

OU1 Working Group Meeting
DOE/CDPHE/EPA
April 27, 1995

Draft Summary of Meeting Discussion

Attendees:

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|--------------------|---------------|
| Tim Reeves | SAIC |
| Gary Kleeman | EPA |
| Tom Peters | PRC |
| Kim Ruger | EGG |
| Elizabeth Pottorff | CDPHE |
| Chris Gilbreth | CDPHE |
| Dave George | DOE |
| Mike Rupert | EGG |
| John Hopkins | EGG |
| Elizabeth Hausler | Dames & Moore |
| Carlos Leon | Dames & Moore |
| Peter Sinton | Dames & Moore |
| Laura Brooks | EGG |
| Florence Munter | Dames & Moore |

Introduction - Carlos Leon

Remedial action objectives, as presented in FS, shown to agency group. Dave George asked if the group was in agreement with these. Agency representatives agreed.

Existing Conditions - Peter Sinton

Upper stratigraphic zone of hillside. Gary Kleeman (EPA) asked if the entire hillside is dry. Peter Sinton replied no, but the hillside is not a continuous saturated zone.

Peter Sinton presented information as follows: According to a table from the RI, 42% of measurements at wells were dry. There is a relationship between water level and precipitation: when precipitation is up, water level usually rises with some lag time. Diagrams indicate the hydraulic conditions at the hillside are continuous over time. There is an apparent vertical downward gradient, from colluvium to bedrock. Potentiometric surface maps indicate that flow is downhill to Woman Creek. January maps show that flow is channelized where saturated thickness is the largest. Therefore, flow is discontinuous and fluctuates with time. April maps indicate that even during recharge, flow is still not continuous. A geotechnical map cross section showed the bedrock channel leading to the french drain, coincident with surface water flow. This is the preferred flow path for groundwater.

Discussion of the bedrock channel leading to the french drain (the preferred flow path). Gary Kleeman stated that this channel is probably continuously saturated. Peter Sinton said that if anything is saturated, the channel is, and for that reason it is chosen for modeling. Peter reiterated that flow is discontinuous in time and space.

Discussion of hydrologic conditions and hillside salinity. Diagrams were used to show that the hillside is mostly saline, with higher salinity located further from Woman Creek. Generally, the homogeneous chemistry of the hillside indicates a single groundwater source; high TDS indicates a long residence time. This plus the difference in the hydraulic conductivities of bedrock and colluvium indicates that colluvium water is derived from bedrock. Gary Kleeman asked if the opposite could be true -- that the water in the bedrock could be derived from colluvium. Peter Sinton responded that this is unlikely given that colluvium has a higher permeability. Peter summarized by stating that the source of water is bedrock (except in the summer) and groundwater flow is nonexistent in colluvium.

Discussion of the hydrogeologic conceptual model. Illustrations were used to indicate a downward vertical gradient. Tim Reeves agreed to the logic given that there is a two order of magnitude difference in the permeabilities of bedrock and colluvium. Peter Sinton went on by stating that given the geologic considerations, water dissolved in bedrock is the only way to get salinity. Gary Kleeman asked if the salinity could already be there due to infiltration from the surface. In response, Peter pointed to the hydrogeologic slope and chemistry - uphill has fresher water from the land surface. The flow line is always from lower TDS to higher. Even though caliche has been precipitated, it is not necessarily going back into solution. Gary Kleeman stated that it could be. Peter Sinton responded by stating given the arid conditions and localized phenomenon in the first few feet of soil, it is unlikely.

Peter Sinton continued the presentation with the following points:

Groundwater discharge points. Naturally, both bedrock and colluvium discharge to Woman Creek. Artificial discharge is to the french drain; there are no other potential discharge points.

Nature and extent of contamination. Not much contamination is found on the hillside; instead, contamination is close to wells 4387 and 1074, and downgradient well 0487. These wells are located in the drum storage area. High residual DNAPL is found at one point but not downgradient at the bedrock channel. This indicates that the residual DNAPL contaminant area is restricted.

The observed concentration in well 4387 indicates that the well is close to the source. The concentration has fluctuated in the short term but remained constant over the long term, indicating a state of equilibrium. The same is true for well 0974 and well 0487, except well 0487 showed one spike coincident with the installation of the french drain. The plume was pulled toward well 0487 until the well was installed, and then pulled away. Bedrock wells don't seem to be contaminated. Therefore, residual DNAPL is found in well 4387.

