

## **APPENDIX J-2**

Revegetation Report  
By Paul Kielhold, April 2009

**REVEGETATION REPORT**

**SUPER CREEK QUARRY – CA MINE ID # 91-33-0003**

**WHITEWATER, COUNTY OF RIVERSIDE, CALIFORNIA**

**Prepared for:**

**Whitewater Rock and Supply Company  
58645 Old Highway 60  
Whitewater, CA 92282**

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**April 2009**

# TABLE OF CONTENTS

SECTION	PAGE
Introduction .....	1
Location .....	1
Site Description .....	1
1. Preparation of Areas for Revegetation .....	3
2. Plant Salvage and Salvage Nurseries .....	5
3. Growth Media Salvage and Storage .....	5
4. Baseline Vegetation Data Collection and Analysis .....	5
5. Seed Collection and Storage .....	6
6. Plant Production .....	6
7. Exotic Species Control .....	6
8. Results of Reclamation Tests .....	6
9. Reclamation Success .....	7
<b>FIGURES</b>	
Figure 1. Regional Location Map .....	2
Figure 2. Revegetation Islands Location Map .....	4
<b>TABLES</b>	
Table 1. Seeding Rates for Revegetation .....	3
Table 2. Summary of Vegetation Baseline Data .....	6
<b>APPENDICES</b>	
Appendix A - Site Photographs	
Appendix B – Seed Tag	
Appendix C – Soil Analysis	

## **Introduction**

This report of revegetation efforts at the Super Creek Quarry is prepared for the use of Mr. Allan Bankus of Whitewater Rock and Supply Company. The Super Creek Quarry is within the city limits of Desert Hot Springs, approximately 2½ miles north of Interstate Highway 10 at Whitewater, California (Figure 1).

The vegetation in the surrounding area is described in previous reports. Two of those reports were prepared by Biological Resource Specialists, 2005. Those reports are titled, "*Baseline Biological Survey for the Proposed Whitewater Rock & Supply Company's Super Creek, 12.3 acre Quarry Expansion, Desert Hot Springs, Riverside County, California*" and its addendum "*2005 Spring Survey for the Proposed Whitewater Rock & Supply Company's Super Creek, 12.3 Acre Quarry Expansion and Potential Super Creek Debris Basin, Desert Hot Springs, Riverside County, California*". The third report, "*Description of Biological Resources, Super Creek Quarry-Proposed SW Overburden Area, Desert Hot Springs, Riverside County, California*", was prepared by Paul Kielhold in September 2008.

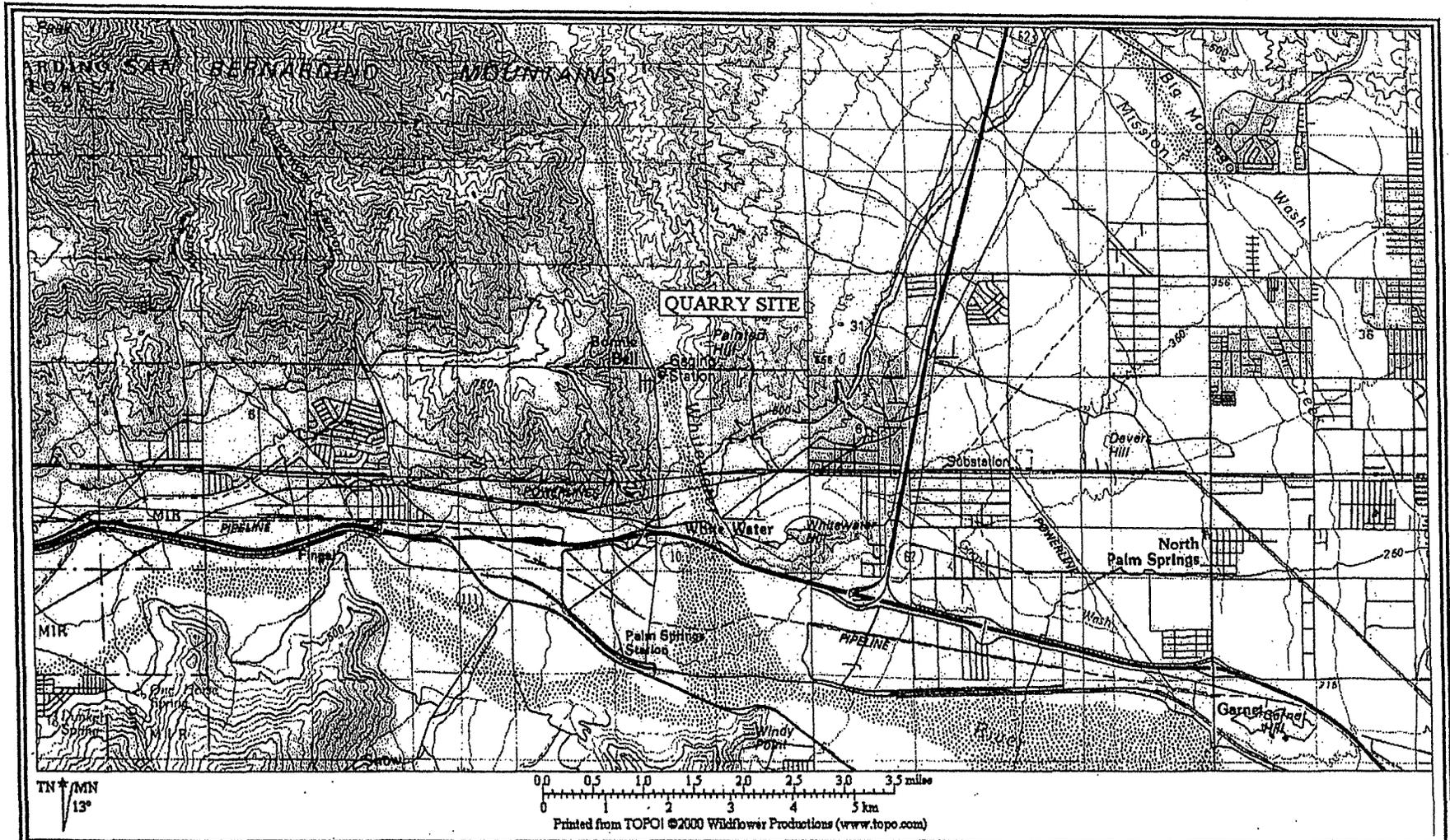
This report documents implementation of actions required by the Super Creek Quarry reclamation plan, (Riverside County RP137), September 1993, which supplemented the 1978 reclamation plan (RP 108). Additional detail is included in the "*Revegetation Plan for Super Creek Quarry, City of Desert Hot Springs, Riverside County, California*", by LSA Associates, 2006 and the "*Whitewater Rock and Supply Company Super Creek Quarry – CA Mine ID #91-33-0003 Revegetation and Monitoring Report – 2008*" by Paul Kielhold, September 2008. The format of this report follows that of the 2008 report.

