VIRGINIA HIGHLANDS
WETLAND DELINEATION REPORT

JULY 14, 2006

Prepared For:

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Reno, Nevada 89523

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[July 14, 2006]

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1.0 INTRODUCTION

On May 23 and 24, 2006, Resource Concepts, Inc. (RCI) completed a wetland delineation for the Virginia Highlands Property (Project Area). The Project Area is approximately 6,700 acres, and is located within Sections 31 and 32, T19N, R22E and Sections 4-6, 7-9, and 16-17 of T18N, R22E (Figure 1), Storey County, Nevada. Delineation of the project area identified 12.33 acres of *Waters of the United States* (WOUS). The WOUS are identified as open drainage channels.

Under Sections 404 and 401 of the Clean Water Act, the Army Corps of Engineers (COE) and/or the Nevada Department of Environmental Protection (NDEP) have jurisdiction over Waters of United States (WOUS). This includes adjacent wetlands and other waters with an identifiable connection to interstate commerce. Any activity which involves the placement of fill, and/or excavation within these jurisdictional areas may require notification and authorization of the appropriate regulatory agency.

1.1 Directions to Site

From Reno, take Interstate 80 East to the Lockwood Exit. Head south on Canyon Road for approximately 5 miles. Canyon Road will turn into NV Highway 655. The property is located on the east side of the highway. Enter the property through the large gates with a sign stating "Virginia Highlands". Access to site is restricted by locked gates. Coordination with property manager is necessary to obtain entrance.

1.2 Contact Information

- ***PREPARES OF THIS DELINEATION REPORT***

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- ***PROPERTY OWNER***

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  1900 Park Hollow Ct.
  Reno, NV 89523

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2.0 SITE DESCRIPTION

The Project Area is approximately 6,700 acres located approximately 15 miles southeast of Reno, NV within Sections 31 and 32 T19N, R22E and Sections 4-6, 7-9, and 16-17 of T18N, R22E (Figure 1).

2.1 Topography

The project area is located in a pocket created by the Virginia Mountain Range to the north and west, and the Flowery Mountain Range to the south and east. The north end of the project area is situated on the gently rolling hills along the south-facing slope of the Virginia Mountain Range, becoming more mountainous toward the south as the property nears the north slope of the Flowery Mountain Range. Site elevation ranges from 5,200 to 6,320 feet (Figure 1).

2.2 Geology

The geology of the project area is dominated by Quaternary and Tertiary (up to 65 million years old) andesite flows and breccias of intermediate composition. There are also small pockets of Tertiary tuffaceous sedimentary rocks.

2.3 Soils

Due to its size and location the project area contains many soil types, however the majority of the soils are of volcanic origin and contain a great deal of stone and gravel. Figure 2 illustrates the mapped soil series found in the Soil Survey of Storey County Area, Nevada (USDA 1990).

The mountainous areas along the north end of the property are predominantly composed of the Devad-Olac-Old Camp association and the Olac-Old Camp-rock outcrop association. The Devada-Olac-Old Camp consists of shallow, well drained, gravely loams of volcanic origin. Olac-Old Camp-rock outcrop soils are formed in colluvium and residuum derived from andesite and basalt with a hard pan present at 10-20 inches. Approximately 10% of this association consists of rock outcrop.

The dominant soils of the central low lands are the Manogue-Hefed-rock outcrop association, the Manogue-Devada-rock outcrop association, and the Manougue very stony clay with 2-15% slopes. The Manogue-Hefed-rock outcrop is composed of moderately deep, very stony loams and clays formed from basic igneous rock. These soils have high shrink-swell potential and consist of approximately 10% rock outcrop.

The soils of the southern mountainous areas are the Ister-Devada association, and the Olac-Old Camp-rock outcrop association. The Ister-Devada soils are very stony loams of volcanic origin. As stated previously, the Olac-Old Camp-rock outcrop soils are formed in colluvium and residuum derived from andesite and basalt with a hard pan present at 10-20 inches. Approximately 10% of this association consists of rock outcrop.

None of the soil associations found within the project area are classified as hydric by *Hydric Soils of the United States* (USDA, 1991) (Figure 2).

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2.4 Climate

Average annual temperature for the project area is 50° Fahrenheit. The average annual precipitation is 9 inches. The number of frost free days is approximately 100 (USDA 1990). The average growing season is approximately 90 - 120 days (USDA 2003).

2.5 Vegetation

The dominant vegetation consists of Wyoming big sagebrush (*Artemisia tridentata* ssp. *Wyomingensis*), rabbitbrush (*Chrysothamnus nauseosus*), antelope bitterbrush (*Purshia tridentata*), littleleaf horsebrush (*Tetradymia glabrata*), and Mormon tea (*Ephedra nevadensis*), with an understory of grasses and a wide variety of herbaceous forbs. Other common species found within this community are sandberg bluegrass (*Poa secunda*), lupine (*Lupinus* sp.), fiddleneck (*Amsinckia intermedia*) and common weed species such as blue mustard (*Chorispora tenella*), and tumble mustard (*Sisymbrium altissimum*).

In disturbed and low lying areas the vegetation was comprised almost entirely of fiddleneck (*Amsinkia intermidia*), cheatgrass (*Bromus tectorum*), and weedy mustards.

Toward the south end of the project area, along some of the higher ridge tops and north-facing slopes, occasional patches of singleleaf pinyon (*Pinus monophylla*) and Utah juniper (*Juniperus osteosperma*) were observed.

Erosional backslopes and rock outcroppings contained little to no vegetation.

No riparian vegetation exists along drainages. No wetland vegetation or vegetation communities dominated by hydrophytic species were identified on site.

3.0 REGULATORY FRAMEWORK

3.1 Definition of Wetlands and Other Waters of the United States (WOUS)

Section 404 of the Federal Clean Water Act authorizes the COE to regulate activities that discharge dredged or fill material to wetlands and other WOUS. As described by EPA's and the COE's regulations (40 CFR § 230.3(s) and 33 CFR § 328.3(a), respectively, the term WOUS encompasses the following resources:

1. All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;
2. All interstate waters including interstate wetlands;
3. All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds, the use, degradation or destruction of which could affect interstate or foreign commerce including any such waters:
   i. Which are or could be used by interstate or foreign travelers for recreational or other purposes; or
   ii. From which fish or shellfish are or could be taken and sold in interstate or foreign commerce; or
   iii. Which are used or could be used for industrial purpose by industries in interstate commerce;
4. All impoundments of waters otherwise defined as WOUS under the definition;
5. Tributaries of waters identified in above paragraphs (1)-(4);
6. The territorial seas; and
7. Wetlands adjacent to waters identified in above paragraphs (1-6) except waters that are themselves wetlands.

EPA and the COE define wetlands as: "areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (EPA regulations at 40 CFR § 230.3(t); COE regulations at 33 CFR § 328.3(b)).

3.2 Limits of Jurisdiction

The following provides the regulatory definitions and criteria followed in determining the geographic extent of potential EPA/COE jurisdiction.

As described at 33 CFR § 328 and § 329, the geographic limits of relevant federal jurisdiction are defined in the following manner:

- *Non-Tidal WOUS:* "The limits of jurisdiction in non-tidal waters: In the absence of adjacent wetlands, the jurisdiction extends to the ordinary high water mark, or [w]hen adjacent wetlands are present, the jurisdiction extends beyond the ordinary high water mark to the limit of the adjacent wetlands. . . ." The term "adjacent" means bordering, contiguous, or neighboring. Wetlands separated from other WOUS by man-made dikes or barriers, natural river berms, beach

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dunes and the like are "adjacent wetlands." The term "ordinary high water mark" means that line on the shore established by the fluctuations of water and indicated by physical characteristics such as clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas.

- *Wetlands:* Implicit in the definition is the need for a site to meet certain water, soil, and vegetation criteria to qualify as a jurisdictional wetland. These criteria and the methods used to determine whether they are met are described in the COE 1987 *Wetlands Delineation Manual.*

3.3 Wetlands Delineation Criteria

The COE 1987 *Wetlands Delineation Manual* identifies the key diagnostic criteria for determining the presence of wetlands. These include:

(1) *Wetland Hydrology:* Inundation or saturation to the surface during the growing season.

(2) *Hydric Soils:* Soils classified as hydric or that possess characteristics associated with reducing soil conditions.

(3) *Predominance of Wetland Vegetation:* Vegetation classified as facultative, facultative wet, or obligate according to its tolerance of saturated (i.e., anaerobic) soil conditions.

Specific criteria used to determine the presence or absence of wetland hydrology, soil, and vegetation conditions are as follows:

3.3.1 Wetland Hydrology

The 1987 COE *Manual* states that wetland hydrology conditions occur when a "site is inundated either permanently or periodically at mean water depths less than or equal to 6.6 feet, or the soil is saturated to the surface at some time during the growing season of the prevalent vegetation." Whether or not a site meets this criterion is determined by the presence of diagnostic indicators of wetland hydrology, which include the following:

Table 1. Primary and Secondary Hydrology Indicators

Primary Indicators	Secondary Indicators
Watermarks	Oxidized Rhizospheres Associated with Living Roots
Drift Lines	Water-Stained Leaves
Water-Borne Sediment Deposits	FAC-Neutral Test
Drainage Patterns Within Wetlands	Local Soil Survey Data

A March 8, 1992, COE memorandum entitled *Clarification and Interpretation of the 1987 Manual* provides further clarification:

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Areas which are seasonally inundated and/or saturated to the surface for a consecutive number of days for more than 12.5 percent of the growing season are wetlands, provided the soil and vegetation parameters are met. Areas wet between 5 percent and 12.5 percent of the growing season in most years may or may not be wetlands. Sites saturated to the surface for less than 5 percent of the growing season are non-wetlands.

In Storey County, the length of the growing season is approximately 90-120 days; 5 percent of the growing season is approximately 4.5 - 6 days.

3.3.2 Hydric Soils

The 1987 COE *Manual* states that the diagnostic environmental characteristics indicative of wetland soil conditions are met where "soils are present and have been classified as hydric, or they possess characteristics that are associated with reducing soil conditions." According to the Manual, indicators of soils developed under reducing conditions may include:

1. Organic soils (Histosols);
2. Histic epipedons;
3. Sulfidic material;
4. Aquic or peraquic moisture regime;
5. Reducing soil conditions;
6. Soil colors (chroma of 2 or less);
7. Soil appearing on hydric soils list; and
8. Iron and manganese concretions.

