KLAMATH IRRIGATION DISTRICT FIELD INFORMATION (Canal Measurements)

SMEAD
No. 153L
UPC 10330

'A' CANAL

Klamath Irrigation District

Gage Location: SW¼ NE¼, Section 30, T38S R9E

Gage Description: Stilling well with continuous chart recorder. ~~Key to gage on Van key chain, also see man at white house (gate keeper for 'A' Canal) for access.~~ CHECK WITH K.I.D.

Measurement Location: ~~Crescent Avenue, bridge near Klamath Union High School, SW¼ SE¼, Section 29, T38S R9E. There is one pump in the SW¼ NW¼, Section 29, T38S R9E, which pumps to the park by the freeway which should be checked and added if pumping. Use canfield reel, 30lb. weight and standard meter.~~

Rating: Standard rating from many measurements made from the Crecent Avenue Bridge. Recent measurements made by K.I.D. hydrologist. Rating should be of good quality.

Jim Esget
Field Engineer

9-9-85

NEW GAGE HOUSE + MEASURING BRIDGE BELOW H.G. + ABOVE TUNNEL.

CONCRETE LINED CHANNEL JUST ABOVE [illegible].

READ RECORDER & TAPE FOR NOTES

READ THE HEAD IN EACH OPENING

'B' CANAL

Klamath Irrigation District

Headwork Location: SE¼ NE¼, Section 19, T39S R10E (Southwell check).

Gages: none.

Headgates: Four rectangular weirs with U-bar to hold 2"x4" or 2"x6" boards to control water surface and flow. Widths right to left are 4', 4', 4.1' and 3.9'. (4' is good for computation purposes on each).

Measuring Section: Bridge where 'B' Canal crosses Reeder Road between Sections 17 and 20, T39S R10E. There is two headgates between Southwell Check and this bridge, and any flow should be added to the measurement. Use Canfield Reel, 30 lb. weight and standard meter.

Quantity Computation: Heads at each weir lip is measured with special gage and the weir chart used to obtain the sum flow for all weirs together.

Weir Chart Accuracy: Appears poor at best. More frequent monitoring of this canal is recommended as compared with other more accurately rated canals.

Error of computed flow compared to measured quantity 15%. See note on computation in folder

9-275-G
11-75

STATE OF OREGON
WATER RESOURCES DEPARTMENT

DISCHARGE MEASUREMENT NOTES

File No. ____ Meas. No. ____ Comp. by JAE Checked by NZR

Stream B CANAL

Date 10-7, 19 80 Party ESGET McBAIN

Width 36.5 Area 120' Vel. .924 G. H. — Disch. 111

Method 21.8 No. secs. 20 G. H. change — in — min. STAND.

Method coef. 1.0 Hor. angle coef. .96 Susp. coef. 1.0 Meter No. ____

Date rated 4-11-69

Spin before meas. ✓ after ok

Wading, cable, ice, boat, upstr., downstr., side bridge ____ feet, mile, above, below gage and ____

Tags checked ____

Meter suspended from rod, or cable

.5 ft. above bottom 30 lb. ____ weight.

Levels obtained ____

GAGE READINGS

Time		Recorder	Inside	Outside
1250	Start	See below		
1400	Finish	no change		

Weighted M. G. H. ____

G. H. correction ____

Correct M. G. H. ____

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

Flow Uniform Weather Sunny Warm

Other ____ Air ____ °F@ ____

Gage None Water ____ °F@ ____

Record removed ____ Intake flushed U L

Observer ____

Control ____

Remarks Note flow thru open wier, heads obtained at drop. Widths also. Accuracy poor thru this control. (perhaps 20%). KID has use of whiskey stick which may improve their accuracy.

G. H. of zero flow ____ ft.

$H_1 = 2.6$ $Q_1 = 59^0$ $w_1 = 4'$

$H_2 = 0.1$ $Q_2 = 1.0$ $w_2 = 4'$

$H_3 = 2.5$ $Q_3 = 60.4$ $w_3 = 4.1'$

$H_4 = 0.60$ $Q_4 = 7.8$ $w_4 = 3.9'$

$Q = 128.2$

READ RECORDER AND INSIDE STICK

'C' CANAL

Klamath Irrigation District

Location of Gage: SE¼ NW¼, Section 30, T39S R10E on left bank 'C' Canal above flume.

Gages: Stilling well with continuous chart recorder. Also inside stick measures to top of well at orange spot. (Bottom of stick is 2.00 feet). Also stilling well in head of flume with staff plate.

Measuring Point: Wooden walkway just upstream of flume entrance. Use Canfield Reel, 30 lb. weight and standard meter.

Ratings: There are separate ratings for flows below 4.0' when the radial gate is in use, and flows above 4.0' when the flume acts as control (Radial gate open). The flume rating is based on the chart recorder gage and the radial gate rating (below 4.0') is based on the staff inside the flume. Both are ratings based on measurements.

*Note: According to Malcom Crawford (President of K.I.D.), the lining of the flume has been eroded out in the last few years, increasing the roughness of the flume, resulting in lower flows (than rated) at any given head. He thought that the difference could be as great as 20% short. He plans to reline the flume this year (1980-81) to restore the accuracy of the ratings.

Recommend more frequent monitoring of this canal until accuracy of ratings is restored.

Jim Esget
Field Engineer

KBA_APP_000587

READ RECORDER & INSIDE STICK

'C-G' CUTOFF (G-Canal)

Klamath Irrigation District

Gage Location: SE¼ NW¼, Section 30, T39S R10E, above concrete weir on left bank.

Gage: Stilling well with continuous chart recorder and inside gaging stick. Stick measures from recording shelf down with stick between nails. Stick is correctly labeled.

Measuring Section: Bridge on 'G' Canal in the NW¼ SW¼, Section 32, T39S R10E - bridge crosses 'G' Canal from Hill Road. There are five headgates between bridge and gage which should be added to measurement if operating. (See photo 2-0142-B). Use Canfield Reel, 30 lb. weight and standard meter.

Rating: Standard rating using measurements. It appears to be accurate.

Jim Esget
Field Engineer

UPSTREAM GAGE, DOWNSTREAM GAGE &

SCREW STOCK ON GATE

'C-4' CANAL

Klamath Irrigation District

Headwork Location: SW¼ NW¼, Section 1, T40S R9E

Gages: Two stilling wells with staff plates, one downstream of 'C-4' headgates on left bank and one upstream of headgates on left bank of 'C' Canal.

Headgates: Two 3.5' ~~metal~~ WOODEN lift gates (rectangular) with metal wheels and screw stock.

Measuring Section: NW¼ NE¼, Section 2, T40S R9E at bridge at intersection of 'C-4' Canal and Midland Road. There are approximately three headgates and one pump between the headworks and bridge which should be added to measurement if operating. Use canfield reel and 30 lb. weight with standard meter.

Flow Computation: $Q = .95\ A\sqrt{2g\Delta H}$

Where ΔH = differential head through gates or upstream well reading minus downstream well level.

$A = 3.5' \cdot h_1$ Where h_1 is the gate opening and is obtained by measuring from top of wheel to top of screw stock.

Example: Staff reading 2.38 on upstream well before and after measurement. Staff reading 1.62 on downstream well before and after

Error 1% of rating quantity from measured quantity.

9-275-F 4-58

STATE OF OREGON
OFFICE OF STATE ENGINEER
Water Resources Department

File No. .....
Meas. No. .....
Comp. by JAE
Checked by PCM

DISCHARGE MEASUREMENT NOTES

Stream C-4 CANAL

Date 10-2, 1980 Party ESGET M McBAIN N

Width 25 Area 83.3 Vel. 1.87 G. H. — Disch. 68.8

Method 27.8 No. secs. 18 G. H. change ..... in ..... min.

Method coef. 1.0 Hor. angle coef. .97 Susp. coef. 1.0 Meter No. 558

Date rated 4-11-69

Spin before meas. ✓ after ✓

Wading, cable, ice, boat, upstr., downstr., side bridge ..... feet, mile, above, below gage and .....

Tags checked .....

Meter suspended from ~~rod~~, or cable

..... ft. above bottom ..... lb. ..... weight.

Levels obtained .....

Time		GAGE READINGS above HG Recorder	Inside	Outside
0930	Start	2.38	1.50 / 1.49	1.63
1015	Finish	2.38	1.50 / 1.49	1.60

Weighted M. G. H. .....
G. H. correction .....
Correct M. G. H. .....

Measurement rated excellent (2%), good (5%), fair (8%), poor (over 8%), based on following conditions: Cross section mud w/ some weeds along edge

Weather Sunny, Breezy

Flow .....

Other ..... Air ..... °F@

Gage None Water ..... °F@

Record removed ..... Intake flushed U L

Observer .....

Control .....

Remarks Gate widths 3½' each (2)

G. H. of zero flow ..... ft.

$Q_1 = 34.89$
$Q_2 = 34.69$ > $Q = 69.58$

KBA_APP_000589

UPSTREAM GAGE, DOWNSTREAM 2 GAGES & SCREW STOCK ON 2 HEADGATES

"G-3" CANAL

Klamath Irrigation District

Headgate Location: NE¼ NE¼, Section 35, T40S R10E

Gages: Stilling well with staff plate upstream of headgates between "G-3" and "G-D" drop headgates. Two stilling wells about 1' downstream of headgates (one for each gate) and covered by a wood plank. (Ditch rider carries gage stick for these wells or a level can be used to compute head differential through the gates).

Headgates: Two rectangular metal lift gates with metal wheels and screw stock. Carry water through two 3' diameter corrugated metal culverts.

Measuring Section: Small wooden footbridge (to a pump), in the SE¼ SW¼, Section 25, T40S R10E. Use a standard wading rod and pygmy meter (very low velocities, regular flow). Add flow from any open headgates. Measuring section is poor, but best available.

Rating Accuracy: Appears poor. This was verified by Malcom Crawford of K.I.D. Problems with rating accuracy maybe due to backwater in the culverts, high roughness in both barrels, and friction at inlet from large surface area (especially at small headgate opening). From discharge measurement on 10-6-80, a discharge

9-275-G
11-75

STATE OF OREGON
WATER RESOURCES DEPARTMENT
DISCHARGE MEASUREMENT NOTES

File No. ____
Meas. No. ____
Comp. by JAE
Checked by NZR

Stream G-3 CANAL
Date 10-6, 1980 Party ESGETH McBAIN
Width 19.0 Area 47.9 Vel. .113 G. H. — Disch. 5.41
Method 2/8 No. secs. 22 G. H. change ____ in ____ min. STAND.
Method coef. 1.0 Hor. angle coef. 1.0 Susp. coef. 1.0 Meter No. ____
Date rated 4-11-69
Spin before meas. ____ after OK
Wading, cable, ice, boat, upstr., downstr., side bridge ____ feet, mile, above, below gage and ____
Tags checked ____
Meter suspended from rod, or ____ ft. above bottom ____ lb. ____ weight.
Levels obtained ____

GAGE READINGS

Time		Recorder	Inside	Outside
1035	Start			
1140	Finish			

Weighted M. G. H. ____
G. H. correction ____
Correct M. G. H. ____

Measurement rated excellent (2%), good (5%), fair (8%), poor (over 8%), based on following conditions: Cross section ____
Flow ____ Weather SUNNY WARM
Other ____ Air ____ °F@ ____
Gage ____ Water ____ °F@ ____
Record removed ____ Intake flushed ____
Observer Elev. top of well upstream head = 3.93
Upstream head 2.96 @ 1035
Control Distance to top of casing from water downstream head - N = 3.60 @ 1035, 3.50 @ 1140
Remarks S = 3.49 @ 1035, 3.53 @ 1140
Screw stock N - 0.49 @ 1035 & 1140
S - 0.12 @ 1035 & 1140
G.H. of zero flow ____ ft.

UPSTREAM GAGE, 3 OPENINGS & 1 SCREW STOCK

'D' CANAL
(at 'G-D' Drop)

Klamath Irrigation District

Work Location: NE¼ NE¼, Section 35, T40S R10E

Stilling well with staff plate upstream of headworks between 'G-D' Drop gates and 'G-3' headgate.

Gates: Consist of threee rectangular weirs with U-bar to insert 2"x4" or 2"x6" planks to control head and flow through weirs. Widths are 5' each. Also there is a fourth weir with a rectangular metal lift gate controlled by a metal lift wheel and screw stock (This gate is rated separately).

Measuring Section: Wooden Bridge in the NE¼ NW¼, Section 36, T40S R10E. Use Canfield Reel and 30 lb. weight. Standard Meter. Should add any headgates open between gates and bridge (2 or 3).

Computation: For three 5' rectangular weirs with stop-logs, measure head at weir lip with special gage. For single metal lift gate use 'G-D' Drop chart. Add for total flow.

Needed: Heads at weir lip for three rectangular weirs with stop-logs. Head from upstream stilling well. Gate opening on metal lift gage (found by measuring from top of wheel to top of metal screw stock with tape measure).

SHOULD CHECK WATER BY-PASS UPSTREAM - DIGITAL

Meas. No. ....
Comp. by JAE
Checked by NZB

DISCHARGE MEASUREMENT NOTES

Stream G-D Drop Canal
Date 10-6, 1980 Party Eggert McBain
Width 43.0 Area 21.7 Vel. .340 G. H. — Disch. 73.7
Method 2/8 No. secs. 21 G. H. change — in — min.
Method coef. 1.0 Hor. angle coef. 1.0 Susp. coef. 1.0 Meter No. Standard
Date rated 4-11-69

GAGE READINGS			
Time	Recorder	Inside	Outside
1340 Start			
1515 Finish			
Weighted M. G. H.			
G. H. correction			
Correct M. G. H.			

Spin before meas. ✓ after ✓
Wading, cable, ice, boat, upstr., downstr., side bridge ..... feet, mile, above, below gage and .....
Tags checked .....
Meter suspended from rod, or Cable
..... ft. above bottom ..... lb. ..... weight.
Levels obtained .....

Measurement rated excellent (2%), good (5%), fair (8%), poor (over 8%), based on following conditions: Cross section Mud
Flow regular Weather Sunny Warm
Other ..... Air ..... °F@
Gage ..... Water ..... °F@
Record removed ..... Intake flushed U
Observer .....
Control .....
Remarks Computed Q = 58.2
Q1 = 14 cfs, Q2 = 19.0 cfs
Q3 = 27.0 cfs Q4 = 10.8 cfs
G. H. of zero flow ..... ft.

#6. Gate opening 0.22 HG #1 - 5' D4pH = 0.12
#2 = 5' 1.9
#3 5' 1.3
G1. 2.46 OK

UPSTREAM GAGE, 2 SCREW STOCK OPENINGS

DOWN STREAM GAGE

'E' CANAL

Klamath Irrigation District

Headwork Location: NW¼ SW¼, Section 14, T39S R10E

Gages: Two stilling wells with staff plates, one upstream of headworks and one downstream, both on left bank.

Gates: Two metal rectangular lift gates with metal wheels and screw stock. Gate widths - right 3.75', left 3.73'. Note right or left gate openings.

Measuring Section: Wooden walkway approximately 200 feet downstream of gates. Use standard wading rod and standard meter.

Flow Computation: $Q = .65\ A\sqrt{2\ g\Delta H}$ (for each gate)

Where ΔH = head differential through gates or upper well reading minus lower well reading.

A = gate width x h_1 where h_1 = gate opening - obtained by measuring from top of wheel to top of screw stock on each gate.

Example: Upstream Well - 2.54 before and after measuring

Downstream Well - 1.64 before and after measuring

Gate opening Right - .59

Rating Eqn error from measurement

6%

STATE OF OREGON
WATER RESOURCES DEPARTMENT
DISCHARGE MEASUREMENT NOTES

File No. ____
Meas. No. ____
Comp. by JAE
Checked by NZR

Stream "E" Canal KID
Date 9-30, 1980 Party Esget J.A.
Width 10.0 Area 14.7 Vel. 1.52 ~~G.H.~~ ΔH ave .90 Disch. 22.3
Method 6 No. secs. 20 G. H. change ____ in ____ min.
Method coef. 1 Hor. angle coef. 1 Susp. coef. 1 Meter No. S-68
Date rated 4-11-69
Spin before meas. ✓ after ✓
Wading, cable, ice, boat, upstr., downstr., side bridge 100 feet, mile, above, below ~~gage and~~ headworks
Tags checked ____
Meter suspended from rod, or ____
____ ft. above bottom ____ lb. ____ weight.
Levels obtained ____

above below

GAGE READINGS				
Time		Recorder	Inside	Outside ΔH
1630	Start	2.55	1.64	0.91
1710	Finish	2.53	1.63	0.90
Weighted M. G. H.				
G. H. correction				
Correct M. G. H.				

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

Flow regular Weather Clear, Warm
Other ____ Air ____ °F@
Gage ____ Water ____ °F@
Record removed ____ Intake flushed ____
Observer ____
Control ____
Remarks Right h_1 = .59' w_1 = 3.75'
Left h_2 = .54' w_2 = 3.73'
G. H. of zero flow ____ ft.

$Q = .65\ A\sqrt{2gah}$

ΔH ave = .90
A_1 = 2.21
A_2 = 2.01

Q_1 = 10.94
Q_2 = 9.95
20.89

9-275-G
11-75

KBA_APP_000592

UPSTREAM GAGE, 2 OPENINGS, DOWNSTREAM GAGE

'F' CANAL

Klamath Irrigation District

Location of Headworks: SW¼ SW¼, Section 14, T39S R10E

Gages: Two stilling wells with staff plates. One upstream of headgate between 'F' & 'F-1' gates and one just downstream of 'F' headgate. Also there is a staffplate on the north side walls of the two gate plates to read gate opening for each of the two gates.

Gate: Two seven foot metal rectangular radial lift gates.

Measuring Section: Measure from wooden walkway approximately 100 yards downstream of headworks. Use standard wading rod and standard meter.

Flow Computation: $Q = .65\ A\sqrt{2\ g\Delta H}$

Where ΔH = head differential through gate or upstream well reading minus downstream well level.

$A = 7' \cdot h_1$ where h_1 is gate staff reading

Example: Upstream 2.70, Downstream 1.54, Gate readings 0.73 & 0.77

Then $Q_1 = .65\ (0.73 \cdot 7')\sqrt{2 \cdot g \cdot (2.70 - 1.54)} \cong 28.7$

Error of rating equation from measurement 0%

STATE OF OREGON
WATER RESOURCES DEPARTMENT
DISCHARGE MEASUREMENT NOTES

File No. ____ Meas. No. ____ Comp. by JAE Checked by NZP

Stream "F" Canal K.I.D.

Date 9-30, 1980 Party Esget J.A.

Width 16 Area 36.8 Vel. 1.61 ave ΔH 1.16 Disch. 59.4

Method .2/.8 No. secs. 19 G. H. change — in ____ min.

Method coef. 1 Hor. angle coef. 1 Susp. coef. 1 Meter No. S-68

Date rated 4-11-69

Spin before meas. ✓ after ✓

Wading, cable, ice, boat, upstr., downstr., side bridge 200 feet, mile, above, below ~~gage and~~ headworks

Tags checked ____

Meter suspended from rod, or ____ ft. above bottom ____ lb. ____ weight.

Levels obtained ____

GAGE READINGS				
Time		~~Recorder~~ Inside HG	~~Inside~~ Outside HG	~~Outside~~ ΔH
1300	Start	2.72	1.54	1.18
1345	Finish	2.69	1.54	1.15

Weighted M. G. H. ____
G. H. correction ____
Correct M. G. H. ____

Measurement rated excellent (2%), good (5%), fair (8%), poor (over 8%), based on following conditions: Cross section ~~[illegible]~~ mud & concrete

Flow regular Weather Clear, Warm

Other ____ Air 70 °F @ 1425

Gage ____ Water 63 °F @ 1430

Record removed ____ Intake flushed ____

Observer ____

Control metal lift gate w/ rectangular concrete opening

Remarks Gate #1 h = 0.73 W_1 = 7.0'
#2 h = 0.77 W_2 = 7.0'

G. H. of zero flow ____ ft.

$Q = .65\ A\sqrt{2g\Delta H}$ A_1 = 5.11 Q_1 = 28.77

ΔH = 1.165 A_2 = 5.39 Q_2 = 30.35

Q Total = 59.12

9-275-G
11-75

UPSTREAM GAGE, OPENING, DOWNSTREAM GAGE

~~'F-1' CANAL~~

Klamath Irrigation District

Headwork Location: SW¼ SW¼, Section 14, T39S R10E

Gages: Two stilling wells with staff plates. One upstream of headgate between 'F' & 'F-1' gates and one just downstream of 'F-1' headgate. Also there is a staffplate on the north side wall of the 'F-1' headgate to read gate opening.

Gate: One seven foot wide radial lift gate (rectangular).

Measuring Section: Measure from wooden walkway approximately 150 yards downstream from headworks. Use standard meter and standard wading rod.

Flow Computation: $Q = .65 \; A \sqrt{2 \, g \Delta H}$

Where ΔH = head differential thru gate or upstream well reading minus downstream well reading.

$A = 7' \cdot h_1$ Where h_1 = gate staff reading

Example: Upstream = 2.50 before and after measuring.
Downstream = 1.38 before and after measuring.
Gate staff reading h_1 = 0.33

Error 13% - computed Q compared to measured Q.

9-275-G
11-75

STATE OF OREGON
WATER RESOURCES DEPARTMENT

DISCHARGE MEASUREMENT NOTES

File No. ____
Meas. No. ____
Comp. by JAE
Checked by NZR

Stream F-1 Canal
Date 10-7, 19 80 Party ESGET M McBAIN
Width 14 Area 22.6 Vel. .66 G. H. ____ Disch. 15.0
Method 2/.8 No. secs. 21 G. H. change ____ in ____ min. STAND
Method coef. 1.0 Hor. angle coef. 1.0 Susp. coef. 1.0 Meter No. S-68

Date rated 4-11-69
Spin before meas. ✓ after ✓
Wading, cable, ice, boat, upstr., downstr., side bridge ____ feet, mile, above, below gage and ____
Tags checked ____
Meter suspended from rod, or ____
____ ft. above bottom ____ lb. ____ weight.
Levels obtained ____

GAGE READINGS

Time		Recorder	Inside	Outside
1010	Start			
1050	Finish			

Weighted M. G. H. ____
G. H. correction ____
Correct M. G. H. ____

Measurement rated excellent (2%), good (5%), fair (8%), poor (over 8%), based on following conditions: Cross section ____
Flow UNIFORM Weather SUNNY
Other ____ Air ____ °F@ ____
Gage ____ Water ____ °F@ ____
Record removed ____ Intake flushed ____
Observer ____

Control STAFF UPSTREAM 2.51 2.50 * #
H6 Setting 0.33 0.33
Remarks Below 1.38 OK ✓
H6 7' wide

G. H. of zero flow ____ ft.
$\Delta H = 1.12$ $w = 7'$ $h = .33'$ $A = 2.31$ sq. ft.
Computed $Q = CA\sqrt{2g\Delta H} = .65 \cdot 2.31 \sqrt{2g \cdot 1.12} = 12.8$

.s.

UPSTREAM GAGE, 2 OPENINGS

VAN BRIMMER CANAL

Klamath Irrigation District

Headworks Location: NW¼ NE¼, Section 3, T41S R10E

Gage: Staff gage on concrete front of headworks. Also one staff gage in each rectangular stilling basin inside concrete front of headworks. Planks on hinge swing up to enable easy reading of inside staff gages.

Headworks: Two eight square foot orifices mounted in concrete front of headworks, with head differential controlled by headgates on two large (30"-36") culvert barrels.

Measurement: Wading 200' below gage with waders and standard meter. One headgate below headworks should be added if flowing.

Computation of Flow: (used equation)

$$Q = .70\ A\sqrt{2\ g\Delta H}$$

Where H = Difference in head through orifice or outstaff reading minus inside staff reading (each barrel).

A = 8 square feet.

Example: Outstaff reading 1.89 before and after measurement. Inside reading 1.73 and 1.73 before and after measuring.

$$Q = 2 \times CA\sqrt{2g\Delta H} = 2 \cdot .70 \cdot 8\sqrt{2 \cdot 32.2 \cdot (1.89-1.73)}$$

$$\cong 36.0 \text{ c.f.s.}$$

Rating Accuracy: Coefficient value appears to be good.

Data needed to compute flow - outside staff and two inside staff readings only.

Jim Esget
Field Engineer

'A' CANAL

Klamath Irrigation District

Gage Location: SW¼ NE¼, Section 30, T38S R9E

Gage Description: Stilling well with continuous chart recorder. Key to gage on Van key chain, also see man at white house (gate keeper for 'A' Canal) for access.

Measurement Location: Crescent Avenue, bridge near Klamath Union High School, SW¼ SE¼, Section 29, T38S R9E. There is one pump in the SW¼ NW¼, Section 29, T38S R9E, which pumps to the park by the freeway which should be checked and added if pumping. Use canfield reel, 30lb. weight and standard meter.

Rating: Standard rating from many measurements made from the Crecent Avenue Bridge. Recent measurements made by K.I.D. hydrologist. Rating should be of good quality.

Jim Esget
Field Engineer

'B' CANAL

Klamath Irrigation District

Headwork Location: SE¼ NE¼, Section 19, T39S R10E (Southwell check).

Gages: none.

Headgates: Four rectangular weirs with U-bar to hold 2"x4" or 2"x6" boards to control water surface and flow. Widths right to left are 4', 4', 4.1' and 3.9'. (4' is good for computation purposes on each).

Measuring Section: Bridge where 'B' Canal crosses Reeder Road between Sections 17 and 20, T39S R10E. There is two headgates between Southwell Check and this bridge, and any flow should be added to the measurement. Use Canfield Reel, 30 lb. weight and standard meter.

Quantity Computation: Heads at each weir lip is measured with special gage and the weir chart used to obtain the sum flow for all weirs together.

Weir Chart Accuracy: Appears poor at best. More frequent monitoring of this canal is recommended as compared with other more accurately rated canals.

Jim Esget
Field Engineer

'C' CANAL

Klamath Irrigation District

Location of Gage: SE¼ NW¼, Section 30, T39S R10E on left bank 'C' Canal above flume.

Gages: Stilling well with continuous chart recorder. Also inside stick measures to top of well at orange spot. (Bottom of stick is 2.00 feet). Also stilling well in head of flume with staff plate.

Measuring Point: Wooden walkway just upstream of flume entrance. Use Canfield Reel, 30 lb. weight and standard meter.

Ratings: There are separate ratings for flows below 4.0' when the radial gate is in use, and flows above 4.0' when the flume acts as control (Radial gate open). The flume rating is based on the chart recorder gage and the radial gate rating (below 4.0') is based on the staff inside the flume. Both are ratings based on measurements.

*Note: According to Malcom Crawford (President of K.I.D.), the lining of the flume has been eroded out in the last few years, increasing the roughness of the flume, resulting in lower flows (than rated) at any given head. He thought that the difference could be as great as 20% short. He plans to reline the flume this year (1980-81) to restore the accuracy of the ratings.

Recommend more frequent monitoring of this canal until accuracy of ratings is restored.

Jim Esget
Field Engineer

KBA_APP_000598

'C-G' CUTOFF (G-Canal)

Klamath Irrigation District

Gage Location: SE¼ NW¼, Section 30, T39S R10E, above concrete weir on left bank.

Gage: Stilling well with continuous chart recorder and inside gaging stick. Stick measures from recording shelf down with stick between nails. Stick is correctly labeled.

Measuring Section: Bridge on 'G' Canal in the NW¼ SW¼, Section 32, T39S R10E - bridge crosses 'G' Canal from Hill Road. There are five headgates between bridge and gage which should be added to measurement if operating. (See photo 2-0142-B). Use Canfield Reel, 30 lb. weight and standard meter.

Rating: Standard rating using measurements. It appears to be accurate.

Jim Esget
Field Engineer

'C-4' CANAL

Klamath Irrigation District

Headwork Location: SW¼ NW¼, Section 1, T40S R9E

Gages: Two stilling wells with staff plates, one downstream of 'C-4' headgates on left bank and one upstream of headgates on left bank of 'C' Canal.

Headgates: Two 3.5' metal lift gates (rectangular) with metal wheels and screw stock.

Measuring Section: NW¼ NE¼, Section 2, T40S R9E at bridge at intersection of 'C-4' Canal and Midland Road. There are approximately three headgates and one pump between the headworks and bridge which should be added to measurement if operating. Use canfield reel and 30 lb. weight with standard meter.

Flow Computation: $Q = .95\ A\sqrt{2g\Delta H}$

Where ΔH = differential head through gates or upstream well reading minus downstream well level.

$A = 3.5' \cdot h_1$ Where h_1 is the gate opening and is obtained by measuring from top of wheel to top of screw stock.

Example: Staff reading 2.38 on upstream well before and after measurement. Staff reading 1.62 on downstream well before and after measuring. Gate openings 1.50 and 1.49.

$Q_1 = .95\ A\sqrt{2g\Delta H} = .95 \cdot (3.5 \times 1.49)\sqrt{2 \cdot g \cdot (2.38-1.62)} \cong 34.7$

$Q_2 = .95\ (3.5 \times 1.50)\sqrt{2 \cdot g \cdot (2.38 - 1.62)} \cong 34.9$

Q Total = 69.6

Equation Accuracy: 'C' value appears good.

Jim Esget
Field Engineer

"G-3" CANAL

Klamath Irrigation District

Headgate Location: NE¼ NE¼, Section 35, T40S R10E

Gages: Stilling well with staff plate upstream of headgates between "G-3" and "G-D" drop headgates. Two stilling wells about 1' downstream of headgates (one for each gate) and covered by a wood plank. (Ditch rider carries gage stick for these wells or a level can be used to compute head differential through the gates).

Headgates: Two rectangular metal lift gates with metal wheels and screw stock. Carry water through two 3' diameter corrugated metal culverts.

Measuring Section: Small wooden footbridge (to a pump), in the SE¼ SW¼, Section 25, T40S R10E. Use a standard wading rod and pygmy meter (very low velocities, regular flow). Add flow from any open headgates. Measuring section is poor, but best available.

Rating Accuracy: Appears poor. This was verified by Malcom Crawford of K.I.D. Problems with rating accuracy maybe due to backwater in the culverts, high roughness in both barrels, and friction at inlet from large surface area (especially at small headgate opening). From discharge measurement on 10-6-80, a discharge coefficient of .33 rather than K.I.D.'s .61 was computed. The coefficient should continue to be checked for stability at various flows.

Flow Computation: Equation $Q = CA\sqrt{2g \cdot \Delta H}$

Where C is coefficient of discharge. K.I.D. has used .61, but measurements have indicated a smaller value (around .33).

ΔH is the difference in head through inlet of culvert, or upstream well minus downstream well levels for each culvert.

A is shaded portion of drawing below.

KBA_APP_000601

Found as follows:

h_1= headgate opening measure from top of wheel to top of screw-stock.

Then $h = \frac{3' - h_1}{2}$

On Table 3, in the Quantities Binder, under culverts, $\frac{d}{D} = \frac{h}{D}$

$A_1 = Ca\ D^2 = Ca \cdot 3^2$ from Table 3.

And area for opening = Total area of culvert opening minus $2 \cdot A_1$ or Area Total - $2A_1$.

Example: Upstream water surface elevation = 2.96.
Downstream water surface elevations are:

North - 1.63 and South 1.73 before and after measurement.

North - h_1 = 0.49 and South - h_1 = 0.12

<u>North Culvert</u>

$C = .61,\ \Delta H = 2.96 - 1.63 = 1.33$

Area: $h = \frac{3' - .49}{2} = 1.26$

$\frac{d}{D} = \frac{h}{D} = \frac{1.26}{3} = .42 \Rightarrow Ca = .3130$

$A_1 = .3130 \cdot D^2 = .3130 \cdot 9 = 2.82$ sq. ft.

$A = A\ Total - 2A_1 = \frac{\pi \cdot D^2}{4} - 2(2.82) = 7.07 - 5.64 = 1.43$ sq. ft.

$Q_N = CA\sqrt{2g\Delta H} = .61 \cdot 1.43\sqrt{2 \cdot g \cdot 1.33} = 8.07$ c.f.s.

<u>South Culvert</u>:

$C = .61,\ \Delta H = 1.23$

Area: $h = \frac{3' - .12}{2} = 1.44$

$\frac{d}{D} = \frac{1.44}{3} = .48 \Rightarrow Ca = .3727$

$A_1 = 3.35\ ft^2$

$$A = A\ Total - 2 \cdot A_1 = \frac{\pi D^2}{4} - 2 \cdot A_1 = 7.07 - 6.70 = .37\ ft^2$$

$$Q_S = CA\sqrt{2g\Delta H} = .61 \cdot .37\sqrt{2 \cdot g \cdot 1.23} = 2.01\ c.f.s.$$

$$Q = Q_N + Q_S = 8.07 + 2.01 = 10.08\ c.f.s.$$

Jim Esget
Field Engineer

'D' CANAL
(at 'G-D' Drop)

Klamath Irrigation District

Headwork Location: NE¼ NE¼, Section 35, T40S R10E

Gage: Stilling well with staff plate upstream of headworks between 'G-D' Drop gates and 'G-3' headgate.

Headgates: Consist of threee rectangular weirs with U-bar to insert 2"x4" or 2"x6" planks to control head and flow through weirs. Widths are 5' each. Also there is a fourth weir with a rectangular metal lift gate controlled by a metal lift wheel and screw stock (This gate is rated separately).

Measuring Section: Wooden Bridge in the NE¼ NW¼, Section 36, T40S R10E. Use Canfield Reel and 30 lb. weight. Standard Meter. Should add any headgates open between gates and bridge (2 or 3).

Flow Computation: For three 5' rectangular weirs with stop-logs, measure head at weir lip with special gage. For single metal lift gate use 'G-D' Drop chart. Add for total flow.

Data Needed: Heads at weir lip for three rectangular weirs with stop-logs. Head from upstream stilling well. Gate opening on metal lift gage (found by measuring from top of wheel to top of metal screw stock with tape measure).

Rating Accuracy: Rating of rectangular weirs appears poor at best with questionable accuracy of metal lift structure. This canal should probably be monitored more often than other canals of more accurate rating.

Jim Esget
Field Engineer

'E' CANAL

Klamath Irrigation District

Headwork Location: NW¼ SW¼, Section 14, T39S R10E

Gages: Two stilling wells with staff plates, one upstream of headworks and one downstream, both on left bank.

Gates: Two metal rectangular lift gates with metal wheels and screw stock. Gate widths - right 3.75', left 3.73'. Note right or left gate openings.

Measuring Section: Wooden walkway approximately 200 feet downstream of gates. Use standard wading rod and standard meter.

Flow Computation: $Q = .65\ A \sqrt{2\ g\Delta H}$ (for each gate)

Where ΔH = head differential through gates or upper well reading minus lower well reading.

A = gate width x h_1 where h_1 = gate opening - obtained by measuring from top of wheel to top of screw stock on each gate.

Example: Upstream Well - 2.54 before and after measuring

Downstream Well - 1.64 before and after measuring

Gate opening Right - .59

Left - .54

$Q_1 = .65\ A \sqrt{2 \cdot g \cdot \Delta H} = .65(.59 \cdot 3.75) \sqrt{2 \cdot g \cdot (2.54 - 1.64)} \cong 10.9$

$Q_2 = .65\ A \sqrt{2 \cdot g \cdot \Delta H} = .65(.54\ \ 3.73) \sqrt{2 \cdot g\ \Delta H} \cong 10.0$

Q Total $\cong$ 20.9 c.f.s.

Rating Accuracy: 'C' value appears good.

Jim Esget
Field Engineer

'F' CANAL

Klamath Irrigation District

Location of Headworks: SW¼ SW¼, Section 14, T39S R10E

Gages: Two stilling wells with staff plates. One upstream of headgate between 'F' & 'F-1' gates and one just downstream of 'F' headgate. Also there is a staffplate on the north side walls of the two gate plates to read gate opening for each of the two gates.

Gate: Two seven foot metal rectangular radial lift gates.

Measuring Section: Measure from wooden walkway approximately 100 yards downstream of headworks. Use standard wading rod and standard meter.

Flow Computation: $Q = .65\ A\sqrt{2\ g\Delta H}$

Where ΔH = head differential through gate or upstream well reading minus downstream well level.

$A = 7' \cdot h_1$ where h_1 is gate staff reading

Example: Upstream 2.70, Downstream 1.54, Gate readings 0.73 & 0.77

Then $Q_1 = .65\ (0.73 \cdot 7')\sqrt{2 \cdot g \cdot (2.70 - 1.54)} \cong 28.7$

$Q_2 = .65\ (0.77 \cdot 7')\sqrt{2 \cdot g \cdot (2.70 - 1.54)} \cong 30.3$

Q Total = 59.0

Rating Accuracy: 'C' value appears good.

Jim Esget
Field Engineer

'F-1' CANAL

Klamath Irrigation District

Headwork Location: SW¼ SW¼, Section 14, T39S R10E

Gages: Two stilling wells with staff plates. One upstream of headgate between 'F' & 'F-1' gates and one just downstream of 'F-1' headgate. Also there is a staffplate on the north side wall of the 'F-1' headgate to read gate opening.

Gate: One seven foot wide radial lift gate (rectangular).

Measuring Section: Measure from wooden walkway approximately 150 yards downstream from headworks. Use standard meter and standard wading rod.

Flow Computation: $Q = .65 \quad A\sqrt{2\ g\Delta H}$

Where ΔH = head differential thru gate or upstream well reading minus downstream well reading.

$A = 7' \cdot h_1$ Where h_1 = gate staff reading

Example: Upstream = 2.50 before and after measuring.

Downstream = 1.38 before and after measuring.

Gate staff reading $h_1 = 0.33$

Then $Q = .65 \quad A\sqrt{2\ g\Delta H} = .65 \cdot (7' \cdot 0.33)\sqrt{2 \cdot g \cdot (2.50 - 1.38)} \cong 12.8$ c.f.s.

Coefficient does not appear good. Headgate was new this year (1980), and an adjustment of this 'C' value should be expected sometime in the future from Klamath Irrigation District.

Jim Esget
Field Engineer

'J' CANAL

Tulelake Irrigation District

Location of Headworks: Anderson - Rose Dam, SE¼ SE¼, Section 7, T41S R11E.

Gages: Outstaff near stilling well above dam headgates on left bank. Stilling well in fenced area for water surface below headgates. Use M-Scope to measure to water subtract from 11.99 to get head above gate bottom. Also, there is an outstaff downstream but the stilling well reading should be used.

Headgates: Five metal rectangular lift gates with wheels and screw stock discharge to 'J' Canal. Also two metal rectangular lift gates to Lost River. Sizes can be measured from walkway upstream of headgates. There is also a Spillway which discharges to Lost River. Gates are electronically controlled and have automatic stabilization of flow through float switches, so it is important to measure gate openings before and after measuring.

Measuring Section: SW¼ SW¼, Section 8, T41S R11E - Wooden footbridge across 'J' Canal. Use canfield reel, 30 lb. weight and standard meter.

Flow Calculation: $Q = CA\sqrt{2g\Delta H}$

Where ΔH is head differential through gates or upstream staff reading minus downstream water surface reading.

C is dependent on ΔH and can be obtained from graph in 'J' Canal folder.

A = width of gage x h_1 Where h_1 = gage opening and can be obtained by measuring from the top of the wheel to the bottom of the stopnut on screw stock for each gate. Also measure gate width corresponding to each gate opening.

Example: Upstream staff reading before and after measuring 3.57, Downstream stilling well water level before 1.09, after measuring 1.19. (1.14 ave.)

$\Delta H = 2.43$

Then C = .75 (from graph)

Three gates (all 7') open 0.72, 0.73, 0.73 before and after measurement.

Then $Q_1 = CA\sqrt{2\ g\Delta H} = .75 \cdot (7' \cdot 0.72)\sqrt{2g \cdot 2.43} \cong 47.3$

$Q_2 + Q_3 = 2 \cdot [.75 \cdot (7' \cdot 0.73)\sqrt{2g \cdot 2.43}] \cong 95.9$

Q total $\cong$ 143.2 c.f.s.

KBA_APP_000608

Rating Accuracy: Appears good.

Note: Contact Jerry Pyle at Tulelake Irrigation District (usually there from 8-8:30 a.m.).

Jim Esget
Field Engineer

VAN BRIMMER CANAL

Klamath Irrigation District

Headworks Location: NW¼ NE¼, Section 3, T41S R10E

Gage: Staff gage on concrete front of headworks. Also one staff gage in each rectangular stilling basin inside concrete front of headworks. Planks on hinge swing up to enable easy reading of inside staff gages.

Headworks: Two eight square foot orifices mounted in concrete front of headworks, with head differential controlled by headgates on two large (30"-36") culvert barrels.

Measurement: Wading 200' below gage with waders and standard meter. One headgate below headworks should be added if flowing.

Computation of Flow: (used equation)

$$Q = .70\ A\sqrt{2\ g\Delta H}$$

Where H = Difference in head through orifice or outstaff reading minus inside staff reading (each barrel).

A = 8 square feet.

Example: Outstaff reading 1.89 before and after measurement. Inside reading 1.73 and 1.73 before and after measuring.

$$Q = 2 \times CA\sqrt{2g\Delta H} = 2 \cdot .70 \cdot 8\sqrt{2 \cdot 32.2 \cdot (1.89-1.73)}$$

$$\cong 36.0 \text{ c.f.s.}$$

Rating Accuracy: Coefficient value appears to be good.

Data needed to compute flow - outside staff and two inside staff readings only.

Jim Esget
Field Engineer

KBA_APP_000610

A CANAL

SMEAD®

No. 153L
UPC 10330

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'A' CANAL

Klamath Irrigation District

Gage Location: SW¼ NE¼, Section 30, T38S R9E

Gage Description: Stilling well with continuous chart recorder. Key to gage on Van key chain, also see man at white house (gate keeper for 'A' Canal) for access.

Measurement Location: Crescent Avenue, bridge near Klamath Union High School, SW¼ SE¼, Section 29, T38S R9E. There is one pump in the SW¼ NW¼, Section 29, T38S R9E, which pumps to the park by the freeway which should be checked and added if pumping. Use canfield reel, 30lb. weight and standard meter.

Rating: Standard rating from many measurements made from the Crecent Avenue Bridge. Recent measurements made by K.I.D. hydrologist. Rating should be of good quality.

Jim Esget
Field Engineer

KLAMATH IRRIGATION DISTRICT

President - Malcom Crawford October 15, 1980

The following canals are presently rated and managed by Klamath Irrigation District: 'A' Canal, 'B' Canal, 'C' Canal, 'C-4' Canal, 'D' Canal, 'E' Canal, 'F' Canal, 'F-1' Canal, 'G' Canal, 'G-3' Canal, and the Van Brimmer Canal.

Klamath Irrigation District has employed a hydrologist to measure through this year at least. He began in the summer of 1979 and he was employed through most of the summer of 1980. My opinion is that his work was accurate. According to the Klamath Irrigation District, other hydrologists were hired in the past to measure their canals. Also other measurements were made by others, the quality of which may vary. The majority of the ratings appear good upon first inspection except for the 'B' Canal and 'G-D' Drop which are free flowing weirs and very inaccurate for rating purposes. These canals in my opinion should be measured more frequently than others.

The 'F-1' Canal headgate is new this year and the discharge coefficient does not appear accurate at this time. The 'C' Canal flume, according to Malcom Crawford, has eroded out in the past few years, increasing the roughness in the flume resulting in lower flows than the rating indicates at any given head. This error may be in the vicinity of 20% according to Mr. Crawford. The first measurement at this site showed a 14% discharge shortage which appears to verify Mr. Crawford's estimation at this time. K.I.D. plans to reline the flume this winter in an effort to restore the rating's accuracy. More frequent measurement of the 'F-1' and 'C' Canals is recommended until the ratings return to accurate levels probably through selection of a more appropriate 'C' value on the 'F-1' Canal and through relining of the flume on the 'C' Canal.

Jim Esget
Field Engineer

A

Canal

Recorder Gage / CFS

RECEIVED FROM KID. OCT 1985

NEW CURVE FOR NEW STATION

CFS	GAGE	CFS	GAGE	CFS	GAGE	CFS	GAGE
200	2.24	300	2.88	400	3.43	500	3.93
205	2.27	305	2.91	405	3.46	505	3.96
210	2.31	310	2.94	410	3.49	510	3.98
215	2.34	315	2.97	415	3.51	515	4.00
220	2.37	320	3.00	420	3.54	520	4.03
225	2.41	325	3.03	425	3.56	525	4.05
230	2.44	330	3.05	430	3.59	530	4.08
235	2.47	335	3.08	435	3.61	535	4.10
240	2.51	340	3.11	440	3.64	540	4.12
245	2.54	345	3.14	445	3.67	545	4.14
250	2.57	350	3.17	450	3.69	550	4.17
255	2.60	355	3.19	455	3.72	555	4.19
260	2.63	360	3.22	460	3.74	560	4.21
265	2.67	365	3.25	465	3.76	565	4.23
270	2.70	370	3.28	470	3.79	570	4.26
275	2.73	375	3.30	475	3.81	575	4.28
280	2.76	380	3.33	480	3.84	580	4.30
285	2.79	385	3.36	485	3.86	585	4.32
290	2.82	390	3.39	490	3.88	590	4.34
295	2.85	395	3.41	495	3.91	595	4.37

6-297

STATE OF OREGON

OFFICE OF STATE ENGINEER

Water Resources Department

Year .....

File No. .....

Discharge measurements of "A" Canal, Klamath Irrigation District

....., *during the year ending September 30, 19*.....

No.	Date	Made by	Width Feet	Area Sq. ft.	Mean Velocity Ft./Sec.	Gage Height Feet	Discharge C.F.S.	Rating Q Corr.	Rating % diff	Method	Mass. Cons. No.	G. Ht. Chgs. Ft.	Time Min.	Temperature Wtr.	Temperature Air	REMARKS
	10/1/80	Esget & B. Bain				7.32	576	605	5%							
	9/9/85	KNAUER WETZEL STUNTEBECK				4.17	505									NEW GAGE & GAGE HOUSE

* Geological Survey Engineer

SUPERCEDED - NEW GAGE

"A" CANAL

Gage Ht.	CFS	Gage Ht.	CFS	Gage Ht.	CFS
3.00	120	4.36	245	5.47	370
3.06	125	4.41	250	5.51	375
3.12	130	4.46	255	5.55	380
3.19	135	4.50	260	5.59	385
3.25	140	4.55	265	5.63	390
3.31	145	4.59	270	5.67	395
3.37	150	4.63	275	5.72	400
3.42	155	4.68	280	5.76	405
3.48	160	4.73	285	5.80	410
3.53	165	4.77	290	5.84	415
3.59	170	4.82	295	5.88	420
3.64	175	4.86	300	5.92	425
3.70	180	4.91	305	5.95	430
3.76	185	4.95	310	5.99	435
3.81	190	5.00	315	6.03	440
3.86	195	5.05	320	6.07	445
3.91	200	5.09	325	6.12	450
3.96	205	5.13	330	6.16	455
4.01	210	5.18	335	6.20	460
4.06	215	5.22	340	6.24	465
4.11	220	5.26	345	6.28	470
4.16	225	5.30	350	6.32	475
4.21	230	5.34	355	6.36	480
4.26	235	5.38	360	6.40	485
4.31	240	5.43	365	6.44	490

"A" CANAL

Gage Ht.	CFS	Gage Ht.	CFS	Gage Ht.	CFS
6.48	495	7.44	620	8.33	745
6.52	500	7.48	625	8.37	750
6.55	505	7.52	630	8.41	755
6.59	510	7.55	635	8.44	760
6.63	515	7.59	640	8.48	765
6.67	520	7.62	645	8.51	770
6.71	525	7.66	650	8.55	775
6.75	530	7.69	655	8.59	780
6.78	535	7.73	660	8.62	785
6.82	540	7.76	665	8.66	790
6.86	545	7.80	670	8.69	795
6.90	550	7.83	675	8.73	800
6.94	555	7.87	680	8.76	805
6.98	560	7.91	685	8.80	810
7.02	565	7.94	690	8.83	815
7.05	570	7.98	695	8.87	820
7.09	575	8.01	700	8.91	825
7.13	580	8.05	705	8.94	830
7.17	585	8.09	710	8.98	835
7.21	590	8.12	715	9.01	840
7.25	595	8.16	720	9.05	845
7.28	600	8.19	725	9.09	850
7.32	605	8.23	730	9.12	855
7.36	610	8.26	735	9.16	860
7.40	615	8.30	740	9.19	865

"A" CANAL

Gage Ht.	CFS	Gage Ht.	CFS	Gage Ht.	CFS
9.23	870	10.09	995	10.96	1120
9.26	875	10.13	1000	10.99	1125
9.30	880	10.16	1005	11.03	1130
9.34	885	10.20	1010	11.06	1135
9.37	890	10.24	1015	11.10	1140
9.41	895	10.27	1020	11.13	1145
9.44	900	10.31	1025	11.17	1150
9.48	905	10.34	1030		
9.51	910	10.37	1035		
9.55	915	10.41	1040		
9.59	920	10.44	1045		
9.62	925	10.47	1050		
9.66	930	10.51	1055		
9.69	935	10.54	1060		
9.73	940	10.57	1065		
9.76	945	10.61	1070		
9.79	950	10.64	1075		
9.83	955	10.67	1080		
9.86	960	10.71	1085		
9.89	965	10.74	1090		
9.93	970	10.78	1095		
9.96	975	10.81	1100		
9.99	980	10.85	1105		
10.03	985	10.89	1110		
10.06	990	10.92	1115		

9-275-F
11-75

STATE OF OREGON
WATER RESOURCES DEPARTMENT

File No. .....
Meas. No. .....
Comp. by DEK
Checked by .....

DISCHARGE MEASUREMENT NOTES

Stream A-CANAL, KLAMATH IRR. DIST. KLA FALLS, ORE

Date 8-6-86, 19..... Party KNAMER STUNTEBECK

Width 24.0 Area 216 Vel. 4.21 G. H. 5.73 Disch. 910

Method 12/.8 No. secs. 17 G. H. change -0.03 in 35 min.

Method coef. 1 Hor. angle coef. 1 Susp. coef. 1 Meter No. .....

~~Date rated~~ USBR METER

Spin before meas. ..... after .....

Wading, cable, ice, boat, upstr., downstr., side bridge @ feet, mile, above, below gage and .....

GAGE READINGS				
Time		Recorder	Inside	Outside
9:45			5.75	
11:05	Start			
1140	Finish		5.72	
Weighted M. G. H.				
G. H. correction				
Correct M. G. H.				

Tags checked .....

Meter suspended from ~~rod,~~ or TYPE A REEL

5 ft. above bottom 30 lb. ..... weight.

Levels obtained .....

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

Flow UNIFORM Weather SUNSHINE

Other ..... Air .....°F@ .....

Gage OK Water .....°F@ .....

..... Record removed ..... Intake flushed U L .....

Observer .....

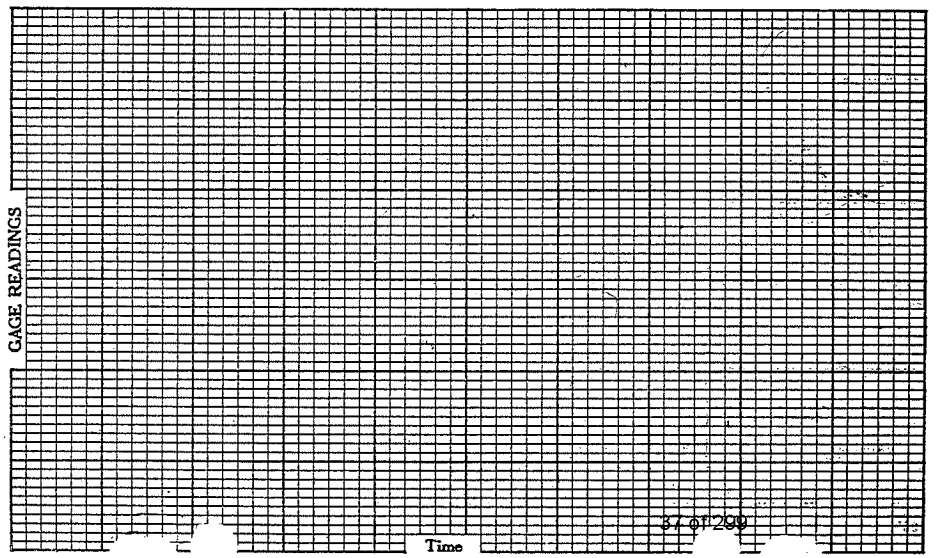
Control CLEAR

Remarks

SW NE SEC 30 T38S R9E W.M.

G. H. of zero flow ..... ft.

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
.0	.10	.20	.30	.40	.50	.60	.70		.80	.85	
											.90
											.92
											.94
											.96
											.97
											.98
											.99
⊙											1.00
											.99
											.98
											.97
											.96
											.94
											.92
.0	.10	.20	.30	.40	.50	.60	.70		.80	.85	.90



.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
	24.0	2.5	LEW							—	—
	21.0										
	19.0	3.0	11.3	.2			4.5	4.0		33.9	135.6
				.8			3.5				
	18.0	1.0	11.4	.2			5.5	4.75		11.4	54.2
				.8			4.0				
	17.0		11.4	.2			4.75	5.88		11.4	67.0
				.8			7.0				
	16.0		11.4	.2			4.75	4.48		11.4	51.1
				.8			4.20				
	15.0		11.4	.2			4.0	4.3		11.4	49.0
				.8			4.6				
	14.0		11.4	.2			4.7	4.35		11.4	49.6
				.8			4.0				
⊙	13.0		11.4	.2			4.8	4.25		11.4	48.4
				.8			3.7				
	12.0		11.4	.2			4.9	4.20		11.4	47.9
				.8			3.5				
	11.0		11.4	.2			4.7	4.25		11.4	48.4
				.8			3.8				
	10.0		11.4	.2			4.6	4.35		11.4	49.6
				.8			4.1				
	9.0		11.4	.2			4.7	4.25		11.4	48.4
				.8			3.8				
	8.0		11.4	.2			5.0	4.3		11.4	49.0
				.8			3.6				
	7.0		11.4	.2			4.6	4.3		11.4	49.0
				.8			4.0				

.80 .85 .90 .92 .94 .96 .97 .98 .99 1.00 .99 .98 .97 .96 .94 .92 .90 .85

.0 .10 .20 .30 .40 .50 .60 .70 .75 .80

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
	6°	1°	11.4	.2	4.5			4.2		11.4	47.9
				.8	3.9						
	5°	3°	11.4	.2	3.8			3.35		34.2	114.6
				.8	2.9						
	~~4°~~			.2							
				.8							
	0°	2.5	R	E	W					—	—
	24°	~~24°~~								216.30	909.7

3-SIEN-PIG

9-275-F
11-75

STATE OF OREGON
WATER RESOURCES DEPARTMENT

DISCHARGE MEASUREMENT NOTES

File No. .....
Meas. No. .....
Comp. by S(KID)
Checked by TPM

Stream A-CANAL, KID, KLAMATH PROJECT

Date 9-9-85, 19..... Party KNAUER, WETZEL, STUNTEBEC (KID)

Width 21.9 Area 182 Vel. 2.80 G. H. 4.17 Disch ~~509~~ 508

Method 2/8 No. secs 18 G. H. change +0.02 in 70 min.

Method coef. 1 Hor. angle coef. 1 Susp. coef. 1 Meter No. GURLEY TT2258

Date rated .....

Spin before meas. ..... after .....

Wading, cable, ice, boat, upstr., downstr., side bridge 5 feet, mile, above, below, gage and .....

GAGE READINGS				TAPE
Time		Recorder	~~Inside~~	~~Outside~~
9:40		4.19		4.16
	Start			
10:50	Finish	4.21		4.18
Weighted M. G. H.				
G. H. correction				
Correct M. G. H.				

Tags checked .....

Meter suspended from ~~rod, or~~ TYPE A REEL

5 ft. above bottom 30 lb. C weight.

Levels obtained .....

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

Flow VERY UNIFORM Weather OVERCAST - RAIN

Other ..... Air .....°F@.....

Gage OK Water .....°F@.....

..... Record removed NO Intake flushed U/L .....

Observer .....

Control WEIR IS CLEAN

Remarks .....

G. H. of zero flow ..... ft.

4.16

.0 .10 .20 .30 .40 .50 .60 .70 .80 .85

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
⊙											

.0 .10 .20 .30 .40 .50 .60 .70 .80 .85

GAGE READINGS

Time

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

[redacted] [redacted] [redacted]

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	
	0.0	1.6	0		REW		10	10		0	—	
	4.0	2.1	9.7	.2			2.5	1.95		20.4	39.8	.85
				.8			1.4					
	5.0	1.0	9.9	.2			2.65	2.45		9.9	24.3	
				.8			2.25					.90
	6.0		9.9	.2			3.25	2.82		9.9	27.9	.92
				.8			2.4					.94
	7.0		9.9	.2			3.2	2.85		9.9	28.2	
				.8			2.5					.96
	8.0		9.9	.2			3.1	2.85		9.9	28.2	.97
				.8			2.6					.98
	9.0		9.9	.2			3.4	3.0		9.9	29.7	.99
				.8			2.6					
	10.0		9.9	.2			3.3	2.9		9.9	28.7	
⊙				.8			2.5					1.00
	11.0		9.9	.2			3.4	3.0		9.9	29.7	
				.8			2.6					
	12.0		9.9	.2			3.4	3.0		9.9	29.7	.99
				.8			2.6					.98
	13.0		9.9	.2			3.4	3.2		9.9	31.7	.97
				.8			3.0					.96
	14.0		9.9	.2			3.3	3.0		9.9	29.7	
				.8			2.75					.94
	15.0		9.9	.2			3.2	3.0		9.9	29.7	.92
				.8			2.8					.90
	16.0		9.9	.2			3.4	3.3		9.9	32.7	
				.8			3.2					
	17.0		9.9	.2			3.3	3.1		9.9	30.7	.85
				.8			2.9					

.0 .10 .20 .30 .40 .50 .60 .70 .75 .80

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
	18 0	1 0	9 9	.2			3.3	2.85		9 9	28.2
				.8			2.4				
	19 0	2 35	9 9	.2			3.1	2.55		23 3	~~59.4~~ ~~60.1~~
				.8			2.0				
	22 7	1 85	0		LEW					0	—
	21 9	21 9								182	~~509~~
											508

9-275-F
11-75

STATE OF OREGON
WATER RESOURCES DEPARTMENT

DISCHARGE MEASUREMENT NOTES

File No. .....
Meas. No. .....
Comp. by DEK
Checked by DLW

Stream A-CANAL - KLAMATH PROJECT USBR KID
Date AUG 23, 1983 Party DON KNAUER - DON WESTON
Width 73 Area 390 Vel. 1.26 G. H. 6.50 Disch. 490
Method 2/8 No. secs. 19 G. H. change -03 in 85 min.
Method coef. 1 Hor. angle coef. 1 Susp. coef. 1 Meter No. E-1

Date rated .....
Spin before meas. OK after .....
Wading, cable, ice, boat, upstr., downstr., side bridge ..... feet, mile, above, below gage and .....

@ CRESCENT ST. CROSSING

Tags checked .....
Meter suspended ~~from rod, or~~ A - REEL
1/2 ft. above bottom 30 lb. ..... weight.
Levels obtained .....

GAGE READINGS				
Time		Recorder	~~Inside~~ TAPE	Outside
835		6.51	6.51	
900	Start			
940	Finish			
1000		6.48	6.48	
Weighted M. G. H.				
G. H. correction				
Correct M. G. H.				

Measurement rated excellent (2%), good (5%), fair (8%), poor (over 8%), based on following conditions: Cross section Rocks 2
Flow UNIFORM Weather CLOUDY
Other ..... Air 56 °F@ 950
Gage OK Water ..... °F@ .....
..... Record removed Y/O Intake flushed U
Observer .....
Control .....
Remarks KID MEASURING EQUIPMENT
SW NE SEC 30 T38S R9E
G. H. of zero flow ..... ft.

