STATE OF COLORADO

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Dedicated to protecting and improving the health and environment of the people of Colorado

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January 4, 1999

Mr. David Sealander
Chief, Environmental Compliance Division
DIR Environmental Compliance and Management
801 Tevis Street
Fort Carson, Colorado 80913-4000

RE: **Comments; Draft Final RCRA Facility Investigation Report, Former Vapor Degreaser (FTC-058/SWMU 16), dated July 1998**

Dear Mr. Sealander:

The Colorado Department of Public Health and Environment, Hazardous Materials and Waste Management Division (the Division) hereby transmits comments, enclosed, on the referenced document.

Our comments reflect the need to evaluate the existing data in respect to direct human contact and ground water protective levels. Comparisons are needed now, rather than later, to allow the Division to determine the adequacy of the investigation in respect to RCRA closure performance standards. A potential result of the comparisons is an addendum to the RFI investigation.

A central concern is whether volatile organic compounds (VOCs) in soils are great enough to warrant an assessment of the transport and fate of the released constituents. This concern stems from interpretations of data collected in 1992, and subsequently, that the Division believes disregard the potential for impact to ground water and surface water resources. The incomplete evaluation of the data along with contamination found down gradient of Building 8000, for which a source has not been defined, precludes immediate approval of the RFI report.

The Division has also determined that the unit is subject to RCRA Closure as opposed to a Corrective Measures Study (CMS). A CMS, in addition to a Closure Plan, may become appropriate if remediation of ground water becomes necessary and cannot be readily incorporated into closure activities. The No Further Action alternative, if viable, may be considered in the subsequent Closure Plan.

A revised report should be submitted no later than March 5, 1999. Please take advantage of the opportunity to clarify any comments by calling me at 303-692-3337.

Sincerely,

Harlen R Ainscough

Harlen R. Ainscough, Project Manager
Corrective Action Unit
Federal Facilities Program

Enclosure

cc: Susan Chaki, CDPHE
Thomas Warren, Ft. Carson
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Colorado Department of Public Health and Environment

Hazardous Materials & Waste Management Division

Comments

Revised

Draft Final

RCRA Facility Investigation Report

Former Vapor Degreaser (FTC-058/SWMU 16)

Ft. Carson, Colorado

dated

July 1998

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Executive Summary: The last paragraph, page ES-ii, states that a CMS may be performed if VOC levels pose a risk; otherwise a request for No Further Action will be prepared. The Former Vapor Degreaser constituted a process involving the use of hazardous materials. The RFI report presents evidence of the abandonment of a discarded material, 1,1,1 trichloroethane (1,1,1 TCA), CAS# 71-55-6, per 6 CCR 261.2(a)(2)(I). The abandonment qualifies the material as a solid waste. As a discarded commercial chemical product 1,1,1 TCA is identified as waste code U226 per 6 CCR 261.33 and 6 CCR 261.33(f). Furthermore, the 1,1,1 TCA released to the concrete pit and sump, and subsequently to the soils, constitutes a "spent" solvent in that reprocessing, i.e. removal from the soils and re-distillation, would be necessary to restore the solvent to the intended use. Since the 1,1,1 TCA was used as a degreasing solution it also qualifies as a F001 waste. The release further constitutes disposal of a hazardous waste in respect to Colorado Revised Statues, C.R.S. 25-15-101(3) and (6)(a), definitions. Therefore, the pit and sump are subject to RCRA closure requirements under 6 CCR 1007-3, Section 264, Subparts G and J, as indicated in Section 264(b). A RCRA Closure Plan, versus a CMS, must be submitted.

Section 1.0: Please submit one copy of the Quality Control Summary Report (QCSR) prepared for this unit. Additionally, as a standard practice, please submit the QCSR for each unit concurrently with the submittal of each RFI Report.

Section 2.1: Relative to the preparation of a CMS, please see the preceding comment to the Executive Summary.

Section 2.3.3: Relative to the second paragraph, page 2-6, a shallow aquifer exists in the vicinity of Building 8001. Please discuss the known extent of ground water, based on area monitoring wells, etc. in the vicinity of Building 8000. The general statement that ground water "may not exist in the vicinity of the Building, including the Vapor Degreaser" is inadequate. Of concern is the potential for the release from the Vapor Degreaser to have migrated, or continue to migrate, laterally along the Alluvial (fill)-Pierre Shale interface to the ground water along B Ditch and subsequently to local surface and ground water resources.

