CAFB 07

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS 27TH FIGHTER WING (ACC)
CANNON AIR FORCE BASE NEW MEXICO

3/27/07

Colonel Scott D. West
Commander
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Cannon AFB NM 88103-5214

Mr. James Bearzi
Chief Hazardous Waste Bureau
New Mexico Environment Department
2905 Rodeo Park Drive, East Building 1
Santa Fe NM 87505-6303

Dear Mr. Bearzi,

Cannon Air Force Base (CAFB) hereby submits the attached response to all General and Specific Comments to the Notice of Deficiency, Corrective Measures Study at SWMUs 31, 48a, 77 and 127, Cannon AFB, NM, EPA ID No. NM7572124454.

If you have any questions or concerns regarding this matter, please do not hesitate to contact my Restoration Project Manager Ms. Kristi L. Doll, at 505-784-1098 or at Kristi.doll@cannon.af.mil.

Sincerely

RONALD A. LANCASTER
Chief, Environmental Flight

Attachment:
Response to NMED's General and Specific Comments

cc:
NMED HWB Bureau (S.L. Vonteddu) w/o Atch
EPA Region VI (B. Sturdivant) w/ Atch

1st Ind, 27 CES/CC

Concur/~~Nonconeur~~.

Stephen D. Wood
STEPHEN D. WOOD, Lt Col, USAF
Commander, 27th Civil Engineer Squadron

2d Ind, 27 MSG/CC, 27 MAR 07, Ltr to Mr. James Bearzi

Concur/~~Nonconcur.~~

Margaret B Poore

MARGARET B. POORE, Colonel, USAF
Commander, 27th Mission Support Group

3d Ind, 27 FW/CC

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who managed the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Scott D West

SCOTT D. WEST, Colonel, USAF
Commander, 27th Fighter Wing

RESPONSE TO COMMENTS
STATE OF NEW MEXICO ENVIRONMENT DEPARTMENT
CORRECTIVE MEASURES STUDY AT SWMUs 31, 48A, 77, AND 127
CANNON AIR FORCE BASE, NEW MEXICO

The New Mexico Environment Department (NMED) has reviewed the Cannon Air Force Base (the Permittee) *Corrective Measures Study at SWMUs 31, 48A, 77, and 127* (Report), dated June 2000. NMED has also reviewed the documents *Final Corrective Measure Implementation Work Plan for SWMU 31 (AGE Maintenance Pad) and SWMU 77 (Civil Engineering Container Storage Area)* dated January 1999, and *Work Plans: SWMUs 31, 48A, 787, and 127* dated November 1998. NMED has determined that the Report is technically deficient. While NMED does not require resubmission of the entire Report, the Permittee must respond to the comments provided in this LETTER and supply the requested additional information within 90 days of the receipts of this letter. NMED will reevaluate the report once the requested information is provided.

Comments by James P. Bearzi, Chief–Hazardous Waste Bureau, dated December 21, 2006.

Comment 1. The soil screening levels applied in the Corrective Measure Study (CMS) are taken from the Region VI media specific screening level (MSSL) tables. It should be noted that the screening levels are based upon a target risk of 1E-06. NMED uses a target risk level of 1E-05. Therefore, the screening levels should be adjusted accordingly. Given that an added factor of conservancy was incorporated into the screenings, the evaluation of contaminants of potential concern (COCs) may be overestimated. The Permittee must either revise the screening to be reflective of the NMED target risk level of 1E-05 or address this issue in the uncertainties discussion.

> **Response:** Agree. The following text will be added to Section 2.5.2: "Tier 1 MSSLs are based on a carcinogenic target risk level of one-in-one-million (1E-06) and a noncarcinogenic hazard quotient of 1. The current NMED guidance recommends using a target risk level of 1E-05. Given this added factor of conservatism, the risks attributed to contaminants of potential concern may be overestimated."

