DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

Interim Final 2/5/99

RCRA Corrective Action
Environmental Indicator (EI) RCRIS code (CA750)

NM ENVIRONMENT DEPARTMENT
RECEIVED

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DISTRICT 1 OFFICE

Migration of Contaminated Groundwater Under Control

Facility Name: *Holloman Air Force Base*
Facility Address: *49 CES/CEV, 550 Tabosa Ave*
Facility EPA ID #: *EPA ID: NM6572124422*

1.Has **all** available relevant/significant information on known and reasonably suspected releases to the groundwater media, 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.

_____ If no - re-evaluate existing data, or

_____ If data are not available, skip to #8 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 "Migration of Contaminated Groundwater Under Control" EI

A positive "Migration of Contaminated Groundwater Under Control" EI determination ("YE" status code) indicates that the migration of "contaminated" groundwater has stabilized, and that monitoring will be conducted to confirm that contaminated groundwater remains within the original "area of contaminated groundwater" (for all groundwater "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 "Migration of Contaminated Groundwater Under Control" EI pertains ONLY to the physical migration (i.e., further spread) of contaminated ground water and contaminants within groundwater (e.g., non-aqueous phase liquids or NAPLs). Achieving this EI does not substitute for achieving other stabilization or final remedy requirements and expectations associated with sources of contamination and the need to restore, wherever practicable, contaminated groundwater to be suitable for its designated current and future uses.

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. Is **groundwater** known or reasonably suspected to be **"contaminated"**[1] above appropriately protective "levels" (i.e., applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action, anywhere at, or from, the facility?

Varies from site to site. See attached table, "Table H-2: CA750 – Question 2 and 8 Responses"

For sites with response "Yes" under "GW Contamination?" column on Table H-2:

___X_ If yes - continue after identifying key contaminants, citing appropriate "levels," and referencing supporting documentation.

For sites with response "None" under "GW Contamination?" column on Table H-2:

__X__ If no - skip to #8 and enter "YE" status code, after citing appropriate "levels," and referencing supporting documentation to demonstrate that groundwater is not "contaminated."

For sites with response "Unknown" under "GW Contamination?" column on Table H-2:

___X_ If unknown - skip to #8 and enter "IN" status code.

Rationale and Reference(s): See attached table for specific references. Those sites listed as "None" under "GW Contamination?" column showed insignificant (if any) contamination either during an investigative stage or as a part of Holloman's Long-Term Monitoring (LTM) of groundwater under the base's Environmental Restoration Program (ERP) formerly known as the Installation Restoration Program (IRP). Many of these sites have undergone some type of corrective measure, e.g., removal of an oil-water separator and petroleum, oil, or lubricant-contaminated soil.

For those sites whose response to Question 2 is "yes", the data show that some level of contamination does exist at the site. However, of these sites, those that are a part of HAFB's LTM program have shown a downward trend over the years. These sites include SWMUs 82, 104, 105, 108, 113B and AOC-T.

For the remainder of sites with "yes", i.e., SWMUs 39, 114, 127, 135 , 170, 229 and AOC-1001 more recent data is required to better assess groundwater contamination and its migration. However, the underlying aquifer in non-potable (contains > 10,000 mg/L TDS) and, in addition, does not present a potential exposure pathway.

The sites marked "unknown", i.e., SWMUs 111, 123, and 183, these sites require additional characterization. SWMU 136 is marked "unknown", however, the contaminant source has been removed and GW contamination is unlikely.

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 appropriate "levels" (appropriate for the protection of the groundwater resource and its beneficial uses).

3. Has the **migration** of contaminated groundwater **stabilized** (such that contaminated groundwater is expected to remain within "existing area of contaminated groundwater"[2] as defined by the monitoring locations designated at the time of this determination)?

For SWMUs 39, 82, 104, 105, 108, 113B, 114, 127, 135, 170, 229 and AOC-T:

__X_ If yes - continue, after presenting or referencing the physical evidence (e.g., groundwater sampling/measurement/migration barrier data) and rationale why contaminated groundwater is expected to remain within the (horizontal or vertical) dimensions of the "existing area of groundwater contamination"[2]).

_____ If no (contaminated groundwater is observed or expected to migrate beyond the designated locations defining the "existing area of groundwater contamination"[2]) - skip to #8 and enter "NO" status code, after providing an explanation.

