

Tables

Table 1**Peak Analysis: Selection of Cores by Known Sampling Methods and Results**

Study	Year	Use	Selected Cores for Peak Concentration	Total Samples
Tierra – Newark Bay Phase I/Phase II (NBSA Remedial Investigation)	2005 and 2007	Cores sampled to refusal. Selected cores that have reached target depth from Tables 5-1 and 5-2 of Tierra 2011 Phase I and Phase II Sediment Deposition Report. ¹	85	119
USEPA/MPI – High-Resolution Sediment Coring Program	2005	All high-resolution cores were sampled to red-brown clay or refusal. Only 3 of the 6 cores with sufficient segments of 2,3,7,8-TCDD measurements were selected.	3	6
USEPA/MPI – Low-Resolution Sediment Coring Program	2006	Cores sampled to refusal. Selected all cores except one core that had a large segmentation gap by the highest concentrated segment.	9	10
USEPA/MPI – EMBM	2007–2008	Cores sampled to refusal. Selected all cores for MPA analysis. Did not select any cores for peak concentration analysis because segmentation was too coarse. ²	0	44
CPG – Low-Resolution Coring Program	2008	Cores sampled to refusal. Selected cores that have reached target depth from Table 2-2 of Low-Resolution Coring Characterization Summary. ³	91	107
CPG – River Mile 10.9 Characterization	2011	Cores sampled to refusal. Selected all cores from this study, including one core less than 2.5 feet long.	54	54
JDG –Sediment Sampling (prior to Lister Avenue Phases 1 and 2 Sediment Removal Action	2011	Cores sampled to refusal. Selected the 3 high-resolution cores with a suitable segmentation scheme.	3	15
CPG – Low-Resolution Coring Program Supplemental Sampling Program	2012	Selected cores with depth less than 2.5 feet. ⁴	9	85
CPG – River Mile 10.9 Addendum A	2012	Cores sampled to refusal. Selected all cores.	15	15

Table 1**Peak Analysis: Selection of Cores by Known Sampling Methods and Results**

Study	Year	Use	Selected Cores for Peak Concentration	Total Samples
CPG – Low-Resolution Coring Program Supplemental Sampling Program 2	2013	Cores sampled to refusal. Selected cores without gaps between segments. ⁵	20	75

Notes:

Cores and samples not selected from known sampling methods, and results were subjected to query criteria to determine if suitable for analysis.

1. Tables 5-1 and 5-2 of the deposition report describe if the core reached the study's target depth of the 1940s horizon. Multiple lines of evidence were tested including: penetration to native red clay, radiochemical dating, refusal, and bathymetric survey differences. We selected the core if any one of the lines of evidence were verified.

2. Segmentation for the EMBM study's cores consisted of one 0.5-foot surface segment and one segment from 0.5 foot to core refusal. While this segmentation scheme is suitable for mass approximation, its segmentation is too coarse to determine a peak concentration.

3. Table 2-2 of the summary report describes each core's penetration depth, recovery, and bottom material. We selected cores that penetrated to refusal or with bottom material of red-brown sand and/or clay.

4. Sampling procedure was to sample down to 2.5 feet. If the core was less than 2.5 feet, it implied hitting refusal.

5. Sampling procedure was to collect continuous segments down to 2.5 feet and also the bottom 1 foot of the core. Cores without gaps between segments indicate a complete depth profile to refusal.

CPG: Cooperating Parties Group

EMBM: Empirical Mass Balance Model

JDG: Joint Defense Group

MPI: Malcolm Pirnie Inc.

NBSA: Newark Bay Study Area

TCDD: tetrachlorodibenzo-p-dioxin

USEPA: U.S. Environmental Protection Agency

Table 2
Peak Analysis: Professional Judgment Cores

Study	Year	Core ID	Peak Concentration	Professional Judgment
Tierra – 1995 Remedial Investigation Sampling Program	1995	216	X	Exclude because core profile does not exhibit clear peak.
		253	O	Include despite segmentation gaps—will interpolate gaps.
		261	O	Include because bottom segment is close to <30 ng/kg criteria.
1999 Sediment Sampling Program	1999	PRP-99-02	X	Exclude because core profile does not exhibit clear peak.
USEPA/MPI – High-Resolution Sediment Coring Program	2005	G0000004-7A	O	Include despite segmentation gaps—will interpolate gaps.
		G0000005-9A	O	
USEPA/MPI – Low-Resolution Sediment Coring Program	2006	G0000023	O	Include despite missing surface segment because significant concentration above 10,000 ng/kg in profile.
CPG – Low-Resolution Coring Program	2008	CLRC-012	O	Include despite segmentation gap—will interpolate gaps.
		CLRC-019	X	Exclude because located in a high depositional area and only 4 feet deep.
		CLRC-070	O	Include despite segmentation gaps—will interpolate gaps.
		CLRC-113	O	Include despite shorter than 2.5-foot depth because all segments are non-detect and RM 15.5 location is unlikely to have a buried peak.
CPG – River Mile 10.9 Characterization	2011	11B-0354	O	Include despite shorter than 2.5 feet depth because it is to refusal.
JDG –Sediment Sampling (prior to Lister Avenue Phases 1 and 2 Sediment Removal Action	2011	HRC-02H	O	Include despite segmentation gaps—will interpolate gaps.
		HRC-03H	O	
		HRC-04H	O	
CPG – Low-Resolution Coring Program Supplemental Sampling Program	2012	12A-0402	X	Exclude because profile does not exhibit clear peak.
		12A-0410	X	
		12A-0426	X	
		12A-0431	X	
CPG – Low-Resolution Coring Program Supplemental Sampling Program 2	2013	13B-0504	O	Include because significant concentration above 10,000 ng/kg in profile.
		13B-0509	O	
		13B-0526	O	
		13B-0528	O	
		13B-0529	O	Include because bottom of continuous section profile meets the <30 ng/kg criteria and meets 50% of peak rule.
		13B-0531	O	
		13B-0533	O	Include because significant concentration above 10,000 ng/kg in profile.
		13B-0534	O	Include because significant concentration above 10,000 ng/kg in profile and bottom of continuous section of profile meets the <30 ng/kg criteria.

