

Attachment 7

Synthetic Precipitation Leaching Procedure Calculations



State of New Jersey

DEPARTMENT OF ENVIRONMENTAL PROTECTION
Site Remediation and Waste Management Program
DIVISION OF ENFORCEMENT, TECHNICAL & FINANCIAL SUPPORT
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PHIL MURPHY
Governor

CATHERINE MCCABE
Commissioner

SHEILA OLIVER
Lt. Governor

MEMORANDUM

TO: *David Doyle, Case Manager, Remediation Oversight Element*

FROM: *Erica Snyder, Research Scientist, BEERA/ETRA*

SUBJECT: *Hudson County Chrome Site 16
45 Linden Avenue
Jersey City, Hudson County
Alternative Soil Remediation Standards for Vanadium and Nickel
PI# G000008644*

DATE: *May 29, 2020*

ETRA has evaluated the Alternative or New Soil Remediation Standard (ARS) Application Form (received May 7, 2020) submitted to the Department for the above Hudson County Chrome Site 16. The property is under direct oversight and does not have a Licensed Site Remediation Professional (LSRP) assigned to the site. ARS were requested for vanadium, based on the ingestion-dermal pathway, and nickel, based on the impact to ground water (IGW) pathway. See comments for each contaminant below.

Vanadium

The submittal requested that an ARS for vanadium of 390 mg/kg for residential use is appropriate based on updated toxicity information found in EPA's *Integrated Risk Information System (IRIS)* and recorded in EPA's *Regional Screening Level (RSL) Tables (November 2020)*. The concentration of vanadium on site ranged up to 87.6 mg/kg, which exceeds the current vanadium residential standard (78 mg/kg). The submittal has been reviewed and an ARS for vanadium of 390 mg/kg for residential use is approved on a site-specific basis using DEP standard exposure assumptions.

Nickel

The Synthetic Precipitation Leaching Procedure (SPLP) spreadsheet included with the submission was reviewed, and provided that the sampling is representative of the Area of



New Jersey Department of Environmental Protection
Site Remediation and Waste Management Program

**ALTERNATIVE OR NEW REMEDIATION STANDARD
 AND/OR SCREENING LEVEL APPLICATION FORM**

Date Stamp
 (For Department use only)

NOTE: This form shall be completed for all contaminants for which a direct contact exposure pathway alternative or new remediation standard, alternative impact to ground water soil remediation standard, alternative vapor intrusion screening level, ecological risk-based remediation goal, and/or ecological risk management decision goal is being implemented and/or requested for a site or area of concern. The form shall be used regardless of whether Department pre-approval is required.

SECTION A. SITE NAME AND LOCATION

Site Name: Hudson County Chrome Site 16

List all AKAs: _____

Street Address: 45 Linden Avenue

Municipality: Jersey City (Township, Borough or City)

County: Hudson Zip Code: 07305

Program Interest (PI) Number(s): G000008644

Case Tracking Number(s): _____

SECTION B. REMEDIATION STANDARD NOTIFICATION SPREADSHEET

Complete and attach the Remediation Standard Notification Spreadsheet which can be found at:
<http://www.nj.gov/dep/srp/srra/forms/>. This form will not be processed by the NJDEP if the spreadsheet is not attached.

SECTION C. PURPOSE FOR SUBMISSION

Pre-Approval Required:

- Ingestion/Dermal Alternative Soil Remediation Standard
- Inhalation Alternative Soil Remediation Standard
 (New Toxicity Data, New Modeling, etc.)
- Development of New Remediation Standard
- Ecological Risk Based Remediation Goal
- Ecological Risk Management Decision Goal

No Pre-Approval Required:

- Inhalation Alternative Soil Remediation Standard
 (Calculation Spreadsheet)
- Impact to Groundwater Alternative Soil Remediation Standard
- Vapor Intrusion Alternative Screening Level
- Development of New Vapor Intrusion Screening Level

SECTION D. PERSON RESPONSIBLE FOR CONDUCTING THE REMEDIATION INFORMATION AND CERTIFICATION

Full Legal Name of the Person Responsible for Conducting the Remediation: PPG

Representative First Name: Mark Representative Last Name: Terril

Title: Corporate Director, Environmental Affairs

Phone Number: (412) 434-2708 Ext: _____ Fax: _____

Mailing Address: One PPG Place

City/Town: Pittsburgh State: PA Zip Code: 15272

Email Address: terril@ppg.com

This certification shall be signed by the person responsible for conducting the remediation who is submitting this notification in accordance with Administrative Requirements for the Remediation of Contaminated Sites rule at N.J.A.C. 7:26C-1.5(a).

