

Permit No. 79-7210

3. Source: Unnamed Stream and Tolo Lake tributary to Telcher Creek

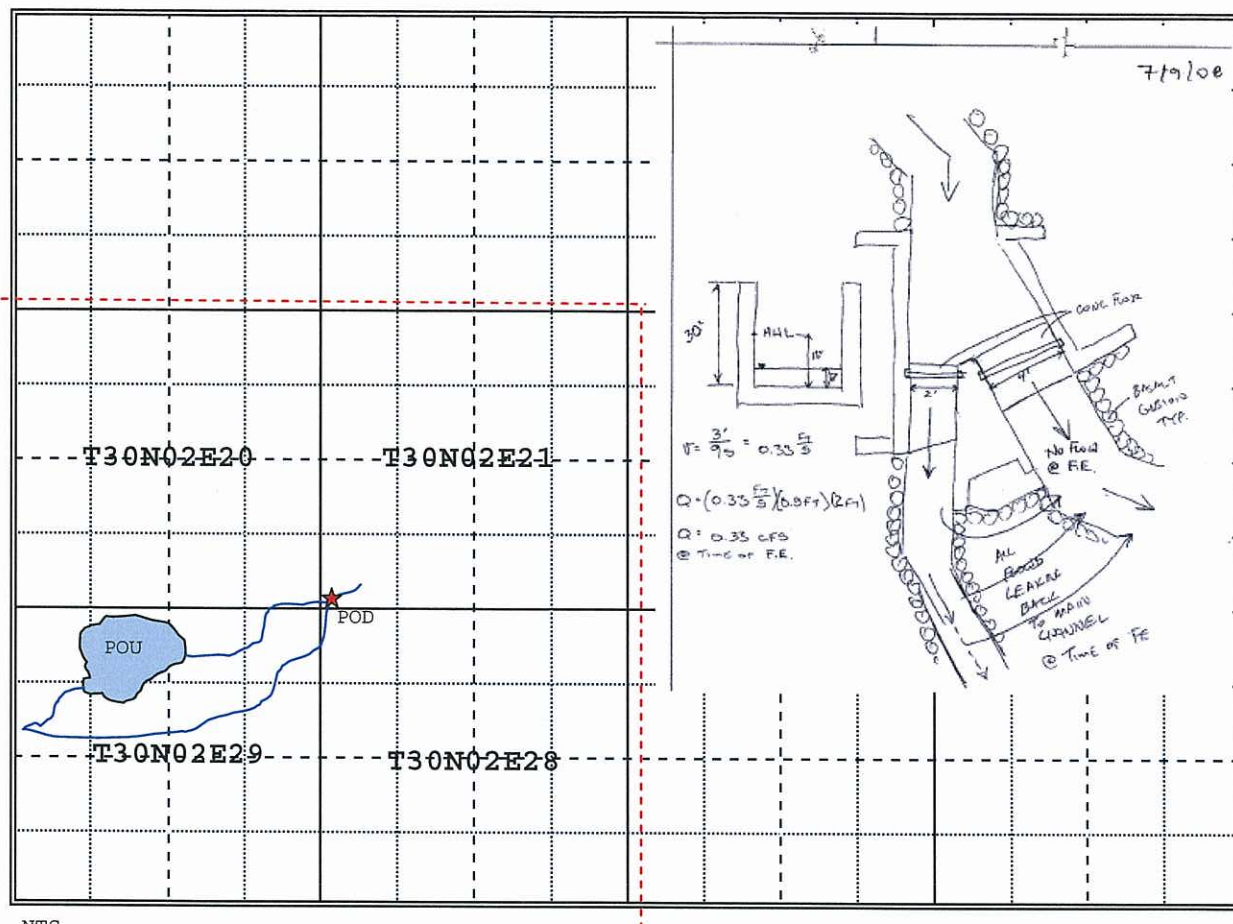
1. Other water rights with the same place of use: None
2. Other water rights with the same point of diversion: None

1. Point(s) of Diversion:

Indicate Method of Determination Aerial Imagery - 2004

[illegible]

3. **Delivery System Diagram:** Indicate all major components and distances between components. Indicate weir size/ditch size/pipe i.d. as applicable.



