

STATEMENT OF BASIS
Osram Sylvania Products, Incorporated
1 Jackson Street
Wellsboro, Pennsylvania 16901
EPA ID#: PAD003046794

I. INTRODUCTION

This Statement of Basis was prepared for the Osram Sylvania Products, Incorporated facility (“Osram” or the “Facility”) located in the Borough of Wellsboro, Tioga County, Pennsylvania. This document explains the corrective measures proposed by the Environmental Protection Agency (“EPA”) given the current environmental conditions at the Facility. This document summarizes the activities that Osram performed under an Administrative Order on Consent, U.S. EPA Docket Number RCRA-3-072-CA (Order), issued to Osram Sylvania Products, Inc. on October 22, 1993. The Order was issued under the authority of Section 3008 (h) of the Resource Conservation and Recovery Act (RCRA), 42 U.S.C. Section 6928 (h).

In accordance with the Order, Osram completed the tasks required in the EPA-approved RCRA Facility Investigation Workplan. The purpose of the RCRA Facility Investigation (RFI) was to evaluate the nature and extent of releases of hazardous wastes and/or hazardous constituents at or from the Facility.

Osram submitted the complete RFI report in April 2000. EPA reviewed this report and is approving the report as part of this Statement of Basis. The results of this RFI support EPA’s proposed corrective measures for the Facility. The RFI, as well as other relevant information, can be found in the Administrative Record, which the public is encouraged to review. The Administrative Record is available at two locations identified in Section VIII, Public Participation, of this document.

Generally, EPA corrective action orders require that a facility owner prepare a Corrective Measures Study (CMS) which identifies possible remedies once the investigation is completed. This requirement for a CMS is contained in the Order for Osram. However, EPA’s evaluation of the investigation results show that remaining contamination is minimal. The soil removed in 1989 in combination with natural processes have served to contain and attenuate the low level of contamination so that EPA is only proposing additional verification of groundwater attenuation in this Statement of Basis. As a result of these site-specific conditions, EPA has concluded that a study of remedial alternatives in the form of a CMS is unnecessary, and EPA expects to proceed directly to the groundwater monitoring program.

EPA welcomes public comment on its proposed corrective measure. Public participation is an important component of the corrective measures selection process. Public comments may

influence EPA's final selection of a corrective measure. If new information or options are presented to EPA through public comments, EPA will address these comments and may modify the proposed corrective measure or select another remedy. EPA will select a final remedy for the Facility after information submitted during the public comment period has been considered.

II. FACILITY BACKGROUND

The Facility was constructed in 1886 by the Columbia Glass Company and occupies approximately 20 acres. Osram (formerly known as GTE -Sylvania Products Corporation), purchased the Facility in September, 1981, from Corning, Incorporated ("Corning"). Corning owned and operated the Facility since the 1920's. Today, Osram produces lime glass envelopes (the glass portion of incandescent light bulbs), which are sold to off-site customers for final assembly.

During the period that Corning owned and operated the Facility, chromium plating rinsewater was disposed of in a dry well located in the southern portion of the Facility. This practice was discontinued before Osram acquired the Facility in 1981. In 1990, EPA conducted an assessment of the Facility as part of the cleanup program established by RCRA Section 3008(h). This assessment identified the presence of several solid waste management units at the Facility. These units were further evaluated by EPA. This evaluation is contained in a report titled *Environmental Priorities Initiative Site Inspection of GTE-Sylvania Corporation (1991)* and is available in the Administrative Record. Based on this evaluation, EPA identified chromium contamination near the former dry well as the sole area of concern. The RFI was designed to define the extent of chromium contamination in both the soils and groundwater in the southern portion of the Facility.

