

Method of Determination:

3. ☒ Delivery System Diagram Attached (required). Indicate all major components and distances between components. Indicate weir size/pipe as applicable.
- ☒ Map Attached Showing Location(s) of point(s) of diversion and place(s) of use (required). Scale must be 1:24,000 or greater.
- ☒ Aerial Photo Attached (required for irrigation of 10+ acres).
- ☒ Photo of Diversion and System Attached

4.

<u>Well or Diversion ID No.*</u>	<u>Motor Make</u>	<u>Hp</u>	<u>Motor Serial No.</u>	<u>Pump Make</u>	<u>Pump Serial No. or Discharge Size</u>
POD	N/A	N/A	N/A	N/A	Could not be determined

^Refers to diversion ID on attached map

D. FLOW MEASUREMENTS

1.

<u>Measurement Equipment</u>	<u>Type</u>	<u>Make</u>	<u>Model No.</u>	<u>Serial No.</u>	<u>Size</u>	<u>Calib. Date</u>
Theoretical	Hazen-Williams	N/A	N/A	N/A	N/A	N/A

2. Measurements: Theoretical

E. FLOW CALCULATIONS

____Additional Computation Sheets Attached

Measured Method: Theoretical

Hazen-Williams Formula

$$V = 1.318 \times C_h \times R^{0.63} \times S^{0.54}$$

V = Velocity (ft/s)

 C_h = Hazen-Williams Friction Coefficient

R = Hydraulic Radius = Cross Sectional Area / Wetted Perimeter

S = h_f/L = Slope of Energy Grade LineFor 1.25" old/plastic pipe: $C_h = 130$; For Delivery System: S = 0.04 w/ R = 0.026 ; $\Rightarrow V = 3.02$ ft/s & Q = 0.03 cfs

F. VOLUME CALCULATIONS

1. Volume Calculations for Irrigation: N/A

2. Volume Calculations for Other Uses:

800 Range Cattle at 12 gpd/head:

$$12 \text{ gpd/head} \times 800 \text{ head} \times 184 \text{ days} = 5.42 \text{ AFA}$$

325850 gallons/AF

30 ungulates (wildlife) @ 12 gpd/ungulate:

$$12 \text{ gpd/head} \times 30 \text{ head} \times 365 \text{ days} = 0.40 \text{ AFA}$$

325850 gallons/AF

Total Recommended = 5.42 AFA (Stock) + 0.40 AFA (Wildlife) = 5.82 AFA

G. NARRATIVE/REMARKS/COMMENTS

Steve Davis from the BLM office in Burley was able to provide the majority of the information required for the beneficial use exam on October 23, 2007. However, one of the legal descriptions (GPS points) for a POU provided by Mr. Davis did not match what was permitted. Also, there was little information provided with regards to the specifics of the delivery system. On November 15, 2007 Jeff Cooper performed a field examination in order to clear up the location discrepancy and provide further detail for the license.

The POD apparently consists of a buried metal water collection box and a metal headbox for settling the solids. It is located approximately 190 ft due North of Worthington Springs. Based on the GPS point provided by the BLM, the actual location of the diversion should actually be 16S 22E S28 SWSESW, though it was permitted for 16S 22E S28 SESESW. Also after talking to Steve Davis, it was determined that the metal box sits in the unnamed stream channel, which was determined to be tributary to Birch Creek.

The POUs consist of a system of five pairs of troughs and a reservoir, with the delivery system being 1 1/4 inch plastic pipe. For the most part, the delivery system is buried to prevent damage. The troughs are generally of the same dimensions, being 13 ft x 5 ft x 3 ft (L x W x D). Water comes in from the inlet of one trough, flows into the second trough, and exits through an outlet, which are found to be at varying depths, though typically about 3 ft. This gives an overall volume of approximately 0.05 AF in all of the troughs. The reservoir has a surface area of approximately 0.22 acres. A drain located on the north end of the reservoir stands at 1.5 ft. This gives a total system capacity of 0.33 AF. The overall system capacity is approximately 0.38 AF. It should be noted that a series of valves were located nearby each of the troughs, allowing flow to be turned off at any point in the system.