Table 2
Peak Analysis: Professional Judgment Cores

Study	Year	Core ID	Peak Concentration	Professional Judgment
CPG – Low-Resolution Coring Program Supplemental Sampling Program 2	2013	13B-0536	O	Include because bottom of continuous section profile meets the <30 ng/kg criteria.
		13B-0538	O	Include because significant concentration above 10,000 ng/kg in profile.
		13B-0539	O	Include because bottom of continuous section profile meets the <30 ng/kg criteria.
		13B-0542	O	Include because bottom of continuous section profile meets the <30 ng/kg criteria and meets max concentration not measured in the bottom segment rule.
		13B-0547	O	
		13B-0550	O	
		13B-0555	O	Include because significant concentration above 10,000 ng/kg in profile.
		13B-0558	O	Include because bottom of continuous section profile meets the <30 ng/kg criteria and meets max concentration not measured in the bottom segment rule.
		13B-0560	O	
		13B-0561	O	Include because bottom of continuous section profile meets max concentration not measured in the bottom segment rule.
		13B-0571	O	Include because bottom of continuous section profile meets the <30 ng/kg criteria and meets max concentration not measured in the bottom segment rule
		13B-0575	O	
		13B-0578	O	

Notes:

CPG: Cooperating Parties Group

JDG: Joint Defense Group

MPI: Malcolm Pirnie Inc.

ng/kg: nanograms per kilogram

USEPA: U.S. Environmental Protection Agency

O: included, X: excluded

Table 3**Subsurface Zeroing: Studies with Samples that Collected Full Chemical Inventory for Use in Subsurface Zeroing**

Study Name	Sample Years	KFI¹ Samples Selected	KFI¹ Samples Rejected	Criteria² Selected	Criteria² Rejected	PJ to Include	PJ to Reject	Total Accepted³
Tierra – 1995 Remedial Investigation Sampling Program	1995	--	--	48	46	1		48
Honeywell International Sampling Programs	1999, 2005, 2006	--	--	10	77	1		11
USEPA/MPI – High-Resolution Sediment Coring Program	2005, 2006	3	3	0	3			3
USEPA/MPI – Low-Resolution Sediment Coring Program	2006	10	0	0	0			10
PRG – 2006 Hackensack River Remedial Investigation	2006	--	--	18	38		1	18
Tierra – Newark Bay Phase I/Phase II	2005, 2007	85	34	1	33			86
Low-Resolution Coring Program	2008	91	16	7	9	1	1	98
USEPA/MPI – EMBM	2008	21	23	0	23			21
Phase I Sediment Assessment	2009	--	--	4	8			4
River Mile 10.9 Characterization	2011	54	0	0	0			54
2011 Lister Ave Sediments	2011	3	12	1	11			4
Low-Resolution Coring Program Supplemental Sampling Program	2012	9	76	21	55			30
River Mile 10.9 Addendum A	2012	15	0	0	0			15
Tierra – Focused Sediment Investigation (River Mile 10.9)	2012	--	--	4	2			4
Low-Resolution Coring Program Supplemental Sampling Program 2	2013	20	55	36	19	12		56

Notes:

1. KFI indicates studies with KFI, whose sampling methods were known. Core logs and sampling methods for each study were reviewed, and samples were confirmed or rejected based on the information. Studies with dashed lines in these columns did not have sampling objectives to reach refusal.

2. Samples rejected from the KFI or from samples without KFI were screened using several criteria to determine if full chemical inventory was likely sampled.

3. Total Accepted represents the number of cores selected from each study where it is assumed that full chemical inventory was likely sampled. This is the sum of the "KFI Samples Selected" and "Criteria Selected" columns.

EMBM: Empirical Mass Balance Model

KFI: Known Full Inventory

MPI: Malcom Pirnie, Inc.

PRG: preliminary remediation goal

USEPA: U.S. Environmental Protection

Table 4
Subsurface Zeroing: Professional Judgement Cores

Study	Year	Core ID	Decision	Professional Judgment
Tierra – 1995 Remedial Investigation Sampling Program	1995	261	O	Included because bottom segment concentration (31 ng/kg) is very close to the 30 ng/kg bottom segment criteria.
Honeywell International Sampling Programs	1999, 2005, 2006	SDD3E-025	O	Included because core has non-detect concentrations in all segments.
PRG – 2006 Hackensack River Remedial Investigation	2006	HRRISED011	X	Excluded because of unknown depositional patterns of the Hackensack river. Could have a buried peak.
CPG – Low-Resolution Coring Program	2008	CLRC-019	X	Exclude because located in a high depositional area and only 4 feet deep.
CPG – Low-Resolution Coring Program Supplemental Sampling Program 2	2013	13B-0511	O	This study sampled to refusal and measured the bottom 1 foot from refusal. Assume native material below refusal.
		13B-0516	O	
		13B-0521	O	
		13B-0524	O	
		13B-0525	O	
		13B-0526	O	
		13B-0533	O	
		13B-0544	O	
		13B-0555	O	
		13B-0557	O	
		13B-0559	O	
		13B-0574	O	

Notes:

CPG: Cooperating Parties Group

MPA: mass per unit area

ng/kg: nanograms per kilogram

PRG: preliminary remediation goal

TCDD: tetrachlorodibenzo-p-dioxin

USEPA: U.S. Environmental Protection Agency

O: included, X: excluded

Table 5**MPA Analysis: Selection of Cores by Known Sampling Methods and Results**

