The Boeing Company
Santa Susana Field Laboratory
5800 Woolsey Canyon Road
Canoga Park, CA 91304-1148

Certified Mail

November 17, 2009
In reply refer to SHEA-109343

Regional Water Quality Control Board
Los Angeles Region
320 West 4th Street, Suite 200
Los Angeles, CA 90013

Attention: Ms. Cassandra Owens

Subject: *Technical Report, Revegetation for Outfall 008*
prepared by Michael Josselyn, Ph. D., Expert Panel Representative
Final Interim Source Removal Action (ISRA) Work Plan submitted in response to California Water Code Section 13304 Order (NPDES No. CA0001309, CI No. 6027, SCP No. 1111, Site ID No. 2040109)

Dear Ms. Owens:

The Boeing Company (Boeing), on behalf of the Surface Water Expert Panel, wishes to provide the attached *Technical Report, Re-vegetation in the Outfall 008 Watershed* prepared by Dr. Michael Josselyn, a representative from the Surface Water Expert Panel. This report has been prepared in conjunction with the Expert Panel's involvement in the Final Interim Source Removal Action (ISRA) project.

If you have any questions or require anything further, please contact Lori Blair at 818-466-8741.

Sincerely,

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

LNB:bjc
Attachment: *Technical Report, Revegetation in the Outfall 008 Watershed*
Photographs of planting activity in Happy Valley areas

cc: Mr. Peter Raftery, RWQCB
Mr. Buck King, DTSC
Mr. Paul Carpenter, DTSC
Mr. Jim O'Tousa, Ventura County
Dr. Michael Josselyn, Surface Water Expert Panel
Mr. Jon Jones, Surface Water Expert Panel

TECHNICAL REPORT
REVEGETATION IN THE OUTFALL 008 WATERSHED

Prepared by:

Michael Josselyn, PhD
Expert Panel Representative

October 30, 2009

Introduction

The Expert Panel, through its representative for the ISRA program, Dr. Michael Josselyn, has been participating in the review of the progress being made by Boeing on the ISRA sites within the watershed of Outfall 008. The Panel has appreciated the opportunity to make recommendations to Boeing and the agencies during this process and to be present during site visits. Because soil erosion is an important factor in transport of pollutants off the property, the Panel has taken particular interest in measures to control soil loss from the ISRA sites and along drainages leading to Outfall 008.

Plant materials that were being grown under contract for the ENTS program are currently available and offer a potential means to reduce soil erosion within existing drainages. These plants were originally chosen for their potential to be installed in ENTS facilities that are wetter than the surrounding vegetative communities, but can be installed in natural drainages.

This memo sets forth the recommendations made by Dr. Josselyn on the installation of these plant materials in Watershed 008. The other members of the Expert Panel agree with these recommendations

Available Plants

Plant species were originally selected for the purpose of revegetating the ENTS (Table 1). The species were selected for their ability to withstand both flooding and periods of drought. These plants require periodic wet conditions when long-term irrigation is not provided.

Table 1. Containerized Plants Available for Boeing SSFL

Species Name	Common Name	Container Size	QTY Available	Recommended Min Spacing (ft)
Baccharis pilularis	Coyote brush	1 gal	497	3.25
Baccharis salicifolia	Mulefat	1 gal or depot	4288	4
Sambucus mexicana	Blue elderberry	1 gal or depot	420	5
Artemisia douglasiana	California mugwort	1 gal	69	1.5
Leymus triticoides	Beardless wild-rye	1 gallon	300	1

Proposed Planting Locations

Planting sites in Watershed 008 that present the best options for survival of the plants and that offer benefits of erosion control and sediment stabilization were selected.

Planting sites were evaluated on the basis of:

- Location in the watershed to provide natural wetland or riparian hydrology to support the plants over the long-term.
- Potential to provide water quality benefits including erosion control, bank stabilization, and channel stabilization.
- Availability and feasibility of installing temporary irrigation.