I certify under penalty of law that I have personally examined and am familiar with the information submitted herein, including all attached documents, and that based on my inquiry of those individuals immediately responsible for obtaining the information, to the best of my knowledge, I believe that the submitted information is true, accurate and complete. I am aware that there are significant civil penalties for knowingly submitting false, inaccurate or incomplete information and that I am committing a crime of the fourth degree if I make a written false statement which I do not believe to be true. I am also aware that if I knowingly direct or authorize the violation of any statute, I am personally liable for the penalties.

Signature: Mark E Terril Date: February 26, 2020

Name/Title: Mark E. Terril/Corporate Director, Environmental Affairs

SECTION E. LICENSED SITE REMEDIATION PROFESSIONAL INFORMATION AND STATEMENT

LSRP ID Number: _____

First Name: _____ Last Name: _____

Phone Numbers: _____ Ext.: _____ Fax: _____

Mailing Address: _____

Municipality: _____ State: _____ Zip Code: _____

Email Address: _____

This statement shall be signed by the LSRP who is submitting this notification in accordance with N.J.S.A. 58:10C-14, and N.J.S.A. 58:10B-1.3b(1) and (2).

(1) I certify, as a Licensed Site Remediation Professional authorized pursuant to N.J.S.A. 58:10C-1 et seq. to conduct business in New Jersey, that for the remediation described in this submission, and all attachments included in this submission, I personally: Managed, supervised, or performed the remediation conducted at this site that is described in this submission, and all attachments included in this submission; and/or periodically reviewed and evaluated the work performed by other persons that forms the basis for the information in this submission; and/or completed the work of another site remediation professional, licensed or not, after having: (1) reviewed all available documentation on which I relied; (2) conducted a site visit and observed the then-current conditions and verified the status of as much of the work as was reasonably observable; and (3) concluded, in the exercise of my independent professional judgment, that there was sufficient information upon which to complete any additional phase of remediation and prepare workplans and reports related thereto.

(2) I certify:

- That I have read this submission and all attachments to this submission;
- That in performing the professional services as the licensed site remediation professional for the entire site or each area of concern, I adhered to the professional conduct standards and requirements governing licensed site remediation professionals provided in N.J.S.A. 58:10C-16;
- That the remediation conducted at the entire site or each area of concern, that is described in this submission and all attachments to this submission, was conducted pursuant to and in compliance with the remediation requirements in N.J.S.A. 58:10C-14.c;
- That the remediation described in this submission, and all attachments to this submission, was conducted pursuant to and in compliance with the regulations of the Site Remediation Professional Licensing Board at N.J.A.C. 7:26I; and
- That the information contained in this submission and all attachments to this submission is true, accurate, and complete.

(3) I certify, when this submission includes a response action outcome, that the entire site or each area of concern has been remediated in compliance with all applicable statutes, rules, and regulations and is protective of public health and safety and the environment.

(4) I certify that no other person is authorized or able to use any password, encryption method, or electronic signature that the Board or the Department have provided to me.

(5) I certify that I understand and acknowledge that:

- If I knowingly make a false statement, representation, or certification in any document or information I submit to the Department I may be subject to civil and administrative enforcement pursuant to N.J.S.A. 58:10C-17.a.1(a) through (f) by the Board, including but not limited to license suspension, revocation, or denial of renewal; and
- If I purposely, knowingly, or recklessly make a false statement, representation, or certification in any application, form, record, document or other information submitted to the Department or required to be maintained pursuant to the Site Remediation Reform Act, I shall be guilty, upon conviction, of a crime of the third degree and shall, notwithstanding the provisions of subsection b. of N.J.S.2C:43-3, be subject to a fine of not less than \$5,000 nor more than \$75,000 per day of violation, or by imprisonment, or both.

(6) I certify that I have read this certification prior to signing, certifying, and making this submission.

