**DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION**

Interim Final 2/5/99

**RCRA Corrective Action**
**Environmental Indicator (EI) RCRIS code (CA725)**

**Current Human Exposures Under Control**

**Facility Name:** **MELROSE AIR FORCE RANGE**
**Address:** **CANNON AIR FORCE BASE, NEW MEXICO 88103-5214**
**Facility EPA ID #:** **NM 5572124456-1**

1. Has **all** available relevant/significant information on known and reasonably suspected releases to soil, groundwater, surface water/sediments, and air, subject to RCRA Corrective Action (e.g., from Solid Waste Management Units (SWMU), Regulated Units (RU), and Areas of Concern (AOC)), been considered in this EI determination?

__X__ If yes - check here and continue with #2 below**. (See listed references in Attachment)**

_____ If no - re-evaluate existing data, or

_____ if data are not available skip to #6 and enter "IN" (more information needed) status code.

## BACKGROUND

### Definition of Environmental Indicators (for the RCRA Corrective Action)

Environmental Indicators (EI) are measures being used by the RCRA Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved, etc.) to track changes in the quality of the environment. The two EI developed to-date indicate the quality of the environment in relation to current human exposures to contamination and the migration of contaminated groundwater. An EI for non-human (ecological) receptors is intended to be developed in the future.

### Definition of "Current Human Exposures Under Control" EI

A positive "Current Human Exposures Under Control" EI determination ("YE" status code) indicates that there are no "unacceptable" human exposures to "contamination" (i.e., contaminants in concentrations in excess of appropriate risk-based levels) that can be reasonably expected under current land- and groundwater-use conditions (for all "contamination" subject to RCRA corrective action at or from the identified facility (i.e., site-wide)).

### Relationship of EI to Final Remedies

While Final remedies remain the long-term objective of the RCRA Corrective Action program the EI are near-term objectives which are currently being used as Program measures for the Government Performance and Results Act of 1993, GPRA). The "Current Human Exposures Under Control" EI are for reasonably expected human exposures under current land- and groundwater-use conditions ONLY, and do not consider potential future land- or groundwater-use conditions or ecological receptors. The RCRA Corrective Action program's overall mission to protect human health and the environment requires that Final remedies address these issues (i.e., potential future human exposure scenarios, future land and groundwater uses, and ecological receptors).

### Duration / Applicability of EI Determinations

EI Determinations status codes should remain in RCRIS national database ONLY as long as they remain true (i.e., RCRIS status codes must be changed when the regulatory authorities become aware of contrary information).

2. Are groundwater, soil, surface water, sediments, or air **media** known or reasonably suspected to be **"contaminated"**[1] above appropriately protective risk-based "levels" (applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action (from SWMUs, RUs or AOCs)?

| | Yes | No | ? | Rationale / Key Contaminants |
|---|---|---|---|---|
| Groundwater | X | | | **SEE # 3 OF ATTACHMENT** |
| Air (indoors)[2] | | X | | |
| Surface Soil (e.g., <2 ft | X | | | |
| Surface Water | | X | | |
| Sediment | | X | | |
| Subsurf. Soil (e.g., >2 ft) | X | | | |
| Air (outdoors) | | X | | |

_____ If no (for all media) - skip to #6, and enter "YE," status code after providing or citing appropriate "levels," and referencing sufficient supporting documentation demonstrating that these "levels" are not exceeded.

__X__ If yes (for any media) - continue after identifying key contaminants in each "contaminated" medium, citing appropriate "levels" (or provide an explanation for the determination that the medium could pose an unacceptable risk), and referencing supporting documentation.

_____ If unknown (for any media) - skip to #6 and enter "IN" status code.

F**or Rationale & References SEE # 2 OF ATTACHMENT**

Footnotes:

[1] "Contamination" and "contaminated" describes media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriately protective risk-based "levels" (for the media, that identify risks within the acceptable risk range).

[2] Recent evidence (from the Colorado Dept. of Public Health and Environment, and others) suggest that unacceptable indoor air concentrations are more common in structures above groundwater with volatile contaminants than previously believed. This is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration necessary to be reasonably certain that indoor air (in structures located above (and adjacent to) groundwater with volatile contaminants) does not present unacceptable risks.

3. Are there **complete pathways** between "contamination" and human receptors such that exposures can be reasonably expected under the current (land- and groundwater-use) conditions?

Summary Exposure Pathway Evaluation Table

| | Potential **Human Receptors** (Under Current Conditions) | | | | | | |
|---|---|---|---|---|---|---|---|
| **"Contaminated" Media** | Residents | Workers | Day-Care | Construction | Trespassers | Recreation | Food[3] |
| Groundwater | NO | NO | NO | NO | NO | NO | NO |
| ~~Air (indoors)~~ | | | | | ___ | ___ | ___ |
| Soil (surface, e.g., <2 ft) | NO | NO | NO | NO | NO | NO | NO |
| ~~Surface Water~~ | | ___ | | | | ___ | ___ |
| ~~Sediment~~ | | | | | | | ___ |
| Soil (subsurface e.g., >2 ft) | NO | NO | NO | NO | NO | NO | |
| ~~Air (outdoors)~~ | | | | | | | ___ |

Instructions for Summary Exposure Pathway Evaluation Table:

1. Strike-out specific Media including Human Receptors' spaces for Media which are not "contaminated") as identified in #2 above.