Comment 2. The Human Health Risk Evaluation Methodology described in Section 2.5 of the Report is not consistent with the methods and results presented in Sections 4 through 7 for the four solid waste management units (SWMUs). According to Section 2.5, a two-tiered approach was used to evaluate potential human health risks. Tier 1 compares the maximum site concentrations to generic human health risk-based screening levels (RBSLs). If Tier 1 RBSLs are exceeded, a Tier 2 analysis is conducted where site-specific target levels (SSTLs) are developed for those compounds exceeding Tier 1 levels. If Tier 2 SSTLs are exceeded, then several alternatives are available that include instituting an interim remedial action, conducting a further tier evaluation (i.e., Tier 3 evaluation), or remediate to Tier 2 SSTLs. Upon reviewing the risk evaluation results presented in Sections 4 through 7, it appears that only SWMU 31 and SWMU 127 contained exceedances of the Tier 2 SSTLs. For these sites a baseline risk assessment (BRA) was also conducted (refer to Appendix C).

It is unclear if the BRA process corresponds to the Tier 3 step of the human health evaluation process. If so, this step needs to be clearly described in Section 2.5. It is also unclear how the results of the Tier 1 and 2 processes were used to determine that a BRA was needed at these two sites. For example, for SWMU 31 the Tier 2 analysis indicated that only two compounds -benzo(a)pyrene and benzo(b)fluoranthene - exceeded the SSTLs. The text in Appendix C then states that a BRA was conducted; conclusions indicate that human health risk was within USEPA acceptable levels without stating the risk results and the USEPA acceptable risk levels. In reviewing the BRA results for SWMU 31, there is no mention of the Tier 1 and 2 analysis, even though the BRA evaluated over 20 chemicals. The Permittee must update the report to clearly explain the tiered human health evaluation approach used for these sites, and present this information in a logical progression.

Response: Agree. The results of the Tier 1 and Tier 2 process were used to determine that a site-specific Tier 3 BRA was needed at SWMU 31 and SWMU 127. The Tier 3 BRA included all detected organic chemicals and all metals exceeding background following the USEPA Region 6 guidance even though only two chemicals exceeded the Tier 2 site-specific target levels (SSTLs) for SWMU 31 and only three chemicals exceeded the Tier 2 SSTLs for SWMU 127.

The following summary of the risk assessment results will be included as Section 4.5.6:

"4.5.6 Tier 3 Evaluation

"Noncarcinogenic hazards and carcinogenic risks to occupational workers, hypothetical future construction workers, and hypothetical future trespassers were estimated in the Tier 3 evaluation. The concentrations of antimony, barium, cadmium, chromium, copper, lead, and zinc exceeded background and were considered chemicals of concern in soil. All detected organic chemicals were also retained as chemicals of concern in soil.

"The total hazard index calculated for noncarcinogenic health effects for the average and reasonable maximum exposure (RME) for occupational exposure was 0.0002 and 0.03, respectively. Neither hazard index exceeds 1.0, which indicates that no adverse health effects are anticipated. The estimated lifetime excess cancer risk under the assumed occupational exposure scenario was 2E-08 and 5E-06, respectively. The risks are within or below the USEPA target risk range of 1E-06 to 1E-04.

"The total hazard index calculated for noncarcinogenic health effects for the average and RME for construction worker exposure was 0.0001 and 0.001, respectively. Neither hazard index exceeds 1.0, which indicates that no adverse health effects are anticipated. The estimated lifetime excess cancer risk under the assumed occupational exposure scenario was 3E-09 and 6E-08, respectively. The risks are below the USEPA target risk range of 1E-06 to 1E-04.

"The total hazard index calculated for noncarcinogenic health effects for the average and RME for the hypothetical future trespasser scenario was 0.00003 and 0.005,

respectively. Neither hazard index exceeds 1.0, which indicates that no adverse health effects are anticipated. The estimated lifetime excess cancer risk under the assumed occupational exposure scenario was 4E-09 and 3E-07, respectively. The risks are below the USEPA target risk range of 1E-06 to 1E-04."

Comment 3. **Section 2.5.1:** The first bullet on page 2-5 indicates that the MSSLs are discussed in detail in Section 4.6.2. However, Section 4.6.2 does not exist. It is possible that this bullet is referring to Section 2.5.2, "Derivation of USEPA Region VI MSSLs". CAFB must correct the cross reference to the section that discussed the MSSLs in detail.

Response: Agree. The reference in the first bullet will be changed to Section 2.5.2.