## **Location**

The Super Creek Quarry is located at the east end of the San Gorgonio pass, which is an east-west trending pass separating the San Bernardino Mountains on the north from the San Jacinto Mountains on the south. It is located at the western edge of the Sonoran desert region. The Super Creek Quarry is generally located within the northwest ¼ of the southwest ¼ of Section 36, Township 2 South, Range 3 East, San Bernardino Base and Meridian and is shown on the *White Water, California*, U. S. Geological Survey, 7½ minute quadrangle map.

## **Site Description**

The quarry sits upon a rocky ridge which separates the Whitewater River on the west from the north end of the Coachella valley on the east. The site slopes steeply to the east and south and has highly variable rainfall typical of desert areas. The average annual rainfall is 5.2 inches at the Palm Springs airport. Elevations range from 1925 feet above sea level at the southeast corner of the quarry to 2400 feet above sea level at the northwest corner. Vegetation is generally described Sonoran Creosote Bush Scrub with elements of Juniper Woodland. Land use in the vicinity is dominated by wind turbines for electric power generation and open space. The site is subject to strong gusty winds prevailing from the west.



**REGIONAL LOCATION MAP  
 SUPER CREEK QUARRY  
 DESERT HOT SPRINGS, RIVERSIDE COUNTY, CALIFORNIA**

**FIGURE 1**

## Revegetation Activities at Super Creek Quarry: December 2008 – April 2009

The following items are identified in the revegetation plan (LSA, 2006; page 14) and their status was reported in the Monitoring Report (Kielhold, 2008).

### 1. Preparation of Areas for Revegetation

Excavation has not been completed in any area of the quarry therefore there are no areas within the quarry to prepare for revegetation. The slopes outside the quarry were prepared and planted beginning in December 2008 and ending in April 2009. Two (2) "islands" ("A" and "B") were prepared and planted on the slopes (Figure 2).

The first island ("A") is located upon an older surface which has been subject to wind and removal of fines and has become "encrusted". The second surface island ("B") is not encrusted. Island "A" is approximately 100 feet wide and 300 feet long sloping to the north. Island "B" is approximately 130 feet wide and 160 feet long sloping to the east. Island "A" contains 10 terraces and Island "B" contains 6 terraces.

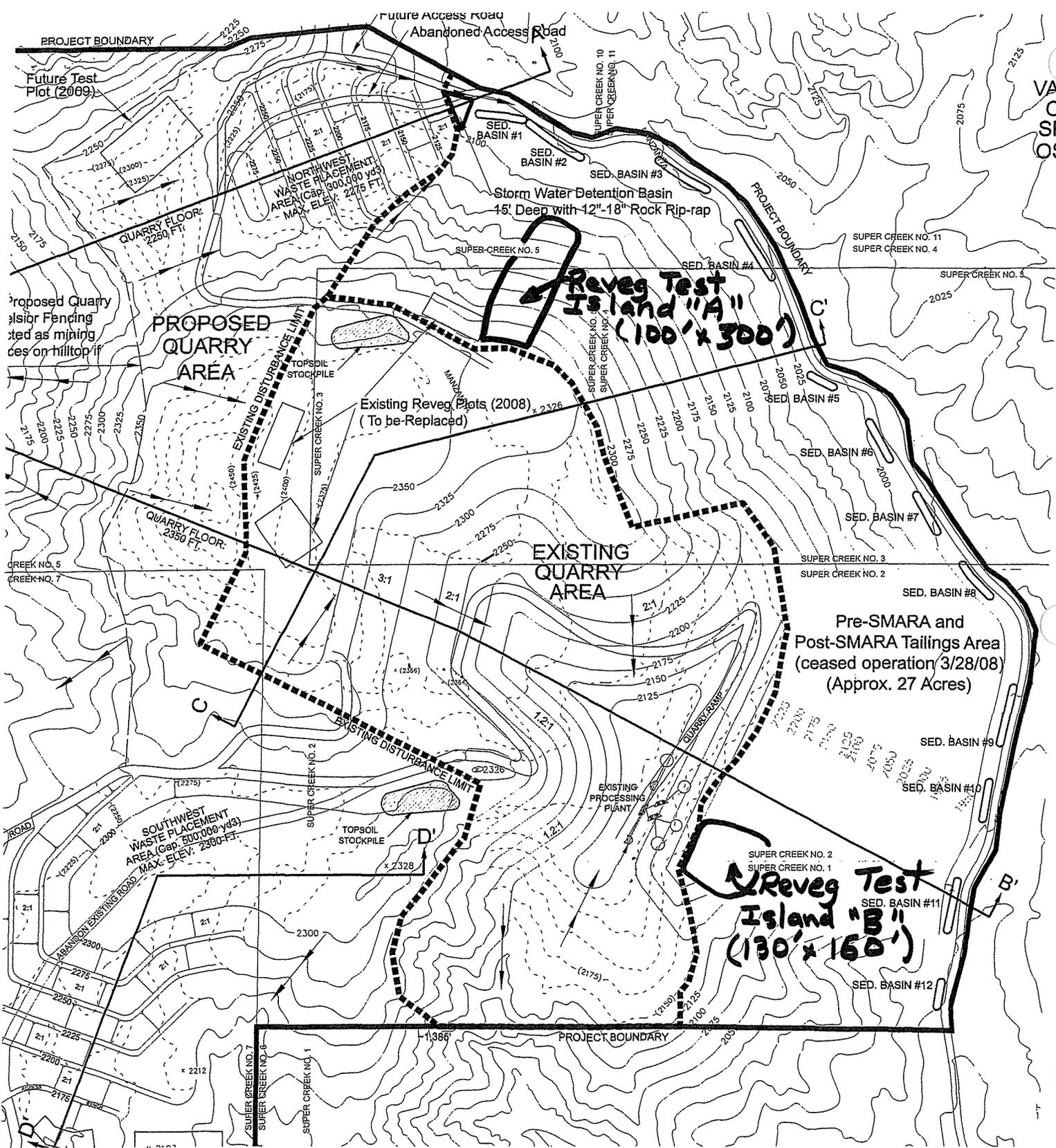
Preparation of the slopes consisted of filling rills in the older surfaces (Island "A") using rock from the quarry which was end dumped from the top-of-slope and then by cutting terraces (Island "A" and Island "B") by hand, across the slope, as the slopes are not accessible by equipment. This created cross-slope terraces which provide breaks in the down slope movement of water as well as catchment of wind born seeds and surface water and provides protection from sun and wind to seedlings.

