

The Boeing Company  
Santa Susana Field Laboratory  
5800 Woolsey Canyon Road  
Canoga Park, CA 91304-1145

Hand Delivered

August 17, 2009  
In reply refer to SHEA-108986

Los Angeles Regional Water Quality Control Board  
320 W. 4<sup>th</sup> Street, Suite 200  
Los Angeles, CA 90013



Attention: Ms. Tracy Egoscue

Subject: Response to RWQCB Comments on Interim Source Removal Action (ISRA)  
Supplemental Plans Submitted in Response to a California Water Code Section 13304  
Order, The Boeing Company, Santa Susana Field Laboratory, Canoga Park, CA (NPDES  
NO. CA0001309, CI NO. 6027, SCP NO. 1111, SITE ID NO. 2040109)

Dear Ms. Egoscue:

The Boeing Company (Boeing) hereby provides responses to RWQCB comments and amendments to supplemental plans prepared to support Interim Source Removal Action (ISRA) activities at the Santa Susana Field Laboratory, Ventura County, California. Responses to RWQCB comments are provided in attachments as listed below, two of which serve as addenda to two of the plans (the Soils Management Plan (SMP) and the Transportation Plan). RWQCB comments on the Storm Water Pollution Prevention Plan (SWPPP) have been incorporated into a revised SWPPP provided in this submittal. In addition, Boeing is providing a copy of the revised grading plans for Outfall 008 ISRA Areas submitted today to the Ventura County Grading Department.

Boeing understands these documents will be reviewed by the RWQCB and DTSC; if you have any questions or require anything further, please contact me at 818-466-8161, or Lori Blair at 818-466-8741. Boeing will consider these responses, plan addenda, and revised SWPPP acceptable for project implementation on August 24, 2009 if no further questions or requirements are indicated by the RWQCB staff. Thank you for your attention to these materials.

Sincerely,

A handwritten signature in black ink, appearing to read "Tom Gallacher".

Mr. Thomas D. Gallacher  
Director, Santa Susana  
Environment, Health and Safety

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Page 2  
August 17, 2009

**Attachments:**

1. Response to RWQCB Comments on ISRA Supplemental Information and Plans (C. Owens)
2. Response to DTSC Comments on ISRA Soil Management Plan; Addendum to ISRA Soil Management Plan
3. Response to RWQCB Comments on ISRA Soil Management Plan; Addendum for ISRA Soil Management Plan and Transportation Plan – Protocol for Handling Radioactive Materials during ISRA Project
4. Letter from Tom Gallacher, The Boeing Company to Su Han, RWQCB, regarding Implementation of Ventura County Air Pollution Control District Rule 55, Fugitive Dust
5. Storm Water Pollution Prevention Plan, Revised August 2009
6. Revised Grading Plans, Outfall 008 [11x17 copies]

cc: Cassandra Owens, RWQCB – All attachments  
Peter Raftery, RWQCB – All attachments  
Buck King, DTSC – All attachments  
Jim Myers, Ventura County – Attachments 1 - 4

**ATTACHMENT 1**

**Response to RWQCB Comments on Supplemental Information and Plans**



BUILDING A BETTER WORLD

# MEMORANDUM

TO: Art Lenox/Lori Blair, Boeing  
Allen Elliott/Steve Slaten, NASA

DATE: August 17, 2009

CC: Rick Lainhart, ACOE  
Bill McElroy, CH2M HILL

REF: 1891614

FROM: Dixie Hambrick/Alex Fischl, MWH

SUBJECT: Response to RWQCB Comments on ISRA Supplemental Information and Plans

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This memorandum provides responses to Regional Water Quality Control Board (RWQCB) review of Interim Source Removal Action (ISRA) supplemental information and plans, including the Health and Safety Plan (HASP), Transportation Plan, Soil Management Plan (SMP), and Radiological Investigation Summary for Outfalls 008 and 009. The supplemental information and plans were prepared by MWH on behalf of The Boeing Company (Boeing) and the National Aeronautics and Space Administration (NASA) pursuant to a California Water Code Section 13304 Cleanup and Abatement Order (CAO) issued by the Los Angeles RWQCB dated December 3, 2008 (RWQCB, 2008).

This memorandum was prepared to respond to RWQCB comments provided in an email dated on July 14, 2009 (Attachment 1). Comments from the RWQCB email on the supplemental information and plans are reproduced below in their entirety, and responses are provided below each comment. The RWQCB and Department of Toxic Substances Control (DTSC) have also provided separate comment review letters for the SMP and Storm Water Pollution Prevention Plan (SWPPP). A revised SWPPP has been prepared to address RWQCB comments on that document. A response to other RWQCB and DTSC comments on the SMP are being responded to in separate memos, each dated August 17, 2009.

## 1) HEALTH AND SAFETY PLAN

***RWQCB Comment #1:*** *Table 1, Occupational Health Exposure and Toxicological Properties for Contaminants of Occupational Health Concern, does not include TCDD.*

**Response:** Dioxin was not included since there is no Permissible Exposure Limit (PEL) established by NIOSH. Dioxin is a general term that describes a group of hundreds of chemicals, of which the most toxic compound is 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD). Generally, the toxicity of other dioxins is measured in relation to TCDD. Dioxin can be formed by burning chlorine-based chemical compounds with hydrocarbons. Dioxin is found in all media, including air, soil, sediment, and water. The highest levels are typically found in soil and sediment, while very low levels are typically found in water and air. Short-term exposure to high levels of dioxin may result in skin lesions and patchy darkening of skin, and altered liver function. Long-term exposure is linked to impairment of the immune system, the developing nervous system, the endocrine system, and reproductive functions. Based on human epidemiology data, dioxin is categorized as a “known human carcinogen”; however, TCDD does not affect genetic material and there is a level of exposure below which cancer risk would be negligible. Based on sample results of *in situ* soils, the exposure level for workers is expected to be low.

***RWQCB Comment #2:*** *One concern raised previously is that the site description is incomplete. The discussion does not include historical activities in the area, or previous clean-ups, or interim measures completed in the area.*

**Response:** A comprehensive site history is included in the Preliminary and Final ISRA Work Plans. Since these plans were intended to supplement the Work Plans, a comprehensive site history was deemed duplicative and unnecessary for each supplemental plan.

## 2) TRANSPORTATION PLAN

***RWQCB Comment #1:*** *Again, the site history is not comprehensive. That information will provide the basis for formulating how the waste material is prepared for moving, dust control measure, covering if required, and decontamination protocols required.*

**Response:** The primary basis for determining how waste material is handled is the soil sample analytical results. Sampling analytical suites were based on site history, chemical use, and previous sampling results in the area. Based on comprehensive sampling results, the chemical

concentrations in removed soil is the basis for formulating how the waste material is prepared for moving, dust control measures, whether covering is required, and decontamination protocols.

### 3) SOIL MANAGEMENT PLAN, ATTACHMENT 1 - ISRA WASTE SAMPLING FOR RADIONUCLIDES

**RWQCB Comment #1:** *Paragraph 2, statement 1, Why is potential analyses specified for waste disposal characterization. I thought that discussions indicated that samples of the waste material would be analyzed.*

**Response:** "Potential" in this case refers to the fact that "[r]adiological analyses shall be conducted only if the results of chemical analyses determine that off-site disposal is necessary." The ISRA Waste Sampling for Radionuclides was written for sampling soils that may or may not be planned for offsite disposal. For the 2009 ISRA Phase I soil removal, all soils are planned for offsite disposal, so yes, all waste characterization soil samples will be analyzed for radionuclides.

**RWQCB Comment #2:** *Third paragraph, statement 3, indicates that DPH and DTSC would be notified if wastes are determined to contain radionuclides above background. Is the background the numbers that were developed during the previous investigations? How do these numbers relate to the regional numbers?*

**Response:** As referenced in Attachment 1, "ISRA Waste Sampling for Radionuclides", radionuclide background data from the following report will be used:

McLaren/Hart, "Additional Soil and Water Sampling at the Brandeis-Bardin Institute and Santa Monica Mountains Conservancy." January 19, 1995. Table 20.  
<http://www.etec.energy.gov/Health-and-Safety/Documents/BrandeisBardin/AddSoilandWaterSamp.pdf>

This project included involvement/oversight/approval by the USEPA, DTSC, DHS, and local community members including the Committee Bridge the Gap. These data represent local background established for that study. The same report cites literature background for the U.S. (in Table 20). In all cases, the data measured locally by McLaren/Hart is significantly lower than the U.S. background data. Also, as described in the ISRA Final Work Plan, a radiological

background study for the SSFL is currently being conducted by USEPA, and once those values are finalized, they will be used for the ISRA project.

#### 4) SSFL RADIOLOGICAL INVESTIGATION SUMMARY

***RWQCB Comment #1:*** *Since there is no data in Outfall 008, is a survey required? If not, why not?*

**Response:** Previous cleanup actions and investigations in the Outfall 008 area did not require radiological surveys, as there was no documented history of radiological testing in Outfall 008. However, in 2007 the DTSC required that if Boeing chooses to ship hazardous and/or non-hazardous soils and debris offsite to the Chemical Waste Management - Kettleman Hills Hazardous Waste Facility (Kettleman) for the Northern Drainage cleanup project, then Boeing must demonstrate the waste does not contain “radioactive material that is not exempt from regulation and licensing or is not expressly authorized for disposal under the Radiation Control Law.” For the ISRA project, a similar requirement was presumed to apply, so the procedures developed and approved by DTSC for the Northern Drainage cleanup project were included for the ISRA project. Any soil or debris with radioactive levels above measureable background will be shipped for offsite disposal to EnergySolutions (Tooele County, UT).

***RWQCB Comment #2:*** *What is the 95th percentile of the measured background concentrations referred to on page 2 of 5 under the Brandeis/Bardin Institute/Santa Monica Mountains Conservancy Project (1992-1994).*

**Response:** The 95<sup>th</sup> percentile was 600 pCi/L. Tritium analyses conducted on soil moisture during the 1992 study exceeded the 95<sup>th</sup> percentile of the measured background (552 pCi/L) in 7 of 118 soil/sediment samples.

***RWQCB Comment #3:*** *What is the measured background for tritium in soil? What is the background concentration published for this region?*

**Response:** Two types of tritium data have been collected: tritium reported in “wet units” of pCi/L soil moisture and tritium reported in “dry units” of pCi/g soil. For the 1992 Brandeis-Bardin

## MEMORANDUM



study, the measured background for tritium was 552 pCi/L. The local background is reported in dry units, which is 0.3 pCi/g.

*Attachment 1 – email from Cassandra Owens, RWQCB, to Lori Blair, Boeing, regarding review of ISRA supplemental information. July 14, 2009.*



## Dixie Hambrick

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**From:** Blair, Lori N [lori.n.blair@boeing.com]  
**Sent:** Tuesday, July 14, 2009 1:11 PM  
**To:** Slaten, Steven W. (HQ-RC000); Bill.McElroy@CH2M.com; richard.s.lainhart@usace.army.mil  
**Cc:** Dixie Hambrick; Alexander Fischl; Lenox, Arthur J  
**Subject:** RWQCB comments/questions on various plans

Below is a copy of the email we just received from Cassandra Owens from the RWQCB. MWH will prepare draft responses for everyone's review by the beginning of next week.

Thanks! - Lori

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-----Original Message-----

**From:** Cassandra Owens [mailto:Cowens@waterboards.ca.gov]  
**Sent:** Tuesday, July 14, 2009 8:33 AM  
**To:** Blair, Lori N  
**Cc:** Peter Raftery  
**Subject:** Santa Susana Field Laboratory ISRA Related Issues

Hi Lori,

I briefly looked at some of the plans that have been sent over. I have a couple of questions:

### Health and Safety Plan

1. Table 1, Occupational Health Exposure and Toxicological Properties for Contaminants of Occupational Health Concern, does not include TCDD.
2. One concern raised previously is that the site description is incomplete. The discussion does not include historical activities in the area, or previous clean-ups, or interim measures completed in the area.

### Transportation Plan

1. Again, the site history is not comprehensive. That information will provide the basis for formulating how the waste material is prepared for moving, dust control measure, covering if required, and decontamination protocols required.

### SSFL Radiological Investigation

1. Since there is no data in Outfall 008, is a survey required? If not, why not?
2. What is the 95th percentile of the measured background concentrations referred to on page 2 of 5 under the Brandeis/Bardin Institute/Santa Monica Mountains Conservancy Project (1992-1994).

What is the measure background for tritium in soil? What is the background concentration published for this region?

#### Attachment 1 ISRA Waste Sampling for Radionuclides

1. Paragraph 2, statement 1, Why is potential analyses specified for waste disposal characterization. I thought that discussions indicated that samples of the the waste material would be analyzed.
2. Third paragraph, statement 3,. indicates that DPH and DTSC would be notified if wastes are determined to contain radionuclides above background. Is the background the numbers that were developed during the previous investigations. How doe these numbers relate to the regional numbers?

Just a few general thoughts on what I looked at.

Thanks  
Cassandra

Cassandra D. Owens  
Unit Chief, Industrial Permitting Unit (NPDES) Los Angeles Regional Water Quality Control  
Board 320 West 4th Street, Suite 200 Los Angeles, CA 90013 Phone (213) 576-6750  
[cowens@waterboards.ca.gov](mailto:cowens@waterboards.ca.gov)

**ATTACHMENT 2**

**Response to DTSC Comments on ISRA Soil Management Plan; Addendum to ISRA  
Soil Management Plan**



**BUILDING A BETTER WORLD**

# MEMORANDUM

TO: Art Lenox/Lori Blair, Boeing  
Allen Elliott/Steve Slaten, NASA

DATE: August 17, 2009

CC: Rick Lainhart, ACOE  
Bill McElroy, CH2M HILL

REF: 1891614

FROM: Dixie Hambrick/Alex Fischl, MWH

SUBJECT: Response to DTSC Comments on ISRA Soil Management Plan; Addendum to ISRA Soil Management Plan

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This memorandum provides responses to the Department of Toxic Substance Control (DTSC) comments on the Interim Source Removal Action (ISRA) Soil Management Plan (SMP). The ISRA SMP was one of the supplemental plans prepared by MWH on behalf of The Boeing Company (Boeing) and the National Aeronautics and Space Administration (NASA) pursuant to a California Water Code Section 13304 Cleanup and Abatement Order (CAO) issued by the Los Angeles RWQCB dated December 3, 2008 (RWQCB, 2008).

This memorandum was prepared to respond to DTSC comments on the SMP (Attachment 1), and serves as an addendum to that plan for implementation of ISRA activities. Comments from the DTSC on the SMP are reproduced below in their entirety, and responses are provided below each comment. Response to other review comments made by RWQCB (C. Owens and T. Egoscue) regarding radiological sampling for waste characterization and radiological soil management protocols, have been provided in separate memos (each dated August 17, 2009).

**DTSC Comment #1:** The ISRA SMP proposes to backfill and re-contour ISRA excavation areas using soil generated from re-grading areas adjacent to the excavations. This proposed regrading approach is atypical and will require chemical characterization of the adjacent soils used for backfill. The ISRA SMP should address chemical characterization and documentation of source of soil backfill.