Scale: 1" = NTS

☒ Copy of USGS Quadrangle Attached Showing location(s) of point(s) of diversion and place(s) of use (required).

☒ Aerial Photo Attached (required for irrigation of 10+ acres)

☒ Photo of Diversion and System Attached

4.

Well or Diversion Identification No.*	Motor Make	Hp	Motor Serial No.	Pump Make	Pump Serial No. or Discharge Size
N/A					

*Code to correspond with No. on map and aerial photo

D. FLOW MEASUREMENTS

1.

Measurement Equipment	Type	Make	Model No.	Serial No.	Size	Calib. Date
N/A						

2. **Measurements:** None taken.

E. NARRATIVE/REMARKS/COMMENTS

In July of 2008 I carried out the initial field exam with Rober Hand (IDFG, Lewiston). At that time, although water was being diverted at the point of diversion (POD) to Tolo Lake, due to sever leaking in the channel, the water was returning to the parent source within 25 feet of the POD. I coordinated this matter with Roy Kinner (Sr. Conservation Officer, Grangeville) at the time, and he indicated that water only reaches Tolo Lake during spring run off. We agreed to return to the POD in Spring of 2009 to observe peak flows. In addition, following the field exam Robert Hand agreed to prepare a bathymetric survey of Tolo Lake for me by the Fall of 2008.

On April 14, 2009 Mr. Hand provided a bathymetric survey of Tolo Lake (see attached). Mr. Hand's survey found a lake volume of 138.5 acre-feet, a surface area of 16.2 ha, a maximum depth of 4.2 meters, and an average depth of 1.4 meters.

Due to budgetary constraints a return field exam visit was regarded as a last resort. Therefore, Roy Kinner agreed to take and provide stream flow measurements and pictures so that I could complete the report without making another site visit.

On July 10, 2009 Mr. Kinner provided nine site pictures of the diversion and a road crossing immediately downstream of the POD. He recorded a length on the culvert at the road crossing of 42 feet, the travel time of an object floating through the culvert of 40 seconds, an entrance depth of flow of 17 inches, and an outlet depth of flow of 16.5 inches. Site picture indicate that the culvert has an approximate inside diameter of 18 inches. Mr. Kinner also provided data for depth of flow, length, width, and travel time at the POD, but was unsure of this data. Therefore I have prepared calculation of flow rate based off the information provided at the culvert.

The site pictures also indicate that the diversion works were repaired/replaced at the point of leakage witnessed the year before with a concrete rectangular channel. Flow through the diversion is confirmed in the pictures.

Have conditions of permit approval been met? ☒ yes ☐ no

F. FLOW CALCULATIONS

_____ Additional Computation Sheets Attached

Measured Method: Stick float; Continuity Equation

Velocity = distance/time = 42 feet/40 seconds = 1.05 ft/sec

Average Depth of Flow = $(17 + 16.5)/2 = 16.75$ inches = 1.40 feet

Unit Circle Equations: $d = R - h$; $\theta = 2 \text{ ARCCOS } (d/R)$; $A = R^2(\theta - \sin\theta)/2$

Radius, $R = 18$ inches = 1.5 ft; depth of flow, $h = 1.40$ ft;

$d = (1.5 - 1.4)$ feet = 0.1 feet

$\theta = 2 \text{ ARCCOS } (0.1/1.5) = 3.01$ radians

$A = [(1.5 \text{ ft})^2(3.01 - \sin(3.01))]/2 = 3.24 \text{ ft}^2$

Continuity Equation: flow rate, $Q = \text{velocity} \times \text{area}$

$Q = (1.05 \text{ ft/sec})(3.24 \text{ ft}^2) = 3.40 \text{ CFS}$

G. VOLUME CALCULATIONS

1. Volume Calculations for Irrigation:

$V_{I,R} = (\text{Acres Irrigated}) \times (\text{Irrigation Requirement}) =$

$V_{D,R} = [\text{Diversion Rate (cfs)}] \times (\text{Days in Irrigation Season}) \times 1.9835 =$