Comment 4. **Section 2.5.1:** Under the fifth bullet on page 2-5 it is noted that if a residential screening level was not available, a screening level was calculated with the exposure component modified to account for industrial exposures. It is unclear why an industrial value would be calculated in the absence of a residential value. This implies that the Tier I screen used a combination of residential-based and industrial-based screening levels - an unacceptable approach. A Tier 1 screening is intended to be conservative; all screening levels must therefore be based on residential exposure assumptions. The Permittee must clarify whether both residential and industrial screening levels were used in the Tier 1 screening. If so, CAFB must revise all calculated screening levels for the Tier 1 screen to be reflective of residential exposure parameters.

Response: Comment noted. It is not clear which bullet the reviewer is referring to on page 2-5. If a Tier 2 site-specific target level was warranted, the exposure frequency and duration for an industrial scenario was used. The Tier 1 screening level MSSLs were based on a residential scenario.

Comment 5. **Section 2.5.1:** The description of the Tier l and Tier 2 process does not specifically indicate what land use scenarios are used for these two steps. The Permittee must state that the Tier I risk-based screening levels (RBSLs) are based on residential exposure and that the Tier 2 site-specific target levels (SSTLs) are based on commercial and construction worker exposures.

Response: Agree. The text in the second sentence of the first bullet at the top of page 2-5 under Section 2.5.1, 3. Tier 1 Evaluation will be revised as follows: "USEPA Region VI residential MSSLs were used as the Tier 1 "look-up" table."

In addition, the second sentence of the fourth bullet under 4. Tier 2 Evaluation will be revised as follows: "Site-specific target levels (SSTLs) were calculated based on the industrial scenario and a 1E-06 risk level using site-specific information and relatively simplistic mathematical models."

Comment 6. **Section 3.7:** The Permittee indicated in the last paragraph of Section 3.7 that other sources for background data were used in determining whether detected metals were within background concentrations. It is noted that in Appendix C levels representative of southwestern

soil and United States soils were used as part of the background screening. This is not an acceptable approach. Regional levels incorporate various geologies, which may not be appropriate for Cannon Air Force Base. Regional levels may therefore overestimate or underestimate site levels. The only acceptable data that may be used in screening out metals is site-specific NMED-approved background data. In reviewing the background comparisons, NMED is concerned that in some cases, the site concentration exceeded the Cannon background concentration, but was nevertheless eliminated as a COC because the concentration was less than a regional level. The Permittee must revise the background screening assessment to be based solely on site-specific data. Chemicals for which site-specific backgrounds are unavailable should be included in the screening level human and ecological evaluations. In addition, the Permittee must revise the COC lists and risk assessments accordingly.

Response: Comment noted. Only Cannon AFB-specific data were used for background screening; regional data were only included for comparison purposes to show that installation-specific data generally fell within expected ranges. All metals that exceeded the background upper tolerance limit (UTL) were carried forward for screening against the MSSL. It appears that the comparison of SWMU 127 maximum soil concentrations to MSSLs inadvertently omitted aluminum and cobalt. Table 7-6 will be edited to include these metals which do not exceed the MSSL.

Comment 7. **Section 4.2:** Section 4.2 is a partial paragraph starting with "with JP-4, oils, and diesel fuel, flows off the pad to the southeast". The Permittee must make connections to complete this paragraph.

Response: Agree. The following text will be added to the first sentence of Section 4.2: "Use of the maintenance pad began in 1971. Water from washing and surface or storm water, potentially contaminated...."

Comment 8. Section 4.4: This comment applies to each SWMU evaluated in the CMS [SWMU 48A (page 5-2), SWMU 77 (page 6-3), and SWMU 127 (page 7-3].

The last paragraph of Section 4.4 indicates that the total recoverable petroleum hydrocarbon (TRPH) maximum concentrations exceeded NMED's action level of 1,000 mg/kg. Given the history of the site, which indicates that jet fuel and diesel fuels were used, and since the site overlies a drinking water aquifer, the more conservative TPH residential screening level for diesel range fraction of TPH, 520 mg/kg, should have been used. This TPH screening level is derived from NMED's guidance, "The New Mexico Environment Department TPH Screening Guidelines (November 2005)", which is based on the Massachusetts Department of Environmental Protection (MADEP) Volatile Petroleum Hydrocarbons/Extractable Petroleum Hydrocarbons (VPH/EPH) approach for evaluating individual hydrocarbon fractions of TPH. The MADEP approach developed screening levels for different hydrocarbon fractions of TPH based on percent composition and the weighted sum of the toxicity of each hydrocarbon fraction. Use of the current screening datum will not change the conclusion of the report because the maximum detected TRPH concentrations exceeds the NMED TPH screening action level. However, the Permittee must refer to the above NMED document for future evaluations of site data to TPH action levels.

