State of Idaho
DEPARTMENT OF WATER RESOURCES
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C. L. "BUTCH" OTTER
Governor

DAVID R. TUTHILL, JR.
Director

November 27, 2007

Ms. Debbie Suehr
Bureau of Reclamation
1150 N. Curtis Road
Boise, ID 83706

RE: Request under Freedom of Information Act

Dear Debbie:

The Idaho Department of Water Resources requests copies of the following information under the Freedom of Information Act (FOIA):

Minidoka Project, ID-WY, North Side Pumping Division – DPR appendix

- *Project Lands* (June 1952; rev. July 1956) no.1
- *Supplement to Project Lands* (1956)
- *Water Supply Supplemental (1954);* no. 1
- *Supplemental Drainage (1954);* no. 1

Minidoka Project, ID-WY, North Side Pumping Division, *Definite Plan Report, Volume 1, General Plan, February 1955,* Region 1

- Three revision sheets inside

Minidoka Project, ID-WY, North Side Pumping Extension – PFWD appendix

- *Drainage Investigations, Supporting Computations* (December 1974)

Minidoka Project, ID-WY, North Side Pumping Division Extension – Planning Report/Draft EIS

- *Hydrology* (July 1985); no. 1 [include large drawings/maps full size]

Minidoka Project, ID-WY, North Side Pumping Division, *Drainwater Management Plan, Draft Environmental Assessment,* December 1993, PN Region

Minidoka Project, ID, WY, North Side, *Minidoka North Side Resource Management Plan,* January 2005, SRAO (CD version)

If you have any questions, please call me at (208) 287-4841.

430 - Hewitt

United States Department of the Interior

BUREAU OF RECLAMATION

PLANNING FIELD BRANCH
4620 OVERLAND STREET
BOISE, IDAHO 83705

IN REPLY REFER TO: 783

December 13, 1974

BUREAU OF RECLAMATION
FILE COPY
DEC 16 1974
ACTION MADE BY
FILE

Memorandum

To: Regional Planning Officer, Boise, Idaho

From: Chief, Planning Field Branch, Boise, Idaho

Subject: Drainage Investigations, Minidoka Project, North Side Pumping Division Extension

Enclosed are two copies of the subject investigation for your review. We would appreciate your comments and ask that you forward a copy to the Division of Water and Land Operations for their comments as well. Any revisions necessary will be incorporated in the material used in the Alternate Plans Appendix for Minidoka North Side Pumping Division Extension.

We are also sending, under separate cover, the supporting computations for further information. We ask that these supporting computations be returned to us following your review.

W. R. McGregor

Enclosures

CONSERVE AMERICA'S ENERGY

Save Energy and You Serve America!

DRAINAGE INVESTIGATIONS

Supporting Computations

Minidoka North Side Pumping
Division Extension

(DECEMBER 1974)

Please return to Boise Field Branch.

Minidoka Drainage Conference
2/28/75

Dave Gangwer, Bert Malmquist, Vannie Garland, "S" Johnson, John Petersen

(1) Bill Hewitt had voiced the concern to Dave Gangwer that more descriptive materials would be needed if it were to stand alone as an appendix. Maybe include some of the supporting computations in the appended material.

Dave had assured Bill that the drainage work would not be an appendix separate - but would be included in another appendix. This will alleviate at least some of Bills concerns. We will:

(2) (a) put drainage basin boundaries on maps finally used

(b) identify the 50-closed basin drain wells by number on map and indicate total in supporting data.

(c) clarify the discussion of closed basin and other drains - and the differences in the plans

(d) use the data shown in table Dave prepared in our writeup of Summary & Major Accomplishments section of the Alternative Plans Appendix

(2)

(2) ~~with~~ give consideration to recommended changes in text material. Primarily these changes are for the purpose distinguishing between closed basin package and not the outlet dams.

(3) There are some discrepancies in costs for acquiring lands for outlet drains (Devo Lake) — Check to make sure the costs for 245 acres and the acres needed (250?) are the same.
[change Devo Lake lake aquisition lands to 15 acres]

(4) In computing runoff — sometimes we used the total presented irrigated land to figure runoff and in one instance we did not — this discrepancy should either corrected or explained. — Gravity vs sprinkler

BY	DATE	PROJECT	SHEET ____ OF ____
CHKD BY	DATE	FEATURE	
DETAILS			

FEATURE	Plan B Acquire seasonal (July) inundated and seep area	Plan F Exchange "1964 flooded area"
Acres involved	725 1/	6,540 1/
Fed. owned	230	460
Private	495	6,080
Enclosed Basins		
No. wells to close	50	50
Acreage involved (all Private)	250 1/	250 1/
Outlet Drains		
No. wells to close	20	20

DRAIN - AREA	TOTAL ACRES	U.S.	PRIVATE TO ACQUIRE	1964 Flooded	TOTAL EXCHANGE	U.S. OWNED	PRIVATE TO EXCHANGE
C - Deno Lake	50	35	15	646	1400	80	1,320
D - Whittle Lake	45	0	45	422	870	35	835
E - Joe Flood Lake	130	85	45	90	130	85	45
F - Cap Holly	200	60	140	1,401	1,810	60	1,750
H - Coyne Sump	50	50	-	804	1,340	200	1,140
N -				492	740	0	740
TOTAL (Acres)	475	230	245	3,855	6,290 2/	460	5,830

