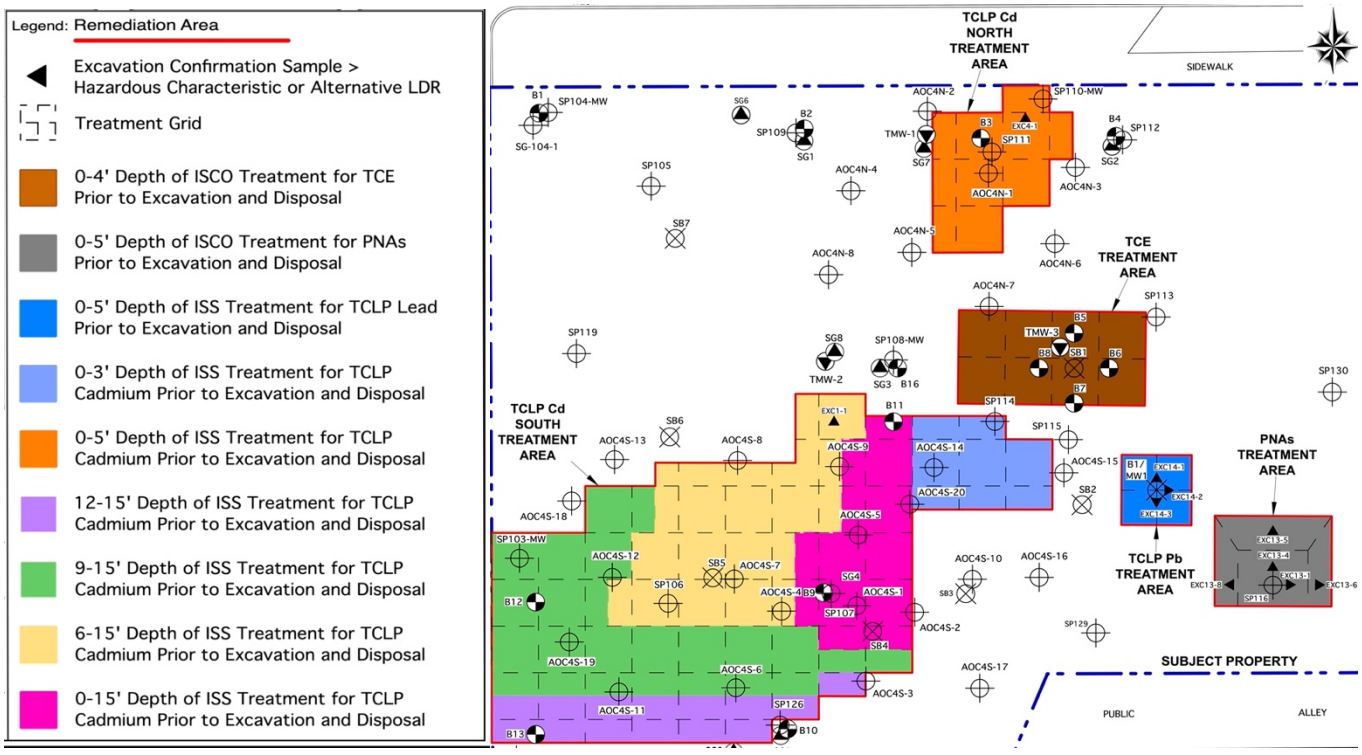
Site Background:
Pioneer Engineering & Environmental Services, LLC (Pioneer) was contracted by School Street Residences, LLC (Client and Remediation Applicant) to provide voluntary environmental site closure services in connection with the Remediation Site commonly identified as 1240 West Melrose Street in Chicago (Cook County), Illinois. The 0.95-acre vacant Remediation Site was formerly developed with a plating and tinning manufacturing facility that was owned and operated by Craftsman Plating & Tinning Corporation (Craftsman). Historical operations at the plating facility reportedly included the use of solvent vapor degreasers and various metal finishing/electroplating activities. Operations at the plating facility ceased in 2018 and the building and all other site improvements were demolished by early 2019. Known impacts at the site include heavy metals (Cadmium and Lead), chlorinated solvents, and polynuclear aeromatic hydrocarbons (PAHs).

