	1180 JT
LW2-C356-D	N			2000 U	2000 U	2000 U	2000 U	2000 U	18000 U	2000 U	2000 U	2000 U	18000 UT
LW2-C361-A	N			2.2 U	2.2 U	2.2 U	2.2 U	7.2	19	9.3	2.2 U	2.2 U	35.5 T
LW2-C361-B	N			1.9 U	1.9 U	1.9 U	22	1.9 U	47 J	45	1.9 U	1.9 U	114 JT
LW2-C366-F1	N			1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 U	1.5 UT
LW2-C372-E	N			2.8 U	2.8 U	2.8 U	2.8 U	2.8 U	2.8 U	2.8 U			2.8 UT
LW2-C373-D	N			1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	30 J	33 J	1.9 U	1.9 U	63 JT
LW2-C384-E	N			2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U			2.2 UT
LW2-C392-D	N			2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	7.8	12			19.8 JT
LW2-C400-D	N			2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	2.7 U	93			93 JT
LW2-C401-F	N			1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 U	1.6 UT
LW2-C405-E	N			1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	1.7 UT
LW2-C409-D	N			1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	6.3 NJ	4.7 J	1.4 U	1.4 U	11 JT
LW2-C420-D	N			2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	68	58			126 JT
LW2-C421-E	N			2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U			2.3 UT
LW2-C425-F1	N			1.7 U	1.7 U	1.7 U	1.7 U	1.7 U	2.8 U	1.7 U	1.7 U	1.7 U	2.8 UT
LW2-C430-A	N			2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	65	68	2.2 U	2.2 U	133 T
LW2-C436-E	N			2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U			2.1 UT
LW2-C439-D	N			2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U	2.2 U			2.2 UT
LW2-C440-D	N			2.8 U	2.8 U	2.8 U	34 J	2.8 U	68	58			160 JT
LW2-C444-E	N			2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U	2.3 U			2.3 UT
LW2-C448-D	N			1.8 U	1.8 U	1.8 U	190	1.8 U	99 J	110	1.8 U	1.8 U	399 JT
LW2-C455-F	N			1.6 U	1.6 U	1.6 U	1.6 U	9.7	1.6 U	1.6 U	1.6 U	1.6 U	9.7 T
LW2-C457-D	N			2.9 U	2.9 U	2.9 U	2.9 U	2.9 U	12 U	9.4 U			12 UT
LW2-C458-D2	FR	LW2-C458-D		2 U	2 U	2 U	2 U	10	22 J	30 J	2 U	2 U	62 JT
LW2-C461-D	N			1.9 U	1.9 U	1.9 U	1.9 U	47	69	69	1.9 U	1.9 U	185 T
LW2-C462-D	N			1.9 U	1.9 U	1.9 U	1.9 U	7.6	18 J	21	1.9 U	1.9 U	46.6 JT
LW2-C468-D	N			2.9 U	2.9 U	2.9 U	2.9 U	2.9 U	26	31			57 JT
LW2-C471-D	N			2 U	2 U	2 U	2 U	5.9	20 J	15 J	2 U	2 U	40.9 JT
LW2-C494-A	N			1.7 U	1.7 U	1.7 U	43 J	1.7 U	1.7 U	190	1.7 U	1.7 U	233 JT
LW2-C521-B	N			2.6 U	2.6 U	2.6 U	72	2.6 U	180	290			542 JT
LW2-C521-D	N			5 U	10 U	8.5 U	2.6 U	2 U	4.6 U	2.1 U			10 UT

Notes:

- For all totals, zero is always used for non-detects. If any of the values included in a total are estimated (J qualified), then the total value is estimated (J qualified). If all analytes in a total are non-detects, then the highest detection limit is used for the total. A "T" qualifier is added to all results that are mathematically derived.
- Coordinate system for geographic coordinates is Oregon State Plane NAD83 HARN/HPGN, Intl. Feet.
- All concentration units are listed as dry weight.

J Estimate.
T Value is an average or selected result (see Kennedy Jenks et al. 2004).
U Not detected at value shown.

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Table 4-1j. R2A Archived Sediment Core Pesticide Data.

Sample ID	Sample Type Code	Analyte Group / CAS No / Chemical Name / Unit / Parent Sample	Pesticides 53-19-0 2,4'-DDD ug/kg	Pesticides 3424-82-6 2,4'-DDE ug/kg	Pesticides 789-02-6 2,4'-DDT ug/kg	Pesticides 72-54-8 4,4'-DDD ug/kg	Pesticides 72-55-9 4,4'-DDE ug/kg	Pesticides 50-29-3 4,4'-DDT ug/kg	Pesticides PP_DDT3ISO Total of 4,4'-DDD, -DDE, -DDT ug/kg	Pesticides 309-00-2 Aldrin ug/kg	Pesticides 319-84-6 alpha-Hexachlorocyclohexane ug/kg	Pesticides 319-85-7 beta-Hexachlorocyclohexane ug/kg	Pesticides 319-86-8 delta-Hexachlorocyclohexane ug/kg
LW2-C011-F1	N		0.08 U	0.083 U	0.31 U	0.13 U	0.064 U	0.45 U	0.45 UT	0.14 U	0.12 U	0.18 U	0.086 U
LW2-C015-E	N		1.1 U	0.2 U	0.47 J	0.55	0.15 U	0.23 U	0.55 T	0.46 U	0.11 U	0.24 U	0.078 U
LW2-C019-D1	N		5.4 U	2.8 U	3.3 U	1.4 NJ	0.84 J	1.1	3.34 JT	0.62 U	0.51 U	0.8 U	2.2 U
LW2-C019-E2	FR	LW2-C019-E1	0.2 U	0.081 U	0.065 U	0.12 U	0.062 U	0.35 U	0.35 UT	0.14 U	0.12 U	0.18 U	0.084 U
LW2-C020-D	N		8 U	5.6 U	8.2 U	7.7 J	4.2 NJ	8.8 J	20.7 JT	0.71 U	0.59 U	1 U	2.9 U
LW2-C034-F	N		0.17 NJ	0.083 U	0.067 U	0.37 J	0.12 J	0.21 UJ	0.49 JT	0.14 UJ	0.12 U	0.18 U	0.086 UJ
LW2-C060-A	N		1.2 NJ	0.23 NJ	0.43	1.8 J	0.33 NJ	0.2 UJ	2.13 JT	0.33 UJ	0.11 U	0.17 U	0.082 UJ
LW2-C061-C	N		2.1 J	1.1	1 J	5 J	3.7 J	1.3 UJ	8.7 JT	0.63 J	0.16 U	0.18 U	0.11 UJ
LW2-C061-E	N		0.2 U	0.2 U	0.06 U	0.15 UJ	0.057 UJ	0.19 UJ	0.19 UJT	0.13 UJ	0.11 U	0.16 U	0.077 UJ
LW2-C066-T	N		0.2 U	0.091 U	0.26 U	0.14 UJ	0.07 UJ	0.69 UJ	0.69 UJT	0.15 UJ	0.13 U	0.28 U	0.094 U
LW2-C121-D	N		0.072 U	0.075 U	0.06 U	0.12 UJ	0.058 UJ	0.19 UJ	0.19 UJT	0.13 UJ	0.11 U	0.16 U	0.078 UJ
LW2-C133-C	N		3.4 J	1.3	1.4	6.3	4	2	12.3 T	0.26 U	0.14 U	0.27 U	0.1 U
LW2-C135-B	N		2.1 U	2.2 U	1.8 U	6.9 J	4.5	61	72.4 JT	3.6 U	3 U	4.6 U	2.3 U
LW2-C135-D	N		6 J	1.2	2.2	11	5.3 J	2.2	18.5 JT	0.4 U	0.14 U	0.55 U	0.2 U
LW2-C138-A	N		3 U	0.41 U	2 U	4.6	2.7 J	1.2 U	7.3 JT	1.2 NJ	0.26 U	0.84 U	0.38 U
LW2-C138-B	N		2.1 NJ	0.44 NJ	1.4 U	3.6 J	1.8 J	2.5 J	7.9 JT	0.17 U	0.14 U	1.2 U	0.18 U
LW2-C138-D	N		0.074 U	0.077 U	0.062 U	0.12 UJ	0.059 UJ	0.2 UJ	0.2 UJT	0.13 UJ	0.11 U	0.17 U	0.079 UJ
LW2-C139-D	N		0.2 U	0.071 U	0.2 U	0.11 UJ	0.055 UJ	0.18 UJ	0.18 UJT	0.12 UJ	0.098 U	0.16 U	0.074 UJ
LW2-C144-A	N		2.2 J	0.87	0.72	3.9 J	3.4 J	1 J	8.3 JT	0.24 J	0.16 U	0.25 U	0.12 U
LW2-C144-B	N		2.4 J	0.66 U	0.83 U	7.7 J	4.6 J	8.7 J	21 JT	0.17 U	0.14 U	0.35 U	0.11 U
LW2-C144-D	N		1.7 NJ	0.31 U	0.94 J	2.9	0.87 NJ	1.2	4.97 JT	0.4 NJ	0.11 U	0.17 U	0.08 U
LW2-C147-D	N		45	2 U	6 U	58 J	13 NJ	24 J	95 JT	7.9 UJ	1.4 U	2.9 J	1.7 U
LW2-C148-B	N		2.6 NJ	0.64 U	0.62 J	5.9 J	3.4	1.2 U	9.3 JT	0.77 U	0.64 U	0.99 U	0.48 U
LW2-C148-D	N		4.9 J	1.8 J	2	7.9	4.8	2.7	15.4 T	0.2 U	0.21 U	0.74 U	0.11 U
LW2-C158-A	N		2.1	0.68 U	0.28 U	4	2.2	1.2	7.4 T	0.24 U	0.14 U	0.65 U	0.11 U
LW2-C158-B	N		2.9 J	0.86	0.84 NJ	4.2 J	3.3 J	1.6 J	9.1 JT	0.33 UJ	0.15 U	0.59 U	0.2 U
LW2-C158-D	N		3.8	1.1	1.5	5.1 J	2.3 J	1.3 J	8.7 JT	0.43 UJ	0.11 U	0.33 U	0.17 U
LW2-C162-A	N		1.8	0.41 NJ	0.36 J	3.2 J	2 J	5.4 J	10.6 JT	0.27 J	0.14 U	0.41 U	0.11 UJ
LW2-C162-B	N		2.8	0.74	1.8 NJ	5.1 J	3.2 J	2 J	10.3 JT	0.3 UJ	0.27 U	0.39 U	0.2 U
LW2-C162-D	N		0.2 U	0.078 U	0.063 U	0.29 J	0.2 UJ	0.2 UJ	0.29 JT	0.13 UJ	0.11 U	0.17 U	0.081 UJ
LW2-C169-A	N		1.3 NJ	0.38 J	0.27 U	1.9	1.7	4.3	7.9 T	0.23	0.15 U	0.46 U	0.12 U
LW2-C169-C	N		4.6 J	1.4 J	1.5 J	7.4	4.7 J	2	14.1 JT	0.48 NJ	0.13 U	0.21 U	0.098 U
LW2-C171-A	N		1.5	0.53 NJ	0.3 J	2.4	1.7	0.91 NJ	5.01 JT	0.38	0.17 U	1.8 J	0.13 U
LW2-C171-D	N		0.15 U	0.079 U	0.064 U	0.19 J	0.061 U	0.2 U	0.19 JT	0.14 U	0.11 U	0.17 U	0.082 U
LW2-C172-E	N		0.71 J	0.22 J	0.062 U	1.4	0.24 J	13 J	14.64 JT	0.22 U	0.11 U	0.17 U	0.08 U
LW2-C173-B	N		3.3 NJ	0.96 J	0.64 U	7.4 J	4.2	1.4 U	11.6 JT	0.89 U	0.74 U	1.2 U	0.56 U
LW2-C173-D	N		0.2 J	0.074 U	0.06 U	0.28	0.086 J	0.19 U	0.366 JT	0.13 U	0.11 U	0.16 U	0.077 U
LW2-C182-D	N		110	1.9 U	20 U	160	58 NJ	44	262 JT	3.1 U	2.6 U	4 U	2 U
LW2-C196-A	N		3.8 J	0.75	1.1 U	3.9 J	2 J	1.2 UJ	5.9 JT	1.5 NJ	0.21 U	0.86 NJ	0.084 UJ
LW2-C196-B	N		1.8 J	0.3 U	0.34 U	1.2 J	0.28 UJ	0.19 UJ	1.2 JT	0.69 UJ	0.15 U	0.22 J	0.077 UJ
LW2-C196-C	N		0.23 U	0.074 U	0.16 J	0.2	0.08 U	0.65	0.85 T	0.13 U	0.11 U	0.16 U	0.076 U
LW2-C202-D	N		0.12 U	0.072 U	0.058 U	0.11 U	0.056 U	0.18 U	0.18 UT	0.13 U	0.099 U	0.16 U	0.075 U
LW2-C215-B	N		0.17 U	0.071 U	0.084 U	0.27 J	0.17 U	0.18 U	0.27 JT	0.12 U	0.097 U	0.2 U	0.073 U
LW2-C215-C	N		0.067 U	0.069 U	0.056 U	0.11 U	0.053 U	0.18 U	0.18 UT	0.12 U	0.095 U	0.15 U	0.072 U
LW2-C252-D	N		3.9 NJ	0.47 U	1.6 U	5.8	3.2 J	1.5 U	9 JT	1.7 U	0.64 U	1 U	0.48 U
LW2-C260-D	N		0.5	0.072 U	0.2	0.47 J	0.096 J	0.9	1.466 JT	0.12 U	0.099 U	0.16 U	0.075 U
LW2-C264-D	N		0.2 U	0.097 U	0.061 U	0.14 U	0.058 U	0.19 U	0.19 UT	0.28 U	0.11 U	0.17 U	0.078 U
LW2-C269-D	N		99	8.9 U	11 U	120 J	5 U	28 J	148 JT	16 U	1.7 U	2.6 U	5.1 U
LW2-C270-D	N		1.1 U	0.52 U	0.36 U	1.4 J	0.17 J	0.2 U	1.57 JT	0.6 U	0.11 U	0.2 U	0.59
LW2-C273-D	N		0.81 U	1.7 U	1.1 U	1.3 NJ	0.81 U	0.57 U	1.3 JT	2.7 U	0.48 U	0.49 U	0.24 U
LW2-C276-D	N		0.92 U	0.39 U	0.31 U	1.1 J	0.3 U	0.97 U	1.1 JT	0.92 U	0.54 U	0.83 U	0.4 U
LW2-C290-A	N		1	0.2 U	1	1.2	0.63 J	7.3	9.13 JT	0.12 U	0.097 U	0.15 U	0.073 U
LW2-C290-B	N		6.4	0.45 U	3	12	3.6 NJ	68	83.6 JT	0.13 U	0.1 U	0.2 U	0.075 U
LW2-C290-D	N		0.11 U	0.077 U	0.062 U	0.12 U	0.059 U	0.2 U	0.2 UT	0.13 U	0.11 U	0.17 U	0.08 U
LW2-C291-A	N		0.88	0.51 U	0.45	1.3	1.7	1.3	4.3 T	0.22 U	0.25 U	0.39 U	0.14 U
LW2-C291-B	N		1.1 NJ	0.2 U	0.71	1.3	2.2	8.2	11.7 T	0.18 U	0.27 U	0.29 U	0.12 U
LW2-C291-C	N		2 U	1.3 U	4.1	1.1 NJ	3.9	4.9	9.9 JT	0.18 U	0.41 U	0.23 U	0.2 U
LW2-C299-A	N		15	7.4 U	9.6 J	15 NJ	6.2	10 J	31.2 JT	1.7 U	1.5 U	2.2 U	1.8 U
LW2-C299-C	N		62 U	24 U	39 U	24 J	9 U	42 NJ	66 JT	44 J	9 U	16 U	14 U
LW2-C300-A	N		5.2 NJ	0.34 U	3.5 J	2.3 J	4.4	3.9	10.6 JT	0.27 U	0.17 U	0.65 U	0.099 U
LW2-C300-B	N		5.8 U	1.3 U	4.5	5.6	6.8	5.7 J	18.1 JT	0.87 U	0.72 U	1.2 U	1.4 J
LW2-C300-D	N		5.8 U	2.1 U	3.5	4.1 J	0.72 J	2.5 U	4.82 JT	3.7 U	0.5 U	2.6 NJ	0.4 U

ANC02609
BZTO104(e)002609

Table 4-1j. R2A Archived Sediment Core Pesticide Data.

Sample ID	Sample Type Code	Analyte Group / CAS No / Chemical Name / Unit / Parent Sample	Pesticides 53-19-0 2,4'-DDD ug/kg	Pesticides 3424-82-6 2,4'-DDE ug/kg	Pesticides 789-02-6 2,4'-DDT ug/kg	Pesticides 72-54-8 4,4'-DDD ug/kg	Pesticides 72-55-9 4,4'-DDE ug/kg	Pesticides 50-29-3 4,4'-DDT ug/kg	Pesticides PP_DDT3ISO Total of 4,4'-DDD, -DDE, -DDT ug/kg	Pesticides 309-00-2 Aldrin ug/kg	Pesticides 319-84-6 alpha-Hexachlorocyclohexane ug/kg	Pesticides 319-85-7 beta-Hexachlorocyclohexane ug/kg	Pesticides 319-86-8 delta-Hexachlorocyclohexane ug/kg
LW2-C302-D	N		200 U	89 U	250 U	260 J	8.5 U	28 U	260 JT	92	16 U	41 U	21 U
LW2-C314-D	N		120	0.8 U	0.53 NJ	170 J	2.5 UJ	71 J	241 JT	0.54 UJ	0.11 U	0.34 J	0.2 UJ
LW2-C327-D	N		38	0.56 U	0.2 U	66	4.4 NJ	14	84.4 JT	0.65 U	0.12 U	0.61 U	0.14 U
LW2-C347-E	N		0.32 NJ	0.078 U	0.063 U	0.15 J	0.13 J	0.2 U	0.28 JT	0.13 U	0.11 U	0.17 U	0.081 U
LW2-C349-D	N		0.3 U	0.17 U	0.17 U	0.11 U	0.2 U	0.17 U	0.2 UT	0.31 U	0.094 U	0.15 U	0.071 U
LW2-C382-D	N		0.099 U	0.081 U	0.23 U	0.21 J	0.062 U	0.21 U	0.21 JT	0.14 U	0.12 U	0.18 U	0.083 U
LW2-C401-T	N		0.2 U	0.081 U	0.066 U	0.12 UJ	0.063 UJ	0.21 UJ	0.21 UJT	0.14 UJ	0.12 U	0.18 U	0.084 U
LW2-C409-D	N		0.7 NJ	0.07 U	0.42	0.32 J	0.28 NJ	0.59 J	1.19 JT	0.12 U	0.096 U	0.15 U	0.073 U
LW2-C420-D	N		5.5 NJ	0.9 U	3.2	3.8 J	2.7 J	5.2	11.7 JT	0.59 U	0.49 U	0.76 U	0.37 U
LW2-C421-A	N		2.7 U	0.22 U	11	1.9	2.4 NJ	14	18.3 JT	0.22 U	0.14 U	0.54 U	0.12 J
LW2-C421-B	N		5 U	0.89 U	41	2.5 J	4.6 U	43	45.6 JT	0.18 U	0.15 U	0.69 NJ	0.28 NJ
LW2-C421-D	N		0.62 U	0.08 U	0.15 U	0.95	0.13 J	0.26 NJ	1.35 JT	0.14 U	0.11 U	0.18 U	0.083 U
LW2-C431-F	N		0.074 U	0.077 U	0.062 U	0.12 UJ	0.059 UJ	0.39 J	0.39 JT	0.13 UJ	0.11 U	0.21 U	0.079 U
LW2-C436-A	N		0.35 U	0.29 U	0.49	1.1	1.4	0.62	3.12 T	0.36 U	0.14 U	0.47 U	0.11 U
LW2-C436-C	N		3.8	2	1.5	7.8 J	11	2.4	21.2 JT	0.74 U	0.62 U	0.96 U	0.47 U
LW2-C440-A	N		0.44 U	0.4 U	0.6	1.7	3.4	1.2 J	6.3 JT	0.56	0.15 U	0.46 U	0.11 U
LW2-C440-C	N		3.5 NJ	0.37 U	2.2	1.9	5.5	2.3	9.7 T	0.19 U	0.14 U	0.65 U	0.099 U
LW2-C444-E	N		0.076 U	0.13 U	0.063 U	0.3 U	0.35 U	0.2 U	0.35 UT	0.14 U	0.11 U	0.17 U	0.082 U
LW2-C447-A	N		0.76 U	0.58 U	1.9	2.1	4.6	1.8	8.5 T	0.51 U	0.14 U	0.22 U	0.11 U
LW2-C447-C	N		3.2	0.44	0.071 U	8.1	2.1 J	0.31	10.51 JT	0.32 U	0.13 U	0.2	0.091 U
LW2-C448-A	N		1 NJ	1.2 U	0.97 J	2.3 J	4.8	1.2	8.3 JT	1.1 J	0.17 U	0.39 U	0.13 U
LW2-C448-C	N		1.3 U	0.35 U	2.5	2.3 J	6.2	2.1	10.6 JT	0.18 U	0.15 U	0.43 U	0.2 U
LW2-C458-D	N		0.44 U	0.28 U	0.75 J	1 J	2.1 J	1.1	4.2 JT	0.17 U	0.14 U	0.48 U	0.14 U
LW2-C521-B	N		23	9.5 U	17 U	25	2.2 U	7.7 U	25 T	9.2 U	1.3 U	4.4	2.1 U
LW2-C521-C	N		13 U	6.4 U	16 J	30 NJ	3 U	2.3 U	30 JT	13 NJ	1.5 U	1.7 U	2 U
LW2-C521-D	N		13 U	5.5 U	5.7 U	4.3 U	2 U	1.8 U	4.3 UT	9.7 U	1.9 U	2 U	3.3

ANC02610
BZTO104(e)002610

Table 4-1j. R2A Archived Sediment Core Pesticide Data.

Sample ID	Sample Type Code	Analyte Group / CAS No / Chemical Name / Unit / Parent Sample	Pesticides 58-89-9 gamma-Hexachlorocyclohexane ug/kg	Pesticides 5103-71-9 cis-Chlordane ug/kg	Pesticides 5103-74-2 trans-Chlordane ug/kg	Pesticides 27304-13-8 Oxychlordane ug/kg	Pesticides 5103-73-1 cis-Nonachlor ug/kg	Pesticides 39765-80-5 trans-Nonachlor ug/kg	Pesticides TOTCHLDANE Total Chlordanes ug/kg	Pesticides 60-57-1 Dieldrin ug/kg	Pesticides 959-98-8 alpha-Endosulfan ug/kg	Pesticides 33213-65-9 beta-Endosulfan ug/kg	Pesticides 1031-07-8 Endosulfan sulfate ug/kg
LW2-C011-F1	N		0.14 U	0.072 U	0.074 U	0.099 U	0.14 U	0.056 J	0.056 JT	0.12 U	0.056 U	0.086 U	0.17 U
LW2-C015-E	N		0.13 U	0.18 U	0.2 U	0.091 U	0.21 U	0.13 U	0.21 UT	1.1 NJ	0.2 U	0.11 U	0.081 U
LW2-C019-D1	N		1.1 U	1.3 U	4.5 U	0.45 U	6 NJ	1.3 U	6 JT	0.53 U	1.3 U	2.8 U	0.4 U
LW2-C019-E2	FR	LW2-C019-E1	0.14 U	0.071 U	0.072 U	0.097 U	0.089 U	0.048 U	0.097 UT	0.12 U	0.055 U	0.084 U	0.27 U
LW2-C020-D	N		2.4 U	1 U	15	1 U	5.8 U	2.8 U	15 T	0.61 U	1 U	5.9 U	1 U
LW2-C034-F	N		0.14 UJ	0.072 UJ	0.074 UJ	0.099 U	0.18 U	0.046 U	0.18 UT	0.12 UJ	0.056 U	0.086 U	0.23 UJ
LW2-C060-A	N		0.17 J	0.07 UJ	0.2 UJ	0.095 U	0.31 U	0.11 J	0.11 JT	0.21 UJ	0.054 U	0.082 U	0.085 UJ
LW2-C061-C	N		0.14 UJ	0.074 UJ	0.91 UJ	0.15 J	1.1 U	0.2 U	0.15 JT	0.12 UJ	0.4 NJ	0.27	0.09 UJ
LW2-C061-E	N		0.13 UJ	0.065 UJ	0.066 UJ	0.089 U	0.064 U	0.041 U	0.089 UT	0.11 UJ	0.051 U	0.077 U	0.08 UJ
LW2-C066-T	N		0.15 UJ	0.08 UJ	0.081 UJ	0.11 U	0.15 U	0.068 U	0.15 UT	0.22 UJ	0.085 J	0.094 U	0.52 U
LW2-C121-D	N		0.13 UJ	0.066 UJ	0.067 UJ	0.09 U	0.064 U	0.042 U	0.09 UT	0.11 UJ	0.094 U	0.078 U	0.08 UJ
LW2-C133-C	N		0.86 NJ	0.42 U	0.85 U	0.18 U	1.1 U	0.2 U	1.1 UT	0.14 U	0.15 J	0.2 U	0.2 U
LW2-C135-B	N		3.6 U	1.9 U	2 UJ	2.6 U	1.9 U	1.2 U	2.6 UT	3.1 U	1.5 U	2.3 U	2.3 U
LW2-C135-D	N		1.2 NJ	0.25 U	1.1	0.12 U	1.6 U	0.054 U	1.1 T	0.14 U	0.066 U	0.67 U	0.25 U
LW2-C138-A	N		0.31 U	0.63 U	0.27 U	0.91 U	0.16 U	0.11 U	0.91 UT	0.87 U	0.13 U	0.88 NJ	0.2 U
LW2-C138-B	N		0.17 U	0.38 J	0.27 J	0.13 U	0.2 U	0.2 U	0.65 JT	0.15 U	0.069 U	0.27	0.11 U
LW2-C138-D	N		0.13 UJ	0.067 UJ	0.069 UJ	0.092 U	0.066 U	0.043 U	0.092 UT	0.11 UJ	0.052 U	0.079 U	0.082 UJ
LW2-C139-D	N		0.12 UJ	0.063 UJ	0.064 UJ	0.085 U	0.2 U	0.04 U	0.2 UT	0.11 UJ	0.049 U	0.074 U	0.076 UJ
LW2-C144-A	N		0.19 U	0.2 U	0.44 J	0.14 U	0.39 J	0.063 U	0.83 JT	0.17 U	0.2 U	0.2 J	0.26 U
LW2-C144-B	N		0.17 U	0.3 J	0.44 NJ	0.14 U	0.085 U	0.24 J	0.98 JT	0.15 U	0.15 U	0.11 U	0.71 U
LW2-C144-D	N		0.13 U	0.068 U	0.26 U	0.093 U	0.28 U	0.27 U	0.28 UT	0.26 U	0.3 U	0.08 U	0.16 U
LW2-C147-D	N		1.6 UJ	2.3 UJ	2.8 UJ	2.5 J	4.2 U	5.6 U	2.5 JT	1.4 UJ	2.3 U	1.1 U	1.1 U
LW2-C148-B	N		0.76 U	0.41 U	0.43 J	0.56 U	0.94 U	0.26 U	0.43 JT	0.66 U	0.32 U	0.48 U	0.5 U
LW2-C148-D	N		0.56 U	0.55 U	0.41 U	0.33 NJ	1.5 U	0.2 U	0.33 JT	0.14 U	0.2 U	0.47 NJ	0.2 U
LW2-C158-A	N		0.17 U	0.2 U	0.2 U	0.12 U	0.32 U	0.38 NJ	0.38 JT	0.76 U	0.19 U	0.11 U	0.22 U
LW2-C158-B	N		0.23 UJ	0.2 UJ	0.48 UJ	0.22	0.59 U	0.35 NJ	0.57 JT	0.16 UJ	0.14 U	0.12 U	0.2 U
LW2-C158-D	N		0.13 UJ	0.07 UJ	0.59 UJ	0.3 J	1.1 U	0.044 U	0.3 JT	0.12 UJ	0.054 U	0.13 U	0.085 U
LW2-C162-A	N		0.16 UJ	0.2 UJ	0.26 UJ	0.12 U	0.34 U	0.17 J	0.17 JT	0.64 J	0.2 U	0.11 U	0.2 UJ
LW2-C162-B	N		0.18 UJ	0.2 UJ	0.4 UJ	0.13 U	0.58 U	0.36 NJ	0.36 JT	0.16 UJ	0.13 U	0.24 U	0.22 U
LW2-C162-D	N		0.13 UJ	0.069 UJ	0.07 UJ	0.094 U	0.067 U	0.044 U	0.094 UT	0.12 UJ	0.46 U	0.081 U	0.084 UJ
LW2-C169-A	N		0.18 U	0.16 U	0.097 U	0.13 U	0.19 U	0.17 J	0.17 JT	0.48 NJ	0.13 U	0.12 U	0.16 U
LW2-C169-C	N		0.39 U	0.28 U	0.51 U	0.15 U	1 NJ	0.17 U	1 JT	0.14 U	0.17 U	0.14 U	0.17 U
LW2-C171-A	N		0.21 U	0.11 U	0.11 U	0.15 U	0.26 J	0.18 J	0.44 JT	0.35 U	0.18 U	0.19 J	0.14 U
LW2-C171-D	N		0.13 U	0.07 U	0.071 U	0.095 U	0.068 U	0.044 U	0.095 UT	0.12 U	0.054 U	0.082 U	0.085 U
LW2-C172-E	N		0.13 U	0.067 U	0.096 U	0.092 U	0.2 U	0.2 U	0.2 UT	0.11 U	0.052 U	0.08 U	0.082 U
LW2-C173-B	N		0.88 U	0.47 U	0.48 UJ	0.64 U	0.46 U	0.8 J	0.8 JT	0.77 U	0.87 U	0.56 U	0.58 U
LW2-C173-D	N		0.13 U	0.065 U	0.066 U	0.089 U	0.064 U	0.041 U	0.089 UT	0.11 U	0.05 U	0.077 U	0.079 U
LW2-C182-D	N		3.1 U	1.7 U	9.2 U	2.3 U	9.2 U	4 U	9.2 UT	2.7 U	4 U	2 U	6.7 U
LW2-C196-A	N		0.31 UJ	0.23 UJ	0.47 UJ	0.59 NJ	0.73 U	0.045 U	0.59 JT	0.12 UJ	0.055 U	0.2 U	0.087 UJ
LW2-C196-B	N		0.2 UJ	0.2 UJ	0.19 UJ	0.12 NJ	0.76 NJ	0.28 NJ	1.16 JT	0.11 UJ	0.52 U	0.12 J	0.08 UJ
LW2-C196-C	N		0.13 U	0.065 U	0.066 U	0.088 U	0.084 U	0.041 U	0.088 UT	0.11 U	0.05 U	0.076 U	0.079 U
LW2-C202-D	N		0.12 U	0.063 U	0.065 U	0.086 U	0.068 U	0.04 U	0.086 UT	0.11 U	0.049 U	0.075 U	0.077 U
LW2-C215-B	N		0.12 U	0.062 U	0.063 U	0.085 U	0.061 U	0.039 U	0.085 UT	0.11 U	0.048 U	0.073 U	0.076 U
LW2-C215-C	N		0.12 U	0.061 U	0.062 U	0.083 U	0.059 U	0.039 U	0.083 UT	0.099 U	0.047 U	0.072 U	0.074 U
LW2-C252-D	N		0.76 U	0.41 U	0.42 U	0.56 U	0.4 U	0.37 U	0.56 UT	3 J	0.39 U	0.48 U	0.5 U
LW2-C260-D	N		0.12 U	0.063 U	0.065 U	0.087 U	0.13 U	0.04 U	0.13 UT	0.11 U	0.049 U	0.075 U	0.078 U
LW2-C264-D	N		0.21 U	0.17 U	0.068 U	0.09 U	0.1 U	0.093 U	0.17 UT	0.11 U	0.051 U	0.078 U	0.081 U
LW2-C269-D	N		4.2 U	7.3 U	5.8 UJ	1.5 U	12 U	9.6 U	12 UT	3.8 U	4.2 U	6.7 U	1.3 U
LW2-C270-D	N		0.25 U	0.23 U	0.29 U	0.22 U	0.52 U	0.36 U	0.52 UT	0.25 J	0.052 U	0.08 U	0.082 U
LW2-C273-D	N		0.81 U	2.2 U	0.9 U	0.28 U	0.39 U	1.3 U	2.2 UT	0.81 U	0.81 U	0.24 U	0.25 U
LW2-C276-D	N		0.64 U	0.34 U	0.35 UJ	0.47 U	0.34 U	0.92 U	0.92 UT	0.69 NJ	0.27 U	0.4 U	0.42 U
LW2-C290-A	N		0.12 U	0.2 U	0.13 J	0.084 U	0.66 U	0.17 NJ	0.3 JT	0.1 U	0.048 U	0.073 U	0.075 U
LW2-C290-B	N		0.12 U	0.064 U	0.3 U	0.087 U	2.2 U	0.041 U	2.2 UT	0.11 U	0.05 U	0.2 U	0.078 U
LW2-C290-D	N		0.13 U	0.067 U	0.069 U	0.092 U	0.066 U	0.043 U	0.092 UT	0.11 U	0.052 U	0.08 U	0.082 U
LW2-C291-A	N		0.21 U	0.16 U	0.2 U	0.16 U	0.33 U	0.19 J	0.19 JT	0.19 U	0.18 U	0.14 U	0.14 U
LW2-C291-B	N		0.18 U	0.2 U	0.29 U	0.13 U	0.39 U	0.21	0.21 T	0.16 U	0.19 U	0.12 U	0.12 U
LW2-C291-C	N		0.43 U	0.091 U	1.6 U	0.2 U	2.3 U	0.058 U	2.3 UT	0.15 U	0.071 U	0.2 U	0.12 U
LW2-C299-A	N		3 U	1.8 U	0.9 UJ	2.9 U	6.1 J	5 U	6.1 JT	2.6 J	1.8 U	5.7 U	1.8 U
LW2-C299-C	N		4.2 U	13 U	6.3 UJ	25 U	18 U	22 U	25 UT	3.6 U	9 U	56 J	15 U
LW2-C300-A	N		0.16 U	0.51 U	2.7 J	0.47 J	1.9 U	0.053 U	3.17 JT	0.26 U	0.065 U	0.59	0.11 U
LW2-C300-B	N		0.86 U	0.46 U	3.4 U	0.63 U	4.6 J	0.29 U	4.6 JT	0.75 U	0.36 U	0.87 U	0.57 U
LW2-C300-D	N		0.6 U	0.86 U	0.33 U	1.7 U	2 U	1.8 U	2 UT	0.52 U	1.3 U	0.38 U	0.39 U

ANC02611
BZTO104(e)002611

Table 4-1j. R2A Archived Sediment Core Pesticide Data.