In addition, the same paragraph indicates that the NMED action level for benzene, toluene, ethylbenzene, and xylenes (BTEX) of 500 mg/kg and the action level of 10 mg/kg for benzene were not exceeded. Again, the "New Mexico Environment Department TPH Screening Guidelines" should be used for both evaluation of soil concentration for direct exposure and for the potential for the contaminants to migrate to groundwater (refer to Table 3 of the guidance).

Response: Comment noted. The TPH screening guidelines established by the November 2005 NMED guidance will be used for future evaluations of sites at Cannon AFB. In addition, screening of individual petroleum constituents will be completed following current guidance.

Comment 9. **Section 4.5.3:** This comment applies to each SMWU evaluated in the CMS [SWMU 48A (pages 5-5 & 5-6), SWMU 77 (pages 6-8 & 6-9), and SWMU 127 (pages 7-6 & 7-7)].

For the essential nutrients, the maximum detected concentrations were compared to recommended daily allowances (RDAs). However, the RDAs or upper intake levels (UILs) should be evaluated as toxicological data. These RDAs/LTLs should be used in conjunction with the soil media-specific screening levels (MSSLs) for developing a specific screening level. When comparing the site data to screening levels developed using similar methodology (e.g., Region 9 Preliminary Remediation Goal equations), it is found that the maximum detected concentrations for all of the essential nutrients are less than the resulting screening level. In the future, when evaluating essential nutrients, the RDAs/ULs should not be used directly for comparison but rather should be used to derive a screening level.

Response: Comment noted. The RDAs (in mg/day) were used as daily intake screening levels after assuming a daily incidental soil ingestion rate of 100 mg/day and using the maximum detected concentrations of the essential nutrients. In the future, the RDAs will be used to derive acceptable soil screening levels rather than daily intake screening levels, as requested.

Comment 10. **Section 4.5.5:** This comment applies to each SMWU evaluated in the CMS [SWMU 48A (pages 5-5 & 5-6), SWMU 77 (pages 6-8 & 6-9), and SWMU 127 (pages 7-6 & 7-7)].

Tier 2 screening levels were developed using the Risk-Based Corrective Action (RBCA) Tool Kit for Chemical Releases. Based upon the magnitude of the screening level provided for chromium (3100 mg/kg), it appears that the chromium was either trivalent chrome (CrIII) or total chrome. However, for the Tier 1 screening purposes, data for hexavalent chrome (CrVI) should be used. If CrVI were expected at the site, a more conservative Tier 2 screening level would likely result. The Permittee must both clarify and justify what form of chromium is present at the site, and modify the evaluations of chromium in the Tier I and Tier 2 evaluation for consistency.

In addition, the resulting screening levels for a commercial worker scenario were compared to the 2005 MSSLs for an indoor, industrial worker. Significant differences were noted, as summarized in the following table.

Chemical	SSTL (from CMS) (mg/kg)	2005 MSSL, industrial indoor worker (in mg/kg)	Maximum Site Concentration (mg/kg)	Retain as Chemical of Concern based on MSSL?
Benzo(a)anthracene	4.3	7.8	2.4	No
Benzo(a) yrene	0.43	0.78	2.7	Yes
Benzo(b)fluoranthene	1.3	7.8	5.6	No
Dibenzo(a,h)anthracene	3.7	0.78	0.63	No
Indeno(1,2,33-cd)pyrene	4.3	7.8	2.3	No
Arsenic	16	3.8	4.6	Yes
Chromium - total	3100	210	130	No
Chromium - hexavalent	3100	64	130	Yes

Based on the more current MSSLs, arsenic is a COPC and benzo(a)pyrene is still retained as a COPC, while benzo(b)fluoranthene is below its screening level. Chromium may or may not be retained as a COPC depending on the type that is likely to be present at the site. The Permittee must conduct a thorough review of the more current toxicity data and MSSLs and revise accordingly.

