

**STATE OF CALIFORNIA  
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
SAN FRANCISCO BAY REGION**

**STAFF SUMMARY REPORT** (Elizabeth Allen)  
**MEETING DATE:** May 14, 2008

**ITEM:** 10

**SUBJECT:** **Environmental Screening Levels** – Status Report

**CHRONOLOGY:** The Board previously considered this topic in November 2000

**DISCUSSION:** This status report explains the Water Board's Environmental Screening Levels (ESLs) - what they are, how they are used, and how we update them to maintain their relevance. ESLs are conservative concentrations for chemicals commonly found in soil and groundwater at sites where chemicals have been spilled, below which we generally do not expect to see impacts from soil or groundwater contamination. Since their introduction, ESLs have become an integral part of the site-cleanup process for Water Board staff, many local agencies, and the regulated community.

Since our office developed the first version of ESLs in 1999, ESLs have evolved to serve as an effective tool in the rapid evaluation of data collected from sites with spills to soil and/or groundwater. Through the use of the ESLs, it is possible to quickly determine whether detected chemicals may pose a significant threat to human health and the environment, and thus warrant further evaluation. The ESLs address not only the environmental protection goals presented in the Basin Plan, but also focus on human health concerns, including vapor intrusion from subsurface contamination into indoor air. For these reasons, the ESLs address a far greater range of possible public health exposure pathways and environmental media than other screening levels available in California.

ESLs have been derived for more than 100 of the most common contaminants. They are contained in a series of tables, which are included in a technical report that describes their derivation and recommended applications. ESLs can also be displayed using an Excel file that will automatically return values for specific exposure conditions. The concentrations provided as ESLs fall into three categories: statutorily-derived concentrations (such as Maximum Contaminant Levels for drinking water), risk-based concentrations, and concentrations that are intended to avoid adverse nuisance conditions. Risk-based concentrations are calculated to be health-protective of both humans and wildlife species. To provide more information, we have included the Executive Summary of the ESL technical report as Appendix A. Both the

technical report and Excel file are available on the Water Board's website at: [www.waterboards.ca.gov/sanfranciscobay/esl.shtml](http://www.waterboards.ca.gov/sanfranciscobay/esl.shtml).

In addition to their use as a simple screening tool, ESLs can also be used in the preparation of a more detailed risk assessment by matching specific exposure pathways with current or anticipated site conditions. In this manner, ESLs serve as a cost-effective tool for performing risk assessments and helping determine if cleanup is needed. While not intended as cleanup goals, ESLs may serve as cleanup goals under specific conditions. As a practical matter, ESLs have also encouraged the restoration of Brownfield sites, by helping prospective buyers and redevelopers to quickly assess future cleanup needs.

ESLs are widely used in this Region, and to a lesser degree in other regions. They are calculated to be representative of conditions encountered in the San Francisco Bay Area, although most of them are applicable elsewhere. The latest version of the Excel file allows the user to select criteria that can be used in other areas of the State. This addition should increase their usefulness in other regions.

ESLs need to be updated regularly. Underlying values change, including statutorily-derived concentrations and risk-based concentrations, and those changes need to be reflected in the ESLs. We also need to update the ESL structure and methods to address new scientific information. For example, in 2005, we added soil-gas screening levels to the ESLs to address vapor intrusion concerns. We have updated the ESLs about every two years since their introduction. The most recent updates were made in November 2007 and April 2008. We expect that the ESLs will continue to be updated to serve as an essential tool for Water Board staff and the oversight of contaminated soil and groundwater cleanup.

**RECOMMEN-  
DATION:**

No action needed – information item

File No. 2109.00 (EA)

Appendix A: ESL Executive Summary

## **Appendix A**

### **ESL Executive Summary**

# Executive Summary

This document presents Environmental Screening Levels (ESLs) for chemicals commonly found in soil and groundwater at sites where releases of hazardous chemicals have occurred. The terminology “environmental” screening levels is intended to better convey the broad scope of the document and clarify that some screening levels are not risk-based in a strict definition of this term.