Study	Year	Use	Selected Cores for MPA	Total Samples
Tierra – Newark Bay Phase I/Phase II (NBSA Remedial Investigation)	2005 and 2007	Cores sampled to refusal. Selected cores that have reached target depth from Tables 5-1 and 5-2 of Tierra 2011 Phase I and Phase II Sediment Deposition Report. ¹	85	119
USEPA/MPI – High-Resolution Sediment Coring Program	2005	All high-resolution cores were sampled to red-brown clay or refusal. Only 3 of the 6 cores with sufficient segments of 2,3,7,8-TCDD measurements were selected.	3	6
USEPA/MPI – Low-Resolution Sediment Coring Program	2006	Cores sampled to refusal. Selected all cores except one core that had a large segmentation gap by the highest concentrated segment.	9	10
USEPA/MPI – EMBM	2007-2008	Cores sampled to refusal. Selected all cores for MPA analysis. Did not select any cores for peak concentration analysis because segmentation was too coarse. ²	21	44
CPG – Low-Resolution Coring Program	2008	Cores sampled to refusal. Selected cores that have reached target depth from Table 2-2 of Low-Resolution Coring Characterization Summary. ³	91	107
CPG – River Mile 10.9 Characterization	2011	Cores sampled to refusal. Selected all cores from this study, including one core less than 2.5 feet long.	54	54
JDG –Sediment Sampling (prior to Lister Avenue Phases 1 and 2 Sediment Removal Action	2011	Cores sampled to refusal. Selected the 3 high-resolution cores with a suitable segmentation scheme.	3	15
CPG – Low-Resolution Coring Program Supplemental Sampling Program	2012	Selected cores with depth less than 2.5 feet. ⁴	9	85
CPG – River Mile 10.9 Addendum A	2012	Cores sampled to refusal. Selected all cores.	15	15

Table 5**MPA Analysis: Selection of Cores by Known Sampling Methods and Results**

Study	Year	Use	Selected Cores for MPA	Total Samples
CPG – Low-Resolution Coring Program Supplemental Sampling Program 2	2013	Cores sampled to refusal. Selected cores without gaps between segments. ⁵	20	75

Notes:

Cores and samples not selected from known sampling methods, and results were subjected to query criteria to determine if suitable for analysis.

1. Tables 5-1 and 5-2 of the deposition report describe if the core reached the study's target depth of the 1940s horizon. Multiple lines of evidence were tested including: penetration to native red clay, radiochemical dating, refusal, and bathymetric survey differences. We selected the core if any one of the lines of evidence were verified.

2. Segmentation for the EMBM study's cores consisted of one 0.5-foot surface segment and one segment from 0.5 foot to core refusal. While this segmentation scheme is suitable for mass approximation, its segmentation is too coarse to determine a peak concentration.

3. Table 2-2 of the summary report describes each core's penetration depth, recovery, and bottom material. We selected cores that penetrated to refusal or with bottom material of red-brown sand and/or clay.

4. Sampling procedure was to sample down to 2.5 feet. If the core was less than 2.5 feet, it implied hitting refusal.

5. Sampling procedure was to collect continuous segments down to 2.5 feet and also the bottom 1 foot of the core. Cores without gaps between segments indicate a complete depth profile to refusal.

CPG: Cooperating Parties Group

EMBM: Empirical Mass Balance Model

JDG: Joint Defense Group

MPA: mass per unit area

MPI: Malcolm Pirnie Inc.

NBSA: Newark Bay Study Area

USEPA: U.S. Environmental Protection Agency

Table 6
MPA Analysis: Professional Judgment Cores for 2,3,7,8-TCDD

Study	Year	Core ID	MPA Analysis	Professional Judgment
Tierra – 1995 Remedial Investigation Sampling Program	1995	253	O	Include despite segmentation gaps—will interpolate gaps.
		261	O	Include because bottom segment is close to <30 ng/kg criteria.
1999 Sediment Sampling Program	1999	PRP-99-02	X	Exclude because core profile does not exhibit clear peak profile consistent with full inventory cores.
USEPA/MPI – High-Resolution Sediment Coring Program	2005	G0000004-7A	O	Include despite segmentation gaps—will interpolate gaps.
		G0000005-9A	O	
USEPA/MPI – Low-Resolution Sediment Coring Program	2006	G0000023	O	Include despite missing surface segment because significant concentration above 10,000 ng/kg in profile.
CPG – Low-Resolution Coring Program	2008	CLRC-012	O	Will interpolate gaps but sample will be run through other query parameters to determine if appropriate for use in MPA analysis.
		CLRC-019	X	Exclude because located in a high depositional area and only 4 feet deep.
		CLRC-070	O	Include despite segmentation gaps—will interpolate gaps.
		CLRC-113	O	Include despite shorter than 2.5-foot depth because all segments are non-detect and RM 15.5 location is unlikely to have significant mass buried.
USEPA/MPI – EMBM	2007-2008	G0000149	O	Include in MPA despite only having two segments because cores capture entire inventory.
		G0000150	O	
		G0000151	O	
		G0000152	O	
		G0000153	O	
		G0000154	O	
		G0000155	O	
		G0000156	O	
		G0000157	O	
		G0000158	O	
		G0000159	O	
		G0000160	O	
		G0000162	O	
		G0000163	O	
		G0000165	O	
		G0000166	O	
		G0000168	O	
		G0000169	O	
		G0000170	O	
		G0000171	O	
		G0000172	O	

