12-3-2004

New Mexico Environment Department Public Hearing on Corrective Measures Study Class 3 Permit Modification, Mixed Waste Landfill, Sandia National Laboratories

Citizen Action (through New Mexico Community Foundation)

Erik A. Ringelberg
Upstream Technologies, Inc., cinephile24@gmail.com

New Mexico Environment Department
Public Hearing on Corrective Measures Study
Class 3 Permit Modification
Mixed Waste Landfill, Sandia National Laboratories
December 3, 2004

Erik Ringelberg, Upstream Technologies, Inc.
Reno, Nevada
On behalf of

Citizen Action

> The proposed waste disposal facility has had only a limited CERCLA/RCRA Remedial Investigation/Facility Investigation) that fails to meet due diligence and ordinary scientific standards for the establishment of understanding regarding the nature and extent of the site contamination.

Site Investigations under CERCLA or under the comparable RCRA regulations are required to meet a basic standard of due diligence. The standard is to fully characterize the site's physical and hydrogeologic features; identify the type(s), concentration(s)/activity(ies), and extent(s) of contamination in site air/water/soil; and establish the likelihood of migration over both the short-term and long-term.

Characterization can only be achieved by the statistical sampling of the contaminated media, and an analysis of spatial trends in concentration. In order to achieve statistical sampling, a statistical sampling plan is generated from an initial site screening to identify variance, then the required number of samples taken to achieve a specified confidence limit is established, then those samples are collected following a (pre)specified randomized collection protocol. (USEPA, USDOE MARSSIM)

There is no evidence that Sandia followed this fundamental scientific approach in its sampling design and collection. Instead, there are clear indications that these were ignored, forcing several rounds of resampling, delaying the project by many years. Moreover, Sandia did apply complex statistical sample analysis techniques to the results of its field investigation. It appears that Sandia was only willing to use statistical science to establish that most collected samples were within 2 standard deviations of the *highest* site "background" concentrations, thus greatly increasing the chances of a type II error. These data are less than useful without a statistical power analysis.

Sandia alleges that no radiological contaminants, other than tritium, were measured in these boreholes.[1] While that is factually correct, since there is no statistical sampling, it

[1] CMS, p. I-11

cannot be inferred that the site has been characterized. Thus statements regarding the nature and extent of contamination-necessary for any risk analysis cannot be made.

The inherent problems with the non-statistical investigation and a statistical analysis can be shown with the repeated identification of toluene in soil and water samples (Reference 1).

The standard 4" Sch. 40/80 monitoring well casing is supposed to have the joint completely dry before it is inserted in the bore hole. No solvents are to be used near the borehole (Reference 2 and 3 as well as standards: ASTM D2855 : " Standard Practice for Making Solvent - Cemented Joints with PVC Pipe & Fittings. " ASTM D2564 : " Standard Specification for Solvent Cements for PVC Plastic Piping Systems." ASTM F402 : " Standard Practice for safe Handling of Solvent Cements, Primers & Cleaners Used for Joining Thermoplastic Pipe & Fittings.").

Therefore only trace solvent material (PPB-PPT) would be found solely on the PVC joints. However, virtually all of these joints are be within the well pack and not near the screened end of the well. So, even this trace material would is not likely be found at the screened zone where sampling occurs.

All wells are to be developed after completion (References 4 and 5) . This purges the vast majority of all fine sediments and any potential contaminants out of the well screen area. This would scour, volatilize, and dilute any remaining solvent from any exposed joints. All wells are required to be purged prior to sampling. That is to remove several (3) volumes of well water, before a teflon bailer is used to collect a water sample. This would again, volatilize and dilute all of the remaining trace solvent, each time the well is sampled.

In my opinion, the only possible way to get Toluene from a well after 6 years, as was documented, is if they poured an entire 8 oz jar or Toluene down the borehole/well (in which case the numbers would be much higher and decrease over time), or if there was Toluene moving through the vadose zone/groundwater. Of course, Toluene is a known constituent of the landfill contamination.

The Phase 2 RFI report further dismisses as laboratory mistakes several soil measurements that show high concentrations of radioactivity, while the measurements showing extremely low concentrations were not similarly dismissed.[2] It is very simple to handle laboratory errors, if in fact that is what they are, through statistical analysis. That analysis must happen, otherwise the data are simply aribitrarily and capriciously being manipulated.

These sampling problems are easily remedied, a statistical sampling plan must be put into place, QA/QC must be followed consistently, and the site must be resampled.

