WD 36A 2003

State of Idaho
DEPARTMENT OF WATER RESOURCES

1301 North Orchard Street, Boise, ID 83706 - P.O. Box 83720, Boise, ID 83720-0098
Phone: (208) 327-7900 Fax: (208) 327-7866 Web Site: www.idwr.state.id.us

DIRK KEMPTHORNE
Governor

KARL J. DREHER
Director

October 15, 2003

Jeff Martin
North Snake Ground Water District
152 East Main Street
Jerome, ID 83338

RE: **Site Visit to Mitigation Pipeline and Curren Ditch, September 29, 2003**

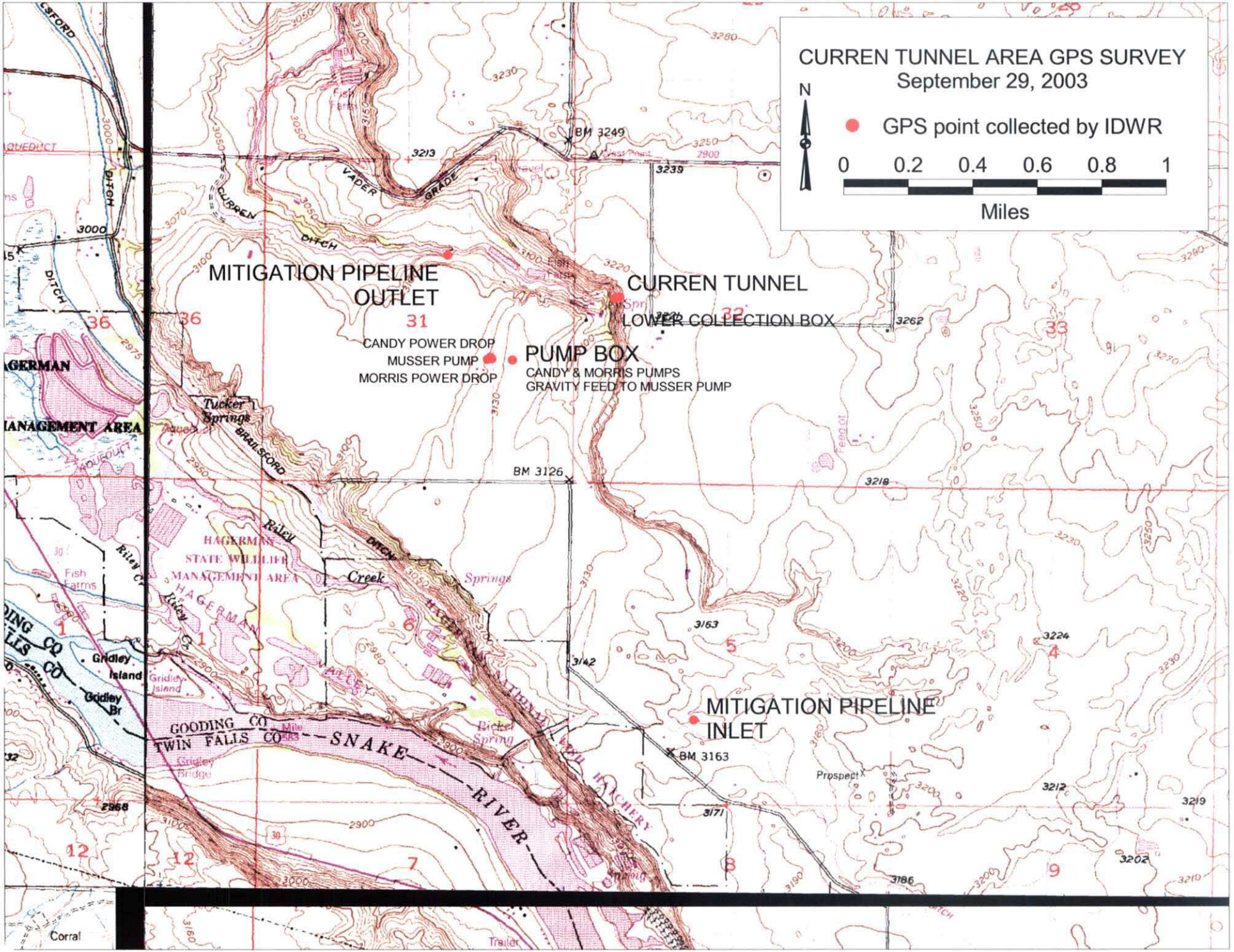
Dear Mr. Martin:

