

## ACHIEVING A “NO-LONGER-CONTAINED-IN” DETERMINATION FOR ENVIRONMENTAL MEDIA

R. Montgomery, Bechtel – B&W Idaho, Inc./INEEL

### ABSTRACT

Environmental restoration and D&D projects sometimes encounter environmental media, soil and groundwater, which have been contaminated with RCRA listed waste through accidental releases or past disposal practices. These media are sometimes also contaminated with radionuclides which pose higher risk to human health and the environment than the chemical contamination. Management of these media as mixed waste is often difficult and expensive. A practical approach to reduce regulatory requirements is a determination by the appropriate regulatory agency that the media “no longer contain” RCRA listed waste. Assuming the media also do not exhibit a characteristic of a hazardous waste, then it can then be managed according to the radiological or other pertinent characteristics. The INEEL and the Idaho Division of Environmental Quality, have developed a risk-based approach to this process leading to cost-effective, yet environmentally protective, management of several media-related waste stream.

### INTRODUCTION

Many sites under the control of the Department of Energy and other federal agencies or private industries are contaminated with listed hazardous waste under the Resource Conservation and Recovery Act. When environmental media such as soil or groundwater is contaminated with listed hazardous waste the Environmental Protection Agency (EPA) has stated that the media is not a waste, but that it “contains” a hazardous waste. When such media is excavated, pumped, or otherwise “managed” it must be managed as hazardous waste due to listed waste it contains. Management of media most often, but not always, occurs as part of a remedial action under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) or the Resource Conservation and Recovery Act (RCRA). RCRA listed waste codes can be removed from an environmental media through application of a “no-longer-contained-in” (NLCI) determination.

This EPA “contained-in” policy has been in place since 1986 when it was first stated in an EPA memorandum.<sup>1</sup> Since then it has been repeated several times in several different EPA letters and memoranda. The concept was also applied to debris, as defined by RCRA. The policy’s application to debris was codified into regulation by inclusion in the Federal Register in 1992.<sup>2</sup> However, while discussed in the HWIR-Media proposed rule<sup>3</sup>, its application to environmental media has never been adopted into regulation. Application of this policy has been delegated to states authorized to enforce RCRA. While EPA has suggested a risk-based approach to the issue, each authorized state is free to apply the policy in an independent manner. This paper describes the approach implemented by Idaho, and how it has changed over time.

### BACKGROUND

The Idaho National Engineering and Environmental Laboratory (INEEL) was added to the National Priorities List (NPL) by EPA in 1989<sup>4</sup> due to contamination of soil and groundwater

## **WM'00 Conference, February 27 – March 2, 2000, Tucson, AZ**

from past releases and waste disposal activities. One of the primary causes for NPL listing was groundwater contamination from injection well activities at Test Area North (TAN) which ceased in 1974. The primary chemical component of the contamination is trichloroethylene (TCE). While remediation of the TCE was addressed under a CERCLA Record of Decision (ROD), there was insufficient evidence to apply a RCRA listed waste code to the TCE. Thus the listed waste issue was not addressed as part of the ROD. After implementation of ROD additional evidence was discovered which caused the INEEL to apply the F001 listed waste code to TCE found in the groundwater.

Post-ROD investigation activities require drilling and sampling additional wells into the TCE plume. Once the saturated zone is encountered, all water and drill cuttings must be managed as listed waste due to direct contact with a source of listed waste, the TCE. Management of large volumes of media which exhibit very low concentrations of TCE is resource-intensive and provides very little additional protection of human health and the environment. The project managers decided to petition the Idaho Department of Health and Welfare, Division of Environmental Quality (DEQ) for a NLCI determination.

### **EARLY NLCI DETERMINATIONS**

Discussions were opened in 1997 with DEQ personnel to determine the requirements for a NLCI determination. DEQ provided a policy statement on NLCI in the form of a letter<sup>5</sup> which stated that such a risk-based determination would be granted on a case-by-case basis. The first media addressed by INEEL and DEQ was diverter seal leakage from drilling operations. INEEL was required to contain and sample the leakage. Once INEEL demonstrated the TCE concentration met the Safe Drinking Water maximum contaminant level of 5 parts per billion (ppb) TCE (the only listed waste constituent disposed) then the F001 listed waste code could be removed and the water discharged to the ground. This agreement was achieved in September 1997 after a written request from INEEL and brief written discussions with DEQ.

This first NLCI has been followed by several additional determinations, primarily related to drilling activities at TAN. The media include purge water and drill cuttings from the saturated zone. The primary difference between the later determinations and the first was that the TCE concentration was raised to 30 ppb TCE in liquid streams. This was based on a 1987 federal register discussion<sup>6</sup> of the risk associated with TCE, establishing that 30 ppb in drinking water resulted in an estimated risk between 1E-6 and 1E-4. The allowable TCE concentration in soil, 27 parts per million (ppm), was based on a risk of 1E-5 derived from values published as Preliminary Remediation Goals (PRG) by EPA Region 9. Water and drill cuttings from the saturated zone are required to be contained and sampled to demonstrate compliance with the NLCI requirements. This requires an impermeable containment around the drill rig to contain diverter seal leakage and cuttings. Purge water and some cuttings are contained in a frac tank located within a secondary containment. Once media are sampled and shown to meet the NLCI, then they may be discharged as described. The cost to meet containment and sampling requirements is about \$20K per well. However, the estimated cost to manage the media as listed waste is about \$60K.