A February 20, 1992, COE memorandum entitled *Regional Interpretation of the 1987 Manual* states that the most recent version of National Technical Committee for Hydric Soils (NTCHS) hydric soil criteria will be used (to make hydric soil determinations). These soil criteria specify at least 15 consecutive days of saturation or 7 days of inundation (flooding or ponding) during the growing season in most years.

The NTCHS, a working group organized by Natural Resource Conservation Service (NRCS), defines a hydric soil as "a soil that formed under conditions of saturation, flooding or ponding long enough during the growing season to develop anaerobic conditions in the upper part [of the soil profile]" (http://soils.usda.gov/use/hydric/intro.html). The most recent (2000) version of the NTCHS hydric soils criteria identifies those soils that are likely to meet this definition. The criteria are as follows (http://soils.usda.gov/use/hydric/criteria.html):

(1) All Histels except Folistels and Histosols except Folists, or

(2) Soils in Aquic suborders, great groups, or subgroups, Albolls suborder, Historthels great group, Histoturbels great group, Pachic subgroups, or Cumulic subgroups that are:
   a. Somewhat poorly drained with a water table equal to 0.0 foot (ft) from the surface during the growing season, or
   b. poorly drained or very poorly drained and have either:
      (i) water table equal to 0.0 ft during the growing season if textures are coarse sand, sand, or fine sand in all layers within 20 inches (in),

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or for other soils

(ii). water table at less than or equal to 0.5 ft from the surface during the growing season if permeability is equal to or greater than 6.0 in/hour (h) in all layers within 20 in, or

(iii). water table at less than or equal to 1.0 ft from the surface during the growing season if permeability is less than 6.0 in/h in any layer within 20 in, or

(3) Soils that are frequently ponded for long duration or very long duration (7 to 30 days) during the growing season, or

(4) Soils that are frequently flooded for long duration or very long duration (7 to 30 days) during the growing season.

On the basis of computer database searches for soils meeting above criterion (2), NRCS has developed hydric soils lists for many parts of the country. Caution should be used when using these lists. Many soils on the lists have ranges in water table depths that allow them to be either hydric or nonhydric depending on landscape position and other site-specific factors. Accordingly, hydric soils lists are good ancillary tools to facilitate wetland determinations, but are not a substitute for onsite investigations. For the latter, NRCS (1995) recommends the use of field indicators of hydric soils. The presence of one or more field indicators suggests processes associated with hydric soil formation have taken place. These indicators are particularly useful because they persist in soils during both wet and dry periods, and may remain even after changes in site conditions such as the elimination of wetland hydrology (NRCS 1995).

3.3.3 Prevalence of Wetland Vegetation

The COE 1987 *Manual* states that the wetland vegetation conditions are met when the prevalent vegetation (i.e., more than 50 percent of vegetation cover or tree basal area) consists of macrophytes that are typically adapted to sites having wetland hydrologic and soil conditions (e.g., periodic or continuous inundation or soil saturation). Hydrophytic vegetation is defined as "plant life growing in water or on a substrate that is at least periodically deficient in oxygen as a result of excessive water content" (Cowardin *et al.* 1979). Hydrophytic vegetative species, due to morphological, physiological, and/or reproductive adaptation(s), have the ability to grow, effectively compete, reproduce, and/or persist in anaerobic soil conditions. Positive indicators of the presence of hydrophytic vegetation include:

(1) More than 50 percent of the dominant species are rated as Obligate ("OBL"), Facultative Wet ("FACW"), or Facultative ("FAC") on lists of plant species that occur in wetlands (see Reed 1988 for California);

(2) Visual observations of plant species growing in sites of prolonged inundation or soil saturation; and

(3) Reports in the technical literature indicating the prevalent vegetation is commonly found in saturated soils.

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Whether or not a site is dominated by hydrophytic vegetation is determined by consulting "National Lists of Plant Species that Occur in Wetlands," which are published by the U.S. Fish and Wildlife Service's National Wetlands Inventory (NWI). Regional Interagency Review Panels develop the lists by determining species' estimated probability of occurrence in wetlands vs. non-wetlands. Classifications are made by unanimous agreement of the panel. NWI lists include plants that grow in a range of soil conditions from permanently wet to dry. Species are divided into the following "indicator categories:"

- "Obligate wetland" (OBL) species, which occur almost always in wetlands (estimated probability >99 percent);
- "Facultative wetland" (FACW) species, which usually occur in wetlands (estimated probability 67 – 99 percent), but are occasionally found in non-wetlands;
- "Facultative" (FAC) species, which are equally likely to occur in wetlands or non-wetlands (estimated probability 34 – 66 percent);
- "Facultative Upland" (FACU) species, which sometimes occur in wetlands (estimated probability 1 – 33 percent), but more often occur in non-wetlands; and
- "Obligate upland" (UPL) species, which occur in wetlands in other regions, but occur almost always in non-wetlands in the region specified (estimated probability >99 percent).

Species that have an indicator status of OBL and FACW species (and some FAC species) are considered to be adapted for life in anaerobic soil conditions. It should be noted that indicator assignments are not based on the results of a statistical analysis of species occurrence. They are a best approximation of wetland affinity based on a synthesis of submitted review comments, published botanical literature, and field experience of the Panel members. If the Panel is unable to reach a unanimous decision on the status of a species, "no agreement" (NA) is recorded. If insufficient information exists to determine the status of a species, "no indicator" (NI) is recorded. Species that are not included in the NWI list are assigned a "not listed" (NL) designation.

The wetland indicator categories do not equate to degrees of wetness, but represent a range of potential occurrence. Based on the probabilities shown above, there is a probability that, while one would expect to find obligate, facultative wet, and facultative plants growing in wetlands, a probability also exists that obligate, and especially, facultative wet, and facultative species will occur in areas that do not exhibit wetland soil and/or hydrology conditions. Therefore, classification of a plant species to a specific category (OBL, FACW, FAC, and UPL) does not mean that the plant is always found in the associated habitat of preference. Many obligate wetland species occur in permanently or semi-permanently flooded wetlands, but a number of obligates also occur and/or are restricted to wetlands which are only temporarily or seasonally flooded. The obligate upland species include a diverse collection of plants which range from weedy species adapted to exist in a number of environmentally stressful or disturbed sites (including wetlands) to species in which a portion of the gene pool always occurs in wetlands. Both the weedy and ecotype representatives of the obligate upland category can occur in seasonally and semi-permanently flooded wetlands (Reed, 1988). For these reasons, the 1987 COE manual does not solely rely on the presence of hydrophytic vegetation to make wetland determinations.

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4.0 DELINEATION METHODS

Field investigations were focused on the blue-line drainages within the property boundary. Existing landforms, vegetation, hydrology, and soil conditions were evaluated within the area using topographic mapping (Figure 1), NRCS soils mapping (Figure 2), National Wetland Inventory maps (Figure 3), aerial photography (Figure 5) and on-site observations in order to identify sites that would likely contain wetlands and other WOUS.

After the absence or presence of hydric vegetation, hydrology and soil field indicators were recorded, the specific features containing potential WOUS were memorialized as line and/or point features using a hand-held Garmin E-trex global positioning system (GPS) unit. The team measured the high, the mid and low flow channels at representative reaches of each blue-line drainage.

Once field data collection was completed, GPS data were incorporated into a Geographic Information System (GIS), and overlaid onto a topographic map and soil map. The overlays were used to assist in the analysis and identification of areas that would potentially qualify as WOUS.

The RCI field delineation team consisted of Lynn Zonge, fluvial geomorphologist, JoAnne Michael, biologist, and Rachel Kozloski, soil scientist. Field investigations were conducted on May 23rd and 24th, 2006.

In order to understand the flow capacity of the low, mid and high channel portions of the drainages identified in the field Manning's Equation were used to estimate the expected discharge value for the low, the mid and the high flow channel for each measured channel cross-section.

The Manning's Equation is:

$V = (R^{2/3} \times S^{1/2} \times 1.49)/n$, where

V = velocity in feet per second
R = the hydraulic radius of the channel
S = the slope of the water surface
n = the Manning resistance coefficient

The measured width and depth of the low, mid, and high channels were used to calculate the hydraulic radius. The slopes were measured from the USGS 7.5' quadrangle maps. A Manning's n of 0.05 was used because this value is appropriate for natural streams with gravel and cobble substrate with few boulders (Chow, 1959). The resultant velocity values were multiplied by the cross-sectional area to yield the discharge values for each of the channel cross-sections.

The potential amount of water available coming into each channel from the surrounding watershed was also evaluated. Magnitude of channel flow was estimated using two methods. The Rational Method was used for the watersheds that are less than one square mile in size. The method provided in the USGS 1993 publication "*Methods for Estimating Magnitude and Frequency of Floods in the Southwestern United States*" was

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used for the larger watersheds. This USGS method is applicable to unregulated streams that drain basins of less than 200 square miles. These two methods are described in more detail as follows:

Rational Method:

Using the Rational Method, Q=AIC where

Q = peak rate of runoff in cubic feet per second
A = area of the contributing watershed in acres
I = rainfall intensity in inches per hour
C = the rational runoff coefficient

The watershed areas were delineated and measured on USGS 7½ minute quadrangle (Chalk Hills, Nevada). The rainfall intensity for the 2-year, 24-hour event (0.04" per NOAA Atlas 14) (Appendix B) was chosen as an appropriate recurrence interval that would most likely result in an ordinary high water mark. A runoff coefficient of 0.15 was used as the most appropriate value for unimproved rough terrain as provided by Dunne and Leopold (1978).

USGS Method:

Using the USGS method for the 2-year event,

Q=0.0333 x Area 0.853 (ELEV/1000) 2.68 [LAT-28)/10]4.1

Q = discharge in cubic feet per second
Area = the drainage area in square miles
ELEV = mean basin elevation, in feet
LAT = latitude of site, in decimal degrees

On the basis of the data obtained in these investigations, the geographic extent of other WOUS was delineated according to the criteria described in Section 3.0. The following sections discuss hydrology, soil, and vegetation conditions observed at the study site during field investigations. Sites were further classified using the U.S. Fish and Wildlife Service's Classification System for Wetland and Deepwater Habitats (Cowardin et al. 1979). The following sections discuss hydrology, soil, and vegetation conditions observed at the study site during field investigations.