Response: Hexavalent chromium was not historically used and was not anticipated to be present at the site. The Tier 1 risk screen and Tier 2 SSTLs used the MSSL for hexavalent chromium applicable at the time of preparation and should not require revision. The major differences between the residential Tier 1 MSSL and the industrial SSTL are due to differences in the exposure frequency, exposure duration, soil ingestion rate, and target risk.

Comment 11. Section 4.7: The residential soil MSSLs in Table 4-7 were compared to the December 2005 version of the MSSLs (http://www.epa.gov/eai-thlr6/bpd/rcrac/pd-n/screenvalues.pdf). Although the MSSLs have been revised for almost all of the chemicals listed in Table 4-7, no new chemical was identified as having a maximum concentration exceeding the MSSL. Therefore, while the magnitude of exceedance may be different, the list of chemicals failing the Tier 1 screening evaluation remains the same.

When comparing the maximum detections to the residential soil levels, the data were evaluated against the soil-to-groundwater migration levels, based upon a dilution attenuation factor (DAF) of 1. It is noted that the following constituents had maximum concentrations greater than the screening level DAF of one: methylene chloride, tetrachloroethene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, carbazole, dibenzo(a,h)anthracene, indeno(1,2,3)pyrene, arsenic, barium, cadmium, and chromium (chromium VI). The polynuclear aromatic hydrocarbons (PAHs) and metals have concentrations significantly above the screening levels, suggesting a potential for migration to groundwater. However, given the site conditions and hydrology, a DAF of 1 may not be appropriate for the site and therefore overestimate the

risks. While this analysis does not support the conclusion of the fate and transport modeling (based upon a review of the site characteristics and the source area), the potential for migration to groundwater is most likely minimal. However, the Permittee must address the use of the soil-to-groundwater screening levels and how this screening relates to the fate and transport evaluation conducted for the site.

Response: The potential for chemicals detected in soil above the residential MSSLs to be transported to underlying groundwater was modeled rather than using the soil-to-groundwater MSSLs to screen site data because a DAF of 1 was not expected to be representative of site conditions. The results of the vadose zone fate and transport modeling for SWMU 31 indicate that chemicals of concern will not reach groundwater in concentrations above tap water screening levels. Predicted concentrations for sorption-only analyses (plus dispersion) are generally one order of magnitude below the tap water MSSL. When biodegradation is also considered, predicted concentrations are zero. The dilution attenuation factors determined for each chemical were well above a DAF of 1, so the vadose zone fate and transport model provides a more accurate reflection of site conditions. This approach used the most current methodology available at the time of the CMS preparation (June 2000).

Comment 12. Section 5 5.1: The rationale provided for the exclusion of groundwater exposures is that the depth to groundwater is approximately 250 feet. However, migration of COCs to groundwater is not based upon depth, but rather the volume of the contaminant source, geology, hydrology, and chemical properties of the contaminants. Given that this site overlies an aquifer that is used as an off-site drinking water source, stronger evidence and justification for excluding this pathway is required. The Permittee must provide additional lines of evidence justifying the exclusion of the groundwater pathway.

Response: Comment noted. See response to Comment 11.

Comment 13. Section 5.5.1: The site conceptual model does not address inhalation of volatile organic compounds (VOC) from the vapor intrusion pathway. Given that several VOCs were detected in site soil, this is potentially a complete exposure route. The Permittee must revise the assessment to address exposure via this pathway. In addition, it is noted that the MSSLs do not incorporate risks via inhalation from vapor intrusion. A separate evaluation of this pathway must therefore be evaluated. The Permittee must revise the CMS accordingly.

Response: Agree. A discussion of potential inhalation of VOCs from the subsurface to indoor air pathway will be added to Section 5.5.1 and the SCEM. However, VOCs were only detected infrequently and at low concentrations, and this pathway is not considered to be significant. Future work will implement the more recent Johnson and Ettinger model (USEPA 2004) to evaluate the vapor intrusion pathway when appropriate.

Comment 14. Table 5.5: When looking at the MSSLs based upon more recent toxicity data (2005 MSSLs), it is agreed that none of the COPCs detected at the site have maximum detected concentrations above the MS SLs.

