Reply To
Attn Of: HW124

VIA FACSIMILE

Captain Tim Merrymon
Eielson AFB
354 CES/CEVR
2258 Central Avenue
Eielson AFB, AK 99702-2225

Re: Review of Sitewide draft RI/Baseline Risk Assessment documents

Dear Captain Merrymon:

EPA reviewed the following technical documents to determine their overall sufficiency to serve together as a remedial investigation and baseline risk assessment report:

- **Sitewide Water-Table Elevations at Eielson Air Force Base, September 1991 to September 1993, draft (dated December 1993)**
- **Background Soil Quality, Eielson Air Force Base, Alaska (dated March 1993)**
- **Background Groundwater Quality, Eielson Air Force Base, Alaska (dated March 1993)**
- **Sampling and Analysis Results for the North Boundary Wells, Eielson Air Force Base, Alaska (dated November 1992)**
The enclosed review provides general and specific comments on these documents. Several of the comments were made due to the fragmented preliminary nature of the documents; these will likely be resolved through preparation of the consolidated RI/FS primary document.

Please call me at (206) 553-6642 if you have any questions or to discuss comment resolution.

Sincerely,

MJ Nearman
Remedial Project Manager

cc: R. Markey, ADEC
    V. Rhoades, PRC
EPA reviewed a series of documents which are proposed to serve together as the secondary documents for the sitewide remedial investigation and baseline risk assessment (RI/BLRA). These documents include the following:

- **Sitewide Water-Table Elevations at Eielson Air Force Base, September 1991 to September 1993, draft (dated December 1993)**
- **Background Soil Quality, Eielson Air Force Base, Alaska (dated March 1993)**
- **Background Groundwater Quality, Eielson Air Force Base, Alaska (dated March 1993)**
- **Sampling and Analysis Results for the North Boundary Wells, Eielson Air Force Base, Alaska (dated November 1992)**
- **Biological Risk Assessment, Draft (dated February 1994)**
- **Screening Baseline Risk Assessment, Sitewide, Draft (dated June 1994)**

These documents were reviewed to determine whether all technical issues pertinent to an RI/BLRA have been addressed. This review provides general comments regarding the total RI/BLRA, followed by specific comments for the Biological Risk Assessment, and the Screening Baseline Risk Assessment, Sitewide. In addition, the Biological Risk Assessment was reviewed to determine whether data generated since February 1994 alters previously published conclusions. Additional data collected was also reviewed to ensure that additional contaminants of concern identified have been adequately addressed. These comments are included in this review.
GENERAL COMMENTS

1. The substitution of these data summaries for an RI/BLRA is not generally acceptable. The presentation of this information as a series of reports impedes technical review and makes identification of any data gaps difficult. EPA (1988) guidance suggests that about half of the necessary information is lacking to reach the stated goals of guidance for an RI report, including: (1) ensuring that all major issues are adequately addressed; (2) producing comparable presentations from different sites; and (3) ensuring adequate documentation and complete data for use in decision making.

The primary document RI/FS report that binds this series of reports together, and possibly which references earlier operable unit-specific documents, may provide an adequate RI report. However, as presented, this series is insufficient.

2. The hydrogeology, background, surface water, sediment, and groundwater monitoring documents are technically sound, given the limited topic of each document. They are data reports of limited scope and detail. Their usefulness in an overall site characterization is limited, although some of the data required for an RI is presented. Major data gaps include both technical gaps and format deficiencies. Technical data gaps include: (1) complete geology and hydrogeology is not presented (e.g., there are no cross sections or borelogs); (2) no air investigation data are presented; (3) no discussion of site-wide features is presented (e.g., geographic features, demography, land use, and climatology); (4) data on contaminant sources, and waste types and characteristics are not presented; and (5) no cohesive picture of the nature and extent of contamination is presented. Much of this information can be extracted from operable unit-specific documents.

Format deficiencies include: (1) no executive summary is presented; (2) no introduction is provided to show site background, nature and extent of problems, and the history of investigations; (3) there are no conclusions or recommendations; (4) no information on potential feasibility study needs is included.

3. The Sampling and Analysis Results for the North Boundary Wells report is technically acceptable if considered a "snapshot" in time of the water quality at the five wells sampled. However, one well, NBW-4, did exhibit detections of arsenic, chromium, iron, lead, and nickel that could indicate contamination. Even though these analytes did not generally exceed drinking water standards (the exceptions being iron and manganese), it would be
premature to dismiss this groundwater as uncontaminated based on the results from a single sampling event. Because of the infrequent sampling schedule (annual sampling) and the fact these data are more than 2 years old, the results should not be considered conclusive proof of no contamination. Additional data and a more frequent sampling schedule are recommended to help evaluate the groundwater quality.