During the field examination, it was also clear that the location of a set of troughs, that had been permitted for T16S R22E S18 SWSW Lot 4 were actually located in T16S R22E S19 NWNW Lot 1.

Because the system was buried, no flow measurement was possible. A theoretical measurement was used to approximate the maximum flow that could occur, based on the system design. Head pressures vary between the POD and each POU. However, the head between the headbox at the spring and the nearest set of troughs, located at T16S R22E S29 NWNE (~1.04 miles away), is ~220 ft. Using the Hazen-Williams Formula it is estimated that a flow of 0.03 cfs.

At the request of the department, Steve Davis spoke to a wildlife biologist with the BLM to determine the number of large animals (ungulates) visiting the troughs. The biologist determined that on average 30 animals/day utilize the water. Using direction from the state office, each of these animals were assigned 12 gallons/day or the same volume range cattle use.

Have conditions of permit approval been met? X Yes No

H. RECOMMENDATIONS**1. Recommended Amounts**

<u>BENEFICIAL USE</u>	<u>PERIOD OF USE</u>	<u>DIVERSION RATE</u>	<u>ANNUAL VOLUME</u>
STOCKWATER	05/01 to 10/31	0.020 CFS	5.42 AF
WILDLIFE	01/01 to 12/31	0.010 CFS	0.40 AF
<u>Totals:</u>		0.020 CFS	5.82 AF

2. Recommended Amendments

☒ Change P.D. as reflected above ☐ Add P.D. as reflected above ☐ None

☒ Change P.U. as reflected above ☐ Add P.U. as reflected above ☐ Other

I. AUTHENTICATION

Field Examiner's Name J. Cooper Date 11/30/2007

Reviewer _____ Date _____

GPS coordinates provided by Steve Davis - Burley BLM office 1/2

REMARKS	Claim	Legal_Desc	Feature	GPS_Date	Datafile	Northing - UTMz11NAD83
2 Troughs	45-2810BLM	POU	trough	7/31/2003	A073117A.cor	4656457.55300000000
Reservoir	45-2810BLM	POU	other	7/31/2003	A073117A.cor	4657211.54100000000
2 Troughs	45-2810BLM	POU	trough	7/31/2003	A073117A.cor	4656295.72900000000
2 Troughs	45-2810BLM	POU	trough	8/1/2003	A080115A.cor	4657993.20100000000
2 Troughs	45-2810BLM	POU	trough	8/1/2003	A080118A.cor	4656848.86300000000
2 Troughs	45-2810BLM	POU	trough	8/6/2003	R080617A.cor	4656662.97300000000
POD (Water Collection Box)				10/2/2007	POD ON UNNAMED STREA	4654803.79200000000

GPS Coordinates provided by Steve Davis - Burley BLM office 2/2

Easting - UTMz11NAD83 Longitude - NAD83 Latitude - NAD83

754305.23100000000	-113.92857264400	42.01906162170	✓
755204.81800000000	-113.91739501400	42.02555156180	✓
756867.86800000000	-113.89773627100	42.01677430460	✓
754225.27700000000	-113.92887169800	42.03289855090	* ✓
755859.59900000000	-113.90965517400	42.02207723650	✓
753101.00900000000	-113.94300826700	42.02129720650	✓
757991.17200000000	-113.88484452100	42.00298956390	

different Sec

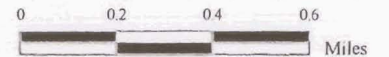
Permit 45-13402

R22E

MAP 1

Legend

- + Point Determined by GPS
- Digitized Pipeline (Not Actual Route)
- GCDB Grid
- Bureau of Land Management
- Private
- State
- Forest Service