---

[2] Phase 2 RFI report, p. 4-144

2. By knowingly failing to discover the nature and quantities/activities of the materials dumped at the site, this decision has lead to defective site management and proposed alternative.

It is simple to understand that if the site investigation is profoundly flawed, then we simply do not know what we are dealing with at the site. This information is critical for current site management, and for the development of any alternatives. This point is the logical transition between the first and last arguments.

3. The remedial alternative is defective due to erroneous assumptions, based both on the incomplete remedial investigation and additional errors based on the expense and safety of other alternatives.

Even disregarding the sampling and analysis problems, there seem to be additional errors in the assumptions used for the development of the remedial alternative. As in the investigation, all data are required to be assessed in the same way. So, on that basis it is unclear as to why the alternatives that leave the waste in place are assessed in a much more simplistic fashion than the non-preferred waste removal alternatives.

Of even greater concern is the unsupported assessment that "…(B)ecause depth to groundwater at the MWL makes groundwater an unlikely pathway for contaminant transport in the future, groundwater data are not evaluated in this risk assessment."[3] The DOE's Idaho National Engineering and Environmental Laboratory (INEEL) is located from 400-600 feet above the Snake River aquifer, yet contamination from its various dumps in the ICDF/SDA complex has reached the water table (References 11, 12, and 13). INEEL also has very similar waste constituents in roughly similar ratios. This assumption appears to be the *basis* for the selection of this alternative, and as such requires much more development and actual discussion. (Dr. Resnikoff will detail much more of the specific groundwater contaminant concerns.)

Sandia calculates cost for leave in place alternatives using only 30 years out of the essentially indefinite life of the contamination. At the very least the costs need to be accurately and equitable characterized for the DOE's estimated Institutional Control (IC) estimation for Sandia, nominally 100 years[4]. A much more reasonable approach would be to assess the complete O and M costs for the length of time matching the decay life of the nuclide of greatest threat when excavated.

The costs themselves appear to be out of line with other similar projects. Project costing is a complex issue, one that requires more through analysis. The costs described for each alternative class, excavation, leave in place, stabilize in place are not congruent. Costs are made up of actual activity cost, ordinary profit, inflation, contingency, and some delay factor. Cost projections can also include profiteering, unknown risk factors, and alternative inflation/deflation.

---

[3] CMS, p. I-3
[4] CMS, p. 29

The industry standard is to use competitive bidding to ensure that the costs contain as much of the first set as possible and as little of the second set as possible. However, competitive bidding, if done at all, is often done long after the alternative selection has been made and never with any corrective feedback.

For example, if I want a particular alternative selected, I would unequally assess its lifespan costs, and increase the lifespan costs of the alternatives I didn't want. The true cost of the alternative selected would not be known for a couple of years and by that time the decision would have been made. Thus the true cost can be accurately depicted for the preferred alternative and the others inflated, the true cost inflated with the others grossly inflated, of the true cost deflated and the alternatives reasonably accurate. The costs bear much greater scrutiny in comparison to similar costs (References 11, 12, and 13).

This great uncertainty over site management and future funding is one of the reasons why corrective measures typically assess the threat provided by these dumps with emphasis on removal or stabilization of the contaminant (References 11, 12, and 13). It does not appear that this critical analysis has occurred in more than cursory fashion. INEEL, 600 feet above the water table and 51 miles from the nearest metropolitan area decided that given similar nuclides and mixed wastes to remove and stabilize its wastes.

It would seem much more reasonable to apply a concerted strategy of statistical sampling, including confirmatory direct probe sampling; vapor extraction for the VOC's, with carbon trapping for the H3; and some combination of in situ vitrification/excavation, and excavation and backfilling in a lined pit. This would allow for the safe removal of the most transportable constituents, and the removal/stabilization of the remaining materials.

These wastes will still retain many if not all of their hazardous characteristics over the next 200 years. It is simply folly or hubris to assume that we can project site security from excavation in the future. The Puebloan people had in good faith considered the very site under their control, then did the Spanish. How then will we control it any more effectively?

Finally, given that Sandia has routinely asked for sampling variances[5], and there are no realistic cost estimates provided for analysis of soil, air and groundwater beyond 30 years, and arguably within, are we to assume that there are no contingency costs to address potential later leaks, since none are estimated? It would seem counterintuitive to reduce monitoring over time, while assuming that it will be equally effective in discovering changing conditions.

[5] CMS p. 22