As you already know, Idaho Department of Water Resources (IDWR) staff visited the mitigation pipeline project and Curren Ditch on September 29, 2003. A copy of the trip report is attached for your reference. Because of excessive algal growth in the Curren Ditch, we were not able to conclude whether or not the proposed measurement method using the sill in the pump box will be adequate. IDWR staff will conduct additional measurements early next irrigation season to evaluate the proposed measurement method.

Respectfully,

Jennifer Berkey
Water Distribution Section

cc: Brian Patton, Idaho Water Resources Board


CURREN TUNNEL AREA GPS SURVEY
September 29, 2003
N
GPS point collected by IDWR
0 0.2 0.4 0.6 0.8 1
Miles
MITIGATION PIPELINE OUTLET
CURREN TUNNEL
LOWER COLLECTION BOX
CANDY POWER DROP
MUSSER PUMP
MORRIS POWER DROP
PUMP BOX
CANDY & MORRIS PUMPS
GRAVITY FEED TO MUSSER PUMP
MITIGATION PIPELINE INLET
BM 3249
BM 3126
BM 3163
VADER GRADE
CURREN DITCH
BRAILSFORD
Tucker Springs
Riley Creek
HAGERMAN STATE WILDLIFE MANAGEMENT AREA
Gridley Island
Gridley Br
GOODING CO
TWIN FALLS CO
SNAKE RIVER
Prospect
Corral

To: Tim Luke

From: Jennifer Berkey, Steve Burrell

Re: Site Visit to Curren Mitigation Pipeline and Curren Tunnel

Date: September 30, 2003

Jennifer Berkey and Steve Burrell visited the Curren mitigation pipeline and Curren Tunnel on September 29, 2003. The following tasks were completed.

1. Measured dimensions of the pump box on the mitigation pipeline.
2. Measured the head at the pump box sill and calculated flow using the Kindsvater-Carter method, which is the method proposed by the North Snake Ground Water District.
3. Current metered the flow in the Curren Ditch downstream of the mitigation pipeline outlet.
4. Read the head measurement at the Curren Ditch weir upstream of the mitigation pipeline outlet and calculated flow using the standard contracted rectangular weir formula.
5. Measured the dimensions of the mitigation pipeline inlet structure.
6. Measured a PCC for the Candy pump, which was pumping from the mitigation pipeline pump box at the time of our site visit. The Morris and Musser pumps were not running.
7. Collected GPS data for the Curren Tunnel outlet, the lower collection box below Curren Tunnel, the mitigation pipeline outlet, inlet, and pump box, the Morris power meter, the Candy power meter, and the Musser pump/power meter.

Sketches of the pump box and the mitigation pipeline inlet structure are attached for reference. A map of GPS points collected is also attached.

The flow measured using a Swoffer meter in the Curren Ditch downstream of the mitigation pipeline outlet was 24.9 cfs. The flow measured by the Curren Ditch weir was 11.0 cfs. These data indicate that the pipeline was supplying 13.9 cfs to Curren Ditch. Algal growth adversely affected the current meter measurement in the Curren Ditch.

The flow leaving the pump box, calculated using the head measurement upstream of the sill and the Kindsvater-Carter equation, was 26.1 cfs. The sill in the pump box is downstream of the pump inlets and the gravity feed line to the Musser pump, thus the flow rate over the sill should equal the flow rate supplied to Curren Ditch. On September 29, 2003, the pump box discharge calculated using the Kindsvater-Carter method was 88% higher than the measurement of flow supplied by the pipeline.

