

**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:** Kinder Morgan Liquids Terminals, LLC \_\_\_\_\_  
**Facility Address:** 906 Clinton Drive Galena Park, Texas 77547 \_\_\_\_\_  
**Facility EPA ID #:** TXD026481523 \_\_\_\_\_

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?

- 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 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).

**Current Human Exposures Under Control  
Environmental Indicator (EI) RCRIS code (CA725)**

2. Are groundwater, soil, surface water, sediments, or air **media** known or reasonably suspected to be **“contaminated”**<sup>1</sup> 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)?

	<u>Yes</u>	<u>No</u>	<u>?</u>	<u>Rationale / Key Contaminants</u>
Groundwater	<u>  X  </u>	<u>    </u>	<u>    </u>	_____
Air (indoors) <sup>2</sup>	<u>    </u>	<u>  X  </u>	<u>    </u>	_____
Surface Soil (e.g., <2 ft)	<u>  X  </u>	<u>    </u>	<u>    </u>	_____
Surface Water	<u>    </u>	<u>  X  </u>	<u>    </u>	_____
Sediment	<u>    </u>	<u>  X  </u>	<u>    </u>	_____
Subsurf. Soil (e.g., >2 ft)	<u>  X  </u>	<u>    </u>	<u>    </u>	_____
Air (outdoors)	<u>    </u>	<u>  X  </u>	<u>    </u>	_____

     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):

Comment 1. Based upon the recent plant-wide investigation report, the key contaminants in the groundwater are benzene, tetrachloroethylene, trichloroethylene, and ethylbenzene, all of which have been detected at three or more SWMUs at concentrations that exceed risk-based levels established by the State of Texas.

Comment 2. One building was identified in the investigation report as located over a groundwater plume, but indoor air sampling did not detect constituents above promulgated exposure levels.

Comment 3. The recent investigation report identified benzene as an important constituent; benzene was detected above its risk based level in surface soil at four SWMUs or SWMU groups; tetrachloroethylene, toluene, trichloroethylene, and arsenic were detected above risk-based levels in two SWMUs or SWMU groups.

Comment 4. Benzene and tetrachloroethylene were identified above their risk-based standards in subsurface soils in more than one SWMU group.

ARCADIS, 2004. Affected Property Assessment Report, Kinder Morgan Liquids Terminals, LLC. October 7, 2004.

Footnotes:

<sup>1</sup> “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).

<sup>2</sup> 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.

**Current Human Exposures Under Control**  
**Environmental Indicator (EI) RCRIS code (CA725)**  
Page 3

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)

<b>“Contaminated” Media</b>	Residents	Workers	Day-Care	Construction	Trespassers	Recreation	Food <sup>3</sup>
Groundwater	NO	NO	NO	NO	NO	NO	NO
<del>Air (indoors)</del>							
Soil (surface, e.g., <2 ft)	NO	NO	NO	NO	NO	NO	NO
<del>Surface Water</del>							
<del>Sediment</del>							
Soil (subsurface e.g., >2 ft)	NO	NO	NO	NO	NO	NO	NO
<del>Air (outdoors)</del>							

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.

Rationale and Reference(s):

No complete exposure pathways have been identified under current site conditions. Access to the site is strictly controlled. Post-9/11 security measures are in place that include a upgrade in security fencing. Workers, including construction contractors, are protected by an enforced safety policy that requires personnel who excavate in areas of concern to wear adequate Personal Protective Equipment (PPE).

ARCADIS, 2004. Affected Property Assessment Report, Kinder Morgan Liquids Terminals, LLC. October 7, 2004.

Kinder Morgan Liquids Terminals, LLC, 2004. Environmental Health and Safety Requirements Manual. Kinder Morgan Liquids Terminals, LLC, 2003. Contractor Safety Manual. Kinder Morgan Liquids Terminals, LLC – Houston Operations. September 19, 2003.

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

**Environmental Indicator (EI) RCRIS code (CA725)**

4 Can the **exposures** from any of the complete pathways identified in #3 be reasonably expected to be **“significant”**<sup>4</sup> (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): \_\_\_\_\_  
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<sup>4</sup> 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.