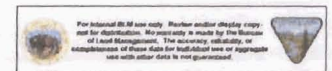


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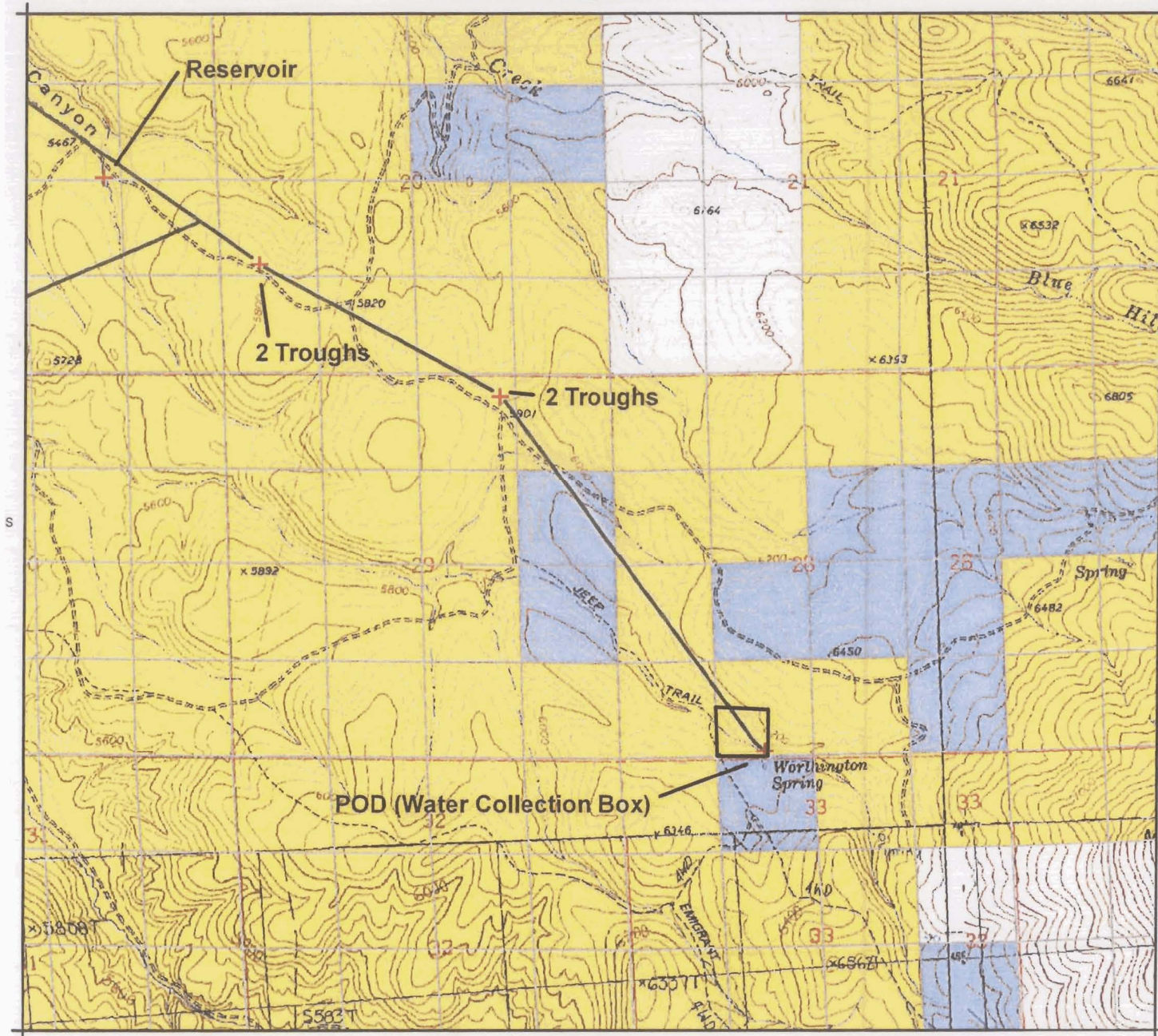


T16S

Quad Map Name:
Blue Hill (A842113)