The Kindsvater-Carter method is the method proposed by the North Snake Groundwater District. However, the district has reported that they have been measuring the head at the sill, rather than upstream of the sill. This results in a lower head reading and a lower estimate of discharge. If the head at the sill measured on September 29, 2003 is used, a flow measurement of 19.2 cfs (38% higher than the current meter measurement) is obtained.

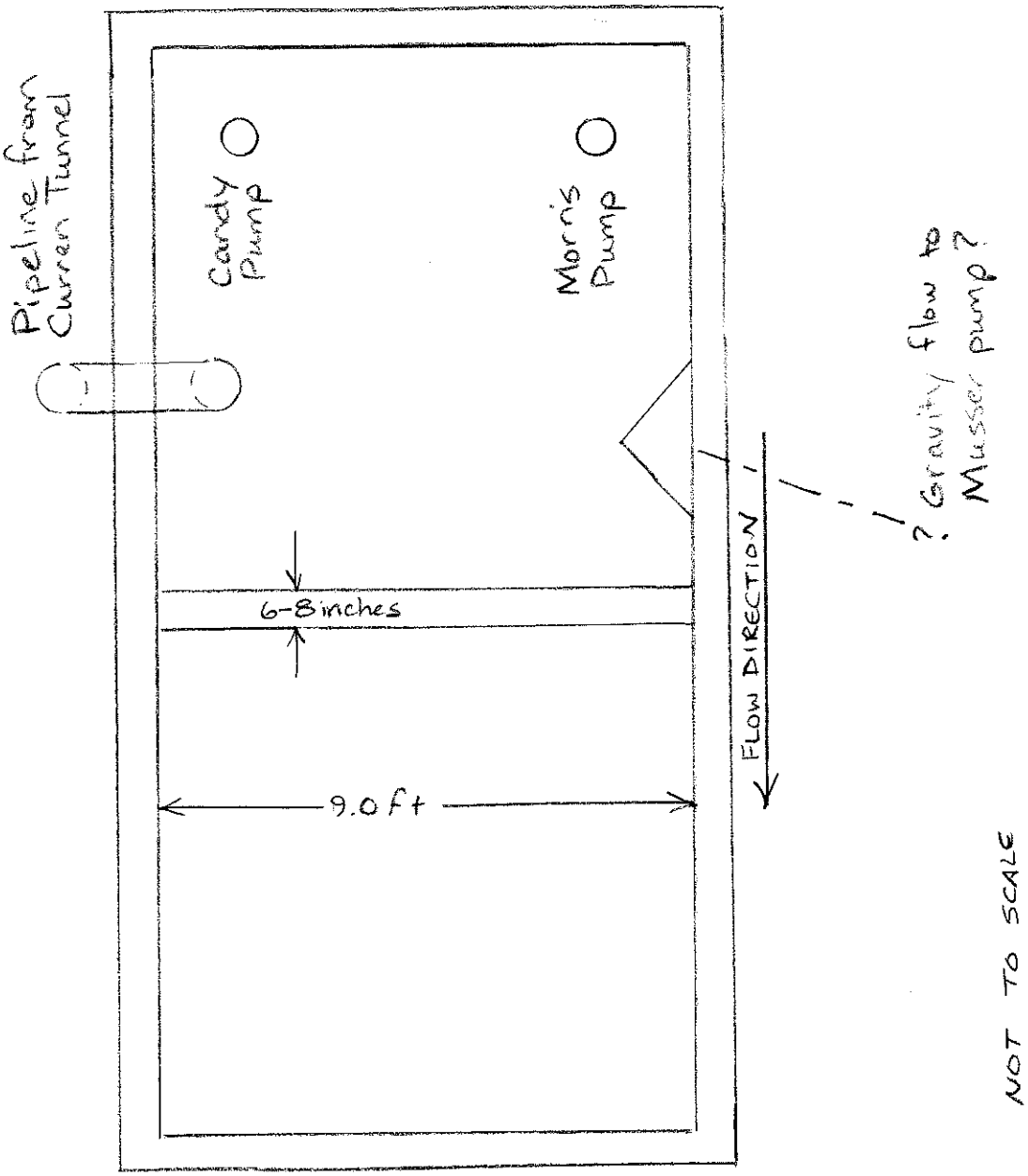
The flow leaving the pump box was also calculated using the formula for a Type 5 culvert, as described by French, R.H., in *Open Channel Hydraulics*, Chapter 8.5. The flow calculated using this equation was 14.7 cfs, approximately 6% higher than the measurement obtained from current metering the ditch.