4. The BLRA is not complete as submitted. The document does not provide enough information to facilitate an evaluation of whether it is technically accurate. The purpose of the screening assessment is not thoroughly discussed. The introduction states that the purpose of the document is "to identify potential sitewide risks to human health and to direct the sitewide sampling that will occur," yet the document omits detailed site conceptual models. The site conceptual models are essential to ensure that all data gaps have been filled.

In addition, only two paragraphs are presented in the results section (Section 2.3). The information listed in the tables is not discussed or interpreted, and no conclusions are presented.

The justification for performing the screening risk assessment using a recreational scenario must be provided. While this may or may not be the most plausible current scenario, it may not be considered conservative enough to be used for screening purposes. A hypothetical residential scenario is generally used for screening purposes unless adequate justification is presented to do otherwise.

SPECIFIC COMMENTS

SITEWIDE SCREENING BASELINE RISK ASSESSMENT

5. Section 1.1, page 1, first paragraph

The assessment notes that the nonmilitary land adjacent to the base (which is also downstream from the base), is "zoned general use." This term should be defined. In particular, the text should specify whether the zoning includes residential use (with associated gardening), agricultural use, and the actual current uses for this land. The text should also indicate whether hunting and fishing occur there. This information is critical for defining all relevant scenarios for this screening baseline risk assessment.

6. Section 1.3, page 2, first paragraph

This list of contaminants of concern was compared to the corresponding list in Section 2.3 of the Biological Risk
Assessment ("U.S. Air Force 1994c"). The latter list includes the natural degradation products of the chlorinated solvents (vinyl chloride, much more toxic than the solvents themselves) and DDT (DDD and DDE, with toxicity comparable to DDT itself). As noted in Appendix C, all of these products have been detected in fish tissue, surface waters, and sediments, and contribute to risk. This list should be expanded to include relevant degradation products to be consistent with the Biological Risk Assessment.

7. Section 2.1, page 3, first paragraph

A recreational scenario is used in a generally reasonable manner; however, this is the only scenario selected. While a recreational scenario may be appropriate as part of a BLRA, it may not be sufficient for a screening risk assessment. Either a residential scenario or an agricultural scenario, including consumption of produce and livestock, is generally used for the screening risk assessment.

8. Section 2.2.4, page 4

a. Toxicity values from obsolete sources are cited, both in this section and in Appendix H. The primary source, the Integrated Risk Information System (IRIS), is updated monthly, usually around the first of the month. The 1992 citation (which does not appear in Section 3.0, References) is outdated. The secondary reference, Health Effects Assessment Summary Tables (HEAST), is reissued annually, usually around March, with some interim supplements. The 1991 citation and reference have been superseded.

b. Lead must be addressed as a potential contaminant of concern either through use of the U.S. Environmental Protection Agency (EPA) Biokinetic Uptake Model or comparison to EPA screening levels. The 1989 citation and reference to screening levels was replaced with the Office of Solid Waste and Emergency Response Directive 93554.12, entitled "Revised Interim Soil Lead Guidance for Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Sites and Resource Conservation and Recovery Act (RCRA) Corrective Action Facilities" dated July 14, 1994. This directive recommends a soil screening level of 400 milligrams per kilogram and procedures to use in adjusting this level at sites with multiple contaminants. Potential lead contamination at the site should be addressed following these recommendations.
9. **Section 2.2.4, page 5, first paragraph**

The predominant contaminants on the base, diesel-range organics and total petroleum hydrocarbons are omitted because "no toxicity data are available." EPA's interim toxicity values may be used with the results discussed in the uncertainty section.

10. **Appendix B, Unpaginated, Tables B.4 and B.5**

The numerical values given here for exposed surface area do not appear to be consistent with the values given in the text (Section 2.1, Page 3, last paragraph). In addition, the text should be changed to reflect the correct units for surface area.

**BIOLOGICAL RISK ASSESSMENT**

**11.** The biological risk assessment reports analytical results for 9 total metals in surface water samples, and the Surface Water and Sediment Investigation (SWSI) includes 19 total metals in its analysis. The additional 10 analytes were compared with the Federal Ambient Water Quality Criteria (AWQC) (EPA 1986), a federally regulated standard used to determine risks to aquatic organisms. The items to be noted include the following:

- **Antimony** was analyzed for a detection limit of 69.4 micrograms per liter (µg/L). The proposed chronic AWQC for antimony is 30 µg/L, and the acute AWQC is 88 µg/L. Because the detection limit is more than twice the chronic AWQC, risks to organisms from antimony cannot be determined, but should be considered a potential problem.