Work was conducted by crews via use of harness and ropes tied off at the top-of-slope. Terraces were cut approximately 2' wide at 25-foot intervals beginning at the top-of-slopes. Maintenance of the drainage berm along the quarry rim may result in moving material, which would change the distance to the top terrace. Precipitation recorded at the Palm Springs Airport was 4.7 inches this season, which is about 90 per cent of the long-term average of 5.2 inches. Seed was obtained from collections conducted during the previous year as well as from commercial sources. The seeding rates are included in Table 1 below.

**TABLE 1. REVEGETATION SEEDING RATES  
SUPER CREEK QUARRY, MARCH/APRIL 2009**

<b>SPECIES</b>	<b>COMMON NAME</b>	<b>LBS. /ACRE</b>	<b>SEEDS/LB.</b>
<i>Achnatherum speciosum</i>	Desert needlegrass	5	97,000
<i>Chrysothamnus nauseosus</i>	Rabbit brush	4	400,000
<i>Encelia farinosa</i>	Brittlebush	4¼	350,000
<i>Ephedra nevadensis</i>	Joint fir	2	19,500
<i>Larrea tridentata</i> <sup>1</sup>	Creosote bush	10	80,000

<sup>1</sup> This seed was collected from the site vicinity during 2008.



VA  
O  
S  
O

Proposed Quarry  
Prior Fencing  
to be replaced as mining  
operations on hilltop if

**PROPOSED  
QUARRY  
AREA**

**Reveg Test  
Island "A"  
(100' x 300')**

**EXISTING  
QUARRY  
AREA**

**Pre-SMARA and  
Post-SMARA Tailings Area  
(ceased operation 3/28/08)  
(Approx. 27 Acres)**

**Reveg Test  
Island "B"  
(130' x 160')**

CREEK NO. 5  
CREEK NO. 7

**SOUTHWEST  
WASTE PLACEMENT  
AREA (Cap: 500,000 yds)  
MAX. ELEV: 2380 FT.**

**NORTHWEST  
WASTE PLACEMENT  
AREA (Cap: 300,000 yds)  
MAX. ELEV: 2275 FT.**

SUPER CREEK NO. 7  
SUPER CREEK NO. 6  
SUPER CREEK NO. 1

PROJECT BOUNDARY

B'

## **2. Plant Salvage and Salvage Nurseries**

Mining has not been extended to any new areas therefore there have been no areas from which to salvage plants and no such areas are expected to become available for salvage this year. However, seed collected earlier this year was planted on the cross-slope terraces when the terraces were completed. All seed collected within the last year was used. Currently, there are no salvaged plants in a nursery or any seed in storage.

## **3. Growth Media Salvage and Storage**

Mining has not been extended to any new areas therefore there have been no areas from which to salvage natural growth media and no such areas are expected to become available for salvage this year. The slopes outside the quarry are covered with native material (predominately sand) which is dislodged during quarrying and created during crushing. This material provides growth media which covers the slopes outside the quarry and is stockpiled within the quarry. The material stockpiled in the quarry appears to be sufficient in volume to create revegetation islands on quarry benches when the final elevations (configuration) are reached.

## **4. Baseline Vegetation Data Collection and Analysis**

Baseline vegetation data was collected during March and April 2009, after the perennial plant species 'green-up'. Precipitation this year, as recorded at the Palm Springs Airport, was 4.7 inches, which is about 90 percent of the long-term average of 5.2 inches. Therefore this sample should be representative of the long-term values. Measures were made of ground cover (projection of aerial canopy) by native perennial plant species as well as their density (# of individual plants per unit area) and diversity (# of species).

Data was collected from areas surrounding the existing quarry which are undisturbed by mining and are within areas proposed for expansion. Data was collected using the point-intercept method. Rock was recorded when the diameter was greater than one inch. If rock had a diameter equal to or less than one inch it was recorded as soil. Soil was recorded when bare mineral soil was encountered by the point intercept. Litter includes remains of both annual and perennial vegetation and includes accumulation from an unknown number of years. Perennial native plants were recorded by species.

Ground cover averaged 15.8 per cent by perennial native plant species. *Larrea tridentata*, *Encelia farinosa* and *Ambrosia dumosa* combined, provided 85 percent of the relative cover, that is 85 per cent of all plant cover (15.8 per cent of ground cover) was from these three species. The density of plants was 70 individual plants per 500 square meters and the total number of perennial plant species in the baseline was nine. The data is summarized in Table 2 below.

**TABLE 2. SUMMARY OF VEGETATION BASELINE DATA  
SUPER CREEK QUARRY, MARCH /APRIL 2009**

<b>Ground Cover Type</b>	<b>Ground Cover Area (Per Cent)</b>	<b>Cover By Species (Per Cent)</b>	<b>No. of Plant Species</b>
Rock (> 1 "dia.)	7.8	NA	NA
Soil	36.2	NA	NA
Litter	40.2	NA	NA
<i>Ambrosia dumosa</i>	(3.3)	21	1
<i>Encelia farinosa</i>	(4.7)	30	1
<i>Ephedra nevadensis</i>	(0.3)	2	1
<i>Eriogonum fasciculatum</i>	(0.3)	2	1
<i>Juniperus californica</i>	(0.5)	3	1
<i>Larrea tridentata</i>	(5.3)	34	1
<i>Lotus scoparius</i>	(0.3)	2	1
<i>Mirabilis coccinea</i>	(0.3)	2	1
<i>Psoralea arborescens</i>	(0.3)	2	1
SUBTOTAL (Per. Native Species)	15.8	98 <sup>1</sup>	9
TOTAL	100	NA	9

<sup>1</sup> Total does not equal 100 due to rounding.