1/ includes seep fring
2/ 5,250 acres gravitly irrigated

BY	DATE	PROJECT	SHEET ____ OF ____
CHKD BY	DATE	FEATURE	
DETAILS			

COST DATA

	Plan B	Plan F
Enclosed Basins –		
250 Ac @ $1200/Ac	$ 300,000	$ 300,000
Acquisition – "C-H" Areas (245 Ac)	294,000	–
Elevate 3.800' of roadway @ $20,000/mile	19,000	19,000
Subtotal	613,000	319,000
+ Contingencies @ 25%	153,300	79,800
Field Costs	766,300	398,800
+ Indirect Costs @ 30%	229,900	119,600
TOTAL COST	996,200	518,400
Closing Drain wells (70 @ $130/well)	9,100	9,100
TOTAL CONST. COST	1,005,300	527,500
ANN. EQUIV.	59,000	31,100
Ann. O & M EST.	35,000	35,000
TOTAL ANNUAL COST		

A&B 498

Acreage Summaries & Criteria Common to Report

SUPPORTING DATA
for
DRAINAGE INVESTIGATIONS

Minidoka Project, Idaho-Wyoming
Minidoka North Side Pumping Division Extension, Idaho

Computations of return flows and the required size of ponds were made using the following criteria:

(1) Assume all drain wells closed.

(2) Assume no reuse of water from Whittle Lake, Joe Flood Pond (end of "E" drain), Cap Holly Lake, and Goyne Sump by MID.

(3) Use average evaporation rate for Minidoka Dam reservoir prior to 1958, i.e., July = .0x12 inches per hour.

(4) Assume seepage losses from drain channels in A&B and MID of .10 inches per hour (based on .12 inch per hour obtained by 40-day submergence tests on similar soils--USBR study).

(5) Assume average width of water surface in drain ditches to equal 5 feet.

(6) Assume return flow from gravity-irrigated lands of .0029 cfs/ac for peak month of July (rate obtained from data in 1963-1968 "Water Use" study on Unit "A" farms--USBR in cooperation with ARS).

(7) Use seepage rate of .2 inch per hour for ponds in small enclosed basins.

(8) Use variable seepage rates of soils in pond areas at end of main drains based on measured data, present use, and characteristics of soils (which resulted in rates of .07 to .5 inch per hour).

(9) Size each pond to control July (peak month) return flows on basis of pertinent evaporation and seepage rates and estimated fringe

seepage area. The effects of siltation upon seepage rates and use of water by tules (cattails) and water grass sedges, etc. were not evaluated.

DG 12/12/74 MINIDOKA
Extension Study

Alt "B" - Acreage Summary of Return Flow Storage Ponds

Area	Size of pond*	Ownership Private**	U.S.
Dero Lake	50	15	35
Whittle Lake	45	45	0
End of "E" Main Drain	130	45	85
Cap Holly Lake	200	140	60
Goyne Sump	50	0	50
	475	245**	230

* Includes the inundated land plus the seepage fringe

Note ** Alt B is a plan to purchase the privately owned lands in the ponded areas and develop the extension tracts for wildlife enchancement and squaring purposes.

* Alt F is a plan "exchange" these private lands for lands in the extension tracts, etc.

DG 5/3/74 MINIDOKA

Rev. 12/5/74

Alt. F- Acreage Summary of Flood Damage Areas

Area	1964 Flood 1/	Total	Ownership Private*	U.S.	Land use 2/ Irrig.	Dry 3/
Deno	646	1,400	1,320	80	890	510
Whittle	422	870	835	35	600	270
"E" Drain	90	130	45	85	55	75
Cap Holly	1,401	1,810	1,750	60	1,380	430
Goyne	804 4/	1,340	1,140	200	945	395
"N" Drain	492	740	740	0	680	60
Total	3,855	6,290	5,830	460	4,550 (700) 5,250	1,740

1/ The acreage affected by the December 1964 flood is based on studies by SCS and USBR.

2/ The land use was measured on 1962 aerial photographs. Since 1962, an estimated 700 acres of dry lands have become irrigated lands

3/ The listed dry lands include the following ponds and acreages: Deno Lake, 30; at end of "E" main drain (Joe Flood Pond), 35; Cap Holly Lake, 50; Goyne Sump, 30 — totalling 145 acres.

Main Drain	Gravity Irrigated Acres	July Return Flows/cfs			Pond	
		Total	Loss	Remainder	Seepage Ac. in./hr	Calc. Size/ Acres
C	8,970	26.01	8.05 1/	17.96	.34 1/	50
D	7,020	20.36	2.1 *	18.26	.50 2/	45
E	3,335	9.67	.62 *	9.05	.07 3/	130
F	16,900	49.01	30.50	18.51 4/	.10 4/	200
Goyne Sump	13,290 5/	36.53	2.75 *	33.78	.67 5/	50

* Evaporation and seepage loss in the conveyance system.