**Response:** Generalized areas considered likely for re-use as local backfill or re-contouring sources for 2009 ISRA excavation areas in Outfall 008 are shown in figures provided in

Attachment 2. These figures depict refined ISRA Areas based on final data gap sampling results, generalized areas of the extent of soil disturbance or local soil borrow areas near the proposed excavation areas, and associated sampling locations. Sampling data are summarized for the Outfall 008 ISRA Areas and surrounding soils in tables included in Attachment 2. The soil disturbance or borrow extents shown on these figures are generalized based on currently planned excavation boundaries and may change during field implementation based on confirmation sampling results. As discussed during a teleconference with the RWQCB and DTSC on August 11 and during the onsite meeting August 13, these adjacent disturbance and local borrow areas in Outfall 008 are consistent with typical sections included in the grading plans provided to Ventura County in the Outfall 008 Grading Permit Application package. All final excavation areas, soil disturbance, and/or borrow areas will be reported in the final ISRA implementation report and as required for other project close-out needs.

As shown on the figures in Attachment 2, sampling has been performed to characterize soils near excavation areas planned for backfill or re-contouring, and these sample results are provided in the tables of Attachment 2, and were previously provided to RWQCB and DTSC for review on July 29/30, 2009. As discussed with the RWQCB and DTSC during the above-referenced teleconference and onsite meeting, soils being re-used for backfill or re-contouring purposes will be characterized for potential ISRA COCs and associated RCRA risk drivers prior to re-use. Soil characterization and soil disturbance areas will be carefully documented and reported in the ISRA Implementation Report, as well in future RFI/RI reports.

Similar figures are not provided for NASA Outfall 009 ISRA locations since backfill in those areas is not anticipated. Restoration at the NASA ISRA sites will be determined following completion of excavation activities, and as warranted based on discussions with the RWQCB and DTSC.

**DTSC Comment #2:** The ISRA SMP indicates that soil for excavation backfill may also be used from onsite borrow sources or from RWQCB approved offsite borrow sources. The ISRA SMP should include a soil borrow source chemical characterization analyte list.

**Response:** The SMP was written to allow for future use of an offsite or onsite borrow source if approved by DTSC; for 2009 ISRA Area implementation, only local borrow soils (adjacent to the excavation areas) will be used. In the future, if an offsite soil borrow source is used for backfill of

ISRA areas, then soils from the borrow area will be analyzed for the chemicals and radionuclides specified on Attachment 3 using the laboratory methods indicated. These criteria were established using DTSC clean fill import criteria, modified to include specific SSFL contaminants (e.g.; perchlorate) and current SSFL soil background levels. If an onsite SSFL soil borrow source is identified for use for ISRA backfill, then DTSC will be asked to approve the sampling suite and analytical results prior to use for onsite backfill.

**DTSC Comment #3:** The proposed sampling frequency for waste characterization of excavated soils is not specifically described. The ISRA SMP should describe soil sampling and analysis frequency for radionuclides.

**Response:** As described in Attachment A of the ISRA SMP, the samples used in determining the non-hazardous/hazardous waste classification of soils designated for offsite disposal are also being subjected to the identified radiological analyses. Samples collected for chemical waste characterization have been and will be analyzed for the radionuclides specified in Attachment A of the SMP, including gamma spectroscopy, strontium-90 and tritium. The laboratory gamma spectroscopy library shall include the following contaminants-of-concern as a minimum: Na-22, K-40, Mn-54, Co-60, Cs-134, Cs-137, Eu-152, Eu-154, Th-228, Th-232, U-235, U-238 and Am-241. Any detection of any gamma emitting radionuclides in the library shall also be reported.

Waste characterization sampling is being conducted according to the following procedure:

Title 22, Section 66261.20 of the California Code of Regulations specifies that sampling and sample management of wastes "...shall be in accord with the sampling planning, methodology... specified in chapter nine of 'Test Methods for Evaluating Solid Waste, Physical/Chemical Methods,' SW-846..." Accordingly, this is the foundation of ISRA waste characterization sampling. It should be noted that SW-846 does not prescribe sampling frequencies. Rather, it requires a sufficient number of samples to achieve a valid and reliable estimate of the prospective waste's average characteristics relative to applicable regulatory limits. SW-846 provides a formula that may be based upon "limited analytical studies" for the purpose of estimating the appropriate number of samples for characterizing a waste.

As ISRA soil is being characterized *in situ*, the limited analytical studies provision referred to above has been implemented for each planned excavation footprint. The analytical results of the ensuing random sampling were then evaluated to determine:

- 1) Whether additional samples are required consistent with the SW-846 formula, in which case additional random sampling will be conducted.
- 2) Whether any individual sample exhibits a constituent of concern at or above a regulatory threshold, which will result in the determination that the waste is hazardous.
- 3) Whether the mean of significantly present constituents of concern have an upper confidence interval at the 80% probability level that equals or exceeds a regulatory threshold, which will result in the determination that the waste is hazardous.
- 4) Whether any individual sample exhibits a constituent of concern at a concentration requiring TCLP and/or STLC WET leachate analysis, which will result in performance of the required analysis.

The number of randomly identified sample collection locations identified for each of the excavation areas was determined based on results of existing relevant analytical data, historical land usage, and size and topography of the planned excavation area. Waste characterization samples collected prior to August 14, 2009 are identified in Attachment 4; final waste characterization sampling will be documented in the ISRA Implementation Report.

Attachment 1:

*DTSC, 2009. Letter from B. King, DTSC to C. Owens, RWQCB, regarding interim Source Removal Action (ISRA), Soil Management Plan, Santa Susana Field Laboratory, Ventura County, California, dated July 2009. August 3.*

Attachment 2:

*Outfall 008 Refined ISRA Area Figures 1 through 7 and Sampling Results Table*

Attachment 3:

*Import Fill Criteria, ISRA Project*

Attachment 4:

*2009 ISRA Area Waste Characterization Summary (August 14, 2009)*



Linda S. Adams  
Secretary for  
Environmental Protection

## Department of Toxic Substances Control

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Maziar Movassaghi  
Acting Director  
700 Heinz Avenue  
Berkeley, California 94710



Arnold Schwarzenegger  
Governor

August 3, 2009

Cassandra Owens  
Regional Water Quality Control Board  
Los Angeles Region  
320 West 4<sup>th</sup> Street, Suite 200  
Los Angeles, California 90013

Interim Source Removal Action (ISRA), Soil Management Plan, Santa Susana Field Laboratory, Ventura County, California, dated July 2009

Dear Ms. Owens:

Staff from the Santa Susana Field Laboratory (SSFL) team of the Department of Toxic Substances Control (DTSC) reviewed the *Interim Source Removal Action Soil Management Plan (ISRA SMP)* submitted by the Boeing Company (Boeing). Attached is a review memorandum prepared for Mr. Jim Pappas dated August 3, 2009.

Our review identified the following three items requiring addition information or clarification.

- 1) The ISRA SMP proposes to backfill and re-contour ISRA excavation areas using soil generated from regrading areas adjacent to the excavations. This proposed regrading approach is atypical and will require chemical characterization of the adjacent soils used for backfill. The ISRA SMP should address chemical characterization and documentation of source of soil backfill.
- 2) The ISRA SMP indicates that soil for excavation backfill may also be used from onsite borrow sources or from RWQCB approved offsite borrow sources. The ISRA SMP should include a soil borrow source chemical characterization analyte list.
- 3) The proposed sampling frequency for waste characterization of excavated soils is not specifically described. The ISRA SMP should describe soil sampling and analysis frequency for radionuclides.



Ms. Cassandra Owens  
August 3, 2009  
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If you have any questions, please contact me at (510) 540-3955 or via email at [BKing@dtsc.ca.gov](mailto:BKing@dtsc.ca.gov).



Mr. Buck King, C.HG  
Senior Engineering Geologist  
Santa Susana Field Laboratory (SSFL) Project Team

cc: Mr. Thomas D. Gallacher  
Director – Safety Health and Environmental Affairs  
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Mr. Allen Elliott  
National Aeronautics and Space Administration  
George C. Marshall Space Flight Center  
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Ms. Merrilee Fellows  
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Ms. Cassandra Owens  
August 3, 2009  
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Mr. Arthur Lenox  
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Ms. Cassandra Owens  
August 3, 2009  
Interim Source Removal Action Soil Management Plan  
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Mr. Paul Carpenter, C. HG.  
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Linda S. Adams  
Secretary for  
Environmental Protection

## Department of Toxic Substances Control

Maziar Movassaghi, Acting Director  
700 Heinz Avenue, Suite 200  
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Arnold Schwarzenegger  
Governor

To: Jim Pappas, P.E.  
Senior Engineering Geologist  
Northern California Permitting and Corrective Action Branch  
Hazardous Waste Management Program

From: Buck King, C.H.G. *Buck King*  
Senior Engineering Geologist  
Geologic Services Branch

Date: August 3, 2009

Re: Interim Source Removal Action, Soil Management Plan

PCA: 22120

Site Code: 530033-48

MPC: 37

Staff from the Geological Service Unit (GSU) of the Geologic Services Branch of the Department of Toxic Substances Control (DTSC) reviewed the work plan titled *Interim Source Removal Action Soil Management Plan, Santa Susana Field Laboratory, Ventura County California (ISRA SMP)* dated July 2009.

### Previous DTSC Comments on Final ISRA Work Plan

The ISRA SMP was reviewed for its responses to previous DTSC comments and concerns (DTSC Letter from Mr. Buck King to Ms. Cassandra Owens dated June 4, 2009) identified during review of the Final ISRA Work Plan dated May 1, 2009. The DTSC letter identified three issues in the Final ISRA Work Plan that should be addressed in the subsequent ISRA SMP. The DTSC June 4, 2009 comments are summarized in the ISRA SMP responsiveness discussion below. Boeing responded to DTSC comments in an *Addendum to Final Interim Source Removal Work Plan (ISRA WP Addendum)* dated June 19, 2009. The ISRA WP Addendum generally addressed the DTSC comments and indicated additional information would be included in the ISRA SMP.

### ISRA SMP Responsiveness to Previous DTSC Comments

The ISRA SMP was reviewed for its technical content and responsiveness to previous DTSC comments.

Mr. Jim Pappas, P.E.  
August 3, 2009  
Page 2 of 3

In response to DTSC Comment 1 requesting additional information regarding radiologic screening and contingency waste management plans in the event unforeseen items or waste are encountered, the ISRA SMP was found to contain a discussion of the radionuclide screening process and soil management procedures. The ISRA SMP indicates that soil samples will be collected and analyzed for a designated suite of radionuclides for waste characterization purposes and includes Attachment A providing additional ISRA Waste radionuclide sampling information. The Attachment A indicates that in the event radionuclides are detected above background levels, the Department of Public Health and DTSC will be notified and the need for further waste evaluation or alternate waste disposition will be determined.

In response to DTSC Comment 2 requesting that the soil confirmation sampling description include a clear reference to use of sampling method EPA Method 5035 for analysis of VOCs in soil, the ISRA SMP was found to contain clear statements indicating use of EPA Method 5035 soil collection method for soil VOC analysis.

In response to DTSC Comment 3 requesting that the SMP describe soil stockpile photo ionization detector (PID) action levels used to fulfill the requirements for Ventura County Air Pollution Control District, the ISRA SMP was found to contain soil stockpile reactive organic compound (ROC) emissions monitoring information including the 50 parts per million (ppm) by volume PID criteria.

### **ISRA SMP Comments**

SMP1. The ISRA SMP proposes to backfill and re-contour ISRA excavation areas using soil generated from regrading areas adjacent to the excavations. This proposed regrading approach is atypical and will require chemical characterization of the adjacent soils used for backfill. The ISRA SMP should address chemical characterization and documentation of source of soil backfill.

SMP2. The ISRA SMP indicates that soil for excavation backfill may also be used from onsite borrow sources or from RWQCB approved offsite borrow sources. The ISRA SMP should include a soil borrow source chemical characterization analyte list.

SMP3. The proposed sampling frequency for waste characterization of excavated soils is not specifically described. The ISRA SMP should describe soil sampling and analysis frequency for radionuclides.

Mr. Jim Pappas, P.E.  
August 3, 2009  
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### **General ISRA Project Comments**

GC1. As stated in the letter from Jim Pappas to Cassandra Owens dated March 19, 2009, the purpose of the ISRA is cleanup of soil to prevent violations of RWQCB NPDES effluent limitations and that DTSC will not consider the removal to be SB 990 compliant unless, after DTSC completes its investigation of these areas, the affected areas are determined to meet SB 990 standards.

GC2. Boeing is responsible for managing and handling all hazardous wastes from this operation pursuant to Title 22 requirements. If Boeing, or the LA RWQCB have any questions or need assistance regarding the adequacy of the ISRA SMP description of characterization of radiological materials, they can contact Mr. James Thomas or Mr. Gary Butner of the Department of Public Health, Radiological Health Branch.

GC3. Until such time as the revised background study and SB 990 compliant risk-based screening levels are approved by DTSC, DTSC is not in a position to approve the placement of any on-site or offsite soil borrow materials. Therefore, although the placement of non-DTSC approved soil borrow material may be adequate for meeting NPDES requirements, whether this soil borrow material can meet SB 990 requirements will not be determined until the new background and Risk-Based Screening Levels are developed.

### **Conclusions**

The GSU recommends that ISRA SMP be revised in response to the request for additional information described above regarding: (1) chemical characterization and documentation of source of adjacent soil used for backfill; (2) chemical characterization and documentation of source of onsite and offsite borrow soils used; and (3) soil sampling and analysis frequency for radionuclides.