		Analyte Group	Pesticides	Pesticides	Pesticides	Pesticides	Pesticides	Pesticides	Pesticides	Pesticides	Pesticides	Pesticides	Pesticides
		CAS No	58-89-9	5103-71-9	5103-74-2	27304-13-8	5103-73-1	39765-80-5	TOTCHLDANE	60-57-1	959-98-8	33213-65-9	1031-07-8
	Sample Type Code	**Chemical Name Unit**	gamma-Hexachloroyclohexane ug/kg	cis-Chlordane ug/kg	trans-Chlordane ug/kg	Oxychlordane ug/kg	cis-Nonachlor ug/kg	trans-Nonachlor ug/kg	Total Chlordanes ug/kg	Dieldrin ug/kg	alpha-Endosulfan ug/kg	beta-Endosulfan ug/kg	Endosulfan sulfate ug/kg
Sample ID		**Parent Sample**											
LW2-C302-D	N		40 U	61 J	59 UJ	59 NJ	180 U	62 U	120 JT	16 U	40 U	95 U	71 U
LW2-C314-D	N		0.76 NJ	0.52 UJ	0.5 UJ	0.97 NJ	0.89 U	0.37 U	0.97 JT	0.12 UJ	0.053 U	0.2 U	0.084 UJ
LW2-C327-D	N		1 NJ	0.07 U	0.37 U	0.4 J	0.99 U	0.2 U	0.4 JT	0.12 U	0.054 U	0.3 U	0.29 NJ
LW2-C347-E	N		0.13 U	0.069 U	0.07 UJ	0.094 U	0.067 U	0.044 U	0.094 UT	0.12 U	0.053 U	0.081 U	0.084 U
LW2-C349-D	N		0.12 U	0.17 U	0.061 U	0.082 U	0.083 U	0.088 U	0.17 UT	0.097 U	0.046 U	0.071 U	0.073 U
LW2-C382-D	N		0.14 U	0.071 U	0.072 UJ	0.096 U	0.17 U	0.045 U	0.17 UT	0.12 U	0.055 U	0.083 U	0.15 U
LW2-C401-T	N		0.14 UJ	0.071 UJ	0.073 UJ	0.097 U	0.087 U	0.045 U	0.097 UT	0.12 UJ	0.055 U	0.084 U	0.087 U
LW2-C409-D	N		0.12 U	0.061 U	0.26 J	0.084 U	0.25 U	0.039 U	0.26 JT	0.1 U	0.048 U	0.073 U	0.075 U
LW2-C420-D	N		0.59 U	0.32 U	2.3 J	0.43 U	3.5 U	0.2 UJ	2.3 JT	0.66 U	0.56 J	0.37 U	0.38 U
LW2-C421-A	N		0.17 U	0.089 U	5.5	0.14 U	2.3 U	0.55 U	5.5 T	4.2 NJ	1.6 NJ	0.86 U	0.11 U
LW2-C421-B	N		0.53 NJ	0.091 U	9.8	0.23 U	3.6 U	1.1 U	9.8 T	5.1 U	1.1 U	1.6 U	0.12 U
LW2-C421-D	N		0.14 U	0.07 U	0.092 NJ	0.096 U	0.15 U	0.045 U	0.092 JT	0.12 U	0.055 U	0.083 U	0.53 U
LW2-C431-F	N		0.13 UJ	0.067 UJ	0.069 UJ	0.092 U	0.066 U	0.043 U	0.092 UT	0.11 UJ	0.052 U	0.079 U	0.082 U
LW2-C436-A	N		0.17 U	0.11 U	0.45 J	0.22 U	0.35 U	0.18 U	0.45 JT	0.15 U	0.25 NJ	0.11 U	0.11 U
LW2-C436-C	N		0.74 U	0.39 U	1.4 U	0.54 U	1.7 U	0.49 U	1.7 UT	0.64 U	0.31 U	0.47 U	0.48 U
LW2-C440-A	N		0.17 U	0.17 U	0.71	0.35	0.35 U	0.41 NJ	1.47 JT	0.15 U	0.2 U	0.11 U	0.11 U
LW2-C440-C	N		0.25	0.17 U	2.2	0.31 U	1.9	0.32 J	4.42 JT	0.14 U	0.17 U	0.31 J	0.11 U
LW2-C444-E	N		0.13 U	0.069 U	0.07 U	0.094 U	0.068 U	0.044 U	0.094 UT	0.12 U	0.054 U	0.082 U	0.084 U
LW2-C447-A	N		0.17 U	0.64 J	1.6	0.2 NJ	1.4 U	0.38 J	2.82 JT	0.15 U	0.18 U	0.18 U	0.21 U
LW2-C447-C	N		0.15 U	0.077 U	0.18 U	0.11 U	0.22 U	0.16 U	0.22 UT	0.13 U	0.06 U	0.16 U	0.095 U
LW2-C448-A	N		0.2 U	0.61 U	1.4 J	0.15 U	0.51 U	0.47	1.87 JT	0.17 U	0.33 U	0.13 U	0.2 U
LW2-C448-C	N		0.18 U	1.7 J	3.3	0.22 J	1.5 U	1.1 J	6.32 JT	0.16 U	0.2 U	0.12 U	0.2 U
LW2-C458-D	N		0.17 U	0.19 U	0.61 NJ	0.13 U	0.54 U	0.14 J	0.75 JT	0.15 U	0.092 NJ	0.11 U	0.19 U
LW2-C521-B	N		3.7 U	2 U	6.7 U	4.7 U	15	3 U	15 T	3 U	1.8 U	2.3 U	3.1 U
LW2-C521-C	N		9.6	3 U	4.9 U	9.8 U	6.7 U	2.4 U	9.8 UT	2.8 U	0.52 U	4.3 U	17 U
LW2-C521-D	N		2.6 U	3.9 U	4.8 U	3.6 U	4.7 U	4.8 U	4.8 UT	2.7 U	2 U	2.9 U	3 U

ANC02612
BZTO104(e)002612

Table 4-1j. R2A Archived Sediment Core Pesticide Data.

Sample ID	Sample Type Code	Analyte Group / CAS No / Chemical Name / Unit / Parent Sample	Pesticides 72-20-8 Endrin ug/kg	Pesticides 7421-93-4 Endrin aldehyde ug/kg	Pesticides 53494-70-5 Endrin ketone ug/kg	Pesticides 76-44-8 Heptachlor ug/kg	Pesticides 1024-57-3 Heptachlor epoxide ug/kg	Pesticides 72-43-5 Methoxychlor ug/kg	Pesticides 2385-85-5 Mirex ug/kg	Pesticides 8001-35-2 Toxaphene ug/kg
LW2-C011-F1	N		0.096 U	0.11 U	0.19 U	0.086 U	0.097 U	0.088 U	0.066 U	5.5 U
LW2-C015-E	N		0.2 U	0.15 U	0.2 U	0.2 U	0.2 U	0.2 U	0.061 U	17 U
LW2-C019-D1	N		0.44 U	0.47 U	2.5 U	0.39 U	4 U	16 U	1 U	310 U
LW2-C019-E2	FR	LW2-C019-E1	0.094 U	0.11 U	0.23 U	0.084 U	0.095 U	0.087 U	0.065 U	5.4 U
LW2-C020-D	N		0.5 U	3.4 U	3.1 U	0.45 U	12 J	32 U	1 U	350 U
LW2-C034-F	N		0.096 UJ	0.11 U	0.083 UJ	0.086 UJ	0.18 J	0.089 U	0.067 U	8.7 U
LW2-C060-A	N		0.092 UJ	0.28 NJ	0.34 NJ	0.082 UJ	0.25 J	0.26	0.22 U	27 U
LW2-C061-C	N		0.2 UJ	0.38 U	1.4 NJ	0.087 UJ	0.75 NJ	0.31 U	0.068 U	72 U
LW2-C061-E	N		0.086 UJ	0.093 U	0.074 UJ	0.077 UJ	0.13 UJ	0.08 U	0.06 U	4.9 U
LW2-C066-T	N		0.11 UJ	0.12 U	0.091 U	0.094 UJ	0.11 UJ	0.097 U	0.073 U	26 U
LW2-C121-D	N		0.087 UJ	0.094 U	0.075 UJ	0.078 UJ	0.088 UJ	0.08 U	0.06 U	5 U
LW2-C133-C	N		0.2 U	0.13 U	1.3 NJ	0.1 U	0.76 J	0.11 U	0.078 U	38 U
LW2-C135-B	N		2.5 U	2.7 U	2.2 U	2.3 U	2.6 U	2.3 U	1.8 U	150 U
LW2-C135-D	N		0.12 U	0.13 U	1.5	0.1 U	1.1 J	0.55 U	0.43 J	45 U
LW2-C138-A	N		0.78 U	1 NJ	0.29 U	0.57 NJ	0.38 U	0.72 U	0.15 U	44 U
LW2-C138-B	N		0.12 U	0.13 U	0.22 U	0.34 U	0.23 U	0.62 U	0.39 U	26 U
LW2-C138-D	N		0.089 UJ	0.096 U	0.077 UJ	0.079 UJ	0.09 UJ	0.082 U	0.062 U	20 U
LW2-C139-D	N		0.083 UJ	0.089 U	0.071 UJ	0.074 UJ	0.084 UJ	0.076 U	0.057 U	4.7 U
LW2-C144-A	N		0.27 U	0.34 J	0.47 U	0.33 U	0.2 U	0.85 U	0.38 U	47 U
LW2-C144-B	N		0.12 U	0.29 J	0.2 U	0.31 U	0.25	0.4 U	0.13 U	14 U
LW2-C144-D	N		0.11 U	0.2 U	0.48 U	0.08 U	0.27 J	0.083 U	0.062 U	36 U
LW2-C147-D	N		2.4 UJ	1.7 U	3.2 U	1 UJ	1.4 J	2 U	6.1 U	170 U
LW2-C148-B	N		0.54 U	0.58 U	0.47 U	0.48 U	0.55 U	0.5 U	0.61 U	94 U
LW2-C148-D	N		0.12 U	0.44 U	2.5 NJ	0.11 U	1.1 NJ	0.11 U	0.078 U	71 U
LW2-C158-A	N		0.12 U	0.3 U	0.099 U	0.11 U	0.34 U	0.11 U	0.35	18 U
LW2-C158-B	N		0.13 UJ	0.36 U	0.66 NJ	0.12 UJ	0.48 J	0.12 U	0.2 U	20 UJ
LW2-C158-D	N		0.28 UJ	0.099 U	0.66 U	0.082 UJ	0.42 J	0.2 U	0.064 U	50 UJ
LW2-C162-A	N		0.12 UJ	0.14 U	0.098 UJ	0.11 UJ	0.35 J	0.43 U	0.079 U	39 U
LW2-C162-B	N		0.13 UJ	0.49 U	0.11 U	0.12 UJ	0.33 NJ	0.38 U	0.088 U	28 UJ
LW2-C162-D	N		0.091 UJ	0.11 U	0.078 UJ	0.081 UJ	0.092 UJ	0.084 U	0.063 U	5.2 U
LW2-C169-A	N		0.13 U	0.14 U	0.26 U	0.12 U	0.48 NJ	0.12 U	0.087 U	16 U
LW2-C169-C	N		0.16 U	0.12 U	0.62 U	0.098 U	0.89 NJ	0.11 U	0.076 U	42 U
LW2-C171-A	N		0.15 U	0.16 U	0.13 U	0.13 U	0.53	0.14 U	0.16 NJ	18 U
LW2-C171-D	N		0.092 U	0.099 U	0.079 U	0.082 U	0.094 U	0.085 U	0.064 U	5.5 U
LW2-C172-E	N		0.089 U	0.096 U	0.077 U	0.08 U	0.09 U	0.082 U	0.062 U	5.1 U
LW2-C173-B	N		0.62 U	0.67 U	0.54 U	0.56 U	0.63 U	0.58 U	0.96 U	36 U
LW2-C173-D	N		0.086 U	0.092 U	0.11 U	0.077 U	0.087 U	0.079 U	0.06 U	4.9 U
LW2-C182-D	N		2.2 U	3.5 U	9.7 U	2 U	2.2 U	2 U	1.5 U	430 U
LW2-C196-A	N		0.35 UJ	0.39 U	0.78 UJ	0.14 UJ	0.34 J	0.56 U	0.39 U	52 U
LW2-C196-B	N		0.16 UJ	0.21 NJ	0.25 NJ	0.12 UJ	0.26 J	0.17 U	0.06 U	23 U
LW2-C196-C	N		0.086 U	0.092 U	0.074 U	0.076 U	0.087 U	0.079 U	0.059 U	4.9 U
LW2-C202-D	N		0.084 U	0.09 U	0.072 U	0.075 U	0.085 U	0.077 U	0.058 U	4.8 U
LW2-C215-B	N		0.082 U	0.089 U	0.071 U	0.073 U	0.084 U	0.076 U	0.057 U	5.1 U
LW2-C215-C	N		0.08 U	0.086 U	0.069 U	0.072 U	0.081 U	0.074 U	0.056 U	4.6 U
LW2-C252-D	N		0.54 U	0.58 U	0.47 U	0.48 U	0.55 U	0.5 U	0.68 U	100 U
LW2-C260-D	N		0.084 U	0.09 U	0.072 U	0.075 U	0.085 U	0.078 U	0.058 U	4.8 U
LW2-C264-D	N		0.088 U	0.2 U	0.076 U	0.078 U	0.089 U	0.24 U	0.061 U	11 U
LW2-C269-D	N		4.9 U	1.5 U	7 U	1.3 U	5.4 J	5.9 U	14 NJ	560 U
LW2-C270-D	N		0.17 U	0.57 U	0.077 U	0.08 U	0.35 J	0.082 U	0.062 U	23 U
LW2-C273-D	N		0.99 U	1.6 U	0.81 U	0.24 U	0.65 U	1.4 U	2 NJ	69 U
LW2-C276-D	N		0.45 U	0.49 U	0.39 U	0.4 U	0.46 U	0.42 U	0.31 U	60 U
LW2-C290-A	N		0.082 U	0.088 U	0.07 U	0.073 U	0.083 U	0.075 U	0.057 U	4.7 U
LW2-C290-B	N		0.084 U	0.2 U	0.38 U	0.075 U	0.2 U	0.078 U	0.2 U	20 U
LW2-C290-D	N		0.089 U	0.096 U	0.077 U	0.08 U	0.091 U	0.082 U	0.062 U	5.1 U
LW2-C291-A	N		0.15 U	0.16 U	0.2 U	0.14 U	0.49 U	0.57 U	0.11 U	23 U
LW2-C291-B	N		0.13 U	0.14 U	0.2 U	0.12 U	0.21 U	0.12 U	0.087 U	20 U
LW2-C291-C	N		0.12 U	0.42 U	1.4 U	0.11 U	0.75 U	2.2 U	0.084 U	110 U
LW2-C299-A	N		1.2 U	1.3 U	9.9 NJ	1.1 U	1.2 U	7.9 NJ	0.81 U	470
LW2-C299-C	N		3 U	3.2 U	2.6 U	9 U	6.3 J	77 U	38 U	2600 U
LW2-C300-A	N		0.12 U	0.12 U	1.1 U	0.099 U	0.89 U	1.7	0.077 U	81 U
LW2-C300-B	N		0.61 U	0.66 U	2 U	0.55 U	2.5 J	0.57 U	0.43 U	150 U
LW2-C300-D	N		0.94 J	0.46 U	1.4 U	0.38 U	2 U	0.39 U	2.5 U	86 U

ANC02613
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Table 4-1j. R2A Archived Sediment Core Pesticide Data.

Sample ID	Sample Type Code	Analyte Group / CAS No / Chemical Name / Unit / Parent Sample	Pesticides 72-20-8 Endrin ug/kg	Pesticides 7421-93-4 Endrin aldehyde ug/kg	Pesticides 53494-70-5 Endrin ketone ug/kg	Pesticides 76-44-8 Heptachlor ug/kg	Pesticides 1024-57-3 Heptachlor epoxide ug/kg	Pesticides 72-43-5 Methoxychlor ug/kg	Pesticides 2385-85-5 Mirex ug/kg	Pesticides 8001-35-2 Toxaphene ug/kg
LW2-C302-D	N		40 U	40 U	220 U	45 U	13 U	42 U	240 J	5300 U
LW2-C314-D	N		0.2 UJ	0.48	0.29 UJ	0.081 UJ	0.24 J	0.91 U	0.34 U	24 U
LW2-C327-D	N		0.2 U	0.79 U	0.59 U	0.082 U	0.24	0.085 U	0.7 U	27 U
LW2-C347-E	N		0.091 U	0.098 U	0.078 U	0.081 U	0.092 U	0.084 U	0.063 U	5.2 U
LW2-C349-D	N		0.079 U	0.085 U	0.068 U	0.071 U	0.08 U	0.073 U	0.055 U	17 U
LW2-C382-D	N		0.093 U	0.11 U	0.17 U	0.083 U	0.095 U	0.086 U	0.065 U	5.3 U
LW2-C401-T	N		0.094 UJ	0.11 U	0.081 U	0.084 UJ	0.096 UJ	0.087 U	0.066 U	5.4 U
LW2-C409-D	N		0.081 U	0.087 U	0.18 J	0.073 U	0.082 U	0.075 U	0.056 U	6.1 U
LW2-C420-D	N		0.42 U	0.45 U	0.72 U	0.37 U	0.42 U	0.8 U	0.29 U	120 U
LW2-C421-A	N		0.74 NJ	0.8 U	1.3 U	0.11 U	0.36 U	0.11 U	0.082 U	160 UJ
LW2-C421-B	N		1.6 NJ	1.7 NJ	2.2 U	0.11 U	0.29 U	0.55 U	0.084 U	210 U
LW2-C421-D	N		0.093 U	0.1 U	0.11 NJ	0.083 U	0.14 J	0.086 U	0.065 U	6.1 U
LW2-C431-F	N		0.089 UJ	0.096 U	0.077 U	0.079 UJ	0.09 UJ	0.082 U	0.062 U	5.1 U
LW2-C436-A	N		0.12 U	0.13 U	0.36 U	0.11 U	0.43	0.11 U	0.079 U	18 U
LW2-C436-C	N		0.52 U	0.56 U	2.4 NJ	0.47 U	0.53 U	0.48 U	0.36 U	51 U
LW2-C440-A	N		0.12 U	0.13 U	0.19 U	0.11 U	0.42 U	0.11 U	0.083 U	29 U
LW2-C440-C	N		0.12 U	0.17 U	0.58 U	0.099 U	0.83 NJ	0.21 U	0.077 U	37 U
LW2-C444-E	N		0.091 U	0.098 U	0.079 U	0.082 U	0.093 U	0.084 U	0.063 U	5.5 U
LW2-C447-A	N		0.12 U	0.13 U	0.3 U	0.11 U	0.42 U	0.11 U	0.079 U	50 U
LW2-C447-C	N		0.12 U	0.24 U	0.16 J	0.091 U	0.12 U	0.095 U	0.13 U	12 U
LW2-C448-A	N		0.14 U	0.21 U	0.22 U	0.13 U	0.61 U	0.13 U	0.16 J	31 U
LW2-C448-C	N		0.13 U	0.14 U	0.3 U	0.12 U	1.2 U	0.12 U	0.087 U	35 U
LW2-C458-D	N		0.12 U	0.21 U	0.23 U	0.11 U	0.59 NJ	0.11 U	0.082 U	14 U
LW2-C521-B	N		7 U	6.6 NJ	13 U	0.92 U	1.1 U	9.5 U	6.8 U	970 U
LW2-C521-C	N		4 U	14 U	9.7 U	2.3 U	0.9 U	27 U	38 J	1400 U
LW2-C521-D	N		5.2 U	2.4 U	5.8 U	1.2 U	1.3 J	20 U	8.5 NJ	420 U

Notes:

- For all totals, zero is always used for non-detects. If any of the values included in a total are estimated (J qualified), then the total value is estimated (J qualified). If all analytes in a total are non-detects, then the highest detection limit is used for the total. A "T" qualifier is added to all results that are mathematically derived.
- Coordinate system for geographic coordinates is Oregon State Plane NAD83 HARN/HPGN, Intl. Feet.
- All concentration units are listed as dry weight.

J Estimate.
T Value is an average or selected result (see Kennedy Jenks et a., 2004).
U Not detected at value shown.

ANC02614
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Table 4-1k. R2A Archived Sediment Core PCB Congener Data.

		Analyte Group	PCB Congeners	PCB Congeners	PCB Congeners	PCB Congeners	PCB Congeners	PCB Congeners	PCB Congeners	PCB Congeners	PCB Congeners
		CAS No	2051-60-7	2051-61-8	2051-62-9	PCB004_010	PCB005_008	25569-80-6	PCB007_009	2050-67-1	PCB012_013
		Chemical Name	2-Chlorobiphenyl	3-Chlorobiphenyl	4-Chlorobiphenyl	PCB004 & 010	PCB005 & 008	2,3'-Dichlorobiphenyl	PCB007 & 009	3,3'-Dichlorobiphenyl	PCB012 & 013
	Sample	**PCB#**	PCB001	PCB002	PCB003	PCB004_010	PCB005_008	PCB006	PCB007_009	PCB011	PCB012_013
	Type	**Unit**	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g
Sample ID	**Code**	**Parent Sample**									
LW2-C019-B2	FR	LW2-C019-B1	882	306	1360	7750	16900	7730	1360	433	3000
LW2-C025-B2	FR	LW2-C025-B1	9.21	5.06	64.4	69.9	806	170	30.6	16.8	250
LW2-C093-A	N		2460	202	1120	8590	13000	2910	1370	119 U	913
LW2-C093-B	N		123	33.8	77.5	229	638	180	66.4	61.4 U	61.4 U
LW2-C111-B2	FR	LW2-C111-B	229 T	57.1 T	212 T	1430 T	6220 T	1130 T	530 T	183 T	425 T
LW2-C184-B	N		79.4	23.8	69.4	377	1640	501	126	38 J	184
LW2-C203-C	N		6220	515	3510	2960	7020	1860	1570	72.2 U	937
LW2-C207-B	N		70.8	42.9	67.5	49.8 U	170	49.8 U	49.8 U	49.8 U	49.8 U
LW2-C263-C	N		33.8 J	42.9 J	55 J	199 U	199 U	199 U	199 U	199 U	199 U
LW2-C277-C	N		95.9	68.6	110	124	536	101	53.6	24.1 U	78.7
LW2-C293-B2	FR	LW2-C293-B	71.1	85.3	86.8	80.3	329	74	25.2 U	31.3 U	25.2 U
LW2-C302-B	N		118	60.6 J	131	306	1210	184 U	184 U	184 U	184 U
LW2-C302-C	N		393	653	789	517 U	517 U	517 U	517 U	517 U	517 U
LW2-C327-D	N		26.6 T	5.88 JT	19.2 T	49.9 T	202 T	131 T	15.8 UT	13.3 UT	52 T
LW2-C342-B	N		117	44.6	67.8	79.7	235	19.8 U	19.8 U	214 U	19.8 U
LW2-C342-C	N		92.5	22.4	80.5	114	510	118	59.5	20.7 U	83
LW2-C366-C1	N		229	36.8	145	1380	4190	763	335	152	285
LW2-C371-B	N		226	45.7	195	523	2520	1010	184	132	336
LW2-C377-E	N		16.7 U	16.7 U	16.7 U	17.3 U	47.9 U	33.5 U	33.5 U	43.8 U	33.5 U
LW2-C382-B	N		773	39	309	233	608	153	96.1	25.2 U	66.9
LW2-C397-C	N		310	46.9	171	293	1060	260	123	36.9 U	136
LW2-C401-E	N		166	24.7 U	119	3370	15100	2230	728	49.5 U	303
LW2-C409-C	N		73.1	6.32 J	24.8	100	320	68.6	20.7 U	20.7 U	20.7 U
LW2-C420-C	N		129	504	272	147	418	152	20.8 U	207 U	100
LW2-C431-B	N		1290	115	644	12300	42900	8170	3730	135 U	1920
LW2-C453-B	N		48300	5910	30000	45400	154000	26100	14000	833	5580
LW2-C455-B	N		65100	7660	38400	353000	1240000	202000	71300	3990	32300
LW2-C455-C	N		3070	405	2540	2420	9130	1790	1020	117	619
LW2-C477-B	N		76.3	29	93.4	97.9	365	84.6	25.2 U	104 U	73.8
LW2-C494-C	N		524	82.4	269	1950	6200	2010	593	200 U	365

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Table 4-1k. R2A Archived Sediment Core PCIB Congener Data.

		Analyte Group	PCB Congeners	PCB Congeners	PCB Congeners	PCB Congeners	PCB Congeners	PCB Congeners	PCB Congeners	PCB Congeners	PCB Congeners
		CAS No	34883-41-5	2050-68-2	PCB016_032	37680-66-3	37680-65-2	38444-73-4	PCB020_021_033	38444-85-8	55720-44-0
		Chemical Name	3,5-Dichlorobiphenyl	4,4'-Dichlorobiphenyl	PCB016 & 032	2,2',4-Trichlorobiphenyl	2,2',5-Trichlorobiphenyl	2,2',6-Trichlorobiphenyl	PCB020 & 021 & 033	2,3,4'-Trichlorobiphenyl	2,3,5-Trichlorobiphenyl
	Sample	**PCB#**	PCB014	PCB015	PCB016_032	PCB017	PCB018	PCB019	PCB020_021_033	PCB022	PCB023
	Type	**Unit**	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g
Sample ID	**Code**	**Parent Sample**									
LW2-C019-B2	FR	LW2-C019-B1	5.05 U	18900	22800	17400	29400	3910	12500	9370	25.1
LW2-C025-B2	FR	LW2-C025-B1	3.31 U	6040	1930	1540	1780	87.1	389	302	2.64
LW2-C093-A	N		24.8 U	5440	10400	8380	16800	3070	10900	6150	22.8
LW2-C093-B	N		61.4 U	310	2760	1840	4720	246	4060	2500	30.7 U
LW2-C111-B2	FR	LW2-C111-B	5.02 UT	3680 T	6680 T	4670 T	10600 T	908 T	8840 T	4710 T	13.9 JT
LW2-C184-B	N		41.8 U	971	2310	1720	3810	297	2740	1570	6.81 J
LW2-C203-C	N		50.6 U	3470	3080	2180	5120	463	3780	1980	25.3 U
LW2-C207-B	N		49.8 U	122	284	198	313	35	387	211	24.9 U
LW2-C263-C	N		199 U	199 U	99.6 U	99.6 U	99.6 U	99.6 U	116	99.6 U	99.6 U
LW2-C277-C	N		24.1 U	408	1250	1060	1020	125	1340	822	12 U
LW2-C293-B2	FR	LW2-C293-B	25.2 U	138	697	558	383	73.2	824	489	12.6 U
LW2-C302-B	N		184 U	358	2440	1510	1950	279	2690	1500	91.9 U
LW2-C302-C	N		517 U	517 U	259 U	259 U	259 U	259 U	259 U	259 U	259 U
LW2-C327-D	N		15.8 UT	126 T	383 T	300 T	669 T	36.8 T	414 T	271 T	7.88 UT
LW2-C342-B	N		19.8 U	225	283	199	405	45.6	321	180	9.89 U
LW2-C342-C	N		20.7 U	411	761	614	1260	80.1	1110	590	3.01 J
LW2-C366-C1	N		41.5 U	1910	9750	5620	19400	1150	12300	7830	16.8 J
LW2-C371-B	N		4.94 U	1420	6320	4080	12400	660	11200	5650	19.5
LW2-C377-E	N		33.5 U	38.7	58.6	31.8	79.6	16.7 U	101	16.7 U	16.7 U
LW2-C382-B	N		25.2 U	217	485	320	700	66.4	510	249	12.6 U
LW2-C397-C	N		25 U	672	1520	1110	2340	176	1940	963	12.5 U
LW2-C401-E	N		49.5 U	5060	23900	15000	42400	2800	31800	17100	35.8
LW2-C409-C	N		20.7 U	259	1120	639	1690	168	949	586	10.3 U
LW2-C420-C	N		20.8 U	186	1050	522	647	75	457	247	16
LW2-C431-B	N		62.5 U	14900	34700	24600	58200	5490	44800	24300	92.2
LW2-C453-B	N		30.9 U	47700	150000	102000	245000	23700	354000	181000	386
LW2-C455-B	N		1290 U	334000	1300000	858000	2330000	215000	1650000	884000	2480
LW2-C455-C	N		50.6 U	3380	6640	4710	11300	948	8100	4380	12.2 J
LW2-C477-B	N		25.2 U	1080	1140	452	963	211	713	776	12.6 U
LW2-C494-C	N		22.5 U	2620	5280	3520	8150	778	5400	3100	8.3 J

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Table 4-1k. R2A Archived Sediment Core PCIB Congener Data.

		Analyte Group	PCB Congeners	PCB Congeners	PCB Congeners	PCB Congeners	PCB Congeners	PCB Congeners	PCB Congeners	PCB Congeners	PCB Congeners
		CAS No	PCB024_027	55712-37-3	38444-81-4	7012-37-5	15862-07-4	35693-92-6	16606-02-3	37680-68-5	37680-69-6
		Chemical Name	PCB024 & 027	2,3',4-Trichlorobiphenyl	2,3',5-Trichlorobiphenyl	2,4,4'-Trichlorobiphenyl	2,4,5-Trichlorobiphenyl	2,4,6-Trichlorobiphenyl	2,4',5-Trichlorobiphenyl	2,3',5'-Trichlorobiphenyl	3,3',4-Trichlorobiphenyl
	Sample	**PCB#**	PCB024_027	PCB025	PCB026	PCB028	PCB029	PCB030	PCB031	PCB034	PCB035
	Type	**Unit**	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g
Sample ID	**Code**	**Parent Sample**									
LW2-C019-B2	FR	LW2-C019-B1	2590	10100	17500	51900	91.3	2.53 U	41600	655	339
LW2-C025-B2	FR	LW2-C025-B1	145	557	1550	3540	1.87	1.66 U	5000	102	26.4
LW2-C093-A	N		1740	2830	4480	20600	113	12.4 U	18200	164	274
LW2-C093-B	N		190	708	1010	8510	30.7 U	30.7 U	8080	81.8	40.9
LW2-C111-B2	FR	LW2-C111-B	815 T	1330 T	2320 T	12400 T	94 T	2.51 UT	14800 T	103 T	159 T
LW2-C184-B	N		260	626	922	5390	25.3	20.9 U	4420	67.8	79.7
LW2-C203-C	N		368	2120	3480	6950	44.4	25.3 U	7040	89.4	156
LW2-C207-B	N		30.1	104	110	801	24.9 U	24.9 U	891	15 J	27
LW2-C263-C	N		99.6 U	99.6 U	99.6 U	147	99.6 U	99.6 U	99.6 U	99.6 U	99.6 U
LW2-C277-C	N		123	224	404	3470	8.43 J	12 U	2740	58.7	53.6
LW2-C293-B2	FR	LW2-C293-B	62.3	176	386	1920	4.71 J	12.6 U	1770	31.6	31.9
LW2-C302-B	N		234	416	743	5000	91.9 U	91.9 U	4730	46.5 J	84.4 J
LW2-C302-C	N		259 U	259 U	259 U	259 U	259 U	259 U	259 U	259 U	259 U
LW2-C327-D	N		33.2 T	274 T	324 T	937 T	2.75 JT	7.88 UT	849 T	12.2 T	16.1 T
LW2-C342-B	N		36	66.8	99.2	765	3.66 J	9.89 U	516	9.26 J	18
LW2-C342-C	N		82	179	270	2350	7.41 J	10.3 U	1630	33.9	35.4
LW2-C366-C1	N		810	1400	2800	20400	60.7	20.7 U	24600	90.4	148
LW2-C371-B	N		504	5660	7180	9250	43	2.47 U	28700	278	234
LW2-C377-E	N		16.7 U	24.6	40.4	154	16.7 U	16.7 U	194	16.7 U	6.81 J
LW2-C382-B	N		45.7	277	503	967	3.29 J	12.6 U	910	11.7 J	27.1
LW2-C397-C	N		165	447	668	4570	14.7	12.5 U	2810	56.9	65.9
LW2-C401-E	N		2290	3040	6430	41200	85.1	14.9 J	50000	282	270
LW2-C409-C	N		111	124	247	2000	5.57 J	10.3 U	1750	19.9	20.7
LW2-C420-C	N		48.1	108	162	2190	10.4 U	10.4 U	1010	16.7	26.9
LW2-C431-B	N		4050	6290	10200	64400	412	31.3 U	56100	538	807
LW2-C453-B	N		17300	39800	82800	251000	1670	15.5 U	677000	3050	2670
LW2-C455-B	N		142000	187000	354000	2160000	15200	644 U	2060000	10600	21000
LW2-C455-C	N		727	1090	1900	12600	63.1	25.3 U	10400	94.4	126
LW2-C477-B	N		165	187	275	2970	6.79 J	12.6 U	1260	15.7	39.6
LW2-C494-C	N		582	1210	1960	9530	49.9	11.3 U	8290	73.2	114

ANC02617
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Table 4-1k. R2A Archived Sediment Core PCIB Congener Data.

		Analyte Group	PCB Congeners	PCB Congeners	PCB Congeners	PCB Congeners	PCB Congeners	PCB Congeners	PCB Congeners	PCB Congeners	PCB Congeners
		CAS No	38444-87-0	38444-90-5	53555-66-1	38444-88-1	38444-93-8	PCB041_064_071_	PCB042_059	PCB043_049	41464-39-5
		Chemical Name	3,3',5-Trichlorobiphenyl	3,4,4'-Trichlorobiphenyl	3,4,5-Trichlorobiphenyl	3,4',5-Trichlorobiphenyl	2,2',3,3'-Tetrachlorobiphenyl	PCB041 & 064 &071 &072	PCB042 & 059	PCB043 & 049	2,2',3,5'-Tetrachlorobiphenyl
	Sample	**PCB#**	PCB036	PCB037	PCB038	PCB039	PCB040	PCB041_064_071_	PCB042_059	PCB043_049	PCB044
	Type	**Unit**	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g
Sample ID	**Code**	**Parent Sample**									
LW2-C019-B2	FR	LW2-C019-B1	26.9	9040	517	200	8120	47700	15300	53800	48900
LW2-C025-B2	FR	LW2-C025-B1	2.43	557	185	23.7	333	6450	842	12900	2890
LW2-C093-A	N		14.6	5070	322	79	7840	51000	13700	68600	105000
LW2-C093-B	N		30.7 U	1190	57.9	16.2 J	2390	14200	4730	14200	19700
LW2-C111-B2	FR	LW2-C111-B	2.51 UT	3720 T	55.4 T	18.2 T	1930 T	9460 T	3850 T	9790 T	11700 T
LW2-C184-B	N		20.9 U	1220	34.2	25.1	972	4920	1970	5410	5790
LW2-C203-C	N		25.3 U	1540	116	45.3	3230	22900	5980	43700	59500
LW2-C207-B	N		24.9 U	203	42.3	18.1 J	202	2210	863	7230	4210
LW2-C263-C	N		99.6 U	99.6 U	99.6 U	99.6 U	99.6 U	250	78.6 J	255	411
LW2-C277-C	N		3.43 J	833	38.9	20.5	749	4290	1610	4540	4950
LW2-C293-B2	FR	LW2-C293-B	12.6 U	427	39.7	13.1	443	2900	1090	4130	3750
LW2-C302-B	N		91.9 U	1080	48.6 J	91.9 U	1480	7640	2600	6280	8690
LW2-C302-C	N		259 U	259 U	259 U	259 U	259 U	259 U	259 U	259 U	259 U
LW2-C327-D	N		7.88 UT	147 T	4.66 JT	4.71 JT	240 T	1150 T	427 T	1450 T	1440 T
LW2-C342-B	N		9.89 U	239	11.9	9.5 J	178	1180	413	1700	1370
LW2-C342-C	N		3.16 J	630	20	21.2	584	3310	1230	3840	3970
LW2-C366-C1	N		17.5 J	4030	156	32	6190	31800	10600	25000	36500
LW2-C371-B	N		2.47 U	2620	200	26.6	1970	13200	6180	17800	21600
LW2-C377-E	N		16.7 U	30.5	16.7 U	16.7 U	32.8	172	54.5	216	294
LW2-C382-B	N		27.6	184	33.5	31.2	373	3360	1080	7550	6500
LW2-C397-C	N		10.3 J	993	44	38.9	1020	6440	2440	9910	9000
LW2-C401-E	N		24.7 U	9270	320	30.2	9100	45900	15800	36800	49100
LW2-C409-C	N		2.22 J	507	22.5	16.1	1080	5270	1860	5850	7980
LW2-C420-C	N		10.4 U	226	134	31.2	476	5440	1470	11200	7520
LW2-C431-B	N		16.1 J	16700	212	130	7250	33400	14200	31100	37000
LW2-C453-B	N		23.9	62500	954	176	31000	143000	58700	137000	165000
LW2-C455-B	N		644 U	510000	7450	1410	345000	1650000	624000	1320000	1810000
LW2-C455-C	N		25.3 U	2860	75.3	25.8	1540	7940	2930	8520	9880
LW2-C477-B	N		12.6 U	1190	28.1	11 J	1100	6810	2150	9180	11200
LW2-C494-C	N		6.49 J	2150	224	28.6	1290	8130	2870	19200	8210

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Table 4-1k. R2A Archived Sediment Core PCIB Congener Data.