LSRP Signature: _____

Date: _____

LSRP Name: _____

Company Name: _____

NJDEP SPLP Spreadsheet, V3.1, November 2013

Case name/area of concern: PPG Site 16
 Case number: G00000791
 Sampling date: 12/20/2012

Contaminant: Nickel (total)
 CAS No: 7440-02-0
 Water solubility (mg/L): NA
 Aqueous reporting limit (µg/L): 4.00E+00
 Soil reporting limit (mg/kg): 4.00E+00
 Health-based GWQC (µg/L): 1.00E+02
 DAF (20, or site-specific if approved): 20
 Leachate Criterion (µg/L): 2.00E+03
 Henry's law constant (dimensionless): 0.00E+00

NOTE:
 USE ONE PAGE PER CONTAMINANT, do not leave empty rows between samples
 Do not enter samples with soil concentrations at or below the reporting limit
 When leachate concentration is non-detect, enter the aqueous reporting limit
 Enter site-specific dilution-attenuation factor (DAF) if desired

 Data entry cells (do not skip rows)
 Optional data entry
 Calculated or locked cells
 Indicates that Alternative Remediation Standard needs to be recalculated

Sample ID	Soil sample weight (kg)	Leachate Volume (L)	Total Soil Concentration (mg/kg)	SPLP Leachate Concentration (µg/L)	Final pH of Leachate (except VOCs)	Optional data		Kd (L/kg)	% Contaminant in Leachate	Field leachate concentration (µg/L)	Pass or fail?
						Sampling Depth (ft)	Soil Type				
016_K007_4.0	0.1	2	149	4.1	10.02			36321.5	0.06	4.10	PASS
016_F005_2.0	0.1	2	654	4.2	11.17			155694.3	0.01	4.20	PASS
016_K007_4.0X	0.1	2	131	4.2	10.1			31170.5	0.06	4.20	PASS
016_F005_1.0	0.1	2	26.2	6.6	10.21			3949.7	0.50	6.63	PASS

SPLP RESULTS for

OPTION 1a: All adjusted leachate concentrations are below the leachate criterion

REMEDIATION STANDARD = 654 mg/kg

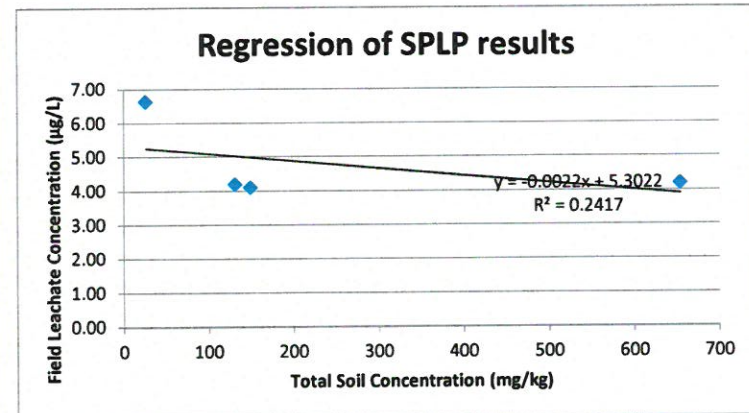
OPTION 1b: Simple inspection of tabulated results to find highest acceptable standard
 EVERYTHING PASSED, OPTION 1b NOT VALID

OPTION 2: Remediation standard using site-specific Kd value

Kd ratio = 39.42, USE MINIMUM Kd
 Kd USED FOR CALCULATING STANDARD = 3949.7 L/kg
 result before rounding = 7899.7006 mg/kg
 REMEDIATION STANDARD = 650 mg/kg (controlled by maximum soil concentration)

OPTION 3: Remediation standard using linear regression

Number of points = 4
 Soil concentration midrange = 340.1
 Number of points above midrange = 1
 Enough points above midrange? NO
 R-Square high enough? NO
 Leachate criterion within range of leachate concentrations? NO
 OPTION 3 NOT VALID





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MEMORANDUM

To	Crystal L. Leavey, LSRP	Page	1
CC	File		
Subject	Alternative Remediation Standard for Nickel and Vanadium PPG Site 16, 45 Linden Avenue East, Jersey City PI G000008644		
From	Matthew Coller, LSRP		
Date	January 18, 2018		