If you have any questions or comments, please contact me at (510) 540-3955

Cc: File

**Table 3-1 - Revised**  
**Outfall 008 Data Gap and Waste Characterization Sample Results**  
 (Page 1 of 4)

Sample ID	Sample Date	Sample Depth	Results in mg/kg																	Dioxins / TCDD TEQ (pg/g)	Radionuclides
			Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc		
CNBS0128S001	25-Feb-09	0 - 0.5	--	--	--	--	0.21 J	--	--	9.3	16.8	--	--	--	--	--	--	52.6	0.6815	--	
CNBS0129S001	25-Feb-09	0 - 0.5	--	--	--	--	0.18 J	--	--	8.3	10.8	--	--	--	--	--	--	49.7	--	--	
CNBS0130S001	25-Feb-09	0 - 0.5	--	--	--	--	0.17 J	--	--	7.9	12.4	--	--	--	--	--	--	48.2	--	--	
CNBS0131S001	9-Apr-09	0 - 0.5	--	--	--	--	--	--	--	9.29	35.1	--	--	--	--	--	--	--	1.03	--	
CNBS0132S001	25-Feb-09	0 - 0.2	--	--	--	--	--	--	--	--	2.1	--	--	--	--	--	--	--	--	--	
CNBS0133S001	25-Feb-09	0 - 0.2	--	--	--	--	--	--	--	--	5.2	--	--	--	--	--	--	--	--	--	
CNBS0134S001	25-Feb-09	0 - 0.2	--	--	--	--	--	--	--	--	6.4	--	--	--	--	--	--	--	--	--	
HZBS0062S001	24-Feb-09	0 - 0.5	--	--	--	--	--	--	--	12.3	13.3	--	--	--	--	--	--	--	4.33	--	
HZBS0063S001	24-Feb-09	0 - 0.5	--	--	--	--	--	--	--	--	25.7	--	--	--	--	--	--	--	--	--	
HZBS0064S001	24-Feb-09	0 - 0.5	--	--	--	--	--	--	--	--	11.7	--	--	--	--	--	--	--	1.94	--	
HZBS0065S001	24-Feb-09	0 - 0.5	--	--	--	--	--	--	--	--	13.1	--	--	--	--	--	--	--	0.718	--	
HZBS0066S001	--	--	Sample Not Collected (Bedrock)																		
HZBS0067D001	24-Feb-09	0 - 0.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.157	--	
HZBS0067S001	24-Feb-09	0 - 0.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.104	--	
HZBS0068S001	25-Feb-09	0 - 0.5	--	--	--	--	0.4	--	--	--	11.7	--	--	--	--	--	--	67.9	--	--	
HZBS0069S001	25-Feb-09	0 - 0.2	--	--	--	--	0.13 J	--	--	6.32	6.7	--	--	--	--	--	--	47.9	0.323	--	
HZBS0070S001	24-Feb-09	0 - 0.5	--	--	--	--	0.22 J	--	--	--	13.2	--	--	--	--	--	--	51.3	1.94	--	
HZBS0071S001	25-Feb-09	0 - 0.5	--	--	--	--	0.4	--	--	--	9.4	--	--	--	--	--	--	45.6	--	--	
HZBS0071S001SP	25-Feb-09	0 - 0.5	--	--	--	--	0.38	--	--	--	11	--	--	--	--	--	--	45 J	--	--	
HZBS0072S001	25-Feb-09	0 - 0.5	--	--	--	--	0.096 J	--	--	--	7.2	--	--	--	--	--	--	54.1	--	--	
HZBS0073S001	24-Feb-09	0 - 0.5	--	--	--	--	--	--	--	--	8.3	--	--	--	--	--	--	--	0.175	--	
HZBS0073S002	20-Mar-09	1.9 - 2.4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.19	--	
HZBS0074S001	25-Feb-09	0 - 0.5	--	--	--	--	--	--	--	--	8.9	--	--	--	--	--	--	--	--	--	
HZBS0075S001	25-Feb-09	0 - 0.5	Sample Not Analyzed																		
HZBS0076S001	25-Feb-09	0 - 0.5	--	--	--	--	--	--	--	--	11.1	--	--	--	--	--	--	--	--	--	
HZBS0077S001	25-Feb-09	0 - 0.5	--	--	--	--	--	--	--	--	13.9	--	--	--	--	--	--	--	0.337	--	
HZBS0078S001	25-Feb-09	0 - 0.5	--	--	--	--	--	--	--	--	53.6	--	--	--	--	--	--	--	--	--	
HZBS0079S001	24-Feb-09	0 - 0.5	--	--	--	--	--	--	--	--	16.2	--	--	--	--	--	--	--	0.231	--	
HZBS0079S002	20-Mar-09	1.5 - 2.0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.012	--	
HZBS0080S001	25-Feb-09	0 - 0.5	--	--	--	--	--	--	--	0.404	23.2	--	--	--	--	--	--	--	0.259	--	
HZBS0081S001	25-Feb-09	0 - 0.5	--	--	--	--	--	--	--	14.6 J	12.4	--	--	--	--	--	--	--	0.164	--	
HZBS0082S001	25-Feb-09	0 - 0.5	--	--	--	--	--	--	--	<0.328 U	25.5	--	--	--	--	--	--	--	0.399	--	
HZBS0082S002	25-Feb-09	3.2 - 3.7	--	--	--	--	--	--	--	7.34 J	6.53	--	--	--	--	--	--	--	0.024	--	
HZBS0083S001	25-Feb-09	0 - 0.5	--	--	--	--	--	--	--	7.06 J	30.5	--	--	--	--	--	--	--	0.843	--	
HZBS0084S001	25-Feb-09	0 - 0.5	--	--	--	--	--	--	--	1.32	15	--	--	--	--	--	--	--	0.275	--	
HZBS0085S001	25-Feb-09	0 - 0.5	--	4	--	--	0.37	--	--	26.2	28.9	--	--	--	--	--	--	--	2.96	--	
HZBS0085S001SP	25-Feb-09	0 - 0.5	--	5.4	--	--	0.48	--	--	17 J	42	--	--	--	--	--	--	--	--	--	
HZBS0086S001	24-Feb-09	0 - 0.5	--	4.5	--	--	0.4	--	--	15.9 J	9.8	--	--	--	--	--	--	--	--	--	
HZBS0087S001	24-Feb-09	0 - 0.5	--	4.8	--	--	0.39	--	--	16.9 J	9.6	--	--	--	--	--	--	--	--	--	
HZBS0088D001	24-Feb-09	0 - 0.5	--	5.4	--	--	0.41	--	--	15.3 J	12.7	--	--	--	--	--	--	77.5	--	--	
HZBS0088S001	24-Feb-09	0 - 0.5	--	4.2	--	--	0.36	--	--	13.9 J	11.1	--	--	--	--	--	--	71.7	--	--	
HZBS0089S001	24-Feb-09	0 - 0.5	--	--	--	--	--	--	--	--	14.9	--	--	--	--	--	--	--	1.41	--	
HZBS0090S001	24-Feb-09	0 - 0.5	--	--	--	--	--	--	--	--	7.6	--	--	--	--	--	--	57.9	0.0604	--	
HZBS0090S001SP	24-Feb-09	0 - 0.5	--	--	--	--	--	--	--	--	7.4	--	--	--	--	--	--	60	0.173	--	
HZBS0091S001	24-Feb-09	0 - 0.3	--	--	--	--	--	--	--	--	8	--	--	--	--	--	--	--	6.68	--	
HZBS0092S001	25-Feb-09	0 - 0.5	--	2.1	--	--	0.21 J	--	--	6.1	21	--	--	--	--	--	--	--	--	--	
HZBS0093S001	24-Feb-09	0 - 0.5	--	4.4	--	--	0.38	--	--	15.3 J	9.8	--	--	--	--	--	--	--	--	--	
HZBS0094S001	24-Feb-09	0 - 0.5	--	4.7	--	--	0.32	--	--	14.8 J	9.5	--	--	--	--	--	--	--	0.524	--	
HZBS0095S001	24-Feb-09	0 - 0.5	--	4.3	--	--	0.39	--	--	14.8 J	9.8	--	--	--	--	--	--	--	--	--	
HZBS0096S001	25-Feb-09	0 - 0.5	Sample Not Analyzed																		
HZBS0097S001	25-Feb-09	0 - 0.5	--	--	--	--	--	--	--	--	13.9	--	--	--	--	--	--	--	--	--	
HZBS0098S001	20-Mar-09	0 - 0.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.97	--	

**Table 3-1 - Revised**  
**Outfall 008 Data Gap and Waste Characterization Sample Results**  
 (Page 2 of 4)

Sample ID	Sample Date	Sample Depth	Results in mg/kg																	Dioxins / TCDD TEQ (pg/g)	Radionuclides
			Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc		
HZBS0098S002	20-Mar-09	1 - 1.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.054	--
HZBS0099S001	20-Mar-09	0 - 0.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	97.5	--
HZBS0100S001	20-Mar-09	0 - 0.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.183	--
HZBS0101S001	20-Mar-09	0 - 0.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.346	--
HZBS0102S001	20-Mar-09	0 - 0.3	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.075	--
HZBS0103S001	20-Mar-09	0 - 0.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.263	--
HZBS0104S001	20-Mar-09	0 - 0.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.31	--
HZBS0105S001	9-Apr-09	0 - 0.5	--	--	--	--	--	--	--	44.5 P	--	--	--	--	--	--	--	--	--	5.32	--
HZBS0106S001	9-Apr-09	0 - 0.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.0358	--
HZBS0106S002	9-Apr-09	3.5 - 4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.00648	--
HZBS0107D001	9-Apr-09	0 - 0.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	6.85	--
HZBS0107S001	9-Apr-09	0 - 0.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	7.35	--
HZBS0108S001	9-Apr-09	0 - 0.5																			Sample Not Analyzed
HZBS0109S001	1-Jun-09	0 - 0.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.972	--
HZBS0110S001	1-Jun-09	0 - 0.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5.04	--
HZBS0111S001	1-Jun-09	0 - 0.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1.62	--
HZBS0112S001	1-Jun-09	0 - 0.5	--	--	--	--	--	--	--	8.07 P	--	--	--	--	--	--	--	--	--	2.14	--
HZBS0113S001	1-Jun-09	0 - 0.5																			Sample Not Analyzed
HZBS0114S001	1-Jun-09	0 - 0.5																			Sample Not Analyzed
HZBS0115S001	1-Jun-09	0 - 0.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3.43	--
HZBS0116S001	1-Jun-09	0 - 0.5																			Sample Not Collected (Bedrock)
HZBS0117S001	1-Jun-09	0 - 0.5																			Sample Not Analyzed
HZBS0118S001	1-Jun-09	0 - 0.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.588	--
HZBS0119S001	1-Jun-09	0 - 0.5																			Sample Not Analyzed
HZBS0120S001	1-Jun-09	0 - 0.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.851	--
HZBS0121S001	1-Jun-09	0 - 0.5																			Sample Not Analyzed
HZBS0122S001	--	--																			Sample Not Collected (Bedrock)
HZBS0123D001	1-Jun-09	0 - 0.5	--	--	--	--	--	--	--	11.1 P	16.3 P	--	--	--	--	--	--	--	--	0.178	--
HZBS0123S001	1-Jun-09	0 - 0.5	--	--	--	--	--	--	--	11.5 P	17 P	--	--	--	--	--	--	--	--	0.197	--
HZBS0124S001	1-Jun-09	0 - 0.5	--	--	--	--	--	--	--	8.91 J	12.7	--	--	--	--	--	--	--	--	0.162	--
HZBS0124S001SP	1-Jun-09	0 - 0.5	--	--	--	--	--	--	--	8.1	12	--	--	--	--	--	--	--	--	0.120	--
HZBS0125S001	30-Jun-09	0 - 0.5																			Sample Not Analyzed
HZBS0126S001	30-Jun-09	0 - 0.5																			Sample Not Analyzed
HZBS0127S001	30-Jun-09	0 - 0.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	10.6	--
HZBS0128S001	30-Jun-09	0 - 0.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	6.28	--
HZBS0129S001	14-Jul-09	0 - 0.5	--	--	--	--	--	--	--	10.1 P	--	--	--	--	--	--	--	--	--	--	--
HZBS0130S001	14-Jul-09	0 - 0.5	--	--	--	--	--	--	--	9.12 P	--	--	--	--	--	--	--	--	--	--	--
HZBS0131S001	14-Jul-09	0 - 0.5	--	--	--	--	--	--	--	39.3 P	--	--	--	--	--	--	--	--	--	--	--
HZBS0132S001	14-Jul-09	0 - 0.5	--	--	--	--	--	--	--	33.7 P	--	--	--	--	--	--	--	--	--	--	--
HZBS0133S001	14-Jul-09	0 - 0.5	--	--	--	--	--	--	--	40.7 P	--	--	--	--	--	--	--	--	--	--	--
HZBS0134S001	14-Jul-09	0 - 0.5	--	--	--	--	--	--	--	48.6 P	--	--	--	--	--	--	--	--	--	--	--
HZBS0135S001	14-Jul-09	0 - 0.5	--	--	--	--	--	--	--	12.8 P	--	--	--	--	--	--	--	--	--	--	--
HZBS0136S001	14-Jul-09	0 - 0.5	--	--	--	--	--	--	--	12.0 P	--	--	--	--	--	--	--	--	--	--	--
HZBS0137S001	14-Jul-09	0 - 0.5	--	--	--	--	--	--	--	15.7 P	--	--	--	--	--	--	--	--	--	--	--
HZBS0138S001	14-Jul-09	0 - 0.5	--	--	--	--	--	--	--	51.4 P	--	--	--	--	--	--	--	--	--	--	--
HZBS0139S001	14-Jul-09	0 - 0.5	--	--	--	--	--	--	--	19.9 P	--	--	--	--	--	--	--	--	--	--	--
HZBS0140S001	14-Jul-09	0 - 0.5	--	--	--	--	--	--	--	16.5 P	--	--	--	--	--	--	--	--	--	--	--
HZBS0141S001	14-Jul-09	0 - 0.5	--	--	--	--	--	--	--	21.1 P	--	--	--	--	--	--	--	--	--	--	--
HZBS0142S001	14-Jul-09	0 - 0.5	--	--	--	--	--	--	--	18.0 P	--	--	--	--	--	--	--	--	--	--	--
HZBS0143S001	14-Jul-09	0 - 0.5	--	--	--	--	--	--	--	33.9 P	--	--	--	--	--	--	--	--	--	--	--
HZBS0144S001	14-Jul-09	0 - 0.5	--	7.89 P	--	--	--	0.172 P	--	16.0 P	9.20 P	--	--	--	--	--	--	--	--	--	--
HZBS0145S001	14-Jul-09	0 - 0.5	--	--	--	--	--	0.492 P	--	--	17.3 P	--	--	--	--	--	--	65.1 P	--	--	--





**Table 3-1 - Revised**  
**Outfall 008 Data Gap and Waste Characterization Sample Results**  
 (Page 4 of 4)

Sample ID	Sample Date	Sample Depth	Results in mg/kg																Dioxins / TCDD TEQ (pg/g)	Radionuclides	
			Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium	Cobalt	Copper	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium			Zinc
ISWC0046S001	1-Jul-09	--	<10 P	5.4 P	70 P	0.65 P	<0.5 P	15 P	4.9 P	7.6 P	17 P	0.018 P	0.88 P	12 P	<2 P	<1 P	<10 P	26 P	49 P	--	X
ISWC0047S001	1-Jul-09	--	<10 P	6 P	49 P	0.68 P	<0.5 P	14 P	4.2 P	4.9 P	4.9 P	0.026 P	0.88 P	10 P	<2 P	<1 P	<10 P	25 P	36 P	--	X
ISWC0048S001	1-Jul-09	--	<10 P	5.6 P	45 P	0.51 P	<0.5 P	14 P	4.1 P	7.8 P	5.6 P	0.012 P	0.8 P	10 P	<2 P	<1 P	1.2 P	22 P	260 P	--	X
<b>2005 Background Comparison Concentrat</b>			8.7	15	140	1.1	1	36.8	21	29	34	0.09	5.3	29	0.655	0.79	0.46	62	110	<b>0.87</b>	--

**Notes:**

Sample Exceeds the 2005 Background Comparison Concentration (MWH, 2005)

J - Result is estimated

mg/kg - milligrams per kilogram

P - Preliminary data, data has not been validated

pg/g - picograms per gram

TCDD TEQ - tetrachlorobenzo-p-dioxin toxic equivalent (normalized to 2,3,7,8-TCDD)

X - result pending

"--" - not analyzed


\* - Sample location is outside excavation area and therefore sample ID to be from waste characterization sample ID changed to RFI sample ID.

Dioxins / TCDD TEQ - A sum of 17 dioxin / furan congener results adjusted for toxicity. The TEQ is calculated by multiplying the result of each congener by its respective World Health Organization's (WHO's) toxic equivalency factor (TEF), which is based on the relative potency of the congener to cause a toxic response relative to 2,3,7,8-TCDD. TCDD TEQ values do not include laboratory data not quantified (DNQ) as specified in the NPDES permit.