Section 2.4: The second paragraph, page 2-7, indicates that a 2000 mg/kg 1,1,1 TCA concentration may have resulted from the bore hole being left open for four days and being impacted by cleaning activities. This interpretation is contradicted by the evidence. The text of Section 2.4 indicates that the hole was left open after the 3-4 foot sample was collected. There is no indication that work on February 14, 1992 continued to the 6½ foot depth them resumed on February 18 with the collection of the 6½ -7½ sample interval. On the contrary, Appendix A (under the heading, "... Coring and Sampling of Containment Pit", for

February 18, 1992, Boring #2) showed, "Discolored, fine wet sand to 6½ feet". This indicates drilling continued to the 6½ depth, presumably from the 4 ft depth, on February 18 not on February 14. Discoloration of this 4-6½ increment from cleaning the pit with water and detergent is questionable. More importantly, the description of work on February 14, prior to cleaning the pit, described the 3-4 ft sample interval as, "174 ppm on PID> Wet blue-gray sand with strong odor" compared to a PID reading of 84 ppm and a strong odor on February 18 for the 6½ - 7½' sample interval. Thus, visual and field data indicate that contamination existed prior to the steam cleaning of the Vapor Degreaser pit. Furthermore, Section 2.4 text states that the borings were analyzed for 1,1,1 TCA. Thus, the head space reading in both the 3-4 and 6½-7½' sample intervals, 174 and 84 ppm respectively, may reflect constituents in addition to 1,1,1 TCA. Please reconsider the interpretation and acknowledge the existence of 2000 mg/kg of 1,1,1 TCA contamination in 1992. The transport and fate of this constituent, relative to the suggestion of limited ground water in the last paragraph of Section 2.3.3, must be addressed in both Sections 4.0 and 5.0.

The second paragraph, page 2-8, states that, "[t]richloroethene(TCE) was the most widespread chlorinated VOC identified in all the samples and detected at the highest levels." Please expand and clarify the discussion of TCE. The Division notes that TCE, per Figure 2-4, was at or below 2 ug/kg in SB2 and SB3 located beyond the immediate area of the sump. Only borehole SB1, adjacent to the sump, showed significant concentrations of TCE. Also, since 1,1,1 TCA was reported to be the solvent used in the degreaser, please discuss the source or origin of TCE and the other constituents (e.g. toluene) in both the SB series holes and in the samples collected during the subsequent RFI phase. (Note: In addition to referencing Figures 4-1 and 4-2, please discuss the VOC results from the five RFI sample locations in the second paragraph, Section 4.3.1, page 4-4.)

<u>Section 3.2:</u> The locations of the borings and direct push samples, coupled with the previous investigations described in Section 2.4, show that 1,1,1 TCA was the only constituent analyzed over the full areal extent of the pit. Since samples for Pit Boreholes 3 thru 6 were non detect for 1,1,1 TCA immediately below the concrete and at the alluvium-bedrock interface, and Head Space Readings did not exceed 4 ppm, the Division will forego further wide spread sampling to identify the initial extent of contamination. However, the Division reserves the option to require additional sampling to establish the fate of 1,1,1 TCA and other constituents(e.g. TCE) detected in Pit Boreholes 1 and 2.

On page 3-4, fourth paragraph, the statement is made that wash water from a severed line did not impact an additional 10 foot interval of VDGSB-EW2 that had been in direct contact with the release of wash water. However, in Section 2.4 it is suggested that cleaning activities may have impacted the 6½ - 7½ sample interval despite a buffer of strata in Pit Borehole #2. Please provide the rationale for the contrasting statements in each section as appropriate. (The Division suggests consideration be given to the differences in sample grain size and permeability.)

<u>Section 4.1:</u> Relative to the first paragraph of the section, the applicability of RCRA Closure requirements versus a CMS have been discussed in general. Specifically, the Division considers the unit, and the documented release therefrom, a potential secondary source to ground water. Consistent with Order on Consent for the Grit/Oil Pit, effective March 24, 1997, a CMS is applicable to the cleanup of ground water impacted by a release. However, since a significant impact to ground water may not have occurred to date, a Closure Plan designed to eliminate potential future impacts, or to demonstrate that such impacts would be insignificant in respect to closure performance standards, must be prepared.

Relative to the second paragraph of the section, the Division suggests that the Division's Proposed Soil Remediation Objectives Policy (SRO Policy), dated December 31, 1997, be considered as the basis for evaluating VOC levels relative

to direct contact exposures and ground water protection. This would allow a meaningful discussion of VOCs, the principal constituents of concern, and further support development of the Closure Plan. Absent the use of the policy, or comparable approach, any release is subject to full decontamination of the affected soils under 6 CCR 1007-3, Section 264.197(a). If the Policy is used, Section 4.3.1 should be expanded to draw perspectives between the various constituent levels and the Tier 2 (generic) or Tier 3 (site adjusted) approaches. Such perspectives are necessary, at this time, to allow the Division to determine whether the RFI Report can be approved with modification or warrants an Addendum to the RFI Work Plan prior to the formulation of the Closure Plan.