___ If unknown - skip to #8 and enter "IN" status code.

Rationale and Reference(s): See attached table and previous responses for reference material and background. For LTM sites, all evidence indicates a downward trend in contaminants. For other sites showing contamination, a corrective measure has already taken place to remove potential contaminant sources.

[2] "existing area of contaminated groundwater" is an area (with horizontal and vertical dimensions) that has been verifiably demonstrated to contain all relevant groundwater contamination for this determination, and is defined by designated (monitoring) locations proximate to the outer perimeter of "contamination" that can and will be sampled/tested in the future to physically verify that all "contaminated" groundwater remains within this area, and that the further migration of "contaminated" groundwater is not occurring. Reasonable allowances in the proximity of the monitoring locations are permissible to incorporate formal remedy decisions (i.e., including public participation) allowing a limited area for natural attenuation.

4. Does "contaminated" groundwater **discharge** into **surface water** bodies?

_____ If yes - continue after identifying potentially affected surface water bodies.

For SWMUs 39, 82, 104, 105, 108, 113B, 114, 127, 135, 170, 229 and AOC-T:

_X___ If no - skip to #7 (and enter a "YE" status code in #8, if #7 = yes) after providing an explanation and/or referencing documentation supporting that groundwater "contamination" does not enter surface water bodies.

_____ If unknown - skip to #8 and enter "IN" status code.

Rationale and Reference(s): All references are given in Table H-2. Through previous investigations and quantitative Risk Assessments, it has been shown that none these units discharge to surface water.

5. Is the **discharge** of "contaminated" groundwater into surface water likely to be **"insignificant"** (i.e., the maximum concentration[3] of each contaminant discharging into surface water is less than 10 times their appropriate groundwater "level," and there are no other conditions (e.g., the nature, and number, of discharging contaminants, or environmental setting), which significantly increase the potential for unacceptable impacts to surface water, sediments, or eco-systems at these concentrations)?

SKIPPED per instructions...

_____ If yes - skip to #7 (and enter "YE" status code in #8 if #7 = yes), after documenting: 1) the maximum known or reasonably suspected concentration[3] of key contaminants discharged above their groundwater "level," the value of the appropriate "level(s)," and if there is evidence that the concentrations are increasing; and 2) provide a statement of professional judgement/explanation (or reference documentation) supporting that the discharge of groundwater contaminants into the surface water is not anticipated to have unacceptable impacts to the receiving surface water, sediments, or eco-system.

_____ If no - (the discharge of "contaminated" groundwater into surface water is potentially significant) - continue after documenting: 1) the maximum known or reasonably suspected concentration[3] of each contaminant discharged above its groundwater "level," the value of the appropriate "level(s)," and if there is evidence that the concentrations are increasing; and 2) for any contaminants discharging into surface water in concentrations[3] greater than 100 times their appropriate groundwater "levels," the estimated total amount (mass in kg/yr) of each of these contaminants that are being discharged (loaded) into the surface water body (at the time of the determination), and identify if there is evidence that the amount of discharging contaminants is increasing.

_____ If unknown - enter "IN" status code in #8.

Rationale and Reference(s):_____

[3] As measured in groundwater prior to entry to the groundwater-surface water/sediment interaction (e.g., hyporheic) zone.

6. Can the **discharge** of "contaminated" groundwater into surface water be shown to be "**currently acceptable**" (i.e., not cause impacts to surface water, sediments or eco-systems that should not be allowed to continue until a final remedy decision can be made and implemented[4])?

SKIPPED per instructions…

_____ If yes - continue after either: 1) identifying the Final Remedy decision incorporating these conditions, or other site-specific criteria (developed for the protection of the site's surface water, sediments, and eco-systems), and referencing supporting documentation demonstrating that these criteria are not exceeded by the discharging groundwater; OR 2) providing or referencing an interim-assessment,[5] appropriate to the potential for impact, that shows the discharge of groundwater contaminants into the surface water is (in the opinion of a trained specialists, including ecologist) adequately protective of receiving surface water, sediments, and eco-systems, until such time when a full assessment and final remedy decision can be made. Factors which should be considered in the interim-assessment (where appropriate to help identify the impact associated with discharging groundwater) include: surface water body size, flow, use/classification/habitats and contaminant loading limits, other sources of surface water/sediment contamination, surface water and sediment sample results and comparisons to available and appropriate surface water and sediment "levels," as well as any other factors, such as effects on ecological receptors (e.g., via bio-assays/benthic surveys or site-specific ecological Risk Assessments), that the overseeing regulatory agency would deem appropriate for making the EI determination.

