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From: Hanson, Kristen
Sent: Tue 3/21/2017 5:10:00 PM
Subject: Haskell Lake Contimaitoin SIte EPA/Tribe Commitmment 2B, Tribal model comments submitted and incorporated

Good Morning,

The model was shared with the Tribe and a short conference call with Bob Egan and Tom Kady was offered to explain the model to Tribal staff. There were a number of questions of the model that neither Bob nor Tom could answer and contractor contact was needed. Bob was going to ask of the contractor and provide feedback to the Tribe and Tom. In addition to the questions raised in the short conference call awaiting feedback, the following comments/questions/and requests of the modeling effort are provided below.

Source Data

Please provide the source data used in the model. During a previous S2C2 presentation, Mr. Jason Ruff was able to demonstrate source data used in the model viewed in a spreadsheet. This is a considerable effort as this is the only place site data has been accumulated in one place.

Overall Comments

The model shows a large perimeter plume blob. The detail of the large area within the plume is not viewable with the exception of one cross section. Horizontal and vertical slices (as demonstrated) would be useful.

Geology interpretations do not include logged and recognized MIPHT identified units, particularly near the source are-

Some of the identified units are helpful, but it is incomplete and the interpretation is particularly incomplete and misleading in the source area. Logged interbedded sand silts and clays correlate to the distinct oscillating MiPHT data between 5-15 feet appear to be missing, particularly in the source area. Other missing logged stratigraphy includes find grain sands, silty sands, gravel, clayey silty sands. Also MIP 5 and BH 17 appear to be missing. The lithology shortcoming is

most apparent in the source area and may be resolved in the planned cross sections. For Example- MIP 6 and BH02 are shown along the models's cross section line. MIP 6 shows interbedded silt/sand/clay unit and BH02 logs silty sand with clay, sand with clay and gravel. The model shows this area as uninterrupted sands and gravel.

Generally I have noticed the organic units extending from the lake to the pond include logged organics like peat and wood and similar logged organics are again noticed on the north side of the site. Finer sediments, shown as lower conductivity units near source area and central portion of the site are logged as interbedded silts/sands/gravels and clays.

Also, there appears to be three areas of lower conductivity (and finer material) that are expressing controls over fate and transport. This are not discernable in the current presentation.

Specific Data and Model Interpretations

The model extends the contaminant plume further east of the clean VAS04. Please provide what data is used to extend the model easterly.

Groundwater collected from BH25 from 17-27 feet is Non Detect, but the model shows the location within the plume.

What data was used to extend the plume to VAS03?

Where there is more than one sampling event at a monitoring well, what data is used (i.e concentration based, date based, method based, etc)?

Estimated Hydraulic Conductivity

Vertical Plan View Slices would be useful here. There are distinct hydraulic controls within the source area at varying depths. The deeper NAPL responds to higher hydraulic conductivity between 10-13 feet.

Soil

BH20 extends to 20 feet but is shown in the model as about 10 feet. PID results from BH04 suggest vertical extent extends to 14-15 feet. PID results do not agree with the model.

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Soil Volumetrics-note

The available soil analytical below the water table is limited(only 2 samples from the water table ad 2 samples from the 10-15 feet below grade) It also appears that the samples are collected near extent margins and not from the highest contaminated area. In addition, the sampling method from depth (open hole geoprobe) provided low recovery soil from caving holes. The reliability of soil samples from depth is low.

Contractor General Comments:

The 4dim files essentially provide broad color graphics of LIF and MIP results for site wide impacts, and very rough depictions of site stratigraphy and hydrogeology, but since the focus right now is on source remediation, zoomed depictions and evaluations of the UST/dispenser/piping area plus the NAPL areas near there (above and below the water table) would be much more useful.

The use of LIF and MIP is great for rough approximations of the highest impacts, often as a first step at a site when a petroleum release is known but the magnitude is not. At this site, the LIF and MIP findings essentially told us what we already knew, in a non-quantified manner. LIF is more useful than MIP to aid in soil excavation planning efforts, since it limits interpretations to sorbed contaminants only (the continuing sources of groundwater contamination). MIP results can lead to overestimates of contaminant footprints (for soil), because of petroleum VOCs spreading throughout the vadose zone as vapor, which MIP cannot differentiate from purely soil contamination.

Also, when we do LIF or MIP work, we always include "soil confirmation borings" during those efforts, to enable direct correlation of the indirect results to actual soil lab results; at a typical frequency of 10 to 30%. I don't think they did that in their 2016 work.

EPA's tech memo could incorporate the pre-2016 soil boring results, which would seemingly improve the current understanding of residual contamination conditions.

I drew our AAA-A' cross section transect onto Bristol Figures 2 and 3; they should do that also, and correlate our maps with the model maps.

Having actual bound copies of the various historical reports would be a big help to me. It does get a bit confusing tracking down electronic bits and pieces

WESTON could prepare hydrogeological cross sections and zoomed plan view map(s) at this area (at much smaller scale than our site wide maps) using all existing data that would allow for better interpretations of current conditions (compared to the model graphics). Alternatively, the Tribe could request EPA to prepare the higher resolution depictions of the source area, instead of us preparing them.

Given the likely substantial cost of remediation ultimately to be completed, I think the focused mapping and interpretation effort is well worth the upfront investment.

Importantly, they would allow much improved presentation (and awareness) of localized heterogeneities in the subsurface, a necessary component in the remedial design and those heterogeneities should be better mapped prior to design. The zoom maps may identify some locations where important data gaps remain regarding stratigraphy (such as uncertainties if peat/clay layers are present). Indirect stratigraphy mapping (versus macrocore or split spoons) can lead to incorrect mapping of these features most pertinent to contaminant behavior and remedy performance.

EPA Scope: Plan view and profile view map

Create a new plan view basemap along with new hydrogeologic cross sections zoomed (1" = 10') into the petroleum release areas at Tower Standard, to allow higher resolution placement and interpretation of historical soil investigation locations and findings. Illustrate subsurface heterogeneities affecting contaminant fate and transport mechanisms, along with other site features and investigative aspects pertinent to both characterization and corrective action considerations. These include UST basins, dispensers and piping, excavated areas, past recovery well(s), past and present building foundations, road, curb, and pavement conditions, all identified silt, clay, and peat layers, and discernable gradational changes in aquifer matrices (i.e. fine to course sand, gravel zones, etc.). At least one figure will include source area lithology, soil contamination (extent and degree), and source area groundwater contamination.

WESTON's scope: conference call with the Tribe and EPA to discuss the proposed map content and review data and map interpretations and comments on final maps. The Tribe has contracted Weston for this scope.