$V = \text{Smaller of } V_{I,R} \text{ and } V_{D,R} =$

2. Volume Calculations for Other Uses:

From the IDFG Bathymetric Survey: Volume = 138.5 ac-ft

H. RECOMMENDATIONS

1. Recommended Amounts

Beneficial Use	Period of Use		Rate of Diversion	Annual Volume
	From	To	Q (cfs)	V (afa)
Wildlife	1/01	12/31	3.40	
Wildlife Storage	1/01	12/31		138.5
Recreation	1/01	12/31	3.40	
Recreation Storage	1/01	12/31		138.5
Diversion to Storage	1/01	12/31	3.40	
Total:			3.40	138.5

2. Recommended Amendments

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

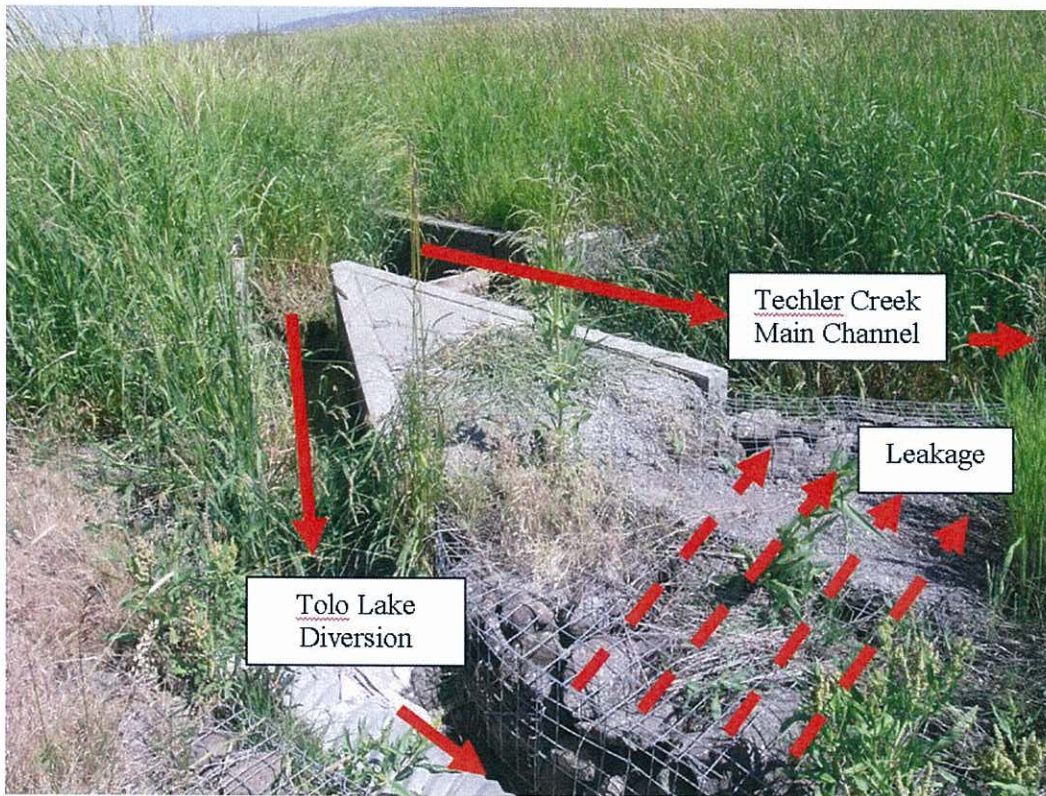
☐ Change P.U. as reflected above ☐ Add P.U. as reflected above ☐ Other

I. AUTHENTICATION

Field Examiner's Name Mathew Weaver Date July 14, 2009

Reviewer _____ Date _____

SEAL



Point of diversion July 2008. Diagram depicts leakage that was occurring.