1/ Evaporation and seepage loss in conveyance system = 3.05 cfs; estimated re-use by MID = 5 cfs; and the existing 30 acre Pond has an estimated-computed seepage rate of .34 acre inches per hour.

2/ Estimated on basis of soil characteristics.

3/ Field measurement near 35-acre existing pond.

4/ The measured average daily inflow to Cap Holly Lake during July 1972 was 13.51 cfs, and the estimated inflow of two drain wells in conveyance system is 5 cfs. The calculated return flow into Cap Holly Lake was 19.8 cfs, not including any farm reuse. The seepage rate is based on the assumption that the clay subsoil under present 50-acre lake will not underlay all of the increased ponded area.

5/ Includes 9,300 acres in MID and 3,990 acres in drainage areas of H and K main drains in the A&B District. It was assumed MID would reuse the return flows of J main drain (3.29 cfs) and N main drain (3.08 cfs) and Mr. Patterson (agreement with A&B) would continue to reuse the return flows of I main drain. The existing Goyne Sump pond covers 20 acres, and its computed seepage is 1.0 acre inch per hour. Seepage rate of .5 inches per hour used for increase in size of pond.

Hem[illegible] of Drainage Basins & Data on Irrigation Runoff Rate

C.O.L. 4/12/72 Minidoka Project
Northside Pumping Extension

Project Drainage

The following information was taken from the Contract between the U.S.B.R. and the Minidoka Irrigation District concerning drainage facilities.

	Irrigated Acreage Drained (ac.)				
Drain	Division Dr. Area	Other Dr. Area	Total Irr. Area Dr'd.	MID Accept. Point.	MID Conveyance Facility
B	3,300	—	3,300	"B" enters MID S.28, T.8S., R.25E.	Canal #25
C	9,200	—	9,200	Water enters ch. in S.29, T.8S., R.25E.	Canal #25 S.29, T.8S., R.25E.
F	16,900	3,000	19,900	Cap Hawley Lake S.6, T.9S., R.24E	Canal B-1 & drain wells (4)
H	3,300	—	3,300	Water enters Discharge Channel	Discharge Ch. to Lat. No. 1752 S.8, T.9S., R.2[illegible]
I	770	—	770	Outlet of County Rd. X-ing S.5, T.9S., R.23E.	
J	1400	—	1400	Drain "J" enters pond & "J" Drain Lat. enters 1710	"J" Discharge Ch. to La[illegible] No. 1710, S.12, T.9S., R.22
K	950	—	950	Water enters desilting pond S.11, T.9S., R.22E.	Discharge channel
N	1800	—	1800	Water enters Drain Lat. "O" S.27, T.9S., R.22E	Drain Lateral "N"
O	3700	—	3700	Check in Drain Lat. "O"	Drain Lat. "O" to Canal #20, S.27, T.9S., R.22.
P	220	—	220	Water enters Canal #20	Canal #20
S	1,400 ✓	—	1400	Outlet from Reservoir "S"	Drain Lat. "S" and Canal #20
U	250 ✓	—	250	Water enters Lat. No. 195	Lat. #195
V	400	—	400	Water enters Dist. Main Drain	Dist. Main Drain
Totals	43,590	3000	46,590		

C.O.L. 11/13/72 Minidoka Project
A&B I.D. Unit "A" Return Flow

Farm losses - P.86, Vol. I, Use of Water - Minidoka Project

	1966	1967	1968
Surface R.O. (% of F.D.)	16%	13.6%	17.6%
Total Farm Losses (% of F.D.)	56.3%	59.0%	57.0%
Surface R.O. as % of total farm losses	28.4%	23.1%	30.9%

Minidoka Unit "A" Efficiencies - P. 104, 105, 106, Vol. I., Use of Water - Minidoka Project.

	1966		1967		1968	
	Total farm loss A.F.	Surface R.O. by above %	Total farm loss A.F.	Surface R.O by above %	Total farm loss A.F.	Surface R.O by above %
A	503.29	142.93	118.87	27.46	503.94	155.72
M	4807.17	1365.24	2873.45	663.77	4,503.78	1391.67
J	5562.48	1579.74	3865.85	893.01	4,952.36	1530.28
J	6943.73	1972.02	8366.96	1,932.65	8,254.81	2550.74
A	4712.65	1338.39	6807.59	1,572.55	3,620.88	1,118.85
S	1716.36	487.45	3178.65	734.27	2,166.82	669.55
O	580.15	164.76	870.60	201.11	695.58	214.93
Total	24,825.83		26,081.47		24,698.17	

C.D.L. 11/14/72 Minidoka Project

A&B I.D. - Unit "A" Return Flow

On Farm Surface Run Off plus Operational Waste

1966 - 13,551 irrigated ac.