III. PREVIOUS INVESTIGATIONS

In January 1988, Osram conducted a site investigation at the Facility and submitted a report to the Pennsylvania Department of Environmental Resources ("PADER"; PADER has since been re-named the Pennsylvania Department of Environmental Protection or "PADEP") titled, *"Preliminary Site Evaluation Report of Past Chromium Rinse Water Discharges."* The purpose of this study was to evaluate the effects of the past chromium plating rinsewater discharges on the soil and groundwater. Six soil borings were drilled and three monitoring wells installed. Results of this investigation verified the presence of hexavalent chromium ranging from <0.2 milligrams per kilogram ("mg/kg") to 4,400 mg/kg in the soils and total chromium, ranging from 15 mg/kg to 25,000 mg/kg. Total chromium was also found in the groundwater at levels ranging from 220 micrograms/liter ("ug/l") to 35,000 ug/l. (Note: Chromium typically exists in two forms in the environment- trivalent and hexavalent. Total chromium tests measure the combined concentration of both forms of chromium, while *hexavalent* chromium tests measure the concentrations of hexavalent only. Hexavalent chromium is more mobile and more toxic, hence EPA considers the hexavalent chromium result to be more significant in environmental studies.)

Osram performed a second investigation in September, 1988, and subsequently it submitted a report to PADER titled, "*Phase II Evaluation Report of Past Chromium Rinse Water Discharges.*" The purpose of this investigation was to further define the effects of past chromium plating rinsewater discharges on the groundwater. Three additional monitoring wells were installed during this investigation, and total chromium concentrations in each of these wells were found to be below detection limits.

A third site investigation was performed by Osram in October 1989 and, subsequently it submitted a report to PADER titled, "*Phase III Evaluation Report of Past Chromium Rinse Water Discharges.*" This investigation was conducted in order to further define the contamination plume, determine groundwater movement, and evaluate the need for groundwater remediation.

In consultation with the PADER, Osram implemented a remediation plan, and submitted a report to PADER in December 1989 titled, "*Summary Report Chromium Contaminated Soil Removal.*" The purpose of the remediation project was to remove all soils exhibiting chromium concentrations in excess of the clean up goals of 10,000 mg/kg for trivalent chromium and 45 mg/kg for hexavalent chromium. Approximately 85 cubic yards of contaminated soil was removed.

In 1990, EPA conducted a Preliminary Assessment of the Facility under the Environmental Priorities Initiative ("EPI"). The findings of this assessment are found in a report entitled "*Environmental Priorities Initiative Preliminary Assessment of GTE-Sylvania Corporation*" which was prepared by the NUS Corporation on behalf of EPA on May 8, 1990.

IV. SUMMARY OF THE RFI FINDINGS

The RFI determined the extent of contamination in groundwater at the Facility. Based on the findings of the RFI, the shallow groundwater beneath the Osram facility contains hexavalent chromium and arsenic in excess of EPA's Maximum Contaminant Levels ("MCLs") for those contaminants. The MCLs are levels established by EPA under the Safe Drinking Water Act (42 U.S.C. § 300f et seq.) The MCL for hexavalent chromium is 0.11 mg/l, and the MCL for arsenic is 0.01 mg/l. There are no known or suspected ongoing releases of either arsenic or hexavalent chromium at the Facility. EPA found no evidence that arsenic has been used at the Facility since Osram bought the Facility in 1981. The use of the chromium dry well ceased in 1981.

A) Soil Investigation

A summary of soil data for the Facility was submitted by Osram as part of the RFI, Task I: Existing Conditions Report, dated January 25, 1994. Based on these soil data, EPA determined that chromium-contaminated soils had been remediated to levels below EPA's Risk Based Concentrations ("RBCs") of 6100 mg/kg, and, consequently, EPA determined that no further

investigation of the soils at the Facility was necessary.

