

**Table 5-3
CCPW Metals Analytical Results in the Unsaturated Soil Zone Compared to IGW Soil Screening Level and Soil Remediation Standards
Forrest Street, Garfield Avenue Group
PPG, Jersey City, New Jersey**

Grid ID (G1)	Location ID (G2)	Location Elevation (ft NAVD88) (G3, G4)	Sample ID (G5, G6)	Depth Interval (ft bgs) (G7)	Sample Start Elevation (ft NAVD88) (G4, G8, G9)	Sample End Elevation (ft NAVD88) (G4, G10)	Lab ID (G11)	Lab SDG (G11)	Date Collected (G12)	Sample Status (G13, G14)	Sample Type (G15)	Validated (Y/N) (G16)	ANTIMONY 7440-36-0 mg/kg N/A IGWSRS-GAG 62.7		CHROMIUM 7440-47-3 mg/kg N/A N/A		NICKEL 7440-02-0 mg/kg N/A 170		THALLIUM 7440-28-0 mg/kg 3 N/A		VANADIUM 7440-62-2 mg/kg N/A N/A		Specific Notes			
													Result (G17, G18)	Qualifier (G19, G20)	Result (G17, G18)	Qualifier (G19, G20)	Result (G17, G18)	Qualifier (G19, G20)	Result (G17, G18)	Qualifier (G19, G20)	Result (G17, G18)	Qualifier (G19, G20)				
AA11B	EF-06	10.3	EF-B06-2.5	2.5 - 3.0 ft	7.8	7.3	460-25254-12	460252541	04/12/2011	remaining	N	Y		4.3	J		334		27.0		< 1.2	U		51.5		S1
BB11B	EF-111A	10.4	EF-111A-0.4-0.9	0.4 - 0.9 ft	10.0	9.5	JB98041-3A	JB98041A	06/27/2015	remaining	N	Y		1.3	J		59.4		21.0		< 1.2	U		18.3		S1
BB11B	EF-111A	10.4	EF-111A-2.0-2.5	2.0 - 2.5 ft	8.4	7.9	JB98041-4A	JB98041A	06/27/2015	remaining	N	Y		< 0.35	UJ		23.3		12.9		0.35	J		49.8		S1
BB11B	EF-111A	10.4	EF-111A-3.0-3.5	3.0 - 3.5 ft	7.4	6.9	JB98041-5A	JB98041A	06/27/2015	remaining	N	Y		< 0.32	UJ		16.1		15.2		0.72	J		19.3		S1
BB11B	FS3	10.1	FS3-1.0-1.5	1.0 - 1.5 ft	9.1	8.6	JB62507-1A	JB62507A	03/20/2014	remaining	N	Y		< 0.31	UJ		18.2		12.4		< 0.38	U		15.0		S1
BB11B	FS3	10.1	FS3-3.0-3.5	3.0 - 3.5 ft	7.1	6.6	JB62507-2A	JB62507A	03/20/2014	remaining	N	Y		0.51	J		14.4		15.5		< 0.30	U		18.0		S1
BB11B	FS3	10.1	FS3-3.0-3.5X	3.0 - 3.5 ft	7.1	6.6	JB62507-3A	JB62507A	03/20/2014	remaining	FD	Y		0.35	J		13.2		14.6		0.41	J		16.8		S1
BB11B	FS4	10.1	FS4-1.0-1.5	1.0 - 1.5 ft	9.1	8.6	JB62666-1A	JB62666A	03/21/2014	remaining	N	Y		1.2	J		158		19.4		0.67	J		20.2		S1
BB11B	FS4	10.1	FS4-3.0-3.5	3.0 - 3.5 ft	7.1	6.6	JB62666-2A	JB62666A	03/21/2014	remaining	N	Y		0.85	J		13.4		14.4		< 0.36	U		19.0		S1
BB11B	FS4	10.1	FS4-3.0-3.5X	3.0 - 3.5 ft	7.1	6.6	JB62666-3A	JB62666A	03/21/2014	remaining	FD	Y		1.1	J		14.2		15.7		< 0.39	U		19.1		S1
CC10B	P4-FOR-CC10B	10.7	P4-FOR-CC10B-3.0-3.5	3.0 - 3.5 ft	7.7	7.2	JC22855-5A	JC22855A	06/23/2016	remaining	N	Y		< 0.35	UJ		16.9		8.9		< 0.47	U		18.2		S1
CC11B	EF-110A	11.1	EF110A-0.8-1.3	0.8 - 1.3 ft	10.3	9.8	JB97556-3A	JB97556A	06/20/2015	remaining	N	Y		1.4	J		16.1		23.2		< 1.1	U		17.7		S1
