6/8/01

ENTERED

DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

Interim Final 2/5/99

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

Current Human Exposures Under Control

6/8/01 GRCB EED

Facility Name: Giant Refining Company
Facility Address: 50 County Road 4990 Bloomfield NM 87413
Facility EPA ID #: NMD089416416

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.

   _____ 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 that 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_	___	___	VOCs, SVOCs, TPH, chromium and MTBE
Air (indoors)[2]	___	___	_NA	
Surface Soil (e.g., <2 ft	_X_	___	___	BETX, SVOCs and TPH
Surface Water	___	___	___	
Sediment	___	___	_NA	
Subsurf. Soil (e.g., >2 ft)	_X_	___	___	BETX, SVOCs and TPH
Air (outdoors)	___	___	_NA	

_____ 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.

Rationale and Reference(s):

Groundwater contamination as phase-separated hydrocarbons and dissolved-phase BETX and other volatile organic compounds (VOCs), naphthalene and other semivolatile organic compounds (SVOCs), MTBE, gasoline- diesel- and oil-range organics (GRO, DRO and ORO) and chromium are present beneath the refinery facility. Based on information provided in Giant Refining Company's "Discharge Plan Application, Site Investigation and Abatement Plan" (Volumes I and II, July, 1999), the refinery is conducting ongoing total fluids recovery as an interim measure to prevent the migration of contaminants in the groundwater. The data suggests that contaminant plumes are currently stable or shrinking. The lateral extent of the phase-separated hydrocarbon plume has been significantly reduced beneath the refinery process areas and aboveground storage tank (AST) farm since the early 1990s.

Historically, hydrocarbon contamination was observed in riverbank deposits along the San Juan River located adjacent to the north of the refinery. Giant Refining Company has constructed a barrier wall along the riverbank, consisting of sheet piles to depths of approximately 15 feet below surface grade and extended by a slurry wall to depths of approximately 30 feet below grade, at the locations where hydrocarbon contamination was observed in the riverbank sediments. Evidence of hydrocarbon contamination has not been observed in seeps along the riverbank since installation of the barrier wall. The affected water table aquifer beneath the refinery is not currently used by the refinery or surrounding properties therefore human exposures to groundwater are controlled for the purposes of this survey [Discharge Plan Application, Site Investigation and Abatement Plan, Giant Refining Company (Volumes I and II, July, 1999) *revision in preparation*]

Petroleum-related surface soil contamination is not documented with the exception of the riverbank sediments discussed above, at SWMUs discussed below, and at five seeps located along a cliff face and in low lying areas located on undeveloped land located north and west of the refinery. The seeps are located at an elevation approximately 100 feet above the river and are located 100 to 500 feet north and west of the refinery boundaries and approximately 25-150 feet south of the San Juan River. The seeps

mark the contact between lithified mudstones and siltstones of the cliff-forming, Tertiary Nacimiento Formation and overlying Quaternary terrace gravel deposits. The gravel deposits are overlain by eolian sand and fill imported during refinery construction

The shallow water table aquifer is present within the Quaternary sediments. Hydrocarbons have historically been detected in soils and groundwater at several of the seeps. The seeps are remote and difficult to access. Groundwater discharged from the seeps is sampled periodically by refinery personnel. Benzene was detected in the seeps at concentrations ranging from less than 1 microgram per liter (µg/L) to 800 µg/L in April 1999. Based on difficulty of accessing the seeps, their location in remote locations and the proximity of the seeps to the refinery, the possibility of human exposure at the seep locations is considered unlikely therefore NMED considers human exposures to be controlled at these locations.

Surface soil contamination has been observed at the facility at the locations of the Transportation Terminal loading areas and Fire Training Area. Human exposures are controlled at the Transportation Terminal loading rack areas and Fire Training Area locations by restricting access and activities at the units, implementation of the Giant Refinery health and safety SOPs and by monitoring work activities at the loading rack locations as well as throughout the refinery [Discharge Plan Application, Site Investigation and Abatement Plan, Giant Refining Company (Volumes I and II, July, 1999) *revision in preparation*, and Giant Refining Company Safety Orders (2000) [Standard Operating Procedures (SOPs)] for Performing Work at Bloomfield Refinery].