The inverse of saturated thickness follows TCE values at well 4387. Thus it was postulated that the source of contamination is below the water table. Well 0487 shows no relation between TCE and the inverse of saturated thickness, which is indirect evidence that there is no source of contamination at well 0487. If the source was above, recharge would inject contamination, and as the gradient increases, concentration would increase, which is not happening, according to Sinton.

A diagram of soil conditions indicated that contamination is above the bedrock/colluvium interface in a low spot and below the water table. Soil gas survey indicates that residual DNAPL is present in an area below the drums, in an even smaller area than was indicated previously. Therefore, the source is in the area of drums, below the water table. Gary Kleeman asked for verification that at well 0487 no DNAPL was found, just a dissolved plume. Sinton stated this is correct.

Fate and transport. Decay/volatilization was included in the model because concentrations haven't increased over time. This indicates that some transformation is taking place. Tom Peters asked for verification that the source was below the water table and above the bedrock. Peters asked for documentation of DNAPL collecting at the line of contrast in permeabilities. Sinton confirmed this information.

Summary of existing conditions. Site hydrology and contaminant distribution are known. The plume is passively being removed; otherwise, it would have reached the french drain by now. Gary Kleeman pointed out that there are not a lot of wells located in the area under discussion, that the model assumes that well 0487 is right in the paleochannel, and that the plume is moving along that paleochannel. Peter Sinton pointed out that the wells are the same distance from the source but show no higher concentrations. Gary Kleeman stated that the conclusions being drawn are not so cut and dried. Peter Sinton stated that the documented information is a good argument for contamination being where it is -- in an area even smaller than beneath where the drums had been stored. Also, Sinton stated a fair amount of dilution has taken place. The model is conservative by one order of magnitude, assumes continuous saturation, and assumes contamination is moving faster than it really is.

SENIOR ENGINEERS & ARCHITECTS
METHODS FOR ACHIEVING A NO FURTHER ACTION DECISION - CARLOS LEON

Risk assessment. The on-site residential use scenario has been eliminated from further consideration. The on-site office worker may be exposed to a 2.3×10^{-4} increase in risk. This risk calculation assumes a homogeneous plume rising up through the office area. Actual baseline risk to human health is not a factor. All risk scenarios are negligible. Full year data show TCE is the highest concentration. If TCE is not reaching the drain, it will not reach Woman Creek. Tom Peters asked if this included footing drain data. Carlos Leon replied that wet season data without the footing drain isn't available yet.

No further action based on point of compliance option. Enough data is available to support that human health would be protected through passive containment via the french drain. The french drain keeps the south side and IHSS 119.1 dry.

Gary Kleeman stated that the two primary goals should be to protect human health and the environment and meet ARARs. Laura Brooks voiced disagreement. On the issue of point of compliance, Dave George stated that the group was not going to decide point of compliance -- he had received two letters from his superiors that indicate the decision will be made by a group of managers other than those present.

POINT OF COMPLIANCE - FLORENCE MUNTER

Point of compliance definitions come from two different perspectives - state groundwater standards and RCRA. Applicable RCRA requirements for areas with more than one solid waste management unit (SWMU) include the option of drawing a line around all SWMUs to designate point of compliance boundary. OU1 is not a regulated unit but it is a SWMU. The RCRA requirements specific to SWMUs are applicable and the RCRA requirements specific to the regulated unit are relevant and appropriate. State groundwater standards and point of compliance regulations are relevant and appropriate requirements. State groundwater standards define point of compliance as point closest to contamination source, considering the site boundary or hydraulically downgradient limit in which contamination exists.

A groundwater classification from the state exists for the area. Areas of State groundwater classifications also define point of compliance. Point of compliance for specified areas are to consider point of compliance at some distance hydrologically downgradient from the activity that is causing contamination and closest to the source. Point of compliance in this case is determined by:

- classified use
- geologic and hydrologic characteristics of the site

- toxicity and persistence of contaminants
- any established wellhead protection areas
- potential of site as an aquifer recharge area
- recommendations of owner/operator.

Chris Gilbreth pointed out that there is a similar point of compliance discussion in the position paper for OUI.