Radiological analysis includes gamma spectroscopy (Na-22, K-40, Mn-54, Co-60, Cs-134, Cs-137, Eu-152, Eu-154, Th-228, Th-232, U-235, U-238 and Am-241), strontium-90, and tritium

# Outfall 008 Refined ISRA Areas HVS-1





## Base Map Legend

-  Administrative Area Boundary
-  RFI Site Boundary
-  Existing Building or Structure
-  Preliminary ISRA Evaluation Area
-  Surface Water Drainage
-  Surface Water Divide
-  Outfall Water Divide
-  Excavation Edge Planned to be Graded to Reestablish Pre-Excavation Drainage Pattern
-  Sample On Hold / Sample Results Pending

### ISRA Constituents of Concern

Copper, Lead, Dioxins  
 2005 Background Comparison Concentrations  
 Copper: 29 mg/kg  
 Lead: 34 mg/kg  
 Dioxins (TCDD TEQ): 0.87 pg/g

### Copper and/or Lead Sample Location (<2 feet bgs)

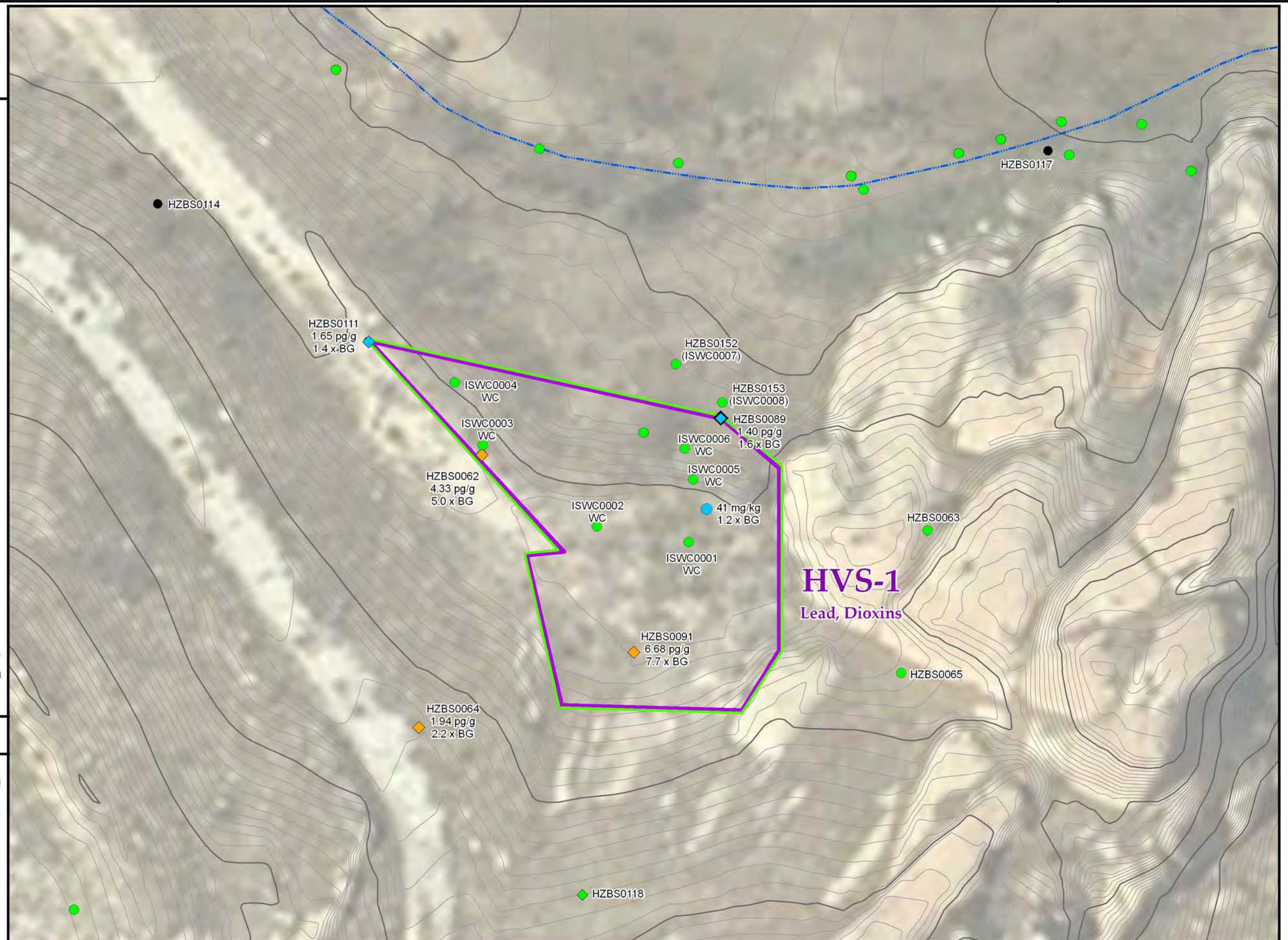
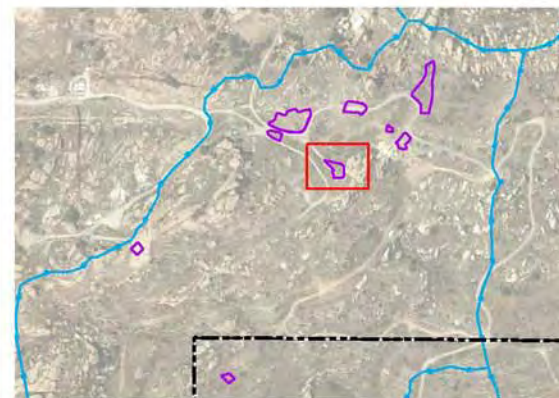
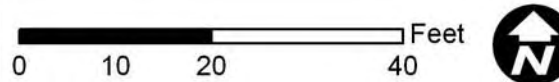
-  ≤ Background (BG)
-  >BG and <2x BG
-  ≥2x BG and <10x BG
-  ≥10x BG and <100x BG

### Dioxin Sample Location (<2 feet bgs)

-  ≤ Background (BG)
-  >BG and <2x BG
-  ≥2x BG and <10x BG
-  ≥10x BG and <100x BG
-  ≥100x BG

### Note:

1. Dioxin represents the sum of 17 dioxin/furan congener results adjusted for toxicity, normalized to 2,3,7,8-TCDD TEQ
2. "WC" Represents Waste Characterization Sample
3. Locations outside ISRA Areas with sample IDs beginning with "ISWC" will be changed to RFI Sample IDs
4. Extent of local borrow source generalized and approximate. Actual extent will vary based on final excavation extents, as directed by project engineer
5. Sample IDs shown represent ISRA data gap samples and ISRA waste characterization samples.



S A N T A S U S A N A F I E L D L A B O R A T O R Y

### Outfall 008 Refined ISRA Areas HVS-2A

#### Base Map Legend

- Administrative Area Boundary
- RFI Site Boundary
- Existing Building or Structure
- Potential Local Borrow Source
- Preliminary ISRA Evaluation Area
- Surface Water Drainage
- Surface Water Divide
- Outfall Water Divide
- Elevation Contour
- Excavation Edge Planned to be Graded to Reestablish Pre-Excavation Drainage Pattern
- Sample On Hold / Sample Results Pending

#### ISRA Constituents of Concern

Copper, Lead, Dioxins

#### 2005 Background Comparison Concentrations

Copper: 29 mg/kg

Lead: 34 mg/kg

Dioxins (TCDD TEQ): 0.87 pg/g

#### Copper and/or Lead Sample Location (<2 feet bgs)

≤ Background (BG)

>BG and <2x BG

≥2x BG and <10x BG

≥10x BG and <100x BG

#### Dioxin Sample Location (<2 feet bgs)

≤ Background (BG)

>BG and <2x BG

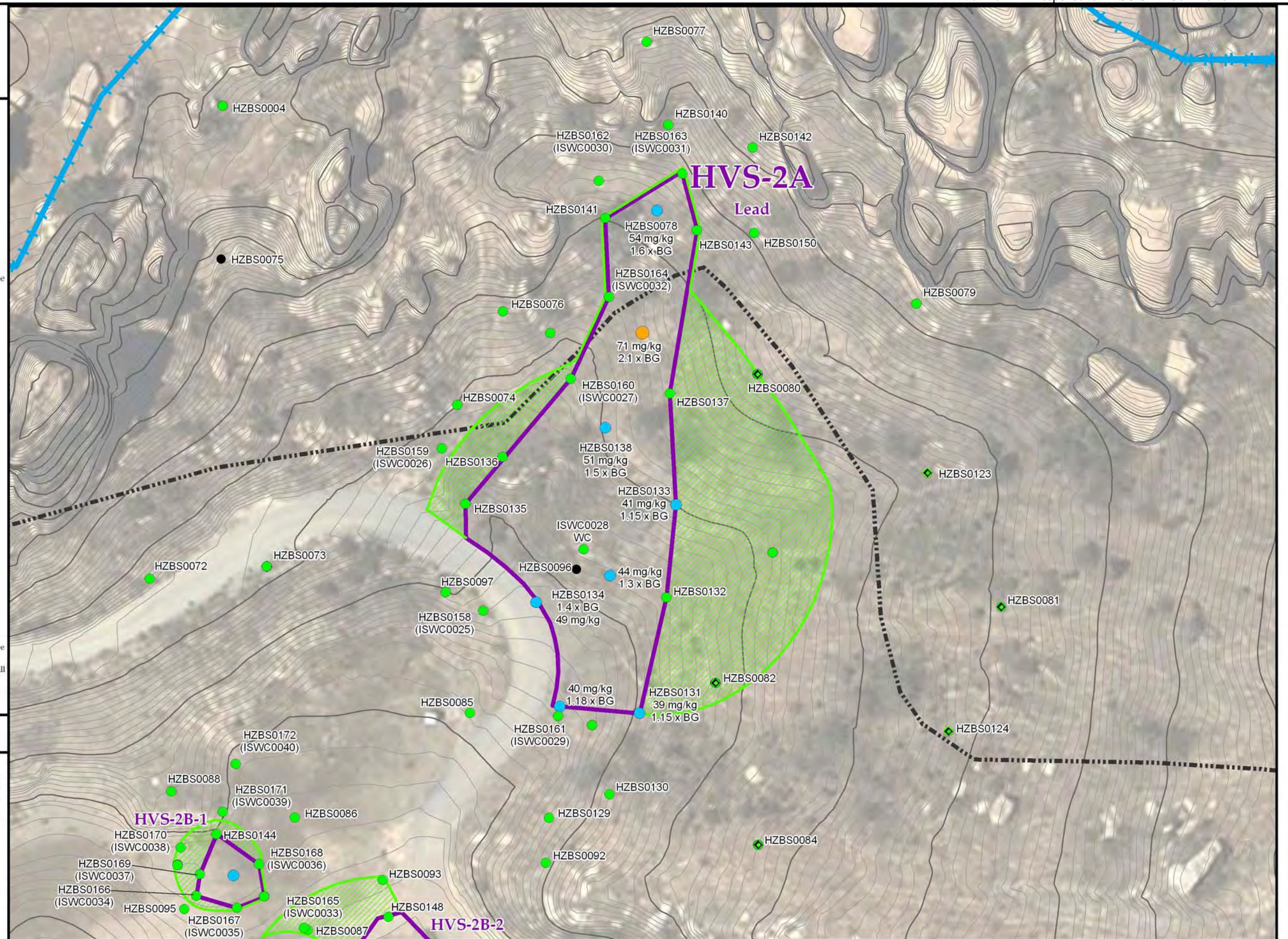
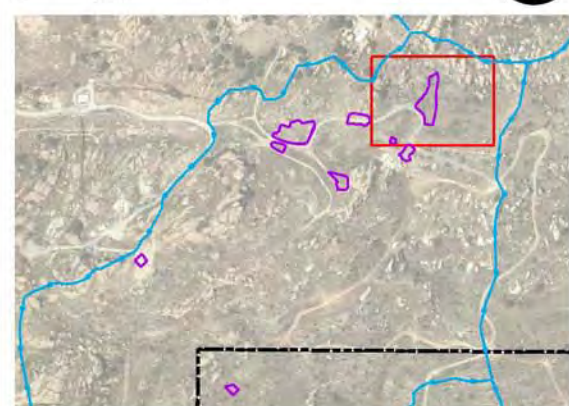
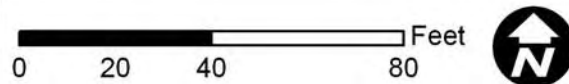
≥2x BG and <10x BG

≥10x BG and <100x BG

≥100x BG

#### Note:











1. Dioxin represents the sum of 17 dioxin furan congener results adjusted for toxicity, normalized to 2,3,7,8-TCDD TEQ
2. "WC" Represents Waste Characterization Sample
3. Locations outside ISRA Areas with sample IDs beginning with "ISWC" will be changed to RFI Sample IDs
4. Extent of local borrow source generalized and approximate. Actual extent will vary based on final excavation extents, as directed by project engineer.
5. Sample IDs shown represent ISRA data gap samples and ISRA waste characterization samples.



SANTA SUSANA FIELD LABORATORY

# Outfall 008 Refined ISRA Areas HVS-2B

## Base Map Legend

-  Administrative Area Boundary
-  RFI Site Boundary
-  Existing Building or Structure
-  Potential Local Borrow Source
-  Preliminary ISRA Evaluation Area
-  Surface Water Drainage
-  Surface Water Divide
-  Excavation Edge Planned To be Graded To be Reestablish Pre-Excavation Drainage Pattern
-  Elevation Contour
-  Outfall Water Divide

