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DEC 13 2001

December 11, 2001

Mr. Amir Gholami, REHS
Alameda County Environmental Health Services
1131 Harbor Bay Parkway, Suite 250
Alameda, California
94502 - 6577

RE: Feasibility Study and Addendum to Interim Remedial Action at 19984 Meekland Ave., Hayward, California.

Mr. Gholami,

Prior to informing regulatory agencies and all other parties involved, we reviewed four different methods to determine which method was most feasibility for our site. We conducted a modified feasibility study "in-house" in response to new information obtained after drilling landfill acceptance borings at the site. We did not provide this feasibility study to you or to other parties involved, rather, we took it upon ourselves to determine the best method, and once the best method was determined, we informed all necessary parties. I apologize for not initially including the feasibility study to you earlier.

Enclosed within this package is our Modified Feasibility Study for the site, as well as our Addendum to Interim Remedial Action which was previously faxed to you.

Please review the enclosed documents and call with comments or questions.

Thank you for your patience and cooperation on this job.

Sincerely,

Aaron Bierman

Aaron Bierman
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Senior Staff Geologist
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Attachments:
1) Feasibility Study (2 pages)
2) Addendum to Interim Remedial Action (2 pages)
3) Large Diameter Auger Footprint and Source Removal Map (1 page)

Modified Feasibility Study

19984 Meekland Avenue, Hayward, California

Below are four methods that were identified to help determine the most feasible way of conducting an Interim Remedial Action at 19984 Meekland Avenue, Hayward.
In coming to a conclusion for determining the most feasible method for an Interim Remedial Action, we evaluated the pros and cons, the costs, as well as the timing to implement the job, and the timing required to eventually meet regulatory clean-up goals.

METHOD #1 - Original Proposed Excavation to 25 feet Below Ground Surface

PROs
Interim Remedial Action already pre-aprroved by Alameda County Health Department and UST fund to conduct source rermoval operations.
Approximately 1/2 of source materials would be removed, the other half of contamination has been identified to be 33-40 feet bgs.
Could use a long reach backhoe to complete work, excavator wouldn't be necessary.
Assume no benching or shoring required.

CONs
None of the deeper contamination would be removed (As identified during drilling of Landfill Acceptance Borings - October 18, 2001
Oxygen Releasing Compound (ORC) would not be targeting the zone of highest contamination.

COSTS
Costs to conduct work would be $106,616.

TIMING
Moblize fairly quickly and complete Interim Remedial Action.
2-3 days to complete work.

CONCLUSIONS
This does not appear to be the most feasible method. Additional borings have given us information which indicates most of the contamination is at a depth of 33-40 feet below ground surface. If this method was chosen for an Interim remedial action, we ***would not*** be removing the majority of the source materials, and the dissolved plume would still be leaching from the zone of highest contamination.

METHOD #2 - Excavation to 40 feet Below Ground Surface

PROs
Would remove all of the source materials from the site including deeper contamination identified from 33-40 feet below ground surface.
Interim Remedial Action would be effective, moving the site toward regulatory closure.
Oxygen Releasing Compound (ORC) would be very efffective. (ORC would be released within the groundwater smear zone enhancing bioremediation).

CONs
Require extensive benching, and shoring to meet OSHA standards.
Potentially require street closure for enough access and benching.
Require extensive de-watering of the excavation.
Require additional days and project management to conduct work.
Increase costs to conduct source removal to 40 feet bgs
Increase liabilty for subcontractors.

COSTS
Costs to conduct work would be $180,000 to $200,000.

TIMING
Would require additional time in obtaining bids for shoring, benching, and schduling contractors, as well as obtaining necessary permits for street closure.
4-5 days to complete work assuming no problems encountered in field.

CONCLUSIONS
This does not appear to be the most feasible method even though all source materials would be removed, because, an excavation to 40 feet would require benching and shoring for support of excavation sidewalls to meet OSHA standards, cost to conduct this work would increase substantially, and due to the depth of the excavation, no contractors want the responsibility.

METHOD #3 - Large Diameter Auger Shafts to 40 feet Below Ground Surface

PROs
Would remove 3/4 of the source materials including the deeper contamination identified from 33-40 feet below ground surface.
Would not require extensive benching, and shoring.
Street could remain open.
Costs to conduct work would be the same as the origianl pre-approved cost by the UST Fund.
Subcontractor ready to conduct work.
Oxygen Releasing Compound (ORC) would be very efffective. (ORC would be released within the groundwater smear zone enhancing bioremediation).
Interim Remedial Action would be effective, moving the site toward regulatory closure.

CONs
Unable to remove all source materials, due to spacing between each 40 foot deep shaft

COSTS
Costs to conduct work would be $106,606 (the same as the already pre-approved costs - just different catagories).

TIMING
3 days to complete work, assuming no problems encountered in field.

CONCLUSIONS
This appears to be the most feasible method, even though not all source materials would be removed. The majority of the contamination would be removed, especially the contamination that is within the groundwater smear zone. Oxygen Releasing Compound (ORC) would be very efffective. ORC would be released within the groundwater smear zone enhancing bioremediation and actively attack the areas of contamination that were left in place between the 40 foot shafts.

METHOD #4 - In-Situ Bioremediation and Installation of Oxygen Diffusion Wells

PROs
Cost to implement and operate would be cheaper than all other methods proposed.
Would be an effective method, but ultimately, a long term process.

CONs
Would not remove any of the source materials.
Would take longer to meet clean-up goals.
Would not be as effective in moving site toward regulatory closure.
May require a microcosim study of the sites subsurface soils to determine if there are organisims present that would degrade contamination.

COSTS
Costs to install and operate four oxygen diffusion wells for one year would be $80,000
These costs due not include a microcosim study.

TIMING
2-3 days to install wells and oxygen diffusers, with two operational visits per month.

CONCLUSIONS
This appears to be a feasible method, however the length of time to cleanup the site would be variable and undetermined. The length of time would depend on the abundance of microbiological activity and the radius of influence that the oxygen diffusers would have in the subsurface. This method would work well in conjunction with Method #3 - Large Diameter Augers.