## **EVOLUTION OF THE NLCI PROCESS**

The risk-based approach applied by DEQ began to change in January 1999 when the INEEL submitted a request for determination on soil from another project not associated with TAN groundwater. During a construction project the INEEL excavated a large volume of soil, some of which was later determined to be contaminated with listed waste.

DEQ stated the approach to a NLCI would be based on a cumulative risk of  $\leq 1E-5$  for all hazardous waste constituents present in the soil, whether or not those constituents were discharged as part of the waste. The list of possible hazardous waste constituents began with Appendix VIII to 40 CFR 261, excluding herbicides since there was no known source of herbicides in the waste stream contaminating the soil. The PRGs published by EPA Region 9 are used to calculate cumulative risk. Discussions with DEQ on sampling this soil continue.

## **APPLICATION OF THE CUMULATIVE RISK APPROACH**

The cumulative risk approach to NLCI is now being applied to new sources of contaminated media at TAN. Groundwater samples are taken by activities outside the CERCLA program. These include compliance monitoring for the percolation pond permit and samples taken by various university researchers. Purge water from these samples is managed as listed waste until a NLCI determination is made. That determination is made based on the cumulative risk from all hazardous constituents present, even if those constituents result from biological degradation of the TCE such as cis- and trans-1,2-dichloroethene.

The PRGs from EPA Region 9 were selected over other sources due to their inclusion of the dermal exposure pathway. The INEEL has proposed that other, less restrictive, values may be used if it can be shown that future management of the media will not result in exposure through one or more pathways. As an example: If excavated soil, subject to a NLCI, were to be buried as radioactive LLW at an approved landfill, then the pathways for dermal exposure and inhalation would not be viable and risk should be based on a groundwater pathway only. The DEQ has not yet formally responded to this approach.

The effect of the cumulative risk approach is that water may be required to be cleaner than drinking water standards before being granted a NLCI determination by the Idaho DEQ. Drinking water MCLs are typically based on an acceptable risk for each contaminant present. With some exceptions (such as arsenic) each contaminant may result in a risk of about  $1E-5$ . Each of the 89 drinking water contaminants may theoretically be present at the MCL, causing a cumulative risk far in excess of  $1E-5$ .

Another effect of this approach is that the DEQ is put into the position of regulating risk from constituents which were not part of the waste disposed. In a situation where these constituents were present in a non-RCRA-listed waste stream and were destined for disposal in a Subtitle D landfill, state regulators would never question the cumulative risk posed by these constituents.

The impact of this conservative approach has been to increase the cost of chemical analysis. Rather than analyze only for TCE, INEEL projects at TAN are now analyzing for a suite of

## **WM'00 Conference, February 27 – March 2, 2000, Tucson, AZ**

volatile and semi-volatile organic compounds. While this extensive list will likely be reduced based on non-detection of many compounds, the issue of increased cost to resource-sensitive programs remains. Projects will be required to sample for constituents which were never part of the listed waste disposed. This approach is supported in a guidance document published by EPA Region 4.<sup>7</sup>

### **PATH FORWARD**

Discussions with DEQ personnel on the technical basis for use of cumulative risk from all hazardous constituents rather than just the constituents for which the waste was first listed continue. The INEEL has researched DEQ's application of the cumulative-risk approach throughout the state and has found that only one NLCI request, outside of those from the INEEL, has been submitted to DEQ. That request occurred in 1998. The DEQ used the cumulative risk approach at that site. The INEEL has requested that DEQ provide any written policies on application of the NLCI process in the state. The only policy statement is the one provided in 1996 which does not specify in how the risk-based approach will be implemented. The INEEL intends to continue discussions with DEQ on this issue.

### **LESSONS FOR OTHER SITES**

It is suggested that each site seeking a NLCI determination for environmental media thoroughly discuss the issue with regulators to determine the requirements and then formalize those requirements through written agreements or formal policy statements issued by the regulators.

### **SUMMARY**

INEEL first submitted requests for NLCI determinations to DEQ in late 1997 and early 1998. These early determinations were granted solely on the basis of the risk posed by the only listed waste constituent resulting in a listed waste code being applied to the media, TCE in this case. The DEQ has changed its basis for granting NLCI determinations without promulgating that change in a state-wide policy statement. The "new" policy requires that from all hazardous waste constituents present in the waste result in a cumulative risk of  $\leq 1E-5$ .

### **REFERENCES**

1. RCRA Regulatory Status of Contaminated Groundwater, November 13, 1996
2. 57 FR 37194, August 18, 1992
3. 61 FR 18805, April 29, 1996
4. 54 FR 44184, November 21, 1989
5. DEQ Guidance Document #GD97-2, Contained-In Policy for Environmental Media, May 30, 1997
6. 52 FR 25700, July 8, 1987
7. Region 4 Management of Contaminated Media, September 7, 1999