KBA_APP_000627

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

River at READ

Angle coefficient	Dist. from initial point	Width (COMPUTE)	Depth (READ)	Observation depth	Revolutions	Time in seconds	VELOCITY At point	VELOCITY Mean in vertical (COMP)	Adjusted for hor. angle or	Area (COMPUTE)	Discharge (COMPUTE)	
—	6	2.0	LEW		9:00		AM			—	—	
—	10	4.0	3.2	.6			0.9			12.8	11.5	.85
—	14	4	5.1	.2			1.3	1.08		20.4	22.0	
				.8			0.85					
	18	4	5.9	.2			1.25	1.23		23.6	29.0	.90
				.8			1.2					.92
	22		6.0	.2			1.4	1.3		24.0	31.2	.94
				.8			1.2					
	26		7.0	.2			1.45	1.33		28.0	37.2	.96
				.8			1.2					.97
	30		7.3	.2			1.55	1.38		29.2	40.3	.98
				.8			1.2					.99
	34		7.3	.2			1.45	1.38		29.2	40.3	
				.8			1.3					
⊙	38		7.2	.2			1.4	1.35		28.8	38.9	1.00
				.8			1.3					
	42		7.2	.2			1.45	1.43		28.8	41.2	
				.8			1.4					.99
	46		7.3	.2			1.45	1.35		29.2	39.4	.98
				.8			1.25					.97
	50		7.3	.2			1.35	1.33		29.2	38.8	.96
				.8			1.3					
	54		7.1	.2			1.4	1.3		28.4	36.9	.94
				.8			1.2					.92
	58		6.1	.2			1.4	1.33		24.4	32.4	.90
				.8			1.25					
	62		4.8	.2			1.25	1.13		19.2	21.7	
				.8			1.0					.85

.0 .10 .20 .30 .40 .50 .60 .70 .75 .80

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
	66		4.3	.2			1.1	0.95		17.2	16.3
				.8			0.8				
	70	4.0	2.2	.6			1.05			8.8	9.24
	74	4.5	2.0	.6			0.4			9.0	3.6
	79	2.5	REW				9:40 A.M.			—	—
	73	73								390.20	489.94
											490.

9-275-F
(May 1971)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
WATER RESOURCES DIVISION

DISCHARGE MEASUREMENT NOTES

Meas. No. _____
Comp. by DWS
Checked by _____

Sta. No. _____
A canal K.I.D. USBR

Date 6-11, 1981 Party DWS RME

Width 7.5 Area 48.2 Vel. _____ G. H. 9.32 Disch. 8.78

Method 2-8 No. secs. 27 G. H. change Ø in 1 hrs. Susp. _____

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

GAGE READINGS				
Time	T G	Recorder	Inside	Outside
1240	9.32			
1255	5			
1340	E			
1350	9.32			
Weighted M. G. H.				
G. H. correction				
Correct M. G. H.				

Type of meter Standard

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 mud

Flow uniform Weather Fair warm

Other _____ Air _____°F@ _____

Gage _____ Water _____°F@ _____

_____ Record removed _____ Intake flushed U _____

Observer _____

Control _____

Remarks _____

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
	-1	1.5	REW@			1255				" "	" "
	2	3.0	1.8	.6	10	50	.456			5.4	2.46
	5	3.0	3.6	.2	25	46	1.20	.804		10.8	8.68
				.8	10	56	.409				
	8	3.0	4.8		30	39	1.68	1.27		14.4	18.30
					15	39	.855				
	11	3	6.0		30	41	1.62	1.13		18.0	20.30
					15	52	.649				
	14	3	6.7		40	49	1.80	1.43		20.1	28.7
					20	42	1.06				
	17	3	6.8		40	46	1.92	1.56		20.4	31.8
					25	43	1.29				
	20	3	7.1		40	43	2.05	1.90		21.3	40.5
					40	50	1.76				
⊙	23	3	7.4		40	43	2.05	1.96		22.2	43.5
					40	47	1.88				
	26	3	7.6		40	39	2.25	2.10		22.8	47.9
					40	45	1.96				
	29	3	7.8		50	47	2.34	2.07		23.4	48.4
					40	49	1.80				
	32	3	7.8		40	39	2.25	2.10		23.4	49.1
					40	45	1.96				
	35	3	7.9		50	48	2.29	2.22		23.7	52.6
					40	41	2.15				
	38	3	7.9		40	39	2.25	2.00		23.7	47.4
					40	50	1.76				
	41	3	8.2		40	40	2.20	2.02		24.6	49.7
					40	48	1.84				
	44	3	8.2		40	39	2.25	2.08		24.6	51.2
					40	46	1.98				
	47	3	8.2		50	46	2.39	2.14		24.6	52.6
					40	47	1.88				

.80 .85 .90 .92 .94 .96 .97 .98 .99 1.00 .99 .98 .97 .96 .94 .92 .90 .85 .80

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

50	3	6.2		40	40	2.20	2.00		~~42~~ 41	49.2	
				40	49	1.80					.80
53	3	8.0		40	40	2.20	1.94		24.0	46.6	
				40	53	1.67					
56	3	7.9		40	44	2.00	1.84		23.7	43.6	.85
				40	53	1.67					
59	3	7.5		40	41	2.15	1.84		22.5	41.4	
				30	43	1.54					.90
62	3	7.3		40	45	1.96	1.83		21.9	40.1	.92
				40	52	1.70					.94
65	3	6.0		40	46	1.92	1.78		18.0	32.0	
				30	40	1.65					.96
68	3	4.4		30	44	1.51	1.52		13.2	20.1	.97
				30	43	1.54					.98
71	2.5	3.3	.2	25	42	1.32	1.23		8.25	10.1	.99
			.8	20	39	1.14					
73	1.5	1.4	.6	15	40		.837		2.1	1.8	
74	.5	—L	E	W@	13	40					1.00
									~~481.6~~	878.0	
75	75								481.6		
											.99
											.98
											.97
											.96
											.94
											.92
											.90
											.85
											.80

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

...easured Q is 5%

9-275-F
4-58

STATE OF OREGON
OFFICE OF STATE ENGINEER
Water Resources Department

File No. .....
Meas. No. .....
Comp. by JAE
Checked by NZR

DISCHARGE MEASUREMENT NOTES

Stream A CANAL - USBR - KID.

Date 10-1, 1980 Party ESGET M McBAIN N

Width 7.3 Area 398 Vel. 1.45 G. H. 7.32 Disch. 576

Method .2+.8 No. secs 22 G. H. change -.01 in 115 min.

Method coef. 1.0 Hor. angle coef. 1.0 Susp. coef. 1.0 Meter No. S-68

Date rated 4-11-69

Spin before meas. ✓ after OK

Wading, bridge, cable, ice, boat, upstr., downstr., side bridge ..... feet, mile, above, below gage and .....

Tags checked .....

Meter suspended from rod, or

..... ft. above bottom ..... lb. ..... weight.

Levels obtained .....

GAGE READINGS				
Time		Recorder	Inside	Outside
1000	Start	7.32		
1115	Finish	7.31		
Weighted M. G. H.				
G. H. correction				
Correct M. G. H.				

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

Flow UNIFORM Weather SUNNY - Breezy

Other ..... Air ..... °F@ .....

Gage Stilling well & recorder OK Water ..... °F@ .....

..... Record removed ..... Intake flushed U L .....

Observer .....

Control .....

Remarks Hydrograph STABLE

G. H. of zero flow ..... ft.

Q from rating = 605

.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	
	82°	2.5	LEW							0	0	
	77°	4.5	3.4	.2	25	41	1.36	1.26		15.3	19.3	.85
				.8	25	48	1.17					
	73°	3.5	5.5	.2	30	43	1.56	1.46		19.2	28.0	
				.8	25	41	1.36					.90
	70°	3.0	6.5	↓	30	43	1.56	1.36		19.5	26.5	.92
					25	49	1.15					.94
	67°	3.0	6.7		30	42	1.59	1.50		20.1	30.2	
					30	48	1.40					.96
	64°	3.0	7.0		30	40	1.67	1.52		21.0	31.9	.97
					25	41	1.36					.98
	61°	3.0	7.0		40	51	1.75	1.59		21.0	33.4	.99
					30	47	1.43					
	58°	3.0	7.3		40	50	1.78	1.52		21.9	33.3	
⊙					25	45	1.25					1.00
	55°	3.0	7.2		40	51	1.75	1.44		21.6	31.1	
					25	50	1.12					
	52°	3.0	7.0		40	51	1.75	1.66		21.0	34.9	.99
					30	43	1.56					.98
	49°	3.0	6.9		40	51	1.75	1.50		20.7	31.0	.97
					25	45	1.25					.96
	46°	3.0	6.8		40	49	1.82	1.63		20.4	33.3	
					25	39	1.43					.94
	43°	3.0	6.8		40	49	1.82	1.67		20.4	34.1	.92
					30	44	1.52					.90
	40°	3.0	7.0		40	51	1.75	1.66		21.0	34.9	
					30	43	1.56					
	↓		↓		↓	↓						.85

.0 .10 .20 .30 .40 .50 .60 .70 .75 .80

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
	37°	3°	6 7		40	51	1.75	1.69		20.1	34.0
					30	41	1.63				
	34°	3°	6 5		30	40	1.67	1.58		19.5	30.8
					30	45	1.49				
	31°	3°	6 3		30	40	1.67	1.58		18.9	29.9
					30	45	1.49				
	28°	3°	5 9		30	45	1.49	1.30		17.7	23.0
					20	41	1.10				
	25°	3 5	5 7		25	41	1.36	1.12		20.0	22.4
					20	51	.89				
	21°	4 5	4 7		25	43	1.30	.90		21.2	19.1
					10	45	.51				
	16°	6°	2 9		20	42	1.07	.88		17.4	15.3
⊙					15	49	.70				
	9°	3 5	REW							0	0
	73	73								397.9	576.4

B CANAL

SMEAD®
No. 153L
UPC 10330
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"B" CANAL

Klamath Irrigation District

December 5, 1980

"B" Canal has been measured by Klamath Irrigation District periodically and is rated through the Southwell check by use of a rectangular weir rating. (See rating folder for Klamath Irrigation District's "B" Canal).

The "B" Canal begins east of the Southwell check and runs generally east where it ends at the Olene flume.

Irrigation water use on this canal is mainly for pasture but also includes alfalfa and grains. Points of diversion are in the form of pumps or metal headgates. Maximum discharge quantities given for headgates are consideralby larger than maximum quantities actually used. In talking with farmers in the area and ditch riders, it was found that headgates are rarely, if ever, opened completely. In the construction of headgates, it was found that culvert size, depth and slope appeared rather arbitrarily considered.

Stock use is generally from the irrigation system or directly from the canals in the irrigation season, and from groundwater seepage in drains or other sources (ground water pumps), during other months when the Klamath Irrigation District's Canals are dry.

Irrigation from the "B" Canal involves generally the area included between that canal and the Lost River, with a few pumps which pump to land above the canal.

Jim Esget
Field Engineer

(Begins at Reeder Road at SE¼, NE¼ Section 19 east of the Southwell Chk.)" B " CANAL

Location	Owner	Hdgt.	Size	Length	Slope	Head Inlet	Head Outlet	Corrugation	Photo	Notes	Q
SE¼, NE¼ SEC 19 T39S R10E	B-1¼ Lateral	Hdgt.	18"cmp	2'		1.1'		A	2-0143-B	Acts as orifice into concrete pipe(36")Use Inlet equation. Delivers to Lanphear, Marm, Seingleton, Garbutt Metler, Blackman, Mitchell	1cf

LOCATION	OWNER	PUMP	MOTOR	Sprinkler Heads & Line, Lifts, etc.	Photo
NW¼, NW¼ SEC 20 T39S R10E	Rice & Banes	Berkely centrifugal	Century Electric motor 20 h.p. Model SC-284UCZ-FCA EM19-313199-02 Intake Size 4" IP Outlet Size 3½"IP Power source power line	System is in operation and and appears adequate to sprinkle land owned.	2-0143-B

Location	Owner	Hdgt.	Size	Length	Slope	Head Inlet	Head Outlet	Corrugation	Photo	Notes	Q
NW¼, NW¼ SEC 20 T39S R10E	Lanphear	Hdgt.	18"cmp	21'	.4/21	1.8'	0	A	2-1043-B	Flow Type B	12cf
NW¼, NW¼ SEC 20 T39S R10E	Lanphear	Hdgt.	18"cmp	33'	.9/33	2.5'	0	A	2-0143-B	Flow Type B	14cf

LOCATION	OWNER	PUMP	MOTOR	Sprinkler Heads & Line, Lifts, etc.	Photo
SW¼, SW¼ SEC 17 T39S R10E	Schell	Berkely centrifugal	Gould Century Electric motor 20 h.p. Part.# 6-321219-01 Intake Size 4" IP Outlet Size 3½"IP Power source 480 volt power line	System is in operation and appears adequate to sprinkle land owned.	2-0143-B

Location	Owner	Hdgt.	Size	Length	Slope	Head Inlet	Head Outlet	Corrugation	Photo	Notes	Q
SW¼, SW¼ SEC 17 T39S R10E	Schell	Hdgt.	18"cmp	26'	.9/26'	.8'	.4'	A	2-0143-B	Flow Type A	9.1c

LOCATION	OWNER	PUMP	MOTOR	Sprinkler Heads & Line, Lifts, etc.	Photo
NW¼, SW¼ SEC 17 T39S R10E	Hilyard, Otteman, Sweatland, and Wagner	Lane & Bowler turbine	U.S. High thrust motor 75 h.p. ID# R-6327-03-309-R2117053 Intake Size 6" IP Outlet Size 6" IP Power source 277 volt power line	System is in operation and appears adequate to sprinkle land owned.	2-0143-B

Location	Owner	Hdgt.	Size	Length	Slope	Head Inlet	Head Outlet	Corrugation	Photo	Notes	Q
NW¼, SW¼ SEC 17 T39S R10E	Schell	Hdgt.							2-1043-B	End of pipe is underground, no ditch. Apparently not used.	
NE¼, SW¼ SEC 17 T39S R10E	Schell	Hdgt.	24"cmp	20'	.1/20	1.3'	.6'	A	2-0143-B	Flow Type A	14cf

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LOCATION	OWNER	PUMP	MOTOR	Sprinkler Heads & Line, Lifts, etc.	Photo
NW¼, SE¼ SEC 17 T39S R10E	Wilson	Berkely centrifugal	Century Squirrel-Cage induction polyphase motor 30 h.p. Model-SC-324UY-FCA EMI-9-313195-02 Suction lift 6' Inlet size 6"IP Discharge Drop 5' Outlet size 6"IP Power source 240 volt power line	Mainline 6" AP System is shared by several property owners and appears sufficient to irrigate land owned.	2-0143-B

Location	Owner	Hdgt.	Size	Length	Slope	Head Inlet	Head Outlet	Corrugation	Photo	Notes	Q
NE¼, SE¼ SEC 17 T39S R10E	Pine Grove Sump	HdgtS	30"cmp 30"cmp						2-0143-B 2-0143-B	Headgates are sufficiently large to carry more than the capacity of the Pumps.	
NE¼, SE¼ SEC 17 T39S R10E	Hac Farms	Hdgt.	18"cmp	25'	0/slope	1.9	0	A		Flow Type B	11cf
NW¼, SW¼ SEC 16 T39S R10E	do	Hdgt.	24"cmp	27'	.4/27	1.1	0	A		Flow Type B	18cf
NE¼, SW¼ SEC 16 T39S R10E	B-3 Lateral	Hdgt.	18"cmp	28'	.6/28	1.4	0	A		Flow Type B	11cf
SW¼, SE¼ SEC 16 T39S R10E	Brown	Hdgt.	18"cmp	55'	0/55'	1.3	0.2	A		Flow Type A- Red	6.8c
SW¼, SE¼ SEC 16 T39S R10E	Grimes	Hdgt.	24"cmp	21'	-.1/21	0.9	0.6	A		Flow Type A - blue	7.3c
SE¼, SE¼ SEC 16 T39S R10E	Brown	Hdgt.	18"cmp	26'	.4/26'	1.7	0.8	A		"Definite ponding" Flow Type A green	12cf
NE¼, NE¼ SEC 21 T39S R10E	Brown & Gabriel	Hdgt.	12"cmp	31'	-.1/31	2.8	T.O.P.	A		Flow Type B - orange	4.3c
NW¼, NW¼ SEC 22 T39S R10E	Gabriel	Hdgt.	24"cmp	27'	-.1/27	1.1	0.3	A		Flow Type A At Grigsbee Creek	13cfs
SE¼, SW¼ SEC 15 T39S R10E	Russell	Hdgt.	12"cmp	25'	-.3/25	1.9	0	A		Flow Type B	4.2c
NE¼, NW¼ SEC 22 T39S R10E	Russell	Hdgt.	12"cmp	25'	+.4/25	2.7	0.7	A		Flow Type A	4.3c

Location	Owner	Hdgt.	Size	Length	Slope	Head Inlet	Head Outlet	Corrugation	Photo	Notes	Q
NW¼, NE¼ SEC 22 T39S R10E	Lyon	Hdgt.	12"cmp	23'	0/23	2.3	0	A		Flow Type B	4.9c

LOCATION	OWNER	PUMP	MOTOR	Sprinkler Heads & Line, Lifts, etc.	Photo
SW¼, SE¼ SEC 15 T39S R10E	Grimes-Kinney Ditch pump	turbine	General Electric motor 60 h.p. Model 5K444XC4A Intake Size 12"IP Suction lift 7' Discharge size 10" IP Discharge lift ≅ 59' Power source 480 volt power line	16" IP mainline - 750' in length to canal $Q \cong \frac{3960\ (\text{pump eff.})\ \text{h.p.}}{H}$ Friction Head ≅ 3' $H \cong 7' + 59' + 3' \cong 69'$ $Q \cong \frac{3960\ (.75)\ 60}{69} \cong 2{,}600$ g.p.m.	2-0143-B

SE¼, SE¼ SEC 15 T39S R10E	Lyon	Hdgt.	12"cmp	20'	.8/20	1.5	0	A		Flow Type B	5.1c

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Appendix D- Canal Measurements

Pine Grove Canal:

P.O.D. - Pumps on a sump from "B" Canal located in the NE$\frac{1}{4}$, NE$\frac{1}{4}$ Section 17, T39S, Range 10E.

Pump Information:

1. Pump - Turbine
   Motor - U.S. Motors Holloshaft Motor, 100 h.p.
   Serial # 1233748, Power Source 440 volt power line
   Suction Lift - 8' Size - 14" I.P.
   Discharge Lift - 44' Size - 16" I.P.
   Discharge to ditch Pipe Length - about 920'
   4,600 g.p.m.
2. Pump Fairbanks - turbine
   Motor - General Electric, 125 h.p.
   Model 5K6324 CH1V, Power Source 440 Volt power line
   Suction Lift - 8' Size 20" I.P.
   Discharge Lift - 44' Size 24" I.P.
   Discharge to ditch Pipe Length - about 920'
   6,800 g.p.m.

Discharge

Pump #1. $Q = \frac{3960\ (\text{pump efficiency})(\text{h.p.})}{\text{Head}}$

Head = 44' + 8' + friction head

friction head $\cong$ 1.2 x 9.50 $\cong$ 12'

$$Q = \frac{3960\ (.75)\ (100)}{44' + 8' + 12'} \cong 4{,}600 \text{ g.p.m.}$$

Pump #2. friction head $\cong$ 3'

$$Q = \frac{3960\ (.75)\ (125)}{44' + 8' + 3'} \cong 6{,}800 \text{ g.p.m.}$$

PINE GROVE CANAL

LOCATION	OWNER	PUMP	MOTOR	Sprinkler Heads & Line, Lifts, etc.	Photo
SE¼, NE¼ SEC 17 T39S R10E	Dixon and Slone	Berkeley Centrifugal	Marathon Electric Motor Model EB 326TTDR7365CCW 50 h.p. Intake Size 5" Outlet Size 5"	Pump located in the sump running between the "B" Canal and the pumps for Pine Grove Canal. System appears to be adequate to irrigate the land owned.	2-0143-B
Pine Grove Canal West Fork from main pump inlets					
SW SE¼, SE¼ SEC 8 T39S R10E	Cunningham	Cornell centrifugal	General Electric, Triclad motor 40, h.p. Model 5K286JL162 Power Source 480 volt power line Intake Size 5" I.P. Outlet Size 5" I.P.	System appears adequate to irrigate the land owned.	2-0143-B
SW¼, SE¼ SEC 8 T39S R10E	Cunningham	Berkely centrifugal	Continental Pump 10 h.p., power source 240 V power line pulleys & belts (4) pulley - motor 10" pulley - pump 8" 1.5' between shafts	Mainline & wheelline System appears sufficient to irrigate the land owned.	2-0143-B
SW¼, SE¼ SEC 8 T39S R10E	Kirkpatrick	Jacuzzi Bros. centrifugal Intake Size 6" Outlet Size 5"	Century Squirrel Cage Induction Polyphase Motor 50 H.P. Model # SC-365UCZ-FCA 9-309979-01 Power source 480 Volt power line	2 wheellines and approx. 2200' of pack line System appears sufficient to irrigate the land owned.	2-0143-B

Location	Owner	Hdgt.	Size	Length	Slope	Head Inlet	Head Outlet	Corrugation	Photo	Notes	Q
SW¼, SE¼ SEC 8 T39S R10E	Kirpatrick	Hdgt.	15"cmp	14'	.2' in 14'	.6'	0'	A	2-0143-B	Free outfall, Flow type C or D	5.6cfs
SE¼, SW¼ SEC 8 T39S R10E	Gooding	Hdgt.	12"cmp	18'	.2' in 18'	.8'	0'	A	do	Free outfall, Flow type B	3.3cfs
NE¼, SW¼ SEC 8 T39S R10E	Gooding	Hdgt.	12"cmp	10'	.1' in 10'	.1' blw T.O.P.	0'	A	2-0144-B	Flow Type C or D	1.7cfs

PINE GROVE CANAL

LOCATION	OWNER	PUMP	MOTOR	Sprinkler Heads & Line, Lifts, etc.	Photo
NW¼, SE¼ SEC 8 T39S R10E	Collier (Marie Ragland) (Carolyn Larson) (Phyllis Kerns)	Berkeley centrifugal	Century Capacitor single phase motor 3, h.p. Model CSN-225C-JC6-3BFA Power source 240 volt power line Intake size 1½" S.P. Outlet Size 1¼" S.P.	200' handline System appears to be adequate to irrigate land owned	2-0144-B
NW¼, SE¼ SEC 8 T39S R10E	Collier (Marie Ragland) (Carolyn Larson) (Phyliss Kerns)	centrifugal	Century Squirrel Cage Induction Polyphase Motor , 50 h.p. Model SC-364UCZ-FCA EMI-9-309345-01 Power Source 240 volt power line Intake Size 5" I.P. Outlet Size 4" I.P.	System appears to be adequate to irrigate land owned.	~~2-0114-B~~ 2-144 B

NE¼, SW¼ SEC 8 T39S R10E	Cheyne & Owens	Hdgt.	12" cmp	appears	unused - is	above	apparent	high water line, and is buried completely at the exit.	2-0144-B		
SE¼, NW¼ SEC 8 T39S R10E	Cheyne & Owens	Berkely centrifugal		General Electric Motor, 50 H.P. Model 5K1405AG20 Power source 480 volt power line Intake Size 5" I.P. Outlet Size 4" I.P.				System appears adequate to irrigate land owned.			2-0144-B
NE¼, NW¼ SEC 8 T39S R10E	Cheyne & Owens	Hdgt.	8"cmp	24'	0	T.O.P.	0'	A	2-0144-B	Inlet Control connects to larger pipe.	.4cfs
NW¼, NW¼ SEC 8 T39S R10E	do	Hdgt.	15"cmp	14'	0	.7'	0'	A	2-0144-B	Flow type B	4.9cfs
NE¼, NW¼ SEC 8 T39S R10E	do	Rain Flow centrifugal		General Electric Triclad Induction Motor, 50 h.p. Model 5K4364XAIY1 Power Source - power line Suction Lift 6' Size 4¼" I.P. Size 4" I.P.				Mainline 8" A.P. 6" A.P. 540' System appears adequate to irrigate land owned.			2-0144-B
SW¼, NW¼ SEC 8 T39S R10E	Zeller	Hdgt.	15"cmp	11'	.05' in 11'	.4'abv b.o.p.	0'	A	2-0144-B		0.6cfs
SW¼, NW¼ SEC 8 T39S R10E	do	Hdgt.		17'	.2' in 17'	.5'abv b.o.p.	0'	-	2-0144-B	Wooden box culvert 1.5' 1'	4.2cfs

PINE GROVE CANAL

Location	Owner	Hdgt.	Size	Length	Slope	Head Inlet	Head Outlet	Corrugation	Photo	Notes	Q
SW¼, NW¼ SEC 8 T39S R10E	do	Hdgt.	15"cmp	11'	.05' in 11'	.5'abv b.o.p.	T.O.P.	A	2-0144-B		0.8cfs
SW¼, NW¼ SEC 8 T39S R10E	Zeller	centrifugal		Westinghouse , 15 h.p. Model – Intake Size 4" I.P. Outlet Size 3¼" I.P.						2000' handline System appears to be adequate for irrigation of land owned.	2-0144-B
SW¼, NW¼ SEC 8 T39S R10E	do	Hdgt.	12"cmp	12'	0	.7'	0'	A	do	Flow Type B	3.2cfs
NW¼, SW¼ SEC 8 T39S R10E	Stiles	Pump, pipe & Power Co. centrifugal		U.S. Electric Motor, 7½ h.p. Model - none apparent Power source 240 Volt power line Intake Size 3½" I.P. Outlet Size 3" I.P.						System appears adequate to irrigate land owned.	2-0144-B
NW¼, SW¼ SEC 8 T39S R10E	Sherrill	Moore Rane centrifugal		Century Squirrel Cage Induction polyphase motor, 20 h.p. Model SC-284UCZ-FCA 9-018366-00 Power source 240 volt power line Intake Size 4" I.P. Outlet Size 3½" I.P.						System appears to be adequate to irrigate land owned.	2-0144-B
NE¼, SE¼ SEC 7 T39S R10E	Cain	Berkeley centrifugal		Marathon Pump, 40 h.p. Model FD-286TTDR7306-CBW-FI Intake Size 5" I.P. Outlet Size 4" I.P. Power source 480 volt power line						System appears to be adequate to irrigate land owned.	2-0144-B
NE¼, SE¼ SEC 7 T39S R10E	Cain	Hdgt.	10"cmp	13'	.6' in 13'	.7'	0'	A	2-0144-B	Flow Type B	2.8cfs
SE¼, SE¼ SEC 7 T39S R10E	do	do	12"cmp							Appears unused, inlet above high water marks. Land sprinkled.	-
do	do	do	12"cmp	12'	.4' in 12'	.3'abv. b.o.p.	0'	A	do		0.7cfs
do	do	do	12"cmp	14'	.3' in 14'	.9'abv b.o.p.	0'	A	do		3.0cfs

Location	Owner	Hdgt.	Size	Length	Slope	Head Inlet	Head Outlet	Corrugation	Photo	Notes	Q
SE¼ SE¼ SEC 7 39-10	do	do	18"cmp	20'	0	.5'	0'	A	do	Flow Type C or D	7.0cfs

LOCATION	OWNER	PUMP	MOTOR	Sprinkler Heads & Line, Lifts, etc.	Photo
T39S R10E	Cunningham	Cornell centrifugal	U.S. Electric Motor, 50 h.p. I.D.# 9400123-283 Power source 490 volt powr line Intake Size 6" I.P. Outlet Size 5" I.P.	System appears to be adequate to irrigate land owned.	2-0143-B

Northwest Lateral											
SW¼, NW¼ SEC 8 T39S R10E	Zeller	Hdgt.	10"cmp	17'	2.0' in 17'	T.O.P.	.2'	A	2-0144-B	Flow Type E	1.3cfs
SW¼, NW¼ SEC 8 T39S R10E	do	Hdgt.	15"cmp	12'	.5' in 12'	.3'	0	A	2-0144-B	Flow Type E	5.0cfs
SW¼, NW¼ SEC 8 T39S R10E	Lateral headgate	Hdgt.	18"cmp	20'	.1' in 20'	.4'	.4'	A	do	This headgate controls the flow in the remainder of this lateral. Flow Type A	2.7cfs
SE¼, SE¼ SEC 8 T39S R10E	Cunningham	Hdgt.	12"cmp	15'	.4' in 15'	.3'	nr T.O.P.	A	2-0143-B	Flow Type C or D	3.3cfs
SE¼, SE¼ SEC 8 T39S R10E	do	Hdgt.	8"cmp	16'	0	.2'	0	A	do	Flow Type C or D	0.8cfs
SE¼, SE¼ SEC 8 T39S R10E	Campbell	Berkely centrifugal		Century Electric, 50 h.p. Part # 9-323059-01 480 volt power line Intake Size 5" I.P. Outlet Size 5" I.P.				No pump presently at site. Mainline in place and buried. Pump being repaired System appears adequate to irrigate land owned.			2-0144-B
SW¼, SW¼ SEC 9 T39S R10E	Campbell	Hdgt.	12"cmp	3'	0	.5'abv b.o.p.	-	A	2-0144-B		0.2cfs
SW¼, SW¼ SEC 9 T39S R10E	Campbell	centrifugal		Uniclosed Motor, 40 h.p. no model indicated Power source - power line Inlet Size 5" I.P. Outlet Size 5" I.P.				System appears adequate to irrigate land owned.			2-0144-B

KBA_APP_000645

PINE GROVE CANAL

Location	Owner	Hdgt.	Size	Length	Slope	Head Inlet	Head Outlet	Corrugation	Photo	Notes	Q
W¼, SW¼ SEC 9 39S R10E	do	Hdgt.	10"cmp	12'	0	T.O.P.	covered w/dirt	A	2-0144-B		0.8cfs
SW¼, SW¼ SEC 9 T39S R10E	I. Campbell	centrifugal		Reliance Motor, 15 h.p. ID# 2Y287077A9 NC Power Source 240 volt power line Intake Size 2" I.P. Outlet Size 2" I.P.				System appears adequate to irrigate land owned.			2-0144-B
W¼, SW¼ SEC 9 39S R10E	Campbell	Hdgt.	8"cmp	14'	.4' in 14'	.6'	0	A	2-0144-B	Flow Type B	1.4cfs
E¼, SW¼ SEC 9 39S R10E	do	Hdgt.	10"I.P.	16'	.4' in 16'	.6'	0	smooth uncoated	do	Flow Type B	2.9cfs
NE¼, SW¼ SEC 9 T39S R10E	Peycore	centrifugal		Century Electric Motor, 20 h.p. Model SC-284-UC7-FC2-1A0 Power source 240 volt power line Intake Size 4¼"I.P. Outlet Size 2" I.P.				System appears adequate to irrigate land owned.			2-0144-B
SE¼, SW¼ SEC 9 T39S R10E	Campbell	centrifugal		Uniclosed Motor, 30 h.p. Model No. - none Power Source 240 volt power line Intake Size 4½" I.P. Outlet Size 3½" I.P.				System appears adequate to irrigate the land owned.			2-0144-B
E¼, NW¼ SEC 16 39S R10E	do	Hdgt.	12"cmp	14'	.05' in 14'	.7'abv b.o.p.	-	A	2-0144-B	Mannings Egn.	1.0cfs
E¼, NW¼ SEC 16 39S R10E	do	Hdgt.	10"cmp	6'	.02' in 6'	.1'blw T.O.P.	-	A	do	Mannings Egn.	0.7cfs
E¼, NW¼ SEC 16 39S R10E	East Lateral - Grimes	Hdgt.	18"cmp	19'	.3' in 19'	.4'	T.O.P.	A	do	Headgate for Eastern lateral of Pine Grove Canal, Flow Type C or D	8.0cfs
NW¼, NW¼ SEC 16 T39S R10E	Cunningham	Pacific centrifugal		Century Electric Motor, 40 h.p. Part. No. 6 323053-01 Power source 480 volt power line Intake Size 5" I.P. Outlet Size 4" I.P.				System appears adequate to irrigate land owned.			2-0143-B

6-207-

STATE OF OREGON

OFFICE OF STATE ENGINEER

Water Resources Department

Year .....

File No. .....

Discharge measurements of "B" Canal, Klamath Irrigation District

....., *during the year ending September 30, 19*.....

No.	Date	Made by	Width Feet	Area Sq. ft.	Mean Velocity Ft./Sec.	Gage Height Feet	Discharge C.F.S.	Computed Rating Q Corr.	Computed Rating % diff	Method	Meas. Sect. No.	G. Ht. Chgd. Ft.	Time Min.	Temperature Wtr.	Temperature Air	REMARKS
	10/7/80	Esget & McBain					111	128	15%							See note on computation in folder
	9/11/85	KNAUER WETZEL STUNTEBECK					91.6	84	8%							

* Geological Survey Engineer

'B' CANAL

Klamath Irrigation District

Headwork Location: SE¼ NE¼, Section 19, T39S R10E (Southwell check).

Gages: none.

Headgates: Four rectangular weirs with U-bar to hold 2"x4" or 2"x6" boards to control water surface and flow. Widths right to left are 4', 4', 4.1' and 3.9'. (4' is good for computation purposes on each).

Measuring Section: Bridge where 'B' Canal crosses Reeder Road between Sections 17 and 20, T39S R10E. There is two headgates between Southwell Check and this bridge, and any flow should be added to the measurement. Use Canfield Reel, 30 lb. weight and standard meter.

Quantity Computation: Heads at each weir lip is measured with special gage and the weir chart used to obtain the sum flow for all weirs together.

Weir Chart Accuracy: Appears poor at best. More frequent monitoring of this canal is recommended as compared with other more accurately rated canals.

Jim Esget
Field Engineer

D Canal at Southwell

CHART FOR RECTANGULAR WIERS

FOR SPILLS AND CHECKS WITH STOP LOGS FOR WIER CREST.

MEASURE HEAD AT WIER LIP

DEPTH OF WATER OVER WIER CREST	WIDTH OF WIER CREST IN FEET 3' (1)	4' (2)	5' (3)	6' (4)	7' (5)	8' (6)
ZERO to 0.1	½	½	½	½	½	1
0.1	1	1	1	2	2	2
0.2	2	2	3	3	4	4
0.3	3	3	4	5	6	7
0.4	4	5	6	7	8	9
0.5	5	6	8	9	11	12
0.6	6	8	10	12	14	15
0.7	7	9	12	14	17	19
0.8	8	11	14	17	20	23
0.9	10	13	17	20	23	26
1.0	11	15	19	23	27	30
1.1	13	17	22	26	30	35
1.2	15	20	24	29	34	39
1.3	16	22	27	33	38	44
1.4	18	24	30	36	42	48
1.5	20	27	33	40	47	53
1.6	22	29	37	44	51	59
1.7	24	32	40	48	56	64
1.8	26	35	43	52	60	69
1.9	28	37	47	56	65	75
2.0	30	40	50	60	70	80
2.1	32	43	54	65	75	86
2.2	35	46	58	69	81	92
2.3	37	49	61	74	86	98
2.4	39	52	65	78	91	104
2.5	42	55	69	83	97	111
2.6	44	59	73	88	102	117
2.7	46	62	77	93	108	124
2.8	49	65	81	98	114	130
2.9	51	69	86	103	120	137
3.0	54	72	90	108	126	144
3.1	57	76	94	113	132	151
3.2	59	79	99	119	138	158
3.3	62	83	103	124	145	166
3.4	65	86	108	130	151	173
3.5	68	90	113	135	158	180

9-275-F
11-75

STATE OF OREGON
WATER RESOURCES DEPARTMENT

DISCHARGE MEASUREMENT NOTES

File No. .....
Meas. No. .....
Comp. by JW
Checked by SFM

Stream B. CANAL, K.I.D., USBR

Date 9/11, 1985 Party KNAUER, WETZEL, STUNTEBECK

Width 36.0 Area 119 Vel. .770 G. H. ..... Disch. 91.6

Method 8/.2 No. secs. 28 G. H. change 0 in 75 min.

Method coef. 1 Hor. angle coef. .99 Susp. coef. 1 Meter No. S-68

Date rated 4-11-69

Spin before meas. ..... after .....

Wading, cable, ice, boat, upstr., downstr., side bridge 5 feet, mile, above, below gage and .....

Tags checked .....

Meter suspended from ~~rod, or~~ TYPE A REEL

0.5 ft. above bottom 30 lb. C weight.

Levels obtained .....

GAGE READINGS				
Time		Recorder	Inside	Outside
8:50	Start			
1005	Finish			
Weighted M. G. H.				
G. H. correction				
Correct M. G. H.				

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

Flow UNIFORM Weather CLOUDY - COOL

Other ..... Air .....°F@ .....

Gage ..... Water .....°F@ .....

..... Record removed ..... Intake flushed U .....

Observer .....

Control .....

Remarks WIER CHART GIVES 84 CFS

G. H. of zero flow ..... ft.

GATE #1 - 1.4 (LEW) Q = 24.
#2 - 1.9 Q = 37.
#3 - 0.5 Q = 6.
#4 - 1.1 (R.E.W.) Q = 17
ΣQ = 84.

.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 0.99	Area	Discharge
	0	2.5	0		Rew					∅	∅
	5	3.5	2.1	.6	1	45	.074	.074	.073	7.35	.567
	7	1.5	2.6	.6	15	45	.758	[illegible]	.750	3.90	2.93
	8	1.	3.1	.2	15	50	.684	.713	.706	3.1	2.19
				.8	15	46	.742				
	9	1.	3.6	.2	15	43	.792	.775	.767	3.6	2.76
				.8	15	45	.758				
	10	1.	4.0		20	50	.904	.782	.774	4.0	3.10
					15	52	.659				
	11	1.	3.8		20	49	.922	.881	.872	3.8	3.31
					20	54	.839				
	12	1.	4.1		20	48	.941	.895	.886	4.1	3.63
					15	40	.849				
	13	1.	4.4		20	48	.941	.895	.886	4.4	3.90
⊙					15	40	.849				
	14	1.	4.2		20	47	.960	.951	.941	4.2	3.95
					20	48	.941				
	15	1.	4.4		20	46	.980	.886	.877	4.4	3.86
					15	43	.792				
	16	1.	4.5		20	45	1.00	.896	.887	4.5	3.99
					15	43	.792				
	17	1.	4.6		20	50	.904	.857	.848	4.6	3.90
					20	56	.810				
	18	1.	4.7		20	43	1.05	.921	.912	4.7	4.29
					15	43	.792				
	19	1.	4.6		20	47	.960	.844	.835	4.6	3.84
					15	47	.727				
	20	1.	4.6		20	48	.941	.858	.849	4.6	3.91
					15	44	.774				

.80 .85 .90 .92 .94 .96 .97 .98 .99 1.00 .99 .98 .97 .96 .94 .92 .90 .85

.0 .10 .20 .30 .40 .50 .60 .70 .75 .80

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
	21	1.	4^{4}		20	49	.922	.848	.840	4.4	3.70
					15	44	.774				
	22	1.	4^{4}		20	49	.922	.803	.795	4.4	3.50
					15	50	.684				
	23	1.	4^{5}		20	49	.922	.817	.809	4.5	3.64
					15	48	.712				
	24	1.	4^{5}		20	46	.980	.826	.818	4.5	3.68
					15	51	.672				
	25	1.	4^{5}		20	49	.922	.810	.802	4.5	3.61
					15	49	.698				
	26	1.	4^{6}		20	52	.870	.646	.639	4.6	2.94
					15	46	.742				
	27	1.	4^{4}		20	50	.904	.839	.831	4.4	3.66
⊙					15	44	.774				
	28	1.	4^{3}		20	50	.904	.839	.831	4.3	3.57
					15	44	.774				
	29	1.	4^{1}		20	52	.870	.831	.823	4.1	3.37
					15	43	.792				
	30	1.5	3^{7}	.2	15	41	.829	.757	.749	5.55	4.16
				.8	15	50	.684				85.957
	32	3.0	2^{7}	.6	15	49	.698	.698	.691	8.1	5.60
	36	2.0	0		LEW					ϕ	ϕ
	36.0	36.0								119.2	91.6

9-275-F
11-75

STATE OF OREGON
WATER RESOURCES DEPARTMENT

DISCHARGE MEASUREMENT NOTES

File No. .....
Meas. No. .....
Comp. by DEK
Checked by DLW

Stream B-CANAL KLAMATH PROJECT USBR KID
Date AUG 23, 1983 Party KNAUER - WESTON
Width 38 Area 125 Vel. 1.25 G. H. — Disch. 156
Method 2/8 No. secs. 18 G. H. change — in — min.
Method coef. 1 Hor. angle coef. 0.96 Susp. coef. 1 Meter No. E-1

Date rated .....
Spin before meas. ..... after .....
Wading, cable, ice, boat, upstr., downstr., side bridge 1/4 feet, mile, above, below gage and .....

Tags checked .....
Meter suspended ~~from rod, or~~ A - REEL
1/2 ft. above bottom 30 lb. ..... weight.
Levels obtained .....

GAGE READINGS				
Time		Recorder	Inside	Outside
1050		READ WEIRS		
	Start			
	Finish			
Weighted M. G. H.				
G. H. correction				
Correct M. G. H.				

Measurement rated excellent (2%), good (5%), fair (8%), poor (over 8%), based on following conditions: Cross section DIRT & SAND
Flow UNIFORM Weather CLOUDY
Other ..... Air 60 °F@ 1140
Gage WEIRS Water ..... °F@ .....
..... Record removed — Intake flushed U .....
Observer —

Control CHANNEL CLEAR

Remarks H_1 - 1 45 Q = 25 5
H_2 - 0 6 Q = 8 165 5
H_3 - 2 3 Q = 49
H_4 - 3 3 Q = 83
G. H. of zero flow ..... ft.

SE 1/4 NE 1/4 SEC 19 T39S R10E

.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	
	0	2.0	LEW	11:10 AM						—	—	
	4	3.0	2.1	.6			1.1			6.3	6.93	.85
	6	2.0	3.2	.6			1.3			6.4	8.32	
												.90
	8		3.9	.2			1.45	1.33		7.8	10.37	.92
				.8			1.2					.94
	10		4.5	.2			1.4	1.38		9.0	12.42	
				.8			1.35					.96
	12		4.6	.2			1.5	1.43		9.2	13.16	.97
				.8			1.35					.98
	14		4.6	.2			1.55	1.43		9.2	13.16	.99
				.8			1.3					
	16		4.6	.2			1.5	1.38		9.2	12.70	
⊙				.8			1.25					1.00
	18		4.6	.2			1.6	1.45		9.2	13.34	
				.8			1.3					
	20		4.7	.2			1.55	1.48		9.4	13.91	.99
				.8			1.4					.98
	22		4.5	.2			1.6	1.53		9.0	13.77	.97
				.8			1.45					.96
	24		4.7	.2			1.6	1.55		9.4	14.57	
				.8			1.5					.94
	26		4.3	.2			1.55	1.45		8.6	12.47	.92
				.8			1.35					.90
	28		3.5	.2			1.4	1.3		7.0	9.10	
				.8			1.2					
	30		3.0	.2			1.2	1.1		6.0	6.60	.85
				.8			1.0					

.0 .10 .20 .30 .40 .50 .60 .70 .75 .80

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
	32	2.0	2.3	.6			0.4			4.6	1.84
	34	3.0	1.5	.6			0.15			4.5	0.68
	38	2.0	REW		11:35 A.M					—	—
	38	38								124.8	163.34

163 X 0.96 = 156

Appendix D- Canal Measurements

9-275-F
11-75

STATE OF OREGON
WATER RESOURCES DEPARTMENT

DISCHARGE MEASUREMENT NOTES

File No. .....
Meas. No. .....
Comp. by NZR
Checked by PJM

Stream B Canal KID
Date 6-12, 1981 Party DWS
Width 35° Area 142 Vel. 1.00 G. H. ..... Disch. 146
Method ..... No. secs. 19 G. H. change ..... in ..... min.
Method coef. ..... Hor. angle coef. ..... Susp. coef. ..... Meter No. S-68
Date rated 4-11-69

GAGE READINGS				
Time		Recorder	Inside	Outside
900				2.84
915	Start			~~2.84~~
1010	Finish			
1020				2.84
Weighted M. G. H.				
G. H. correction				
Correct M. G. H.				

Spin before meas. ..... after .....
Wading, cable, ice, boat, upstr., downstr., side bridge 3/4 feet, mile, above, below gage and .....

Tags checked .....
Meter suspended from rod, or .....
.5 ft. above bottom 30 lb. ..... weight.
Levels obtained .....

Measurement rated excellent (2%), good (5%), fair (8%), poor (over 8%), based on following conditions: Cross section mud
Flow uniform Weather cold windy
Other ..... Air ..... °F@ .....
Gage ..... Water ..... °F@ .....
..... Record removed ..... Intake flushed U L .....
Observer .....
Control see inside 2nd sheet
Remarks Add 4.5 cfs for 2 Partly opened headgates

G. H. of zero flow ..... ft.

.0 .10 .20 .30 .40 .50 .60 .70 .75 .80

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	
	-1	.5	REW @		09	15						
	0	1.5	1.5		5	53	.233	.233		2.25	.524	.85
	2	2.0	2.3		7	43	.383	.383		4.60	1.76	
	4	2.0	3.0		20	41	1.10	.960		6.00	5.76	
					15	42	.810					.90
	6	2.0	3.8		20	38	1.15	1.04		7.60	7.90	.92
					20	48	.941					.94
	8	2.0	4.6		25	40	1.40	1.25		9.20	11.5	
					20	41	1.10					.96
	10	2.0	5.0		25	39	1.43	1.26		10.0	12.6	.97
					20	41	1.10					.98
	12	2.0	5.3		30	49	1.37	1.30		10.6	13.8	.99
					25	46	1.22					
	14	2.0	5.3		25	43	1.30	1.15		10.6	12.2	
⊙					20	45	1.00					1.00
	16	2.0	5.4		25	40	1.40	1.19		10.8	12.8	
					20	46	.980					
	18	2.0	5.2		25	45	1.25	1.06		10.4	11.0	.99
					15	39	.870					.98
	20	2.0	51		25	43	1.30	1.09		10.2	11.1	.97
					20	51	.887					.96
	22	2.0	5.3		25	42	1.33	~~1.10~~ 1.09		10.6	11.6 ok	
					15	40	.849					.94
	24	2.0	5.2		25	42	1.33	1.16		10.4	12.1	.92
					20	45	1.00					.90
	26	2.0	5.0		25	45	1.25	1.05		10.0	10.50	
					15	40	.849					
	28	2.0	4.2		20	43	1.05	.812		8.40	6.82	.85
					10	40	.575					

.0 .10 .20 .30 .40 .50 .60 .70 .75 .80

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
	30	2.0	3.2		20	51	.887	.712		6.40	4.56
					10	43	.536				
	32	2.0	2.1	.6	10	52	.448	.448		4.20	1.88
					~~10~~						
	34	1.0	LEW @		1010						
										142 25	141 584
	35°	35°									
								(open Headgates) +			4.5
											146
⊙											

Head works from Left side

1.	1.2'		
2.	3.6	No Boards	
3.	.05		
4	2.85		

Staff Gage 2.84

Crop [illegible] computed flow compared to measured quantity 15%. See note on computation in folder

9-275-G
11-75

STATE OF OREGON
WATER RESOURCES DEPARTMENT

File No. ____
Meas. No. ____
Comp. by JAE
Checked by NZR

DISCHARGE MEASUREMENT NOTES

Stream B CANAL

Date 10-7, 1980 Party ESGET HCBAIN

Width 36.5 Area 120.1 Vel. .924 G. H. — Disch. 111

Method .2/.8 No. secs. 20 G. H. change — in — min.

Method coef. 1.0 Hor. angle coef. .96 Susp. coef. 1.0 Meter No. STAND.

Date rated 4-11-69

Spin before meas. ✓ after ok

Wading, cable, ice, boat, upstr., downstr., side bridge ____ feet, mile, above, below gage and ____

Tags checked ____

Meter suspended from rod, or cable

.5 ft. above bottom 30 lb. ____ weight.

Levels obtained ____

GAGE READINGS				
Time		Recorder	Inside	Outside
1250				
	Start	See below		
1400	Finish	no change		
Weighted M. G. H.				
G. H. correction				
Correct M. G. H.				

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

Flow Uniform Weather Sunny Warm

Other ____ Air ____ °F@ ____

Gage None Water ____ °F@ ____

Record removed ____ Intake flushed U L

Observer ____

Control ____

Remarks Note flow thru open wier, heads obtained at drop. Widths also. Accuracy poor thru this control. (perhaps 20%). KID has use of whiskey stick which may improve their accuracy.

G. H. of zero flow ____ ft.

$H_1 = 2.6$ $Q_1 = 59.0$ $w_1 = 4'$
$H_2 = 0.1$ $Q_2 = 1.0$ $w_2 = 4'$
$H_3 = 2.5$ $Q_3 = 60.4$ $w_3 = 4.1'$
$H_4 = 0.60$ $Q_4 = 7.8$ $w_4 = 3.9'$

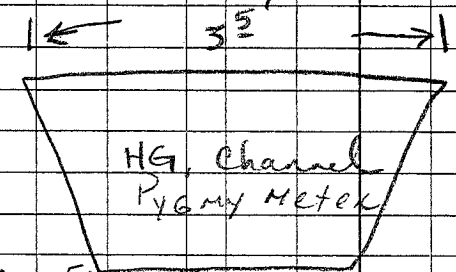
$Q = 128.2$

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
	0^{5}	1^{25}	REW					0	0	0	0
	3^{0}	2^{25}	0^{95}	.6	0	0				2.14	0
	5^{0}	2^{00}	1^{7}	.6	5	58		.215		3.40	.73
	7^{0}	2^{00}	2^{2}	.6	15	45		.758		4.40	3.34
	9^{0}	1^{75}	2^{9}	.2	20	50	.904	.876		5.08	4.45
				.8	15	40	.849				
	10^{5}	1^{75}	3^{5}		20	44	1.02	.990		6.12	6.06
					20	47	.960				
	12^{5}	1^{75}	4^{3}		20	42	1.07	1.07		7.52	8.05
					20	42	1.07				
	14^{0}	1^{75}	4^{5}		20	40	1.12	1.08		7.88	8.51
					20	43	1.05				
	16^{0}	1^{75}	4^{7}		25	47	1.19	1.10		8.22	9.04
					20	44	1.02				
⊙	17^{5}	1^{75}	4^{7}		25	49	1.15	1.03		8.22	8.47
					20	50	.904				
	19^{5}	1^{75}	4^{6}		20	41	1.10	1.03		8.05	8.29
					20	47	.960				
	21^{0}	1^{75}	4^{5}		25	48	1.17	1.10		7.88	8.67
					20	44	1.02				
	23^{0}	1^{75}	4^{4}		20	40	1.12	1.07		7.70	8.24
					20	44	1.02				
	24^{5}	1^{75}	4^{6}		20	40	1.12	1.05		8.05	8.45
					20	46	.980				
	26^{5}	1^{75}	4^{6}		20	42	1.07	1.02		8.05	8.21
					20	46	.980				
	28^{0}	1^{75}	4^{6}		20	46	.980	.960		8.05	7.73
					20	48	.941				
	↓				↓	↓					

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
	30^{0}	1^{75}	4^{0}		20	50	.904	.876		7.00	6.13
					15	40	.849				
	31^{5}	1^{75}	3^{45}	.2	15	39	.868	.821		6.04	4.96
				.8	15	44	.774				
	33^{5}	2^{75}	2^{3}	.6	15	43	.792	.792		6.32	5.01
	37^{0}	1^{75}	LEW							0	0
	36^{50}	36^{50}								120.12	114.34

Q = 114.34 X .96 = 109.80



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
	0	.50	0							0	0
	1^{0}	1.00	0^{35}		60	43		1^{39}		.350	.49
	2^{0}	.75	0^{4}		80	45		1^{76}		.300	.53
	2^{5}	.75	0^{3}		30	43		.718		.225	.16
	3^{5}	.50	0							0	0
	3^{5}	3^{5}									
											1.2

109.8 + 1.2 = 111

C CANAL

SMEAD®
No. 153L
UPC 10330

"C" Flume Head

	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
4.0	100	101	101	102	102	103	104	104	105	105
.1	106	107	107	108	108	109	110	110	111	111
.2	112	113	113	114	115	116	116	117	118	118
.3	119	120	120	121	121	122	123	123	124	124
.4	125	126	126	127	127	128	129	129	130	130
.5	131	132	132	133	134	135	135	136	137	137
.6	138	139	139	140	141	142	142	143	144	144
.7	145	146	146	147	147	148	149	149	150	150
.8	151	152	152	153	154	155	155	156	157	157
.9	158	159	159	160	161	162	162	163	164	164
5.0	165	166	167	167	168	169	170	171	171	172
.1	173	174	174	175	176	177	177	178	179	179
.2	180	181	182	182	183	184	185	186	186	187
.3	188	188	189	190	191	192	192	193	194	194
.4	195	196	197	197	198	199	200	201	201	202
.5	203	204	205	205	206	207	208	208	209	210
.6	211	212	213	213	214	215	216	217	217	218
.7	219	220	221	221	222	223	224	225	225	226
.8	227	228	229	229	230	231	232	233	233	234
.9	235	236	237	237	238	239	240	240	241	242
6.0	243	244	245	246	247	248	248	249	250	251
.1	252	253	254	254	255	256	257	258	258	259
.2	260	261	262	263	264	265	265	266	267	268
.3	269	270	271	271	272	273	274	275	275	276
.4	277	278	279	280	281	282	282	283	284	285
.5	286	287	288	289	290	291	291	292	293	294
.6	295	296	297	298	299	300	300	301	302	303
.7	304	305	306	306	307	308	309	310	310	311
.8	312	313	314	315	316	317	317	318	319	320
.9	321	322	323	324	325	326	326	327	328	329
7.0	330	331	332	333	334	334	335	336	337	338
.1	339	340	341	342	343	343	344	345	346	347
.2	348	349	350	[illegible]	[illegible]	352	353	354	355	[illegible]

"C" Canal Table for below 4.0' level

	0	01	02	03	04	05	06	07	08	09
1.0										
.1										
.2										
.3										
.4 4.5										
.6	3	3	4	4	4	4	5	5	5	6
.7	6	6	6	7	7	7	7	7	8	8
.8	8	8	9	9	9	9	10	10	10	11
.9	11	11	12	12	12	12	13	13	13	14
2.0	14	14	15	15	15	15	16	16	16	17
.1	17	17	18	18	19	19	20	20	21	21
.2	22	22	23	23	23	23	24	24	24	25
.3	25	25	26	26	27	27	27	28	28	29
.4	29	29	29	30	30	30	30	30	31	31
.5	31	31	32	32	33	33	33	34	34	35
.6	35	35	36	36	37	37	37	38	38	39
.7	39	39	40	40	41	41	41	42	42	43
.8	43	43	44	44	45	45	45	46	46	47
.9	47	47	48	48	49	49	49	50	50	51
3.0	51	51	52	52	53	53	53	54	54	55
.1	55	55	56	56	57	57	58	58	59	59
.2	60	60	61	61	62	62	62	63	63	64
.3	64	64	65	65	66	66	67	67	68	68
.4	69	69	70	70	71	71	71	72	72	73
.5	73	73	74	74	75	75	76	76	77	77
.6	78	79	79	80	80	81	82	82	83	83
.7	84	84	85	85	86	86	87	87	88	88
.8	89	90	90	91	91	92	93	93	94	94
.9	95	95	96	96	97	97	98	98	99	99
4.0	100	101	101	102	102	103	104	104	105	105
.1										
.2										
.3										
.4										
.5										

9-207-

STATE OF OREGON

OFFICE OF STATE ENGINEER

Water Resources Department

Year .....

File No. .....

Discharge measurements of "C" Canal, Klamath Irrigation District

....., *during the year ending September 30, 19*.....

No.	Date	Made by	Width Feet	Area Sq. ft.	Mean Velocity Ft./Sec.	Gage Height Feet	Discharge C.F.S.	Rating Corr.	Rating % diff	Method	Meas. Sec. No.	G. El. Chgs. Ft.	Time Min.	Temperature Wtr.	Temperature Air	REMARKS
	10/2/80	Esget & McKain					219	250	14%							See rating note in folder.
	9/9/85	KNAUER WETZEL STUNTEBECK					149	192	22%							

* Geological Survey Engineer

'C' CANAL

Klamath Irrigation District

Location of Gage: SE¼ NW¼, Section 30, T39S R10E on left bank 'C' Canal above flume.

Gages: Stilling well with continuous chart recorder. Also inside stick measures to top of well at orange spot. (Bottom of stick is 2.00 feet). Also stilling well in head of flume with staff plate.

Measuring Point: Wooden walkway just upstream of flume entrance. Use Canfield Reel, 30 lb. weight and standard meter.

Ratings: There are separate ratings for flows below 4.0' when the radial gate is in use, and flows above 4.0' when the flume acts as control (Radial gate open). The flume rating is based on the chart recorder gage and the radial gate rating (below 4.0') is based on the staff inside the flume. Both are ratings based on measurements.

*Note: According to Malcom Crawford (President of K.I.D.), the lining of the flume has been eroded out in the last few years, increasing the roughness of the flume, resulting in lower flows (than rated) at any given head. He thought that the difference could be as great as 20% short. He plans to reline the flume this year (1980-81) to restore the accuracy of the ratings.

Recommend more frequent monitoring of this canal until accuracy of ratings is restored.

Jim Esget
Field Engineer

9-275-F
11-75

STATE OF OREGON
WATER RESOURCES DEPARTMENT

DISCHARGE MEASUREMENT NOTES

File No. .....
Meas. No. .....
Comp. by JW
Checked by SPM

Stream C-CANAL, KID., KLAMATH PROJECT
Date 9-9-85, 19.... Party KNAUER, WETZEL, SCHANTEBECK
Width 14.7 Area ~~55.5~~ 61.1 Vel. ~~2.66~~ 2.44 G. H. ..... Disch. ~~142.~~ 149.
Method 2/8 No. secs. 14 G. H. change 0 in 40 min.
Method coef. 1 Hor. angle coef. 1 Susp. coef. 1 Meter No. GURLEY TT 2258

Date rated .....
Spin before meas. ..... after .....
Wading, cable, ice, boat, upstr., downstr., side bridge 250 feet, mile, above, below gage and .....

GAGE READINGS STICK				
Time		Recorder	~~Inside~~	~~Outside~~
11:20		5.36		5.36±
	Start			
12:00	Finish	5.36		5.35±
Weighted M. G. H.				
G. H. correction				
Correct M. G. H.				

Tags checked .....
Meter suspended ~~from rod,~~ or TYPE A REEL
.5 ft. above bottom 30 lb. C weight.
Levels obtained .....

Measurement rated excellent (2%), good (5%), fair (8%), poor (over 8%), based on following conditions: Cross section CONCRETE CANAL
Flow VERY UNIFORM Weather OVERCAST
Other ..... Air .....°F@.....
Gage OK Water .....°F@.....
..... Record removed ..... Intake flushed U L .....
Observer .....