Table 6
MPA Analysis: Professional Judgment Cores for 2,3,7,8-TCDD

Study	Year	Core ID	MPA Analysis	Professional Judgment
CPG – River Mile 10.9 Characterization	2011	11B-0354	O	Include despite shorter than 2.5-foot depth because it is to refusal.
JDG – Sediment Sampling (prior to Lister Avenue Phases 1 and 2 Sediment Removal Action)	2011	HRC-02H	O	Include despite segmentation gaps—will interpolate gaps.
		HRC-03H	O	
		HRC-04H	O	
CPG – Low-Resolution Coring Program Supplemental Sampling Program 2	2013	13B-0504	O	Include because significant concentration above 10,000 ng/kg in profile.
		13B-0509	O	
		13B-0526	O	
		13B-0528	O	
		13B-0529	O	Include because bottom of continuous section profile meets the <30 ng/kg criteria and meets 50%
		13B-0531	O	
		13B-0533	O	Include because significant concentration above 10,000 ng/kg in profile.
		13B-0534	O	Include because significant concentration above 10,000 ng/kg in profile and bottom of continuous section of profile meets the <30 ng/kg criteria.
		13B-0536	O	Include because bottom of continuous section profile meets the <30 ng/kg criteria.
		13B-0538	O	Include because significant concentration above 10,000 ng/kg in profile.
		13B-0539	O	Include because bottom of continuous section profile meets the <30 ng/kg criteria.
		13B-0542	O	Include because bottom of continuous section profile meets the <30 ng/kg criteria and meets 50% of peak rule.
		13B-0547	O	
		13B-0550	O	Include because significant concentration above 10,000 ng/kg in profile.
		13B-0555	O	
		13B-0558	O	Include because bottom of continuous section profile meets the <30 ng/kg criteria and meets 50%
		13B-0560	O	
		13B-0561	O	Include because bottom of continuous section profile meets 50% of peak rule.
		13B-0571	O	Include because bottom of continuous section profile meets the <30 ng/kg criteria and meets 50% of peak rule.
		13B-0575	O	
		13B-0578	O	

Notes:

CPG: Cooperating Parties Group

EMBM: Empirical Mass Balance Model

JDG: Joint Defense Group

MPA: mass per unit area

MPI: Malcolm Pirnie Inc.

ng/kg: nanograms per kilogram

TCDD: tetrachlorodibenzo-p-dioxin

USEPA: U.S. Environmental Protection Agency

O: included, X: excluded

Table 7
MPA Analysis: Professional Judgment Cores for Total PCBs

Study	Year	Core ID	Reason Investigated	MPA Analysis	Professional Judgment
Tierra – 1995 Remedial Investigation Sampling Program	1995	223	Shorter than 2,3,7,8-TCDD profile	O	Missing segment(s) but likely captured most of inventory
		232	Missing surface segment	O	Missing segment(s) but likely captured most of inventory
		236	Gaps in profile	X	Unclear if most of inventory was captured due to missing segments
		238	Shorter than 2,3,7,8-TCDD profile	O	Missing segment(s) but likely captured most of inventory
		240	Gaps in profile	X	Unclear if most of inventory was captured due to missing segments.
		241	Gaps in profile	X	Unclear if most of inventory was captured due to missing segments.
		246	Gaps in profile	X	Missing most of inventory
		248	Gaps in profile	O	Missing segment(s) but likely captured most of inventory
		253	Shorter than 2,3,7,8-TCDD profile	O	Missing segment(s) but likely captured most of inventory
		254	Shorter than 2,3,7,8-TCDD profile	O	Missing segment(s) but likely captured most of inventory
		278	Shorter than 2,3,7,8-TCDD profile	O	Despite missing segment, core has high concentrations
		285	Data anomaly	X	Peak concentration was non-detect
		286	Data anomaly	X	Peak concentration was non-detect
		288	Missing surface segment	X	Missing segments where 2,3,7,8-TCDD had elevated concentration
USEPA/MPI – High Resolution Sediment	2005	G0000004-7A	Gaps in profile	O	Missing segment(s) but likely captured most of inventory
		G0000005-9A	Gaps in profile	O	Missing segment(s) but likely captured most of inventory
		G0000012-29A	Gaps in profile	O	Missing segment(s) but likely captured most of inventory
Tierra – Phase I Sediment Assessment	2009	PRR1SEDV02	Shorter than 2,3,7,8-TCDD profile	O	Missing segment(s) but likely captured most of inventory
		PRR1SEDV03	Shorter than 2,3,7,8-TCDD profile	X	Missing most of inventory
		PRR1SEDV05	Shorter than 2,3,7,8-TCDD profile	O	Missing segment(s) but likely captured most of inventory
		PRR1SEDV06	Gaps in profile	X	Missing most of inventory
		PRR1SEDV08	Shorter than 2,3,7,8-TCDD profile	X	Missing most of inventory
		PRR1SEDV09	Shorter than 2,3,7,8-TCDD profile	X	Missing most of inventory
		PRR1SEDV12	Gaps in profile	X	Missing most of inventory

Table 7
MPA Analysis: Professional Judgment Cores for Total PCBs

Study	Year	Core ID	Reason Investigated	MPA Analysis	Professional Judgment
CPG – Low-Resolution Coring Program Supplemental Sampling Program 2	2013	13B-0547	Gaps in profile	O	This study sampled to refusal and used co-located coring; shorter profile likely due to co-located core finding refusal at a more shallow depth

Notes:

CPG: Cooperating Parties Group

EMBM: Empirical Mass Balance Model

MPA: mass per unit area

MPI: Malcolm Pirnie Inc.

