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# REMOVAL SITE EVALUATION - PLANT 2/3
# FEED MATERIALS PRODUCTION CENTER
# U.S. DEPARTMENT OF ENERGY

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## Introduction

In the draft Federal Facilities Consent Agreement, removal action number 1 describes ongoing work to characterize the subsurface of the FMPC buildings. This work, the Facilities Testing Program, in conjunction with the ongoing Remedial Investigation/Feasibility Study (RI/FS), is aimed at investigating the production area by means of installing borings and obtaining soil samples to determine the extent of contamination and the location and extent of any contaminated perched water.

The Production and Additional Suspect Area Work Plan addendum to the RI/FS Work Plan called for an investigation of Plant 2/3 because this area is where uranium is processed in soluble forms. Tankage inside and outside Plant 2/3 contain uranyl nitrate. The general sump is also within this area and consists of numerous aboveground tanks with liquid wastes from the processing operations.

## Source Term

The soil data in the Plant 2/3 area indicates that there is a wide-spread area where uranium is being introduced to the environment through surface deposition. This area is indicated by the 50 ppm line on Figure 1. Soil values of up to 3880 ppm have been found, and water contaminated with up to 46,850 ppb uranium has been found. Although surface deposition is wide-spread, it does not appear to be contributing to the subsurface contamination since the extent of uranium contamination decreases dramatically below a depth of 1.5 feet.

The significant contribution appears to occur principally in the vicinity of the western third of Plant 2/3 and northwest of the Raffinate Area. The occurrence of consistently high uranium values in soil samples at almost all depths in a few borings indicates that these borings are located near the source of the contamination. Sumps, tanks, and transfer lines in these areas will be checked to determine if there is any current or continuing release of uranium bearing solutions to the environment. Historic records will also be reviewed to determine if some event that is no longer active is the source of the uranium found in this investigation.

Figure 1 is a map of the area which shows the results of soil samples taken from the surface to a depth of 1.5 feet. The map shows all the data available as of mid-March 1990. Each boring location is marked with a dot and the total uranium of the sample is plotted in parentheses next to the dot. The boring numbers have been left off of the map to reduce the clutter. Building outlines, above ground tanks, and roadways are shown for orientation.

Four sets of contours are used in Figure 1 to delineate the extent of the presence of uranium in the soil. The lowest value contoured is for 50 ppm or approximately 35 pCi/g. The remaining contours

are at 50 ppm intervals with the highest contour at 200 ppm. Since the frequency of values greater than 200 ppm is low, it does not seem helpful to use additional contours to delineate the areas where high readings occur.

There are two depth intervals where contamination appears to be spreading laterally. The first interval is between three and five feet below the land surface. Lateral migration is not wide spread at this level because it is above the perched water table. A review of the Visual Classification of Soil forms indicates that there is often an increase in the number of blow counts for driving the sampler six inches in this depth interval. There are also some indications that there are thin gravel layers with in this depth interval. The change in soil density coupled with the gravels may be the cause of the lateral migration at this level.

The second depth interval where lateral migration is occurring is from a depth of 10 feet downward. This correlates with the presence of perched water in the soil and the presence of more sandy intervals within the soil.

Figure 2 shows the average total uranium in perched groundwater in ppb. The contours are on a logarithmic scale and the contoured interpretation shown in Figure 2 is a window showing a section of the interpretation for the entire Production Area. Virtually the entire area of the map is underlain with perched groundwater that contains greater than 100 ppb total uranium. The area where total uranium exceeds 1000 ppb is for the most part centered on the same area where consistently high soil values are located.

There have been traces of kerosene and tributalphosphate in soils in the borings along the north side of Plant 2/3. Water samples will be collected in the near future from several piezometers along the northeast side of Plant 2/3 to determine if organics are present in the groundwater. Observations and HNu readings during soil and water sampling indicate that if organics are present they will be at low concentrations.

**Assessment of the Need for Removal Action**

Consistent with 40 CFR 300.65 and the National Contingency Plan, 40 CFR 300.415, the lead agency (DOE) shall determine the appropriateness of a removal action. The factors to be considered in this determination are listed in 40 CFR 300.65 (b)(2) and the NCP, 40 CFR 300.415 (b)(2). Of the eight factors listed, the following apply to the contamination in and near Plant 2/3.

40 CFR 300.65 (b)(2)(ii)

Actual or potential contamination of drinking water supplies or sensitive ecosystems.

40 CFR 300.65 (b)(2)(iv)

High levels of hazardous substances or pollutants or contaminants in soils largely at or near the surface, that may migrate.

The soil and water contamination, the potential migration of the contaminants, and high levels of uranium at or near the surface which could migrate are factors supporting the need for a removal action.

**Appropriateness of a Response**

It has been determined that a response is appropriate due to both the levels of contamination found in and near Plant 2/3 and the potential for the contaminants to migrate. A removal action to address the existing contamination and to mitigate the possibility of further release and migration to the environment should be undertaken.

If a planning period of less than six months exists prior to initiation of a response, DOE will prepare an Action Memorandum. The Action Memorandum will describe the selected response and supporting documentation for the decision.