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NAVY RESPONSES TO AGENCY COMMENTS ON DRAFT FINAL INTERIM-ACTION OPERABLE UNIT IV ALTERNATIVE SELECTION REPORT NAVAL STATION TREASURE ISLAND HUNTERS POINT ANNEX SAN FRANCISCO, CALIFORNIA

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NAVY RESPONSES TO AGENCY COMMENTS ON THE DRAFT FINAL INTERIM-ACTION OU IV ALTERNATIVE SELECTION REPORT

The following are the Navy's responses to the comments made by the California Environmental Protection Agency Department of Toxic Substances Control (DTSC), the United States Environmental Protection Agency, Region IX (EPA), and Bechtel Environmental, Inc. (Bechtel; the EPA's consultant), on the *Draft Final Interim-Action Operable Unit IV Alternative Selection Report, Naval Station Treasure Island, Hunters Point Annex, San Francisco, California*, dated April 26, 1993. Agency comments are reproduced here exactly as in the original documents. Because the Interim-Action OU IV ASR is considered a secondary document, it will not be revised or issued final to address these comments.

I. DTSC COMMENTS AND NAVY RESPONSES

Comment 1: **As stated in the Department's comment #18, the Department considers the 10^{-6} cancer risk as the point of departure at which risk management decisions will be considered at the site (the Department has also addressed this issue in comments dated 9/24/92, 11/30/92). Risk levels in excess of 10^{-6} are indicative of sites which may be candidates for risk management actions to lower the site-specific risk.**

Response: This comment is acknowledged. Section 4.0 of the Risk Assessment (Appendix A of the OU IV ASR) provides a full discussion of these risk levels.

Comment 2: **The Department's comment #12 regarding investigation of the B aquifer was inadequately addressed. Further analysis and presentation of the site geologic model must be presented in the Parcel Remedial Investigation (RI) to justify the Navy's decision to limit the scope of groundwater investigation to the A aquifer.**

Response: To streamline the interim-action study presentation and because available data do not indicate the presence of point-source-related chemicals in A-aquifer groundwater, evaluation of existing data with regard to the B-aquifer was not presented in the Interim-Action OU IV ASR. However, a presentation of B-aquifer data, including a parcel-based geologic model and the rationale for limiting the groundwater investigation to the A-aquifer, will be included in the Parcel B RI report.

Comment 3: **Discussions are underway between regulatory agencies and the Navy to resolve whether any use of the "interim ambient levels" is appropriate in**

the site Remedial Investigation/Feasibility Study reports. As agreed in the June 9, 1992 meeting, the Navy is responsible for assessing the risk at the site, regardless of source.

Response: The comment is acknowledged. The parcel RI reports will include an assessment of risk due to possible chemical exposure at each parcel, regardless of the source.

II. EPA COMMENTS AND NAVY RESPONSES

Comment 1: **The determination of the reportable risk range as 10^{-4} excess lifetime cancer risk. As stated previously and supported in this document, Superfund risk assessments present risks above the point of departure of 10^{-6}. The decision point for remediation or action needs to be justified by more than the risk assessment alone and, as stated in EPA directives, there is no hard number or risk line but a range of 10^{-6} to 10^{-4}. Therefore, the risks above the point of departure should be presented and discussed. This does not put any constraints on what risk range is chosen for the final decision point, in this case for interim action. In this revision all the risk calculations are presented in the appendix but a complete discussion of the risks above 10^{-6} and hazard index of 1 should be in the main text so that the risk managers and the public have as complete a picture as possible. Additionally, it would benefit the Navy to have the discussions presented above the point of departure of 10^{-6} in all documents, e.g. RI/FS reports, so as not to necessitate extensive revisions and unwarranted costs in the future.**