		Analyte Group	PCB Congeners	PCB Congeners	PCB Congeners	PCB Congeners	PCB Congeners	PCB Congeners	PCB Congeners	PCB Congeners	PCB Congeners
		CAS No	70362-45-7	41464-47-5	2437-79-8	PCB048_075	62796-65-0	68194-04-7	PCB052_069	41464-41-9	15968-05-5
		Chemical Name	2,2',3,6-Tetrachlorobiphenyl	2,2',3,6'-Tetrachlorobiphenyl	2,2',4,4'-Tetrachlorobiphenyl	PCB048 & 075	2,2',4,6-Tetrachlorobiphenyl	2,2',4,6'-Tetrachlorobiphenyl	PCB052 & 069	2,2',5,6'-Tetrachlorobiphenyl	2,2',6,6'-Tetrachlorobiphenyl
	Sample Type	**PCB#**	PCB045	PCB046	PCB047	PCB048_075	PCB050	PCB051	PCB052_069	PCB053	PCB054
Sample ID	**Code**	**Unit** / **Parent Sample**	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g
LW2-C019-B2	FR	LW2-C019-B1	8370	5320	27300	7650	260	5410	62400	12400	241
LW2-C025-B2	FR	LW2-C025-B1	559	938	9970	727	41.4	1650	9560	2260	14.1
LW2-C093-A	N		4870	2240	16300	7430	120	1770	195000	7520	109
LW2-C093-B	N		2160	1010	5090	3110	33.8	717	27400	2380	28.7 J
LW2-C111-B2	FR	LW2-C111-B	2000 T	887 T	3800 T	2330 T	42.8 T	651 T	13700 T	1850 T	31.3 T
LW2-C184-B	N		886	389	1920	1210	27.8	280	6910	819	11.6 J
LW2-C203-C	N		1580	762	9750	3060	42.3	530	127000	3060	17.8 J
LW2-C207-B	N		138	80	3270	301	24.9 U	64.1	8810	250	24.9 U
LW2-C263-C	N		22 J	99.6 U	78.4 U	58 J	99.6 U	99.6 U	709	99.6 U	99.6 U
LW2-C277-C	N		636	264	1550	1120	17.6	210	5500	583	7.04 J
LW2-C293-B2	FR	LW2-C293-B	351	153	1780	661	10.2 J	126	5580	366	5.55 J
LW2-C302-B	N		1290	560	2210	1890	91.9 U	318	9020	1290	22.7 J
LW2-C302-C	N		259 U	259 U	259 U	259 U	259 U	259 U	259 U	259 U	259 U
LW2-C327-D	N		223 T	98 T	418 T	251 T	4.82 JT	65.1 T	2180 T	210 T	2.76 JT
LW2-C342-B	N		129	64.5	696	212	5.87 J	106	2290	240	6.91 J
LW2-C342-C	N		437	195	1320	765	14	156	5160	455	5.05 J
LW2-C366-C1	N		5780	2460	8970	7680	76.7	1590	36500	5310	70.7
LW2-C371-B	N		3370	1450	6950	2720	68.2	955	22900	3330	43.8
LW2-C377-E	N		19.4	11.8 J	75 U	19.4	16.7 U	6.52 J	538	28	16.7 U
LW2-C382-B	N		174	132	2560	447	7.7 J	194	13800	475	7.42 J
LW2-C397-C	N		783	359	3160	1460	25	279	14600	881	8.58 J
LW2-C401-E	N		8610	3780	11700	12300	127	2510	48300	8260	122
LW2-C409-C	N		833	381	1940	965	15.6	288	11400	879	11.8
LW2-C420-C	N		213	532	8050	671	10.4 U	2270	16200	2320	170
LW2-C431-B	N		8010	3270	11000	10300	181	2230	35300	6550	113
LW2-C453-B	N		35000	15200	55200	33900	636	9920	172000	31700	535
LW2-C455-B	N		363000	149000	453000	464000	5860	101000	1680000	314000	5090
LW2-C455-C	N		1460	616	2880	1990	26.5	424	13100	1300	21.4 J
LW2-C477-B	N		875	328	2630	929	16.3	283	20500	1020	15.7
LW2-C494-C	N		1310	703	18200	1860	32.5	5240	15900	4520	285

ANC02619
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Table 4-1k. R2A Archived Sediment Core PCIB Congener Data.

		Analyte Group	PCB Congeners	PCB Congeners	PCB Congeners	PCB Congeners	PCB Congeners	PCB Congeners	PCB Congeners	PCB Congeners	PCB Congeners
		CAS No	74338-24-2	PCB056_060	70424-67-8	41464-49-7	PCB061_070	54230-22-7	74472-34-7	33284-54-7	PCB066_076
		Chemical Name	2,3,3',4-Tetrachlorobiphenyl	PCB056 & 060	2,3,3',5-Tetrachlorobiphenyl	2,3,3',5'-Tetrachlorobiphenyl	PCB061 & 070	2,3,4,6-Tetrachlorobiphenyl	2,3,4',5-Tetrachlorobiphenyl	2,3,5,6-Tetrachlorobiphenyl	PCB066 & 076
	Sample Type	**PCB#**	PCB055	PCB056_060	PCB057	PCB058	PCB061_070	PCB062	PCB063	PCB065	PCB066_076
Sample ID	**Code**	**Unit** / **Parent Sample**	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g
LW2-C019-B2	FR	LW2-C019-B1	621	28700	419	147	50600	8.83	2240	22.9	42800
LW2-C025-B2	FR	LW2-C025-B1	68.8	1870	64	20.3	4380	1.66 U	299	2.59	2820
LW2-C093-A	N		1550	26300	326	283	123000	15	2200	21.5	57000
LW2-C093-B	N		170	9220	56.8	43.6	21500	30.7 U	561	30.7 U	14500
LW2-C111-B2	FR	LW2-C111-B	129 T	4770 T	57.4 T	31.3 T	10900 T	2.51 UT	371 T	10.2 T	8360 T
LW2-C184-B	N		55.8	2760	42.5	45.9	6630	20.9 U	248	20.9 U	5540
LW2-C203-C	N		749	12300	274	331	75600	25.3 U	1410	25.3 U	32300
LW2-C207-B	N		58.5	1020	23.1 J	68.7	5780	24.9 U	185	24.9 U	4740
LW2-C263-C	N		99.6 U	200	99.6 U	99.6 U	549	99.6 U	99.6 U	99.6 U	269
LW2-C277-C	N		43.5	2360	30.5	46.7	6030	12 U	226	4.79 J	5170
LW2-C293-B2	FR	LW2-C293-B	58.3	1650	46.7	32.3	4890	12.6 U	144	12.6 U	3900
LW2-C302-B	N		121	5180	49.3 J	91.9 U	8800	91.9 U	324	91.9 U	6840
LW2-C302-C	N		259 U	259 U	259 U	259 U	259 U	259 U	259 U	259 U	259 U
LW2-C327-D	N		10.6 T	465 T	8.4 JT	5.62 JT	1040 T	7.88 UT	34.3 T	7.88 UT	775 T
LW2-C342-B	N		18.3	509	7.55 J	16.7	1640	9.89 U	48.7	9.89 U	1320
LW2-C342-C	N		40.4	1800	18.7	37.6	4990	10.3 U	161	10.3 U	3840
LW2-C366-C1	N		399	21400	120	39.4	34500	12.4 J	1140	21.2	26100
LW2-C371-B	N		301	11500	173	57.9	20200	2.47 U	915	5.52	15100
LW2-C377-E	N		7.36 J	141	16.7 U	16.7 U	415	16.7 U	9.22 J	16.7 U	282
LW2-C382-B	N		69.7	1180	31.7	57.6	7100	12.6 U	152	12.6 U	3600
LW2-C397-C	N		120	3450	67.3	117	12600	12.5 U	397	12.5 U	9660
LW2-C401-E	N		559	30000	190	75.1	47600	24.7 U	1660	24.7 U	38800
LW2-C409-C	N		66.9	2710	15.8	29.4	7270	10.3 U	148	10.3 U	4730
LW2-C420-C	N		10.4 U	1280	25.8	69.3	8110	10.4 U	220	10.4 U	4030
LW2-C431-B	N		383	19100	227	143	34800	13.8 J	1370	45.9	29500
LW2-C453-B	N		3050	119000	1050	5900	189000	36.8	7090	155	159000
LW2-C455-B	N		27100	1030000	8230	2760	1570000	810	56400	1490	1280000
LW2-C455-C	N		133	4540	45.5	40	11200	25.3 U	308	25.3 U	8030
LW2-C477-B	N		135	2720	18	64.7	9160	12.6 U	174	12.6 U	6590
LW2-C494-C	N		212	4000	108	73.1	10500	11.3 U	375	12.7	8650

ANC02620
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Table 4-1k. R2A Archived Sediment Core PCIB Congener Data.

		Analyte Group	PCB Congeners	PCB Congeners	PCB Congeners	PCB Congeners	PCB Congeners	PCB Congeners	PCB Congeners	PCB Congeners	PCB Congeners
		CAS No	73575-53-8	73575-52-7	74338-23-1	32690-93-0	32598-13-3	70362-49-1	41464-48-6	33284-52-5	70362-50-4
		Chemical Name	2,3',4,5-Tetrachlorobiphenyl	2,3',4,5'-Tetrachlorobiphenyl	2,3',5',6-Tetrachlorobiphenyl	2,4,4',5-Tetrachlorobiphenyl	3,3',4,4'-Tetrachlorobiphenyl	3,3',4,5-Tetrachlorobiphenyl	3,3',4,5'-Tetrachlorobiphenyl	3,3',5,5'-Tetrachlorobiphenyl	3,4,4',5-Tetrachlorobiphenyl
	Sample	**PCB#**	PCB067	PCB068	PCB073	PCB074	PCB077	PCB078	PCB079	PCB080	PCB081
	Type	**Unit**	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g
Sample ID	**Code**	**Parent Sample**									
LW2-C019-B2	FR	LW2-C019-B1	1330	491	2.53 U	19800	4420	2.53 U	432	2.53 U	345
LW2-C025-B2	FR	LW2-C025-B1	99.9	164	317	1560	467	1.66 U	55.8	1.66 U	14.6
LW2-C093-A	N		1700	748	12.4 U	27900	2770	12.4 U	2930	12.4 U	1890
LW2-C093-B	N		306	110	30.7 U	6460	955	30.7 U	227	30.7 U	165
LW2-C111-B2	FR	LW2-C111-B	353 T	95.1 T	2.51 UT	4000 T	736 T	2.51 UT	107 T	2.51 UT	74.9 T
LW2-C184-B	N		192	91.2	20.9 U	2480	450	20.9 U	107	20.9 U	33.1
LW2-C203-C	N		2010	838	25.3 U	14700	1560	25.3 U	1440	25.3 U	1320
LW2-C207-B	N		44.7	367	24.9 U	976	219	24.9 U	277	24.9 U	54.6
LW2-C263-C	N		99.6 U	99.6 U	99.6 U	160	84.5 J	99.6 U	67 J	99.6 U	85.3 J
LW2-C277-C	N		135	90.1	12 U	2220	428	12 U	126	12 U	28.3
LW2-C293-B2	FR	LW2-C293-B	114	123	12.6 U	1300	251	12.6 U	212	12.6 U	39.7
LW2-C302-B	N		256	67.9 J	91.9 U	3440	602	91.9 U	116	91.9 U	62.1 J
LW2-C302-C	N		259 U	259 U	259 U	259 U	61 J	259 U	259 U	259 U	259 U
LW2-C327-D	N		38.2 T	17.3 T	7.88 UT	376 T	59.6 T	7.88 UT	13.7 T	7.88 UT	1.76 JT
LW2-C342-B	N		30.1	48.9	9.89 U	537	111	9.89 U	53.1	9.89 U	30.2
LW2-C342-C	N		100	87.2	10.3 U	1780	309	10.3 U	92.6	10.3 U	19
LW2-C366-C1	N		853	133	20.7 U	15200	2030	20.7 U	248	20.7 U	183
LW2-C371-B	N		1120	86.5	2.47 U	8950	1240	2.47 U	139	2.47 U	127
LW2-C377-E	N		8.19 J	16.7 U	16.7 U	115	25 U	16.7 U	14.3 J	16.7 U	7.01 U
LW2-C382-B	N		68.6	223	12.6 U	1340	216	12.6 U	240	13.7	45.6
LW2-C397-C	N		220	270	12.5 U	3940	799	12.5 U	333	12.5 U	88.3
LW2-C401-E	N		1270	89.9	24.7 U	22100	3070	24.7 U	260	24.7 U	240
LW2-C409-C	N		84.9	79.4	10.3 U	2150	363	10.3 U	134	10.3 U	49.6
LW2-C420-C	N		38.8	292	10.4 U	1700	270	10.4 U	230	10.4 U	55.6
LW2-C431-B	N		1430	280	31.3 U	15900	3120	31.3 U	314	31.3 U	131
LW2-C453-B	N		203	15.5 U	15.5 U	82300	13700	15.5 U	907	15.5 U	895
LW2-C455-B	N		58900	4300	644 U	739000	120000	644 U	6490	644 U	5010
LW2-C455-C	N		272	102	25.3 U	4050	723	25.3 U	209	25.3 U	85.1
LW2-C477-B	N		81.8	174	12.6 U	2280	456	12.6 U	299	12.6 U	96.1
LW2-C494-C	N		287	385	330	3530	761	11.3 U	450	40.8	20.9

ANC02621
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Table 4-1k. R2A Archived Sediment Core PCIB Congener Data.

		Analyte Group	PCB Congeners	PCB Congeners	PCB Congeners	PCB Congeners	PCB Congeners	PCB Congeners	PCB Congeners	PCB Congeners	PCB Congeners
		CAS No	52663-62-4	60145-20-2	PCB084_092	PCB085_116	55312-69-1	PCB087_117_125	PCB088_091	73575-57-2	PCB090_101
		Chemical Name	2,2',3,3',4-Pentachlorobiphenyl	2,2',3,3',5-Pentachlorobiphenyl	PCB084 & 092	PCB085 & 116	2,2',3,4,5-Pentachlorobiphenyl	PCB087 & 117 & 125	PCB088 & 091	2,2',3,4,6'-Pentachlorobiphenyl	PCB090 & 101
	Sample	**PCB#**	PCB082	PCB083	PCB084_092	PCB085_116	PCB086	PCB087_117_125	PCB088_091	PCB089	PCB090_101
	Type	**Unit**	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g
Sample ID	**Code**	**Parent Sample**									
LW2-C019-B2	FR	LW2-C019-B1	5630	2.53 U	18400	6940	1210	13100	8150	827	31000
LW2-C025-B2	FR	LW2-C025-B1	527	4.56	3200	777	48.6	1340	1750	71.9	4910
LW2-C093-A	N		31600	12.4 U	135000	43000	4230	124000	39900	1960	318000
LW2-C093-B	N		3110	30.7 U	13900	4290	128	12700	3900	373	30700
LW2-C111-B2	FR	LW2-C111-B	1340 T	2.51 UT	5510 T	1780 T	266 JT	4670 T	1760 T	124 T	12300 T
LW2-C184-B	N		699	20.9 U	3400	985	25.5	2020	1120	102	7600
LW2-C203-C	N		18500	25.3 U	89700	24700	880	79400	23900	1130	205000
LW2-C207-B	N		745	24.9 U	8220	1220	117	3540	2370	69	22100
LW2-C263-C	N		140	99.6 U	616	227	99.6 U	621	178	99.6 U	2040
LW2-C277-C	N		657	12 U	3550	1010	18.6	1860	991	96.6	8060
LW2-C293-B2	FR	LW2-C293-B	554	12.6 U	5480	952	18.3	2440	1320	67.7	16400
LW2-C302-B	N		977	91.9 U	3100	1350	91.9 U	2670	1120	157	7320
LW2-C302-C	N		259 U	259 U	259 U	259 U	259 U	259 U	259 U	259 U	708
LW2-C327-D	N		91.3 T	7.88 UT	559 T	134 T	4.05 JT	289 T	228 T	16.2 T	1250 T
LW2-C342-B	N		252	9.89 U	1460	392	9.89 U	903	592	21.4	3650
LW2-C342-C	N		670	10.3 U	3080	962	16.4	2030	1090	69.2	7740
LW2-C366-C1	N		4150	40.8	11300	6240	460	11200	4450	725	23800
LW2-C371-B	N		2250	2.47 U	7620	2680	245	5600	2980	391	13100
LW2-C377-E	N		91.9	16.7 U	582	155	39.8	572	124	16.7 U	2120
LW2-C382-B	N		1310	12.6 U	8230	1890	33.2	5520	2670	99.7	18700
LW2-C397-C	N		2280	12.5 U	12300	3820	63.2	8300	3610	203	29700
LW2-C401-E	N		4190	32.3	10500	5710	430	9430	4460	875	18700
LW2-C409-C	N		1440	5.49 J	6050	2060	64.5	5310	1920	149	14700
LW2-C420-C	N		1480	10.4 U	8810	2200	10.4 U	6270	4010	106	20900
LW2-C431-B	N		2300	22.5 J	10600	3440	191	6670	3660	463	25600
LW2-C453-B	N		13000	15.5 U	52100	14000	3370	41000	15400	2030	111000
LW2-C455-B	N		129000	1450	316000	165000	13300	296000	130000	23700	638000
LW2-C455-C	N		1440	25.3 U	6540	2140	39.6	5300	1950	135	18900
LW2-C477-B	N		3460	7.19 J	14000	5250	86.5	13300	4700	240	35400
LW2-C494-C	N		1450	11.3 U	13000	2400	38.8	5110	7490	143	37300

ANC02622
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Table 4-1k. R2A Archived Sediment Core PCIB Congener Data.

		Analyte Group	PCB Congeners	PCB Congeners	PCB Congeners	PCB Congeners	PCB Congeners	PCB Congeners	PCB Congeners	PCB Congeners	PCB Congeners
		CAS No	73575-56-1	73575-55-0	PCB095_098_102	73575-54-9	41464-51-1	38380-01-7	39485-83-1	60145-21-3	56558-16-8
		Chemical Name	2,2',3,5,6-Pentachlorobiphenyl	2,2',3,5,6'-Pentachlorobiphenyl	PCB095 & 098 & 102	2,2',3,6,6'-Pentachlorobiphenyl	2,2',3,4',5'-Pentachlorobiphenyl	2,2',4,4',5-Pentachlorobiphenyl	2,2',4,4',6-Pentachlorobiphenyl	2,2',4,5',6-Pentachlorobiphenyl	2,2',4,6,6'-Pentachlorobiphenyl
	Sample Type	**PCB#**	PCB093	PCB094	PCB095_098_102	PCB096	PCB097	PCB099	PCB100	PCB103	PCB104
Sample ID	**Code**	**Unit** / **Parent Sample**	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g
LW2-C019-B2	FR	LW2-C019-B1	2.53 U	493	29600	813	12200	17500	425	532	25.2
LW2-C025-B2	FR	LW2-C025-B1	1.66 U	398	6810	105	1010	2270	324	406	3.76
LW2-C093-A	N		12.4 U	1040	253000	1860	95800	122000	722	1910	10.2 J
LW2-C093-B	N		30.7 U	107	22900	214	9860	13100	114	219	30.7 U
LW2-C111-B2	FR	LW2-C111-B	2.51 UT	58.1 T	9590 T	112 T	3890 T	5680 T	58.6 T	135 T	2.51 UT
LW2-C184-B	N		20.9 U	35.4	5330	67.4	1960	3640	71.6	178	20.9 U
LW2-C203-C	N		25.3 U	523	160000	924	61000	79700	489	1450	25.3 U
LW2-C207-B	N		24.9 U	47.2	14900	64	4610	12700	225	591	24.9 U
LW2-C263-C	N		99.6 U	99.6 U	1480	99.6 U	401	594	99.6 U	99.6 U	99.6 U
LW2-C277-C	N		12 U	32.5	5510	57	1980	3830	48.6	225	12 U
LW2-C293-B2	FR	LW2-C293-B	12.6 U	28	11100	44.2	2020	6600	136	525	12.6 U
LW2-C302-B	N		91.9 U	52.7 J	5740	96.8	2070	3100	51.2 J	99.6	91.9 U
LW2-C302-C	N		685	259 U	633	259 U	259 U	259 U	259 U	259 U	259 U
LW2-C327-D	N		7.88 UT	6.38 JT	1180 T	12.9 T	268 T	581 T	19.4 T	56.2 T	7.88 UT
LW2-C342-B	N		9.89 U	22	2780	27.6	833	1750	54.6	118	2.62 J
LW2-C342-C	N		10.3 U	36.3	5700	51.8	1910	3320	60.7	145	10.3 U
LW2-C366-C1	N		20.7 U	206	18900	435	8970	11800	99.2	172	20.7 U
LW2-C371-B	N		2.47 U	145	12500	191	4740	6300	69.2	181	2.47 U
LW2-C377-E	N		16.7 U	16.7 U	1390	16.7 U	391	524	16.7 U	16.7 U	16.7 U
LW2-C382-B	N		7.06 J	73.6	15200	95.5	4970	8140	146	312	3.03 J
LW2-C397-C	N		12.5 U	81.7	20000	133	7750	14100	168	622	12.5 U
LW2-C401-E	N		24.7 U	224	16500	463	8200	11100	89.4	160	24.7 U
LW2-C409-C	N		10.3 U	59.3	11400	101	4220	5880	76.3	148	2.09 J
LW2-C420-C	N		10.4 U	225	16600	283	5130	8660	968	570	61.8
LW2-C431-B	N		31.3 U	157	19100	315	6480	12300	183	639	31.3 U
LW2-C453-B	N		15.5 U	574	88300	1320	36800	52300	310	1070	10.1 J
LW2-C455-B	N		644 U	6570	546000	14700	243000	307000	2410	4760	130 J
LW2-C455-C	N		25.3 U	55.9	13600	99.6	4160	7330	80.5	273	25.3 U
LW2-C477-B	N		12.6 U	120	26700	192	10400	14700	111	257	12.6 U
LW2-C494-C	N		11.3 U	675	24600	697	4290	19500	2230	2440	59.1

ANC02623
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Table 4-1k. R2A Archived Sediment Core PCIB Congener Data.

		Analyte Group	PCB Congeners	PCB Congeners	PCB Congeners	PCB Congeners	PCB Congeners	PCB Congeners	PCB Congeners	PCB Congeners	PCB Congeners
		CAS No	32598-14-4	PCB106_118	PCB107_109	PCB108_112	38380-03-9	PCB111_115	68194-10-5	74472-37-0	56558-17-9
		Chemical Name	2,3,3',4,4'-Pentachlorobiphenyl	PCB106 & 118	PCB107 & 109	PCB108 & 112	2,3,3',4',6-Pentachlorobiphenyl	PCB111 & 115	2,3,3',5',6-Pentachlorobiphenyl	2,3,4,4',5-Pentachlorobiphenyl	2,3',4,4',6-Pentachlorobiphenyl
	Sample Type	**PCB#**	PCB105	PCB106_118	PCB107_109	PCB108_112	PCB110	PCB111_115	PCB113	PCB114	PCB119
		Unit	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g
Sample ID	**Code**	**Parent Sample**									
LW2-C019-B2	FR	LW2-C019-B1	11700	27800	2250	2360	35300	1410	2.53 U	883	1130
LW2-C025-B2	FR	LW2-C025-B1	1270	2950	392	344	3150	93.4	49.2	103	239
LW2-C093-A	N		88600	257000	17600	14000	353000	6850	12.4 U	5480	5500
LW2-C093-B	N		7570	22500	1500	1350	34700	486	30.7 U	444	545
LW2-C111-B2	FR	LW2-C111-B	3590 T	10900 T	766 T	582 T	13900 T	270 T	2.51 UT	228 T	337 T
LW2-C184-B	N		1470	5460	586	366	7310	81	51.9	99.3	323
LW2-C203-C	N		49600	162000	11300	9040	225000	3000	25.3 U	2790	4060
LW2-C207-B	N		2080	12500	1470	832	19700	206	24.9 U	114	1110
LW2-C263-C	N		438	1360	143	99.6 U	1760	48.9 J	99.6 U	99.6 U	37.2 J
LW2-C277-C	N		1160	5230	617	388	7470	59.6	27.5	65.2	370
LW2-C293-B2	FR	LW2-C293-B	1580	7110	898	418	10800	92.4	97	85.7	743
LW2-C302-B	N		2140	5120	465	386	7310	182	91.9 U	167	169
LW2-C302-C	N		206 J	492	259 U	259 U	614	259 U	259 U	259 U	259 U
LW2-C327-D	N		175 T	666 T	72.1 T	50.5 T	1160 T	14 T	13.1 T	10.9 T	66.1 T
LW2-C342-B	N		649	2490	252	146	3590	38	9.89 U	41.8	166
LW2-C342-C	N		1390	5310	563	333	7450	70.1	20.4	87.9	248
LW2-C366-C1	N		9490	19300	1470	1430	27200	771	20.7 U	710	496
LW2-C371-B	N		4290	9890	849	853	15400	468	2.47 U	265	376
LW2-C377-E	N		360	1120	68.7	50.1	1830	26.4	13.2 J	24.4	26.4
LW2-C382-B	N		3310	12300	1140	833	19900	220	73.9	198	649
LW2-C397-C	N		5790	22000	2110	1290	30100	337	114	357	1180
LW2-C401-E	N		8630	15000	1240	1330	21800	679	24.7 U	741	449
LW2-C409-C	N		3430	10800	792	633	15700	243	26	212	306
LW2-C420-C	N		3980	13600	1210	897	20800	269	10.4 U	258	805
LW2-C431-B	N		4710	14300	1490	1180	22700	341	101	380	1020
LW2-C453-B	N		30800	84500	5050	4850	115000	3550	15.5 U	2060	2640
LW2-C455-B	N		237000	488000	40400	40300	703000	20600	644 U	19100	13000
LW2-C455-C	N		4250	13400	1090	644	17800	189	25.3 U	239	489
LW2-C477-B	N		8390	29000	2140	1550	41800	511	51.9	315	802
LW2-C494-C	N		4580	16700	2270	820	22400	317	494	273	2840

Notes:

- For all totals, zero is always used for non-detects. If any of the values included in a total are estimated (J qualified), then the total value is estimated (J qualified). If all analytes in a total are non-detects, then the highest detection limit is used for the total. A "T" qualifier is added to all results that are mathematically derived.
- Coordinate system for geographic coordinates is Oregon State Plane NAD83 HARN/HPGN, Intl. Feet.
- All concentration units are listed as dry weight.

J Estimate.
T Value is an average or selected result (see Kennedy Jenks et al. 2004).
U Not detected at value shown.

ANC02624
BZTO104(e)002624

Table 4-1k. R2A Archived Sediment Core PCB Congener Data.

		Analyte Group	PCB_Congeners	PCB_Congeners	PCB_Congeners	PCB_Congeners	PCB_Congeners	PCB_Congeners	PCB_Congeners	PCB_Congeners
		CAS No	68194-12-7	56558-18-0	76842-07-4	65510-44-3	70424-70-3	57465-28-8	39635-33-1	PCB128_162
		Chemical Name	2,3',4,5,5'-Pentachlorobiphenyl	2,3',4,5',6-Pentachlorobiphenyl	2,3,3',4',5'-Pentachlorobiphenyl	2,3',4,4',5'-Pentachlorobiphenyl	2,3',4',5,5'-Pentachlorobiphenyl	3,3',4,4',5-Pentachlorobiphenyl	3,3',4,5,5'-Pentachlorobiphenyl	PCB128 & 162
	Sample	**PCB#**	PCB120	PCB121	PCB122	PCB123	PCB124	PCB126	PCB127	PCB128_162
	Type	**Unit**	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g
Sample ID	**Code**	**Parent Sample**								
LW2-C019-B2	FR	LW2-C019-B1	30	2.53 U	428	570	1030	122	2.53 U	2870
LW2-C025-B2	FR	LW2-C025-B1	28	18.9	53.8	77.2	117	16.7	1.66 U	453
LW2-C093-A	N		437	12.4 U	2520	2910	10300	975	12.4 U	50800
LW2-C093-B	N		45.7	30.7 U	233	306	923	62	30.7 U	4410
LW2-C111-B2	FR	LW2-C111-B	13.2 T	2.51 UT	115 T	130 T	398 T	39.3 T	2.51 UT	2120 T
LW2-C184-B	N		51.7	20.9 U	58.6	71.9	173	29.5	20.9 U	800
LW2-C203-C	N		273	25.3 U	1320	2190	5750	509	25.3 U	35500
LW2-C207-B	N		47.1	24.9 U	70.8	93.5	364	32.2	24.9 U	1880
LW2-C263-C	N		99.6 U	99.6 U	40 J	46.7 J	99.6 U	70.4 J	48.6 J	361
LW2-C277-C	N		58.7	12 U	43.1	49.7	127	21.5	12 U	1020
LW2-C293-B2	FR	LW2-C293-B	120	26.2	53.9	59.6	182	31.5	12.6 U	1870
LW2-C302-B	N		91.9 U	91.9 U	90.8 J	115	250	61.3 J	91.9 U	1010
LW2-C302-C	N		259 U	259 U	259 U	259 U	259 U	259 U	259 U	259 U
LW2-C327-D	N		11.8 T	3.32 JT	6.69 JT	9.02 T	22.3 T	3.02 JT	7.88 UT	118 T
LW2-C342-B	N		29	9.89 U	24.9	31.3	99.3	13.2	9.89 U	524
LW2-C342-C	N		43.9	10.3 U	59	72.9	175	27.4	10.3 U	1080
LW2-C366-C1	N		27.1	20.7 U	381	481	776	111	20.7 U	2080
LW2-C371-B	N		13.3	2.47 U	167	233	358	47.3	2.47 U	1240
LW2-C377-E	N		55.6	16.7 U	13.8 J	16.9	40.8	7.94 J	16.7 U	379
LW2-C382-B	N		106	12.6 U	105	143	476	48.8	12.6 U	2250
LW2-C397-C	N		181	12.5 U	217	304	759	102	12.5 U	4530
LW2-C401-E	N		24.7 U	24.7 U	366	427	612	73.1	24.7 U	1010
LW2-C409-C	N		36.6	10.3 U	118	173	451	34	10.3 U	2070
LW2-C420-C	N		10.4 U	10.4 U	127	153	529	66.3	10.4 U	2410
LW2-C431-B	N		153	31.3 U	196	254	555	76.9	31.3 U	2170
LW2-C453-B	N		820	15.5 U	930	4330	3080	284	15.5 U	13900
LW2-C455-B	N		597 J	644 U	9550	13500	22200	2020	644 U	44800
LW2-C455-C	N		63.6	25.3 U	128	152	470	72.5	25.3 U	2700
LW2-C477-B	N		103	12.6 U	295	420	1040	77.2	12.6 U	6480
LW2-C494-C	N		403	100	151	205	554	121	11.3 U	3510

ANC02625
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Table 4-1k. R2A Archived Sediment Core PCIB Congener Data.

		Analyte Group	PCB_Congeners	PCB_Congeners	PCB_Congeners	PCB_Congeners	PCB_Congeners	PCB_Congeners	PCB_Congeners	PCB_Congeners
		CAS No	55215-18-4	52663-66-8	61798-70-7	PCB132_161	PCB133_142	PCB134_143	52744-13-5	38411-22-2
		Chemical Name	2,2',3,3',4,5-Hexachlorobiphenyl	2,2',3,3',4,5'-Hexachlorobiphenyl	2,2',3,3',4,6-Hexachlorobiphenyl	PCB132 & 161	PCB133 & 142	PCB134 & 143	2,2',3,3',5,6'-Hexachlorobiphenyl	2,2',3,3',6,6'-Hexachlorobiphenyl
	Sample	**PCB#**	PCB129	PCB130	PCB131	PCB132_161	PCB133_142	PCB134_143	PCB135	PCB136
	Type	**Unit**	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g
Sample ID	**Code**	**Parent Sample**								
LW2-C019-B2	FR	LW2-C019-B1	840	1030	5.97	5770	609	1150	2470	2610
LW2-C025-B2	FR	LW2-C025-B1	118	219	1.66 U	835	306	335	1150	1060
LW2-C093-A	N		15500	15600	63	93200	8210	16100	35700	35800
LW2-C093-B	N		1380	1670	30.7 U	7570	818	1380	3200	3220
LW2-C111-B2	FR	LW2-C111-B	613 T	678 T	2.51 UT	3850 T	407 T	697 T	1410 T	1360 T
LW2-C184-B	N		208	486	7.92 J	1940	324	366	1570	1290
LW2-C203-C	N		10200	13400	30.4	61400	5180	11300	22500	23500
LW2-C207-B	N		510	1380	24.9 U	6830	1780	1230	4150	4320
LW2-C263-C	N		120	203	99.6 U	871	115	169	465	544
LW2-C277-C	N		247	862	12 U	2930	468	523	1810	1540
LW2-C293-B2	FR	LW2-C293-B	488	1840	12.6 U	7900	1550	1320	6090	5150
LW2-C302-B	N		318	505	91.9 U	2460	202	419	1310	1310
LW2-C302-C	N		259 U	259 U	259 U	275	259 U	259 U	259 U	259 U
LW2-C327-D	N		33.2 T	80.5 T	7.88 UT	357 T	57.1 T	58.1 T	268 T	252 T
LW2-C342-B	N		139	342	9.89 U	1180	179	200	753	674
LW2-C342-C	N		300	726	10.3 U	2590	382	453	1490	1350
LW2-C366-C1	N		719	973	39.1	4360	440	816	2020	2210
LW2-C371-B	N		344	606	7.78	2820	423	546	1540	1370
LW2-C377-E	N		99	182	16.7 U	1230	89.2	176	650	691
LW2-C382-B	N		669	1110	12.6 U	4890	627	865	2640	2490
LW2-C397-C	N		1230	2640	12.5 U	9560	1150	1730	5530	5300
LW2-C401-E	N		343	476	24.7 U	2420	229	433	1180	1330
LW2-C409-C	N		674	940	3.17 J	3690	456	707	1820	1740
LW2-C420-C	N		766	1270	10.4 U	4980	722	1000	2620	2640
LW2-C431-B	N		618	1420	31.3 U	6680	982	1190	5040	4460
LW2-C453-B	N		3180	4670	15.5 U	38700	2930	6150	15500	17800
LW2-C455-B	N		15200	19800	644 U	99700	9030	18700	47900	57000
LW2-C455-C	N		695	1340	25.3 U	7080	732	1140	3900	3860
LW2-C477-B	N		1960	2670	9.38 J	9530	940	1880	3780	3930
LW2-C494-C	N		840	2900	11.3 U	12600	2880	2160	12900	11000

ANC02626
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Table 4-1k. R2A Archived Sediment Core PCIB Congener Data.

