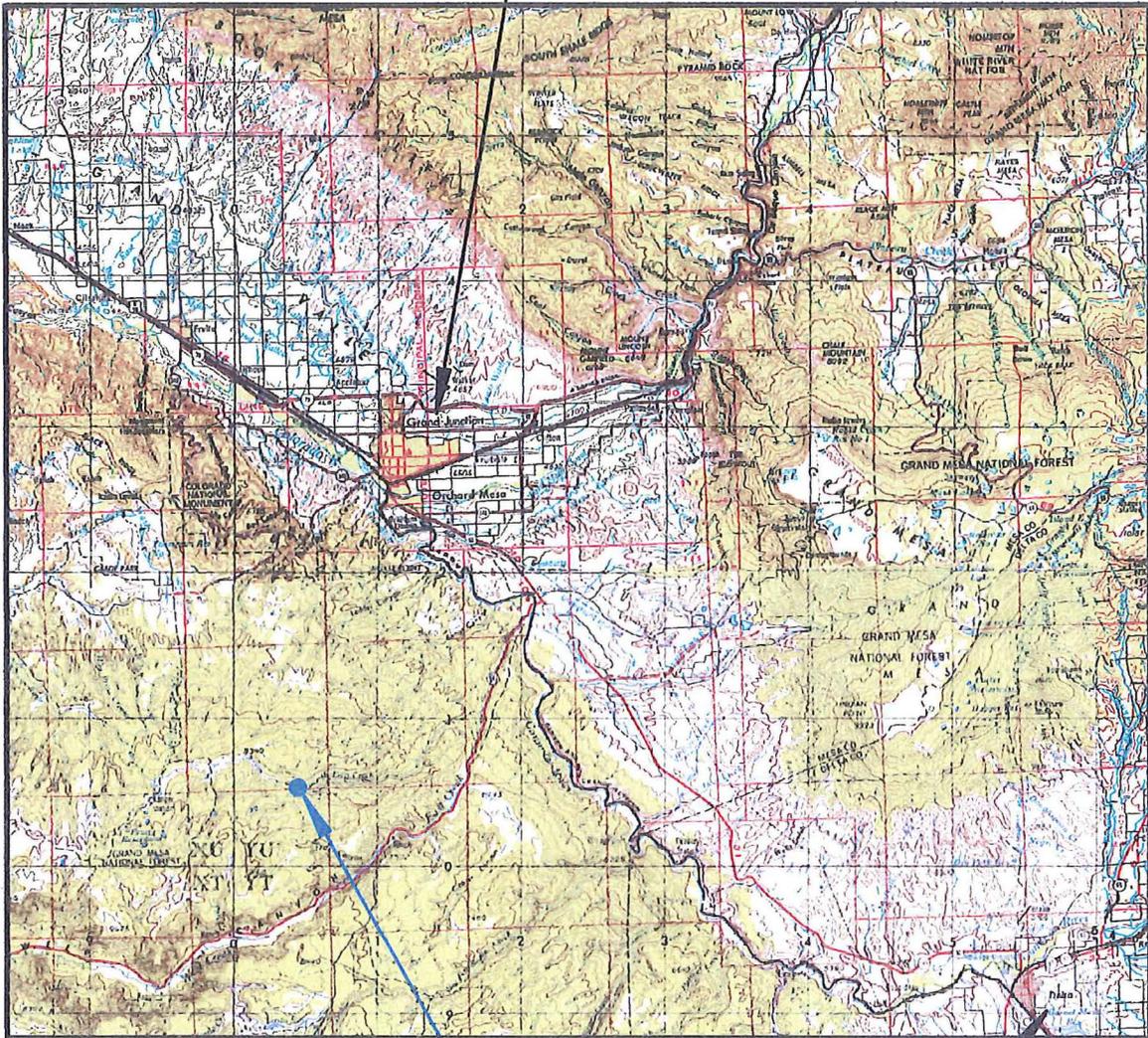
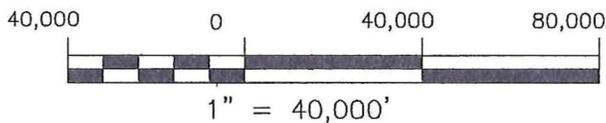


GRAND JUNCTION, CO



DELTA, CO

TIPPINGS SOLITUDE LAKE
DAM LOCATION



EASTERN
ENGINEERS, INC.