Response: As seen in Appendix A of the Draft Final OU IV ASR, all numerical health risk results posed by soil and groundwater, regardless of levels, were reported and discussed in the main text for potential chemicals of concern (COCs) and in the attachment for all detected analytes, including laboratory contaminants and background metals. Only the health-based levels (HBLs) for the COCs based on the carcinogenic effects were derived based on an excess cancer risk of 1E-04. That is because a cumulative excess cancer risk of 1E-06, or even 1E-05, is not attainable due to background conditions at HPA, as presented by the Navy in the Parcel A meeting with the agencies on June 10, 1993. For example, arsenic at interim ambient levels of 13 ppm in soil poses an estimated excess carcinogenic risk of 3E-05 via ingestion and dermal contact. Also, it does not matter what target excess cancer risk level is used to derive the HBLs because all health risks were fully calculated, presented, and discussed in Appendix A of the ASR. These HBLs were subsequently revised based on site-specific conditions to arrive at the target remedial goals (TRG) for the interim remediation action (IRA). To obtain an HBL corresponding to a 1E-05 or 1E-06 excess cancer risk, the HBL based on an excess cancer risk of 1E-04 presented in the ASR can be divided by a factor of 10 or 100, respectively.

Comment 2: **The derivation of unnecessary reference dose concentrations. This document goes to great lengths to explain the rationale for the derivation of reference doses for total petroleum hydrocarbons, total oil and grease and lead. In the case of lead, considerable national resources have already been invested to incorporate the state of the science into a model that uses pharmacokinetic data to evaluate the health risk from lead.**

The derivation of a reference dose is neither warranted nor necessary with the availability of this model to predict clean-up criteria and no further resources should be invested on derivations of lesser quality. The other two, TPH and TOG, are being double counted in the risk assessment. The derivation of toxicity values is based on the assumption that the original is more toxic than the remaining components. However, this does not take into account the marked changes in composition of the mixture after release into the environment. Therefore, since the toxicity of the remaining products have already been accounted for individually, i.e. VOCs, PAHs and heavy metals, there is no need to determine a health based criteria for nonspecific determinations such as TPH or TOG. Both discussions and conclusions based on human health effects should be deleted.

Response: In allocating scarce national resources to address environmental problems, a complete picture of the fundamental principles of risk analysis (*Harvard Center for Risk Analysis [HCRA], 1992*) needs to be provided to help the public improve their understanding of risks (*EPA, 1990a*) and to identify the most serious environmental problems needing cleanups. Efforts spent on the OU IV ASR were at a minimum to achieve the above goals, taking advantage of the results from previous Army studies (*PRC, 1992*) and EPA studies (*EPA, 1990b, 1991b, 1991c, 1991d, and 1992*).

As presented in pages A-23 to A-25 of Appendix A, no reference dose was derived for lead. Instead, the EPA's Uptake/Biokinetic model for lead was run to arrive at a cleanup level for lead in the soil, as recommended by EPA (*EPA, 1991b, 1991d*). In addition, the reference doses for total petroleum hydrocarbons (TPH) as diesel and total oil and grease were derived based on the EPA and National Resource Council (NRC) guidelines (*NRC, 1988; EPA, 1986, 1988; Schoeny, 1993*) and recommendations (*Dourson, 1991; Hertzberg, 1991; Velazquez, 1991*) for complex mixtures. For TPH mixtures, which are comprised of mostly paraffins, the use of concentration data on only the target compound list (TCL) for volatile organic compounds (VOCs), semivolatile organic compounds (SOCs), and metals to address the health effects of TPH as a whole may be limited. For health protection purposes, the Superfund Technical Support Center (*EPA, 1992*) recommends that toxicity values derived from invivo studies in hydrocarbon fuels as a mixture be used in assessing risk from the insoluble and nonvolatile fuel components and that toxicity values for individual components be additionally used in assessing risks from the more soluble components (for example, benzene, toluene, ethylbenzene, and xylenes [BTEX]), which can be quantified and accounted for independent of the parent mixtures.