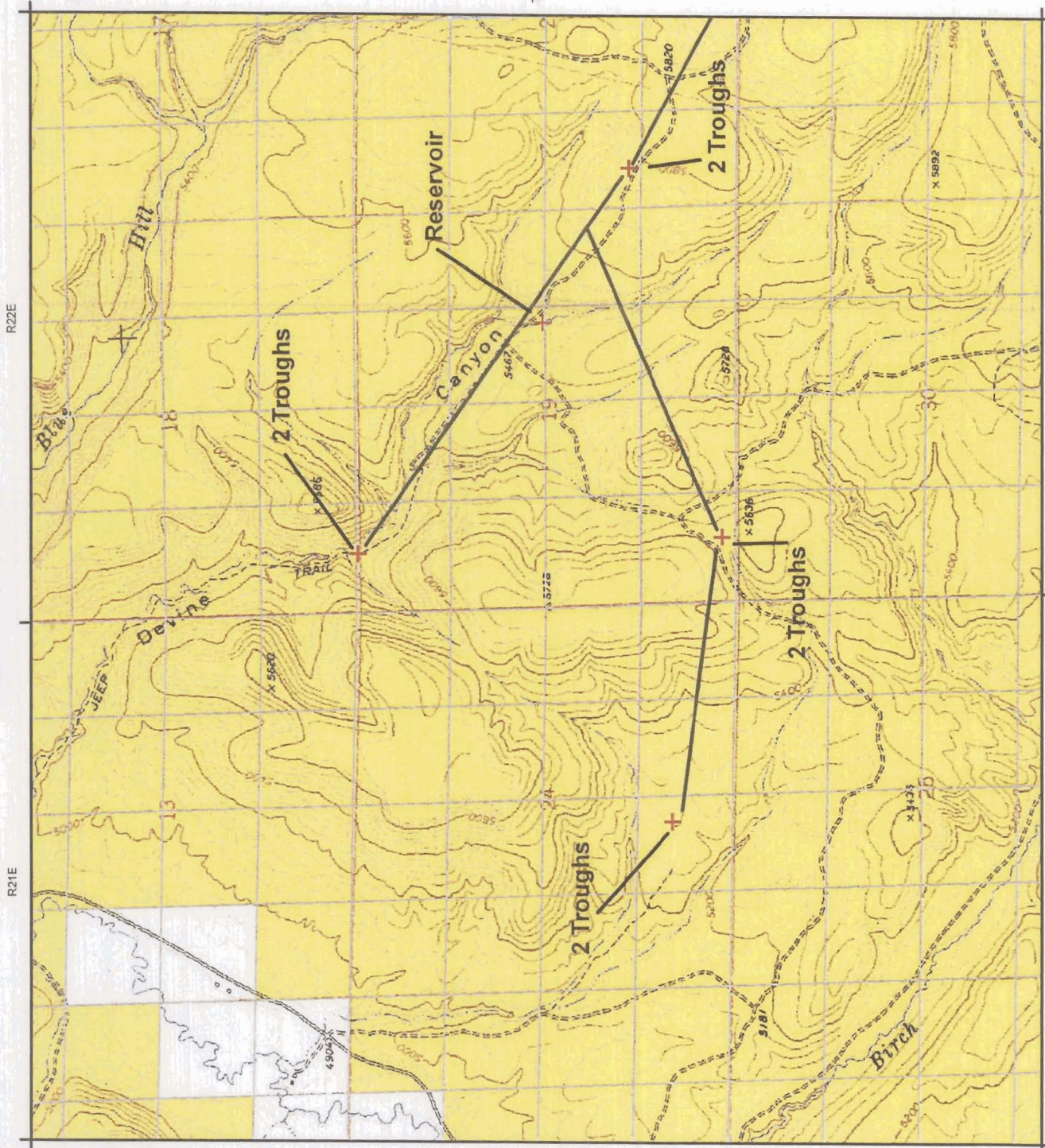


October 18, 2007
Permit_45-13402Map1.mxd



Note: 40 acre aliquot parts and Lots are POU's unless otherwise noted; 10 acre aliquot parts are POD's

Permit 45-13402



MAP 2

Legend

- + Point Determined by GPS
- Digitized Pipeline (Not Actual Route)
- GCDB Grid
- Bureau of Land Management
- Private
- State
- Forest Service



1:24,000

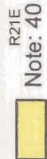
T16S

T16S

Quad Map Name:
Blue Hill (A842113)