CC11B	EF-110A	11.1	EF110A-2.0-2.5	2.0 - 2.5 ft	9.1	8.6	JB97556-4A	JB97556A	06/20/2015	remaining	N	Y		< 0.36	U		16.4		14.7		< 0.22	U		24.4		S1
CC11B	EF-110A	11.1	EF110A-3.0-3.5	3.0 - 3.5 ft	8.1	7.6	JB97556-5A	JB97556A	06/20/2015	remaining	N	Y		< 0.38	U		16.5		14.6		< 0.23	U		27.1		S1
DD10B	FS23	11.3	FS23-2.0-2.5	2.0 - 2.5 ft	9.3	8.8	JB98947-2A	JB98947A	07/11/2015	remaining	N	Y		< 0.38	UJ		16.2		16.7		0.72	J		20.1		
DD10B	FS23	11.3	FS23-2.0-2.5X	2.0 - 2.5 ft	9.3	8.8	JB98947-3A	JB98947A	07/11/2015	remaining	FD	Y		< 0.39	UJ		16.6		16.7		0.58	J		19.8		
DD10B	FS23	11.3	FS23-3.0-3.5	3.0 - 3.5 ft	8.3	7.8	JB98947-4A	JB98947A	07/11/2015	remaining	N	Y		< 0.31	UJ		14.9		15.8		0.41	J		20.1		
FF9B	P4-FOR-FF9B	12.2	P4-FOR-FF9B-1.0-1.5	1.0 - 1.5 ft	11.2	10.7	JC22855-9A	JC22855A	06/23/2016	remaining	N	Y		< 0.30	UJ		111		26.4		< 8.1	U		29.4	J	S2
FF9B	P4-FOR-FF9B	12.2	P4-FOR-FF9B-3.0-3.5	3.0 - 3.5 ft	9.2	8.7	JC22855-12A	JC22855A	06/23/2016	remaining	N	Y		< 0.35	UJ		23.2		18.6		< 0.48	U		19.6		S2
FF9B	P4-FOR-FF9B	12.2	P4-FOR-FF9B-3.0-3.5X	3.0 - 3.5 ft	9.2	8.7	JC22855-13A	JC22855A	06/23/2016	remaining	FD	Y		< 0.33	UJ		20.7		20.1		< 0.45	U		20.6		S2
FF9B	P4-FOR-FF9B	12.2	P4-FOR-FF9B-5.0-5.5	5.0 - 5.5 ft	7.2	6.7	JC22855-14A	JC22855A	06/23/2016	remaining	N	Y		< 0.36	UJ		167		28.2		< 0.49	U		46.7		S2
GG8B	P4-FOR-GG8B	12.9	P4-FOR-GG8B-2.5-3.0	2.5 - 3.0 ft	10.4	9.9	JC22963-2	JC22963	06/24/2016	remaining	N	Y												12.8		
GG9B	P4-FOR-GG9B	13.1	P4-FOR-GG9B-2.5-3.0	2.5 - 3.0 ft	10.6	10.1	JC22963-1	JC22963	06/24/2016	remaining	N	Y												23.8		
HH8B	EF-07	13.3	EF-B07-2.5	2.5 - 3.0 ft	10.8	10.3	460-25301-13	460253011	04/13/2011	remaining	N	Y												234		
HH8B	EF-07	13.3	EF-B07-6.0	6.0 - 6.5 ft	7.3	6.8	460-25350-1	460253501	04/14/2011	remaining	N	Y												20.4		
HH8B	P4-FOR-HH8B	13.4	P4-FOR-HH8B-2.5-3.0	2.5 - 3.0 ft	10.9	10.4	JC23102-3	JC23102	06/27/2016	remaining	N	Y												34.0		
HH9B	EF-109	13.5	EF-B109-1.0-1.5	1.0 - 1.5 ft	12.5	12.0	JB15988-14	JB15988	09/11/2012	remaining	N	Y		1.0	J				15.4							
HH9B	P4-FOR-HH9B	14.1	P4-FOR-HH9B-2.5-3.0	2.5 - 3.0 ft	11.6	11.1	JC23102-4	JC23102	06/28/2016	remaining	N	Y												23.8		
Y11B	FS16	10.1	FS16-3.0-3.5	3.0 - 3.5 ft	7.1	6.6	JB63591-3A	JB63591A	04/02/2014	remaining	N	Y		< 0.34	UJ		59.0		17.0		< 0.52	U		24.5		S1
Y12B	P4-FOR-Y12B	10.5	P4-FOR-Y12B-0.5-1.0	0.5 - 1.0 ft	9.9	9.4	JC22855-17A	JC22855A	06/23/2016	remaining	N	Y		0.44	J		1090		92.1		0.83	J		129		S3
Y12B	P4-FOR-Y12B	10.5	P4-FOR-Y12B-2.0-2.5	2.0 - 2.5 ft	8.4	7.9	JC22855-18A	JC22855A	06/23/2016	remaining	N	Y		0.83	J		422		51.3		< 0.93	U		31.7		S3
Y12B	P4-FOR-Y12BR	10.5	P4-FOR-Y12BR-0.5-1.0	0.5 - 1.0 ft	9.9	9.4	JC23104-12A	JC23104A	06/28/2016	remaining	N	Y		0.96	J		564		53.2		< 0.48	U		84.6		S3

