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23 August 1995

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77 West Jackson Boulevard
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EPA Contract No.: 68-W8-0089

Work Assignment No.: 032-5PZ2 Yeoman Creek Landfill Site

Document Control No.: 4500-32-ALQY

Subject: Steering Committee Comments on the Proposed Plan

Dear Mr. Boice:

At your request, WESTON has provided additional information relative to certain comments raised by the Yeoman Creek/Edwards Field Steering Committee. The comments you asked us to respond are several of the many points raised by Mr. Jeff Diver of the Yeoman Creek Steering Committee in his letter of 15 July 1995, which was addressed to you and to Ms. Narsete of U.S. EPA. As requested by you the comments that WESTON reviewed are the following:

* U.S. EPA unreasonably assumes that the FML will be poorly constructed (Comment 5).

* Installing a two-foot-thick clay layer as part of a cap would be detrimental to short-term effectiveness (Comment 6, Footnote).

* Groundwater recharge to the creek is insignificant (Comment 8).

* Leachate treatment is insignificant and too costly (Comment 9).

* Installing a leachate collection system would be detrimental to short-term effectiveness (Comment 10).

* Installing a leachate collection system would drain nearby wetlands (Comment 11).

* The cost estimate for the proposed plan is incorrect (Comment addressed on Page 27).

Our overall observation is that the responses provided by the steering committee do not appear to form a coherent, unified objection to the proposed plan. For example, two comments insist that little leachate or groundwater flows from the landfill to the river, while a third comment insists that if the flow of water from the landfill to the river is interrupted, the wetland habitats will be negatively impacted. If the landfill is so dry that it produces no leachate, then it does not sustain the wetland. If the landfill's leachate does sustain the wetland, the flow of water from the landfill must be significant. The only unified theme the three comments have in common is disagreement to the proposed plan.

WESTON has offered the following specific responses on each point highlighted by you on the proposed plan:

PRP Comment 5: The U.S. EPA unreasonably assumes that the FML will be poorly constructed.

Response: The steering committee has provided information related to ensuring the reliability of the FML during construction by implementing an appropriate QA/QC program, which is likely to reduce the precipitation infiltration by 99.4% instead of 84.9% as documented by the U.S. EPA HELP model. The steering committee also believes that with the rigorous QA/QC will make the field performance similar to that of options 4A and 4B. Compared to options 4, options 4A and 4B have additional impermeable layer beneath the Geomembrane layer as indicated in Figure 19 of the FS report. While the rationale provided by the steering committee may be valid, U.S. EPA should evaluate the appropriateness of the additional cost of implementing option 4B to reduce an additional infiltration potential of approximately 15% The CQA proposed by the steering committee is a typical a CQA program for a HDPE liner material. This program is no more stringent than recommended in the Technical Guidance Document, Quality Assurance and Quality Control for Waste Containment for Waste Containment Facilities, September 1993 (EPA/600/R-93/182).

PRP Comment 6, Footnote 7: Replacement of two feet compacted clay by a GCL. The footnote also suggests that the 2-feet clay layer would require recontouring of the landfill, exposing landfill contents, thereby creating "risks" to neighboring residents, an odor problem, and a traffic problem.

Response: The use of GCL in place of 2-feet compacted clay is appropriate since it is expected to provide similar performance (e.g. permeability) to that of a 2-feet compacted clay. The use of GCL will likely result in a cost saving compared to the compacted clay and will also eliminate the issues related to the risks identified by the steering committee. However, if the 2-feet compacted clay is selected for remedial action at this site then the concerns about excavation, traffic and short term risks raised by the PRPs can be easily rectified during construction as discussed below.

Excavation: The design provided by an FS is only a first, rough description of an alternative. During remedial design, the design engineers can further refine a cap's design so that excavation is minimized. Alternative cut-and-fill configurations can be examined. Slope stabilization can be considered. All of these mitigating methods can potentially reduce the area of the landfill requiring excavation.

Traffic: Additional traffic would definitely be required to import clay for installing clay layer. Lewis Avenue is a large street with capacity to accommodate trucks. Furthermore, stockpiling can mitigate time-of-day issues. If capacity during rush hour is a problem, limits can be established on rush-hour deliveries. If night time noise is a problem, limits can be established on the hours of deliveries.

Short Term Risks: The means are readily available for mitigating risks due to dusts and vapors. Active dust and vapor suppression technologies are readily available. Popular methods of mitigation include temporary containment structures, chemical suppressants (e.g., vapor suppression foam), temporary covers, and water sprays. Each active vapor suppression method has been used successfully at hazardous waste sites. Passive dust and vapor suppression control is also possible. Emissions are highest when temperatures are hot (favoring volatile emissions) and dry (favoring emission as dust). Passive avoidance of emissions is easily achieved by scheduling work for springtime, when the climate is cool and wet, and avoiding work in the summertime, when the climate is hot and dry. More information on mitigating dust and vapor, are available from the U.S. EPA Risk Reduction Engineering Laboratory; Dust and Vapor Suppression Technologies for Excavating Contaminated Soils, Sludges, and Sediments.