### 5. Seed Collection and Storage

All seed collected in 2008 was planted this winter (2008-2009). There currently is no seed in storage. Seed collection will continue during the appropriate season of each year for the dominant species onsite. Collected seed will continue to be planted on cross-slope terraces created as described in No. 1 above. When quarry excavation reaches final elevations (surface configuration), planting will also be extended to these areas.

### 6. Plant Production

Plant production is evaluated during the appropriate season of the year. Production will be measured by the occurrence of new plants recruited into the population regardless of their origin (naturally occurring or planted).

### 7. Exotic Species Control

The vegetation community in the vicinity is composed largely of non-native (exotic) annual species. The dominant species are mustard (*Brassica tournefortii*), stork's bill (*Erodium cicutarium*) and grasses (*Bromus* spp., *Poa* sp. and *Schismus barbatus*). These species were identifiable at the beginning of the data collection period (March), but had died by the end of the period (April), and therefore were recorded in the baseline data as litter.

Due to their widespread occurrence and dominance within the region, no efforts will be made to control these species. The occurrence of other non-native species, Russian thistle (*Salsola tragus*) and tamarisk will continue to be monitored and they will be removed from areas where plants interfere with reclamation.

## **8. Results of Reclamation Tests**

The results of the previous revegetation tests are recorded in the 2008 report. Original plot No.1 has been replaced with Island "A" and original plot No. 2 will be eliminated with the expansion of the quarry. Monitoring efforts will be extended to include existing revegetation Islands "A" and "B" and all other revegetation areas added in the future.

## **9. Reclamation Success**

Plant cover, density and diversity on revegetated areas will be measured and compared to the baseline vegetation data when the reclaimed areas appear to be successfully revegetated.

## **Summary**

This year the following revegetation tasks were accomplished:

- i. Monitoring of original revegetation plots
- ii. Collection of seed
- iii. Laboratory analysis of soil for plant macronutrients
- iv. Hand cutting terraces on finished slopes
- v. Purchase of seed from commercial source
- vi. Seeding of terraces (Revegetation Islands "A" and "B")
- vii. Collection of baseline vegetation data

## **APPENDIX “A”**

### **Site Photographs**

#### **Page 1**

**Upper** – View of cross-slope terrace looking west to unmined areas.

**Lower** - View of cross-slope terrace looking east.

#### **Page 2**

**Upper** – View of cross-slope terrace looking east to unmined areas.

**Lower** - View of slope from west.

#### **Page 3**

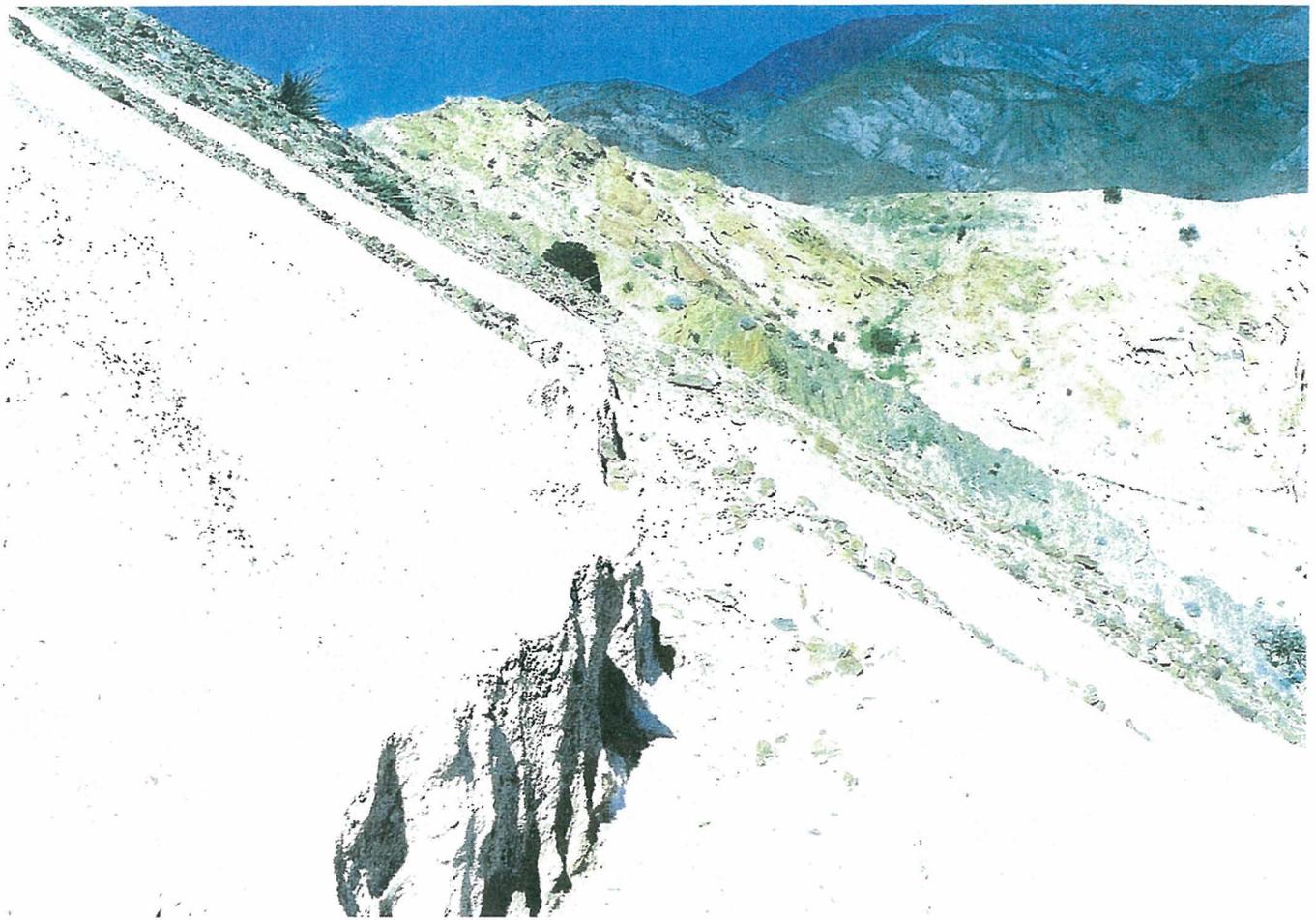
**Upper left-** Area of baseline vegetation data collection.