① Month and days of operation		② Farm R.O. (Sheet #1) AF	③ Op. Waste (p. 104,5,6 Vol. I.) AF	④ Column 4=2+3	⑤ Total R.O. cfs	⑥ Total R.O. cfs/irr. ac.	⑦ R.O. 1cfs/
A	15	142.93	153.03	295.96	9.95	.0007	
M	31	1,365.24	276.53	1641.77	26.70	.0020	
J	30	1,579.74	182.47	1762.21	29.62	.0022	
J	31	1,972.02	276.55	2248.57	37.79	.0028	
A	31	1,338.39	335.51	1,673.90	27.22	.0020	
S	30	487.45	322.86	810.31	13.62	.0010	
O	15	164.76	127.34	292.10	9.82	.0007	

1967 - 13,532 irrigated ac.

A	15	27.46	25.56	53.02	1.78	.0001
M	31	663.77	199.46	863.23	14.04	.0010
J	30	893.01	216.99	1,110.00	18.65	.0014
J	31	1,932.65	224.98	2157.63	35.09	.0026
A	31	1572.55	254.78	1827.33	29.72	.0022
S	30	734.27	220.49	954.76	15.54	.0011
O	15	201.11	114.78	315.89	10.62	.0008

1968 - 13,570 irrigated ac.

A	15	155.72	113.67	269.39	9.05	.0007
M	31	1391.67	258.69	1650.36	26.84	.0020
J	30	1530.28	306.58	1836.86	30.87	.0023
J	31	2550.74	231.13	2781.87	45.24	.0033
A	31	1,118.85	231.63	1350.48	22.70	.0017
S	30	669.55	267.14	936.69	15.74	.0012
O	15	214.93	188.86	403.79	13.57	.0010

	3yr. avg.	
A	.0005	2000 ac.
M	.0017	588 ac
J	.0020	500 ac.
J	.0029	345 ac.
A	.0020	500 ac
S	.0011	909 ac.
O	.0008	1250 ac.

C.O.L. 11/14/72 Minidoka Project
A&B I.D. - Unit "A"

On Farm Surface Runoff.

1966 - 13,551 irrigated acres

Month & days of operation		Sur. R.O. from Sheet #1 A.F.	Sur. R.O. cfs	Sur. R.O. cfs/irr. ac.	Sur. R.O. 1 cfs/
A	15	142.93	4.80	.0004	2500 ac.
M	31	1,365.24	22.20	.0016	625 ac.
J	30	1,579.74	26.55	.0020	500 ac.
J	31	1,972.02	32.07	.0024	417 ac.
A	31	1,338.39	21.76	.0016	625 ac.
S	30	487.45	8.19	.0006	1667 ac.
O	15	164.76	5.54	.0004	2500 ac.

1967 - 13,532 irrigated acres

A	15	27.46	0.92	.00007	14,285 ac.
M	31	663.77	10.79	.0008	1,250 ac.
J	30	893.01	15.01	.0011	909 ac.
J	31	1932.65	31.43	.0023	435 ac
A	31	1572.55	25.57	.0019	526 ac.
S	30	734.27	12.34	.0009	1,111 ac.
O	15	201.11	6.76	.0005	2,000 ac.

1968 - 13,570 irrigated acres

A	15	155.72	5.23	.0004	2500 ac.
M	31	1391.67	22.63	.0017	588 ac
J	30	1530.28	25.72	.0019	526 ac.
J	31	2550.74	41.48	.0031	323 ac.
A	31	1,118.85	18.19	.0013	769 ac.
S	30	669.55	11.25	.0008	1250 ac
O	15	214.93	7.22	.0005	2000 ac.

	3yr. totals	1 cfs/ ___ ac. 3yr. average
A	19,285	6,428
M	2,463	821
J	1,935	645
J	1,175	392
A	1,920	640
S	4,028	1,343
O	6,500	2,167

A&B 509

Computations – Return Flows

D.G 12/2/74 Minidoka 1 2

Extension Lands

Sizing of storage pond for irrigation Run-off

"C" Main Drain

Maximum Ponded, measurement on contact print photo = 33.5 acres

Wetted Area of drains
= 44.5 mi × 5280' × [4' wide + 2(0.5)]
= 1,174,800 ft²
= 27.0 Acres

Total Existing area available for seepage & evapotation
33.5 + 27.0 = 60.5 Acres

There are two drains wells in small inclosed basins (approx 250 Acres) and three drain wells on main system. Most lands above the A&B District are sprinkler irrigation and irrigation runoff is estimated to equal that of the small inclosed basins

∴ Total Areas irrigated = 8970 Acres
X July (peak mo.) return flow = .0029 Cfs/Ac
= 26.01 Cfs

Evaporation & seepage of drains
= .012 + .10 = .112
= 27 X .112 = 3.024 Ac in/hr
= 3.024 X 1.0083 = 3.05 Cfs

Evoporation of Pond
= 33.5 X .012 = .402 Ac in/hr
.402 X 1.0083 = .41 Cfs

Remaining Return Flow subject to seepage, etc
26.01 − (3.05 + .41) = 22.55 Cfs
Estimated inflow of 3 drain wells = 6 Cfs
Estimated Reuse by MID = 5 Cfs
∴ 22.55 − 11.0 = 11.55 Cfs Seepage by 33.5 Ac
= 11.55 X .9917 = 11.47 Ac in/hr
∴ Pond seepage = 33.5 ÷ 11.47 = 0.34 IRH

