



PROJECT

Reduce PCE and TCE concentrations in soil to below remedial standards

Confidential Client/Consultant Site
Northwest USA



SUMMARY

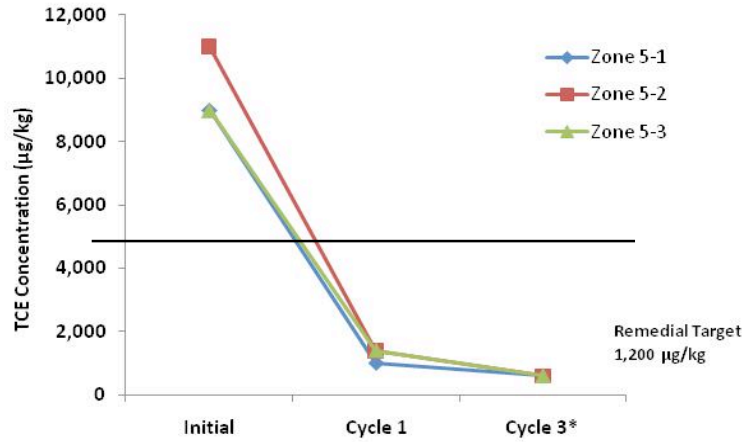
As a result of historical site operations by prior owners, soil at this site was impacted by chlorinated solvents, specifically tetrachloroethene (PCE) and trichloroethene (TCE). Soil PCE and TCE concentrations were as high as 3,800 mg/kg and 220 mg/kg, respectively, which exceeded the remedial standards of 19 mg/kg and 1.2 mg/kg. Following a review of available technologies, the consultant selected Daramend® technology for treatment of the soil. In this case, treatment was applied to excavated soil in a lined treatment cell, but the technology can be applied *in situ* if the impacted soil is in the top 2 foot depth.

THE CHALLENGE

Treatment of the 335 tons of impacted soil using Daramend treatment required sequential anaerobic – aerobic cycling of the soil to generate strong reducing conditions followed by a short aerobic polishing stage. This was accomplished by tilling 1% (wt/wt basis) of Daramend amendment into the soil and using irrigation equipment to increase soil moisture content to 80% of the soil's water holding capacity (WHC). The treated soil was then left undisturbed for a minimum of 7 days followed by tilling to promote aerobic conditions. Following this first anaerobic – aerobic 'cycle', the process was repeated for cycle 2, then again for cycle 3. The total Daramend application rate was 3% (i.e, 3 x 1% applications).

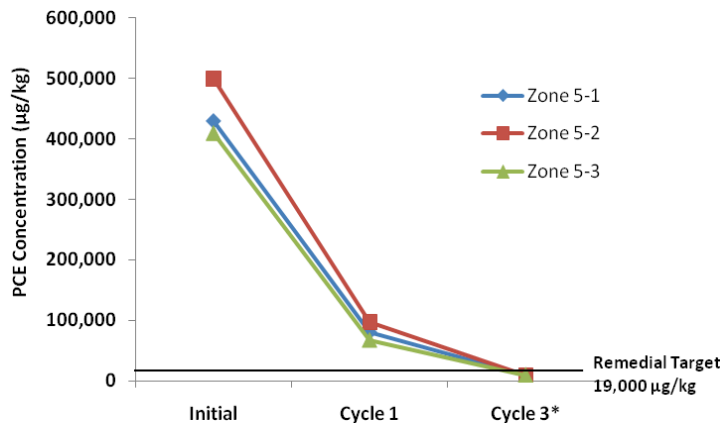
THE RESULT

Soil samples were collected and analyzed for cVOC concentrations follow cycle 1 and cycle 3. Cycle 1 results indicated that substantial reductions had been achieved after the initial treatment period. Results of the cycle 3 sampling event confirmed concentrations of both PCE and TCE were below the remedial targets of 19 mg/kg for PCE and 1.2 mg/kg for TCE. The total treatment time required was 3 months. Results are presented in Figures 1 and 2.



Cycle 3* - actual data not available, consultant confirmed all values below remedial target. Figure assumes ½ remedial target.

Figure 1. Effect of reductive Daramend treatment on TCE concentrations in soil.



Cycle 3* - actual data not available, consultant confirmed all values below remedial target. Figure assumes ½ remedial target.

Figure 2. Effect of reductive Daramend treatment on PCE concentrations in soil.

THE CONCLUSION

The reductive Daramend approach was highly effective in the treatment of PCE and TCE in soil at this site. Overall product cost was approximately \$10,000, which equates to approximately \$30/ ton of soil. This approach enabled rapid, cost-effective and lasting treatment.

