

**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:** NGK Metals Corporation  
**Facility Address:** P.O. Box 13367, Reading, Pennsylvania 19612-3367  
**Facility EPA ID #:** PAD 04 454 0136

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?

**YE** 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).

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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	<b>YE</b>			pump and treat system is operating 250 g/min. are pumped at the facility 24 h./day.
Air (indoors) <sup>2</sup>		NO		
Surface Soil (e.g., <2 ft)		NO		an impermeable cap over the main part of source area is in place.
Surface Water		NO		
Sediment		NO		
Subsurf. Soil (e.g., >2 ft)	<b>YE</b>			an impermeable cap over the main part of source area is in place
Air (outdoors)		NO		

----- 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):**

1) July 1989 and November 1990 on-site survey, and three surface/sediment sampling in the Laurel Run. 2) RFI dated November 15, 1990. 3) March - August 1991 the soil and groundwater on- and off-site investigation, an inventory of homes and commercial businesses water wells. 4) The Ecological and Risk Assessment, 1991. 5) The Administrative Order dated December 20, 1993. 6) First, 1991 and second, June 23, 1998 Petitioned Public Health Assessment Initial Release performed by Agency for Toxic Substances and Disease Registry, Atlanta, Georgia. 7) RCRA Corrective Measures Study (CMS) final Report, 1992. 8) EPA study “Levels of Beryllium and Chromium in Soil, Muhlenberg Township, Pennsylvania,” August, 1995. 9) EPA study “Analytical methods for beryllium in ambient air samples,” June 23, 1997. 10) RCRA Corrective Measure Implementation, Western Red Mud Area, Soil Boring Investigation Report dated March, 2002.

The facility occupied 65 acres site from 1935. From 1936 to 1965 the facility was involved in the extraction of beryllium hydroxide from beryl ore, production of beryllium salts, production of various shapes of beryllium metal and alloys. The extraction of beryllium hydroxide from beryl ore was discontinued at the site in 1965. From 1965 to November of 1992, the activities on the site included calcining of beryllium hydroxide, production of beryllium-containing alloys, hot and cold rolling of beryllium copper and beryllium nickel alloys, heat treatment of alloys and chemical and mechanical cleaning of beryllium alloys. In November of 1992, the production of master alloys, the melt and cast operations were discontinued.

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Laurel Run, a perennial stream, adjacent to the facility, which receives surface water run-off and the NPDES discharge from the facility's wastewater treatment plant. The Schykill River, located 3 miles down gradient of the facility, which serves as one of the drinking water sources for the city of Pottstown, PA.

The material disposed of in the Red Mud area was after the extraction of beryllium from the ore - the red gangue material. The chemical composition of Red Mud is: silicon 24-27.5%, fluoride 6.5-10.5%, iron 6.5-7.5%, sodium 1-3%, beryllium 0.3-0.75%, aluminum 6.5-7.5%, potassium 0.5-1%, magnesium, calcium, copper and phosphorus all less than 0.5%. Approximately 3,000 parts per million of water soluble beryllium is existed in Red Mud.

In July 1989 and November 1990 on-site survey, and three surface/sediment sampling were taken from the Laurel Run. The RCRA Facility Investigation (RFI) Report is dated November 15, 1990. In accordance with RFI the soil and groundwater on- and off-site investigation, an inventory of homes and commercial businesses water well took a place in March -August 1991. Also, off-site investigation in the vicinity of NGK took a place in March -August 1991, at the same time the Ecological and Risk Assessment was performed on the site. RCRA Corrective Measures Study (CMS) and CMS Final Report were finalized in 1992. On December 20, 1993 EPA signed the 3008 (h) Administrative Order.

In August, 1995 EPA conducted a study "Levels of Beryllium and Chromium in Soil, Muhlenberg Township, Pennsylvania." The conclusion the study was: "Be concentrations in the area are within the expected range for local area rocks and soil, due to the presence of Be as a naturally occurring element," "the facility has not caused an increase in the Be concentration in the area soil."

Two health assessments were performed for the NGK site. First, 1991 to June 1993, and second, June 23, 1998 Petitioned Public Health Assessment Initial Release performed by Agency for Toxic Substances and Disease Registry (ATSDR), Atlanta, Georgia. On June 23, 1997 EPA has completed the study on analytical methods for beryllium in ambient air samples. EPA found that "the methods used by NGK in its ambient air monitoring program may, indeed, fail to detect all beryllium present in the samples. However, EPA admitted that analytical differences are not significant enough to alter the Agency for Toxic Substances and Disease Registry's report for this facility, where ATSDR concluded there is no health threat based on ambient air monitoring." On June 23, 1998 second Petitioned Health Consultation (ATSDR) concluded: "the off-site ambient air beryllium concentrations indicated that the facility present no public health hazard to non-hypersensitive population."