Site Background

The Site was identified as a Non-Residential Hudson County Chrome (HCC) site by the New Jersey Department of Environmental Protection (NJDEP) and is designated as HCC Site 16 in the July 19, 1990 Administrative Consent Order (ACO) between the NJDEP and PPG. Previous buildings at Site 16 included a transformer house. The east side of Site 16 was occupied by Lehigh Valley Railroad (LVRR) Warehouse and the west side was occupied by a junk yard. The LVRR occupied the majority of the area in Site 16, as well as the area to the east of Site 16. Standard Oil occupied the area to the north of Site 16 (AECOM, 2011). The LVRR Warehouse was constructed by Lawrence Construction and is currently used as a storage facility. The majority of the Site is currently used by the warehouse and the remaining areas consist of a paved asphalt parking lot and unpaved areas. Soil investigations completed between 1987 and 2013 documented the presence of chromate chemical production waste (CCPW) or CCPW-impacted materials and analytical exceedances of the NJDEP's Soil Remediation Standards (SRS) and/or the Chromium Soil Cleanup Criteria (CrSCC). The recommended Remedial Action (RA) for soils at the Site included the excavation and removal of visible CCPW and soils with concentrations of Hexavalent Chromium and Total Chromium above the CrSCC and Antimony, Nickel, Thallium, and Vanadium above the SRS or default IGW SSLs.

Site-Specific Impact to Groundwater Soil Remediation Standard (IGWSRS) for Nickel

A site-specific IGWSRS was calculated for nickel using the Synthetic Precipitation Leaching Procedure (SPLP) methodology and the NJDEP's SPLP Spreadsheet (V3.1, November 2013). Four soil samples were collected from the Site on December 20, 2012 and submitted for total nickel analysis and SPLP nickel analysis.

Based on the NJDEP's guidance, the Default Leachate Criterion for Class II Ground Water for nickel is 2,000 micrograms per liter (ug/l). Option 1 of the NJDEP's guidance allows for the determination of a site-specific IGWSRS from a direct comparison of field leachate concentrations against the Default Leachate Criterion. The results of the total and SPLP nickel analyses were entered into the NJDEP SPLP Spreadsheet for the calculation of field leachate concentrations. Calculated field leachate concentrations were observed to be below the Default Leachate Criterion of 2,000 ug/l and ranged from 4.1 ug/l to 6.6 ug/l. Option 1 allows the highest total contaminant concentration to be used as the site-specific IGWSRS. The highest total nickel

concentration was observed in sample 016_F005_2.0. As a result, the site-specific IGWSRS for nickel is 654 milligrams per kilogram (mg/kg).

Soil samples used for the calculation of a site-specific IGWSRS for nickel, including 016_F005_2.0, were removed during soil excavation activities. Following the completion of RA activities for soil, nickel concentrations remaining on the site range from 7.8 mg/kg to 96.3 mg/kg.

Ingestion/Dermal Alternative Soil Remediation Standard for Vanadium

In correspondence dated July 15, 2016, the NJDEP indicated that a change in the Technical Regulations for Site Remediation (N.J.A.C. 7:26E) that required analysis for metals using the Target Analyte List (TAL) rather than Priority Pollutant (PP) metals, has resulted in the NJDEP receiving a larger data set for vanadium than in the past. Background soil studies conducted in NJ have typically shown vanadium concentrations of 25 mg/kg, and the NJDEP has indicated that recent data sets are indicating a wide range of naturally elevated vanadium with no use or discharges of vanadium at sites within the Site Remediation Program.

Prior to RA activities, vanadium concentrations in soil ranged from non-detect to 718 mg/kg. Following the completion of RA activities for soil, vanadium concentrations remaining on the site range from 8 mg/kg to 87.6 mg/kg.

The USEPA has developed Regional Soil Screening Level of 390 mg/kg for residential exposure for vanadium and compounds (<https://www.epa.gov/risk/regional-screening-levels-rsls-users-guide-november-2015>) as listed in the Generic Tables (May 2016 - <https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables-may-2016>) with a target cancer risk (TR) of 1E-06 and a target hazard quotients (THQ) of 1.0. PPG proposes to use 390 mg/kg as the Ingestion Alternative Soil Remediation Standard for vanadium for this site.

Concern (AOC) and the QA/QC is acceptable, the proposed IGW ARS of 654 mg/kg for nickel is approved.

If you have any questions regarding this notice, you may contact Erica Snyder at erica.snyder@dep.nj.gov for questions related to the ingestion-dermal pathway or Swati Toppin at swati.toppin@dep.nj.gov for questions related to the IGW pathway.

c: Kevin Schick, Bureau Chief, BEERA
Swati Toppin, BEERA/ETRA