

DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

Interim Final Guidance: 2/5/99

RCRA Corrective Action

Environmental Indicator (EI) RCRIS code (CA750)

Migration of Contaminated Groundwater Under Control

Today's Date: 12/14/99

Facility Name: National Chromium
Facility Address: Senexet Road, Putnam, CT
Facility EPA ID #: CTD001160811

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”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?

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):

Groundwater. GW at the site is contaminated with chromium which originated from the old plating building, AOC 9. Recent GW data collected from discrete piezometers, P1, P2 and P3 (located immediately upgradient of the AOC 9 extraction well, EW-1 and installed by UConn’s Environmental Research Institute (ERI) and analyzed by MIT’s Civil and Environmental Engineering Dept.), revealed total (assumed) chromium concentrations at P2 of 54, 41 and 38 ug/ml (mg/l) at depths of 13, 15 and 17 feet below grade, respectively. May 12, 1998 *Summary of Recovery Well Operation* report at Appendix E. This data demonstrates a reduction in total chromium concentrations at discrete locations based on a comparison with October 1988 GW data collected from MW’s 5 and 10 which exhibited maximum total chromium concentrations of 80.00 mg/l and March 1989 GW data collected at MW’s 11s, 11d and 12 which demonstrated maximum total chromium levels of 63.5 mg/l. See November 1996 Environmental Indicator Evaluation (EIE) at p. 8. Nickel had also been detected in GW at the site: up to 11.00 mg/l in October of 1988 and up to 6.85 mg/l in March of 1989. These nickel concentrations are apparently in excess of Connecticut Department of Health Services recommended concentration limits of 1.00 mg/l for nickel, *Id.*, and are in excess of CTDEP’s Surface Water Criteria (SWC) for nickel (0.88 mg/l).

AOC 9 Extraction Well. Operation of the AOC 9 Extraction/Recovery Well was initiated on Dec. 11, 1995. Total chromium concentrations at startup was 230 mg/l. As of Dec. 24, 1997, approximately two (2) years later, total chromium concentration has been reduced to 10 mg/l. *Summary of Recovery Well Operation* report at p. 2.

Groundwater Classification. Based on the most recent Environmental Indicator Evaluation (EIE) dated November of 1996, the groundwater at the site is classified as “GB” while “surrounding groundwater is presumed to be classified GA (suitable for potable use without treatment).” EIE at p. 4. Based on a conversation with Maurice Hamel of CTDEP, this statement is correct: apparently, the GW plume was reclassified by CTDEP as a result of the agency’s recognition of the site groundwater plume. CTDEP was apparently somewhat conservative in classifying the areal extent of the plume: the 1987 GW classification map indicates some 10 to 20 acres is classified as GB whereas the entire facility property is 7 acres.

Potential Receptors. The site is bordered by Senexet Road to the east; Peake Brook Road to the south; woods, marsh, and the Little River to the west and south; and woods and residential homes to the north. EIE at p. 4. The Little River is classified as a Class B surface water, with designated uses of recreation, fish and wildlife habitat, agricultural and industrial supply and other legitimate uses. *Id.* at pp. 4 and 5. The town of Putnam receives its water from various water supplies located upgradient and downgradient from the site; the available information indicates these water supply sources are located upgradient or, if downgradient or side gradient, at least 1.3 miles from the site. National Chromium investigated the location of potential private wells within a one-half mile radius of the facility; no private wells were discovered. *Id.*

