Table 2-3
Cr^{+6} and Chromium Analytical Results for Concrete Compared to Chromium Soil Cleanup Criteria
Forrest Current-Use Remediation Areas, Garfield Avenue Group
PPG, Jersey City, New Jersey

												Analyte CAS RN RDCSRS CrSCC Units	CHROMIUM 7440-47-3 120000 N/A mg/kg		CHROMIUM (HEXAVALENT) 18540-29-9 N/A 20 mg/kg		
Grid ID (G1)	Location ID (G2)	Location Elevation (ft NAVD88) (G3, G4)	Sample ID (G5)	Depth Interval (ft bgs) (G6)	Sample Start Elevation (ft NAVD88)	Sample End Elevation (ft NAVD88)	Lab ID (G9)	Lab SDG (G9)	Date Collected (G10)	Sample Status (G11)	Sample Type (G12)	Validated (Y/N) (G13)	Result (G14, G15)	Qualifier (G16, G17, G18)	Result (G14, G15)	Qualifier (G16, G17)	Specific Notes
AA12B	114-98F-IRM-E		114-98F-IRM-20140714-E				JB71607-3	JB71607	07/14/2014	remaining	N	Y			1.5	J	**S1, S2**
AA12B	114-98F-IRM-E		114-98F-IRM-20140714-E				JB71607-3A	JB71607A	07/14/2014	remaining	N	Y	24.5				**S1, S2**
AA12B	114-98F-IRM-W		114-98F-IRM-20140714-W				JB71607-2	JB71607	07/14/2014	remaining	N	Y			1.2	J	**S1, S2**
AA12B	114-98F-IRM-W		114-98F-IRM-20140714-W				JB71607-2A	JB71607A	07/14/2014	remaining	N	Y	10.9				**S1, S2**
BB14B	FS21	10.4	FS21-CT	0.0 - 0.3	10.4	10.1	JB96227-27	JB96227	06/04/2015	remaining	N	Y			**323**		**S1, S3**
BB14B	FS21	10.4	FS21-CT	0.0 - 0.3	10.4	10.1	JB96227-27A	JB96227A	06/04/2015	remaining	N	Y	374				**S1**
BB14B	FS21	10.4	FS21-CB	0.3 - 0.5	10.1	9.9	JB96227-28	JB96227	06/04/2015	remaining	N	Y			0.78		**S1**
BB14B	FS21	10.4	FS21-CB	0.3 - 0.5	10.1	9.9	JB96227-28A	JB96227A	06/04/2015	remaining	N	Y	14.1				**S1**
CC14B	FS-CH-West		FS-CH-WEST-1				460-63481-4	460634811	09/23/2013	remaining	N	Y			**26.6**	J	**S4, S5**
CC14B	FS-CH-West		FS-CH-WEST-1-X				460-63481-5	460634811	09/23/2013	remaining	FD	Y			15.1	J	**S4**
DD13B	FS-CH-South		FS-CH-SOUTH-1				460-63481-2	460634811	09/23/2013	remaining	N	Y			**789**	J	**S4, S5**
DD14B	FS-CH-East		FS-CH-EAST-1				460-63481-3	460634811	09/23/2013	remaining	N	Y			2.9	J	**S4**
DD14B	FSI1A	3.4	FSI1A-CT	0.0 - 0.1	3.4	3.3	JB64216-3	JB64216	04/09/2014	remaining	N	Y			1.0	J	**S4**
DD14B	FSI1A	3.4	FSI1A-CT	0.0 - 0.1	3.4	3.3	JB64216-3A	JB64216A	04/09/2014	remaining	N	Y	13.5				**S4**
DD14B	FSI1A	3.4	FSI1A-CB	0.1 - 0.2	3.3	3.2	JB64216-4	JB64216	04/09/2014	remaining	N	Y			1.5	J	**S4**
DD14B	FSI1A	3.4	FSI1A-CB	0.1 - 0.2	3.3	3.2	JB64216-4A	JB64216A	04/09/2014	remaining	N	Y	11.6				**S4**