Control FLUME CONTROL - RADIAL GATE OPEN

Remarks R

G. H. of zero flow ..... ft.

Q FROM CHART = 192 cfs

.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	
	16.5	0.5	4.2		L.E.W.		EST. 1.3			2.1	~~2~~ 2.73	
	15.5	1.0	4.2	.2			2.7	2.55		4.2	10.7	.85
				.8			2.4					
	14.5	1.0	4.2	.2			2.6	2.55 ~~2.50~~		4.2	10.7 ~~10.5~~	
				.8			2.5					.90
	13.5	1.0	4.2	.2			2.6	2.50		4.2	10.5	.92
				.8			2.4					.94
	12.5	1.0	4.2	.2			2.6	2.50		4.2	10.5	
				.8			2.4					.96
	11.5	1.0	4.2	.2			2.6	2.50		4.2	10.5	.97
				.8			2.4					.98
	10.5	1.0	4.2	.2			2.5	2.45		4.2	10.3	.99
				.8			2.4					
	9.5	1.0	4.2	.2			2.5	2.45		4.2	10.3	
⊙				.8			2.4					1.00
	8.5	1.0	4.2	.2			2.6	2.45		4.2	10.3	
				.8			2.3					
	7.5	1.0	4.1	.2			2.7	2.6		4.1	10.7	.99
				.8			2.5					.98
	6.5	1.0	4.1	.2			2.7	2.7		4.1	11.1	.97
				.8			2.7					.96
	5.5	1.0	4.1	.2			2.7	2.7		4.1	11.1	
				.8			2.7					.94
	4.5	1.0	4.1	.2			2.7	2.65		4.1	10.9	.92
				.8			2.6					.90
	3.5	1.35	4.1	.2			2.7	2.6		5.54	14.4	
				.8			2.5					
	1.8	0.85	4.1		R.E.W.		EST 1.3			3.49	~~3~~ 4.54	.85
	14.7	14.7								~~55.5~~ 61.1	~~142.~~ ~~146.07~~ 149.27	

.0 .10 .20 .30 .40 .50 .60 .70 .75 .80

.0 .10 .20 .30 .40 .50 .60 .70 .80

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	
												.85
	1.8			REW								
												.90
												.92
												.94
												.96
												.97
												.98
												.99
⊙												1.00
												.99
												.98
												.97
												.96
												.94
												.92
												.90
												.85
												.80

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

9-275-F
11-75

STATE OF OREGON
WATER RESOURCES DEPARTMENT

DISCHARGE MEASUREMENT NOTES

File No. .....
Meas. No. .....
Comp. by DEK
Checked by DLW

Stream C-CANAL, KLAMATH PROJECT, USBR, KID.
Date AUG 23 1983 Party KNAUER WESTON
Width 14.8 Area 52.8 Vel. 2.54 G. H. 4.83 Disch. 134
Method 2/.8 No. secs. 16 G. H. change +01 in 40 min.
Method coef. 1 Hor. angle coef. 1 Susp. coef. 1 Meter No. E-1

Date rated .....
Spin before meas. ..... after .....
Wading, cable, ice, boat, upstr., downstr., side bridge 200 feet, mile, above, below gage and .....

GAGE READINGS				
Time		Recorder	Inside	Outside
2:30		4.82	4.82	
	Start			
	Finish			
3:10		4.83	4.83	
Weighted M. G. H.				
G. H. correction				
Correct M. G. H.				

Tags checked .....
Meter suspended ~~from rod,~~ or A-REEL
12 ft. above bottom 10 lb. ..... weight.
Levels obtained .....

Measurement rated excellent (2%), good (5%), fair (8%), poor (over 8%), based on following conditions: Cross section CONCRETE
Flow UNIFORM Weather CLOUDY
Other ..... Air .....°F@ .....
Gage OK Water .....°F@ .....
..... Record removed ..... Intake flushed U/L .....
Observer .....
Control CLEAR
Remarks
SE¼ NW¼ SEC 30 T39S R10E
G. H. of zero flow ..... ft.

RATED Q = 153

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
	0.7	0.4	L.E.W. 2:35 P.M.							—	—
	1.5	0.9	3.0	.2			2.75	2.75		2.7	7.43
				.8			2.75				
	2.5	1.0	3.7	.2			2.65	2.63		3.7	9.73
				.8			2.6			~~3~~	
	3.5		3.7	.2			2.85	2.83		3.7	10.47
				.8			2.8				
	4.5		3.7	.2			3.0	2.9		3.7	10.73
				.8			2.8				
	5.5		3.7	.2			3.0	2.88		3.7	10.66
				.8			2.75				
	6.5		3.7	.2			2.9	2.78		3.7	10.29
				.8			2.65				
	7.5		3.7	.2			2.85	2.78		3.7	10.29
⊙				.8			2.7				
	8.5		3.7	.2			2.65	2.60		3.7	9.62
				.8			2.55				
	9.5		3.7	.2			2.75	2.63		3.7	9.73
				.8			2.5				
	10.5		3.7	.2			2.6	2.6		3.7	9.62
				.8			2.6				
	11.5		3.7	.2			2.65	2.63		3.7	9.73
				.8			2.6				
	12.5		3.7	.2			2.7	2.7		3.7	9.99
				.8			2.7				
	13.5		3.5	.2			2.7	2.63		3.5	9.21
				.8			2.55				
	14.5	1.0	2.4	.6			2.6			2.4	6.24
	15.5	0.5	R.E.W. 3:00 P.M.							—	—

14.8 14.8

5.6 133.74

47.=

9-275-F
11-75

STATE OF OREGON
WATER RESOURCES DEPARTMENT

DISCHARGE MEASUREMENT NOTES

F... No. .....
Meas. No. .....
Comp. by DWS
Checked by N2K

Stream C-Canal
Date 6-16, 1981 Party DWS
Width 15' Area 67' Vel. 3.42 G. H. ..... Disch. 229 cfs
Method ..... No. secs..... G. H. change ..... in ..... min.
Method coef. ..... Hor. angle coef. ..... Susp. coef. ..... Meter No. S-68

Date rated .....
Spin before meas. ✓ after ✓
Wading, cable, ice, boat, (upstr.), downstr., (side bridge) 150 (feet) mile, above, (below gage) and .....

GAGE READINGS				
Time		Recorder	Inside	Outside
1100				
1115	Start		6.08	
1150	Finish		6.08	
Weighted M. G. H.				
G. H. correction				
Correct M. G. H.				

Tags checked .....
Meter suspended from rod, or .....
.5 ft. above bottom 30 lb. ..... weight.
Levels obtained .....

Measurement rated excellent (2%), good (5%), fair (8%), poor (over 8%), based on following conditions: Cross section Cement
Flow uniform Weather cool windy
Other ..... Air .....°F@ .....
Gage ..... Water .....°F@ .....
..... Record removed ..... Intake flushed U/L .....
Observer .....

Control Concret flume

Remarks .....

G. H. of zero flow ..... ft.

RATED Q = 250 cfs

.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	
	0	.5	RF w @			1114						.80
	1	1.	4.7		80	51	3.47	3.00		4.7	14.1	.85
	8				50	44	2.52					
	2	1	4.8		80	51	3.47	3.44		4.8	16.5	
					80	52	3.40					.90
	3	1	4.8		80	51	3.47	3.44		4.8	16.5	.92
					80	52	3.40					.94
	4	1	4.8		60	40	3.32	3.32		4.8	15.9	
					60	40	3.32					.96
	5	1	4.8		60	40	3.32	3.28		4.8	15.7	.97
					60	41	3.24					.98
	6	1	4.8		60	39	3.40	3.28		4.8	15.7	.99
					60	42	3.16					
	7	1	4.8		60	39	3.40	3.36		4.8	16.1	
⊙					60	40	3.32					1.00
	8	1	4.8		60	39	3.40	3.36		4.8	16.1	
					60	40	3.32					
	9	1	4.8		80	50	3.54	3.50		4.8	16.8	.99
					80	51	3.47					.98
	10	1	4.8		80	49	3.61	3.54		4.8	17.0	.97
					80	51	3.47					.96
	11	1	4.8		80	49	3.61	3.54		4.8	17.0	
					80	51	3.47					.94
	12	1	4.8		80	48	3.68	3.61		4.8	17.3	.92
					80	50	3.54					.90
	13	1	4.8		80	48	3.68	3.61		4.8	17.3	
					80	50	3.54					
	14	1	4.8		80	48	3.68	3.58		4.8	17.2	.85
					80	51	3.47					

.0 .10 .20 .30 .40 .50 .60 .70 .75 .80

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
	15	.5	L Few		@	1150				—	
										67'	229.2
	15	15									

Appendix D- Canal Measurements

17% error of rated quantity from measured quantity
See rating notes in folder

9-275-F
4-58

STATE OF OREGON
OFFICE OF STATE ENGINEER
Water Resources Department

No. .....
Meas. No. .....
Comp. by JAE
Checked by NZR

DISCHARGE MEASUREMENT NOTES

Stream "C" Canal KID

Date 10-2, 19 80 Party Esget M. McBain (N)

Width 15 Area 68.7 Vel. 3.19 G. H. 6.08 Disch. 219

Method 2/8 No. secs. 21 G. H. change ..... in ..... min.

Method coef. 1.0 Hor. angle coef. 1.0 Susp. coef. 1.0 Meter No. S-68

Date rated 4-11-69

Spin before meas. ✓ after ✓

Wading, cable, ice, boat, walkway with upstr., downstr., side bridge ..... feet, mile, above, below gage and .....

Tags checked .....

Meter suspended from rod, or .....

..... ft. above bottom ..... lb. ..... weight.

Levels obtained .....

GAGE READINGS				
Time		Recorder	Inside	Outside
1140	Start		6.09	6.09
1245	Finish		6.08	6.08
Weighted M. G. H.				
G. H. correction				
Correct M. G. H.				

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

Flow regular Weather Clear, warm

Other ..... Air ..... °F@ .....

Gage Stilling well + recorder - OK Water ..... °F@ .....

..... Record removed — Intake flushed U/L —

Observer None

Control Concrete flume

Remarks — Note rating off, according to Malcom Crawford, because of wearing of flume coating. Repairs due this winter.

G. H. of zero flow — ft.

Rated Q = 250 cfs

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

River at—

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
17.5	.50	LEW		0	0				0	0
16.5	.75	4.8	.2	60	40	3.32	3.14		3.60	11.3
			.8	60	45	2.95				
15.0	.75	4.85	.2	80	52	3.40	3.28		3.64	11.9
			.8	60	42	3.16				
14.5	.75	4.85	.2	80	51	3.47	3.36		3.64	12.2
			.8	60	41	3.24				
13.5	.75	"	.2	80	51	3.47	3.40		3.64	12.4
			.8	60	40	3.32				
12.5	.75	4.9	.2	70	45	3.44	3.38		3.68	12.4
			.8	60	40	3.32				
12.0	.75	"	.2	80	52	3.40	3.36		3.68	12.4
			.8	60	40	3.32				
11.0	.75	"	.2	60	39	3.40	3.32		3.68	12.2
			.8	60	41	3.24				
10.5	.75	4.85	.2	60	40	3.32	3.24		3.64	11.8
			.8	60	42	3.16				
9.5	.75	"	.2	60	40	3.32	3.24		3.64	11.8
			.8	60	42	3.16				
9.0	.75	"	.2	60	40	3.32	3.28		3.64	11.9
			.8	60	41	3.24				
8.0	.75	4.8	.2	60	41	3.24	3.16		3.60	11.4
			.8	60	43	3.09				
7.5	.75	4.85	.2	60	41	3.24	3.16		3.64	11.5
			.8	60	43	3.09				
6.5	.75	4.75	.2	60	41	3.24	3.13		3.56	11.1
			.8	60	44	3.02				
6.0	.75	4.85	.2	60	42	3.16	3.09		3.64	11.2
			.8	60	44	3.02				

.80 .85 .90 .92 .94 .96 .97 .98 .99 1.00 .99 .98 .97 .96 .94 .92 .90 .85

.0 .10 .20 .30 .40 .50 .60 .70 .75 .80

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
	5°	.75	4.1	.2	60	42	3.16	3.12		3.52	11.0
	~~4.5~~			.8	60	43	3.09				
	4.5	.75	4.75	.2	60	40	3.32	3.20		3.56	11.4
				.8	60	43	3.09				
	3.5	.75	4.8	.2	60	42	3.16	3.16		3.60	11.4
				.8	60	42	3.16				
	3°	.75	4.75	.2	60	41	3.24	3.16		3.56	11.2
				.8	60	43	3.09				
	2°	.75	4.75	.2	60	43	3.09	2.49		3.56	8.9
				.8	40	47	1.89				
	1.5	.25	REW		0	0				0	0
	15	15								68.72	219.4

C-4 CANAL

SMEAD®
No. 153L
UPC 10330

0-267-

STATE OF OREGON

OFFICE OF STATE ENGINEER

Water Resources Department

Year .....

File No. .....

Discharge measurements of "C-4" Canal, Klamath Irrigation District

....., *during the year ending September 30, 19*.....

No.	Date	Made by	Width Feet	Area Sq. ft.	Mean Velocity Ft./Sec.	Gage Height Feet	Discharge C.F.S.	Computed Rating Corr.	Computed Rating % diff	Method	Meas. Scan. No.	G. Ht. Chgs. Ft.	Time Min.	Temperature Wtr.	Temperature Air	REMARKS
	10/2/80	Esget & McBain					68.8	69.6	1%							
	9/10/82	KNAUER WEIZEL SCHNEBECK					32.2									

* Geological Survey Engineer

'C-4' CANAL

Klamath Irrigation District

Headwork Location: SW¼ NW¼, Section 1, T40S R9E

Gages: Two stilling wells with staff plates, one downstream of 'C-4' headgates on left bank and one upstream of headgates on left bank of 'C' Canal.

Headgates: Two 3.5' metal lift gates (rectangular) with metal wheels and screw stock.

Measuring Section: NW¼ NE¼, Section 2, T40S R9E at bridge at intersection of 'C-4' Canal and Midland Road. There are approximately three headgates and one pump between the headworks and bridge which should be added to measurement if operating. Use canfield reel and 30 lb. weight with standard meter.

Flow Computation: $Q = .95\ A\sqrt{2g\Delta H}$

Where ΔH = differential head through gates or upstream well reading minus downstream well level.

$A = 3.5' \cdot h_1$ Where h_1 is the gate opening and is obtained by measuring from top of wheel to top of screw stock.

Example: Staff reading 2.38 on upstream well before and after measurement. Staff reading 1.62 on downstream well before and after measuring. Gate openings 1.50 and 1.49.

$Q_1 = .95\ A\sqrt{2g\Delta H} = .95 \cdot (3.5 \times 1.49)\sqrt{2 \cdot g \cdot (2.38-1.62)} \cong 34.7$

$Q_2 = .95\ (3.5 \times 1.50)\sqrt{2 \cdot g \cdot (2.38 - 1.62)} \cong 34.9$

Q Total = 69.6

Equation Accuracy: 'C' value appears good.

Jim Esget
Field Engineer

DISCHARGE IN C.F.S.-BOTH GATES OPEN 0.1 OF A FOOT

2 RECTANGULAR GATES-EACH 3.5' WIDE

AREA 0.70 COEFF. 0.95

HEAD	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
0.0	0.0	0.5	0.7	0.9	1.1	1.2	1.3	1.4	1.5	1.6
0.10	1.7	1.8	1.8	1.9	2.0	2.1	2.1	2.2	2.3	2.3
0.20	2.4	2.4	2.5	2.6	2.6	2.7	2.7	2.8	2.8	2.9
0.30	2.9	3.0	3.0	3.1	3.1	3.2	3.2	3.2	3.3	3.3
0.40	3.4	3.4	3.5	3.5	3.5	3.6	3.6	3.7	3.7	3.7
0.50	3.8	3.8	3.8	3.9	3.9	4.0	4.0	4.0	4.1	4.1
0.60	4.1	4.2	4.2	4.2	4.3	4.3	4.3	4.4	4.4	4.4
0.70	4.5	4.5	4.5	4.5	4.6	4.6	4.6	4.7	4.7	4.7
0.80	4.8	4.8	4.8	4.9	4.9	4.9	4.9	5.0	5.0	5.0
0.90	5.1	5.1	5.1	5.1	5.2	5.2	5.2	5.3	5.3	5.3
1.00	5.3	5.4	5.4	5.4	5.4	5.5	5.5	5.5	5.5	5.6
1.10	5.6	5.6	5.6	5.7	5.7	5.7	5.7	5.8	5.8	5.8
1.20	5.8	5.9	5.9	5.9	5.9	6.0	6.0	6.0	6.0	6.1
1.30	6.1	6.1	6.1	6.2	6.2	6.2	6.2	6.3	6.3	6.3
1.40	6.3	6.3	6.4	6.4	6.4	6.4	6.5	6.5	6.5	6.5
1.50	6.5	6.6	6.6	6.6	6.6	6.6	6.7	6.7	6.7	6.7
1.60	6.7	6.8	6.8	6.8	6.8	6.9	6.9	6.9	6.9	6.9
1.70	7.0	7.0	7.0	7.0	7.0	7.1	7.1	7.1	7.1	7.1
1.80	7.2	7.2	7.2	7.2	7.2	7.3	7.3	7.3	7.3	7.3
1.90	7.4	7.4	7.4	7.4	7.4	7.5	7.5	7.5	7.5	7.5
2.00	7.6	7.6	7.6	7.6	7.6	7.7	7.7	7.7	7.7	7.7

Example: 2 Gates each open 1.2'; Head 1.35
Solution: 6.2 X 12 = 74.4 C.F.S.

Example: 1 Gate open 1.5'; Head 2.03
Solution: (7.6 x 15) ÷ 2 = 57.0 C.F.S.

Example: 1 Gate open 1.0' and 1 Gate open 0.8'; Head 1.47
Solution: Avg. Gate opening = (1.0 + 0.8) ÷ 2 = 0.9

9-275-F
11-75

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STATE OF OREGON
WATER RESOURCES DEPARTMENT

File No. .....
Meas. No. .....
Comp. by JW
Checked by SFM

DISCHARGE MEASUREMENT NOTES

Stream C-4 CANAL KID. KLAMATH PROJECT

Date 9-10-85, 19..... Party KNAUER, WETZEL, STUNTEBECK

Width 24.0 Area 79.1 Vel. .407 G. H. ..... Disch. 32.2

Method 2/8 No. secs. 21 ~~G. H.~~ change 0 in 75 min.

Method coef. 1 Hor. angle coef. .99 Susp. coef. 1 Meter No. 5-68

Date rated 4-11-69

GAGE READINGS			UP	DOWN
Time		Recorder	~~Inside~~	~~Outside~~
8:45			2.38	1.52
	Start			
950	Finish		—	—
Weighted M. G. H.				
G. H. correction				
Correct M. G. H.				

Spin before meas. ..... after .....

Wading, cable, ice, boat, upstr., downstr., side bridge .6 feet, mile, above, below gage and .....

Tags checked .....

Meter suspended ~~from rod,~~ or REEL

.5 ft. above bottom 30 lb. C weight.

Levels obtained .....

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

Flow UNIFORM Weather PARTLY CLOUDY

Other ..... Air ..... °F@ .....

Gage OK Water ..... °F@ .....

..... Record removed ..... Intake flushed U L .....

Observer .....

Control CHANNEL IS CLEAR

Remarks CHANGE MADE @ H.G. @ 8:45

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	
	23°	1.5	LEW		0	0		0		0	0	
	20°	2.0	2 7	.6	7	40	.410	.410		5.40	2.21	.85
	19°	1.0	3 1	.2	7	41	.401	.385		3.10	1.19	
				.8	10	64	.369					
	18°	1.0	3 6	.2	10	52	.448	.429		3.60	1.54	.90
				.8	7	40	.410					.92
	17°	1.0	3 8	.2	10	49	.474	.442		3.80	1.68	.94
				.8	7	40	.410					
	16°	1.0	4 1	.2	10	47	.493	.484		4.10	1.98	.96
				.8	10	49	.474					.97
	15°	1.0	4 3	.2	10	44	.525	.483		4.30	2.08	.98
				.8	10	53	.440					.99
	14°	1.0	4 5	.2	10	40	.575	.516		4.50	2.32	
				.8	10	51	.456					
⊙	13°	1.0	4 4	.2	10	41	.561	.486		4.40	2.14	1.00
				.8	7	40	.410					
	12°	1.0	4 4	.2	10	42	.549	.484		4.40	2.13	
				.8	10	56	.418					.99
	11°	1.0	4 5	.2	10	43	.536	.460		4.50	2.07	.98
				.8	7	43	.383					.97
	10°	1.0	4 3	.2	10	44	.525	.443		4.30	1.90	.96
				.8	7	46	.360					
	9°	1.0	4 3	.2	10	48	.483	.392		4.30	1.69	.94
				.8	5	40	.300					.92
	8°	1.0	4 3	.2	10	51	.456	.395		4.30	1.70	.90
				.8	7	50	.333					
	7°	1.0	4 3	.2	10	49	.474	.378		4.30	1.63	
				.8	5	43	.281					.85

.0 .10 .20 .30 .40 .50 .60 .70 .75 .80

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
	6.0	1.0	4.2	.2	10	54	.432	.327		4.20	1.37
				.8	5	56	.222				
	5.0	1.0	4.2	.2	7	40	.410	.346		4.20	1.45
				.8	5	43	.281				
	4.0	1.0	3.3	.2	7	44	.375	.368		3.30	1.21
				.8	7	46	.360				
	3.0	1.0	2.9	.2	7	48	.346	.323		2.90	~~0.94~~ .937
				.8	5	40	.300				
	2.0	2.0	2.6	.6	5	51	.241	.241		5.20	1.25
	-1.0	1.5	REOW		0	0	0			0	0
	24.0	24.0								79.1	32.5
⊙											x.99
											32.2

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
.97	10°	1.5	3.3	.2	15	55	.625	.668	.648	4.95	3.21
				.8	15	48	.712				
.99	8°	2.5	2.4	.6	15	52	.659		.639	6.00	3.83
.97	5°	1.5	LEW		0	0				0	0
	25	25								83.20	58.92
add		WIDTH		5½'							
					Lower						
		HG Channel					Pygmy				
	0	.50	0		0	0		0		0	0
	1°	1.00	0.85		50	45		1.12		.85	.95
	2°	1.00	1.1		50	49		1.03		1.10	1.13
	3°	1.25	1.25		40	44		.92		1.56	1.44
⊙	4.5	1.25	0.8		40	46		.88		1.00	.88
	5.5	.50	0		0	0		0		0	0
	5.5	5.5	4½'								
add											
		HG Channel			Upper		Pygmy				
	0	.25	0		0	0		0			
	0.5	.75	1.09		30	39		.79		.75	.59
	1.5	1.00	1.1		100	38		2.58		1.10	2.84
	2.5	1.50	0.6		60	42		1.42		.90	1.28
	4.5	1.00	0		0	0		0			0
	4.5	4.5									68.03
add		PUMP								+	.80
		.8 cfs							Q =		68.83

.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	
97	30°	1°	REW				0	0		0	0	
97	28°	2°	2 4	.6	3	50	.158		.153	4.80	.73	.85
97	26°	1 5	3 3	.2	15	50	.684	.616	.598	4.95	2.96	
				.8	10	42	.549					
97	25°	1 5	3 6	.2	15	56	.684	.644	.625	5.40	3.38	.90
				.8	15	57	.604					.92
97	23°	1 5	4 1	.2	15	43	.792	.738	.716	6.15	4.40	.94
				.8	15	50	.684					
97	22°	1°	4 2	.2	15	41	.829	.786	.762	4.20	3.20	.96
				.8	15	46	.742					.97
97	21°	1 5	4 4	.2	15	41	.829	.802	.777	6.60	5.13	.98
				.8	15	44	.774					.99
97	19°	1 5	4 4	.2	20	50	.904	.848	.823	6.60	5.43	
				.8	15	43	.792					
97	18°	1°	4 4	.2	20	48	.941	.876	.849	4.40	3.74	1.00
				.8	15	42	.810					
97	17°	1°	4 4	.2	20	49	.922	.848	.823	4.40	3.62	
				.8	15	44	.774					.99
97	16°	1°	4 6	.2	20	49	.922	.876	.849	4.60	3.91	.98
				.8	15	41	.829					.97
97	15°	1°	4 4	.2	15	42	.810	.801	.777	4.40	3.42	.96
				.8	15	43	.792					
97	14°	1°	4 2	.2	15	41	.829	.794	.770	4.20	3.23	.94
				.8	15	45	.758					.92
97	13°	1 5	4 1	.2	15	41	.829	.820	.795	6.15	4.89	.90
				.8	15	42	.810					
97	11°	1 5	3 6	.2	15	47	.727	.734	.712	5.40	3.84	
				.8	15	46	.742					.85
	↓				↓	↓						

.0 .10 .20 .30 .40 .50 .60 .70 .75 .80

Error 1% of rating
antity from measured quantity.

9-275-F
4-58

STATE OF OREGON
OFFICE OF STATE ENGINEER
Water Resources Department

File No. .....
Meas. No. .....
Comp. by JAE
Checked by PFM

DISCHARGE MEASUREMENT NOTES

Stream C-4 CANAL

Date 10-2, 1980 Party ESGET M McBAIN N

Width 25 Area 83.2 Vel. .827 G. H. — Disch. 68.8

Method .2/.8 No. secs. 18 G. H. change ..... in ..... min.

Method coef. 1.0 Hor. angle coef. .97 Susp. coef. 1.0 Meter No. S 68

Date rated 4-11-69

Spin before meas. ✓ after ✓

Wading, cable, ice, boat, upstr., downstr., side bridge ..... feet, mile, above, below gage and .....

Tags checked .....

Meter suspended from ~~rod~~, or cable

..... ft. above bottom ..... lb. ..... weight.

Levels obtained .....

GAGE READINGS		above HG	at HG	below HG
Time		~~Recorder~~	~~Inside~~	~~Outside~~
0930	Start	2 38	1 50 & 1 49	1 63
1015	Finish	2 38	1 50 & 1 49	1 60
Weighted M. G. H.				
G. H. correction				
Correct M. G. H.				

Measurement rated excellent (2%), good (5%), fair (8%), poor (over 8%), based on following conditions: Cross section mud w/ some weeds along edge.

Flow ..... Weather SUNNY, Breezy

Other ..... Air ..... °F@ .....

Gage None ..... Water ..... °F@ .....

..... Record removed ..... Intake flushed U L .....

Observer .....

Control .....

Remarks Gate widths 3½' each (2)

G. H. of zero flow ..... ft.

0 75
0 78

$Q_1 = 34.89$
$Q_2 = 34.69$ > $Q = 69\ 58$

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

[redacted] [redacted] [redacted] 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
	2	1.0	REW @ 1330								
	4.0	1.5	2.0		2	60	.099	.099		3.0	0.30
	5	1.0	2.3		NO	Flow	-0-	-0-		2.3	.000
	6	1.0	2.7		1	38	.084	.042		2.7	.11
	7				NO	Flow	-0-				
	7	1.0	3.2		1	40	.081	.040		3.2	.13
	8				NO	Flow	-0-				
	8	1.0	3.6		2	53	.109	.054		3.6	.19
					NO	Flow	-0-				
	9	1.0	3.8		2	70	.089	.044		3.8	.17
					NO	Flow	-0-				
	10	1.0	4.2		NO	Flow	-0-	-0-		4.2	.000
					NO	Flow	-0-				
	11	1.5	4.2		NO	Flow	-0-	.044		6.3	.28
⊙					1	35	.089				
	13	2.0	4.2		1	74	.056	.033		8.4	.70
					2	52	.110				
	15	2.0	4.4		1	39	.082	.082		8.8	.72
					1	39	.082				
	17	2.0	4.5		3	57	.142	.106		9.0	.95
					1	51	.069				
	19	2.0	4.4		2	57	.103	.112		8.8	.99
					3	70	.120				
	21	2.0	3.9		2	46	.121	.060		7.8	.47
					NO	Flow	-0-				
	23	2.0	3.3	.2	2	48	.118	.102		6.6	.67
				.8	1	37	.085				
	25	2.0	2.5	.6	2	56	.104	.104		5.0	.52
	27	1.0	1 Few			@ 1420					

.80 .85 .90 .92 .94 .96 .97 .98 .99 1.00 .99 .98 .97 .96 .94 .92 .90 .85

.0 .10 .20 .30 .40 .50 .60 .70 .75 .80

25 2.00 8.25 6.20

9-275-F
11-75

STATE OF OREGON
WATER RESOURCES DEPARTMENT

DISCHARGE MEASUREMENT NOTES

File No. .....
Meas. No. .....
Comp. by N2R
Checked by PFM

Stream C-4 Canal K.I.D

Date 6-12, 1981 Party D.W.S

Width 25.0 Area 83.5 Vel. 0.07 G. H. ..... Disch. 6.20

Method 2/8 No. secs. 17 G. H. change ..... in ..... min.

Method coef. ..... Hor. angle coef. ..... Susp. coef. ..... Meter No. S-68

Date rated 4-11-69

GAGE READINGS				
Time		Recorder	Inside	Outside
			1.56	
1330	Start			
	Finish			
Weighted M. G. H.				
G. H. correction				
Correct M. G. H.				

Spin before meas. ..... after .....

Wading, cable, ice, boat, upstr., downstr., side bridge ½ feet, mile, above, below gage and .....

Tags checked .....

Meter suspended from rod, or

5 ft. above bottom 30 lb. ..... weight.

Levels obtained .....

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

Flow Very slow Weather Very windy-cold

Other ..... Air ..... °F@ .....

Gage ..... Water ..... °F@ .....

..... Record removed ..... Intake flushed U/L .....

Observer .....

Control ..... There were Pumps Pumping into The Canal down stream causing backwater at This measuring Pt.

Remarks "C" canal 2.37
Right Gate opening .26
Left Gate opening .29

G. H. of zero flow ..... ft.

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
	8		4.3	.2			0.55	0.5		4.3	2.15
				.8			0.45				
	7		4.0	.2			0.45	0.43		4.0	1.80
				.8			0.45				
	6		3.8	.2			0.45	0.43		3.8	1.63
				.8			0.4				
	5	1.0	3.4	.2			0.45	0.43		3.4	1.46
				.8			0.4				
	4	2.5	3.1	.2			0.4	0.4		7.75	3.10
				.8			0.4				
	0	2.0	LEW, 9:15 A.M.							—	—
	25	25								82.25	34.10
	HG EST. 1.5 CFS									+	1.5
											35.6
	~~36 X .97 = 35~~										
	35.6 X .97 = 34.5										

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

River at—

ficient	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
	25	1.0	REW.	8:50		A.M.				—	—
	23	1.5	2.0	.6			0.2			3.0	0.60
	22	1.0	2.4	.6			0.4			2.4	0.96
	21		2.8	.6			0.4			2.8	1.12
	20		3.3	.2			0.4	0.4		3.3	1.32
				.8			0.4				
	19		3.7	.2			0.35	0.35		3.7	1.30
				.8			0.35				
	18		4.1	.2			0.35	0.38		4.1	1.56
				.8			0.4				
	17		4.3	.2			0.45	0.35		4.3	1.51
				.8			0.25				
	16		4.4	.2			0.45	0.38		4.4	1.67
				.8			0.3				
⊙	15		4.3	.2			0.45	0.38		4.3	1.63
				.8			0.3				
	14		4.4	.2			0.5	0.43		4.4	1.89
				.8			0.35				
	13		4.4	.2			0.53	0.45		4.4	1.98
				.8			0.35				
	12		4.5	.2			0.5	0.43		4.5	2.03
				.8			0.4				
	11		4.5	.2			0.5	0.48		4.5	2.16
				.8			0.45				
	10		4.5	.2			0.55	0.5		4.5	2.25
				.8			0.45				
	9		4.4	.2			0.5	0.45		4.4	1.98
				.8			0.4				

.80 .85 .90 .92 .94 .96 .97 .98 .99 1.00 .99 .98 .97 .96 .94 .92 .90 .85

.0 .10 .20 .30 .40 .50 .60 .70 .75 .80

9-275-F
11-75

STATE OF OREGON
WATER RESOURCES DEPARTMENT

DISCHARGE MEASUREMENT NOTES

File No. .....
Meas. No. .....
Comp. by DEK
Checked by DLW

Stream C-4 CANAL, KLA PROJECT USBR, KID.
Date AUG 24, 1983 Party KNAUER WESTON
Width 25.0 Area 82.2 Vel. 0.43 G. H. ..... Disch. 35.6
Method 2/.8 No. secs 22 G. H. change ..... in ..... min.
Method coef. 1 Hor. angle coef. 0.97 Susp. coef. 1 Meter No. E-1

Date rated .....
Spin before meas. ..... after .....
Wading, cable, ice, boat, upstr., downstr., side bridge 1/2 feet, mile, above, below gage and .....

Tags checked .....
Meter suspended from ~~rod, or~~ A-REEL
1/2 ft. above bottom 10 lb. ..... weight.
Levels obtained .....

GAGE READINGS				
Time		~~Recorder~~ UP	~~Inside~~ GATE	~~Outside~~ DOWN
825		1.71	0.86 / 0.84	1.69
	Start			
	Finish			
920		1.62	0.86 / 0.84	1.55
Weighted M. G. H.				
G. H. correction				
Correct M. G. H.				

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

Flow UNIFORM Weather FOG

Other ..... Air .....°F@ .....

Gage OK Water .....°F@ .....

..... Record removed ..... Intake flushed U .....

Observer .....

Control CLEAR

Remarks
SW1/4 NW1/4 SEC. 1 T40S R9E

G. H. of zero flow ..... ft.

D CANAL

SMEAD
No. 153L
UPC 10330
smead.com • Made in USA
MINIMUM RECYCLED CONTENT

'D' CANAL

LOCATION	NAME	DELIVERY	NOTES
Photo #1-0094-A			NOTE: heads at inlest and outlets from top of pipes.
T40S R10E			
NE¼ NE¼, Sec 35	3-C Camp	12" cmp	(30%) .4'/9', inlet 0.5, outlet 1.0
NW¼ NW¼, Sec 36	Nelson	12" cmp	(50%) 0.4/27', inlet 1.4, outlet 1.0
NW¼ NW¼, Sec 36	Kandra	18" cmp	0.2/37', inlet 1.3, outlet 0.0
NE¼ NW¼, Sec 36	Kandra	18" cmp	(70%) 1.0/65', inlet 3.4, outlet 3.0
NW¼ NE¼, Sec 36	D-5 Lateral	24" cmp	0.1/25', inlet 2.5, outlet 1.7
NE¼ NE¼, Sec 36	Dean	18"cmp to centrifugal pump	50 h.p. G.E. Motor
SE¼ NE¼, Sec 36	Toley Drain	30" cmp	To south (spill)
T40S R11E			
SW¼ NW¼, Sec 31	Paschke	24" cmp	0.1/70', inlet 1.3, outlet 1.0
SW¼ NW¼, Sec 31	Dean	18" cmp	unused (field sprinkled from 50 h.p. pump)
SW¼ NW¼, Sec 31	Kandra	18" cmp	0.2/29, inlet 1.3, outlet 0.4
NE¼ SW¼, Sec 31	Britten	18" cmp to gas engine and pump	
SW¼ SE¼, Sec 31	Britten	18" cmp	0.2/68', inlet 1.6, outlet 0.5
T41S R11E			
NE¼ NE¼, Sec 6	Petrick	24" cmp	0.3/61, inlet 1.4, outlet 0.2
NE¼ SE¼, Sec 6	'D-6' Lateral	to west 24"cmp	0.1/27, inlet 1.4, outlet 1.0
NE¼ SE¼, Sec 6	Giacomini	18" cmp to centrifugal pump, 15 h.p. G.E. Motor	
NE¼ SE¼, Sec 6	Moore	18" cmp to centrifugal pump, 40 h.p. Elec. Motor	
SE¼ SE¼, Sec 6	'D-7' Lateral	24" cmp	0.8/33', inlet 1.6, outlet 0.5
SW¼ SW¼, Sec 5	Giacomini	18" cmp	0.2/17, inlet 0.6, outlet 0.4
SE¼ SW¼, Sec 5	Giacomini	18" cmp	0.3/23, inlet 1.3, outlet 0.6
SE¼ SW¼, Sec 5	'D-8' Lateral	24" cmp	0.2/27, inlet 1.5 outlet 0.5
SW¼ SE¼, Sec 5	Giacomini	18" cmp	unused
SE¼ SE¼, Sec 5	'D-9' Lateral	24" cmp	0.2/20', inlet 2.5, outlet 0.2
SW¼ SW¼, Sec 4	Lyons	centrifugal pump	50 h.p. G.E. Motor

NOTE: D-CANAL SURVEYED IN PORTIONS OF 1980 & 1981 DEK.

LOCATION	NAME	DELIVERY	NOTES
Photo #1-0093-A			Note: heads at inlet and outlet from top c pipes
T41S R11E			
SW¼ SW¼, Sec 4	Lacey	18" cmp	0 5/34', inlet 0.5, outlet 0
SE¼ SW¼, Sec 4	'D-9½'Lateral	24" cmp	0 4/86, inlet 2.6, outlet 2.1
SW¼ SE¼, Sec 4	'D-9' drain	2- 5'x 9' rectangular openings	
SW¼ SE¼, Sec 4	Pope	centrifugal pump 50 h.p. Gould Motor	
SW¼ SE¼, Sec 4	Pope	centrifugal pump 15 h.p. G.E. Motor	
SW¼ SE¼, Sec 4	Pope	18" cmp	unused
SE¼ SE¼, Sec 4	Hickey	18" cmp	unused
SE¼ SE¼, Sec 4	Dodds Hollow	Ditch 18" x	24" wooden box to two pumps
Photo #1-0093-B			
NE¼ NE¼, Sec 9	'D-10'Lateral	30" cmp	3 0/70', inlet 2.4, outlet 0.0
NE¼ NE¼, Sec 9	Hickey	12" cmp	0 1/25', inlet 2.5, outlet 0.0
NW¼ NW¼, Sec 10	Hickey	18" cmp	0 1/23', inlet 1.4, outlet 0.7
Lot 3, Sec 10	Hickey	18" cmp	unused (to feed lot)
Lot 2, Sec 10	'D-11'Lateral	24"concrete	0 6/25, inlet 1.8, outlet = free fall
Lot 1, Sec 10		12" cmp	2 0/39, inlet 2.1, outlet = free fall
Lot 1, Sec 10	'D-12'Lateral	30" cmp	0 4/25, inlet 1.3, outlet = free fall
Lot 1, Sec 10	Kandra	18" cmp	unused (changed to sprinkler)
NW¼ NE¼, Sec 10	Kandra	18" cmp	unused (changed to sprinkler)
SW¼ SE¼, Sec 3	Detrick	24" cmp	
SW¼ SE¼, Sec 3	Detrick	18" cmp to	75 h.p. & 50 h.p. centrifugal pumps
NW¼ SE¼, Sec 3	Detrick	18" cmp to	75 h.p. motor on centrifugal pump
NE¼ SE¼, Sec 3	'D-13'Lateral	24" cmp	0 5/29', inlet 2.7, outlet 0.7
NW¼ SW¼, Sec 2	Cacka	18" cmp	0 4/31, inlet 1.5, outlet 0.0
NW¼ SW¼, Sec 2	Cacka	18" cmp	unused (changed to sprinkler)

LOCATION	NAME	DELIVERY	NOTES
Photo #1-0093-B			Note: heads at inlets and outlets from top of pipes.
T41S R11E			
NW¼ SW¼, Sec 2		portable centrifugal pump	8 cylinder propane engine
NE¼ SW¼, Sec 2	Cacka	24" cmp	50 h.p. motor on centrifugal pump
NE¼ SW¼, Sec 2		12" cmp	to north to feed lot
NW¼ SE¼, Sec 2	E. Cacka	12" cmp	(to yard) 2^{6}/220', inlet 5.0, outlet 0.0
NW¼ SE¼, Sec 2	McKoen	12" cmp	to pumps to north
SW¼ SE¼, Sec 2	McKoen	18" cmp	unused
SE¼ SE¼, Sec 2	McKoen	18" cmp	unused
SE¼ SE¼, Sec 2	McKoen	18" cmp	2 turbin pumps 1-17 hp electric motor 1-25 hp electric motor
SE¼ SE¼, Sec 2	'D-14'Lateral	24" cmp	0^{2}/17', inlet 2.3, outlet = 0.0
NE¼ SE¼, Sec 2	Cacka	18" cmp	0^{3}/23', inlet = 2.2, outlet = free fall
NW¼ SW¼, Sec 1	Payger	1½ hp electric pump for yard	
NW¼ SW¼, Sec 1	Payger	12" cmp	0^{2}/24, inlet 1.2, outlet 0.0 (20%)
NW¼ SW¼, Sec 1	Pumps to ditch 2 - 20 hp		G.E. motors on turbin pump Measured 4.2 cfs 5-13-81
SE¼ NW¼, Sec 1	Payger	18"cmp	0^{1}/31', inlet 1.0, outlet 1.0
SE¼ NW¼, Sec 1	Payger	12" cmp to 40 hp G.E. motor on centrifugal pun Measured. 390 gal/min 5-13-81	
SE¼ NW¼, Sec 1	D-15'Lateral	24" cmp	0^{1}/25', inlet 3.0, outlet 1.0
Photo #1-0093-B			Note: heads at inlets and outlets from top of pipe
T41S R11E			
SW¼ NE¼, Sec 1	T. Wolfe	18" cmp	40 hp G.E. electric motor to centrifugal pump going north
SW¼ NE¼, Sec 1	Wolfe	18" cmp	2 - 60 hp electric motors and centrifugal pumps
SE¼ NE¼, Sec 1	Bradshaw	18" cmp	20 hp electric motor with centrifugal pump
SE¼ NE¼, Sec 1	'D-16'Lateral	36" cmp	$0^{1'}$/28', inlet $2^{8'}$, outlet -0-
Photo #2-0133-B			
T41S R12E			
Lot 1, Sec 7	Johnson/Payger	32" cmp 32 x 48" cmp	arc } drain during off-season, canal to pumps to north during irrigation season
NE¼ NW¼, Sec 7	Kirk Spill	32" cmp	spill to south

LOCATION	NAME	DELIVERY	NOTES
Photo #2-0133-B			Note: inlet & outlet heads from top of pipe.
T41S R12E			
NW¼ NE¼, Sec 7	Kirpatrick	18" cmp	to 50 hp electric motor and centrifugal pump
NE¼ NE¼, Sec 7	Kirpatrick	18" cmp	to 50 hp G.E. electric motor and centrifugal pump
NE¼ NE¼, Sec 7	Hansen ?	18" cmp	to pump ?
NE¼ NE¼, Sec 7	'D-17'Lateral	18" cmp	0^{1}/27', inlet 1^{7}, outlet 0^{5}'
NW¼ NW¼, Sec 8	Wilson	24"cmp to pump	0^{9}/44' - inlet 1^{1}, outlet 0^{6}
NW¼ NW¼, Sec 8	Kandra	18" cmp goes to	2 - 30 hp pumps 0^{2}/33' - inlet 0^{6} outlet top of pipe
NE¼ NW¼, Sec 8	Kandra	18" cmp	unused
NE¼ NW¼, Sec 8	D-18'Lateral	36" cmp	0^{8}/80' - inlet 2^{3}, outlet = free fall
SW¼ NE¼, Sec 8	Drazil	18" cmp to pump	- 0^{3}/100, inlet 2^{4}, outlet 1^{8}
SW¼ NE¼, Sec 8	Shasta V.I.D.		see information in file
SE¼ NE¼, Sec 8	Alford	18"cmp to pump	0^{1}/90(30'cmp + 60'steel)inlet 2^{2},out. 2^{0}
Photo #2-0134-A			
T41S R12E			
SE¼ NE¼, Sec 8	D-19'Lateral	30" cmp	0^{2}/100' - inlet 4^{3}, outlet 1^{6}
NE¼ SW¼, Sec 9	McVay	18"cmp to pump	0^{4}/70' - inlet 4^{3}, outlet 2^{0}
SW¼ SE¼, Sec 9	P. Bloahm	24" cmp	0^{1}/20' - inlet 2^{5}, outlet 1^{2}
SW¼ SE¼, Sec 9		18"cmp to pump	0^{4}/29' - inlet 2^{5}, outlet 2^{0}
NW¼ NE¼, Sec 16	D-20'Lateral	24" cmp	0^{1}/16' - inlet 2^{0}, outlet free fall
NW¼ NE¼, Sec 16	Heyden	18" cmp	0^{7}/25' - inlet 3^{1}, outlet 0^{0}
NE¼ NE¼, Sec 16	'D-21' Lateral	18" cmp	unused
SE¼ NE¼, Sec 16	Malin Park	12"cmp to pump	30 hp electric motor to centrifugal pu
SE¼ NE¼, Sec 16	Park & City lots	12" cmp	
SE¼ NE¼, Sec 16	Malin I.D.		Pumps - see information in file
SW¼ NW¼, Sec 15	city lots	16" cmp	0^{4}/45' (90° elbow) inlet 2^{6}, outlet 1^{0} 10% of capacity
SW¼ NW¼, Sec 15	city lots	12" cmp	0^{2}/18', inlet 1^{8}, outlet 1^{2}
SW¼ NW¼, Sec 15	city lots	12" cmp	0^{4}/23', inlet 4^{0}, outlet 1^{9}

KBA_APP_000696

LOCATION	NAME	DELIVERY	NOTES
Photo #2-0134-A			Note: inlet & outlet heads from top of pipe.
T41S R12E			
SW¼ NW¼, Sec 15	'D-22'Lateral	24" cmp	0.1/23' - inlet 2.2, outlet = free fall
SE¼ NW¼, Sec 15		18" cmp	0.3/20' - inlet 2.1, outlet 1.5
SE¼ NW¼, Sec 15		18" cmp	0.4/92' - inlet 2.9, outlet 1.0
SE¼ NW¼, Sec 15	(Drain to south)		Malin Spill #1
NW¼ SE¼, Sec 15	'D-23'Lateral	24" cmp	0.3/74' - inlet 1.6, outlet -0.3
NE¼ SE¼, Sec 15	D-23½	24" cmp	0.5'/111'- inlet 2.0, outlet -0.5
NE¼ SE¼, Sec 15	D-24	24" cmp	0.7'/78' inlet 1.3, outlet 0.0
NE¼ SW¼, Sec 14	N. Stastney	50 H.P. pump	/Electric motor (H.G. from canal)
SE¼ SW¼, Section 14	Spill to Drain	24" cmp	0.3'/45' - inlet 1.7 outlet = free fall
SW¼ SE¼, Sec. 14	Clark	50 H.P. pump	/Electric motr (H.G. from canal)
SW¼ NW¼, Section 24	Clark	40 H.P. pump	/Electric motor (H.G. from canal)
SE¼ NW¼, Sec 24	D-24 D-25	24" cmp	0.3'/23' Inlet 2.2 outlet = 0.5
NE¼ SW¼, Sec 24	Byrnes	18" cmp	0.1'/26' Inlet 1.8 outlet 1.5
OREGON/CALIFORNIA	STATE LINE		
Photo #2-0135-A &	1-0179-B		
T48N R5E			
SW¼ SW¼, Sec 14	D-25½	24" cmp	0.5/31' - inlet 1.5 outlet = free fall
SW¼ SW¼, Sec 14	Byrnes	18" cmp	0.2/20' - inlet 2.5 outlet = 1.4
SW¼ SW¼, Sec. 14	Byrnes	50 H.P. pump/	Electric motor (H.G. from canal)
NW¼ NW¼, Sec. 24	LeQuieu	30 H.P. pump/	Electric motor (H.G. from canal)
NW¼ NW¼, Sec. 24	Byrnes	18" cmp	0.2/79' - inlet 1.2, outlet 1.1
SE¼ NW¼, Sec. 24 Checked to here!	Dalton	40 H.P. pump/	Electric motor (H.G. from canal)
SE¼ SW¼, Sec. 24	D-26	24" cmp	1.3/80' - inlet 1.6, outlet 1.2
SE¼ SW¼, Sec. 24	Macken	18" cmp	0.7/84' - inlet 2.4, outlet 1.8
SE¼ SW¼, Sec. 24	Macken	18" cmp	1.7/60' - inlet 3.0, outlet 2.1

LOCATION	NAME	DELIVERY	NOTES
Photo #2-0135-A &	1-0179-B		
T48N R5E			
NE¼ NW¼, Sec. 25	Macken (?)	18" cmp	unused - changed to pump
NE¼ NW¼, Sec. 25	Moore	18" cmp	unused - changed to pump
NE¼ NW¼, Sec. 25	Moore	50 H.P.) 100 H.P.)pumps	/Electric motors (H.G. from canal)
SE¼ NW¼, Sec. 25	Moore	18" cmp	Unused - changed to pump
SW¼ SE¼, Sec. 25	?	30" cmp	0 1/25' inlet 0.2, outlet 0.0
NW¼ NE¼, Sec. 36	Byrne	2 - 50 HP pumps	/Electirc motors (H.G. from canal)
END OF D-CANAL			

9-275-F
11-75

STATE OF OREGON
WATER RESOURCES DEPARTMENT

DISCHARGE MEASUREMENT NOTES

File No. .....
Meas. No. .....
Comp. by JW
Checked by SFM

Stream D-CANAL, KID. KLAMATH PROJECT

Date 9-10-85 19..... Party KNAUER, WETZEL, STUNTZNER

Width 49.0 Area 21.7 Vel. .51 G. H. 2.79 Disch. 124.

Method 2/.8 No. secs. 23 G. H. change 0 in 75 min.

Method coef. 1 Hor. angle coef. 1 Susp. coef. 1 Meter No. 5-68

Date rated 4-11-69

Spin before meas. ..... after .....

Wading, cable, ice, boat, (upstr.), downstr., (side bridge) 1/4 feet, (mile) above, below (gage) and .....

Tags checked .....

Meter suspended ~~from rod, or~~ RBRL

5 ft. above bottom 30 lb. C weight.

Levels obtained .....

GAGE READINGS UP				
Time		Recorder	~~Inside~~	~~Outside~~
10:50			2.79	
	Start			
12:05	Finish		2.79	
Weighted M. G. H.				
G. H. correction				
Correct M. G. H.				

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

Flow UNIFORM Weather CLOUDY

Other ..... Air ..... °F@ .....

Gage OK Water ..... °F@ .....

..... Record removed ..... Intake flushed U/L .....

Observer .....

Control ~~CHANNEL~~ / WEIR OK

Remarks .....

G. H. of zero flow ..... ft.

(RIGHT) 1 - 0.85 Q = 15.5 4 - 0.9 (LEFT) Q = 17

HG = 1.36 (STAFF GAGE) (1.15 SCREW STOCK) Q = 51

3 - 0.85 Q = 15.5 Σ Q = 99 cfs

.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	
	5 0	1.5	L EW		0	0				0		
	8 0	2.5	2 3	.6	5	40	.300			5.75	1.73	.85
	10 0	2.0	3 1	.2	7	40	.410	.473		6.20	2.93	
				.8	10	43	.536					
	12 0	2.0	3 7	.2	10	44	.525 ~~.536~~	.514 ~~.520~~		7.40	3.80 ~~3.85~~	.90
				.8	10	46	.503					.92
	14 0	2.0	4 9	.2	15	60	.575	.529		9.80	5.18	.94
				.8	10	48	.483					
	16 0	2.0	5 3	.2	10	44	.525	.520		10.6	5.51	.96
				.8	10	45	.514					.97
	18 0	2.0	5 5	.2	10	43	.536	.496		11.0	5.46	.98
				.8	10	51	.456					.99
	20 0	2.0	6 3	.2	10	41	.561	.518		12.6	6.53	
				.8	10	49	.474					
⊙	22 0	2.0	5 7	.2	15	52	.659	.648		11.4	7.39	1.00
				.8	15	54	.636					
	24 0	2.0	6 0	.2	15	48	.712	.663 ~~.665~~		12.0	7.96 ~~7.98~~	
				.8	15	56	.614					.99
	26 0	2.0	6 4	.2	15	47	.727	.651		12.8	8.33	.98
				.8	10	40	.575					.97
	28 0	2.0	6 2	.2	15	49	.698	.667		12.4	8.27	.96
				.8	15	54	.636					
	30 0	2.0	6 2	.2	15	46	.742	.684		12.4	8.48	.94
				.8	15	55	.625					.92
	32 0	2.0	5 8	.2	15	47	.727	.671		11.6	7.78	.90
				.8	15	56	.614					
	34 0	2.0	6 1	.2	15	49	.698	.666		12.2	7.39	
				.8	10	45	.514					.85

.0 .10 .20 .30 .40 .50 .60 .70 .75 .80

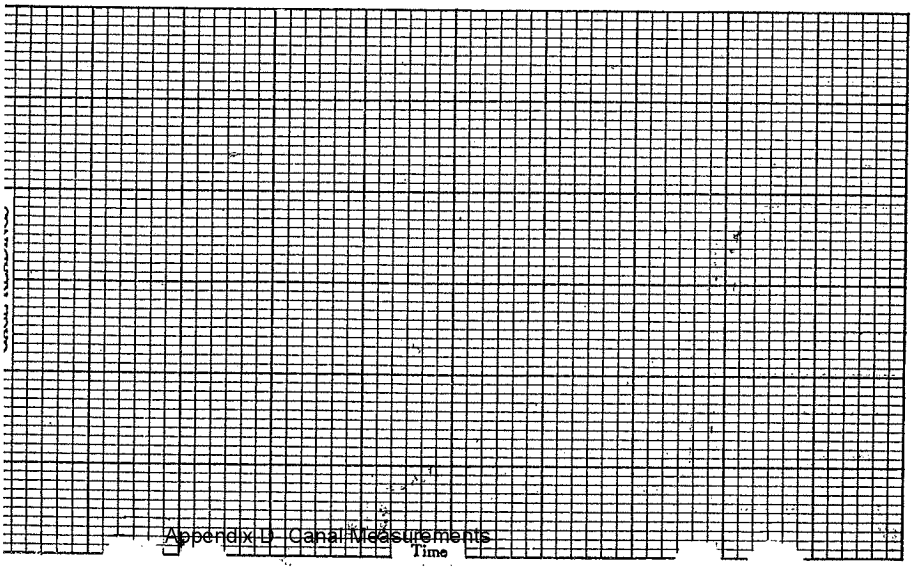
Angle-coefficient	Dist. from initial point	Width	Depth	Observation depth	Revolutions	Time in seconds	VELOCITY At point	VELOCITY Mean in vertical	Adjusted for hor. angle or ---------	Area	Discharge
	36°	2.0	6°	.2	15	54	.636	.560		12.0	6.72
				.8	10	48	.483				
	38°	2.0	5 4	.2	15	57	.604	.565		10.8	6.10
				.8	10	44	.525				
	40°	2.0	5 2	.2	15	52	.659	.622		10.4	6.47
				.8	15	59	.584				
	42°	2.0	4 9	.2	15	55	.625	.564		9.80	5.53
				.8	10	46	.503				
	44°	2.0	4°	.2	10	40	.575	.534		8.00	4.27
				.8	10	47	.493				
	46°	2.0	3 7	.2	10	43	.536	.501		7.40	3.71
				.8	10	50	.465				
	48°	4.0	2 6	.6	7	42	.392			10.4	4.08
⊙											
	54°	3.0	0 REW		0	0				0	0
	49.0	49.0								217.	124.

.0 .10 .20 .30 .40 .50 .60 .70 .80 .85

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
⊙											

.90 .92 .94 .96 .97 .98 .99 1.00 .99 .98 .97 .96 .94 .92 .90

.0 .10 .20 .30 .40 .50 .60 .70 .80 .85



9-275-F
11-75

STATE OF OREGON
WATER RESOURCES DEPARTMENT

File No. .....
Meas. No. .....
Comp. by DLW
Checked by DEK

DISCHARGE MEASUREMENT NOTES

Stream D- CANAL, KLAMATH PROJECT USBR KID

Date AUG. 24, 1983 Party KNAMER WESTON

Width 43 Area 208 Vel. 0.38 G. H. — Disch. 80 79.4

Method 2/8 No. secs. 21 G. H. change — in — min.

Method coef. 1 Hor. angle coef. 1 Susp. coef. 1 Meter No. E-1

Date rated .....

Spin before meas. ..... after .....

Wading, cable, ice, boat, upstr., downstr., side bridge 1/4 feet, mile, above, below gage and .....

Tags checked .....

Meter suspended ~~from rod~~, or A-REEL

1/2 ft. above bottom 10 lb. ..... weight.

Levels obtained .....

GAGE READINGS				
Time		Recorder	Inside	Outside
1030				
	Start			
1120	Finish			
Weighted M. G. H.				
G. H. correction				
Correct M. G. H.				

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

Flow UNIFORM Weather SUNSHINE / PARTLY ~~CLOUDY~~

Other ..... Air 61 °F@ 11:15

Gage OK. Water ..... °F@ .....

..... Record removed ..... Intake flushed U

Observer .....

Control CLEAR

Remarks HG1 = 0.22 Q = 3 HG1 0.22
HG2 = 0.26 Q = 4 HG2 0.26
SG 2.68 HG3 = 1.49 Q = 64 HG3 1.49
G. H. of zero flow ..... Q = 0 ~~ft.~~ HG4 0
HG4 = 0

71 cfs

NE¼ NE¼ SEC 35 T40S R10E 11% ERROR

KBA_APP_000703

.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	
	5	1.5	REW.		10:40 AM.						2.89	
	8	2.5	3.3	.2			0.4	0.35		8.25	~~3.3~~	.85
				.8			0.3					
	10	2	4.0	.2			0.45	0.38		8.0	3.04	
				.8			0.3					.90
	12		4.6	.2			0.45	0.45		9.2	4.14	.92
				.8			0.45				4.10	.94
	14		5.4	.2			0.45	0.38		10.8	~~4.86~~	
				.8			0.3					.96
	16		5.5	.2			0.45	0.35		11.0	3.85	.97
				.8			0.25					.98
	18		5.8	.2			0.45	0.35		11.6	4.06	.99
				.8			0.25					
	20		6.2	.2			0.55	0.40		12.4	4.96	
⊙				.8			0.25					1.00
	22		6.4	.2			0.5	0.43		12.8	5.50	
				.8			0.35					
	24		6.2	.2			0.5	0.4		12.4	4.96	.99
				.8			0.3					.98
	26		6.2	.2			0.6	0.45		12.4	5.58	.97
				.8			0.3					.96
	28		6.3	.2			0.6	0.48		12.6	6.05	
				.8			0.35					.94
	30		6.3	.2			0.55	0.43		12.6	5.42	.92
				.8			0.3					.90
	32		6.3	.2			0.5	0.45		12.6	5.67	
				.8			0.4					
	34		6.4	.2			0.4	0.35		12.8	4.48	.85
				.8			0.3					

.0 .10 .20 .30 .40 .50 .60 .70 .75 .80

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
	36		5.8	.2			0.4	0.33		11.6	3.83
				.8			0.25				
	38		5.3	.2			0.45	0.40		10.6	4.24
				.8			0.35				
	40		4.8	.2			0.35	0.30		9.6	2.88
				.8			0.25				
	42	2	3.8	.2			0.3	0.28		7.6	2.13
				.8			0.25				
	44	3	3.0	.2			0.2	0.18		9.0	1.62
				.8			0.15				
	48	2	L.E.W.		11:10 AM.					207.9	~~80.16~~ 79.40
	43	43								208	80

.0 .10 .20 .30 .40 .50 .60 .70 .80 .85

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
⊙											

.90 .92 .94 .96 .97 .98 .99 1.00 .99 .98 .97 .96 .94 .92 .90

.0 .10 .20 .30 .40 .50 .60 .70 .80 .85

GAGE READINGS

Time

9-275-F
11-75

STATE OF OREGON
WATER RESOURCES DEPARTMENT

DISCHARGE MEASUREMENT NOTES

File No. .....
Meas. No. .....
Comp. by NZR
Checked by .....

Stream D-Canal

Date 6-16, 1986 Party DWS

Width 45.0 Area 222.6 Vel 1.17 G. H. ..... Disch. 261.0

Method ..... No. secs ..... G. H. change ..... in ..... min.

Method coef. ..... Hor. angle coef. ..... Susp. coef. ..... Meter No. S-68

Date rated .....

Spin before meas. ✓ after ✓

Wading, cable, ice, boat, (upstr.), downstr., (side bridge) 1/4 feet (mile), above, (below gage) and .....

Tags checked .....

Meter suspended from rod, or

.5 ft. above bottom 30 lb. ..... weight.

Levels obtained .....

GAGE READINGS				
Time		Recorder	Inside	Outside
	Start	See Note Below		
	Finish			
Weighted M. G. H.				
G. H. correction				
Correct M. G. H.				

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

Flow uniform Weather Mainly Sun, Clouds

Other ..... Air ..... °F@ .....

Gage ..... Water ..... °F@ .....

..... Record removed ..... Intake flushed U/L .....

Observer .....