Downstream of diversion in conveyance channel to Tolo Lake looking upstream at the point of diversion, Spring/Summer 2009. Leaky basalt caissons (previous picture) have been replaced with concrete walls. Conveyance channel has been lined with cement downstream of end of diversion.



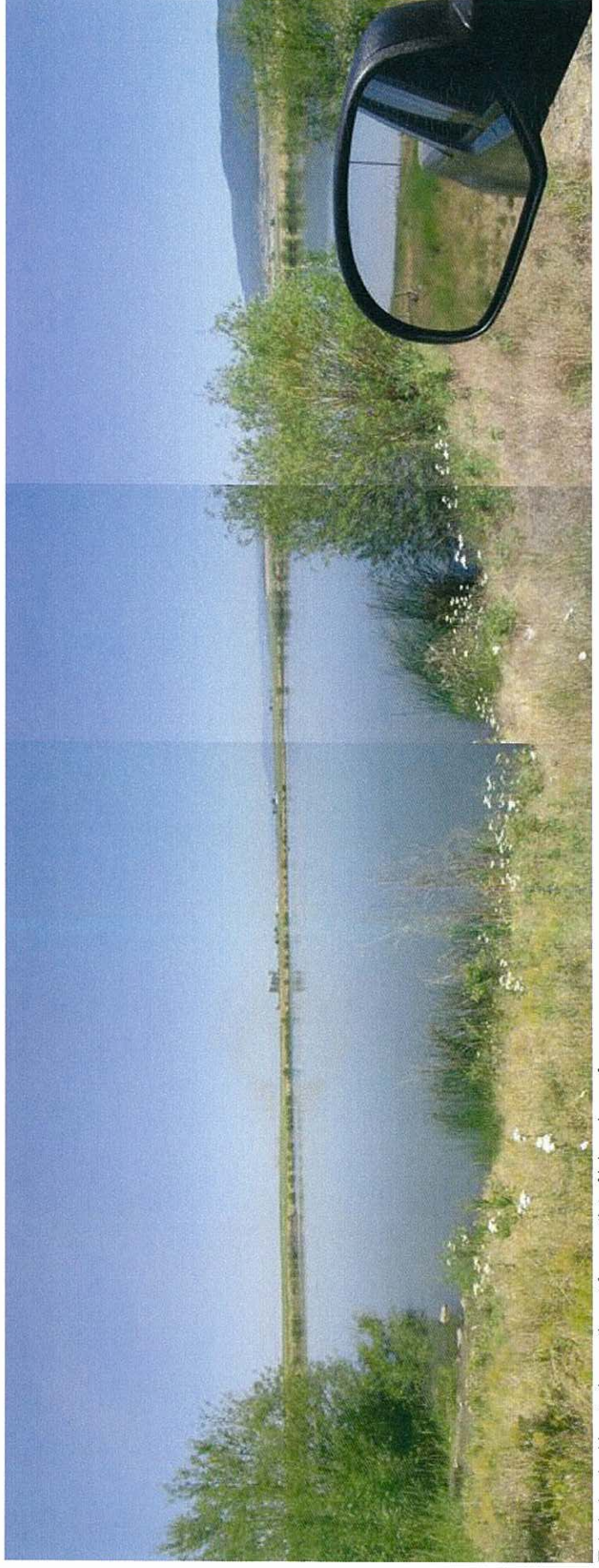
Upstream of diversion looking downstream Spring/Summer 2009. Tolo Lake is located near the tree that can be observed in the far background on the left side of the image.



Downstream of diversion in Techler Creek channel looking upstream at the point of diversion, Spring/Summer 2009.