		Analyte Group	PCB_Congeners	PCB_Congeners	PCB_Congeners	PCB_Congeners	PCB_Congeners	PCB_Congeners	PCB_Congeners	PCB_Congeners
		CAS No	35694-06-5	PCB138_163_164	PCB139_149	59291-64-4	52712-04-6	68194-14-9	74472-40-5	PCB146_165
		Chemical Name	2,2',3,4,4',5-Hexachlorobiphenyl	PCB138 & 163 & 164	PCB139 & 149	2,2',3,4,4',6'-Hexachlorobiphenyl	2,2',3,4,5,5'-Hexachlorobiphenyl	2,2',3,4,5',6-Hexachlorobiphenyl	2,2',3,4,6,6'-Hexachlorobiphenyl	PCB146 & 165
	Sample	**PCB#**	PCB137	PCB138_163_164	PCB139_149	PCB140	PCB141	PCB144	PCB145	PCB146_165
	Type	**Unit**	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g
Sample ID	**Code**	**Parent Sample**								
LW2-C019-B2	FR	LW2-C019-B1	1160	16400	12900	75.5	3140	679	10.6	2600
LW2-C025-B2	FR	LW2-C025-B1	198	3800	3810	33.6	631	124	1.66 U	1180
LW2-C093-A	N		20100	261000	199000	1430	44900	10600	131	33000
LW2-C093-B	N		1400	26000	16500	155	4570	1070	8.01 J	3700
LW2-C111-B2	FR	LW2-C111-B	769 T	12100 T	7670 T	69.7 T	2020 T	381 T	4.54 T	1760 T
LW2-C184-B	N		218	6570	7590	126	1210	347	20.9 U	1730
LW2-C203-C	N		11900	189000	122000	905	33100	6940	70.9	23300
LW2-C207-B	N		512	21500	24000	676	4200	948	24.9 U	9920
LW2-C263-C	N		99.6 U	3770	3100	99.6 U	858	207	99.6 U	590
LW2-C277-C	N		235	10100	9570	166	1750	402	12 U	2910
LW2-C293-B2	FR	LW2-C293-B	333	29300	30900	555	6570	1590	12.6 U	9160
LW2-C302-B	N		292	8660	7640	91.9 U	1960	565	91.9 U	1300
LW2-C302-C	N		259 U	994	1270	259 U	285	259 U	259 U	259 U
LW2-C327-D	N		29.9 T	1200 T	1440 T	31 T	221 T	59.1 T	7.88 UT	353 T
LW2-C342-B	N		138	4430	4170	62.8	756	165	9.89 U	1080
LW2-C342-C	N		311	9330	8330	111	1700	408	2.11 J	2140
LW2-C366-C1	N		734	15400	13100	76.2	3190	892	20.7 U	2020
LW2-C371-B	N		389	8220	7490	2.47 U	1450	408	6.71	1880
LW2-C377-E	N		76.3	4560	4290	16.7 U	1170	262	16.7 U	640
LW2-C382-B	N		704	15400	14000	206	2610	716	5.98 J	3040
LW2-C397-C	N		1420	36500	31000	363	6660	1490	8.07 J	6860
LW2-C401-E	N		312	8250	7540	44.6	1880	455	24.7 U	1180
LW2-C409-C	N		721	13400	10000	134	2320	544	5.29 J	2140
LW2-C420-C	N		808	16600	14500	204	2720	712	10.4 U	3140
LW2-C431-B	N		598	23900	26800	478	4760	1230	31.3 U	6460
LW2-C453-B	N		4050	110000	90100	195	29000	4910	23.8	19500
LW2-C455-B	N		14800	350000	328000	1730	79300	22300	172 J	41800
LW2-C455-C	N		692	24700	23100	201	5370	1280	25.3 U	4730
LW2-C477-B	N		2170	35200	22600	207	5270	1200	15.8	3770
LW2-C494-C	N		803	48100	61200	1680	9930	2470	5.26 J	18400

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Table 4-1k. R2A Archived Sediment Core PCB Congener Data.

		Analyte Group	PCB_Congeners	PCB_Congeners	PCB_Congeners	PCB_Congeners	PCB_Congeners	PCB_Congeners	PCB_Congeners	PCB_Congeners
		CAS No	68194-13-8	74472-41-6	68194-08-1	52663-63-5	68194-09-2	35065-27-1	60145-22-4	33979-03-2
		Chemical Name	2,2',3,4',5,6-Hexachlorobiphenyl	2,2',3,4',5,6'-Hexachlorobiphenyl	2,2',3,4',6,6'-Hexachlorobiphenyl	2,2',3,5,5',6-Hexachlorobiphenyl	2,2',3,5,6,6'-Hexachlorobiphenyl	2,2',4,4',5,5'-Hexachlorobiphenyl	2,2',4,4',5,6'-Hexachlorobiphenyl	2,2',4,4',6,6'-Hexachlorobiphenyl
	Sample	**PCB#**	PCB147	PCB148	PCB150	PCB151	PCB152	PCB153	PCB154	PCB155
	Type	**Unit**	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g
Sample ID	**Code**	**Parent Sample**								
LW2-C019-B2	FR	LW2-C019-B1	496	42.6	60.5	3420	41.1	14000	321	3.15
LW2-C025-B2	FR	LW2-C025-B1	571	114	131	1810	10.9	3580	541	6.24
LW2-C093-A	N		6740	226	306	43700	322	190000	2570	6.21 J
LW2-C093-B	N		531	92.6	51.4	3850	23.3 J	20000	429	30.7 U
LW2-C111-B2	FR	LW2-C111-B	237 T	29.1 T	21.3 T	1870 T	11.4 T	9810 T	183 T	2.51 UT
LW2-C184-B	N		200	77.8	42.7	2310	7.48 J	7160	355	20.9 U
LW2-C203-C	N		4120	138	195	28200	182	151000	1690	25.3 U
LW2-C207-B	N		503	562	213	2090	17.3 J	26600	2150	8.77 J
LW2-C263-C	N		99.6 U	99.6 U	99.6 U	1050	99.6 U	4110	47.6 J	99.6 U
LW2-C277-C	N		160	89.8	31.9	2970	6.35 J	11700	456	12 U
LW2-C293-B2	FR	LW2-C293-B	414	425	144	3630	7.6 J	35600	1600	7.25 J
LW2-C302-B	N		143	91.9 U	91.9 U	2350	91.9 U	8970	114	91.9 U
LW2-C302-C	N		259 U	259 U	259 U	358	259 U	1170	259 U	259 U
LW2-C327-D	N		32.5 T	18.7 T	11.6 T	401 T	7.88 UT	1450 T	89.8 T	7.88 UT
LW2-C342-B	N		130	35.5	26.1	1130	4.68 J	4790	202	9.89 U
LW2-C342-C	N		185	65.5	34.7	2380	5.76 J	9580	317	10.3 U
LW2-C366-C1	N		322	18.8 J	19.3 J	3730	19.9 J	13500	135	20.7 U
LW2-C371-B	N		164	53.4	20.2	2090	11.9	7420	237	2.47 U
LW2-C377-E	N		25.7	16.7 U	16.7 U	1300	16.7 U	5180	28.4	16.7 U
LW2-C382-B	N		476	152	62.5	3630	18.7	15100	578	2.65 J
LW2-C397-C	N		655	149	101	9060	23.8	36800	983	12.5 U
LW2-C401-E	N		138	11.6 J	13.3 J	2250	12.5 J	8120	98.9	24.7 U
LW2-C409-C	N		302	64.2	28.1	2380	14.4	10500	289	10.3 U
LW2-C420-C	N		1180	138	149	3440	72.2	14600	661	16.2
LW2-C431-B	N		384	254	125	8590	13.2 J	27000	1200	31.3 U
LW2-C453-B	N		795	117	107	27900	55.3	120000	1050	15.5 U
LW2-C455-B	N		6210	331 J	326 J	96700	395 J	322000	2520	644 U
LW2-C455-C	N		297	85.4	57.1	7150	25.3 U	27200	538	25.3 U
LW2-C477-B	N		892	38.9	35.8	4780	36	24200	338	12.6 U
LW2-C494-C	N		4120	938	876	21900	243	67000	5570	36.2

ANC02628
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Table 4-1k. R2A Archived Sediment Core PCIB Congener Data.

		Analyte Group	PCB_Congeners	PCB_Congeners	PCB_Congeners	PCB_Congeners	PCB_Congeners	PCB_Congeners	PCB_Congeners	PCB_Congeners
		CAS No	38380-08-4	69782-90-7	PCB158_160	39635-35-3	41411-63-6	52663-72-6	59291-65-5	32774-16-6
		Chemical Name	2,3,3',4,4',5-Hexachlorobiphenyl	2,3,3',4,4',5'-Hexachlorobiphenyl	PCB158 & 160	2,3,3',4,5,5'-Hexachlorobiphenyl	2,3,4,4',5,6-Hexachlorobiphenyl	2,3',4,4',5,5'-Hexachlorobiphenyl	2,3',4,4',5',6-Hexachlorobiphenyl	3,3',4,4',5,5'-Hexachlorobiphenyl
	Sample Type	**PCB#**	PCB156	PCB157	PCB158_160	PCB159	PCB166	PCB167	PCB168	PCB169
		Unit	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g
Sample ID	**Code**	**Parent Sample**								
LW2-C019-B2	FR	LW2-C019-B1	1920	407	1710	168	78.1	706	17.5	1.85 U
LW2-C025-B2	FR	LW2-C025-B1	321	56.2	323	93.8	15.5	112	8.44	0.282 U
LW2-C093-A	N		31600	7140	31300	923	1300	11700	253	18.3
LW2-C093-B	N		2690	588	2750	130	104	974	38.7	14.2
LW2-C111-B2	FR	LW2-C111-B	1280 T	281 T	1280 T	94.4 T	47.2 T	480 T	13.9 T	1.27 UT
LW2-C184-B	N		505	83.5	552	100	25.7	211	16 J	1.37 U
LW2-C203-C	N		20400	4560	21200	765	916	8060	210	1.78 J
LW2-C207-B	N		1260	234	1600	317	37.1	529	97.3	2.05 J
LW2-C263-C	N		301	67.8 J	419	91.4 J	99.6 U	139	99.6 U	77.5 U
LW2-C277-C	N		646	106	768	167	18.6	261	30.5	1.37 J
LW2-C293-B2	FR	LW2-C293-B	1610	153	2270	481	20.3	638	85.2	1.68 J
LW2-C302-B	N		654	136	919	91.9 U	50.9 J	293	91.9 U	1.28 U
LW2-C302-C	N		81.2 J	45.8 U	259 U	259 U	259 U	39.6 J	259 U	9.1 U
LW2-C327-D	N		80.9 T	12.8 T	101 T	16.1 T	2.98 JT	33 T	4.09 JT	0.495 JT
LW2-C342-B	N		327	61.8	389	9.89 U	9.36 J	140	10.6	1.07 J
LW2-C342-C	N		689	116	795	126	24	285	20.1	1.46 J
LW2-C366-C1	N		1300	276	1810	170	89.4	537	18.7 J	6.49 U
LW2-C371-B	N		734	160	861	102	34.4	296	10.6	2.94 U
LW2-C377-E	N		325	31.3	407	86.3	4.58 J	135	16.7 U	1.38 U
LW2-C382-B	N		1390	281	1520	155	54.3	541	35.8	3.96 J
LW2-C397-C	N		2850	539	3350	385	100	1150	83.8	3.79
LW2-C401-E	N		726	133	843	93.9	24.7 J	257	24.7 U	1.09 U
LW2-C409-C	N		1290	278	1560	76.3	51.7	509	26.5	1.05 J
LW2-C420-C	N		1520	296	1850	119	61.7	603	40.3	3.92 J
LW2-C431-B	N		1450	228	2120	382	52.2	622	69.3	3.71 U
LW2-C453-B	N		9740	1640	9120	2170	220	3720	84.3	10
LW2-C455-B	N		32200	6060	39400	3710	1210	11600	316 J	5.36 U
LW2-C455-C	N		1990	288	2250	317	48.4	752	15.6 J	4.31 U
LW2-C477-B	N		3510	902	4330	152	169	1410	53.6	2.94 J
LW2-C494-C	N		2810	424	3560	984	51.6	1220	271	12.5

ANC02629
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Table 4-1k. R2A Archived Sediment Core PCIB Congener Data.

		Analyte Group	PCB_Congeners	PCB_Congeners	PCB_Congeners	PCB_Congeners	PCB_Congeners	PCB_Congeners	PCB_Congeners	PCB_Congeners
		CAS No	35065-30-6	52663-71-5	52663-74-8	68194-16-1	38411-25-5	40186-70-7	52663-65-7	52663-70-4
		Chemical Name	2,2',3,3',4,4',5-Heptachlorobiphenyl	2,2',3,3',4,4',6-Heptachlorobiphenyl	2,2',3,3',4,5,5'-Heptachlorobiphenyl	2,2',3,3',4,5,6-Heptachlorobiphenyl	2,2',3,3',4,5,6'-Heptachlorobiphenyl	2,2',3,3',4,5',6-Heptachlorobiphenyl	2,2',3,3',4,6,6'-Heptachlorobiphenyl	2,2',3,3',4,5',6'-Heptachlorobiphenyl
	Sample Type	**PCB#**	PCB170	PCB171	PCB172	PCB173	PCB174	PCB175	PCB176	PCB177
		Unit	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g
Sample ID	**Code**	**Parent Sample**								
LW2-C019-B2	FR	LW2-C019-B1	3720	1090	646	91.8	4020	499	532	2150
LW2-C025-B2	FR	LW2-C025-B1	1440	441	307	38.3	1810	82.2	235	1070
LW2-C093-A	N		38900	10500	5950	1110	31500	12.4 U	4690	19900
LW2-C093-B	N		4220	1230	725	119	4190	211	604	2490
LW2-C111-B2	FR	LW2-C111-B	2150 T	595 T	363 T	52.5 T	2280 T	2.51 UT	285 T	1380 T
LW2-C184-B	N		2110	620	390	53.7	2600	119	357	1630
LW2-C203-C	N		30000	8770	4860	872	28200	1340	3760	17000
LW2-C207-B	N		5320	1500	961	129	5740	263	1150	5100
LW2-C263-C	N		1300	430	248	50 J	1520	99.6 U	245	890
LW2-C277-C	N		3160	975	610	76.6	4050	177	593	2520
LW2-C293-B2	FR	LW2-C293-B	10500	3150	1900	240	11900	560	1890	8190
LW2-C302-B	N		2560	747	502	91.9 U	3060	91.9 U	438	1630
LW2-C302-C	N		401	259 U	259 U	259 U	319	259 U	259 U	257 J
LW2-C327-D	N		361 T	105 T	62.4 T	9.45 T	416 T	20.1 T	62.5 T	278 T
LW2-C342-B	N		1200	330	210	26.4	1420	63.9	198	869
LW2-C342-C	N		2750	754	495	66	3150	158	465	1880
LW2-C366-C1	N		3880	1140	722	128	4860	237	665	2610
LW2-C371-B	N		2100	633	394	65.3	2390	2.47 U	328	1510
LW2-C377-E	N		1760	506	305	43.4	1930	16.7 U	280	1010
LW2-C382-B	N		3030	913	538	76.6	3600	169	537	2190
LW2-C397-C	N		9460	2850	1720	230	11800	588	1740	6880
LW2-C401-E	N		2600	730	436	62.2	3070	151	421	1720
LW2-C409-C	N		2130	597	341	55.6	2020	114	322	1350
LW2-C420-C	N		3020	883	498	74.7	2940	155	461	1870
LW2-C431-B	N		7430	2320	1390	186	10000	413	1390	6180
LW2-C453-B	N		41400	13200	7540	1050	57400	5250	6150	27200
LW2-C455-B	N		98200	27800	16900	2520	118000	4920	15800	64400
LW2-C455-C	N		8780	2430	1480	200	9970	382	1320	5990
LW2-C477-B	N		4480	1220	678	127	4350	205	571	2420
LW2-C494-C	N		20700	5750	3820	438	26800	1080	3810	17900

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Table 4-1k. R2A Archived Sediment Core PCIB Congener Data.

		Analyte Group	PCB_Congeners	PCB_Congeners	PCB_Congeners	PCB_Congeners	PCB_Congeners	PCB_Congeners	PCB_Congeners	PCB_Congeners
		CAS No	52663-67-9	52663-64-6	35065-29-3	74472-47-2	PCB182_187	52663-69-1	74472-48-3	52712-05-7
		Chemical Name	2,2',3,3',5,5',6-Heptachlorobiphenyl	2,2',3,3',5,6,6'-Heptachlorobiphenyl	2,2',3,4,4',5,5'-Heptachlorobiphenyl	2,2',3,4,4',5,6-Heptachlorobiphenyl	PCB182 & 187	2,2',3,4,4',5',6-Heptachlorobiphenyl	2,2',3,4,4',6,6'-Heptachlorobiphenyl	2,2',3,4,5,5',6-Heptachlorobiphenyl
	Sample	**PCB#**	PCB178	PCB179	PCB180	PCB181	PCB182_187	PCB183	PCB184	PCB185
	Type	**Unit**	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g
Sample ID	**Code**	**Parent Sample**								
LW2-C019-B2	FR	LW2-C019-B1	780	1870	9010	224	4510	2170	4.4	506
LW2-C025-B2	FR	LW2-C025-B1	673	1290	3790	13.7	3000	842	2.88	214
LW2-C093-A	N		6340	14600	76000	1110	40100	20200	42.9	3550
LW2-C093-B	N		944	1920	9400	55.1	5490	2640	30.7 U	470
LW2-C111-B2	FR	LW2-C111-B	502 T	1040 T	5340 T	2.51 UT	3300 T	1340 T	2.51 UT	277 T
LW2-C184-B	N		615	1310	5380	47.5	3560	1420	20.9 U	301
LW2-C203-C	N		4910	11700	61100	482	30100	15700	27.1	3110
LW2-C207-B	N		2780	4510	13200	105	13100	3980	14.4 J	619
LW2-C263-C	N		323	757	3780	99.6 U	2170	1020	99.6 U	201
LW2-C277-C	N		999	2090	8360	20.5	5820	2350	12 U	424
LW2-C293-B2	FR	LW2-C293-B	3270	6760	27300	88.4	18200	7640	9.04 J	1330
LW2-C302-B	N		594	1480	6730	220	3900	1850	91.9 U	391
LW2-C302-C	N		259 U	269	1120	259 U	685	319	259 U	259 U
LW2-C327-D	N		113 T	218 T	923 T	8.83 T	655 T	256 T	7.88 UT	46.1 T
LW2-C342-B	N		356	768	3110	9.89 U	2180	854	9.89 U	146
LW2-C342-C	N		774	1630	6950	21.4	4590	1990	2.7 J	331
LW2-C366-C1	N		942	2220	10500	231	6270	2830	9.15 J	643
LW2-C371-B	N		596	1150	5130	95.7	3390	1390	2.47 U	288
LW2-C377-E	N		375	903	4740	16.7 U	2660	1310	16.7 U	247
LW2-C382-B	N		954	2030	8380	32.6	6020	2370	5.39 J	422
LW2-C397-C	N		2660	6200	25100	59.1	16700	7370	8.55 J	1270
LW2-C401-E	N		592	1490	6920	24.7 U	3920	1900	24.7 U	349
LW2-C409-C	N		549	1050	4500	21.9	3120	1370	4.24 J	192
LW2-C420-C	N		797	1550	6890	10.4 U	4300	2000	10.4 U	291
LW2-C431-B	N		2270	5080	21500	31.7	13800	5600	31.3 U	1100
LW2-C453-B	N		8560	21700	110000	2290	48800	24300	15.9	7240
LW2-C455-B	N		21700	54700	255000	571 J	141000	67500	644 U	13500
LW2-C455-C	N		2000	4730	22100	25.3 U	12700	5560	25.3 U	1110
LW2-C477-B	N		803	1880	10100	70.6	5890	2690	5.62 J	472
LW2-C494-C	N		7580	15900	56600	11.3 U	43200	14500	33.3	2760

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Table 4-1k. R2A Archived Sediment Core PCIB Congener Data.

		Analyte Group	PCB_Congeners	PCB_Congeners	PCB_Congeners	PCB_Congeners	PCB_Congeners	PCB_Congeners	PCB_Congeners	PCB_Congeners
		CAS No	74472-49-4	74487-85-7	39635-31-9	41411-64-7	74472-50-7	74472-51-8	69782-91-8	35694-08-7
		Chemical Name	2,2',3,4,5,6,6'-Heptachlorobiphenyl	2,2',3,4',5,6,6'-Heptachlorobiphenyl	2,3,3',4,4',5,5'-Heptachlorobiphenyl	2,3,3',4,4',5,6-Heptachlorobiphenyl	2,3,3',4,4',5',6-Heptachlorobiphenyl	2,3,3',4,5,5',6-Heptachlorobiphenyl	2,3,3',4',5,5',6-Heptachlorobiphenyl	2,2',3,3',4,4',5,5'-Octachlorobiphenyl
	Sample Type	**PCB# Unit**	PCB186 pg/g	PCB188 pg/g	PCB189 pg/g	PCB190 pg/g	PCB191 pg/g	PCB192 pg/g	PCB193 pg/g	PCB194 pg/g
Sample ID	**Code**	**Parent Sample**								
LW2-C019-B2	FR	LW2-C019-B1	2.53 U	12.1	151	728	140	2.53 U	376	2000
LW2-C025-B2	FR	LW2-C025-B1	1.66 U	31.7	55.6	319	57.4	1.66 U	184	1010
LW2-C093-A	N		15.7	49.8	1600	6890	1370	12.4 U	3060	12700
LW2-C093-B	N		30.7 U	18.3 J	178	789	161	30.7 U	436	2340
LW2-C111-B2	FR	LW2-C111-B	2.51 UT	5.78 T	85.7 T	408 T	77.5 T	2.51 UT	213 T	1500 T
LW2-C184-B	N		20.9 U	7.1 J	81.1	464	84.1	20.9 U	275	1300
LW2-C203-C	N		11.7 J	30.7	1190	5400	1150	25.3 U	2660	11700
LW2-C207-B	N		24.9 U	51.2	196	1080	201	24.9 U	789	4020
LW2-C263-C	N		99.6 U	99.6 U	99.6 U	320	75.2 J	99.6 U	178	805
LW2-C277-C	N		12 U	8.07 J	117	641	124	12 U	447	2060
LW2-C293-B2	FR	LW2-C293-B	12.6 U	41.1	361	2150	417	12.6 U	1380	5340
LW2-C302-B	N		91.9 U	91.9 U	111	620	135	91.9 U	341	1420
LW2-C302-C	N		259 U	259 U	20 U	259 U	259 U	259 U	259 U	282
LW2-C327-D	N		7.88 UT	2.58 JT	14.1 T	76.6 T	14.4 T	7.88 UT	48.7 T	178 T
LW2-C342-B	N		9.89 U	7.42 J	45.1	246	44.7	9.89 U	154	734
LW2-C342-C	N		10.3 U	7.65 J	99	560	104	10.3 U	335	1600
LW2-C366-C1	N		11.4 J	20.7 U	153	884	174	20.7 U	489	2760
LW2-C371-B	N		2.47 U	2.47 U	82.4	408	89.4	2.47 U	235	1220
LW2-C377-E	N		16.7 U	16.7 U	68.9	363	70.5	16.7 U	196	1080
LW2-C382-B	N		12.6 U	14.7	117	635	121	12.6 U	387	2310
LW2-C397-C	N		12.5 U	20.5	355	1970	375	12.5 U	1190	5390
LW2-C401-E	N		24.7 U	24.7 U	106	550	102	24.7 U	314	1650
LW2-C409-C	N		10.3 U	9.06 J	92.4	386	88	10.3 U	228	806
LW2-C420-C	N		10.4 U	34.5	141	624	135	10.4 U	364	1550
LW2-C431-B	N		31.3 U	27.7 J	264	1610	324	31.3 U	1080	5180
LW2-C453-B	N		15.5 U	26.5	1390	7330	1610	15.5 U	4580	28900
LW2-C455-B	N		644 U	644 U	3580	20900	4160	644 U	11300	57300
LW2-C455-C	N		25.3 U	14.9 J	304	1750	327	25.3 U	985	5150
LW2-C477-B	N		3.29 J	9.11 J	199	846	168	12.6 U	405	2570
LW2-C494-C	N		11.3 U	187	743	4440	819	11.3 U	3310	14100

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Table 4-1k. R2A Archived Sediment Core PCIB Congener Data.

		Analyte Group	PCB_Congeners	PCB_Congeners	PCB_Congeners	PCB_Congeners	PCB_Congeners	PCB_Congeners	PCB_Congeners	PCB_Congeners
		CAS No	52663-78-2	PCB196_203	33091-17-7	68194-17-2	52663-75-9	52663-73-7	40186-71-8	2136-99-4
		Chemical Name	2,2',3,3',4,4',5,6-Octachlorobiphenyl	PCB196 & 203	2,2',3,3',4,4',6,6'-Octachlorobiphenyl	2,2',3,3',4,5,5',6-Octachlorobiphenyl	2,2',3,3',4,5,5',6'-Octachlorobiphenyl	2,2',3,3',4,5,6,6'-Octachlorobiphenyl	2,2',3,3',4,5',6,6'-Octachlorobiphenyl	2,2',3,3',5,5',6,6'-Octachlorobiphenyl
	Sample	**PCB#**	PCB195	PCB196_203	PCB197	PCB198	PCB199	PCB200	PCB201	PCB202
	Type	**Unit**	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g
Sample ID	**Code**	**Parent Sample**								
LW2-C019-B2	FR	LW2-C019-B1	862	2210	84.5	338	1910	300	332	529
LW2-C025-B2	FR	LW2-C025-B1	466	1010	44.8	51.5	930	151	160	260
LW2-C093-A	N		6150	14700	502	2050	12100	1860	1870	2880
LW2-C093-B	N		877	5310	130	634	9940	345	649	3070
LW2-C111-B2	FR	LW2-C111-B	603 T	1940 T	56 T	248 T	1620 T	210 T	251 T	440 T
LW2-C184-B	N		556	1530	58.2	78.3	1400	192	199	306
LW2-C203-C	N		5300	11400	469	1130	10300	1650	1720	2640
LW2-C207-B	N		1550	8380	238	809	13900	582	1060	4180
LW2-C263-C	N		323	1170	99.6 U	99.6 U	1080	145	99.6 U	99.6 U
LW2-C277-C	N		1050	2300	91.7	118	2120	291	330	481
LW2-C293-B2	FR	LW2-C293-B	2810	6290	256	394	5350	786	858	1180
LW2-C302-B	N		661	2030	81.2 J	112	1830	254	227	346
LW2-C302-C	N		259 U	335	259 U	259 U	259 U	259 U	259 U	259 U
LW2-C327-D	N		75.9 T	274 T	10 T	14.1 T	244 T	31.2 T	31.5 UT	46.9 UT
LW2-C342-B	N		290	1030	33.2	47	988	116	119	188
LW2-C342-C	N		664	2140	69.1	108	1910	236	246	372
LW2-C366-C1	N		1250	3740	140	201	3370	468	445	676
LW2-C371-B	N		643	1490	65.4	154	1310	199	220	338
LW2-C377-E	N		531	1490	53.6	142	1400	185	191	375
LW2-C382-B	N		731	3570	98.7	137	3370	385	443	777
LW2-C397-C	N		2530	6660	238	378	5980	844	869	1280
LW2-C401-E	N		778	1860	61.1	100	1630	213	223	314
LW2-C409-C	N		257	1330	50.6	52.1	1410	129	208	384
LW2-C420-C	N		652	2000	70.1	88.3	1620	204	217	305
LW2-C431-B	N		2140	6620	199	266	6040	722	748	1180
LW2-C453-B	N		15100	24900	996	4150	24700	3340	3860	6630
LW2-C455-B	N		23300	67000	2200	3630	64100	7830	7690	12600
LW2-C455-C	N		2550	6790	214	689	7520	756	874	1910
LW2-C477-B	N		795	4530	92.7	163	4300	438	479	960
LW2-C494-C	N		5580	16400	589	833	15300	1930	2110	3020

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Table 4-1k. R2A Archived Sediment Core PCIB Congener Data.

		Analyte Group	PCB_Congeners	PCB_Congeners	PCB_Congeners	PCB_Congeners	PCB_Congeners	PCB_Congeners	PCB_Congeners	PCB_Homologs
		CAS No	74472-52-9	74472-53-0	40186-72-9	52663-79-3	52663-77-1	2051-24-3	1336-36-3	27323-18-8
		Chemical Name	2,2',3,4,4',5,6,6'-Octachlorobiphenyl	2,3,3',4,4',5,5',6-Octachlorobiphenyl	2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl	2,2',3,3',4,4',5,6,6'-Nonachlorobiphenyl	2,2',3,3',4,5,5',6,6'-Nonachlorobiphenyl	2,2',3,3',4,4',5,5',6,6'-Decachlorobiphenyl	Polychlorinated biphenyls	Monochlorobiphenyl
	Sample Type	**PCB#**	PCB204	PCB205	PCB206	PCB207	PCB208	PCB209		
		Unit	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g
Sample ID	**Code**	**Parent Sample**								
LW2-C019-B2	FR	LW2-C019-B1	2.53 U	85.7	1580	169	425	597	1100000	2550
LW2-C025-B2	FR	LW2-C025-B1	1.66 U	46.4	266	35.7	54.2	39	162000	78.6
LW2-C093-A	N		12.4 U	548	5880	614	1480	2390	4340000	3790
LW2-C093-B	N		13.8 J	137	68100	2860	26600	88100	730000	234
LW2-C111-B2	FR	LW2-C111-B	2.51 UT	54.3 T	1400 T	142 T	371 T	669 T	338000 T	499 T
LW2-C184-B	N		20.9 U	68.5	767	97.2	212	629	188000	173
LW2-C203-C	N		25.3 U	510	9800	774	3060	9360	2830000	10200
LW2-C207-B	N		19.6 J	242	78300	3760	32800	92600	486000	181
LW2-C263-C	N		99.6 U	49.4 J	640	81.7 J	200	895	50500	132
LW2-C277-C	N		12 U	89.3	804	104	206 U	784	198000	275
LW2-C293-B2	FR	LW2-C293-B	12.6 U	233	1750	191	433	1750	400000	243
LW2-C302-B	N		91.9 U	91.2 J	2290	140	334	7760	223000	310
LW2-C302-C	N		259 U	259 U	269	259 U	259 U	283	13600	1830
LW2-C327-D	N		7.88 UT	10.1 T	152 UT	18.2 UT	46.3 UT	213 T	35100 T	51.7 T
LW2-C342-B	N		9.89 U	35.1	456	50.1 U	122 U	387	76500	230
LW2-C342-C	N		10.3 U	70.2	681	78.9	167 U	423	170000	195
LW2-C366-C1	N		18.6 J	138	2060	311	513	2000	695000	411
LW2-C371-B	N		2.47 U	59.3	743	90.6	207	945	425000	467
LW2-C377-E	N		16.7 U	47	2230	168	745	4000	64300	16.7 U
LW2-C382-B	N		12.6 U	96.4	2010	220	498	1350	291000	1120
LW2-C397-C	N		12.5 U	233	2140	237	491	1410	571000	528
LW2-C401-E	N		24.7 U	77.1	677	67.8	162	510	888000	285
LW2-C409-C	N		10.3 U	35.5	533	67.4	157 U	84.7 U	237000	104
LW2-C420-C	N		10.4 U	81.8	528	69.5	116 U	224	316000	905
LW2-C431-B	N		31.3 U	232	2490	268	553	774	1120000	2050
LW2-C453-B	N		15.5 U	1180	58400	3670	21300	128000	5990000	84200
LW2-C455-B	N		644 U	2610	65200	5410	22800	127000	36800000	111000
LW2-C455-C	N		25.3 U	212	21300	1500	8410	54200	591000	6010
LW2-C477-B	N		12.6 U	103	3010	329	705	821	506000	199
LW2-C494-C	N		4.15 J	628	3400	427	575	353	953000	875

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Table 4-1k. R2A Archived Sediment Core PCIB Congener Data.

		Analyte Group	PCB_Homologs	PCB_Homologs	PCB_Homologs	PCB_Homologs	PCB_Homologs	PCB_Homologs	PCB_Homologs	PCB_Homologs
		CAS No	25512-42-9	25323-68-6	26914-33-0	25429-29-2	26601-64-9	28655-71-2	55722-26-4	53742-07-7
		Chemical Name	Dichlorobiphenyl	Trichlorobiphenyl	Tetrachlorobiphenyl	Pentachlorobiphenyl	Hexachlorobiphenyl	Heptachlorobiphenyl	Octachlorobiphenyl	Nonachlorobiphenyl
	Sample Type	**PCB#**								
		Unit	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g
Sample ID	**Code**	**Parent Sample**								
LW2-C019-B2	FR	LW2-C019-B1	56000	230000	456000	232000	77800	33200	8650	2170
LW2-C025-B2	FR	LW2-C025-B1	7380	17700	61400	32900	22000	15900	4130	356
LW2-C093-A	N		32300	110000	730000	1940000	1170000	287000	55400	7980
LW2-C093-B	N		1420	36000	151000	186000	109000	36300	23400	97600
LW2-C111-B2	FR	LW2-C111-B	13600 T	72200 T	92100 T	78500 T	51500 T	19700 T	6910 T	1920 T
LW2-C184-B	N		3830	25500	50200	43400	36400	21400	5680	1080
LW2-C203-C	N		17900	38500	426000	1220000	811000	232000	46700	13600
LW2-C207-B	N		292	3670	41400	110000	120000	60800	35000	115000
LW2-C263-C	N		199 U	264	3280	10300	17700	13500	3570	922
LW2-C277-C	N		1300	13600	43000	43600	52000	33600	8930	1110
LW2-C293-B2	FR	LW2-C293-B	652	7880	34100	70100	152000	107000	23500	2380
LW2-C302-B	N		1870	22800	69100	44400	41600	25300	7050	2760
LW2-C302-C	N		517 U	259 U	61	3340	4470	3370	616	269
LW2-C327-D	N		568 T	4680 T	11000 T	6970 T	6790 T	3690 T	918 T	217 UT
LW2-C342-B	N		754	3210	13000	20400	22000	12200	3580	628
LW2-C342-C	N		1300	9680	34700	42700	45300	27100	7420	927
LW2-C366-C1	N		9010	111000	281000	166000	71100	39600	13200	2880
LW2-C371-B	N		6130	95000	162000	92200	41000	20300	5700	1040
LW2-C377-E	N		38.7	722	2490	9640	22000	16800	5500	3150
LW2-C382-B	N		1370	5350	51000	107000	76300	32500	11900	2730
LW2-C397-C	N		2580	17900	82500	168000	172000	98600	24400	2870
LW2-C401-E	N		26800	246000	398000	142000	39800	25400	6910	906
LW2-C409-C	N		748	9990	56600	86600	58700	18600	4660	758
LW2-C420-C	N		1210	6970	72900	119000	79800	27000	6790	713
LW2-C431-B	N		83900	352000	307000	140000	129000	82000	23300	3310
LW2-C453-B	N		294000	2190000	1470000	690000	538000	397000	114000	83400
LW2-C455-B	N		2230000	12700000	14200000	4450000	1670000	943000	248000	93400
LW2-C455-C	N		18500	66100	82300	101000	122000	82200	26700	31200
LW2-C477-B	N		1810	10400	79300	215000	142000	37500	14400	4050
LW2-C494-C	N		13900	50500	117000	174000	301000	231000	60400	4400

Notes:

- For all totals, zero is always used for non-detects. If any of the values included in a total are estimated (J qualified), then the total value is estimated (J qualified). If all analytes in a total are non-detects, then the highest detection limit is used for the total. A "T" qualifier is added to all results that are mathematically derived.
- Coordinate system for geographic coordinates is Oregon State Plane NAD83 HARN/HPGN, Intl. Feet.
- All concentration units are listed as dry weight.

J Estimate.
T Value is an average or selected result (see Kennedy Jenks et al. 2004).
U Not detected at value shown.

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Table 4-11. R2A Archived Sediment Core Dioxin/Furan Data.