Control Stilling well gage 3.0H on G-Canal

Left to right Headgates

Remarks 2.1' 1.35' 1.85' screw gate .8H

54 28.5 45 40 / 167.5 cfs

G. H. of zero flow ..... ft.

36% Error

KBA_APP_000707

.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	
	2	2.	REW @ 1330									
	6	3.5	2.2		10	54	.432			7.7	3.33	.85
	9	3	3.9		20	51	.887	.830		11.7	9.71	
					15	44	.774					
	12	3	4.8		20	40	1.12	1.12		14.4	16.1	.90
					20	40	1.12					.92
	15	3	5.9		25	40	1.40	1.22		17.7	21.6	.94
					20	43	1.05					
	18	3	6.6		25	39	1.43	1.26		19.8	24.9	.96
					20	41	1.10					.97
	21	3	6.6		30	42	1.59	1.42		19.8	28.1	.98
					25	45	1.25					.99
	24	3	6.4		30	45	1.49	1.34		19.2	25.7	
					25	47	1.19					
⊙	27	3	6.5		25	39	1.43	1.34		19.5	26.1	1.00
					25	45	1.25					
	30	3	6.6		30	43	1.56	1.42		19.8	28.1	
					25	44	1.27					.99
	33	3	6.7		30	46	1.46	1.40		20.1	28.1	.98
					25	42	1.33					.97
	36	3	5.9		25	39	1.43	1.22		17.7	21.6	.96
					20	44	1.02					
	39	3	5.2		25	46	1.22	1.16		15.6	18.1	.94
					20	41	1.10					.92
	42	3°	4.1		10	39	.589	.575		12.3	7.07	.90
					10	41	.561					
	45	2.5	2.9		10	43	.536	.347		7.25	2.52	
					3	50	.158					.85
	47	1.0	LEW @ 1415							822.6	261.0	

.0 .10 .20 .30 .40 .50 .60 .70 .75 .80

45° 45"

21% Error of Computed Q from measured Q. See Accuracy Not in folder

9-275-F
4-58

STATE OF OREGON
OFFICE OF STATE ENGINEER
Water Resources Department

File No. .....
Meas. No. .....
Comp. by JAE
Checked by NZR

DISCHARGE MEASUREMENT NOTES

Stream G-D Drop Canal

Date 10-6, 1980 Party ESGET McBAIN

Width 43.0 Area 217 Vel. .340 G. H. ..... Disch. 73.7

Method .2/.8 No. secs. 21 G. H. change — in — min.

Method coef. 1.0 Hor. angle coef. 1.0 Susp. coef. 1.0 Meter No. Standard

Date rated 4-11-69

GAGE READINGS				
Time		Recorder	Inside	Outside
1340	Start			
1515	Finish			
Weighted M. G. H.				
G. H. correction				
Correct M. G. H.				

Spin before meas. ✓ after ✓

Wading, cable, ice, boat, upstr., downstr., side bridge ..... feet, mile, above, below gage and .....

Tags checked .....

Meter suspended from rod, or Cable

..... ft. above bottom ..... lb. ..... weight.

Levels obtained .....

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

Flow regular Weather Sunny Warm

Other ..... Air ..... °F@ .....

Gage ..... Water ..... °F@ .....

..... Record removed ..... Intake flushed U L .....

Observer .....

Control .....

Remarks Computed Q = 58.2

Q_1 = 1.4 cfs, Q_2 = 19.0 cfs

Q_3 = 27.0 cfs Q_4 = 10.8 cfs

G. H. of zero flow ..... ft.

HG. opening 0.22 HG #1 = 5' Depth = 0.12

5 Gr. 2.96 ok #2 = 5' 1.0

#3 5' 1.3

.0 .10 .20 .30 .40 .50 .60 .70 .75 .80

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	
	6°	1°	REW							0	0	
	8°	2°	3°	.2	5	47	.260	.218		6.00	1.31	.85
				.8	3	44	.176					
	10°	"	4[2]		7	46	.360	.310		8.00	2.48	
					5	47	.260					.90
	12°	"	4[6]		7	45	.367	.300		9.20	2.76	.92
					5	53	.233					.94
	14°	"	5[2]		10	57	.411	.343		10.40	3.57	
					5	44	.275					.96
	16°	2[50]	5[8]		7	46	.360	.320		14.50	4.64	.97
					5	43	.281					.98
	19°	2[50]	6[3]		7	40	.410	.338		15.75	5.32	.99
					7	64	.266					
	21°	2°	6[5]		7	40	.410	.382		13.00	4.97	
⊙					7	47	.353					1.00
	23°	"	6[25]		10	51	.456	.412		12.50	5.15	
					7	45	.367					
	25°	"	6[3]		10	47	.493	.416		12.60	5.24	.99
					7	49	.340					.98
	27°	"	6[4]		10	49	.474	.417		12.80	5.34	.97
					7	46	.360					.96
	29°	"	6[5]		10	49	.474	.420		13.00	5.46	
					7	45	.367					.94
	31°	"	6[5]		7	40	.410	.382		13.00	4.97	.92
					7	47	.353					.90
	33°	"	6[5]		7	44	.375	.368		13.00	4.78	
					7	46	.360					
	35°	"	6[1]		7	52	.321	.301		13.40	4.03	.85
					5	43	.281					

.0 .10 .20 .30 .40 .50 .60 .70 .75 .80

.0 .10 .20 .30 .40 .50 .60 .70 .80

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	
	37°	2°	5[8]		7	49	.340	.314		11.60	3.64	.85
					5	42	.287					
	39°	2°	5[35]		5	41	.294	.294		10.70	3.15	
					5	41	.294					.90
	41°	"	4[9]		5	42	.287	.294		9.80	2.88	.92
					7	56	.300					.94
	43°	"	4[1]		5	46	.265	.249		8.20	2.04	
					5	53	.233					.96
	45°	3°	3[3]		5	53	.233	.196		9.90	1.94	.97
					3	50	.158					.98
	49°	2°	LEW							0	0	.99
	43°	43°								217.4	73.62	
⊙												1.00
												.99
												.98
												.97
												.96
												.94

9-357-

STATE OF OREGON

OFFICE OF STATE ENGINEER

Water Resources Department

Year .....

File No. .....

Discharge measurements of "G-D"-Drop ("D" Canal) Klamath Irrigation District

....., *during the year ending September 30, 19*.....

No.	Date	Made by	Width Feet	Area Sq. ft.	Mean Velocity Ft./Sec.	Gage Height Feet	Discharge C.F.S.	Computed Rating Corr.	Computed Rating % diff	Method	Meas. Sect. No.	G. Ht. Chgs. Ft.	Time Min.	Temperature Wtr.	Temperature Air	REMARKS
	10/6/80	Esget & McBain					73.7	58.2	21%							See Note in file on Accuracy
	9/10/85	KNAUER STUNTEBECK WETZEL					124.	99	20%							

* Geological Survey Engineer

~~B Canal at Southwest~~

CHART FOR RECTANGULAR WIERS

FOR SPILLS AND CHECKS WITH STOP LOGS FOR WIER CREST.

MEASURE HEAD AT WIER LIP

	1	2	3	4	5	6
DEPTH OF WATER OVER WIER CREST	WIDTH OF WIER CREST IN FEET 3'	4'	5'	6'	7'	8'
ZERO to 0.1	1/2	1/2	1/2	1/2	1/2	1
0.1	1	1	1	2	2	2
0.2	2	2	3	3	4	4
0.3	3	3	4	5	6	7
0.4	4	5	6	7	8	9
0.5	5	6	8	9	11	12
0.6	6	8	10	12	14	15
0.7	7	9	12	14	17	19
0.8	8	11	14	17	20	23
0.9	10	13	17	20	23	26
1.0	11	15	19	23	27	30
1.1	13	17	22	26	30	35
1.2	15	20	24	29	34	39
1.3	16	22	27	33	38	44
1.4	18	24	30	36	42	48
1.5	20	27	33	40	47	53
1.6	22	29	37	44	51	59
1.7	24	32	40	48	56	64
1.8	26	35	43	52	60	69
1.9	28	37	47	56	65	75
2.0	30	40	50	60	70	80
2.1	32	43	54	65	75	86
2.2	35	46	58	69	81	92
2.3	37	49	61	74	86	98
2.4	39	52	65	78	91	104
2.5	42	55	69	83	97	111
2.6	44	59	73	88	102	117
2.7	46	62	77	93	108	124
2.8	49	65	81	98	114	130
2.9	51	69	86	103	120	137
3.0	54	72	90	108	126	144
3.1	57	76	94	113	132	151
3.2	59	79	99	119	138	158
3.3	62	83	103	124	145	166
3.4	65	86	108	130	151	173
3.5	68	90	113	135	158	180

G-D DROP CHART

GATE PENNING	STAFF GAUGE READING													
	2.00	2.10	2.20	2.30	2.40	2.50	2.60	2.70	2.80	2.90	3.00	3.10	3.20	3.30
0.10	4	4	4	4	5	5	5	5	5	5	5	5	5	5
0.20	8	9	9	9	9	9	9	9	10	10	10	10	10	10
0.30	13	13	13	13	13	14	14	14	14	14	15	15	15	15
0.40	17	17	17	18	18	18	18	19	19	19	19	20	20	20
0.50	21	21	21	22	22	22	23	23	23	24	24	24	25	25
0.60	25	25	25	26	26	27	27	27	28	28	29	29	29	30
0.70	28	29	29	30	30	31	31	32	32	33	33	34	34	34
0.80	32	33	33	34	34	35	36	36	37	37	38	38	39	39
0.90	36	37	37	38	38	39	40	40	41	42	42	43	43	44
1.00	39	40	41	42	42	43	44	44	45	46	46	47	48	48
1.10	43	44	45	45	46	47	48	49	49	50	51	51	52	53
1.20	46	47	48	49	50	51	52	53	53	54	55	56	56	57
1.30	50	51	52	53	54	55	56	56	57	58	59	60	61	62
1.40	53	54	55	56	57	58	59	60	61	62	63	64	65	66
1.50	56	57	59	60	61	62	63	64	65	66	67	68	69	70
1.60	59	61	62	63	64	66	67	68	69	70	71	72	73	74
1.70	62	64	65	66	68	69	70	71	73	74	75	76	77	78
1.80	65	67	68	70	71	72	74	75	76	78	79	80	81	82

G-D DROP CHART

GATE OPENNING	STAFF GAUGE READING 2.00	2.10	2.20	2.30	2.40	2.50	2.60	2.70	2.80	2.90	3.00	3.10	3.20	3.3
1.90	68	70	71	73	74	76	77	79	80	81	83	84	85	86
2.00	71	73	74	76	77	79	80	82	83	85	86	88	89	90
2.10	74	75	77	79	80	82	84	85	87	88	90	91	93	94
2.20	76	78	80	82	83	85	87	88	90	92	93	95	96	98
2.30	79	81	83	84	86	88	90	92	93	95	97	98	100	101
2.40	81	83	85	87	89	91	93	95	97	98	100	102	103	105
2.50	83	85	88	90	92	94	96	98	100	101	103	105	107	109
2.60	85	88	90	92	94	97	99	101	103	105	106	108	110	112
2.70	87	90	92	95	97	99	101	103	106	108	110	112	114	115
2.80	89	92	94	97	99	102	104	106	108	111	113	115	117	119
2.90	91	94	97	99	102	104	106	109	111	113	116	118	120	122
3.00	93	96	99	101	104	106	109	111	114	116	118	121	123	125
3.10	94	97	100	103	106	109	111	114	116	119	121	124	126	128
3.20	96	99	102	105	108	111	114	116	119	121	124	126	129	131
3.30	97	101	104	107	110	113	116	118	121	124	126	129	131	134
3.40	98	102	105	109	112	115	118	121	123	126	129	132	134	137
3.50	100	103	107	110	113	117	120	123	126	128	131	134	137	139
3.60	100	104	108	111	115	118	121	125	128	131	134	137	139	142

G-D DROP CHART

GATE OPENNING	STAFF GAUGE READING													
	2.00	2.10	2.20	2.30	2.40	2.50	2.60	2.70	2.80	2.90	3.00	3.10	3.20	3.3
3.70	101	105	109	113	116	120	123	126	130	133	136	139	142	145
3.80	102	106	110	114	118	121	125	128	132	135	138	141	144	147
3.90	102	107	111	115	119	123	126	130	133	137	140	143	146	149
4.00	103	107	112	116	120	124	128	131	135	138	142	145	148	152
4.10	103	108	112	117	121	125	129	133	136	140	144	147	151	154

'D' CANAL
(at 'G-D' Drop)

Klamath Irrigation District

Headwork Location: NE¼ NE¼, Section 35, T40S R10E

Gage: Stilling well with staff plate upstream of headworks between 'G-D' Drop gates and 'G-3' headgate.

Headgates: Consist of threee rectangular weirs with U-bar to insert 2"x4" or 2"x6" planks to control head and flow through weirs. Widths are 5' each. Also there is a fourth weir with a rectangular metal lift gate controlled by a metal lift wheel and screw stock (This gate is rated separately).

Measuring Section: Wooden Bridge in the NE¼ NW¼, Section 36, T40S R10E. Use Canfield Reel and 30 lb. weight. Standard Meter. Should add any headgates open between gates and bridge (2 or 3).

Flow Computation: For three 5' rectangular weirs with stop-logs, measure head at weir lip with special gage. For single metal lift gate use 'G-D' Drop chart. Add for total flow.

Data Needed: Heads at weir lip for three rectangular weirs with stop-logs. Head from upstream stilling well. Gate opening on metal lift gage (found by measuring from top of wheel to top of metal screw stock with tape measure).

Rating Accuracy: Rating of rectangular weirs appears poor at best with questionable accuracy of metal lift structure. This canal should probably be monitored more often than other canals of more accurate rating.

Jim Esget
Field Engineer

KBA_APP_000716

E CANAL

SMEAD®
No. 153L
UPC 10330
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"E" CANAL

KLAMATH IRRIGATION DISTRICT

"E" Canal is periodically measured by Klamath Irrigation District and is rated through a metal liftgate using the equation $Q = CA\sqrt{2g\Delta h}$, (See rating folder for Klamath Irrigation District "E" Canal).

The "E" Canal begins at the Olene Gap flume and runs generally east staying north of Lost River through most of Poe Valley where it ends.

Irrigation water is diverted through pumps and metal headgates and is primarily used for pasture although there is also use on alfalfa and grain fields, with most grain fields being sprinkled. Maximum discharge quantities given for headgates are somewhat greater than maximum quantities actually used since headgates are rarely if ever opened completely. This fact was verified by farmers and ditch riders in the area. The construction of headgates appears somewhat arbitrary and there is a great variety of culvert sizes, slopes and depth of construction with little correlation to amount of land presently being irrigated.

Stock use is generally from the irrigation systems or directly from the canals during irrigation season, and is from groundwater seepage in drains or other sources such as groundwater wells during other months when the "E" Canal is dry.

Irrigation from the "E" Canal involves generally the area between "E" Canal and Lost River. This land was flood irrigated in the past and is included in Klamath Irrigation District. There are also pumps on "E" Canal which pump to land above (north generally) the canal. This land can be listed in two groups. One is lands covered by Warren Act Contracts which generally in the past used turbine pumps which lifted water to gravity flow ditches above the canal. Second is lands included in Klamath Basin Improvement District and includes lands without a Warren Act Contract or supplementary to Warren Act Contract lands which use pump and sprinkler systems and were generally developed more recently than that land involved in Warren Act contracts.

The "E" Canal now ends on the Lost River Ranch in the SW¼ NW¼, Section 26 where the canal is completely covered over and according to Mr. Kennedy the owner of Lost River Ranch, it has been that way for about two years.

Jim Esget
Field Engineer

" E " CANAL

LOCATION	NAME	HDGT.	SIZE	SLOPE	length	Inlet Head	Outlet Hd.	Cor.Type	Photo #	Notes	Q
SW¼, NE¼ SEC 14 LOT 3 T 39S R [redacted] 10E	DeHoop	hdgt.	18"cmp	9.3'n 35'	35' +42'= 77'	.6' inlet	0' outlet	annular	1-0099-A	2 slopes - bend in culvert type E Flow free outfall	9.3cfs

LOCATION	NAME	PUMP	MOTOR	Sprinkler Heads & Line, Lifts, etc.	Quantity
NW¼, SE¼ SEC 11 T 39S R [redacted] 10E	Marshall	turbine	U.S. Electric Motor Hollashaft - high thrust 60 cycle - 75 h.p. Model # R-2842-02-171-0 Serial # R2035465 Electricla source 480 volt power line	Intake Size - 8" I.P. Suction Lift - 5' Outlet Size - 15" I.P. Discharge Lift - 38' Discharge to Ditch	5,200 g.p.m.
SW¼, NE¼ SEC 11 24"cmp max. head 1.0' above top of leading to sump. T 39S, R 10E	Fairclaw	Pamona Niagra turbine pipe	G.E. Motor, Denver, Colo. 40 h.p. - 60 cycle, 1800 rpm no model or serial no. apparent Discharge to two ditches Electrical source 480 volt power line	Intake Size - 11" I.P. Suction Lift - 8' Outlet Size - 12" I.P. Discharge Lift: Lower Ditch 1) 12' Upper Ditch 2) 16'	5,400 g.p.m.
SE¼, NW¼ SEC 12 check with irrigation Dist. on this land T 39S, R 10E	Stevenson	Berkely Pump centrifugal	Franklin Electric 2 h.p., 3450 rpm Model # 1103052412 Serial # 7375375 450' sprinkler handline size 2" a.p. current source 120 volt house line	Intake Size - 2" abs pipe Suction Lift - 2' Outlet Size - 2" al pipe Discharge Drop - 5' ave. 10 rainbird heads - 7/64" 3" AP inlet	~~assume 20psi~~ ~~15 g.p.m.~~ 30 g.p.m.
NW¼, NE¼ SEC 12 T 39S, R 10E	Fairclaw	Pacific Pump centrifugal	U.S. Electric Motors 50 h.p., 60 cycle, 1765 rpm Type R-1, no serial # ID# GP 1053634 North Field - 80' handline only (8# size) found South Field - 1400' mainline 6" 2400' wheel line 5" 30 weather tec heads 9/32"	Intake Size - 8" I.P. Suction Lift - 4' Outlet Size - 8" A.P. Discharge Lifts: Lower Field - 2' ave drop Upper Field - 3' lift electrical source 480 volts	610 g.p.m.
SE¼, NE¼ SEC 12 T 39S, R 10E	Marshall	belt driven turbine pump pulley 12" Motor pulley 5"	Ajax Electric 7½ h.p.	Discharge to two ditches Discharge lifts 15' and 25'- 20' ave. Suction Lift - 0' Assume pump 60% efficient	890 g.p.m.

LOCATION	NAME	HDGT.	SIZE	SLOPE	length	Inlet Head	Outlet Hd.	Cor.Type	Photo #	Notes	Q
SE¼,NE¼ SEC 12 T 39 S, R 10 E	Marshall	hdgt.	12"cmp	.1'n 15'	15'	.9' inlet	.8' outlet	Annular	1-0099-A	Type A Flow	1.6cfs
NE¼, SE¼ SEC 12 T 39S, R 10E	do	do	24"cmp	.3'n 20'	20'	.6' inlet	0 outlet	Annular	do	Free Outfall Type C or D	17cfs
NE¼, SE¼ SEC 12 T 39S, R 10E	do	do	18"cmp	.0'n 20'	20'	.6 inlet	.5 outlet	Annular	do	Type A Flow	2.7cfs
NE¼, SE¼ SEC 12 T 39S, R 10E	do	do	24"cmp	.0'n 20'	20'	.5 inlet	0 outlet	do	do	Type C or D	14cfs
NE¼, SE¼ SEC 12 T 39S, R 10E	do	do	18"cmp	.1'n 20'	20'	.9 inlet	.7 outlet	do	do	Type A Flow	4.7cfs
NE¼, SW¼ SEC 18 T 39S, R 11½E	do	do	18"cmp	0'in 20'	20'	1.4'inlet	1.1 outlet	do	do	Type A Flow	4.7cfs

LOCATION	NAME	PUMP	MOTOR	Sprinkler Heads & Line, Lifts, etc.	Quantity
NE¼, SW¼ SEC 18 T 39S, R 11½E	Marshall	Cornell centrifugal	General Electric 50 h.p. Model # 5K324JL156A	1880' of 6" AL Mainline 1) 1320' of 4" AL Wheel line 1) 9/32" -33 2) 200' of 4" AL Handline 2) ¼" - 5 3) 2400' of 3" AL Handline 3) ¼" - 60 Suction Lift - 2.5' size 6" only 50 heads run at one time Discharge Lift - 5' ave Outlet size 6"	710 g.p.m.

NE¼, SW¼ SEC 18 T 39S, R 11½E	do	hdgt	18"cmp	.6 n 19'	19'	.6'	0	Annular	1-0099-A	Type C or D Flow	7.3cfs
SW¼, SE¼ SEC 18 T 39S, R 11½E	do	do	18"cmp	.4 n 25'	25'	.6	0	do	do	Type ~~A Flow~~ C or D Flow	8.5cfs
SW¼, SE¼ SEC 18 T 39S, R 11½E	do	do	18"cmp	.5 n 22'	22'	1.0'	.9'	do	do	Type A Flow	2.7cfs
SE¼, SE¼ SEC 18 T 39S, R 11½E	Chapman	do	18"cmp	.7 n 22'	22'	.8	1.2'	do	1-0098-A	Type A Flow	4.6cfs
NE¼, NE¼ SEC 19 T 39S, R 11½E	do	do	18"cmp	0' in17'	17'	.4	—	do	do	Area of Outlet 50% of pipe Type B Flow	4.5cfs

NW¼, NW¼ SEC 20 T 39S, R 11½E	do	Cornell centrifugal	General Electric 40 h.p.	Suction Lift - 3' size 5" Discharge Lift ave. 5' - 4" size ave. for north field only 7920' of 6" AL Mainline 3/16" - 45 3960' of 4" AL Mainline 3/16 x 1/8 - 45 1760' of 3" AL Handline 3/16 x 3/32 - 50	810 g.p.m.

KBA_APP_000720

LOCATION	NAME	HDGT.	SIZE	SLOPE	length	Inlet Head	Outlet Hd.	Cor. Type	Photo #	Notes	Q
NW¼, NW¼ SEC 20	Newman	hdgt.	18"cmp	.1 in 12'	12'	.9'	0'	Annular	1-0098-A	Flow Type B	9.0cfs

LOCATION	NAME	PUMP	MOTOR	Sprinkler Heads & Line, Lifts, etc.	Quantity
SE¼, NW¼ SEC 20 *note - also irrigates around house with same pump T 39S, R 11½E	Newman	Cornell model centrifugal	4WB30 - 2 Marathon Electric Pump 30 h.p., 3450 rpm, 3 phase Model EE 284TTDR 7625 AAW Serial No. 1034012	Intake Size - 8" I.P. Suction Lift - 8' Outlet Size 6" AL pipe Discharge Drop - 4' ave. 36 Rainbird heads - 5/32" 1500' 6" mainline 1440' 3" handline *note - he has extra line on had to sell	280 g.p.m.
SE¼, NW¼ SEC 20 T 39S, R 11½E	Woodwicks Case - Mills	Morse centrifugal	Fairbanks Morse Line Star type Q7K 15 h.p., 3 phase, 60 cycles 1745 rpm - full load #577201 Electrial source 24o volts	Intake Size - 6" I.P. Suction Lift - 7' Outlet Size - 3½ pcv Discharge Lift - 3', to branch - Mills, Woodwicks Woodwicks 5-3/16" 440' - 3" handline Rainbird heads 4-5/32" Woodwicks 4' - 7' lift range Mills - see file Case - lower field	270 g.p.m.

SE¼, NW¼ SEC 20 T 39S, R 11½E	Case	hdgt.	18"cmp	On 12'	12'	.6'	0'	Annular	1-0098-A	Flow Type B	7.3cfs
SE¼, NW¼ SEC 20 T 39S, R 11½E	~~De Argello~~ Durighello	do	18"cmp	O n 14'	14'	.8'	0'	Annular	do	Flow Type B	8.0cfs
SE¼, NE¼ SEC 20 T 39S, R 11½E	~~Hovell~~ Sullivan	do	18"cmp	.4'n80'	80'	.7'	0'	Helical	do	Flow Type B	8.4cfs

LOCATION	NAME	PUMP	MOTOR	Sprinkler Heads & Line, Lifts, etc.	Quantity
SE¼, NW¼ SEC 21 T39S, R 11½E	Wilkenson compute separately	Berkely Pump centrifugal	Century Pump motor 20 h.p., 3 phase, 3500 rpm Part # 6-321219-01 electrical source 480 volts	Intake Size - 5" I.P. Suction Lift - 5' Outlet Size - 5" A.P. Inlet to Sump 12" cmp max. head 1.4' above top Discharge Lifts: North Fields - 12' ave lift South Fields - 10' ave. drop below road - 5' drop to 16' drop 30 3/16" rainbird heads 3" handline Upper Field: 70' 5" mainline 1080' - 3" handline A.P. 27 - 3/16" Rainbird heads Lower Field: 80' 5" mainline A.P. connected to 53' 3" mainline A.P. below road 600' 5" mainline A.P. 1200' 3" handline A.P. approx. 500' of 3½" A.P. joins lower mainline (including 53' mentioned above).	280 g.p.m. to pump.

LOCATION	NAME	HDGT.	SIZE	SLOPE	length	Inlet Head	Outlet Hd.	Cor.Type	Photo #	Notes	Q
SE¼, NW¼ SEC 21 T39S, R 11½E	Wilkenson	hdgt.	12"cmp	0'n 12'	12'	1.3'	0'	Annular	1-0098-B	Flow Type B	4.5cfs
SW¼, NE¼ SEC 21 T39S, R 11½E	De Jong	do	12"cmp	7.6'n250'	250'	1.0'	0'	do	do	Flow Type B	3.4 cfs

SW¼, NE¼ SEC 21 T39S, R 11½E	De Jong compute together Mr. De Jong does not holding pond.	Cornell centrifugal pump into	General Electric 30 h.p. Model # 5K284 - JL158A	Ave. 11' discharge lift size 6" I.P. Suction Lift 5' size 6" S.P. Southwest - 50' of 4" S.P., 90' of 4" A.P. 200' of 3" A.P. mainline. 450' of 3" A.P. Handline 11 - 13/64" heads Southeast - 50' of 4" SP., 600' of 4" A.P., 240' - 3" A.P. connected to a Nelson 100-FA w/.60" nozzle Northwest - 510' of 5" A.P., 520' of 3" A.P. mainline connected to a Nelson 100-FA nozzle size .7" Northeast- 510' of 5" A.P., 520' of 3"A.P. to two Nelson 100-FA guns, nozzles .6" each.	290 g.p.m.

" E " CANAL

LOCATION	NAME	HDGT.	SIZE	SLOPE	length	Inlet Head	Outlet Hd.	Cor. Type	Photo #	Notes	Q
SE¼, NE¼ SEC 21 T39S, R 11½ E	De Jong	hdgt.	18"cmp	.2'n18'	18'	1.2'	0'	Annular	1-0098-B	Flow Type B	10cfs

LOCATION	NAME	PUMP	MOTOR	Sprinkler Heads & Line, Lifts, etc.	Quantity
SE¼, NE¼ SEC 21 T39S, R 11½ E	De Jong both pumps connected to common mainline	Berkeley centrifugal Berekely centrifugal	U.S. Electric Uniclosed Motor 30 h.p., Model # 9200782 - 854 Century Electric Motor 30 h.p., Model #SC-324UY-9-003652-00	Suction Lift - 7' size 6" I.P. Discharge Lift ave. 60' size 4" I.P. Handline - 3/16" - 35 heads 990' of 8" A.P. Mainline 270' of 6" A.P. Mainline 990' of 6" A.P. Mainline Wheel lines 1) 1360' of 4" A.P. heads 9/32" - 2, 3/16" - 25, 3/8 - 2, 11/64 - 5 2) 1320' of 4" A.P. heads 9/32" -31, 3/16" - 2	970 g.p.m.

SE¼, NE¼ SEC 21 T39S, R 11½ E	De Jong	hdgt.	18'cmp	.3' n 18'	18'	1.7'	0'	Annular	1-0098-B	Flow Type B	12cfs
NE¼, SE¼ SEC 21 T39S, R 11½ E	do	do	18'cmp	.2' n 18'	18'	1.0'	0'	do	do	Flow Type B	9.1cfs
NE¼, SE¼ SEC 21 T39S, R 11½ E	do	do	12"cmp	.2' n 15'	15'	1.6'	0'	do	do	Flow Type B	5.0cfs
NW¼, SW¼ SEC 22 T39S, R 11½ E	Horton	do	18"cmp	.7' n 25'	25'	2.0'	0'	do	do	Flow Type B	13cfs
NW¼, SW¼ SEC 22 T39S, R 11½ E	do	do	12"cmp	1.0'n26'	26'	2.2'	0'	do	do	Flow Type B	5.5cfs
NW¼, SW¼ SEC 22 T39S, R 11½ E	do	do	24"cmp	0' n 72'	72'	1.0'	0'	do	do	Flow Type C or D	13cfs
SE¼, SW¼ SEC 22 T39S, R 11½ E	Lost River Ranch	do	12"cmp	1.o'n18'	18'	.9'	0'	do	do	Flow Type B	4.6cfs
SE¼, SW¼ SEC 22 T39S, R 11½ E	do	do	18"cmp	0' n 24'	24'	.2'	0'	do	do	Flow Type C or D	5.3cfs
SE¼, NW¼ SEC 27 T39S, R 11½ E	do	do	12"cmp	.7'n 22'	22'	.9'	0'	do	do	Flow Type B	4.2cfs
SW¼, NE¼ SEC 27 T39S, R 11½ E	do	do	12"cmp	.6'n 20'	20'	1.2'	0'	do	do	Flow Type B	4.5cfs
NW¼, SE¼ SEC 27 T39S, R 11½ E	do	do	18"cmp	.5'n 20'	20'	1.8'	0'	do	do	Flow Type B	13cfs
SE¼, NE¼ SEC 27	do	do	18"cmp	.4 n 15'	15'	1.0'	0'	do	do	Flow Type B	11cfs
SE¼, NE¼ SE 7	do	do	12"cmp	0' 24'	24'	.6'	0'	do	do	Flow Type B	2.4cfs

LOCATION	NAME	PUMP	MOTOR	Sprinkler Heads & Line, Lifts, etc.	Quantity
SW¼, NW¼ SEC 26 T39S, R11½E Note - Mr. Kennedy & his manager stated that "E" Canal had been covered over for about two years. See photo for area covered over.	Lost River Ranch Mr. Kennedy	Cornell centrifugal Berkely centrifugal	General Electric Triclad AC motor 30 h.p., Model# 5K284 JN 1107, #KJ Marathon Electric Motor 30 h.p.,Model DB 284 TTDR 7312 AAW type - TDR-BCZ	Suction Lift - 6' size 8" I.P. (both) Discharge Lift - ave. north - 14' } ave. by area south - 7' } Discharge Size - 6" I.P. (both) 1260' - 8" A.P. Mainline 2460' - 6" A.P. Mainline 2700' - 3" A.P. Handline heads 5/32" - 10 9/64" - 80 Wheel lines 1) north 4" A.P. 9/64" - 39, 7/64" - 1 2) center 4" A.P. 9/64" - 35, 5/32" - 1 3) south 5" A.P. 9/64" -15, 3/16" - 42	780 g.p.m.

9-275-G
11-75

STATE OF OREGON
WATER RESOURCES DEPARTMENT

DISCHARGE MEASUREMENT NOTES

File No. .....
Meas. No. .....
Comp. by NZR
Checked by .....

Stream E. Canal

Date 6-15-, 1981 Party OWS

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

Method ..... No. secs..... G. H. change ..... in ..... min.

Method coef. ..... Hor. angle coef. ..... Susp. coef. ..... Meter No. S-68

Date rated .....

Spin before meas. ..... after .....

Wading, cable, ice, boat, upstr., downstr., side bridge ..... feet, mile, above, below gage and .....

Plank across canal at gage

Tags checked .....

Meter suspended from rod, or

..... ft. above bottom ..... lb. ..... weight.

Levels obtained .....

GAGE READINGS				
Time		Recorder	Inside	Outside
1020	Start		upper	2.56
			lower	2.20
				0.36
1100	Finish			2.56
				2.20
				0.36
Weighted M. G. H.				
G. H. correction				
Correct M. G. H.				

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

Flow fairly uniform Weather Clear warm

Other ..... Air .....°F@ .....

Gage ..... Water .....°F@ .....

..... Record removed ..... Intake flushed U L

Observer .....

Control ..... Left gate closed

Remarks Some moss ~~Lower~~ Right ~~Upper~~ gate open 1.4'

G. H. of zero flow ..... ft.

Q FROM CHART = 16 cfs

.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
	2.4	.30			HEW	1020					
	3.0	.55	1.4		10	41	.561				
	3.5	.5	1.7		15	56	.614				
	4.0	.5	1.8		15	45	.758				
	4.5	.5	2.0		15	58	.594				
	5.0	.5	2.1		15	48	.712				
	5.5	.5	2.2		20	43	1.05				
	6.0	.5	2.3		20	48	.941				
	6.5	.5	2.35		20	50	.904				
	7.0	.5	2.4		15	44	.774				
	7.5	.5	2.45		20	47	.960				
	8.0	.5	2.6	.2	30	48	1.40	1.06			
				.8	15	48	.712				
	8.5	.5	2.5		30	47	1.43	1.12			
⊙					15	42	.810				
	9.0	.5	2.6	.2	20	39	1.15	.938			
				.8	15	47	.727				
	9.5	.5	2.4	.6	20	44	1.02	1.00			
	10.0		2.2		20	46	.980				
	10.5	.5	2.1		15	45	.758				
	11.0	.5	2.0		15	48	.712				
	11.5	.5	1.5		20	45	1.00				
	12.0	.5	1.2		20	39	1.15				
	12.5	.75	.9		15	46	.742				
	13.5	.5	REW @		1100						
	11:										

.80 .85 .90 .92 .94 .96 .97 .98 .99 1.00 .99 .98 .97 .96 .94 .92 .90 .85

.0 .10 .20 .30 .40 .50 .60 .70 .75 .80

Rating Eqn error from measurement
6%

9-275-G
11-75

STATE OF OREGON
WATER RESOURCES DEPARTMENT

File No. .....
Meas. No. .....
Comp. by JAE
Checked by NZR

DISCHARGE MEASUREMENT NOTES

Stream "E" Canal KID

Date 9-30, 19 80 Party Esget, J. A.

Width 10.0 Area 14.7 Vel. 1.52 ΔH ave .90 Disch. 22.3

Method 6 No. secs. 20 G. H. change ..... in ..... min.

Method coef. 1 Hor. angle coef. 1 Susp. coef. 1 Meter No. 5-69

Date rated 4-11-69

Spin before meas. ✓ after ✓

Wading, cable, ice, boat, upstr., downstr., side bridge 100 feet mile, above, below ~~gage~~ and head works

Tags checked .....

Meter suspended from rod, or

..... ft. above bottom ..... lb. ..... weight.

Levels obtained .....

GAGE READINGS				ΔH
Time		~~Recorder~~	~~Inside~~	~~Outside~~ above / below
		2.55	1.64	0.91
1630	Start			
1710	Finish	2.53	1.63	0.90
Weighted M. G. H.				
G. H. correction				
Correct M. G. H.				

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

Flow regular Weather Clear, Warm

Other ..... Air ..... °F@ .....

Gage ..... Water ..... °F@ .....

..... Record removed ..... Intake flushed U L .....

Observer .....

Control .....

Remarks Right $h_1 = .59'$ $w_1 = 3.75'$
Left $h_2 = .54'$ $w_2 = 3.73'$

G. H. of zero flow ..... ft.

$Q = .65 A\sqrt{2gh}$

$\Delta H ave = .90$
$A_1 = 2.21$
$A_2 = 2.01$

$Q_1 = 10.94$
$Q_2 = 9.95$ } 20.89

.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 64 151	Discharge @1630
	2.5	.50	0		LCW		0	0		0	0
	3.5	.75	.90	.6	15	44		.77		.68	.52
	4.0	.50	1.00		15	43		.79		.50	.40
	4.5		1.20		20	42		1.07		.60	.64
	5.0		1.45		25	43		1.30		.72	.94
	5.5		1.55		30	46		1.46		.78	1.14
	6.0		1.55		30	44		1.52		.78	1.19
	6.5		1.65		30	45		1.49		.82	1.22
	7.0		1.75		30	40		1.67		.88	1.47
	7.5		1.85		30	43		1.56		.92	1.44
	8.0		2.00		30	41		1.63		1.00	1.63
	8.5		2.05		40	49		1.82		1.02	1.86
	9.0		2.10		40	48		1.86		1.05	1.95
.98	9.5		2.05		40	49		1.82	1.78	1.02	1.82
⊙	10.0		2.10		40	50		1.78		1.05	1.87
	10.5		1.80		40	51		1.75		.90	1.58
.99	11.0		1.55		40	51		1.75	1.73	.78	1.35
	11.5		1.30		25	47		1.19		.65	.77
	12.0	.50	1.10	.6	20	46		.98		.55	.54
	12.5	.25	RCW		@	1710	0	0		0	0
	10.0	10.0								14.70	22.33
						64	150				

.80 .85 .90 .92 .94 .96 .97 .98 .99 1.00 .99 .98 .97 .96 .94 .92 .90 .85

.0 .10 .20 .30 .40 .50 .60 .70 .75 .80

-.04
-.01

9-275-F
11-75

STATE OF OREGON
WATER RESOURCES DEPARTMENT

DISCHARGE MEASUREMENT NOTES

File No. .....
Meas. No. .....
Comp. by DLW
Checked by DEK

Stream E. CANAL, KLAMATH PROJECT USBR, KID
Date AUG 24, 1983 Party KNAUER WESTON
Width 108 Area 143 Vel. 1.35 G. H. — Disch. 194
Method 6 No. secs. 16 G. H. change — in — min.
Method coef. 1 Hor. angle coef. 1 Susp. coef. 1 Meter No. S-68
Date rated .....
Spin before meas. ..... after .....
Wading, cable, ice, boat, upstr., downstr., side bridge 150 feet, mile, above, below gage and .....

GAGE READINGS				
Time		~~Recorder~~	~~Inside~~	~~Outside~~
1100		DS. 1.58	UP. 2.56	
	Start			
1:20	Finish	DS. 1.57	US 2.58	
Weighted M. G. H.				
G. H. correction				
Correct M. G. H.				

Tags checked .....
Meter suspended from rod, or .....
..... ft. above bottom ..... lb. ..... weight.
Levels obtained .....

Measurement rated excellent (2%), good (5%), fair (8%), poor (over 8%), based on following conditions: Cross section PIPE & CONCRETE
Flow FAIRLY UNIFORM Weather SUNSHINE
Other ..... Air .....°F@ .....
Gage OK Water .....°F@ .....
..... Record removed ..... Intake flushed U L .....
Observer .....
Control CHANNEL CLEAR
Remarks .....
NW¼ SW¼ SEC 14 T39S R10E
G. H. of zero flow ..... ft.

ΔH = 0.98
ΔH = 1.01
1.00

NEED GATE OPENINGS

.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	
	6.7	0.4	R.E.W		1:00	P.M. .849				—	—	
	7.5	0.75	0.4		15	40	.849			0.3	0.25	.85
	8.2	0.35	0.8		25	42	1.33			0.56	0.74	
	8.9		1.3		30	47	1.43			0.91	1.30	
	9.6		1.85		30	44	1.52			1.3	1.98	.90
	10.3		1.9		30	45	1.49			1.33	1.98	.92
	11.0		1.9		30	43	1.56			1.33	2.07	.94
	11.7	0.7	1.9		30	44	1.52			1.33	2.02	
	12.4		1.8		25	44	1.27			1.26	1.60	.96
	13.1		1.8		25	44	1.27			1.26	1.60	.97
	13.8		1.7		25	42	1.33			1.19	1.58	.98
	14.5		1.5		25	40	1.40			1.05	1.47	.99
	15.2	0.7	1.4		25	44	1.27			0.98	1.24	
	15.9	0.35	1.2		20	41	1.10			0.84	0.92	
⊙	16.6	0.8	0.9		20	47	.960			0.63	0.60	1.00
	17.5	0.45	L.E.W		1:20	P.M.				0.22	—	
	10.8	6.6								14.27	19.35	
		10.85								14.3	19.4	.99
										14.36	19.44	.98
												.97
												.96
												.94
												.92
												.90
												.85

.0 .10 .20 .30 .40 .50 .60 .70 .75 .80

9-275-F
11-75

STATE OF OREGON
WATER RESOURCES DEPARTMENT

DISCHARGE MEASUREMENT NOTES

File No. .....
Meas. No. .....
Comp. by JW
Checked by SFM

Stream E-CANAL KID. USBR

Date 9-11-85, 19..... Party K.-W.-S.

Width 10.0 Area 13.7 Vel. 1.19 G. H. 1.47 Disch. ~~16.0~~ 16.3

Method 6 No. secs. 18 G. H. change 0 in 25 min.

Method coef. 1 Hor. angle coef. 1 Susp. coef. 1 Meter No. PIGMY 3010 W-270073

Date rated 10-29-66

GAGE READINGS		UP	DOWN	
Time		Recorder	~~Inside~~	~~Outside~~
11:15			2.57	1.47
	Start			
11:40	Finish		N/C	
Weighted M. G. H.				
G. H. correction				
Correct M. G. H.				

Spin before meas. ..... after .....

Wading, cable, ice, boat, upstr., downstr., side bridge 100 feet, mile, above, below gage and .....

Tags checked .....

Meter suspended from rod, or

..... ft. above bottom ..... lb. ..... weight.

Levels obtained .....

Measurement rated excellent (2%), good (5%), fair (8%), poor (over 8%), based on following conditions: Cross section 60% CONC. LINED, 40% DIRT CANAL

Flow CHANNELED RIGHT Weather SUNNY

Other ..... Air 65 °F@ .....

Gage ..... Water ..... °F@ .....

..... Record removed ..... Intake flushed U L .....

Observer .....

Control APPEARS OK

Remarks .....

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
	14.0	0.5 R.E	W.O							0	
	13.0	0.85	0.6	.6	30	40	.769			.510	.392
	12.3	0.65	1.0	.6	50	49	1.03			.650	.670
	11.7	0.55	1.5	"	50	47	1.07			.825	.883
	11.2	0.5	1.9	"	60	44	1.36			.950	1.29
	10.7	0.5	1.9	"	60	43	~~1.17~~ 1.39			.950	~~1.11~~ 1.32
	10.2	0.5	1.9	"	60	40	1.49			.950	1.42
⊙											
	9.7	0.5	1.9	"	50	42	1.19			.950	1.13
	9.2	0.5	1.9	"	60	45	1.33			.950	1.26
	8.7	0.5	1.9	"	60	47	1.28			.950	1.22
	8.2	0.5	1.9	"	50	40	1.25			.950	1.19
	7.7	0.5	1.9	"	60	46	1.30			.950	1.24
	7.2	0.5	1.8	"	50	43	1.17			.900	1.05
	6.7	0.5	1.7	"	50	44	1.14			.850	.969

.80 .85 .90 .92 .94 .96 .97 .98 .99 1.00 .99 .98 .97 .96 .94 .92 .90 .85

.0 .10 .20 .30 .40 .50 .60 .70 .75 .80

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
	6.2	0.5	1.5	"	50	48	1.05			.750	.788
	5.7	0.5	1.4	"	50	47	1.07			.700	.749
	5.2	0.85	1.1	.6	30	42	.734			.935	.686
	4.0	0.5	0		L.E.W.		.0			0	0
										13.7	~~16.0~~ 16.3
	10.0	10.0									

9-275-G
11-75

STATE OF OREGON
WATER RESOURCES DEPARTMENT

DISCHARGE MEASUREMENT NOTES

File No. .....
Meas. No. .....
Comp. by JAE
Checked by NZR

Stream "E" Canal K10

Date 9-30, 1980 Party Esget, J.A.

Width 10.5 Area 15.8 Vel. 1.59 G. H. — Disch. 25.2

Method 6 No. secs. 21 G. H. change — in — min.

Method coef. 1 Hor. angle coef. 1 Susp. coef. 1 Meter No. S-68

Date rated 4-11-69

Spin before meas. ✓ after ✓

Wading, cable, ice, boat, upstr., downstr., side bridge ..... feet, mile, above, below gage and 120 feet below headgate on wooden walkway

Tags checked .....

Meter suspended from rod or .....

..... ft. above bottom ..... lb. ..... weight.

Levels obtained .....

GAGE READINGS				
Time		~~Above Recorder~~	~~Below Inside~~ HG	Outside
		~~2.21~~	~~1.21~~	
1135	Start	~~2.21~~	~~1.21~~	—
		gates moved during measurement		
1200	Finish	~~2.68~~	~~1.55~~	~~1.63~~
Weighted M. G. H.				
G. H. correction				
Correct M. G. H.				

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

Flow regular Weather Clear, Warm

Other ..... Air 72 °F@ 1200

Gage ..... Water 62 °F@ 1200

..... Record removed ..... Intake flushed U L

Observer .....

Control Rectangular Headgate

Remarks Ditch Rider moved headgate after measurement. Cannot be used to check rating.

G. H. of zero flow ..... ft.

KBA_APP_000734

.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
										LEW @	1135
	1.0	.50	0		0	0				0	0
	2.0	.75	.70		15	48		.71		.52	.37
	2.5	.50	1.05		15	40		.85		.52	.44
	3.0		1.25		20	42		1.07		.62	.66
.99	3.5		1.40		25	41		1.36	1.35	.70	.94
	4.0		1.55		30	45		1.49		.78	1.16
	4.5		1.65		30	45		1.49		.82	1.22
	5.0		1.70		30	39		1.71		.85	1.45
	5.5		1.80		30	40		1.67		.90	1.50
	6.0		2.00		40	50		1.78		1.00	1.78
	6.5		2.05		40	49		1.82		1.02	1.86
	7.0		2.15		40	50		1.78		1.08	1.92
	7.5		2.15		40	46		1.93		1.08	2.08
	8.0		2.15		40	45		1.98		1.08	2.14
⊙	8.5		2.20		40	47		1.89		1.10	2.09
	9.0		1.95		40	49		1.82		.98	1.78
	9.5		1.90		40	49		1.82		.95	1.73
	10.0		1.45		30	40		1.67		.72	1.20
	10.5		1.25		10	46		.50		.62	.31
	11.0	.50	.90		25	48		1.17		.45	.53
	11.5	.25	REW		@	1200				0	0
	10.5	10.5								15.79	25.16

GH above 2.68
below 1.25
at measuring site 1.62

.0 .10 .20 .30 .40 .50 .60 .70 .75 .80

.80 .85 .90 .92 .94 .96 .97 .98 .99 1.00 .99 .98 .97 .96 .94 .92 .90 .85

'E' CANAL

Klamath Irrigation District

Headwork Location: NW¼ SW¼, Section 14, T39S R10E

Gages: Two stilling wells with staff plates, one upstream of headworks and one downstream, both on left bank.

Gates: Two metal rectangular lift gates with metal wheels and screw stock. Gate widths - right 3.75', left 3.73'. Note right or left gate openings.

Measuring Section: Wooden walkway approximately 200 feet downstream of gates. Use standard wading rod and standard meter.

Flow Computation: $Q = .65\ A \sqrt{2\ g\Delta H}$ (for each gate)

Where ΔH = head differential through gates or upper well reading minus lower well reading.

A = gate width x h_1 where h_1 = gate opening - obtained by measuring from top of wheel to top of screw stock on each gate.

Example: Upstream Well - 2.54 before and after measuring

Downstream Well - 1.64 before and after measuring

Gate opening Right - .59

Left - .54

$Q_1 = .65\ A \sqrt{2 \cdot g \cdot \Delta H} = .65(.59 \cdot 3.75) \sqrt{2 \cdot g \cdot (2.54 - 1.64)} \cong 10.9$

$Q_2 = .65\ A \sqrt{2 \cdot g \cdot \Delta H} = .65(.54\ \ 3.73) \sqrt{2 \cdot g\ \Delta H} \cong 10.0$

Q Total $\cong$ 20.9 c.f.s.

Rating Accuracy: 'C' value appears good.

Jim Esget
Field Engineer

FLOW CHART FOR E-CANAL HEADWORKS (EACH GATE)

GATE OPENING (FEET)

HEAD ACROSS GATE - ΔH (FEET)	.1	.2	.3	.4	.5	.6	.7	.8	.9	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.1	2.2	2.3	2.4	2.5	2.6
.1	1	1	2	2	3	4	4	5	6	6	7	7	8	9	9	10	10	11	12	12	13	13	14	15	15	16
.2	1	2	3	3	4	5	6	7	8	9	10	10	11	12	13	14	15	16	16	17	18	19	20	21	22	22
.3	1	2	3	4	5	6	7	8	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25		
.4	1	2	4	5	6	7	9	10	11	12	13	15	16	17	18	20	21	22	23	24	26					
.5	1	3	4	5	7	8	10	11	12	14	15	16	18	19	21	22	23	25	26							
.6	1	3	4	6	7	9	10	12	13	15	16	18	19	21	22	24	25									
.7	2	3	5	6	8	10	11	13	15	16	18	19	21	23	24	25										
.8	2	3	5	7	9	10	12	14	16	17	19	21	22	24	26											
.9	2	4	6	7	9	11	13	15	17	18	20	22	24	26												
1.0	2	4	6	8	10	12	14	15	17	19	21	23	25													
1.1	2	4	6	8	10	12	14	16	18	20	22	24	26													
1.2	2	4	6	8	11	13	15	17	19	21	23	25														
1.3	2	4	7	9	11	13	15	18	20	22	24	26														
1.4	2	5	7	9	11	14	16	18	21	23	25															
1.5	2	5	7	9	12	14	17	19	21	24	26															
1.6	2	5	7	10	12	15	17	20	22	24	27															
1.7	3	5	8	10	13	15	18	20	23	25																
1.8	3	5	8	10	13	16	18	21	23	26																
1.9	3	5	8	11	13	16	19	21	24	27																
2.0	3	5	8	11	14	16	19	22	25																	

1. READ GAGES TO FIND AVAILABLE HEAD.
2. DETERMINE FLOW NEED THROUGH EACH GATE. TRY TO KEEP GATES EVEN.
3. FIND REQUIRED GATE OPENING AT TOP OF CHART. MEASURE GATE STEM.
4. LARGE CHANGES WILL CAUSE ΔHEAD TO CHANGE. READJUST GATE OPENING AFTER FLOW STEADIES DOWN.

$$Q = .65\ A\sqrt{2GH}$$

0-107-

STATE OF OREGON

OFFICE OF STATE ENGINEER

Water Resources Department

Year .....

File No. .....

Discharge measurements of "E" Canal, Klamath Irrigation District

....., *during the year ending September 30, 19*.....

No.	Date	Made by	Width Feet	Area Sq. ft.	Mean Velocity Ft./Sec.	Gage Height Feet	Discharge C.F.S.	Equation Rating Corr.	Equation Rating % diff	Method	Meas. Secs. No.	G. Ht. Chgs. Ft.	Time Min.	Temperature Wtr.	Temperature Air	REMARKS
	9/30/80	Esgat				–	25.2									
	9/30/80	Esgat				–	22.3	22.9	6%							
	9/11/85	KNAUER WETZEL STUNTEBECK				–	16.3									

* Geological Survey Engineer

F CANAL

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"F" CANAL

KLAMATH IRRIGATION DISTRICT

December 5, 1980

"F" Canal has been periodically measured by Klamath Irrigation District hydrologist and is rated through two rectangular metal lift gates using equation $Q = CA\sqrt{2g\Delta h}$. (See rating folder for Klamath Irrigation District "F" Canal).

The "F" Canal begins at the ~~south~~ NORTH end of the Olene Gap flume and runs generally east staying south of Lost River through most of Poe Valley where it ends.

Irrigation and stock uses are much the same as described for "E" Canal which runs north of Lost River in the same area. Also pumping above the canal is covered in the same manner, through Warren Act Contracts and the Klamath Basin Improvement District as is the "E" Canal. (See "E" Canal folder Klamath Irrigation District).

Jim Esget
Field Engineer

" F " CANAL

Location	Owner	Hdgt.	Size	Length	Slope	Head Inlet	Head Outlet	Corrugation	Photo	Notes	Q
NE¼, SE¼ SEC 14 T39S, R 10E LOT 10	Taylor High	Hdgt.	18"cmp	19'	0	1.4	0	Annular	1-0098-A	Type B Flow	10 cfs

LOCATION	OWNER	PUMP	MOTOR	Sprinkler Heads & Line, Lifts, etc.	Quantity
NE¼, SE¼ SEC 14 T39S, R.10E LOT 10	Taylor High	Centrifugal	Uniclosed Motor ID # 940 1912-355 BR 21924 40 hp Lifts: Suction Lift 7' - 6" I.P. Discharge Lift 30' ave - 4" I.P.	600' - 12" I.P. Mainline 1000' - 4" A.P. Handline - 25-3/16" heads -40' spacing 1000' - 3" A.P. Handline - 25-3/16" heads-40' spacing	460 g.p.m.

SW¼, NW¼ SEC 13 T39S R10E LOT 6	Taylor High	Hdgt.	18"cmp	23'	.1' in 23'	1.3	0	Annular	1-0098-A	Type B Flow	9.5cfs
SE¼, NW¼ SEC 13 T39S R10E LOT 7	do	do	12"cmp	25'	0	2.2	2.1	do	do	Type A Flow	1.0cfs
SE¼, NW¼ SEC 13 T39S, R10E LOT 7	do	do	18"cmp	20'	.3' in 20'	1.8	0	do	do	Type B Flow	12 cfs
SW¼, SE¼ SEC 13 T39S, R10E	do	do	18"cmp	30'	0	1.4	.2	do	do	Type A Flow	8.1cfs

SW¼, SE¼ SEC 13 T39S, R 10E	Taylor High	Turbine with pulleys 6" wheel on motor 10"wheel on turbine	Make unreadable Model 5K4254A2 7.5 HP Lifts: Suction Lift - 6' Suction Size - 12" Discharge Lift - 20' to ditch size - 6" I.P.	Assume Motor 60% efficient Note - Mr. High said that this pump had not been used for a couple years, and when operational, the pipe would not carry water to the gravity flow ditch. He plans to put in a new pump and sprinkler system.	600 g.p.m.

SE¼, SW¼ SEC 19 T39S, R 11½E	Taylor High	Hdgt.	12"cmp	18'	.1' in 18'	2.4'	1.2'	Annular	1-0098-A	Type A Flow	4.2cfs
SW¼, SE¼ SEC 19 T39S, R 11½E	do	do	12"cmp	26'	1.4'in 26'	2.1'	o	do	do	Type B Flow	5.8cfs
NE¼, NE¼ SEC 30 T39S, R 11½E	do	do	18"cmp	20'	0	1.2'	0	do	do	Type B Flow	9.1 cfs
SW¼, NW¼ SEC 29 T39S, R 11½E	do	do	18"cmp	20'	0	1.5'	0	do	do	Type B Flow	10 cfs
NW¼, NW¼ SEC 29 T39S R 11½E	do	do	18"cmp	24'	.5 in 24'	1.8'	0	do	do	Type B Flow	12 cfs

" F " CANAL

Location	Owner	Hdgt.	Size	Length	Slope	Head Inlet	Head Outlet	Corrugation	Photo	Notes	Q
SW¼, SW¼ SEC 20 T39S, R11½E	Kirsh Bros.	Hdgt.	12"cmp	23'	.5' in 23'	2.2'	0	Annular	1-0098-A	Flow Type B	5.2cfs
SE¼, SW¼ SEC 20 T39S, R11½E	do	do	18"cmp	31'	3.6' in 31'	1.6'	0	do	do	Flow Type B	17 cfs
NE¼, NW¼ SEC 29 T39S, R11½E	do	do	18"cmp	29'	.4' in 29'	1.4'	0	do	do	Flow Type B	10 cfs
NW¼, NE¼ SEC 29 T39S, R11½E	do	do	18"cmp	27'	.3' in 27'	1.9'	0	do	do	Flow Type B	12 cfs
NW¼, NE¼ SEC 29 T39S, R11½E	do	do	18"cmp	35'	4.1' in 35'	2.0'	0	do	do	Flow Type B	18 cfs

LOCATION	OWNER	PUMP	MOTOR	Sprinkler Heads & Line	Quantity
SW¼, NE¼ SEC 29 T39S, R11½E	Kirsh Bros.	Pacific Pump belt driven Motor Pulley 20" Pump Pulley 5" 6 V-belt	Motor - driven by Power take-off on Ford tractor. 85 HP, motor on tractor. Lifts: Suction Lift - 4' Size 6" Discharge Lift - 18'ave.size-4½"	2340' - 6" Mainline 4360' - 3" AL Handline 109 - 3/16" heads Assume pump efficiency = 50%	690 g.p.m.

SW¼, NE¼ SEC 29 T39S, R11½E	Kirsh Bros.	Hdgt.	18"cmp	35'	.5' in 35'	.5'	0	Helical	1-0098-A	Flow Type E	9.0cfs
SW¼, NE¼ SEC 29 T39S, R11½E	do	do	18"cmp	32'	0	1.0'	0	Annular	do	Flow Type B	7.5cfs
SW¼, NE¼ SEC 29 T39S, R11½E	F-2	do	24"cmp	23'	.6' in 23'	1.8'	0	do	do	Flow Type B F-2 lateral	24 cfs

NW¼, SE¼ SEC 29 T39S, R11½E	De Hoop	Turbine	Niagra Propeller Pump 8 HP Model PH-1861 Suction Lift - 11' Size 13" I.P. Discharge Size 12" I.P.	Pump Auxillary Only - uses main pump at NW¼, SE¼ Sec 29, now and only occationally uses this pump. The area in NW¼, NE¼, SW¼ Sec 29 was sprinkled in the past, but has not been watered for two to three years according to Mr. De Hoop.	none computed see main pump below

NW¼, SE¼ SEC 29 T39S, R11½E	De Hoop	Hdgt.	18"cmp	20'	.3' in 20'	1.0'	.2'	Annular	1-0098-A	Flow Type A	8.9 cfs

NW¼, SE¼ SEC 29 T39S, R11½E	De Hoop	Centrifugal	General Electric Triclad Motor 50 hp Model - 5K 324 JL 146 Suction Lift 11' size 10" IP Discharge Lifts: West-2' lift East-2' drop Size 8" IP	Mainline - 8" A.P. - 1880', 6"AP-160',5"AP-520', 3" AP - 4280' Handline - 30-11/64", 2 Nelson 100FA w/7/10" nozzles, 1- Rainbird 102 w/7/10" nozzles, 1 Nelson 100FA w/8/10" nozzle, 1 Nelson 100FA w/ 9/10" nozzle. Wheeline - West: 5" AP-1520', 19-9/32" spacing 80' East: 8" IP-mainline-1450', 5"AP-1640' 21- 9/32", spacing 80'	840 g.p.m.