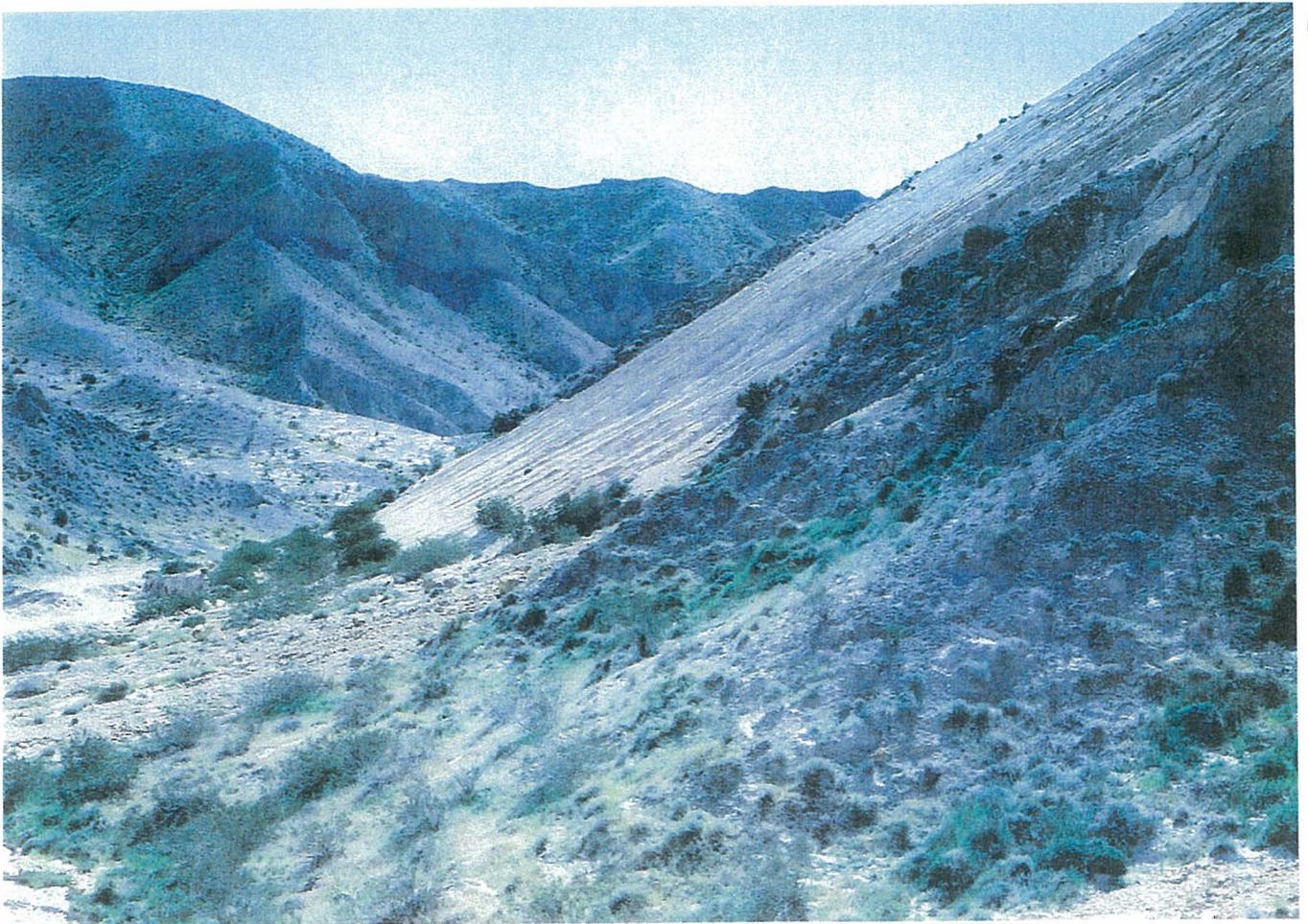
**Lower left-** Area of baseline vegetation data collection.