Increase Needed in size of pond
= 6 cfs X .9917 = 5.95 Ac in/hr

"C" Main Drain

Required size of Pond (Rounded)
Existing size = 30.0
Increase size = 20.0 (15Ac Private, 5Ac. U.S.)
Total = 50.0

D.G. 12/2/74 MINIDOKA

Extension Lands Study

Sizing of storage pond for Irrigation Run-off

"D" Drain

wetted area of drains
= 30.75 mi. x 5280' x [4' wide + 2(0.5)]
= 811,800 ft²
= 18.6 Acres

Total Area available for seepage & evaporation
= 18.6 Ac

Drainage Area Acreage in A&B Dist
Total = 9920
Dry = - 750
Sprinkler Irrig = -1980
Enclosed basin = - 170
∴ Gravity Irrig = 7020

There are five drain wells on the drainage system of the 7020 acres and and the reuse of waste water is unknown

Total acres gravity irrigated = 7020 Acres
x July (Peak mo.) runoff flow = .0029 cfs/Ac
= 20.36 cfs

Evaporation + Seepage = .012 + 0.10 = 0.112
= 18.6 x 0.112 = 2.083 Ac in/hr
= 2.083 x 1.0083 = 2.10 cfs

Remaining Return Flow subject to Seepage & Evaporation
= 20.36 - 2.10 = 18.26 cfs
= 18.26 x .9917 = 18.11 Ac in/hr

Estimated seepage (IRH) of Whittle Lake soils and evaporation = 0.50 Ac in/hr
∴ 18.11 ÷ 0.5 = 36.2 Ac need for reservoir

Fringe seepage and rounding = 50 acres
required storage pond

DG 11/17/74 | MINIDOKA
Extension Lands

Sizing of Storage Pond (Joe Flood Pond)

"E" Main Drain

Maximum ponded, measurement on aerial photo
= 36.8 acres

Wetted area of drains
= 9.0 mi X 5280' X [4' Wide + 2(0.5)]
= 237600 ft^2
= 5.5 acres

Total area available for seepage and evaporation
= 36.8 + 5.5 = 42.3

There are three drain wells (one not used, one receives runoff from 20 acres, and the other in full use) and one Known drain water right for 80 acre feet.

Total acres irrigated = 3335
X July (peak mo) return Flow = .0029 cfs/Ac
= 9.67 cfs

Evaporation + IRH = .012 + .10 = .112
= 5.5 X .112 = .616 Ac in/hr
= .616 X 1.0083 = 0.62 cfs

Remaining Return Flow subject to Seepage & Evp.
= 9.67 - 0.62 = 9.05 cfs
= 9.05 X .9917 = 8.98 Ac in/hr

Field Determined Perm. Rate & Sizing
= 0.07 in/hr Field test on surface
= 8.98 ÷ (.07 + .012) = 109.5 Ac. Needed

Potential area to elev. 4118" = 118.6 acres

Ownership of 109.5 Acres
US 71.3 Acres
Joe Flood 38.2 Acres*

* Squaring Fields fringe seepage will increase acreage to 130 Ac

DG 11/25/74 MINIDOKA 1 2

11/25/74 Extension Lands

Sizing of Storage Pond (Cap Holly Lake)

"F" Main Drain

Maximum Existing Ponded Area
6 Small reservoirs = 8.8 Acres
Cap Holly Lake = 50.0 "

Wetted area of drains
= 60 mi X 5280' (4' wide + 2 (0.5)
= 1,584,000 ft²
= 36.4 Acres

There are two drain wells, a pump relift station and an unknown number of on-farm reuse systems

Total acres irrigated on Unit "B" = 16,900
X July (Peak month) return flow = .0029 cfs/Ac
= 49.01 cfs

Evaporation & Seepage Loss above Cap Holly Lake
Evaporation = .012"/hr X 452 = .5424 Ac in/hr
= .5424 X 1.0083 = .547 Cfs
Seepage = .10"/hr X 452 = 4.52 Ac in/hr
= 4.52 X 1.0083 = 4.56 Cfs

Relift Pump station = 24.1 cfs computed on April 15 - July 15, 1972 record

Two drain wells inflow = 5.0 estimated

Unit "B" Return Flow = 49.01 cfs
Return Flow Above B = 5.00 cfs, estimated
Total = 54.01

Loss Above Cap Holly
Evaporation = .55 cfs
Seepage = 4.56 cfs
Relift = 24.1
Drain wells inflow = 5.0
Total = 34.21

Remaining Return Flow subject to Seepage and Evaporation in Cap Holly Lake
= 19.8 cfs - Reuse on private farm systems
13.51 cfs Measured, July 1972.