2. enter "yes" or "no" for potential "completeness" under each "Contaminated" Media -- Human Receptor combination (Pathway).

Note: In order to focus the evaluation to the most probable combinations some potential "Contaminated" Media - Human Receptor combinations (Pathways) do not have check spaces ("___"). While these combinations may not be probable in most situations they may be possible in some settings and should be added as necessary.

__**X**__ If no (pathways are not complete for any contaminated media-receptor combination) - skip to #6, and enter "YE" status code, after explaining and/or referencing condition(s) in-place, whether natural or man-made, preventing a complete exposure pathway from each contaminated medium (e.g., use optional Pathway Evaluation Work Sheet to analyze major pathways).

____ If yes (pathways are complete for any "Contaminated" Media - Human Receptor combination) - continue after providing supporting explanation.

_____ If unknown (for any "Contaminated" Media - Human Receptor combination) - skip to #6 and enter "IN" status code

**For Rationale and Reference SEE #3 of the ATTACHMENT**

[3] Indirect Pathway/Receptor (e.g., vegetables, fruits, crops, meat and dairy products, fish, shellfish, etc.)

4. Can the **exposures** from any of the complete pathways identified in #3 be reasonably expected to be **"significant"**[4] (i.e., potentially "unacceptable" because exposures can be reasonably expected to be: 1) greater in magnitude (intensity, frequency and/or duration) than assumed in the derivation of the acceptable "levels" (used to identify the "contamination"); or 2) the combination of exposure magnitude (perhaps even though low) and contaminant concentrations (which may be substantially above the acceptable "levels") could result in greater than acceptable risks)?

   ____ If no (exposures can not be reasonably expected to be significant (i.e., potentially "unacceptable") for any complete exposure pathway) - skip to #6 and enter "YE" status code after explaining and/or referencing documentation justifying why the exposures (from each of the complete pathways) to "contamination" (identified in #3) are not expected to be "significant."

   _____ If yes (exposures could be reasonably expected to be "significant" (i.e., potentially "unacceptable") for any complete exposure pathway) - continue after providing a description (of each potentially "unacceptable" exposure pathway) and explaining and/or referencing documentation justifying why the exposures (from each of the remaining complete pathways) to "contamination" (identified in #3) are not expected to be "significant."

   _____ If unknown (for any complete pathway) - skip to #6 and enter "IN" status code

   Rationale and Reference(s)

If there is any question on whether the identified exposures are "significant" (i.e., potentially "unacceptable") consult a human health Risk Assessment specialist with appropriate education, training and experience.

5. Can the "significant" **exposures** (identified in #4) be shown to be within **acceptable** limits?

_____ If yes (all "significant" exposures have been shown to be within acceptable limits) - continue and enter "YE" after summarizing and referencing documentation justifying why all "significant" exposures to "contamination" are within acceptable limits (e.g., a site-specific Human Health Risk Assessment).

_____ If no (there are current exposures that can be reasonably expected to be "unacceptable")- continue and enter "NO" status code after providing a description of each potentially "unacceptable" exposure.

_____ If unknown (for any potentially "unacceptable" exposure) - continue and enter "IN" status code

Rationale and Reference(s):

6. Check the appropriate RCRIS status codes for the Current Human Exposures Under Control EI event code (CA725), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (and attach appropriate supporting documentation as well as a map of the facility):

__X__ YE - Yes, "Current Human Exposures Under Control" has been verified. Based on a review of the information contained in this EI Determination, "Current Human Exposures" are expected to be "Under Control" at the **MELROSE AIR FORCE RANGE** facility, **EPA ID # NM5572124456**, located near **Melrose, New Mexico**, under current and reasonably expected conditions. This determination will be re-evaluated when the Agency/State becomes aware of significant changes at the facility.