TIPPINGS SOLITUDE LAKE DAM
VICINITY MAP

MESA AND DELTA COUNTIES, COLORADO

DRAWN PBB

CHECKED BDM

DATE: 5/26/2015

WORK ORDER NUMBER 4102

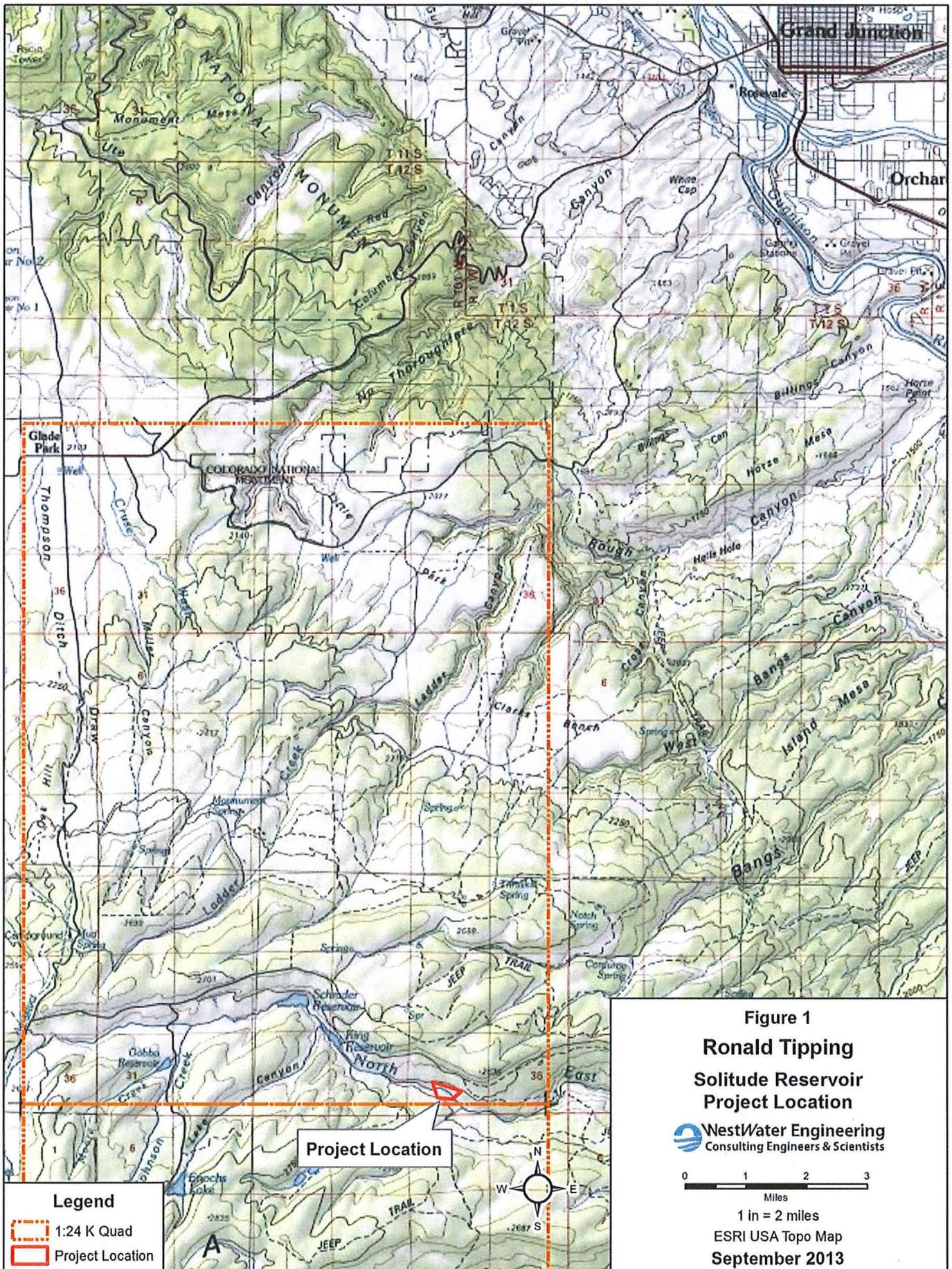


Figure 1
Ronald Tipping
Solitude Reservoir
Project Location

NestWater Engineering
 Consulting Engineers & Scientists

0 1 2 3
 Miles

1 in = 2 miles

ESRI USA Topo Map

September 2013

Flow
↓



38.8775 N, -108.6519 W