The ESLs are considered to be conservative. Under most circumstances, and within the limitations described, the presence of a chemical in soil, soil gas or groundwater at concentrations below the corresponding ESL can be assumed to not pose a significant, long-term (chronic) threat to human health and the environment. Additional evaluation will generally be necessary at sites where a chemical is present at concentrations above the corresponding ESL. Active remediation may or may not be required depending on site-specific conditions and considerations. This document may especially be beneficial for use at sites with limited impacts, where the preparation of a more formal environmental assessment may not be warranted or feasible due to time and cost constraints.

The ESLs were developed to address environmental protection goals presented in the *Water Quality Control Plan for the San Francisco Bay Basin* (Basin Plan; San Francisco Bay Area Regional Water Quality Control Board; RWQCBSF 2006). These goals include:

#### Surface Water and Groundwater:

- Protection of drinking water resources;
- Protection of aquatic habitats;
- Protection against vapor intrusion into buildings;
- Protection against adverse nuisance conditions.

#### Soil:

- Protection of human health (direct-exposure);
- Protection against vapor intrusion into buildings;

- Protection against leaching and subsequent impacts to groundwater;
- Protection of terrestrial biota;
- Protection against adverse nuisance conditions.

The ESLs are presented in a series of lookup tables. Each table reflects a specific combination of soil, groundwater and land-use characteristics that strongly influence the magnitude of environmental concerns at a given site. This allows the user to select ESLs that are most applicable to a given site.

The ESL document presents a tiered approach to environmental risk assessments. Under Tier 1, sample data are directly compared to ESLs selected for the site and decisions are made regarding the need for additional site investigation, remedial action or a more detailed risk assessment. In a Tier 2 risk assessment, a selected component(s) of the Tier 1 ESL is modified with respect to site-specific considerations. An example may be the adjustment of a screening level for direct exposure with respect to an approved, alternative target risk level. Site data are then compared to the revised screening level as well as the remaining, unmodified components of the Tier 1 ESL. This provides an intermediate but still relatively rapid and cost-effective option for preparing more site-specific risk assessments. Risk assessment models and assumptions that depart significantly depart from those used to develop the Tier 1 ESLs are described in a more traditional, Tier 3 risk assessment. The Tier 1 methodology can still provide a common platform to initiate a Tier 3 risk assessment and help ensure that all potentially significant environmental concerns are considered.

The Tier 1 ESLs presented in the lookup tables are NOT regulatory cleanup standards. Use of the ESLs and this document in general is intended to be entirely optional on the part of the regulated facility and subject to the approval of the case manager in the overseeing regulatory agency. The presence of a chemical at concentrations in excess of an ESL does not necessarily indicate that adverse impacts to human health or the environment are occurring; this simply indicates that a potential for adverse risk may exist and that additional evaluation is warranted. Use of

the ESLs as cleanup levels should be evaluated in view of the overall site investigation results and the cost/benefit of performing a more site-specific risk assessment.

Reliance on only the Tier 1 ESLs to identify potential environmental concerns may not be appropriate for some sites. Examples include sites that require a detailed discussion of potential risks to human health, sites where physical conditions substantially differ from those assumed in development of the ESLs (e.g., mine sites, landfills, etc., with high or low pH) and sites where impacts pose heightened threats to sensitive ecological habitats. The latter could include sites that are adjacent to wetlands, streams, rivers, lakes, ponds, marine shorelines, or sites that otherwise contain or border on areas where protected or endangered species may be present. Potential impacts to sediment are also not addressed. (e.g., presence of endangered or protected species). The need for a detailed ecological risk assessment should be evaluated on a site-by-site basis for areas where significant concerns may exist. Notification to the Natural Resource Trustee Agencies (including the state Department of Toxics Substances Control and Department of Fish and Game and the federal Fish and Wildlife Service, Department of the Interior and National Oceanic and Atmospheric Administration) may also be required, particularly if the release of a hazardous substance may impact surface waters.

The ESLs should not be used to determine when impacts at a site should be reported to a regulatory agency. All releases of hazardous substances to the environment should be reported to the appropriate regulatory agency in accordance with governing regulations. The lookup tables will be updated on a regular basis, as needed, in order to reflect changes in the referenced sources as well as lessons gained from site investigations and field observations.