The selected planting sites within the watershed of Outfall 008 are located primarily in existing natural drainages and the vegetation is expected to provide stabilization along the drainage. In addition, planting area HV-PLANT1 is proposed in an area outside of the existing drainage in an abandoned road with no existing vegetation. A small gully has formed along the road and planting in this area is expected to reduce the continued establishment of a larger gully and hold soil in place in unvegetated areas adjacent to the gully. The upper portion of planting area HV-PLANT5 is an area with flat topography with a drainage pipe that provides drainage for the entire area. The drainage pipe will be filled to restore hydrology to the area, which will allow a larger area for water retention and plant establishment.

It is recommended that plants be irrigated for one to two years because it is common for SSFL to have long periods of drought and high temperatures, even during winter months. It is not recommended to plant where irrigation is not available. A 5,000-gallon tank will be installed that will be filled by water truck one to three times per month. A watering schedule for the proposed plantings has been recommended and provided to Boeing.

The attached figures and table illustrate the proposed planting locations, plant quantities to be installed, and the technical installation specifications for the plant installation. The plant quantities proposed for Watershed 008 are a portion of the plants available, with the remaining plants to be distributed elsewhere on the SSFL site, including the culvert modification areas in the Outfall 009 watershed.

As illustrated in the drawings, mulefat wattles are recommended for installation at 25-feet intervals in the drainage above Outfall 008. Mulefat whips and poles will be collected from on site and the brush wattles will be constructed and installed as shown in the attached details. Boeing biological contractors will oversee the collection of the mulefat to ensure that existing mulefat plants are not overly harvested. The mulefat wattles are expected to provide stabilization and small-scale water retention within the drainage to support mulefat establishment and provide sediment retention. In larger runoff events, and prior to the vegetation becoming well established, the wattles and plants could be damaged by larger channel flows.

Expected Outcome

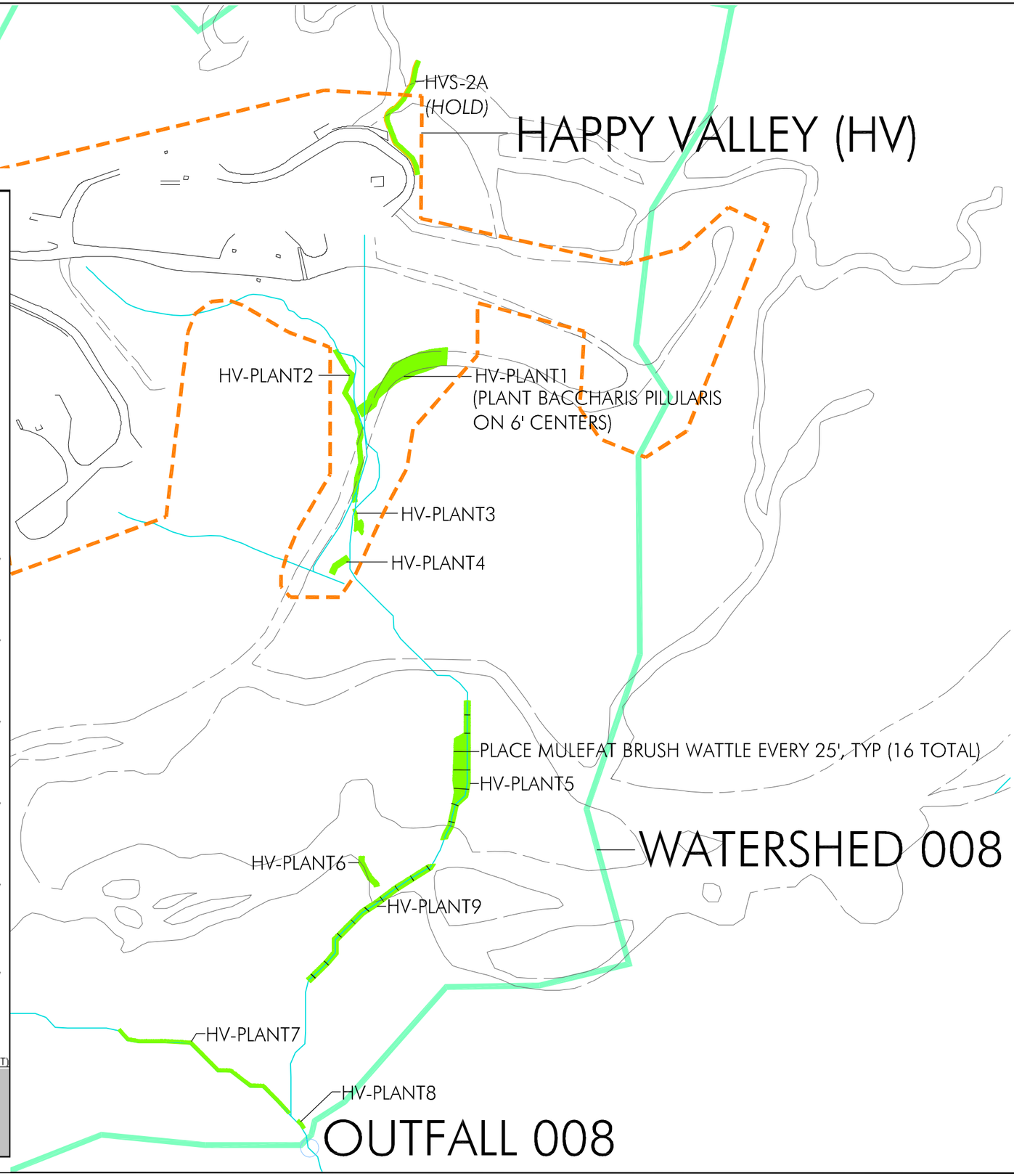
The areas of planting within existing natural drainages and adjacent areas with erosion issues, in combination with areas of brush wattle installation, will increase sediment capture, stabilize the drainage, and reduce erosion.