5.0 DELINEATION SUMMARY

The wetland delineation within the Project Area identified 12.33 acres of WOUS. The WOUS are described as nineteen (19) ephemeral drainages.

5.1 Presence of Hydric Soils

None of the soil associations are listed on the national hydric soils (USDA/NRCS, 1995) list or on the county soils list for the Storey County Area (USDA 1990). No ponded or saturated conditions were observed on the project site.

5.2 Site Hydrology Conditions

The project area lies within Virginia Hills in the Truckee River watershed. All delineated drainages flow into Long Valley Creek, which flows into the Truckee River, a *water of the United States.*

All of the measured channels had several indicators of channel flow. The channels generally had high, medium, and low flow channels. Each type of channel had observable flow lines as indicated by scour lines, shelving, vegetation debris, and sand, silt and clay deposits. More recent flows appeared to be present in the low and mid channels as the high channel lacked vegetation debris and sediment. Given that vegetation decomposes (oxidizes) at a fairly rapid rate (within 1-3 years) in the arid southwest and fine sediment will blow away in strong winds which are common to the area, the indicators provide some indication that the flows within the low and mid channels are of a more recent time period.

There are no precipitation gauges near the site; the closest one is located in Sparks, Nevada.

The results of the Manning's Equation for each channel width and the hydraulic modeling using the Rational Method and the USGS Southwest method are provided in Table 2. A review of Table 2 reveals that the calculated discharge values using the Rational Method and the USGS method (with 2-year recurrence intervals) did not correlate with one specific measured width range (eg. high, mid or low flow channels), but may be closest to the measured widths for either the low, the mid, or the high flow channels. The highlighted flow rates represent the flows closest to the modeled flow rates, and the corresponding channel width as measured in the field was used to calculate WOUS acreage.

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Table 2. Average Discharge Values for the Low-, Mid-, and High-Flow Channels as Calculated by Manning's Equation and Compared to Flow Rates Estimated by the USGS Southwest and Rational Method.

Drainage ID	Manning's Equation			Flow Southwest Method	Flow Rational Method
	Q low* (cfs)	Q Mid* (cfs)	Q Hi* (cfs)		
1N	7.84	146.6	226.1	19.99	18.60
1N top	2.39	5.9	29.0	16.53	14.88
1Na	0.13	0.7	9.6	9.15	7.44
1Nb	0.47	4.3	18.0	11.07	9.30
2Sa	0.65	5.3	21.1	7.16	5.58
2Sa1	0.16	1.9	7.5	2.80	1.86
2Sa low	0.47	6.3	38.1	9.15	7.44
2Sb	0.16	2.7	25.8	18.27	16.74
2Sb2	0.13	3.9	23.5	16.53	14.88
2Sb2-1	0.23	0.5	4.8	5.07	3.72
2Sb2-2	0.59	4.6	9.4	14.75	13.02
2Sb3	0.02	0.3	2.2	2.80	1.86
2N	0.27		1.2	16.53	14.88
2Nb	0.38	4.7	15.6	16.53	14.88
2Nb1	1.14			12.93	11.16
3	8.50			9.15	7.44
3w	0.77			5.07	3.72

*Flow rates modeled using in-field measurements of low, medium, and high flow widths.

5.3 Prevalent Wetland Vegetation

No wetland vegetation or vegetation communities dominated by hydrophytic species were identified on site. Riparian vegetation along delineated drainages typically consisted of upland scrub-shrub species dominated by Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis,* UPL), bitterbrush (*Purshia tridentata,* UPL), and rabbitbrush (*Chrysothamnus nauseousus,* UPL).

Review of the National Wetland Inventory (Figure 3) does not identify any wetlands within the project area.

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6.0 AREAS REGULATED BY THE CORPS

On the basis of the methods and criteria for delineating wetlands and other WOUS, as defined in the COE 1987 *Manual*, and Corps guidance documents and regulations, the RCI team found no locations within the study area that collectively had present indicators of hydric soil, a prevalence of wetland vegetation, and wetland hydrology; therefore, no wetlands were found. However, other WOUS were found.

Other WOUS were delineated based on:

1. Determining the presence of an ordinary high water mark (OHWM) as defined by field indicators, including observable flow lines as indicated by scour lines, shelving, vegetation debris, and sand, silt and clay deposits, and then
2. Using the Rational Method or the USGS method to compare channel widths for a 2-year event.

The channel widths were selected based on field measurements and flow modeling and are most representative of flow during ordinary rainfall conditions, which are believed to occur, on average, every two years (eg. 50% of the time). It is believed, based on field indicators and rainfall data, that flows from less frequent rainfall events of a greater magnitude than 1 inch of daily rainfall are not representative of normal hydrology conditions. Figure 4 illustrates the WOUS and locations of data points.

Table 3. Delineated Waters of the United States

Drainage Segment	Width (feet)	Length (feet)	Area (acres)
1N	5.4	12,027	1.49
1Na	4.0	3,557	0.33
1NB	11.7	6,312	1.70
2*	4.0	3,672	0.34
2N	4.7	4,020	0.43
2Nb	8.9	3,245	0.66
2Nb1	4.0	2,063	0.19
2S*	2.0	3,892	0.18
2Sa	5.0	9,749	1.12
2Sa1	5.5	4,663	0.59
2Sb	12.9	3,131	0.93
2Sb2	12.5	1,068	0.31
2Sb2-1	5.7	7,981	1.04
2Sb2-2	7.0	6,504	1.05
2Sb3	5.5	6,195	0.78
3	6.7	2,682	0.41
3W	2.0	3,561	0.16
4	2.0	6,587	0.30
5*	2.0	3,948	0.18
		TOTAL	**12.33**

*Channel width estimated based on comparison to drainages with similar watershed sizes.

VH0104

6.1 Non-regulated waters

Six (6) vegetated swale areas that were noted as blue-lines on the USGS Chalk Hills 7.5 minute quadrangle were found to be non-jurisdictional. The determination of non-jurisdiction is based on the absence of an ordinary high water mark as defined by 33 CFR § 328 and § 329. These swales represent topographic lows in the landscape, but none exhibited a defined bed and bank or evidence of recent flows. Each swale was fully vegetated with upland shrub and grass species. It is believed that these areas may carry flow during extreme high water events, but not under normal rainfall conditions. Table 4 describes the six (6) blue-lines that were determined to be non-jurisdictional.

Table. 4 Blue-lines Determined to be Non-jurisdictional Based on Field Delineation

Swale ID No.	Description	Reference Photos*
2Na	No defined channel, no OHWM. Area dominated by sagebrush, rabbitbrush, phlox, wild buckwheat. No break or change in vegetation. No evidence of flow.	21
2Nb2	Defined topographic swale. No OHWM or evidence of flow. No change in substrate or destruction of vegetation. Swale fully vegetated with sagebrush, snakeweed, cheatgrass, phlox, tansy mustard.	22
1S	No defined channel, no OHWM. Area dominated by sagebrush, bitterbrush, phlox, death cammis. No break or change in vegetation. No evidence of flow.	23
2Sa2	Drainage appears to start as a breach in rock outcrop that hits the flat area below and disperses. No defined channel, no OHWM. Area dominated by sagebrush, bitterbrush, cheatgrass, and scattered juniper. No break or change in vegetation.	24
2Sb1	No defined channel, no OHWM. Area dominated by sagebrush, rabbitbrush, and cheatgrass. No break or change in vegetation.	25
3E	No defined channel, no OHWM. Area dominated by sagebrush, rabbitbrush, fiddlehead, and cheatgrass. No break or change in vegetation.	26

**Photos are located in Appendix A.*

VH0105

7.0 CONCLUSIONS AND RECOMMENDATIONS

The wetland delineation within the Project area identified 12.33 acres of WOUS. The WOUS are identified as nineteen (19) open water channels with a hydrologic connection to the Truckee River, a *water of the United States*. No wetlands were located within the project area.

The ACOE is the regulatory authority with regard to wetlands or other WOUS. The ACOE must make the final determination as to jurisdictional status of all areas within the project limits. It is recommended that a copy of this report be sent to ACOE for jurisdictional determination and verification.

8.0 REFERENCES

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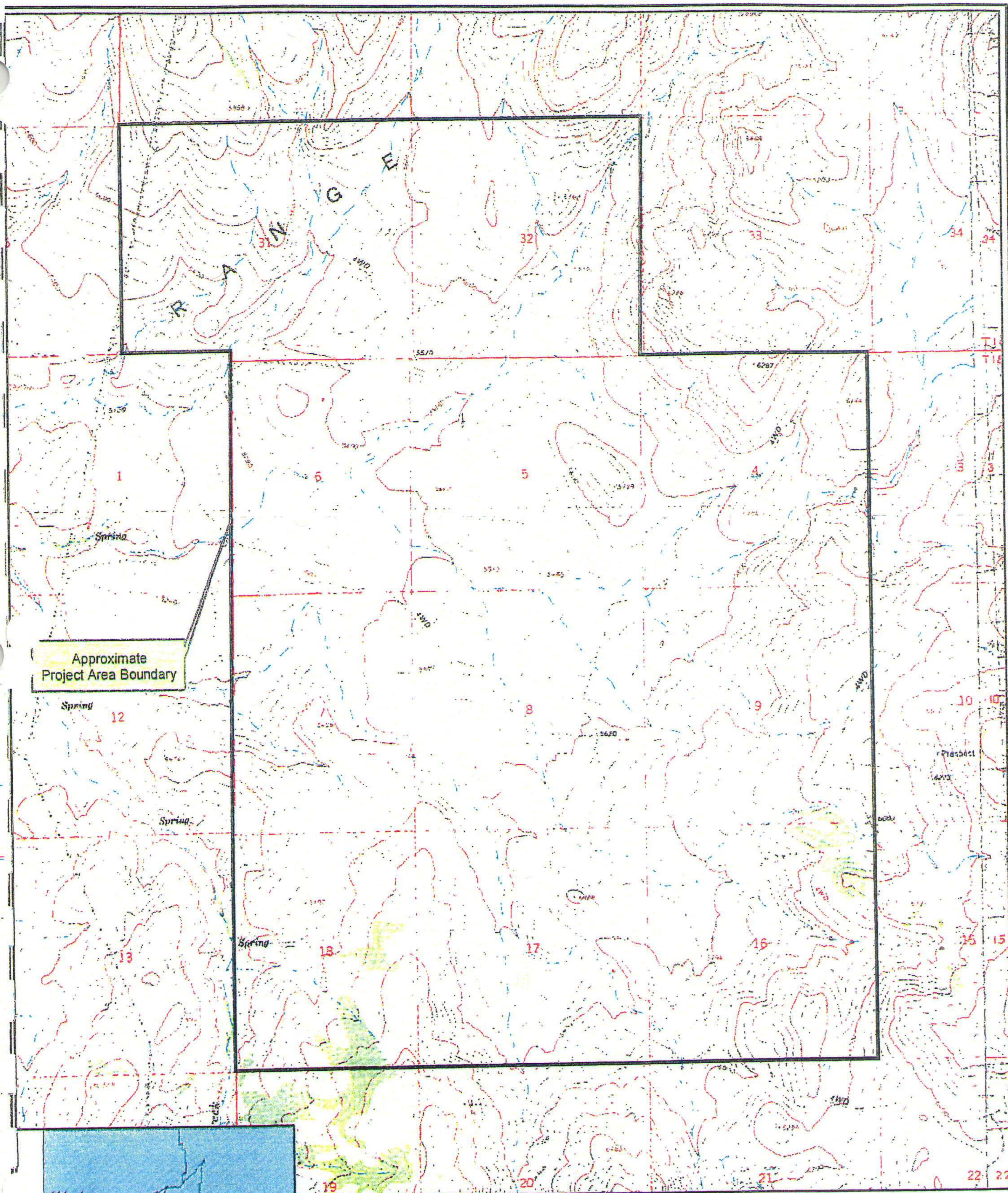
VH0107