		Analyte Group	Dioxin_Furan_Homolog	Dioxin_Furan_Homolog	Dioxin_Furan_Homolog	Dioxin_Furan_Homolog	Dioxin_Furan_Homolog	Dioxin_Furan_Homolog	Dioxin_Furan_Homolog	Dioxin_Furan_Homolog	Dioxin_Furan
		CAS No	41903-57-5	36088-22-9	34465-46-8	37871-00-4	3268-87-9	30402-14-3	30402-15-4	55684-94-1	38998-
	Sample Type	**Chemical Name**	Tetrachlorodibenzo-p-dioxin homologs	Pentachlorodibenzo-p-dioxin homologs	Hexachlorodibenzo-p-dioxin homologs	Heptachlorodibenzo-p-dioxin homologs	Octachlorodibenzo-p-dioxin	Tetrachlorodibenzofuran homologs	Pentachlorodibenzofuran homologs	Hexachlorodibenzofuran homologs	Heptachlorodi homol
Sample ID	**Code**	**Parent Sample**	**Unit** pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/
LW2-C011-C2	FR	LW2-C011-C1	0.243	0.598	5.01	32.6	160	8.46	3.56	3.95	8.06
LW2-C015-B	N		0.097	0.015 U	4.53	33.1	215	2.42	2.48	4.13	8.01
LW2-C019-B2	FR	LW2-C019-B1	0.225	0.032 U	5.32	33.1	123	5.78	2.88	3.76	5.8
LW2-C025-B2	FR	LW2-C025-B1	0.134	0.22	2.07	15.2	60.9	3.03	3.53	3.18	2.97
LW2-C060-A	N		0.241	0.237	3.34	26.2	82.5	1.6	1.56	1.87	2.69
LW2-C067-A	N		0.007 U	1.59	48	347	830	1.31	1.76	6.04	12
LW2-C067-B	N		0.067 U	2.33	55.2	396	1170	2.11	2.99	8.57	26.1
LW2-C093-A	N		2.4	5.05	30.9	175	684	22.4	26.2	33.6	48.3
LW2-C093-B	N		5.36	8.22	37.7	208	1000	25.2	45.8	67.2	139
LW2-C111-A2	FR	LW2-C111-A	1.33	1.18	15.2	142	769	4.8	8.43	19.3	59.5
LW2-C111-D2	FR	LW2-C111-D	6.14	8.07	48.7	326	2020 J	20	48.5	117	256
LW2-C112-B	N		0.394	1.23	13.5	111	477	1.72	5.08	15	27.7
LW2-C133-C	N		0.123	0.785	8.29	104	175	1.89	4.08	6.13	7.65
LW2-C136-B	N		0.721 T	1.57 T	13.8 T	126 T	428 JT	10.4 T	12.1 T	19.5 T	25.7
LW2-C136-C	N		3.72	6.22	35.4	285	1980 J	85.1	258	218	169
LW2-C144-A	N		0.07	0.012 U	0.02 U	4.67	16.2 J	0.1 U	0.12	0.443	1.24
LW2-C144-B	N		0.827 T	1.68 T	11.6 T	66.9 T	317 T	7.2 T	8.33 T	18 T	20.8
LW2-C144-D	N		0.01 U	0.06	0.634	4.99	28	0.984	4.38	29.3	22.1
LW2-C196-A	N		0.525	1.35	10.6	81.1	409	2.05	6.81	15.5	35.1
LW2-C196-B	N		0.197	0.325	3.13	23.8	126	1.81	2.87	6.2	12.7
LW2-C196-C	N		0.007 U	0.009 U	0.692	4.83	24.8	0.013 U	0.402	1.26	3.1
LW2-C203-C	N		3.78	5.22	26.6	196	845	37.7	88.1	88.1	168
LW2-C215-B	N		0.01 U	0.058	1.12	7.34	32.4	0.008 U	0.429	1.07	1.67
LW2-C232-B	N		0.011 U	0.016 U	0.272	1.85	10.026 U	0.013 U	0.159	0.321	0.748
LW2-C277-C	N		2.27	4.12	44.7	471	2380 J	14.5	27.1	96	202
LW2-C290-A	N		0.101	0.118	2.92	31.3	134	0.494	1.31	4.99	9.92
LW2-C290-B	N		0.489	0.755	5.31	43.3	201	1.92	3.78	9.32	14.8
LW2-C290-D	N		0.007 U	0.006 U	0.184	0.845	3.157 U	0.008 U	0.006 U	0.036	0.228
LW2-C291-A	N		0.624	1.7	17.9	108	439	0.846	4.04	14.4	27.6
LW2-C291-B	N		0.357	1.88	17.3	174	609 J	1.02	5.84	18.4	27.9
LW2-C291-C	N		1.58	5.87	64.1	492	2340 J	6.43	25.7	73.6	96.3
LW2-C293-B2	FR	LW2-C293-B	4.28	5.23	47.8	497	2130	13.2	39.5	114	221
LW2-C302-B	N		1.21	1.52	33.3	190	893	57.7	98.6	120	103
LW2-C302-C	N		0.414 U	288	4280	30500	28100	17.4	107	120	1420
LW2-C314-D	N		0.351	0.349	3.22	27.6	84.6	10.5	19.3	21.1	12.3
LW2-C327-D	N		1.03	1.08	5.99	42	167	25.9	23.2	23.2	21.4

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Table 4-11. R2A Archived Sediment Core Dioxin/Furan Data.

		Analyte Group	Dioxin_Furan_Homolog	Dioxin_Furan_Homolog	Dioxin_Furan_Homolog	Dioxin_Furan_Homolog	Dioxin_Furan_Homolog	Dioxin_Furan_Homolog	Dioxin_Furan_Homolog	Dioxin_Furan_Homolog	Dioxin_Furan
		CAS No	41903-57-5	36088-22-9	34465-46-8	37871-00-4	3268-87-9	30402-14-3	30402-15-4	55684-94-1	38998-
	Sample Type	**Chemical Name**	Tetrachlorodibenzo-p-dioxin homologs	Pentachlorodibenzo-p-dioxin homologs	Hexachlorodibenzo-p-dioxin homologs	Heptachlorodibenzo-p-dioxin homologs	Octachlorodibenzo-p-dioxin	Tetrachlorodibenzofuran homologs	Pentachlorodibenzofuran homologs	Hexachlorodibenzofuran homologs	Heptachlorodi homol
Sample ID	**Code**	**Unit Parent Sample**	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/
LW2-C334-D	N		3.49	3.41	2.51	2.58	7.402 U	80.3	52.5	7.23	2.92
LW2-C335-E	N		0.015 U	0.014 U	0.013 U	0.341	1.329 U	0.012 U	0.011 U	0.011 U	0.023
LW2-C342-B	N		0.066	0.061	2.12	19.6	95.7	0.209	0.83	4.57	8.33
LW2-C342-C	N		0.482	1.23	8.74	65	310	2.75	5.6	12.7	21.2
LW2-C348-A	N		1.02	0.09 U	6.17	96.6	361	138	583	793	308
LW2-C348-B	N		6.21	2.22	42	319	1960 J	2130	3170	3480	1850
LW2-C366-C1	N		2.62	1.16	25.8	191	850	271	398	500	252
LW2-C377-D	N		5.05	5.19	24.8	174	830	29.3	76.7	127	127
LW2-C382-B	N		0.511	0.658	8.79	74.9	399	2.01	6.57	26.7	109
LW2-C405-B	N		0.376	1.41	9	67.1	302	3.23	5.21	11.3	21.1
LW2-C417-C	N		1.47	4.01	28.7	185	1060	12.8	18.7	34.1	77.2
LW2-C426-A	N		1.16	2.95	24.9	248	1580	5.07	8.58	23.2	89.5
LW2-C430-C	N		1.87	2.44	27.6	351	3000 J	9.77	19.6	57.2	299
LW2-C431-B	N		8.28	19.7	136	957	6230 J	26.4	48.8	151	234
LW2-C453-B	N		10	9.26	63.1	847	6080 J	41.5	33.5	96.3	495
LW2-C455-B	N		138	120	987	11700	183000	394	399	1130	966
LW2-C455-C	N		16.5	41.9	95.8	978	5190 J	71.1	132	186	680
LW2-C494-C	N		0.254	0.702	6.19	36.2	200	1.86	4.98	7.29	11.1

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Table 4-11. R2A Archived Sediment Core Dio

		Analyte Group	_Homolog
		CAS No	75-3
	Sample Type Code	**Chemical Name**	benzofuran ogs
		Unit	g
Sample ID		**Parent Sample**	
LW2-C011-C2	FR	LW2-C011-C1	
LW2-C015-B	N		
LW2-C019-B2	FR	LW2-C019-B1	
LW2-C025-B2	FR	LW2-C025-B1	
LW2-C060-A	N		
LW2-C067-A	N		
LW2-C067-B	N		
LW2-C093-A	N		
LW2-C093-B	N		
LW2-C111-A2	FR	LW2-C111-A	
LW2-C111-D2	FR	LW2-C111-D	
LW2-C112-B	N		
LW2-C133-C	N		
LW2-C136-B	N		T
LW2-C136-C	N		
LW2-C144-A	N		
LW2-C144-B	N		T
LW2-C144-D	N		
LW2-C196-A	N		
LW2-C196-B	N		
LW2-C196-C	N		
LW2-C203-C	N		
LW2-C215-B	N		
LW2-C232-B	N		
LW2-C277-C	N		
LW2-C290-A	N		
LW2-C290-B	N		
LW2-C290-D	N		
LW2-C291-A	N		
LW2-C291-B	N		
LW2-C291-C	N		
LW2-C293-B2	FR	LW2-C293-B	
LW2-C302-B	N		
LW2-C302-C	N		
LW2-C314-D	N		
LW2-C327-D	N		

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Table 4-11. R2A Archived Sediment Core Dio

			Analyte Group	_Homolog
			CAS No	75-3
			Chemical Name	benzofuran ogs
	Sample Type		**Unit**	g
Sample ID	**Code**	**Parent Sample**		
LW2-C334-D	N			
LW2-C335-E	N			U
LW2-C342-B	N			
LW2-C342-C	N			
LW2-C348-A	N			
LW2-C348-B	N			
LW2-C366-C1	N			
LW2-C377-D	N			
LW2-C382-B	N			
LW2-C405-B	N			
LW2-C417-C	N			
LW2-C426-A	N			
LW2-C430-C	N			
LW2-C431-B	N			
LW2-C453-B	N			
LW2-C455-B	N			
LW2-C455-C	N			
LW2-C494-C	N			

ANC02639
BZTO104(e)002639

Table 4-11. R2A Archived Sediment Core Dioxin/Furan Data.

		Analyte Group	Dioxin_Furan_Homolog	Dioxins_Furans	Dioxins_Furans	Dioxins_Furans	Dioxins_Furans	Dioxins_Furans	Dioxins_Furans	Dioxins_Furans
		CAS No	39001-02-0	1746-01-6	40321-76-4	39227-28-6	57653-85-7	19408-74-3	35822-46-9	51207-31-9
	Sample Type	**Chemical Name**	Octachlorodibenzofuran	2,3,7,8-Tetrachlorodibenzo-p-dioxin	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	2,3,7,8-Tetrachlorodibenzofuran
Sample ID	**Code**	**Unit** / **Parent Sample**	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g
LW2-C011-C2	FR	LW2-C011-C1	5.862 U	0.058 U	0.066 U	0.082 U	0.678 J	0.322 J	13.3	0.626
LW2-C015-B	N		6.638 U	0.012 U	0.015 U	0.064 J	0.645 J	0.309 J	13.9	0.331 U
LW2-C019-B2	FR	LW2-C019-B1	3.03	0.045 U	0.032 U	0.142 J	0.759 J	0.32 J	12.2	0.694
LW2-C025-B2	FR	LW2-C025-B1	3.282 U	0.017 U	0.02 U	0.049 J	0.312 J	0.142 J	7.07	0.254
LW2-C060-A	N		2.919 U	0.012 U	0.015 U	0.037 J	0.305 J	0.136 J	11.3	0.373
LW2-C067-A	N		10.8	0.007 U	0.093 J	0.409 J	2.56	2.44	143	0.172 U
LW2-C067-B	N		27.7	0.067 U	0.213 J	0.515 U	4.64	3.38	170	0.409 U
LW2-C093-A	N		35.8	0.172 J	0.567 J	0.544 J	5.17	2.2	87.4	1.7
LW2-C093-B	N		104	0.18 U	0.816 J	0.719 J	5.71	2.79	101	1.67
LW2-C111-A2	FR	LW2-C111-A	75.8	0.028 U	0.238 J	0.449 J	2.44	1.27 J	67.5	0.866
LW2-C111-D2	FR	LW2-C111-D	233	0.297 J	0.754 J	1.09 J	6.52	2.61	165	2.1
LW2-C112-B	N		23.6	0.077 U	0.16 J	0.212 J	3.21	0.796 J	57.8	0.287 U
LW2-C133-C	N		5.772 U	0.022 U	0.092 J	0.101 J	1.12 J	0.432 J	21.6	0.885
LW2-C136-B	N		13.789 UJT	0.102 UT	0.199 JT	0.26 JT	1.91 JT	0.85 JT	44.7 JT	1.88 JT
LW2-C136-C	N		195	0.272 J	0.548 J	0.671 J	5.62	2.01	128	27.4
LW2-C144-A	N		1.365 U	0.013 U	0.012 U	0.02 U	0.022 U	0.019 U	2.08	0.1 U
LW2-C144-B	N		21.8 T	0.138 UT	0.224 JT	0.276 JT	1.98 JT	1 JT	34.2 T	2.59 JT
LW2-C144-D	N		9.38	0.01 U	0.01 U	0.01 U	0.083 J	0.047 J	2.1	0.424
LW2-C196-A	N		30.6	0.018 U	0.169 J	0.16 U	1.8	0.475 J	37.6	0.655
LW2-C196-B	N		9.43	0.01 U	0.038 U	0.051 J	0.369 J	0.15 J	9.85	0.447
LW2-C196-C	N		1.763 U	0.007 U	0.009 U	0.008 U	0.13 J	0.047 U	2.25	0.013 U
LW2-C203-C	N		115	0.078 U	0.447 J	0.442 J	3.29	0.013 U	90.7	1.36
LW2-C215-B	N		0.999 U	0.01 U	0.007 U	0.023 J	0.208 J	0.092 J	3.52	0.063 U
LW2-C232-B	N		0.734 U	0.011 U	0.016 U	0.015 U	0.018 U	0.016 U	1.01 U	0.013 U
LW2-C277-C	N		158	0.194 J	0.374 J	0.628 J	7.49	2.15	216	5.38
LW2-C290-A	N		6.547 U	0.006 U	0.01 U	0.054 J	0.534 J	0.009 U	14	0.099
LW2-C290-B	N		10.163 U	0.056 J	0.067 J	0.094 J	0.872 J	0.35 J	19.7	0.225 J
LW2-C290-D	N		0.305 U	0.007 U	0.006 U	0.01 U	0.011 U	0.01 U	0.359 U	0.008 U
LW2-C291-A	N		20.9	0.013 U	0.353 U	0.661 J	2.96	2.25	52.4	0.275 J
LW2-C291-B	N		17.1 J	0.049 U	0.256 J	0.331 J	3.69	1.39 J	66.6 J	0.477
LW2-C291-C	N		51.9	0.104 U	0.63 J	1.17 J	13.8	3.79	249	0.786
LW2-C293-B2	FR	LW2-C293-B	172	0.182 U	0.449 J	0.78 J	6.76	2.37	202	1.71
LW2-C302-B	N		121	0.048 U	0.275 U	0.389 J	2.07	0.839 J	82.1 J	37.8
LW2-C302-C	N		899	12.8 J	32.3 J	10.4 J	142 J	39.7 J	5460	18.9
LW2-C314-D	N		10.4	0.01 U	0.008 U	0.039 J	0.295 J	0.254 J	13.5	3.82
LW2-C327-D	N		22.6	0.22 J	0.223 J	0.093 J	0.728 J	0.342 J	17.7	7.99

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Table 4-11. R2A Archived Sediment Core Dioxin/Furan Data.

		Analyte Group	Dioxin_Furan_Homolog	Dioxins_Furans	Dioxins_Furans	Dioxins_Furans	Dioxins_Furans	Dioxins_Furans	Dioxins_Furans	Dioxins_Furans
		CAS No	39001-02-0	1746-01-6	40321-76-4	39227-28-6	57653-85-7	19408-74-3	35822-46-9	51207-31-9
	Sample Type	**Chemical Name**	Octachlorodibenzofuran	2,3,7,8-Tetrachlorodibenzo-p-dioxin	1,2,3,7,8-Pentachlorodibenzo-p-dioxin	1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	2,3,7,8-Tetrachlorodibenzofuran
Sample ID	**Code**	**Parent Sample**	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g
LW2-C334-D	N		2.644 U	1.37	2.02	0.088 J	1.12	0.337 J	1.25 J	3.92
LW2-C335-E	N		0.148 U	0.015 U	0.014 U	0.013 U	0.014 U	0.013 U	0.148 U	0.012 U
LW2-C342-B	N		4.887 U	0.007 U	0.03 U	0.041 J	0.473 J	0.148 J	11.5	0.121 U
LW2-C342-C	N		16.06 U	0.036 U	0.112 J	0.155 J	1.41 J	0.639 J	31	0.285 J
LW2-C348-A	N		262	0.026 U	0.09 U	0.081 U	1.372 U	0.815 J	36.6	60.7
LW2-C348-B	N		1950 J	0.454	0.218 U	1.255 U	6.51	2.695 U	148	613
LW2-C366-C1	N		221	0.102 U	0.108 U	0.574 J	3.93	1.78	90.7	81.4
LW2-C377-D	N		105	0.296 J	0.489 J	0.595 J	3.79	1.88	85	6.58
LW2-C382-B	N		91.4	0.008 U	0.093 J	0.132 J	1.44	0.545 J	40	0.127 U
LW2-C405-B	N		18.6	0.049 U	0.201 J	0.279 J	1.62	0.792 J	36.1	0.326
LW2-C417-C	N		102	0.191 J	0.375 J	0.578 J	4.25	2.12	87.8	0.48
LW2-C426-A	N		141	0.168 J	0.344 J	0.553 J	3.56	1.88 J	112	0.88
LW2-C430-C	N		378	0.179 U	0.345 J	0.488 J	3.9	1.77	165	0.847
LW2-C431-B	N		132	1.46	3	2.49	23.6	10.6	462	1.54
LW2-C453-B	N		988	5.51	1.34 J	1.32 J	9.92	6.34	429	1.33
LW2-C455-B	N		18800	83.6	20.6	16.2	171	85.3	10800	34.3
LW2-C455-C	N		900	2.16	1.58 J	1.7	15.7	6.42	423	1.57
LW2-C494-C	N		10.399 U	0.041 U	0.109 J	0.123 J	0.797 J	0.481 J	17.8	0.219 J

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Table 4-11. R2A Archived Sediment Core Dioxin/Furan Data.

		Analyte Group	Dioxins_Furans	Dioxins_Furans	Dioxins_Furans	Dioxins_Furans	Dioxins_Furans	Dioxins_Furans	Dioxins_Furans	Dioxins_Furans
		CAS No	57117-41-6	57117-31-4	70648-26-9	57117-44-9	72918-21-9	60851-34-5	67562-39-4	55673-89-7
	Sample Type	**Chemical Name**	1,2,3,7,8-Pentachlorodibenzofuran	2,3,4,7,8-Pentachlorodibenzofuran	1,2,3,4,7,8-Hexachlorodibenzofuran	1,2,3,6,7,8-Hexachlorodibenzofuran	1,2,3,7,8,9-Hexachlorodibenzofuran	2,3,4,6,7,8-Hexachlorodibenzofuran	1,2,3,4,6,7,8-Heptachlorodibenzofuran	1,2,3,4,7,8,9-Heptachlorodibenzofuran
Sample ID	**Code**	**Unit** **Parent Sample**	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g
LW2-C011-C2	FR	LW2-C011-C1	0.313 J	0.336 U	0.935 J	0.384 J	0.082 U	0.336 J	2.34	0.224 J
LW2-C015-B	N		0.131 J	0.159 J	0.317 J	0.209 J	0.028 U	0.181 J	2.32	0.153 J
LW2-C019-B2	FR	LW2-C019-B1	0.201 J	0.413 J	0.062 U	0.073 U	0.073 U	0.082 U	2.12	0.063 U
LW2-C025-B2	FR	LW2-C025-B1	0.009 U	0.171 J	0.445 J	0.158 J	0.012 U	0.088 J	1.078 U	0.096 U
LW2-C060-A	N		0.238 J	0.138 J	0.321 J	0.14 J	0.015 U	0.061 J	0.894 J	0.073 U
LW2-C067-A	N		0.127 J	0.112 J	0.309 J	0.131 J	0.036 U	0.109 J	3.46	0.188 J
LW2-C067-B	N		0.39 J	0.28 J	0.861 J	0.419 J	0.117 U	0.288 J	6.91	0.368 J
LW2-C093-A	N		1.04 J	1.06 J	2.69	3.19	0.057 J	0.649 J	17.4	0.874 J
LW2-C093-B	N		1.82 J	1.47 J	5.11	6.16	0.092 J	1.2 J	54.2	1.91 J
LW2-C111-A2	FR	LW2-C111-A	0.589 J	0.463 J	1.5 J	0.604 J	0.054 U	0.264 U	15.2	0.982 J
LW2-C111-D2	FR	LW2-C111-D	6.9	2.55	15.1	6.98	0.254 J	1.26 J	88.4	4.38
LW2-C112-B	N		0.298 J	0.214 J	0.834 J	0.419 J	0.023 U	0.443 J	7.3	0.346 J
LW2-C133-C	N		0.718 J	0.322 J	1.3 J	0.441 J	0.02 U	0.122 U	2.4	0.316 J
LW2-C136-B	N		1.77 JT	0.762 JT	2.86 JT	1.49 JT	0.0735 JT	0.126 JT	7.6 JT	0.975 JT
LW2-C136-C	N		75.4	29.5	101	27.4	0.743 J	6.27	57.3	10.1
LW2-C144-A	N		0.012 U	0.013 U	0.083 U	0.017 U	0.018 U	0.018 U	0.459 J	0.036 U
LW2-C144-B	N		2.08 JT	0.867 JT	6.76 JT	1.3 JT	0.085 JT	0.354 JT	8.47 T	1.48 JT
LW2-C144-D	N		2.62	0.333 J	15.5	9.28	0.224 J	0.966 J	16.6	3.08
LW2-C196-A	N		0.486 J	0.318 J	1.1 J	0.644 J	0.015 U	0.2 J	11.5	0.416 J
LW2-C196-B	N		0.369 J	0.197 J	1.02 J	0.348 J	0.018 U	0.087 J	3.95	0.334 J
LW2-C196-C	N		0.057 J	0.009 U	0.129 J	0.065 J	0.011 U	0.048 U	1.01 J	0.051 J
LW2-C203-C	N		1.09 J	1.34 J	4.11	3.65	0.026 U	2.23	61.4	1.79
LW2-C215-B	N		0.008 U	0.008 U	0.072 J	0.042 J	0.005 U	0.021 J	0.557 U	0.014 U
LW2-C232-B	N		0.008 U	0.01 U	0.013 U	0.016 U	0.015 U	0.014 U	0.308 U	0.026 U
LW2-C277-C	N		3.05	1.9	6.81	2.28	0.223 J	0.738 J	48.1	3.35
LW2-C290-A	N		0.088 J	0.082 J	0.542 J	0.144 U	0.008 U	0.07 J	2.61	0.218 J
LW2-C290-B	N		0.458 J	0.158 U	1.92	0.556 J	0.026 U	0.121 J	4.34	0.366 J
LW2-C290-D	N		0.006 U	0.006 U	0.006 U	0.007 U	0.007 U	0.007 U	0.09 U	0.019 U
LW2-C291-A	N		0.216 J	0.224 J	1.23 J	0.407 J	0.027 U	0.449 J	7.67	0.478 J
LW2-C291-B	N		0.259 J	0.247 J	1.28 J	0.433 J	0.026 U	0.59 J	8.11 J	0.485 J
LW2-C291-C	N		1.14 J	0.867 J	4.3	1.68 J	0.125 J	2.07	28.7	1.58 J
LW2-C293-B2	FR	LW2-C293-B	2.57	2.55	15.2	4.08	0.202 J	1.23 J	58.5	4.91
LW2-C302-B	N		46.9	16.5	63.5 J	17.4 J	0.056 U	4.58	46.9 J	12.3 J
LW2-C302-C	N		50.1 J	19.5 J	17.7 J	19 J	1.54 J	3.28 J	117 J	10.3 J
LW2-C314-D	N		7.87	2.74	11.7	2.87	0.007 U	0.523 J	5.63	1.95
LW2-C327-D	N		7.27	3.42	10.6	2.85	0.116 J	0.619 J	8.57	2.12

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Table 4-11. R2A Archived Sediment Core Dioxin/Furan Data.

		Analyte Group	Dioxins_Furans	Dioxins_Furans	Dioxins_Furans	Dioxins_Furans	Dioxins_Furans	Dioxins_Furans	Dioxins_Furans	Dioxins_Furans
		CAS No	57117-41-6	57117-31-4	70648-26-9	57117-44-9	72918-21-9	60851-34-5	67562-39-4	55673-89-7
	Sample Type	**Chemical Name**	1,2,3,7,8-Pentachlorodibenzofuran	2,3,4,7,8-Pentachlorodibenzofuran	1,2,3,4,7,8-Hexachlorodibenzofuran	1,2,3,6,7,8-Hexachlorodibenzofuran	1,2,3,7,8,9-Hexachlorodibenzofuran	2,3,4,6,7,8-Hexachlorodibenzofuran	1,2,3,4,6,7,8-Heptachlorodibenzofuran	1,2,3,4,7,8,9-Heptachlorodibenzofuran
Sample ID	**Code**	**Unit** / **Parent Sample**	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g	pg/g
LW2-C334-D	N		1.43	2.01	0.983 J	0.984 J	0.022 U	0.756 J	1.71	0.151 J
LW2-C335-E	N		0.009 U	0.011 U	0.011 U	0.012 U	0.012 U	0.014 U	0.045 U	0.025 U
LW2-C342-B	N		0.04 U	0.044 J	0.215 J	0.083 U	0.014 U	0.123 J	2.18	0.137 J
LW2-C342-C	N		0.281 J	0.206 J	1.05 J	0.447 J	0.027 U	0.386 J	6.42	0.381 J
LW2-C348-A	N		269	76.8	492	146	5.62	20.4	177	68.6
LW2-C348-B	N		1240	521	2050	604	22	90.9	942	420
LW2-C366-C1	N		170	49.2	289	89.5	3.83	11.3	129	47.3
LW2-C377-D	N		26.1	6.14	56.1	15.3	0.601 J	1.81	39.1	6.57
LW2-C382-B	N		0.092 J	0.18 J	0.647 J	0.948 J	0.135 J	0.841	42.4	0.735 J
LW2-C405-B	N		0.177 J	0.233 J	0.64 J	0.371 J	0.028 J	0.198 J	5.92	0.401 J
LW2-C417-C	N		0.356 J	0.437 J	2.85	1.96	0.145 J	0.528 J	26.2	4.19
LW2-C426-A	N		0.22 J	0.349 J	1.21 J	0.794 J	0.057 J	0.375 J	21.9	0.935 J
LW2-C430-C	N		0.887 J	0.676 J	2.36	2.51	0.079 J	1.62 J	68	1.62 J
LW2-C431-B	N		1.83	2.22	10.5	6.08	0.259 J	3.01	76.8	5.57
LW2-C453-B	N		0.811 J	0.798 J	3.43	2.03	0.083 U	2.48	96.3	4.5
LW2-C455-B	N		16.783 U	29.9	59.9	23	0.026 U	17.3	924	42.7
LW2-C455-C	N		1 J	1.98	6.87	8.9	0.202 J	2.08	182	7.08
LW2-C494-C	N		0.067 J	0.14 J	0.32 J	0.2 J	0.027 U	0.145 J	2.96	0.22 J

Notes:

- For all totals, zero is always used for non-detects. If any of the values included in a total are estimated (J qualified), then the total value is estimated (J qualified). If all analytes in a total are non-detects, then the highest detection limit is used for the total. A "T" qualifier is added to all results that are mathematically derived.
- Coordinate system for geographic coordinates is Oregon State Plane NAD83 IIARN/IIPGN, Intl. Feet.
- All concentration units are listed as dry weight.

J Estimate.
T Value is an average or selected result (see Kennedy Jenks et al. 2004).
U Not detected at value shown.

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PORTLAND HARBOR RI/FS

ROUND 2A ARCHIVED CORE SEDIMENT DATA REPORT

APPENDIX A

DATA QUALITY SUMMARY

DRAFT

DO NOT QUOTE OR CITE
This document is currently under review by US EPA and its federal, state, and tribal partners, and is subject to change in whole or in part.

May 8, 2006

Prepared for

The Lower Willamette Group

Prepared by

Integral Consulting Inc.

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LIST OF ACRONYMS

EPA	U.S. Environmental Protection Agency
MDL	method detection limit
MRL	method reporting limit
MS/MSD	matrix spike/matrix spike duplicate
PARCC	precision, accuracy, representativeness, completeness, comparability
PCB	polychlorinated biphenyl
PCDD/Fs	polychlorinated dibenzo-p-dioxins/furans
PSEP	Puget Sound Estuary Program
QAPP	quality assurance project plan
RDL	reported detection limit
RI/FS	remedial investigation and feasibility study
RPD	relative percent difference
SVOCs	semivolatile organic compounds

1. INTRODUCTION

This report summarizes the data quality of analyses performed on archived subsurface (core) sediment samples collected during Round 2 of the Portland Harbor remedial investigation and feasibility study (RI/FS). Samples were collected during multiple field efforts in the summer and fall of 2004 (hereafter referred to as Round 2A). A portion of each of the core sediment samples was frozen and archived for possible future analyses, in accordance with the core sediment sampling approach in the Round 2 Field Sampling Plan for Sediment Sampling and Benthic Toxicity Testing (Integral et al. 2004).

At the request of the U.S. Environmental Protection Agency (EPA), a subset of Round 2 archived core sediment samples was analyzed for conventionals, metals, butyltins, organochlorine pesticides, semivolatile organic compounds (SVOCs), petroleum hydrocarbons, polychlorinated biphenyl (PCB) Aroclors and congeners, and polychlorinated dibenzo-p-dioxins and furans (PCDD/Fs). These archived core sediment samples were analyzed according to the sample preparation and analytical procedures in the Round 2 Quality Assurance Project Plan (QAPP; Integral and Windward 2004), and the Round 2 QAPP Addendum 2: PCB Congener Analysis in Sediment Samples, (Integral 2004). Deviations from the QAPP and QAPP Addendum 2 are noted in Section 3.4 of the main body of this report.

Columbia Analytical Services (Kelso, WA; Houston, TX) completed analyses for conventionals, metals, butyltins, organochlorine pesticides, SVOCs, petroleum hydrocarbons, PCB Aroclors, and PCDD/Fs. Alta Analytical (El Dorado Hills, CA) completed analyses for PCB congeners. Archived core sediment samples were prepared and analyzed by methods detailed in Table A-1.

2. DATA QUALITY AND USABILITY

Data generated in the field and at the laboratories were verified and validated according to the criteria and procedures described in the Round 2 QAPP, and QAPP Addendum 2 (Integral and Windward 2004, Integral 2004). Data quality and usability were evaluated based on the results of the data validation and the data quality objectives for the Round 2 data. The performance criteria in the QAPP included project analytical goals for precision, accuracy, representativeness, completeness, and comparability (PARCC) of the Round 2 data.

The precision, accuracy, representativeness, and comparability of the data were assessed during data validation, as described in the *Data Validation* section below and in the Round 2 QAPP. Completeness is calculated by comparing the total number of acceptable data (non-rejected data) to the total number of data points generated. Completeness for the Round 2 archived core sediment data is summarized by parameter group in Table A-2. Completeness was >99% overall, which exceeds the QAPP completeness objective of 95%.

2.1. DATA VALIDATION

Data validation was conducted as required by the Round 2 QAPP (Integral and Windward 2004) and is summarized in Section 3.2 of the main body of this report. The data validation subcontractor for the Round 2 archived core sediment data was EcoChem, Inc., located in Seattle, WA. Data verification and validation was conducted in accordance with *Guidance on Environmental Data Verification and Validation* (EPA 2002a). Data verification and validation for organic compounds and metals was completed according to methods described in the EPA guidance for data review (EPA 1995, 1996, 1999b, 2002b). As required by the Round 2 QAPP and QAPP Addendum 2 (Integral and Windward 2004, Integral 2004), approximately 10% of the archived core sediment data were fully validated, and the remaining data were subjected to Level 3 data validation, which includes the evaluation and assessment of the sample results and applicable quality control results reported by the laboratory. The following deliverables were reviewed during Level 3 and full data validation:

- The case narrative discussing analytical problems (if any) and procedures
- Chain-of-custody documentation and laboratory sample receipt logs
- Instrument calibration results
- Method blank results
- Results for laboratory quality control samples required by the referenced method including laboratory control sample/laboratory control sample duplicate analyses, matrix spike/matrix spike duplicate (MS/MSD) analyses, and surrogate recoveries

- Results for field quality control samples (i.e., field duplicates, and field split samples)
- Analytical results for the archived core sediment samples.

In addition to review and assessment of the documentation identified above, full validation included verification of reported concentrations of the results for field samples and quality control samples, verification of intermediate transcriptions, and review of instrument data, such as mass spectra, to verify analyte identification procedures. The EcoChem data validation reports are provided in Appendix C.

Data qualifiers were assigned during data validation if applicable control limits were not met, in accordance with the U.S. EPA data validation guidelines (EPA 1995, 1996, 1999b, 2002b) and the quality control requirements included in the referenced methods (ASTM 2003, EPA 2006, Krone et al. 1989, Plumb 1981, PSEP 1986). The quality control limits for surrogate spikes, MS/MSD samples, laboratory control samples, and ongoing precision and recovery for the laboratories are summarized in Tables A-3 and A-4. The data validation qualifiers and definitions are summarized in Table A-5. Data quality reports and a tabular summary of qualified data generated by EcoChem are included in Appendix C and Appendix B, respectively.

2.2. DATA QUALITY

The EcoChem data validation reports (Appendix C) provide detailed information on the data quality issues and data validation qualifiers for each parameter group for each laboratory data package. A summary of the qualified data by parameter group, with the reasons for qualification, is included in Table A-6.

The discussion below includes a comparison of the reported detection limits to the detection limits specified in the Round 2 QAPP and QAPP Addendum 2 (Integral and Windward 2004, Integral 2004), followed by a summary of the qualified data for each parameter group and any limitations to the usability of the data.

2.2.1. Reported Detection Limits

Sediment data for Round 2 of the Portland Harbor RI/FS were reported to the method detection limit (MDL) in most cases. Sample-specific detection limits were reported for PCB congeners and PCDD/Fs, as specified in the method protocols (EPA methods 1668A and 1613B; EPA 1999a, 1994, respectively). These detection limits are based on the signal-to-noise ratio of the analytical system for each analyte and sample. In several cases, the MDL and method reporting limit (MRL) were elevated at the laboratory or during data validation because matrix interference or the presence of another analyte interfered with the quantification of a given analyte. MDLs and MRLs were also elevated when results were restated as undetected during data validation because of possible sample contamination, as indicated by the presence of target analytes in an associated method blank or equipment blank.

The reported detection limit (RDL) is the collective term for the detection limit or reporting limit used to quantify non-detects, as applicable to each sample and analyte. Table A-7 provides the MDLs included in the Round 2 QAPP and QAPP Addendum 2 (Integral and Windward 2004, Integral 2004) and the minimum and maximum RDL attained by the laboratories for each analyte and sample type.

2.2.2. Field Quality Control Samples

Field replicates were collected to assess the variability of the results. Field replicate samples were generated by collecting an additional sediment sample at a designated station, processing this sample separately in the same manner as the original sample, and submitting the replicate as a separate sample for analysis at the laboratory. The field replicate sample results are summarized in Table A-8.

The comparability of the replicate results was assessed by calculating the relative percent difference (RPD) of the results. A control limit of 50 RPD is recommended by the Puget Sound Estuary Program (PSEP) and the Puget Sound Ambient Monitoring Program (PSEP 1997) for analytical precision for organic analyses. Because there is no standard control limit for comparison of field replicate results, an RPD of 50 was established as a conservative target control limit for detected results greater than 5 times the reporting limit. Greater variability is expected for results within 5-10 times the reporting limit because the background signal variations (i.e., "noise") are greater relative to the lower analyte levels. The precision of the results is acceptable. Sediment data were not qualified based solely on the field replicate results.

2.2.2.1. Summary of Qualified Data

Selected data not meeting the data quality criteria were qualified as undetected or estimated during validation, in accordance with the QAPP. A summary of the qualified data by parameter group, including the reasons for qualification, is included in Table A-6. A complete list of qualified results with reason codes is provided in Appendix B (on CD). Data qualified as undetected are usable for all intended purposes. Data qualified as estimated are usable for all intended purposes, with the knowledge that these data may be less precise or less accurate than unqualified data.