PCB: polychlorinated biphenyl

TCDD: tetrachlorodibenzo-p-dioxin

USEPA: U.S. Environmental Protection Agency

O: included, X: excluded

Table 8

MPA Analysis: Professional Judgment Cores for Total 4,4'-DDx

Study	Year	Core ID	Reason Investigated	MPA Analysis	Professional Judgment
Tierra – 1995 Remedial Investigation Sampling Program	1995	205	Gaps in profile	X	Unclear if most of inventory was captured due to missing segments
		206	Shorter than 2,3,7,8-TCDD profile	X	Missing segments where 2,3,7,8-TCDD had elevated concentration
		207	Missing surface segment	X	Missing most of inventory
		208	Missing surface segment	O	Missing segment(s) but likely captured most of inventory
		209	Shorter than 2,3,7,8-TCDD profile	O	Missing segment(s) but likely captured most of inventory
		213	Gaps in profile	X	Unclear if most of inventory was captured due to missing segments
		214	Gaps in profile	X	Missing most of inventory
		217	Gaps in profile	X	Missing most of inventory
		222	Gaps in profile	X	Missing most of inventory
		223	Shorter than 2,3,7,8-TCDD profile	O	Missing segment(s) but likely captured most of inventory
		224	Shorter than 2,3,7,8-TCDD profile	O	Missing segment(s) but likely captured most of inventory
		225	Shorter than 2,3,7,8-TCDD profile	X	Missing segments where 2,3,7,8-TCDD had elevated concentration
		227	Shorter than 2,3,7,8-TCDD profile	X	Missing segments where 2,3,7,8-TCDD had elevated concentration
		228	Shorter than 2,3,7,8-TCDD profile	O	Missing segment(s) but likely captured most of inventory
		230	Shorter than 2,3,7,8-TCDD profile	X	Missing segments where 2,3,7,8-TCDD had elevated concentration
		231	Shorter than 2,3,7,8-TCDD profile	X	Missing segments where 2,3,7,8-TCDD had elevated concentration
		232	Gaps in profile	X	Unclear if most of inventory was captured due to missing segments
		234	Gaps in profile	X	Missing most of inventory
		235	Gaps in profile	O	Missing segment(s) but likely captured most of inventory
		236	Missing surface segment	X	Unclear if most of inventory was captured due to missing segments
		237	Gaps in profile	X	Unclear if most of inventory was captured due to missing segments
		238	Gaps in profile	X	Missing most of inventory
		240	Gaps in profile	X	Missing most of inventory
		241	Missing surface segment	O	Missing segment(s) but likely captured most of inventory
		242	Shorter than 2,3,7,8-TCDD profile	O	Missing segment(s) but likely captured most of inventory

Table 8
MPA Analysis: Professional Judgment Cores for Total 4,4'-DDx

Study	Year	Core ID	Reason Investigated	MPA Analysis	Professional Judgment
Tierra – 1995 Remedial Investigation Sampling Program	1995	243	Shorter than 2,3,7,8-TCDD profile	X	Missing most of inventory
		244	Gaps in profile	X	Unclear if most of inventory was captured due to missing segments
		245	Shorter than 2,3,7,8-TCDD profile	X	Missing segments where 2,3,7,8-TCDD had elevated concentration
		247	Missing surface segment	X	Missing segments where 2,3,7,8-TCDD had elevated concentration
		248	Gaps in profile	X	Unclear if most of inventory was captured due to missing segments
		251	Shorter than 2,3,7,8-TCDD profile	O	Missing segment(s) but likely captured most of inventory
		252	Gaps in profile	X	Missing segments where 2,3,7,8-TCDD had elevated concentration
		253	Shorter than 2,3,7,8-TCDD profile	X	Missing segments where 2,3,7,8-TCDD had elevated concentration
		254	Shorter than 2,3,7,8-TCDD profile	O	Missing segment(s) but likely captured most of inventory
		255	Shorter than 2,3,7,8-TCDD profile	O	Missing segment(s) but likely captured most of inventory
		256	Missing surface segment	X	Missing segments where 2,3,7,8-TCDD had elevated concentration.
		258	Shorter than 2,3,7,8-TCDD profile	O	Missing segment(s) but likely captured most of inventory
		261	Missing surface segment	O	The missing surface segment was likely a low concentration judging from low concentrations in profile as well as in the 2,3,7,8-TCDD profile
		262	Missing surface segment	O	The missing surface segment was likely a low concentration judging from low concentrations in profile as well as in the 2,3,7,8-TCDD profile
		266	Missing surface segment	X	Missing segments where 2,3,7,8-TCDD had elevated concentration
		267	Missing surface segment	X	Missing segments where 2,3,7,8-TCDD had elevated concentration
		270	Gaps in profile	O	Missing segment(s) but likely captured most of inventory.
		273	Shorter than 2,3,7,8-TCDD profile	O	Missing segment(s) but likely captured most of inventory.
		274	Shorter than 2,3,7,8-TCDD profile	O	Missing segment(s) but likely captured most of inventory.
		275	Shorter than 2,3,7,8-TCDD profile	O	Missing segment(s) but likely captured most of inventory