In general, the toxicity of TPH is not significantly being double-counted in the risk assessment process because TCL VOCs, SOCs, and metals are

minor components of TPHs. An example is given in Attachment 1 for a soil sample taken at Boring IR02B290 at a 3.5-foot depth. The results indicate that a cumulative excess cancer risk of 3E-05 posed by all detected chemicals via direct contact, with background arsenic contributing 2E-05, does not appear to warrant a removal or remedial action at IR02B290. However, a removal or remedial action may be warranted to address total oil and grease detected at 54,000 ppm at this location. If EPA Region IX believes that HBLs for TPH should not be derived and that the TPH tests being nonspecific are not useful, the continued practice of performing various TPH tests should be seriously evaluated by EPA as currently they are widely used in determining degrees of contaminations as well as establishing cleanup criteria.

Comment 3: **Inhalation of chromium containing dust will be a significant addition to the risk for the industrial exposure and this pathway should not be eliminated.**

Response: The statement above applies to chromium VI only, which is a human carcinogen (Group A) via the inhalation route of exposure. To estimate the HBL for chromium VI in the soil under the industrial scenario, in the absence of actual field particulate concentration data, the particulate emission factor (PEF) derived from the Cowherd model was used (*EPA, 1991a*) in the following equations:

$$PEF = \frac{LS \times V \times DH \times 3{,}600\ sec/hr}{A} \times \frac{1{,}000\ g/Kg}{0.036 \times (1-G) \times (U_m/U_t)3 \times F(x)} = 4.63E{+}09 m^3/Kg$$

where:

Parameter	Definition Units	Default Value (EPA, 1986b)
LS	Width of contaminated area (m)	45 m
V	Wind speed in the mixing zone (m/sec)	2.25 m/sec
DH	Diffusion height (m)	2m
A	Area of contamination (m^2)	2,025 m^2
0.036	Respirable fraction (g/m^2-hr)	0.036 g/m^2-hr
G	Fraction of vegetative covers (unitless)	0
U_m	Mean annual wind speed (m/sec)	4.5 m/sec
U_t	Threshold wind speed (m/sec) at 10 m	12.8 m/sec
F(x)	Function dependent on U_m/U_t (unitless) (determined using nomograph in Cowherd, 1985)	0.0497

$$HBL_i = \frac{TR \times BW \times AT \times 365\ d/yr}{SF_i \times IR \times (1/PEF) \times EF \times ED} = 7{,}360\ mg/Kg$$

where:

HBL_i	=	Health-based level for chromium VI via inhalation of particulates
TR	=	Target excess cancer risk, assumed 1E-04
BW	=	Body weight (Kg) - assumed 70 Kg
AT	=	Averaging time (year) -- assumed 70 years
SF_i	=	Inhalation slope factor, 42 $(mg/Kg\text{-}day)^{-1}$ for chromium VI
IR	=	Inhalation rate (m^3/day) -- assumed 20 m^3/day
PEF	=	Particulate emission factor (m^3/Kg) -- assumed 4.63E+09 m^3/Kg
EF	=	Exposure frequency (days/year) -- assumed 250 days/year
ED	=	Exposure duration (year) -- assumed 25 years

Consequently, an HBL of 73 mg/kg for chromium VI corresponds to an excess cancer risk of 1E-06 or 1E-05, respectively. Since the chromium VI levels in the soil at HPA are always much less than 1 mg/kg, there are no anticipated significant health risks posed by chromium VI at HPA.

Comment 4: **The derivation of the relative absorption factor (RAF) for the dermal pathway should be completely presented. Since the RAF for the ingestion and inhalation pathways are 1, this part of the discussion is superfluous. The values referenced for the dermal pathway are also inconsistent, such as with benzo(a)pyrene and dibenzo(a,h)anthacene, these differences should be explained.**

Response: The equation used in the derivation of the RAF for the dermal pathways is presented on page A-32. Except for certain chemicals as listed in Tables A-6 and A-7 of Appendix A, dermal RAFs for most of the chemicals are taken from the Massachusetts Department of Environment Protection (MDEP) reference (*MDEP, 1992*). Please refer to the references listed in the text for verification.

Comment 5: **The executive summary should be corrected to read the 95% upper confidence limit of the mean as the concentration term and not the 95 percentile of the concentration.**

Response: The comment is acknowledged.