B) Groundwater Investigation

The groundwater investigation completed during the RFI indicates that groundwater at the Facility generally flows toward the north or northwest and discharges to Charleston Creek. Any residual chromium contamination in the groundwater attributable to the former drywell is expected to migrate in this direction, toward one or more of the 14 groundwater monitoring wells at the Facility. Concentrations of hexavalent chromium in the groundwater measured during the RFI ranged from non-detect to 4.72 mg/l. Arsenic levels in the groundwater ranged from non-detect to 0.168 mg/l, and were found exceeding the applicable MCL only at monitoring well MW-13

which exhibited an average arsenic concentration of 0.095 mg/l. Sampling of the Facility's monitoring wells during the RFI indicated that concentrations of dissolved hexavalent chromium in the groundwater are generally comparable to concentrations reported for the same wells 9 to 11 years ago.

Historical groundwater monitoring data demonstrate that the hexavalent chromium plume has not substantially moved in the past ten years, and that the plume remains within the Facility's boundaries. The Charleston Creek is located approximately 550 feet from the former dry well in the direction of groundwater flow. Given the average hydraulic conductivity (23 feet/day) and gradient (0.017) measured as part of the RFI, and the typically high mobility of hexavalent chromium in groundwater, the fact that chromium concentrations have remained stable over the past ten years is indicative of natural geochemical processes which limit the mobility of the chromium plume at the Facility.

Under the subsurface conditions that exist beneath the Osram Facility, the potential for oxidation-reduction is favorable. Under these conditions, hexavalent chromium is reduced to the less toxic trivalent chromium, which then precipitates out of the groundwater as an immobile, insoluble mineral. This process is enhanced by the presence of organic matter or clays in the subsurface and a neutral to slightly alkaline soil pH, such as is found at the Osram Facility. Once hexavalent chromium has been reduced to trivalent chromium and then precipitated as a mineral through this geochemical process, the chromium is both immobile and less toxic. Given the available data and the subsurface conditions, EPA does not expect the hexavalent chromium in groundwater beneath the Facility to impact the water quality of Charleston Creek in the future.

C) Surface Water Investigation

Surface water from the Facility flows north towards Charleston Creek. Approximately 0.5 miles downstream of the Facility (northwest), the Charleston Creek joins Kelsey Creek to form Marsh Creek. Storm water runoff from the manufacturing areas of the Facility is collected by catch basins and eventually discharges to Charleston Creek through Outfall 001 or Outfall 002 each of which is permitted under Osram's National Pollution Discharge Elimination Permit No.

PA0008915. As part of the RFI, four stream gauges were installed along Charleston Creek to evaluate the interconnection between the overburden aquifer and surface waters.

A summary of existing sediment and surface water quality data was submitted by Osram as part of the RFI, Task I: Existing Conditions Report, dated January 25, 1994. These results revealed arsenic in Charleston Creek ranging from non-detect to 0.0022 mg/l, and total chromium ranging from non-detect to 0.0052 mg/l. Sampling of the sediments in Charleston Creek found arsenic ranging from 5.5 mg/kg to 22 mg/kg. Total chromium in the sediments ranged between 10 mg/kg and 19.2 mg/kg. Based on these results, and data from the onsite monitoring wells, EPA has concluded that Facility operations have not substantially impacted the surface water or sediments in Charleston Creek. This finding was supported in the ecological risk screening assessment, contained in the Final RFI Report, which can be found in the Administrative Record.

V. SUMMARY OF HEALTH RISKS

Osram completed an assessment of potential contaminant migration pathways as well as current and future human exposure scenarios for the groundwater contamination at the Facility as part of the RFI. Based on groundwater flow and data collected from the onsite monitoring wells, no existing pathways for human exposure exist from the contamination in the groundwater at the Facility. Furthermore, no human exposure to contamination originating from the groundwater beneath the Facility is expected to occur in the future.

A) Human Health Risk

Public water in the Wellsboro area is supplied by the Wellsboro Municipal Water Authority which obtains groundwater, surface water and spring water from sources located over 1.3 miles southeast and hydraulically upgradient from the Osram Facility. The nearest private well in the direction of the hexavalent chromium plume is located northwest of the Facility, approximately 1200 feet beyond Charleston Creek.