The presumptive remedies were 1. in-situ stabilization (ISS) pre-treatment for characteristically hazardous concentrations of cadmium (Cd) and lead (Pb) pre-treatment of the impacted soils to allow disposal of these impacted soils and/or construction spoils as non-hazardous special waste, and 2. in-situ chemical oxidation (ISCO) for the pre-treatment of TCE and various PAHs. The focus of this case study is on the Cd and Pb soil treatment for offsite disposal as non-hazardous waste. Maximum concentrations of target contaminants were up to 4,720 mg/kg Pb and 531 mg/kg Cd. Maximum TCLP concentrations were 0.223 mg/l Pb and 5.77 mg/l Cd.

Solution:
A treatability study was performed to test various chemistries and priorpriatary reagent(s) that would minimize both cadmium and lead at the site. Of the chemistries tested, CERES MTS® achieved the ISS remediation goals at a dosage rate of 5% and was deemed to be the most cost effective and confident solution.

Approach:
Field scale remediation with MTS® successfully resulted in achieving cadmium and lead reduction in all confirmation soil samples across the site at a dosage rate of 5 wt. %. A summary of full-scale results is provided below. Mechanical mixing was accomplished with an excavator.



As depicted in the Figure, the two cadmium treatment areas TCLP Cadmium-North (700 square feet; 0-5 feet BSG) and TCLP Cadmium-South (4,950 square feet; varying intervals between 0-15 feet BSG), as well as the new TCLP Lead treatment area (225 square feet; 0-5 feet BSG) mentioned above (Excavation 14). Remediation was performed by physically mixing the chemical reagent into individual treatment cells consisting of approximately 30 yd3 (cadmium areas) and 10 yd3 (lead area) of soil. On various dates from mid-January to early February 2022, approximately 139 tons of Ceres-MTS granules were mechanically mixed into the cadmium treatment cells using a backhoe and adding water as needed in order to maximize contact of the remedial amendment with the impacted soils; a total of approximately 1,700 cubic yards of cadmium-impacted soils were treated. On February 14, 2022, approximately 2 tons of Ceres-MTS powder was mixed into the lead treatment cells, and a total of approximately 42 cubic yards of lead-impacted soils were treated.

Full Scale Results:

Batch confirmation samples were collected for each 200 cubic yards of treated soil. Treated soil samples from the site were tested by TCLP method for Cadmium and lead and are shown summarized in the following table. TCLP concentrations were reduced significantly and the maximum TCLP concentration was 0.08 mg/l for Cd and below detection limit for lead. The reduction in Cd ranged from approximately 86% to 100%.

Contact C.E.R.E.S. Remediation Products for information about cadmium, chromium or lead remediation at your site.

C.E.R.E.S. is a remediation products manufacturer focusing on innovative and economical solutions for the sustainable remediation of heavy metals, chlorinated solvents, and petroleum hydrocarbons.

TCLP Cadmium-North	Cd-7	0.0050
	Cd-18	<0.0010
TCLP Cadmium-South	Cd-1	0.021
	Cd-2	0.0091
	Cd-3	0.080
	Cd-4	0.047
	Cd-5	<0.0010
	Cd-6	0.0095
	Cd-7	0.0050
	Cd-8	0.0026
	Cd-9	0.0057
	Cd-10	0.021
	Cd-11	0.050
	Cd-12	0.0096
	Cd-13	0.016
	Cd-14	0.0087
	Cd-15	0.018
	Cd-16 (1/24)	0.015
	Cd-16 (1/27)	0.0115
	Cd-17	<0.0010
	Cd-19	<0.0010
TCLP Lead	Pb-1	<0.0050

MTS® Metals Treatment Solution

Metals Treatment Solution (MTS®) is a product group of technologically advanced site specific engineered proprietary chemistries for use in chemical sequestration and immobilization of heavy metals as a stand alone solution or in combination with stabilization and solidification applications.

Decades of heavy metals remediation and sequestration experience have culminated into the MTS® group of products that target many heavy metal contaminants.