

APPENDIX 5-H

FORMAT FOR A RISK ASSESSMENT REPORT

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Cover Page

- _____ A. Provide DOH UST facility ID Number
- _____ B. Provide facility name and address. If available, provide latitude and longitude coordinates
- _____ C. Date report prepared
- _____ D. Name, address, and telephone number of person/company preparing report

Table of Contents

1. Introduction/Purpose

- _____ A. Brief statement of purpose, including site specific objectives of the risk assessment

2. Background

A. Site Description

- _____ · A brief description of the site location and surrounding area
- _____ · The location of any populations that could be affected by the release

B. Vicinity map or sketch

- _____ · North arrow
- _____ · Streets
- _____ · Surface water bodies
- _____ · Water supply or injection wells

_____ C. A U.S.G.S. 7.5 minute topographic quadrangle map indicating the location of the site

Note: All maps of the facility area should follow conventional mapping scenarios and should be easily read and interpreted. If this is not possible on one map, multiple maps are encouraged. If several maps are presented, all maps shall be in the same scale to aid in map comparisons. If geological maps are submitted, they should adhere to all normal geologic mapping conventions.

D. Site Plan(s) drawn to scale showing details of the following:

- _____ · The type and extent of onsite, ground surface cover (i.e. asphalt, concrete, soil, fill material, grass, etc.)
- _____ · Locations of all products and waste fluid tanks (existing and removed), associated piping, sampling points (identify sample depths), and dispenser pumps
- _____ · Adjacent streets, buildings and property lines
- _____ · North arrow
- _____ · Area of excavation
- _____ · Locations of any stockpiled soil
- _____ · Locations of field measurements
- _____ · Utility conduits
- _____ · Surface water drainage courses
- _____ · Sewerage
- _____ · Water supply or injection wells
- _____ · Catch basins, dry wells

E. Scope of Risk Assessment

- _____ · Complexity of Assessment and Rationale
- _____ · Overview of Study Design

3. Identification of chemicals of potential concern

A. General site-specific data collection considerations

- _____ · Detailed historical information relevant to data collection
- _____ · Preliminary identification of potential human exposure
- _____ · Modeling parameter needs
- _____ · Background sampling
- _____ · Sampling locations and media
- _____ · Sampling methods
- _____ · Quality assurance/quality control methods
- _____ · Analytical services

B. General site-specific data evaluation considerations

- _____ · Steps used (including optional screening procedural steps, if used)
- _____ · Quality assurance/quality control methods during evaluation
- _____ · General data uncertainty

C. Environmental area of interest (complete for all media)

- _____ · Area and media-specific sample collection strategy (e.g., sample size, sampling locations, etc.)
- _____ · Data from site investigations
- _____ · Evaluation of analytical methods
- _____ · Evaluation of quantitation limits
- _____ · Evaluation of qualified and coded data
- _____ · Types of chemicals in blanks

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- _____ · Tentatively identified compounds
- _____ · Comparison of chemical concentrations with background
- _____ · Further limitation of number of chemicals
- _____ · Uncertainties, limitations, gaps in quality of collection or analysis
- _____ D. Environmental area of interest (repeat for all areas of interest, as appropriate)
- _____ E. Summary of Chemicals of Potential Concern

4. Exposure assessment

A. Characterization of Exposure Setting

- _____ · Physical Setting
 - _____ - Climate
 - _____ - Vegetation
 - _____ - Soil type
 - _____ - Surface Hydrology
 - _____ - Ground water hydrology
- _____ · Potentially Exposed Populations
 - _____ - Relative locations of human and non-human populations with respect to site
 - _____ - Population sizes, characteristics, and habits
 - _____ - Current land use
 - _____ - Potential alternate future land uses
 - _____ - Subpopulations of potential concern

B. Identification of exposure pathways

- _____ · Sources and receiving media
- _____ · Fate and transport in release media
- _____ · Exposure points and exposure routes
- _____ · Integration of sources, releases, fate and transport mechanisms, exposure points, and exposure routes into complete exposure pathways
- _____ · Summary of exposure pathways to be quantified in exposure assessment

C. Quantification of exposure

- _____ · Exposure concentrations
- _____ · Estimation of chemical intakes for individual pathways