DP 1 Up

DP 1 Wet

DP 2 Wet

DP 2 Up

38.8738 N, -108.6457 W

Legend

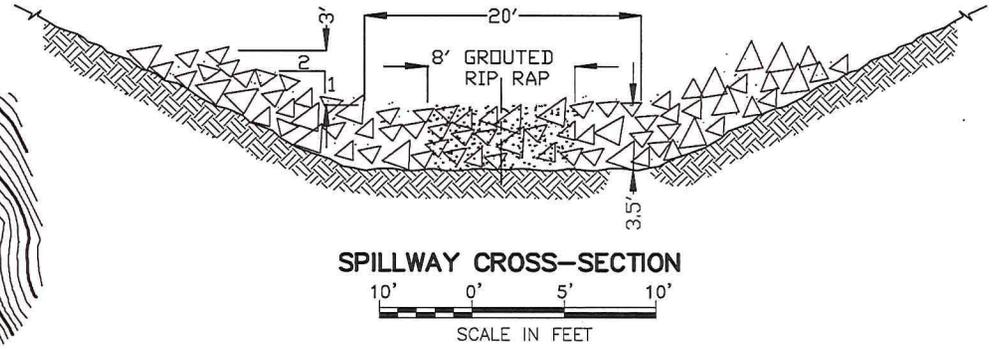
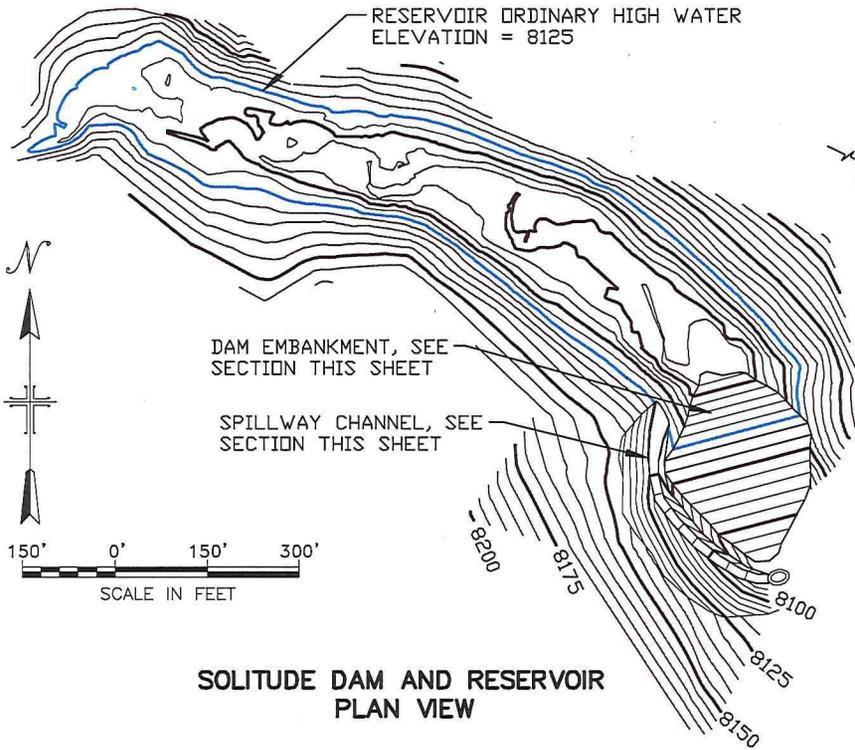
- ◆ Boundary Flags
- ★ Data Points
- Survey Area
- Non Wetland Waters
- ▨ Wetlands

Figure 2
Ronald Tipping
Solitude Reservoir
Wetland Delineation

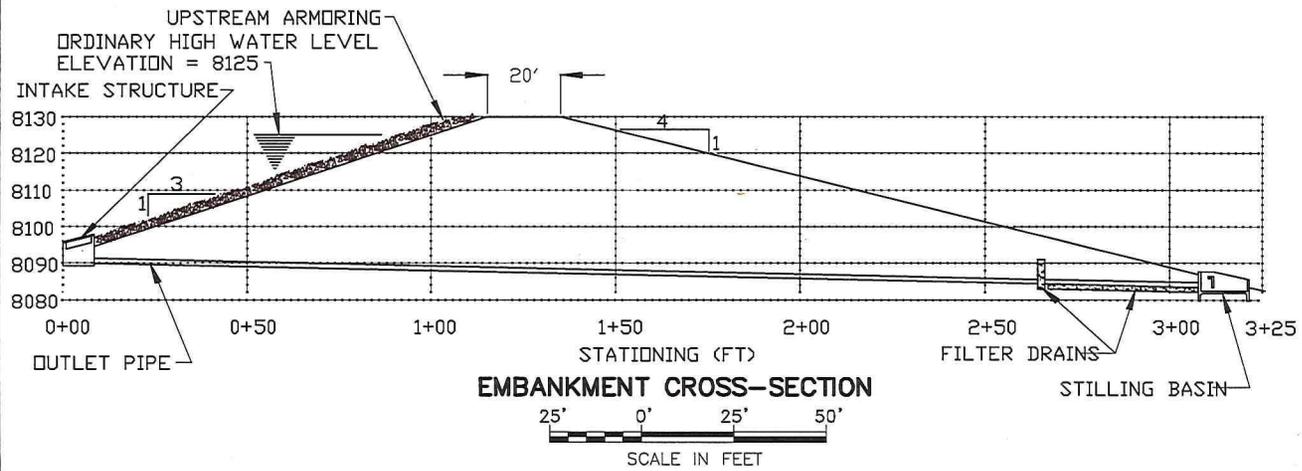
 **NestWater Engineering**
Consulting Engineers & Scientists