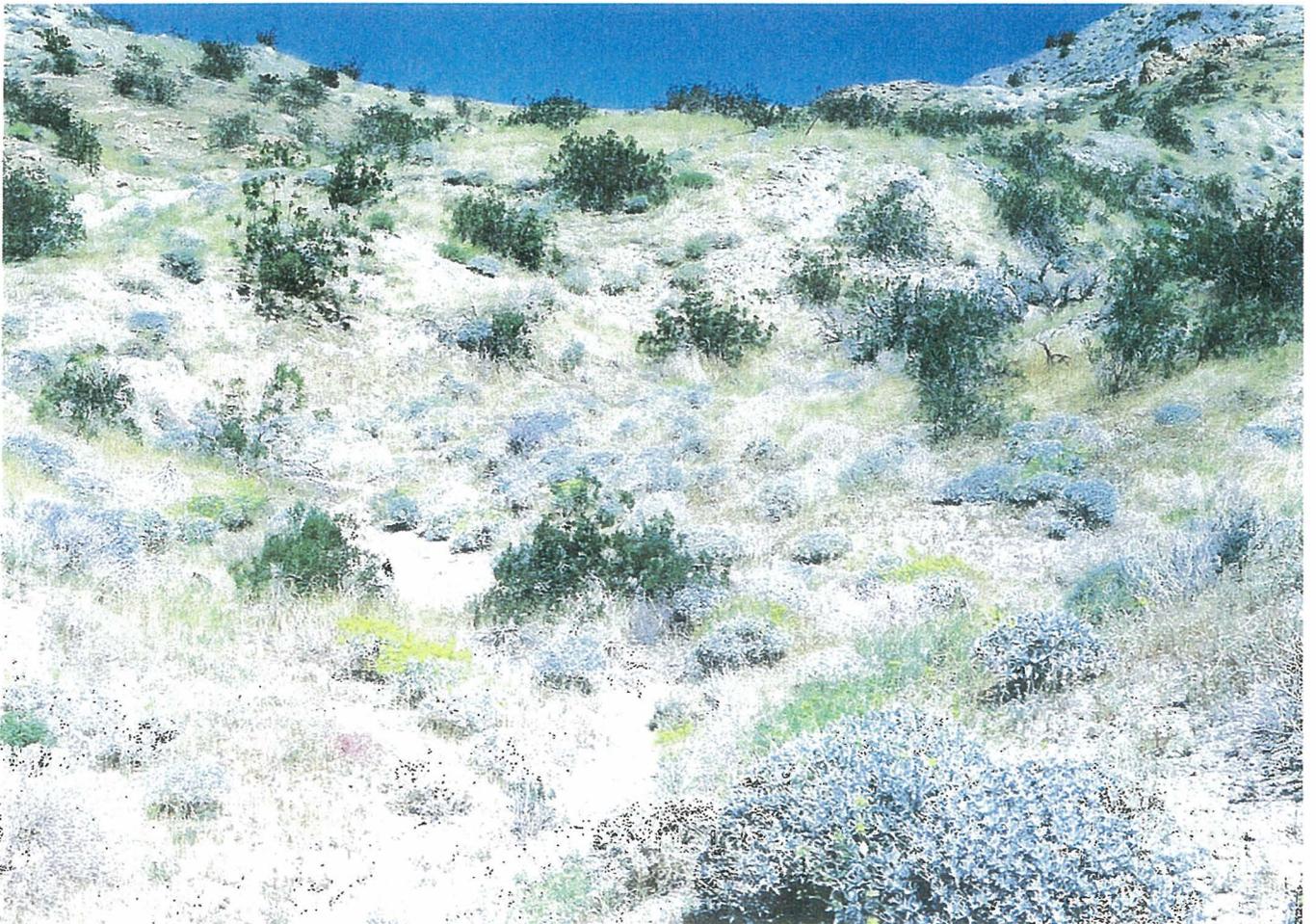
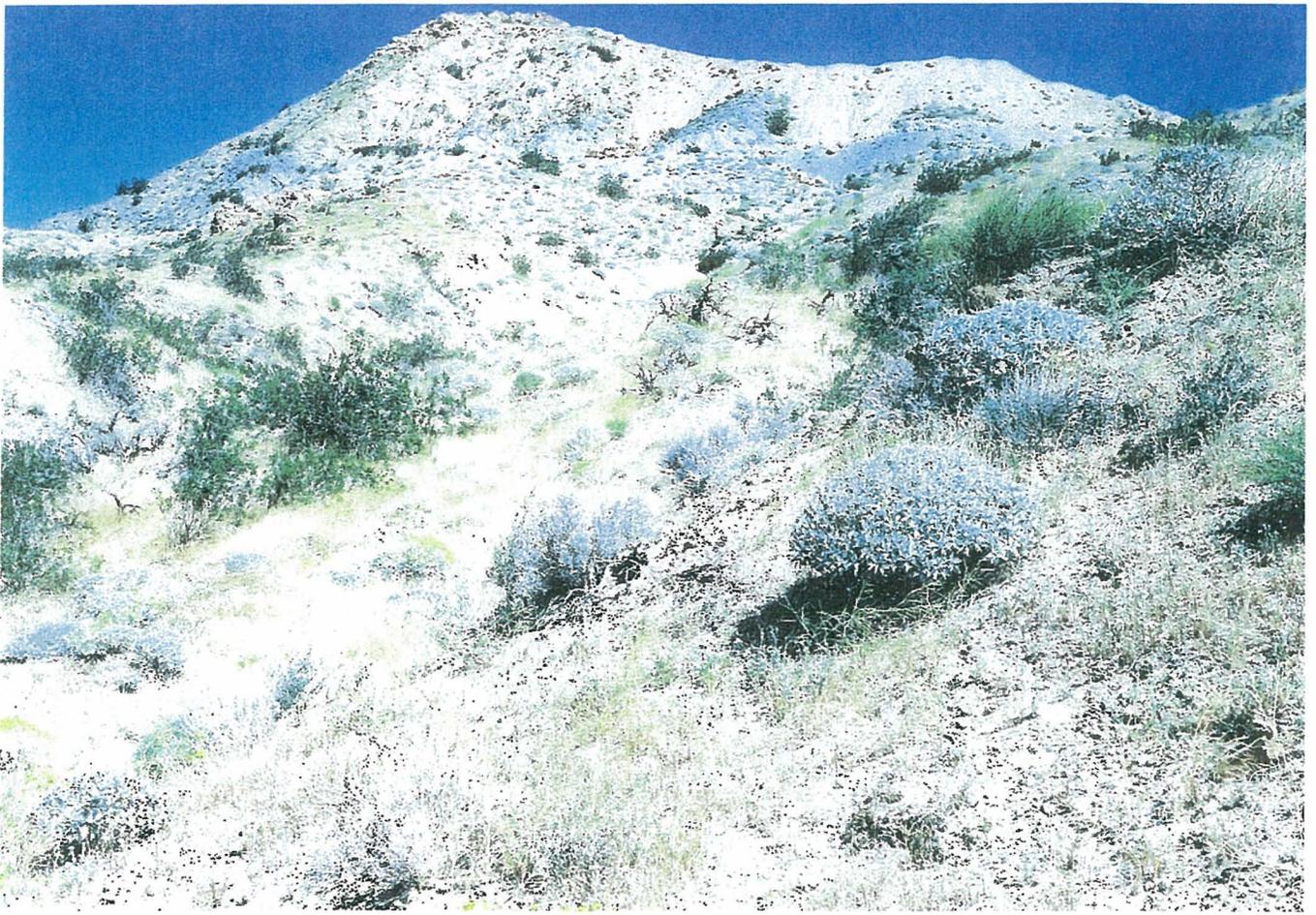
#### **Page 4**