However, the available information indicates that the dissolved-phase chromium (Cr6+) plume is controlled by the AOC 9 groundwater extraction well. UConn and National Chromium's consultant recently finished field work which confirmed the effectiveness of the groundwater extraction system; this work, the reporting of which is currently in process at this time, apparently satisfies recent requests by CTDEP to confirm the performance of the extraction well. Personal conversation with Whitby Ellsworth of National Chromium, December 9, 1999. See below for further information regarding the AOC 9 extraction well. In addition, studies conducted by UConn's ERI reveal that "99% of the chromium in the aquifer is bound to the aquifer sediment"; "a slow, kinetically-controlled attenuation mechanism is influencing heavy metal mobility at the site"; "experiments show that only a fraction of the total chromium in the soil at the site is readily leachable from the subsurface soil under typical environmental conditions"; and "partitioning coefficients for chromium between the wetland sediment and pore water were calculated and found to be very high [indicating] the chromium in the wetland sediments is immobile." *Overview of Research Conducted at the National Chromium Inc. by the Environmental Research Institute at the University of Connecticut*, June 1996 at p. 1. ERI's studies have demonstrated that the dominant mechanisms retarding chromium in the groundwater at the site include "adsorption onto organic matter and iron oxide coatings on mineral surfaces." *Id.* at p. 12. Also of particular significance is the site aquifer chemistry: "redox potentials (Eh) ranged from -112 to -192 mV, indicating that the pore water was in a reducing environment. . . . No hexavalent chromium was detected in any of the 10 [wetland pore water] samples analyzed, indicating that the aqueous phase 'mobile' chromium entering the wetland had been reduced from Cr(VI) to Cr(III). Sulfide was detected in two of the four samples analyzed, indicating the presence of reducing conditions in the wetland. Apparent partitioning coefficients (K_d) for chromium between the sediment and pore water were calculated for three locations. The average K_d for chromium was 317,000 ml/g (for 0-30 cm) and 71,000 ml/g (for 30-40 cm). The high K_d values demonstrate that virtually all the chromium in the wetland is bound to the sediment, and that by comparison, very little chromium is mobile in the pore water." *Id.* at p. 17. The information demonstrates that dissolved-phase chromium (Cr6+) which migrates towards or into the wetland area is reduced to Cr3+ and subsequently tightly bound to the soil. In sum, it is unlikely that the site groundwater plume is contaminating groundwater beyond the immediate GB plume and wetland area.

Surface Soil/Sediments.

AOC 9 (soils beneath and surrounding Old Plating Building). Following decommissioning and removal of the AOC 3/AOC 9 plating tanks and equipment in February of 1999 and various interim measures to remove surface soils at AOC 10 (chrome tank 7 exhaust vent) and AOC 12 (chrome tank number 8 exhaust stack), there still remains surface soil contamination under the AOC 9 old plating building which includes "both the former wood-floored plating area and the soil beneath this area." See, *Stabilization Workplan*, dated February 1999 at p. 7. However, with the recent (Feb. 1999) decommissioning activities at AOC 9, the former wood flooring has been removed and the floor has been covered with a new plywood floor. Thus, surface soil contamination at AOC 9 is currently considered "to be limited to the soils underlying the plating floor area," *Id.*, which includes a small "crawl space" under the building. *Id.* This space is "enclosed within the wall of the building" and "[t]he only access [to this area] is via a hatchway inside the building which is kept locked at all times. There is currently no activity in this portion of the building other than decontamination [activities] . . ." *Id.*

CTDEP RSR DEC. Incidentally, under Section 22a-133k-1, et seq. of CTDEP's Remediation Standards Regulations (RSR), the soils under the Old Plating Building may be considered "inaccessible soil" per 22a-133k-1(a)(28)(C)(i) since they are located "beneath an existing building". Under 22a-133k-2(b), the RSR Direct Exposure Criteria (DEC) does not apply to inaccessible soils provided that a land use restriction is in effect if such inaccessible soil is less than 15 feet below the ground surface. In addition, since the building constitutes an effective cap, this source of contamination does not constitute a continuing degradation threat to the aquifer which would otherwise mandate remediation under the State of Connecticut's Pollutant Mobility Criteria and established groundwater policy.