The precision and accuracy of the Round 2A archived core sediment data was acceptable. The completeness of the Round 2A archived core sediment data was >99% (see Table A-2). Overall, the data quality was good and will meet program objectives and goals for the RI/FS.

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Table A-1. Laboratory Methods for Round 2A Archived Core Sediment Samples.

Analytes	Laboratory	Sample Preparation		Quantitative Analysis	
		Protocol	Procedure	Protocol	Procedure
Conventional Analyses	CAS Kelso				
Total solids		NA	--	E160.3	Balance
Grain size		NA	--	PSEP 1986	Sieves and pipette method
Total organic carbon		Plumb 1981	Acid pretreatment	Plumb 1981	Combustion; coulometric titration
Specific gravity		--	--	ASTM D-854-83	Gravimeter
Metals	CAS Kelso				
Antimony, arsenic, cadmium, lead, silver		EPA 3050	Strong acid digestion	EPA 6020	ICP/MS
Aluminum, chromium, copper, nickel, zinc		EPA 3050	Strong acid digestion	EPA 6010B	ICP/OES
Selenium		EPA 3050	Strong acid digestion	EPA 7742	AAS
		EPA 7742	Hydride generation		
Mercury		EPA 7471A	Acid digestion/oxidation	EPA 7471A	CVAAS
Butyltins	CAS Kelso	Krone et al. 1989	Solvent Extraction	Krone et al. 1989	GC/FPD
Organochlorine Pesticides and Selected SVOCs	CAS Kelso	EPA 3541	Soxhlet extraction	EPA 8081A	GC/ECD
		EPA 3620B	Florisil® cleanup		
		EPA 3660B	Sulfur cleanup		
Semivolatile Organic Compounds[a]	CAS Kelso				
Tri-, tetra-, and pentachlorophenols[b]		EPA 8151A	Solvent extraction	EPA 8151A	GC/ECD
			Esterification		
Polycyclic aromatic hydrocarbons		EPA 3541	Automated Soxhlet extraction	EPA 8270C	GC/MS - SIM
		EPA 3640A	Gel permeation chromatography		
		EPA 3630C	Silica gel cleanup		
SVOCs (other than PAHs and tri-, tetra-, and pentachlorophenols)		EPA 3541	Automated Soxhlet extraction	EPA 8270C	GC/MS - LVI
		EPA 3640A	Gel permeation chromatography		
Petroleum Hydrocarbons	CAS Kelso				
Gasoline-range hydrocarbons		NWTPH-Gx	Methanol extraction	NWTPH-Gx	GC/FID
			Purge and trap		
Diesel- and oil-range hydrocarbons		NWTPH-Dx	Sovent extraction	NWTPH-Dx	GC/FID
			Silica gel cleanup (as needed)		
PCB Aroclors	CAS Kelso	EPA 3541	Soxhlet extraction	EPA 8082	GC/ECD
		EPA 3665A	Sulfuric acid cleanup		
		EPA 3620B	Florisil® cleanup		
		EPA 3660B	Sulfur cleanup		

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Table A-1. Laboratory Methods for Round 2A Archived Core Sediment Samples.

Analytes	Laboratory	Sample Preparation		Quantitative Analysis	
		Protocol	Procedure	Protocol	Procedure
PCB Congeners	Alta	EPA 1668A	Soxhlet/Dean Stark extraction Sulfuric acid cleanup Silica column cleanup	EPA 1668A	HRGC/HRMS
PCDD/Fs	CAS Houston	EPA 1613B	Soxhlet/Dean Stark extraction Sulfuric acid cleanup Silica/carbon column cleanup	EPA 1613B	HRGC/HRMS

Notes:

[a] Samples will be screened using GC/FID to determine levels of analytes and interferences, and, if necessary, to adjust sample quantities used for extraction.

[b] Results for tri-, tetra-, and pentachlorophenols will be reported if concentrations are sufficiently high to be detected and quantified. Low-level calibrations will not be employed for these chlorinated phenols when analyzed by GC/MS.

AAS - atomic absorption spectrometry
ASTM - American Society for Testing and Materials
CAS - Columbia Analytical Services
CVAAS - cold vapor atomic absorption spectrometry
EPA - U.S. Environmental Protection Agency
GC/ECD - gas chromatography/electron capture detection
GC/FID - gas chromatography/flame ionization detection
GC/FPD - gas chromatography/flame photometric detection
GC/MS - gas chromatography/mass spectrometry
HRGC/HRMS - high resolution gas chromatography/high resolution mass spectrometry
ICP/OES - inductively coupled plasma/optical emission spectrometry
ICP/MS - inductively coupled plasma - mass spectrometry
LVI - large-volume injector
NA - not applicable
NWTPH - Northwest total petroluem hydrocarbons
PAH - polycyclic aromatic hydrocarbon
PCB - polychlorinated biphenyl
PSEP - Puget Sound Estuary Program
SIM - selected ion monitoring
SVOC - semivolatile organic compound

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Table A-2. Percent Completeness by Parameter Group.

Analysis	Total # of Data Points[1]	Number of Data Points		Completeness (%)
		Accepted	Rejected	
Butyltins	20	20	0	100
Conventionals[2]	568	568	0	100
Dioxin/furan homologs	540	540	0	100
Dioxins/furans	810	810	0	100
Grainsize	1833	1833	0	100
Metals	478	478	0	100
Organochlorine pesticides	2464	2464	0	100
PAHs	1071	1071	0	100
PCB Aroclors	842	842	0	100
PCB congener homologs	270	270	0	100
PCB congeners	5070	5070	0	100
Petroleum hydrocarbons	88	88	0	100
Phenols	971	971	0	100
Phthalates	366	350	16	96
SVOCs	2218	2101	117	95
Round 2 Archived Core Sediment Sampling Project Total	**17609**	**17476**	**133**	**>99**

Notes:

[1]Totals include field replicates and split samples, and exclude field blanks.

[2] Includes specific gravity, total organic carbon, and total solids.

Table A-3. Laboratory Control Limits for Round 2A Archived Core Sediment Samples.

Analysis	Percent Recovery
Petroleum Hydrocarbons	
Triacontane	50 - 150
Semivolatile Organic Compounds	
2-Fluoro-1,1'-biphenyl	10 - 104
Nitrobenzene-d5	10 - 99
p-Terphenyl-d14	32 - 134
Phenols	
2,4,6-Tribromophenol	23 - 113
2-Fluorophenol	11 - 87
4-Bromo-2,6-dichlorophenol	38 - 155
Phenol-d6	20 - 99
Butyltins	
Tripropyltin hydride	10 - 127
PCB Congeners	
^{13}C-2,2',3,3',4,4',5,5',6,6'-Decachlorobiphenyl	-
^{13}C-2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl	-
^{13}C-2,2',3,3',4,4',5,5'-Octachlorobiphenyl	-
^{13}C-2,2',3,3',4,4',5-Heptachlorobiphenyl	-
^{13}C-2,2',3,3',4,5,5',6,6'-Nonachlorobiphenyl	-
^{13}C-2,2',3,3',5,5',6,6'-Octachlorobiphenyl	-
^{13}C-2,2',3,3',5,5',6-Heptachlorobiphenyl	-
^{13}C-2,2',3,4,4',5,5'-Heptachlorobiphenyl	-
^{13}C-2,2',3,4',5,6,6'-Heptachlorobiphenyl	-
^{13}C-2,2',3,5',6-Pentachlorobiphenyl	-
^{13}C-2,2',4,4',5,5'-Hexachlorobiphenyl	-
^{13}C-2,2',4,4',6,6'-Hexachlorobiphenyl	-
^{13}C-2,2',4,5,5'-Pentachlorobiphenyl	-
^{13}C-2,2',4,6,6'-Pentachlorobiphenyl	-
^{13}C-2,2',5,5'-Tetrachlorobiphenyl	-
^{13}C-2,2',6,6'-Tetrachlorobiphenyl	-
^{13}C-2,2',6-Trichlorobiphenyl	-
^{13}C-2,2'-Dichlorobiphenyl	-
^{13}C-2,3,3',4,4',5,5'-Heptachlorobiphenyl	-
^{13}C-2,3,3',4,4',5'-Hexachlorobiphenyl	-
^{13}C-2,3,3',4,4',5-Hexachlorobiphenyl	-
^{13}C-2,3,3',4,4'-Pentachlorobiphenyl	-
^{13}C-2,3',4,4',5,5'-Hexachlorobiphenyl	-
^{13}C-2,3',4,4',5'-Pentachlorobiphenyl	-
^{13}C-2,3',4,4',5-Pentachlorobiphenyl	-

Table A-3. Laboratory Control Limits for Round 2A Archived Core Sediment Samples.

Analysis	Percent Recovery
^{13}C-2,3,4,4',5-Pentachlorobiphenyl	-
^{13}C-2,4,4'-Trichlorobiphenyl	-
^{13}C-2,4',6-Trichlorobiphenyl	-
^{13}C-2,5-Dichlorobiphenyl	-
^{13}C-2-Chlorobiphenyl	-
^{13}C-3,3',4,4',5,5'-Hexachlorobiphenyl	-
^{13}C-3,3',4,4',5-Pentachlorobiphenyl	-
^{13}C-3,3',4,4'-Tetrachlorobiphenyl	-
^{13}C-3,4,4',5-Tetrachlorobiphenyl	-
^{13}C-3,4,4'-Trichlorobiphenyl	-
^{13}C-4-Chlorobiphenyl	-
2,2',3,3',4,4',5,5',6,6'-Decachlorobiphenyl	20 - 166
Dioxin/Furans	
^{13}C-1,2,3,4,6,7,8-Heptachlorodibenzofuran	40 - 135
^{13}C-1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	40 - 135
^{13}C-1,2,3,4,7,8,9-Heptachlorodibenzofuran	40 - 135
^{13}C-1,2,3,4,7,8-Hexachlorodibenzofuran	40 - 135
^{13}C-1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	40 - 135
^{13}C-1,2,3,6,7,8-Hexachlorodibenzofuran	40 - 135
^{13}C-1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	40 - 135
^{13}C-1,2,3,7,8,9-Hexachlorodibenzofuran	40 - 135
^{13}C-1,2,3,7,8-Pentachlorodibenzofuran	40 - 135
^{13}C-1,2,3,7,8-Pentachlorodibenzo-p-dioxin	40 - 135
^{13}C-2,3,4,6,7,8-Hexachlorodibenzofuran	40 - 135
^{13}C-2,3,4,7,8-Pentachlorodibenzofuran	40 - 135
^{13}C-2,3,7,8-Tetrachlorodibenzofuran	40 - 135
^{13}C-2,3,7,8-Tetrachlorodibenzo-p-dioxin	40 - 135
^{13}C-Octachlorodibenzo-p-dioxin	40 - 135
PAHs	
Fluoranthene-d10	10 - 129
Fluorene-d10	10 - 122
Organochlorine Pesticides	
2,4,5,6-Tetrachloro-m-xylene	38 - 125
o-Terphenyl	50 - 150

Table A-4. Laboratory Control Limits for Round 2A Archived Core Sediment Matrix Spike, Laboratory Control Samples, and Ongoing Precision and Recovery

Analysis	Matrix Spike Recovery (percent)	Laboratory Control Sample Recovery	Type of Duplicate	Control Limit Relative Percent Difference
Metals				
Aluminum	75 - 125	--	LD	30
Antimony	70 - 130	--	LD	30
Arsenic	70 - 122	--	LD	30
Cadmium	77 - 122	--	LD	30
Chromium	57 - 145	--	LD	30
Copper	59 - 144	--	LD	30
Lead	74 - 117	--	LD	30
Mercury	61 - 129	--	LD	30
Nickel	79 - 124	--	LD	30
Selenium	64 - 120	--	LD	30
Silver	70 - 130	--	LD	30
Zinc	51 - 148	--	LD	30
Butyltins				
Butyltin ion	10 - 64	--	MSD	50
Dibutyltin ion	10 - 141	--	MSD	50
Tributyltin ion	10 - 140	--	MSD	50
Tetrabutyltin	10 - 132	--	MSD	50
Conventionals				
Specific gravity	--	--	LD	20
Total organic carbon	75 - 125	--	LD	40
Total solids	--	--	LD	40
Organochlorine Pesticides				
2,4'-DDD	39 - 139	--	MSD	50
2,4'-DDE	45 - 135	--	MSD	50
2,4'-DDT	40 - 136	--	MSD	50
4,4'-DDD	32 - 156	--	MSD	50
4,4'-DDE	35 - 146	--	MSD	50
4,4'-DDT	31 - 161	--	MSD	50
Aldrin	39 - 143	--	MSD	50
alpha-Endosulfan	10 - 141	--	MSD	50
alpha-Hexachlorocyclohexane	41 - 148	--	MSD	50
beta-Endosulfan	21 - 135	--	MSD	50
beta-Hexachlorocyclohexane	37 - 152	--	MSD	50
cis-Chlordane	40 - 140	--	MSD	50
cis-Nonachlor	70 - 130	--	MSD	50
delta-Hexachlorocyclohexane	35 - 162	--	MSD	50
Dieldrin	48 - 142	--	MSD	50
Endosulfan sulfate	39 - 148	--	MSD	50
Endrin	44 - 146	--	MSD	50
Endrin aldehyde	18 - 137	--	MSD	50
Endrin ketone	37 - 149	--	MSD	50
gamma-Hexachlorocyclohexane	45 - 153	--	MSD	50
Heptachlor	35 - 151	--	MSD	50
Heptachlor epoxide	37 - 148	--	MSD	50
Methoxychlor	35 - 158	--	MSD	50
Mirex	68 - 119	--	MSD	50
Oxychlordane	70 - 130	--	MSD	50
Toxaphene	52 - 156	--	MSD	50
trans-Chlordane	33 - 161	--	MSD	50
trans-Nonachlor	70 - 130	--	MSD	50
Semivolatile Organic Compounds				
1,2,4-Trichlorobenzene	10 - 89	--	MSD	40
1,2-Dichlorobenzene	10 - 82	--	MSD	40
1,3-Dichlorobenzene	10 - 78	--	MSD	40
1,4-Dichlorobenzene	10 - 77	--	MSD	40
2,4-Dinitrotoluene	28 - 126	--	MSD	40
2,6-Dinitrotoluene	28 - 122	--	MSD	40
2-Chloronaphthalene	23 - 102	--	MSD	40
2-Nitroaniline	29 - 117	--	MSD	40
3,3'-Dichlorobenzidine	10 - 80	--	MSD	40
3-Nitroaniline	10 - 97	--	MSD	40

Table A-4. Laboratory Control Limits for Round 2A Archived Core Sediment Matrix Spike, Laboratory Control Samples, and Ongoing Precision and Recovery

Analysis	Matrix Spike Recovery (percent)	Laboratory Control Sample Recovery	Type of Duplicate	Control Limit Relative Percent Difference
4-Bromophenyl phenyl ether	26 - 116	--	MSD	40
4-Chloroaniline	10 - 75	--	MSD	40
4-Chlorophenyl phenyl ether	22 - 113	--	MSD	40
4-Nitroaniline	10 - 105	--	MSD	40
Aniline	10 - 55	--	MSD	40
Azobenzene	28 - 101	--	MSD	40
Benzoic acid	10 - 113	--	MSD	40
Benzyl alcohol	26 - 106	--	MSD	40
Bis(2-chloroethoxy) methane	24 - 101	--	MSD	40
Bis(2-chloroethyl) ether	13 - 107	--	MSD	40
Bis(2-chloroisopropyl) ether	10 - 92	--	MSD	40
Carbazole	27 - 125	--	MSD	40
Dibenzofuran	33 - 110	--	MSD	40
Hexachlorobenzene	32 - 130	--	MSD	40
Hexachlorobutadiene	10 - 130	--	MSD	40
Hexachlorocyclopentadiene	10 - 64	--	MSD	40
Hexachloroethane	10 - 130	--	MSD	40
Isophorone	22 - 119	--	MSD	40
Nitrobenzene	16 - 102	--	MSD	40
N-Nitrosodimethylamine	19 - 94	--	MSD	40
N-Nitrosodiphenylamine	18 - 135	--	MSD	40
N-Nitrosodipropylamine	22 - 115	--	MSD	40
Phenols				
2,3,4,5-Tetrachlorophenol	38 - 163	--	MSD	40
2,3,5,6-Tetrachlorophenol	45 - 160	--	MSD	40
2,4,5-Trichlorophenol	60 - 135	--	MSD	40
2,4,6-Trichlorophenol	38 - 140	--	MSD	40
2,4-Dichlorophenol	21 - 109	--	MSD	40
2,4-Dimethylphenol	10 - 93	--	MSD	40
2,4-Dinitrophenol	10 - 140	--	MSD	40
2-Chlorophenol	23 - 94	--	MSD	40
2-Methylphenol	10 - 100	--	MSD	40
2-Nitrophenol	20 - 105	--	MSD	40
4,6-Dinitro-2-methylphenol	10 - 118	--	MSD	40
4-Chloro-3-methylphenol	21 - 112	--	MSD	40
4-Methylphenol	10 - 116	--	MSD	40
4-Nitrophenol	24 - 120	--	MSD	40
Pentachlorophenol	48 - 157	--	MSD	40
Phenol	21 - 106	--	MSD	40
Phthalate Esters				
Bis(2-ethylhexyl) phthalate	10 - 158	--	MSD	40
Butylbenzyl phthalate	23 - 136	--	MSD	40
Dibutyl phthalate	20 - 131	--	MSD	40
Diethyl phthalate	28 - 116	--	MSD	40
Dimethyl phthalate	32 - 111	--	MSD	40
Di-n-octyl phthalate	27 - 143	--	MSD	40
Polycyclic Aromatic Hydrocarbons				
2-Methylnaphthalene	27 - 106	--	MSD	40
Acenaphthene	32 - 114	--	MSD	40
Acenaphthylene	36 - 113	--	MSD	40
Anthracene	38 - 133	--	MSD	40
Benz(a)anthracene	24 - 149	--	MSD	40
Benzo(a)pyrene	30 - 146	--	MSD	40
Benzo(b)fluoranthene	26 - 144	--	MSD	40
Benzo(g,h,i)perylene	23 - 142	--	MSD	40
Benzo(k)fluoranthene	29 - 136	--	MSD	40
Chrysene	38 - 133	--	MSD	40
Dibenz(a,h)anthracene	33 - 136	--	MSD	40
Fluoranthene	30 - 143	--	MSD	40
Fluorene	39 - 118	--	MSD	40
Indeno(1,2,3-cd)pyrene	24 - 147	--	MSD	40
Naphthalene	22 - 101	--	MSD	40
Phenanthrene	29 - 130	--	MSD	40

Table A-4. Laboratory Control Limits for Round 2A Archived Core Sediment Matrix Spike, Laboratory Control Samples, and Ongoing Precision and Recovery

Analysis	Matrix Spike Recovery (percent)	Laboratory Control Sample Recovery	Type of Duplicate	Control Limit Relative Percent Difference
Pyrene	28 - 143	--	MSD	40
PCDD/Fs				
Heptachlorodibenzofuran homologs	--	--	LD	40
Heptachlorodibenzo-p-dioxin homologs	--	--	LD	40
Hexachlorodibenzofuran homologs	--	--	LD	40
Hexachlorodibenzo-p-dioxin homologs	--	--	LD	40
Octachlorodibenzofuran	--	--	LD	40
Octachlorodibenzo-p-dioxin	--	--	LD	40
Pentachlorodibenzofuran homologs	--	--	LD	40
Pentachlorodibenzo-p-dioxin homologs	--	--	LD	40
Tetrachlorodibenzofuran homologs	--	--	LD	40
Tetrachlorodibenzo-p-dioxin homologs	--	--	LD	40
1,2,3,4,6,7,8-Heptachlorodibenzofuran	--	--	LD	40
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	--	--	LD	40
1,2,3,4,7,8,9-Heptachlorodibenzofuran	--	--	LD	40
1,2,3,4,7,8-Hexachlorodibenzofuran	--	--	LD	40
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	--	--	LD	40
1,2,3,6,7,8-Hexachlorodibenzofuran	--	--	LD	40
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	--	--	LD	40
1,2,3,7,8,9-Hexachlorodibenzofuran	--	--	LD	40
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	--	--	LD	40
1,2,3,7,8-Pentachlorodibenzofuran	--	--	LD	40
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	--	--	LD	40
2,3,4,6,7,8-Hexachlorodibenzofuran	--	--	LD	40
2,3,4,7,8-Pentachlorodibenzofuran	--	--	LD	40
2,3,7,8-Tetrachlorodibenzofuran	--	--	LD	40
2,3,7,8-Tetrachlorodibenzo-p-dioxin	--	--	LD	40
PCB Aroclors				
Aroclor 1016	33 - 155	--	MSD	50
Aroclor 1221	--	--	--	--
Aroclor 1232	--	--	--	--
Aroclor 1242	--	--	--	--
Aroclor 1248	--	--	--	--
Aroclor 1254	--	--	--	--
Aroclor 1260	36 - 161	--	MSD	50
Aroclor 1262	--	--	--	--
Aroclor 1268	--	--	--	--
PCB Homologs				
Dichlorobiphenyl	--	--	--	--
Heptachlorobiphenyl	--	--	--	--
Hexachlorobiphenyl	--	--	--	--
Monochlorobiphenyl	--	--	--	--
Nonachlorobiphenyl	--	--	--	--
Octachlorobiphenyl	--	--	--	--
Pentachlorobiphenyl	--	--	--	--
Tetrachlorobiphenyl	--	--	--	--
Trichlorobiphenyl	--	--	--	--
PCB Congeners				
2,2',3,3',4,4',5,5',6,6'-Decachlorobiphenyl	--	--	--	--
2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl	--	--	--	--
2,2',3,3',4,4',5,5'-Octachlorobiphenyl	--	--	--	--
2,2',3,3',4,4',5,6,6'-Nonachlorobiphenyl	--	--	--	--
2,2',3,3',4,4',5,6-Octachlorobiphenyl	--	--	--	--
2,2',3,3',4,4',5-Heptachlorobiphenyl	--	--	--	--
2,2',3,3',4,4',6,6'-Octachlorobiphenyl	--	--	--	--
2,2',3,3',4,4',6-Heptachlorobiphenyl	--	--	--	--
2,2',3,3',4,5,5',6,6'-Nonachlorobiphenyl	--	--	--	--
2,2',3,3',4,5,5',6'-Octachlorobiphenyl	--	--	--	--
2,2',3,3',4,5,5',6-Octachlorobiphenyl	--	--	--	--
2,2',3,3',4,5,5'-Heptachlorobiphenyl	--	--	--	--
2,2',3,3',4,5',6,6'-Octachlorobiphenyl	--	--	--	--
2,2',3,3',4,5,6,6'-Octachlorobiphenyl	--	--	--	--

Table A-4. Laboratory Control Limits for Round 2A Archived Core Sediment Matrix Spike, Laboratory Control Samples, and Ongoing Precision and Recovery

Analysis	Matrix Spike Recovery (percent)	Laboratory Control Sample Recovery	Type of Duplicate	Control Limit Relative Percent Difference
2,2',3,3',4,5',6'-Heptachlorobiphenyl	--	--	--	--
2,2',3,3',4,5',6-Heptachlorobiphenyl	--	--	--	--
2,2',3,3',4,5,6'-Heptachlorobiphenyl	--	--	--	--
2,2',3,3',4,5,6-Heptachlorobiphenyl	--	--	--	--
2,2',3,3',4,5'-Hexachlorobiphenyl	--	--	--	--
2,2',3,3',4,5-Hexachlorobiphenyl	--	--	--	--
2,2',3,3',4,6,6'-Heptachlorobiphenyl	--	--	--	--
2,2',3,3',4,6-Hexachlorobiphenyl	--	--	--	--
2,2',3,3',4-Pentachlorobiphenyl	--	--	--	--
2,2',3,3',5,5',6,6'-Octachlorobiphenyl	--	--	--	--
2,2',3,3',5,5',6-Heptachlorobiphenyl	--	--	--	--
2,2',3,3',5,6,6'-Heptachlorobiphenyl	--	--	--	--
2,2',3,3',5,6'-Hexachlorobiphenyl	--	--	--	--
2,2',3,3',5-Pentachlorobiphenyl	--	--	--	--
2,2',3,3',6,6'-Hexachlorobiphenyl	--	--	--	--
2,2',3,3'-Tetrachlorobiphenyl	--	--	--	--
2,2',3,4,4',5,5'-Heptachlorobiphenyl	--	--	--	--
2,2',3,4,4',5,6,6'-Octachlorobiphenyl	--	--	--	--
2,2',3,4,4',5',6-Heptachlorobiphenyl	--	--	--	--
2,2',3,4,4',5,6-Heptachlorobiphenyl	--	--	--	--
2,2',3,4,4',5-Hexachlorobiphenyl	--	--	--	--
2,2',3,4,4',6,6'-Heptachlorobiphenyl	--	--	--	--
2,2',3,4,4',6'-Hexachlorobiphenyl	--	--	--	--
2,2',3,4,5,5',6-Heptachlorobiphenyl	--	--	--	--
2,2',3,4,5,5'-Hexachlorobiphenyl	--	--	--	--
2,2',3,4',5,6,6'-Heptachlorobiphenyl	--	--	--	--
2,2',3,4,5,6,6'-Heptachlorobiphenyl	--	--	--	--
2,2',3,4',5,6'-Hexachlorobiphenyl	--	--	--	--
2,2',3,4',5,6-Hexachlorobiphenyl	--	--	--	--
2,2',3,4,5',6-Hexachlorobiphenyl	--	--	--	--
2,2',3,4',5'-Pentachlorobiphenyl	--	--	--	--
2,2',3,4,5-Pentachlorobiphenyl	--	--	--	--
2,2',3,4',6,6'-Hexachlorobiphenyl	--	--	--	--
2,2',3,4,6,6'-Hexachlorobiphenyl	--	--	--	--
2,2',3,4,6'-Pentachlorobiphenyl	--	--	--	--
2,2',3,5,5',6-Hexachlorobiphenyl	--	--	--	--
2,2',3,5,6,6'-Hexachlorobiphenyl	--	--	--	--
2,2',3,5,6'-Pentachlorobiphenyl	--	--	--	--
2,2',3,5,6-Pentachlorobiphenyl	--	--	--	--
2,2',3,5'-Tetrachlorobiphenyl	--	--	--	--
2,2',3,6,6'-Pentachlorobiphenyl	--	--	--	--
2,2',3,6'-Tetrachlorobiphenyl	--	--	--	--
2,2',3,6-Tetrachlorobiphenyl	--	--	--	--
2,2',4,4',5,5'-Hexachlorobiphenyl	--	--	--	--
2,2',4,4',5,6'-Hexachlorobiphenyl	--	--	--	--
2,2',4,4',5-Pentachlorobiphenyl	--	--	--	--
2,2',4,4',6,6'-Hexachlorobiphenyl	--	--	--	--
2,2',4,4',6-Pentachlorobiphenyl	--	--	--	--
2,2',4,4'-Tetrachlorobiphenyl	--	--	--	--
2,2',4,5',6-Pentachlorobiphenyl	--	--	--	--
2,2',4,6,6'-Pentachlorobiphenyl	--	--	--	--
2,2',4,6'-Tetrachlorobiphenyl	--	--	--	--
2,2',4,6-Tetrachlorobiphenyl	--	--	--	--
2,2',4-Trichlorobiphenyl	--	--	--	--
2,2',5,6'-Tetrachlorobiphenyl	--	--	--	--
2,2',5-Trichlorobiphenyl	--	--	--	--
2,2',6,6'-Tetrachlorobiphenyl	--	--	--	--
2,2',6-Trichlorobiphenyl	--	--	--	--
2,3,3',4,4',5,5',6-Octachlorobiphenyl	--	--	--	--
2,3,3',4,4',5,5'-Heptachlorobiphenyl	--	--	--	--
2,3,3',4,4',5',6-Heptachlorobiphenyl	--	--	--	--
2,3,3',4,4',5,6-Heptachlorobiphenyl	--	--	--	--
2,3,3',4,4',5'-Hexachlorobiphenyl	--	--	--	--
2,3,3',4,4',5-Hexachlorobiphenyl	--	--	--	--
2,3,3',4,4'-Pentachlorobiphenyl	--	--	--	--
2,3,3',4',5,5',6-Heptachlorobiphenyl	--	--	--	--

Table A-4. Laboratory Control Limits for Round 2A Archived Core Sediment Matrix Spike, Laboratory Control Samples, and Ongoing Precision and Recovery

Analysis	Matrix Spike Recovery (percent)	Laboratory Control Sample Recovery	Type of Duplicate	Control Limit Relative Percent Difference
2,3,3',4,5,5',6-Heptachlorobiphenyl	--	--	--	--
2,3,3',4,5,5'-Hexachlorobiphenyl	--	--	--	--
2,3,3',4',5'-Pentachlorobiphenyl	--	--	--	--
2,3,3',4',6-Pentachlorobiphenyl	--	--	--	--
2,3,3',4-Tetrachlorobiphenyl	--	--	--	--
2,3,3',5',6-Pentachlorobiphenyl	--	--	--	--
2,3,3',5'-Tetrachlorobiphenyl	--	--	--	--
2,3,3',5-Tetrachlorobiphenyl	--	--	--	--
2,3',4,4',5,5'-Hexachlorobiphenyl	--	--	--	--
2,3',4,4',5',6-Hexachlorobiphenyl	--	--	--	--
2,3,4,4',5,6-Hexachlorobiphenyl	--	--	--	--
2,3',4,4',5'-Pentachlorobiphenyl	--	--	--	--
2,3,4,4',5-Pentachlorobiphenyl	--	--	--	--
2,3',4,4',6-Pentachlorobiphenyl	--	--	--	--
2,3',4',5,5'-Pentachlorobiphenyl	--	--	--	--
2,3',4,5,5'-Pentachlorobiphenyl	--	--	--	--
2,3',4,5',6-Pentachlorobiphenyl	--	--	--	--
2,3',4,5'-Tetrachlorobiphenyl	--	--	--	--
2,3',4,5-Tetrachlorobiphenyl	--	--	--	--
2,3,4',5-Tetrachlorobiphenyl	--	--	--	--
2,3,4,6-Tetrachlorobiphenyl	--	--	--	--
2,3',4-Trichlorobiphenyl	--	--	--	--
2,3,4'-Trichlorobiphenyl	--	--	--	--
2,3',5',6-Tetrachlorobiphenyl	--	--	--	--
2,3,5,6-Tetrachlorobiphenyl	--	--	--	--
2,3',5'-Trichlorobiphenyl	--	--	--	--
2,3',5-Trichlorobiphenyl	--	--	--	--
2,3,5-Trichlorobiphenyl	--	--	--	--
2,3'-Dichlorobiphenyl	--	--	--	--
2,4,4',5-Tetrachlorobiphenyl	--	--	--	--
2,4,4'-Trichlorobiphenyl	--	--	--	--
2,4',5-Trichlorobiphenyl	--	--	--	--
2,4,5-Trichlorobiphenyl	--	--	--	--
2,4,6-Trichlorobiphenyl	--	--	--	--
2-Chlorobiphenyl	--	--	--	--
3,3',4,4',5,5'-Hexachlorobiphenyl	--	--	--	--
3,3',4,4',5-Pentachlorobiphenyl	--	--	--	--
3,3',4,4'-Tetrachlorobiphenyl	--	--	--	--
3,3',4,5,5'-Pentachlorobiphenyl	--	--	--	--
3,3',4,5'-Tetrachlorobiphenyl	--	--	--	--
3,3',4,5-Tetrachlorobiphenyl	--	--	--	--
3,3',4-Trichlorobiphenyl	--	--	--	--
3,3',5,5'-Tetrachlorobiphenyl	--	--	--	--
3,3',5-Trichlorobiphenyl	--	--	--	--
3,3'-Dichlorobiphenyl	--	--	--	--
3,4,4',5-Tetrachlorobiphenyl	--	--	--	--
3,4,4'-Trichlorobiphenyl	--	--	--	--
3,4',5-Trichlorobiphenyl	--	--	--	--
3,4,5-Trichlorobiphenyl	--	--	--	--
3,5-Dichlorobiphenyl	--	--	--	--
3-Chlorobiphenyl	--	--	--	--
4,4'-Dichlorobiphenyl	--	--	--	--
4-Chlorobiphenyl	--	--	--	--
PCB004 & 010	--	--	--	--
PCB005 & 008	--	--	--	--
PCB007 & 009	--	--	--	--
PCB012 & 013	--	--	--	--
PCB016 & 032	--	--	--	--
PCB020 & 021 & 033	--	--	--	--
PCB024 & 027	--	--	--	--
PCB041 & 064 &071 &072	--	--	--	--
PCB042 & 059	--	--	--	--
PCB043 & 049	--	--	--	--
PCB048 & 075	--	--	--	--
PCB052 & 069	--	--	--	--
PCB056 & 060	--	--	--	--

Table A-4. Laboratory Control Limits for Round 2A Archived Core Sediment Matrix Spike, Laboratory Control Samples, and Ongoing Precision and Recovery

Analysis	Matrix Spike Recovery (percent)	Laboratory Control Sample Recovery	Type of Duplicate	Control Limit Relative Percent Difference
PCB061 & 070	--	--	--	--
PCB066 & 076	--	--	--	--
PCB084 & 092	--	--	--	--
PCB085 & 116	--	--	--	--
PCB087 & 117 & 125	--	--	--	--
PCB088 & 091	--	--	--	--
PCB090 & 101	--	--	--	--
PCB095 & 098 & 102	--	--	--	--
PCB106 & 118	--	--	--	--
PCB107 & 109	--	--	--	--
PCB108 & 112	--	--	--	--
PCB111 & 115	--	--	--	--
PCB128 & 162	--	--	--	--
PCB132 & 161	--	--	--	--
PCB133 & 142	--	--	--	--
PCB134 & 143	--	--	--	--
PCB138 & 163 & 164	--	--	--	--
PCB139 & 149	--	--	--	--
PCB146 & 165	--	--	--	--
PCB158 & 160	--	--	--	--
PCB182 & 187	--	--	--	--
PCB196 & 203	--	--	--	--
Polychlorinated biphenyls	--	--	--	--
Petroleum Hydrocarbons				
Diesel-range Hydrocarbons	--	--	LD	40
Residual-range Hydrocarbons	--	--	LD	40
Grain Size				
>9 Phi clay	--	--	LD	20
8-9 Phi clay	--	--	LD	20
Coarse sand	--	--	LD	20
Coarse silt	--	--	LD	20
Fine gravel	--	--	LD	20
Fine sand	--	--	LD	20
Fine silt	--	--	LD	20
Medium gravel	--	--	LD	20
Medium sand	--	--	LD	20
Medium silt	--	--	LD	20
Very coarse sand	--	--	LD	20
Very fine sand	--	--	LD	20
Very fine silt	--	--	LD	20

Notes:
LD - laboratory duplicate
MSD - matrix spike duplicate

Table A-5. Data Validation Qualifiers and Definitions.

Data Qualifier	Definition
U	The material was analyzed for, but was not detected. The associated numerical value is the sample quantitation limit.
J	The associated numerical value is an estimated quantity.
R	Rejected.
NJ	Presumptive evidence of the presence of the material at an estimated quantity.
UJ	The material was analyzed for, but was not detected. The sample quantitation limit is an estimated quantity.

Table A-6. Summary of Qualified Data by Parameter Group for Round 2A Archived Core Sediment Samples.