III. BECHTEL COMMENTS AND NAVY RESPONSES

Response to Comments 1 and 2: The discussion in Sections 2.3 and 4.4.1 of conditions that must be met before an interim action is recommended should be further clarified. Quantitative (or semi-quantitative) criteria should be provided for the following:

- assessment of chemicals most frequently detected in soil samples, e.g., 10% of surface (0- to 2-foot depth) samples;
- assessment of chemical most consistently detected in groundwater samples from the same wells in different sampling rounds, e.g., 2 samples with detectable concentrations above background out of 3 samples.
- comparison of soil and groundwater metal concentrations to disputed background levels and health based levels, e.g., if the 95% upper confidence limit Cd concentration in a quaternary bay mud sample was less than or equal to the site wide bay mud background concentration, then the bay mud was not considered contaminated;
- assessment of spatial trends in the chemical concentrations in soil and groundwater, e.g., decreasing concentration with increasing distance from a location where a spill may have occurred;
- comparison of soil and groundwater chemical distributions, e.g., areas of high soil concentration are associated with areas of high groundwater concentrations and the relationship between the distributions is consistent with probable soil to groundwater transport mechanisms;
- comparison of groundwater concentrations to MCLs, e.g., concentrations determined in three sampling rounds were averaged and the upper 95% confidence limit concentration was compared to the corresponding MCL;
- identification of remedial units using risk assessment results, e.g., if surface (0 to 2-foot depth) soil concentrations were less than or equal to health based levels, then the soil represented by that sample was excluded from the remedial unit.

Figures A-7 and A-8 should be revised to include the decision criteria requested above and incorporated into Section 2.0 of the report.

Response: The discussion in Section 4.4.1 addresses identification of contaminants related to point-source releases. The application of the approach for

assessing point sources in soil is presented as a flow chart in attached Figure 1. Recommendations for interim action are also based on risk evaluation as described in Appendix A of the ASR.

Potentially contaminated groundwater was considered for interim action if two conditions were met: (1) the groundwater quality at each well met EPA potable water definitions (e.g., below 10,000 ppm TDS), and (2) chemicals were consistently detected [i.e., in at least two sampling rounds] above MCLs in an individual well. Other criteria used qualitatively included the proximity to soil contaminated with similar constituents and the site history of chemical usage. Discussion of risk related criteria used to evaluate groundwater for possible interim action is included in Appendix A.

As previously stated, because the OU IV ASR is considered a secondary document, it will not be revised; any revisions will be incorporated in the Parcel B RI report.

Response to Comment 3: **The Navy's response is acceptable.**

Response: The comment is acknowledged.

Response to Comment 4: **See Daniel Stralka's comment No. 2 on the Draft Final ASR.**

Response: See Response to EPA Comment No. 2 on the Draft Final ASR.

Response to Comment 5: **The sentence in question occurs in the introductory portion of the section on general methods in both the draft and the draft final reports. Exposure assumptions are indeed identified and referenced in subsections describing how health-based levels for each medium were developed. The Navy's response is acceptable.**

Response: The comment is acknowledged.

Response to Comment 6: **The Navy's response is not acceptable. Bechtel feels it is important to identify the probable pathways of exposure for both current and future**

land uses and, if any of those pathways were not included in the assessment, to explain why they were not included. In the revised draft risk assessment, the Navy devoted a nine line paragraph to identify the pathways it chose to include in the risk assessment and to explain why it eliminated some. While this is an improvement over the original draft, it still falls short of Bechtel's expectations. While the rationale for including and excluding pathways is acceptable and the pathways included in the assessment well identified, the probable pathways that were not included were not fully identified. Two were mentioned only as examples.

Response: For purposes of the ASR (a focused document not intended to duplicate the rigorous comprehensive evaluations performed for RI/PHEE/FS reports) and based on the DTSC's recommendations, only pathways that contribute the most to the risks were evaluated. A comprehensive list of probable exposure pathways for both current and future land uses at HPA can be found in earlier submittals (e.g., *HLA, 1991*). For the ASR purposes, exclusion of pathways not contributing the most to the risks is not expected to impact the reports, Navy's recommendations regarding the need for interim actions at OU IV.