### ISRA Constituents of Concern

Copper, Lead, Dioxins

### 2005 Background Comparison Concentrations

Copper: 29 mg/kg  
Lead: 34 mg/kg  
Dioxins (TCDD TEQ): 0.87 pg/g

### Copper and/or Lead Sample Location (<2 feet bgs)

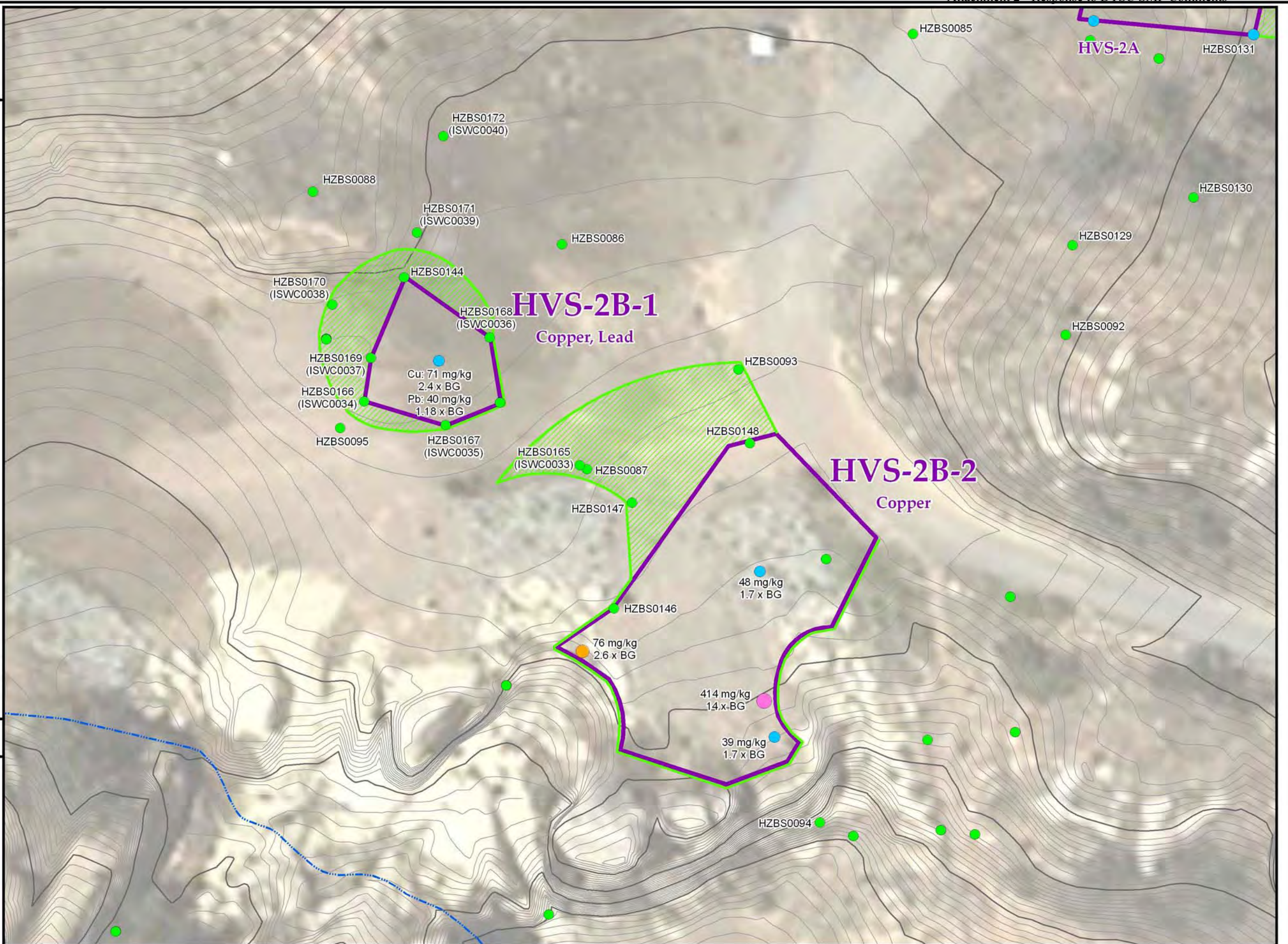
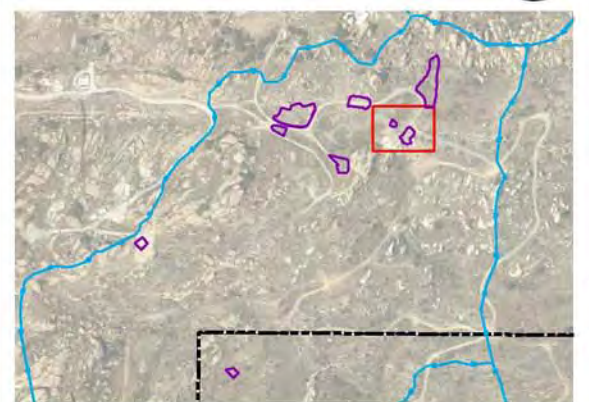
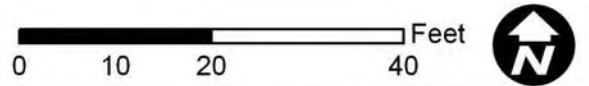
- ≤ Background (BG)
- >BG and <2x BG
- ≥2x BG and <10x BG
- ≥10x BG and <100x BG

### Dioxin Sample Location (<2 feet bgs)

- ◆ ≤ Background (BG)
- ◆ >BG and <2x BG
- ◆ ≥2x BG and <10x BG
- ◆ ≥10x BG and <100x BG
- ◆ ≥100x BG












### Note:

1. Dioxin represents the sum of 17 dioxin/furan congener results adjusted for toxicity, normalized to 2,3,7,8-TCDD TEQ
2. "WC" Represents Waste Characterization Sample
3. Locations outside ISRA Areas with sample IDs beginning with "ISWC" will be changed to RFI Sample IDs
4. Extent of local borrow source generalized and approximate. Actual extent will vary based on final excavation extents, as directed by project engineer.
5. Sample IDs shown represent ISRA data gap samples and ISRA waste characterization samples.



# Outfall 008 Refined ISRA Areas HVS-2C

## Base Map Legend

-  Administrative Area Boundary
-  RFI Site Boundary
-  Existing Building or Structure
-  Potential Local Borrow Source
-  Preliminary ISRA Evaluation Area
-  Surface Water Drainage
-  Elevation Contour
-  Surface Water Divide
-  Outfall Water Divide
-  Excavation Edge Planned to be Graded to Reestablish Pre-Excavation Drainage Pattern
-  Sample On Hold / Sample Results Pending

### ISRA Constituents of Concern

Copper, Lead, Dioxins


### 2005 Background Comparison Concentrations


Copper: 29 mg/kg


Lead: 34 mg/kg


Dioxins (TCDD TEQ): 0.87 pg/g

### Copper and/or Lead Sample Location (<2 feet bgs)


 ≤ Background (BG)


 >BG and <2x BG


 ≥2x BG and <10x BG


 ≥10x BG and <100x BG


### Dioxin Sample Location (<2 feet bgs)

 ≤ Background (BG)

 >BG and <2x BG

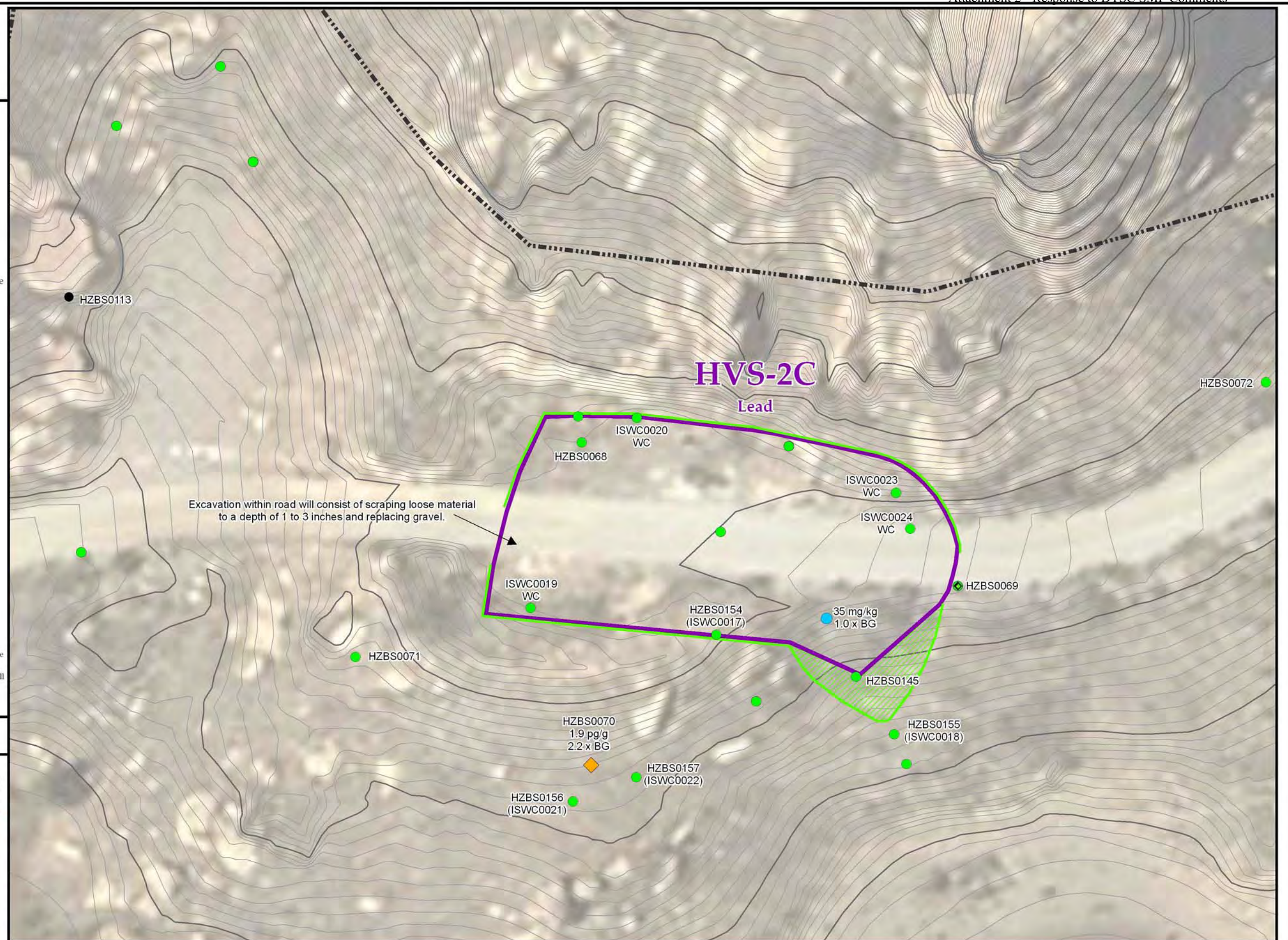
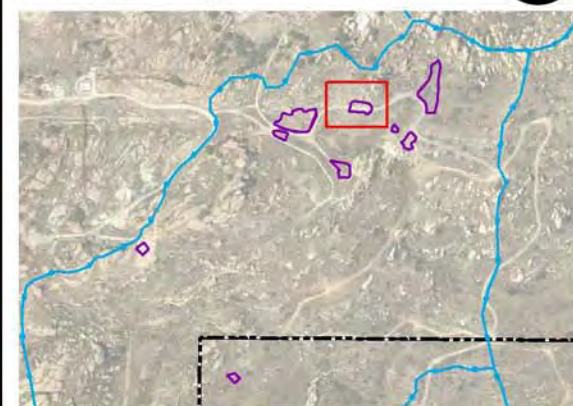
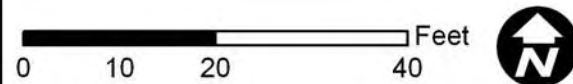
 ≥2x BG and <10x BG

 ≥10x BG and <100x BG

 ≥100x BG

### Note:

1. Dioxin represents the sum of 17 dioxin/furan congener results adjusted for toxicity, normalized to 2,3,7,8-TCDD TEQ
2. "WC" Represents Waste Characterization Sample
3. Locations outside ISRA Areas with sample IDs beginning with "ISWC" will be changed to RFI Sample IDs
4. Extent of local borrow source generalized and approximate. Actual extent will vary based on final excavation extents, as directed by project engineer.
5. Sample IDs shown represent ISRA data gap samples and ISRA waste characterization samples.



### Outfall 008 Refined ISRA Areas HVS-3 and HVS-4

#### Base Map Legend

- Administrative Area Boundary
- RFI Site Boundary
- Existing Building or Structure
- Preliminary ISRA Evaluation Area
- Surface Water Drainage
- Elevation Contour
- Surface Water Divide
- Outfall Water Divide
- Excavation Edge Planned to be Graded to Reestablish Pre-Excavation Drainage Pattern
- Sample On Hold / Sample Results Pending

#### ISRA Constituents of Concern

Copper, Lead, Dioxins

#### 2005 Background Comparison Concentrations

Copper: 29 mg/kg

Lead: 34 mg/kg

Dioxins (TCDD TEQ): 0.87 pg/g

#### Copper and/or Lead Sample Location (-2 feet bgs)

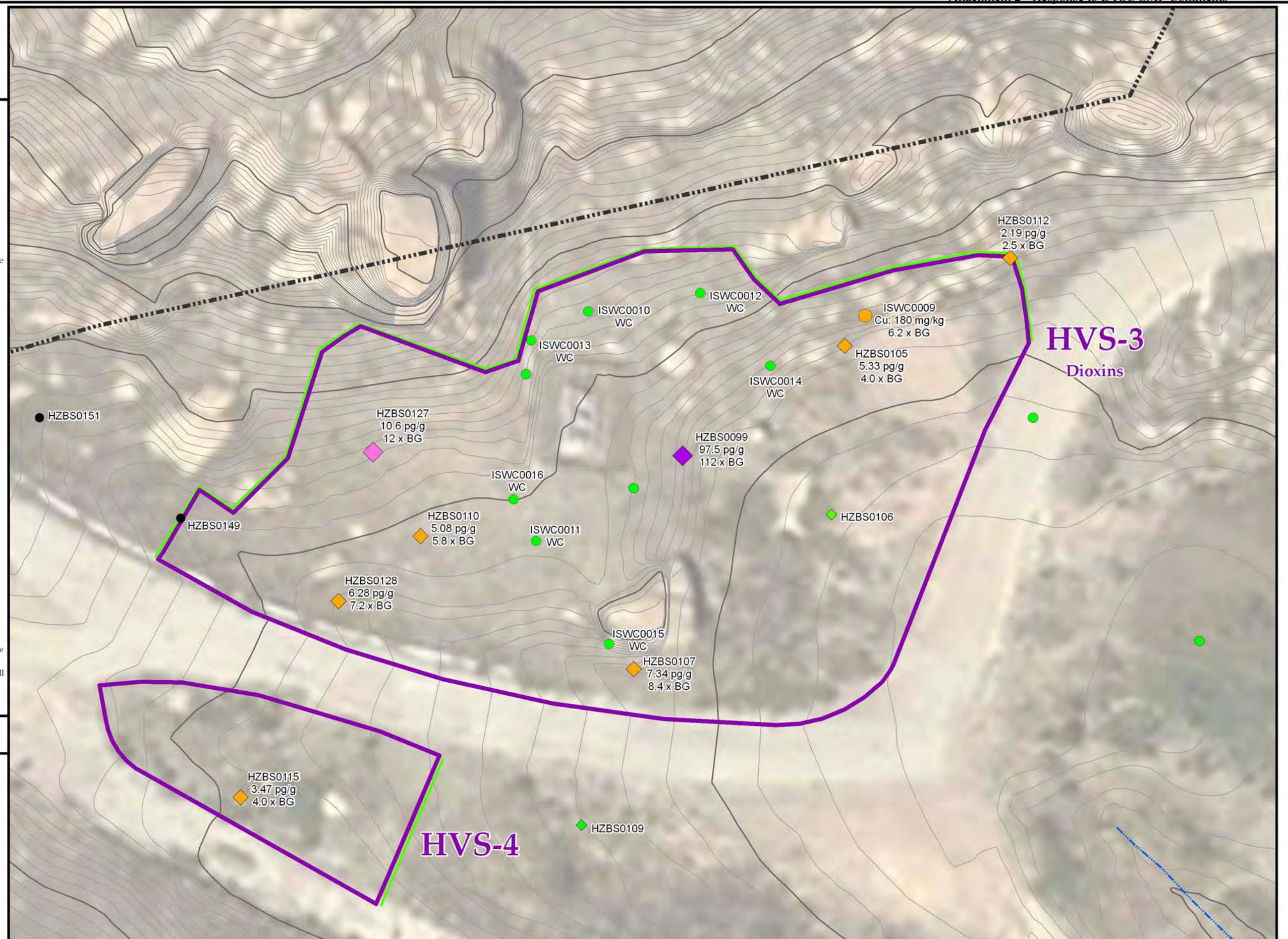
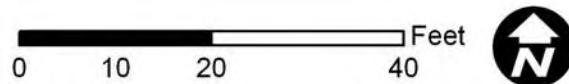
- ≤ Background (BG)
- >BG and <2x BG
- ≥2x BG and <10x BG
- ≥10x BG and <100x BG

#### Dioxin Sample Location (-2 feet bgs)

- ≤ Background (BG)
- >BG and <2x BG
- ≥2x BG and <10x BG
- ≥10x BG and <100x BG
- ≥100x BG

#### Note:

1. Dioxin represents the sum of 17 dioxin/furan congener results adjusted for toxicity, normalized to 2,3,7,8-TCDD TEQ
2. "WC" Represents Waste Characterization Sample
3. Locations outside ISRA Areas with sample IDs beginning with "ISWC" will be changed to RFI Sample IDs
4. Extent of local borrow source generalized and approximate. Actual extent will vary based on final excavation extents, as directed by project engineer.
5. Sample IDs shown represent ISRA data gap samples and ISRA waste characterization samples.