D.G. 11/25/74 MINIDOKA 2 2

Extension Lands

Sizing of Storage Pond, Cap Holly Lake

Return Flow, from Unit "B", Subject to Seepage and Evaporation in Cap Holly Lake

= 13.51 Cfs Measured avg. daily use July 1972
5.0 Cfs Estimated inflow to two drain wells
18.51 Cfs

Computed size of Flooding - Cap Holly Lake
= 18.51 cfs x .9977 = 1835.64 AC in/hr
Est IrH = 0.10" and evaporation = .012"
∴ 18.36 ÷ .112 = 163.9 acres required
+ fringe seepage = 200 Acres

DG 11/26/74 MINIDOKA

Extensions Lands

Sizing of Storage Pond (Goyne Sump)

"H" Drain

Maximum ponded area, measured photos

Tract #5, unit "B" = 2.3 Acres

Goyne Sump, MID = 30.0 Acres

Wetted area of drains

= 16.5 mi X 5280' X [4' wide + 2(0.5)]

= 435,600 ft² = 10.0 acres

There are two drain wells on "H" drain which disposed of Irrigation runoff water.

Total areas on unit "B", "H" drain area

= 3,300 = 450 dry + 2850 irrigated ?

X July (~~peak mo.~~) ~~return~~ flow = .0029 cfs

= 7.56 cfs

2,850
.0029
+ 8.265 cfs (?)

Evaporation + seepage on drains & pond above Goyne

= 12.3 acres X (.012 + .10) = 1.3776 Ac in/hr

= 1.3776 X 1.0083 = 1.39 CFS

Remaining Return Flow Into Goyne Sump

= 7.56 - 1.39 = 6.17 CFS

= 6.17 X .9917 = 6.12 Ac in/hr

~~Estimated Permeability Rate of Goyne Sump~~

Note: "H" drain is not spilling any irrigation runoff water into Goyne Sump. The 30 acre pond and its drain well is serving only the MID drainage area

3,300. ×
29. =
95,700.0000 *

29. ×
2,850. =
82,650.0000 *

D.G 11/27/74 MINIDOKA
Extension Lands

Check On Permeabilities

"I" Main Drain

Maximum Ponding Area, measured on contact print photo = 1.5 acres

Wetted Area of Drains
= 1.8 mi × 5280' × [4' wide + 2(0.5)]
= 47,520 ft²
= 1.1 Acres

Total area available for seepage and evaporation
= 1.5 + 1.1 = 2.6 acres

There are no known drain wells or reuse of return flows in the drainage area

Total acres irrigated = 540

July (peak Mo.) return flow = .0029 cfs/Ac
= 1.57 cfs

Evaporation loss = .012 in/hr
= 2.6 × .012 = .0312 Ac in/hr
= .0312 × 1.0083 = .031 cfs

Remaining Return Flow subject to seepage
= 1.57 − .03 = 1.54 cfs
= 1.54 × .9917 = 1.54 Ac in/hr

Computed Permeability Rate
= 1.54 ÷ 2.6
= 0.59 in/hr

Note: The pond is near the south edge of the SW4 Sec 5-9S-23E on private property. There is an agreement with owner to handle the runoff water. (A & B vs Patterson)

DG 12/6/74 MINIDOKA
Extension Lands

Irrigation Runoff
"J" Main Drain

Pond on Unit "B" estimated size = 2.0 Acres

Wetted Area of Drains
= 8 mi. X 5280' X [4' Wide + (2 X 0.5)]
= 211,200 ft²
= 4.8 Acres

Total Existing Area available for seepage & evaporation
= 2.0 + 4.8 = 6.8 acres

There is one drain well & MID reuse the remainder of runoff.

Total area irrigated = 1400 Acres
X July (peak mo) return flow = .0029 cfs/Ac
= 4.06 cfs

Evaporation & seepage of drains & pond
= .012 + 0.10 = .112 Ac in/hr
= 6.8 X .112 = .7616 Ac in/hr
= .76 X 1.0083 = .77 cfs

Remaining Return flow available for reuse (MID) or Goyne Sump
= 4.06 - .77 = 3.29 cfs

∴ In this study it was assumed MID would use the available return flow (3.29 cfs)

DG 12/3/74 MINIDOKA

Extension Lands

Irrigation Runoff into Goyne Sump

"K" Main Drain

Maximum Ponded, measurement on L.C. sheet = 2.4 acres

Wetted area of drains to MID drain
= 4 mi X 5280' X [4' wide + 2(0.5)]
= 105,600 ft²
= 2.4 Acres

Total existing area available for seepage & evaporation
= 2.4 + 2.4 = 4.8 acres

There is one drain well and no known reuse of return flow in drainage area

Total area irrigated = 690 Acres (dry = 60 Ac.)
X July (peak mo.) return flow = .0029 cfs/ac
= 2.0 cfs

Evaporation & seepage of drains & pond
= .012 + .10 = 0.112
= 4.8 X .112 = 0.5376 Ac. in/hr
= 0.54 X 1.0083 = 0.54 cfs

Remaining return flow via D-9E to Goyne Sump
= 2.0 − 0.54 = 1.46 cfs

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Extension Lands

Irrigation Runoff into Goyne Sump
"N" Main Drain

Maximum Ponded, Measurements on L.C sheet and aerial photo = 2.6 + 2.7 + 2.0 = 7.3 Acres

Wetted area of drains.
= 5.5 in A&B + 2.0 MID to reach Goyne Sump drain = 7.5 Mi
= 7.5 Mi X 5280 X [4' Wide + 2.0(0.5)']
= 198,000 ft²
= 4.5 Acres