Response to Comment 7: **On July 17, 1992 the EPA promulgated maximum contaminant levels (MCLs) for 18 synthetic organic chemicals and 5 inorganic chemicals including antimony, beryllium, nickel, and thallium. These MCLs become enforceable in January 1994 and should be included in Table E1 and considered when evaluating the need to assess risk associated with groundwater at the site.**

Response: The list of federal MCLs used to assess the risk associated with groundwater at HPA will be updated to reflect both current state and federal MCLs and the referenced federal MCLs enforceable in January 1994. Risk evaluations for HPA which have either not yet been performed or are in their early stages will use this revised list of MCLs.

Response to Comment 8: **The summary of uncertainties is not acceptable; a more complete analysis is needed. If development of a complete conceptual model is out of scope, then a model specific to OU IV should be developed. A separate subsection should be devoted to the analysis of uncertainties. The section should identify the factors with the greatest uncertainty, describe how each might affect the risk estimates (overestimate or underestimate), and state whether or not the sum of these factors**

overestimates or underestimates risk. For example, how might the omission of "minor" exposure pathways offset the conservatism of cancer slope factors?

Response: For simplicity purposes of the ASR, a separate section devoted to the analysis of uncertainties may not be necessary. Because parameter-related uncertainties are not strictly additive, the proposed section cannot fully address the risk assessment-related uncertainties in a useful manner. The most useful uncertainty analysis for the risk assessment process is probably the Monte-Carlo method, which is outside the scope of work for an ASR. Overall, the RME approach as recommended by EPA is very health protective and conservative.

Because the OU IV ASR is considered a secondary document, it will not be revised. However, this comment is acknowledged and any revision will be incorporated in the Parcel B RI report and in future ASR documents.

Response to Comment 10: The Navy's response is acceptable.

Response: The comment is acknowledged.

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ATTACHMENT 1

HEALTH RISK SCREENING OF DETECTED CHEMICALS AT IR02B290 (USING HBLs)

BASED ON POTENTIAL ADULT AND CHILD EXPOSURE

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Sheet 1 of 2

Chemical Name	HBLs - Adults (a,b)		HBLs - Children		Exposure Point	Health Risks to Adults		Health Risks to Children	
	Cancer mg/kg	Non-cancer mg/kg	Cancer mg/kg	Non-cancer mg/kg	Concentration mg/kg (c)	Excess Cancer Risk	Hazard Index	Excess Cancer Risk	Hazard Index
SOCs (d)									
Bis(2-ethylhexyl)phthalate	6.9E+03	8.2E+03	2.4E+04	1.2E+03	2.8E-01	4.1E-09	3.4E-05	1.2E-09	2.3E-04
Benzo(a)anthracene	2.7E+01	3.7E+03	1.6E+02	9.3E+02	1.3E-01	4.8E-07	3.5E-05	8.3E-08	1.4E-04
Benzo(a)pyrene	2.7E+00	3.7E+03	1.6E+01	9.3E+02	1.2E-01	4.5E-06	3.2E-05	7.7E-07	1.3E-04
Benzo(b)fluoranthene	2.7E+01	3.7E+03	1.6E+02	9.3E+02	2.2E-01	8.2E-07	5.9E-05	1.4E-07	2.4E-04
Benzo(ghi)perylene		3.7E+03		9.3E+02	2.2E-01		5.9E-05		2.4E-04
Benzo(k)fluoranthene	2.7E+01	3.7E+03	1.6E+02	9.3E+02	1.2E-01	4.5E-07	3.2E-05	7.7E-08	1.3E-04
Chrysene	2.7E+03	3.7E+03	1.6E+04	9.3E+02	1.8E-01	6.7E-09	4.8E-05	1.1E-09	1.9E-04
Fluoranthene		3.4E+03		8.4E+03	1.6E-01		4.8E-05		1.9E-05
Indeno(1,2,3-cd)pyrene	2.7E+01	3.7E+03	1.6E+02	9.3E+02	2.1E-01	7.8E-07	5.6E-05	1.3E-07	2.3E-04
Phenanthrene		3.7E+03		9.3E+02	9.9E-02		2.7E-05		1.1E-04
Pyrene		2.5E+03		6.3E+03	2.4E-01		9.5E-05		3.8E-05
SUBTOTAL - SOCs						**7.0E-06**	**5.3E-04**	**1.2E-06**	**1.7E-03**
PESTICIDES/PCBs (e)									
DDT (4,4-)	7.8E+01	5.7E+01	4.3E+02	1.3E+01	4.6E-02	5.9E-08	8.1E-04	1.1E-08	3.4E-03
Aroclor-1260	6.5E+00	2.1E+01	3.1E+01	4.4E+00	4.2E-01	6.5E-06	2.0E-02	1.3E-06	9.5E-02
SUBTOTAL - PEST/PCBs						**6.6E-06**	**2.1E-02**	**1.3E-06**	**9.8E-02**
TPHs (f)									
Total Oil & Grease		6.0E+03		1.3E+04	5.4E+04		9.0E+00		4.1E+00
SUBTOTAL - TPHs						**0.0E+00**	**9.0E+00**	**0.0E+00**	**4.1E+00**
METALS									
Arsenic	4.4E+01	1.0E+02	1.7E+02	1.7E+01	7.3E+00	1.7E-05	7.2E-02	4.3E-06	4.4E-01
Barium		2.9E+04		4.3E+03	1.9E+02		6.5E-03		4.4E-02
Chromium (total)		2.5E+05		4.6E+04	1.7E+02		7.0E-04		3.7E-03