^{PMC}
CTDEP RSR PEM. This area would likely also constitute "environmentally isolated soil" per 22a-133k-

1(a)(15). As environmentally isolated soil, this area appears to satisfy an exception to remediation under the RSR's Pollutant Mobility Criteria (PMC) as described under 22a-133k-2(C)(4) since the area is a GB area. However, this exception requires a land use restriction is in place. Currently, it does not appear that National Chromium has applied for, or obtained, a land use restriction from the CTDEP.

AOC 8 (Little River/Wetland Area). This AOC "consists of the low-lying wetland system associated with the Little River. The area is located approximately 25 to 30 feet below the elevation of the facility building . . ." *Stabilization Workplan* at p. 6. The wetland area is described as a "combination of naturally-occurring wetlands and man-made wetlands," since the wetlands is partially attributable to historical permitted discharges of treated wastewater from the facility. EIE at p. 5. Permitted discharges ended in 1993 causing "the areal extent of the wetlands [to] decrease[] and the area is now considerably dryer and less diverse than when the discharge [occurred]." *Id.* Sampling results indicate that chromium in surficial soils is "exclusively trivalent" but that said Cr³⁺ concentrations at "certain locations" exceeds CTDEP's RSR Direct Exposure Criteria (DEC) for residential areas (DEC Cr(III) 3,900 mg/kg). *Stabilization Workplan* at p. 6. Only one sample, however, exceeds the RSR DEC for Commercial/Industrial areas (51,000 mg/kg). *Id.* Numerous studies conducted by UConn's ERI indicate that the wetlands surficial soils has a high affinity for adsorption of Cr(III), that "chromium detected in the wetlands sediments is very immobile and is strongly bound to the sediments." EIE at p. 5; *also see* the discussion presented above. In addition to continuing academic studies conducted by UConn's ERI, MIT's Civil and Environmental Engineering Dept and the University of Maryland at College Park's Department of Natural Resource Sciences, National Chromium has proposed in its recent *Stabilization Workplan* to "consolidate all existing soils data and prepare a figure showing sampling locations and compare the available results to CTDEP's soil criteria," and an "updated wetlands survey" to determine the nature and extent of the wetlands areas as a result of the cessation of permitted discharges to the area. EIE at pp. 6-7. EPA recently commented on the *Stabilization Workplan* which indicated that "while not easily accessible, there are no physical barriers that would prevent access to the area." *Stabilization Workplan* at p. 6. EPA proposed that a fence be installed and notices posted as an institutional land use control interim measure and that this task be considered a priority under the current workplan. National Chromium has concurred with this recommendation. *See E-Mail Correspondence to John Miller of National Chromium dated 3/1/99 and a letter response from National Chromium dated 3/5/99.* On December 9, 1999, EPA visited the National Chromium site and observed that a fence had indeed been erected to surround the entire wetlands area. In addition, the fence is adequately and clearly posted to discourage trespassers.

Subsurface Soils.

The presence of chromium in site soils is largely attributable to historical releases at AOC 9 and AOC's 10 and 12. Recent soils data collected from soil borings for discrete piezometers, P1, P2 and P3 (located immediately upgradient of the AOC 9 extraction well, EW-1) installed by UConn's ERI and analyzed by MIT's Civil and Environmental Engineering Dept., revealed total (assumed) chromium concentrations ranging from approximately 100 to 550 ug/g (mg/kg) over depths of 140 to 210 inches below grade (BG) (approximately 11.5 to 17.5 ft BG). *Summary of Recovery Well Operation* report, dated May 12, 1998 at Appendix E. Depth to groundwater was recently measured at P1, P2 and P3 at 11.06, 11.58 and 9.91 ft BG. *Id.* at Appendix D. Under CTDEP's RSR DEC, Section 22a-133k-1, et seq., the soils at the AOC 9 GW extraction well area may be considered "inaccessible," per 22a-133k-1(a)(28)(A) since it is reasonable to conclude that chromium contamination impacted soils in this area, having leached from soils within the near vicinity of the Old Plating Building, is "more than four feet below the ground surface" at the AOC 9 plume area (which is located some distance from the AOC 9 building). However, although inaccessible from a human health-DEC perspective, vadose zone sources that do not meet the criteria for environmentally isolated soils per 22a-133k-1(15), provide a continuing threat of degradation to the aquifer and require remediation since such soils constitute a violation of CTDEP's groundwater policy.