Location	Owner	Hdgt.	Size	Length	Slope	Head Inlet	Head Outlet	Corrugation	Photo	Notes	Q
SE¼, SE¼ SEC 29 T39S, R 11½E	F-2½	Hdgt.	24"cmp	30'	.5' in 30'	3.3'	1.0'	Annular	1-0098-A	Flow Type A F-2½ lateral	25 cfs
NE¼, NE¼ SEC 32 T39S, R 11½E	Perry	do	18"cmp	19'	0	1.1'	.5'	do	1-0097-A	Flow Type A	6.6cfs
SE¼, NE¼ SEC 32 T39S, R 11½E	~~Knard~~ Grant	Centrifugal Centifugal both motors connected to common mainline no valves		Century Motor 25 HP Model-SC-286UC7-FCA FMI9-313200-02 U.S. Electric Motor 15 hp Model-2103056 Suction Lift - 2' both Size - 6" IP both Discharge Lift - 0' ave. Size - 6" IP both						Mainline 8" IP - 1500' Handline 4" AP - 960' 3" AP - 2500' Heads 46 - 3/16" 23 - 13/64" Headgate to channel with pump collapsing and filled with mud. Very poor repair.	480 g.p.m.
NE¼, NE¼ SEC 32 T39S, R 11½E	Perry	Hdgt.	18"cmp	20'	.3 in 20'	1.7'	0	Annular	1-0097-A	Flow Type B	12 cfs
NW¼, NW¼ SEC 33 T39S, R 11½E	do	do	12"cmp	31'	.5' in 31'	2.3'	0	do	do	Flow Type B	4.9 cfs
NW¼, SW¼ SEC 33 T39S, R 11½E	~~Knard & Bowman~~ Cunard	Centrifugal		General Electric Triclad Motor 50 hp Model - 5K324YK156 Suction Lift - 5' Size - 10" IP Discharge Drop - 5' ave. Size - 8" IP						Mainline - 8"AP-1300', 6"AP - 1300' Wheel lines 1) 4"AP-1280' heads 17-5/16"-80' spacing 2) 4"AP-1200' heads 15-5/16"-80' spacing calculate together	660 g.p.m.
NW¼, SW¼ SEC 33 T39S, R 11½E	Wells	Hdgt.	18"cmp	16'	.3' in 16'	.5'	.5'	Annular	1-0097-A	Flow Type A	4.9 cfs
NE¼, SW¼ SEC 33 East T39S, R 11½E	Mathes	Cornell Centrifugal		Marathon Electric Motor 30 hp Model EB284TTDR-97312 BB-W Suction Lift - 4' Size 6" Discharge Lift 3'Ave. Size 4"						Mainline - 1280' - 6" AP Mainline 2640' - 4" AP wheelline - 66-3/16" heads 1320' - 4" AP handline - 33-3/16" heads 40' spacing calculate w/wheel lines only.	620 g.p.m.
LOCATION	OWNER	PUMP		MOTOR						Sprinkler Heads & Line	Quantity
NW¼, SW¼ SEC 33 T39S, R 11½E	Karner & Knard	Centrifugal		Uniclosed Motor 30 hp, Model 3460376 480 volt power source Suction Lift 8' size 8" IP Discharge Lift Upper Field - 115' Lower Field - 22' > 44' wt. ave.						Mainline 8" AP-2500', 4" AP-500' Wheelline 1) 4"AP-1300' - 33 - 3/16" 2) 4"AP-1240' - 31 - 3/16" Handline 3) 4"AP-1400' - 34 - 13/64" calculate together	590 g.p.m.

Location	Owner	Hdgt.	Size	Length	Slope	Head Inlet	Head Outlet	Corrugation	Photo	Notes	Q
SE¼, SW¼ SEC 33 T39S, R11½E	Mathes	Hdgt.	12"cmp	19'	.4' in 19'	1.4	1.0	Annular	1-0097-A	Flow Type A	3.0cfs
Lot 4, SEC 4 T40S, R11E	Rodgers	do	12"cmp	20'	.4' in 20'	1.5	1.0	do	1-0096-A	Flow Type A	3.3cfs

LOCATION	OWNER	PUMP	MOTOR	Sprinkler Heads & Line, Lifts, etc.	Quantity
Lot 3, SEC 4 T40S R11E ~~[illegible]~~	Rodgers System A west-see file Rodgers & Son	Worthington turbine pump	Brook Electric Motor 25 hp Model - 203/103A Suction Lift - 2' size 5" Discharge Lift-3' ave. size - 4"	Mainline 800'-6" AP, 720' - 5" AP Wheel line 2200' - 5" AP- 55-7/32"(2 laterals) Handline 720' - 4" AP - 18-7/32" Laterals 1)1200' 5" AP - 30 -7/32" 2)1000' 5" AP + 720' 4"AP- 43-7/32"	540 g.p.m. from above
Lot 3, SEC 4 T40S R11E ~~[illegible]~~	Rodgers System B East same site as above	Cornell Centrifugal Cornell Centrifugal pumps connected to common main-line	General Electric Motor 75 hp Model 5K364YK132 General Electric Motor 75 hp Model 5K364YK132 Suction Lift 4' both size 6" Discharge Lift North Field 2' North Center 3' Center 43' } 42' wt. ave. South Center 47' South 101'	Mainline 3280' -10" AP, 2520'-8"AP, 1000'-6"AP Wheel line 5520' - 4" AP Handline 1520' - 4" AP } 216 - 3/16" heads 1600' - 3" AP 40' spacing all compute together	1270 g.p.m.

Lot 3, SEC 4 T40S, R11E	F-4	Hdgt.	24"cmp	25'	.3' in 25'	3.5'	0	Annular	1-0096-A	Flow Type B	30 cfs
Lot 3, SEC 4 T40S, R11E	Rodgers	Hgt.	12"cmp	16'	.1' in 16'	1.3'	1.0'	do	do	Flow Type A	2.3 cfs
Lot 3, SEC 4 T40S, R11E	do	Hdgt.	12"cmp	16'	.7' in 16'	.8'	1.0'	do	do	Flow Type A	2.6 cfs
Lot 3, SEC 4 T40S, R11E	Cantrell	do	12"cmp	19'	.6' in 19'	1.6'	1.1'	do	do	Flow Type A	3.5 cfs

Lot 2, SEC 4 T40S, R11E	Cantrell	centrifugal	General Electric Motor 40 hp Model 5K286JL162 Power Source 480 volts Suction Lift - 4' Size 10" IP Discharge Drop 4' ave. Size 6" IP	Mainline 6" AP-2,000', 4" AP - 1280' Wheel line 1) 4" AP-1320', 33-3/16" heads 40' spacing 2) 4" AP-1320', 33-5/32" heads 40' spacing Handline 3) 3" AP-1920', 42-3/16" heads 40' spacing watergun Nelson 100-FA, nozzle size .70" compute together	540 g.p.m.

Location	Owner	Hdgt.	Size	Length	Slope	Head Inlet	Head Outlet	Corrugation	Photo	Notes	Q
Lot 7, SEC 4 T40S, R11E	Wells	Hdgt.	18"cmp	19'	0	2.4'	1.1'	Annular	1-0096-B	Flow Type A	9.5 cfs

LOCATION	OWNER	PUMP	MOTOR	Sprinkler Heads & Line	Quantity
Lot 7, SEC 4 T40S R11E	Rodgers	Berkeley centrifugal	Century Squirrel Cage Induction Poly phase motor 25 hp Model SC-286 UCZ-FCA EM19-313200-02 240 volt power source Suction Lift 6' size 6" IP Discharge drop 5' ave. size 6" IP	Mainline 6" AP - 1120', 6" IP - 200' Wheel line 4" AP - 1320', 33 - 3/16", 40' spacing	320 gpm
Lot 10, SEC 4 T40S, R11E	Wells	centrifugal centrifugal	Century Electric Motor 25 hp Model SC-286UCZ-FCA-1A0 Century Electric Motor 25 HP Model SC-286UCZ-FCA 901 8377-00 440 volt power source each Suction Lift-11' both size 6"IP Discharge Lift Upper Fields - 26' Lower Fields - 12' 18' wt. ave.	Mainline 8" IP - 150', 8" IP-1360', 6"AP 1200' Wheellines 1) 4"AP-2720', 68-5/32" 2) 4"AP-2640', 66-3/16" (2 laterals) Handline 3) 3"AP-1600', 28-5/32", 8-11/64" 40' spacing on all.	720 g.p.m.
Lot 9, SEC 4 T40S R11E	Rodgers	Berkeley Centrifugal	Marathon Electric Motor 30 HP Model CK284TTDR7312AAW 480 Volt power source Suction Lift 6' Size 6" IP Discharge Lift - 10' ave. size 6"IP	Mainline 8"AP - 1240' Wheel line 4"AP - 1320', 33-3/16" heads, 40' spacing	340 g.p.m.

Lot 12, SEC 3 T40S, R 11E	Rodgers	Hdgt.	18"cmp	22'	.3' in 22'	1.2'	1.3'	Annular	1-0096-B	Flow Type A	3.8 cfs

Lot 12, SEC 3 T40S, R11E	Rodgers	Cornell Rainflow centrifugal	General Electric Motor 50 hp Model 5K324XAM101 480 volt power source Suction Lift 3' size 6" Discharge drop 1' wt. ave. size-5"	Mainline - 3500' - 6"AP, 700'-3"AP Wheelline - 1) 33 - 3/16", 4"AP - 1320' 2) 31 - 3/16", 4"AP - 1240' 40' spacing 3) 47 - 3/16", 4"AP - 1880'	640 g.p.m.

Lot 11, SEC 3 T40S, R11E	F-5	Hdgt.	30"cmp	27'	1.0' in 27'	1.2'	0	Annular	1-0096-B	Flow Type E	35 cfs
Lot 11, SEC 3	Rodgers	do	18"cmp	18'	.2' in 18'	1.6'	.5'	do	do	Flow Type A	9.8 cfs

LOCATION	OWNER	PUMP	MOTOR	Sprinkler Heads & Line, Lifts, etc.	Quantity
Lot 14, SEC 3 T 40S, R 11E	Wells	centrifugal	General Electric Motor 50 hp Model 5K324XAM101 Power source 480 volt power line Suction Lift 7' size 10"IP Discharge Lift 11' size 10"AP	Mainline 10"AP - 3640' Wheelline 1)4"AP 2400', 31-5/32", 40' spacing 2)6"AP 1240', 42-5/32", 40' spacing 3)4"AP 1400', 30-11/64", 40' spacing	690 g.p.m.

Location	Owner	Hdgt.	Size	Length	Slope	Inlet	Outlet	Corrugation	Photo	Notes	Q
Lot 15, SEC 3 T40S, R 11E	Rodgers	Hdgt.	18"cmp	20'	0	2.0'	0	Annular	1-0096-B	Flow Type B	12 cfs
Lot 15, SEC 3 T40S, R 11E	F-6	Hdgt.	24"cmp	20'	.9' in 20'	1.1'	0	do	do	Flow Type B	23 cfs
Lot 15, SEC 3 T40S, R 11E	Rodgers	dO	24"cmp	17'	.3' in 17'	.7'	.6'	do	do	Flow Type A	11 cfs

Lot 18, SEC 3 T40S, R 11E	Rodgers & Cornell	Cornell Centrifugal	General Electric Motor 75 hp Model 5K364YK132 Suction Lift 3' size $5\frac{1}{2}$" Discharge Lift 20' size $5\frac{1}{2}$"	Mainline - 1200' - 10"AP, 1000'-8"AP, 1200'-6"AP, 1100'-5"AP Wheelline - 1) 4" AP - 1320, 33 - 3/16" 2) 4" AP - 2240, 56 - 3/16" 3) 4" AP - 1320, 33 - 3/16" 40' spacing 4) 4" AP - 1320, 33- 3/16" 5) 4" AP - 1600, 40 - 3/16" 6) 4" AP - 1320, 33 - 3/16" 7) 4" AP - 760, 19 - 3/16"	840 g.p.m.

Lot 17, SEC 3 T40S, R 11E	Rodgers	Hdgt.	24" cmp	20'	0	.7'	0	Annular	1-0096-B	Flow Type C or D	16 cfs
Lot 20, SEC 2 T40S, R 11E	F-7	do	24"cmp	20'	.3' in 20'	1.0'	0	do	do	Flow Type C or D - not used	20 cfs

Lot 19, SEC 2 T40S, R 11E	Bowman	Berkeley centrifugal Berkeley centrifugal Berkeley centrifugal	Century Electric Motor , 40 hp Model G-323053-01 Marathon Electric Motor, 30 hp Model EB 284TTDR7312 BBW Marathon Electric Motor, 30 hp Model EB 284TTDR 7312 BBW Suction Lift 4' each size $4\frac{1}{2}$",$3\frac{1}{2}$", $3\frac{1}{2}$" respectiviely. Discharge Lift - north 7' drop south 1' lift } 1' drop wt. ave. west 3' drop	Mainline 8" AP - 2720', 6" AP - 4920' Wheelline: 1) 1320' - 4" AP, 33 - 3/16" 2) 1320' - 4" AP, 33 - 3/16" 40'-spacing 3) 1320' - 4" AP, 33 - 3/16" 4) 1320' - 4" AP, 33 - 3/16" 5) 1080' - 4" AP, 27 - 3/16" 6) 1080' - 4" AP, 27 - 3/16" Handline: 7) 880' - 3" AP, 22 - 3/16" 8) 880' - 3" AP, 22 - 3/16" 9) 1320' - 3" AP, 33 - 3/16" 40' spacing 10) 1000' - 3" AP, 25 - 3/16" 11) 1000' - 3" AP, 25 - 3/16" 12) 520' - 3" AP, 13 - 3/16" 13) 520' - 3" A 13 - 3/16" calculate togethe.	1,000 g.p.m

LOCATION	OWNER	PUMP	MOTOR	Sprinkler Heads & Line, Lifts, etc.	Quantity
Lot 19, SEC 2 T40S, R11E	Poe Valley Ranch	Cornell centrifugal Cornell centrifugal	General Electric Motor, 50 hp Model 5K324YK 156 General Electric Motor, 50 hp Model 5K324YR 156 Suction Lift 3' size 6" Discharge Lift 14' ave Size 5"	Mainline 10" AP - 3780' 8" AP - 1580' 6" AP - 1580' 4" AP - 9280' Wheel Line 9360' - 4" AP, 7/32"-117, 3/16"-117 Handline 22 - 7/32", 22-3/16" 2 laterals compute together	1,480 g.p.m.

Location	Owner	Hdgt.	Size	Length	Slope	Inlet	Outlet	Corrugation	Photo	Notes	Q
Lot 14, SEC 2 T40S, R11E		Hdgt.	18"cmp	28'	.4' in 28'	1.0'	.2'	Annular	1-0096-B	Flow Type A	8.5 cfs
Lot 14, SEC 2 T40S, R11E	Rajnus	do	18"cmp	24'	0	1.0'	0	do	do	Flow Type B	7.9 cfs

Lot 16, SEC 2 T40S, R11E	Rajnus	turbine	U.S. Electric vertical motor 100 hp Model C-2955-03-273 83-06618 480 volt power source Suction Lift 12' size 10" IP Discharge Lift 1' ave. size 8"IP	Mainline - 10"IP - 350', 6"AP-1040', 10"AP-3450' Wheelline 1)66 - 3/16", 4" AP (2 laterals) 2)66 - 3/16", 4" AP (2 laterals) 3)32 - 3/16", 4" AP Handline 4)964 - 7/64" 3"AP 40' spacing Use 6 laterals w/29 heads each, also 7 w/33 each.	1300g.pm
Lot ~~9~~ 8, SEC 2 T40S, R11E	Rajnus	centrifugal	Uniclosed Motor 50 hp 480 volt power source suction Lift 8' size 10" IP Discharge Lift 0' size 6" IP	Mainline 10" IP - 350', 8" AP - 1680' Handline - use 800' - 3" AP, 20 - 7/64"-10 = 200 heads wheellines - use 2 laterals, 33-3/16", 4" AP 40' spacing on each.	1080 g.p.m.
Lot ~~9~~ 8, SEC 2 west T40S R11E	Wells	Centrifugal	General Electric Triclad Induction Motor, 50 hp Model 5K 324 YK 156 Power source 480 volt Suction Lift - 8' size 10" IP Discharge Drop 8' ave. size 8"IP	Mainline - 8" AP - 2900' Wheelline 1)33-3/16", 4"AP - 1320' 2)33-3/16", 4"AP - 1320' Handline 8 laterals each 40' spacing all 1000' - 4" AP, 25 - 5/32"	1250 g.pm.

Lot 8, SEC 2 to East T40S, R11E	Wells	Hdgt.	18"cmp	19'	.4' in 19'	1.3'	T.O.P.	Annular	1-0096-B	Flow Type B	11 cfs
Lot 8, SEC 2 to North T40S, R11E	Rajnus	do	18"cmp	14'	.1' in 14'	1.3'	.3'	do	do	Flow Type A	9.6 cfs
Lot 1, SEC 2 T40S, R11E	Wells	do	18"cmp	17'	.6' in 17'	1.0'	.3'	do	do	Flow Type A	9.9 cfs
Lot 1, SEC 2	F-8	do	24"cmp	30'	.1' in 30'	1.4'	T.O.P.	do	do	Flow Type B	18 cfs

OCATION	OWNER	PUMP	MOTOR	Sprinkler Heads & Line, Lifts, etc.	Quantity
Lot 3, SEC 2 T40S, R11E	Wells	centrifugal centrifugal	Century Motor, 30 hp Model SC-324UY-FCA-EMI 9-313195-02 General Electric Triclad Induction Motor, 30 hp Model 5K284YK182 Suction Lift 5' both size 8"IP both Discharge lifts: southeast - 11' southwest - 9' northeast - 16' northwest - 4' > 10' wt. ave.	Mainline 8" AP - 480', 6" AP - 4000' Wheellines 1) 600' - 4"AP 15-13/64" 2) 800' - 4"AP 20-17-3/16" & 3-13/64" 3) 1600' - 4"AP 40-13/64" Handline 4) 8400' - 4"AP 170-5/32" spacing 40 on each	870 g.p.m.

9-275-F
11-75

STATE OF OREGON
WATER RESOURCES DEPARTMENT

DISCHARGE MEASUREMENT NOTES

File No. .....
Meas. No. .....
Comp. by JW
Checked by SFM

Stream F. CANAL, K.I.D., USBR.

Date 9 – 11, 19 85 Party KNAUER / WETREL / STUNTEBECK

Width 15.9 Area 35.3 Vel. 1.21 G. H. ..... Disch. 42.8

Method .6 No. secs. 16 G. H. change ..... in ..... min.

Method coef. 1 Hor. angle coef. 1 Susp. coef. 1 Meter No. 5-68

Date rated 4-11-69

GAGE READINGS				
Time		Recorder	~~Inside~~ UPSTM	~~Outside~~ DOWNSTM
12:40	Start		265	141
1:10	Finish		265	141
Weighted M. G. H.				
G. H. correction				
Correct M. G. H.				

Spin before meas. ..... after .....

Wading, cable, ice, boat, upstr., downstr., side bridge 150 feet, mile, above, below gage and .....

Tags checked .....

Meter suspended from rod, or

..... ft. above bottom ..... lb. ..... weight.

Levels obtained .....

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

Flow UNIFORM Weather SUNNY

Other ..... Air 65 °F@ .....

Gage ..... Water .....°F@ .....

..... Record removed ..... Intake flushed U L .....

Observer .....

Control .....

Remarks .....

G. H. of zero flow ..... ft.

LH GATE OPEN 1.00 (comp. 40.6 cfs)

.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	
												.80
	3.1	0.65	Ø L.E.W.				Ø			Ø	Ø	.85
	5.0	1.15	1.0	.6	20	40	1.12			1.15	1.29	.90
	6.0	1.	1.6	.6	25	43	1.30			1.6	2.08	.92
	7.0	1.	2.6	"	25	46	1.22			2.6	3.17	.94
	8.0	1.	3.0	"	25	46	1.22			3.0	3.66	.96
	9.0	1.	3.0	"	25	48	1.17			3.0	3.51	.97
	10.0	1.	3.0	"	25	46	1.22			3.0	3.66	.98
⊙												1.00
	11.0	1.	3.0	"	25	46	1.22			3.0	3.66	
	12.0	1.	3.0	"	25	45	1.25			3.0	3.75	.99
	13.0	1.	3.0	"	25	43	1.30			3.0	3.90	.98
	14.0	1.	3.0	"	25	44	1.27			3.0	3.81	.97
	15.0	1.	3.1	"	25	44	1.27			3.1	3.94	.96
	16.0	1.	2.8	"	25	40	1.40			2.8	3.92	.94
	17.0	1.	1.7	"	15	41	.829 ~~.821~~			1.7	~~1.40~~ 1.41	.92
												.90
												.85

.0 .10 .20 .30 .40 .50 .60 .70 .75 .80

.0 .10 .20 .30 .40 .50 .60 .70 .80

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	
	18.0	1.3	1.0	.6	15	43	.792			1.3	1.03	.85
	19.0	0.8	Ø R.E.W.							Ø	Ø	.90
												.92
	15.9	15.9								35.3	42.8	.94
												.96
												.97

9-275-G
11-75

STATE OF OREGON
WATER RESOURCES DEPARTMENT

File No. .....
Meas. No. .....
Comp. by DEK
Checked by DLW

DISCHARGE MEASUREMENT NOTES

Stream F-CANAL, KLAMATH PROJECT USBR, KID.
Date AUG 24, 1983 Party KNAUER WESTON
Width 16 Area 38.4 Vel. 1.73 G. H. ..... Disch. ~~66.5~~ 65.9
Method 6 No. secs. 17 G. H. change ..... in ..... min.
Method coef. 1 Hor. angle coef. 1 Susp. coef. 1 Meter No. S-68

GAGE READINGS		UP		DWN
Time		~~Recorder~~	~~Inside~~	~~Outside~~
1:35		2.55		1.63
	Start			
	Finish			
1:55		2.55		1.64
Weighted M. G. H.				
G. H. correction				
Correct M. G. H.				

Date rated .....
Spin before meas. ..... after .....
Wading, cable, ice, boat, upstr., downstr., side bridge 200 feet, mile, above, below gage and .....
Tags checked .....
Meter suspended from rod, or .....
..... ft. above bottom ..... lb. ..... weight.
Levels obtained .....

Measurement rated excellent (2%), good (5%), fair (8%), poor (over 8%), based on following conditions: Cross section CONCRETE FLUME
Flow UNIFORM Weather SUNSHINE
Other ..... Air .....°F@ .....
Gage OK Water .....°F@ .....
..... Record removed ..... Intake flushed U L .....
Observer .....
Control CHANNEL CLEAR
Remarks SW1/4 SW1/4 SEC 14 T39S RIDE

G. H. of zero flow 9 0 9 0 ft.

G, 0 9
G2 0

Q from CHART = 62 cfs

KBA_APP_000751

.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
	0	0.5	R.E.W.		1:40 P.M.					—	—
	1	1.0	0.6	.6	20	40	1.12			0.6	0.67
	2		1.4		25	40	1.40			1.4	1.96
	3		2.1		30	44	1.52			2.1	3.19
	4		3.0		30	40	1.67			3.0	5.01
	5		3.3		40	51	1.75			3.3	5.78
	6		3.2		30	40	1.67			3.2	5.34
	7		3.3		40	48	1.86			3.3	6.14
	8		3.3		40	50	1.78			3.3	5.87
	9		3.3		40	50	~~1.87~~ 1.78			3.3	~~6.17~~ 5.87
	10		3.3		40	50	~~1.87~~ 1.78			3.3	~~6.17~~ 5.87
	11		3.3		40	48	1.86			3.3	6.14
	12		3.2		40	51	1.75			3.2	5.60
	13		2.5		30	41	1.63			2.5	4.08
⊙	14		1.7		40	52	1.71			1.7	2.91
	15	1.2	0.9		30	40	1.67			0.9	1.50
	16	0.5	L.E.W.		1:55 P.M.					—	—
	16	16								30.40	~~66.53~~ 65.93
											65.9

.80 .85 .90 .92 .94 .96 .97 .98 .99 1.00 .99 .98 .97 .96 .94 .92 .90 .85

.0 .10 .20 .30 .40 .50 .60 .70 .75 .80

9-275-F
11-75

STATE OF OREGON
WATER RESOURCES DEPARTMENT

DISCHARGE MEASUREMENT NOTES

File No. .....
Meas. No. .....
Comp. by NZR
Checked by RJM

Stream F-Canal

Date 6-15, 1981 Party DWS

Width 16.6 Area 41.8 Vel. 1.23 G. H. ..... Disch. 51.3

Method ..... No. secs. 18 G. H. change ..... in ..... min.

Method coef. ..... Hor. angle coef. ..... Susp. coef. ..... Meter No. S-68

Date rated .....

Spin before meas. ✓ after ✓

Wading, cable, ice, boat, upstr., downstr., side bridge ..... feet, mile, above, below gage and Plank across canal 100' down stream

GAGE READINGS				
Time		Recorder	~~Inside~~	Outside
1120			lower	1.82
	Start		upper	2.35
	Finish			
			lower	1.82
			upper	2.35
Weighted M. G. H.				
G. H. correction				
Correct M. G. H.				

53 / 0

53 / 0

Tags checked .....

Meter suspended from rod, or

..... ft. above bottom ..... lb. ..... weight.

Levels obtained .....

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

Flow fairly uniform Weather clear warm

Other ..... Air .....°F@ .....

Gage ..... Water .....°F@ .....

..... Record removed ..... Intake flushed U L .....

Observer .....

Control Right gate 1.0' left gate 1.0'

Remarks Lots of moss floating

G. H. of zero flow ..... ft.

Q from chart = 26 x 2 = 52 cfs

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
	.9	.55	REW @			1130					
	2.0	1.05	.9		20	44	1.02	1.02		.945	.964
	3	1.0	1.6		20	40	1.12	1.12		1.60	1.79
	4	1.0	2.3		15	42	.810	.810		2.30	1.86
	5	1.0	3.0	.2	20	41	1.10	.830		3.00	2.49
	~~8~~			.8	10	41	.561				
	6	1.0	3.4		30	45	1.49	1.12		3.40	3.81
					15	45	.758				
	7	1.0	3.5		30	43	1.56	1.26		3.50	4.41
					20	47	.960				
	8	1.0	3.5		30	40	1.67	1.16		3.50	4.06
					15	53	.647				
	9	1.0	3.5		30	40	1.67	1.37	1	3.50	4.80
					20	42	1.07				
⊙	10	1.0	3.5		30	39	1.71	1.29		3.50	4.52
					15	39	.870				
	11	1.0	3.4		30	40	1.67	1.20		3.40	4.08
					15	47	.727				
	12	1.0	3.4		30	40	1.67	1.34		3.40	4.56
					20	44	1.02				
	13	1.0	3.4		30	39	1.71	1.27		3.40	4.32
					15	41	.829				
	14	1.0	2.8	.2	30	39	1.71	1.44		2.80	4.03
				.8	20	38	1.18				
	15	1.0	2.0	.6	30	41	1.63	1.63		2.00	3.26
	16	1.0	1.3		30	42	1.59	1.59		1.30	2.07
	17	.75	.35		20	41	1.10	1.10		.262	.288
	17.5	.25	REW @		120	5					
	16.6	16.6								41.8	51.3

Error of rating equation from measurement 0%

9-275-G
11-75

STATE OF OREGON
WATER RESOURCES DEPARTMENT

File No. .....
Meas. No. .....
Comp. by JAE
Checked by NZR

DISCHARGE MEASUREMENT NOTES

Stream "F" Canal R.I.D.

Date 9-30, 1980 Party Esget, J.A.

Width 16 Area 36.8 Vel. 1.61 ave ~~G.H.~~ ΔH 1.16 Disch. 59.4

Method .2/.8 No. secs. 19 G. H. change — in ..... min.

Method coef. 1 Hor. angle coef. 1 Susp. coef. 1 Meter No. S-68

Date rated 4-11-69

Spin before meas. ✓ after ✓

Wading, cable, ice, boat, upstr., downstr., side bridge 200 feet, mile, above, below ~~gage and~~ headworks

Tags checked .....

Meter suspended from rod, or

..... ft. above bottom ..... lb. ..... weight.

Levels obtained .....

GAGE READINGS				
Time		~~Recorder~~ above HG	~~Inside~~ below HG	Outside ΔH
1300	Start	2.72	1.54	1.18
1345	Finish	2.69	1.54	1.15
Weighted M. G. H.				
G. H. correction				
Correct M. G. H.				

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

Flow regular Weather Clear, Warm

Other ..... Air 70 °F@ 1425

Gage — Water 63 °F@ 1430

..... Record removed ..... Intake flushed U/L

Observer .....

Control metal lift gate w/ rectangular concrete opening

Remarks Gate #1 h = 0.73 W_1 = 7.0'
#2 h = 0.77 W_2 = 7.0'

G. H. of zero flow ..... ft.

$Q = .65 A \sqrt{2g\Delta H}$

$\Delta H = 1.165$

$A_1 = 5.11'$ $Q_1 = 28.77$

$A_2 = 5.39$ $Q_2 = 30.35$

Q Total = 59.12

.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	
	2.00	.37	0		REW		LEW			0	0	.80
	2.75	.75	.25	.5	15	47	.73			.19	.14	.85
	3.50	.75	.95	.6	25	42	1.33			.71	.94	
	4.25	.75	1.65	.6	40	49	1.82			1.24	2.26	
	5.00	.75	2.05	.6	40	50	1.78			1.54	2.74	.90
	5.75	.88	2.75	.2	40	46	1.93	1.80		2.42	4.36	.92
				.8	30	40	1.67					.94
	6.75	1.00	2.95	.2	40	50	1.78	1.72		2.95	5.07	
				.8	30	40	1.67					.96
	7.75	.88	3.10	.2	40	49	1.82	1.70		2.73	4.64	.97
				.8	30	42	1.59					.98
	8.50	.87	3.20	.2	40	51	1.75	1.60		2.78	4.45	.99
				.8	30	46	1.46					
	9.50	.88	3.25	.2	40	50	1.78	1.57		2.86	4.49	
⊙				.8	25	41	1.36					1.00
	10.25	.87	3.20	.2	40	51	1.75	1.54		2.78	4.28	
				.8	25	42	1.33					
	11.25	.88	3.20	.2	40	48	1.86	1.69		2.82	4.77	.99
				.8	30	44	1.52					.98
	12.00	.87	3.20	.2	40	48	1.86	1.68		2.78	4.67	.97
				.8	30	45	1.49					.96
	13.00	1.00	3.20	.2	40	51	1.75	1.60		3.20	5.12	
				.8	30	46	1.46					.94
.98	14.00	1.00	3.10	.2	40	51	1.75	1.60	1.57	3.10	4.87	.92
				.8	30	46	1.46					.90
	15.00	1.00	2.50	.6	30	43	1.56			2.50	3.90	
	16.00	1.00	1.50	.6	25	40	1.40			1.50	2.10	
	17.00	1.00	.25	.6	15	44	.77			.75	.58	.85
	18.00	.50			LEW	@	1345			0	0	
.0	.10	.20	.30	.40	.50		.60		.70	.75	.80	

✓ 16.00 ✓ 36.25 59.38

[redacted]

FLOW DISCHARGE FOR EACH GATE AT F & F-1 CANALS.

$.65 A\sqrt{2gh}$

GATE OPENING (FEET)

MAR. 1979

M.D.C.

HEAD DIFFERENCE ACROSS GATE (FEET)	.1	.2	.3	.4	.5	.6	.7	.8	.9	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9	3.0
.1	1	2	4	5	6	7	8	9	10	12	13	14	15	16	17	18	20	21	22	23	24	25	27	28	29	30	31	32	33	34
.2	2	3	4	7	8	10	11	13	15	16	18	20	21	23	25	26	28	29	31	33	34	36	38	39	41	42	44	45	47	49
.3	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52	54	56	58	60
.4	2	5	7	9	12	14	16	19	21	23	25	28	30	32	35	37	39	41	44	46	48	51	53	55	58	60	62	65	67	69
.5	3	5	8	10	13	15	18	21	23	26	28	31	34	36	39	41	44	46	49	52	54	57	59	62	65	67	70	72	75	77
.6	3	6	8	11	14	17	20	23	25	28	31	34	37	40	42	45	48	51	54	57	59	62	65	68	71	74	76	79	82	85
.7	3	6	9	12	15	18	21	24	27	30	33	36	39	42	45	48	51	54	57	60	63	66	69	72	75	79	82	86	89	92
.8	3	7	10	13	16	20	23	26	29	33	36	39	42	46	49	52	56	59	62	65	69	72	75	78	82	85	88	91	95	98
.9	3	7	10	14	17	21	24	28	31	35	38	42	45	48	52	55	59	62	66	69	73	76	80	83	87	90	94	97	100	
1.0	4	7	11	15	18	22	26	29	33	37	40	44	47	51	55	58	62	66	69	73	77	80	84	88	91	95	99	102		
1.1	4	8	12	15	19	23	27	31	34	38	42	46	50	54	57	61	65	69	73	77	80	84	88	92	96	100				
1.2	4	8	12	16	20	24	28	32	36	40	44	48	52	56	60	64	68	72	76	80	84	88	92	96	100					
1.3	4	8	12	17	21	25	29	33	37	42	46	50	54	58	62	67	71	75	79	83	87	92	96	100						
1.4	4	9	13	17	22	26	30	35	39	43	48	52	56	60	65	69	73	78	82	86	91	95	99							
1.5	4	9	13	18	22	27	31	36	40	45	49	54	58	63	67	72	76	80	85	89	94	98								
1.6	5	9	14	18	23	28	32	37	42	46	51	55	60	65	69	74	79	83	88	92	97	101								
1.7	5	10	14	19	24	29	33	38	43	48	52	57	62	67	71	76	81	86	90	95	100									
1.8	5	10	15	20	24	29	34	39	44	49	54	59	64	69	73	78	83	88	93	98	103									
1.9	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	86	91	96	101										
2.0	5	10	15	21	26	31	36	41	46	52	57	62	67	72	77	83	88	93	98	103										
2.1	5	11	16	21	26	32	37	42	48	53	58	63	69	74	79	85	90	95	100											
2.2	5	11	16	21	27	32	38	43	49	54	59	65	70	76	81	87	92	97	102											
2.3	6	11	17	22	27	33	39	44	50	55	61	66	72	77	83	88	94	99												
2.4	6	11	17	23	28	34	39	45	51	56	62	68	73	79	85	90	96	102												
2.5	6	11	17	23	29	35	40	46	52	58	63	69	75	81	86	92	98	104												
2.6	6	12	18	24	29	35	41	47	53	59	65	71	77	82	88	94	100													
2.7	6	12	18	24	30	36	42	48	54	60	66	72	78	84	90	96	102													
2.8	6	12	18	24	31	37	43	49	55	61	67	73	79	85	92	98														
2.9	6	12	19	25	31	37	43	50	56	62	68	75	81	87	93	99														
3.0	6	13	19	25	32	38	44	50	57	63	69	76	82	88	95	101														
3.1	6	13	19	26	32	38	45	51	58	64	71	77	83	90	96	103														
3.2	6	13	19	26	32	39	46	52	59	65	72	78	84	91	98	104														
3.3	7	13	20	27	33	40	46	53	60	66	73	79	86	93	99															
3.4	7	13	20	27	34	40	47	54	61	67	74	81	87	94	101															

1. LOOK AT GAGES TO FIND AVAILABLE HEAD.
2. DETERMINE REQUIRED FLOW FOR EACH GATE.
3. FIND GATE OPENING AT TOP OF CHART.
4. LARGE CHANGES WILL CAUSE SOME CHANGE IN HEAD.
5. READJUST GATE OPENING AFTER FLOW STEADIES DOWN.

9-107-

STATE OF OREGON

OFFICE OF STATE ENGINEER

Water Resources Department

Year .....

File No. .....

Discharge measurements of "F" Canal Klamath Irrigation District

....., *during the year ending September 30, 19*.....

No.	Date	Made by	Width Feet	Area Sq. ft.	Mean Velocity Ft./Sec.	Gage Height Feet	Discharge C.F.S.	Equation Rating Computed Corr.	Equation Rating % diff	Method	Meas. Secs. No.	G. Ht. Chgs. Ft.	Time Min.	Temperature Wtr.	Temperature Air	REMARKS
	9/30/80	Esget					59.4	59.1	0%							
	9/11/85	KNAUER STUNTEBECK WEIZEL					12.8	40.6	5%							

* Geological Survey Engineer

'F' CANAL

Klamath Irrigation District

Location of Headworks: SW¼ SW¼, Section 14, T39S R10E

Gages: Two stilling wells with staff plates. One upstream of headgate between 'F' & 'F-1' gates and one just downstream of 'F' headgate. Also there is a staffplate on the north side walls of the two gate plates to read gate opening for each of the two gates.

Gate: Two seven foot metal rectangular radial lift gates.

Measuring Section: Measure from wooden walkway approximately 100 yards downstream of headworks. Use standard wading rod and standard meter.

Flow Computation: $Q = .65\ A\sqrt{2\ g\Delta H}$

Where ΔH = head differential through gate or upstream well reading minus downstream well level.

$A = 7' \cdot h_1$ where h_1 is gate staff reading

Example: Upstream 2.70, Downstream 1.54, Gate readings 0.73 & 0.77

Then $Q_1 = .65\ (0.73 \cdot 7')\sqrt{2 \cdot g \cdot (2.70 - 1.54)} \cong 28.7$

$Q_2 = .65\ (0.77 \cdot 7')\sqrt{2 \cdot g \cdot (2.70 - 1.54)} \cong 30.3$

Q Total = 59.0

Rating Accuracy: 'C' value appears good.

Jim Esget
Field Engineer

F-1 CANAL

SMEAD®
No. 1531
UPC 10330
smead.com • Made in USA
MINIMUM 30% RECYCLED CONTENT

"F-1" CANAL

KLAMATH IRRIGATION DISTRICT

December 5, 1980

The "F-1" Canal has a new headgate and is rated through one rectangular metal liftgate using the equation $Q = CA\sqrt{2g\Delta h}$. (See folder for Klamath Irrigation District's "F-1" Canal).

The "F-1" Canal begins at the south end of the Olene Gap flume and runs generally west to near Reeder Road where it ends, and stays south of Lost River.

Irrigation water is diverted through pumps and metal headgates and is primarily used for pasture and small amounts of use for grain and alfalfa. Maximum discharge quantities given for headgates are somewhat greater than maximum quantities used since headgates are seldom if ever fully opened. Culvert size, slope and depth below the surface varies greatly with little correlation to irrigated land.

Stock use is generally from the irrigation system or from the canal during irrigation season and is from springs, groundwater wells or seepage during other months when the "f-1" Canal is dry (normally about mid-October to April).

Irrigated land from"F-1" Canal lies mostly between the canal and Lost River except for some areas above the canal which are sprinkled from pump systems. As in the "E" and "F" Canals, lands below the canal which were flooded in times past are included in the Klamath Irrigation District, while lands above (south of), the "F-1" Canal are either considered Warren Act Contract areas or under Klamath Basin Improvement District. (See "E" Canal folder).

Jim Esget
Field Engineer

(Beginning at Olene flume)

"F-1" CANAL

Location	Owner	Hdgt.	Size	Length	Slope	Head Inlet	Head Outlet	Corrugation	Photo	Notes	Q
SW¼ SW¼, SEC 14 T39S R10E	Kinney	Hdgt.	12" cmp	20'	+1.1/20'	1.2'	free outflow	A	2-0143-B	Flow Type B - appears unused, canal in poor repair.	5.1cfs
NE¼ NE¼, SEC 22 T39S R10E	Kinney	Hdgt.	12" cmp	21'	+1.7/21'	1.3'	free outflow	A	2-0143-B	Flow Type B	5.8cfs

LOCATION	OWNER	PUMP	MOTOR	Sprinkler Heads & Line, Lifts, etc.	Photo
NW¼ SE¼, SEC 22 T39S R10E	Jacomini	Berkeley Centrifugal	Marathon Electric Motor 60 h.p. Model ED 326TTDR7303BBW Power source 480 volt Intake Size 5"IP Outlet Size 4½"IP	System appears adequate to irrigate land owned.	2-0143-B

NW¼ SE¼, SEC 22 T39S R10E	Jacomini	Hdgt.	18"cmp	35'	3.2'in 35'	1.1'	0'	A	2-0143-B	Flow Type B	15cfs
NW¼ SE¼, SEC 22 T39S R10E	Jacomini	centrifugal	Marathon Electric Motor 75 h.p. Model HF 364 TTDS 7321 AAWF-1 Power source 480 volt power line Intake size - 4½" IP Outlet size - 3½" IP	System appears adequate to irrigate land owned.	2-1043-B						
NW¼ SE¼, SEC 22 T39S R10E	Jacomini	Hdgt.	18"cmp	26'	+.5'in 26'	.7'	0	A	2-0143-B	Flow Type C or D	9.0cfs
SW¼ SE¼, SEC 22 T39S R10E	Jacomini	Berkeley centrifugal	Marathon Electric Motor 30 h.p. Model AN-284 TTDR 7312 AAW Intake size 5½" IP Outlet size 3½" IP Power source 480 volt power line	System appears adequate to irrigate land owned.	2-0143-B						
NE¼ NW¼, SEC 27 T39S R10E	to several owners	Hdgt.	24" cmp	19'	0	.5'	.4'	A	2-0142-B	Flow Type A	5.3cfs
NE¼ NW¼, SEC 27 T39S R10E	O'Neill	Hdgt.	24" cmp	19'	-.3/19	.9'	.5'	A	2-0142-B	Flow Type A	5.3cfs
SE¼ SW¼, SEC 27 T39S R10E	O'Neill	Hdgt.	18" cmp	19'	+.4/19	1.5'	0	A	2-0142-B	Flow Type B	12cfs
NW¼ NW¼, SEC 34 T39S R10E	O'Neill	Hdgt.	24" cmp	16'	+.1/16	1.0'	0	A	2-0142-B	Flow Type C or D	19cfs

LOCATION	OWNER	PUMP	MOTOR	Sprinkler Heads & Line, Lifts, etc.	Photo
NE¼ NE¼, SEC 33 T39S R10E	O'Neill Pacific	portable pump centrifugal belt driven pulleys Motor 18" pump 6",6 belts 18"distance between pulleys.	Motor Internation Harvester cat Model TD-6	Heads 9/32", 35# pressure read at nozzles . 15 - lateral 14 - lateral 4" AP - mainline System in operation during visit.	2-0142-B 370g.p.m.
SW¼ SE¼, SEC 28 T39S R10E	Monroe	Berkeley centrifugal	Century Electric Motor 10 h.p. Part # 6-323244-69 Intake size 2¾" IP Outlet size 2½" IP Power source 240 volt power line	3" AP Mainline System appears adequate to irrigate land owned.	2-0142-B
SW¼ SE¼, SEC 28	Dobry	Moore Rane centrifugal	Century Squirrel-Cage Induction polyphase motor, 30 h.p. Model SC-324UY-FC1-1 Intake size 4" IP Outlet size 3½" IP Power source 480 volt powerline	System appears adequate to irrigate land owned.	2-0142-B

Location	Owner	Hdgt.	Size	Length	Slope	Head Inlet	Head Outlet	Corrugation	Photo	Notes	Q
SW¼ SE¼, SEC 28 T39S R10E	F-1A Lateral	Hdgt.	24"cmp	25'	1.7/25	1.9'	0	A	2-0142-B	Concrete box located end of pipe appears not to constrict flow	29cfs
SW¼ SE¼, SEC 28 T39S R10E	Dehlinger	Hdgt.	18"cmp	20'	.4/20	1.1'	0	A	2-0142-B	Flow Type B	10cfs
SW¼ SE¼, SEC 28 T39S R10E	Dehlinger	Hdgt.	18"cmp	21'	.1/20	.8'	0	A	2-0142-B	Flow Type B	7.9cfs
NW¼ NE¼, SEC 33 T39S R10E	Dehlinger	Hdgt.	18"cmp	6'	-.1/6	1.3'	.2	A	2-0142-B	Flow Type A	10cfs
NE¼ NW¼, SEC 33 T39S R10E	Dehlinger	Rain Flow centrifugal	General Electric Tri clad Induction Motor, 50 h.p. Model 5K324XAM101 Power source 480 volt power line Intake size 6¼" IP Outlet size 6" IP	System appears adequate to irrigate land owned.	2-0142-B						

Location	Owner	Hdgt.	Size	Length	Slope	Head Inlet	Head Outlet	Corrugation	Photo	Notes	Q
NE¼ NW¼, SEC 33 T39S R10E	Dehlinger	Hdgt.	18"cmp	16'	.3/16	1.1	.3	A	2-0142-B	Flow Type A	6.4cfs

LOCATION	OWNER	PUMP	MOTOR	Sprinkler Heads & Line, Lifts, etc.	Photo
SW¼ SW¼, SEC 28 T39S R10E	Dehlinger	Byron & Jackson Division - Borg Warner Corp. Sumpmaster Turbine	U.S. Holloshaft High Thrust Motor 30 h.p. Model - none indicated power source 480 volt power line Intake size 6½" IP Outlet size 6" IP	System appears adequate to irrigate land owned.	2-0142-B

SW¼ SW¼, SEC 28 T39S R10E	Dehlinger	Hdgt.	18"cmp	12'	.3/12	1.4'	1.2'	A	2-0142-B	Flow Type A	6.7cfs
SW¼ SW¼, SEC 28 T39S R10E	Born	Berkeley Centrifugal w/ belt & pulleys pump pulley 4" motor pulley 7" 18" between shafts.	Sears h.p. unknown (≅ 1 H.P. very small) Model unknown Intake size 1¾" IP Outlet size 1¼" IP Power source 120 volt housewire	Sprinkles around lawn							2-0142-B
SE¼ SE¼, SEC 29 T39S R10E	F-1B Lateral	Hdgt.	18"cmp	16'	.3/16	1.6	free outflow	A	2-0142-B	Flow Type B	12cfs
SE¼ SE¼, SEC 29 T39S R10E	F-1C Lateral	Hdgt.	24"cmp		.1 head					$Q = CA\sqrt{2gH}$, $C \cong .65$	5.2cfs
SE¼ SE¼, SEC 29 T39S R10E	Born	centrifugal	Uniclosed Motor, 25 h.p. Model 206VAMPS 65 8 Type H-1 Suction lift - 5' Intake size - 4" IP Discharge lift - 35' ave. Outlet size - 4" IP Power source 240 volt power line	1)6" AP mainline - 1500', 4" AP - 450' lateral - 360-4" AP-520'-3" AP heads - ½-1/8", ½-3/16" 2)4" AP mainline - 1000' lateral 3" AP-480', same heads as above compute together							2-0142-B 260 g.p.m.
SE¼ SE¼, SEC 29 T39S R10E	Whisenhunt	Berkeley centrifugal	Berkely 2 h.p. motor	System appears adequate to irrigate land owned							2-0142-B
SE¼ SE¼, SEC 29 T39S R10E	Christensen	Hdgt.	18"cmp	14'	.2/14	1.1	.3	A	2-0142-B	Flow Type A Note: Use ½ area on exit-buried now	4.6cfs
SE¼ SE¼, SEC 29 T39S R10E	Christensen	centrifugal	Sears Deluxe, 2 h.p. Model C56N2S11 Intake Size 2½" PVC Outlet size 2" PVC 120 volt house current	System appears adequate to irrigate land owned.							2-0142-B

Location	Owner	Hdgt.	Size	Length	Slope	Head Inlet	Head Outlet	Corrugation	Photo	Notes	Q
SW¼ SE¼, SEC 29 T39S R10E	Brookshire	Hdgt.	18"cmp	13'	.1/13	1.9	TOP	A	2-0142-B	Flow Type B	13cfs
SW¼ SE¼, SEC 29 T39S R10E	Lamb	Hdgt.	18"cmp	12'	o slope	.5'	.2'	A	2-0142-B	Flow Type A	5.2cfs

LOCATION	OWNER	PUMP	MOTOR	Sprinkler Heads & Line, Lifts, etc.	Photo
SW¼ SE¼, SEC 29 T39S R10E	Johnson	"	2 h.p.	System appears adequate to irrigate land owned.	2-0142-B
SW¼ SE¼, SEC 29 T39S R10E	Lamb	Berkeley centrifugal 240 volt power source	Century Squirrel-Cage Induction polyphase motor, 15 h.p. Model SC-256UCZ-KCA-EMI-9-306037-04 Suction Lift - 5' Intake size 4" IP Discharge drop 20', outlet size 3½" IP	Mainline - 760' of 4" AP Laterals 1) 280'-3"AP, 7-9/64" heads, 40' SP 2) 360'-3"AP, 9-11/64" heads, 40' SP 3) 680'-3"AP, 17-11/64" heads, 40' SP	2-0142-B 215 g.p.m.
SE¼ SW¼, SEC 29 T39S R10E	Garboden, Steers & Lamb	Cornell centrifugal	General Elecric Motor, 25 h.p. Model 5K 364 XA 30B Suction lift 4', Intake szie 3½"IP Discharge lift 51' outlet size 3" IP 240 volt power source	Mainline 600' - 6" IP, 780' - 6" AP Laterals four each 280' - 3" AP, 7 heads 3/16" Note: compute for Garboden only, system appears adequate for other owners.	2-0142-B 285 g.p.m.

SE¼ SW¼, SEC 29 T39S R10E	Lamb	Hdgt.	12"cmp	10'	.3/10'	1.1'	.6'	A	2-0142-B	Flow Type A	3.5cfs
SE¼ SW¼, SEC 29 T39S R10E	Lamb	Hdgt.	12"cmp	14'	.3/14'	.2'	0	A	2-0142-B	Flow Type C or D	2.8cfs
NW¼ NW¼, SEC 32 T39S R10E	Huck	Hdgt.	12"cmp	52'	-.6/52	2.1	free outflow	smooth iron	2-0142-B	12' of Annular connected to 40' of smooth iron-Appears unused-Ditches in poor repair.	3.9cfs
SW¼ SW¼, SEC 29 T39S R10E	Huck	Hdgt.	12"cmp	32'	0	3.0'	0	A	2-0142-B	Flow Type B	5.0cfs
NW¼ NW¼, SEC 32 T39S R10E	Huck	Hdgt.	10"cmp	252'	7'/252'	.1'	0	smooth iron pipe	2-0142-B	Flow Type E, n = .014	1.2cfs

9-275-F
11-75

STATE OF OREGON
WATER RESOURCES DEPARTMENT

File No. .....
Meas. No. .....
Comp. by JW
Checked by SFM

DISCHARGE MEASUREMENT NOTES

Stream F-1 CANAL - K.I.D. - USBR

Date 9 - 11 ., 1985 Party KNAUER / WEIZEL / STUNTEBECK

Width 14.0 Area 26.5 Vel. .619 G. H. 1.22 Disch. 16.4

Method .6 No. secs. 13 G. H. change -0.01 in 20 min.

Method coef. 1 Hor. angle coef. 1 Susp. coef. 1 Meter No. S-68

Date rated 4-11-69

GAGE READINGS				
Time		Recorder	~~Inside~~ UP STREAM	~~Outside~~ DOWN
1:10	Start		2.65	1.22
1:30	Finish			1.21
Weighted M. G. H.				
G. H. correction				
Correct M. G. H.				

Spin before meas. ..... after .....

Wading, cable, ice, boat, upstr., downstr., side bridge 350' feet, mile, above, below gage and .....

Tags checked .....

Meter suspended from rod, or .....

..... ft. above bottom ..... lb. ..... weight.

Levels obtained .....

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

Flow UNIFORM Weather PARTLY CLOUDY

Other ..... Air 60 °F@ .....

Gage ..... Water .....°F@ .....

..... Record removed ..... Intake flushed U .....

Observer .....

Control NOT OBSERVABLE

Remarks .....

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
	2°	1°	R.E.W.				0			0	0
	4°	1.5	1 2	.6	7	44	.375			1.80	0.675
	5°	1.0	1 7	"	7	44	.375			1.70	0.638
	6°	1.0	2 2	"	10	44	.525			2.20	1.16
	7°	1.0	2 7	"	15	47	.727			2.70	1.96
	8°	1.0	3 1	"	15	45	.758			3.10	2.35
	9°	1.0	3 2	"	15	45	.758			3.20	2.43
⊙											
	10°	1.0	3 1	"	15	47	.727			3.10	2.25
	11°	1.0	2 8	"	15	57	.604			2.80	1.69
	12°	1.0	2 4	"	10	41	.561			2.40	1.35
	13°	1.0	1 8	"	15	52	.659			1.80	1.19
	14°	1.5	1 1		10	57	.411			1.65	0.678
	16°	1.0	L.E.W.				0			0	0
	14.0	14.0								26.5	16.4

.80 .85 .90 .92 .94 .96 .97 .98 .99 1.00 .99 .98 .97 .96 .94 .92 .90 .85

.0 .10 .20 .30 .40 .50 .60 .70 .75 .80

9-275-G
11-75

STATE OF OREGON
WATER RESOURCES DEPARTMENT

DISCHARGE MEASUREMENT NOTES

File No. .....
Meas. No. .....
Comp. by DEK
Checked by DLW

Stream F-1 CANAL, KLA. PROJECT USBR, KID
Date AUG 24, 1983 Party KNAMAR WESTON
Width 12 Area 22.6 Vel. 1.31 G. H. ..... Disch. 29.5
Method .6 No. secs. 13 G. H. change ..... in ..... min.
Method coef. 1 Hor. angle coef. 1 Susp. coef. 1 Meter No. S-68

Date rated .....
Spin before meas. ..... after .....
Wading, cable, ice, boat, upstr., downstr., side bridge 3/8 feet, mile, above, below gage and .....
@ BRIDGE CROSSING
Tags checked .....
Meter suspended from rod, or .....
..... ft. above bottom ..... lb. ..... weight.
Levels obtained .....

GAGE READINGS				
Time		Recorder	~~Inside~~ UP	~~Outside~~ DOWN
2:00		2.55	0.9	1.77
2:25	Start			
	Finish			
2:45		2.55	0.9	1.78
Weighted M. G. H.				
G. H. correction				
Correct M. G. H.				

Measurement rated excellent (2%), good (5%), fair (8%), poor (over 8%), based on following conditions: Cross section DIRT
Flow UNIFORM Weather SUNSHINE
Other ..... Air .....°F@ .....
Gage OK Water .....°F@ .....
..... Record removed ..... Intake flushed U/L .....
Observer .....
Control CHANNEL
Remarks SW1/4 SW1/4 SEC 14 T39S R10E
G. H. of zero flow ..... ft.

$\Delta H = 0.78$
$\Delta H = 0.77 / 0.775$ Q(from chart) = 29 cfs

KBA_APP_000768

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

READ COMPUTE READ READ River at LOOK-UP COMPUTE

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
	7.0	0.5	LEW		2:25	PM				—	—
	8.0	1.0	1.3	.6	10	43	.536			1.3	0.70
	9.0		1.6		25	46	1.22			1.6	1.95
	10.0		2.0		25	43	1.30			2.0	2.60
	11.0		2.4		25	40	1.40			2.4	3.36
	12.0		2.6		30	45	1.49			2.6	3.87
	13.0		2.7		30	45	1.49			2.7	4.02
	14.0		2.5		30	47	1.43			2.5	3.58
	15.0		2.4		25	43	1.30			2.4	3.12
	16.0		2.2		25	42	1.33			2.2	2.93
	17.0		1.9		25	46	1.22			1.9	2.32
	18.0	1.0	1.0		20	42	1.07			1.0	1.07
	19.0	0.5	REW		2:40	PM				—	—
	12	12								22.60	29.52

.85 .90 .92 .94 .96 .97 .98 .99 1.00

.99 .98 .97 .96 .94 .92 .90 .85

.0 .10 .20 .30 .40 .50 .60 .70 .75 .80

9-275-F
11-75

STATE OF OREGON
WATER RESOURCES DEPARTMENT

DISCHARGE MEASUREMENT NOTES

File No. .....
Meas. No. .....
Comp. by NZR
Checked by PJM

Stream F-1 Canal
Date 6-15, 1981 Party DWS
Width 14.0 Area 36.2 Vel. .54 G. H. ..... Disch. 19.4
Method ..... No. secs. 15 G. H. change ..... in ..... min.
Method coef. ..... Hor. angle coef. ..... Susp. coef. ..... Meter No. 5-68
Date rated .....

GAGE READINGS				
Time		Recorder	~~Inside~~	Outside
	Start		upper	2.35
			lower	1.85
			upper	2.35
	Finish		lower	1.85
Weighted M. G. H.				
G. H. correction				
Correct M. G. H.				

Spin before meas. y after y
Wading, cable, ice, boat, upstr., downstr., side bridge ..... feet, mile, above, below gage and .....
Plank across channel @ 150 yd downstream
Tags checked .....
Meter suspended from rod, or
..... ft. above bottom ..... lb. ..... weight.
Levels obtained .....

Measurement rated excellent (2%), good (5%), fair (8%), poor (over 8%), based on following conditions: Cross section mud
Flow fairly uniform Weather Clear warm
Other ..... Air .....°F@ .....
Gage ..... Water .....°F@ .....
..... Record removed ..... Intake flushed U/L .....
Observer .....
Control gate .8' open
Remarks some floating moss
G. H. of zero flow ..... ft.

Δ H 50 Q from chart = 21 cfs

KBA_APP_000770

.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
	15	.5	REW @ 1330								
	14	1.0	.9	.6	3	43	.179			.9	.161
	13	1.0	1.6	.6	7	39	.420			1.6	.672
	12	1.0	2.0	.6	5	41	.294			2.0	.588
	11	1.0	2.7	.2	10	49	.474	.372		2.7	1.00
				.8	5	45	.270				
	10	1.0	3.3		10	45	.514	.390		3.3	1.29
					5	46	.265				
	9	1.0	3.55		15	52	.659	.550		3.55	1.95
					10	53	.440				
	8	1.0	3.9		15	48	.712	.593		3.9	2.31
					10	49	.474				
	7	1.0	4.0		15	46	.742	.658		4.0	2.63
					10	40	.575				
⊙	6	1.0	4.0		15	48	.712	.561		4.0	2.24
					7	40	.410				
	5	1.0	3.8		15	53	.647	.611		3.8	2.32
					10	40	.575				
	4	1.0	3.1	.2	15	47	.727	.720		3.1	2.23
				.8	15	48	.712				
	3	1.0	2.1	.6	15	54	.636			2.1	1.34
	2	1.0	1.3		10	47	.493			1.3	.641
	1	.5	LEW @ 1400								
	14°	14°								36.2	19.4

.80 .85 .90 .92 .94 .96 .97 .98 .99 1.00 .99 .98 .97 .96 .94 .92 .90 .85

.0 .10 .20 .30 .40 .50 .60 .70 .75 .80

Error 13% - computed Q compared to measured Q.

9-275-G
11-75

STATE OF OREGON
WATER RESOURCES DEPARTMENT

DISCHARGE MEASUREMENT NOTES

File No. .....
Meas. No. .....
Comp. by JAE
Checked by NZR

Stream F-1 Canal

Date 10-7, 19 80 Party ESGET M McBAIN N

Width 14 Area 22.6 Vel. .660 G. H. ..... Disch. 15.0

Method 2/.8 No. secs. 21 G. H. change ..... in ..... min. STAND

Method coef. 1.0 Hor. angle coef. 1.0 Susp. coef. 1.0 Meter No. S-68

Date rated 4-11-69

Spin before meas. ✓ after ✓

Wading, cable, ice, boat, upstr., downstr., side bridge ..... feet, mile, above, below gage and .....

Tags checked .....

Meter suspended from rod, or .....

..... ft. above bottom ..... lb. ..... weight.

Levels obtained .....

GAGE READINGS				
Time		Recorder	Inside	Outside
1010	Start			
1050	Finish			
Weighted M. G. H.				
G. H. correction				
Correct M. G. H.				

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

Flow UNIFORM Weather SUNNY

Other ..... Air ..... °F@ .....

Gage ..... Water ..... °F@ .....

..... Record removed ..... Intake flushed U L .....

Observer .....

Control STAFF UPSTREAM 2.51 2.50 * ‡

HG Setting 0.33 0.33

Remarks Below 1.38 OK ✓

HG 7' wide

G. H. of zero flow ..... ft.

$\Delta H = 1.12$ $w = 7'$ $h = .33'$ $A = 2.31$ sq. ft.