**Current Human Exposures Under Control**  
**Environmental Indicator (EI) RCRIS code (CA725)**  
Page 6

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 - 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 Kinder Morgan Liquids Terminals, LLC facility, EPA ID # TXD026481523, located at 906 Clinton Drive, Galena Park, Texas 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 12/30/04  
(print) Kellie Jones  
(title) Project Manager

Supervisor (signature) \_\_\_\_\_ Date 12/30/04  
(print) Cathy Remmert  
(title) Team Leader  
Texas Commission on Environmental Quality

Locations where References may be found:

TCEQ Central Records, Austin, Texas  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Contact telephone and e-mail numbers:

**Project Manager listed above**  
**(512) 239-2343**  
**corraact@tceq.state.tx.us**

**Final Note: The purpose of the Human Exposures EI is to qualitatively screen exposures based on current land and groundwater use. A "YE" determination does not constitute a screening tool that ends the corrective action process. The "YE" determination may be changed at any time as new information becomes available.**

Current Human Exposures Under Control  
Environmental Indicator (EI) RCRIS code (CA725)  
Page 6

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 Kinder Morgan Liquids Terminals, LLC facility, EPA ID # TXD026481523, located at 906 Clinton Drive, Galena Park, Texas 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) K Jones Date 12/30/04  
(print) Kellie Jones  
(title) Project Manager

Supervisor (signature) Cathy Remmert Date 12/30/04  
(print) Cathy Remmert  
(title) Team Leader  
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Final Note: The purpose of the Human Exposures EI is to qualitatively screen exposures based on current land and groundwater use. A "YE" determination does not constitute a screening tool that ends the corrective action process. The "YE" determination may be changed at any time as new information becomes available.

*Handwritten note:*  
Not updated 1/21/05  
- from emailed signature  
- 1/21/05

**DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION**

Interim Final 2/5/99

**RCRA Corrective Action  
Environmental Indicator (EI) RCRIS code (CA750)****Migration of Contaminated Groundwater Under Control**

**Facility Name:** Kinder Morgan Liquids Terminals, LLC \_\_\_\_\_  
**Facility Address:** 906 Clinton Drive Galena Park, Texas 77547 \_\_\_\_\_  
**Facility EPA ID #:** TXD026481523 \_\_\_\_\_

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?

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).

**Migration of Contaminated Groundwater Under Control  
Environmental Indicator (EI) RCRIS code (CA750)**

Page 2

2. Is **groundwater** known or reasonably suspected to be “**contaminated**”<sup>1</sup> 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?

  X   If yes - continue after identifying key contaminants, citing appropriate “levels,” and referencing supporting documentation.

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.”

If unknown - skip to #8 and enter “IN” status code.

Rationale and Reference(s):

RFI activities conducted at the facility identified releases to groundwater from some of the RCRA SWMUs, including the East Plant Waste Management Area (EPWMA) benzene release, Tract A, SWMU Group C2, SWMU Group W1, and SWMU Group W3. The key contaminants are listed below by SWMU or area of concern:  
Tract A: benzene (ND - 240 mg/L) and trichloroethylene (ND - 0.028 mg/l)  
SWMU Group C2: benzene (ND - 960 mg/L), toluene (ND - 185 mg/L), ethylbenzene (ND - 136 mg/L), xylene (ND - 12.8 mg/L), trichloroethylene (ND - 63.1 mg/L), tetrachloroethylene (ND - 105 mg/L), and lead (ND - 0.189 mg/L)  
EPWMA Benzene Release: benzene (ND - 14.6 mg/L) and ethylbenzene (ND - 0.295 mg/L)  
SWMU Group W1: 1,2-dichloroethane (ND - 12.9 mg/L)  
SWMU Group W3: benzene (ND - 62.2 mg/L), ethylbenzene (ND - 3.1 mg/L), xylene (ND - 58 mg/L), trichloroethylene (ND - 20 mg/L) and tetrachloroethylene (ND - 28 mg/L)  
North Plant Tank Farm: MTBE (0.0164 mg/L - 25000 mg/L)

References:

ARCADIS, January 29, 2004. Affected Property Assessment Report – North Plant Tank Farm, Kinder Morgan Liquids Terminals, LLC.

ARCADIS, October 7, 2004. Affected Property Assessment Report, Kinder Morgan Liquids Terminals, LLC.

ARCADIS Geraghty & Miller, July 31, 1998. RCRA Facility Investigation Report Phase II, GATX Terminals Corporation.

Footnotes:

<sup>1</sup>“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).