Because the flow in the pump box does not appear to meet the requirement of fully developed flow, neither of the above procedures to calculate flow can be recommended without verification by adequate current meter measurements. Because the current meter measurement collected in the ditch on September 29, 2003 was adversely affected by algae, we do not believe this measurement should be used to draw conclusions regarding acceptability of the proposed method. Ideally, current meter measurements for comparison with the proposed method would be collected earlier in the irrigation season when algal growth is less of a problem.

There is not currently a staff gage installed in the pump box. The North Snake Ground Water District reports that head measurements on the sill have been collected by measuring the water line on a stick or pole that is inserted through the grate. If the proposed measurement method can be calibrated, it is recommended that a staff gage be installed at an appropriate location to allow different observers to obtain consistent head readings.

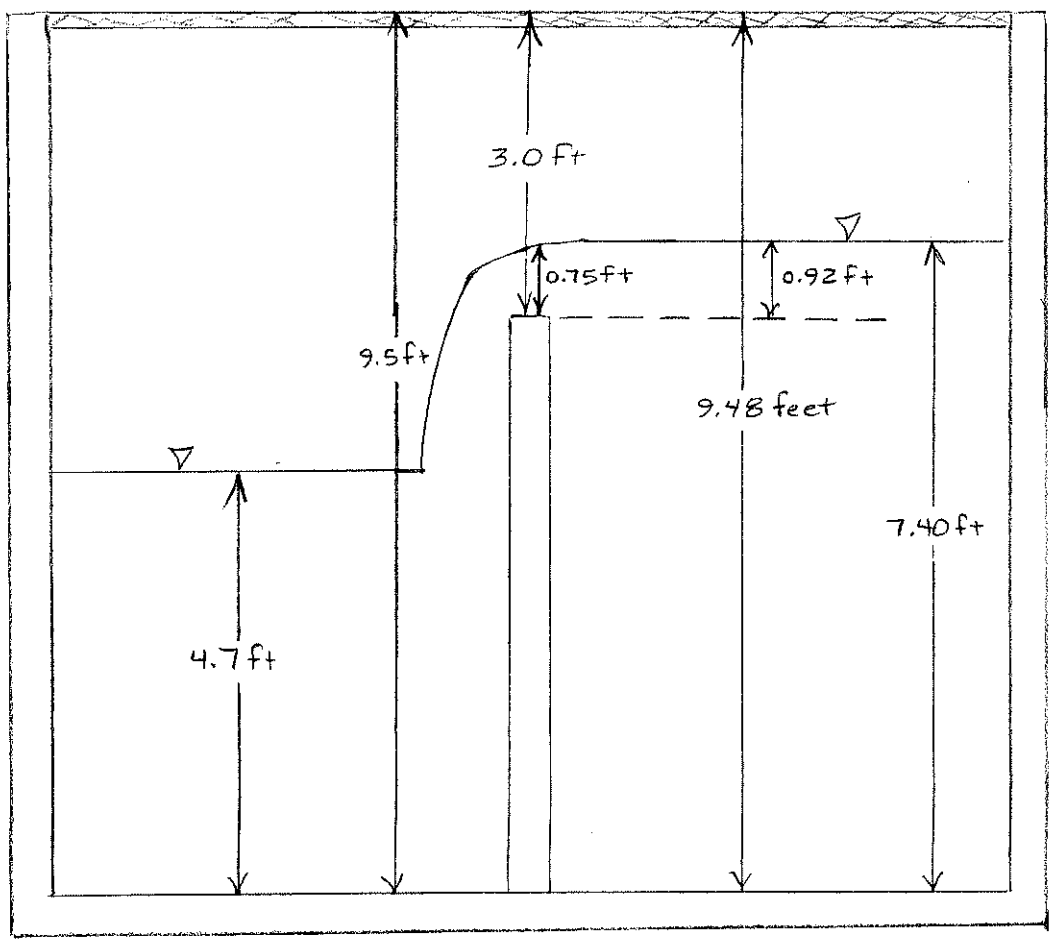
Site visit notes and PCC data for the Candy pump have been entered in WMIS under the "Candy pipe" POD. At the Candy pump, a discharge of 397 gpm (0.884 cfs) was measured using the Panametrics polysonic flow meter. A PCC of 219 kWh/AF was calculated from the measured flow rate and power demand. Site visit notes and PCC data have been entered in WMIS under the "Candy pipe" POD.