Groundwater contamination at the Facility is not a threat to human health for the following reasons:

1. As stated in Section IV, the RFI results indicate that subsurface conditions are acting to remove dissolved hexavalent chromium from the groundwater beneath the Facility, essentially immobilizing the contaminant plume within the Facility's boundaries. Further study of this reductive process at the Facility shows that hexavalent chromium in the groundwater will drop to concentrations below the Method Detection Limit of 0.003 mg/l prior to reaching Charleston Creek.

2. Groundwater contamination at the Facility is limited to the overburden aquifer. This is evident given the absence of contamination in the deep wells within the overburden aquifer

underlying the Facility and the lower permeability of the underlying bedrock formation which would deter groundwater from moving into the deeper bedrock aquifer. Vertical gradients measured in the overburden aquifer beneath the Facility verify that Charleston Creek is acting as a hydraulic boundary for the shallow aquifer, and that water in the shallow aquifer is discharged to Charleston Creek.

3. Groundwater modelling was used to simulate the effects of pumping of the four closest offsite wells on groundwater beneath the Osram Facility. These studies revealed that none of the water within the overburden aquifer flows into the bedrock aquifer beneath the Creek. Therefore, the groundwater in the overburden aquifer cannot reach offsite wells.

4. Concentrations of hexavalent chromium and arsenic in Charleston Creek, sampled by Osram in 1994, were found to be well below the relevant Ambient Water Quality Criteria

(AWQC) levels established by PADEP under Pennsylvania's Clean Streams Law. The AWQC level established for arsenic is 0.150 mg/l and the level established for hexavalent chromium is 0.010 mg/l.

5. Groundwater within the Facility boundary is currently not used nor planned for use as drinking water.

B) Future Exposure Assessment

Potential future exposure scenarios were investigated as part of the RFI using fate and transport analysis for both hexavalent chromium and arsenic in the groundwater. Results of this analysis indicated that the concentration of hexavalent chromium in the groundwater is reduced through natural processes to below 0.003 mg/l before reaching Charleston Creek. Conservative estimates of in-stream concentrations were predicted using the PADEP calculation for diffuse flow of contaminated groundwater. The average arsenic concentration in Charleston Creek was predicted to be 0.00245 mg/l, which is considerably lower than the applicable MCL and the allowable ambient Water Quality Criteria of 0.150 mg/l as established by the EPA and PADEP. These predicted concentrations are supported by the fact there is no ongoing source of either hexavalent chromium or arsenic to the groundwater and the length of time since the initial release which occurred prior to 1981.

C) Ecological Risk Assessment

Osram performed an ecological assessment to assess the impact of the hexavalent chromium and arsenic-impacted groundwater on the surrounding environment. The Charleston Creek was identified as an ecological receptor; however, estimated concentrations of both arsenic and hexavalent chromium entering the Creek were found to be well below EPA water quality criteria established for the protection of aquatic life (150 ug/l for total arsenic, and 10 ug/l for hexavalent chromium). Based on this assessment, contaminated groundwater under the Facility is not adversely affecting Charleston Creek.

VI. SCOPE OF CORRECTIVE ACTION

Based on the findings of the RFI, EPA proposes that Osram implement a semi-annual groundwater monitoring program for a period of three years to continue monitoring of hexavalent chromium and arsenic concentrations in the groundwater. EPA expects this additional monitoring to confirm the conclusions made in the RFI.

EPA proposes that the Facility impose use restrictions for groundwater beneath the Site to prohibit its use as a potable source. EPA proposes that these restrictions be developed by Osram and submitted to EPA for approval. EPA uses the term *institutional controls* to describe restrictions placed on land or water use that are imposed on facilities to prevent exposure to environmental contamination. Under this proposed remedy, Osram will submit a description of institutional controls that will guarantee that the groundwater will not be used for drinking purposes as long as contamination remains. (Of course, given the natural chemical attenuation that is occurring at this site, these restrictions may not need to be permanent.)