In addition to comparing the maximum detections to the residential soil levels, the data were also evaluated against the soil-to-groundwater migration levels, based upon a DAF of 1. It is noted that the following constituents had maximum concentrations greater than the screening level DAF of 1: ethylbenzene, methylene chloride, 1,2-dichlorobenzene, 1,4-dichlorobenzene, 2-methylnaphthalene, and 4-chloroaniline. Several of these constituents had maximum concentrations significantly above the screening levels, suggesting a potential for migration to groundwater. However, given the site conditions and hydrology, a DAF may not be appropriate for the site and may overestimate the risks. Therefore, while this analysis does not support the conclusion of the fate and transport modeling, a review of the site characteristics and the source area leads one to conclude that the potential for migration to groundwater is most likely minimal. However, the Permittee must address the use of the soil-to-groundwater screening levels and how this screening relates to the fate and transport evaluation conducted for the site.

Response: Comment noted. See response to Comment 11.

Comment 15. **Section 6.7:** The site conceptual model does not address inhalation of VOCs from the vapor intrusion pathway. Given that several VOCs were detected in site soil, this is potentially a complete exposure route. The Permittee must revise the assessment to address exposure via this pathway. In addition, it is noted that the MSSLs do not incorporate risks via inhalation from vapor intrusion. Thus a separate evaluation of this pathway must be evaluated. The Permittee must revise the CMS accordingly.

Response: Agree. A discussion of potential inhalation of VOCs from the subsurface to indoor air pathway will be added to Section 5.5.1 and the SCEM. However, VOCs were only detected infrequently and at low concentrations, and this pathway is not considered to be significant.

Comment 16. **Section 6.7.4:** Tier 2 screening levels are provided on the table on page 6-12. The site maximum detections listed in the table were compared against the 2005 MSSLs for an indoor, industrial worker. While differences between the screening levels and the 2005 MSSLs were noted, the site maximum concentrations were below the 2005 MSSLs for an indoor industrial worker.

Response: Comment noted.

Comment 17. **Table 6.9:** Considering more recent toxicity data (2005 MSSLs), NMED agrees that the list of COPCs detected at the site have maximum detected concentrations above the MSSLs.

In addition to comparing the maximum detections to the residential soil levels, the data were also evaluated against the soil-to-groundwater migration levels based upon a DAF of 1. The following two constituents had maximum concentrations greater than the screening level DAF of 1: pentacholorophenol and endrin ketone. The maximum concentrations were not significantly above the screening levels, suggesting a minor potential for migration to groundwater. Given the site conditions and hydrology, a DAF may not be appropriate for the site and may overestimate the risks. Therefore, while this analysis does not support the conclusion of the fate and transport modeling, a review of the site characteristics and the source area leads one to conclude that the

potential for migration to groundwater is most likely minimal. However, the Permittee must address the use of the soil-to-groundwater screening levels and how this screening relates to the fate and transport evaluation conducted for the site.

Response: Comment noted. The CMS report was prepared in accordance with the most current methodology available at the time of its preparation (June 2000). See response to Comment 11.

Comment 18. Section 7.5.1: The site conceptual model does not address inhalation of VOCs from the vapor intrusion pathway. Given that several VOCs were detected in site soil, with some detected above the screening level, this is potentially a complete exposure route. The Permittee must revise the assessment to address exposure via this pathway. In addition, it is noted that the MSSLs do not incorporate risks via inhalation from vapor intrusion. Thus a separate evaluation of this pathway must be evaluated. The Permittee must revise the CMS accordingly.

Response: Agree. See response to Comment 15.

Comment 19. Section 7.5.5: Tier 2 screening levels are provided on the table on page 7-10. The site maximum detections listed in the table were compared against the 2005 MSSLs for an indoor, industrial worker. It is noted that there were differences between the screening levels and the 2005 MSSLs and also with the identified COCs that exceeded their MSSLs, as noted in the below table.

Chemical	SSTL (from CMS) (mg/kg)	2005 MSSL, industrial indoor worker (in mg/kg)	Maximum Site Concentration (mg/kg)	Retain as Chemical of Concern based on MSSL?
Benzo(a)anthracene	4.3	7.8	8	Yes
Benzo(a)pyrene	0.43	0.78	8.6	Yes
Benzo(b)fluoranthene	1.3	7.8	17	Yes
Dibenzo(a,h)anthracene	3.7	0.78	0.28	No
Benzene	4.6	1.5	3.8	Yes
Xylenes	23,000	210	260	Yes

When looking at the MSSLs based upon more recent toxicity data, all of the chemicals with the exception of dibenzo(a,h)anthracene are above the MSSL. The Permittee must revise these accordingly.