ATTACHMENT 1

HEALTH RISK SCREENING OF DETECTED CHEMICALS AT IR02B290 (USING HBLs)

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BASED ON POTENTIAL ADULT AND CHILD EXPOSURE

Chemical Name	HBLs - Adults (a,b)		HBLs - Children		Exposure Point Concentration mg/kg (c)	Health Risks to Adults		Health Risks to Children	
	Cancer mg/kg	Non-cancer mg/kg	Cancer mg/kg	Non-cancer mg/kg		Excess Cancer Risk	Hazard Index	Excess Cancer Risk	Hazard Index
Copper		2.5E+04		6.6E+03	5.7E+01		2.3E-03		8.6E-03
Lead				5.0E+02	7.6E+01				
Manganese		5.8E+04		8.6E+03	8.6E+02		1.5E-02		1.0E-01
Mercury		5.9E+01		1.2E+01	3.4E-01		5.7E-03		2.8E-02
Nickel		1.1E+04		1.4E+03	5.6E+02		5.3E-02		4.1E-01
Selenium		3.5E+03		3.8E+02	1.1E-01		3.1E-05		2.9E-04
Vanadium		2.0E+03		3.5E+02	5.6E+01		2.8E-02		1.6E-01
Zinc		2.0E+05		2.3E+04	2.0E+02		9.7E-04		8.6E-03
SUBTOTAL - METALS						**1.7E-05**	**1.8E-01**	**4.3E-06**	**1.2E+00**
TOTAL (g)						**3E-05**	**9E+00**	**7E-06**	**5E+00**

NOTES: Blank means no data or nondetects.

(a) Shaded values indicate the most health-protective HBLs to be compared with environmental data.

(b) HBL - Health-based level, based on an excess cancer risk of 1E-04 for carcinogenic effects and an HI of 1 for noncarcinogenic effects.

(c) Exposure point concentration is the chemical concentration detected at a 3.25-foot depth.

(d) SOCs - Semivolatile organic compounds.

(e) PESTICIDES/PCBs - Pesticides/Polychlorinated biphenyls.

(f) TPHs - Total petroleum hydrocarbons.

(g) A cumulative excess cancer risk of 3E-05, with background arsenic contributing 2E-05, does not warrant a removal/remediation at IR02B290. However, a removal/remediation action may be warranted for total oil and grease detected at 54,000 ppm.

