

**From:** Deni Chambers, CEM  
Renee Kalmes

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**To:** Shannon Harbour, PE  
Nevada Division of Environmental Protection (NDEP)

**RE:** Proposed Evaluation Procedures for Parcels C, D, F, G, H Risk Evaluation  
Tronox Facility, Henderson, Nevada

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## **COMMENTS:**

Tronox proposes the following procedures for the Parcel C, D, F, G, & H risk evaluation:

### **1. Background Evaluation**

We propose to combine Parcels C, D, F, G, & H data to conduct the background metals and radionuclide evaluation. Based on the conceptual site model for these parcels, as well as review of the metals and radionuclide data, no significant sources of metals or radionuclide contamination were identified. Therefore, evaluating the entire dataset as a whole is appropriate.

Specifically, the types of activities historically conducted in the parcels are not associated with metal or radionuclide contamination. No Letter of Understanding areas (LOUs) were identified in Parcels C/D and only asbestos was detected at levels above remediation goals. A trucking operation and an underground storage tank were located in portions of Parcel F and remediation was based on asbestos, polycyclic aromatic hydrocarbons (PAHs), and one sample with an arsenic concentration of 11.3 milligrams per kilogram (mg/kg). Although magnesium chloride was identified as a possible waste stream associated with this trucking operation, a review of the magnesium data for all of the parcels indicates that magnesium concentrations in soil in Parcel F are consistent with magnesium concentrations in the other parcels. Finally, with regard to Parcel G, no waste streams or chemical uses have been identified and remediation was based on asbestos and one detection of benzo(a)pyene [B(a)P]. Parcel H remained undeveloped and remediation was based solely on asbestos detections.

Consistent with prior NDEP guidance, RZ-A will be used as the background dataset.



## 2. Asbestos Evaluation

Risk calculations will be presented on a parcel-by-parcel basis as follows: Parcels C/D, Parcel F, Parcel G and Parcel H. Both on-site commercial workers and short-term construction workers will be evaluated quantitatively. Consistent with the approved Health Risk Assessment (HRA) for RZ-A, off-site receptors will not be evaluated quantitatively because exposure to on-site workers will be higher than for off-site receptors.

## 3. Risk Screening Evaluation

All inorganic chemicals shown to be present at the site at concentrations greater than background and all organic chemicals detected in at least one sample across all of the parcels will be included in a screening-level risk evaluation. This evaluation will utilize the lower of the NDEP indoor or outdoor worker basic comparison level (BCL), which takes into account exposure via incidental soil ingestion, dermal contact with soil (outdoor worker only), and inhalation of vapors or particulates in ambient air, to estimate cumulative excess cancer risks and non-cancer hazard indices. This approach is consistent with the approach taken for Parcels A/B and will streamline the risk evaluation for Parcels C, D, F, G, and H. The range of detection limits for non-detect chemicals will also be evaluated to ensure detection limits are below NDEP BCLs and are adequate for risk assessment purposes. Specifically, this evaluation will consist of the following steps:

- a. For carcinogenic chemicals, an excess cancer risk will be estimated for each chemical by taking the ratio of the maximum detected concentration from all parcels to the lower of the NDEP indoor or outdoor worker BCL based on a cancer endpoint and multiplying that ratio by  $1 \times 10^{-6}$ . These values will be summed to estimate a screening-level cumulative excess cancer risk for an on-site commercial worker.
- b. For non-carcinogenic chemicals, a hazard index will be estimated for each chemical by taking the ratio of the maximum detected concentration from all parcels to the lower of the NDEP indoor or outdoor worker BCL based on a non-cancer endpoint (regardless of target organ). These values will be summed to estimate a screening-level cumulative hazard index for an on-site commercial worker.

If the cumulative cancer risk is below  $1 \times 10^{-6}$  and the cumulative hazard index is below 1, no further refined risk evaluation will be conducted. If a further refinement is needed, then maximum detections within each parcel (i.e., Parcels C/D, F, G, and H) will be used. The potential risks for short-term construction workers will be evaluated qualitatively or semi-quantitatively based on these screening-level results for on-site commercial workers and the results for the approved HRA for RZ-A. Specifically, the RZ-A HRA indicates that the potential excess cancer risk for construction workers is lower than that calculated for commercial workers; therefore, if the screening-level cumulative excess cancer risk for a commercial worker is less than  $1 \times 10^{-6}$ , then the risk for a construction worker will also be less than  $1 \times 10^{-6}$ . For non-cancer effects, the RZ-A HRA indicates that the potential hazard index for construction



workers is higher than that calculated for commercial workers, but only by a factor of ~4. Therefore, if the screening level cumulative hazard index for a commercial worker is more than a factor of 4 lower than 1, then the cumulative hazard index for a construction worker will also be less than 1.

#### **4. Evaluation of non-direct contact exposure pathways**

Findings from the site-wide soil gas HRA will be qualitatively discussed in the Parcels report. With regard to soil to leaching pathway, soil concentrations will be compared to NDEP LBCLs DAF1 and DAF20. Any soil exceedances of LBCLs will also be discussed in context of the leaching site-specific levels (LSSLs), which were calculated using site-specific chemical and soil properties as described in the revised leaching memorandum (submitted to NDEP on September 9, 2010).

#### **Conclusion**

If you have any further questions or would like to discuss the above information, please contact us.

