



County of Santa Cruz

Health Services Agency ♦ Environmental Health



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Human Health and Ecological Risk Assessments in Santa Cruz County

The Santa Cruz County Environmental Health Division (SCCEHD) Environmental Cleanup Program is responsible for reviewing technical reports, providing regulatory oversight, and approving mitigating measures associated with contaminated sites. Some sites cannot be cleaned up to background levels or established regulatory standards. In these rare instances, a Human Health Risk Assessment (HRA) and/or Ecological Risk Assessment (ERA) may be appropriate. Because of the specialized nature of HRAs/ERAs, a qualified professional may be retained by the County to assist the Health Officer in determining the adequacy of the HRA and/or ERA and any potential engineering and/or institutional controls proposed to protect human health and/or the environment. The cost of the services provided by the County's qualified professional will be at the sole expense of the Responsible Party (SCCC, Chapter 7.100.340).

The technical review of HRAs and ERAs shall be done in accordance with United States Environmental Protection Agency (USEPA) guidelines (1989, 1998) and associated USEPA and California Environmental Protection Agency (CalEPA) guidance (see References Cited). The review components may include, but may not be limited to the following:

Analysis of Site Data Used in HRA/ERA – The site characterization data employed in the HRA/ERA will be reviewed to ensure that data needs for risk assessment (e.g., sample number, location, analytical detection limits, and quality assurance criteria) are met. Appropriate application of site data in the estimation of exposure concentrations and chemical doses will be assessed. Conformity with USEPA (1992a) HRA data usability evaluation criteria will be evaluated. Initial screening of analytical data should utilize the most stringent of the current version of each of the following guidance screening concentrations: (1) CalEPA/DTSC HHRA Note 3 DTSC-Modified Screening Levels (DTSC-SLs); (2) USEPA Regional Screening Levels (RSLs); and (3) San Francisco Bay Regional Water Quality Control Board (SFB-RWQCB) Environmental Screening Levels (ESLs).

Conceptual Site Model – The conceptual site model (CSM) will be evaluated for thoroughness and relevance to the site. The CSM supports the identification of sources of contamination, chemicals of potential concern (COPCs), environmental media of interest, potential exposure pathways and receptors and adequacy of site characterization data (USEPA, 1988, 1989, 1998). CSMs for HRAs should include current human receptors as well as potential or planned future human receptors. CSMs for ERAs should include relevant plants, invertebrates, birds, and mammals represented by applicable feeding guilds as well as State and Federal special status species, as applicable.

Identification of Chemicals of Potential Concern (COPCs) and Chemicals of Potential Ecological Concern (COPECs) – The selection criteria applied to identify COPCs/COPECs will be evaluated for consistency with risk assessment guidance (CalEPA/DTSC, 1992, 1996, 2019a; USEPA, 1989, 1998). Methods for characterizing background distributions, if used as a selection criterion for

COPC/COPEC selection, will be evaluated for consistency with CalEPA/DTSC and USEPA guidance (CalEPA/DTSC, 1997, 2008; USEPA, 2002a).

Exposure Assessment – For both HRAs and ERAs, the following exposure assessment components will be evaluated in accordance with CalEPA/DTSC and USEPA guidance (CalEPA/DTSC, 1996, 2019b; USEPA, 1989, 1993, 1996, 2000a, 2002b, 2011, 2014):

- Identification of, and rationale for, exposure scenarios (e.g., current/future, baseline/remedial action scenarios)
- Identification of potential human and ecological receptors, as applicable
- Identification of, and rationale for, complete (or potentially complete) exposure pathways
- Dose equation for each complete (or potentially complete) exposure
- Exposure point concentrations (methodology, including fate/transport modeling and statistical analysis of site data)
- Exposure parameters used in dose calculations (including chemical-specific bioavailability values), and exposure input values for fate/transport models and lead uptake models).

Calculation of exposure point concentrations (EPCs) will be evaluated. The statistical methods applied as the basis for EPCs shall be evaluated for concurrence with USEPA (2002c, 2015a, 2015b) guidance, which recommends the 95 percent upper confidence level (UCL) on the mean concentration as the best estimate of the EPC if there are a sufficient number of samples to calculate the 95% UCL. USEPA ProUCL software is recommended for calculating the 95% UCL. In the absence of technical justification for selection of an alternative 95% UCL value, the 95% UCL value recommended by ProUCL software shall be used to represent the EPC.

Toxicity Assessment – The 2018 Toxicity Criteria Rule (Title 22 CCR, Sections 68400.5, 69020-69022) requires that toxicity criteria used in HRAs and in the development of human health screening levels in California follow a specific hierarchy for selection. In general, the primary source of toxicity criteria is the CalEPA/OEHHA Toxicity Criteria Database followed in order by the USEPA Integrated Risk Information System (IRIS), and the toxicity criteria used to derive USEPA (2021) Regional Screening Levels. CalEPA/DTSC (2019c) provides the most current summary of applicable toxicity criteria under the Toxicity Criteria Rule. Toxicity profiles, if provided, will be reviewed for accuracy and relevance to the HRA (e.g., specification of effect-level doses when discussing toxicological endpoints).

For ERAs, Toxicity Reference Values (TRVs) for birds and mammals shall be obtained preferentially from CalEPA/DTSC EcoNotes 4, 5, and 6 (CalEPA, 2000, 2002, 2009). Media-based (soil, sediment, surface water) toxicity values protective of plants, invertebrates, and aquatic organisms shall be obtained from applicable agency sources including USEPA (2005) Soil Screening Levels (SSLs), USEPA (2000b) Sediment Quality Guidelines (SQGs), SFB-RWQCB (2019) Aquatic Habitat Screening Levels, and USEPA (2021) National Recommended Water Quality Criteria for Aquatic Life.

Risk Characterization – Methods for characterizing cancer and noncancer risk, and interpretation criteria for lead uptake model results, will be evaluated in accordance with relevant guidance (i.e., USEPA, 1989, 1995). Dose (average daily dose and lifetime average dose) and risk characterization (incremental lifetime cancer risk and noncancer hazard quotient) values will be recalculated for key COPCs to evaluate if errors were made in the HRA. Hazard quotient values for ERAs will also be recalculated for key COPECs to evaluate if errors were

made in the ERA. For both HRAs and ERAs, the appropriate assessment of cumulative risks and hazards will be evaluated. Fate/transport model and lead model results will also be evaluated.

Risk characterization uncertainties, including identification of contributions of chemicals and assumptions of total risk (i.e., identification of drivers) will be evaluated in accordance with USEPA guidance (1992b, 1995).

The County's qualified professional will perform site visits and make additional inquiries if needed for an appropriate understanding of the specific site conditions.

The County's qualified professional will prepare and submit a technical memorandum to SCCEHD summarizing the components of the review and providing technical comments regarding the HRA. Comments will be presented as explicitly as possible (e.g., suggestions or examples may be provided) to ensure that all comments are successfully addressed by the HRA authors. The County's qualified professional will be available to discuss memorandum and/or attend meetings as needed with the County, Responsible Party¹, Responsible Party's consultant, the public, and/or others regarding the HRA and technical review.

¹Responsible Party as defined in Section 25260 and 101480 of the Health and Safety Code

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