DD14B	FSI1B	3.4	FSI1B-CT	0.0 - 0.1	3.4	3.3	JB64216-5	JB64216	04/09/2014	remaining	N	Y			0.73	J	**S4**
DD14B	FSI1B	3.4	FSI1B-CT	0.0 - 0.1	3.4	3.3	JB64216-5A	JB64216A	04/09/2014	remaining	N	Y	20.6				**S4**
DD14B	FSI1B	3.4	FSI1B-CB	0.3 - 0.4	3.1	3	JB64216-6	JB64216	04/09/2014	remaining	N	Y			0.38	J	**S4**
DD14B	FSI1B	3.4	FSI1B-CB	0.3 - 0.4	3.1	3	JB64216-6A	JB64216A	04/09/2014	remaining	N	Y	10.7				**S4**
DD14B	FSI2	3.4	FSI2-CT	0.0 - 0.1	3.4	3.3	JB64216-9	JB64216	04/09/2014	remaining	N	Y			11.4	J	**S4**
DD14B	FSI2	3.4	FSI2-CT	0.0 - 0.1	3.4	3.3	JB64216-9A	JB64216A	04/09/2014	remaining	N	Y	48.2				**S4**
DD14B	FSI2	3.4	FSI2-CM	0.2 - 0.3	3.2	3.1	JB64216-10	JB64216	04/09/2014	remaining	N	Y			**21.8**	J	**S4, S5**
DD14B	FSI2	3.4	FSI2-CM	0.2 - 0.3	3.2	3.1	JB64216-10A	JB64216A	04/09/2014	remaining	N	Y	68.7				**S4**
DD15B	FS-CH-North		FS-CH-NORTH-1				460-63481-1	460634811	09/23/2013	remaining	N	Y			**155**	J	**S4, S5**
DD15B	FSI1	3.6	FSI1-CT	0.0 - 0.1	3.6	3.5	JB64216-1	JB64216	04/09/2014	remaining	N	Y			0.94	J	**S4**
DD15B	FSI1	3.6	FSI1-CT	0.0 - 0.1	3.6	3.5	JB64216-1A	JB64216A	04/09/2014	remaining	N	Y	8.3				**S4**
DD15B	FSI1	3.6	FSI1-CB	0.4 - 0.5	3.2	3.1	JB64216-2	JB64216	04/09/2014	remaining	N	Y			0.50	J	**S4**
DD15B	FSI1	3.6	FSI1-CB	0.4 - 0.5	3.2	3.1	JB64216-2A	JB64216A	04/09/2014	remaining	N	Y	8.1				**S4**
DD15B	FSI1C	3.5	FSI1C-CT	0.0 - 0.1	3.5	3.4	JB64216-7	JB64216	04/09/2014	remaining	N	Y			1.2	J	**S4**
DD15B	FSI1C	3.5	FSI1C-CT	0.0 - 0.1	3.5	3.4	JB64216-7A	JB64216A	04/09/2014	remaining	N	Y	10.6				**S4**
DD15B	FSI1C	3.5	FSI1C-CB	0.3 - 0.4	3.2	3.1	JB64216-8	JB64216	04/09/2014	remaining	N	Y			0.76	J	**S4**
DD15B	FSI1C	3.5	FSI1C-CB	0.3 - 0.4	3.2	3.1	JB64216-8A	JB64216A	04/09/2014	remaining	N	Y	5.8				**S4**
FF12B	90 FORREST-2015-Q2		90 FORREST-2015-Q2				JB97861-1	JB97861	06/24/2015	remaining	N	Y			**65.0**		**S6, S7**
FF12B	90 FORREST-2015-Q2		90 FORREST-2015-Q2				JB97861-1A	JB97861A	06/24/2015	remaining	N	Y	192				**S6**
GG12B	114-90F-IRM-20140714		114-90F-IRM-20140714				JB71607-1	JB71607	07/14/2014	remaining	N	Y			**44.6**	RA	**S6, S7**
GG12B	114-90F-IRM-20140714		114-90F-IRM-20140714				JB71607-1A	JB71607A	07/14/2014	remaining	N	Y	127				**S6**
Y14B	FS19	10.2	FS-CC19-0.0-0.5	0.0 - 0.5	10.2	9.7	JB48426-1R	JB48426R	09/25/2013	remaining	N	Y			2.6	J	**S1**