FIGURES & DETAILS

HAPPY VALLEY PLANT LEGEND

Area Name	Estimated Area (sf)	Recommended Species	Recomended Quantity	Irrigation
HVS-2A (HOLD)	1092	*Baccharis pilularis*	0	Hard pipe from fire line
		Baccharis salicifolia	(72)	Spray or Drip
		Sambucus mexicana	0	
		Artemisia douglasiana	0	
		Leymus triticoides	(100)	
HV-PLANT 1	2979	*Baccharis pilularis*	86	Hard pipe from fire line
		Baccharis salicifolia	10	Spray or Drip
		Sambucus mexicana	0	
		Artemisia douglasiana	0	
		Leymus triticoides	20	
HV-PLANT 2	1334	*Baccharis pilularis*	128	Hard pipe from fire line
		Baccharis salicifolia	0	Spray
		Sambucus mexicana	0	
		Artemisia douglasiana	0	
		Leymus triticoides	30	
HV-PLANT 3	222	*Baccharis pilularis*	0	Hard pipe from fire line
		Baccharis salicifolia	0	Spray or Drip
		Sambucus mexicana	4	
		Artemisia douglasiana	40	
		Leymus triticoides	0	
HV-PLANT 4	233	*Baccharis pilularis*	0	Hard pipe from ex. spray
		Baccharis salicifolia	15	Spray or Drip
		Sambucus mexicana	2	
		Artemisia douglasiana	10	
		Leymus triticoides	0	
HV-PLANT 5	2759	*Baccharis pilularis*	0	Hard pipe from ex. spray
		Baccharis salicifolia	189	Drip
		Sambucus mexicana	8	
		Artemisia douglasiana	0	
		Leymus triticoides	60	
HV-PLANT 6	330	*Baccharis pilularis*	0	Hard pipe from ex. spray
		Baccharis salicifolia	22	Spray or Drip
		Sambucus mexicana	0	
		Artemisia douglasiana	0	
		Leymus triticoides	0	
HV-PLANT 7	985	*Baccharis pilularis*	0	Hard pipe from ex. spray
		Baccharis salicifolia	65	Spray or Drip
		Sambucus mexicana	4	
		Artemisia douglasiana	0	
		Leymus triticoides	30	
HV-PLANT 8	50	*Baccharis pilularis*	0	Hard pipe from ex. spray
		Baccharis salicifolia	3	Spray or Drip
		Sambucus mexicana	0	
		Artemisia douglasiana	0	
		Leymus triticoides	0	
HV-PLANT 9	1904	*Baccharis pilularis*	0	Hard pipe from ex. spray
		Baccharis salicifolia	125	Spray or Drip
		Sambucus mexicana	0	
		Artemisia douglasiana	0	
		Leymus triticoides	0	
				ON CENTER SPACING (FT)
OCT 28 DELIVERY TOTAL:		*Baccharis pilularis*	214	3.25*
11888		*Baccharis salicifolia*	430	4
		Sambucus mexicana	18	5
		Artemisia douglasiana	50	1.5
		Leymus triticoides	140	1
			851	