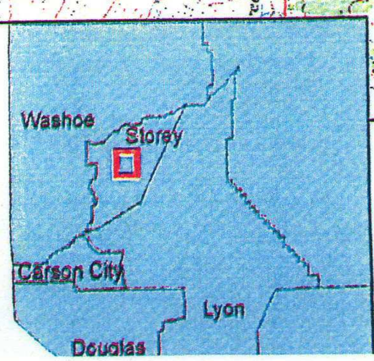


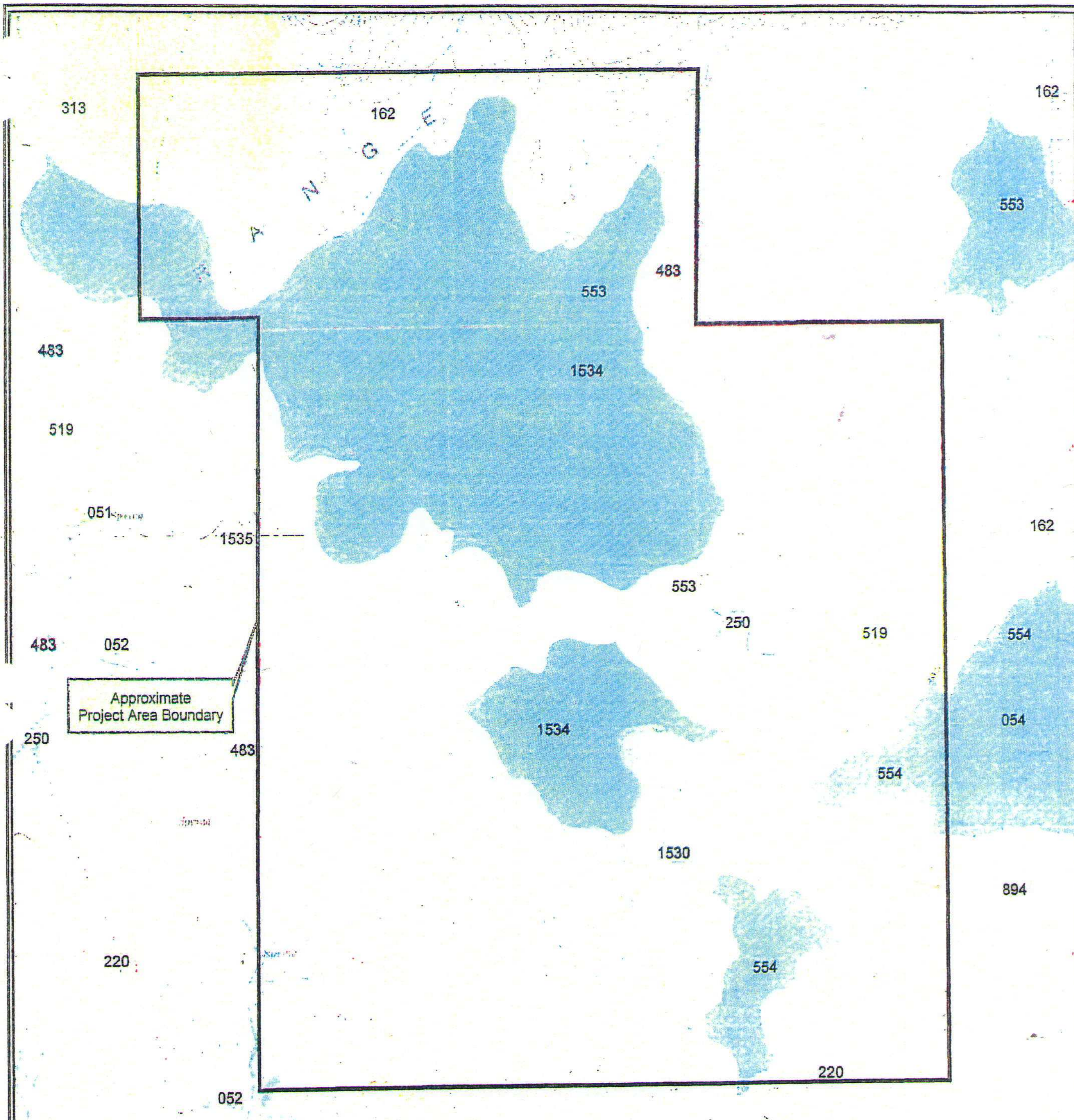
Figure 1
Virginia Highlands, LLC.
Wetland Delineation
Project Location Map

VH0108

1:35,000

0 0.5 1 Miles

RESOURCE CONCEPTS



Legend

- Project Boundary
- 051- Old Camp-Hefed-Rock outcrop
- 052- Old Camp-Rubble land-Rock outcrop
- 054- Old Camp-Olac-Indiano
- 1410- Burnborough-Gabica
- 1530- Manogue-Devada-Rock outcrop
- 1533- Manogue cobbly clay
- 1534- Manogue-Hefed-Rock outcrop
- 1535- Manogue very stony clay
- 162- Devada-Olac-Old Camp
- 220- Ister-Devada
- 250- Chalco-Haar
- 313- Risley-Rubble land-Devada
- 483- Olac-Old Camp-Rock outcrop
- 519- Loomer-Zephan-Olac
- 553- Fulstone cobbly loam
- 553- Fulstone cobbly loam
- 554- Fulstone-Reno
- 894- Indiano-Devada

RESOURCE CONCEPTS INC.

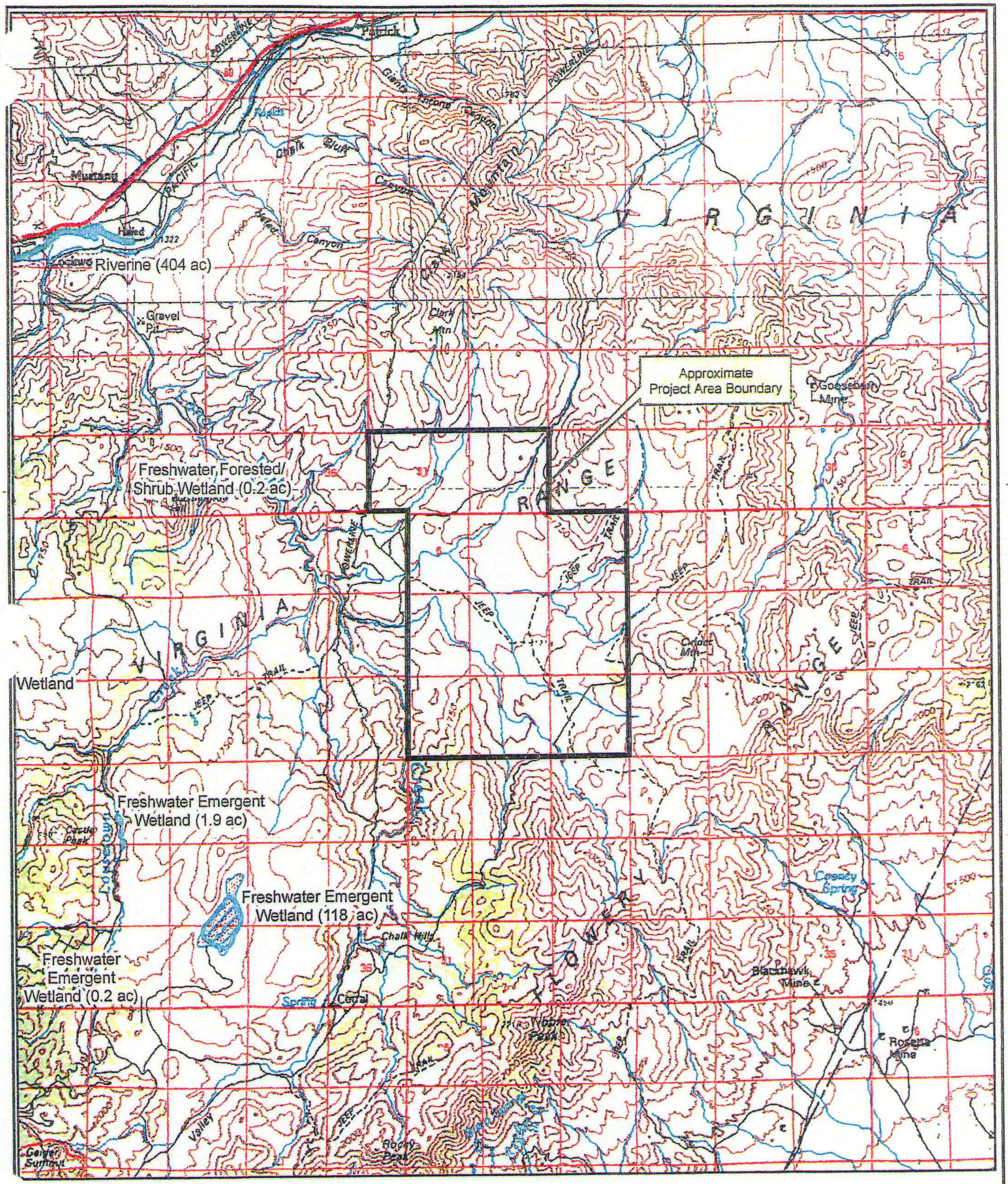
N W E S

0 0.5 1 Miles

1:35,000

VH0109

Figure 2
Virginia Highlands, LLC.
Wetland Delineation
Storey County
Soil Map Units