Total area available for seepage & evaporation
= 7.3 + 4.5 = 11.8 Acres

There is No Known reuse in A&B District but MID reuses all return flow except inflow of one drain well

Total area irrigated = 1520 Acres (dry = 600 Ac)
X July (Peak mo.) return flow = .0029 cfs/ac.
= 4.41 cfs

Evaporation & seepage of drains and ponds
= .012 + .10 = .112 Ac in/hr
= 11.8 X .112 = 1.3216 Ac in/hr
= 1.32 X 1.0083 = 1.33 cfs

Remaining return flow for reuse, etc.
= 4.41 - 1.33 = 3.08 cfs

In this study it was assumed MID would reuse the return flows of "N" main drain

DG 12/3/74 MINIDOKA
Extension Lands

Sizing of storage required for A&B Return Flow in Goyne Sump

Goyne Sump

Return Flow from A & B
= 6.17 cfs from "H" Main Drain
= 1.46 cfs from "K" Main Drain
7.63 cfs, total

Return Flow from MID
1) Total area irrigated = 9300 Acres
X July (Peak mo) return flow = .0029 cfs/Ac
= 26.97

2.) - Evaporation and seepage of wetted area of drain
12 mi X 5280 X [4' + 2(0.5)] = 316,800 ft²
= 7.3 Acres
= 7.3 X .112 = 0.8176
= 0.8176 X 1.0083 =
= .82 cfs

3.) Return reaching Goyne sump
= 26.97 - .82
= 26.15 cfs reflow into Goyne sump (20 acre pond and one drain)

(1) Evaporation of Goyne Sump
= 20 X .012 = .24 Ac in/hr
= .24 X 1.0083 = .24 cfs

(2) MID - Return Flow to Goyne Sump available for seepage & drain well
= 26.15 - .24 = 25.91 cfs
25.91 - 5.91 (estimated inflow to drain well)
= 20 cfs

(3) ∴ computed perm. rate of Goyne Sump
= 20 cfs X .9917 = 19.83 Ac in/hr
20 Ac ÷ 19.83 = 1.01 Ac in/hr

Increase size to store return flow from A&B
= 7.63 cfs X .9917 = 7.57 Ac in/hr
∴ 7.57 ÷ 1.01 = 7.5 Acres

Ponded Area - Enclosed Basins

7-1654 (7-73)
Bureau of Reclamation

COMPUTATION SHEET

BY RJJ	DATE 12-74	PROJECT Minidoka	SHEET ____ OF ____
CHKD BY	DATE	FEATURE NSPD Extension	
DETAILS Assumptions used to determin Pond size.			

Enclosed Basins.

Ponded areas formed by closing drain wells in enclosed basins were determined using Darcy's Law $Q = KiA$ or $Q = K\frac{H}{L}A$

Sence $H = y + L$ this equasion can be written $y = \frac{QL}{KA} - L$

Assuming static conditions with constant flow "Q" and constant Area "A", the differential depth with respect to time is equal to 0.

i.e. $\frac{dy}{dt} = 0 = \frac{QL}{KA} - L$

or $A = \frac{Q}{K}$

The following table lists ponded areas computed on this basis. Q was estimated to be 0.0029 cfs per acre. and K was estimated at 0.2 in/hr.

7-1654 (7-73)
Bureau of Reclamation

COMPUTATION SHEET

BY	DATE	PROJECT	SHEET ___ OF ___
RYJ	12-3-74	Minidoka	
CHKD BY	DATE	FEATURE	Ac x .0029 = Q
		NSPD Ext.	
DETAILS			Q ÷ .200376 = Ar
Closing of Drain wells Enclosed Basin			

Well Number	Contributing Area	Q	Pond Area
1 34 CD 823	278 Acres	0.81 cfs	4.04 Acres
2 21 AD 823	738 "	2.14 "	10.68 "
3 10 CD 823	66 "	0.19	0.96 "
4 22 ED 823	93 "	0.27	1.35
5 28 AD 823	360 "	1.04	5.21
6 23 AD 824	441 "	1.28	6.38
7 28 BD 823	155	0.45	2.24
8 22 AD 823	344	1.00	4.98
9 26 BD 823	212	0.61	3.07
10 35 BD 823	178	0.52	2.58
11 8 AD 823	255	0.74	3.69
12 10 DD 823	76	0.22	1.10
13 26 AD 823	380	1.10	5.50
14 9 BD 823	298	0.86	4.31
15 25 BD 823	73	0.21	1.06
16 34 AD 823	145	0.42	2.10
17 27 BD 823	350	1.02	5.07
18 34 BD 823	153	0.44	2.21
19 14 AD 823	180	0.52	2.61
20 22 BD 823	270	0.78	3.91
21 26 CD 823	336	0.97	4.86
22 26 DD 823	337	0.98	4.88
23 25 CD 823	334	0.97	4.83
24 35 AD 823	194	0.56	2.81
25 34 DD 823	224	0.65	3.24
26 2 AD 923	392	1.14	5.67
27 10 AD 823	81	0.23	1.17
28 10 BD 823	191	0.55	2.76
29 4 AD 823	163	0.47	2.36
30 5 AD 823	172	0.50	2.49
31 22 DD 823	87	0.25	1.26
32 25 AD 823	334	0.97	4.83
33 32 AD 725	147	0.43	2.13
34 3 AD 825	No Log for well		
35 19 AD 825	265	0.77	3.84
36 13 AD 824	237	0.69	3.43
37 25 CD 824	354	1.03	5.12
38 28 AD 824	268	0.78	3.88
39 31 AD 824	40	0.12	0.58
40 14 BD 823	132	0.38	1.91