Mitigation Pipeline - Pump box plan view 9/29/2003



NOT TO SCALE

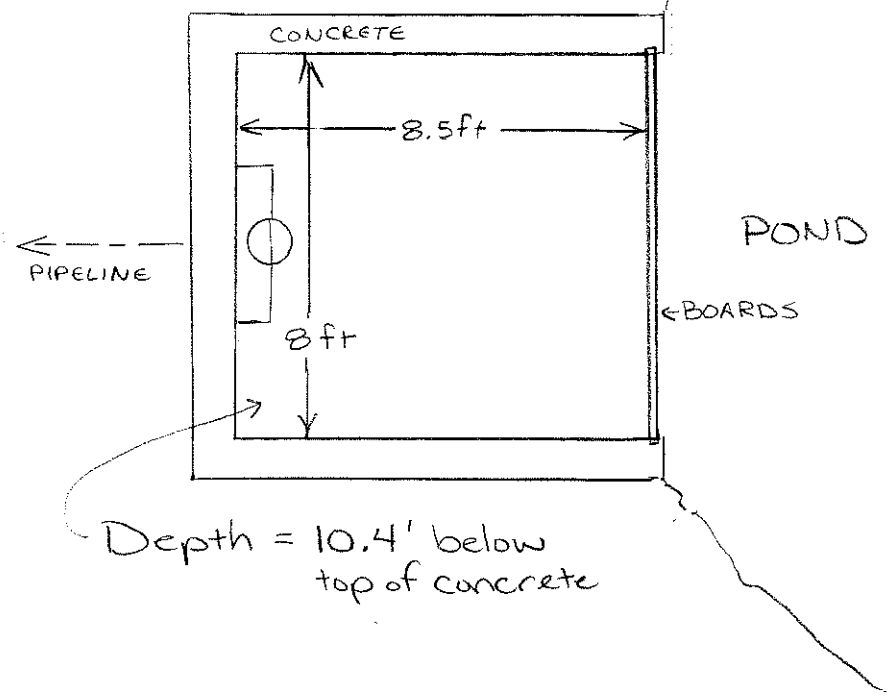
Mitigation Pit, Inc. - Pump box profile 9/29/2003



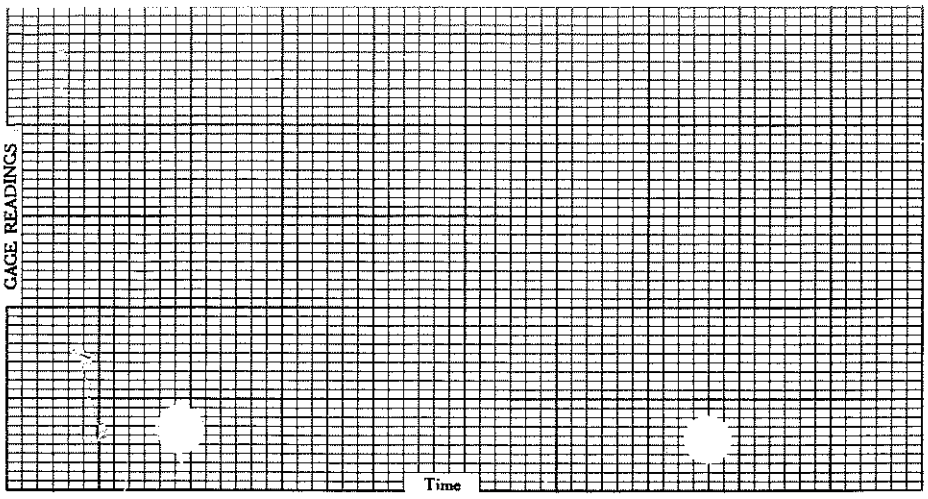
NOT TO SCALE
WATER LEVELS MEASURED ON 9/29/2003