Table 8
MPA Analysis: Professional Judgment Cores for Total 4,4'-DDx

Study	Year	Core ID	Reason Investigated	MPA Analysis	Professional Judgment
Tierra – 1995 Remedial Investigation Sampling Program	1995	276	Shorter than 2,3,7,8-TCDD profile	O	Missing segment(s) but likely captured most of inventory
		277	Gaps in profile	X	Missing most of inventory
		284	Gaps in profile	X	Missing segments where 2,3,7,8-TCDD had elevated concentration
		285	Shorter than 2,3,7,8-TCDD profile	X	Missing segments where 2,3,7,8-TCDD had elevated concentration
		286	Shorter than 2,3,7,8-TCDD profile	X	Missing segments where 2,3,7,8-TCDD had elevated concentration
		288	Gaps in profile	X	Missing most of inventory.
		289	Gaps in profile	X	Missing segments where 2,3,7,8-TCDD had elevated concentration
		290	Gaps in profile	X	Missing segments where 2,3,7,8-TCDD had elevated concentration
		291	Gaps in profile	X	Missing segments where 2,3,7,8-TCDD had elevated concentration
		293	Gaps in profile	X	Missing most of inventory
		294	Gaps in profile	X	Missing most of inventory
		296	Shorter than 2,3,7,8-TCDD profile	X	Missing segments where 2,3,7,8-TCDD had elevated concentration
		211B	Gaps in profile	X	Missing most of inventory
		226A	Shorter than 2,3,7,8-TCDD profile	O	Missing segment(s) but likely captured most of inventory
USEPA/MPI – High Resolution Sediment	2005	G0000004-7A	Gaps in profile	X	Missing most of inventory
		G0000005-9A	Gaps in profile	X	Missing most of inventory
		G0000012-29A	Gaps in profile	X	Missing most of inventory
Tierra - Newark Bay Phase I/Phase II (NBSA Remedial Investigation) (2005)	2005	NB01SED031	Gaps in profile	X	Unclear if most of inventory was captured due to missing segments
		NB01SED036	Gaps in profile	X	Missing segments where 2,3,7,8-TCDD had elevated concentration
		NB02SED075	Shorter than 2,3,7,8-TCDD profile	O	Missing segment(s) but likely captured most of inventory
		NB02SED078	Gaps in profile	O	Missing segment(s) but likely captured most of inventory
		NB02SED082	Gaps in profile	O	Missing segment(s) but likely captured most of inventory
		NB02SED088	Gaps in profile	X	Missing most of inventory
USEPA/MPI – High Resolution Sediment	2006	G0000019	Gaps in profile	X	Missing most of inventory
		G0000023	Gaps in profile	X	Missing most of inventory
		G0000024	Gaps in profile	X	Missing most of inventory
USEPA/MPI – Low Resolution Sediment Coring Program	2006	G0000025	Shorter than 2,3,7,8-TCDD profile	O	Missing segment(s) but likely captured most of inventory

Table 8**MPA Analysis: Professional Judgment Cores for Total 4,4'-DDx**

Study	Year	Core ID	Reason Investigated	MPA Analysis	Professional Judgment
USEPA/MPI – EMBM	2007	G0000020	Gaps in profile	X	Missing most of inventory
		G0000022	Gaps in profile	X	Missing most of inventory
		G0000026	Gaps in profile	X	Missing most of inventory
		G0000151	Shorter than 2,3,7,8-TCDD profile	X	Missing most of inventory
		G0000152	Shorter than 2,3,7,8-TCDD profile	X	Missing most of inventory
		G0000153	Shorter than 2,3,7,8-TCDD profile	X	Missing most of inventory
		G0000155	Missing surface segment	O	Missing the surface segment but has the subsurface segment where most of the 2,3,7,8-TCDD inventory was measured
		G0000156	Missing surface segment	O	Missing the surface segment but has the subsurface segment where most of the 2,3,7,8-TCDD inventory was measured
		G0000157	Missing surface segment	O	Missing the surface segment but has the subsurface segment where most of the 2,3,7,8-TCDD inventory was measured
		G0000159	Missing surface segment	O	Missing the surface segment but has the subsurface segment where most of the 2,3,7,8-TCDD inventory was measured
		G0000163	Shorter than 2,3,7,8-TCDD profile	X	Missing most of inventory
		G0000168	Shorter than 2,3,7,8-TCDD profile	O	Missing the subsurface segment but has the surface 0- to 0.5-foot segment with a high concentration and where most of the 2,3,7,8-TCDD inventory was measured
		G0000171	Missing surface segment	X	Missing most of inventory
		G0000172	Shorter than 2,3,7,8-TCDD profile	O	Missing the subsurface segment but has the surface 0- to 2.5-foot segment where most of the 2,3,7,8-TCDD inventory was measured
CPG – Low-Resolution Coring Program	2008	CLRC-060	Gaps in profile	O	Missing segment(s) but likely captured most of inventory

Table 8**MPA Analysis: Professional Judgment Cores for Total 4,4'-DDx**

Study	Year	Core ID	Reason Investigated	MPA Analysis	Professional Judgment
JDG –Sediment Sampling (prior to Lister Avenue Phases 1 and 2 Sediment)	2011	HRC-02H	Gaps in profile	O	Missing segment(s) but likely captured most of inventory
		HRC-03H	Gaps in profile	O	Missing segment(s) but likely captured most of inventory
		HRC-04H	Gaps in profile	O	Missing segment(s) but likely captured most of inventory
CPG – Low-Resolution Coring Program Supplemental Sampling Program 2	2013	13B-0533	Shorter than 2,3,7,8-TCDD profile	O	This study sampled to refusal and used co-located coring; shorter profile likely due to co-located core finding refusal at a more shallow depth
		13B-0551	Shorter than 2,3,7,8-TCDD profile	O	This study sampled to refusal and used co-located coring; shorter profile likely due to co-located core finding refusal at a more shallow depth

Notes:

CPG: Cooperating Parties Group

EMBM: Empirical Mass Balance Model

JDG: Joint Defense Group

MPA: mass per unit area

MPI: Malcolm Pirnie Inc.