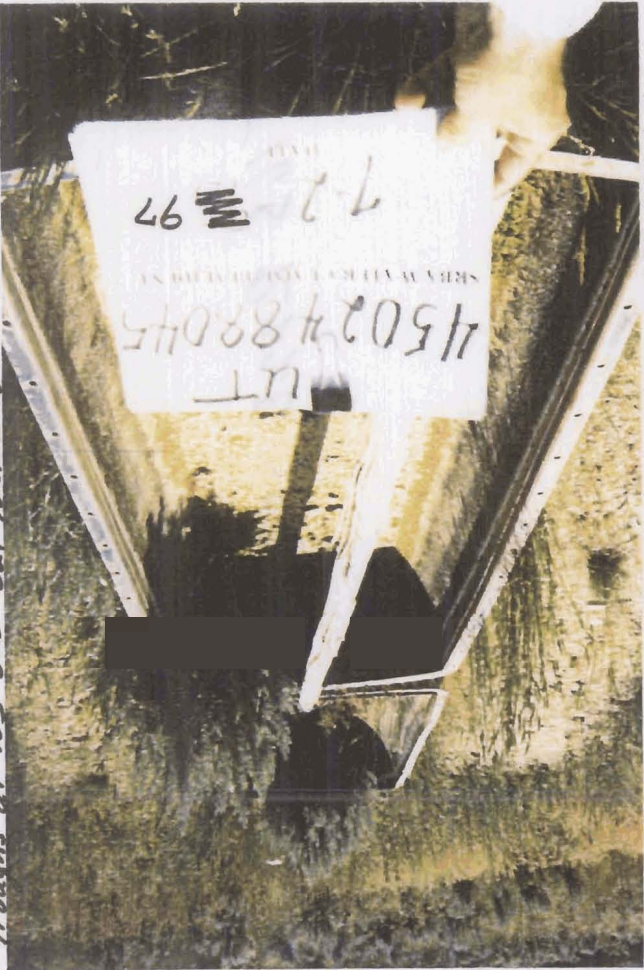


Note: 40 acre aliquot parts and Lots are POU's unless otherwise noted; 10 acre aliquot parts are POD's