Petroleum-related subsurface soil contamination is known to be present beneath the refinery process areas and tank farms. In addition, petroleum-related subsurface soil contamination is suspected to be present at the Transportation Terminal locations, at the Fire Training Area and downgradient (north and west) of the refinery. The areas north and west of the refinery consist of undeveloped land that is considered unlikely to be developed due to the long, narrow dimensions and inaccessibility. NMED will require monitoring of construction activities and corrective action if development is anticipated in the areas located north and west of the refinery before corrective action is completed at the Bloomfield Refinery. Giant Refinery is currently evaluating corrective measures for the refinery process areas, the tank farm, the Transportation Terminal, the Fire Training Area and those areas located off site that have been impacted by historical petroleum releases. A Corrective Measures Study is anticipated to be submitted to NMED for review in July 2001. Human exposures are controlled at these locations by restricting access to these locations, implementation of health and safety SOPs and by monitoring work activities throughout the refinery [Discharge Plan Application, Site Investigation and Abatement Plan, Giant Refining Company (Volumes I and II, July, 1999) *revision in preparation*, and Giant Refining Company Safety Orders (2000) [SOPs] for Performing Work at Bloomfield Refinery]

REGULATED UNIT SUMMARY

There are no regulated units at Giant Refining Company's Bloomfield Refinery. The wastewater treatment system is permitted to discharge to a Class I injection well located on the refinery property. The injection well is administered through a New Mexico Department of Energy, Minerals and Natural Resources Oil Conservation Division (OCD) discharge permit that incorporates RCRA requirements for sampling and testing of the wastewater. [OCD Discharge Plan GW-01, April 2000).

SOLID WASTE MANAGEMENT UNIT SUMMARY

A SWMU Assessment is currently being prepared by Giant Refining Company in compliance with a 3008 (h) Administrative Order on Consent dated December 1992. The terms of the Administrative Order on Consent require that Giant's Bloomfield Refinery submit a Corrective Measures Study (CMS) that evaluates corrective action options at the facility. The Giant Refining Company is currently revising their Discharge Plan Application, Site Investigation and Abatement Plan dated, July 1999, to achieve compliance with both the CMS requirements of the Administrative Order on Consent and the New Mexico OCD's requirements for a Discharge and Abatement Plan. The revision will include an assessment of all SWMUs at the refinery and the status of each SWMU with regard to the need for further action. The following summary provides a description of the current status of the SWMUs at the Bloomfield Refinery relative to potential human exposures [References: Giant Refining Company Safety Orders [SOPs] for performing work at the Giant Refining Company, Bloomfield Refinery (2000), RCRA Facility Investigation Task 2 Work Plan, Bloomfield Refining Company (1993) and Discharge Plan Application, Site Investigation and Abatement Plan dated, (July 1999) *revision in preparation*]:

SWMU #1 – Former Drum Storage Area - the former drum storage area is currently not in use at the refinery. The former Drum Storage Area has been paved with asphalt and is currently used as a parking lot for the main refinery administrative offices. Human exposures are controlled by the presence of the asphalt cap that covers the location. Human exposures at the at the former Drum Storage Area also are controlled by compliance with the rules and restrictions implemented through the Giant Refinery health and safety SOPs and adherence to Giant's SOPs for performing construction work at the facility.

SWMU #2 – Underground Piping – the majority of underground piping has been removed at the facility. The remaining underground piping is associated with the wastewater treatment system. Refinery sumps and catch basins associated with the storm water collection system and the loading terminal sumps and drains are connected to the wastewater treatment system via underground piping. The piping will be investigated as part of the SWMU assessment portion of the CMS. The underground piping is buried at depths greater than 1.5 feet therefore human exposures are controlled by the pipeline backfill that serves as a cap over the piping and the pipeline trenches. Human exposures to the underground piping also are controlled by Giant Refinery SOPs for performing construction work at the facility and by implementation of the refinery health and safety SOPs that include monitoring and notification requirements when conducting excavation activities.