D. Identification of uncertainties

- _____ · Current and future land use
- _____ · Environmental sampling and analysis
- _____ · Exposure pathways evaluated
- _____ · Fate and transport modeling
- _____ · Parameter values

E. Summary of exposure assessment

5. Toxicity assessment

A. Toxicity information for non-carcinogenic effects

- _____ · Appropriate exposure periods for toxicity values
- _____ · Up-to-date RFDs for all chemicals

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- _____ · One and ten-day health advisories for shorter term oral exposures
- _____ · Overall database and the critical study on which the toxicity value is based (including the critical effect and the uncertainty and modifying factors used in the calculation)
- _____ · Effects that may appear at doses higher than those required to elicit the critical effect
- _____ · Absorption efficiency considered
- B. Toxicity information for carcinogenic effects
- _____ · Exposure averaged over a lifetime
- _____ · Up-to-date slope factors for all carcinogens
- _____ · Weight-of-evidence classification for all carcinogens
- _____ · Type of cancer for class A carcinogens
- _____ · Concentration above which the dose-response curve is no longer linear
- C. Chemicals for which no EPA toxicity values are available
- _____ · Review by Environmental Criteria and Assessment Office
- _____ · Qualitative evaluation
- _____ · Documentation/justification of any new toxicity values developed
- D. Uncertainties related to toxicity information
- _____ · Quality of the individual studies
- _____ · Completeness of the overall database
- E. Summary of toxicity information

6. Risk Characterization

A. Current land use conditions

- _____ · Carcinogenic risk of individual substances
- _____ · Chronic hazard quotient calculation (individual substances)
- _____ · Subchronic hazard quotient calculation (individual substances)
- _____ · Shorter-term hazard quotient calculation (individual substances)
- _____ · Carcinogenic risk (multiple substances)
- _____ · Chronic hazard index (multiple substances)
- _____ · Subchronic hazard index (multiple substances)
- _____ · Shorter-term hazard index calculation (multiple substances)
- _____ · Segregation of hazard indices
- _____ · Justification for combining risks across pathways
- _____ · Non-carcinogenic hazard index (multiple pathways)
- _____ · Carcinogenic risk (multiple pathways)

B. Future land use conditions

- _____ · Carcinogenic risk of individual substances
- _____ · Chronic hazard quotient calculation (individual substances)
- _____ · Subchronic hazard quotient calculation (individual substances)
- _____ · Carcinogenic risk (multiple substances)
- _____ · Chronic hazard index (multiple substances)
- _____ · Subchronic hazard index (multiple substances)
- _____ · Segregation of hazard indices

- _____ · Justification of combining risks across pathways
- _____ · Non-carcinogenic hazard index (multiple pathways)
- _____ · Carcinogenic risk (multiple pathways)

C. Uncertainties

- _____ · Site-specific uncertainty factors
 - _____ - Definition of physical setting
 - _____ - Model applicability and assumptions
 - _____ - Parameter values for fate/transport and exposure calculations
- _____ · Summary of toxicity assessment uncertainty
 - _____ - Identification of potential health effects
 - _____ - Deviation of toxicity value
 - _____ - Potential for synergistic or antagonistic interactions
 - _____ - Uncertainty in evaluating less-than-lifetime exposures

D. Comparison of risk characterization results to human studies

- _____ · Agency for Toxic Substances and Disease Registry (ATSDR) health assessment
- _____ · Site-specific health studies (pilot studies or epidemiological studies)
- _____ · Incorporation of studies into the overall risk characterization

E. Summary discussion and tabulation of the risk characterization

- _____ · Key site-related contaminants and key exposure pathways identified
- _____ · Types of health risk of concern
- _____ · Level of confidence in the quantitative information used to estimate risk

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- _____ · Presentation of qualitative information on toxicity
- _____ · Confidence in the key exposure estimates for the key exposure pathways
- _____ · Magnitude of the carcinogenic and non-carcinogenic risk estimates
- _____ · Major factors driving risk
- _____ · Major factors contributing to uncertainty
- _____ · Exposed population characteristics
- _____ · Comparison with site-specific health studies

7. Summary

- _____ A. Chemicals of potential concern
- _____ B. Exposure assessment
- _____ C. Toxicity assessment
- _____ D. Risk characterization