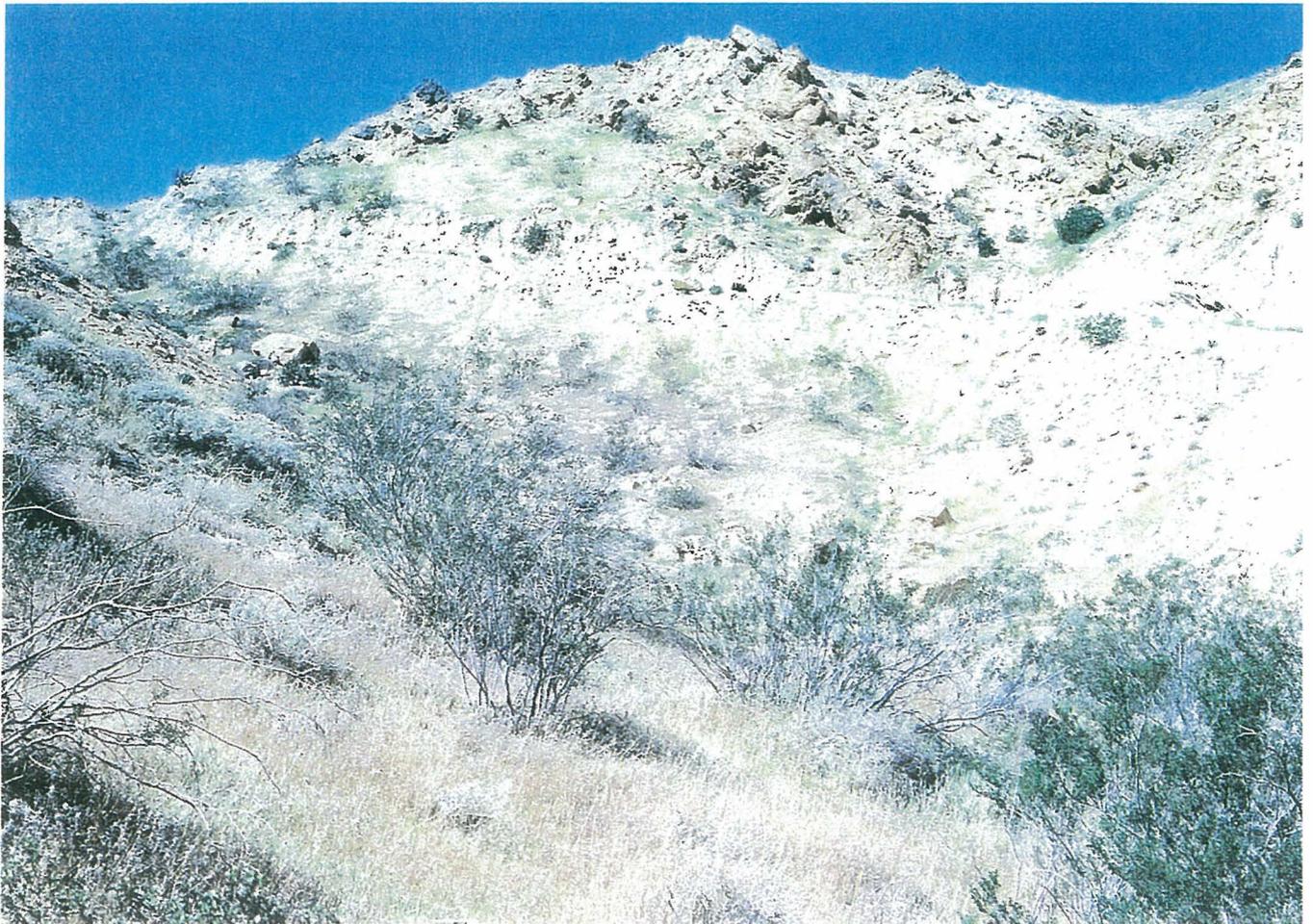
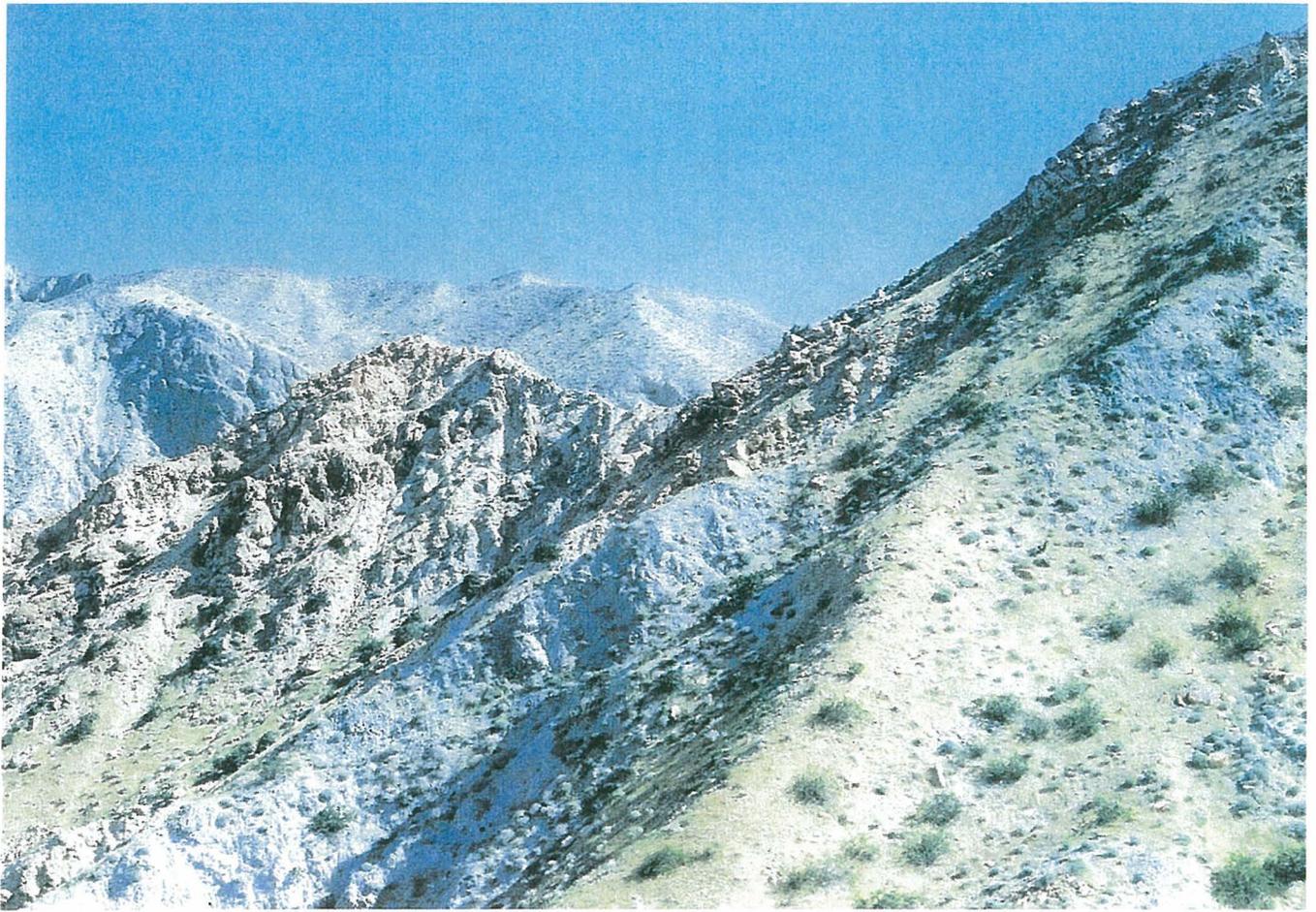
**Upper** - Area of baseline vegetation data collection.