Computed $Q = CA\sqrt{2g\Delta H} = .65 \cdot 2.31\sqrt{28 \cdot 1.12} = 12.8$

KBA_APP_000772

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
	15.5	0.75	LEW		0	0				0	0
	14.0	1.25	0.7	.6	2	70		.089		.875	.078
	13.0	1.0	1.25		3	50		.158		1.250	.198
	12.0	1.0	1.7		10	50		.465		1.200	.790
	11.0	0.75	2.2		15	51		.672		1.650	1.11
	10.5	0.5	2.4		15	46		.742		1.200	.890
	10.0	0.5	2.5	.6	15	46		.742		1.250	.928
	9.5	0.5	2.6	.2	20	49	.922	.763		1.300	.992
				.8	15	57	.604				
	9.0	0.5	2.6	.2	20	47	.960	.754		1.300	.980
				.8	10	42	.549				
	8.5	0.5	2.6	.2	20	44	1.02	.866		1.300	1.126
				.8	15	48	.712				
	8.0	0.5	2.5	.6	20	57		.796		1.250	.995
⊙	7.5	0.5	2.5		20	49		.922		1.250	1.152
	7.0	0.5	2.4		15	40		.849		1.200	1.019
	6.5	0.5	2.25		20	52		.870		1.125	.979
	6.0	0.5	2.15		15	44		.774		1.075	.832
	5.5	0.5	2.05		15	42		.810		1.025	.830
	5.0	0.5	1.85		15	45		.758		.925	.701
	4.5	0.5	1.65		15	55		.625		.825	.516
	4.0	0.75	1.4		10	45		.514		1.050	.540
	3.0	1.25	0.8	.6	7	45		.367		1.000	.367
	1.5	0.75	REW							0	0
	14.0	14.0								22.55	15.02

Error of rating equation from measurement 15%

9-275-G
11-75

STATE OF OREGON
WATER RESOURCES DEPARTMENT

File No. .....
Meas. No. .....
Comp. by JAE
Checked by NZR

DISCHARGE MEASUREMENT NOTES

Stream "F-1" Canal K.I.D.

Date 9-30, 1980 Party Esget, J.A.

Width ..... Area 25.3 Vel. .62 ~~G. H.~~ ave ΔH=1.24 Disch. 15.7

Method ..... No. secs..... G. H. change ..... in ..... min.

Method coef. ..... Hor. angle coef. ..... Susp. coef. ..... Meter No. S-68

Date rated .....

Spin before meas. ✓ after ✓

Wading, cable, ice, boat, upstr., downstr., side bridge 100 feet, mile, above, ~~below gage and~~ below Head - works

Tags checked .....

Meter suspended from rod, or

..... ft. above bottom ..... lb. ..... weight.

Levels obtained .....

GAGE READINGS		above	below	ΔH
Time		~~Recorder~~ HG	~~Inside~~ HG	~~Outside~~
1400	Start	2.68	1.44	1.24
1425	Finish	2.68	1.44	1.24
Weighted M. G. H.				
G. H. correction				
Correct M. G. H.				

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

Flow regular Weather Warm, Clear

Other ..... Air 70 °F@ 1425

Gage — Water 63 °F@ 1430

Record removed — Intake flushed U L

Observer —

Control metal lift gate, rectangular concrete opening

Remarks Gate h = 0.33
w = 7'

G. H. of zero flow ..... ft.

$Q = .65 A \sqrt{2g\Delta H}$ A = 2.31

ave ΔH = 1.24

Q = 13.4

.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
	16.5	.75	0		LEW		@	1400		0	0
	15.0	1.25	1.25		3	58		.140		1.562	.219
	14.0	1.00	1.40		5	43		.281		1.400	.393
	13.0	1.00	1.60		10	51		.456		1.600	.730
	12.0	1.00	1.95		10	40		.575		1.950	1.121
	11.0	.75	2.05		15	59		.604		1.538	.929
	10.5	.75	2.15		15	47		.727		1.612	1.172
	9.5	.75	2.15		15	52		.659		1.612	1.062
	9.0	.75	2.20		15	49		.698		1.650	1.152
	8.0	.75	2.15		15	50		.684		1.612	1.103
	7.5	.75	2.20		15	43		.792		1.650	1.307
	6.5	.75	2.20		15	47		.727		1.650	1.200
	6.0	.75	2.20		15	47		.727		1.650	1.200
	5.0	.75	2.00		26	51		.887		1.500	1.330
⊙	4.5	.75	1.90		15	42		.810		1.425	1.154
	3.5	1.00	1.60		15	44		.774		1.600	1.238
	2.5	1.25	1.00		5	44		.275		1.250	.344
	1.0	.75			REW	@	1425			0	0
	15.5	15.5								25.261	15.654

.80 .85 .90 .92 .94 .96 .97 .98 .99 1.00 .99 .98 .97 .96 .94 .92 .90 .85

.0 .10 .20 .30 .40 .50 .60 .70 .75 .80

FLOW DISCHARGE FOR EACH GATE AT F & F-1 CANALS.

$.65 A\sqrt{2gh}$

GATE OPENING (FEET)

MAR. 1979

MOC.

HEAD DIFFERENCE ACROSS GATE (FEET)

	.1	.2	.3	.4	.5	.6	.7	.8	.9	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9	3.0
.1	1	2	4	5	6	7	8	9	10	12	13	14	15	16	17	18	20	21	22	23	24	25	27	28	29	30	31	32	33	34
.2	2	3	4	7	8	10	11	13	15	16	18	20	21	23	25	26	28	29	31	33	34	36	38	39	41	42	44	45	47	49
.3	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48	50	52	54	56	58	60
.4	2	5	7	9	12	14	16	19	21	23	25	28	30	32	35	37	39	41	44	46	48	51	53	55	58	60	62	65	67	69
.5	3	5	8	10	13	15	18	21	23	26	28	31	34	36	39	41	44	46	49	52	54	57	59	62	65	67	70	72	75	77
.6	3	6	8	11	14	17	20	23	25	28	31	34	37	40	42	45	48	51	54	57	59	62	65	68	71	74	76	79	82	85
.7	3	6	9	12	15	18	21	24	27	30	33	36	39	42	45	48	51	54	57	60	63	66	69	72	75	79	82	86	89	92
.8	3	7	10	13	16	20	23	26	29	33	36	39	42	46	49	52	56	59	62	65	69	72	75	78	82	85	88	91	95	98
.9	3	7	10	14	17	21	24	28	31	35	38	42	45	48	52	55	59	62	66	69	73	76	80	83	87	90	94	97	100	
1.0	4	7	11	15	18	22	26	29	33	37	40	44	47	51	55	58	62	66	69	73	77	80	84	88	91	95	99	102		
1.1	4	8	12	15	19	23	27	31	34	38	42	46	50	54	57	61	65	69	73	77	80	84	88	92	96	100				
1.2	4	8	12	16	20	24	28	32	36	40	44	48	52	56	60	64	68	72	76	80	84	88	92	96	100					
1.3	4	8	12	17	21	25	29	33	37	42	46	50	54	58	62	67	71	75	79	83	87	92	96	100						
1.4	4	9	13	17	22	26	30	35	39	43	48	52	56	60	65	69	73	78	82	86	91	95	99							
1.5	4	9	13	18	22	27	31	36	40	45	49	54	58	63	67	72	76	80	85	89	94	98								
1.6	5	9	14	18	23	28	32	37	42	46	51	55	60	65	69	74	79	83	88	92	97	101								
1.7	5	10	14	19	24	29	33	38	43	48	52	57	62	67	71	76	81	86	90	95	100									
1.8	5	10	15	20	24	29	34	39	44	49	54	59	64	69	73	78	83	88	93	98	103									
1.9	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	86	91	96	101										
2.0	5	10	15	21	26	31	36	41	46	52	57	62	67	72	77	83	88	93	98	103										
2.1	5	11	16	21	26	32	37	42	48	53	58	63	69	74	79	85	90	95	100											
2.2	5	11	16	21	27	32	38	43	49	54	59	65	70	76	81	87	92	97	102											
2.3	6	11	17	22	27	33	39	44	50	55	61	66	72	77	83	88	94	99												
2.4	6	11	17	23	28	34	39	45	51	56	62	68	73	79	85	90	96	102												
2.5	6	11	17	23	29	35	40	46	52	58	63	69	75	81	86	92	98	104												
2.6	6	12	18	24	29	35	41	47	53	59	65	71	77	82	88	94	100													
2.7	6	12	18	24	30	36	42	48	54	60	66	72	78	84	90	96	102													
2.8	6	12	18	24	31	37	43	49	55	61	67	73	79	85	92	98														
2.9	6	12	19	25	31	37	43	50	56	62	68	75	81	87	93	99														
3.0	6	13	19	25	32	38	44	50	57	63	69	76	82	88	95	101														
3.1	6	13	19	26	32	38	45	51	58	64	71	77	83	90	96	103														
3.2	6	13	19	26	32	39	46	52	59	65	72	78	84	91	98	104														
3.3	7	13	20	27	33	40	46	53	60	66	73	79	86	93	99															
3.4	7	13	20	27	34	40	47	54	61	67	74	81	87	94	101															

1. LOOK AT GAGES TO FIND AVAILABLE HEAD.
2. DETERMINE REQUIRED FLOW FOR EACH GATE.
3. FIND GATE OPENING AT TOP OF CHART.
4. LARGE CHANGES WILL CAUSE SOME CHANGE IN HEAD.
5. READJUST GATE OPENING AFTER FLOW STEADIES DOWN.

6-207-

STATE OF OREGON

OFFICE OF STATE ENGINEER

Water Resources Department

Year .....

File No. .....

Discharge measurements of "F-1" Canal Klamath Irrigation District

....., *during the year ending September 30, 19*.....

No.	Date	Made by	Width Feet	Area Sq. ft.	Mean Velocity Ft./Sec.	Gage Height Feet	Discharge C.F.S.	Equation Rating Computed Corr.	Equation Rating % diff	Method	Meas. Sum. No.	G. Ht. Chgs. Ft.	Time Min.	Temperature Wtr.	Temperature Air	REMARKS
	9/30/80	Esget				—	15.7	13.4	15%							
	10/7/80	Esget, McBain					14.7	12.8	13%							
	9/11/85	KNAUER STUNTEBECK WETZEL					16.4									

* Geological Survey Engineer

'F-1' CANAL

Klamath Irrigation District

Headwork Location: SW¼ SW¼, Section 14, T39S R10E

Gages: Two stilling wells with staff plates. One upstream of headgate between 'F' & 'F-1' gates and one just downstream of 'F-1' headgate. Also there is a staffplate on the north side wall of the 'F-1' headgate to read gate opening.

Gate: One seven foot wide radial lift gate (rectangular).

Measuring Section: Measure from wooden walkway approximately 150 yards downstream from headworks. Use standard meter and standard wading rod.

Flow Computation: $Q = .65 \quad A\sqrt{2\ g\Delta H}$

Where ΔH = head differential thru gate or upstream well reading minus downstream well reading.

$A = 7' \cdot h_1$ Where h_1 = gate staff reading

Example: Upstream = 2.50 before and after measuring.

Downstream = 1.38 before and after measuring.

Gate staff reading $h_1 = 0.33$

Then $Q = .65 \quad A\sqrt{2\ g\Delta H} = .65 \cdot (7' \cdot 0.33)\sqrt{2 \cdot g \cdot (2.50 - 1.38)} \cong 12.8$ c.f.s.

Coefficient does not appear good. Headgate was new this year (1980), and an adjustment of this 'C' value should be expected sometime in the future from Klamath Irrigation District.

Jim Esget
Field Engineer

MEMO TO FILE: "G" CANAL, K.I.D.

U.S.B.R. Klamath Project

December 17, 1981

When surveying began in this area of the K.I.D. we contacted the district and USBR. Jim Bsget rode the G-Canal with K.I.D.'s ditch rider and was shown the various deliveries. Jim began the surveys along the G-Canal east of the Lost River. It soon became apparent that some users within K.I.D. had changed delivery points. They no longer recieve water from the G-Canal, they had pumps in the Lost River.

Considering the fact that the G-Canal delivers water that is diverted from Klamath Lake and these K.I.D users had changed sources, that is to the Lost River, I felt that they may have jeaporized their water rights. I went to the Klamath Irrigation District and the USBR, Klamath Project and asked about these pumps in the Lost River. K.I.D. told me that they did not own or operate those pumps, that they were strictly the water users responsibility. I was told that they did not deliver water from the G-Canal to dump into the Lost River for these pumps. I went to the USBR and was told that they had but one written contract with reference to these private pumps.

The USBR explained that Tulelake I.D. operates station 48 at the Lost River Diversion Channel which releases water into Lost River for delivery to the J-Canal. T.I.D. releases sufficient amounts from the Lost River Diversion Channel for their needs in the J-Canal, plus all losses in the Lost River channel between station 48 and the J-Canal which includes the private pumps, and minus any gains.

I checked with Delbert Sparks the local watermaster and it seemed that my concerns about the changes in water sources and systems would not have any affect on the water rights.

At present we are waiting on the USBR, Klamath Project to verify which pumps and associated irrigated land we should include in the Klamath River Adjudication mapping or Lost River Certificate mapping.

D.E. Kramer
Adjudicated Field Supervisor

"G" CANAL

Klamath Irrigation District

December 5, 1980

"G" Canal has a continuous chart recorder in stilling well above a concrete weir. Measurements were made by Klamath Irrigation District's hydrologist. Standard Rating.

The "G" Canal begins in the SE¼ NW¼, Section 30, T39S R10E, north of Lost River. It runs generally south, under the Lost River through a concrete siphon, and then toward Merrill staying east of Lost River, ending north of Merrill.

Irrigation water is diverted through pumps and metal headgates and is used for pasture, alfalfa and grain, with grain fields generally being sprinkled. Maximum discharge quantities given for headgates are larger than actual maximum quantities used in most cases since headgates are rarely opened fully. There is great variety in culvert size, slope and depth below ground.

Stock use is generally from the irrigation systems or directly from "G" Canal during irrigation season, and other than Klamath water sources during other months when "G" Canal is dry.

Irrigated land for the most part lies between the canal and Lost River which is (or was in the past), mostly flood irrigated and is included in Klamath Irrigation District. Lands above the canal which are sprinkled or pumped to a higher ditch are covered through either Warren Act Contracts or through the Klamath Basin Improvement District. (See "E" Canal folder for the distinction).

Jim Esget
Field Engineer

Location	Owner	Hdgt.	Size	Length	Slope	Head Inlet	Head Outlet	Corrugation	Photo	Notes	Q
NE¼ NE¼, Section 31 T39S R10E	Reed	Hdgt.	18"	23'	+.4/23	3.2'	0'	Annular		Type B Flow	16 cfs
SE¼ NE¼, Section 31 T39S R10E	Reed	Hdgt.	18"	23'	-.4/23	3.1'	0.2'	Annular		Type B Flow - outlet head measured below top of pipe-filled in to that depth.	13 cfs
NW¼ SW¼, Section 32 T39S R10E	Reed	Hdgt.		--	- - - -	- -	- -	- - - -		Appears unused - blocked end	
NW¼ SW¼, Section 32 T39S R10E	Johnson	Hdgt.	24"	27'	+.1/27	1.9'	0'	Annular		Type B Flow	22 cfs
NW¼ SW¼, Section 32 T39S R10E	Johnson	Hdgt.	12"	488'		1.1'		Annular		sump-for pump use only-no flood irrigation	
SW¼ SW¼, Section 32 T39S R10E	Sarutzki	Hdgt.	18"	21'	0'/slope	3.1'	free outflow	Annular		Type B Flow	15cfs

LOCATION	OWNER	PUMP	MOTOR	Sprinkler Heads & Line, Lifts, etc.	Photo
NE¼ NE¼, Section 6 T40S R10E	Thompson	centrifugal	60 h.p. Marathon Electric Motor	18" cmp to pump - not a claimant	
SE¼ NE¼, Section 6 T40S R10E North Pump	Arant & Hill	Centrifugal	General Electric Motor 15 hp, Model 5K2150N107 Suction Lift 6', Intake size 3" IP Discharge drop 4' ave Outlet size 2½" IP, 240 volt power source	4" AP mainline 4" AP Wheelline, 7/32" heads - 33 Handline - 2" AP, 3/32" heads - 16 40' sp (2 laterals)	320 g.p.m.

SE¼ NE¼, Section 6 T40S R10E	Sarutzki	Hdgt.	18"	38'	+ 6/38	2.2'	0'	Annular		Type B Flow	12cfs
NW¼ SW¼, Section 5 T40S R10E	Viets	Hdgt.	18"	26'	-.3/26	2.5'	0.8'	Annular		Type A Flow	9.3cfs
NW¼ SW¼, Section 5 T40S R10E	G-1 Lateral	Hdgt.	36"	26'	assume zero	2.7'	1.0'	Annular		Type A Flow	50cfs
NW¼ SW¼, Section 5 T40S R10E	Davidson, Collman, Burt & Anderson	Hdgt.	18"	16'	-.2/16	2.0'	0'	Annular		Type B Flow	13cfs

LOCATION	OWNER	PUMP	MOTOR	Sprinkler Heads & Line, Lifts, etc.	Photo
NW¼ SW¼, Section 5 T40S R10E South Pump	Arant	Turbine	U.S. Electric Holloshaft Motor 50 hp, Model SF.15.NRR-R 3921439 Suction lift 9', Inlet size 9" IP Discharge lift 10' ave., Outlet size 8" IP, Power source 480 volt	Mainline 1000' - 8" IP 560' - 6" AP Wheellines 1)33-7/32" heads, 4" AP 2)33-7/32" heads, 4" AP 3)36-7/32" heads, 4" AP Handlines 1)29-3/16" heads, 3" AP 2)30-11/64" heads, 3" AP 3)32-7/32" heads, 3" AP 40' spacing each	860 g.p.m.

Location	Owner	Hdgt.	Size	Length	Slope	Head Inlet	Head Outlet	Corrugation	Photo	Notes	Q
NE¼ SW¼, Section 5 T40S R10E	Collman	Hdgt.	12"	35'	+.6/35	1.5'	0'	Annular		Type B Flow - no ditches present at this time.	4.2cfs
NW¼ SE¼, Section 5 T40S R10E	Ralston	Centrifugal		Uniclosed Motor 10 hp, Model ID# F-9242-00-272 Intake size 3" IP Outlet size 2½" IP Power source 240 volt				System appears adequate to irrigate land indicated on photo.			
SW¼ SE¼, Section 5 T40S R10E	Collman	Hdgt.	12"	33'	-.2/33	2.2'	0.8'	Annular		Type A Flow	3.0cfs
SW¼ SE¼, Section 5 T40S R10E	Wise	Berkeley Centrifugal		Gould Century Motor 10 hp, No model no. Intake size 3" IP Outlet size 2½" IP Power Source 240 volt				System appears adequate to irrigate land owned.			
NW¼ NE¼, Section 8 T40S R10E	Lousignont	Hdgt.	18"	21'	+.4/21	2.0'	0'	Annular		Type B Flow	13 cfs
NW¼ NE¼, Section 8 T40S R10E	do	Centrifugal		Johnston Water systems 3/4 hp, Model 207-34967 Intake size 1 3/4" IP Outlet size 1½" IP 120 volt power source (house current)				Adequate for use around house			
NW¼ NE¼, Section 8 T40S R10E	do	pump, pipe & power company Turbine Pump		General Electric Motor 30 hp, Model 5K6238XH38A Intake 6" IP Outlet 6" IP Power source 480 volt				System appears adequate to irrigate land owned.			

Location	Owner	Hdgt.	Size	Length	Slope	Head Inlet	Head Outlet	Corrugation	Photo	Notes	Q
SW¼ NE¼, Section 8 T40S R10E	Brookshire	Hdgt.	18"	19'	+.1/19	1.4'	0'	Annular		Type B Flow	10 cfs

LOCATION	OWNER	PUMP	MOTOR	Sprinkler Heads & Line, Lifts, etc.	Photo
NW¼ SE¼, Section 8 T40S R10E Pump #1	Brookshire	Centrifugal	Induction Motor General Electric 20 hp, Model 17E 341 Intake size 8" IP Outlet size 6" IP Suction lift 6' Discharge lift 36' ave. 240 volt power source	Mainline 12" IP Lift to two ditches 30' lower ditch 40' upper ditch	820 g.p.m. Lower Ditch 580 g.p.m. Upper Ditch
NW¼ SE¼, Section 8 T40S R10E Pump #2	Brookshire	berkeley centrifugal	Century Electric Motor (Gould) 40 hp, Part # 6-323053-01 Intake size 5" IP Outlet size 4½" IP Suction lift 7' 240 volt power source	System in operation during visit Mainline Laterals 3" AP - 1) 34 - 3/16" 2) 35 - 3/16" 40 lbs. pressure	2-0141-B 450 g.p.m.

Location	Owner	Hdgt.	Size	Length	Slope	Head Inlet	Head Outlet	Corrugation	Photo	Notes	Q
NW¼ SE¼, Section 8 T40S R10E	do	Hdgt.	18"	71'	-.2/71	2.0'	T.O.P.	Annular		Type B Flow	7.8 cfs
SW¼ SE¼, Section 8 T40S R10E	Jones	Hdgt.	18"	20'	+.6/20	2.2'	0'	Annular		Type B Flow	14 cfs

LOCATION	OWNER	PUMP	MOTOR	Sprinkler Heads & Line, Lifts, etc.	Photo
SW¼ SE¼, Section 8 T40S R10E	Rookhuyzen	Turbine	U.S. Electric Motor - high thrust 50 hp, Model SF 1.15 Discharge lift - 22' ave. Intake size 8" IP Outlet size 8" IP Power source - power line Suction lift 8'	8" IP Mainline - 100', 8" AP 1000' Wheelline 4" AP, 11/64" - 32 heads, 40' sp Handline 4" AP, 11/64" - 32 heads, 40' spacing (3 handlines)	680 g.p.m.

Location	Owner	Hdgt.	Size	Length	Slope	Head Inlet	Head Outlet	Corrugation	Photo	Notes	Q
NW¼ NE¼, Section 17 T40S R10E	Rookhuyzen	Hdgt.	18"	29'	1.2/29	1.4'	0'	Annular		Type B Flow	12 cfs

LOCATION	OWNER	PUMP	MOTOR	Sprinkler Heads & Line, Lifts, etc.	Photo
NW¼ NE¼, Section 17 T40S R10E	Dobberpuhl	Centrifugal	Century 2 hp, Model 8-135268-02 Intake size 2" Outlet size 1 3/4"	System appears adequate to irrigate land owned. 120 volt house current	

Location	Owner	Hdgt.	Size	Length	Slope	Head Inlet	Head Outlet	Corrugation	Photo	Notes	Q
SW¼ NE¼, Section 17 T40S R10E	Coffin	Hdgt.	18"	25'	+0.5/25	1.6'	0'	Annular		Type B Flow	12 cfs

LOCATION	OWNER	PUMP	MOTOR	Sprinkler Heads & Line, Lifts, etc.	Photo
SW¼ NE¼, Section 17 T40S R10E	do	Berkely Centrifugal	General Electric Motor 75 hp, Model 5K1445CV5 Intake size 8" IP Outlet size 6" IP 120 volt power source - power line	Pump in operation during visit.	
NW¼ SE¼, Section 17 T40S R10E	Coffin	Centifugal pump portable	operated by Ford tractor - diesel 2000 - Super Dexta - power takeoff 6 belts - 18"-shaft pulley 5"-pump pulley	System appears adequate to irrigate land owned	2-0141-B
SE¼ SE¼, Section 17 T40S R10E	Hendrickson	centrifugal	Marathon Electric 20 hp, Model JE 254TTDR-7320CD-F1W Intake size 3" IP Outlet size 3" IP, Discharge drop 240 volt power source Suction lift = 0'	6" AP Mainline 3" AP Lateral to fire hose Nelson F100T Gun (w/ 7/10" nozzle)	150 g.p.m.
SE¼ SE¼, Section 17 T40S R10E	Heim	Rain Flow Centrifugal	Baldor Stream Cooled Electric Motor belt driven 15 hp, Suction lift 7' Discharge lift 18', Distance between pulleys 18" Motor pulley 6" dia., Pump pulley 6" dia., Intake size 4" IP Outlet size 3½" IP, power source 240 volt)	System in operation during visit. Mainline 5" AP - 950' Lateral 3" AP - 1200' 2 - Nelson 100-FA, 24° guns with .6 nozzles	185 g.p.m.

NW¼ NW¼, Section 21 T40S R10E	Baker	Hdgt.	18"	20'	+.5/20	1.4'	0'	Annular		Type B Flow	12 cfs
NW¼ NW¼, Section 21 T40S R10E	Coffin	Hdgt.	18"	30'	-.3/30	1.5'	0'	Annular		Type B Flow	8.5 cfs

NW¼ NW¼, Section 21 T40S R10E	Coffin	centrifugal	General Electric Triclad Induction Motor, 50 hp Model 5K4364 XA1Y3 Intake size 5" IP Outlet size 3½" IP Power source 480 volt	System appears adequate to irrigate land owned.	

Location	Owner	Hdgt.	Size	Length	Slope	Head Inlet	Head Outlet	Corrugation	Photo	Notes	Q
SE¼ NW¼, Section 21 T40S R10E	Schlecht	Hdgt.	8"	36'	+.5/36	0.9'	0.2'	Annular		Type A Flow	1.0cfs
NW¼ SE¼, Section 21 T40S R10E	do	Hdgt.	18"	37'	+.4/37	1.6'	0.3'	Annular		Type A Flow	9.0cfs
SW¼ SE¼, Section 21 T40S R10E	dO	Hdgt.	18"	30'	+.1/30	1.7'	0.2'	Annular		Type A Flow	9.5cfs
SE¼ SE¼, Section 21 T40S R10E	Coffin	Hdgt.	18"	27'	+.3/27	0.4'	0.2'	Annular	2-0140-B	Type A Flow	5.7cfs

LOCATION	OWNER	PUMP	MOTOR	Sprinkler Heads & Line, Lifts, etc.	Photo
SE¼ SE¼, Section 21 T40S R10E	Kusler	two pumps Berkeley Centr. Intake size 3"IP Outlet size 2¼"IP Rainflow Centr. Intake size 2¼"IP Outlet size - 1 3/4"IP	Century Electric Motor Model part #6-321217-01 10 hp General Electric Triclad Model 5K213JK66 10 hp, power source 240 volt	Systems in operation during visit and are adequate to irrigate land owned.	2-0140-B

SW¼ SW¼, Section 22 T40S R10E	Coffin	Hdgt.	30"	31'	+.5/31	2.5'	0'T.O.P.	Annular	2-0139-B	exit-effective, area = 1/3, Type B Flow(adjusted for area)	14cfs
NE¼ NW¼, Section 27 T40S R10E	Coffin	Hdgt.	18"	36'	+.8/36	2.0'	o'	Annular	do	Flow Type B - appears unused, land sprinkled	12cfs

NW¼ NE¼, Section 27 T40S R10E	Coffin	Berkeley Centri.	Century Electric Motor Part #6-333000-02, 15 hp Intake size 3½" IP Outlet size 3" IP Power source 240 volt	System appears adequate to irrigate land owned.	do

SW¼ NE¼, Section 27 T40S R10E	Coffin	Hdgt.	18"	92'	-.3/92	3.1'	0'	Annular	do	Type B Flow	8.7cfs

SE¼ NE¼, Section 27 T40S R10E	Turner	Berkeley Centri-fugal	Marathon Electric Motor Model AF-286TTDR7306AAW, 40 hp Intake size 6" IP Outlet size 6" IP Power source 480 volt	System appears adequate to irrigate land owned.	Klamath County Photo KLA 79 23-87

LOCATION	OWNER	PUMP		MOTOR				Sprinkler Heads & Line, Lifts, etc.			Photo
SW¼ NW¼, Section 26 T40S R10E	Hill, Bill	Turbine (old system)		Hollowshaft Electric Motor 10 hp, Model HU-3, serial #3288011 Intake size 8" IP Outlet size 8" IP Power source 240 volt				Gravity system flood irrigates land in SW¼ NW¼, Section 26 T40S R10E			do
SW¼ NW¼, Section 26 T40S R10E	Hill, Bill	Centrifugal (new system)		General Electric Motor 10 hp, Model 5K284D1619 Intake size 4½" IP Outlet size 3½" AP power source 240 volt power line				New system, running during visit. Appears adequate to irrigate land owned.			Klamath County Photo KLA 79 23-87
NW¼ SW¼, Section 26 T40S R10E	Hill, Bill	Hdgt.	18"	132'	+1.2/132	1.9'	0'	Annular	do	Type B Flow	8.1 cfs
NE¼ SW¼, Section 26 T40S R10E	Hill. Lou	Hdgt.	18"	74'	-1.4/74	3.0'	0'	Annular	do	Type B Flow	7.3 cfs
SW¼ SE¼, Section 26 T40S R10E	Hill, Lou	Hdgt.	18"	24'	-1.0/24	3.4'	0.4'	Annular	do	Type A Flow	11 cfs
SE¼ SE¼, Section 26 T40S R10E	Hill, Lou	turbine		General Electric triclad induction motor, 15 hp Model 5K4284 XG2 Intake size 8" IP Outlet size 8" IP Power source 240 volt power line				Flood irrigates from ditch system appears adequate to irrigate land owned.			do
SE¼ SE¼, Section 26 T40S R10E	Hill, Lou	Hdgt.	18"	111'	0/slope	3.7'	o'	Annular	do	Type B Flow	9.4cfs

South end "G" Canal, SE¼ SE¼, Section 26, T40S R10E

9-275-F
11-75

STATE OF OREGON
WATER RESOURCES DEPARTMENT

DISCHARGE MEASUREMENT NOTES

File No. .....
Meas. No. .....
Comp. by JW
Checked by SFM

Stream G CANAL - K.I.D., KLAMATH PROJECT
Date 9 - 9, 1985 Party KNAUER, WETZEL, STUNTEBECK
Width 48.3 Area 232. Vel. 0.569 G. H. 2.25 Disch. 132.
Method 2/.8 No. secs. 23 G. H. change 0 in 50 min.
Method coef. 1 Hor. angle coef. 1 Susp. coef. 1 Meter No. GURLEY T2258

GAGE READINGS				STICK
Time		Recorder	Inside	~~Outside~~
1:00		2.24		2.25
	Start			
1:50	Finish			
		2.24		2.25
Weighted M. G. H.				
G. H. correction				
Correct M. G. H.				

Date rated .....
Spin before meas. ..... after .....
Wading, cable, ice, boat, upstr., downstr., side bridge 3/4 feet, mile, above, below gage and .....

Tags checked .....
Meter suspended ~~from rod~~, or TYPE A. REEL
5 ft. above bottom 30 lb. C weight.
Levels obtained .....

Measurement rated excellent (2%), good (5%), fair (8%), poor (over 8%), based on following conditions: Cross section DIRT CANAL
Flow UNIFORM Weather P/C
Other ..... Air 60 °F@ .....
Gage OK Water ..... °F@ .....
..... Record removed ..... Intake flushed UL
Observer .....
Control CLEAR
Remarks HEADGATES DOWN TO MEASURING SECTION ALL CLOSED
G. H. of zero flow ..... ft.

Q FROM TABLE = 185 cfs

Angle coefficient	Dist. from initial point	Width	Depth	Observation depth	Revolutions F/S	Time in seconds	VELOCITY At point	VELOCITY Mean in vertical	Adjusted for hor. angle or	Area	Discharge
1	31°	2.	5.4	.2	0.8			0.65		10.8	7.02
				.8	0.5						
	33°	2.	5.2	.2	0.5			0.45		10.4	4.68
				.8	0.4						
	35°	2.	5.3	.2	0.6			0.5		10.6	5.30
				.8	0.4						
	37°	2.	4.7	.2	0.6			0.55		9.40	5.17
				.8	0.5						
	39°	2.	4.5	.2	0.5			0.5		9.00	4.5
				.8	0.5						
	41°	2.	3.9	.2	0.5			0.35		7.80	2.73
				.8	0.2						
	43°	3.8	2.8	.6	0.2			0.2		10.6	~~2.13~~ 2.12
⊙											
	48.6	2.8	0 R.E.	W	0					0	0
	48.3	48.3								232.	132.

.0 .10 .20 .30 .40 .50 .60 .70 .80 .85 .90 .92 .94 .96 .97 .98 .99 1.00 .99 .98 .97 .96 .94 .92 .90 .85 .80

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

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

River at—

Angle coefficient	Dist. from initial point	Width	Depth	Observation depth	Revolutions F/S	Time in seconds	VELOCITY At point	VELOCITY Mean in vertical	Adjusted for hor. angle or	Area	Discharge
	0.3	1.35 L.	0 E.W		0					0	0
	3.0	2.35	2.5	.6				0		5.88	0
	5.0	2.	3.7	.2	0.4			0.3		7.40	2.22
				.8	0.2						
	7.0	2.	4.7	.2	0.6			0.55		9.40	5.17
				.8	0.5						
	9.0	2.	5.7	.2	0.6			0.6		11.4	6.84
				.8	0.6						
	11.0	2.	6.3	.2	0.6			0.45		12.6	5.67
				.8	0.3						
	13.0	2.	7.1	.2	0.8			0.7		14.2	9.94
				.8	0.6						
	15.0	2.	7.5	.2	0.6			0.5		15.0	7.50
				.8	0.4						
⊙	17.0	2.	7.1	.2	0.7			0.6		14.2	8.52
				.8	0.5						
	19.0	2.	6.5	.2	0.8			0.75		13.0	9.75
				.8	0.7						
	21.0	2.	6.4	.2	0.8			0.8		12.8	10.2
				.8	0.8						
	23.0	2.	6.2	.2	0.9			0.75		12.4	9.3
				.8	0.6						
	25.0	2.	6.0	.2	0.8			0.8		12.0	9.6
				.8	0.8						
	27.0	2.	6.0	.2	0.8			0.7		12.0	8.4
				.8	0.6						
	29.0	2.	5.8	.2	0.7			0.6		11.6	6.96
				.8	0.5						

.80 .85 .90 .92 .94 .96 .97 .98 .99 1.00 .99 .98 .97 .96 .94 .92 .90 .85

.0 .10 .20 .30 .40 .50 .60 .70 .75 .80

9-275-F
11-75

STATE OF OREGON
WATER RESOURCES DEPARTMENT

File No. .....
Meas. No. .....
Comp. by DEK
Checked by DLW

DISCHARGE MEASUREMENT NOTES

Stream G-CANAL, KLA. PROJECT USBR, KID.
Date AUG 23, 1983 Party KNAUER-WESTON
Width 48 Area 225 Vel. 0.51 G. H. 1.78 Disch. 115
Method 2/8 No. secs. 23 G. H. change 0 in 90 min.
Method coef. 1 Hor. angle coef. 1 Susp. coef. 1 Meter No. E-1

Date rated .....
Spin before meas. ..... after .....
Wading, cable, ice, boat, upstr., downstr., side bridge 3/8 feet, mile, above, below gage and .....
1ST BRIDGE SOUTH OF LOST RIVER
Tags checked .....
Meter suspended ~~from rod, or~~ A-REEL
1/2 ft. above bottom 10 lb. ..... weight.
Levels obtained .....

GAGE READINGS				
Time		Recorder	Inside	Outside
1250		1.78	1.78	
	Start			
	Finish			
220		1.78	1.78	
Weighted M. G. H.				
G. H. correction				
Correct M. G. H.				

Measurement rated excellent (2%), good (5%), fair (8%), poor (over 8%), based on following conditions: Cross section DIRT & SAND
Flow UNIFORM Weather CLOUDY
Other ..... Air .....°F@ .....
Gage OK Water .....°F@ .....
..... Record removed ..... Intake flushed U/L .....
Observer .....
Control CLEAR
Remarks SE1/4 NW1/4 SEC 30 T39S R10E
G. H. of zero flow ..... ft.

Q (FROM TABLE) = 122 cfs

.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	
	0	2.0	LEW.		1:15 P.M.					—	—	
	4	3.0	2.8	.6			0.2			8.4	16.8	.85
	6	2.7	3.7	.2			0.3	0.325		7.4	24.1	
				.8			0.35					.90
	8		5.1	.2			0.45	0.4		10.2	40.8	.92
				.8			0.35					.94
	10		6.0	.2			0.5	0.475		12.0	57.0	
				.8			0.45					.96
	12		6.5	.2			0.6	0.5		13.0	65	.97
				.8			0.4					.98
	14		6.4	.2			0.6	0.525		12.8	73.6	.99
				.8			0.55					
	16		6.5	.2			0.6	0.53		13.0	68.9	
⊙				.8			0.45					1.00
	18		6.5	.2			0.65	0.55		13.0	71.5	
				.8			0.45					
	20		6.3	.2			0.7	0.63		12.6	79.4	.99
				.8			0.55					.98
	22		6.2	.2			0.65	0.58		12.4	71.9	.97
				.8			0.5					.96
	24		6.2	.2			0.6	0.55		12.4	68.2	
				.8			0.5					.94
	26		6.0	.2			0.55	0.5		12.0	60	.92
				.8			0.45					.90
	28		5.9	.2			0.6	0.55		11.8	64.9	
				.8			0.5					
	30		5.6	.2			0.65	0.55		11.2	61.6	.85
				.8			0.45					

.0 .10 .20 .30 .40 .50 .60 .70 .75 .80

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
	32		5.4	.2			0.55	0.5		10.8	5.4
				.8			0.45				
	34		5.2	.2			0.45	0.4		10.4	4.16
				.8			0.35				
	36		5.0	.2			0.55	0.45		10.0	4.50
				.8			0.35				
	38		4.2	.2			0.5	0.45		9.4	4.23
				.8			0.4				
	40		4.2	.2			0.45	0.45		8.4	3.78
				.8			0.45				
	42	2.0	3.4	.2			0.5	0.45		6.8	3.06
				.8			0.4				
	44	3.0	2.3	.6			0.45			6.9	3.11
⊙											
	48	2.0	R.E.W.		1:50 P.M.					—	—
	40	48								224.90	110.61
										+	4.5
	DITCH		1 CFS ±								115
	DITCH		2 CFS ±								
	PUMP		1/2 CFS ±								
	PUMP		1 CFS ±								
			4.5								

9-275-F
11-75

STATE OF OREGON
WATER RESOURCES DEPARTMENT

DISCHARGE MEASUREMENT NOTES

File No. .....
Meas. No. .....
Comp. by N2R
Checked by .....

Stream G-G Canal cutoff KID

Date 6-12, 1981 Party DWS

Width 48.0 Area 269.7 Vel. .98 G. H. 2.82 Disch. 270

Method ..... No. secs..... G. H. change ..... in ..... min.

Method coef. ..... Hor. angle coef. ..... Susp. coef. ..... Meter No. S-68

Date rated .....

Spin before meas. ✓ after ✓

Wading, cable, ice, boat, upstr., downstr., side bridge ..... feet, mile, above, below gage and .....

See

Tags checked .....

Meter suspended from rod, or

..... ft. above bottom ..... lb. ..... weight.

Levels obtained .....

GAGE READINGS				
Time		Recorder	Inside	Outside
	Start			
			2.82	
	Finish		No Change	
Weighted M. G. H.				
G. H. correction				
Correct M. G. H.				

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

Flow ..... Weather Clear, Some clouds, Cold windy

Other ..... Air .....°F@ .....

Gage ..... Water .....°F@ .....

..... Record removed ..... Intake flushed U L .....

Observer .....

Control .....

Remarks Add 3 cfs for 2 headgates letting water out

G. H. of zero flow ..... ft.

Q (FROM TABLE) = 279 cfs

.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	
	-2	1.0	LEW		100							.80
	0	2.5	2.4		3	45	.172	.172		6.0	1.03	.85
	3	3.0	4.4		15	46	.742	.639		13.2	8.43	
					10	43	.536					
	6	3.0	5.7		20	45	1.00	.952		17.1	16.3	.90
					20	50	.904					.92
	9	3.0	6.8		20	40	1.12	1.12		20.4	22.8	.94
					20	40	1.12					
	12	3.0	7.3		15	47	.727	.670		21.9	14.6	.96
					15	56	.614					.97
	15	3.0	7.4		20	44	1.02	1.14		22.2	25.3	.98
					25	45	1.25					.99
	18	3.0	7.2		25	40	1.40	1.32		21.6	28.5	
					25	45	1.25					
⊙	21	3.0	7.1		30	45	1.49	1.37		21.3	29.1	1.00
					25	45	1.25					
	24	3.0	6.8		30	46	1.46	1.28		20.4	26.1	
					20	41	1.10					.99
	27	3.0	6.6		25	41	1.36	1.22		19.8	24.1	.98
					20	42	1.07					.97
	30	3.0	6.8		20	38	1.18	.995		20.4	20.3	.96
					15	42	.810					
	33	3.0	6.5		15	44	.774	.716		19.5	13.9	.94
					15	52	.659					.92
	36	3.0	5.9		20	47	.960	1.00		17.7	17.7	.90
					20	44	1.02					
	39	3.0	4.9		15	40	.849	.780		14.7	11.4	
					15	48	.712					.85
.0	.10	.20	.30	.40	.50		.60		.70	.75	.80	

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
1°	42	3.0	3.5		10	40	.575	.562		10.5	5.90
					10	42	.549				
	45	2.0	1.5		–					3.0	1.17
					7	42	.392	.392			
	46	.5	DREW	@	11	50					
	48	48°								269.2	266.6
								(Open Headgates) +			3
											269.6

KBA_APP_000796

Error of rating from measurement
1%

[redacted]275-F
4-58

STATE OF OREGON
OFFICE OF STATE ENGINEER
Water Resources Department

File No. .....
Meas. No. .....
Comp. by JAE
Checked by NZR

DISCHARGE MEASUREMENT NOTES

Stream C-G CUTOFF

Date 10-1, 19 80 Party ESGET M HCBAIN N

Width 47 Area 24.1 Vel. .548 G. H. 1.86 Disch. 132

Method 2/.8 No. secs. 21 G. H. change — in — min.

Method coef. 1.0 Hor. angle coef. 1.0 Susp. coef. 1.0 Meter No. S-68

Date rated 04-11-69

Spin before meas. ✓ after ✓

Wading, cable, ice, boat, upstr., downstr., side bridge ..... feet, mile, above, below gage and .....

Tags checked .....

Meter suspended from rod, or

..... ft. above bottom ..... lb. ..... weight.

Levels obtained .....

GAGE READINGS				
Time		Recorder	Inside	Outside
1300	Start	1.86	1.86	
1410	Finish	1.86	1.86	
Weighted M. G. H.				
G. H. correction				
Correct M. G. H.				

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

Flow UNIFORM Weather SUNNY WARM

Other ..... Air .....°F@ .....

Gage A-OK Water .....°F@ .....

..... Record removed No Intake flushed No

Observer None

Control WIER

Remarks Measure at bridge
NW SW Sec 32 T39 R10 - rated on
concrete broadcrested WIER-WIER

G. H. of zero flow ..... ft.

covered w/ moderate Q MOSS
All HG's closed at this Date
Rated Q = 133

KBA_APP_000797

.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
	1°	2.0	LEW		0	0				0	0
	5°	3.5	3.8	.2	7	49	.340	.370		13.3	4.9
				.8	7	41	.401				
	8°	2.5	5.4	.2	10	51	.456	.465		13.5	6.3
				.8	10	49	.474				
	10°	2.0	6.2	↓	10	41	.561	.513		12.4	6.4
					10	50	.465				
	12°	2.0	6.9		15	54	.636	.592		13.8	8.2
					10	42	.549				
	14°	2.0	7.5		15	58	.594	.530		15.0	8.0
					10	50	.465				
	16°	2.0	7.6		15	49	.698	.624		15.2	9.5
					10	42	.549				
	18°	2.0	6.9		15	43	.792	.714		13.8	9.9
⊙					15	54	.636				
	20°	2.0	6.7		15	44	.774	.700		13.4	9.4
					15	55	.625				
	22°	2.0	6.9		15	46	.742	.673		12.6	8.5
					15	57	.604				
	24°	2.0	6.3		15	46	.742	.639		12.6	8.1
					10	43	.536				
	26°	2.0	6.2		15	49	.698	.636		12.4	7.9
					10	40	.575				
	28°	2.0	6.0		15	51	.672	.582		12.0	7.0
					10	47	.493				
	30°	2.0	6.0		15	53	.647	.565		12.0	6.8
					10	48	.483				

.80 .85 .90 .92 .94 .96 .97 .98 .99 1.00 .99 .98 .97 .96 .94 .92 .90 .85

.0 .10 .20 .30 .40 .50 .60 .70 .75 .80

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
	32°	2°	5 8		15	58	.594	.554		11.6	6.4
					10	45	.514				
33 5	34°	2°	6 1		10	48	.483	.442		12.2	5.4
					7	41	.401				
	36°	2°	6°		10	43	.536	.496		12.0	6.0
					10	51	.456				
	38°	2°	5 4		10	45	.514	.494		10.8	5.3
					10	49	.474				
	40°	2 5	4 6		10	49	.474	.404		11.5	4.6
					7	50	.333				
	43°	4°	2 8		7	52	.321	.274		11.2	3.1
					5	55	.226				
	48°	2 5	REW				0	0		0	0
⊙	47	47								241.3	131.7

C-6

1	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09	
1.00	46	47	47	48	48	49	49	50	51	52	1.00
.10	53	53	54	55	56	57	58	59	60	61	.10
.20	62	62	63	64	65	66	67	68	69	70	.20
.30	71	71	72	73	74	75	76	77	78	79	.30
.40	80	81	82	83	84	85	86	87	88	88	.40
.50	90	91	92	93	94	95	96	97	98	99	.50
.60	100	101	102	103	104	105	106	107	108	110	.60
.70	112	114	116	117	118	119	120	121	122	123	.70
.80	124	125	127	128	130	131	133	134	135	136	.80
.90	137	139	140	142	143	145	146	147	148	149	.90
2.00	150	151	153	154	156	157	159	160	161	162	2.00
.10	163	164	166	167	169	170	172	173	175	176	.10
.20	178	179	181	183	184	185	187	188	190	191	.20
.30	193	195	196	198	199	201	202	204	205	207	.30
.40	209	211	212	214	215	217	219	220	222	223	.40
.50	225	227	228	230	231	233	234	236	237	239	.50
.60	241	243	244	246	247	249	250	252	254	256	.60
.70	258	260	261	263	265	267	268	270	272	273	.70
.80	275	277	279	281	283	284	286	287	289	291	.80
.90	293	295	297	299	300	302	304	306	308	309	.90
3.00	311	313	315	317	319	321	322	324	326	328	3.00
.10	330	332	334	336	338	340	341	343	345	347	.10
.20	349	351	353	355	357	359	360	362	364	366	.20
.30	368	370	372	374	376	378	380	382	384	386	.30
.40	388	390	392	394	396	398	400	402	404	406	.40
.50	408	410	412	414	416	418	420	422	424	426	.50
.60	428	430	432	434	436	439	441	443	445	447	.60
.70	449	451	453	455	457	459	461	463	465	467	.70
.80	469	471	473	475	477	479	481	483	485	487	.80
.90	489	491	493	495	497	499	501	503	505	507	.90
4.00	509	511	513	515	517	519	521	523	525	527	4.00
	00	.01	.02	.03	.04	.05	.06	.07	.08	.09	

7—210
(Oct. 1936)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

Computed by _____
Checked by _____
Date _____

Rating table for C G 0 - 1.00 *River at* _____

near _____, *from* _____, 19____, *to* _____, 19____

Gage height	Discharge	Difference	Gage height	Discharge	Difference	Gage height	Discharge	Difference	Gage height	Discharge	Difference	Gage height	Discharge	Difference
Feet	*Sec.-ft.*	*Sec.-ft.*	*Feet*	*Sec.-ft.*	*Sec.-ft.*	*Feet*	*Sec.-ft.*	*Sec.-ft.*	*Feet*	*Sec.-ft.*	*Sec.-ft.*	*Feet*	*Sec.-ft.*	*Sec.-ft.*
.00			.20	5		.40	12		.60	21		.80	33	
.10			.10	5		.10	12		.10	22		.10	34	
.20			.20	6		.20	13		.20	22		.20	34	
.30			.30	6		.30	13		.30	23		.30	35	
.40			.40	6		.40	14		.40	23		.40	35	
.50			.50	7		.50	14		.50	24		.50	36	
.60			.60	7		.60	14		.60	25		.60	37	
.70			.70	7		.70	15		.70	25		.70	37	
.80			.80	7		.80	15		.80	26		.80	38	
.90			.90	8		.90	16		.90	26		.90	38	
.10	2		.30	8		.50	16		.70	27		.90	39	
.10	2		.10	8		.10	17		.10	28		.10	40	
.20	3		.20	9		.20	17		.20	28		.20	40	
.30	3		.30	9		.30	18		.30	29		.30	41	
.40	3		.40	10		.40	18		.40	29		.40	42	
.50	4		.50	10		.50	19		.50	30		.50	43	
.60	4		.60	10		.60	19		.60	31		.60	43	
.70	4		.70	11		.70	20		.70	31		.70	44	
.80	4		.80	11		.80	20		.80	32		.80	45	
.90	5		.90	12		.90	21		.90	32		.90	45	
												1.00	46	

The above table is not applicable for ice or obstructed channel conditions. It is based on _____ discharge measurements made during _____

_____ and is _____ well defined between gage heights _____ feet and _____ feet.

Above gage height _____ feet the rating curve is _____ a tangent, the difference being _____ per tenth.

U. S. GOVERNMENT PRINTING OFFICE 6—7838

7—210
(Oct. 1936)

(2)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

Computed by _____
Checked by _____
Date _____

Rating table for CG 1.00- 200 *River at* _____

near _____, *from* _____, 19____, *to* _____, 19____

Gage height	Discharge	Difference	Gage height	Discharge	Difference	Gage height	Discharge	Difference	Gage height	Discharge	Difference	Gage height	Discharge	Difference
Feet	*Sec.-ft.*	*Sec.-ft.*	*Feet*	*Sec.-ft.*	*Sec.-ft.*	*Feet*	*Sec.-ft.*	*Sec.-ft.*	*Feet*	*Sec.-ft.*	*Sec.-ft.*	*Feet*	*Sec.-ft.*	*Sec.-ft.*
1.00	46		1.20	62		1.40	80		1.60	100		1.80	124	
.10	47		.10	62		.10	81		.10	101		.10	125	
.20	47		.20	63		.20	82		.20	102		.20	127	
.30	48		.30	64		.30	83		.30	103		.30	128	
.40	48		.40	65		.40	84		.40	104		.40	130	
.50	49		.50	66		.50	85		.50	105		.50	131	
.60	49		.60	67		.60	86		.60	106		.60	133	
.70	50		.70	68		.70	87		.70	107		.70	134	
.80	51		.80	69		.80	88		.80	108		.80	135	
.90	52		.90	70		.90	89		.90	110		.90	136	
1.10	53		1.30	71		1.50	90		1.70	112		1.90	137	
.10	53		.10	71		.10	91		.10	114		.10	139	
.20	54		.20	72		.20	92		.20	116		.20	140	
.30	55		.30	73		.30	93		.30	117		.30	142	
.40	56		.40	74		.40	94		.40	118		.40	143	
.50	57		.50	75		.50	95		.50	119		.50	145	
.60	58		.60	76		.60	96		.60	120		.60	146	
.70	59		.70	77		.70	97		.70	121		.70	147	
.80	60		.80	78		.80	98		.80	122		.80	148	
.90	61		.90	79		.90	99		.90	123		.90	149	
												2.00	150	

The above table is not applicable for ice or obstructed channel conditions. It is based on _____ discharge measurements made during _____

_____ and is _____ well defined between gage heights _____ feet and _____ feet.

Above gage height _____ feet the rating curve is _____ a tangent, the difference being _____ per tenth.

U. S. GOVERNMENT PRINTING OFFICE 6—7838

7—210
(Oct. 1936)

(3)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

Computed by _____
Checked by _____
Date _____

Rating table for CG 2.00 - 3.00 *River at* _____

near _____, *from* _____, 19____, *to* _____, 19____

Gage height	Discharge	Difference	Gage height	Discharge	Difference	Gage height	Discharge	Difference	Gage height	Discharge	Difference	Gage height	Discharge	Difference
Feet	*Sec.-ft.*	*Sec.-ft.*	*Feet*	*Sec.-ft.*	*Sec.-ft.*	*Feet*	*Sec.-ft.*	*Sec.-ft.*	*Feet*	*Sec.-ft.*	*Sec.-ft.*	*Feet*	*Sec.-ft.*	*Sec.-ft.*
2.00	150		2.20	178		2.40	209		2.60	241		2.80	275	
.10	151		.10	179		.10	211		.10	243		.10	277	
.20	153		.20	181		.20	212		.20	244		.20	279	
.30	154		.30	182		.30	214		.30	246		.30	281	
.40	156		.40	184		.40	215		.40	247		.40	283	
.50	157		.50	185		.50	217		.50	249		.50	284	
.60	159		.60	187		.60	219		.60	250		.60	286	
.70	160		.70	188		.70	220		.70	252		.70	287	
.80	161		.80	190		.80	222		.80	254		.80	289	
.90	162		.90	191		.90	223		.90	256		.90	291	
2.10	163		2.30	193		2.50	225		2.70	258		2.90	293	
.10	164		.10	195		.10	227		.10	260		.10	295	
.20	166		.20	196		.20	228		.20	261		.20	297	
.30	167		.30	198		.30	230		.30	263		.30	298	
.40	169		.40	199		.40	231		.40	265		.40	300	
.50	170		.50	201		.50	233		.50	267		.50	302	
.60	172		.60	202		.60	234		.60	268		.60	304	
.70	173		.70	204		.70	236		.70	270		.70	306	
.80	175		.80	205		.80	237		.80	272		.80	307	
.90	176		.90	207		.90	239		.90	273		.90	309	
												3.00	311	

The above table is not applicable for ice or obstructed channel conditions. It is based on _____ discharge measurements made during _____

_____ and is _____ well defined between gage heights _____ feet and _____ feet.

Above gage height _____ feet the rating curve is _____ a tangent, the difference being _____ per tenth.

U. S. GOVERNMENT PRINTING OFFICE 6—7838

7—210
(Oct. 1936)

(4)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

Computed by .....
Checked by .....
Date .....

Rating table for CG 3.00 - 3.50 *River at* .....

near ....., *from* ....., 19....., *to* ....., 19.....

Gage height	Discharge	Difference	Gage height	Discharge	Difference	Gage height	Discharge	Difference	Gage height	Discharge	Difference	Gage height	Discharge	Difference
Feet	*Sec.-ft.*	*Sec.-ft.*	*Feet*	*Sec.-ft.*	*Sec.-ft.*	*Feet*	*Sec.-ft.*	*Sec.-ft.*	*Feet*	*Sec.-ft.*	*Sec.-ft.*	*Feet*	*Sec.-ft.*	*Sec.-ft.*
3.00	311		3.20	349		3.40	388		.00			.00		
.10	313		.10	351		.10	390		.10			.10		
.20	315		.20	353		.20	392		.20			.20		
.30	317		.30	355		.30	394		.30			.30		
.40	319		.40	357		.40	396		.40			.40		
.50	321		.50	359		.50	398		.50			.50		
.60	322		.60	360		.60	400		.60			.60		
.70	324		.70	362		.70	402		.70			.70		
.80	326		.80	364		.80	404		.80			.80		
.90	328		.90	366		.90	406		.90			.90		
3.10	330		3.30	368		3.50	408		.00			.00		
.10	332		.10	370		.10			.10			.10		
.20	334		.20	372		.20			.20			.20		
.30	336		.30	374		.30			.30			.30		
.40	338		.40	376		.40			.40			.40		
.50	340		.50	378		.50			.50			.50		
.60	341		.60	380		.60			.60			.60		
.70	343		.70	382		.70			.70			.70		
.80	345		.80	384		.80			.80			.80		
.90	347		.90	386		.90			.90			.90		

The above table is not applicable for ice or obstructed channel conditions. It is based on ..... discharge measurements made during .....

..... and is ..... well defined between gage heights ..... feet and ..... feet.

Above gage height ..... feet the rating curve is ..... a tangent, the difference being ..... per tenth.

.....

.....

.....

.....

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U. S. GOVERNMENT PRINTING OFFICE 6—7838

'C-G' CUTOFF (G-Canal)

Klamath Irrigation District

Gage Location: SE¼ NW¼, Section 30, T39S R10E, above concrete weir on left bank.

Gage: Stilling well with continuous chart recorder and inside gaging stick. Stick measures from recording shelf down with stick between nails. Stick is correctly labeled.

Measuring Section: Bridge on 'G' Canal in the NW¼ SW¼, Section 32, T39S R10E - bridge crosses 'G' Canal from Hill Road. There are five headgates between bridge and gage which should be added to measurement if operating. (See photo 2-0142-B). Use Canfield Reel, 30 lb. weight and standard meter.

Rating: Standard rating using measurements. It appears to be accurate.

Jim Esget
Field Engineer

8-157

STATE OF OREGON
OFFICE OF STATE ENGINEER
Water Resources Department

Year .....

File No. .....

Discharge measurements of "C-G" Cutoff ("G" Canal), Klamath Irrigation District

....., *during the year ending September 30, 18*.....

No.	Date	Made by	Width Feet	Area Sq. ft.	Mean Velocity Ft./Sec.	Gage Height Feet	Discharge C.F.S.	Rating Q Corr.	Rating % diff	Method	Meas. Book No.	Gage Ht. Ft.	Time Min.	Temperature Wtr.	Temperature Air	REMARKS
	10/1/80	Esget & McBain					132	133	1%							
	9/9/85	KNAUER STONTENECK WETZEL					132	185	29%							

* Geological Survey Engineer

G-3 CANAL

SMEAD®
No. 153L
UPC 10330
smead.com • Made in USA

PHOTO'S USED TO SURVEY 'G-3' CANAL

Klamath Project U.S.B.R.

1-0093-A
1-0094-A

LOCATION	NAME	DELIVERY	NOTES
Photo #1-0094-A			Note: all inlet and outlet heads from top of c.m.p.
T40S R10E			
SW¼ SW¼, Sec.25	Clark	12"cmp	.2'/21', inlet 2.0, outlet 1.0 (75%)
SE¼ SW¼, 25	Clark	12"cmp	.2'/19', inlet 2.0, outlet 0.6
SE¼ SW¼, 25	Clark	centrifugal pump	40 h.p. G.E. motor
SW¼ SE¼, 25	Dean (?)	turbin pump	40 h.p. Fairbanks-Morse
SW¼ SE¼, 25	Johnson (?)	centrifugal pump	20 h.p. motor
NW¼ NE¼, Sec.36	Kandra	18"cmp	.1'/15', inlet 1.0', outlet 0 (50%)
NE¼ NE¼, 36	Dean	18"cmp	.1'/18', inlet 1.0', oultet 0
T40S R11E			
NW¼ NW¼, Sec.31	Dean	turbin pump	20 h.p. G.E. motor
NW¼ NW¼, 31	Dean & O'Neil	3 centrifugal pumps	3 - 60 h.p. G.E. motors
NE¼ NW¼, 31	Dean	18"cmp	unused - outlet buried
SW¼ NE¼, 31	Scronce	18"cmp	.1'/20', inlet 1.3', outlet 1.0'
SE¼ NE¼, 31	Scronce	2 centrifugal pumps	2 - 50 h.p. motors
SW¼ NE¼, 31	K.I.D. SPILL	24" cmp to south	
SE¼ NE¼, 31	Retterath	18"cmp	.1'/53', inlet 1.8', outlet 0.5'
NE¼ SE¼, 31	Retterath	turbin pump	20 h.p. motor
NE¼ SE¼, 31	Retterath	18"cmp	.1'/18', inlet 0.8', outlet = free
NW¼ SW¼, 32	Retterath	SPILL 24" cmp to west	
SW¼ SW¼, Sec.32	Wilson	18"cmp	.3'/18', inlet 1.3', outlet 0.8'
SW¼ SW¼ 32	Hadley - McCormic	2 turbin pumps	2 - 20 h.p. motors (Byron-Jackson pump
SW¼ SW¼ 32	Wilson	18"cmp	.1'/17', inlet 1.6', outlet 1.0'
Photo #1-0093-A			
T41S R11E			
NW¼ NW¼, Sec. 5	Petrik	18"cmp	.1'/17', inlet 0.9', outlet 0.8'
T41S R11E			
NW¼ NW¼, Sec. 5	Petrik	18"cmp	.1'/20', inlet 1.2', outlet 1.1'

LOCATION	NAME	DELIVERY	NOTES
SW¼ NW¼, Sec. 5	Giacomini	centrifugal pump	7½ h.p. G.E. motor, pump submerged, total lift = 6'/30', 10" discharge, pipe, open discharge
SW¼ NW¼, 5	Giacomini	18" cmp	.1'/20', inlet 1.6', outlet 0.5'
SW¼ NW¼, 5	JOHNS DRAIN/SPILL	18" cmp	.1'/15', inlet 1.3', outlet 0.6'
NW¼ SW¼, 5	Giacomini	24" cmp	.7'/27', inlet 1.0', outlet 1.6'
SE¼ NW¼, 5	Lyon	centrifugal pump	50 h.p. G.E. motor - Cornell pump
NW¼ SE¼, 5	Giacomini	centrifugal pump	10 h.p. motor, suction lift = 6', discharge lift 5/220', intake size = 8' outlet size = 6", open discharge.