_____If no - (the discharge of "contaminated" groundwater can not be shown to be "**currently acceptable**") - skip to #8 and enter "NO" status code, after documenting the currently unacceptable impacts to the surface water body, sediments, and/or eco-systems.

_____ If unknown - skip to 8 and enter "IN" status code.

Rationale and Reference(s):_____

[4] Note, because areas of inflowing groundwater can be critical habitats (e.g., nurseries or thermal refugia) for many species, appropriate specialist (e.g., ecologist) should be included in management decisions that could eliminate these areas by significantly altering or reversing groundwater flow pathways near surface water bodies.

[5] The understanding of the impacts of contaminated groundwater discharges into surface water bodies is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration to be reasonably certain that discharges are not causing currently unacceptable impacts to the surface waters, sediments or eco-systems.

7. Will groundwater **monitoring** / measurement data (and surface water/sediment/ecological data, as necessary) be collected in the future to verify that contaminated groundwater has remained within the horizontal (or vertical, as necessary) dimensions of the "existing area of contaminated groundwater?"

SWMUs 82, 104, 105, 108, 113B and AOC-T (sites undergoing LTM):

___X_ If yes - continue after providing or citing documentation for planned activities or future sampling/measurement events. Specifically identify the well/measurement locations which will be tested in the future to verify the expectation (identified in #3) that groundwater contamination will not be migrating horizontally (or vertically, as necessary) beyond the "existing area of groundwater contamination."

__ __ If no - enter "NO" status code in #8.

SWMUs 39, 114, 127, 135 , 170, 229 and AOC-1001:

___X_ If unknown - enter "IN" status code in #8.

Rationale and Reference(s): **For SWMUs 82, 104, 105, 108, 113B and AOC-T (sites undergoing LTM), these sites are part of HAFB's LTM program. The next sampling event will occur during mid-2001. Sampling events occur biennially. All LTM sites are in various stages with two or three sampling events completed (not including the 2001 event). Well locations can be found in the LTM references given in the attached tables. All wells are within the site areas.**

It is unknown at this time whether LTM will be required at SWMUs 39, 114, 127, 135 , 170, 229 and AOC-1001.

8. Check the appropriate RCRIS status codes for the Migration of Contaminated Groundwater Under Control EI (event code CA750), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (attach appropriate supporting documentation as well as a map of the facility).

(See attached Table H-2)

__X__ YE - Yes, "Migration of Contaminated Groundwater Under Control" has been verified. Based on a review of the information contained in this EI determination, it has been determined that the "Migration of Contaminated Groundwater" is "Under Control" at the __**Listed sites (see attached table in response to questions 2 and 8)**__facility , EPA ID # _**NM6572124422**_____ , located at___**Holloman AFB NM**_. Specifically, this determination indicates that the migration of "contaminated" groundwater is under control, and that monitoring will be conducted to confirm that contaminated groundwater remains within the "existing area of contaminated groundwater" This determination will be re-evaluated when the Agency becomes aware of significant changes at the facility.

_____ NO - Unacceptable migration of contaminated groundwater is observed or expected.

(See attached Table H-2)

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

Signed: @ Cornelius Amindyas, NMED/HWB Date 07/10/01

Completed by (signature) [signature] Date 3 Jul 01
(print) Jose A. Gallegos
(title) Restoration Element Leader, Environmental Engineer

Supervisor (signature) [signature] Date 3 July 01
(print) John R. Poland
(title) Chief, Environmental Flight
(EPA Region or State) New Mexico

NMED-HWB
John E. Kieling
Signed @ [signature] Date 7/10/01

Locations where References may be found:

References may be found at the Environmental Flight, Building 55 at Holloman AFB. Also, the same documents have been filed with the New Mexico Environment Department Hazardous Waste Bureau, formerly, the Hazardous and Radioactive Materials Bureau or HRMB. Many of the documents also are part of Holloman's Information Repository located at the City of Alamogordo (NM) Public Library.

Contact telephone and e-mail numbers

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ATTACHMENTS AVAILABLE UPON REQUEST