Table 2-3
Cr^{+6} and Chromium Analytical Results for Concrete Compared to Chromium Soil Cleanup Criteria
Forrest Current-Use Remediation Areas, Garfield Avenue Group
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ABBREVIATIONS:
bgs - below ground surface
CAS RN - Chemical Abstracts Service Registry Number
Cr - chromium
Cr^{+3} - trivalent chromium
Cr^{+6} - hexavalent chromium
CrSCC - Chromium Soil Cleanup Criteria
FD - field duplicate sample type
ft - feet
HDPE - high-density polyethylene
IRM - Interim Remedial Measure
mg/kg - milligrams per kilogram
N - normal sample type
NAVD88 - North American Vertical Datum of 1988
NJDEP - New Jersey Department of Environmental Protection
RDCSRS - Residential Direct Contact Soil Cleanup Criteria
SCC - Soil Cleanup Criteria
SDG - sample delivery group
SRS - Soil Remediation Standard

QUALIFIERS:
J - The result was an estimated value; the associated numerical value was an approximate concentration of the analyte in the sample.
RA - The result was rejected due to deficiencies but is considered usable for decision-making purposes.

GENERAL NOTES:
G1. “Grid ID” refers to an area, typically 30 ft by 30 ft, identified as Grid Row W through HH (extending west to east) and Grid Column 10B through 17B (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. “Depth Interval” is based on the “Location Elevation.”
G7. “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.
G8. “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.
G9. “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.
G10. “Date Collected” refers to the date the sample was collected.
G11. “Sample Status” indicates whether a sample is remaining or removed:
- “Remaining” indicates that the sample remains in-place at that location; and
- “Removed” indicates the sample was removed during excavation.
G12. “Sample Type” indicates whether the sample type is normal (N) or a field duplicate (FD).
G13. “Y” indicates that a sample underwent data validation and “N” indicates that data validation was not conducted.
G14. “Result” refers to the analytical result which is reported in mg/kg.
G15. Bold text indicates that the result exceeds the CrSCC or RDCSRS. Non-bold text indicates that the result does not exceed the CrSCC or RDCSRS. Note that there are no Cr cleanup criteria or remediation standards for concrete, so the results are being compared to the CrSCC and RDCSRS.
G16. “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.
G17. Non-detect results are shown on this table using the Method Detection Limit, if available; otherwise they are shown at the Reporting Limit.
G18. There is currently no NJDEP SRS and no NJDEP SCC for total Cr. Therefore, total Cr results are compared to the NJDEP Residential SCC for Cr^{+3} of 120,000 mg/kg as the cleanup criteria for soil at the Garfield Avenue Group Sites. There is no non-residential SCC for Cr^{+3}. Bold values indicate a result that exceeds the NJDEP Residential SCC.

SPECIFIC NOTES:
S1. This sample is remaining in place within the 98/100 Forrest Street Building Footprint.

S2. This sample was collected from the interior of the garage door entrance of the 98 Forrest Street Building at the request of NJDEP based on the observation of a yellow-green coloration in this area. As described in the technical memorandum entitled *PPG 90 and 98 Forrest Street Building Inspection*, dated September 18, 2014 (AECOM, 2014), this area is not considered an IRM since the Cr^{+6} results were less than 20 mg/kg, and the area was not recommended for future inspections. The yellow-green coloration observed in this area is not chromium related.

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Cr^{+6} and Chromium Analytical Results in Concrete Compared to Chromium Soil Cleanup Criteria
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S3. This sample is remaining in place within the 98/100 Forrest Street Building Footprint with a Cr^{+6} concentration greater than 20 mg/kg. Green staining was observed below the surface of the concrete slab in this concrete core sample, but no chromium blooming was observed. For the current–use remediation, this sample is being addressed via engineering controls (98/100 Forrest Street Existing Concrete Cap). For future residential-use remediation, this sample will be removed during future building demolition per the *Conceptual Future Residential-Use Remedial Excavation Plan*, provided in Appendix M.

S4. This sample is remaining in place within the 90 Forrest Street Boiler Room Basement.

S5. This sample is remaining in place within the 90 Forrest Street Boiler Room Basement with a Cr^{+6} concentration greater than 20 mg/kg. For the current-use remediation, this sample is being addressed via engineering controls (90 Forrest Street Boiler Room Engineering Control, consisting of an HDPE dimpled membrane, drainage system, and epoxy coating) and institutional controls (deed notice). For the future residential-use remediation, the sample will be removed during future building demolition per the *Conceptual Future Residential-Use Remedial Excavation Plan* provided as Appendix M.

S6. This sample is remaining in place within the 84 Forrest Street Building Footprint and Loading Dock.

S7. This sample is remaining in place within the 84 Forrest Building Footprint and Loading Dock with a Cr^{+6} concentration greater than 20 mg/kg. For the current-use remediation, this sample is being addressed via engineering controls (84 Forrest Street Engineering Control, consisting of a new concrete block wall, an HDPE liner between the new and existing concrete block wall, an epoxy material, a protective wearing surface, and dock bumpers) and institutional controls (deed notice). For the future residential-use remediation, the sample will be removed during future building demolition per the *Conceptual Future Residential-Use Remedial Excavation Plan,* provided in Appendix M.