The corrective measures implementation and construction on the facility are in process. The construction on the facility started in 1993 and will be finished to the end of 2003. First Phase, a construction of an impermeable cap over the main source area at the facility, and the installation of a groundwater collection - extraction system was finished in 1997. The Second Phase, a construction and operation of a groundwater treatment system with discharge of treated groundwater to Laurel Run is operational since June 24, 2002. The "pump and treat" system is pumping 250 gpm 24 h/day from 4 recovery wells. The Third Phase, a construction of an additional impermeable cap over the Eastern Red Mud Area of the facility is scheduled for 2003.

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 CO Dept. of Public Health and Environment, and others) suggest that unacceptable indoor air concentrations are more common in structures above contaminated groundwater than previously believed. While this is a rapidly developing field current evidence (1/99) suggest that indoor air in structures located above (and adjacent to) contaminated groundwater should not be assumed to be acceptable without physical evidence.

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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	Res.	Worker	Const.	Tresp.	Recreat.	Food3
Groundwater	NO___	NO___	___			___
Air (indoors)	NO___	NO__				
Soil (surface, e.g., <2 ft)	NO___	NO___	___	___	___	___
Surface Water	NO___	NO___		___	___	___
Sediment	NO	NO___		___	___	___
Soil (subsurface e.g., >2 ft)	NO	NO	___			___
Air (outdoors)	NO___	NO___	___	___		

**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):**

1) July 1989 and November 1990 on-site survey, and three surface/sediment sampling in the Laurel Run. 2) RFI dated November 15, 1990. 3) March - August 1991 the soil and groundwater on- and off-site investigation, an inventory of homes and commercial businesses water wells. 4) The Ecological and Risk Assessment, 1991. 5) The Administrative Order dated December 20, 1993. 6) First, 1991 and second, June 23, 1998 Petitioned Public Health Assessment Initial Release performed by Agency for Toxic Substances and Disease Registry, Atlanta, Georgia.. 7) RCRA Corrective Measures Study (CMS) final Report, 1992. 8) EPA study “Levels of Beryllium and Chromium in Soil, Muhlenberg Township, Pennsylvania,” August, 1995. 9) EPA study “Analytical methods for beryllium in ambient air samples,” June 23, 1997. 10) RCRA Corrective Measure Implementation, Western Red Mud Area, Soil Boring Investigation Report dated March, 2002.

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4. Can the exposures from 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)?

**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):**

1) July 1989 and November 1990 on-site survey, and three surface/sediment sampling in the Laurel Run. 2) RFI dated November 15, 1990. 3) March - August 1991 the soil and groundwater on- and off-site investigation, an inventory of homes and commercial businesses water wells. 4) The Ecological and Risk Assessment, 1991. 5) The Administrative Order dated December 20, 1993. 6) First, 1991 and second, June 23, 1998 Petitioned Public Health Assessment Initial Release performed by Agency for Toxic Substances and Disease Registry, Atlanta, Georgia. 7) RCRA Corrective Measures Study (CMS) final Report, 1992. 8) EPA study “Levels of Beryllium and Chromium in Soil, Muhlenberg Township, Pennsylvania,” August, 1995. 9) EPA study “Analytical methods for beryllium in ambient air samples,” June 23, 1997. 10) RCRA Corrective Measure Implementation, Western Red Mud Area, Soil Boring Investigation Report dated March, 2002.

<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.

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

**YE** 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 each potentially “unacceptable” exposure.

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

**Rationale and Reference(s):**

1) July 1989 and November 1990 on-site survey, and three surface/sediment sampling in the Laurel Run. 2) RFI dated November 15, 1990. 3) March - August 1991 the soil and groundwater on- and off-site investigation, an inventory of homes and commercial businesses water wells. 4) The Ecological and Risk Assessment, 1991. 5) The Administrative Order dated December 20, 1993. 6) First, 1991 and second, June 23, 1998 Petitioned Public Health Assessment Initial Release performed by Agency for Toxic Substances and Disease Registry, Atlanta, Georgia. 7) RCRA Corrective Measures Study (CMS) final Report, 1992. 8) EPA study “Levels of Beryllium and Chromium in Soil, Muhlenberg Township, Pennsylvania,” August, 1995. 9) EPA study “Analytical methods for beryllium in ambient air samples,” June 23, 1997. 10) RCRA Corrective Measure Implementation, Western Red Mud Area, Soil Boring Investigation Report dated March, 2002.

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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 **NGK Metals Corporation, Reading, Pa** facility, EPA ID # **PAD 04 454 0136**, located at Tuckerton Road 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: 06-26-02  
(print) V. IOFF  
(title) Remedial Project Manager

Supervisor (signature) Date: 08-22-02  
(print) Paul GOTTHOLD  
(title) PA Operations Branch Chief  
EPA, Region 3

**Locations where References may be found:**

NGK Metals Inc., Reading, Pa  
EPA, Reg.3, 1650 Arch St, Philadelphia, Pa

**Contact telephone and e-mail numbers:**

(name) Victoria Ioff  
(phone #) 215-814-3415  
(e-mail) ioff.vickie@epa.gov

**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.**