*NOTE: ON CENTER SPACING FOR BAPI IN HV-PLANT1 IS 6'



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Boeing SSFL

Watershed 008

Figure 1

Happy Valley Containerized Planting Areas

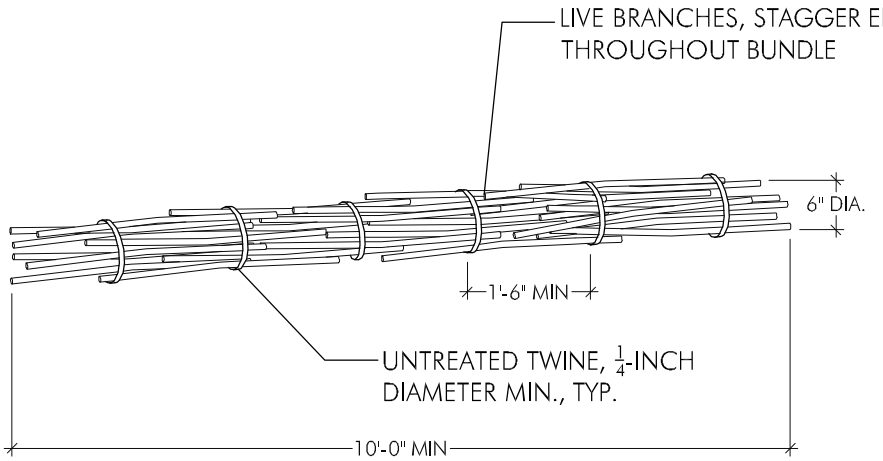
N

0' 150'

LEGEND

- PLANTING AREA
- WATERSHED
- RFI BOUNDARY
- STREAMS
- MULEFAT WATTLES

Date: October 2009
Image Date:
Image Source:
Map By: Megan Stromberg
Filepath: L:\Acad 2000 Files\17000-17188\dwg\Containerized Planting - Fall 2009\Containerized Planting Areas - Oct 2009.dwg



NOTES:

1. WOODY MATERIAL SHALL BE BRANCHES FROM BACCHARIS SALICIFOLIA (MULEFAT) WITH AN AVERAGE DIAMETER BETWEEN $\frac{1}{2}$-INCH AND 1 INCH AND NOT LESS THAN 4 FEET IN LENGTH. THE BRANCH SHALL BE STRIPPED OF LEAVES PRIOR TO BUNDLING.
2. BRANCHES SHALL BE SELECTED FROM A MINIMUM OF FIVE INDIVIDUAL PLANTS. NO MORE THAN 20% OF AN INDIVIDUAL SHRUB SHALL BE CUT. BRANCHES SHALL BE REMOVED EVENLY THROUGHOUT THE ENTIRE SHRUB TO MAINTAIN AN EVEN BRANCHING PATTERN.
3. SECURE BRUSH WATTLE WITH TWINE BY WRAPPING TWICE AROUND BRUSH BUNDLE, TIGHTENING AND TYING OFF WITH A NON-SLIPPING KNOT SUCH AS A SURGEON'S KNOT.
4. STORE BRUSH WATTLES WRAPPED IN WET BURLAP IN A SHADED AREA.