0 225 450
Feet
1 in = 225 feet
ESRI USA Topo Map
September 2013

↓
Flow



SOLITUDE DAM AND RESERVOIR PLAN VIEW



TIPPINGS SOLITUDE LAKE DAM PLAN AND SECTIONS

TIPPINGS SOLITUDE LAKE SUMMARY OF ALTERNATIVES

| PROPOSED ACTION | CHARACTERISTICS |
|---|--|
| <p>Located at 108° 38' 52" W Longitude, 38° 52' 34" N Latitude on North East Creek. This would involve constructing a new 43 foot high dam with a total capacity of 65 acre-feet (46.2 acre-feet active and 18.8 acre-feet fish conservation pool) Estimated cost: \$1,671,252</p> | <ol style="list-style-type: none"> 1. All on land owned by project proponent. 2. 1.5 acres of wetlands impacts. |
| <p>1. Alternative Dam Site Number 1 Located at 108° 32' 55" W Longitude, 38° 53' 18" N Latitude on North East Creek. This would involve constructing a new 35 foot high dam with a total capacity of 46.2 acre-feet located 5.4 miles downstream from the proposed Tippings Solitude Lake dam site plus a 21 foot high dam with a total capacity of 18.8 acre-feet to serve as a fish conservation pool. Estimated cost: \$2,416,953</p> | <ol style="list-style-type: none"> 1. Dam and reservoir encroaches on 5 acres of BLM land. 2. 2.6 acres of wetlands impacts (1.1 acres greater than proposed action). 3. Cost is 45 percent greater than proposed action. |
| <p>2. Alternative Dam Site Number 2 Located at 108° 40' 49" W Longitude, 38° 53' 17" N Latitude on Lake Canyon Creek. This would involve constructing a new 19 foot high dam with a total capacity of 46.2 acre-feet located 1.9 miles upstream from the proposed Tippings Solitude Lake dam site (immediately upstream from the existing King reservoir) plus a 21 foot high dam located at the Tippings Solitude Lake dam site with a total capacity of 18.8 acre-feet to serve as a fish conservation pool. Estimated cost: \$1,925,626</p> | <ol style="list-style-type: none"> 1. Requires obtaining land not owned by proponent. Uncertain whether that is possible. 2. Requires connecting to G H and S dam (not owned by proponent) outlet with feeder pipeline. Uncertain whether that is possible. 3. 2.2 acres of wetlands impacts (0.7 acres greater than proposed action). 4. Cost is 15 percent greater than proposed action. |
| <p>3. King Lake Reservoir Enlargement Located at 108° 40' 28" W Longitude, 38° 53' 07" N Latitude on North East Creek. This would involve enlarging the existing King Lake reservoir (located 1.6 miles upstream from the proposed Tippings Solitude Lake dam) by increasing the normal water level 2 feet for an added capacity of 46.2 acre-feet plus a 21 foot high dam located at the Tippings Solitude Lake dam site with a total capacity of 18.8 acre-feet to serve as a fish conservation pool. Estimated cost: \$1,160,233</p> | <ol style="list-style-type: none"> 1. Requires obtaining land not owned by proponent. Uncertain whether that is possible. 2. 1.6 acres of wetlands impacts (0.1 acres greater than proposed action). |
| <p>4. Efficiency Improvements to Bradbury Ditch and Irrigations System on Lands Served by Bradbury Ditch Ditch diversion located at 108° 32' 13" W Longitude, 38° 54' 09" N Latitude on North East Creek. This would involve installing a pipeline in the existing feeder ditch (located 7 miles downstream from the proposed Tippings Solitude Lake dam), preparing the irrigated land and installing a sprinkler irrigation system for the lands served by the Bradbury ditch plus constructing a 21 foot high dam located at the Tippings Solitude Lake dam site with a total capacity of 18.8 acre-feet to serve as a fish conservation pool. Estimated present value cost: \$1,517,520</p> | <ol style="list-style-type: none"> 1. This is part of a current long term plan by the proponent to switch from flood irrigation to sprinkler irrigation but the plan still leaves an overall irrigation deficit which exceeds the active volume of the proposed Solitude reservoir (46.2 acre-feet) 2. 3.9 acres of wetlands impacts (2.4 acres greater than proposed action). |
| <p>5. Lease Water This would involve leasing water from owners of other storage facilities in the drainage basin, plus constructing a 21 foot high dam located at the Tippings Solitude Lake dam site with a total capacity of 18.8 acre-feet to serve as a fish conservation pool. Estimated present value cost: \$20,306,156</p> | <ol style="list-style-type: none"> 1. Cost is over 12 times greater than proposed action. |