**Lower** - Area of baseline vegetation data collection.









**APPENDIX "B"**



PO BOX 1275  
6155 CARPINTERIA AVE  
CARPINTERIA · CA 93013 · USA  
PHONE: 805-684-0436  
FAX: 805-684-2798  
WWW.SSEEDS.COM

Date: 2/3/2009 - SO #OP-37603

Mix:

Bulk Lbs Species

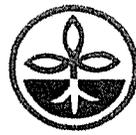
5.00	ACHNATHERUM HYMENOIDES
4.00	CHRYSOTIAMINUS NAUSEOSUS
4.00	ENCELIA FARINOSA
2.00	EPHEDRA NEVADENSIS
<u>15.00</u>	

Net Wt: 15.00 Lbs - 1 Bag

Additional: 10 lbs. Larrea tridentata  
.25 lbs. Encelia farinosa

SEE REVERSE SIDE FOR WARRANTY & CALIFORNIA NURSERY STOCK CERTIFICATE

**APPENDIX "C"**



Project : Whitewater Rock

Report No : 08-256-0016  
Purchase Order :  
Date Recd : 09/12/2008  
Date Printed : 09/17/2008  
Page : 1 of 1

## COMPREHENSIVE SOIL ANALYSIS

Sample Description - Sample ID	Half Sat %	pH	ECe dS/m	NO <sub>3</sub> -N ppm	NH <sub>4</sub> -N ppm	PO <sub>4</sub> -P ppm	K ppm	Ca ppm	Mg ppm	Cu ppm	Zn ppm	Mn ppm	Fe ppm	Organic % dry wt.	Lab No.
	TEC	Qual Lime		Sufficiency Factors											
1 - WW Reference Comp. Of 3	15	7.1	0.8	11	7	10	215	1544	81	1.6	1.9	6	27	1.2	10732
	88	None		0.6	0.6	2.0	1.2	0.5	1.5	0.5	0.7	0.7			
2 - WW Waste Comp. Of 2	15	4.5	31.5	13	4	12	31	1559	47	0.9	8.5	34	7	0.7	10733
	-19	None		0.6	0.7	3.6	35.6	4.5	-83.7	-211.8	-382.5	-16.9			
3 - WW Brown Comp of 3	18	5.8	1.6	15	5	12	91	1304	368	1.6	7.0	20	19	0.8	10734
	112	None		0.5	0.5	0.7	0.8	1.7	1.3	1.4	1.9	0.4			
4 - WW Reveg 1 Comp Of 2	17	4.4	11.8	10	3	11	27	503	56	1.3	1.8	18	8	0.9	10735
	-4	None		0.4	0.5	1.2	2.3	1.7	10.3	3.8	16.9	1.6			
5 - WW Reveg 2 Comp Of 2	7	6.5	1.2	17	7	12	114	554	41	1.0	1.9	4	13	1.2	10736
	33	None		1.7	1.4	2.8	1.1	0.6	2.7	1.3	1.1	0.9			

Saturation Extract Values						SAR	Gravel %		Percent of Sample Passing 2 mm Screen					USDA Soil Classification	Lab No.
Ca meq/L	Mg meq/L	Na meq/L	K meq/L	B ppm	SO <sub>4</sub> meq/L		Coarse 5 - 12	Fine 2 - 5	Sand			Silt .002-.05	Clay 0-.002		
									Very Coarse 1 - 2	Coarse 0.5 - 1	Med. to Very Fine 0.05 - 0.5				
4.4	1.2	1.0	0.6	0.10	1.4	0.6	17.2	8.0	11.3	13.7	51	17.1	6.9	Gravelly Sandy Loam	10732
85.9	21.7	23.9	220.0	0.19	55.1	3.3	22.9	8.6	13.5	16.7	39.8	18.1	11.9	Gravelly Sandy Loam	10733
2.4	1.9	9.9	0.3	0.08	12.5	6.7	9.7	9.2	13.7	18.3	40	17.1	10.9	Gravelly Sandy Loam	10734
34.3	12.5	14.3	54.7	0.09	29.0	3.0	13.7	9.3	12.4	18.3	40.3	18.1	10.9	Gravelly Sandy Loam	10735
5.4	2.1	1.7	2.2	0.11	10.1	0.9	28.7	10.1	15.4	18.8	41.8	14.1	9.9	Very Gravelly Sandy Loam	10736

Sufficiency factor (1.0=sufficient for average crop) below each nutrient value. N factor based on 200 ppm constant feed. SAR = Sodium adsorption ratio. Half Saturation %=approx field moisture capacity. Nitrogen(N), Potassium(K), Calcium(Ca) and Magnesium(Mg) by sodium chloride extraction. Phosphorus(P) by sodium bicarbonate extraction. Copper(Cu), Zinc(Zn), Manganese(Mn) & Iron(Fe) by DTPA extraction. Sat. ext. method for salinity (ECe as dS/m), Boron (B), Sulfate(SO<sub>4</sub>), Sodium(Na). Gravel fraction expressed as percent by weight of oven-dried sample passing a 12mm(1/2 inch) sieve. Particle sizes in millimeters. Organic percentage determined by Walkley-Black or Loss on Ignition.

\* LOW , SUFFICIENT , HIGH