9-275-F
11-75

STATE OF OREGON
WATER RESOURCES DEPARTMENT

DISCHARGE MEASUREMENT NOTES

File No. .....
Meas. No. .....
Comp. by JW
Checked by SFM

Stream G-3 CANAL

Date 9-10-, 1985 Party KNAUER, WETZEL, Stuntzbeck

Width 13.0 Area 30.6 Vel. .536 G. H. ..... Disch. 16.4

Method .6 No. secs. 18 G. H. change 0 in 30 min.

Method coef. 1 Hor. angle coef. 1 Susp. coef. 1 Meter No. S-68

Date rated 9-11-69

GAGE READINGS		Up Recorder	~~Inside~~ Down Left	~~Outside~~ Down Right
Time				
1:10		2.76	0.91	0.93
	Start			
1:40	Finish	2.76		
Weighted M. G. H.				
G. H. correction				
Correct M. G. H.				

Spin before meas. ..... after .....

Wading, cable, ice, boat, (upstr.) downstr., side bridge 100 (feet) mile, above, (below) gage and .....

Tags checked .....

Meter suspended from (rod) or .....

..... ft. above bottom ..... lb. ..... weight.

Levels obtained .....

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

Flow uniform Weather Cloudy

Other ..... Air ..... °F@ .....

Gage ..... Water ..... °F@ .....

..... Record removed ..... Intake flushed U L .....

Observer .....

Control .....

Remarks Cross section very soft mud on Bottom

G. H. of zero flow ..... ft.

9-275-F
11-75

STATE OF OREGON
WATER RESOURCES DEPARTMENT

DISCHARGE MEASUREMENT NOTES

No. .....
Meas. No. .....
Comp. by .....
Checked by .....

Stream G-3 CANAL

Date AUG 24 ., 1983 Party KNAUER WESTON

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

Method ..... No. secs..... G. H. change ..... in ..... min.

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

Date rated .....

Spin before meas. ..... after .....

Wading, cable, ice, boat, upstr., downstr., side bridge ..... feet, mile, above, below gage and .....

NO MEASUREMENT
VERY LITTLE FLOW

Tags checked .....

Meter suspended from rod, or .....

..... ft. above bottom ..... lb. ..... weight.

Levels obtained .....

GAGE READINGS				
Time		Recorder	Inside	Outside
1020				
	Start			
	Finish			
Weighted M. G. H.				
G. H. correction				
Correct M. G. H.				

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 L .....

Observer .....

UPSTREAM HEAD 2.68 @ 1020

Control S-
N-

Remarks .....

NE¼ NE¼ SEC 35 T40S R10E

G. H. of zero flow ..... ft.

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
	2.0	0.5	REW				0			0	0
	3.0	1.0	1.0	.6	5	51	.241			1.0	0.241
	4.0	0.85	1.6	.6	10	53	.440			1.36	0.598
	4.7	0.7	2.0	.6	10	48	.483			1.40	0.676
	5.4	0.7	2.3	.6	10	54	.432			1.61	0.696 ~~0.700~~
	6.1	0.7	2.6	.6	10	42	.549			1.82	0.999
	6.8	0.7	2.9	.6	10	43	.536			2.03	1.09
	7.5	0.7	3.0	.6	10	40	.575			2.10	1.21
	8.2	0.7	3.1	.6	10	40	.575			2.17	1.25
	8.9	0.7	3.1	.6	10	40	.575			2.17	1.25
	9.6	0.7	3.1	.6	10	42	.549			2.17	1.19
	10.3	0.7	3.0	.6	10	40	.575			2.10	1.21
	11.0	0.7	3.0	.6	10	40	.575			2.10	1.21
	11.7	0.7	3.0	.6	15	56	.614			2.10	1.29
⊙	12.4	0.7	2.9	.6	15	55	.625			2.03	1.27
	13.1	0.7	2.8	.6	10	40	.575			1.96	1.13
	13.8	0.95	2.6	.6	10	51	.456			2.47	1.13
	15	0.6	LEW				0			0	0
	13.0	13.0								30.6	16.4

9-275-F
11-75

STATE OF OREGON
WATER RESOURCES DEPARTMENT

DISCHARGE MEASUREMENT NOTES

F No. .....
Meas. No. .....
Comp. by NZR
Checked by .....

Stream G-3 Canal

Date 6-16, 1981 Party DWS

Width 17.5 Area 42.0 Vel. .60 G. H. ..... Disch. 25!

Method 2.8 No. secs. 22 G. H. change ..... in ..... min.

Method coef. ..... Hor. angle coef. ..... Susp. coef. ..... Meter No. Pygmy US-28-7030

Date rated .....

GAGE READINGS				
Time		Recorder	Inside	Outside
1440	Start			
		See	Note	
			Below	
1575	Finish		same	
Weighted M. G. H.				
G. H. correction				
Correct M. G. H.				

Spin before meas. ✓ after —

Wading, cable, ice, boat, upstr., downstr., side bridge ..... feet, mile, above, below gage and .....

Plank across canal

See section Description

Tags checked .....

Meter suspended from rod, or

..... ft. above bottom ..... lb. ..... weight.

Levels obtained .....

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

Flow uniform Weather clear warm windy

Other ..... Air .....°F@ .....

Gage ..... Water .....°F@ .....

..... Record removed ..... Intake flushed U

Observer .....

	(SOUTH?) Right	(NORTH?) Left
Control well reading	1.73	2.01
Screw gate	.7 —	.71 —

Remarks Staff gage in well on G-canal 3.04

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
	5	.5	REW	@	14	40					
	6	1.0	.7	.6	5	47	.140			.7	.098
	7	.9	3.0	.2	25	52	.604	.356		2.7	.961
				.8	3	42	.107				
Pict	7.8	.4									
.4	8.2	.4									
	9	.9	3.4		30	43	.701	.612		3.06	1.87
					25	49	.523				
	10	1.0	3.5		40	45	.883	.682		3.5	2.39
					20	43	.480				
	11	1.0	3.4		40	40	.988	.750		3.4	2.55
					20	40	.513				
	12	1.0	3.4		40	40	.988	.734		3.4	2.50
					20	43	.480				
⊙	13	1.0	3.2		40	41	.965	.734		3.2	2.35
					20	41	.502				
	14	1.0	3.3		40	42	.943	.669		3.3	2.21
					15	40	.395				
	15	1.0	3.1		40	44	.902	.767		3.1	2.38
					25	40	.632				
	16	1.0	3.1		40	41	.965	.784		3.1	2.43
					25	42	.604				
	17	1.0	3.2		30	39	.769	.615		3.2	1.97
					20	45	.461				
	18	.7	3.0		30	46	.658	.564		2.1	1.18
					20	44	.470				
Pict .5	18.4	.20									
	18.9	.05									

.0 .10 .20 .30 .40 .50 .60 .70 .75 .80

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
	19	.55	2.5		20	46	.452	.443		1.38	.611
					20	48	.434				
	20	1.0	2.4		15	41	.386	.386		2.4	.926
					15	41	.386				
	21	1.0	2.1		7	43	.193	.217		2.1	.456
					10	47	.241				
	22	.75	1.8	.2	7	39	.209	.176		1.35	.238
				.8	5	45	.144				
	22.5	.25		LEW@		15	15				
	17.5	16.4								42.0	25.1
	-.9										
	16.6										

9-275-G
11-75

STATE OF OREGON
WATER RESOURCES DEPARTMENT

DISCHARGE MEASUREMENT NOTES

No. .....
Meas. No. .....
Comp. by JAE
Checked by NZR

Stream G-3 CANAL

Date 10-6, 1980 Party ESGET " McBAIN "

Width 19.0 Area 47.9 Vel. .113 G. H. — Disch. 5.41

Method 2/.8 No. secs. 22 G. H. change ..... in ..... min. STAND.

Method coef. 1.0 Hor. angle coef. 1.0 Susp. coef. 1.0 Meter No. .....

Date rated 4-11-69

Spin before meas. ..... after OK

Wading, cable, ice, boat, upstr., downstr., side bridge ..... feet, mile, above, below gage and .....

Tags checked .....

Meter suspended from rod, or

..... ft. above bottom ..... lb. ..... weight.

Levels obtained .....

GAGE READINGS				
Time		Recorder	Inside	Outside
1035				
	Start			
1140	Finish			
Weighted M. G. H.				
G. H. correction				
Correct M. G. H.				

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

Flow ..... Weather Sunny Warm

Other ..... Air .....°F@ .....

Gage ..... Water .....°F@ .....

..... Record removed ..... Intake flushed U L .....

Observer Elev. top of well upstream head = 3^{23}

Upstream head 2.96 @ 1035

Control Distance to top of casing from water downstream head – N = 3^{50} @ 1035, 3^{50} @ 1140

Remarks S = 3^{49} @ 1035, 3^{53} @ 1140

Screw Stock N – 0^{49} @ 1035 & 1140

S – 0^{12} @ 1035 & 1140

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	
	2°	.50	REW							0	0	
	3°	1.00	1°	.6	/	/				1.00	0	.85
	4°	1.00	1⅝		/	/				1.50	0	
	5°	1.00	2°		1	70	.057	.028		2.00	.056	
	6°	1.00	2⅘	.6	/	/	0	0		2.40	0	.90
	7°	.75	3°	.2	1	65	.060	.030		2.25	.068	.92
				.8	/	/	0					.94
	7½	.75	3 15/16	.2	1	45	.075	.082		2.36	.194	
				.8	2	70	.089					.96
	8½	.75	3⅜		3	62	.132	.129		2.48	.320	.97
					3	66	.126					.98
	9°	.75	3¼		3	46	.169	.144		2.55	.367	.99
					3	70	.120					
	10°	.75	3¼		5	59	.212	.174		2.55	.444	
⊙					3	60	.136					1.00
	10½	.75	3¼		5	56	.222	.174		2.55	.444	
					3	65	.127					
	11½	.75	3¼		5	57	.219	.171		2.55	.436	.99
					3	68	.123					.98
	12°	.75	3⅜		5	56	.222	.172		2.48	.427	.97
					3	69	.121					.96
	13°	.75	3 35/64		5	53	.233	.171		2.51	.429	
					3	79	.109					.94
	13½	.75	3⅜		5	51	.241	.168		2.48	.417	.92
					2	63	.096					.90
	14½	.75	3⅜		5	50	.245	.172		2.48	.427	
					2	60	.099					
	15°	.75	3¼		5	55	.226	.152		2.32	.353	.85
					1	42	.078					

.0 .10 .20 .30 .40 .50 .60 .70 .75 .80

9-275-G
11-75

STATE OF OREGON
WATER RESOURCES DEPARTMENT

DISCHARGE MEASUREMENT NOTES

File No. .....
Meas. No. .....
Comp. by .....
Checked by .....

Stream 6-3 Canal PAGE 2

Date ....., 19..... Party .....

Width ..... Area ..... Vel. ..... G. H. ..... Disch. 5.41

Method ..... No. secs..... G. H. change ..... in ..... min.

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

Date rated .....

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

Spin before meas. ..... after .....

Wading, cable, ice, boat, upstr., downstr., side bridge ..... feet, mile, above, below gage and .....

.....

.....

.....

Tags checked .....

Meter suspended from rod, or

.....

..... ft. above bottom ..... lb. ..... weight.

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 L .....

Observer .....

.....

Control .....

.....

Remarks .....

.....

.....

G. H. of zero flow ..... ft.

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
	16°	1.00	3°	.2	5	56	.222	.161		3.00	.483
				.8	2	59	.100				
	17°	1.00	3°		/	/	0	0		3.00	0
	18°	1.00	2⁴	.6	2	80	.080	.080		2.40	.192
	19°	1.50	2⁰⁵	.6	2	50	.114	.114		3.08	.351
	21°	1.00	LEW							0	0
	19°	19°								47.9	5.408

$Q_1 = .61 \cdot .49 \cdot .55 \sqrt{2 \cdot g \cdot 1.33} = 1.52$ $\quad 2^{49}$

$Q_2 = .61 \cdot .12 \cdot .55 \sqrt{2 \cdot g \cdot 1.23} = .36$ $\quad .59$

.30 $\quad$ 1.28

								999⁹⁹			
								5⁶⁰			
		$\Delta H_N = 1^{23}$				3^{73}	=	994	39 =	upstream ~~Lower~~ Well top	
		$\Delta H_S = 1^{23}$				5^{22}	[illegible]	149 995	88 =	upper #1 ~~Right~~ S	
						5^{23}	[illegible]	15 995	89 =	" #2 ~~Left~~ N	
						-3^{60}					
						1^{63}	=	North			
						1^{73}	=	South			

"G-3" Canal, Klamath Irrigation District

Headgate Location: NE $\frac{1}{4}$, NE $\frac{1}{4}$ SEC 35, T40S, R10E.

Gages: Stilling well with staff plate upstream of headgates between G-3 and G-D drop headgates. Two stilling wells about 1' downstream of headgates (one for each gate) and covered by a wood plank. (Ditch rider carries gage stick for these wells or a level can be used to compute head differential thru the gates).

Headgates: Two rectangular metal lift gates with metal wheels and screw stock. Carry water thru two 3' diameter corrugated metal culverts.

Measuring Section: Small wooden footbridge (to a pump) in the SE $\frac{1}{4}$, SW $\frac{1}{4}$ SEC 25, T40S, R10E. Use a standard wading rod and pygmy meter (very low velocities, regular flow). Add flow from any open headgates. Measuring section is poor, but best available.

~~Flow Computation: Use G-3 rating as shown at bottom of rating.~~

Rating Accuracy — Appears poor. This was verified by Malcolm Crawford of K.I.D. Problems with rating accuracy may be due to backwater in the culverts, [illegible] roughness in both barrels, and friction at inlet

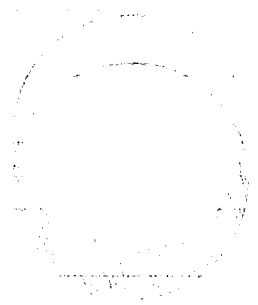
From discharge measurement on W-6-R0, a discharge coefficient of .33 rather than K.I.D.'s .61 was computed. The coefficient should continue to be checked for stability at various flows.

Computation: Equation $Q = CA\sqrt{2g \cdot \Delta H}$

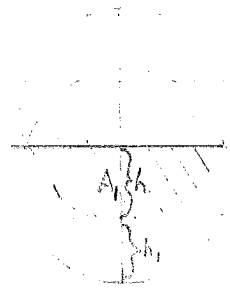
where C is coefficient of discharge. KID has used .61, but measurements have indicated a smaller value (around .33)

ΔH is the difference in head thru inlet of culvert, or upstream well minus downstream well levels for each culvert.

A is shaded portion of drawing below.



Found as follows:



h_1 = headgate opening measured from top of wheel to top of screwstock.

Then $h = \frac{3' - h_1}{2}$

On table 3, in the Quantities Binder, under culverts,

$\frac{d}{D} = \frac{h}{D}$ $A_1 = C_a D^2 = C_a \cdot 3^2$ from Table 3.

And Area of Opening = Total Area of Culvert opening minus $2 \cdot A_1$ or Area Total $- 2A_1$.

<u>Example.</u> Upstream water surface elevation = $2^{\underline{96}}$.

Downstream water surface elevations are:

North $- 1^{\underline{63}}$ and South $1^{\underline{73}}$ before and after measurement.

North $- h_1 = 0^{\underline{49}}$ and South $- h_1 = 0^{\underline{12}}$

<u>North Culvert</u>

$C = .61$, $\Delta H = 2^{\underline{96}} - 1^{\underline{63}} = 1^{\underline{33}}$

Area: $h = \frac{3' - .49}{2} = 1.26$

$\frac{d}{D} = \frac{h}{D} = \frac{1.26}{3} = .42 \Rightarrow C_a = .3130$

$A_1 = .3130 \cdot D^2 = .3130 \cdot 9 = 2.82$ sq. ft

$A = A_{Total} - 2A_1 = \frac{\pi \cdot D^2}{4} - 2(2.82) = 7.07 - 5.64 = 1.43$ sq. ft

$Q_N = CA\sqrt{2g\Delta H} = .61 \cdot 1.43\sqrt{2 \cdot g \cdot 1.33} = 8.07$ cfs

<u>South Culvert</u>

$C = .61$, $\Delta H = 1.23$

Area: $h = \frac{3' - .12}{2} = 1.44$

$\frac{d}{D} = \frac{1.44}{3} = .48 \Rightarrow C_a = .3927$

$A_1 = 3.35$ ft^2

$$A = A_{Total} - 2 \cdot A_1 = \frac{\pi D^2}{4} - 2 \cdot A_1 = 2.02 - 6.20 = .37 \text{ ft}^2$$

$$Q_S = CA\sqrt{2g\Delta H} = .61 \cdot .37\sqrt{2 \cdot g \cdot 1.23} = 2.01 \text{ cfs}$$

$$Q = Q_N + Q_S = 8.07 + 2.01 = 10.08 \text{ cfs}$$

Jim Esget
Field Engineer

9-207-

STATE OF OREGON

OFFICE OF STATE ENGINEER

Water Resources Department

Year .....

File No. .....

Discharge measurements of "G-3" Canal, Klamath Irrigation District

....., *during the year ending September 30, 19*.....

No.	Date	Made by	Width Feet	Area Sq. ft.	Mean Velocity Ft./Sec.	Gage Height Feet	Discharge C.F.S.	Rating Corr.	Rating % diff	Method	Meas. Sum. No.	G. Ht. Chgs. Ft.	Time Min.	Temperature Wtr.	Temperature Air	REMARKS
	10/6/80	Esget & McBain					5.41	5.1	87%							[illegible]
	9/10/85	KNAUER STUNTEBECK WETZEL					16.4									

* Geological Survey Engineer

8.1 cfs est Nozzly Others closed Middle 1H' = 0.50 8865 up 8672 down

9-230

DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

File Number { Washington..... District.....

G-3 2 Gates open 0.1 Area 0.55 C = 0.61

Head	Q	h	Q	h	Q	h	Q	h	Q	h	Q	
.01	0.27	.31	1.50	.61	2.10	.91	2.57	1.21	2.96	1.51	3.30	
.02	0.38	.32	1.54	.62	2.12	.92	2.58	1.22	2.97	1.52	3.31	
.03	0.47	.33	1.54	.63	2.13	.93	2.60	1.23	2.98	1.53	3.33	
.04	0.54	.34	1.57	.64	2.15	.94	2.61	1.24	2.99	1.54	3.34	
.05	0.60	.35	1.59	.65	2.17	.95	2.62	1.25	3.00	1.55	3.35	
.06	0.66	.36	1.61	.66	2.18	.96	2.64	1.26	3.02	1.56	3.36	
.07	0.71	.37	1.64	.67	2.20	.97	2.65	1.27	3.03	1.57	3.37	
.08	0.76	.38	1.66	.68	2.22	.98	2.67	1.28	3.04	1.58	3.38	
.09	0.81	.39	1.68	.69	2.23	.99	2.68	1.29	3.05	1.59	3.39	
.10	0.85	.40	1.70	.70	2.25	1.00	2.69	1.30	3.07	1.60	3.40	
.11	0.89	.41	1.72	.71	2.27	1.01	2.70	1.31	3.08	1.61	3.41	
.12	0.93	.42	1.74	.72	2.28	1.02	2.71	1.32	3.09	1.62	3.42	
.13	0.97	.43	1.76	.73	2.30	1.03	2.73	1.33	3.10	1.63	3.43	
.14	1.00	.44	1.78	.74	2.31	1.04	2.74	1.34	3.11	1.64	3.44	
.15	1.04	.45	1.80	.75	2.33	1.05	2.75	1.35	3.12	1.65	3.45	
.16	1.08	.46	1.82	.76	2.34	1.06	2.77	1.36	3.13	1.66	3.46	
.17	1.11	.47	1.84	.77	2.36	1.07	2.78	1.37	3.15	1.67	3.47	
.18	1.14	.48	1.86	.78	2.37	1.08	2.79	1.38	3.16	1.68	3.48	
.19	1.17	.49	1.88	.79	2.39	1.09	2.81	1.39	3.17	1.69	3.49	
.20	1.20	.50	1.90	.80	2.40	1.10	2.82	1.40	3.18	1.70	3.50	
.21	1.23	.51	1.92	.81	2.42	1.11	2.83	1.41	3.19	1.71	3.51	
.22	1.26	.52	1.94	.82	2.43	1.12	2.84	1.42	3.20	1.72	3.52	
.23	1.29	.53	1.96	.83	2.45	1.13	2.86	1.43	3.21	1.73	3.53	
.24	1.32	.54	1.98	.84	2.46	1.14	2.87	1.44	3.23	1.74	3.55	
.25	1.34	.55	1.99	.85	2.48	1.15	2.88	1.45	3.24	1.75	3.56	
.26	1.37	.56	2.01	.86	2.49	1.16	2.90	1.46	3.25	1.76	3.57	
.27	1.40	.57	2.03	.87	2.51	1.17	2.91	1.47	3.26	1.77	3.58	
.28	1.42	.58	2.05	.88	2.52	1.18	2.92	1.48	3.27	1.78	3.59	
.29	1.45	.59	2.06	.89	2.54	1.19	2.93	1.49	3.28	1.79	3.60	
.30	1.47	.60	2.08	.90	2.55	1.20	2.94	1.50	3.29	1.80	3.61	

If gates are open 0.8 and head = 0.75 then Q = 0.8 × 2.33 or 18.6 cfs.
Multiply Q opposite head by gate opening - both gates should have same opening.

Page 3 Gate opening IN Tenths G-3

Head IN Tenths	1.00	1.08	1.17	1.25	1.33	1.58	1.67	1.80	2.00	2.51	2.33	2.58	2.67	2.83	3.00
.08	5.16	5.59	5.90	6.22	6.51	7.05	7.67	8.20	8.69	9.33	9.74	10.13	10.63	10.91	11.31
.10	5.77	6.24	6.60	6.93	7.29	7.85	8.58	9.11	9.74	10.45	10.89	11.31	11.82	12.22	12.62
head .12	6.31	6.87	7.22	7.60	7.98	8.67	9.37	10.00	10.65	11.42	11.94	12.35	12.93	13.37	13.77
.15	6.85	7.41	7.78	8.23	8.63	9.33	10.13	10.80	11.51	12.35	12.89	13.35	14.00	14.44	14.91
.17	7.27	7.96	8.34	8.78	9.18	9.98	10.87	11.55	12.31	13.15	13.77	14.26	14.98	15.46	15.96
.19	7.74	8.51	8.85	9.33	9.76	10.63	11.53	12.24	13.07	14.00	14.62	15.13	15.89	16.41	16.98
.21	8.13	8.85	9.33	9.82	10.24	11.18	12.13	12.91	13.77	14.73	15.37	15.98	16.74	17.30	17.85
.23	8.56	9.29	9.78	10.31	10.78	11.73	12.74	13.55	14.44	15.49	16.18	16.78	17.56	18.18	18.71
.25	8.93	9.72	10.22	10.80	11.29	12.24	13.33	14.18	15.11	16.18	16.89	17.54	18.40	18.98	19.58
.27	9.31	10.11	10.67	11.24	11.73	12.76	13.88	14.77	15.78	16.89	17.56	18.24	19.13	19.76	20.33
.29	9.65	10.49	11.05	11.66	12.20	13.22	14.40	15.31	16.34	17.52	18.22	18.91	19.82	20.48	21.11
.31	10.00	10.87	11.44	12.04	12.60	13.68	14.89	15.89	16.89	18.11	18.89	19.60	20.55	21.27	21.94
.33	10.33	11.22	11.82	12.46	13.00	14.22	15.37	16.41	17.52	18.67	19.52	20.29	21.22	21.89	22.66
.35	10.67	11.55	12.20	12.85	13.43	14.62	15.78	16.89	18.00	19.29	20.04	20.85	21.89	22.66	23.33
.38	10.97	11.91	12.53	13.22	13.77	15.07	16.32	17.36	18.52	19.82	20.67	21.51	22.66	23.33	23.89
.40	11.22	12.22	12.89	13.55	14.18	15.37	16.78	17.89	19.00	20.35	21.24	22.11	23.11	23.89	24.77

Gate opening in tenths G-3

Page 4 head	1.00	1.08	1.17	1.25	1.33	1.58	1.67	1.80	2.00	2.51	2.33	2.58	2.67	2.83	3.08
.42	11.55	12.55	13.44	13.97	14.55	15.87	17.30	18.33	19.54	20.89	21.82	22.66	23.78	24.44	25.33
.46	12.13	13.15	13.88	14.66	15.29	16.65	18.04	19.22	20.44	22.00	22.89	23.78	24.99	25.77	26.44
.50	12.67	13.77	14.48	15.33	15.96	17.34	18.87	20.07	21.37	23.11	24.00	24.89	26.00	26.89	27.78
.54	13.18	14.26	15.11	15.91	16.58	18.07	19.60	20.89	22.33	23.89	24.89	26.00	27.11	28.00	28.89
.58	13.68	14.86	15.67	16.49	17.21	18.78	20.40	21.74	23.11	24.89	25.88	27.00	28.23	29.11	30.00
.62	14.16	15.33	16.20	17.09	17.78	19.38	21.11	22.66	24.00	25.66	26.78	27.78	29.22	30.04	31.00
.67	14.64	15.85	16.71	17.69	18.40	20.02	21.78	23.22	24.77	26.44	27.56	28.67	30.00	31.00	32.00
.71	15.09	16.41	17.30	18.22	18.96	20.67	22.55	24.00	25.55	27.45	28.45	29.56	31.00	32.00	32.89
.75	15.56	16.89	17.78	18.71	19.52	21.33	23.22	24.77	26.22	28.11	29.44	30.45	32.00	33.00	34.11
.79	16.00	17.34	18.22	19.29	20.07	21.89	24.00	25.33	27.11	28.89	30.11	31.44	32.89	33.88	35.00
.83	16.43	17.78	18.69	19.74	20.55	22.44	24.44	26.00	27.67	29.67	30.78	32.16	33.73	34.77	36.00
.92	17.12	18.67	19.65	20.71	21.56	23.55	25.55	27.22	29.00	31.00	32.33	33.71	35.22	36.45	37.60
1.00	17.98	19.47	20.46	21.63	22.62	24.46	26.67	28.41	30.31	32.44	33.77	35.08	36.83	38.11	39.29
1.08	18.45	20.26	21.31	22.44	23.49	25.55	27.78	29.74	31.55	33.77	35.11	36.55	38.49	39.56	40.89
1.17	19.34	21.00	22.16	23.33	24.22	26.44	28.89	30.67	32.78	35.00	36.56	38.00	39.89	41.11	42.44
1.25	20.00	21.78	23.07	24.00	25.24	27.52	29.94	31.78	33.88	36.45	37.78	39.34	41.15	42.66	44.00
1.33	20.67	22.66	23.66	24.99	26.00	28.45	30.78	32.89	35.00	37.45	39.07	40.67	42.66	44.00	45.00
1.42	21.33	23.11	24.40	25.77	26.89	29.33	31.96	33.88	36.11	38.67	40.33	41.78	43.89	45.33	46.67
1.50	21.78	23.78	25.11	26.44	27.56	30.22	32.78	34.89	37.23	39.56	41.56	43.07	45.22	46.44	48.00

Table 3.—Coefficients for pipe of circular section flowing partly full

[Coefficients for (1) area, (2) wetted perimeter, (3) hydraulic radius, (4) conveyance, (5) discharge for critical-depth flow, and (6) top width]

d/D [1]	(1) $A=C_aD^2$	(2) $P=C_pD$	(3) $R=C_rD$	(4) $K=C_k\frac{D^{8/3}}{n}$	(5) $Q=C_qD^{5/2}$	(6) $T=C_tD$	d/D [1]	(1) $A=C_aD^2$	(2) $P=C_pD$	(3) $R=C_rD$	(4) $K=C_k\frac{D^{8/3}}{n}$	(5) $Q=C_qD^{5/2}$	(6) $T=C_tD$
	C_a	C_p	C_r	C_k	C_q	C_t		C_a	C_p	C_r	C_k	C_q	C_t
0.01	0.0013	0.2003	0.0066	0.000068	0.0006	0.199	0.51	0.4027	1.5908	0.2531	0.2394	1.449	1.000
.02	.0037	.2838	.0132	.000307	.0025	.280	.52	.4127	1.6108	.2562	.2472	1.504	.999
.03	.0069	.3482	.0197	.000747	.0055	.341	.53	.4227	1.6308	.2592	.2556	1.560	.998
.04	.0105	.4027	.0262	.001376	.0098	.392	.54	.4327	1.6509	.2621	.2630	1.616	.997
.05	.0147	.4510	.0325	.002228	.0153	.436	.55	.4426	1.6710	.2649	.2710	1.674	.995
.06	.0192	.4949	.0389	.00328	.0220	.475	.56	.4526	1.6911	.2676	.2791	1.733	.993
.07	.0242	.5355	.0451	.00457	.0298	.510	.57	.4625	1.7113	.2703	.2873	1.792	.990
.08	.0294	.5735	.0513	.00601	.0389	.543	.58	.4724	1.7315	.2728	.2955	1.853	.987
.09	.0350	.6094	.0575	.00775	.0491	.572	.59	.4822	1.7518	.2753	.3031	1.915	.984
.10	.0409	.6435	.0635	.00966	.0605	.600	.60	.4920	1.7722	.2776	.3115	1.977	.980
.11	.0470	.6761	.0695	.0118	.0731	.626	.61	.5018	1.7926	.2799	.3192	2.041	.975
.12	.0534	.7075	.0755	.0142	.0868	.650	.62	.5115	1.8132	.2821	.3268	2.106	.971
.13	.0600	.7377	.0813	.0168	.1016	.673	.63	.5212	1.8338	.2842	.3346	2.172	.966
.14	.0668	.7670	.0871	.0195	.1176	.694	.64	.5308	1.8546	.2862	.3423	2.239	.960
.15	.0739	.7954	.0929	.0225	.1347	.714	.65	.5404	1.8755	.2882	.3501	2.307	.954
.16	.0811	.8230	.0985	.0257	.1530	.733	.66	.5499	1.8965	.2900	.3579	2.376	.947
.17	.0885	.8500	.1042	.0291	.1724	.751	.67	.5594	1.9177	.2917	.3658	2.446	.940
.18	.0961	.8763	.1097	.0327	.1928	.768	.68	.5687	1.9391	.2933	.3727	2.518	.933
.19	.1039	.9020	.1152	.0366	.2144	.785	.69	.5780	1.9606	.2948	.3805	2.591	.925
.20	.1118	.9273	.1206	.0405	.2371	.800	.70	.5872	1.9823	.2962	.3874	2.666	.917
.21	.1199	.9521	.1259	.0446	.2609	.815	.71	.5964	2.0042	.2975	.3953	2.741	.908
.22	.1281	.9764	.1312	.0491	.2857	.828	.72	.6054	2.0264	.2987	.4021	2.819	.898
.23	.1365	1.0003	.1364	.0537	.3116	.842	.73	.6143	2.0488	.2998	.4090	2.898	.888
.24	.1449	1.0239	.1416	.0586	.3386	.854	.74	.6231	2.0714	.3008	.4157	2.978	.877
.25	.1535	1.0472	.1466	.0634	.3666	.866	.75	.6319	2.0944	.3017	.4226	3.061	.866
.26	.1623	1.0701	.1516	.0685	.3957	.877	.76	.6405	2.1176	.3024	.4283	3.145	.854
.27	.1711	1.0928	.1566	.0740	.4259	.888	.77	.6489	2.1412	.3031	.4349	3.231	.842
.28	.1800	1.1152	.1614	.0792	.4571	.898	.78	.6573	2.1652	.3036	.4415	3.320	.828
.29	.1890	1.1373	.1662	.0848	.4893	.908	.79	.6655	2.1895	.3039	.4470	3.411	.815
.30	.1982	1.1593	.1709	.0907	.523	.917	.80	.6736	2.2143	.3042	.4524	3.505	.800
.31	.2074	1.1810	.1756	.0968	.557	.925	.81	.6815	2.2395	.3043	.4578	3.602	.785
.32	.2167	1.2025	.1802	.1027	.592	.933	.82	.6893	2.2653	.3043	.4630	3.702	.768
.33	.2260	1.2239	.1847	.1088	.628	.940	.83	.6969	2.2916	.3041	.4681	3.806	.751
.34	.2355	1.2451	.1891	.1155	.666	.947	.84	.7043	2.3186	.3038	.4731	3.914	.733
.35	.2450	1.2661	.1935	.1220	.704	.954	.85	.7115	2.3462	.3033	.4768	4.028	.714
.36	.2546	1.2870	.1978	.1283	.743	.960	.86	.7186	2.3746	.3026	.4816	4.147	.694
.37	.2642	1.3078	.2020	.1350	.784	.966	.87	.7254	2.4038	.3018	.4851	4.272	.673
.38	.2739	1.3284	.2062	.1421	.825	.971	.88	.7320	2.4341	.3007	.4884	4.406	.650
.39	.2836	1.3490	.2102	.1488	.867	.975	.89	.7384	2.4655	.2995	.4916	4.549	.626
.40	.2934	1.3694	.2142	.1561	.910	.980	.90	.7445	2.4981	.2980	.4935	4.70	.600
.41	.3032	1.3898	.2182	.1631	.955	.984	.91	.7504	2.5322	.2963	.4951	4.87	.572
.42	.3130	1.4101	.2220	.1702	1.000	.987	.92	.7560	2.5681	.2944	.4966	5.06	.543
.43	.3229	1.4303	.2258	.1780	1.046	.990	.93	.7612	2.6061	.2921	.4977	5.27	.510
.44	.3328	1.4505	.2295	.1854	1.093	.993	.94	.7662	2.6467	.2895	.4979	5.52	.475
.45	.3428	1.4706	.2331	.1931	1.141	.995	.95	.7707	2.6906	.2865	.4970	5.81	.436
.46	.3527	1.4907	.2366	.2002	1.190	.997	.96	.7749	2.7389	.2829	.4963	6.18	.392
.47	.3627	1.5108	.2401	.2080	1.240	.998	.97	.7785	2.7934	.2787	.4940	6.67	.341
.48	.3727	1.5308	.2435	.2160	1.291	.999	.98	.7817	2.8578	.2735	.4902	7.41	.280
.49	.3827	1.5508	.2468	.2235	1.343	1.000	.99	.7841	2.9412	.2666	.4824	8.83	.199
.50	.3927	1.5708	.2500	.2317	1.396	1.000	1.00	.7854	3.1416	.2500	.4633	-------	.000

[1] d=maximum depth of water in feet; D=diameter of pipe, in feet.

Taken from USGS, Book 3 Chapter C3 [illegible] at culverts [illegible] Gulch [illegible].

"G-3" CANAL

Klamath Irrigation District

Headgate Location: NE¼ NE¼, Section 35, T40S R10E

Gages: Stilling well with staff plate upstream of headgates between "G-3" and "G-D" drop headgates. Two stilling wells about 1' downstream of headgates (one for each gate) and covered by a wood plank. (Ditch rider carries gage stick for these wells or a level can be used to compute head differential through the gates).

Headgates: Two rectangular metal lift gates with metal wheels and screw stock. Carry water through two 3' diameter corrugated metal culverts.

Measuring Section: Small wooden footbridge (to a pump), in the SE¼ SW¼, Section 25, T40S R10E. Use a standard wading rod and pygmy meter (very low velocities, regular flow). Add flow from any open headgates. Measuring section is poor, but best available.

Rating Accuracy: Appears poor. This was verified by Malcom Crawford of K.I.D. Problems with rating accuracy maybe due to backwater in the culverts, high roughness in both barrels, and friction at inlet from large surface area (especially at small headgate opening). From discharge measurement on 10-6-80, a discharge coefficient of .33 rather than K.I.D.'s .61 was computed. The coefficient should continue to be checked for stability at various flows.

Flow Computation: Equation $Q = CA\sqrt{2g \cdot \Delta H}$

Where C is coefficient of discharge. K.I.D. has used .61, but measurements have indicated a smaller value (around .33).

ΔH is the difference in head through inlet of culvert, or upstream well minus downstream well levels for each culvert.

A is shaded portion of drawing below.

KBA_APP_000830

Found as follows:

h_1= headgate opening measure from top of wheel to top of screw-stock.

Then $h = \frac{3' - h_1}{2}$

On Table 3, in the Quantities Binder, under culverts, $\frac{d}{D} = \frac{h}{D}$

$A_1 = Ca\ D^2 = Ca \cdot 3^2$ from Table 3.

And area for opening = Total area of culvert opening minus $2 \cdot A_1$ or Area Total - $2A_1$.

Example: Upstream water surface elevation = 2.96.
Downstream water surface elevations are:

North - 1.63 and South 1.73 before and after measurement.

North - h_1 = 0.49 and South - h_1 = 0.12

<u>North Culvert</u>

$C = .61,\ \Delta H = 2.96 - 1.63 = 1.33$

Area: $h = \frac{3' - .49}{2} = 1.26$

$\frac{d}{D} = \frac{h}{D} = \frac{1.26}{3} = .42 \Rightarrow Ca = .3130$

$A_1 = .3130 \cdot D^2 = .3130 \cdot 9 = 2.82$ sq. ft.

$A = A\ Total - 2A_1 = \frac{\pi \cdot D^2}{4} - 2(2.82) = 7.07 - 5.64 = 1.43$ sq. ft.

$Q_N = CA\sqrt{2g\Delta H} = .61 \cdot 1.43\sqrt{2 \cdot g \cdot 1.33} = 8.07$ c.f.s.

<u>South Culvert</u>:

$C = .61,\ \Delta H = 1.23$

Area: $h = \frac{3' - .12}{2} = 1.44$

$\frac{d}{D} = \frac{1.44}{3} = .48 \Rightarrow Ca = .3727$

$A_1 = 3.35\ ft^2$

$$A = A\ Total - 2 \cdot A_1 = \frac{\pi D^2}{4} - 2 \cdot A_1 = 7.07 - 6.70 = .37\ ft^2$$

$$Q_S = CA\sqrt{2g\Delta H} = .61 \cdot .37\sqrt{2 \cdot g \cdot 1.23} = 2.01\ c.f.s.$$

$$Q = Q_N + Q_S = 8.07 + 2.01 = 10.08\ c.f.s.$$

Jim Esget
Field Engineer

J CANAL

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'J' CANAL

Tulelake Irrigation District

Location of Headworks: Anderson - Rose Dam, SE¼ SE¼, Section 7, T41S R11E.

Gages: Outstaff near stilling well above dam headgates on left bank. Stilling well in fenced area for water surface below headgates. Use M-Scope to measure to water subtract from 11.99 to get head above gate bottom. Also, there is an outstaff downstream but the stilling well reading should be used.

Headgates: Five metal rectangular lift gates with wheels and screw stock discharge to 'J' Canal. Also two metal rectangular lift gates to Lost River. Sizes can be measured from walkway upstream of headgates. There is also a Spillway which discharges to Lost River. Gates are electronically controlled and have automatic stabilization of flow through float switches, so it is important to measure gate openings before and after measuring.

Measuring Section: SW¼ SW¼, Section 8, T41S R11E - Wooden footbridge across 'J' Canal. Use canfield reel, 30 lb. weight and standard meter.

Flow Calculation: $Q = CA\sqrt{2g\Delta H}$

Error 7% of computed Q
Vensesk measured Q.

9-275-G
11-75

STATE OF OREGON
WATER RESOURCES DEPARTMENT
DISCHARGE MEASUREMENT NOTES

File No. ____ Meas. No. ____
Comp. by JAE Checked by NZR

Stream "J" Canal Tulelake I.D.
Date Oct 9 1982 Party Espel (M), Sipar K.S. (N)
Width 59 Area 369 Vel. .417 G. H. ____ Disch. 154
Method 3/4 & No. secs. 25 G. H. change ____ in ____ min.
Method coef. 1.0 Hor. angle coef. 1.0 Susp. coef. 1.0 Meter No. 8-68
Date rated 4-11-69
Spin before meas. ✓ after ✓
Wading, cable, ice, boat, upstr., downstr., side bridge 1/4 feet, mile, above, below gage and ____
Tags checked ____
Meter suspended from ~~rod~~, or cable
.5 ft. above bottom 30 lb. weight.
Levels obtained ____

Time		GAGE READINGS Recorder	Inside	Outside
0930	Start	.53	.109	1.32
0945	Finish	3524	.112	1.30

Weighted M. G. H. ____
G. H. correction ____
Correct M. G. H. ____

Measurement rated excellent (2%), good (5%), fair (8%), poor (over 8%), based on following conditions: Cross section ____
Flow regular Weather Clear, cool
Other ____ Air ____ °F@
Gage ____ Water ____ °F@
Record removed ____ Intake flushed ____
Observer ____ before after
Control Measured down 10¾, 10⅛ from rim
Remarks #1 0.93 #2 0.93 #3 0.93
Lost to Right 2' 2' 2'
weight 4 lbs after C = .25
ΔH = 2.93
G.H. of zero flow ____ ft. #1 0.92 #2 0.93 #3 0.93

COMPUTED $Q = CA\sqrt{2gH} = 49.34 \times 95.9 = 143.2$ cfs

'J' CANAL

Tulelake Irrigation District

Location of Headworks: Anderson - Rose Dam, SE¼ SE¼, Section 7, T41S R11E.

Gages: Outstaff near stilling well above dam headgates on left bank. Stilling well in fenced area for water surface below headgates. Use M-Scope to measure to water subtract from 11.99 to get head above gate bottom. Also, there is an outstaff downstream but the stilling well reading should be used.

Headgates: Five metal rectangular lift gates with wheels and screw stock discharge to 'J' Canal. Also two metal rectangular lift gates to Lost River. Sizes can be measured from walkway upstream of headgates. There is also a Spillway which discharges to Lost River. Gates are electronically controlled and have automatic stabilization of flow through float switches, so it is important to measure gate openings before and after measuring.

Measuring Section: SW¼ SW¼, Section 8, T41S R11E - Wooden footbridge across 'J' Canal. Use canfield reel, 30 lb. weight and standard meter.

Flow Calculation: $Q = CA\sqrt{2g\Delta H}$

Where ΔH is head differential through gates or upstream staff reading minus downstream water surface reading.

C is dependent on ΔH and can be obtained from graph in 'J' Canal folder.

A = width of gage x h_1 Where h_1 = gage opening and can be obtained by measuring from the top of the wheel to the bottom of the stopnut on screw stock for each gate. Also measure gate width corresponding to each gate opening.

Example: Upstream staff reading before and after measuring 3.57, Downstream stilling well water level before 1.09, after measuring 1.19. (1.14 ave.)

$\Delta H = 2.43$

Then C = .75 (from graph)

Three gates (all 7') open 0.72, 0.73, 0.73 before and after measurement.

Then $Q_1 = CA\sqrt{2\ g\Delta H} = .75 \cdot (7' \cdot 0.72)\sqrt{2g \cdot 2.43} \cong 47.3$

$Q_2 + Q_3 = 2 \cdot [.75 \cdot (7' \cdot 0.73)\sqrt{2g \cdot 2.43}] \cong 95.9$

Q total $\cong$ 143.2 c.f.s.

KBA_APP_000835

Rating Accuracy: Appears good.

Note: Contact Jerry Pyle at Tulelake Irrigation District (usually there from 8-8:30 a.m.).

Jim Esget
Field Engineer

9-107-

STATE OF OREGON

OFFICE OF STATE ENGINEER

Water Resources Department

Year .....

File No. .....

Discharge measurements of "J" Canal, Tulelake Irrigation District

....., *during the year ending September 30, 19*.....

No.	Date	Made by	Width Feet	Area Sq. ft.	Mean Velocity Ft./Sec.	Gage Height Feet	Discharge C.F.S.	Computed Rating Corr.	Computed Rating % diff	Method	Meas. Acc. No.	G. Ht. Chg. Ft.	Time Min.	Temperature Wtr.	Temperature Air	REMARKS
	10/9/80	Esget, & Sparks					154	143	7%							

* Geological Survey Engineer

Anderson Rose Dam

LOCATION	HIGH	NORMAL	LOW	OTHER
N Canal @ R	~~37.20~~ 37.50	37.20	36.80	
N Canal @ PP#5	37.20 37.00	37.0 37.00	36.50 36.50	
N Canal @ Radial gate	36.50	36.2	36.0	
N Canal below Radial Gate	36.0	35.70	35.50	
N - 17 @ G	34.50	34.0	33.50	
N - 17 @ Discharge		Stilling Well 37.35	~~Stilling Well~~ ~~37x35~~	Top of Gage 36.66
Plant N		1.80 to 2.00		
45 Drain	3.00	2.75	2.0	
Hisel Drain	29.00	28.20		Top of Gage 31.50
Crest of Anderson Rose Dam				4055.94
J Canal Sill				4049.25
River Gate Sill				4043.70
Station #48 Gate Sill				4075.00
Station #48 Top of Gauge				4089.00
Station #48 0 on Gauge is				4085°

Drain 10 - 12" Cipoletti Weir

" 14 - 6' Rectangular Weir

" 11 - 8' Rectangular Weir

" 46N 8' Rectangular Weir

Anderson - Rose Dam

J Gates

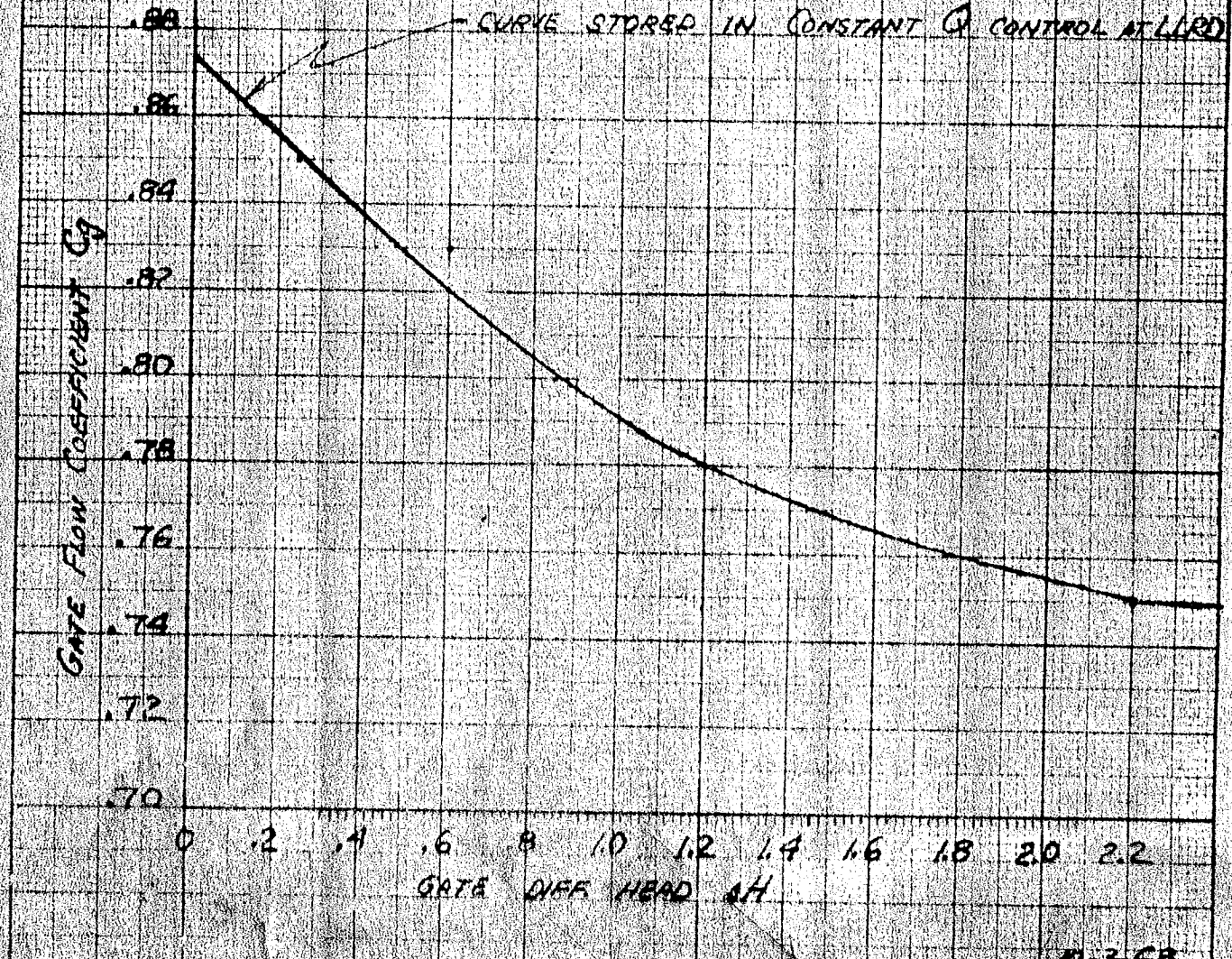
$Q = CA\sqrt{2gh}$

TULELAKE IRRIGATION DISTRICT
LLRD

GATE FLOW COEFFICIENT C_g VS DIFFERENTIAL HEAD ΔH

DATA PER TELECON. FRED. FANNER - GEO. CONDRASHOFF 9-13-68

ΔH (FT.)	C_g
0 - .50	.85
.50 - .70	.83
.70 - 1.00	.80
1.00 - 1.40	.78
1.40 —	.75



10-3-68
G.C.

9-275-F
11-75

STATE OF OREGON
WATER RESOURCES DEPARTMENT

File No. .....
Meas. No. .....
Comp. by NZR
Checked by .....

DISCHARGE MEASUREMENT NOTES

Stream J-Canal R.I.D.

Date 6-26, 1981 Party DWS

Width 63° Area 437.9 Vel. 1.39 G. H. ..... Disch. 609.0

Method ..... No. secs..... G. H. change ..... in ..... min.

Method coef. ..... Hor. angle coef. ..... Susp. coef. ..... Meter No. S-68

Date rated .....

Spin before meas. ✓ after ✓

Wading, cable, ice, boat, upstr., downstr., side bridge 450 feet, mile, above, below gage and .....

Tags checked .....

Meter suspended from rod, or .....

..... ft. above bottom ..... lb. ..... weight.

Levels obtained .....

GAGE READINGS				
Time		Recorder	Inside	Outside
	Start	See control Below		
	Finish			
Weighted M. G. H.				
G. H. correction				
Correct M. G. H.				

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

Flow fairly uniform Weather Clear warm

Other ..... Air .....°F@ .....

Gage ..... Water .....°F@ .....

..... Record removed no Intake flushed U L

Observer .....

@ 1040 1 2 3 well O.G.

Control gates R to L 1.84, 1.84 1.84 1.83 10.22 6.11

@ 1210 O.G. 6.10 every Thing else no change

Remarks .....

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
	7	1	LEW @ 10.50								
weak	9	2.5	3.2	.6	10	45	.514	.514		8.0	4.11
	12	3	4.9		20	46	.980	.904		14.7	12.8
					15	41	.829				
	15	3	6.0		25	39	1.48	1.38		18.0	24.8
					25	42	1.33				
	18	3	7.3		30	41	1.63	1.58		21.9	34.6
					30	44	1.52				
	21	3	8.1		30	41	1.63	1.53		24.3	37.2
					25	39	1.48				
	24	3	8.4		30	40	1.67	1.58		25.2	39.8
					30	45	1.49				
	27	3	8.5		30	39	1.71	1.60		25.5	40.8
					30	45	1.49				
⊙	30	3	8.6		30	41	1.63	1.61		25.8	41.5
	~~3~~		~~8.6~~		30	42	1.59				
	33	3	8.7		40	49	1.82	1.70		26.1	44.4
					30	42	1.59				
	36	3	9.0		30	42	1.59	1.51		27.0	40.8
					30	47	1.43				
	39	3	9.0		40	49	1.82	1.72		27.0	46.4
					30	41	1.63				
	42	3	8.8		40	46	1.93	1.80		26.4	47.5
					30	40	1.67				
	45	3	8.8		30	39	1.71	1.60		26.4	42.2
					30	45	1.49				
	48	3	8.8		40	49	1.82	1.54		26.4	40.6
					25	44	1.27				
.0	.10	.20	.30	.40	.50		.60		.70	.75	.80

.80 .85 .90 .92 .94 .96 .97 .98 .99 1.00 .99 .98 .97 .96 .94 .92 .90 .85

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
	51	3	8.6		30	40	1.67	1.44		25.8	37.2
					25	46	1.22				
	54	3	8.1		25	39	1.28	1.29		24.3	31.4
					20	38	1.15				
	57	3	7.1		20	44	1.02	.924		21.3	19.7
					15	41	.829				
	60	3.5	6.0	.2	20	51	.887	.654		21.0	13.7
				.8	7	39	.420				
weeds	64	4.0	4.1	.6	10	50	.465	.465		16.4	7.63
	68	3.0	2.3	.6	3	42	.392	.392		6.9	2.70
	70	1.0	REW		@	1200					
	63	63°								437.9	609.8

Error 7% of computed Q
Venses measured Q

9-275-G
11-75

STATE OF OREGON
WATER RESOURCES DEPARTMENT

DISCHARGE MEASUREMENT NOTES

File No. .....
Meas. No. .....
Comp. by JAE
Checked by NZR

Stream "J" Canal, Tulelake I. D.
Date Oct 9, 1980 Party Esget (M), Sparks (N)
Width 57 Area 369 Vel. .417 G. H. — Disch. 154
Method .4/.8 No. secs. 25 G. H. change — in — min.
Method coef. 1.0 Hor. angle coef. 1.0 Susp. coef. 1.0 Meter No. 8-68
Date rated 4-11-69

upstream

GAGE READINGS				
Time		~~Recorder~~	Inside	Outside
			below	below
0820	Start	.357	.109	1.30
0945	Finish	.357*	.119	1.30
Weighted M. G. H.				
G. H. correction				
Correct M. G. H.				

Spin before meas. ✓ after ✓
Walk bridge
Wading, cable, ice, boat, upstr., downstr., side bridge 1/4 ~~feet~~, mile, above, below gage and .....

Tags checked .....
Meter suspended ~~from rod~~, or cable
.5 ft. above bottom 30 lb. ..... weight.
Levels obtained .....

Measurement rated excellent (2%), good (5%), fair (8%), poor (over 8%), based on following conditions: Cross section mud, sand
Flow regular Weather Clear, cool
Other ..... Air .....°F@ .....
Gage ..... Water .....°F@ .....
..... Record removed ..... Intake flushed U L .....
Observer .....

Control Measured down from rim before 10.8, after 10.8

Remarks Left to Right #1 0.72 #2 0.73 #3 0.73
widths 7' 7' 7'
after C = .75
ΔH = 2.43

G. H. of zero flow ..... ft.
#1 0.72 #2 0.73 #3 0.73

COMPUTED Q = CA√2gΔH = 47.3 + 95.9 = 143.2 144.6

.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
	10	2.25	LEW	@	0835					0	0
	14.5	3.50	4.8	.2	3	57	.142	.108		16.80	1.8
				.8	1	46	.074				
	17.0	2.75	6.0		5	56	.222	.224		16.50	3.7
					5	55	.226				
	20.0	2.50	7.1		7	50	.333	.296		17.75 ~~50.0~~	5.3
					5	47	.260				
	22.0	2.0	7.4		10	54	.432	.408		14.8	6.0
					7	43	.383				
	24.0	2.0	7.8		7	40	.410	.410		15.6	6.4
					7	40	.410				
	26.0	2.0	7.7		10	40	.575	.486		15.4	7.5
					10	59	.398				
	28.0	2.0	7.6		10	42	.549	.480		15.2	7.3
⊙					7	40	.410				
	30.0	2.0	7.8		15	60	.575	.575		15.6	9.0
					10	40	.575				
	32.0	2.0	8.0		15	55	.625	.570		16.0	9.1
					10	45	.514				
	34.0	2.0	8.1		10	39	.588	.541		16.2	8.8
					10	47	.493				
	36.0	2.0	8.2		10	40	.575	.568		16.4	9.3
					10	41	.561				
	38.0	2.0	8.2		10	42	.549	.516		16.4	8.5
					10	48	.483				
	40.0	2.0	8.3		15	57	.604	.514		16.6	8.5
					10	55	.425				
	42.0	2.0	8.2	.2	15	47	.727	.620		16.4	10.2
				.8	10	45	.514				

.0 .10 .20 .30 .40 .50 .60 .70 .75 .80

.80 .85 .90 .92 .94 .96 .97 .98 .99 1.00 .99 .98 .97 .96 .94 .92 .90 .85

.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
	44	2.0	8.2		15	54	.636	.518		16.4	8.5
					7	41	.401				
	46	2.0	8.1		10	43	.536	.484		16.2	7.8
					10	54	.432				
	48	2.0	8.0		15	58	.594	.565		16.0	9.0
					10	43	.536				
	50	2.0	7.8		10	40	.575	.544		15.6	8.5
					10	45	.514				
	52	2.0	7.6		10	43	.536	.434		15.2	6.6
					7	50	.333				
	54	2.0	7.0		10	45	.514	.418		14.0	5.9
					7	52	.321				
	56	2.5	6.5		5	51	.241	.204		16.25	3.3
					3	47	.166				
⊙	59	3.0	5.4	.2	3	45	.172	.134		16.20	2.2
				.8	2	62	.097				
	62	4.0	4.4	.2	1	45	.075	.038		17.6	.7
				.8	0	—	0			0	0
	67	2.5	REW@09:45							369.10	153.9
	57	57									

.85 .90 .92 .94 .96 .97 .98 .99 1.00 .99 .98 .97 .96 .94 .92 .90 .85

.0 .10 .20 .30 .40 .50 .60 .70 .75 .80

DAILY OPERATIONS MASTER SPREAD SHEET (R.R.F.)