Response: Comment noted. The CMS report was prepared in accordance with the most current methodology available at the time of its preparation (June 2000).

Comment 20. Section 7.6: The maximum detected concentration for indeno(1,2,3) pyrene is listed as 5.1 mg/kg. When compared to the residential soil MSSL (0.56 mg/kg) listed in the table, the concentration for indeno(1,2,3)pyrene exceeded the MSSL. However, the table lists

indeno(1,2,3)pyrene as not exceeding the MSSL. The Permittee must revise the table accordingly.

Response: Agree. Table 7-6 will be edited to indicate that Indeno(1,2,3-cd)pyrene exceeds the MSSL. However, this chemical was included as a chemical of concern in the risk assessment.

Comment 21. **Table 7.6:** In light of more recent toxicity data (2005 MSSLs), NMED agrees that the list of COPCs detected at the site have maximum detected concentrations above the MSSLs (with the exception of indeno(1,2,3)pyrene, which should be added as noted above).

In addition to comparing the maximum detections to the residential soil levels, the data were also evaluated against the soil-to-groundwater migration levels based upon a DAF of 1. The following constituents had maximum concentrations greater than the screening level DAF of 1: toluene, xylenes, 2-methylnaphthalene, benzo(a)pyrene, benzo(s)anthracene, benzo(b)fluoranthene, benzo(g,h,i)perylene, carbazole, chrysene, dibenzo(a,h)anthracene, phenantlu-ene; antimony, barium, cadmium, chromium (CrVI and total), and silver. In some cases, the maximum concentrations were significantly above the screening levels, suggesting a potential for migration to groundwater. Given the site conditions and hydrology, a DAF may not be appropriate for the site and may overestimate the risks. This analysis does not support the conclusion, that groundwater could not be affected. This combined with a review of the site characteristics and the source area, raises the possibility of a potential for migration to groundwater. The Permittee must address the use of the soil-to-groundwater screening levels and how this screening relates to the fate and transport evaluation conducted for the site.

Response: Comment noted. The CMS report was prepared in accordance with the most current methodology available at the time of its preparation (June 2000). See response to Comment 11.

Comment 22. As noted in Appendix C, "Human Health Evaluation Backup Data", an industrial screening level for lead of 2,000 mg/kg was applied. Currently, the standard default screening level for lead (refer to Region 6 Medium-specific Screening Levels and Region 9 Preliminary Remediation Goals) is 800 mg/kg. However, the maximum detected lead concentration at all of the sites was below 100 mg/kg. While there is concern with the proposed industrial screening level for lead, none of the site concentrations were significantly elevated and all concentrations were below the residential screening level of 400 mg/kg. The Permittee must revise the industrial screening level for lead in the report to reflect the current standard screening level.

Response: Comment noted. The CMS report was prepared in accordance with the most current methodology available at the time of its preparation (June 2000). As noted, no lead concentrations exceed 100 mg/kg.

GENERAL COMMENTS:

There are some general comments concerning the methodology used in the risk assessments provided in Appendix C. Instead of listing the comments for each assessment, the concerns have been outlined below. Please note that these comments apply to each of the risks assessments.

Comment 1. The discussions in Appendix C often indicate that something is "explained in Appendix C". For example, under the discussion of exposure point concentrations (example see Section 4.3.5, page 4-6, Appendix C-1), the methodology for determining the upper confidence level is referenced as being explained in Appendix C. However, this information could not be located in Appendix C. The Permittee must clarify what explanation in Appendix C is being referenced.

Response: The discussions in Appendix C which state that further explanation is provided in Appendix C will be changed to indicate that "....further explanation is provided in Appendix C of the Baseline Risk Assessment for Appendix III Solid Waste Management Units – Phase I (W-C 1994b)."