TCDD: tetrachlorodibenzo-p-dioxin

USEPA: U.S. Environmental Protection Agency

O: included, X: excluded

Table 9
MPA Analysis: Professional Judgment Cores for Mercury

Study	Year	Core ID	Reason Investigated	MPA Analysis	Professional Judgment
Tierra – 1995 Remedial Investigation Sampling Program	1995	284	Shorter than 2,3,7,8-TCDD profile	X	Missing most of inventory
USEPA/MPI – High Resolution Sediment	2005	G0000004-7A	Gaps in profile	X	Unclear if most of inventory was captured due to missing segments
		G0000005-9A	Gaps in profile	O	Missing segment(s) but likely captured most of inventory
		NB01SED036	Shorter than 2,3,7,8-TCDD profile	O	Missing segment(s) but likely captured most of inventory
CPG – Low-Resolution Coring Program	2008	CLRC-061	Shorter than 2,3,7,8-TCDD profile	O	Missing segment(s) but likely captured most of inventory
		CLRC-068	Gaps in profile	O	Missing segment(s) but likely captured most of inventory
CPG – Low-Resolution Coring Program Supplemental Sampling Program 2	2013	13B-0547	Shorter than 2,3,7,8-TCDD profile	O	This study sampled to refusal and used co-located coring; shorter profile likely due to co-located core finding refusal at a more shallow depth

Notes:

CPG: Cooperating Parties Group

MPA: mass per unit area

MPI: Malcolm Pirnie Inc.

TCDD: tetrachlorodibenzo-p-dioxin

USEPA: U.S. Environmental Protection Agency

O: included, X: excluded

Table 10
MPA Analysis: Professional Judgment Cores for HMW PAHs

Study	Year	Core ID	Reason Investigated	MPA Analysis	Professional Judgment
Tierra – 1995 Remedial Investigation Sampling Program	1995	232	Missing surface segment	O	Missing segment(s) but likely captured most of inventory
USEPA/MPI – High Resolution Sediment	2005	G0000004-7A	Gaps in profile	O	Missing segment(s) but likely captured most of inventory
		G0000005-9A	Gaps in profile	O	Missing segment(s) but likely captured most of inventory
		G0000012-29A	Gaps in profile	O	Missing segment(s) but likely captured most of inventory
USEPA/MPI – Low Resolution Sediment Coring Program	2006	G0000022	Gaps in profile	X	Unclear if most of inventory was captured due to missing segments
CPG – Low-Resolution Coring Program	2008	CLRC-061	Gaps in profile	O	Missing segment(s) but likely captured most of inventory
		CLRC-068	Gaps in profile	O	Missing segment(s) but likely captured most of inventory
CPG – River Mile 10.9 Characterization	2011	11B-0307	Gaps in profile	O	Missing segment(s) but likely captured most of inventory
		11B-0320	Gaps in profile	O	Missing segment(s) but likely captured most of inventory
CPG – Low-Resolution Coring Program Supplemental Sampling Program 2	2013	13B-0531	Gaps in profile	X	Missing most of inventory
		13B-0533	Gaps in profile	X	Missing most of inventory
		13B-0547	Shorter than 2,3,7,8-TCDD profile	O	This study sampled to refusal and used co-located coring; shorter profile likely due to co-located core finding refusal at a more shallow depth
		13B-0550	Shorter than 2,3,7,8-TCDD profile	O	This study sampled to refusal and used co-located coring; shorter profile likely due to co-located core finding refusal at a more shallow depth
		13B-0551	Shorter than 2,3,7,8-TCDD profile	O	This study sampled to refusal and used co-located coring; shorter profile likely due to co-located core finding refusal at a more shallow depth
		13B-0552	Shorter than 2,3,7,8-TCDD profile	O	This study sampled to refusal and used co-located coring; shorter profile likely due to co-located core finding refusal at a more shallow depth

Table 10**MPA Analysis: Professional Judgment Cores for HMW PAHs**

Study	Year	Core ID	Reason Investigated	MPA Analysis	Professional Judgment
CPG – Low-Resolution Coring Program Supplemental Sampling Program 2	2013	13B-0553	Shorter than 2,3,7,8-TCDD profile	O	This study sampled to refusal and used co-located coring; shorter profile likely due to co-located core finding refusal at a more shallow depth
		13B-0561	Shorter than 2,3,7,8-TCDD profile	O	Missing segment(s) but likely captured most of inventory.
		13B-0572	Gaps in profile	X	Missing most of inventory

Notes:

CPG: Cooperating Parties Group

EMBM: Empirical Mass Balance Model

HMW PAH: high-molecular-weight polycyclic aromatic hydrocarbon

MPA: mass per unit area

MPI: Malcolm Pirnie Inc.

TCDD: tetrachlorodibenzo-p-dioxin

USEPA: U.S. Environmental Protection Agency

O: included, X: excluded

Table 11
MPA Analysis: Professional Judgment Cores for LMW PAHs

Study	Year	Core ID	Reason Investigated	MPA Analysis	Professional Judgment
Tierra – 1995 Remedial Investigation Sampling Program	1995	232	Missing surface segment	O	Missing segment(s) but likely captured most of inventory
		275	Gaps in profile	O	Missing segment(s) but likely captured most of inventory
USEPA/MPI – High Resolution Sediment	2005	G0000004-7A	Gaps in profile	O	Missing segment(s) but likely captured most of inventory
		G0000005-9A	Gaps in profile	O	Missing segment(s) but likely captured most of inventory
		G0000012-29A	Gaps in profile	O	Missing segment(s) but likely captured most of inventory
USEPA/MPI – Low Resolution Sediment Coring Program	2006	G0000022	Gaps in profile	O	Despite missing segment core has high concentrations
CPG – Low-Resolution Coring Program	2008	CLRC-061	Gaps in profile	O	Missing segment(s) but likely captured most of inventory
		CLRC-068	Gaps in profile	O	Missing segment(s) but likely captured most of inventory
CPG – River Mile 10.9 Characterization	2011	11B-0307	Gaps in profile	O	Missing segment(s) but likely captured most of inventory
		11B-0320	Gaps in profile	O	Missing segment(s) but likely captured most of inventory
CPG – Low-Resolution Coring Program Supplemental Sampling Program 2	2013	13B-0533	Shorter than 2,3,7,8-TCDD profile	O	This study sampled to refusal and used co-located coring; shorter profile likely due to co-located core finding refusal at a more shallow depth
		13B-0547	Shorter than 2,3,7,8-TCDD profile	O	This study sampled to refusal and used co-located coring; shorter profile likely due to co-located core finding refusal at a more shallow depth
		13B-0550	Shorter than 2,3,7,8-TCDD profile	O	This study sampled to refusal and used co-located coring; shorter profile likely due to co-located core finding refusal at a more shallow depth