Section 4.2.1: This section states that fill material was described as "wet" only in borings constructed in February 1992 in the sump area, but borings in 1995 and 1996, also adjacent to the sump, encountered neither ground water or wet zones. Given the fact that the Vapor Degreaser remained in service until approximately February 6, 1992 (Appendix A), this information may indicate that the "wet" conditions were evidence of a substantial or sustained release. In contrast the lack of wet conditions or ground water in 1995 and 1996, long after the unit was removed from service, suggests migration of the released constituents rendering the fill material relatively "dry". In the absence of ground water, both LNAPLs and DNAPLs may have dispersed from the sump area and the fill material onto the Pierre Shale barrier layer. This report frequently acknowledges higher constituent levels at the bedrock interface. If this interpretation is plausible, as the Division believes, consideration must be given to the transport of 1,1,1 TCA and other constituents away from the sump and to their ultimate fate. Although ground water was not encountered in the immediate area of the Vapor Degreaser pit, the potential for contamination of ground water adjacent to B-Ditch and ultimately to public water resources must be considered fully. Consideration should also be given to the Vapor Degreaser as the source of contaminated water found in manholes to the Building 8001 waste lines. It may be recalled that contamination was more pronounced up gradient of the Building 8001 waste storage tanks and subsequently lead to the evaluation of the waste lines as the source of that contamination. Consideration must now be given to the Vapor Degreaser, in addition to the waste lines, as the source of ground water contamination in the area. Before the significance of this potential can be determined, it is necessary to compare the existing data to constituents levels in soils deemed to be protective of ground water (i.e. the SRO Policy). Accordingly, please refer to the second comment to Section 4.1.

Additionally, an attempt should be made to reconstruct, or reasonably estimate, the volume of solvents used in the degreaser to the total disposed as waste, recycled or routinely lost in the process. If successful, this would provide some perspective on the relative volumes and severity of the release to soils.

Section 4.2.2: The elevated head space readings at the Pierre Shale-Fill Material interface is consistent with LNAPLs, as well as DNAPLs, migrating downward in the absence of ground water. The extent of contamination and the potential for constituents to come in contact with ground water is evident and necessitates further evaluation before the RFI Report may be approved.

Section 4.3.1: Relative to the second paragraph of the section, diminished constituent concentrations with depth in the Pierre Shale are consistent with expectations (although clays are not a certain deterrent to all solvents). However, the statement, as written, suggests that the constituents have been unable to migrate and no impact to ground water has occurred. Please revise the narrative to discuss the potential for lateral movement along the Pierre Shale contact and potential impacts to ground water along B-Ditch. Potential impacts to surface water, and ecological receptors, must also be considered independently of ground water.

Relative to the third paragraph of the section, the order of magnitude variation in VOCs between the duplicate samples collected "essentially at the contact

between the fill materials and the weathered Pierre Shale", and the primary sample from soils immediately below, reinforces the potential for lateral migration and the need to estimate the volume of the release. (Please see the second comment to Section 4.2.1.) If the volume of the release was small, the Pierre Shale may have captured the release thereby reducing the potential impact to ground water. Please evaluate this potential fate scenario and discuss in an appropriate section.

Relative to the last paragraph of the section, page 4-5, please provide "process knowledge" on metals that may have originated from engine and other parts as a result of the vapor degreasing process. Alternatively or additionally, please consider application of the Divisions' SRO Policy to the inorganic constituents.

Section 4.3.2: As described in Section 3.2, page 3-4, boring VDGSB-EW2 was left open approximately one month when it was discovered that a wastewater line from the new steam cleaning unit had been severed and the borehole had filled with wastewater. Are the constituent levels shown in Table 4-3 consistent with wastewater from the steam unit, or perhaps, did the water in the boring become contaminated during the period of contact between the water and previously contaminated soils? If from the latter scenario, it may be possible to gain insight from the data on the expected level of impact to ground water. Assuming the wastewater line is connected to the industrial sewer, data should be available on constituent levels influent to the sewer. If so, please compare that data to the data in Table 4-3 and discuss accordingly. If appreciable differences exist between the data sets, please also compare constituent concentrations in the relevant soil samples of VDGSB-EW2 to the corresponding VDG-L-VEW2 water sample in respect to the "source to ground water potential" of the soils.

Section 5.1: The fifth sentence, second paragraph, of the section suggests that the wet zone was a result of steam cleaning activities. In consideration of the comment to Section 2.4, please revise the sentence.

Relative to the first paragraph of page 5-2, please see the first comment to Section 4.3.1. As written, the potential for lateral migration is not properly considered. The minimal impact to deeper Pierre Shale does not preclude lateral migration to ground water and surface water.

Relative to the second paragraph of page 5-2, the Division does not concur with the statement that the 1992 sample data is suspect. The comment to Section 2.4 conveys the Division's concern on this issue. We further note that borehole VDGSB-EW2 failed to collect a sample across the fill material-bedrock interface which has been shown to be consistently the most highly contaminated zone. Direct push samples VDG-DP01 and VDG-DP02 show low detections and no detections of solvents, respectively, over a four foot increment. The potential diluting effects of this wide sample increment makes these results inconclusive. Furthermore, the drilling logs of Appendix B provide no details (i.e. odor, discoloration, etc.,) to warrant the large sample increment. Only the sample from Borehole VDGSB-EW3 focused on the fill material-bedrock contact. The apparent integrity of the 1992 samples and the sampling design of the 1995-6 samples do not support a determination of No Further Action at this time.

Tables: Please provide a table of analytical data from the previous investigations (i.e the "B" and "SB" series borings) discussed in Section 2.4.