

Pond B Soil Analyses

received 10/27/2014
Project 8737
DOC 2142486
Pit Facility 285604
E&P waste Facility 292833

This information, submitted as an attachment to the Pond B regarding the sampling of soils in and adjacent to Pond B, the analysis of those samples, and an evaluation of that analytical data.

Soil Sampling

Soil samples in and around Pond B were collected by Jack Sosebee and Rick Obernolte on September 29, 2014. The sample from the pond bottom (designated as sample B Center) was collected near the pond outlet. Background samples of native soil were collected outside the area disturbed by pond construction and in each of the four cardinal directions from the pond. The background soil samples are designated as samples B North, B East, B South, and B West in the analytical report discussed below. Soil sample locations are shown on the attached Google Earth photograph of Pond B.

Samples were collected by first excavating a small pit to a depth of 12 inches. The sides of the pit were then scraped down with a shovel or metal trowel to create a composite sample of the upper 12 inches of soil. The sample was placed in clean containers provided by ACZ Laboratories (ACZ, the laboratory that performed the required chemical analyses). Filled sample containers were placed in ice chests provided by ACZ and chilled with ice separated from the samples. The shovel and trowels were then scraped free of soil, washed in phosphate-free soapy water, and rinsed twice with distilled water before collecting the next sample.

The samples were driven to Denver on September 29, 2014 and shipped to ACZ on September 30, 2014.

Chemical Analysis

Analyses of Table 910-1 contaminants of concern were conducted by ACZ and reported in the two attached analytical reports (ACZ Project Numbers L20851 and L20852). In addition to the samples associated with Pond B, the two analytical reports also include data for Pond A and Pond E samples which are not included in this discussion.

The ACZ analytical report includes a case narrative, inorganic analytical results, inorganic reference (report header explanations, QC sample types, QC sample type explanations, qualifiers, method references, and comments), inorganic QC summary, inorganic extended qualifier report, organic analytical results, organic reference (report header explanations, QC sample types, QC sample type explanations, qualifiers, method references, and comments), organic QC summary, organic extended qualifier report, certification qualifiers, sample receipt summary, and chain-of-custody form.

Analytical Data

The inorganic and organic analytical results are summarized in the attached Pond B Soil Analytical Results table. Analytical results below the detection limits are noted as less than the

method detection limit. All analyses were performed within holding times recommended by the U.S. Environmental Protection Agency.

Analytical Results

As shown in the attached table, concentrations of all Table 910-1 contaminants of concern in the B Center sample (bottom of Pond B, near the outlet) were within the Table 910-1 concentration limits except arsenic, boron, and pH.

Arsenic - The concentration of arsenic in the B Center sample was 2.6 mg/Kg, compared to the Table 910-1 limit of 0.39 mg/Kg. However, the concentrations of arsenic in all of the background samples also exceeded the Table 910-1 limit, indicating that the arsenic in Pond B is naturally present and not due to contamination.

Boron – The concentration of boron in the B Center sample was 4 mg/Kg, compared to the Table 910-1 limit of 2 mg/Kg. However, the concentrations of boron in all of the background samples also exceeded the Table 910-1 limit, indicating that the boron in Pond B is naturally present and not due to contamination.

pH - The pH of the B Center sample was 5.3, outside the Table 910-1 allowed range of 6-9. However, the pHs of the background samples, while within the Table 910-1 allowed range, were on the low end of that range. The Natural Resources Conservation Service soil survey of the region (relevant pages attached), provides data indicating that the Fuera-Dargol-Vamer complex soils on which Pond B was constructed and which contribute sediment to Pond B are known to have a low pH. The upper portions of the Fuera, Dargol, and Vamer soils all have a pH of 5.6-6.5, a range that includes the B Center pH. It appears likely that native soils in the vicinity of Pond B have a naturally low pH.