LCP Chemicals ARCO Neighborhood Testing Plan

TECHNICAL ASSISTANCE REPORT
May2004

Overview

We recently received for review the Draft Work Plan for Off-site Soil Sampling, LCP Chemicals Superfund Site, Brunswick, Georgia, dated May 7, 2004. This plan summarizes past sampling activities in the neighborhood next to the site, the ARCO neighborhood, and proposes some additional testing.

Overall, the actual testing proposed is very limited. Few new samples are collected and tested under this plan. Only very limited conclusions could be drawn from such a simplistic look at pollution in the neighborhood. The study appears designed to "prove" the old sampling was correct rather than find out if the neighborhood is safe.

Background

The LCP Chemicals superfund site is a 550-acre site along the Turtle River in Glynn County Georgia. The site was the location of several industrial chemical plants producing bleach, petroleum products, or paint. These operations left the area heavily contaminated with known chemical toxins from ground, water and air pollution. The site is in the process of being cleaned with Federal and State oversight. One issue for the local community is the extent of contamination from air pollution and any surface runoff. Various industries at the site used "stacks" and fans to vent chemical processes directly into the air. Most pollutants travel only a short distance before settling back to the ground, and the ARCO neighborhood is in the pathway of any possible contamination. In an earlier evaluation the Environmental Protection Agency noted: "**It is very likely that this airborne deposition traveled with prevailing winds, and mercury was therefore distributed over a potentially rather large area. The prevailing wind direction for this area is from the northwest, away from the marsh area**." *[emphasis added;* Section 7.1.3, airborne redeposition (page 42, Operable Unit One Upland Soils and Estuary March 2002)*]*.

The Testing Plan

Plan Designs:

All testing plans are designed to answer a question. Sampling locations, the number of samples, and the testing methods are all chosen to provide specific answers. As a result some testing plans are broad with numerous samples along a grid pattern in order to provide as much detail as possible on the way in which chemicals are found in the area. Broad testing plans are designed to answer questions such as "how extensive is contamination," or "are all areas free of toxins." However, other sampling pans are very narrow, only designed to answer a very specific question. Narrow testing plans are directed to very limited questions, a confirmation test for a previously tested area is one example of a limited sampling plan. The testing discussed in the Draft Work Plan is a narrow testing plan, only directed to one small area near the site fences.

Single versus Composite Samples:

Single samples, sometimes called "discrete" samples, are one test for each sample taken in the field. Composite samples are mixed samples where several samples from over a wide area are mixed before testing. Single discrete samples provide more detail with less possibility of error. There are two types of error: false-positives occur when a sample is reported as contaminated when it is really clean, and false-negatives are reporting a sample as clean when it is really contaminated. Both false-positives and false-negatives are rare for discrete samples. Composite sampling has a much higher error rate for false-negatives. When several samples are mixed any contaminated samples are diluted with clean samples. If there are five samples in the composite and all five are contaminated then the sample will show up as a positive. However, if only one sample would be positive by discrete sampling and four are clean, then the one positive sample will be a false negative in composite sampling from dilution. Composite sampling is less expensive than discrete sampling. All of the sampling proposed for the ARCO study is composite sampling.

Phased Testing:

Fourteen composite samples are planned for an initial phase 1 study. Each sample is taken from a very broad area of 10,000 square feet (according to section 3.2 the sampling station is a 100' by 100' square, with 5 samples taken and mixed together from the square). All total the area actually being composite sampled in phase 1 for the 14 samples is about 3 acres. However, these sampling squares are not "contiguous" or joined together, they are dispersed over an area of about 60 acres (on Figure 2 provided for review, the phase 1 area is shown with a scale of 7/8" equals 400 feet, the measured phase 1 area was about 6" by 2").

So the 14 phase 1 samples are just a few pounds of surface soil mixed together from an area covering nearly 60 acres. The results from these few pounds of dirt are then used to determine if EPA will require a larger study, called phase 2, that will actually test the neighborhood.

Discussion

In this proposed study each mixed sample represents about 4 acres. This is far below recommended sampling guidelines, and is not a valid scientific sampling plan. The combination of mixing samples before testing and sampling over such a wide area can result in false-negative reporting of actual site conditions.

Suggestions for changes to the plan include:

· Five of the fourteen proposed phase 1 samples are on LCP property and are not properly called "ARCO neighborhood" samples, all of the proposed samples should be within the neighborhood blocks;

· Closer grids—100' by 100' is too coarse, a better grid size is on the order of 25' by 25';

· The plan should clearly state that testing will evaluate toxins at residential safety levels;

· Sediment testing of the pond shown on the EPA's sampling map is needed, it is large enough to easily have received fallout during plant operations and residents indicate that children often fish this pond;

· Include existing testing data from local school grounds in the site description and add sample locations to the neighborhood plan to fill in any data gaps;

· For proper evaluation of the plan the figures should be representative of the actual site area, as provided features such as streams and railroads were omitted, a detailed plan should be provided;

· An air dispersion model is needed—usually sample patterns for airborne depositions are made after careful atmospheric modeling.

Conclusions

The sample pattern chosen for this study seems arbitrary and capricious, not scientific. The number of samples chosen are too few and too far apart. The small sampling footprint is only a small percentage of the actual neighborhood area of concern.

Earlier, EPA noted that pollution may be present in this neighborhood. This study as described will neither prove nor disprove that possibility. If the study finds some pollution then it only means that at least one more study is needed, the phase 2. However, if nothing is found it fails to prove the site is safe because of the poor study design. The Plan as proposed will not answer the question: "Is the ARCO neighborhood safe from LCP toxins?"

Written by R. Kevin Pegg, Ph.D.; edited by Dr. Mary S. Saunders. Copies of the newsletter are available from the GEC, at the Glynn County library, or at **www.Enviro-Issues.com** on the Internet**.**

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