PRP Comment 8: Groundwater recharge to the creek must be insignificant because the base flow of the creek is negligible.

Even if the comment were correct that infiltrating water somehow did not flow in significant amount to the river, there would still be sufficient reason to try to collect the leachate, since the leachate must be going somewhere even if it is not going to the creek. Observing a water balance on the landfill, water infiltrating downward through the landfill can either emerge as a leachate seep into the creek or emerge as contaminated groundwater. WESTON site manager has observed water in the Yeoman Creek along the Yeoman Creek Landfill during all oversight while crossing the creek. The Yeoman Creek Landfill is an intermittent stream therefore it may be dry in other areas but has water in it along the Yeoman Creek landfill during most of the year. Hence the statement made that Yeoman Creek is dry during most of the year is incorrect. Therefore, the leachate discharge from the landfill is most likely source of water in the Yeoman Creek.

PRP Comment 9: Groundwater treatment is both too minuscule and too costly.

Response: The steering committee in their response has not addressed the need to provide pretreatment of the contaminants present in the leachate. Instead, they argue that incurring 2 million dollars for a "questionable benefit" (little or no incremental human health or benefit) is not cost effective.

The comment obscures the fact that the treatment flowrate is quite ordinary for groundwater. The hydraulic conductivity (1E-06 cm/sec by the PRPs' measurement) and gradient (0.01 by the PRPs' potentiometric surfaces) within the fill are ordinary values in groundwater, resulting in a very ordinary flow (500 gal/min by the PRPs' calculation) for a passive recovery system. Despite these very ordinary values, the Steering Committee has chosen theoretical devices to make the flowrate look unusual, even foolish. For example, the use of nonstandard units is striking: "one ounce of water and/or leachate per minute per 100 feet of trench." Such units are highly unusual and appear calculated to produce a small number. If the U.S. EPA were to respond in kind, the Agency could just as well reorder the units to produce an equivalent equally striking quantity with the opposite effect: the landfill produces 1,400,000 milliliters of leachate per kilometer per day.

Furthermore, the comment puts undue emphasis on the quantity of leachate. The comment obscures the fact that water is highly contaminated, exceeding industrial wastewater pretreatment standards for COD, TSS, ammonia, cyanide, iron, lead, and zinc. The water is too contaminated for discharge to sewer without pretreatment, but the Steering Committee is suggesting that it be allowed to flow into Yeoman Creek.

As for cost, ten cents per gallon for pretreatment and disposal to the POTW is an entirely ordinary cost for treatment of such hazardous wastewater. The option of complete on-site treatment was considered in the FS, but selected pretreatment prior to discharging to the POTW to reduce the cost.

PRP Comment 10: Installing a leachate collection system would be detrimental to short-term effectiveness. (Page 13 of PRP comments.)

Response: Here, as with the earlier comment on the clay cap layer, the Steering Committee makes ambiguous references to "risks" and odors. WESTON recommends dealing with the "risks" of building a leachate collection trench in the same way as dealing with the "risks" of building a clay cap layer.

The Steering Committee's concern about leachate entering the creek seems remarkable, considering that Comment 9 insisted that only a "nominal" volume of leachate was available for collection. The leachate from the waste during construction can be contained from going into the Yeoman Creek by sound construction practices. For example, the excavated waste can be placed on the plastic liners with leachate collection sumps on the landfill for dewatering. The leachate can than be transported into the drum and the dewatered waste can be placed appropriately under new landfill cover.

PRP Comment 11: Installing a leachate collection system would drain nearby wetlands. "Altering the water balance in the Creek and the wetlands by increasing the water outflow could very well negatively impact these habitats."

Response: This comment contradicts Comment 8, in which the Steering Committee stated that "groundwater recharge to Yeoman Creek is not a significant factor at this site." It also contradicts Comment 9, which insists that the trenches will collect only a "nominal" volume of leachate. In contrast to those earlier comments, Comment 11 implies that elimination of water from the landfill will impact the habitats it the nearby wetlands. Both comments cannot be true.

If the Steering Committee desires to provide additional protection of wetlands, the Agency should consider amending the proposed plan to include full on-site treatment and discharge to Yeoman Creek through a new NPDES-compliant outfall. Such a system would prevent any dewatering of the wetland. The FS (at Section 4.3.7.4.3) developed and screened such a system. The FS dismissed the on-site treatment option on the basis that it had higher cost, but similar effectiveness as disposal at a POTW. Now, with the Steering Committee's new awareness of a wetland issue, the option of on-site treatment and disposal to Yeoman Creek becomes more attractive and should be reexamined.