SWMU #3 – Transportation Terminal Sump – there is evidence of petroleum-related contamination in the vicinity of the Transportation Terminal Sump. The unit is being investigated in accordance with the requirements for the New Mexico OCD abatement plan and in order to fulfill the requirements for the CMS. NMED anticipates that the results of the investigation will be included as part of the revised CMS/Discharge and Abatement Plan currently in preparation by Giant Refining Company. Surface contamination was not observed during site visits conducted by NMED in 2000 and early 2001; however, surface contamination may be present at the unit as the result of incidental spills associated with truck loading operations. Human exposures are controlled at the unit by limiting access to the Transportation Terminal Sump and by the rules and restrictions for construction work included in the Giant Refinery SOPs and by implementation of the refinery health and safety and spill response SOPs for refinery operations in the event of an accidental release.

SWMU #4 – Heat Exchanger Bundle Cleaning Area – the Heat Exchanger Bundle Cleaning Area is used, on average, two to three times a year. The sludge generated during cleaning operations is placed in drums and disposed as hazardous waste within 90 days after completion of bundle cleaning activities. Water generated during the cleaning operations is discharged to the refinery wastewater treatment system. This process has been confirmed by several inspections conducted by NMED and EPA within the past two years. Human exposures are controlled at this unit by restricting access to the unit and by implementation of the Giant Refining Company SOPs for compliance with State and Federal health and safety regulations and the SOPs for conducting construction work at the facility.

SWMU #5 – Underground Piping – see SWMU #2 description above.

SWMU #6 – Evaporation Ponds – the Evaporation Ponds were converted to raw water ponds in 1995. The raw water ponds hold water pumped from the San Juan River prior to treatment for use as contact- and noncontact process water used in refinery operations. Possible residual petroleum-related contamination associated with the historical use of the Evaporation Ponds as part of the refinery wastewater treatment system is being evaluated by Giant Refining Company to meet the requirements of the CMS. Surface soil contamination is unlikely at the Evaporation Ponds site because it has been used to hold fresh water for approximately six years. In addition, the Evaporation Ponds SWMU is located east of the refinery process areas and tank farm and access to the ponds is restricted. Based on the available data, petroleum-related contamination is not present in surface soils at the Evaporation Ponds therefore incidental human exposures are currently controlled at this unit. Potential human exposures via excavation and construction activities are controlled by Giant Refinery restrictions and requirements for performing work at the refinery and the health and safety SOPs required within the refinery facility.

SWMU #7 – Landfill – the Landfill is located east of the refinery process areas and tank farm. The landfill is not currently in use and has been covered with imported clean soil. EPA issued a No Further Action (NFA) determination for the unit in 1994. NMED will evaluate the need for further investigation as part of its review of the CMS currently in preparation by Giant Refining Company. The presence of the soil cover

precludes incidental contact with residual petroleum-related contamination placed in the unit during historical refinery operations. Human exposures are controlled by limiting access to the Landfill and implementation of health and safety procedures in accordance with the Giant Refinery SOPs for performing work within the refinery facility.

SWMU #8 – Landfill Pond – The Landfill Pond no longer exists. The Landfill Pond was a low-lying area adjacent to the east of the Landfill that collected storm water drainage from the surrounding area and possibly other fluids associated with the landfill. The location of the landfill pond was subsequently excavated as a source of fill dirt. The Landfill Pond area currently consists of partially vegetated soil. The low-lying area has been removed and the site has been graded to conform to the general contours of the surrounding arroyo. Human exposures are considered to be controlled at the unit based on the removal of the soils from the low-lying and surrounding areas.

SWMU #9 – Fire Training Area – the Fire Training area remains in use. Previous investigations have detected diesel-range hydrocarbon contamination in surface and subsurface soils at the unit. Petroleum-related surface soil contamination is present at the Fire Training Area; however, human exposures are controlled by limiting access to the Fire Training Area to those occasions when training is actively taking place and by implementing the Giant Refinery health and safety SOPs as part of the training exercises. The Fire Training Area will be evaluated in the SWMU assessment required for the CMS currently in preparation by Giant Refining Company. Based on the results of the assessment, NMED may require corrective action or additional restrictions to limit hazards to human health and the environment at the unit.