### Outfall 008 Refined ISRA Areas CYN-1

#### Base Map Legend

- Administrative Area Boundary
- RFI Site Boundary
- Existing Building or Structure
- Potential Local Borrow Source
- Preliminary ISRA Evaluation Area
- Surface Water Drainage
- Elevation Contour
- Surface Water Divide
- Outfall Water Divide
- Excavation Edge Planned to be Graded to Reestablish Pre-Excavation Drainage Pattern
- Planned Borrowed Soil Characterization Sample Location

#### ISRA Constituents of Concern

Copper, Lead, Dioxins

#### 2005 Background Comparison Concentrations

Copper: 29 mg/kg  
Lead: 34 mg/kg  
Dioxins (TCDD TEQ): 0.87 pg/g

#### Copper and/or Lead Sample Location (-2 feet bgs)

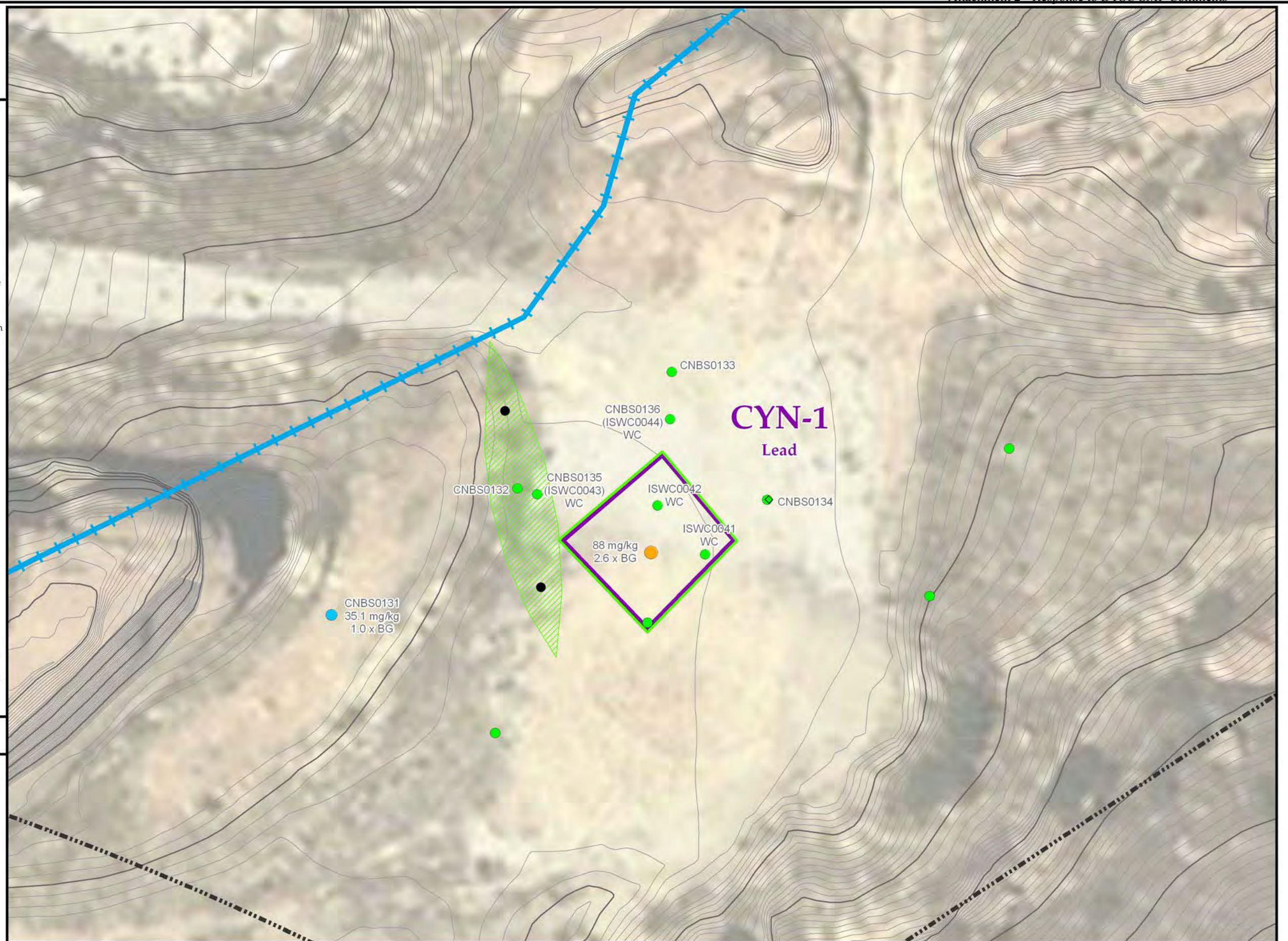
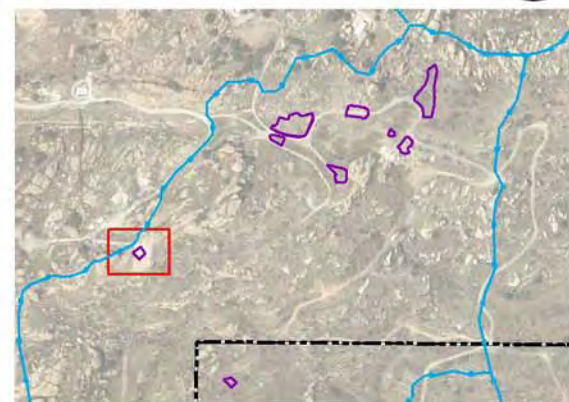
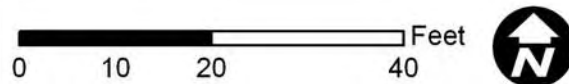
- ≤ Background (BG)
- >BG and <2x BG
- ≥2x BG and <10x BG
- ≥10x BG and <100x BG

#### Dioxin Sample Location (-2 feet bgs)

- ≤ Background (BG)
- >BG and <2x BG
- ≥2x BG and <10x BG
- ≥10x BG and <100x BG
- ≥100x BG

#### Note:

1. Dioxin represents the sum of 17 dioxin/furan congener results adjusted for toxicity, normalized to 2,3,7,8-TCDD TEQ
2. "WC" Represents Waste Characterization Sample
3. Locations outside ISRA Areas with sample IDs beginning with "ISWC" will be changed to RFI Sample IDs
4. Extent of local borrow source generalized and approximate. Actual extent will vary based on final excavation extents, as directed by project engineer.
5. Sample IDs shown represent ISRA data gap samples and ISRA waste characterization samples.












S A N T A S U S A N A F I E L D L A B O R A T O R Y





# Outfall 008 Refined ISRA Areas DRG-1

## Base Map Legend

-  Administrative Area Boundary
-  RFI Site Boundary
-  Existing Building or Structure
-  Preliminary ISRA Evaluation Area
-  Surface Water Drainage
-  Surface Water Divide
-  Outfall Water Divide
-  Elevation Contour
-  Excavation Edge Planned to be Graded to Reestablish Pre-Excavation Drainage Pattern

### ISRA Constituents of Concern

Copper, Lead, Dioxins


### 2005 Background Comparison Concentrations


Copper: 29 mg/kg


Lead: 34 mg/kg


Dioxins (TCDD TEQ): 0.87 pg/g

### Copper and/or Lead Sample Location (<2 feet bgs)


 ≤ Background (BG)


 >BG and <2x BG


 ≥2x BG and <10x BG


 ≥10x BG and <100x BG


### Dioxin Sample Location (<2 feet bgs)

 ≤ Background (BG)

 >BG and <2x BG

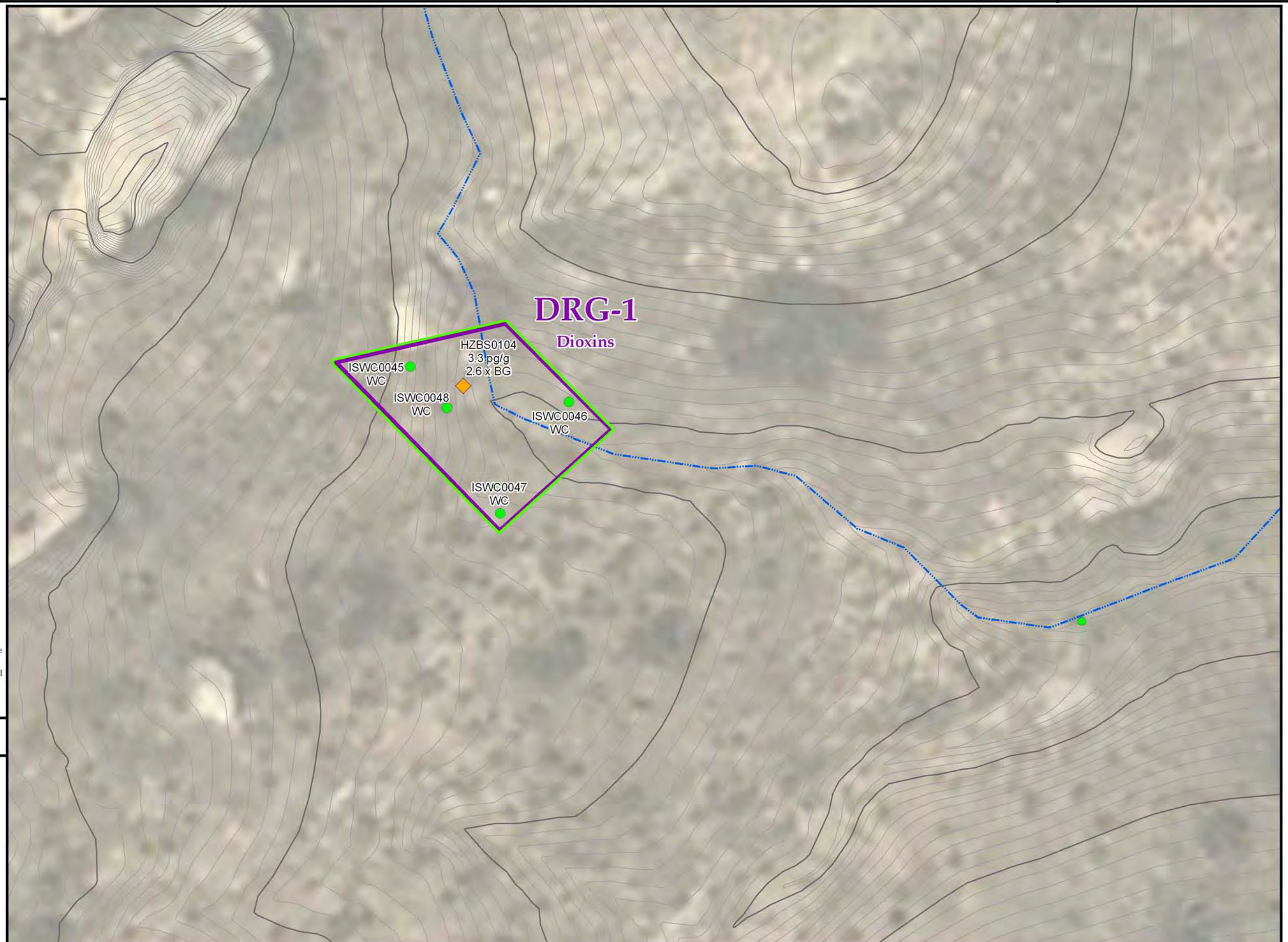
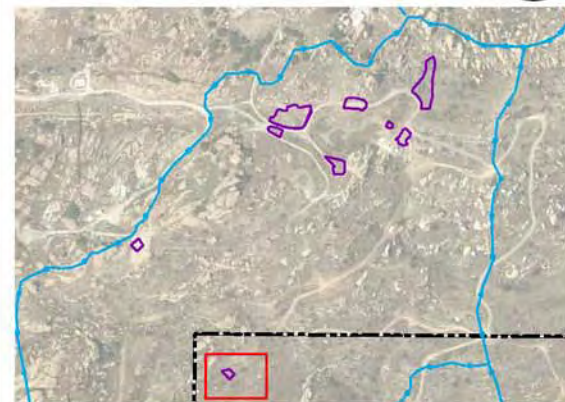
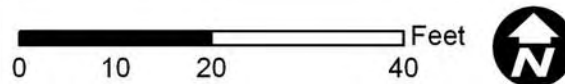
 ≥2x BG and <10x BG

 ≥10x BG and <100x BG

 ≥100x BG

### Note:

1. Dioxin represents the sum of 17 dioxin/furan congener results adjusted for toxicity, normalized to 2,3,7,8-TCDD TEQ
2. "WC" Represents Waste Characterization Sample
3. Locations outside ISRA Areas with sample IDs beginning with "ISWC" will be changed to RFI Sample IDs
4. Extent of local borrow source generalized and approximate. Actual extent will vary based on final excavation extents, as directed by project engineer.
5. Sample IDs shown represent ISRA data gap samples and ISRA waste characterization samples.



S A N T A S U S A N A F I E L D L A B O R A T O R Y

**ATTACHMENT 3**  
**CRITERIA FOR IMPORT FILL**  
**ISRA SOIL MANAGEMENT PLAN RESPONSE TO COMMENTS / ADDENDUM**  
**(Page 1 of 2)**

<i>Compounds</i>	<i>Analytical Method</i>	<i>Screening Criteria</i>
VOCs	EPA 8260	Non-detectable <sup>(a)</sup>
SVOCs	EPA 8270C	Non-detectable <sup>(a)</sup>
PAHs/NDMA	EPA 8270C SIM	Non-detectable <sup>(a)</sup>
PCBs	EPA 8082	Non-detectable <sup>(a)</sup>
Pesticides	EPA 8081	Non-detectable <sup>(a)</sup>
Perchlorate <sup>(b)</sup>	EPA 314M	Non-detectable <sup>(a)</sup>
Energetics	EPA 8330A	Non-detectable <sup>(a)</sup>
Anions	EPA 300.0	Non-detectable <sup>(a)</sup>
Fluoride	EPA 300.0	6.7 mg/kg
Ammonia-N	EPA 350.3	Non-detectable <sup>(a)</sup>
Petroleum Hydrocarbons: C <sub>4</sub> - C <sub>12</sub>	EPA 8015M	10 mg/kg
Petroleum Hydrocarbons: C <sub>8</sub> - C <sub>30</sub>	EPA 8015M	100 mg/kg
Petroleum Hydrocarbons: C <sub>30</sub> - C <sub>40</sub>	EPA 8015B	100 mg/kg

<i>Metals</i>	<i>Analytical Method</i>	<i>SSFL Background Value/Screening Criteria (mg/kg) <sup>(c)</sup></i>	<i>Southern California Background (mg/kg) <sup>(d)</sup></i>
Aluminum	EPA 6010/6020B	20,000	106,000
Antimony	EPA 6010/6020B	8.7	1.95
Arsenic	EPA 6010/6020B	15	11
Barium	EPA 6010/6020B	140	1,400
Beryllium	EPA 6010/6020B	1.1	2.7
Boron	EPA 6010/6020B	9.7	74
Cadmium	EPA 6010/6020B	1	1.7
Calcium	EPA 6010/6020B	NA	45,577
Chromium Total	EPA 6010/6020B	37	1,579
Cobalt	EPA 6010/6020B	21	46.9
Copper	EPA 6010/6020B	29	96.4
Iron	EPA 6010/6020B	28,000	87,000
Lead	EPA 6010/6020B	34	97.1
Lithium	EPA 6010/6020B	37	90
Manganese	EPA 6010/6020B	495	1,687
Mercury	EPA 7471A	0.09	0.9
Molybdenum	EPA 6010/6020B	5.3	9.6
Nickel	EPA 6010/6020B	29	509
Phosphorous	EPA 6010/6020B	NA	97.1
Potassium	EPA 6010/6020B	6,400	30,000
Selenium	EPA 6010/6020B	0.655	0.43
Silver	EPA 6010/6020B	0.79	8.3
Sodium	EPA 6010/6020B	110	73,400
Strontium	EPA 6010/6020B	NA	271
Tin	EPA 6010/6020B	NA	2.44
Titanium	EPA 6010/6020B	NA	12,890
Thallium	EPA 6010/6020B	0.46	1.1
Vanadium	EPA 6010/6020B	62	288
Zinc	EPA 6010/6020B	110	236
Zirconium	EPA 6010/6020B	8.6	610