	Number of Samples[1]	Number of Data Points		Total # of Data Points	Detection and Qualification Frequencies (percent)		Reason for Qualification
		Detected	Undetected				
Conventionals	208	567	1	568	100	detected	
					0	undetected	
					25	J	HT/SP
					< 1	U	LB
Metals	50	413	65	478	86	detected	
					14	undetected	
					21	J	HT/SP, MS/MSD, Precision, ICP %D
					13	U	LB
					< 1	UJ	LB, ICP %D
Butyltins	5	15	5	20	75	detected	
					25	undetected	
					5	NJ	CC
					5	U	LB
PCB Aroclors	98	122	720	842	14	detected	
					86	undetected	
					4	J	CC
					1	NJ	CC
Organochlorine Pesticides	88	479	1985	2464	19	detected	
					81	undetected	
					7	J	CC, MS/MSD, Precision, LCS
					5	NJ	CC, MS/MSD, LCS
					9	UJ	Cal. C, MS/MSD, Precision, LCS
Semivolatile Organic Compounds[2]	138	101	2117	2218	5	detected	
					95	undetected	
					1	J	CC, LCS, Surrogate recovery
					1	NJ	CC, MS/MSD, LCS
					5	R	MS/MSD, Surrogate recovery
					4	UJ	Cal. C, MS/MSD, Precision, LCS
Phenols[2]	61	46	925	971	5	detected	
					95	undetected	
					< 1	J	CC
					3	U	LB
					5	UJ	Cal. C, LCS
Phthalate Esters[2]	61	34	332	366	9	detected	
					91	undetected	
					1	J	Surrogate recovery
					4	R	Surrogate recovery
					13	U	LB
					2	UJ	LB, Surrogate recovery

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Table A-6. Summary of Qualified Data by Parameter Group for Round 2A Archived Core Sediment Samples.

	Number of Samples[1]	Number of Data Points		Total # of Data Points	Detection and Qualification Frequencies (percent)		Reason for Qualification
		Detected	Undetected				
Polycyclic Aromatic Hydrocarbons[2]	63	941	130	1071	88	detected	
					12	undetected	
					< 1	J	MS/MSD
					4	U	LB
PCB Homologs	30	265	5	270	98	detected	
					2	undetected	
					< 1	U	LB
PCB Congeners	30	4224	846	5070	83	detected	
					17	undetected	
					< 1	J	Precision
					1	U	LB
PCDD/F Homologs	54	489	51	540	91	detected	
					9	undetected	
					2	J	Precision, LRE
					4	U	LB, PFP
					< 1	UJ	LB, Precision
PCDD/Fs	54	630	180	810	78	detected	
					22	undetected	
					3	J	CC, Precision, Surrogate recovery
					6	U	LB, PFP
Grain Size	141	1658	175	1833	205	detected	
					22	undetected	
					90	J	HT/SP
					10	UJ	HT/SP
Petroleum Hydrocarbons	44	71	17	88	9	detected	
					2	undetected	
					65	J	CP
					6	U	LB

Notes:

[1] Includes replicates and splits, excludes field blanks.

[2] The analyte groupings for SVOCs, phenols, PAHs, and phthalates are as defined in the Round 2 QAPP, Table A6-2 (Integral and Windward 2004)

Cal. C - calibration (continuing)
CC - compound confirmation
CP - chromatographic pattern in sample does not match pattern of calibration standard
HT/SP - holding time/sample preservation
ICP %D - ICP serial dilution % difference
LB - lab blank contamination (e.g., method blank, instrument, etc.)
LCS - laboratory control sample recoveries
LRE - linear range exceeded
MS/MSD - matrix spike (MS & MSD) recoveries
PFP - potential false positives

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Table A-7. Reported Detection Limits for Round 2A Archived Core Sediment Samples.

Analyte	CAS Number	Units	Round 2 QAPP MDL[1]	Reported Detection Limits Minimum	Reported Detection Limits Maximum	Total # Data Points	# Undetected Results
Conventional Analyses							
Specific gravity	SPEC_GRAV	NA	--	--	--	141	--
Total organic carbon	TOC	percent	0.02	0.02	0.11	152	1
Total solids	TSO	percent	0.01	--	--	275	--
Metals							
Aluminum	7429-90-5	mg/kg	2	6.4	9.7	42	--
Antimony	7440-36-0	mg/kg	0.02	0.03	0.04	42	--
Arsenic	7440-38-2	mg/kg	0.05	0.07	0.1	42	--
Cadmium	7440-43-9	mg/kg	0.006	0.006	0.259	42	22
Chromium	7440-47-3	mg/kg	0.04	0.4	0.7	42	--
Copper	7440-50-8	mg/kg	0.07	0.6	2.4	42	--
Lead	7439-92-1	mg/kg	0.02	0.02	0.02	42	--
Mercury	7439-97-6	mg/kg	0.01	0.008	0.009	16	--
Nickel	7440-02-0	mg/kg	0.03	0.4	0.7	42	--
Selenium	7782-49-2	mg/kg	0.05	0.03	0.24	42	42
Silver	7440-22-4	mg/kg	0.02	0.005	0.03	42	1
Zinc	7440-66-6	mg/kg	0.1	0.4	0.8	42	--
Butyltins							
Butyltin ion	78763-54-9	ug/kg	0.071	0.052	17	5	2
Dibutyltin ion	14488-53-0	ug/kg	0.041	0.048	9.6	5	--
Tributyltin ion	36643-28-4	ug/kg	0.16	0.096	20	5	1
Tetrabutyltin	1461-25-2	ug/kg	0.12	0.12	24	5	2
PCBs Aroclors							
Aroclor 1016	12674-11-2	ug/kg	--	1.4	2000	98	98
Aroclor 1221	11104-28-2	ug/kg	--	1.4	2000	98	98
Aroclor 1232	11141-16-5	ug/kg	--	1.4	2000	98	98
Aroclor 1242	53469-21-9	ug/kg	--	1.4	2000	98	91
Aroclor 1248	12672-29-6	ug/kg	--	1.4	2000	98	76
Aroclor 1254	11097-69-1	ug/kg	--	1.4	18000	98	58
Aroclor 1260	11096-82-5	ug/kg	--	1.4	2000	98	46
Aroclor 1262	37324-23-5	ug/kg	--	1.4	2000	78	78
Aroclor 1268	11100-14-4	ug/kg	--	1.4	2000	78	77
Chlorinated Pesticides							
2,4'-DDD	53-19-0	ug/kg	--	0.067	200	88	43
2,4'-DDE	3424-82-6	ug/kg	--	0.069	89	88	69
2,4'-DDT	789-02-6	ug/kg	--	0.056	250	88	48
4,4'-DDD	72-54-8	ug/kg	--	0.11	17	88	16

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Table A-7. Reported Detection Limits for Round 2A Archived Core Sediment Samples.

Analyte	CAS Number	Units	Round 2 QAPP MDL[1]	Reported Detection Limits		Total # Data Points	# Undetected Results
				Minimum	Maximum		
4,4'-DDE	72-55-9	ug/kg	--	0.053	9	88	32
4,4'-DDT	50-29-3	ug/kg	--	0.17	28	88	38
Aldrin	309-00-2	ug/kg	--	0.12	19	88	74
alpha-Endosulfan	959-98-8	ug/kg	--	0.046	40	88	81
alpha-Hexachlorocyclohexane	319-84-6	ug/kg	--	0.094	16	88	88
beta-Endosulfan	33213-65-9	ug/kg	--	0.071	95	88	78
beta-Hexachlorocyclohexane	319-85-7	ug/kg	--	0.15	41	88	79
cis-Chlordane	5103-71-9	ug/kg	--	0.061	13	88	83
cis-Nonachlor	5103-73-1	ug/kg	--	0.059	180	88	79
delta-Hexachlorocyclohexane	319-86-8	ug/kg	--	0.071	21	88	83
Dieldrin	60-57-1	ug/kg	--	0.097	16	88	80
Endosulfan sulfate	1031-07-8	ug/kg	--	0.073	71	88	87
Endrin	72-20-8	ug/kg	--	0.079	40	88	85
Endrin aldehyde	7421-93-4	ug/kg	--	0.085	40	88	80
Endrin ketone	53494-70-5	ug/kg	--	0.068	220	88	76
gamma-Hexachlorocyclohexane	58-89-9	ug/kg	--	0.12	40	88	80
Heptachlor	76-44-8	ug/kg	--	0.071	45	88	87
Heptachlor epoxide	1024-57-3	ug/kg	--	0.08	13	88	58
Methoxychlor	72-43-5	ug/kg	--	0.073	77	88	85
Mirex	2385-85-5	ug/kg	--	0.055	38	88	79
Oxychlordane	27304-13-8	ug/kg	--	0.082	25	88	74
Toxaphene	8001-35-2	ug/kg	--	4.6	5300	88	87
trans-Chlordane	5103-74-2	ug/kg	--	0.061	59	88	68
trans-Nonachlor	39765-80-5	ug/kg	--	0.039	62	88	68
Semivolatile Organic Compounds							
1,2,4-Trichlorobenzene	120-82-1	ug/kg	--	1.9	2300	61	61
1,2-Dichlorobenzene	95-50-1	ug/kg	--	1.6	2000	61	61
1,3-Dichlorobenzene	541-73-1	ug/kg	--	2	2400	61	61
1,4-Dichlorobenzene	106-46-7	ug/kg	--	2.3	2800	61	61
2,4-Dinitrotoluene	121-14-2	ug/kg	--	3.4	4200	61	61
2,6-Dinitrotoluene	606-20-2	ug/kg	--	3.4	4200	61	61
2-Chloronaphthalene	91-58-7	ug/kg	--	4.4	5300	61	61
2-Nitroaniline	88-74-4	ug/kg	--	3.3	4000	61	61
3,3'-Dichlorobenzidine	91-94-1	ug/kg	--	4.5	5500	61	61
3-Nitroaniline	99-09-2	ug/kg	--	3.2	3900	61	61
4-Bromophenyl phenyl ether	101-55-3	ug/kg	--	1.7	2100	61	61
4-Chloroaniline	106-47-8	ug/kg	--	2.6	3100	61	61
4-Chlorophenyl phenyl ether	7005-72-3	ug/kg	--	2.5	3000	61	61
4-Nitroaniline	100-01-6	ug/kg	--	4.2	5100	61	61

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Table A-7. Reported Detection Limits for Round 2A Archived Core Sediment Samples.

Analyte	CAS Number	Units	Round 2 QAPP MDL[1]	Reported Detection Limits		Total # Data Points	# Undetected Results
				Minimum	Maximum		
Aniline	62-53-3	ug/kg	--	1.9	2300	61	61
Azobenzene	103-33-3	ug/kg	--	3	3600	61	61
Benzoic acid	65-85-0	ug/kg	--	120	150000	61	61
Benzyl alcohol	100-51-6	ug/kg	--	4.5	5500	61	60
Bis(2-chloroethoxy) methane	111-91-1	ug/kg	--	1.6	2000	61	61
Bis(2-chloroethyl) ether	111-44-4	ug/kg	--	3	3600	61	61
Bis(2-chloroisopropyl) ether	39638-32-9	ug/kg	--	1.5	1800	61	61
Carbazole	86-74-8	ug/kg	--	1.6	2000	61	43
Dibenzofuran	132-64-9	ug/kg	--	0.21	130	63	16
Hexachlorobenzene	118-74-1	ug/kg	--	0.059	3100	149	137
Hexachlorobutadiene	87-68-3	ug/kg	--	0.23	2100	149	141
Hexachlorocyclopentadiene	77-47-4	ug/kg	--	19	23000	61	61
Hexachloroethane	67-72-1	ug/kg	--	0.065	3300	149	134
Isophorone	78-59-1	ug/kg	--	2	2400	61	61
Nitrobenzene	98-95-3	ug/kg	--	2.5	3000	61	61
N-Nitrosodimethylamine	62-75-9	ug/kg	--	7.4	9000	61	61
N-Nitrosodiphenylamine	86-30-6	ug/kg	--	2.7	3300	61	61
N-Nitrosodipropylamine	621-64-7	ug/kg	--	3.9	4800	61	61
Phenols							
2,3,4,5-Tetrachlorophenol	4901-51-3	ug/kg	--	0.52	68	60	59
2,3,5,6-Tetrachlorophenol	935-95-5	ug/kg	--	0.51	7.3	60	59
2,4,5-Trichlorophenol	95-95-4	ug/kg	--	0.4	20	60	60
2,4,6-Trichlorophenol	88-06-2	ug/kg	--	0.31	4.3	60	60
2,4-Dichlorophenol	120-83-2	ug/kg	--	2.2	2700	61	61
2,4-Dimethylphenol	105-67-9	ug/kg	--	6.7	8100	61	61
2,4-Dinitrophenol	51-28-5	ug/kg	--	44	53000	61	61
2-Chlorophenol	95-57-8	ug/kg	--	2.1	2600	61	61
2-Methylphenol	95-48-7	ug/kg	--	4.2	5100	61	61
2-Nitrophenol	88-75-5	ug/kg	--	3.2	3900	61	61
4,6-Dinitro-2-methylphenol	534-52-1	ug/kg	--	2.1	2600	61	61
4-Chloro-3-methylphenol	59-50-7	ug/kg	--	2.6	3100	61	61
4-Methylphenol	106-44-5	ug/kg	--	3.6	4300	61	41
4-Nitrophenol	100-02-7	ug/kg	--	37	45000	61	61
Pentachlorophenol	87-86-5	ug/kg	--	0.56	8.5	60	51
Phenol	108-95-2	ug/kg	--	2.5	2800	61	46
Phthalate Esters							
Bis(2-ethylhexyl) phthalate	117-81-7	ug/kg	--	2.2	2600	61	44
Butylbenzyl phthalate	85-68-7	ug/kg	--	1.9	2300	61	57

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Table A-7. Reported Detection Limits for Round 2A Archived Core Sediment Samples.

Analyte	CAS Number	Units	Round 2 QAPP MDL[1]	Reported Detection Limits		Total # Data Points	# Undetected Results
				Minimum	Maximum		
Dibutyl phthalate	84-74-2	ug/kg	--	3.3	3900	61	53
Diethyl phthalate	84-66-2	ug/kg	--	4.3	5200	61	59
Dimethyl phthalate	131-11-3	ug/kg	--	2.2	2700	61	60
Di-n-octyl phthalate	117-84-0	ug/kg	--	1.5	1800	61	59
Polycyclic Aromatic Hydrocarbons							
2-Methylnaphthalene	91-57-6	ug/kg	--	0.41	2600	63	11
Acenaphthene	83-32-9	ug/kg	--	0.19	1200	63	7
Acenaphthylene	208-96-8	ug/kg	--	0.27	1700	63	10
Anthracene	120-12-7	ug/kg	--	0.27	1700	63	7
Benz(a)anthracene	56-55-3	ug/kg	--	0.19	1200	63	4
Benzo(a)pyrene	50-32-8	ug/kg	--	0.27	1700	63	4
Benzo(b)fluoranthene	205-99-2	ug/kg	--	0.57	360	63	8
Benzo(g,h,i)perylene	191-24-2	ug/kg	--	0.28	170	63	4
Benzo(k)fluoranthene	207-08-9	ug/kg	--	0.4	250	63	8
Chrysene	218-01-9	ug/kg	--	0.49	3100	63	5
Dibenz(a,h)anthracene	53-70-3	ug/kg	--	0.31	200	63	17
Fluoranthene	206-44-0	ug/kg	--	0.41	2600	63	3
Fluorene	86-73-7	ug/kg	--	0.23	1500	63	8
Indeno(1,2,3-cd)pyrene	193-39-5	ug/kg	--	0.29	180	63	4
Naphthalene	91-20-3	ug/kg	--	0.44	13000	63	25
Phenanthrene	85-01-8	ug/kg	--	0.4	13000	63	2
Pyrene	129-00-0	ug/kg	--	0.43	2700	63	3
Chlorinated PCDD/Fs							
1,2,3,4,6,7,8-Heptachlorodibenzofuran	67562-39-4	pg/g	0.033	0.007	2.12	54	5
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	35822-46-9	pg/g	0.035	0.01	6.123	54	3
1,2,3,4,7,8,9-Heptachlorodibenzofuran	55673-89-7	pg/g	0.052	0.008	2.305	54	8
1,2,3,4,7,8-Hexachlorodibenzofuran	70648-26-9	pg/g	0.013	0.004	1.419	54	5
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	39227-28-6	pg/g	0.03	0.005	1.357	54	11
1,2,3,6,7,8-Hexachlorodibenzofuran	57117-44-9	pg/g	0.013	0.005	1.844	54	7
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	57653-85-7	pg/g	0.034	0.005	2.696	54	5
1,2,3,7,8,9-Hexachlorodibenzofuran	72918-21-9	pg/g	0.017	0.005	1.385	54	32
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	19408-74-3	pg/g	0.032	0.005	2.695	54	8
1,2,3,7,8-Pentachlorodibenzofuran	57117-41-6	pg/g	0.017	0.006	16.783	54	8
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	40321-76-4	pg/g	0.029	0.006	4.393	54	21
2,3,4,6,7,8-Hexachlorodibenzofuran	60851-34-5	pg/g	0.013	0.005	1.634	54	9
2,3,4,7,8-Pentachlorodibenzofuran	57117-31-4	pg/g	0.017	0.006	2.713	54	8
2,3,7,8-Tetrachlorodibenzofuran	51207-31-9	pg/g	0.02	0.008	12.259	54	12
2,3,7,8-Tetrachlorodibenzo-p-dioxin	1746-01-6	pg/g	0.026	0.006	3.78	54	38

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Table A-7. Reported Detection Limits for Round 2A Archived Core Sediment Samples.

Analyte	CAS Number	Units	Round 2 QAPP MDL[1]	Reported Detection Limits Minimum	Reported Detection Limits Maximum	Total # Data Points	# Undetected Results
PCDD/F Homologs							
Heptachlorodibenzofuran homologs	38998-75-3	pg/g	--	0.007	2.037	54	1
Heptachlorodibenzo-p-dioxin homologs	37871-00-4	pg/g	--	0.01	0.545	54	--
Hexachlorodibenzofuran homologs	55684-94-1	pg/g	--	0.004	1.419	54	1
Hexachlorodibenzo-p-dioxin homologs	34465-46-8	pg/g	--	0.005	0.241	54	2
Octachlorodibenzofuran	39001-02-0	pg/g	--	0.017	35.397	54	18
Octachlorodibenzo-p-dioxin	3268-87-9	pg/g	--	0.019	10.026	54	4
Pentachlorodibenzofuran homologs	30402-15-4	pg/g	--	0.006	1.309	54	2
Pentachlorodibenzo-p-dioxin homologs	36088-22-9	pg/g	--	0.006	0.218	54	8
Tetrachlorodibenzofuran homologs	30402-14-3	pg/g	--	0.007	0.633	54	6
Tetrachlorodibenzo-p-dioxin homologs	41903-57-5	pg/g	--	0.005	0.414	54	9
PCB Congeners							
2,2',3,3',4,4',5,5',6,6'-Decachlorobiphenyl	2051-24-3	pg/g	0.9	1.66	644	30	1
2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl	40186-72-9	pg/g	0.53	1.66	644	30	1
2,2',3,3',4,4',5,5'-Octachlorobiphenyl	35694-08-7	pg/g	0.94	1.66	644	30	--
2,2',3,3',4,4',5,6,6'-Nonachlorobiphenyl	52663-79-3	pg/g	0.51	1.66	644	30	3
2,2',3,3',4,4',5,6-Octachlorobiphenyl	52663-78-2	pg/g	2.06	1.66	644	30	1
2,2',3,3',4,4',5-Heptachlorobiphenyl	35065-30-6	pg/g	0.41	1.66	644	30	--
2,2',3,3',4,4',6,6'-Octachlorobiphenyl	33091-17-7	pg/g	0.94	1.66	644	30	2
2,2',3,3',4,4',6-Heptachlorobiphenyl	52663-71-5	pg/g	0.55	1.66	644	30	1
2,2',3,3',4,5,5',6,6'-Nonachlorobiphenyl	52663-77-1	pg/g	0.74	1.66	644	30	7
2,2',3,3',4,5,5',6'-Octachlorobiphenyl	52663-75-9	pg/g	1.54	1.66	644	30	1
2,2',3,3',4,5,5',6-Octachlorobiphenyl	68194-17-2	pg/g	1.37	1.66	644	30	2
2,2',3,3',4,5,5'-Heptachlorobiphenyl	52663-74-8	pg/g	0.49	1.66	644	30	1
2,2',3,3',4,5',6,6'-Octachlorobiphenyl	40186-71-8	pg/g	1.14	1.66	644	30	3
2,2',3,3',4,5,6,6'-Octachlorobiphenyl	52663-73-7	pg/g	1.21	1.66	644	30	1
2,2',3,3',4,5',6'-Heptachlorobiphenyl	52663-70-4	pg/g	0.72	1.66	644	30	--
2,2',3,3',4,5',6-Heptachlorobiphenyl	40186-70-7	pg/g	1.15	1.66	644	30	7
2,2',3,3',4,5,6'-Heptachlorobiphenyl	38411-25-5	pg/g	1.36	1.66	644	30	--
2,2',3,3',4,5,6-Heptachlorobiphenyl	68194-16-1	pg/g	0.65	1.66	644	30	2
2,2',3,3',4,5'-Hexachlorobiphenyl	52663-66-8	pg/g	0.8	1.66	644	30	1
2,2',3,3',4,5-Hexachlorobiphenyl	55215-18-4	pg/g	0.79	1.66	644	30	1
2,2',3,3',4,6,6'-Heptachlorobiphenyl	52663-65-7	pg/g	0.43	1.66	644	30	1
2,2',3,3',4,6-Hexachlorobiphenyl	61798-70-7	pg/g	2.54	1.66	644	30	22
2,2',3,3',4-Pentachlorobiphenyl	52663-62-4	pg/g	1.3	1.66	644	30	1
2,2',3,3',5,5',6,6'-Octachlorobiphenyl	2136-99-4	pg/g	0.59	1.66	644	30	3
2,2',3,3',5,5',6-Heptachlorobiphenyl	52663-67-9	pg/g	0.59	1.66	644	30	1
2,2',3,3',5,6,6'-Heptachlorobiphenyl	52663-64-6	pg/g	0.33	1.66	644	30	--

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Table A-7. Reported Detection Limits for Round 2A Archived Core Sediment Samples.

Analyte	CAS Number	Units	Round 2 QAPP MDL[1]	Reported Detection Limits		Total # Data Points	# Undetected Results
				Minimum	Maximum		
2,2',3,3',5,6'-Hexachlorobiphenyl	52744-13-5	pg/g	1.42	1.66	644	30	1
2,2',3,3',5-Pentachlorobiphenyl	60145-20-2	pg/g	0.9	1.66	644	30	23
2,2',3,3',6,6'-Hexachlorobiphenyl	38411-22-2	pg/g	1.21	1.66	644	30	1
2,2',3,3'-Tetrachlorobiphenyl	38444-93-8	pg/g	1.2	1.66	644	30	2
2,2',3,4,4',5,5'-Heptachlorobiphenyl	35065-29-3	pg/g	0.68	1.66	644	30	--
2,2',3,4,4',5,6,6'-Octachlorobiphenyl	74472-52-9	pg/g	0.74	1.66	644	30	26
2,2',3,4,4',5',6-Heptachlorobiphenyl	52663-69-1	pg/g	0.61	1.66	644	30	--
2,2',3,4,4',5,6-Heptachlorobiphenyl	74472-47-2	pg/g	0.8	1.66	644	30	9
2,2',3,4,4',5-Hexachlorobiphenyl	35694-06-5	pg/g	1.01	1.66	644	30	2
2,2',3,4,4',6,6'-Heptachlorobiphenyl	74472-48-3	pg/g	0.48	1.66	644	30	16
2,2',3,4,4',6'-Hexachlorobiphenyl	59291-64-4	pg/g	1	1.66	644	30	5
2,2',3,4,5,5',6-Heptachlorobiphenyl	52712-05-7	pg/g	0.63	1.66	644	30	1
2,2',3,4,5,5'-Hexachlorobiphenyl	52712-04-6	pg/g	0.58	1.66	644	30	--
2,2',3,4',5,6,6'-Heptachlorobiphenyl	74487-85-7	pg/g	0.53	1.66	644	30	8
2,2',3,4,5,6,6'-Heptachlorobiphenyl	74472-49-4	pg/g	0.79	1.66	644	30	26
2,2',3,4',5,6'-Hexachlorobiphenyl	74472-41-6	pg/g	1.1	1.66	644	30	4
2,2',3,4',5,6-Hexachlorobiphenyl	68194-13-8	pg/g	0.73	1.66	644	30	2
2,2',3,4,5',6-Hexachlorobiphenyl	68194-14-9	pg/g	1.66	1.66	644	30	1
2,2',3,4',5'-Pentachlorobiphenyl	41464-51-1	pg/g	1.25	1.66	644	30	1
2,2',3,4,5-Pentachlorobiphenyl	55312-69-1	pg/g	1.78	1.66	644	30	5
2,2',3,4',6,6'-Hexachlorobiphenyl	68194-08-1	pg/g	1.29	1.66	644	30	4
2,2',3,4,6,6'-Hexachlorobiphenyl	74472-40-5	pg/g	1.06	1.66	644	30	16
2,2',3,4,6'-Pentachlorobiphenyl	73575-57-2	pg/g	0.69	1.66	644	30	3
2,2',3,5,5',6-Hexachlorobiphenyl	52663-63-5	pg/g	1.45	1.66	644	30	--
2,2',3,5,6,6'-Hexachlorobiphenyl	68194-09-2	pg/g	1.25	1.66	644	30	6
2,2',3,5,6'-Pentachlorobiphenyl	73575-55-0	pg/g	0.36	1.66	644	30	3
2,2',3,5,6-Pentachlorobiphenyl	73575-56-1	pg/g	1.53	1.66	644	30	28
2,2',3,5'-Tetrachlorobiphenyl	41464-39-5	pg/g	5.31	1.66	644	30	1
2,2',3,6,6'-Pentachlorobiphenyl	73575-54-9	pg/g	0.54	1.66	644	30	3
2,2',3,6'-Tetrachlorobiphenyl	41464-47-5	pg/g	1.07	1.66	644	30	2
2,2',3,6-Tetrachlorobiphenyl	70362-45-7	pg/g	1.27	1.66	644	30	1
2,2',4,4',5,5'-Hexachlorobiphenyl	35065-27-1	pg/g	1.18	1.66	644	30	--
2,2',4,4',5,6'-Hexachlorobiphenyl	60145-22-4	pg/g	1.06	1.66	644	30	1
2,2',4,4',5-Pentachlorobiphenyl	38380-01-7	pg/g	0.97	1.66	644	30	1
2,2',4,4',6,6'-Hexachlorobiphenyl	33979-03-2	pg/g	0.85	1.66	644	30	22
2,2',4,4',6-Pentachlorobiphenyl	39485-83-1	pg/g	0.26	1.66	644	30	3
2,2',4,4'-Tetrachlorobiphenyl	2437-79-8	pg/g	3.42	1.66	644	30	3
2,2',4,5',6-Pentachlorobiphenyl	60145-21-3	pg/g	0.44	1.66	644	30	3
2,2',4,6,6'-Pentachlorobiphenyl	56558-16-8	pg/g	0.51	1.66	644	30	20

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Table A-7. Reported Detection Limits for Round 2A Archived Core Sediment Samples.

Analyte	CAS Number	Units	Round 2 QAPP MDL[1]	Reported Detection Limits		Total # Data Points	# Undetected Results
				Minimum	Maximum		
2,2',4,6'-Tetrachlorobiphenyl	68194-04-7	pg/g	1.11	1.66	644	30	2
2,2',4,6-Tetrachlorobiphenyl	62796-65-0	pg/g	1.5	1.66	644	30	6
2,2',4-Trichlorobiphenyl	37680-66-3	pg/g	1.3	1.66	644	30	2
2,2',5,6'-Tetrachlorobiphenyl	41464-41-9	pg/g	0.98	1.66	644	30	2
2,2',5-Trichlorobiphenyl	37680-65-2	pg/g	1.35	1.66	644	30	2
2,2',6,6'-Tetrachlorobiphenyl	15968-05-5	pg/g	1.9	1.66	644	30	4
2,2',6-Trichlorobiphenyl	38444-73-4	pg/g	0.95	1.66	644	30	3
2,3,3',4,4',5,5',6-Octachlorobiphenyl	74472-53-0	pg/g	1.17	1.66	644	30	1
2,3,3',4,4',5,5'-Heptachlorobiphenyl	39635-31-9	pg/g	0.29	1.66	644	30	2
2,3,3',4,4',5',6-Heptachlorobiphenyl	74472-50-7	pg/g	0.52	1.66	644	30	1
2,3,3',4,4',5,6-Heptachlorobiphenyl	41411-64-7	pg/g	0.67	1.66	644	30	1
2,3,3',4,4',5'-Hexachlorobiphenyl	69782-90-7	pg/g	0.55	1.66	644	30	1
2,3,3',4,4',5-Hexachlorobiphenyl	38380-08-4	pg/g	0.82	1.66	644	30	--
2,3,3',4,4'-Pentachlorobiphenyl	32598-14-4	pg/g	0.92	1.66	644	30	--
2,3,3',4',5,5',6-Heptachlorobiphenyl	69782-91-8	pg/g	0.49	1.66	644	30	1
2,3,3',4,5,5',6-Heptachlorobiphenyl	74472-51-8	pg/g	0.8	1.66	644	30	30
2,3,3',4,5,5'-Hexachlorobiphenyl	39635-35-3	pg/g	0.47	1.66	644	30	3
2,3,3',4',5'-Pentachlorobiphenyl	76842-07-4	pg/g	0.98	1.66	644	30	1
2,3,3',4',6-Pentachlorobiphenyl	38380-03-9	pg/g	1.77	1.66	644	30	--
2,3,3',4-Tetrachlorobiphenyl	74338-24-2	pg/g	1.04	1.66	644	30	3
2,3,3',5',6-Pentachlorobiphenyl	68194-10-5	pg/g	1.04	1.66	644	30	17
2,3,3',5'-Tetrachlorobiphenyl	41464-49-7	pg/g	1.22	1.66	644	30	4
2,3,3',5-Tetrachlorobiphenyl	70424-67-8	pg/g	1.18	1.66	644	30	3
2,3',4,4',5,5'-Hexachlorobiphenyl	52663-72-6	pg/g	0.49	1.66	644	30	--
2,3',4,4',5',6-Hexachlorobiphenyl	59291-65-5	pg/g	0.43	1.66	644	30	5
2,3,4,4',5,6-Hexachlorobiphenyl	41411-63-6	pg/g	0.61	1.66	644	30	3
2,3',4,4',5'-Pentachlorobiphenyl	65510-44-3	pg/g	0.86	1.66	644	30	1
2,3,4,4',5-Pentachlorobiphenyl	74472-37-0	pg/g	0.73	1.66	644	30	2
2,3',4,4',6-Pentachlorobiphenyl	56558-17-9	pg/g	0.92	1.66	644	30	1
2,3',4',5,5'-Pentachlorobiphenyl	70424-70-3	pg/g	1.12	1.66	644	30	2
2,3',4,5,5'-Pentachlorobiphenyl	68194-12-7	pg/g	1.04	1.66	644	30	5
2,3',4,5',6-Pentachlorobiphenyl	56558-18-0	pg/g	0.88	1.66	644	30	26
2,3',4,5'-Tetrachlorobiphenyl	73575-52-7	pg/g	1.34	1.66	644	30	4
2,3',4,5-Tetrachlorobiphenyl	73575-53-8	pg/g	1.15	1.66	644	30	2
2,3,4',5-Tetrachlorobiphenyl	74472-34-7	pg/g	1.14	1.66	644	30	2
2,3,4,6-Tetrachlorobiphenyl	54230-22-7	pg/g	0.9	1.66	644	30	24
2,3',4-Trichlorobiphenyl	55712-37-3	pg/g	0.82	1.66	644	30	2
2,3,4'-Trichlorobiphenyl	38444-85-8	pg/g	0.91	1.66	644	30	3
2,3',5',6-Tetrachlorobiphenyl	74338-23-1	pg/g	0.72	1.66	644	30	28

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Table A-7. Reported Detection Limits for Round 2A Archived Core Sediment Samples.

Analyte	CAS Number	Units	Round 2 QAPP MDL[1]	Reported Detection Limits		Total # Data Points	# Undetected Results
				Minimum	Maximum		
2,3,5,6-Tetrachlorobiphenyl	33284-54-7	pg/g	1.3	1.66	644	30	19
2,3',5'-Trichlorobiphenyl	37680-68-5	pg/g	0.93	1.66	644	30	3
2,3',5-Trichlorobiphenyl	38444-81-4	pg/g	0.77	1.66	644	30	2
2,3,5-Trichlorobiphenyl	55720-44-0	pg/g	0.71	1.66	644	30	15
2,3'-Dichlorobiphenyl	25569-80-6	pg/g	2.22	3.31	1290	30	6
2,4,4',5-Tetrachlorobiphenyl	32690-93-0	pg/g	1.09	1.66	644	30	1
2,4,4'-Trichlorobiphenyl	7012-37-5	pg/g	1.54	1.66	644	30	1
2,4',5-Trichlorobiphenyl	16606-02-3	pg/g	1.17	1.66	644	30	2
2,4,5-Trichlorobiphenyl	15862-07-4	pg/g	0.61	1.66	644	30	7
2,4,6-Trichlorobiphenyl	35693-92-6	pg/g	0.91	1.66	644	30	29
2-Chlorobiphenyl	2051-60-7	pg/g	0.5	1.66	644	30	1
3,3',4,4',5,5'-Hexachlorobiphenyl	32774-16-6	pg/g	0.77	0.282	77.5	30	14
3,3',4,4',5-Pentachlorobiphenyl	57465-28-8	pg/g	0.63	1.66	644	30	1
3,3',4,4'-Tetrachlorobiphenyl	32598-13-3	pg/g	1.08	1.66	644	30	1
3,3',4,5,5'-Pentachlorobiphenyl	39635-33-1	pg/g	0.78	1.66	644	30	29
3,3',4,5'-Tetrachlorobiphenyl	41464-48-6	pg/g	1.65	1.66	644	30	1
3,3',4,5-Tetrachlorobiphenyl	70362-49-1	pg/g	2.81	1.66	644	30	30
3,3',4-Trichlorobiphenyl	37680-69-6	pg/g	0.41	1.66	644	30	2
3,3',5,5'-Tetrachlorobiphenyl	33284-52-5	pg/g	0.85	1.66	644	30	28
3,3',5-Trichlorobiphenyl	38444-87-0	pg/g	0.89	1.66	644	30	18
3,3'-Dichlorobiphenyl	2050-67-1	pg/g	4.99	3.31	1290	30	21
3,4,4',5-Tetrachlorobiphenyl	70362-50-4	pg/g	1.02	1.66	644	30	2
3,4,4'-Trichlorobiphenyl	38444-90-5	pg/g	0.59	1.66	644	30	2
3,4',5-Trichlorobiphenyl	38444-88-1	pg/g	0.6	1.66	644	30	4
3,4,5-Trichlorobiphenyl	53555-66-1	pg/g	0.86	1.66	644	30	3
3,5-Dichlorobiphenyl	34883-41-5	pg/g	2.98	3.31	1290	30	30
3-Chlorobiphenyl	2051-61-8	pg/g	0.61	1.66	644	30	2
4,4'-Dichlorobiphenyl	2050-68-2	pg/g	2.79	3.31	1290	30	2
4-Chlorobiphenyl	2051-62-9	pg/g	0.63	1.66	644	30	1
PCB004 & 010	PCB004_010	pg/g	4.33	3.31	1290	30	4
PCB005 & 008	PCB005_008	pg/g	4.41	3.31	1290	30	3
PCB007 & 009	PCB007_009	pg/g	4.63	3.31	1290	30	11
PCB012 & 013	PCB012_013	pg/g	6.05	3.31	1290	30	9
PCB016 & 032	PCB016_032	pg/g	2.54	1.66	644	30	2
PCB020 & 021 & 033	PCB020_021_033	pg/g	1.35	1.66	644	30	1
PCB024 & 027	PCB024_027	pg/g	2.49	1.66	644	30	3
PCB041 & 064 &071 &072	PCB041_064_071_	pg/g	3.45	1.66	644	30	1
PCB042 & 059	PCB042_059	pg/g	2.04	1.66	644	30	1
PCB043 & 049	PCB043_049	pg/g	2.2	1.66	644	30	1

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Table A-7. Reported Detection Limits for Round 2A Archived Core Sediment Samples.