SWMU #10 – Spray Irrigation Area – the Spray Irrigation Area was formerly used to aerate refinery wastewater by spraying water pumped from the Evaporation Ponds into a former open field. This unit has been out of use since 1994. Giant Refining Company subsequently constructed an office building with landscaping and a parking lot on the site. The New Mexico OCD required Giant Refining Company to conduct soil sampling at the unit and to install a groundwater monitoring well at the site. Petroleum contamination was not detected in soil samples at the unit and petroleum constituents were not detected in groundwater samples obtained from the well. The Spray Irrigation Area has been capped with a structure, an asphalt parking lot and landscaping consisting of imported topsoil and sod. An evaluation of residual hydrocarbons in subsurface soils will be included in the CMS currently in preparation by Giant Refining Company. Human exposures are controlled by the presence of the structure, asphalt parking lot and clean topsoil cap and by the construction restrictions and health and safety requirements included in the Giant Refinery SOPs for performing work within the refinery facility.

SWMU #11 – API Separator – the API separator is currently an active part of the wastewater treatment system. The majority of the API Separator is covered to limit exposure to air emissions and the possibility of exposure to the wastewater. Giant Refining Company is required to characterize the nature and extent of contamination in the vicinity of the API Separator as part of the CMS required by the Administrative Order on Consent. Human exposures are controlled by implementation of the Giant Refinery SOPs for health and safety compliance, the SOPS for performing construction work at the facility and by limiting access to the unit.

SWMU #12 – Aeration Ponds – the Aeration Ponds are operating wastewater treatment aeration ponds. The ponds are being evaluated for status as aggressive biological treatment units as defined in 40 CFR 261.31(b)(2). Further investigation will likely be required to evaluate petroleum-related subsurface soil and groundwater contamination at the unit. Human exposures at the Aeration Ponds are controlled by compliance with state and federal regulations implemented through the Giant Refinery health and safety SOPs, adherence to Giant's SOPs for performing work at the facility and by controlling access to the unit.

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	__Yes	_No	_No	_No
~~Air (indoors)~~	___	___	___	___	___	___	___
Soil (surface, e.g., <2 ft)	_No	_No	_No	_Yes	_No	_No	_No
~~Surface Water~~	___	___	___	___	___	___	___
~~Sediment~~	___	___	___	___	___	___	___
Soil (subsurface e.g., >2 ft)	_No	_No	_No	_Yes	_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.

_____ 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).

__X__ 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

Rationale and Reference(s):

There is potential for worker exposure during excavation activities at the refinery process areas and tank farms and at the following SWMUs: Aeration Ponds, Transportation Terminal Sump, Fire Training Area, and API Separator [RCRA Facility Investigation Task 2 Work Plan, Bloomfield Refining Company (1993) and Discharge Plan Application, Site Investigation and Abatement Plan dated, (July 1999) *revision in preparation*).

[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)?

__X__ 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):

There is one potentially complete exposure pathway at the Facility. The potentially complete exposure pathway scenario is that of a trench worker exposed during construction activities. Human exposures are controlled during excavation and construction activities by restricting access and activities within the refinery facility, requiring work permits that limit excavation and construction activities, implementing procedures that require conformance with health and safety requirements and by monitoring work activities throughout the refinery. Proper notification of encounters with contaminated media are part of the facility SOPs. Interim measures and remedial action are required to be implemented if contamination in any media is encountered (Giant Refining Company Safety Orders (2000) [SOPs] for compliance with Federal OSHA and New Mexico OSHA Health and Safety Standards and the Giant Refining Company Safety Orders (2000) [SOPs] for performing work at the Giant Refining Company, Bloomfield Refinery.

[4] 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):

YE 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 _____ _____ facility, EPA ID #_____, located at _____ 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 (signature) _____ Date _____
(print)
(title)

Supervisor (signature) _____ Date 6/8/01
(print) Stephen Pullen
(title) WRES I
(EPA Region or State) New Mexico

Locations where References may be found:

Giant Refining Company, Bloomfield Refinery
U#50 County Road 4990, Bloomfield, New Mexico 87413

New Mexico Environment Department Hazardous Waste Bureau
2905 Rodeo Park Drive East Building 1, Santa Fe New Mexico 87505

Contact telephone and e-mail numbers

(name) Dave Cobrain
(phone #) _____
(e-mail) david_cobrain@nmenv.state.nm.us

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.