Date: ____________, 19____

J-CANAL SYSTEM

Sub-Lateral	Night	Day	Max CFS	Night	Day	Gate or Weir Size
Total Needed J-Canal			810			
J-1 Headworks			185			1-6' Radial
J-1-A HDWKS			60			2-48" Gates
J-1-A T.O.'s						
J-1-A-1			40			1-30" Gate
J-1-A-2			35			1-36" Gate
J-1-A-3			20			1-30" Gate
J-1-A4			25			1-30" Gate
J-1-B			40			1-48" Gate
J-1-C			25			1-30" Gate
J-1-D			25			5' Weir
J-1 T.O.'s						
J-Canal T.O.'s						
THRU CHECK #1			680			
J-3 Headworks			35			6' Weir
J-3 Parallel			9			2.5' Orifice
J-4 Headworks			8			3' Orifice
J-Canal T.O.'s						
THRU CHECK #2			680			
J-5 Headworks			15			4' Weir
J-5-A Headworks						
J-6 Headworks			41			10' Weir
J-7 Headworks			35			8' Weir
J-Canal T.O.'s						
THRU CHECK #3			608			
J-8 Headworks			25			10' Weir
J-9 Headworks			60			6' Weir
J-9 T.O.'s			48			
J-9-A			22			
J-Canal T.O.'s						
THRU CHECK #4			540			
J-10 Headworks			45			10' Weir
J-11 Headworks			43			10' Weir
J-Canal T.O.'s						
Plant 7	1-8 CFS	1-16 CFS	24	—	—	12' Weir
THRU CHECK #5			450			
J-12 Headworks			11			
J-13 Headworks			50			1-6' Radial
J-13 T.O.'s			28			
J-13-A			25			
J-14 Headworks			125			2-3' Orifice
J-14 T.O.'s						
J-14-A HDWKS			60			
J-14-A T.O.'s						
J-14-A-1			29			
J-14-B HDWKS			80			
J-14-B T.O.'s						
J-14-B-1			48			
J-15 Headworks			33			8' Weir
J-Canal T.O.'s						
THRU CHECK #6			303			
J-16 Headworks			33			1-36" Gate
J-17 Headworks			13			2.5' Orifice
J-18 Headworks			115			2-36" Gates
J-18 T.O.'s						
J-18-A HDWKS			30			
J-18-B HDWKS			80			
J-18-B T.O.'s						
J-18-B-1 HDWKS			60			
J-Canal T.O.'s						
THRU CHECK #7			185			
J-Canal Loss				+	+	
J-20 Headworks			30			3' Orifice
J-Canal T.O.'s						
D-Canal Pickup	CFS	P.M. / A.M.				
THRU CHECK #8			185			
J-21 Headworks			45			1-36" Gate
J-21 T.O.'s			25			
J-21-A			25			
J-22 Headworks			100			1-36" Gate
J-22 T.O.'s			40			
J-22-A			30			
J-22-B			30			
J-Canal T.O.'s						
THRU CHECK #9			100			
J-Canal T.O.'s						
THRU CHECK #10			100			
J-Canal T.O.'s						
THRU CHECK #11			100			
J-Canal T.O.'s						
Spill Into Plant A						1-5' Gate, 1-5' Bay
THRU CHECK #12			100			
J-Canal T.O.'s						
Backspill From Plant "A"	P.M.	A.M.		—	—	1-30" Gate
THRU CHECK #13			100			
J-Canal T.O.'s						
THRU CHECK #14			100			
J-23 Headworks			23			3' Orifice
J-Canal T.O.'s						
Plant 24			14	—	—	
J-Canal into "North N"			100			1-3X4' Gate

And Rose Dam J-Headworks 4-5' & 3-7' Gates

Gates used	Hand Auto	Time	Upstream Level	Actual Flow	Set Point Insert

And. Rose Dam Lost River Spill (2-5' Gates)

Time	Upstream	Gate opening	Area	%	Net Head	Over spillway	Under spillway	Total

Indian Springs Gaging Station

Time	Water Level	Flow

Station 48 (2-5' Gates)

Time	Upstream	Gate position	Net Head	Flow

K.I.D. Pumps

Name	No. of units	Capacity	+ Start - Stop	Time	Total Pump Water Night	Day
Van Brimmer 1@8, 1@13 - 21 CFS						
Adams Flume 2@13, 2@18 = 62 CFS						
Stukel Pump 2@40, 1@25 = 105 CFS						

"J" SYSTEM NIGHT AND DAY CHANGES

Time	Night	Day	Time	Night	Day

Checks

Maximum	Checks	% Eff	Hand or Auto	Time	Area	G.O.	Up	Down	Net	CFS
3.20 Max Orem 2-20' Radials	Check 1									
3.30 Max. Wilson 2-13' Radials	Check 2									
3.30 Max Takacs 2-12' Radials	Check 3									
3.30 Max McVay 2-11' Radials	Check 4									
3.30 Max Unruh 1-18' Radial	Check 5									
3.25 Max Will 1-18' Radial	Check 6									
3.00 Max. Vokach 1-12' Radial	Check 7									
3.00 Max Towne 1-12' Radial	Check 8									
3.00 Max 1-14' Radial	Check 9									
Davis	Check 10									
3.30 Max Sells 3-4.5' Gates	Check 11									
3.00 Max 1-14' Radial	Check 12									
3.00 Max. 3-4.5' Gates	Check 13									
3.30 Max. Bell 1-14' Radial	Check 14									
3.00 Max Funnel	"J" Canal Into "N" Canal									

MISCELLANEOUS

North Side J Canal

Rides	10-4
1	___
2	___
3	___
4	___
Washracks	___

Called Pacific Power and Light

Date: __________ Time: ______

NORTH "N" SYSTEM

Eastside Water

Lateral	CFS Max	Night	Day
N-1	51		
N-4	30		
N-6	31		
N-8	25		
N-10	20		
N-T.O.'s	Ride 6		
N-12 HDWKS	Ride 7		
	East → Night / Day		
N-12 A			
N-12 T.O.'s			
N-12-B			
N-13	25		
N-14	25		
N-15	25		
N-15-A	25		
N-15-B	25		
N-15			

Westside Lake Water

Lateral	CFS Max	Night	Day
N-12-B	40		
N-12-C	40		
N-12-D	30		
N-12-E	45		
N-12 T.O.'s	Ride 6		
	Ride 7		
Total Lake →			

Maximum pump water and allow from J-Canal

Plant	CFS	Available
R	80	
4	33	
5	100	
6	50	
End[illegible]	100	
Total	363	

Total North "N" Water

SOUTH "N" SYSTEM

Lateral	CFS Max	Night	Day
N-19	20		
N-18	21		
N-16 HDWKS	50		
N-16 T.O.'s			
N-16-A	30		
N-16-B	25		
N-EXT.	30		
S-T.O.'s			
N-17 HDWKS	60		
N-17 T.O.'s			
N-17-A	42		
N-17-A-1	14		
N-17-B	28		
N-17-C	14		
		—	—
N-20	54		

Pump Q 2@25 = 50

Total Radial Gate

South N Total

North N Total

Total Water Required

"M" SYSTEM

Lateral	CFS Max	Night	Day
M Canal	58		
M-1	20		
M-4	7		
M-3	20		
M-8	10		
M-5	20		
M-7	10		
M-T.O.'s			
M-2 Canal	72		
M-2-A HDWKS			
M-2-A T.O.'s			
M-2-A-1	42		
M-2-A-2	44		
M-2-B	20		
M-2-D	22		
M-2-E	10		
M-2 T.O.'s			

M-Canal Total

M-2 Canal Total

Plant "A" 3@33 = 100

Backspill from A Plant

Total flow from M & M-2

Q-CANAL SYSTEM

Gate Sizes	Max CFS	Lateral	Night	Day
2-60"	130	Q Total		
1-42"	35	Q-1		
1-42"	30	Q-2		
		Q-T.O.'s		
	35	Q-Tip		
	Plant W	Backspill	—	—
	66	Q-3		
		Q-3 T.O.'s		
1-36"	30	Q-3-A		
1-36"	30	Q-3-B		
1-30"	20	Q-3-C		
	11	Q-3-D		

R-CANAL SYSTEM

Gate Sizes	Max CFS	Lateral	Night	Day
2-48"	76	R-Total		
		R-T.O.'s		
	30	R-1		
	25	R-2		
	22	R-1-A		
	11	R-1-B		

DAILY PUMP READINGS

Plant	No. Units Needed P.M.	A.M.	Hand or Auto	Elevations P.M.	A.M.	Operating Elevations Max.	Min.	Normal	Irrig. High	No. of Units & Capacity
A						29.00	27.50	28.25		3@33=100
B						27.00	25.00	26.00		3@25=75
C						23.00	21.40	22.50	25.00	1@33=33
D										3@8, 2@7 =38
G						34.50	33.50	34.00		3@14=42
H										2@15=30
J										2@10=20
K										1@14=14
L										1@9, 1@12=2
M										1@9, 1@18=3, 1@7
N										1@17=17
O										1@14=14
Q										2@25=50
Drain Canal	G.O.	AM	PM			28.50 / 35.50	26.00 / 34.70	27.50 / 35.20		
R										2@40=80
T										1@10=10
U										1@10=10
V										2@10=20
W										3@22=66
X										1@11=11
Y										2@11=22
2							29.0			1@14=14
3						26.70	24.50	25.60		2@27=54
4						28.70	26.70	27.80		1@33=33
5										3@33=100
Drain Canal	G.O. → PM	AM				28.50 / 37.20	26.50 / 36.50	27.00 / 37.00		
6						28.70	26.70	27.00		2@25=50
7										1@8, 1@16=24
8										1@2=2
9						21.00	19.00	19.50	23.00	3@27=80
10						21.50	20.50	21.00	25.00	3@30=90
11						24.50	23.50	24.00	26.50	2@25=50
21										1@16=16
22						2.00	1.00	1.50		1@12=12
23										1@13=13
24						29.00	26.50	28.50		1@14=14
26										1@5, 1@13=18
27						24.00	23.00	23.70		1@13=13
28						29.50	28.00	29.00		1@24=24
41										1@8=8

Stronghold Spill, Radial Gate, R-Plant, and Riser Readings

Stronghold Spill	Elevations P.M.	A.M.	Gate Opening P.M.	A.M.	Pos. 1	Pos. 2	Pos. 3	Pos. 4
					28.40 / 27.60	29.00 / 29.20	29.50 / 30.00	OFF

Radial Gate 1-6' Gate 3-6' Bays	Elevations Max	Min	Normal	Up	Down	Net	G.O.	Area	CFS	Spill
	36.50	36.00	36.20							

R-Plant 4-6.5' Bays	Elevations Max.	Min.	Normal	Up	G.O	Area	Spill
	37.50	36.80	37.20				

Risers	Elevations Max	Min	Normal	Elevations P.M.	A.M.	Gate Opening P.M.	A.M.
U-Riser	2.90	1.80	2.20				
V-Riser			3.00				
Hisel's	29.00		28.20				Spill
Haskins Drain	31.30						

LOST RIVER DIVERSION
CHANNEL

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LOST RIVER DIVERSION CHANNEL

WATER & POWER RESOURCES SERVICE

October 15, 1980

The Water & Power Resources Service puts out a weekly discharge rate for the following stations (as well as others): Lost River Diversion Channel below Lost River Diversion Dam, Station #48, Miller Hill Pumping Plant and Lost River Diversion Channel from Klamath River. Values for Lost River Diversion Channel from Klamath River are not directly computed nor measured, but are obtained from the following algorithm:

LRDC from Klamath River = Station #48 - LRDC below Dam - Miller Hill Pumping plant.

Station #48- Is presently closed - no flow. Measurements will start next summer.

Lost River Diversion Channel below Dam:

Miller Hill Pump Plant - According to Abner Bardall and Mike White, from the Water and Power Resources Service, the Miller Hill Pump Plant pumps an average of 35 c.f.s. per day and any excess over that constant amount is spilled back to the Lost River Diversion Channel through the C-4E Drain. Water and Power Resources Service records indicate 35 c.f.s. for periods of pump operation and zero otherwise.

Lost River Diversion Dam release to Lost River Diversion Dam - Water & Power Resources Service -

Headworks Location: SE¼ SW¼, Section 29, T39S R10E.

Gages: See description of Water & Power Resources Service.

Measuring Section: Wooden Walk (cable suspended) located in the NE¼ NE¼, Section 31, T39S R10E, at point where 'C-6' cutoff Canal siphons under Lost River. Key to gates to dam and walkway are on Van keyring. Walkway labeled in feet for measurement. Use canfield reel and 30 lb. weight with standard meter.

Flow Calculation: See description of W.P.R.S.. Call W.P.R.S. for gate openings at date of measurement. It also appears that due to very flat slope in the Diversion Canal, many hours are needed after gate adjustment before flow equalizes at the wooden walkway. It is recommended that prior arrangements be made with the W.P.R.S. (Mike White), 882-7761, extension 361, so they can delay gate adjustment (normally 9:00a.m.), until after the measurement.

Example: Staff gage in reservoir - 4088.67
Well water surface below gates - 4086.48
Single 14' gate open 0.50 others closed

$$Q = .80 \cdot 14 \cdot .50 \sqrt{2g\ (4088.67 - 4086.48)} \cong 66.5 \text{ c.f.s.}$$

Rating Accuracy: Appears poor, probably due to the very flat channel slope. This is verified by Water & Power Resources Service's publications which indicated 'C' values have been very unstable (little correlation with head). Measurements should be made after many hours of stabilizing after a gate change (7:00a.m. is best).

Jim Esget
Field Engineer

9-275-G
11-75

STATE OF OREGON
WATER RESOURCES DEPARTMENT

DISCHARGE MEASUREMENT NOTES

File No. .....
Meas. No. .....
Comp. by JAE
Checked by PFM

Stream Lost River Diversion Channel
Date 11-26, 1980 Party Esget, J.A. (M), Sparks (N)
Width 5.8 Area 1.74 Vel. .592 G. H. — Disch. 1.03
Method 2/8 No. secs..... G. H. change 0 in ..... min. Standard
Method coef. 1.0 Hor. angle coef. 1.0 Susp. coef. 1.0 Meter No. S-68
Date rated 4-11-69
Spin before meas. ✓ after ✓

GAGE READINGS flw abv				
Time		Recorder	~~Inside~~	Outside
			86.43	87.17
0750	Start			
0850	Finish		86.43	87.17
Weighted M. G. H.				
G. H. correction				
Correct M. G. H.				

Wading, cable, ice, boat, upstr., downstr., side bridge 3/4 feet, mile, above, below ~~gage~~ Dam and at syphon

Tags checked .....
Meter suspended ~~from rod~~ cable, or
.5 ft. above bottom 30 lb. ..... weight.
Levels obtained .....

Measurement rated excellent (2%), good (5%), fair (8%), poor (over 8%), based on following conditions: Cross section Concrete
Flow regular Weather Cold, very foggy
Other ..... Air — °F@
Gage — Water — °F@
Record removed ..... Intake flushed U L
Observer .....
Control concrete flume clear
Remarks Gate Opening — 1.1 gate #2 83 cfs
Measurement taken about 2 days after last gate change.
G. H. of zero flow ..... ft.

KBA_APP_000850

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

River at—

Meter 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
	68	1.5	REW	@	0750					0	0
	65	3	2.3	.6	10	45		.514		6.90	3.55
	62	2.5	3.3	.2	15	55	.625	.630		8.25	5.20
				.8	15	54	.636				
	60	2	3.3	.2	15	51	.672	.624		6.60	4.12
				.8	15	60	.575				
	58	2	3.3	.2	15	49	.698	.644		6.60	4.25
				.8	10	39	.589				
	56	2	3.4	.2	15	51	.672	.578		6.80	3.93
				.8	10	48	.483				
	54	2	3.3	.2	15	49	.698	.630		6.60	4.16
				.8	10	41	.561				
	52	2	3.3	.2	15	48	.712	.644		6.60	4.25
				.8	15	60	.575				
⊙	50	2	3.3	.2	15	46	.742	.734		6.60	4.84
				.8	15	47	.727				
	48	2	3.3	.2	15	46	.742	.713		6.60	4.71
				.8	15	50	.684				
	46	2	3.3	.2	15	46	.742	.700		6.60	4.62
			~~3.3~~	.8	15	52	.659				
	44	2	3.3	.2	15	44	.774	.705		6.60	4.65
				.8	15	54	.636				
	42	2	3.3	.2	15	48	.712	.705		6.60	4.65
				.8	15	49	.698				
	40	2	3.3	.2	15	49	.698	.698		6.60	4.61
				.8	15	49	.698				
	38	2	3.3	.2	15	45	.758	.636		6.60	4.20
				.8	10	45	.514				

.80 .85 .90 .92 .94 .96 .97 .98 .99 1.00 .99 .98 .97 .96 .94 .92 .90 .85

.0 .10 .20 .30 .40 .50 .60 .70 .75 .80

.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 of	Area	Discharge
	36	2	3.3	.2	15	50	.684	.639		6.60	4.22
				.8	15	58	.594				
	34	2	3.3	.2	15	57	.604	.576		6.60	3.80
				.8	10	42	.549				
	32	2	3.3	.2	15	57	.604	.599		6.60	3.95
				.8	15	58	.594				
	30	2	3.3	.2	15	58	.594	.530		6.60	3.50
				.8	10	50	.465				
	28	2	3.3	.2	10	46	.503	.432		6.60	2.85
				.8	7	46	.360				
	26	2	3.3	.2	10	53	.440	.472		6.60	3.12
				.8	10	46	.503				
	24	2	3.3	.2	10	50	.465	.484		6.60	3.19
				.8	10	46	.503				
⊙	22	2	3.3	.2	10	45	.514	.520		6.60	3.43
				.8	10	44	.525				
	20	2	3.3	.2	10	48	.483	.498		6.60	3.29
				.8	10	45	.514				
	18	2	3.3	.2	10	42	.549	.507		6.60	3.35
				.8	10	50	.465				
	16	2.5	3.2	.2	10	42	.549	.507		8.00	4.06
				.8	10	50	.465				
	13	3	1.9	.6	7	47		.353		5.70	2.01
	10	1.5	LEW @ 0850							0	0
	58	58								174.25	102.51

.80 .85 .90 .92 .94 .96 .97 .98 .99 1.00 .99 .98 .97 .96 .94 .92 .90 .85

.0 .10 .20 .30 .40 .50 .60 .70 .75 .80

8AM – .8 – 882-7761 Ext 361

Johnny Fisher

9-275-G
11-75

3PM

STATE OF OREGON
WATER RESOURCES DEPARTMENT

File No. .....
Meas. No. .....
Comp. by JAE
Checked by NZR

DISCHARGE MEASUREMENT NOTES

Stream Lost Run Diversion Channel B/w Dam

Date 10 – 9, 1980 Party Esget (M), Sparks (N)

Width 58 Area 178.4 Vel. .598 G. H. ..... Disch. 106.7

Method .2/.8 No. secs. 27 G. H. change — in — min.

Method coef. 1.0 Hor. angle coef. 1.0 Susp. coef. 1.0 Meter No. S-68

Date rated 4-11-69

Spin before meas. ✓ after ✓

Wading, cable, ice, boat, upstr., downstr., side bridge 1/2 feet, mile, above, below gage and from foot bridge at C-G Siphon

Tags checked .....

Meter suspended from rod, or cable

.5 ft. above bottom 30 lb. ..... weight.

Levels obtained .....

GAGE READINGS			below	above
Time		Recorder	Inside	Outside
	Start	4086 52		4088 67
	Finish	4086 48		4088 67
Weighted M. G. H.				
G. H. correction				
Correct M. G. H.				

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

Flow regular Weather Cool, windy

Other ..... Air ..... °F@ .....

Gage ..... Water ..... °F@ .....

Record removed ..... Intake flushed U L

Observer .....

Control .....

Remarks Note gates changed from .80 to .50 at 9 AM – appears to be affecting flow. Measure again another day.

G. H. of zero flow ..... ft.

Computed Q = 66.5 cfs

8866
8655
2 U

6 655

6 55

6 45

6 855

.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
	36	2.0	3.3	.2	15	49	.698	.479		6.6	3.16
				.8	5	47	.260				
	34	2.0	3.4		10	41	.561	.481		6.8	3.27
					7	41	.401				
	32	2.0	3.4		10	40	.575	.520		6.8	3.54
					10	50	.465				
	30	2.0	3.4		15	50	.684	.508		6.8	3.45
					7	50	.333				
	28	2.0	3.4		15	59	.584	.534		6.8	3.63
					10	48	.483				
	26	2.0	3.4		10	43	.536	.500		6.8	3.40
					10	50	.465				
	24	2.0	3.3		10	43	.536	.460		6.6	3.04
					7	43	.383				
⊙	22	2.0	3.4		10	48	.483	.418		6.8	2.84
					7	47	.353				
	20	2.5	3.4		10	53	.440	.345		8.5	2.93
					5	49	.250				
	17	3.0	3.3	.2	10	51	.456	.430		9.9	4.26
				.8	10	58	.404				
	14	3.5	2.5	.6	7	48		.346		8.75	3.03
	10	2.0	LEW @								
	58	58								178.4	106.22

.80 .85 .90 .92 .94 .96 .97 .98 .99 1.00 .99 .98 .97 .96 .94 .92 .90 .85

.0 .10 .20 .30 .40 .50 .60 .70 .75 .80

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

Riverlat—

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	
	68	1.5	RE	W						0	0	
	65	3.0	2.4	.6	10	50		.465		7.2	3.35	.85
	62	2.5	3.4	.2	15	45	.758	.702		8.5	5.97	
				.8	15	53	.647					
	60	2.0	3.5		15	44	.774	.634		7.0	4.44	.90
					10	47	.493					.92
	58	2.0	3.4		15	44	.774	.705		6.8	4.79	.94
					15	54	.636					
	56	2.0	3.4		15	41	.829	.732		6.8	4.98	.96
					15	54	.636					.97
	54	2.0	3.3		15	42	.810	.810		6.6	5.35	.98
					15	42	.810					.99
	52	2.0	3.4		15	39	.868	.798		6.8	5.43	
					15	47	.727					
⊙	50	2.0	3.4		15	39	.868	.840		6.8	5.71	1.00
					15	42	.810					
	48	2.0	3.4		20	50	.904	.759		6.8	5.16	
					15	56	.614					.99
	46	2.0	3.4		20	52	.870	.831		6.8	5.65	.98
					15	43	.792					.97
	44	2.0	3.4		20	52	.870	.791		6.8	5.38	.96
					15	48	.712					
	42	2.0	3.4		20	52	.870	.758		6.8	5.15	.94
					15	53	.647					.92
	40	2.0	3.4		15	46	.742	.658		6.8	4.47	.90
					10	40	.575					
	38	2.0	3.4	.2	15	47	.727	.638		6.8	4.34	
				.8	10	42	.549					.85

.0 .10 .20 .30 .40 .50 .60 .70 .75 .80

Lost River Diversion Dam Release to Diversion Channel

CHAPTER II

Structural, Mechanical and Electrical

A. General

Lost River Diversion Dam (also known as Wilson Dam) is a horseshoe-shaped, concrete, multiple-arch structure with earth embankment wings. The dam was completed in 1912 to provide flood protection for Tule Lake Basin. See Exhibits G and H for plan and sections.

The dam is located in Klamath County, Oregon, on the Lost River in Section 29, Township 39 South, Range 10 East, Mount Diablo Base and Meridian; Latitude: 42°9', Longitude: 121°10'.

The forebay area or reservoir, is known as Wilson Reservoir.

B. Outlet Works

1. Lost River Diversion Channel Headworks (See Exhibits I and J)

   a. There are three 14 foot high by 14 foot wide drum lift radial gates, each hoisted by an electrically powered geared mechanism.

   b. Each gate sill is flush with floor of gateway at Elev. 4079.0.

   c. Gate opening indicator for each gate is calibrated to read vertical opening of gate.

   d. Calculation of discharge through each gate:

      (1) Read the reservoir water surface elevation from the gage on the right abutment of the concrete spillway structure.

      (2) Use the wood staff stored in the car house to determine the water surface elevation in the stilling well at the gage located approximately 50 feet downstream from the headworks on the south side of the channel. The top of the gage is at Elev. 4094.76 feet.

(3) Use the following formula to compute discharge:

$Q = CA\sqrt{2gH}$ where

Q= Discharge in ft.^{3}/sec.

C= Coefficient of discharge - this varies somewhat with head or velocity and gate opening. It may range below 0.70 to above 0.90 in extreme cases. No accurate means of predetermining "C" has been developed. An average value of 0.80 has been used in the past for all heads.

H= Difference between the reservoir water surface elevation and the stilling well water surface elevation measured in feet.

g= 32.2 ft. /sec.^{2}

2. Outlet gate (called 'By-Pass' on drawings)

a. The opening is 4 feet wide by 6 feet high.

b. The gate is rectangular leaf, actuated by a hand-operated screw lift mechnism.

c. The gate is presently not operable and plans are being proposed to renovate it.

d. In the past discharge has been computed by the following methods:

(1) Use conventional formula for submerged orifice

$Q = CA\sqrt{2gH}$ where

Q= Discharge in ft.^{3}/sec.

C= 0.7

A= 4 ft. x S (S= gate opening in feet)

g= 32.2 ft./sec.^{2}

H= Head in feet (difference between vertical distance plumbed to river below dam and water level in gate well).

6-207-

STATE OF OREGON
OFFICE OF STATE ENGINEER
Water Resources Department

Year .....

File No. .....

Discharge measurements of Lost River Diversion Channel below Lost River Diversion Dam, **during the year ending September 30, 19**.....

No.	Date	Made by	Width Feet	Area Sq. ft.	Mean Velocity Ft./Sec.	Gage Height Feet	Discharge C.F.S.	Computed ~~Rating~~ Q Corr.	% diff	Method	Meas. Sum. No.	G. Ht. Chge. Ft.	Time Min.	Temperature Wtr.	Air	REMARKS
	10/9/80	Esget, Sparks					107	See	meas note							Note: Miller Hill Pumping Plant is off. Zero Flow
	11/26/80	Esget Sparks					103	83	19%							Computed C ≅ .97 2 days after gate change

* Geological Survey Engineer

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11-75

STATE OF OREGON
WATER RESOURCES DEPARTMENT

DISCHARGE MEASUREMENT NOTES

File No. .....
Meas. No. .....
Comp. by JAE
Checked by NZR

Stream Lost River at J Canal below dam

Date 10-9, 19 80 Party DWS (N) JAE (M)

Width 51 Area 70.2 Vel. 1.22 G. H. ..... Disch. 85.9

Method .21.8 No. secs. 22 G. H. change — in — min.

Method coef. 1.0 Hor. angle coef. 1.0 Susp. coef. 1.0 Meter No. S-68

Date rated 4-11-69

above

GAGE READINGS				
Time		Recorder	Inside	Outside
		Elev 6.00		
	Start	3.57		
		6.03		
	Finish	3.58		
Weighted M. G. H.				
G. H. correction				
Correct M. G. H.				

Spin before meas. ✓ after ✓

Wading, cable, ice, boat, upstr., downstr., side bridge 100 feet, mile, above, below ~~gage and~~ Dam

20' below Dam

Tags checked .....

Meter suspended from rod, or

..... ft. above bottom ..... lb. ..... weight.

Levels obtained .....

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

Flow ..... Weather Clear warm

Other ..... Air ..... °F@ .....

Gage ..... Water ..... °F@ .....

~~Record removed~~ ..... ~~Intake flushed~~ L

Observer .....

~~4046.02~~ ~~2.32~~

Control ~~4043.70~~

~~S = .39~~ .40

Remarks .....

~~h = 2.12~~

~~Q = 35 + 12.4 = 47.4~~

G. H. of zero flow ~~before~~ ft. after

~~4056.02~~
~~4054.94~~
~~.08~~

#1	#2	#1	#2
.39	.40	.39	.40

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
	5	3.5	RE	W@		1015					
	12	5.0	1.1	.6	5	41		.294			
.97	15	3.5	1.4		7	40		.410	.398	5.50	1.62
	19	3.5	1.15		15	62		.557		4.90	1.95
	22	3.5	.70		30	39		1.71		4.02	2.24
	26	~~3.0~~	.90		20	42		1.07		2.45	4.19
	~~37~~	~~2.5~~	~~1.70~~		~~3~~	~~40~~				2.70	2.89
	28	2.5	1.10		15	48		.712			
	31	3.0	1.70		3	70		.120		2.75	1.96
	34	2.0	1.80		15	43		.992		5.10	.61
	35	1.0	2.20		25	41		1.36		3.60	2.85
	36	1.0	2.15	.6	40	45		1.98		2.20	2.99
	37	1.0	2.65	.2	50	47	2.36	2.14		2.15	4.26
				.8	40	46	1.93			2.65	5.67
⊙	38	1.0	2.60	.2	60	44	3.02	2.54			
				.8	40	43	2.07			2.60	6.60
	39	1.0	2.80	.2	60	42	3.16	2.69			
				.8	40	40	2.22			2.80	7.53
	40	1.0	2.70	.2	60	41	3.24	2.48			
				.8	40	52	1.71			2.70	6.70
	41	1.0	2.50	.6	50	42		2.64			
	42	1.0	2.55	.6	50	46		2.41		2.50	6.60
.96	43	1.0	2.45		50	48		2.31	2.22	2.55	6.15
	44	1.5	2.40		40	41		2.17		2.45	5.44
	46	2.5	1.80		20	39		1.15		3.60	7.81
	49	5.0	1.70		7	54		.311		4.50	5.18
	56	3.5	LE	W@		1050				8.50	2.64
	51	51								0	0
										70.22	85.88

9-275-G
11-75

STATE OF OREGON
WATER RESOURCES DEPARTMENT

File No. .....
Meas. No. .....
Comp. by JAE
Checked by NCR

DISCHARGE MEASUREMENT NOTES

Stream Lost River at Dehlinger Lane

Date 10-9, 1980 Party Esget (M), Sparks (N)

Width 44 Area 92.6 Vel. 1.43 G. H. — Disch. 132

Method .2/.8 No. secs. 23 G. H. change — in — min.

Method coef. 1.0 Hor. angle coef. .98 Susp. coef. 1.0 Meter No. S-68

Date rated 4-11-69

GAGE READINGS				
Time		Recorder	Inside	Outside
1430	Start			
1515	Finish			
Weighted M. G. H.				
G. H. correction				
Correct M. G. H.				

Spin before meas. ✓ after ✓

Wading, ~~cable~~ bridge, ice, boat, ~~upstr.~~, downstr., side bridge ..... feet, mile, above, below gage and from upstream side of bridge on Dehlinger Lane

Tags checked .....

Meter suspended ~~from rod, or~~ cable

5 ft. above bottom 30 lb. ..... weight.

Levels obtained .....

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

Flow regular Weather Sunny, moderate

Other ..... Air ....°F@ .....

Gage — Water ....°F@ .....

..... Record removed ..... Intake flushed U

Observer .....

Control —

Remarks .....

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
	7	1.0	RE	4	@	1430					
.98	9	2.0	1.0	.6	25	43		1.30	1.27	2.0	2.54
.98	11	2.0	1.2		30	43		1.56	1.53	2.4	3.67
.98	13	2.0	1.4		30	41		1.63	1.60	2.8	4.48
.98	15	2.0	1.6		30	40		1.67	1.64	3.2	5.25
.98	17	2.0	1.6		30	40		1.67	1.64	3.2	5.25
.98	19	2.0	1.7		30	41		1.63	1.60	3.4	5.44
.98	21	2.0	1.9		30	40		1.67	1.64	3.8	6.23
.98	23	2.0	2.0		30	39		1.71	1.68	4.0	6.72
.98	25	2.0	2.1		30	39		1.71	1.68	4.2	7.06
.99	27	2.0	2.1		30	41		1.63	1.61	4.2	6.76
.99	29	2.0	2.5	.6	30	45		1.49	1.48	5.0	7.40
.99	31	2.0	3.0	.2	30	39	1.71	1.43	1.42	6.0	8.52
				.8	25	49	1.15				
.99	33	2.0	3.4		40	48	1.86	1.49	1.48	6.8	10.06
					20	40	1.12				
.99	35	2.0	3.5		30	38	1.75	1.38	1.37	7.0	9.59
					20	45	1.00				
.99	37	2.0	3.3		30	39	1.71	1.34	1.33	6.6	8.78
					20	46	.98				
.99	39	2.0	2.8		30	42	1.59	1.33	1.32	5.6	7.39
					20	42	1.07				
.99	41	2.0	2.6	.2	30	45	1.49	1.36	1.35	5.2	7.02
				.8	25	46	1.22				
.99	43	2.0	2.4	.6	25	47		1.19	1.18	4.8	5.66
.99	45	2.0	2.4		20	41		1.10	1.09	4.8	5.23
.99	47	2.0	1.9		20	39		1.15	1.14	3.8	4.33
	49	2.0	1.9		25	47		1.19		3.8	4.52
	51	1.0	1	E	W@	15	15			0	0
.0	4.14	4.24	.30	.40	.50		.60		.70	92.75	139.90

STATION #48
Tule Lake Irrigation District

Tule Lake Irrigation District operates both station #48 and 'J' Canal. During periods when Klamath Irrigation District Canals are in operation (usually early April through middle October), there is seepage gain to the Lost River below the Lost River Diversion Dam from the K.I.D. Canals and from irrigation drainage from those canals. A measurement was made on the Lost River at Dehlinger Lane which is approximately 2-3 river miles downstream of the Lost River Diversion Dam. Flow was measured at about 132 c.f.s.. Another measurement was made at 'J' Canal and one on Lost River below Anderson-Rose Dam. Measurements were made when dam releases from Lost River Diversion Dam to Lost River were steady and Station #48 was closed (no flow). Measurements were made the same day (10-9-80). Flow at 'J' Canal was about 154 c.f.s. and on Lost River was about 86c.f.s.. The only sources of water between these measurements are from Klamath Irrigation District Canals, and there was little irrigation being done on the date of measurement. Gains to the Lost River from K.I.D. Canals between the sites measured should be near maximum during the 1980 irrigation season with samller than normal evaporation losses and near normal canal flows (all K.I.D. Canals were flowing that date). Gains indicated by the measurements were about 154 + 86 - 132 = 108 c.f.s. for these roughly 14 river miles of Lost River between measuring sites. Little if any of the gain should be attributed to precipitation since weather was dry all summer and there were record highs for October a week before measurements were made. Seepage gains from Klamath Irrigation District Canals of the magnitude measured was verified by Tule Lake Irrigation District who said that they had shut off Station #48 because seepage gains in the Lost River below the Lost River Diversion Dam were of sufficient amount to supply the 'J' Canal on that date and had been for a few weeks prior to October 9, 1980.

Jim Esget
Field Engineer

Station 48

4. Discharge through gates can be computed by conventional formula: $Q = CA\sqrt{2gh}$ where
   - A = 14.0 x Gate opening in feet.
   - h = Difference between forebay water elevation and downstream water elevation at stilling well.
   - C = Coefficient of discharge -- This varies somewhat with head or velocity and gate opening. It may range below 0.70 and above 0.90 in extreme cases. No accurate means of predetermining C has been developed. However, see following subpart C for rapid rating measurement procedure.

B. Slope Method--Stage Reading at Each End of 6.35 Mile Reach, C-G and Joe Wright Gages

1. For reasonably accurate and fast measurement of flow in Channel to Klamath River, enter Plate 1 with Elevation of W.S. observed at above staff gages.

2. Chart is most convenient during flood periods when time is short and channel observations have provided the gage readings.

C. Concrete Lined Section at C-G Canal Siphon Crossing

1. Lined section with raised bottom at elevation 4082.96 and walkway is ideal measurement Station.

2. A single depth and single velocity measurement, with meter, can be converted to accurate measurement of total flow.

3. Total flow in cfs = Q = 0.97 AV where
   - A = Water area from table on Plate 2 corresponding to d = depth of water over floor at elevation 4082.96.
   - Area $A = 48d + 1.5\ d^2$.
   - V = Velocity at a point near middle of channel (Measure V at about .6d or at .2d and .8d).

4. For higher velocity flows where depth is difficult to measure, d can be determined by reference to attached Plate 2.

D. TURNOUT AND DROP TO LOST RIVER, STA. 48+00

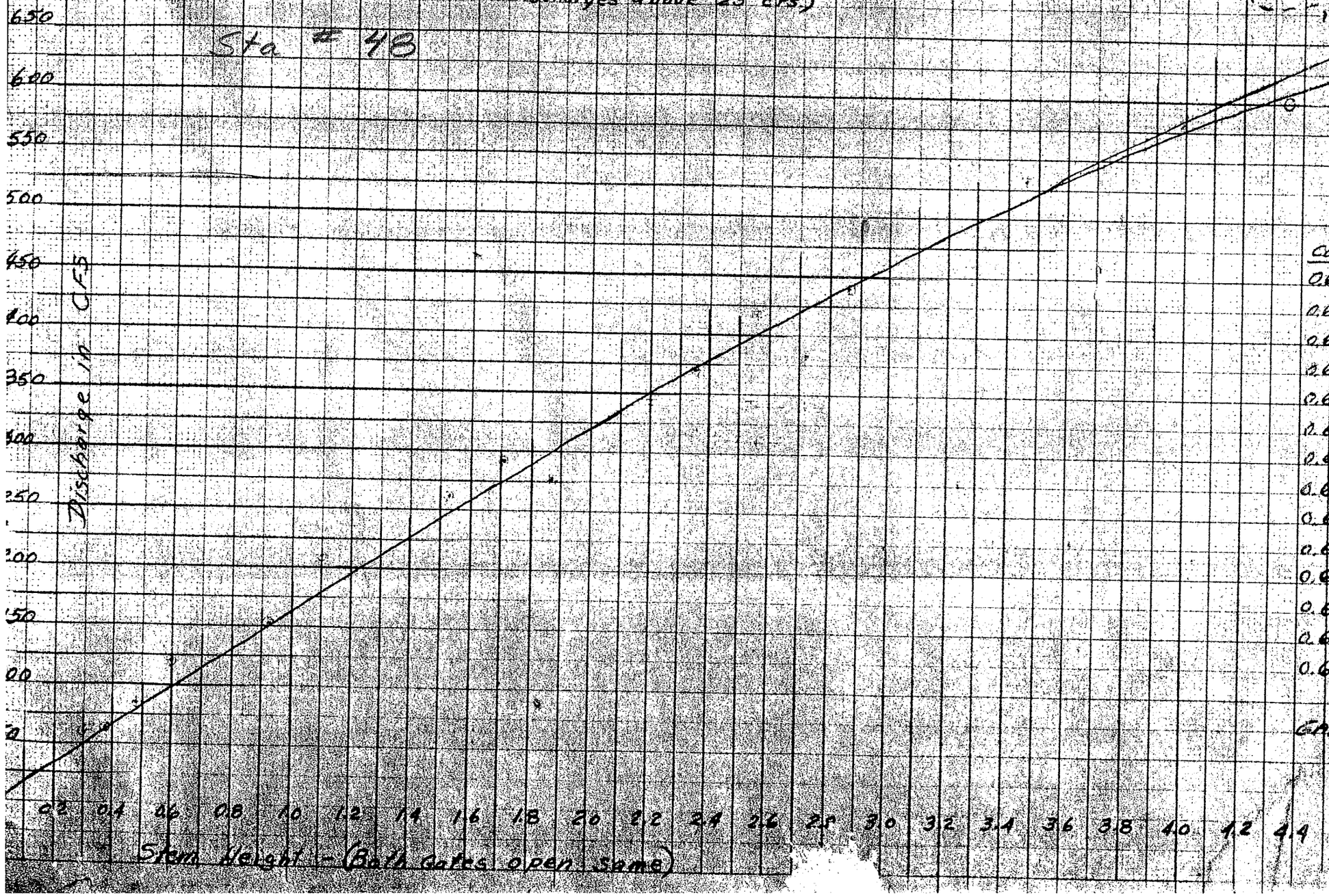
1. Primary point of release to Lower Lost River.

2. Gates - Two rectangular, leaf type over openings 5.0' wide and 5.0' high. Sill at elevation 4075.0.

3. Discharge of each gate computed from formula $Q = CA\sqrt{2gh}$ where A = 5.0 x Gate Opening S measured in feet on Stem (from wheel hub to underside of stop nut) and h is head to middle of gate opening = Gage Reading - 4075.0 - $\frac{1}{2}$ S. For 1968 staff gage location, C varies from 0.64 for small openings to 0.61 at 5.0' opening.

Elev. Gate Sills = 4075.00 (USBR datum)
Elev. Staff Gage-Top = 4089.00 USBR datum
(Both gates to be opened equally for discharges above 25 cfs)

Sta # 48



(Use when releasing amounts to Overspan Channel from

Use lower curve
Total supply of water is Klamath River.

Cd.	CFS	Height of Gate Stem (Feet)
0.64	50	0.31
0.64	100	0.61
0.63	150	0.92
0.63	200	1.23
0.63	250	1.55
0.63	300	1.87
0.62	350	2.20
0.62	400	2.56
0.62	450	2.92
0.62	500	3.33
0.62	550	3.76
0.61	600	4.27
0.61	650	4.94
0.61	656	5.00

TABLE
GATE STEM HT. vs. DISCHARGE
(Approximate)

6-207

STATE OF OREGON

OFFICE OF STATE ENGINEER

Water Resources Department

Year .....

File No. .....

Discharge measurements of Station #48, Power & Water Resources Service, Discharge from Lost River Diversion Channel to Lost River, **during the year ending September 30, 19**.....

No.	Date	Made by	Width Feet	Area Sq. ft.	Mean Velocity Ft./Sec.	Gage Height Feet	Discharge C.F.S.	Rating Corr.	Rating % diff	Method	Meas. Sum. No.	G. Ht. Chgs. Ft.	Time Min.	Temperature Wtr.	Temperature Air	REMARKS
	10/9/80	Esget, Sparks					No Flow									

* Geological Survey Engineer

Station #48, Power and Water Resources Service and Tulelake Irrigation District.

Headworks Location: NE$\frac{1}{4}$, NW$\frac{1}{4}$ SEC31, T39S, R10E

Gages:

VAN BRIMMER CANAL

SMEAD®
No. 1531
UPC 10330
smead.com • Made in USA
MINIMUM 10% POST-CONSUMER RECYCLED CONTENT

VAN BRIMMER CANAL

Klamath Irrigation District

Headworks Location: NW¼ NE¼, Section 3, T41S R10E

Gage: Staff gage on concrete front of headworks. Also one staff gage in each rectangular stilling basin inside concrete front of headworks. Planks on hinge swing up to enable easy reading of inside staff gages.

Headworks: Two eight square foot orifices mounted in concrete front of headworks, with head differential controlled by headgates on two large (30"-36") culvert barrels.

Measurement: Wading 200' below gage with waders and standard meter. One headgate below headworks should be added if flowing.

Computation of Flow: (used equation)

$$Q = .70\ A\sqrt{2\ g\Delta H}$$

Where H = Difference in head through orifice or outstaff reading minus inside staff reading (each barrel).

Error of rated quantity from measured quantity 5%.

STATE OF OREGON
OFFICE OF STATE ENGINEER
Water Resources Department

DISCHARGE MEASUREMENT NOTES

File No. ____
Meas. No. ____
Comp. by JAE
Checked by WZP

Stream VAN BRIMMER CNL
Date 10-6, 1980 Party ESGET M McBAIN N
Width 16.5 Area 34.3 Vel. 1.00 G. H. ____ Disch. 34.4
Method 21.8 No. secs. 29 G. H. change — in ____ min.
Method coef. 1.0 Hor. angle coef. 1.0 Susp. coef. 1.0 Meter No. STAND.
Date rated 4-11-69
Spin before meas. ____ after OK
Wading, cable, ice, boat, upstr., downstr., side bridge ____ feet, mile, above, below gage and ____
Tags checked ____
Meter suspended from rod, or ____
____ ft. above bottom ____ lb. ____ weight.
Levels obtained ____

GAGE READINGS				
Time		Recorder	Inside	Outside
1220	Start			
1310	Finish			
Weighted M. G. H.				
G. H. correction				
Correct M. G. H.				

Measurement rated excellent (2%), good (5%), fair (8%), poor (over 8%), based on following conditions: Cross section UNIFORM Weather SUNNY WARM
Flow ____ Air ____ °F@ ____
Other ____ Water ____ °F@ ____
Gage ____ Record removed ____ Intake flushed U
Observer EQUATION Info. @ 1220 a @ 1310
UPSTREAM H LO 189 " @ "
RO 189 " @ "
Control DOWNSTREAM H LO 173 " @ "
RO 173 " @ "
Remarks LO = Left Orifice
G. H. of zero flow ____ ft.

Computed Q = 18.0 x 2 = 36.0 cfs

9-275-F
4-58

KBA_APP_000870

9-251

STATE OF OREGON
OFFICE OF STATE ENGINEER
Water Resources Department

Year .....

File No. .....

Discharge measurements of Van Brimmer Canal, Klamath Irrigation District

....., *during the year ending September 30, 19*.....

No.	Date	Made by	Width Feet	Area Sq. ft.	Mean Velocity Ft./Sec.	Gage Height Feet	Discharge C.F.S.	Compared Rating Corr.	Compared Rating % diff	Method	Meter No.	Gage Ht. Ft.	Time Min.	Temperature Wtr.	Temperature Air	REMARKS
	10/6/80	Engel [illegible]					34.4	36.0	5%							
	6/18/81	SPARKS					50.1									
	9/28/83	SPARKS					26.2									
	9/10/85	KNAUER WETZEL STUNTEBECK					27.6	27.0	3%							

* Geological Survey Engineer

VAN BRIMMER CANAL

Klamath Irrigation District

Headworks Location: NW¼ NE¼, Section 3, T41S R10E

Gage: Staff gage on concrete front of headworks. Also one staff gage in each rectangular stilling basin inside concrete front of headworks. Planks on hinge swing up to enable easy reading of inside staff gages.

Headworks: Two eight square foot orifices mounted in concrete front of headworks, with head differential controlled by headgates on two large (30"-36") culvert barrels.

Measurement: Wading 200' below gage with waders and standard meter. One headgate below headworks should be added if flowing.

Computation of Flow: (used equation)

$$Q = .70\ A\sqrt{2\ g\Delta H}$$

Where H = Difference in head through orifice or outstaff reading minus inside staff reading (each barrel).

A = 8 square feet.

Example: Outstaff reading 1.89 before and after measurement. Inside reading 1.73 and 1.73 before and after measuring.

$$Q = 2 \times CA\sqrt{2g\Delta H} = 2 \cdot .70 \cdot 8\sqrt{2 \cdot 32.2 \cdot (1.89-1.73)}$$

$$\cong 36.0 \text{ c.f.s.}$$

Rating Accuracy: Coefficient value appears to be good.

Data needed to compute flow - outside staff and two inside staff readings only.

Jim Esget
Field Engineer

Van Brimmer Headgates

Size 8 sq ft ORIFICE (2)

Table 31

$Q = 0.70 A\sqrt{2gH}$.

Head	Cubic Ft. per Sec.	Head	Cubic Ft. per Sec.	Head	Cubic Ft. per Sec
.04	8.9	.26	22.9	.48	31.1
.05	10.0	.27	23.3	.49	31.4
		.28	23.8	.50	31.8
.06	11.0	.29	24.2		
.07	11.9	.30	24.6	.51	32.1
.08	12.7			.52	32.4
.09	13.5	.31	25.0	.53	32.7
.10	14.2	.32	25.4		To be figured
		.33	25.8	Estimated from here.	
.11	14.9	.34	26.2	.55	33.3
.12	15.6	.35	26.6	.60	34.8
.13	16.2			.65	36.3
.14	16.8	.36	27.0	.70	37.8
.15	17.4	.37	27.3	.75	39.2
		.38	27.7	.80	40.6
.16	18.0	.39	28.1	.85	42.0
.17	18.5	.40	28.4	.90	43.4
.18	19.1			.95	44.8
.19	19.6	.41	28.8	1.00	45.2
.20	20.1	.42	29.1		
		.43	29.5		
.21	20.6	.44	29.8		
.22	21.1	.45	30.1		
.23	21.5				
.24	22.0	.46	30.5		
.25	22.5	.47	30.8		

9-275-F
11-75

STATE OF OREGON
WATER RESOURCES DEPARTMENT

DISCHARGE MEASUREMENT NOTES

File No. .....
Meas. No. .....
Comp. by .....
Checked by .....

Stream Van Brimmer Canal
Date 9-28, 1983 Party DWS
Width 15 Area 2.79 Vel. ..... G. H. ..... Disch. 26.2
Method 6 2/8 No. secs. ..... G. H. change .10 in 38 min.
Method coef. ..... Hor. angle coef. ..... Susp. coef. ..... Meter No. SOH1

Date rated .....
Spin before meas. ← after ←
Wading, cable, ice, boat, upstr., downstr., side bridge 200 feet, mile, above, below gage and .....

Tags checked .....
Meter suspended from rod, or .....
..... ft. above bottom ..... lb. ..... weight.
Levels obtained .....

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

Measurement rated excellent (2%), good (5%), fair (8%), poor (over 8%), based on following conditions: Cross section Mud
Flow Uniform Weather Clear warm
Other ..... Air .....°F@
Gage ..... Water .....°F@
..... Record removed ..... Intake flushed U L
Observer .....

Control Ok, Clear
1045 1123
Remarks R.Gate Start 1.36 Finish 1.46
L.Gate Start 1.48 " 1.58
Gage broken & loose O.G. Start .50 " .60
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
	20	.25	REW		@	10:50					
	20.5	.75	1.0		7	51	.319			.75	.240
	21.5	~~1.00~~	1.4		7	46	.352			1.4	.493
	22.5	~~1.50~~ 1.00	1.5		15	39	.856			1.5	1.28
	23.5	~~.50~~ 0.89	2.1		20	46	.968			1.85	1.79
	24.25	.75	2.3		20	43	1.03			1.72	1.77
	25.0	.75	2.4		20	42	1.06			1.8	1.91
	25.75	.75	2.5		25	40	1.38			1.88	2.59
	26.5	.75	2.65		25	43	1.29	1.23		1.99	2.45
					25	47	1.18				
	27.25	.75	2.7		25	42	1.32	1.25		2.02	2.52
					25	47	1.18				
	28.0	.75	2.6		25	42	1.32	1.25		1.95	2.44
					25	47	1.18				
⊙	28.75	.75	2.45		25	45	1.23			1.84	2.26
	29.5	.75	2.25		25	44	1.26			1.69	2.13
	30.25	.75	2.05		25	46	1.20			1.54	1.85
	31.0	.88	1.85		15	46	.731			1.63	1.19
S	32.0	1.00	1.6		15	50	.674		.445	1.6	.71
S	33.0	1.00	1.3		5	48	.247		.163	1.3	.21
S	34.0	1.00	1.1		10	46	.494		.326	1.1	.36
	35.0	.5	REW		@	11:20					
	15.0	15.0								27.6	26.2

.80 .85 .90 .92 .94 .96 .97 .98 .99 1.00 .99 .98 .97 .96 .94 .92 .90 .85

.0 .10 .20 .30 .40 .50 .60 .70 .75 .80

9-275-F
11-75

STATE OF OREGON
WATER RESOURCES DEPARTMENT

DISCHARGE MEASUREMENT NOTES

File No. .....
Meas. No. .....
Comp. by DWS
Checked by NZR

Stream Van Brimmer Canal

Date 6-18, 1981 Party DWS

Width 17.3 Area 47.6 Vel. 1.05 G. H. ..... Disch. 50.1

Method 6.2 & 8 No. secs. 18 G. H. change .06 in 55 min.

Method coef. ..... Hor. angle coef. ..... Susp. coef. ..... Meter No. S-68

Date rated .....

Spin before meas. ✓ after ✓

(Wading), cable, ice, boat, upstr., downstr., side bridge 200 feet, mile, above, (below gage) and .....

(around corner)

Tags checked .....

(Meter suspended from rod), or .....

..... ft. above bottom ..... lb. ..... weight.

Levels obtained .....

GAGE READINGS				
Time		~~Recorder~~	~~Inside~~	Outside
1110			Left	1.97 ±.01
1120	Start		Right	1.76 ±.05
			Front	2.16
1155	Finish			1.91 ±.01
1205				1.63 ±.05
			Front	2.10
Weighted M. G. H.				
G. H. correction				
Correct M. G. H.				

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

Flow Uniform Weather Clear Warm

Other ..... Air .....°F@ .....

Gage ..... Water .....°F@ .....

..... Record removed ..... Intake flushed U .....

Observer .....

Control gates open { Right 1.15 / Left 1.05

Remarks Some grass on bottom of canal

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
	35	.5	LEW @		11	20					
	34	1	1.5	.6	15	40	.849	.849		1.5	1.27
	33	1	2.0	.6	15	41	.829	.829		2.0	1.66
	32	1	2.4	.6	20	40	1.12	1.12		2.4	2.69
	31	1	2.8	.2	30	43	1.56 ~~2.09~~	1.34 ~~1.60~~		2.8	3.75 ~~4.48~~
				.8	20	40	1.12				
	30	1	3.0		30	40	1.67	1.43		3.0	4.29
			3		25	47	1.19				
	29	1	3.2		30	40	1.67	1.44		3.2	4.61
					25	46	1.22				
	28	1	3.3		30	41	1.63	1.39		3.3	4.59
					20	39	1.15				
	27	1	3.5		30	46	1.46	1.26		3.5	4.41
					20	42	1.07				
⊙	26	1	3.7		25	40	1.40	1.14		3.7	4.22
					20	52	.870				
	25	1	3.75		25	43	1.30	.882		3.75	3.31
					10	50	.465				
	24	1	3.8		20	39	1.15	.795		3.80	3.02
					10	53	.440				
	23	1	3.7		20	50	.904	.628		3.70	2.32
					7	47	.353				
	22	1	3.35		20	47	.960	.876		3.35	2.93
					15	43	.792				
	21	1	3.0		20	43	1.05	.921		3.0	2.76
					15	43	.792				
	20	1	2.4	.6	20	45	1.00	1.00		2.4	2.40
	19	1.15	1.9		18	39	.870	.800		2.18	1.90 ~~1.89~~
	17.7	.65	RE W @		1155					~~2.18~~	

.0 .10 .20 .30 .40 .50 .60 .70 .75 .80 .85 .90 .92 .94 .96 .97 .98 .99 1.00 .99 .98 .97 .96 .94 .92 .90 .85

17.3 17.3

47.58 50.13

Error of rated quantity from measured quantity 5%.

9-275-F
4-58

STATE OF OREGON
OFFICE OF STATE ENGINEER
Water Resources Department

File No. .....
Meas. No. .....
Comp. by JAE
Checked by NZR

DISCHARGE MEASUREMENT NOTES

Stream VAN BRIMMER CNL

Date 10-6, 1980 Party ESGET M McBAIN N

Width 16.5 Area 34.3 Vel. 1.00 G. H. ..... Disch. 34.4

Method 2/.8 No. secs. 29 G. H. change ..... in ..... min. STAND.

Method coef. 1.0 Hor. angle coef. 1.0 Susp. coef. 1.0 Meter No. .....

Date rated 4-11-69

Spin before meas. ..... after OK

GAGE READINGS				
Time		Recorder	Inside	Outside
1220	Start			
1310	Finish			
Weighted M. G. H.				
G. H. correction				
Correct M. G. H.				

Wading, cable, ice, boat, upstr., downstr., side bridge ..... feet, mile, above, below gage and .....

Tags checked .....

Meter suspended from rod, or .....

..... ft. above bottom ..... lb. ..... weight.

Levels obtained .....

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

Flow UNIFORM Weather SUNNY WARM

Other ..... Air .....°F@ .....

Gage ..... Water .....°F@ .....

Intake flushed U L .....

Record removed .....

Observer EQUATION Info. @ 1220 & @ 1310

Upstream H LO 189 " @ "

Control RO 189 " @ "

Downstream H LO 173 " @ "

RO 173 " @ "

Remarks .....

LO = Left Orifice

G. H. of zero flow ..... ft.

Computed Q = 18.0 X 2 = 36.0 cfs

18.0 x 2 36 cfs.

KBA_APP_000878

.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°	.50	LEW							0	0	
	4°	1.00	0.80	.6	10	46		.503		.80	.40	.85
	5°	.75	1.25		20	48		.941		.94	.88	
	5.5	.50	1.45		20	43		1.05		.72	.76	
	6°	.50	1.45		20	41		1.10		.82	.90	.90
	6.5	.50	1.8		25	50		1.12		.90	1.01	.92
	7°	.50	2°		20	41		1.10		1.00	1.10	.94
	7.5	.50	2.2		20	41		1.10		1.10	1.21	
	8°	.50	2.4	.6	20	42		1.07		1.20	1.28	.96
	8.5	.50	2.55	.2	25	47	1.19	1.08		1.28	1.38	.97
				.8	20	47	.960					.98
	9°	.50	2.7	.2	25	48	1.17	1.06		1.35	1.43	.99
				.8	20	47	.960					
	9.5	.50	2.85	.2	25	49	1.15	1.06		1.42	1.51	
⊙				.8	20	47	.960					1.00
	10°	.50	3°	.2	25	48	1.17	1.08		1.50	1.62	
				.8	20	45	1.00					
	10.5	.50	3.1	.2	25	50	1.12	1.08		1.55	1.67	.99
				.8	20	43	1.05					.98
	11°	.50	3.2	.2	25	49	1.15	1.06		1.60	1.70	.97
				.8	20	46	.980					.96
	11.5	.50	3.25	.2	20	42	1.07	1.04		1.62	1.68	
				.8	20	45	1.00					.94
	12°	.50	3.2	.2	20	41	1.10	1.08		1.60	1.73	.92
				.8	20	43	1.05					.90
	12.5	.50	3.2	.2	25	49	1.15	1.11		1.60	1.78	
				.8	20	42	1.07					
	13°	.50	3.15	.2	20	41	1.10	1.02		1.58	1.61	.85
				.8	20	48	.941					

.0 .10 .20 .30 .40 .50 .60 .70 .75 .80

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
	13.5	.50	3.1	.2	20	42	1.07	1.01		1.55	1.57
				.8	20	48	.941				
	14.0	.50	3.05	.2	20	40	1.12	1.03		1.52	1.57
				.8	20	48	.941				
	14.5	.50	2.85	.2	20	43	1.05	.99		1.42	1.41
				.8	20	49	.922				
	15.0	.50	2.75	.2	20	42	1.07	.98		1.38	1.35
				.8	20	51	.887				
	15.5	.50	2.5	.6	20	47		.960		1.25	1.20
	16.0	.50	2.25	.6	20	52		.870		1.12	.97
	16.5	.50	2.0	.6	20	45		1.00		1.00	1.00
	17.0	.75	1.65	.6	15	42		.810		1.24	1.00
	18.0	1.25	1.0	.6	10	43		.536		1.25	.67
⊙	19.5	.75	REW							0	0
	16.5	16.5								34.31	34.39

9-275-F
11-75

STATE OF OREGON
WATER RESOURCES DEPARTMENT

File No. .....
Meas. No. .....
Comp. by JW
Checked by SFM

DISCHARGE MEASUREMENT NOTES

Stream VAN BRIMMER CANAL - KID, KLAMATH PROJECT

Date 9-10-85, 19..... Party K-W-S

Width 16.0 Area ~~27.0~~ 26.9 Vel. 1.03 G. H. ..... Disch. ~~27.7~~ 27.6

Method .6 No. secs. 19 G. H. change .06 in 25 min.

Method coef. 1 Hor. angle coef. 1 Susp. coef. 1 Meter No. S-68

Date rated 4-11-69

GAGE READINGS				
Time		~~Recorder~~ UP	~~Inside~~ R+	~~Outside~~ L+
2:00		1.97	1.91	1.92
	Start			
2:25	Finish	2.03		
Weighted M. G. H.				
G. H. correction				
Correct M. G. H.				

Spin before meas. ..... after .....

Wading, cable, ice, boat, upstr., downstr., side bridge 200 feet, mile, above, below gage and .....

Tags checked .....

Meter suspended from rod, or .....

..... ft. above bottom ..... lb. ..... weight.

Levels obtained .....

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

Flow uniform Weather Partially cloudy

Other ..... Air ..... °F@ .....

Gage ..... Water ..... °F@ .....

..... Record removed ..... Intake flushed U L .....

Observer .....

Control HEAD gates ok

Remarks .....

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
	4.0	1.0	REW				0			0	0
	6.0	1.5	1.3	.6	7	46	.360			1.95	0.702
	7.0	0.85	1.7	.6	10	44	.525			1.45	0.759
	7.7	0.7	1.8	.6	15	59	.584			1.26	0.736
	8.4	0.7	1.8	.6	15	48	.712			1.26	0.897
	9.1	0.7	1.9	.6	20	49	.922			1.33	1.23
	9.8	0.7	2.2	.6	20	43	1.05			1.54	1.62
	10.5	0.7	2.3	.6	20	40	1.12			1.61	1.80
	11.2	0.7	2.5	.6	25	46	1.22			1.75	2.14
	11.9	0.7	2.5	.6	25	46	1.22			1.75	2.14
	12.6	0.7	2.5	.6	25	43	1.30			1.75	2.28
	13.3	0.7	2.5	.6	25	41	1.36			1.75	2.38
	14.0	0.7	2.5	.6	25	41	1.36			1.75	2.38
	14.7	0.7	2.3	.6	25	40	1.40			1.61	2.25
⊙	15.4	0.7	2.0	.6	25	43	1.30			1.40	1.82
	16.1	0.7	1.8	.6	25	48	1.17			1.26	1.47
	16.8	0.7	1.6	.6	15	42	.810			1.12	0.907
	17.5	0.85	1.3	.6	20	51	.887			~~1.25~~ 1.10	~~1.44~~ 1.980
	18.5	1.25	1.0	.6	20	52	.870			1.25	1.09
	20.0	0.75	LEW		0	0	0			0	0
	16.0	16.0								~~27.0~~	~~27.7~~
										26.9	27.6

.80 .85 .90 .92 .94 .96 .97 .98 .99 1.00 .99 .98 .97 .96 .94 .92 .90 .85

.0 .10 .20 .30 .40 .50 .60 .70 .75 .80