Legend

NWI Data

Project Boundary

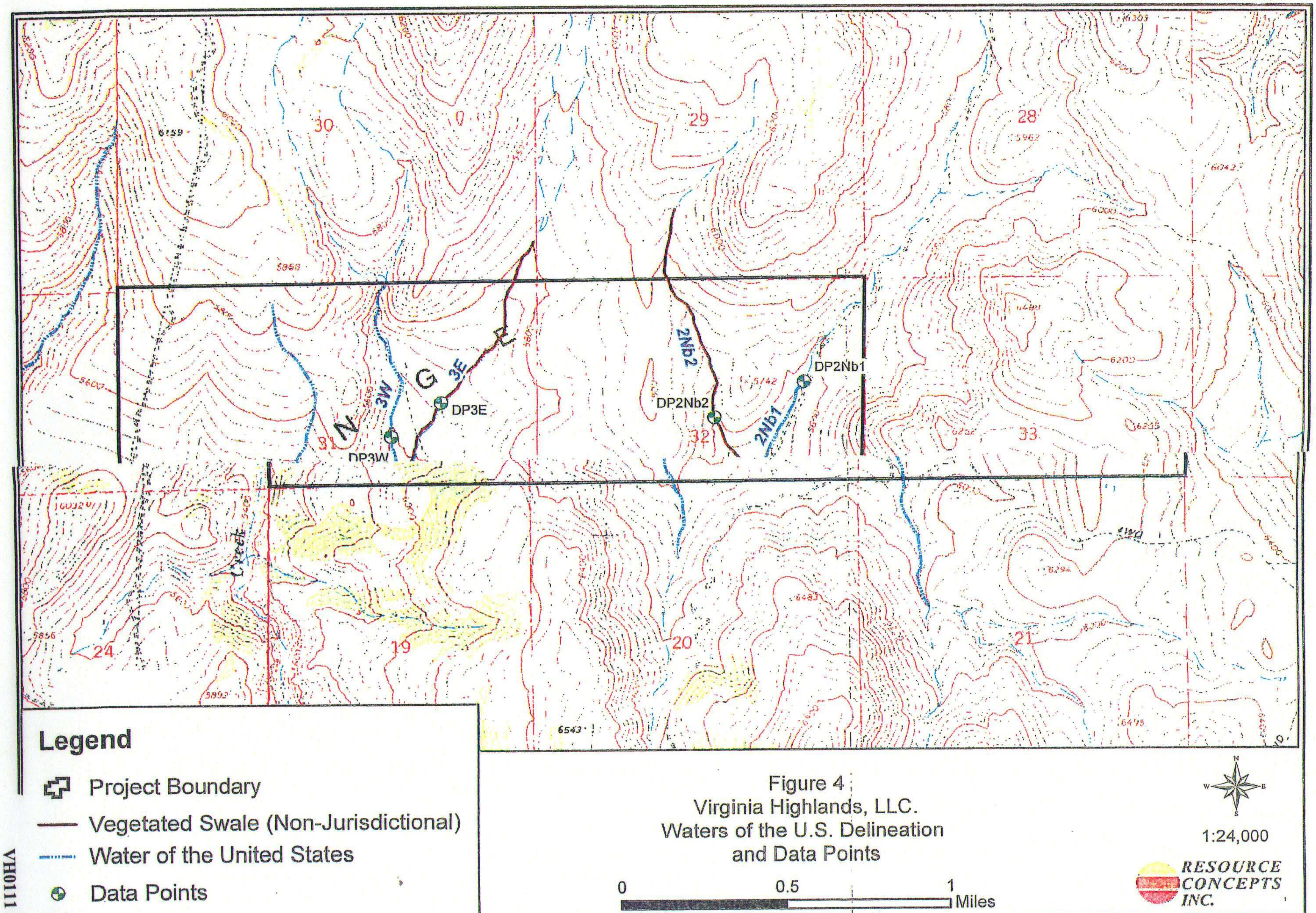
Figure 3
Virginia Highlands, LLC.
Wetland Delineation
National Wetlands Inventory Data

VH0110

0 2.5 5 Miles

1:100,000

RESOURCE CONCEPTS INC.



Legend

- Project Boundary
- Vegetated Swale (Non-Jurisdictional)
- Water of the United States
- Data Points

Figure 4
Virginia Highlands, LLC.
Waters of the U.S. Delineation
and Data Points

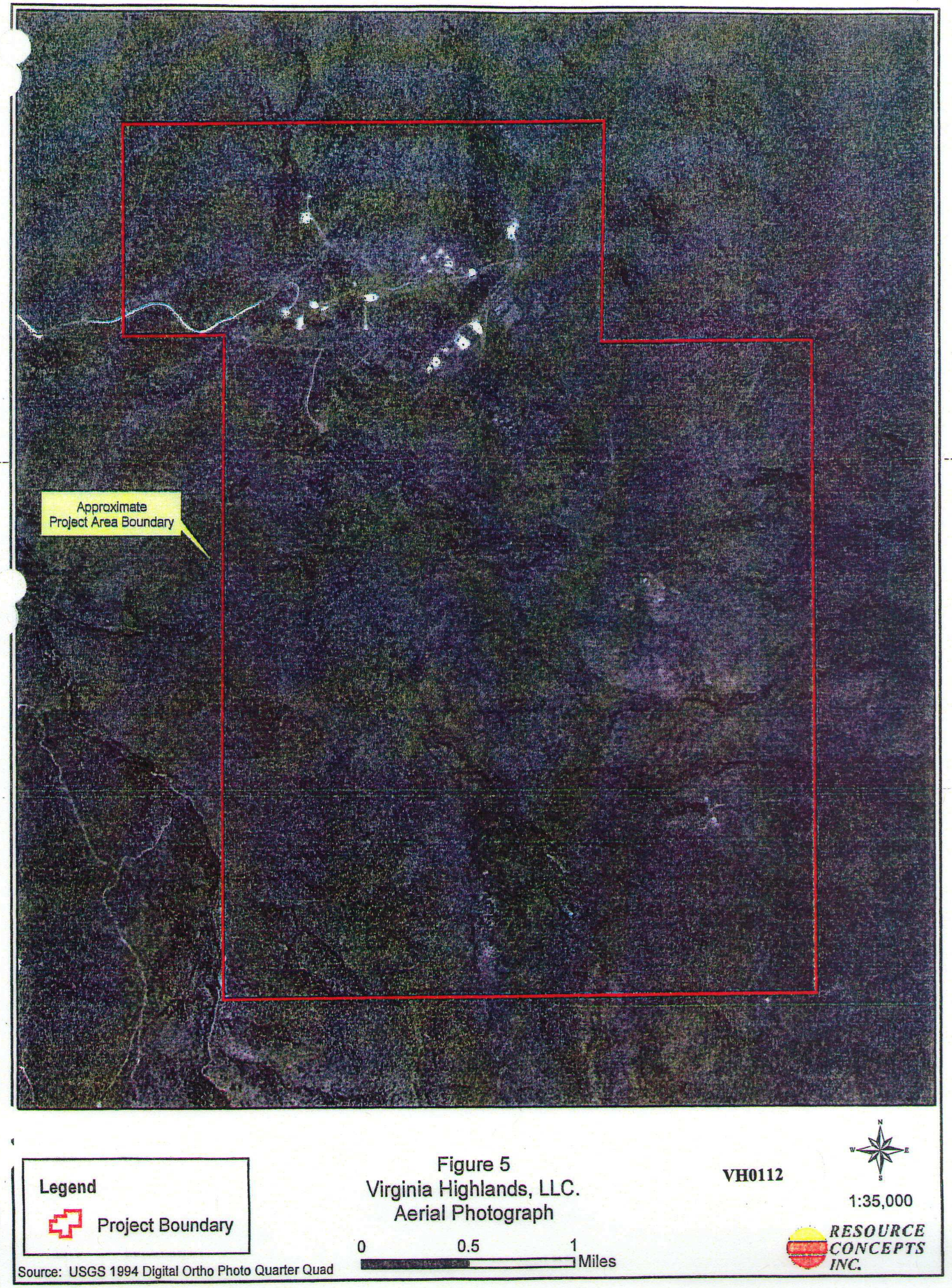


Figure 5
Virginia Highlands, LLC.
Aerial Photograph

Source: USGS 1994 Digital Ortho Photo Quarter Quad

VH0112

1:35,000

RESOURCE CONCEPTS INC.

Appendix A

Site Photographs

1). Data point DP1N low: Photo downslope of drainage 1N.

2). Data point DP1Na: Photo upstream of drainage 1Na.