Comment 2. The specific method of determining the 95% UCL was not provided, although it appears that an one-tailed test based on a normal distribution was used. This is not an appropriate test. It is unusual for environmental data to be normally distributed. CAFB must discuss the type of testing done to determine that all of the data set distributions were normal, and provide the results of these tests. If no data set distribution testing was conducted, then the data must be re-evaluated and the 95% UCL must be calculated based upon individual data set distributions. The Permittee must discuss the uncertainty in using censored data with normal distribution testing. It is likely that data sets will have different distributions and different tests may need to be applied. It is suggested that the following guidance be consulted and the software ProUCL (available free on-line) be used: Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites, OSWER 9285.6-10, December 2002.

Response: Comment noted. The standard practice at the time of CMS' preparation (June 2000) was to assume the data are lognormally distributed rather than normally distributed. The 95% UCL is shown in the Result column but is taken from the 95% UCL calculated using the natural log transformed data (Log Result column). We do not believe that the additional effort involved in deteriming the data set distributions and recalculation of the 95% UCLs will yield results that are substantially different than those provided in this report. Future work will follow the recommendations in the referenced guidance (Calculating Upper Confidence Limits for Exposure Point Concentrations at Hazardous Waste Sites, OSWER 9285.6-10, December 2002).

Comment 3. Concentrations of volatile organic compounds (VOCs) released from the soil were estimated using 1991 EPA methodologies. While this approach applied is acceptable (it was the current methodology applied at the time), the more recent Johnson and Ettinger model is used to evaluate the vapor intrusion pathway (USEPA, 2004; http://www.epa.gov/oswer/ riskassessment/airmodel/pdf/2004 0222 3phase users-guide. pdf).

Response: Agree. See response to Comment 13.

Comment 4. The use of non-detects is referenced as being addressed in Appendix C. However, it is not clear where this is addressed or how non-detects/censored data were addressed and applied in the risk assessment. The Permittee must clarify this.

Response: Agree. Discussion will be added to Section 4.3.5 of Appendix C (of the CMS) to indicate that one-half of the reporting limit (RL) was used to calculate the exposure point concentrations, unless this value would have biased the results high (i.e., one-half the RL was substantially higher than any of the detected concentrations). This approach can be seen in Table 4-7 of Appendix C (of the CMS). Data rejected during the chemistry reviews and validations would not have been included in the calculations; it does not appear that any other censoring occurred.

Comment 5. Toxicity data for total petroleum hydrocarbons (TPH) are provided. Currently, TPH date are evaluated based upon carbon chain length and associated toxicity. Please refer to NMED's guidance, "The New Mexico Environment Department TPH Screening Guidelines (November 2005)". The NMED TPH guidance is based on the Massachusetts Department of Environmental Protection (MADEP) Final Updated Petroleum Hydrocarbon Fraction Toxicity Values for the VPH/EPH/APH methodology (incorporating April 2005 erratum) (2003). The Permittee must revise the toxicity data to be consistent with current toxicity data.

Response: Comment noted. The CMS report was prepared in accordance with the most current methodology available at the time of its preparation (June 2000). Future work will incorporate the NMED TPH guidance (NMED 2005), as appropriate.

Comment 6. Some constituents were eliminated as a COC due to low detection frequency (less than five-percent). As stated in the "Risk Assessment for Superfund Guidance, Volume I Human Health Evaluation Manual" (EPA 1989), chemicals that are detected infrequently may be eliminated from additional consideration. The guidance also states that if there is reason to suspect the presence of the chemical at the site based upon site history, the chemical may not be eliminated based on frequency of detection. The Permittee must discuss whether any of the chemicals eliminated as a COC may be present due to site history. Where this is true, the risk assessment must be revised to include these chemicals.

Response: Comment noted. Metals that exceeded background levels and RDAs as well as all detected organic compounds (except those that were considered to be laboratory contaminants) were evaluated as COPCs. Aside from TPH and TRPH which were not evaluated as COCs at any of the sites, it appears that the only location where any COPCs were eliminated as COCs occurred at Boring 7707 at SWMU 77. Here relatively elevated concentrations of TRPH and PAHs detected in a near surface soil sample were eliminated from further discussion, not on the basis of a low detection frequency, but because the sample was collected immediately below an asphalt pad, the boring log indicated that the sample contained asphalt fragments, and deeper samples from this boring were virtually nondetect for organic compounds. Based on this, the presence of the contaminants was attributed to the asphalt pavement and not to site operations or a release from SWMU 77.