**Migration of Contaminated Groundwater Under Control**  
**Environmental Indicator (EI) RCRIS code (CA750)**

Page 3

3. Has the **migration** of contaminated groundwater **stabilized** (such that contaminated groundwater is expected to remain within “existing area of contaminated groundwater”<sup>2</sup> as defined by the monitoring locations designated at the time of this determination)?

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”<sup>2</sup>).

If no (contaminated groundwater is observed or expected to migrate beyond the designated locations defining the “existing area of groundwater contamination”<sup>2</sup>) - 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):\_

Tract A: The data indicate that the benzene and trichloroethylene plumes are delineated and stable (ARCADIS Geraghty & Miller, 1998).

SWMU Group C2: A groundwater recovery system is in operation that provides hydraulic control. The plume is fully delineated (ARCADIS, 2004b).

EPWMA Benzene Release: The plume is delineated on all sides. But the south side of the plume is the Houston Ship Channel (ARCADIS 2004b) Release to surface water is negligible; see response to question 4 below.

SWMU Group W1: A groundwater recovery system is in operation that provides hydraulic control. The 1,2-dichloroethane plume is fully delineated. (ARCADIS, 2004b)

SWMU Group W3: The groundwater plume has been delineated on all sides. But the south side of the plume is the Houston Ship Channel (ARCADIS 2004b); see response to question 4 below.

North Plant Tank Farm: The MTBE has not exited the facility, and appears to be stable (ARCADIS, 2004a)

ARCADIS Geraghty & Miller, 1998. RCRA Facility Investigation Report Phase II, GATX Terminals Corporation, July 31, 1998.

ARCADIS, 2004a. Affected Property Assessment Report – North Plant Tank Farm, Kinder Morgan Liquids Terminals, LLC, January 29, 2004.

ARCADIS, 2004b. Affected Property Assessment Report, Kinder Morgan Liquids Terminals, LLC, October 7, 2004.

<sup>2</sup>“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.

**Migration of Contaminated Groundwater Under Control  
Environmental Indicator (EI) RCRIS code (CA750)**

Page 4

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

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

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):

Houston Ship Channel

EPWMA Benzene Release: Calculations based on a Texas guidance document (TCEQ, 2002) were conducted for this plume and are presented in ARCADIS, 2004b. These calculations were used for comparison to human risk-based standards; no standard was exceeded.

SWMU Group W3: Calculations based on a Texas guidance document (TCEQ, 2002) were conducted for this plume and are presented in ARCADIS, 2004b. The standards used were calculated to be protective of the designated uses for Segment No. 1007 of the Houston Ship Channel, which is the segment applicable to the Kinder Morgan facility. The designated uses of Segment No. 1007 are navigation and industrial supply. The maximum groundwater concentration of benzene exceeded its computed standard, although the average detected benzene concentration is below the standard.

ARCADIS Geraghty & Miller, 1998. RCRA Facility Investigation Report Phase II, GATX Terminals Corporation. July 31, 1998.

ARCADIS, 2004a. Affected Property Assessment Report – North Plant Tank Farm, Kinder Morgan Liquids Terminals, LLC, January 29, 2004.

ARCADIS, 2004b. Affected Property Assessment Report, Kinder Morgan Liquids Terminals, LLC, October 7, 2004.

Texas Commission on Environmental Quality (TCEQ), 2002. Determining PCLs for Surface Water and Sediment, December 2002.

**Migration of Contaminated Groundwater Under Control  
Environmental Indicator (EI) RCRIS code (CA750)**

Page 5

5. Is the **discharge** of “contaminated” groundwater into surface water likely to be **“insignificant”** (i.e., the maximum concentration<sup>3</sup> 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)?

  X   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<sup>3</sup> 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<sup>3</sup> 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<sup>3</sup> 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):

EPWMA Benzene Release: The groundwater concentrations of benzene have not been detected at concentrations greater than ten times its Texas surface water or sediment standard. No other constituent has exhibited “significant” contamination in data collected in the last 5 years.