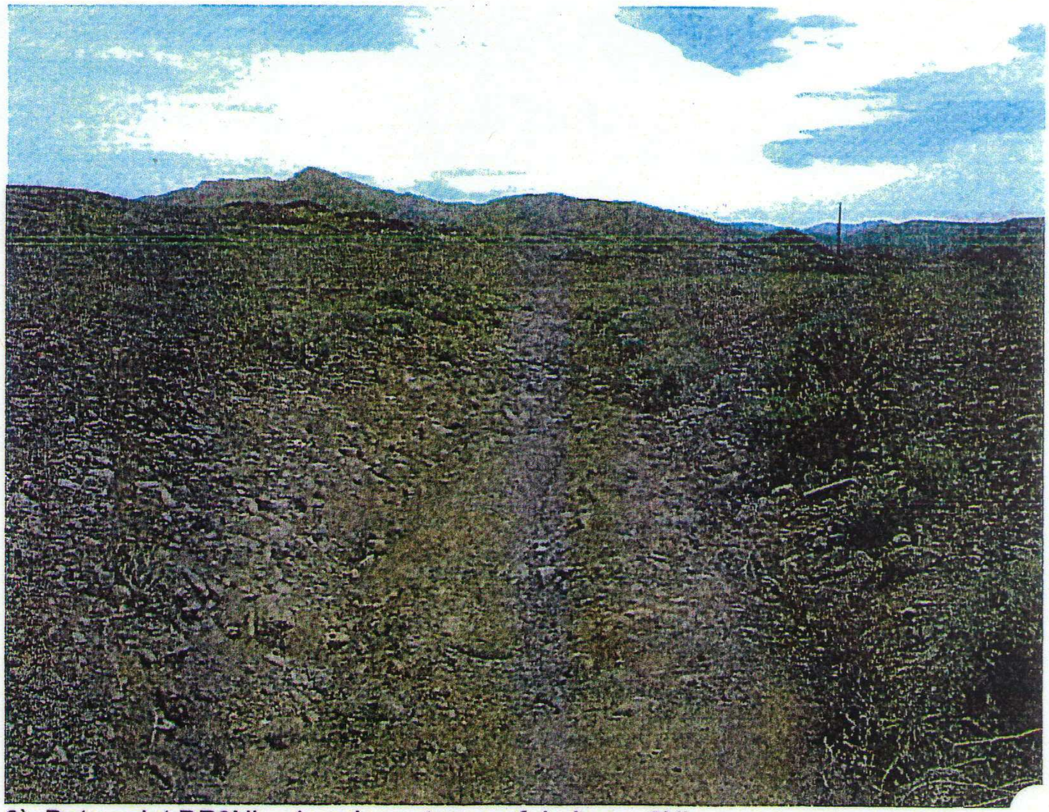
VH0114

3). Data point DP1Nb: Photo downstream of drainage 1Nb.

4). Data point DP2: Photo downstream of drainage 2.

VH0115

5). Data point DP2N: Photo upstream of drainage 2N.



6). Data point DP2Nb, view downstream of drainage 2Nb.

VH0116

7). Data point DP2Nb1, view downstream. Data point taken at top of drainage 2Nb1.

8). Data point DP2Sa, view downstream of drainage 2Sa.

VH0117

9). Data point DP2Sa1, view downstream of drainage 2Sa1.

10). Data point DP2Sb, view downstream of drainage 2Sb.

VH0118

11). Data point DP2Sb2, view downstream of drainage 2Sb2.

12). Data point DP2Sb2-1, view upstream of drainage 2Sb2-1.

VH0119

13). Data point DP2Sb2-2, view down stream of drainage 2Sb2-2.

14). Data point DP2Sb3, view down stream of drainage 2Sb3.

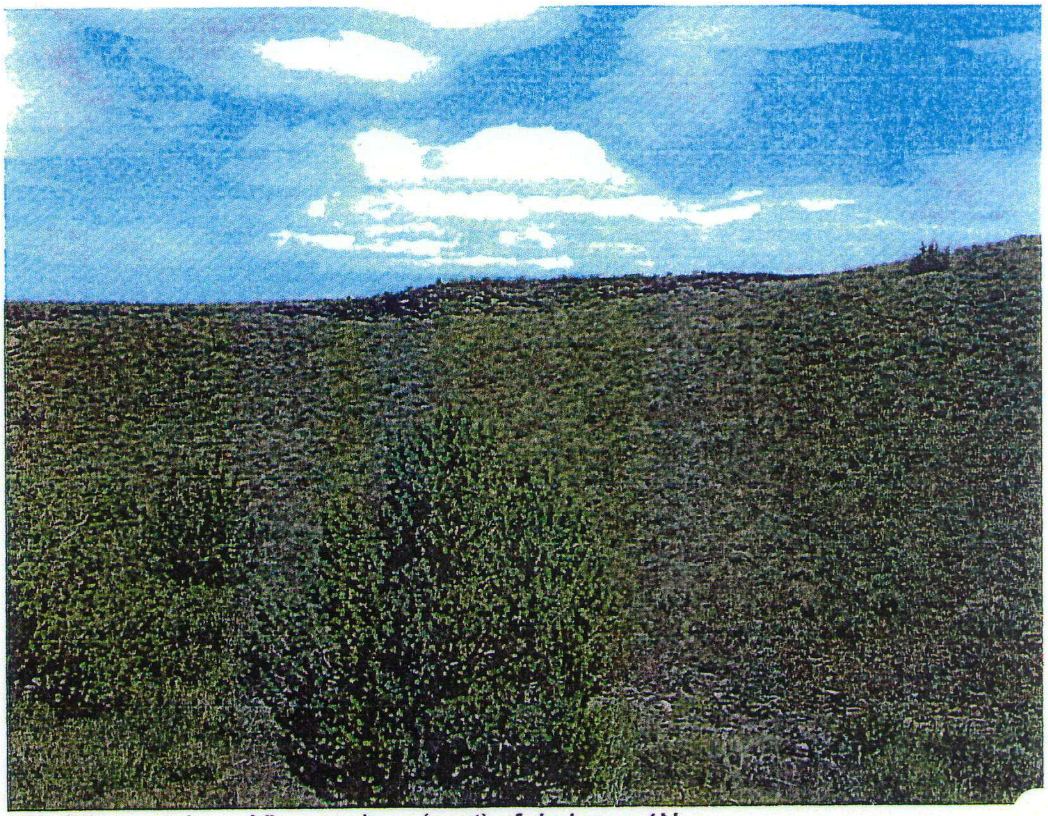
VH0120

15). Data point DP3, view down stream of drainage 3.

16). Data point DP3W, view down stream of drainage 3W.

VH0121

17). Data point DP4, view up stream of drainage 4.



18). Site overview. View upslope (east) of drainage 1N.

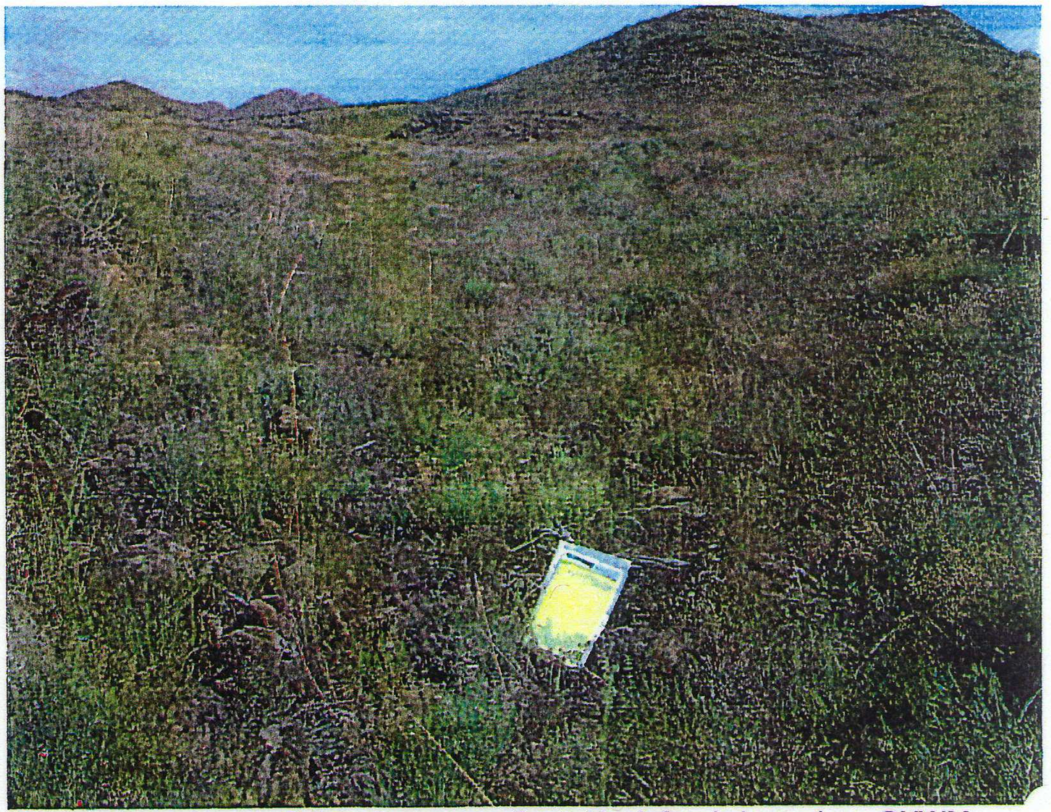
VH0122

19). Site overview. View downslope (north) of upland area, looking toward 2Sb.

20.) Site overview. Photo taken from hill near 2Na, view west.