The Facility will be required to maintain health and safety procedures to prevent future construction worker exposure to contaminated groundwater.

EPA will evaluate the need for additional action, if any, at the end of the three-year monitoring period.

VII. EVALUATION OF PROPOSED REMEDY AT OSRAM SITE USING REMEDY SELECTION CRITERIA

Remedy Selection

EPA has established a two-phase evaluation system for remedy selection. During the first phase, potential remedies are screened to see if they meet the threshold criteria listed below. Remedy options that meet the threshold criteria are then further evaluated using the balancing criteria also listed below.

Threshold Criteria

1. protective of human health and the environment
2. attain media clean-up standards
3. control source releases
4. comply with waste management standards

Balancing Criteria

- a. long-term reliability and effectiveness
- b. reduction of toxicity, mobility, or volume of wastes
- c. short-term effectiveness

- d. implementability
- e. cost

EPA's proposed remedy at the Osram Facility is made-up of three parts: 1) The soils removal; 2) the three-year groundwater monitoring program; and 3) the restriction on future use of on-site groundwater as a drinking-water source (institutional controls) while natural attenuation takes place.

EPA's proposed remedy meets each of the threshold criteria as described below.

1. Protective of Human Health and the Environment
2. Attain Media Clean-up Standards

During the soils removal project, Osram excavated and disposed of soils with hexavalent chromium levels above 45mg/kg. This clean-up level is well below the Risk Based

Concentration (RBC) Tables level which EPA uses for developing soil clean-up standards.

The RBC standard for hexavalent chromium is 6100 mg/kg for soil on industrial property and 230 mg/kg for residential soil.

The groundwater investigations show that the hexavalent chromium and arsenic plume is entirely within the Osram property, and the plume has not migrated in 11 years. Data collected during the RFI indicate that site geology and geochemistry are acting to attenuate the plume before it reaches Charleston Creek. Concentrations of hexavalent chromium and arsenic have been found to be well below their respective Ambient Water Quality Criteria levels established by PADEP. The proposal to continue monitoring levels of both hexavalent chromium and arsenic for three years is expected to add to EPA's understanding of the groundwater system and will provide additional data expected to confirm that the constituents are not moving off-site and that natural attenuation is occurring due to the effects of dilution and geochemistry.

The groundwater on-site is not currently used as a drinking water source, nor, according to Osram, are there plans for any such future use. The restriction on drinking water wells within the plant property will be guaranteed through EPA's review and approval of institutional controls that Osram will propose under this Statement of Basis. Typically, these institutional controls will consist of several different instruments, such as a deed notice, a local zoning restriction or ordinance, or a prohibition established by a local water supply company. EPA expects the actual suite of controls proposed by Osram will include redundant protection to assure that the restriction on potable use of groundwater is maintained as long as necessary, no matter who is the

future property owner.

Osram understands EPA's position and has agreed to include a restriction on groundwater use, subject to EPA approval. Thus, EPA believes that natural attenuation combined with exposure prevention by way of institutional controls are adequate to meet the cleanup standard for groundwater.

3. Control Source Releases

The completion of the soils removal project ensures that the source of hexavalent chromium for direct contact exposure, as well as the source of a continuing release to groundwater, has been eliminated. The groundwater is not a source of release to Charleston Creek, the human and ecological exposure point for groundwater. The continued monitoring is expected to provide additional data that the source has been successfully controlled.

4. Comply with Waste Management Standards

During the soils removal project, the contaminated soils were excavated and disposed of in accordance with the applicable hazardous wastes requirements set forth in RCRA. The groundwater sampling, over the next three years will be conducted in accordance with Osram's Quality Assurance/Quality Control project plan already approved by EPA.

EPA's proposed remedy addresses the balancing criteria as described below.

1. Long-Term Reliability and Effectiveness

The soils removal project provided a permanent, effective remedy to address soil contamination, as well to eliminate the source of the groundwater contamination.