SWMU Group W3: The groundwater concentration of benzene and other key constituents in monitoring wells close to the Houston Ship Channel were compared to the surface water and sediment standards defined under Texas Risk Reduction Program. The key contaminants, benzene, total xylene, 1,2-dichloroethane, cis-1,2-dichloroethylene, trichloroethylene, tetrachloroethylene, and vinyl chloride and bis(2-chloroethyl)ether, have not been measured at concentrations greater than ten times their respective standards. The key constituents of concern identified in the final investigation report (ARCADIS, 2004) either were below the “ten times” threshold of their standards, or their exceedances of the threshold were inland and delineated on the seaward side by groundwater samples that were below the threshold. Calculations based on (TCEQ, 2002) were conducted for this plume and are presented in ARCADIS, 2004.

ARCADIS, 2004. Affected Property Assessment Report, Kinder Morgan Liquids Terminals, LLC, October 7, 2004.

Texas Commission on Environmental Quality (TCEQ), 2002. Determining PCLs for Surface Water and Sediment, December 2002.

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

**Environmental Indicator (EI) RCRIS code (CA750)**

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<sup>4</sup>)?

\_\_\_\_\_ 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,<sup>5</sup> 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): \_\_\_\_\_  
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<sup>4</sup> 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.

<sup>5</sup> 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.

**Migration of Contaminated Groundwater Under Control  
Environmental Indicator (EI) RCRIS code (CA750)**

Page 7

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?”

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.

If unknown - enter “IN” status code in #8.

Rationale and Reference(s):

Tract A: The future of Tract A will be decided upon completion and approval of the final corrective measure study. It is possible that another round of sampling at the monitoring wells will be needed. The key monitoring location at Tract A is MW-9.

SWMU Group C2: The groundwater monitoring wells are sampled quarterly, according to the RCRA Permit (HW-50054).

EPWMA Benzene Release: The final investigation report (ARCADIS, 2004) was recently submitted to the TCEQ. A Response Action Plan will be required, and some of the key monitoring wells will have to be sampled to monitor the success of the chosen remedy. These key wells are RI-1-02, RI-1-06D, and RI-1-07.

SWMU Group W1: The groundwater monitoring wells are sampled twice per year, according to the RCRA Permit (HW-50054).

SWMU Group W3: The final investigation report (ARCADIS, 2004) was recently submitted to the TCEQ. A Response Action Plan will be required, and some of the key monitoring wells will have to be sampled to monitor the success of the chosen remedy. The key monitoring wells are MW-25 through MW-28, which are closest to the Houston Ship Channel.

North Plant Tank Farm: Kinder Morgan installed permanent monitoring wells in November 2004 and will monitor them twice per year until Texas groundwater standards are met. This will likely occur in three years. The most important wells are the four that are downgradient and parallel to Clinton Drive: MW-13, MW-14, MW-15, and MW-16.

ARCADIS, 2004. Affected Property Assessment Report, Kinder Morgan Liquids Terminals, LLC, October 7, 2004.

**Migration of Contaminated Groundwater Under Control  
Environmental Indicator (EI) RCRIS code (CA750)  
Page 8**

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).

- 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 Kinder Morgan Liquids Terminals, LLC facility, EPA ID # TXD026481523, located at 906 Clinton Drive, Galena Park, Texas. 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.
- IN** - More information is needed to make a determination.

Completed by (signature) \_\_\_\_\_ Date 12/30/04 \_\_\_\_\_  
(print) Kellie Jones  
(title) **Project Manager**

Supervisor (signature) \_\_\_\_\_ Date 12/30/04 \_\_\_\_\_  
(print) Cathy Remmert  
(title) Team Leader  
**Texas Commission on Environmental Quality**

Locations where References may be found:

**TCEQ Central Records, Austin, Texas** \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Contact telephone and e-mail numbers:

**Project Manager listed above**  
**(512) 239-2343**  
**corraect@tceq.state.tx.us**

**Final Note: The purpose of the Migration of Contaminated Groundwater EI is to verify that the groundwater plume is stable. A "YE" determination does not constitute a screening tool to end the corrective action process. The "YE" determination may be changed at any time as new information becomes available.**

Migration of Contaminated Groundwater Under Control  
Environmental Indicator (EI) RCRIS code (CA750)  
Page 8

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).

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

\_\_\_ IN - More information is needed to make a determination.

Completed by (signature) [Signature] Date 12/30/04  
(print) Kellie Jones  
(title) Project Manager

Supervisor (signature) [Signature] Date 12/30/04  
(print) Cathy Rembert  
(title) Team Leader  
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*Not updated 1/2/05  
- [unclear] - 1/5/05  
[unclear]*