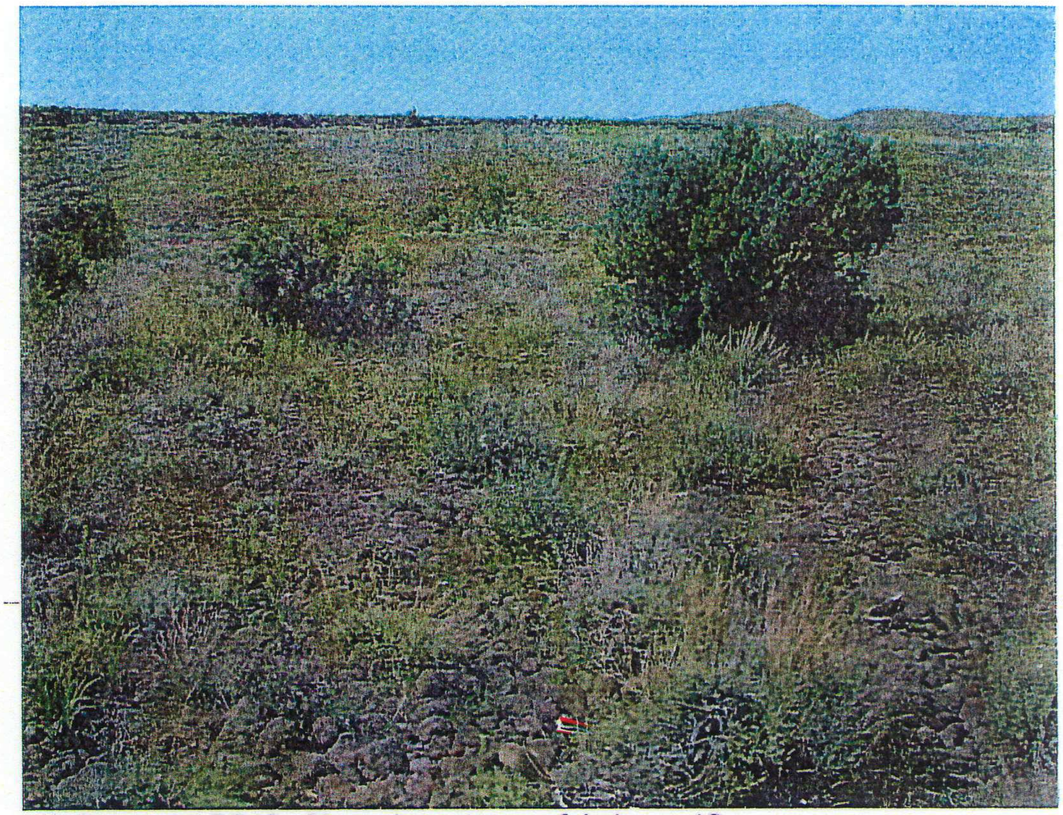
VH0123

21). Location of swale 2Na, view down gradient. No defined channel, no OHWM.



22). Location of swale 2Nb2, view up gradient. No defined channel, no OHWM.

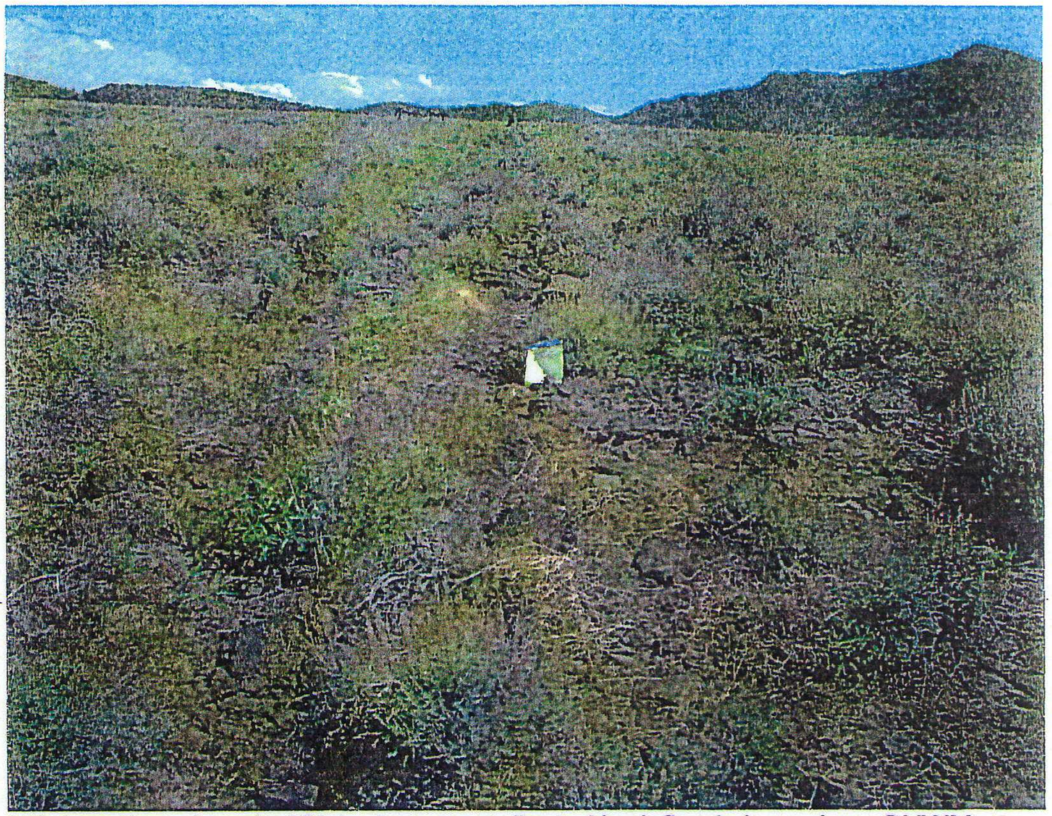
VH0124



23). Data point DP1S: Photo downstream of drainage 1S.

24). Location of swale 2Sa2, view up gradient. No defined channel, no OHWM.

VH0125



25). Location of swale 2Sb1, view up gradient. No defined channel, no OHWM.

26). Location of swale 3E, view up gradient. No defined channel, no OHWM.

VH0126

Appendix B

Point Precipitation Frequency Estimates
From
NOAA Atlas 14

POINT PRECIPITATION FREQUENCY ESTIMATES FROM NOAA ATLAS 14

California 38.95 N 119.94 W 6541 feet

from "Precipitation-Frequency Atlas of the United States" NOAA Atlas 14, Volume 1, Version 3
G.M. Bonnin, D. Todd, B. Lin, T. Parzybok, M.Yekta, and D. Riley
NOAA, National Weather Service, Silver Spring, Maryland, 2003

Extracted: Mon May 22 2006

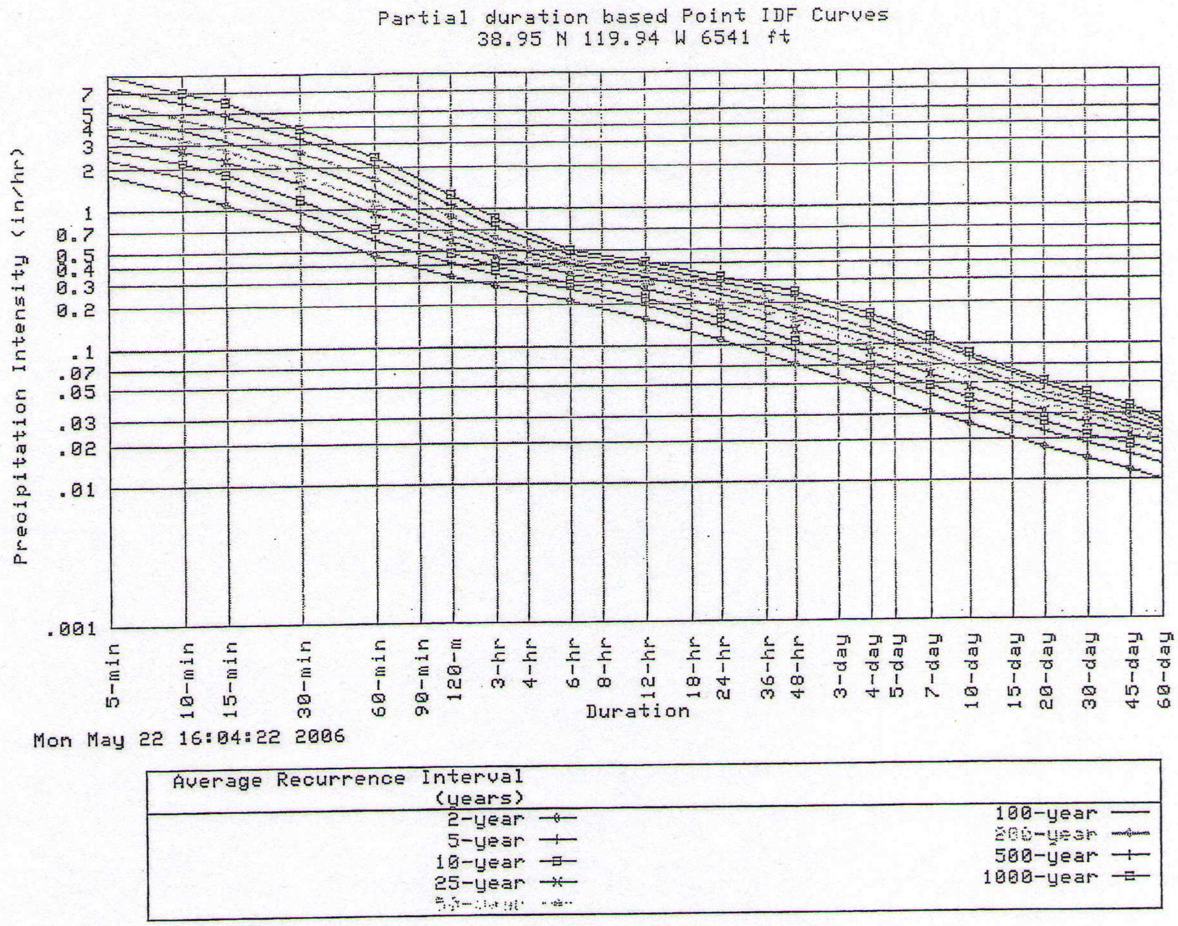
Confidence Limits | Seasonality | Location Maps | Other Info. | GIS data | Maps | Help | D

Precipitation Intensity Estimates (in/hr)

ARI* (years)	5 min	10 min	15 min	30 min	60 min	120 min	3 hr	6 hr	12 hr	24 hr	48 hr	4 day	7 day	10 day	20 day	30 day	45 day	60 day
2	1.79	1.36	1.12	0.76	0.47	0.33	0.28	0.21	0.16	0.11	0.07	0.05	0.03	0.03	0.02	0.01	0.01	0.01
5	2.32	1.76	1.46	0.98	0.61	0.41	0.34	0.26	0.19	0.14	0.09	0.06	0.04	0.03	0.02	0.02	0.02	0.01
10	2.82	2.15	1.77	1.19	0.74	0.48	0.38	0.29	0.22	0.16	0.11	0.07	0.05	0.04	0.03	0.02	0.02	0.02
25	3.59	2.73	2.26	1.52	0.94	0.58	0.45	0.33	0.26	0.19	0.13	0.09	0.06	0.05	0.03	0.03	0.02	0.02
50	4.28	3.26	2.70	1.81	1.12	0.66	0.50	0.37	0.29	0.21	0.15	0.10	0.07	0.05	0.04	0.03	0.02	0.02
100	5.12	3.90	3.22	2.17	1.34	0.76	0.55	0.40	0.32	0.23	0.17	0.11	0.08	0.06	0.04	0.03	0.03	0.02
200	6.13	4.66	3.86	2.60	1.61	0.87	0.63	0.43	0.35	0.26	0.19	0.13	0.09	0.07	0.04	0.04	0.03	0.02
500	7.72	5.87	4.86	3.27	2.02	1.06	0.74	0.47	0.38	0.29	0.22	0.15	0.10	0.08	0.05	0.04	0.03	0.03
1000	9.24	7.03	5.81	3.91	2.42	1.26	0.87	0.50	0.41	0.31	0.24	0.17	0.11	0.09	0.05	0.04	0.03	0.03

Text version of table

* These precipitation frequency estimates are based on a partial duration series. ARI is the Average Recurrence Interval. Please refer to the documentation for more information. NOTE: Formatting forces estimates near zero to appear as zero.