BRUSH WATTLE FABRICATION

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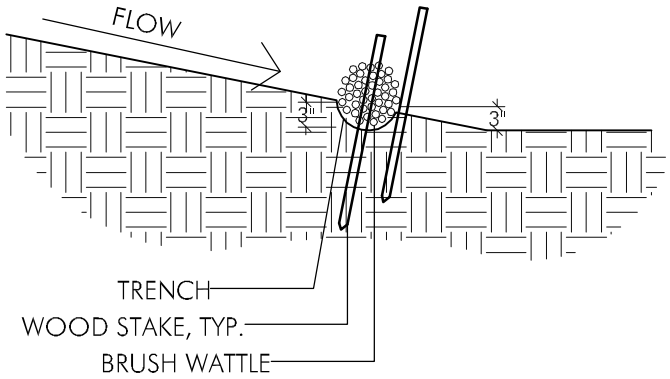

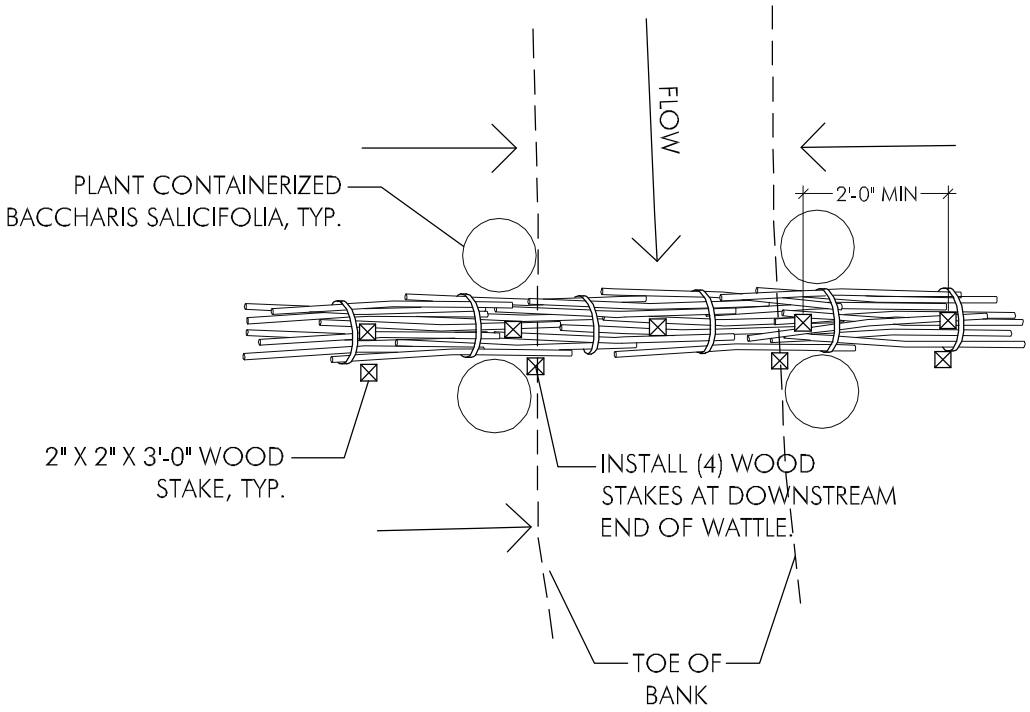

NOTES:

1. FIRMLY COMPACT LOOSE SOIL AROUND BRUSH WATTLE.
2. ATTACH BRUSH WATTLE TO THE WOOD STAKES INSTALLED AT THE DOWNSTREAM END OF THE WATTLE WITH TWINE.

BRUSH WATTLE CHECK DAM INSTALLATION DETAIL

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