Mitigation Pipe! - Inlet structure

Plan view - NOT TO SCALE



Depth = 10.4' below top of concrete



★ GPO:1971—O-425-824

STATE OF IDAHO

DEPARTMENT OF WATER RESOURCES

Water District 01

DISCHARGE MEASUREMENT NOTES

Meas. No. _____

Comp. by _____

Checked by _____

Sta. No. _____

Date 9/29, 2003 Party J. Berkey, S. Burrell

Width _____ Area _____ Vel. _____ G. H. _____ Disch. _____

Method _____ No. secs. _____ G. H. change _____ in _____ hrs. Susp. _____

Method coef. _____ Hor. angle coef. _____ Susp. coef. _____ Meter No. _____

GAGE READINGS				
Time		Recorder	Inside	Outside
Weighted M. G. H.				
G. H. correction				
Correct M. G. H.				

Type of meter _____

Date rated _____ for rod, other.

Meter _____ ft. above bottom of weight.

Spin before meas. _____ after _____

Meas. plots ____ % diff. from rating _____

(Wading), cable, ice, boat, upstr., downstr., side

bridge _____ feet, mile, above, below

gage, and _____

Check-bar, found _____

changed to _____ at _____

Correct _____

Levels obtained _____

Measurement rated excellent (2%), good (5%), fair (8%), poor (over 8%), based on following conditions: Cross section _____

Flow _____ Weather _____

Other _____ Air _____°F@ _____

Gage _____ Water _____°F@ _____

_____ Record removed _____ Intake flushed U _____

Observer _____

_____

Control _____

_____

Remarks algal growth on bottom of channel, especially right half of channel - 0.6 depth readings only collected - too much algae to collect 0.20 reading

G. H. of zero flow _____ ft.

.0 .10 .20 .30 .40 .50 .60 .70 .75

River at—

Angle coefficient	Dist. from initial point	Width	Depth	Observation depth	Revolutions	Time in seconds	VELOCITY: At point	VELOCITY: Mean in vertical	Adjusted for hor. angle or -------	Area	Discharge
	3.5		0.				)				
	6.5	"	1.	0.5			.51	"			
	7.5	"	2.4	.2							
REW	4.5	2.25	0.0				0			0	0
	9.0	3.00	2.4	0.6			0.09			7.20	0.648
	10.5	1.50	2.6	0.6			0.37			3.90	1.443
	12.0	1.25	2.7	0.6			0.33			3.375	1.114
	13.0	1.00	2.8	0.6			0.54			2.80	1.512
	14.0	1.00	2.9	0.6			0.29			2.90	0.841
	15.0	1.00	3.1	0.6			0.30			3.10	0.930
	16.0	1.00	3.0	0.6			0.76			3.00	2.280
	17.0	1.00	3.0	0.6			0.73			3.00	2.190
	18.0	1.00	3.0	0.6			0.98			3.00	2.940
⊙	19.0	1.00	3.0	0.6			0.80			3.00	2.400
	20.0	1.00	1.5	0.6			1.11			1.50	1.665
	21.0	1.00	2.2	0.6			1.16			2.20	2.552
	22.0	1.00	1.7	0.6			1.12			1.70	1.904
	23.0	1.25	1.4	0.6			0.85			1.75	1.488
	24.5	2.00	1.4	0.6			0.36			2.80	1.008
LEW	27.0	1.25	0				0			0	0
											24.92

.0 .10 .20 .30 .40 .50 .60 .70 .75

.0 .10 .20 .30 .40 .50 .60 .70 .75