Semi-annual groundwater monitoring is expected to confirm EPA's understanding of the groundwater system and will provide data to ensure the reliability and effectiveness of the natural attenuation processes at the Facility.

The restriction of on-site groundwater use for drinking purposes through EPA- approved institutional controls will assure that no future human exposure to contaminated groundwater will occur.

2. Reduction of Toxicity, Mobility, or Volume of Wastes

The soils removal project greatly reduced the volume of hazardous constituents in the soils. Data indicate that natural processes at the Facility are reducing the toxicity of the chromium contamination from the hexavalent state to the trivalent state. Continued monitoring is expected to confirm this trend.

3. Short-Term Effectiveness

There are few short-term environmental impacts related to this proposal. The soils have been removed. Therefore, evaluating continuing community protection, worker exposure and other environmental impacts is appropriate only for *potential* exposure to groundwater. The only possible exposures to groundwater at the Facility is to workers taking environmental samples or to workers excavating soil in the vicinity of the contaminated plume. Osram has already submitted a Health and Safety Plan that provides for proper worker training and protective clothing if groundwater exposure is expected. It is also relevant to note that the current levels of groundwater contamination do not represent an immediate threat to anyone who may be exposed during routine sampling or construction activities. (The levels of contamination at Osram are being addressed because they exceed the *long-term* exposure represented by anyone drinking the water for a period of years.)

4. Implementability

If the proposed remedy becomes final, EPA believes the remedy will be simple to implement. The groundwater monitoring technology and protocol are already in place and have been approved by EPA. EPA proposes to implement this remedy through a facility-lead agreement with Osram. In this approach, Osram will provide EPA a written commitment to complete the steps outlined in the final remedy. In the event that Osram fails to implement the final remedy as specified in the Facility-Lead Agreement, EPA will take appropriate steps to compel Osram to perform the necessary work.

5. Cost

Cost is often used to select among several alternatives of equal effectiveness. In this case, EPA is confident that the proposed remedy will be adequate to address the residual low-level contamination of groundwater. Therefore, cost is not a relevant balancing criteria for the Osram remedy.

VIII. PUBLIC PARTICIPATION

On March 5, 2003 EPA placed an announcement in the Wellsboro Gazette to notify the public of the availability of this Statement of Basis, its supporting Administrative Record and the

public's opportunity to request a public meeting on EPA's proposed corrective action for the Facility. If a public meeting is requested, EPA will make the necessary arrangements and will provide at least (30) calendar days prior notice.

Copies of this Statement of Basis will be mailed to persons who request a copy. In addition, the Administrative Record and this Statement of Basis is available for review during business hours

at the two following locations:

U.S. Environmental Protection Agency
Region III (3WC22)
1650 Arch Street
Philadelphia, PA 19103

Phone: 215-814-3410
Contact: Paul Gotthold

The Green Free Library
134 Main Street
Wellsboro, PA 16901

Phone: 570-724-4876

EPA is requesting comments from the public on its proposed corrective action for the Osram Facility. Comments on, or questions regarding, EPA's proposal may be submitted to:

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U.S. EPA, Region III
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Philadelphia, PA 19103
Phone: 215-814-3410
Fax: 215-814-3113
E-mail: Gotthold.Paul@epamail.epa.gov

Following the thirty (30) day public comment period ending it November 1, 2001, EPA will prepare a Final Decision and Response to Comments in which it will identify the selected scope of corrective action for the Osram Facility. The Response to Comments will address all significant written comments and any significant oral comments generated at a public meeting if a meeting is held. The Final Decision and Response to Comments will be made available to the public. If, on the basis of such comments or other relevant information, significant changes are proposed to be made to the scope of corrective action for the Facility as identified by EPA in this Statement of Basis, EPA will seek additional public comments on any proposed revised corrective measure alternative.

Date

USEPA Region III

James J. Burke, Director
Waste and Chemical Management Division