PRP Comment: The cost estimate for the proposed plan is incorrect. The cost of Alternative 4B would be $26.9 million, not $25.7 million.

Response: The discrepancy identified by the Steering Committee amounts to approximately four percent of the present value of Alternative 4B. This cost difference is insignificant compared to the anticipated accuracy of a cost estimate in an FS. Agency guidance sets the accuracy target at +50 percent to -30 percent (U.S. EPA, Guidance for Conducting RI/FS under CERCLA, October 1988.) While the Steering Committee is correct in trying to eliminate known discrepancies, the accuracy target is so much larger than the identified discrepancy that the impact of the correction is negligible. Furthermore, since cost is only one of seven balancing criteria used to select the preferred alternative, it is clear that the slight difference in cost does not affect the ranking of the alternatives.

<u>Other Comments</u>:
In addition to responding to specific Committee's written comments, you have also asked WESTON to respond to some additional points:

* What are other ways to collect the landfills' leachate before it reaches the creek?

* How can the landfill's leachate be monitored so that the effect of the leachate on the river can be measured?

Several ways are available to collect the landfill's leachate: a toe drain, horizontal wells, and vertical wells are all possible. The collection measures could be combined with barriers for additional effectiveness. Most of these measures were already discussed in the FS. Alternatively, also as discussed in the FS for Alternative 4, the creek could be placed into a culvert for the length of its passage along the Yeoman Creek Landfill, thus preventing the leachate to mix with the river flow.

A toe drain would intercept leachate without intercepting much groundwater. A toe drain is a granular drainage device installed along the downgradient face of a landfill. The toe drain could intercept all shallow leachate, eliminating the potential for surface seeps. A toe drain typically does not extend very far below the ground, so it would be less effective than a trench in collecting leachate.

Horizontal wells can be placed into the landfills parallel to the creek to intercept leachate before it escapes to the creek. Several horizontal wells could be installed in parallel, some of them distant from the creek so that recovery of leachate would be maximized while recovery of creek water is minimized. Such wells could, in effect, create an after-the-fact leachate collection system. Engineered leachate collection systems on new landfills resemble horizonal wells in appearance and function. Horizontal wells have been demonstrated for removal of groundwater beneath a landfill at the DOE Savannah River Site. This measure is likely to be costly and would require disturbing the landfill content.

Vertical wells could be placed into the landfill to collect leachate; however, experience suggests that vertical wells in fill material tend to have limited radii of influence. The FS (at p. 50) discussed the possibility of vertical wells and rejected them, pointing out the heterogeneity of waste as being detrimental to reliable extraction.

Placing the creek into a culvert would be highly effective in excluding leachate from the creek. The FS considered this artificial-channel option (starting at FS p. 45 and culminating in Alternative 4A), but did not pursue it.

Adding a barrier for use in conjunction with leachate collection would improve the effectiveness of leachate collection, while reducing inadvertent dewatering of the surrounding groundwater and Yeoman Creek. The FS developed a deep slurry wall technology (starting at FS p. 61 and culminating in Alternative 5) along these lines. Furthermore, besides slurry wall there are other methods that can be used to ensure that the leachate collection system collects leachate rather than water from the Yeoman Creek. These methods are Vibrating Beam, HDPE wall, and Sheet piling. These methods should be evaluated during the remedial design phase to determine their applicability at the site. With slightly lesser efficiency the Yeoman Creek water flowing into the leachate collection pipe can be reduced by placing on an impermeable membrane along the face of the trench, on the Yeoman Creek side of trench. This is already included in the FS developed leachate/collection system. However, the estimated volume of surface water, 270 gpd is a conservatively maximum amount, which may not be accounting for the expected reduced flow due to impermeable membrane.

Several ways are available to monitor the leachate leaving the landfill and entering the river: using soil gas probes as monitoring wells, installing new shallow monitoring wells in the fill, and, possibly, groundwater modeling as an adjunct to new monitoring wells.

As demonstrated during the RI, soil gas probes can be used to monitor the piezometric surface of the leachate. The probes may also be acceptable for monitoring the quality of the leachate. Combining the direction and quality of groundwater, the effect of the landfill on the creek could be computed.

Shallow monitoring wells would provide even better characterization of the groundwater flow and contaminant transport.

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One way to reduce the number of new monitoring wells required would be to install a limited number of monitoring wells and calibrate a groundwater model to match the observations in the wells. That way, behavior across the entire landfill-river boundary could be inferred. The model would also automatically calculate water flux and contaminant flux from the leachate to the river.

Direct measurement of Yeoman Creek's water quality should not be used to measure the effect of leachate on the creek. When the creek flows, it will dilute the leachate due to mixing. Furthermore, fluctuations in the upstream levels of contamination in the creek would introduce additional uncertainties.

We hope that our evaluation assists you in responding to some of the Steering Committee's public comments.

If you have any questions, please call.

Very truly yours,

ROY F. WESTON, INC.

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