7-1654 (7-73)
Bureau of Reclamation

COMPUTATION SHEET

BY	DATE	PROJECT	SHEET ____ OF ____
CHKD BY	DATE	FEATURE	
DETAILS			

41	9 AD 823	127	0.37	1.84
42	22 CD 823	77	0.22	1.11
43	29 AD 823	No Log for Well		
44	17 AD 922	526	1.53	7.61
45	26 AD 922	293	0.85	4.24
46	33 AD 922	212	0.61	3.07
47	10 AD 1022	195	0.57	2.82
48	3 AD 1022	65	0.19	0.94
49	13 AD 1021	914	2.65	13.23
50	22 FD 823	270	0.78	3.91
				173.87

Avg 3.62 Ac/pond.
surface Area.

Used 5 Acres per well assuming 1.4 Ac of waterlogged fring area.

Cost Estimates.

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COMPUTATION SHEET

BY RJJ	DATE 12-74	PROJECT Minidoka	SHEET ___ OF ___
CHKD BY	DATE	FEATURE NSPD Ext.	
DETAILS Unit Prices			

Land Value.

As per telephone conversation with Lord Ericson on 12-4-74

Current Land values for irrigated land around Minidoka. Area.
$1000/Acre plus 20% for severance

Road Elevating.

Assumed $20,000/mi

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COMPUTATION SHEET

BY RJJ	DATE 12-74	PROJECT Minidoka	SHEET ___ OF ___
CHKD BY	DATE	FEATURE NSPD Extension	
DETAILS Unit Prices			

Well Closure.

The following information was taken from Garry Burwell's notes (former Civil Engineer with Planning Field Branch currently retired.)

Dept. of Water Administration furnished the following information:

Estimated cost of closing an inverted drainage well is $100.

Casing would be plugged at 18' level and filled with concrete. Some wells might require sealing on the outside of the casing and increase the cost accordingly.

This price was assumed to be July 72 price level as per other computations involved.

indexed to Oct 74

$100 \times 1.78/1.39 = \$128$ /well

used $130 /well

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COMPUTATION SHEET

BY	DATE	PROJECT	SHEET ___ OF ___
RJJ	12-74	Minidoka	
CHKD BY	DATE	FEATURE	
		NSPD Extension	
DETAILS			
Cost Estimate			

Drainage Plan for Alternate "B"

Aquisition of seepage pond R.O.W. ($1000/Ac + 20% severance)

Deno Lake	20 Ac @ $1200/Ac	=	$24,000
Whittle Lake	45 Ac @ "		54,000
"E" Drain	45 Ac @ "		54,000
Cap Holly Lake.	140 Ac @ "		168,000
Goyne Sump.	-o-		-o-
Enclosed Basins	250 Ac @ $1200/Ac		300,000
	Total R.O.W.		$600,000

15 Ac noted elsewhere

Elevate 650' roadway (Goyne Sump Area) @ $20,000/mi	7,000
Elevate 3150' roadway (Cap Holly Area) @ $20,000/mi	12,000
Sub Total	$619,000
Contingencies 25%	154,800
Field Cost	$773800
Indirect Cost 30%	232,200
Total Cost - Ponds.	1006,000
Closing drain wells 70 @ $130/well (Lump Sum)	9100
Total Construction Cost	1015,100
Annual Equivalent (.0589455)	60,000
Annual O&M est. @	35,000
[illegible]	$95,000

7-1654 (7-73)
Bureau of Reclamation

COMPUTATION SHEET

BY	DATE	PROJECT	SHEET ___ OF ___
RYJ	12-74	Minidoka	
CHKD BY	DATE	FEATURE	
		NSPD Extension	
DETAILS			
Cost Estimate.			

Drainage Plan Alternative "F"

Elevate 650' of roadway (Goyn Sump Area) @ $20,000/mi		$7000
Elevate 3150' of roadway (Cap Holly Area) @ $20,000/mi		12.000
Sub Total		19.000
Contingencies	25%	4.800
Field Cost		23,800
Indirect Cost	30%	7.200
Total Cost - ponds.		31,000
Capping Drain Wells 70 @ $130/well (Lump Sum)		9,100
Total Construction Cost		40,100
Acquire [illegible] 250 Ac @ $1200/Ac w/ 25% Contingencies + 30% Indirect		487,500
Annual Equivalent (.0589455)		~~2,400~~ 31,100.
Annual O&M est @		35,000
Total Annual Cost		~~$31,400~~ 6,[illegible]500

527,600
.58 9455

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