____ NO - "Current Human Exposures" are NOT "Under Control."

____ IN - More information is needed to make a determination.

Completed by _____ Date 3-22-07
**Cheryl Frischkorn**
**Environmental Specialist/Scientist**
**NMED Hazardous Waste Bureau**

Supervisor _____ Date 3/22/2007
**John E. Kieling**
**Program Manager**
**NMED Hazardous Waste Bureau**

Locations where References may be found:
**New Mexico Environmental Department, Hazardous Waste Bureau**
**2905 Rodeo Park Drive East, Building 1**
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**FINAL NOTE: THE HUMAN EXPOSURES EI IS A QUALITATIVE SCREENING OF EXPOSURES AND THE DETERMINATIONS WITHIN THIS DOCUMENT SHOULD NOT BE USED AS THE SOLE BASIS FOR RESTRICTING THE SCOPE OF MORE DETAILED (E.G., SITE-SPECIFIC) ASSESSMENTS OF RISK.**

# ATTACHMENT

**To the**
**RCRA Corrective Action**
**Environmental Indicator (EI) RCRIS code (CA750)**
**Migration of Contaminated Groundwater Under Control**
**For**
**Melrose Air Force Range, New Mexico**

## 2.)

| CONTAMINANT | MAXIMUM CURRENT CONCENTRATION ** (SCREENING LEVELS)*** | AREA OR SWMU # |
|---|---|---|
| barium | 31 mg/l and 2.5 mg/l (1.0 mg/l) | SWMU 115 and SWMU 133 |
| chromium | 0.42 mg/l, 0.114 mg/l, and 0.36 mg/l (0.05 mg/l) | SWMU 115, SWMU 130, and SWMU 133 |
| nickel | 0.45 mg/l (0.10 mg/l) | SWMU 115 |
| selenium | 0.088 mg/l (0.05 mg/l) | SWMU 130 |
| cadmium | 96.01 mg/l (0.01 mg/l) | SWMU 133 |
| perchlorate | 0.02 mg/l | Well MWQ15 (USGS) |
| selenium | 0.160 mg/l (0.05 mg/l) | Well MWQ15 (USGS) |
| vanadium | 78, 55, 60, 55, 49, and 65 mg/l (37 mg/l) | Wells MWQ 3, 4, 5, 6, 7, and 13 (USGS) |

** Concentrations listed are taken from the most recent report available at time of CA750 evaluation.
*** Ground water screening levels are New Mexico Water Quality Control Commission Human Health Standards or EPA Region 6 Human Health Medium-SPECIFIC Screening Levels

**RATIONALE:**
Monitoring for potential hazardous constituents in the ground water across the Range at SWMU monitoring points and U.S. Geological Survey (USGS) monitoring points reveal concentrations of pesticides, explosives, volatile organic compounds, and semi-volatile organic compounds to be non-detect or below New Mexico Water Quality Control Commission (WQCC standards). A number of metals, as well as perchlorate, were detected above screening levels in the ground water at Melrose (SEE TABLE ABOVE). However, no contaminant release patterns from specific SWMUs were noted and these detections do not correlate with metals detected above background values in the overlying soils. The occurrences of metals in the ground water, more than likely, reflect natural background conditions. With the exception of the area beneath SWMU 115, ground water is greater than 150 feet below the ground surface. The

2soils and bedrock geology at Melrose are highly alkaline in nature, making the migration of metals from a SWMU to the depths at which groundwater is encountered at Melrose is highly unlikely. Groundwater flow rates determined from the aquifer testing conducted during the RCRA Facility Investigation are on the order of 0.01 to less than 5 feet per year.

There is no permanent surface water at the Range. Two wells at Range Headquarters supply water for fire suppression and non-potable domestic supply. The Melrose Bombing Range water system consists of one production well, a treatment unit, two storage tanks, and the distribution system. Water from the production well (Well 11), located approximately a mile north of the Ranges Office Complex, provides water that is disinfected using injected hyperchlorination. A second well was disconnected from use due to quality concerns regarding arsenic and perchlorate.

**REFERENCES**:


1.) Langman, J.B, Gebhardt, F.E., and Falk, S.E., United States Geological Survey Ground-Water Hydrology and Water Quality of the Southern High Plains Aquifer, Melrose Air Force Range, Cannon Air Force Base, Curry and Roosevelt Counties, New Mexico, 2002-03, Scientific Investigation Report 2004-5158, Prepared in cooperation with the U.S. Air Force, Cannon Air Force Base, 2004.

2.) Department of the Air Force, Cannon Air Force Base, Part A RCRA Permit Application Corrective Action for Melrose Air Force Range, Cover Letter December 2004.

3.) United States Geological Survey, United States Air Force Ground-Water Monitoring at Melrose Air Force Range, Analytical Results of Samples Collected December 13, 14, 15, and 16, 2004, Prepared for Cannon Air Force Base, April 2005.

4.) Foster Wheeler Environmental Corporation, RCRA Facility Investigation Report Addendum for Melrose Bombing Range Cannon Air Force Bas, New Mexico, Prepared for Cannon Air Force Base, February 2003.

5.) Ebasco (Foster Wheeler Environmental Corporation), Draft Phase I RCRA Facility Investigation for Melrose Air Force Range, Volumes I through V, October 1996.

6.) New Mexico Water Quality Control Commission, 20.6.2 NMAC New Mexico Water Quality Control Commission Regulations, Effective September 15, 2002.

7.) Environmental Protection Agency, Region 6 Human Health Medium-Specific Screening Levels, 2006.