Table 11
MPA Analysis: Professional Judgment Cores for LMW PAHs

Study	Year	Core ID	Reason Investigated	MPA Analysis	Professional Judgment
CPG – Low-Resolution Coring Program Supplemental Sampling Program 2	2013	13B-0551	Shorter than 2,3,7,8-TCDD profile	O	This study sampled to refusal and used co-located coring; shorter profile likely due to co-located core finding refusal at a more shallow depth
		13B-0552	Shorter than 2,3,7,8-TCDD profile	O	This study sampled to refusal and used co-located coring; shorter profile likely due to co-located core finding refusal at a more shallow depth
		13B-0553	Shorter than 2,3,7,8-TCDD profile	O	This study sampled to refusal and used co-located coring; shorter profile likely due to co-located core finding refusal at a more shallow depth
		13B-0561	Shorter than 2,3,7,8-TCDD profile	O	This study sampled to refusal and used co-located coring; shorter profile likely due to co-located core finding refusal at a more shallow depth
		13B-0572	Gaps in profile	X	Missing most of inventory

Notes:

CPG: Cooperating Parties Group

EMBM: Empirical Mass Balance Model

LMW PAH: low-molecular-weight polycyclic aromatic hydrocarbon

MPA: mass per unit area

MPI: Malcolm Pirnie Inc.

TCDD: tetrachlorodibenzo-p-dioxin

USEPA: U.S. Environmental Protection Agency

O: included, X: excluded

Table 12
Studies with Available Bulk Density Information

Study	Year
Tierra – Newark Bay Phase I/Phase II (NBSA Remedial Investigation)	2005 and 2007
USEPA/MPI – Low-Resolution Sediment Coring Program	2006
CPG – Low-Resolution Coring Program	2008
Tierra – Phase I Geotechnical Assessment	2009
CPG – River Mile 10.9 Characterization	2011
JDG –Sediment Sampling (prior to Lister Avenue Phases 1 and 2 Sediment Removal Action	2011
CPG – Low-Resolution Coring Program Supplemental Sampling Program	2012

Notes:

CPG: Cooperating Parties Group

JDG: Joint Defense Group

MPI: Malcolm Pirnie Inc.

NBSA: Newark Bay Study Area

USEPA: U.S. Environmental Protection Agency

Table 13
Net Sedimentation Rate By Location ID

Location ID	Net Sedimentation Rate (centimeters/year)
213	1.49
214	4.88
217	2.47
222	8.23
223	5.18
225	8.23
227	6.40
228	5.79
230	4.57
231	7.92
232	3.35
234	7.92
235	4.57
236	2.41
237	1.71
238	2.26
239	6.10
240	2.04
241	6.10
242	7.62
243	3.96
245	6.71
248	5.79
249	2.83
251	4.88
252	6.10
253	3.35
254	3.96
255	7.01
256	3.66
257	4.57
258	2.23
259	1.65
260	4.88
268	2.65
270	2.99
271	3.66
272	5.49
273	2.16
274	2.01
275	2.87
276	8.84
277	2.32
278	2.53
283	12.19

Table 13
Net Sedimentation Rate By Location ID

Location ID	Net Sedimentation Rate (centimeters/year)
284	2.07
285	3.66
286	3.96
289	0.94
290	0.98
292	4.57
296	4.88
11B-0310	2.62
11B-0322	2.46
11B-0331	0.24
11B-0342	1.98
11B-0346	0.71
11B-0349	0.56
226A	5.18
A01-SD1	1.70
A02-SD1	0.66
A03-SD1	2.44
B01-SD1	1.70
B02-SD1	1.40
CLRC-021	2.03
CLRC-022	1.35
CLRC-023	4.40
CLRC-024	1.35
CLRC-025	3.05
CLRC-026	0.68
CLRC-027	7.11
CLRC-028	4.40
CLRC-029	0.68
CLRC-030	2.03
CLRC-031	2.03
CLRC-032	3.05
CLRC-033	2.03
CLRC-034	2.02
CLRC-036	4.40
CLRC-037	2.03
CLRC-038	2.03
CLRC-039	3.05
CLRC-040	0.68
CLRC-041	2.03
CLRC-042	1.18
CLRC-043	1.35
CLRC-044	1.13
CLRC-045	0.68
CLRC-047	1.13
CLRC-048	0.58

Table 13
Net Sedimentation Rate By Location ID

Location ID	Net Sedimentation Rate (centimeters/year)
CLRC-050	0.68
CLRC-051	0.40
CLRC-055	0.56
CLRC-056	4.40
CLRC-057	0.68
CLRC-058	0.68
CLRC-060	2.03
CLRC-063	0.68
CLRC-064	0.56
CLRC-065	0.56
CLRC-067	0.68
CLRC-068	1.13
CLRC-069	0.56
CLRC-073	0.68
CLRC-074	4.97
CLRC-076	0.56
CLRC-077	1.35
CLRC-078	3.05
CLRC-082	7.11
CLRC-084	1.35
CLRC-085	1.35
CLRC-087	0.80
CLRC-115	2.03
G0000005-9A	10.08
G0000012-29A	2.30
HRC-02H	3.76
HRC-03H	2.59
HRC-04H	3.02