National Chromium, however, is working towards remediating this area and, along these lines, has been the focus of numerous studies by academic institutions, such as the University of Connecticut's (UConn) Environmental Research Institute (ERI); these studies have investigated the fate and transport of metals in soils and groundwater. Some of these studies include: *An Evaluation of Batch Leaching Procedures for Heavy Metal*

Mobility Estimates From Soils (May 1996); Chromium Mobility in Freshwater Wetlands (Oct. 1995); Modeling of Multicomponent Transport in Groundwater and Its Application to Chromium Systems (PhD Dissertation, 1996); Enhanced Mobilization of Heavy Metals Using Sequential Extraction (Oct. 1995); An exploratory Study of the Sorption Behavior of Chromate in Glaciated Soils (Masters Thesis, 1995); The Role of Wetlands in the Immobilization of Chromium Contamination (Tech. Report 1994); Sequential Extraction of Chromium from Contaminated Aquifer Sediments (Spring 1994); Vertical Distribution and Partitioning of Chromium in a Glaciofluvial Aquifer (Summer 1994); Equilibrium Studies of Chromate Adsorption on Glacio-Fluvial Aquifer Sediments (Tech. Report, 1994); and, Redox Capacity Analysis and Heavy Metal Sequential Extraction For Site Assessment of Subsurface Contamination (Tech. Report, 1993). In sum, the direction of these studies is towards developing the possibility of remediating the AOC 9 subsurface soils by innovative soil flushing techniques.

Summary: Migration of Contaminated Groundwater Under Control

In summary, although groundwater contamination exists, dissolved-phase contamination is currently being captured and controlled by the AOC 9 extraction well system. In addition, the substantial volume of information indicates that dissolved-phase contamination that is somehow not captured by the recovery well will likely be reduced by, and subsequently irreversibly bound to, subsurface soils and wetlands soils. Further qualification is presented below.

Footnotes:

"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"² 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"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):

The answer to this question depends upon where the "existing area of contaminated groundwater" is considered to be. There could be two answers: (1) the area includes both the AOC 9 plume and the wetlands area or (2) the area includes the AOC 9 plume area only. Placing the deference on the side of protectiveness of human health and the environment, for the purposes of this question, it will be assumed that the "existing area of contaminated groundwater" is the AOC 9 plume area only.

In letters dated February 16, 1998 and May 18, 1998, CTDEP expressed some concern with the operation of the AOC 9 recovery well, including it's effectiveness to control the migration of dissolved-phase chromium (Cr(VI)). In short, there had been uncertainty whether the AOC 9 recovery system is, in fact, capturing and controlling the dissolved-phase plume. Based on personal conversation with Whitby Ellsworth of National Chromium during an EPA site visit on December 9, 1999, recent work conducted by UConn and National Chromium's consultant has demonstrated that the recovery well is in fact operating effectively.

Notwithstanding, the interpretation of this section (i.e., applying to the AOC 9 plume area exclusively), further qualification as to the wetlands area is provided below under a worst case scenario.

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.

**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 concentration³ 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 concentration³ 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 concentration³ 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 concentrations³ 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):

For purposes of this question and notwithstanding recent data demonstrating the effectiveness of the AOC 9 groundwater recovery system, the “existing area of contaminated groundwater” is assumed to consist of both the AOC 9 plume and the wetlands area. This question ultimately requests qualification of overall risk or impact due to “discharge” of groundwater to “surface water;” this analysis considers a worst case scenario under an assumption - unsupported by recent data - that the AOC 9 recovery well does not operate comprehensively.