Confidence Limits -

* Upper bound of the 90% confidence interval Precipitation Intensity Estimates (in/hr)																		
ARI (years)**	**5 min**	**10 min**	**15 min**	**30 min**	**60 min**	**120 min**	**3 hr**	**6 hr**	**12 hr**	**24 hr**	**48 hr**	**4 day**	**7 day**	**10 day**	**20 day**	**30 day**	**45 day**	**60 day**
2	2.05	1.56	1.29	0.87	0.54	0.36	0.30	0.23	0.17	0.13	0.08	0.05	0.04	0.03	0.02	0.02	0.01	0.01
5	2.66	2.02	1.67	1.13	0.70	0.45	0.37	0.28	0.21	0.16	0.11	0.07	0.05	0.04	0.03	0.02	0.02	0.02
10	3.24	2.47	2.04	1.37	0.85	0.53	0.42	0.32	0.25	0.18	0.12	0.08	0.06	0.05	0.03	0.02	0.02	0.02
25	4.14	3.16	2.61	1.75	1.09	0.65	0.49	0.36	0.29	0.22	0.15	0.10	0.07	0.06	0.04	0.03	0.02	0.02
50	4.99	3.80	3.14	2.12	1.31	0.75	0.56	0.40	0.32	0.24	0.17	0.12	0.08	0.06	0.04	0.03	0.03	0.02
100	6.05	4.61	3.81	2.56	1.59	0.88	0.63	0.44	0.36	0.27	0.20	0.13	0.09	0.07	0.05	0.04	0.03	0.03
200	7.42	5.64	4.66	3.14	1.94	1.03	0.74	0.48	0.40	0.30	0.22	0.15	0.10	0.08	0.05	0.04	0.03	0.03
500	9.64	7.33	6.06	4.08	2.52	1.33	0.92	0.54	0.45	0.34	0.26	0.18	0.12	0.09	0.06	0.05	0.04	0.03
1000	11.89	9.05	7.48	5.03	3.12	1.62	1.12	0.62	0.49	0.37	0.28	0.20	0.13	0.10	0.06	0.05	0.04	0.03

* The **upper** bound of the confidence interval at 90% confidence level is the value which 5% of the simulated quantile values for a given frequency are greater than.
** These precipitation frequency estimates are based on a partial duration series. ARI is the Average Recurrence Interval.
Please refer to the documentation for more information. NOTE: Formatting prevents estimates near zero to appear as zero.

*** Lower bound of the 90% confidence interval**

VH0129

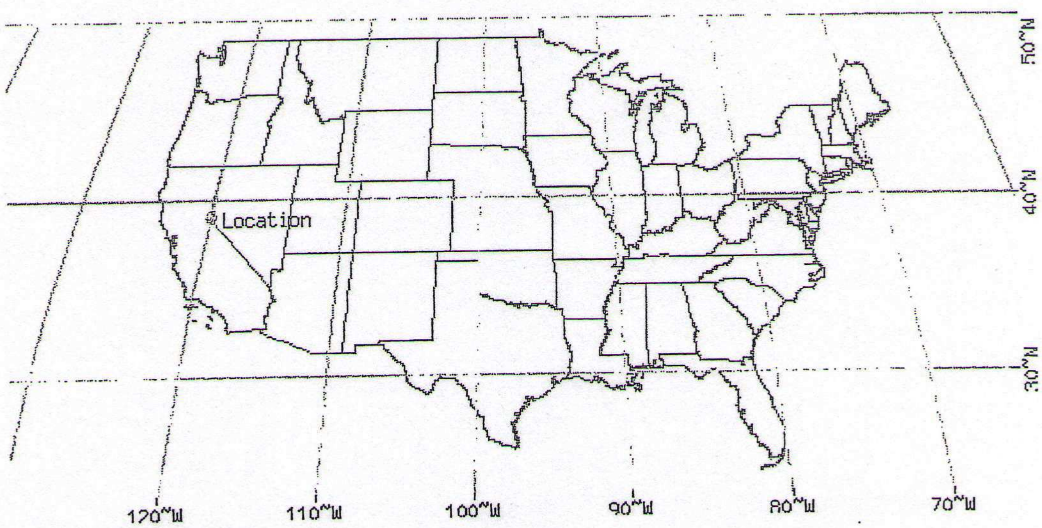
Precipitation Intensity Estimates (in/hr)																		
ARI** (years)	5 min	10 min	15 min	30 min	60 min	120 min	3 hr	6 hr	12 hr	24 hr	48 hr	4 day	7 day	10 day	20 day	30 day	45 day	60 day
2	1.60	1.21	1.00	0.67	0.42	0.30	0.26	0.20	0.14	0.10	0.06	0.04	0.03	0.02	0.02	0.01	0.01	0.01
5	2.05	1.56	1.29	0.87	0.54	0.37	0.31	0.24	0.17	0.12	0.08	0.05	0.03	0.03	0.02	0.02	0.01	0.01
10	2.48	1.89	1.56	1.05	0.65	0.43	0.35	0.27	0.20	0.14	0.09	0.06	0.04	0.03	0.02	0.02	0.02	0.01
25	3.05	2.32	1.92	1.29	0.80	0.51	0.41	0.30	0.23	0.16	0.11	0.07	0.05	0.04	0.03	0.02	0.02	0.02
50	3.54	2.69	2.22	1.50	0.93	0.57	0.44	0.33	0.25	0.18	0.13	0.08	0.06	0.05	0.03	0.02	0.02	0.02
100	4.08	3.11	2.57	1.73	1.07	0.64	0.48	0.35	0.27	0.20	0.14	0.09	0.06	0.05	0.03	0.03	0.02	0.02
200	4.67	3.55	2.94	1.98	1.22	0.71	0.54	0.37	0.29	0.22	0.16	0.11	0.07	0.06	0.04	0.03	0.02	0.02
500	5.52	4.20	3.47	2.34	1.45	0.83	0.62	0.40	0.31	0.25	0.18	0.12	0.08	0.06	0.04	0.03	0.03	0.02
1000	6.22	4.73	3.91	2.63	1.63	0.94	0.70	0.42	0.33	0.27	0.20	0.14	0.09	0.07	0.04	0.04	0.03	0.02

* The **lower** bound of the confidence interval at 90% confidence level is the value which 5% of the simulated quantile values for a given frequency are less than.

** These precipitation frequency estimates are based on a partial duration maxima series. ARI is the Average Recurrence Interval.

Please refer to the documentation for more information. NOTE: Formatting prevents estimates near zero to appear as zero.

Maps -



These maps were produced using a direct map request from the U.S. Census Bureau Mapping and Cartographic Resources Tiger Map Server.

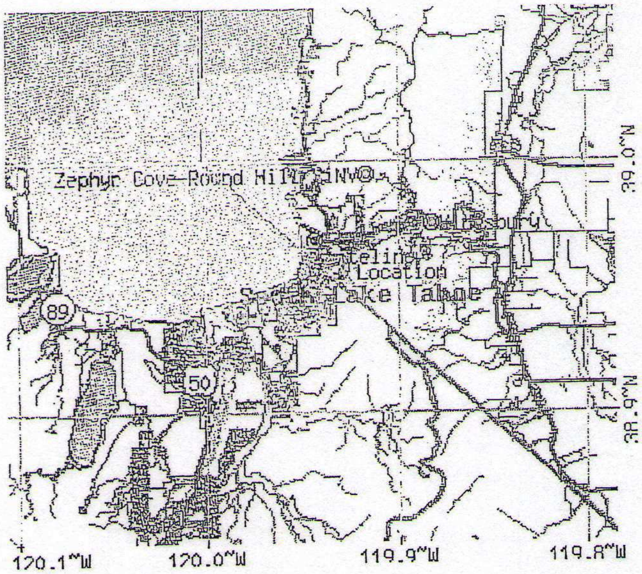
Please read disclaimer for more information.

LEGEND

State
County
Indian Resv
Lake/Pond/Ocean
Street
Expressway
Highway
Connector
Stream
Military Area
National Park
Other Park
City
County

Scale 1:228583 0 2 4 6 8 mi / 0 2 4 6 8 10 km

*average--true scale depends on monitor resolution



Other Maps/Photographs -

View USGS digital orthophoto quadrangle (DOQ) covering this location from TerraServer; **USGS Aerial Photograph** may also be available
from this site. A DOQ is a computer-generated image of an aerial photograph in which image displacement caused by terrain relief and camera tilts has been removed. It combines the image characteristics of a photograph with the geometric qualities of a map. Visit the National Digital Orthophoto Program (NDOP) for more information.

Watershed/Stream Flow Information -

Find the Watershed for this location using the U.S. Environmental Protection Agency's site.

Climate Data Sources -

Precipitation frequency results are based on data from a variety of sources, but largely NCDC. The following links provide general information
about observing sites in the area, regardless of if their data was used in this study. For detailed information about the stations used in this study,
please refer to our documentation.

Using the **National Climatic Data Center's (NCDC)** station search engine, locate other climate stations within:

+/-30 minutes ...OR... +/-1 degree of this location (38.95/-119.94). Digital ASCII data can be obtained directly from NCDC.

Find Natural Resources Conservation Service (NRCS) SNOTEL (SNOwpack TELemetry) stations by visiting the **Western Regional Climate Center's state-specific SNOTEL station maps**.

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Questions?: HDSC.Questions@noaa.gov

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