**ATTACHMENT 3**  
**CRITERIA FOR IMPORT FILL**  
**ISRA SOIL MANAGEMENT PLAN RESPONSE TO COMMENTS / ADDENDUM**  
**(Page 2 of 2)**

<i>Dioxins/Furans</i>	<i>Analytical Method</i>	<i>SSFL Background Value/Screening Criteria (ng/kg) <sup>(c)</sup></i>
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	EPA 8290/1613	13
1,2,3,4,6,7,8-Heptachlorodibenzofuran	EPA 8290/1613	2.5
1,2,3,4,7,8,9-Heptachlorodibenzofuran	EPA 8290/1613	0.19
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	EPA 8290/1613	0.34
1,2,3,4,7,8-Hexachlorodibenzofuran	EPA 8290/1613	0.73
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	EPA 8290/1613	0.95
1,2,3,6,7,8-Hexachlorodibenzofuran	EPA 8290/1613	0.3
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	EPA 8290/1613	1.1
1,2,3,7,8,9-Hexachlorodibenzofuran	EPA 8290/1613	0.43
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	EPA 8290/1613	0.18
1,2,3,7,8-Pentachlorodibenzofuran	EPA 8290/1613	0.59
2,3,4,6,7,8-Hexachlorodibenzofuran	EPA 8290/1613	0.45
2,3,4,7,8-Pentachlorodibenzofuran	EPA 8290/1613	0.64
2,3,7,8-Tetrachlorodibenzo-p-dioxin	EPA 8290/1613	0.5
2,3,7,8-Tetrachlorodibenzofuran	EPA 8290/1613	1.80
Octachlorodibenzo-p-dioxin	EPA 8290/1613	140
Octachlorodibenzofuran	EPA 8290/1613	8.1

<i>Radionuclides</i>	<i>Analytical Method</i>	<i>MDA (pCi/g)</i>
Gamma emitters <sup>(e)</sup>	Gamma Spec, HASL 300	0.213 (Cs-137)
Strontium-90	Modified EPA 905.0	0.13
Tritium	Modified EPA 906.0	0.3

Notes:

- (a) Low detections of laboratory contaminants possible and will be evaluated on a case by case basis. Detection limits will be targeted by the laboratory as specified in the analytical method.
- (b) Perchlorate analysis performed on soil water extract according to RFI protocols to achieve lower reporting limits.
- (c) SSFL site-specific soil background concentrations approved by DTSC in site Standardized Risk Assessment Methodology Work Plan (MWH, 2005). Southern California regional background values provided for reference. As noted in ISRA Work Plan, chemical and radiological background studies by DTSC and EPA ongoing.
- (d) Kearney Study, 1996 (maximum value).
- (e) Gamma spectroscopy library shall include as a minimum: Na-22, K-40, Mn-54, Co-60, Cs-134, Cs-137, Eu-152, Eu-154, Th-228, Th-232, U-235, U-238, Am-241. All other radionuclides in library shall be reported if detected.

Acronyms:

- |  |   |
|--|---|
| ENTS - Engineered Natural Treatment System | PAH - polycyclic aromatic hydrocarbon         |
| EPA - Environmental Protection Agency      | PCB - polychlorinated biphenyl                |
| HASL - Health and Safety Laboratory        | RCRA - Resource Conservation and Recovery Act |
| mg/kg - milogram per kilogram              | RFI - RCRA Facility Investigation             |
| MDA - minimum detectable activity          | SVOC - semi-volatile organic compound         |
| NA - not applicable                        | ug/L - micrograms per liter                   |
| NDMA - N-nitrosodimethylamine              | VOC - volatile organic compound               |

**ATTACHMENT 4**  
**WASTE CHARACTERIZATION SAMPLES**  
**ISRA SOIL MANAGEMENT PLAN RESPONSE TO COMMENTS / ADDENDUM**  
 (Page 1 of 2)

Object ID	Radionuclides *	CAM 17 Metals (6010B/7471A)	VOCs (8260B)	SVOCs (8270C)	PCBs (8082)	96-Hour Acute Aquatic Toxicity LC50
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**CYN-1**

ISWC0041	X	X				
ISWC0042	X	X				
ISWC0094	X	X				
ISWC0095	X	X				

**DRG-1**

ISWC0045	X	X				
ISWC0046	X	X				
ISWC0047	X	X				
ISWC0048	X	X				

**HVS-1**

ISWC0001	X	X				
ISWC0002	X	X				
ISWC0003	X	X				
ISWC0004	X	X				
ISWC0005	X	X				
ISWC0006	X	X				

**HVS-2A**

ISWC0028	X	X				
ISWC0077	X	X				
ISWC0078	X	X				
ISWC0079	X	X				
ISWC0080	X	X				
ISWC0081	X	X				
ISWC0082	X	X				
ISWC0083	X	X				

**HVS-2B-1**

ISWC0084	X	X				
ISWC0085	X	X				

**HVS-2B-2**

ISWC0086	X	X				
ISWC0087	X	X				
ISWC0088	X	X				
ISWC0089	X	X				

**HVS-2C**

ISWC0019	X	X				
ISWC0020	X	X				
ISWC0023	X	X				
ISWC0024	X	X				

**HVS-3**

ISWC0009	X	X				
ISWC0010	X	X				
ISWC0011	X	X				
ISWC0012	X	X				
ISWC0013	X	X				

**ATTACHMENT 4**  
**WASTE CHARACTERIZATION SAMPLES**  
**ISRA SOIL MANAGEMENT PLAN RESPONSE TO COMMENTS / ADDENDUM**  
 (Page 2 of 2)

Object ID	Radionuclides *	CAM 17 Metals (6010B/7471A)	VOCs (8260B)	SVOCs (8270C)	PCBs (8082)	96-Hour Acute Aquatic Toxicity LC50
ISWC0014	X	X				
ISWC0015	X	X				
ISWC0016	X	X				

**HVS-4**

ISWC0090	X	X				
ISWC0091	X	X				
ISWC0092	X	X				
ISWC0093	X	X				

**ELV-1C**

ISWC0049	X	X		X	X	
ISWC0050	X	X		X	X	
ISWC0051	X	X		X	X	
ISWC0052	X	X		X	X	X
ISWC0053	X	X		X	X	
ISWC0054	X	X		X	X	
ISWC0055	X	X		X	X	
ISWC0056	X	X		X	X	
ISWC0057	X	X		X	X	
ISWC0058	X	X		X	X	
ISWC0059	X	X		X	X	
ISWC0060	X	X		X	X	

**ELV-1D**

ISWC0061	X	X	X	X		
ISWC0062	X	X	X	X		
ISWC0063	X	X	X	X		X
ISWC0064	X	X	X	X		
ISWC0065	X	X	X	X		
ISWC0066	X	X	X	X		X
ISWC0067	X	X	X	X		
ISWC0068	X	X	X	X		
ISWC0069	X	X	X	X		X
ISWC0070	X	X	X	X		
ISWC0071	X	X	X	X		
ISWC0072	X	X	X	X		
ISWC0073	X	X	X	X		
ISWC0074	X	X	X	X		X
ISWC0075	X	X	X	X		
ISWC0076	X	X	X	X		

**Notes:**

\* Radionuclide analysis included gamma spectroscopy, strontium-90 and tritium. The laboratory gamma spectroscopy library shall also include the following contaminants-of-concern as a minimum: Na-22, K-40, Mn-54, Co-60, Cs-134, Cs-137, Eu-152, Eu-154, Th-228, Th-232, U-235, U-238 and Am-241. Any detection of any gamma emitting radionuclides in the library was

Due to time constraints, not all waste characterization samples shown on Attachment 2 Figures.

**ATTACHMENT 3**

**Response to RWQCB Comments on ISRA Soil Management Plan; Addendum to  
ISRA Soil Management Plan and Transportation Plan**



**BUILDING A BETTER WORLD**

# MEMORANDUM

TO: Art Lenox/Lori Blair, Boeing  
Allen Elliott/Steve Slaten, NASA

DATE: August 17, 2009

CC: Rick Lainhart, ACOE  
Bill McElroy, CH2M HILL

REF: 1891614

FROM: Dixie Hambrick/Alex Fischl, MWH

SUBJECT: Response to RWQCB Comments on ISRA Soil Management Plan; Addendum for  
ISRA Soil Management Plan and Transportation Plan - Protocol for Handling  
Radioactive Materials during ISRA Project

---

This memorandum provides a response to Regional Water Quality Control Board (RWQCB) comments regarding radiological soil management protocols made on the Interim Source Removal Action (ISRA) Soil Management Plan (SMP) (Attachment 1). This memorandum also serves as an addendum to the ISRA SMP and Transportation Plan prepared to support ISRA activities since it addresses additional soil management and transportation actions required if elevated radionuclide measurements are detected in soils planned for ISRA action.

Included in RWQCB comments on the SMP are comments made by DTSC on the SMP. A response to DTSC comments have been prepared separately, in a memo dated August 17, 2009, which also amends the ISRA SMP. The DTSC responses have been published separately since response to RWQCB comments amends both the ISRA SMP and the Transportation Plan.

## **Background**

In 2007 the Department of Toxic Substances Control (DTSC) required that if Boeing chooses to ship hazardous and/or non-hazardous soils and debris offsite for the Northern Drainage cleanup project, then Boeing must demonstrate the waste does not contain "radioactive material that is not exempt from regulation and licensing or is not expressly authorized for disposal under the Radiation Control Law." For the ISRA project, a similar requirement was presumed to apply, so the procedures developed and approved by DTSC for the Northern Drainage cleanup project have been included for the ISRA project.

### **ISRA Waste Characterization Sampling for Radionuclides**

As per the ISRA Waste Sampling for Radionuclides (Attachment A - ISRA SMP), all of the chemical samples taken for waste disposal characterization shall be split for potential analyses for gamma spectroscopy, strontium-90 and tritium, using an offsite laboratory. Radiological analyses shall be conducted only if the results of chemical analyses determine that offsite disposal is necessary. As specified in the Final ISRA Work Plan (MWH 2009), excavation with offsite disposal is the remedial alternative selected for the 2009 ISRA Areas. Remedial alternatives for remaining ISRA Areas will be documented in an addendum to the ISRA Work Plan.

### **Handling of Materials with Elevated Radionuclides**

The Department of Public Health (DPH) and the DTSC will be notified if wastes are determined to contain radionuclides above background. The need for radiological controls, further waste evaluation and waste disposition shall be determined in consultation with the DPH and DTSC. Depending on the level of contamination, radiological controls could include, but not be limited to, radiation safety training for field personnel, assignment of personnel radiation dosimetry, posting of "Radiation Caution" signs and barriers, and implementation of contamination controls for personnel and equipment. If Boeing (in consultation with DPH and DTSC) determines, by dose assessment, that the waste can be classified as "decommissioned materials" as defined in Executive Order D-62-02 (attached), then the waste may be sent to a Class 1 or Class 2 landfill. If DPH and DTSC determine that the waste should be classified as low-level radioactive waste (LLRW), then the waste will be disposed of at a low-level radioactive waste disposal facility (e.g. EnergySolutions in Clive, Utah). Export approval would be sought from the Southwestern LLRW Commission.





# California Regional Water Quality Control Board

## Los Angeles Region



Linda S. Adams  
Agency Secretary

320 W. 4th Street, Suite 200, Los Angeles, California 90013  
Phone (213) 576-6600 FAX (213) 576-6640 - Internet Address: <http://www.waterboards.ca.gov/losangeles>

Arnold Schwarzenegger  
Governor

### Attachment 1 Response to RWQCB SMP Comments

August 13, 2009

Mr. Thomas D. Gallacher Director, SSFL – Environment, Health & Safety  
The Boeing Company  
Santa Susana Field Laboratory  
5800 Woolsey Canyon Road  
Canoga Park, CA 91304-1148

#### COMMENTS ON SOIL MANAGEMENT PLAN FOR INTERIM SOURCE REMOVAL ACTION SUBMITTED IN RESPONSE TO A CALIFORNIA WATER CODE SECTION 13304 ORDER – THE BOEING COMPANY, SANTA SUSANA FIELD LABORATORY, CANOGA PARK, CA (NPDES NO. CA0001309, CI NO. 6027, SCP NO. 1111, SITE ID NO. 2040109)

Dear Mr. Gallacher:

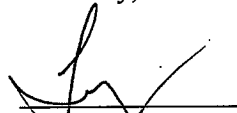
Los Angeles Regional Water Quality Control Board (Regional Board) staff have reviewed the July 10, 2009, *Soil Management Plan* (SMP) submitted in response to a California Water Code Section 13304 Order dated December 3, 2008.

The Boeing Company does not believe that radioactively contaminated soil will be encountered during excavation in the watersheds of Outfalls 008 and 009 as part of Interim Source Removal Actions. However, because of the history of nuclear research and known releases of radioactive material at the Santa Susana Field Laboratory the Regional Board requests that you provide additional information on the disposal of radioactively contaminated soil, if any is encountered.

The SMP indicates that contaminated soil may be disposed of at Antelope Valley, McKittrick, Buttonwillow, and Kettleman City landfills. It is the Regional Board's understanding that these facilities will not accept radioactively contaminated material, including soil with low levels of radiation contamination. Please inform the Regional Board regarding the disposal option in the event radioactive soil is encountered. In addition, the Regional Board received comments from the Department of Toxic Substances Control regarding the SMP (attached) and Ventura County (forwarded via e-mail).