The current maximum concentration of dissolved-phase chromium in the AOC 9 plume - as determined from either piezometer, P2 (average conc. = 44.33 mg/l) or the most recent recovery well concentration (10 mg/l) - is greater than 10 times CTDEP’s Surface Water Criteria (SWC) for hexavalent chromium (Cr(VI)) or $10 \times 110 \text{ ug/l} = 1,100 \text{ ug/l}$ (1.1 mg/l). Since most, if not all, Cr(III) complexes have limited aqueous solubility, the assumption here is that the measured dissolved-phase chromium concentrations represent predominantly, if not exclusively, hexavalent chromium.

First, the available data suggests that dissolved-phase chromium concentrations are decreasing as a result of the operation of the AOC 9 recovery well. Although for the purposes of this question, the effectiveness of the AOC 9 extraction well is discounted, the available historical information nonetheless indicates that the AOC 9 recovery well is operating according to design specifications. See, *Summary of Recovery Well Operation*, dated May 12, 1998. Therefore, assuming it is not 100%

effective, it is reasonable to conclude that it is largely effective in controlling the AOC 9 plume.

Therefore, assuming the escape of small volumes of groundwater from the AOC 9 recovery well, such release does not likely pose a control risk since the data substantiates that such dissolved-phase Cr6+ contamination would be reduced and subsequently bound to site or wetland area soils and organic matter. In short, the wetlands area can be thought of as a secondary control mechanism. Although the wetlands area should require remediation at some time in the future when and if National Chromium attempts to achieve a final remedy, at this time, the presence of the wetlands area is, in fact, a secondary control mechanism to the migration of contaminants from the site. As a result of both the operation of the AOC 9 groundwater recovery system and the wetlands, therefore, it is not likely that hexavalent chromium is discharging from the Little River wetlands in excess of 100 times CTDEP's SWC for the reasons elucidated above.

With respect to the chromium contamination potentially affecting the wetlands ecosystem, first, there does not appear to be any visual signs of ecological stress in the wetlands area and second, based on personal correspondence with Maurice Hamel of CTDEP, ecological sampling conducted some years ago did not evidence impacts to area flora and fauna including fish or invertebrates.

In sum, the “discharge of ‘contaminated’ groundwater into surface water [is] likely to be ‘insignificant’.”

Accordingly, at this time, it is possible to conclude, (1) based on recent data collected by UConn and National Chromium, the AOC 9 recovery well/system is controlling the dissolved-phase plume and reducing groundwater dissolved-phase concentrations, and (2) even under the assumption that minor quantities of dissolved-phase Cr6+ contamination escape the AOC 9 recovery well field, substantial information exists to support the conclusion that the wetlands area and vicinity soils act to reduce and irreversibly bind chromium contamination. Accordingly, National Chromium meets the Migration of Contaminated Groundwater Under Control (CA750) indicator.

National Chromium had set a date of the fall of 2000 for achieving stabilization at the site under the Stabilization Workplan. With the erection of the new fence and recent empirical data substantiating the effectiveness of the AOC 9 groundwater recovery system, National Chromium has achieved this environmental objective approximately one year in advance of prior scheduling estimates.

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

**Migration of Contaminated Groundwater Under Control
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 implemented⁴)?

_____ 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.

**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 National Chromium facility, EPA ID # CTD001160811, located at Senexet Road, Putnam, CT. 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) Raphael Cody
(print) Raphael Cody
(title) RCRA Facility Manager

Date: 3/11/99
Revised: 6/25/99
Updated: 12/14/99

Supervisor (signature) Matt Hoagland
(print) Matt Hoagland
(title) Chief, RCRA Corrective Action
(EPA Region or State) Region I

Date 12/22/99

Locations where References may be found:

See facility files

STATE contact telephone and e-mail numbers

(name) Maurice Hamel
(phone #) 860/424-3787
(e-mail) maurice.hamel@PO.State.CT.US