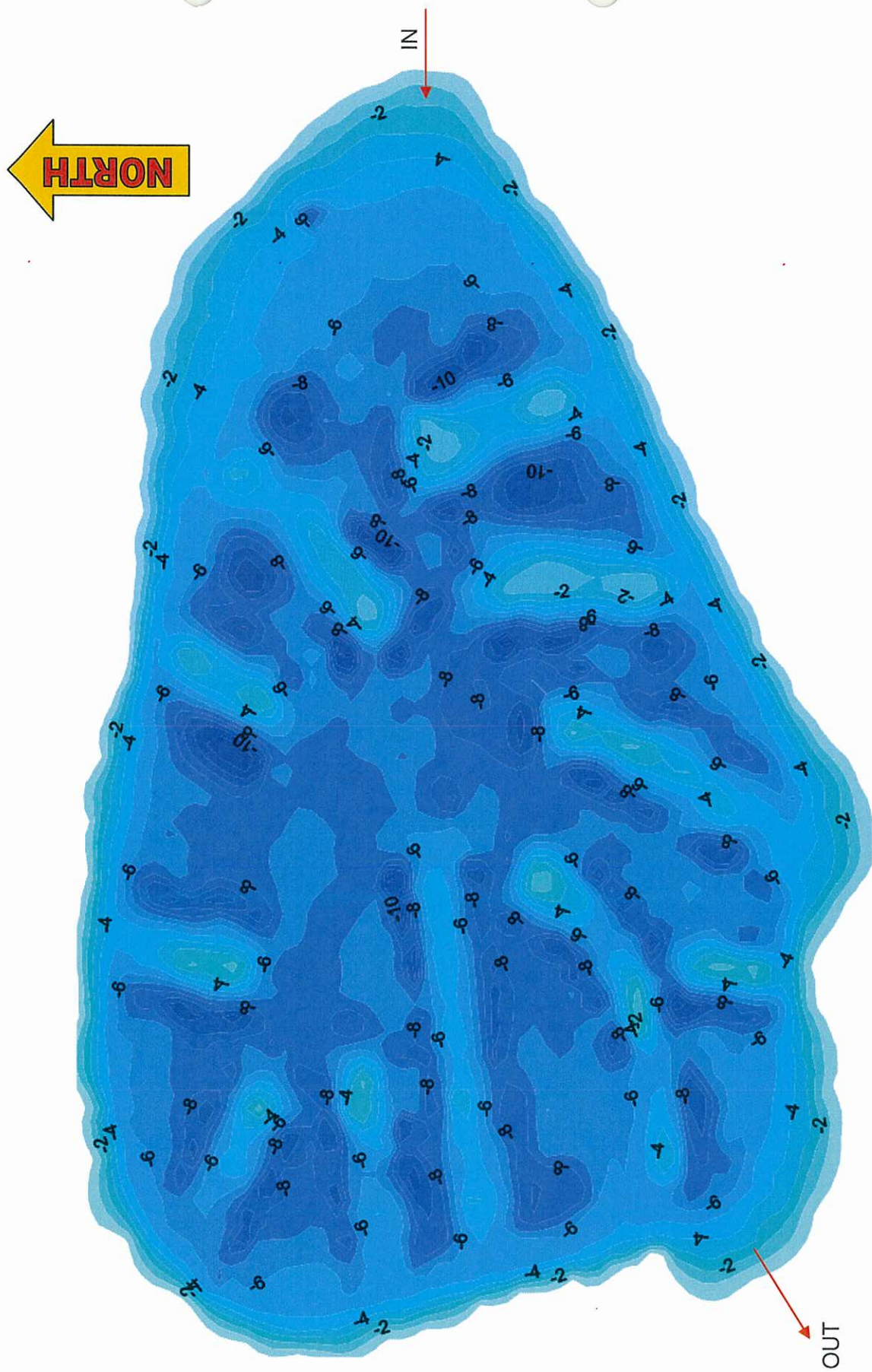


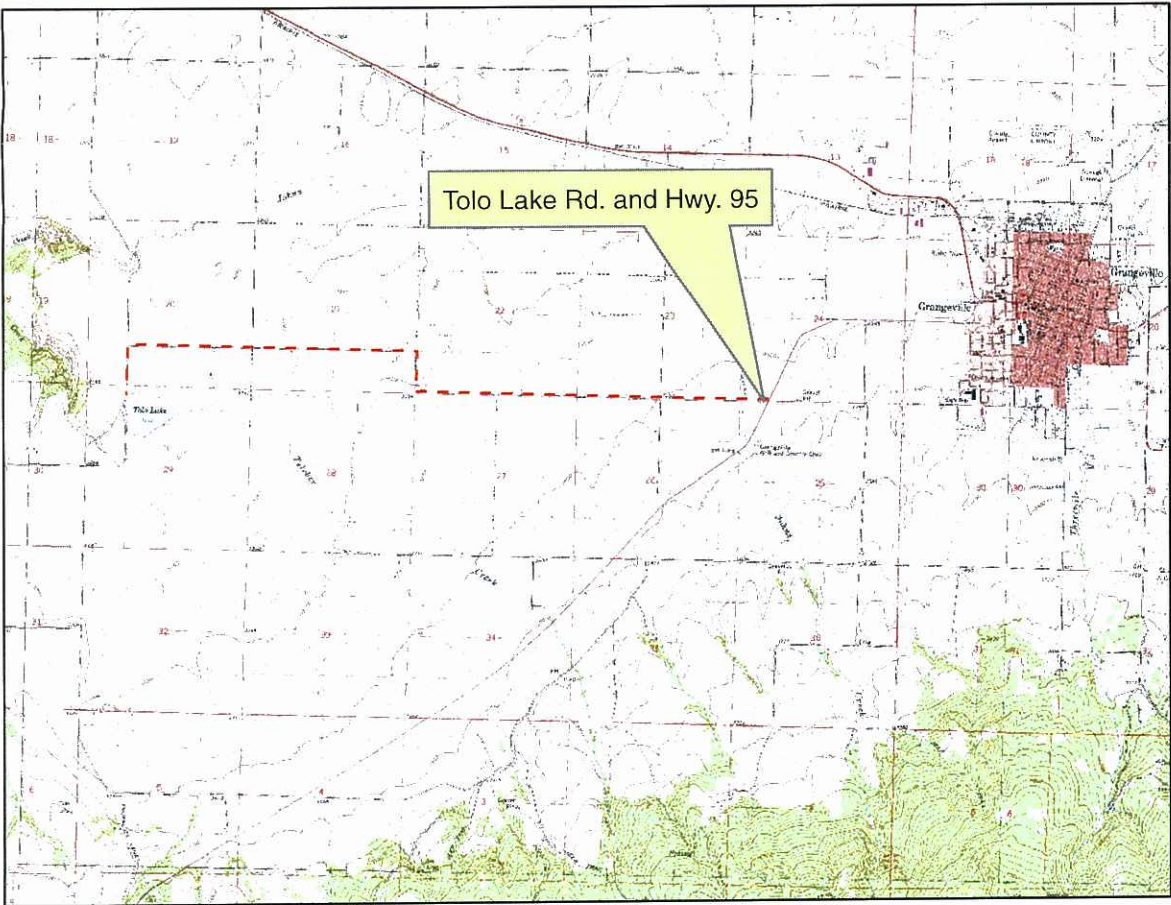
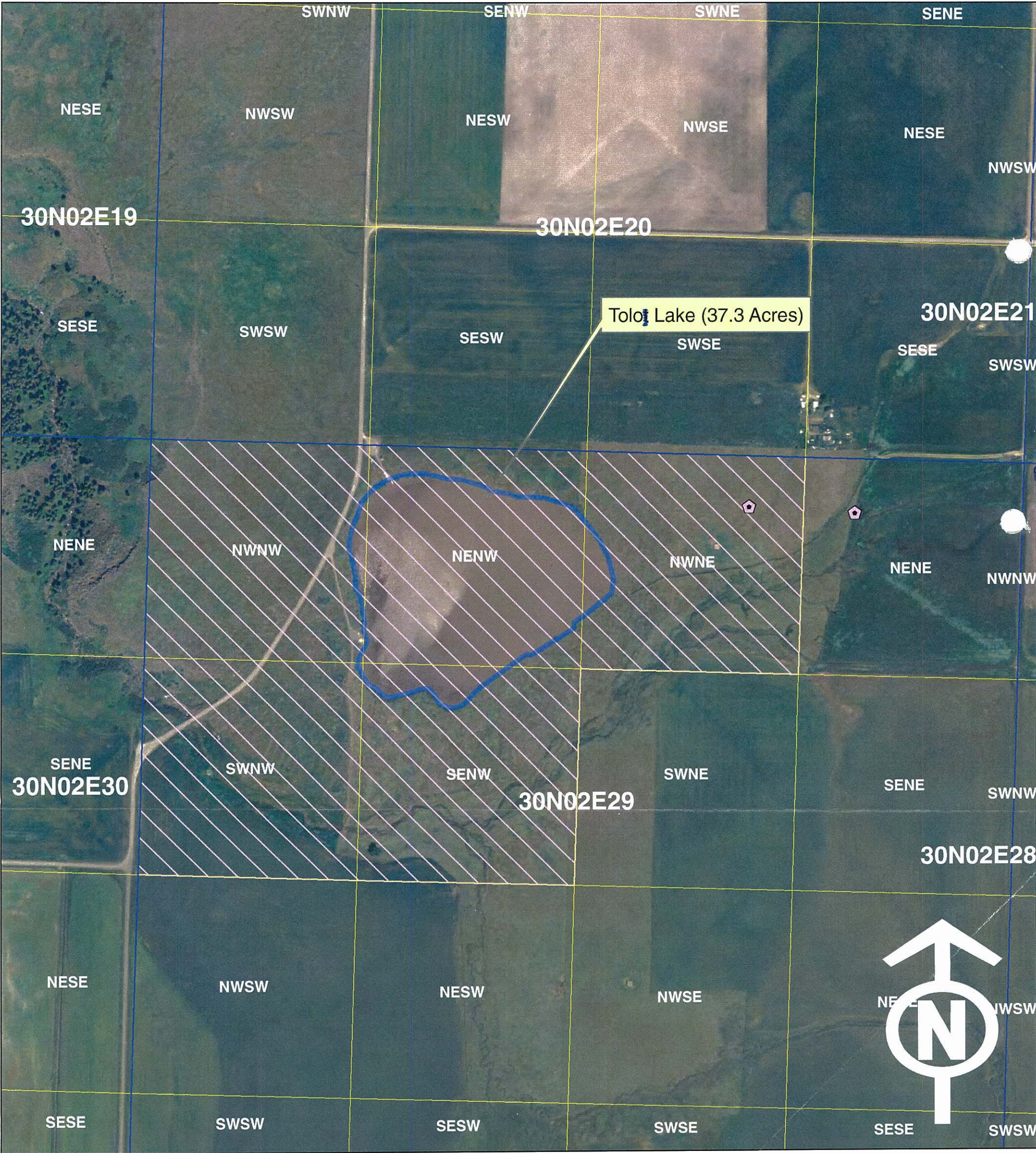
Tolo Lake Picnic Area and Boat Launch, recreational place of use.



Tolo Lake, looking to the northeast from outlet of lake, place of use.

Bathymetric map of Tolo Lake, Idaho (depths shown are in meters)
Developed 2008 by Idaho Department of Fish and Game





Legend

-  79-7219 Permit POD
-  Sections
-  79-7219 Permit POU
-  QQ
-  Township/Range

NOTES:

**79-7219 Tolo Lake
Field Exam Exhibit**