October 17, 2007
Permit_45-13402Map2.mxd

Troughs at 16S 22E S29 NWNW



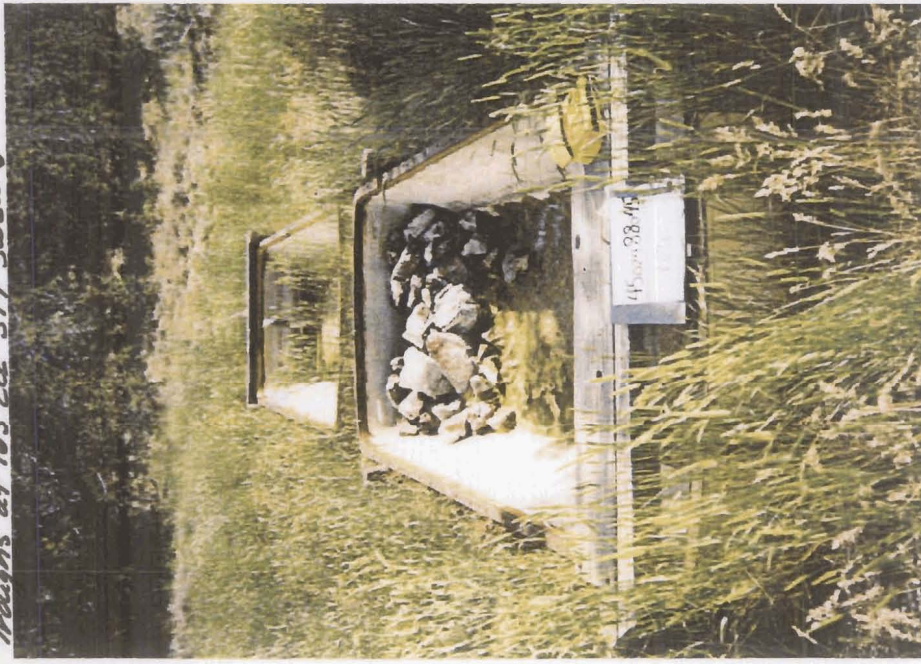
Troughs at 16S 22E S24 SESW



Troughs at 16S 22E S20 NWSW



Troughs at 16S 22E S19 SWSW



Troughs at 16S 22E S19 NWNW



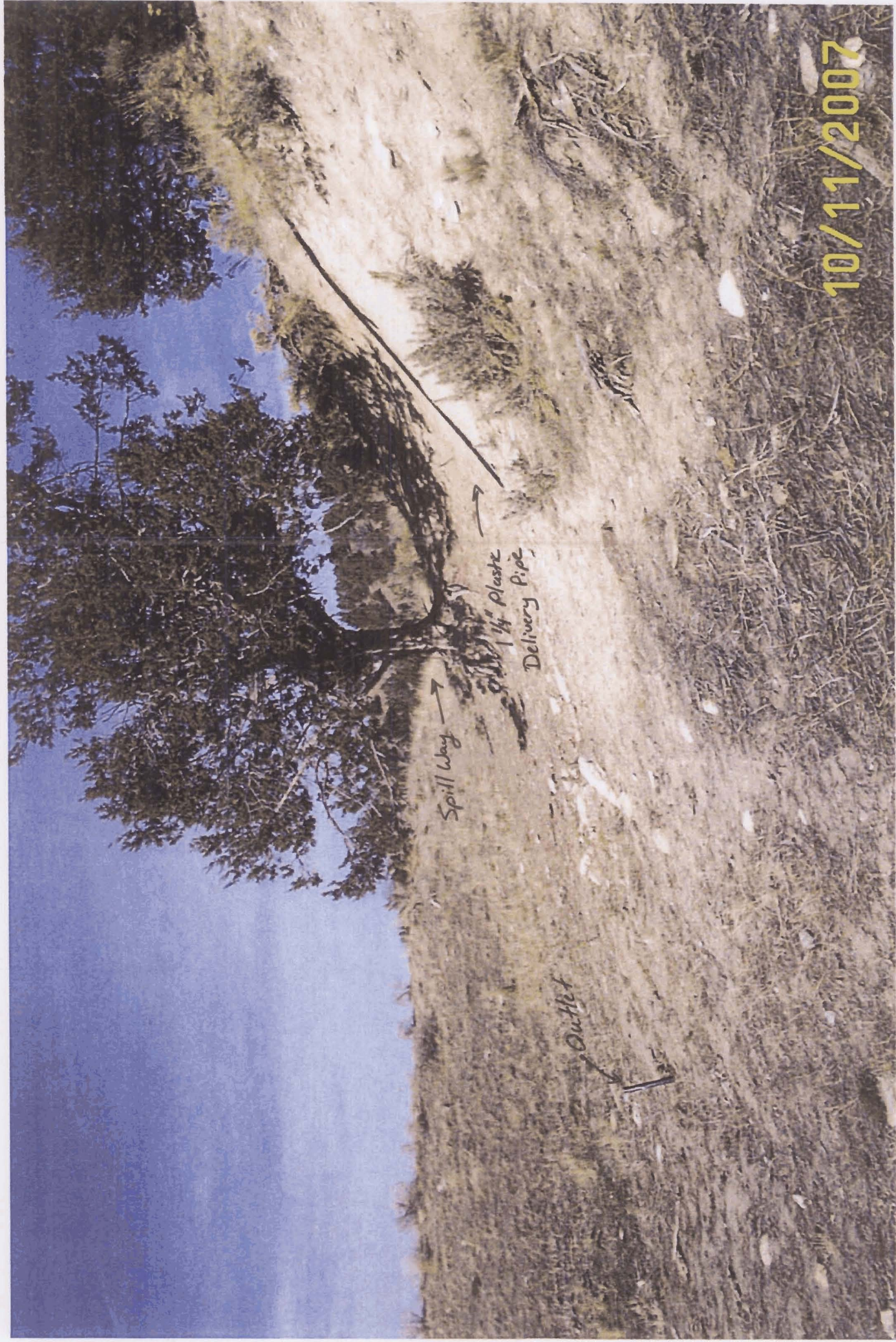
10/11/2007

Small Dam in Devine Canyon (Looking Downstream)
T16 S R22 E S19 SWNE



10/11/2007

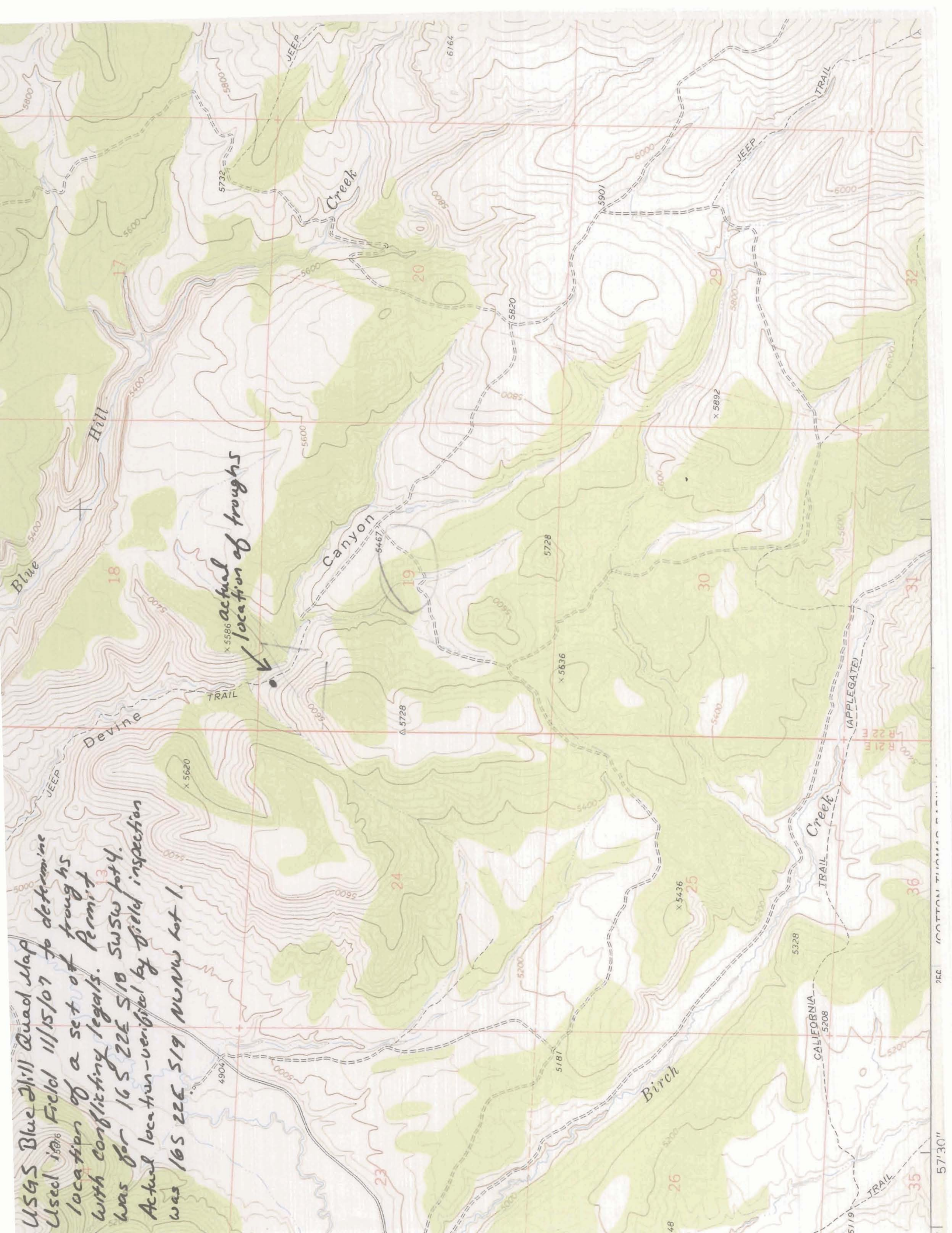
Small Dam in Dewine Canyon (Looking Upstream)
T165 R22E S19 SWNE



10/11/2007

Small Dam in Devine Canyon showing delivery system (as on map) and outlet
T16S R22E S19 T54NE

USGS Blue Hill Quad Map
 Used 100% Field 11/15/07 to determine
 location of a set of troughs
 with conflicting legal³. Permit
 was for 16S 22E S18 SWSW 1/4.
 Actual location-verified by field inspection
 was 16S 22E S19 NWNW 1/4.





2004 Oakley NAIP Aerial Photograph

1:24000