- **Cadmium** was analyzed for a detection limit of 4.7 µg/L. The chronic AWQC for cadmium is 1.1 µg/L, and the acute AWQC is 3.9 µg/L. Because the detection limit is more than four times the chronic AWQC and above the acute AWQC concentration, the risks posed to organisms from cadmium cannot be determined, but should be considered a potential problem.

- The chronic AWQC for silver is exceeded in French Creek at two sampling locations, but the highest concentration is detected in the French Creek background sample; therefore, it is unlikely that elevated silver concentrations are attributable to the site.

- **Vanadium** was detected in Garrison Slough, French Creek, and Lily Lake. Because it was detected in the Lily Lake sample and the French Creek background samples, it
is unlikely on-site concentrations are attributable to the site. Also, no AWQC are available for vanadium to be used for determining risk.

- All other SWSI total metals not in the Biological Risk Assessment were either not detected or were below AWQC.
- Volatile organic compounds that were analyzed for during the SWSI and not in the BLRA were either not detected or below AWQC.
- Detection limits were higher than the chronic AWQC concentrations for the following pesticides: chlordane, endrin, methoxychlor, and toxaphene.
- Analyses of seven isomers of polychlorinated biphenyls (PCB) were performed. The detection limits for each isomer were at least one order of magnitude above chronic AWQC. Because the detection limits are greater than the chronic AWQC, risks to organisms from PCBs cannot be determined, but they should be considered a potential problem.
- No semivolatile organic compounds were detected in surface water.

12. No federal sediment criteria exist for risk-based comparison, although guidelines have been recommended through several sources. The sediment analysis was compared to these guidelines to provide the potential risk from contaminated sediments on site.

- Silver was detected in Garrison Slough (0.51 micrograms per kilogram [μg/kg]) and French Creek (0.61 μg/kg) in excess of the lowest guideline (0.51 μg/kg, published by Persaud [1991]).
- Pesticides and PCBs were not analyzed for during the BLRA. The SWSI included analysis on 18 pesticides and seven isomers of PCB.
- Chlordane, dieldrin, heptachlor epoxide, and toxaphene were not detected at the detection limit but the sediment guideline for the lowest effect is lower that the detection limit; therefore, evaluation of risk cannot be determined through this method.
- Concentrations of 4,4'-DDD detected in Garrison Slough and Lily Lake (310 μg/kg and 16 μg/kg, respectively) were substantially above the guideline concentrations.
of 8 μg/kg provided by Persaud et al. (1991).
Concentrations of 4,4′-DDE detected in Garrison Slough also exceeded guideline concentrations of 8 μg/kg (Persaud et al., 1991). Concentrations of 4,4-DDT in Garrison Slough substantially exceeded guidelines provided by Hart et al. in 1988 guidelines (9 μg/kg).

- Sediment guidelines for delta-BHC, endosulfan I, endosulfan II, endosulfan sulfate, endrin aldehyde, and methoxychlor were not available.

- Laboratory results indicate the seven isomers of PCB that were analyzed for were not detected. All detection limits were below sediment quality guidelines (Persaud et al. 1991, Hart et al. 1988). However, the 1994 Sitewide Monitoring Program Sampling and Analysis Addendum, which reports analytical results from sampling in August and September of 1994, indicates levels of PCBs up to 55,000 μg/kg in Garrison Slough sediments. Elevated levels of PCBs are detected for about a mile with the hot spot at the upstream end of the contaminated zone. Concentrations of PCBs in the contaminated zone are orders of magnitude above the State of Washington guidelines which state that concentrations of 0.01 mg/kg dry weight would exhibit no effect, 0.07 mg/kg dry weight is the lowest observable adverse effect level, and 530 mg/kg dry weight would produce severe effects. Crustaceans and younger developmental stages are the most sensitive organisms in the benthic zone and toxicity increases with exposure (Eisler 1986). Therefore, it is probable that the elevated levels of PCBs in the sediment are adversely affecting the populations of aquatic invertebrates in the benthic zone. In addition, any fry in this zone are most likely adversely impacted. Fish that are feeding in this zone are at a potential risk as well.

- Semivolatile organic compounds detected in sediments were well below available guidelines used.

13. The main ecological concern is the elevated levels of DDT and its metabolites in sediments. Since many waterfowl are bottom-feeders and DDT and its metabolites are highly toxic to avian species, this may pose a potential risk. PCBs are far above aquatic invertebrate and fish LC₅₀ limits. The zone of contamination in Garrison Slough most likely has a substantial effect on invertebrate populations and the overall health of all aquatic organisms inhabiting this area. Silver concentrations in
sediment are barely elevated above provided guidelines for the lowest effect; therefore, silver in sediments would not pose a significant risk to ecological receptors. Analytes and compounds analyzed at detection limits above criteria or those for which no criteria are available cannot be evaluated; however, they may still pose a risk.

REFERENCES