Figure 1.
Point Source Determination Flow Chart
For Soil Contamination

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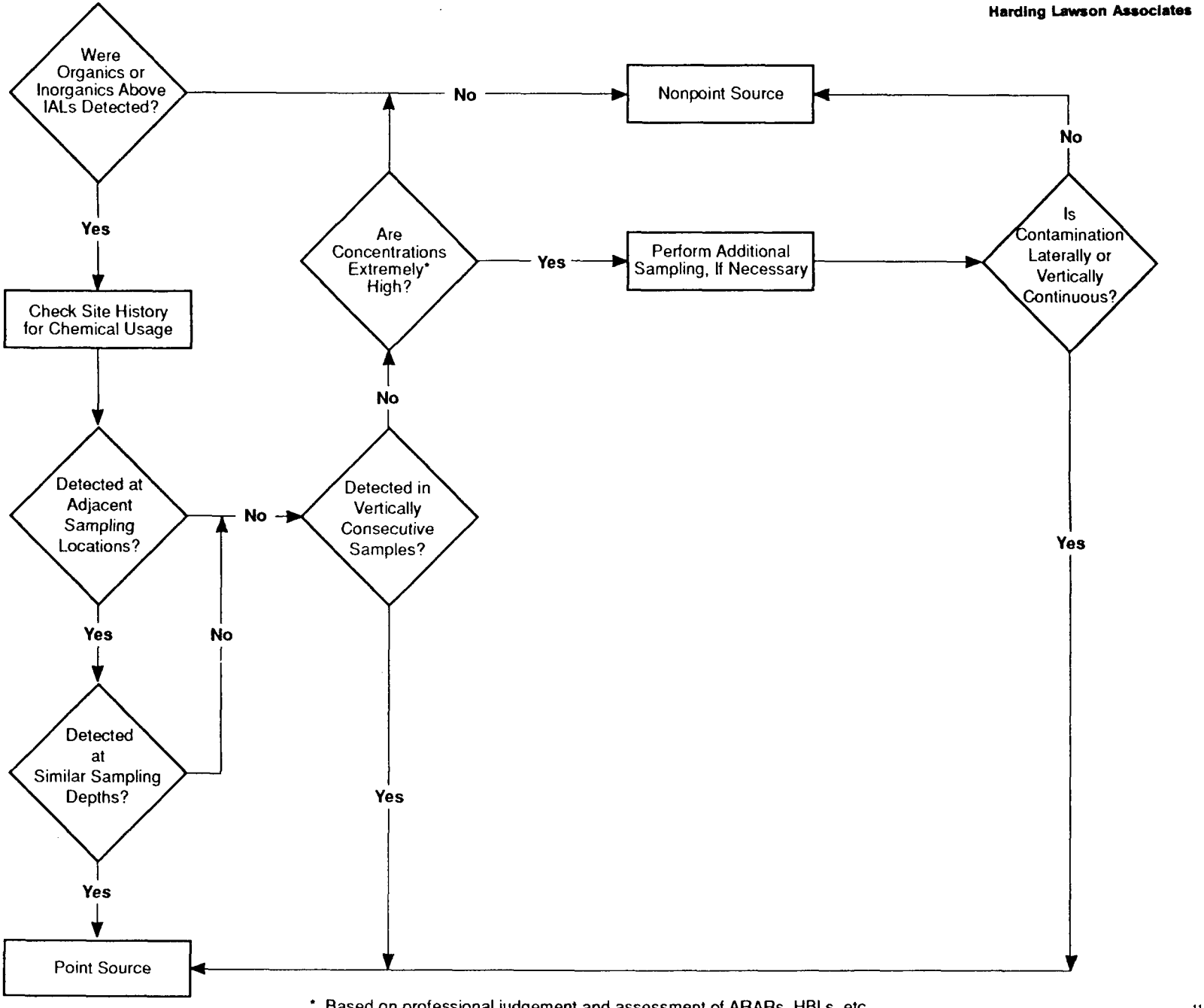

* Based on professional judgement and assessment of ARARs, HBLs, etc.

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