Table 5-3
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ABBREVIATIONS:

bgs - below ground surface
CAS RN - Chemical Abstracts Service Registry Number
CCPW - Chromate Chemical Production Waste
Cr⁺⁶ - hexavalent chromium
CrSCC - Chromium Soil Cleanup Criteria
DIGWSSL - Default Impact to Groundwater Soil Screening Level
El. - elevation
FD - field duplicate sample type
Forrest RAWP - March 2018 *Interim Remedial Action Work Plan, Forrest Street and Forrest Street Properties Deferred Remediation Areas* (AECOM)
ft - feet
HDPE - high-density polyethylene
IGW - Impact to Groundwater
IGWSRS-GAG - Impact to Groundwater Soil Remediation Standard - Garfield Avenue Group (alternative remediation standard as proposed in the *Supplemental Soil Remedial Investigation Report, Final (Revision 1)*, dated August 30, 2018 and approved by NJDEP on October 22, 2018)
mg/kg - milligrams per kilogram
N - normal sample type
NAVD88 - North American Vertical Datum of 1988
NJDEP - New Jersey Department of Environmental Protection
N/A - not applicable
SDG - sample delivery group
U.S. - United States

QUALIFIERS:

J - The result was an estimated value; the associated numerical value was an approximate concentration of the analyte in the sample.
U - The analyte was not detected above the sample reporting limit shown.
UJ - The analyte was not detected above the sample reporting limit shown and the reporting limit was approximate.

GENERAL NOTES:

G1. "Grid ID" refers to an area, typically 30 ft by 30 ft, identified as Grid Row V through HH (extending west to east) and Grid Column 7B through 12B (extending from south to north).
G2. "Location ID" refers to the location name where samples were collected.
G3. "Location Elevation" refers to the pre-remediation surface elevation for samples collected from the pit bottom, and the surface elevation of the sample location when the sample was collected via boring or test pit.
G4. Elevation vertical datum is NAVD88, in U.S. survey ft.
G5. "Sample ID" refers to the name of a sample collected at a given location and is unique to the depth of the sample collected. The depth listed in the Sample ID may not necessarily correspond to the actual sample depth interval due to corrections made as a result of post-field work review of surveyed surface elevations and/or boring logs. In some cases, the "Sample ID" in the table is a variant of the sample ID in the laboratory report and/or data validation report. In these cases, the "Lab ID" associates the sample results to the laboratory report and/or data validation report.
G6. This table compares sample results from the unsaturated zone to the DIGWSSL and the IGWSRS-GAGs. The groundwater elevation (above which is the unsaturated zone) on this Site was estimated as the 50th percentile groundwater elevation from seven monitoring wells located on or adjacent to Forrest Street gauged between December 2003 and December 2016. The monitoring well locations and data are included in Appendix A. The estimated groundwater elevation for this Site is El. 6.3 ft NAVD88.
G7. "Depth Interval" is based on the "Location Elevation."
G8. "Sample Start Elevation" refers to the start of the sample interval. There may be up to 0.1 ft variation between the listed Sample Start Elevation and the elevation calculated using the Location Elevation and Depth Interval due to rounding of the numbers.
G9. In some grids, there may be up to 0.1 ft variation between the sample start elevation of the pit bottom or sidewall sample and the post-excavation elevation survey point due to rounding of the numbers.
G10. "Sample End Elevation" refers to the end of the sample interval. There may be up to 0.1 ft variation between the listed Sample End Elevation and the elevation calculated using the Location Elevation and Depth Interval due to rounding of the numbers.
G11. "Lab ID" refers to the identification number assigned to the sample by the analytical laboratory performing the sample analysis. "Lab SDG" refers to the delivery group number assigned to the sample by the analytical laboratory.
G12. "Date Collected" refers to the date the soil sample was collected.
G13. "Sample Status" of "remaining" indicates the soil in that interval is outside the excavation footprint, and remains in-place at that location.
G14. The post-excavation survey points and 1-ft post-excavation contours representing the as-built terminal excavation elevations are provided on Figure 5-3.
G15. "Sample Type" indicates whether the sample type is normal (N) or a field duplicate (FD).
G16. "Y" indicates that a sample underwent data validation and "N" indicates that data validation was not conducted.
G17. "Result" refers to the analytical result which is reported in mg/kg. A blank entry indicates that the sample was not tested for that analyte.
G18. Bold text indicates that the result exceeds the DIGWSSL or the IGWSRS-GAG. Non-bold text indicates that the result does not exceed the DIGWSSL or the IGWSRS-GAG.
G19. "Qualifier" refers to the data qualifier assigned by the data validation team reviewing the data from the laboratory for validated data. For unvalidated data, it refers to the qualifier assigned by the laboratory.
G20. Non-detect results are shown on this table using the Method Detection Limit, if available; otherwise they are shown at the Reporting Limit.

SPECIFIC NOTES:

S1. This sample is remaining in place within the Forrest Street Utility Offset, which is being addressed via engineering controls (HDPE Liner) and institutional controls (notice in lieu of deed notice), as appropriate for the abutting Forrest Street Properties' current use, as described in the Forrest RAWP.

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S2. In Grid FF9B, the thallium concentration in sample P4-FOR-FF9B-1.0-1.5 was not detected, but the reporting limit was greater than the DIGWSSL. If thallium were present, it would be expected to be co-located with Cr⁺⁶ or other CCPW constituents. Hexavalent chromium was not detected at concentrations greater than the CrSCC (Table 5-1), CCPW metals were not detected at concentrations greater than the DIGWSSLs or the IGWSRS-GAGs, and visual CCPW was not observed at this location. Detected thallium results did not exceed the DIGWSSL within the northeastern portion of Site 114 as presented in AECOM's February 2012 *Remedial Investigation Report – Soil, Garfield Avenue Group Non-Residential Chromate Chemical Production Waste Sites 114, 132, 133, 135, 137, 143 and 186, Jersey City, New Jersey*, approved by NJDEP on March 13, 2012, or in the eastern end of Forrest Street (where remedial excavation was not required), indicating that elevated thallium concentrations associated with Site 114 CCPW are not present in this area. Additional samples from the same boring location (P4-FOR-FF9B) had detection limits low enough to demonstrate compliance with the DIGWSSL. Additionally, laboratory report JC22855A states that the thallium detection limit for sample P4-FOR-FF9B-1.0-1.5 was elevated due to dilution required for high interfering element. Based on these lines of evidence, there is no indication that thallium remains in place in Forrest Street at concentrations greater than the DIGWSSL.

S3. This sample is remaining in place within the 100 Forrest Street Loading Dock Driveway, which is being addressed via engineering controls (Existing Asphalt and Concrete Cap) and institutional controls (notice in lieu of deed notice), as appropriate for the abutting Forrest Street Properties' current use, as described in the Forrest RAWP.