Analyte	CAS Number	Units	Round 2 QAPP MDL[1]	Reported Detection Limits		Total # Data Points	# Undetected Results
				Minimum	Maximum		
PCB048 & 075	PCB048_075	pg/g	1.75	1.66	644	30	1
PCB052 & 069	PCB052_069	pg/g	3.33	1.66	644	30	1
PCB056 & 060	PCB056_060	pg/g	2.45	1.66	644	30	1
PCB061 & 070	PCB061_070	pg/g	--	1.66	644	30	1
PCB066 & 076	PCB066_076	pg/g	--	1.66	644	30	1
PCB084 & 092	PCB084_092	pg/g	1.6	1.66	644	30	1
PCB085 & 116	PCB085_116	pg/g	1.29	1.66	644	30	1
PCB087 & 117 & 125	PCB087_117_125	pg/g	1.81	1.66	644	30	1
PCB088 & 091	PCB088_091	pg/g	1.63	1.66	644	30	1
PCB090 & 101	PCB090_101	pg/g	1.49	1.66	644	30	--
PCB095 & 098 & 102	PCB095_098_102	pg/g	6.39	1.66	644	30	--
PCB106 & 118	PCB106_118	pg/g	2.14	1.66	644	30	--
PCB107 & 109	PCB107_109	pg/g	1.27	1.66	644	30	1
PCB108 & 112	PCB108_112	pg/g	1	1.66	644	30	2
PCB111 & 115	PCB111_115	pg/g	1.72	1.66	644	30	1
PCB128 & 162	PCB128_162	pg/g	1.15	1.66	644	30	1
PCB132 & 161	PCB132_161	pg/g	0.98	1.66	644	30	--
PCB133 & 142	PCB133_142	pg/g	3.9	1.66	644	30	1
PCB134 & 143	PCB134_143	pg/g	4.07	1.66	644	30	1
PCB138 & 163 & 164	PCB138_163_164	pg/g	2.08	1.66	644	30	--
PCB139 & 149	PCB139_149	pg/g	1.84	1.66	644	30	--
PCB146 & 165	PCB146_165	pg/g	1.72	1.66	644	30	1
PCB158 & 160	PCB158_160	pg/g	1.29	1.66	644	30	1
PCB182 & 187	PCB182_187	pg/g	1.08	1.66	644	30	--
PCB196 & 203	PCB196_203	pg/g	2.32	1.66	644	30	--
Polychlorinated biphenyls	1336-36-3	pg/g	--	0	0	30	--
PCB Homologs							
Dichlorobiphenyl	25512-42-9	pg/g	--	3.31	1290	30	2
Heptachlorobiphenyl	28655-71-2	pg/g	--	1.66	644	30	--
Hexachlorobiphenyl	26601-64-9	pg/g	--	1.66	644	30	--
Monochlorobiphenyl	27323-18-8	pg/g	--	1.66	644	30	1
Nonachlorobiphenyl	53742-07-7	pg/g	--	1.66	644	30	1
Octachlorobiphenyl	55722-26-4	pg/g	--	1.66	644	30	--
Pentachlorobiphenyl	25429-29-2	pg/g	--	1.66	644	30	--
Tetrachlorobiphenyl	26914-33-0	pg/g	--	1.66	644	30	--
Trichlorobiphenyl	25323-68-6	pg/g	--	1.66	644	30	1

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Table A-7. Reported Detection Limits for Round 2A Archived Core Sediment Samples.

Analyte	CAS Number	Units	Round 2 QAPP MDL[1]	Reported Detection Limits		Total # Data Points	# Undetected Results
				Minimum	Maximum		
Grain Size							
>9 Phi clay	GS_MFCLAY	percent	0.1	--	--	141	--
8-9 Phi clay	GS_CCLAY	percent	0.1	--	--	141	--
Coarse sand	GS_CS	percent	0.1	--	--	141	--
Coarse silt	GS_CSILT	percent	0.1	--	--	141	--
Fine gravel	GS_FG	percent	0.1	0	0	141	62
Fine sand	GS_FS	percent	0.1	--	--	141	--
Fine silt	GS_FSILT	percent	0.1	--	--	141	--
Medium gravel	GS_MG	percent	0.1	0	0	141	109
Medium sand	GS_MS	percent	0.1	--	--	141	--
Medium silt	GS_MSILT	percent	0.1	--	--	141	--
Very coarse sand	GS_VCS	percent	0.1	0	0	141	4
Very fine sand	GS_VFS	percent	0.1	--	--	141	--
Very fine silt	GS_VFSILT	percent	0.1	--	--	141	--
Petroleum Hydrocarbons							
Diesel Range Hydrocarbons	DRH	mg/kg	7.1	4.4	8.3	44	9
Residual Range Hydrocarbons	RRH	mg/kg	4.6	4.1	37	44	8

Notes:

[1] MDLs for PCB congeners obtained from Table 1 of Round 2 QAPP Addendum 2 (Integral 2004). MDLs for PCB congeners are provided on a dry-weight basis and assume 50% moisture in the samples and a sample weight of 10g.

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Table A-8. Results for Round 2A Archived Core Sediment Field Replicate Samples.

Analyte Group/Chemical Name	Unit	Field Replicates					
		Number Collected	Number Detected	RPD Above 50	Minimum	Maximum	Average
Conventionals							
Specific gravity	NA	11	11	--	1.3	2.0	1.7
Total organic carbon	percent	11	11	--	0.070	4.3	1.6
Total solids	percent	13	13	--	40.5	79.3	65.4
Grain Size							
>9 Phi clay	percent	11	11	--	0.56	20.3	8.5
8-9 Phi clay	percent	11	11	--	0.23	13.5	4.7
Coarse sand	percent	11	11	--	0.070	13.9	3.6
Coarse silt	percent	11	11	--	0.60	24.7	13.3
Fine gravel	percent	11	6	--	0.15	1.1	0.47
Fine sand	percent	11	11	--	0.89	18.0	8.1
Fine silt	percent	11	11	--	0.42	18.7	10.9
Medium gravel	percent	11	2	--	0.18	1.1	0.63
Medium sand	percent	11	11	--	0.39	68.2	17.3
Medium silt	percent	11	11	--	0.70	25.4	16.4
Very coarse sand	percent	11	11	--	0.070	1.8	0.53
Very fine sand	percent	11	11	--	1.2	16.4	8.9
Very fine silt	percent	11	11	--	0.32	18.0	7.5
Metals							
Aluminum	mg/kg	2	2	--	18100	24000	21050
Antimony	mg/kg	2	2	--	0.10	0.22	0.16
Arsenic	mg/kg	2	2	--	3.3	9.10	6.2
Cadmium	mg/kg	2	1	--	0.19	0.19	0.19
Chromium	mg/kg	2	2	--	19.5	28.0	23.8
Copper	mg/kg	2	2	--	25.6	31.2	28.4
Lead	mg/kg	2	2	--	5.7	11.9	8.8
Nickel	mg/kg	2	2	--	18.5	26.5	22.5
Selenium	mg/kg	2	0	--	--	--	--
Silver	mg/kg	2	2	--	0.072	0.10	0.086
Zinc	mg/kg	2	2	--	67.0	75.7	71.4
Semivolatile Organic Compounds							
1,2,4-Trichlorobenzene	ug/kg	5	0	--	--	--	--
1,2-Dichlorobenzene	ug/kg	5	0	--	--	--	--
1,3-Dichlorobenzene	ug/kg	5	0	--	--	--	--
1,4-Dichlorobenzene	ug/kg	5	0	--	--	--	--
2,4-Dinitrotoluene	ug/kg	5	0	--	--	--	--
2,6-Dinitrotoluene	ug/kg	5	0	--	--	--	--
2-Chloronaphthalene	ug/kg	5	0	--	--	--	--
2-Nitroaniline	ug/kg	5	0	--	--	--	--
3,3'-Dichlorobenzidine	ug/kg	5	0	--	--	--	--
3-Nitroaniline	ug/kg	5	0	--	--	--	--
4-Bromophenyl phenyl ether	ug/kg	5	0	--	--	--	--
4-Chloroaniline	ug/kg	5	0	--	--	--	--
4-Chlorophenyl phenyl ether	ug/kg	5	0	--	--	--	--
4-Nitroaniline	ug/kg	5	0	--	--	--	--
Aniline	ug/kg	5	0	--	--	--	--
Azobenzene	ug/kg	5	0	--	--	--	--
Benzoic acid	ug/kg	5	0	--	--	--	--
Benzyl alcohol	ug/kg	5	0	--	--	--	--
Bis(2-chloroethoxy) methane	ug/kg	5	0	--	--	--	--
Bis(2-chloroethyl) ether	ug/kg	5	0	--	--	--	--
Bis(2-chloroisopropyl) ether	ug/kg	5	0	--	--	--	--
Carbazole	ug/kg	5	2	--	4.0	6.4	5.2
Dibenzofuran	ug/kg	4	3	--	2.6	2300	808
Hexachlorobenzene	ug/kg	6	0	--	--	--	--
Hexachlorobutadiene	ug/kg	6	0	--	--	--	--
Hexachlorocyclopentadiene	ug/kg	5	0	--	--	--	--

Table A-8. Results for Round 2A Archived Core Sediment Field Replicate Samples.

Analyte Group/Chemical Name	Unit	Field Replicates					
		Number Collected	Number Detected	RPD Above 50	Minimum	Maximum	Average
Hexachloroethane	ug/kg	6	0	--	--	--	--
Isophorone	ug/kg	5	0	--	--	--	--
Nitrobenzene	ug/kg	5	0	--	--	--	--
N-Nitrosodimethylamine	ug/kg	5	0	--	--	--	--
N-Nitrosodiphenylamine	ug/kg	5	0	--	--	--	--
N-Nitrosodipropylamine	ug/kg	5	0	--	--	--	--
Phenols							
2,3,4,5-Tetrachlorophenol	ug/kg	5	0	--	--	--	--
2,3,5,6-Tetrachlorophenol	ug/kg	5	0	--	--	--	--
2,4,5-Trichlorophenol	ug/kg	5	0	--	--	--	--
2,4,6-Trichlorophenol	ug/kg	5	0	--	--	--	--
2,4-Dichlorophenol	ug/kg	5	0	--	--	--	--
2,4-Dimethylphenol	ug/kg	5	0	--	--	--	--
2,4-Dinitrophenol	ug/kg	5	0	--	--	--	--
2-Chlorophenol	ug/kg	5	0	--	--	--	--
2-Methylphenol	ug/kg	5	0	--	--	--	--
2-Nitrophenol	ug/kg	5	0	--	--	--	--
4,6-Dinitro-2-methylphenol	ug/kg	5	0	--	--	--	--
4-Chloro-3-methylphenol	ug/kg	5	0	--	--	--	--
4-Methylphenol	ug/kg	5	2	--	5.6	10.0	7.8
4-Nitrophenol	ug/kg	5	0	--	--	--	--
Pentachlorophenol	ug/kg	5	1	--	4.4	4.4	4.4
Phenol	ug/kg	5	4	--	3.4	13.0	6.2
Phthalates							
Bis(2-ethylhexyl) phthalate	ug/kg	5	2	--	3.1	810	407
Butylbenzyl phthalate	ug/kg	5	1	--	260	260	260
Dibutyl phthalate	ug/kg	5	2	--	6.5	23	14.8
Diethyl phthalate	ug/kg	5	0	--	--	--	--
Dimethyl phthalate	ug/kg	5	1	--	8.4	8.4	8.4
Di-n-octyl phthalate	ug/kg	5	1	--	110	110	110
Polycyclic Aromatic Hydrocarbons							
2-Methylnaphthalene	ug/kg	4	3	--	4.7	250	142
Acenaphthene	ug/kg	4	4	--	0.31	6700	1757
Acenaphthylene	ug/kg	4	4	--	0.33	43.0	25.1
Anthracene	ug/kg	4	4	--	1.1	2300	637
Benz(a)anthracene	ug/kg	4	4	--	1.1	1100	352
Benzo(a)pyrene	ug/kg	4	4	--	1.2	440	209
Benzo(b)fluoranthene	ug/kg	4	4	--	0.87	530	188
Benzo(g,h,i)perylene	ug/kg	4	4	--	1.4	320	128
Benzo(k)fluoranthene	ug/kg	4	4	--	0.77	390	154
Chrysene	ug/kg	4	4	--	1.4	1200	400
Dibenz(a,h)anthracene	ug/kg	4	3	--	4.8	47.0	30.3
Fluoranthene	ug/kg	4	4	--	7.5	6700	1912
Fluorene	ug/kg	4	4	--	0.49	5500	1437
Indeno(1,2,3-cd)pyrene	ug/kg	4	4	--	1.1	270	120
Naphthalene	ug/kg	4	3	--	19.0	320	160
Phenanthrene	ug/kg	4	4	--	6.4	14000	3834
Pyrene	ug/kg	4	4	--	9.7	5200	1565
Chlorinated Pesticides							
2,4'-DDD	ug/kg	1	0	--	--	--	--
2,4'-DDE	ug/kg	1	0	--	--	--	--
2,4'-DDT	ug/kg	1	0	--	--	--	--
4,4'-DDD	ug/kg	1	0	--	--	--	--
4,4'-DDE	ug/kg	1	0	--	--	--	--
4,4'-DDT	ug/kg	1	0	--	--	--	--
Aldrin	ug/kg	1	0	--	--	--	--
alpha-Endosulfan	ug/kg	1	0	--	--	--	--

Table A-8. Results for Round 2A Archived Core Sediment Field Replicate Samples.

Analyte Group/Chemical Name	Unit	Field Replicates					
		Number Collected	Number Detected	RPD Above 50	Minimum	Maximum	Average
alpha-Hexachlorocyclohexane	ug/kg	1	0	--	--	--	--
beta-Endosulfan	ug/kg	1	0	--	--	--	--
beta-Hexachlorocyclohexane	ug/kg	1	0	--	--	--	--
cis-Chlordane	ug/kg	1	0	--	--	--	--
cis-Nonachlor	ug/kg	1	0	--	--	--	--
delta-Hexachlorocyclohexane	ug/kg	1	0	--	--	--	--
Dieldrin	ug/kg	1	0	--	--	--	--
Endosulfan sulfate	ug/kg	1	0	--	--	--	--
Endrin	ug/kg	1	0	--	--	--	--
Endrin aldehyde	ug/kg	1	0	--	--	--	--
Endrin ketone	ug/kg	1	0	--	--	--	--
gamma-Hexachlorocyclohexane	ug/kg	1	0	--	--	--	--
Heptachlor	ug/kg	1	0	--	--	--	--
Heptachlor epoxide	ug/kg	1	0	--	--	--	--
Methoxychlor	ug/kg	1	0	--	--	--	--
Mirex	ug/kg	1	0	--	--	--	--
Oxychlordane	ug/kg	1	0	--	--	--	--
Toxaphene	ug/kg	1	0	--	--	--	--
trans-Chlordane	ug/kg	1	0	--	--	--	--
trans-Nonachlor	ug/kg	1	0	--	--	--	--
PCB Aroclors							
Aroclor 1016	ug/kg	4	0	--	--	--	--
Aroclor 1221	ug/kg	4	0	--	--	--	--
Aroclor 1232	ug/kg	4	0	--	--	--	--
Aroclor 1242	ug/kg	4	1	--	160	160	160
Aroclor 1248	ug/kg	4	1	--	10.0	10.0	10.0
Aroclor 1254	ug/kg	4	2	--	22.0	94.0	58.0
Aroclor 1260	ug/kg	4	2	--	30.0	42.0	36.0
Aroclor 1262	ug/kg	4	0	--	--	--	--
Aroclor 1268	ug/kg	4	0	--	--	--	--
PCB Congeners							
2,2',3,3',4,4',5,5',6,6'-Decachlorobiphenyl	pg/g	4	4	--	39.0	1750	755
2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl	pg/g	4	4	--	266	1750	1232
2,2',3,3',4,4',5,5'-Octachlorobiphenyl	pg/g	4	4	--	1010	5340	2445
2,2',3,3',4,4',5,6,6'-Nonachlorobiphenyl	pg/g	4	4	--	35.7	191	133
2,2',3,3',4,4',5,6-Octachlorobiphenyl	pg/g	4	4	--	466	2810	1174
2,2',3,3',4,4',5-Heptachlorobiphenyl	pg/g	4	4	--	1440	10500	4440
2,2',3,3',4,4',6,6'-Octachlorobiphenyl	pg/g	4	4	--	44.8	256	110
2,2',3,3',4,4',6-Heptachlorobiphenyl	pg/g	4	4	--	441	3150	1315
2,2',3,3',4,5,5',6,6'-Nonachlorobiphenyl	pg/g	4	4	--	54.2	433	316
2,2',3,3',4,5,5',6'-Octachlorobiphenyl	pg/g	4	4	--	930	5350	2448
2,2',3,3',4,5,5',6-Octachlorobiphenyl	pg/g	4	4	--	51.5	394	249
2,2',3,3',4,5,5'-Heptachlorobiphenyl	pg/g	4	4	--	307	1900	802
2,2',3,3',4,5',6,6'-Octachlorobiphenyl	pg/g	4	4	--	160	858	399
2,2',3,3',4,5,6,6'-Octachlorobiphenyl	pg/g	4	4	--	151	786	361
2,2',3,3',4,5',6'-Heptachlorobiphenyl	pg/g	4	4	--	1070	8190	3183
2,2',3,3',4,5',6-Heptachlorobiphenyl	pg/g	4	3	--	82.2	560	380
2,2',3,3',4,5,6'-Heptachlorobiphenyl	pg/g	4	4	--	1810	11900	4980
2,2',3,3',4,5,6-Heptachlorobiphenyl	pg/g	4	4	--	38.3	240	105
2,2',3,3',4,5'-Hexachlorobiphenyl	pg/g	4	4	--	219	1840	957
2,2',3,3',4,5-Hexachlorobiphenyl	pg/g	4	4	--	118	840	512
2,2',3,3',4,6,6'-Heptachlorobiphenyl	pg/g	4	4	--	235	1890	733
2,2',3,3',4,6-Hexachlorobiphenyl	pg/g	4	1	--	6.0	6.0	6.0
2,2',3,3',4-Pentachlorobiphenyl	pg/g	4	4	--	527	5630	2003
2,2',3,3',5,5',6,6'-Octachlorobiphenyl	pg/g	4	4	--	260	1180	599
2,2',3,3',5,5',6-Heptachlorobiphenyl	pg/g	4	4	--	489	3270	1303
2,2',3,3',5,6,6'-Heptachlorobiphenyl	pg/g	4	4	--	995	6760	2729
2,2',3,3',5,6'-Hexachlorobiphenyl	pg/g	4	4	--	1150	6090	2775
2,2',3,3',5-Pentachlorobiphenyl	pg/g	4	1	--	4.6	4.6	4.6

Table A-8. Results for Round 2A Archived Core Sediment Field Replicate Samples.

Analyte Group/Chemical Name	Unit	Field Replicates					
		Number Collected	Number Detected	RPD Above 50	Minimum	Maximum	Average
2,2',3,3',6,6'-Hexachlorobiphenyl	pg/g	4	4	--	1060	5150	2533
2,2',3,3'-Tetrachlorobiphenyl	pg/g	4	4	--	333	8120	2717
2,2',3,4,4',5,5'-Heptachlorobiphenyl	pg/g	4	4	--	3790	27300	11318
2,2',3,4,4',5,6,6'-Octachlorobiphenyl	pg/g	4	0	--	--	--	--
2,2',3,4,4',5',6-Heptachlorobiphenyl	pg/g	4	4	--	842	7640	2986
2,2',3,4,4',5,6-Heptachlorobiphenyl	pg/g	4	3	--	13.7	224	109
2,2',3,4,4',5-Hexachlorobiphenyl	pg/g	4	4	--	198	1160	591
2,2',3,4,4',6,6'-Heptachlorobiphenyl	pg/g	4	3	--	2.9	9.0	5.4
2,2',3,4,4',6'-Hexachlorobiphenyl	pg/g	4	4	--	33.6	555	184
2,2',3,4,5,5',6-Heptachlorobiphenyl	pg/g	4	4	--	214	1330	580
2,2',3,4,5,5'-Hexachlorobiphenyl	pg/g	4	4	--	631	6570	3075
2,2',3,4',5,6,6'-Heptachlorobiphenyl	pg/g	4	4	--	5.5	41.1	22.6
2,2',3,4,5,6,6'-Heptachlorobiphenyl	pg/g	4	0	--	--	--	--
2,2',3,4',5,6'-Hexachlorobiphenyl	pg/g	4	4	--	30.2	425	153
2,2',3,4',5,6-Hexachlorobiphenyl	pg/g	4	4	--	230	571	428
2,2',3,4,5',6-Hexachlorobiphenyl	pg/g	4	4	--	124	1590	689
2,2',3,4',5'-Pentachlorobiphenyl	pg/g	4	4	--	1010	12200	4728
2,2',3,4,5-Pentachlorobiphenyl	pg/g	4	4	--	18.3	1210	337
2,2',3,4',6,6'-Hexachlorobiphenyl	pg/g	4	4	--	20.4	144	89.0
2,2',3,4,6,6'-Hexachlorobiphenyl	pg/g	4	2	--	4.3	10.6	7.4
2,2',3,4,6'-Pentachlorobiphenyl	pg/g	4	4	--	67.7	827	272
2,2',3,5,5',6-Hexachlorobiphenyl	pg/g	4	4	--	1810	3630	2670
2,2',3,5,6,6'-Hexachlorobiphenyl	pg/g	4	4	--	7.6	41.1	17.7
2,2',3,5,6'-Pentachlorobiphenyl	pg/g	4	4	--	28.0	493	244
2,2',3,5,6-Pentachlorobiphenyl	pg/g	4	0	--	--	--	--
2,2',3,5'-Tetrachlorobiphenyl	pg/g	4	4	--	2890	48900	16835
2,2',3,6,6'-Pentachlorobiphenyl	pg/g	4	4	--	44.2	813	268
2,2',3,6'-Tetrachlorobiphenyl	pg/g	4	4	--	153	5320	1829
2,2',3,6-Tetrachlorobiphenyl	pg/g	4	4	--	351	8370	2825
2,2',4,4',5,5'-Hexachlorobiphenyl	pg/g	4	4	--	3580	35600	15753
2,2',4,4',5,6'-Hexachlorobiphenyl	pg/g	4	4	--	176	1600	660
2,2',4,4',5-Pentachlorobiphenyl	pg/g	4	4	--	2270	17500	7963
2,2',4,4',6,6'-Hexachlorobiphenyl	pg/g	4	3	--	3.2	7.3	5.5
2,2',4,4',6-Pentachlorobiphenyl	pg/g	4	4	--	58.8	425	236
2,2',4,4'-Tetrachlorobiphenyl	pg/g	4	4	--	1780	27300	10705
2,2',4,5',6-Pentachlorobiphenyl	pg/g	4	4	--	134	532	399
2,2',4,6,6'-Pentachlorobiphenyl	pg/g	4	2	--	3.8	25.2	14.5
2,2',4,6'-Tetrachlorobiphenyl	pg/g	4	4	--	126	5410	1960
2,2',4,6-Tetrachlorobiphenyl	pg/g	4	4	--	10.2	260	88.6
2,2',4-Trichlorobiphenyl	pg/g	4	4	--	558	17400	6040
2,2',5,6'-Tetrachlorobiphenyl	pg/g	4	4	--	366	12400	4219
2,2',5-Trichlorobiphenyl	pg/g	4	4	--	383	29400	10566
2,2',6,6'-Tetrachlorobiphenyl	pg/g	4	4	--	5.6	241	72.7
2,2',6-Trichlorobiphenyl	pg/g	4	4	--	73.2	3910	1246
2,3,3',4,4',5,5',6-Octachlorobiphenyl	pg/g	4	4	--	46.4	233	105
2,3,3',4,4',5,5'-Heptachlorobiphenyl	pg/g	4	4	--	55.6	361	163
2,3,3',4,4',5',6-Heptachlorobiphenyl	pg/g	4	4	--	57.4	417	172
2,3,3',4,4',5,6-Heptachlorobiphenyl	pg/g	4	4	--	319	2150	903
2,3,3',4,4',5'-Hexachlorobiphenyl	pg/g	4	4	--	56.2	407	223
2,3,3',4,4',5-Hexachlorobiphenyl	pg/g	4	4	--	321	1920	1273
2,3,3',4,4'-Pentachlorobiphenyl	pg/g	4	4	--	1270	11700	4488
2,3,3',4',5,5',6-Heptachlorobiphenyl	pg/g	4	4	--	184	1380	538
2,3,3',4,5,5',6-Heptachlorobiphenyl	pg/g	4	0	--	--	--	--
2,3,3',4,5,5'-Hexachlorobiphenyl	pg/g	4	4	--	85.8	481	207
2,3,3',4',5'-Pentachlorobiphenyl	pg/g	4	4	--	53.8	428	162
2,3,3',4',6-Pentachlorobiphenyl	pg/g	4	4	--	3150	35300	15663
2,3,3',4-Tetrachlorobiphenyl	pg/g	4	4	--	58.3	621	218
2,3,3',5',6-Pentachlorobiphenyl	pg/g	4	2	--	49.2	97.0	73.1
2,3,3',5'-Tetrachlorobiphenyl	pg/g	4	4	--	20.3	147	58.1
2,3,3',5-Tetrachlorobiphenyl	pg/g	4	4	--	46.7	419	146
2,3',4,4',5,5'-Hexachlorobiphenyl	pg/g	4	4	--	112	706	480

Table A-8. Results for Round 2A Archived Core Sediment Field Replicate Samples.

Analyte Group/Chemical Name	Unit	Field Replicates					
		Number Collected	Number Detected	RPD Above 50	Minimum	Maximum	Average
2,3',4,4',5',6-Hexachlorobiphenyl	pg/g	4	4	--	8.4	85.2	31.5
2,3,4,4',5,6-Hexachlorobiphenyl	pg/g	4	4	--	15.5	78.1	40.3
2,3',4,4',5'-Pentachlorobiphenyl	pg/g	4	4	--	59.6	570	206
2,3,4,4',5-Pentachlorobiphenyl	pg/g	4	4	--	85.7	883	323
2,3',4,4',6-Pentachlorobiphenyl	pg/g	4	4	--	239	1130	608
2,3',4',5,5'-Pentachlorobiphenyl	pg/g	4	4	--	117	1030	429
2,3',4,5,5'-Pentachlorobiphenyl	pg/g	4	4	--	14.9	120	48.2
2,3',4,5',6-Pentachlorobiphenyl	pg/g	4	2	--	18.9	26.2	22.6
2,3',4,5'-Tetrachlorobiphenyl	pg/g	4	4	--	108	491	222
2,3',4,5-Tetrachlorobiphenyl	pg/g	4	4	--	99.9	1330	469
2,3,4',5-Tetrachlorobiphenyl	pg/g	4	4	--	144	2240	761
2,3,4,6-Tetrachlorobiphenyl	pg/g	4	1	--	8.8	8.8	8.8
2,3',4-Trichlorobiphenyl	pg/g	4	4	--	176	10100	3008
2,3,4'-Trichlorobiphenyl	pg/g	4	4	--	302	9370	3640
2,3',5',6-Tetrachlorobiphenyl	pg/g	4	1	--	317	317	317
2,3,5,6-Tetrachlorobiphenyl	pg/g	4	3	--	2.6	22.9	12.2
2,3',5'-Trichlorobiphenyl	pg/g	4	4	--	31.6	655	220
2,3',5-Trichlorobiphenyl	pg/g	4	4	--	386	17500	5372
2,3,5-Trichlorobiphenyl	pg/g	4	3	--	2.6	25.1	12.7
2,3'-Dichlorobiphenyl	pg/g	4	4	--	74.0	7730	2269
2,4,4',5-Tetrachlorobiphenyl	pg/g	4	4	--	1300	19800	6613
2,4,4'-Trichlorobiphenyl	pg/g	4	4	--	1920	51900	17490
2,4',5-Trichlorobiphenyl	pg/g	4	4	--	1770	41600	14968
2,4,5-Trichlorobiphenyl	pg/g	4	4	--	1.9	91.3	45.5
2,4,6-Trichlorobiphenyl	pg/g	4	0	--	--	--	--
2-Chlorobiphenyl	pg/g	4	4	--	9.2	882	296
3,3',4,4',5,5'-Hexachlorobiphenyl	pg/g	4	1	--	1.7	1.7	1.7
3,3',4,4',5-Pentachlorobiphenyl	pg/g	4	4	--	16.7	122	52.5
3,3',4,4'-Tetrachlorobiphenyl	pg/g	4	4	--	251	4420	1466
3,3',4,5,5'-Pentachlorobiphenyl	pg/g	4	0	--	--	--	--
3,3',4,5'-Tetrachlorobiphenyl	pg/g	4	4	--	55.8	432	200
3,3',4,5-Tetrachlorobiphenyl	pg/g	4	0	--	--	--	--
3,3',4-Trichlorobiphenyl	pg/g	4	4	--	26.4	339	138
3,3',5,5'-Tetrachlorobiphenyl	pg/g	4	0	--	--	--	--
3,3',5-Trichlorobiphenyl	pg/g	4	2	--	2.4	26.9	14.7
3,3'-Dichlorobiphenyl	pg/g	4	3	--	16.8	433	206
3,4,4',5-Tetrachlorobiphenyl	pg/g	4	4	--	14.6	345	117
3,4,4'-Trichlorobiphenyl	pg/g	4	4	--	427	9040	3391
3,4',5-Trichlorobiphenyl	pg/g	4	4	--	13.1	200	63.6
3,4,5-Trichlorobiphenyl	pg/g	4	4	--	39.7	517	196
3,5-Dichlorobiphenyl	pg/g	4	0	--	--	--	--
3-Chlorobiphenyl	pg/g	4	4	--	5.1	306	113
4,4'-Dichlorobiphenyl	pg/g	4	4	--	138	18900	7155
4-Chlorobiphenyl	pg/g	4	4	--	64.4	1360	431
PCB004 & 010	pg/g	4	4	--	69.9	7750	2333
PCB005 & 008	pg/g	4	4	--	329	16900	6031
PCB007 & 009	pg/g	4	3	--	30.6	1360	636
PCB012 & 013	pg/g	4	3	--	250	3000	1223
PCB016 & 032	pg/g	4	4	--	697	22800	8039
PCB020 & 021 & 033	pg/g	4	4	--	389	12500	5438
PCB024 & 027	pg/g	4	4	--	62.3	2590	904

Table A-8. Results for Round 2A Archived Core Sediment Field Replicate Samples.

Analyte Group/Chemical Name	Unit	Field Replicates					
		Number Collected	Number Detected	RPD Above 50	Minimum	Maximum	Average
PCB041 & 064 &071 &072	pg/g	4	4	--	2900	47700	16628
PCB042 & 059	pg/g	4	4	--	842	15300	5276
PCB043 & 049	pg/g	4	4	--	4130	53800	20173
PCB048 & 075	pg/g	4	4	--	661	7650	2865
PCB052 & 069	pg/g	4	4	--	5580	62400	22835
PCB056 & 060	pg/g	4	4	--	1650	28700	9208
PCB061 & 070	pg/g	4	4	--	4380	50600	17568
PCB066 & 076	pg/g	4	4	--	2820	42800	14395
PCB084 & 092	pg/g	4	4	--	3200	18400	8083
PCB085 & 116	pg/g	4	4	--	777	6940	2597
PCB087 & 117 & 125	pg/g	4	4	--	1340	13100	5353
PCB088 & 091	pg/g	4	4	--	1320	8150	3230
PCB090 & 101	pg/g	4	4	--	4910	31000	16078
PCB095 & 098 & 102	pg/g	4	4	--	6810	29600	14203
PCB106 & 118	pg/g	4	4	--	2950	27800	12040
PCB107 & 109	pg/g	4	4	--	392	2250	1080
PCB108 & 112	pg/g	4	4	--	344	2360	922
PCB111 & 115	pg/g	4	4	--	92.4	1410	459
PCB128 & 162	pg/g	4	4	--	453	2870	1816
PCB132 & 161	pg/g	4	4	--	835	7900	4541
PCB133 & 142	pg/g	4	4	--	306	1550	718
PCB134 & 143	pg/g	4	4	--	335	1320	874
PCB138 & 163 & 164	pg/g	4	4	--	3800	29300	15275
PCB139 & 149	pg/g	4	4	--	3810	30900	13770
PCB146 & 165	pg/g	4	4	--	1180	9160	3665
PCB158 & 160	pg/g	4	4	--	323	2270	1388
PCB182 & 187	pg/g	4	4	--	3000	18200	7225
PCB196 & 203	pg/g	4	4	--	1010	6290	2858
Polychlorinated biphenyls	pg/g	4	4	--	162000	1100000	497250
PCB Homologs							
Dichlorobiphenyl	pg/g	4	4	--	652	56000	19333
Heptachlorobiphenyl	pg/g	4	4	--	15900	107000	43800
Hexachlorobiphenyl	pg/g	4	4	--	22000	152000	75500
Monochlorobiphenyl	pg/g	4	4	--	78.6	2550	841
Nonachlorobiphenyl	pg/g	4	4	--	356	2380	1682
Octachlorobiphenyl	pg/g	4	4	--	4130	23500	10748
Pentachlorobiphenyl	pg/g	4	4	--	32900	232000	102600
Tetrachlorobiphenyl	pg/g	4	4	--	34100	456000	160700
Trichlorobiphenyl	pg/g	4	4	--	7880	230000	80795
PCDD/Fs							
1,2,3,4,6,7,8-Heptachlorodibenzofuran	pg/g	6	5	--	2.1	88.4	33.3
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	pg/g	6	6	--	7.1	202	77.8
1,2,3,4,7,8,9-Heptachlorodibenzofuran	pg/g	6	4	--	0.22	4.9	2.6
1,2,3,4,7,8-Hexachlorodibenzofuran	pg/g	6	5	--	0.45	15.2	6.6
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	pg/g	6	5	--	0.049	1.1	0.50
1,2,3,6,7,8-Hexachlorodibenzofuran	pg/g	6	5	--	0.16	7.0	2.4
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	pg/g	6	6	--	0.31	6.8	2.9
1,2,3,7,8,9-Hexachlorodibenzofuran	pg/g	6	2	--	0.20	0.25	0.23
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	pg/g	6	6	--	0.14	2.6	1.2
1,2,3,7,8-Pentachlorodibenzofuran	pg/g	6	5	--	0.20	6.9	2.1
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	pg/g	6	3	--	0.24	0.75	0.48
2,3,4,6,7,8-Hexachlorodibenzofuran	pg/g	6	4	--	0.088	1.3	0.73
2,3,4,7,8-Pentachlorodibenzofuran	pg/g	6	5	--	0.17	2.5	1.2
2,3,7,8-Tetrachlorodibenzofuran	pg/g	6	6	--	0.25	2.1	1.0
2,3,7,8-Tetrachlorodibenzo-p-dioxin	pg/g	6	1	--	0.30	0.30	0.30

Table A-8. Results for Round 2A Archived Core Sediment Field Replicate Samples.

Analyte Group/Chemical Name	Unit	Field Replicates					
		Number Collected	Number Detected	RPD Above 50	Minimum	Maximum	Average
PCDD/F Homologs							
Heptachlorodibenzofuran homologs	pg/g	6	6	--	3.0	256	92.2
Heptachlorodibenzo-p-dioxin homologs	pg/g	6	6	--	15.2	497	174
Hexachlorodibenzofuran homologs	pg/g	6	6	--	3.2	117	43.5
Hexachlorodibenzo-p-dioxin homologs	pg/g	6	6	--	2.1	48.7	20.7
Octachlorodibenzofuran	pg/g	6	4	--	3.0	233	121
Octachlorodibenzo-p-dioxin	pg/g	6	6	--	60.9	2129	877
Pentachlorodibenzofuran homologs	pg/g	6	6	--	2.9	48.5	17.7
Pentachlorodibenzo-p-dioxin homologs	pg/g	6	5	--	0.22	8.1	3.1
Tetrachlorodibenzofuran homologs	pg/g	6	6	--	3.0	20.0	9.2
Tetrachlorodibenzo-p-dioxin homologs	pg/g	6	6	--	0.13	6.1	2.1

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Length	Method	Size	Ratio	Date	Time	CRC-32	Attr	Name
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5889KB		1077KB	81.8%					1

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