Summary of POC possibilities: (1) at the downgradient facility boundary, (2) between SWMUs and downgradient facility boundary, (3) beyond the facility boundary. In practice, point of compliance could be downgradient of the french drain or at Woman Creek. Gary Kleeman added also it could be at the edge of the plume, upgradient of the french drain. Chris Gilbreth concurred, reiterating that the plume hasn't made it to the french drain. Peter Sinton said the plume is between well 0487 and the french drain. Gary Kleeman stated based on the regs, the most likely location of the point of compliance is at the edge of groundwater contamination, upgradient of the french drain and downgradient from IHSS. Carlos Leon stated that the intent is to protect water source that could be of use. Chris Gilbreth stated that if the state identifies point of compliance but the water quality control commission can't enforce it, why not have the option of using point of compliance from some other source. Gary Kleeman stated we do have the option to use the groundwater regulations. In addition, SWMUs do not matter. Laura Brooks stated we need to look at the whole picture, including RCRA. Carlos Leon stated we need to look at intent for use of the water source. Laura Brooks and Gary Kleeman suggested looking at whether state groundwater regs can set point of compliance. Gary Kleeman stated it is a fairly small area, why not just remediate it. Tim Reeves stated we need to determine what is a logical procedure and take that approach. Chris Gilbreth stated that the state is not suggesting to waive an ARAR.

Case studies at Lowry and Rocky Mountain Arsenal were presented by Florence Munter.

Further Discussion - Carlos Leon

Discussion on intent of IS/ROD process continued among parties. Chris Gilbreth stated it is the State's intent to protect the environment. Carlos Leon stated it is the intent of the State's groundwater regulations to protect groundwater from a nondegradation perspective. Dave George reiterated that the contamination may be very slowly cleaning itself up. Gary Kleeman disagreed, and said that contamination is also exceeding ARARs. Carlos Leon disagreed, and stated there is no justification for establishing the point of compliance at well area. Gary Kleeman asked why can't cleanup take place in cost effective manner. Chris Gilbreth

stated cost is not the issue. Carlos Leon stated why spend anything. Gary Kleeman stated if you don't clean-up, OU1 is in violation of the law. Peter Sinton asked where the plume is going if it is not going to the french drain. Gary Kleeman suggested that the plume is very slowly going downhill. Elizabeth Pottorff asked how contaminants are passively removed. Peter Sinton stated contaminants are passively removed through volatilization. This is evidenced by the equilibrium state of the contamination: the source into groundwater is being balanced by removal. Pollutants are not going to bedrock, but to air. Gary Kleeman agreed that there may be some degree of volatilization. Peter Sinton also pointed out that there is no vinyl chloride present. Vinyl chloride is an end product that would be found if passive remediation was taking place through decay. Sinton stated that the set point of compliance should be at the french drain. Elizabeth Pottorff stated she is not comfortable with the french drain continuing to desaturate if not pumped. The issue of if and when the french drain would be sampled and pumped was discussed. Gary Kleeman suggested the use of soil vapor extraction (SVE) for the source until the process becomes impractical to use on the remaining concentrations.

Gary Kleeman stated he can't support a no further action based on the feasibility study and proposed plan. Instead, we should consider source removal actions based on ARARs with the point of compliance at the edge of the contaminated plume. Dave George reminded the group of the two letters that remove the point of compliance determination from the group. Gary Kleeman stated EPA and the state are fairly aligned with the point of compliance discussion. If the point of compliance is placed away from the edge of plume, no remediation would take place. Carlos Leon stated the point of compliance should be set at what it is trying to protect based on a reasonable limit on what is to be clean. Gary Kleeman stated the point of compliance is to be set at a line of no further degradation of groundwater. Carlos Leon stated correct, but set it at a reasonable location. Tim Reeves stated there are many factors arguable and to be considered. The point is that there is room in the guidance for discussion. Chris Gilbreth stated that there isn't room in state groundwater regs for discussion, but there may be in RCRA. Laura Brooks asked the EPA representative to look at the preamble to the NCP - it allows determination of use of groundwater as a potential drinking water source and allows flexibility to use waste in place as an option. Tim Reeves asked what EPA, CDPHE, DOE would be comfortable with if given no risk. Tom Peters suggested that the group should be prepared for either scenario, as point of compliance will be decided by others. Dave George stated that the contamination source is less than 55 gallons. Gary Kleeman and Elizabeth Pottorff asked for the source of this information. Peter Sinton stated that the source area is 3' x 5' x 1' and the model indicates that the contamination source is most likely less than this size. Carlos Leon suggested taking the current analyses to the public (i.e., hold a public meeting. Mike Rupert asked about milestone dates for the final proposed plan. Gary Kleeman stated he is not concerned with milestones; EPA will not fine DOE for missing a milestone date. According to Kleeman,

the resolution of the point of compliance issue is more important and should be resolved prior to a public meeting.