Please provide the Regional Board with your responses to all comments no later than **August 18, 2009**. The responses may be made in an addendum to the SMP or as a modification of the SMP. **Please telephone Mr. Peter Raftery at (213) 576-6724 or email him at [praftery@waterboards.ca.gov](mailto:praftery@waterboards.ca.gov) if you have any questions.**

Sincerely,

  
Tracy J. Egoscue  
Executive Officer

Attachment: DTSC comment letter dated August 3, 2009

cc list next page

**California Environmental Protection Agency**



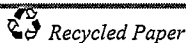
*Our mission is to preserve and enhance the quality of California's water resources for the benefit of present and future generations.*

**Attachment 1  
Response to RWQCB SMP Comments**

cc: Honorable Alex Padilla, Senator 20th District  
Honorable Fran Pavley, Senator, 23rd District  
Honorable Tony Strickland, Senator 19th District  
Assemblymember Bob Blumenfield, Assemblymember 40th District Assembly  
Assemblymember Pedro Nava, Assemblymember 35th District  
Assemblymember Audra Strickland, Assemblymember 37th District  
Mr. Jarrod Degonia, c/o Assemblymember Cameron Smyth  
Ms. Rondi Guthrie, c/o Assemblywoman Audra Strickland  
Ms. Samantha Stevens, c/o Assemblymember Bob Blumenfield  
Mr. Aron Miller, c/o Senator Fran Pavley  
Ms. Linda Parks, Ventura County Board of Supervisors  
Mr. Damon Wing, c/o Ms. Linda Parks, Ventura County Board of Supervisors  
Mr. Gerard Abrams, Department of Toxic Substances Control, Sacramento  
Mr. David Beckman, National Resources Defense Council  
Ms. Lori Blair, Boeing  
Mr. William Bowling  
Mr. Michael Bubman, c/o Bell Creek Homeowners Association  
Ms. Jeannie Chari  
Mr. Paul Costa, Boeing  
Mr. Craig Cooper, Environmental Protection Agency, Region 9  
Mr. Daniel Cooper, Lawyers for Clean Water  
Mr. David Cooper, Environmental Protection Agency, Region 9  
Ms. Elizabeth Crawford  
Ms. Nicole Doner, Ventura County Planning Division  
Ms. Ginn Doose  
Mr. Allen Elliott, National Aeronautics and Space Administration  
Mr. John Farrow, M. R. Wolfe & Associates, P.C.  
Ms. Merrilee Fellows, National Aeronautics and Space Administration  
Mr. Tom Ford, Santa Monica Bay Keeper  
Dr. Mark Gold, Heal the Bay  
Mr. A. J. Greenstein  
Mr. Matt Hagemann, Soil/Water/Air Protection Enterprise  
Ms. Carol Henderson, Office Manager, Bell Canyon Homeowners Association  
Mr. Dan Hirsch, Committee to Bridge the Gap  
Ms. Heather L. Hoecherl Esq., Director of Science and Policy, Heal the Bay  
Mr. Philip Isorena, State Water Resources Control Board, Division of Water Quality  
Ms. Kirsten James, MESM, Staff Scientist, Heal the Bay  
Ms. Stephanie Jennings, United States Department of Energy  
Ms. Barbara Johnson, Susana Knolls Homeowners, Inc.  
Dr. Michael Josselyn, WRA, Inc.  
Mr. Thomas Johnson, ETEC Project Manager, United States Department of Energy  
Ms. Teresa Jordan  
Mr. Thomas Kelly, Environmental Protection Agency, Region 9, (WTR-5)  
Dr. Jae Kim, Tetra Tech

cc list continues on next page

***California Environmental Protection Agency***



*Our mission is to preserve and enhance the quality of California's water resources for the benefit of present and future generations.*

**Attachment 1  
Response to RWQCB SMP Comments**

cc list continued

Mr. Buck King Department of Toxic Substances Control, Sacramento  
Ms. Bonnie Klea  
Mr. Wayne Lee  
Mr. Michael Levy, State Water Resources Control Board, Office of Chief Counsel  
Mr. Michael Lopez, U.S. Department of Energy, Oakland  
Mr. John Luker  
Ms. Carissa Marsh, The Simi Valley Acorn  
Ms. Marie Mason  
Mr. Daniel Maccabee, Brandeis-Bardin Institute  
Mr. Nicole Moutoux, Environmental Protection Agency, Region 9  
Mr. Jerry Murphy, c/o Bell Creek Homeowners Association  
Mr. Jim Pappas, Department of Toxic Substances Control, Sacramento  
Mr. William Paznokas, Department Of Fish and Game, Region 5  
Mr. Sheldon Plotkin, Southern California Federation of Scientists'  
Ms. Bunny Raskin  
Mr. Norm Riley, Department of Toxic, Substances Control, Sacramento  
Ms. Chris Rowe  
Ms. Sharon Rubalcava, Weston, Benshoof, Rochefort, Rubalcava, MacCuish, LLP  
Ms. Darlene Ruiz, Hunter Ruiz Research, Consulting and Advocacy  
Mr. Adam Salkin  
Mr. Mathew Sanders, Paul, Hastings, Janofsky & Walker LLP  
Ms. Lorraine Scott  
Mr. Joseph Smith, Department of Toxic Substances Control, Office of Legal Counsel  
Sacramento  
Dr. Michael Stenstrom, SSFL Stormwater Expert Panel  
Ms. Rebecca Tadesse, Branch Chief of Materials Decommissioning, U.S. Nuclear Regulatory  
Commission  
Ms. Stephanie Trotter, State Water Resources Control Board  
Mr. Rick Verguitz, Water & Environmental Resources Section, Ventura County Watershed  
Protection District  
Mr. Mati Waiya, Wishtoyo Foundation  
Mr. Jack M. Wallace  
Ms. Christina Walsh  
Ms. Marge Weems  
Ms. Darla Weiss, Ventura County Watershed Protection District  
Ms. Mary Wiesbrock  
Dr. Daniel Wiseman, West Hills Neighborhood Council-Santa Monica Mountains Area  
Committee  
Mr. Anthony Zepeda  
Mr. Cybil Zeppieri  
Mr. Lori Zinkan  
Ms. Elizabeth Zlotnik

cc list continues on next page

***California Environmental Protection Agency***



Mr. Thomas D. Gallacher  
The Boeing Company

- 4 -

August 13, 2009

**Attachment 1**  
**Response to RWQCB SMP Comments**

cc list continued

California Coastal Commission, South Coast District  
California State University, Northridge  
City Manager, City of Simi Valley  
City of Los Angeles, Bureau of Engineering, Wastewater Systems Engineering Division  
Department of Health Services, Public Water Supply Branch  
Department of Interior, U.S. Fish and Wildlife Service  
Environmental Protection Agency, Region 9, Office of Radiation Programs  
Environmental Protection Agency, Region 9, Permits Branch (WTR-5)  
Friends of the Los Angeles River  
Los Angeles and San Gabriel Rivers Watershed Council  
Los Angeles County, Department of Health Services  
Los Angeles County, Department of Public Works, Environmental Programs Division  
Masry & Vititoe Law Offices  
NOAA, National Marine Fisheries Service  
Simi Valley Library  
The Boeing Company Santa Susana Field Laboratory  
U.S. Army Corps of Engineers  
ULARA Watermaster  
Ventura County Air Pollution Control District  
Ventura County Environmental Health Division  
Ventura County Public Works  
Water Replenishment District of Southern California

***California Environmental Protection Agency***



*Our mission is to preserve and enhance the quality of California's water resources for the benefit of present and future generations.*

Mr. Thomas D. Gallacher  
The Boeing Company

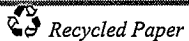
- 5 -

August 13, 2009

**Attachment 1**  
**Response to RWQCB SMP Comments**

s:\!newshareddrive\folders\site cleanup i unit\shared\proj\ss\flowfalls 008 and 009 related\response to 008 009 smp rad disposal issues jul09.doc

***California Environmental Protection Agency***



*Our mission is to preserve and enhance the quality of California's water resources for the benefit of present and future generations.*



## Department of Toxic Substances Control



Linda S. Adams  
Secretary for  
Environmental Protection

Maziar Movassaghi  
Acting Director  
700 Heinz Avenue  
Berkeley, California 94710

**Response to RWQCB SMP Comments**



Attachment

Arnold Schwarzenegger  
Governor

August 3, 2009

Cassandra Owens  
Regional Water Quality Control Board  
Los Angeles Region  
320 West 4<sup>th</sup> Street, Suite 200  
Los Angeles, California 90013

Interim Source Removal Action (ISRA), Soil Management Plan, Santa Susana Field Laboratory, Ventura County, California, dated July 2009

Dear Ms. Owens:

Staff from the Santa Susana Field Laboratory (SSFL) team of the Department of Toxic Substances Control (DTSC) reviewed the *Interim Source Removal Action Soil Management Plan (ISRA SMP)* submitted by the Boeing Company (Boeing). Attached is a review memorandum prepared for Mr. Jim Pappas dated August 3, 2009.

Our review identified the following three items requiring addition information or clarification.

- 1) The ISRA SMP proposes to backfill and re-contour ISRA excavation areas using soil generated from regrading areas adjacent to the excavations. This proposed regrading approach is atypical and will require chemical characterization of the adjacent soils used for backfill. The ISRA SMP should address chemical characterization and documentation of source of soil backfill.
- 2) The ISRA SMP indicates that soil for excavation backfill may also be used from onsite borrow sources or from RWQCB approved offsite borrow sources. The ISRA SMP should include a soil borrow source chemical characterization analyte list.
- 3) The proposed sampling frequency for waste characterization of excavated soils is not specifically described. The ISRA SMP should describe soil sampling and analysis frequency for radionuclides.

Ms. Cassandra Owens  
August 3, 2009  
Interim Source Removal Action Soil Management Plan  
Page 2

*Attachment 1  
Response to RWQCB SMP Comments*

If you have any questions, please contact me at (510) 540-3955 or via email at [BKing@dtsc.ca.gov](mailto:BKing@dtsc.ca.gov).



Mr. Buck King, C.HG  
Senior Engineering Geologist  
Santa Susana Field Laboratory (SSFL) Project Team

cc: Mr. Thomas D. Gallacher  
Director – Safety Health and Environmental Affairs  
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5800 Woolsey Canyon Road  
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George C. Marshall Space Flight Center  
Mail Code: AS10  
Marshall Space Flight Center, Alabama 35812

Ms. Merrilee Fellows  
NASA Manager for Community Involvement  
for Environmental Remediation  
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Mr. Thomas Johnson  
Deputy Federal Project Director  
US Department of Energy  
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Ms. Cassandra Owens  
August 3, 2009  
Interim Source Removal Action Soil Management Plan  
Page 3

*Attachment 1  
Response to RWQCB SMP Comments*

Mr. Arthur Lenox  
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Mr. David Dassler  
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Project Director  
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Project Manager  
Santa Susana Field Laboratory Project Team  
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Sacramento, California 95826-3200

Mr. Gerard Abrams, C.HG.  
Senior Engineering Geologist  
Department of Toxic Substances Control  
8800 Cal Center Drive  
Sacramento, California 95826-3200



Ms. Cassandra Owens  
August 3, 2009  
Interim Source Removal Action Soil Management Plan  
Page 4

*Attachment 1  
Response to RWQCB SMP Comments*

Mr. Paul Carpenter, C. HG.  
Senior Engineering Geologist  
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Chatsworth, California 91311

Mr. Larry Woodson  
Public Participation Supervisor  
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Mr. Eric Maher  
Senior Hazardous Substances Scientist  
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Department of Toxic Substances Control  
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Sacramento, California 95812-0806



# Department of Toxic Substances Control



Attachment  
**Response to RWQCB SMP Comments**

Maziar Movassaghi, Acting Director  
700 Heinz Avenue, Suite 200  
Berkeley, California 94710

Arnold Schwarzenegger  
Governor



Linda S. Adams  
Secretary for  
Environmental Protection

To: Jim Pappas, P.E.  
Senior Engineering Geologist  
Northern California Permitting and Corrective Action Branch  
Hazardous Waste Management Program

From: Buck King, C.H.G. *Buck King*  
Senior Engineering Geologist  
Geologic Services Branch

Date: August 3, 2009

Re: Interim Source Removal Action, Soil Management Plan

PCA: 22120

Site Code: 530033-48

MPC: 37

Staff from the Geological Service Unit (GSU) of the Geologic Services Branch of the Department of Toxic Substances Control (DTSC) reviewed the work plan titled *Interim Source Removal Action Soil Management Plan, Santa Susana Field Laboratory, Ventura County California (ISRA SMP)* dated July 2009.

## Previous DTSC Comments on Final ISRA Work Plan

The ISRA SMP was reviewed for its responses to previous DTSC comments and concerns (DTSC Letter from Mr. Buck King to Ms. Cassandra Owens dated June 4, 2009) identified during review of the Final ISRA Work Plan dated May 1, 2009. The DTSC letter identified three issues in the Final ISRA Work Plan that should be addressed in the subsequent ISRA SMP. The DTSC June 4, 2009 comments are summarized in the ISRA SMP responsiveness discussion below. Boeing responded to DTSC comments in an *Addendum to Final Interim Source Removal Work Plan (ISRA WP Addendum)* dated June 19, 2009. The ISRA WP Addendum generally addressed the DTSC comments and indicated additional information would be included in the ISRA SMP.

## ISRA SMP Responsiveness to Previous DTSC Comments

The ISRA SMP was reviewed for its technical content and responsiveness to previous DTSC comments.

In response to DTSC Comment 1 requesting additional information regarding radiologic screening and contingency waste management plans in the event unforeseen items or waste are encountered, the ISRA SMP was found to contain a discussion of the radionuclide screening process and soil management procedures. The ISRA SMP indicates that soil samples will be collected and analyzed for a designated suite of radionuclides for waste characterization purposes and includes Attachment A providing additional ISRA Waste radionuclide sampling information. The Attachment A indicates that in the event radionuclides are detected above background levels, the Department of Public Health and DTSC will be notified and the need for further waste evaluation or alternate waste disposition will be determined.

In response to DTSC Comment 2 requesting that the soil confirmation sampling description include a clear reference to use of sampling method EPA Method 5035 for analysis of VOCs in soil, the ISRA SMP was found to contain clear statements indicating use of EPA Method 5035 soil collection method for soil VOC analysis.

In response to DTSC Comment 3 requesting that the SMP describe soil stockpile photo ionization detector (PID) action levels used to fulfill the requirements for Ventura County Air Pollution Control District, the ISRA SMP was found to contain soil stockpile reactive organic compound (ROC) emissions monitoring information including the 50 parts per million (ppm) by volume PID criteria.

### **ISRA SMP Comments**

SMP1. The ISRA SMP proposes to backfill and re-contour ISRA excavation areas using soil generated from regrading areas adjacent to the excavations. This proposed regrading approach is atypical and will require chemical characterization of the adjacent soils used for backfill. The ISRA SMP should address chemical characterization and documentation of source of soil backfill.

SMP2. The ISRA SMP indicates that soil for excavation backfill may also be used from onsite borrow sources or from RWQCB approved offsite borrow sources. The ISRA SMP should include a soil borrow source chemical characterization analyte list.

SMP3. The proposed sampling frequency for waste characterization of excavated soils is not specifically described. The ISRA SMP should describe soil sampling and analysis frequency for radionuclides.

### **General ISRA Project Comments**

GC1. As stated in the letter from Jim Pappas to Cassandra Owens dated March 19, 2009, the purpose of the ISRA is cleanup of soil to prevent violations of RWQCB NPDES effluent limitations and that DTSC will not consider the removal to be SB 990 compliant unless, after DTSC completes its investigation of these areas, the affected areas are determined to meet SB 990 standards.

GC2. Boeing is responsible for managing and handling all hazardous wastes from this operation pursuant to Title 22 requirements. If Boeing, or the LA RWQCB have any questions or need assistance regarding the adequacy of the ISRA SMP description of characterization of radiological materials, they can contact Mr. James Thomas or Mr. Gary Butner of the Department of Public Health, Radiological Health Branch.

GC3. Until such time as the revised background study and SB 990 compliant risk-based screening levels are approved by DTSC, DTSC is not in a position to approve the placement of any on-site or offsite soil borrow materials. Therefore, although the placement of non-DTSC approved soil borrow material may be adequate for meeting NPDES requirements, whether this soil borrow material can meet SB 990 requirements will not be determined until the new background and Risk-Based Screening Levels are developed.

### **Conclusions**

The GSU recommends that ISRA SMP be revised in response to the request for additional information described above regarding: (1) chemical characterization and documentation of source of adjacent soil used for backfill; (2) chemical characterization and documentation of source of onsite and offsite borrow soils used; and (3) soil sampling and analysis frequency for radionuclides.

If you have any questions or comments, please contact me at (510) 540-3955

Cc: File